Prescribing for older people with chronic & complex health needs: How Veterans' MATES may assist

V Tammy s 47F Natalie s 47F J Simon s 47F Andrew L s 47F
John D s 47F Nicole L s 47F Graeme s 47F Elizabeth E s 47F

Veterans' MATES

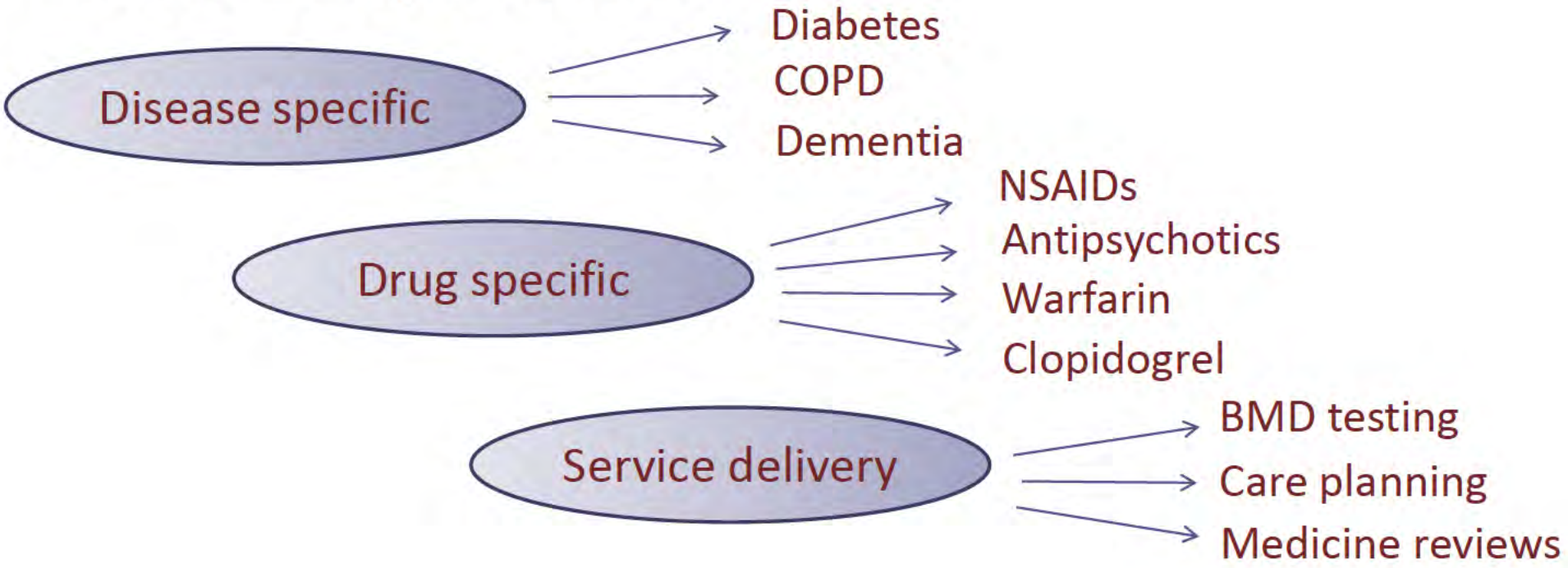
UniSA | Sansom Institute for Health Research

What is Veterans' MATES?

Veterans' MATES improves the health of the veteran community by providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team

The Veterans' MATES approach

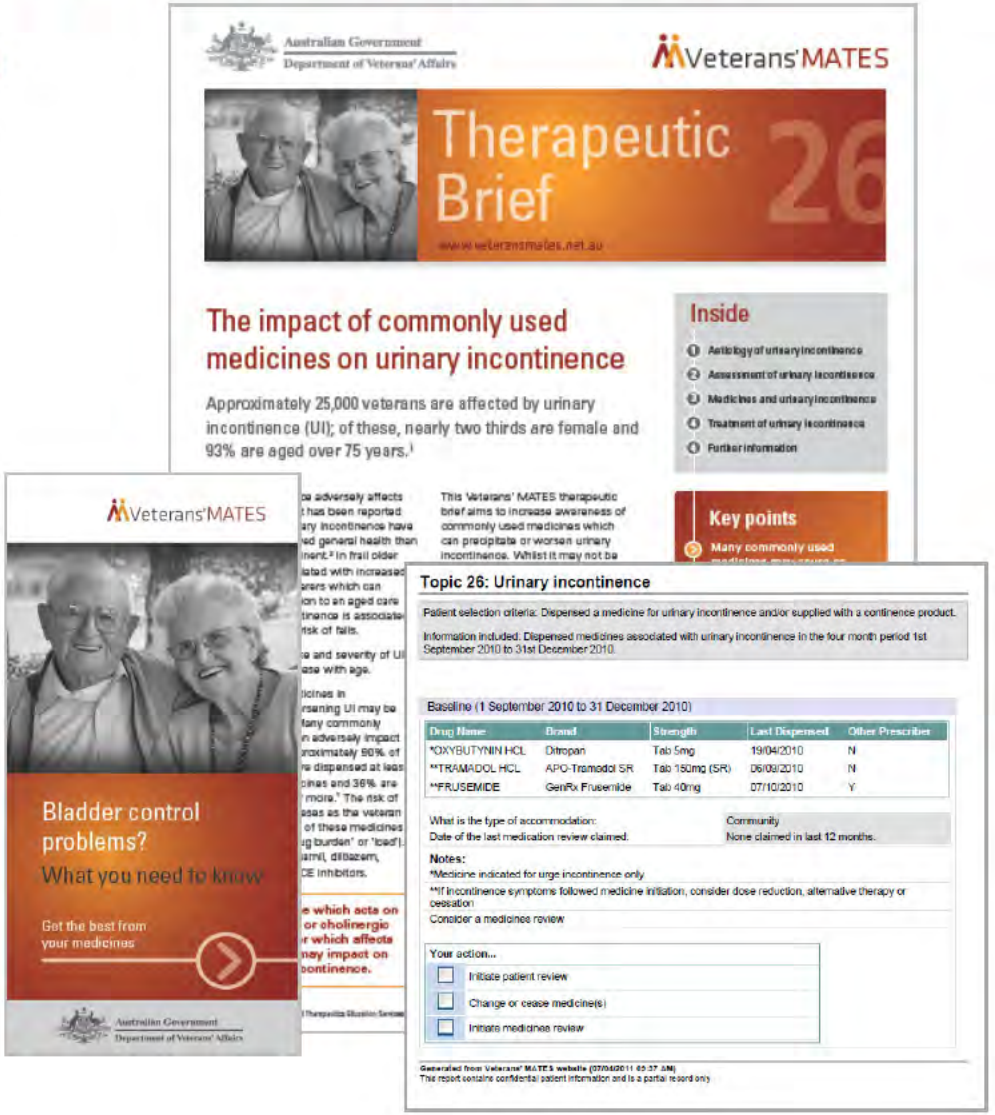
- Veterans' MATES is delivering 34 educational topics over the 9 years, June 2004 to June 2013.
- To date 28 topics delivered:



The Veterans' MATES approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material is sent to members of the veteran community for whom the health topic is relevant.



The Veterans' MATES approach

- Who has received the topics?
  - Members of veteran community
  - General Practitioners
  - Specialists - Ophthalmologists
  - Nursing - Directors of Residential Aged Care Facilities, Continence Nurse Advisors
  - Pharmacists – accredited pharmacists
- Sent every three months to approximately
  - 10,000 general practitioners
  - 8,500 pharmacies and accredited pharmacists
  - 35,000 veterans

Department of Veterans' Affairs health claims data

- Treatment population of approximately 248,800 veterans; median age is 83 years, with 5 co-morbidities
- Approximately 130 million prescription records over 10 years
- 200 million Medicare and allied health records (GP visits, radiology, pathology etc)
- 6 million hospital records (public and private)

Topic area selection

- Medication-related problem analysis
- Module topic selected
- Patient specific feedback & evidence based information developed
- Topic implementation
- Evaluation

So what happens to our veterans?

Evaluation has demonstrated:

- Changes in targeted medicines and services
- Improved health outcomes
- Stakeholder satisfaction

Veterans' MATES highlights

Improving the management of heart failure

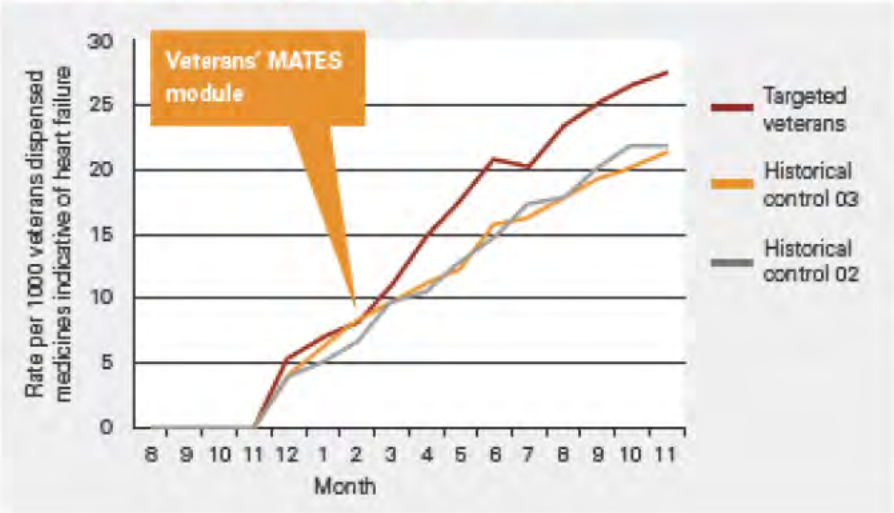
So what happened?

- 46% reduction in likelihood of hospitalisation for heart failure in those who received a Home Medicines Review

- Increase in the use of beta blocker medicines

- Decrease in the use of NSAIDS

Increase beta-blocker medicine use in those with heart failure who were previously untreated



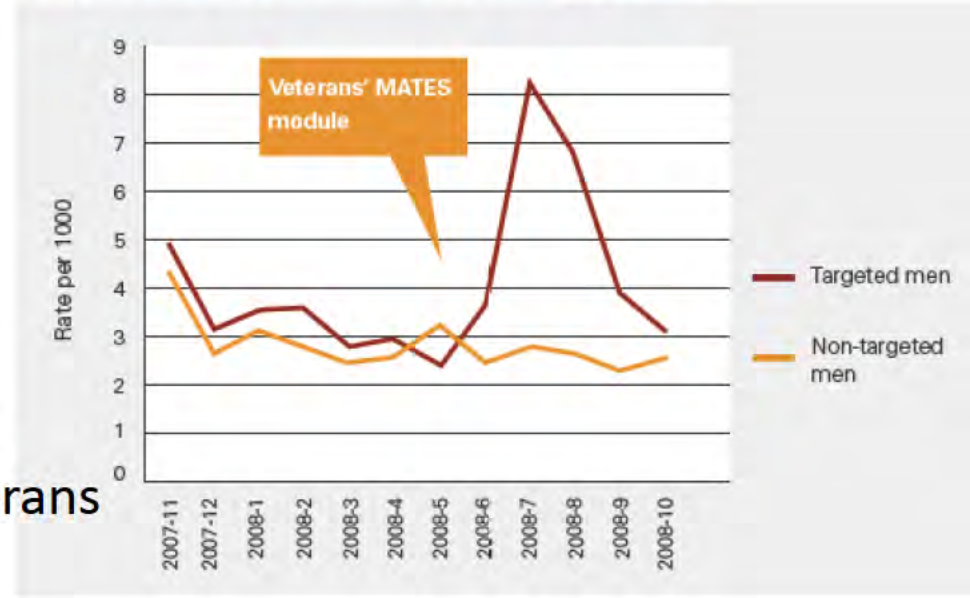
Veterans' MATES highlights

Reducing the risk of falls & hip fractures

So what happened?

- Reduction in use of medicines that increase the risk of falls and hip fractures:
  - ↓ Risperidone (antipsychotic)
  - ↓ Benzodiazepines (sleeping pills)
  - ↓ "Z drugs" (sleeping pills)
- Increase in Bone Mineral Tests to detect osteoporosis
- 24% increase in use of medicines to treat osteoporosis in male veterans

Uptake of Bone Mineral Testing in men



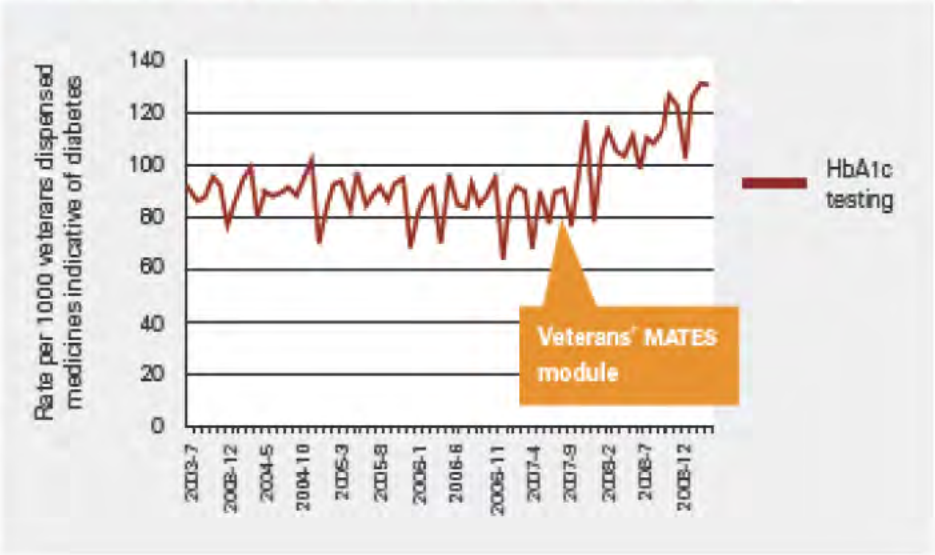
Veterans' MATES highlights

Improving the management of diabetes

So what happened?

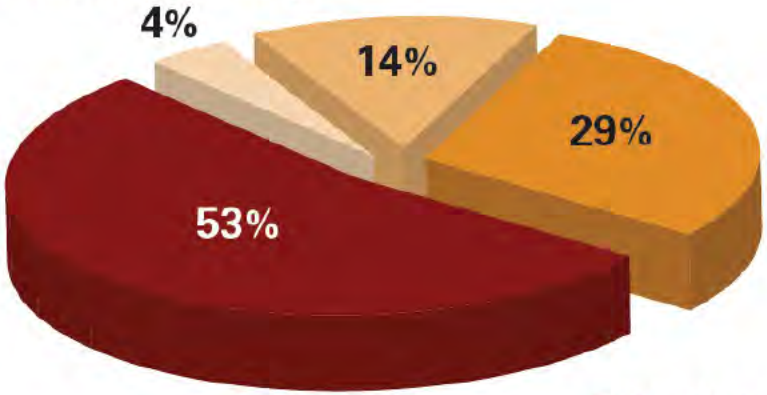
- ✓ Increase in the number of diabetes monitoring tests and management plans:
  - ↑ GP management plans
  - ↑ Glycosylated haemoglobin tests
  - ↑ Microalbuminuria tests
- ✓ Decrease in use of NSAIDS
- ✓ Increase in cardiovascular medicines

Increase in glycosylated haemoglobin testing

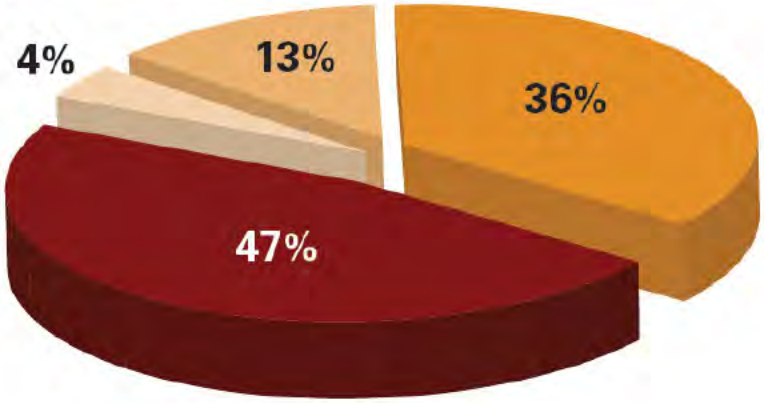


What they say about Veterans' MATES

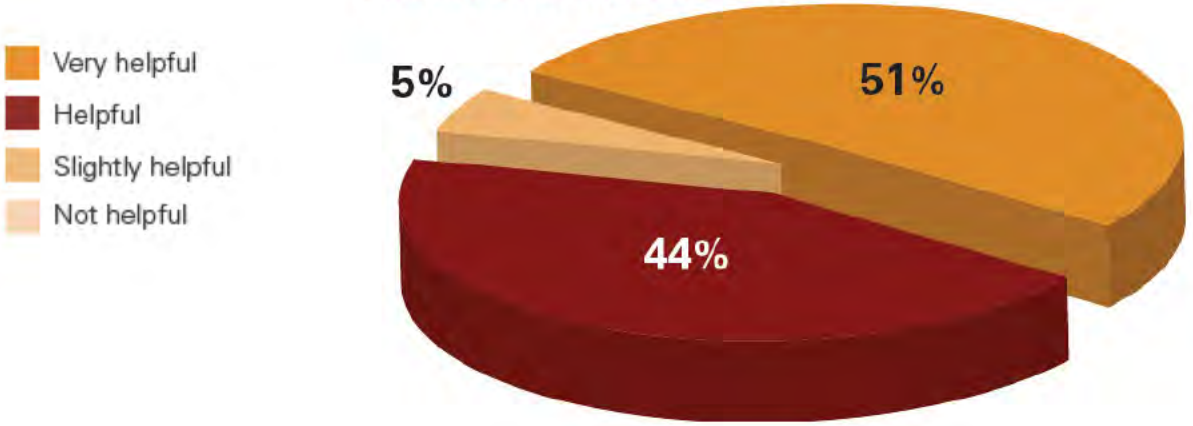
82% of veterans reported the educational material to be helpful



83% of general practitioners considered the educational material useful

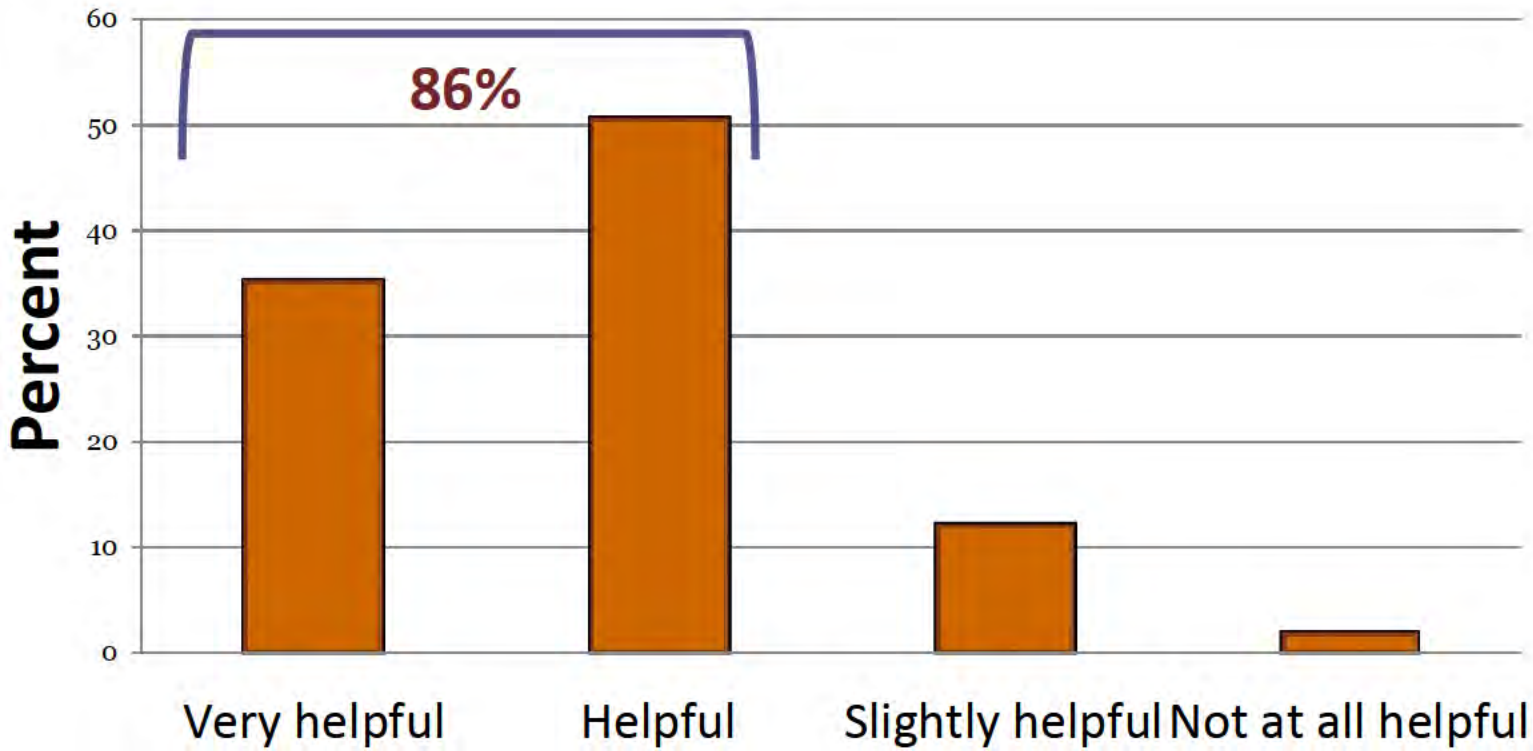


95% of pharmacists considered the educational material useful



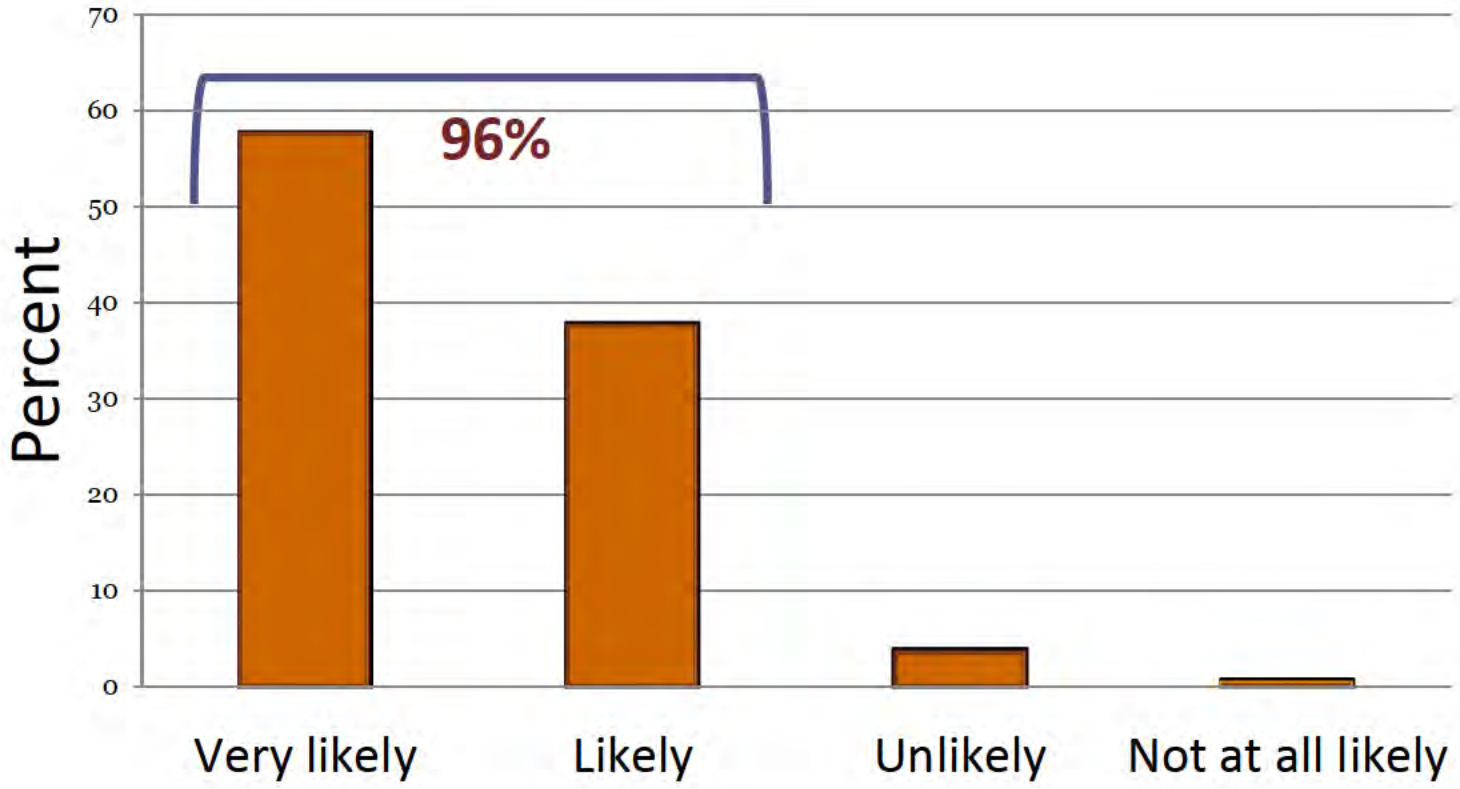
What they say about Veterans' MATES

Directors of Care response to the helpfulness of the dementia therapeutic brief when discussing a resident's medicines with their doctor.



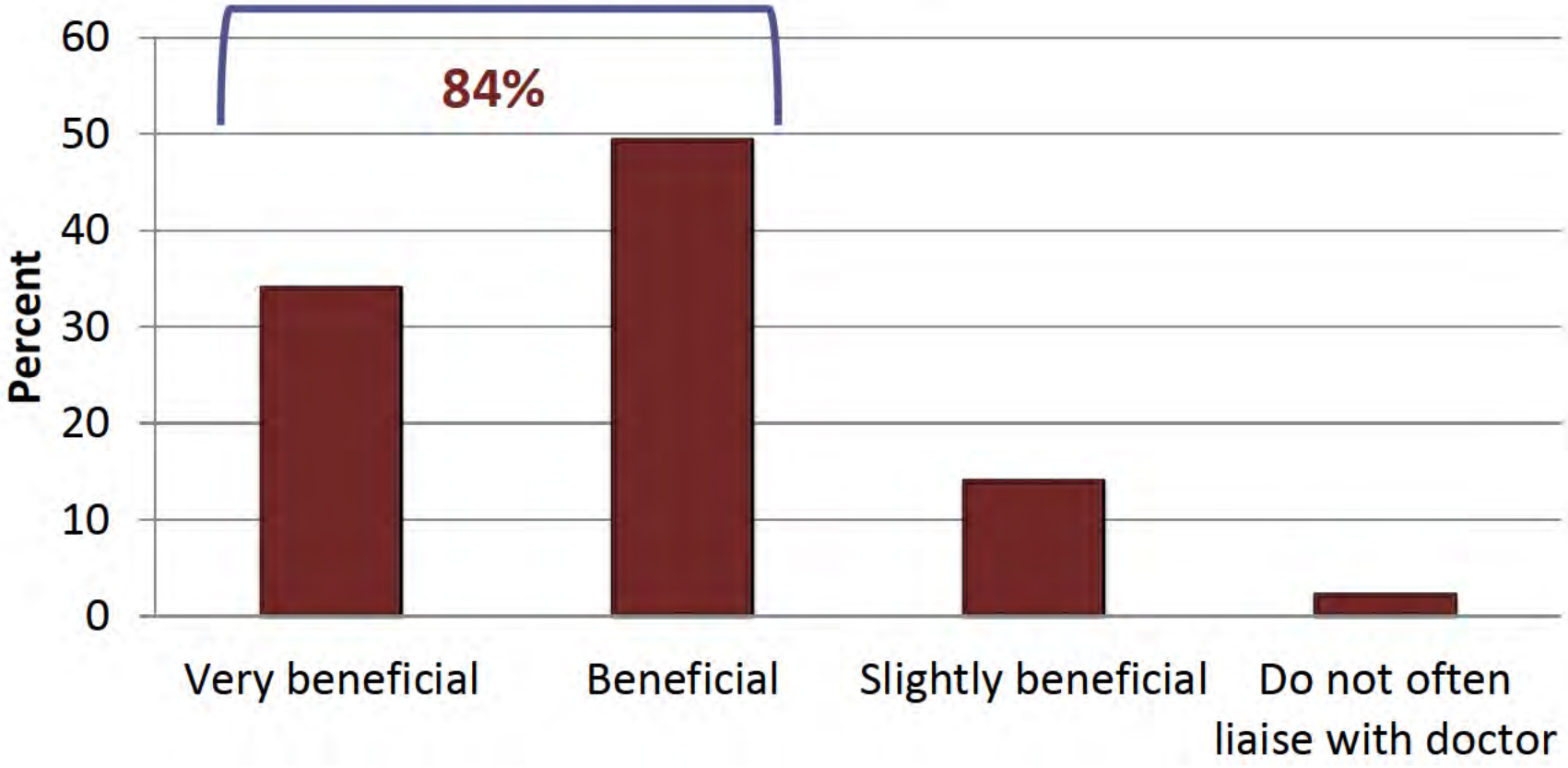
What they say about Veterans' MATES

Directors of Care likelihood of distributing the dementia therapeutic brief to facility staff.

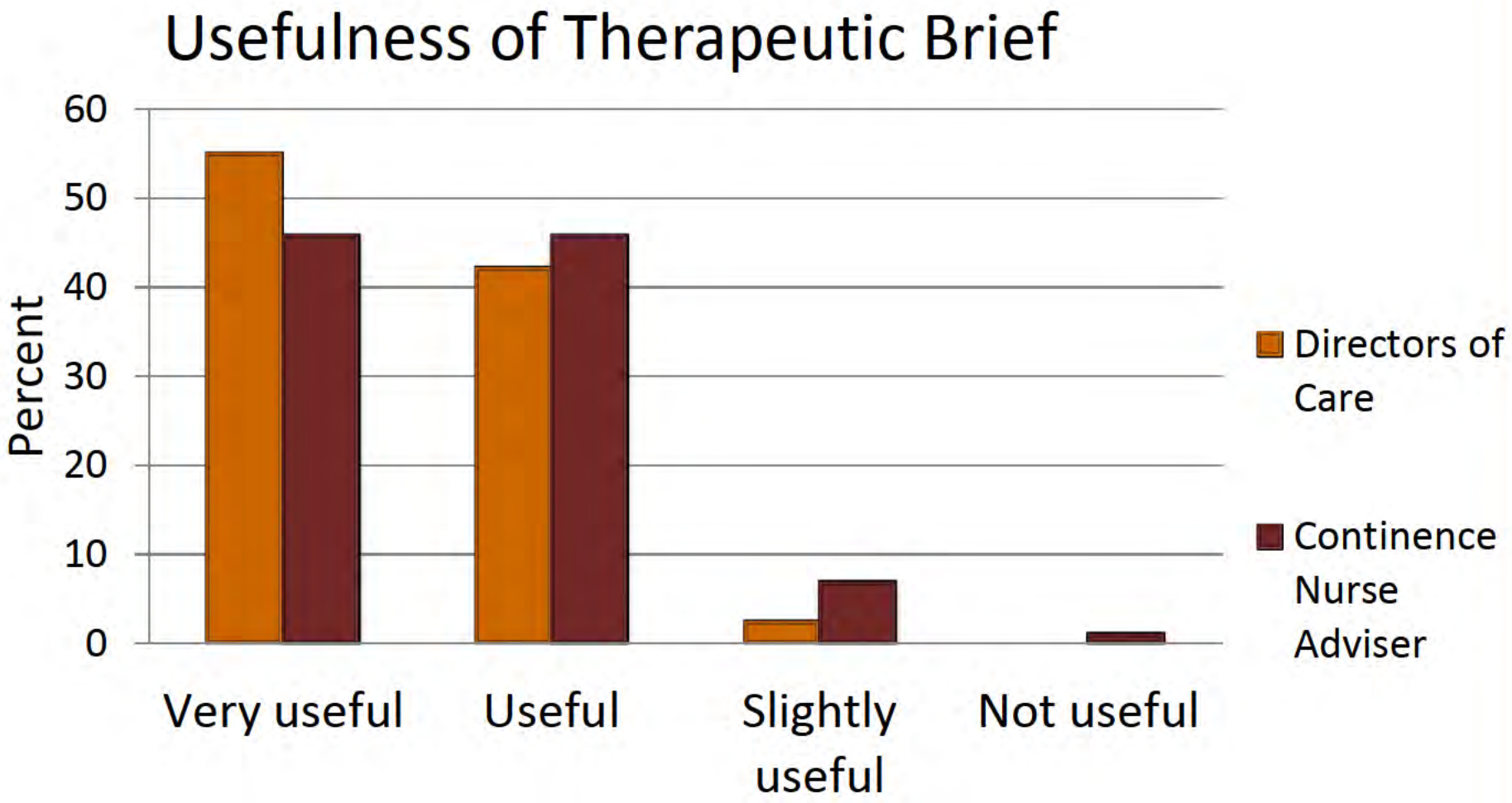


What they say about Veterans' MATES

Continence Nurse Advisers rating the benefit of the Therapeutic Brief when liaising with the patient's GP



What they say about Veterans' MATES



Assisting Nurse Practitioners

- Provides evidence-based information:

  www.veteransmates.net.au

- Provides practical solutions
- Facilitates discussion with other health professionals and your patients

Veterans' MATES

funded by
Department
of
Veterans' Affairs

UniSA | Sansom Institute for Health Research

Statin Use in the Elderly: Dose, Potency and Potential for Harm

J D Barratt[1] s 47F att[1], J Ilomaki[1], EE s 47F ead[1]
[1]Quality Use of Medicines and Pharmacy Research Centre, University of South Australia

This research was funded by the Australian Government Department of Veterans' Affairs as part of the delivery of the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) project. The authors have no conflicts of interest to declare.

Introduction

- HMG Co A Reductase Inhibitors (statins) are one the most widely used medicines classes in Australia.[1] Statins are effective in the primary prevention of cardiovascular events and all-cause mortality[2] as well as secondary prevention of cardiovascular events.[3] However, the benefit of statins in primary prevention of cardiovascular events in low-risk older people is less certain despite being increasingly prescribed to this group.[4]
- Statins are associated with increased risk of myopathy, especially in older people.[5] Use of low potency and low dose statins help to reduce this adverse effect. In the elderly patient the statin dose may need to be adjusted accordingly.

Study Aim

- To describe the prevalence and incidence of statin use in older patients and to determine if initiation of statins is associated with an increased risk of initiation of medicines that may be used to treat myopathy.

Methods

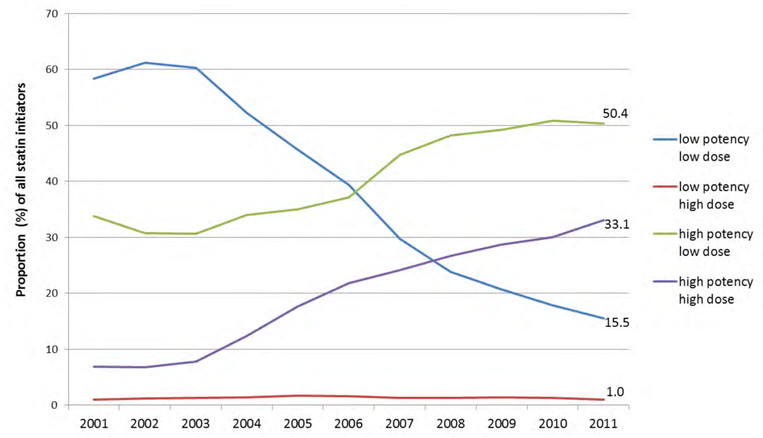
- Prescription sequence symmetry analyses (PSSA) were undertaken using Australian Government, Department of Veterans' Affairs (DVA) medicines data which contain details of all prescription medicines for which DVA pay a subsidy, between 1/1/2001 and 31/12/2011.
- PSSA analysis examined the association of incident dispensing of non-steroidal anti-inflammatory drugs (NSAIDs), indicative of treatment for myopathy, before and after incident dispensing of statins.
- The ratio of the number of people who initiated NSAIDs after initiation of a statin, versus the number of people who initiated NSAIDs before initiation of a statin (the crude sequence ratio) was calculated.
- The adjusted sequence ratio (ASR) was obtained by dividing the crude sequence ratio by the null-effect ratio and 95% confidence intervals were calculated. The bootstrap method was used to generate 95% confidence intervals using 500 replicates.
- All analyses were undertaken using SAS, V9.3 (SAS institute, USA).

Results

- Statin use increased in the population from 17% in 2001 to 33% in 2011.
- Statins were initiated in 4% per year in patients 85 years or over compared to 5% in those aged less than 85 years.
- Of those patients on statins aged 85 years or over, 60% had no prior hospitalisation event for cardiac disease.
- High dose, high potency statins were used by one in four of those aged 85 years and older.

Results (continued)

Figure 1. Trends in statin use among the veteran population



- Significant positive associations between initiation of statins and subsequent initiation of NSAIDs were found. ASRs were 1.30 (95% confidence interval (CI) 1.11-1.52) for rosuvastatin (Figure 2), 1.39 (95% confidence interval (CI) 1.32-1.47) for atorvastatin and 1.67 (95% CI 1.56–1.78) for simvastatin (Figure 3).

Figure 2. Increased risk of NSAID initiation following Rosuvastatin initiation

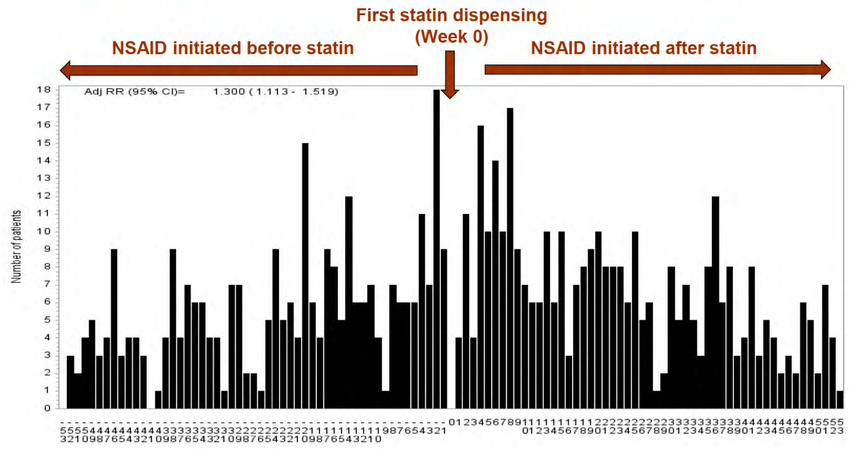
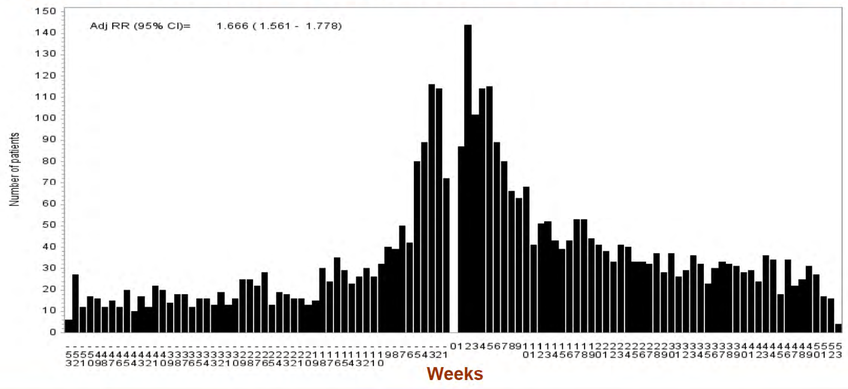


Figure 3. Increased risk of NSAID initiation following Simvastatin initiation



Conclusion

- Initiation of statins is common in the older population. Initiation of statins was associated with initiation of NSAIDs which may be suggestive of myopathy. The effectiveness of statin use in the older population for primary prevention, for which there is limited evidence, must be weighed against the potential for adverse events.

References

1. Australian Government, Canberra. Australian Statistics on Medicines 2009.
2. Taylor F, et al. Cochrane Database Syst Rev. 2011;Jan 19;(1):CD004816.
3. Gutierrez J, et al. Arch Intern Med. 2012;172(12):909-19.
4. Ali R, et al. Am J Geriatr Pharmacother. 2007;5(1):52-63.
5. Escobar C, et al. Vasc. Health Risk Manag 2008;4(3):525-33.

UniSA | Sansom Institute for Health Research

Veterans' MATES

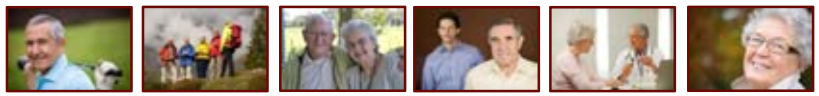
Validation of an updated Rx-Risk comorbidity index





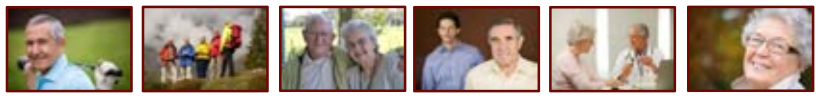

What is the Rx-Risk index?

- The Rx-Risk index is a measure for determining an individual's comorbidities based on their prescription medicine dispensing
- Rx-Risk is based on pharmacy data and allows us to determine an individual's current comorbidities
- It has more comorbidity categories than diagnosis-based measures (like Charlson, Elixhauser)
- The first comorbidity index based on prescription medicine dispensing was developed in the early 1990's
- Due to continual advances in pharmaceutical disease management and as new medicines are used to treat particular diseases, e.g. treatment for hepatitis B and C, the Rx-Risk requires periodical updating and re-validation



Updated Rx-Risk

- The updated Rx-Risk index consists of 46 comorbidity categories
- For each Rx-Risk category, medicines indicative of each condition were mapped to the World Health Organisation's Anatomical Therapeutic Chemical (ATC) classification system
- The mapping was performed by consensus between two pharmacists
- If an individual had ≥1 dispensing for a medicine in a given category then they were considered to have been treated (using medicines) for that comorbidity

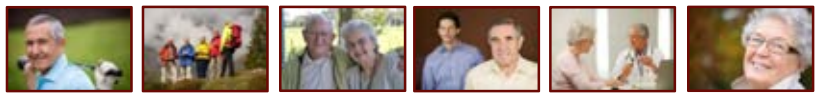


Objective

1. To determine the validity of the updated Rx-Risk index in predicting one-year mortality in an outpatient population

2. What is the best way to use Rx-Risk when predicting one-year mortality? i.e. a score, indicator variables

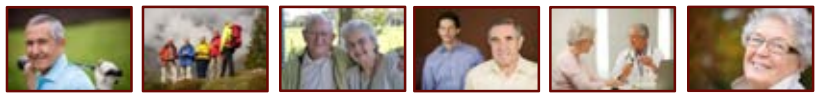
3. Is Rx-Risk a better predictor of one-year mortality than crude prescription counts?



Data Source

- The primary data source was the Australian Government Department of Veterans' Affairs (DVA) administrative claims database
  - This dataset includes all medicines dispensed on the Australian Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme, as well as all medical, hospital and allied health services claimed by veterans

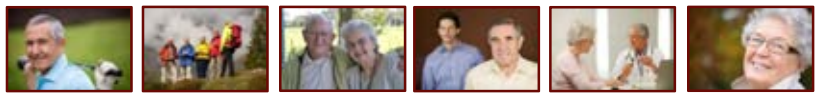
- External validation of the Rx-Risk index was conducted using the Pharmaceutical Benefits Scheme (PBS) 10% sample of the Australian population.
  - This dataset contains information on the dispensing of prescription medicines



Study Population

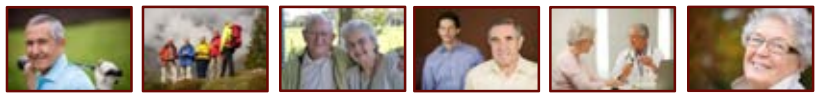
- Included individuals in the DVA dataset with at least one health care encounter between 01 July 2013 and 31 December 2013.
  - Health care encounter could be one of the following;
    1. A medication dispensing
    2. A doctor's visit
    3. A hospitalisation
- Limited to Gold card holders (individuals eligible for full health care coverage)
- Aged between 65 and 100 years

- Rx-Risk and prescription counts were calculated between 01 January 2014 and 31 December 2014
- Death was determined in the following year, 2015



Study Design

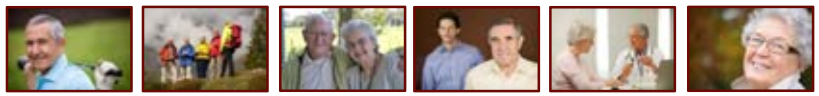
- A baseline logistic regression model comprising age and gender, with one-year mortality as the outcome.
- Rx-Risk was added to the baseline model as (i) an unweighted score, (ii) a weighted score, and (iii) with 43 comorbidity categories as indicator variables.
- Three crude prescription counts were added separately
- C-statistic and AIC were used to determine the best predictor of one-year mortality.
  - C-statistic between 0 and 1; closer to 1 the better
  - AIC; smaller the better



Measures of Rx-Risk and Prescription Counts

- An unweighted score: a simple count of the number of comorbidities a person has ranging from 0-43
- A weighted score: that weights the comorbidity categories depending on the strength of their association with one-year mortality, e.g, CHF would be expected to carry a higher weight than migraine. Then sum the weighted categories.
- 43 individual variables: each comorbidity category is treated as a binary variable indicating the presence / absence of each condition

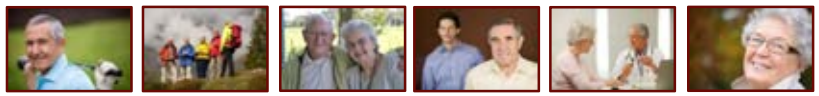
- Prescription count Measures
  - Total number of prescriptions dispensed
  - Total number unique medicines dispensed based on ATC codes
  - Total number unique medicines dispensed based on PBS codes



How Comorbidity weights were calculated

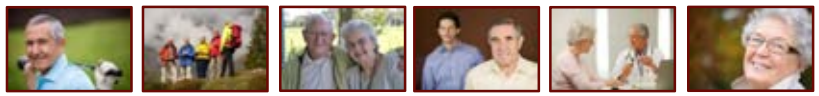
- A baseline logistic regression model comprising of age and gender, with one-year mortality as the outcome.
- Then 43 indicator variables were added to the baseline model
- Comorbidities weighted according to odds ratio and p-value

Odds ratio	P-value	Weighted Rx-Risk score
Any odds ratio	>0.10	0
<1	≤0.10	-1
1.0 ≤ and <1.2	≤0.10	1
1.2 ≤ and <1.4	≤0.10	2
1.4 ≤ and <1.6	≤0.10	3
1.6 ≤ and <1.8	≤0.10	4
1.8 ≤ and <2.0	≤0.10	5
≥ 2	≤0.10	6



Results of the Validation Study

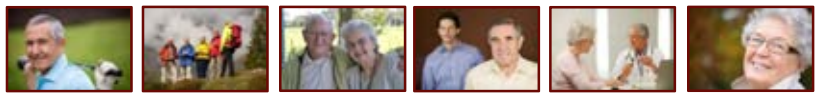
Models	AIC	Difference in AIC	C-statistic (95% Confidence Interval)
Base Model (BM): age and gender	80538.5		0.738 (0.734, 0.742)
Rx-Risk measures			
BM + unweighted Rx-Risk	79420.1	1118.4	0.751 (0.747, 0.754)
BM + weighted Rx-Risk	76102.4	4436.1	0.786 (0.782, 0.789)
BM + 43 comorbidity indicators	75692.2	4846.3	0.791 (0.788, 0.795)
Crude Measures			
BM + prescription count	79105.9	1432.6	0.755 (0.751, 0.759)
BM + unique ATC medicine count	78374.5	2164.0	0.762 (0.758, 0.766)
BM + unique PBS medicine count	78210.2	2328.3	0.764 (0.760, 0.768)



Internal and External Validation

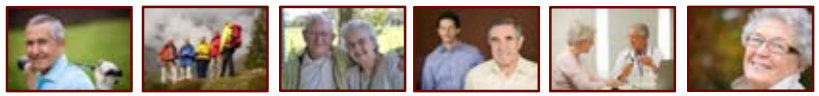
- Two internal validation methods - for validating the logistic regression model used to calculate the comorbidity weights.
  - K-fold cross-validation
  - Bootstrapping

- External validation
  - Used the PBS data
  - Baseline binary logistic regression, comprising age and gender, with one-year mortality as the outcome.
  - Rx-Risk added to the baseline model as (i) a weighted score, and (ii) 43 comorbidity categories as indicator variables.
  - Then weights calculated in the DVA dataset were applied to the PBS cohort, and vice versa.



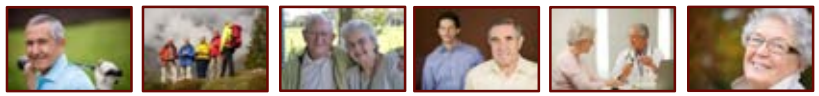
Results of Internal Validation

	C-statistic
BM + weighted Rx-Risk	0.786
Internal Validation Methods	
Training – weight based on OR, average	0.786
Testing – weight based on OR, average	0.785
5000 bootstrap samples, average	0.786



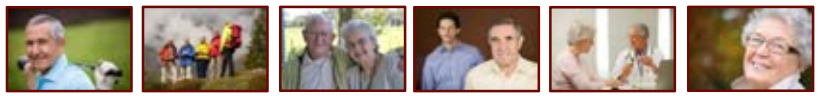
Results of External Validation

Models	AIC	Difference in AIC	C-statistic (95% Confidence Interval)
Base Model (BM): age and gender	79527.9		0.761 (0.756, 0.766)
Rx-Risk measures			
BM + weighted Rx-Risk	75849.6	3678.3	0.809 (0.805, 0.813)
BM + 43 comorbidity indicators	71689.1	7838.8	0.845 (0.842, 0.849)
Crude Measures			
DVA weights applied to PBS cohort	73143.8	6384.1	0.833 (0.829, 0.837)
PBS weights applied to DVA cohort	78573.5	1965.0	0.761 (0.757, 0.764)



Conclusion

- The updated Rx-Risk index strongly predicted one-year mortality
- Modelling Rx-Risk as a weighted score or individual covariates was found to be most predictive of one-year mortality
- In practice, modelling Rx-Risk as individual covariates may be more easily applied



Evaluating the effect of the Veterans' MATES program on the prescribing of antipsychotics in the elderly

Jemisha s 47F Anna s 47F Nicole s 47F Mhairi s 47F Lisa s 47F Tammy s 47F Elizabeth s 47F
[1]Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute for Health Research, School of Pharmacy and Medical Sciences, University of South Australia, Adelaide

BACKGROUND

- The Veterans' Medicine Advice and Therapeutics Education Services (MATES) program is an Australian health promotion program to improve the health and well-being of the veteran population
- **August 2015**: The Australian Therapeutic Good Administration (TGA) changed the recommendation for risperidone to treat behavioural and psychological symptoms of dementia (BPSD) for a maximum of 12 weeks and only in moderate to severe dementia of the Alzheimer type.
- **August 2016**: The Australian Government Department of Veterans' Affairs (DVA) Veterans' MATES program implemented an intervention to raise awareness of TGA's change in recommendation and reduce the use of antipsychotics among veterans with dementia

OBJECTIVE

- To evaluate the effect of the intervention on the prescribing of antipsychotics in the veteran population

METHOD

- Health claims data that contains details of all prescription medicines subsidised by the DVA were used
- Veterans aged 65 years or older, treated with antipsychotics, hospitalised for dementia or prescribed a medicine for dementia were targeted in 2016
- The rate of veterans using risperidone for dementia in the target group was compared with two historical control groups, one in 2014 (prior to the TGA restriction) and another in 2015 (after the TGA restriction)
- Cox-proportional hazards models were used to compare the rate of cessation in the 9 months following the intervention

Figure 1: Veterans' MATES brochures used in the intervention

RESULTS

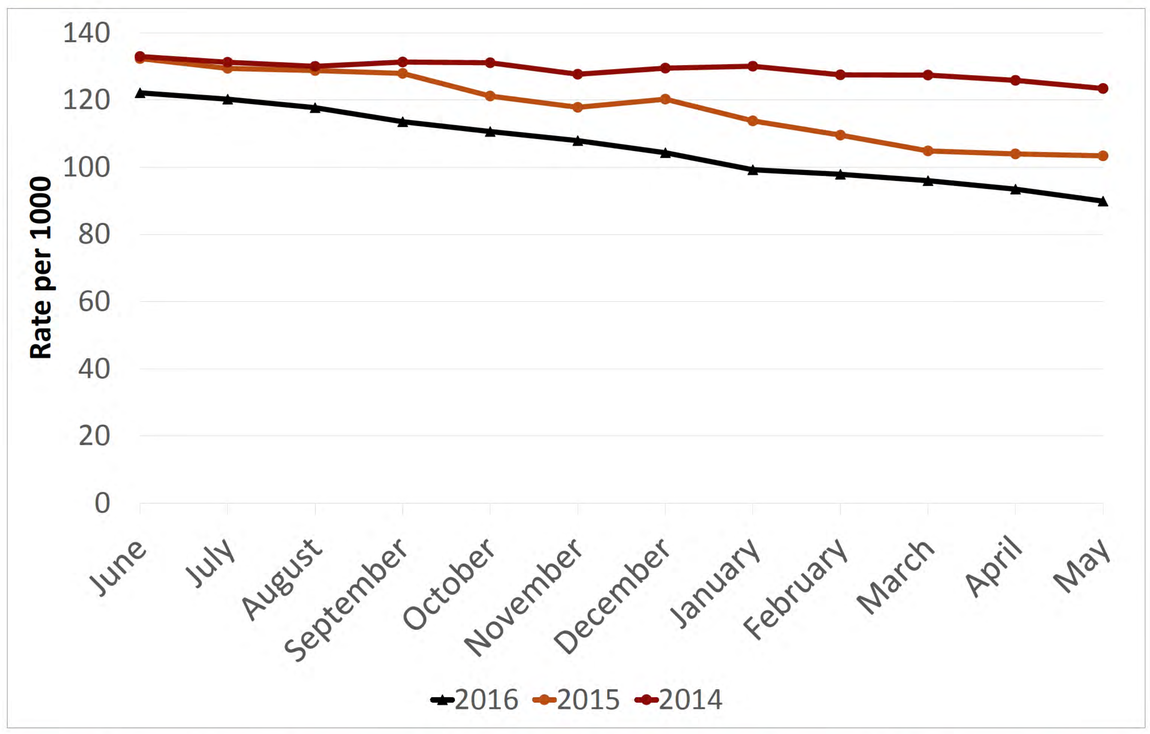


Figure 2: Rate of veterans using risperidone for dementia before the TGA restriction (2014), after the TGA restriction (2015) and after the Veterans' MATES intervention (2016)

- The rate of risperidone use was lower after the Veterans' MATES intervention (2016) and the TGA restriction (2015) compared to 2014
- There was no difference in rate of use of other antipsychotics (excluding risperidone) between the groups

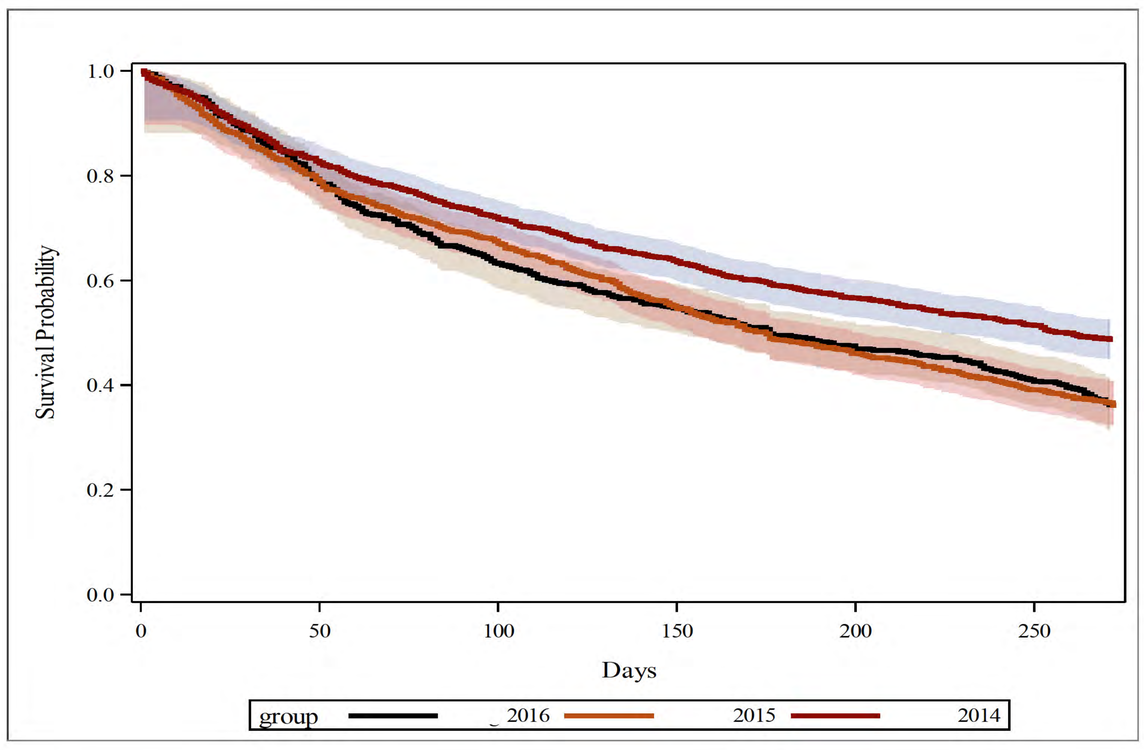
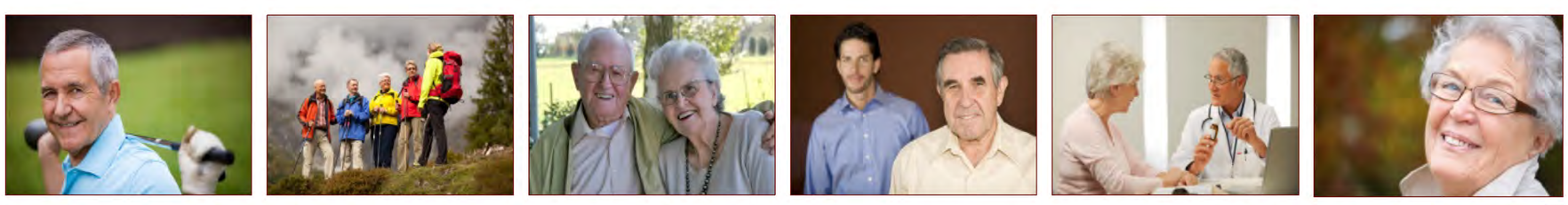


Figure 3: Time to cessation with 95% CI for users of risperidone before the TGA restriction (2014), after the TGA restriction (2015) and after the Veterans' MATES intervention (2016)

- Veterans were 40% more likely to cease risperidone after the intervention (Hazard Ratio (HR) 1.4; 95% confidence interval (CI) 1.2-1.5) and after the TGA restriction (HR 1.4; 95% CI 1.2-1.5) compared to 2014

CONCLUSION

- Both the Veterans' MATES intervention and the TGA restriction were successful in reducing the rate of use of risperidone for psychological and behavioural symptoms of dementia in the veteran population



ACKNOWLEDGEMENTS: This study was supported with funding from the Australian Government Department of Veterans' Affairs for the Veterans' MATES program.

www.veteransmates.net.au

The utilisation and impact of the ‘drug’ in Drug-Eluting Stents

Nicole s 47F Emmae s 47F John s 47F Elizabeth s 47F
[1]Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, School of Pharmacy and Medical Sciences, University of South Australia, Adelaide

BACKGROUND

- Clopidogrel is registered in Australia for the secondary prevention of vascular events following percutaneous coronary intervention (PCI) with drug eluting stents (DES)
- Recommendations for the duration of clopidogrel with drug eluting stents have changed over time from 6 weeks to a minimum of 12 months, and dual antiplatelet therapy (clopidogrel and aspirin) is recommended after DES
- The optimal duration of clopidogrel is unknown and appropriate duration is a balance between efficacy (avoiding repeat myocardial infarction) and safety (avoiding bleeds)

OBJECTIVE

- To assess the utilisation of drug-eluting stents (DES) over time by product type and drug
- To examine whether the change in the duration of clopidogrel and use of dual therapy with aspirin following insertion of a DES affected rates of death, bleeds and re-hospitalisation for myocardial infarction (MI) or angina

METHOD

- Six cohorts according to the year of DES insertion;
  - cohort1:2002-2003 to cohort 6:2012-2013.
- Patients initiated on clopidogrel within 6 weeks of DES insertion were included
- Cox-proportional hazards models were used to estimate the risk of clopidogrel cessation, readmission for myocardial infarction or angina, major bleed or death within 2 years of DES insertion stratified by cohort

CONCLUSION

- The type of DES product, the ‘drug’, the duration of clopidogrel and the prevalence of aspirin in combination with clopidogrel after DES insertion has changed rapidly over the last 10 years
- Outcomes in the 12 months after DES insertion have remained similar with the exception of re-hospitalisation for MI or angina, which showed a lower risk in recent cohorts where use of aspirin was highest

RESULTS

Figure 1: Over 23 different DES products were implanted

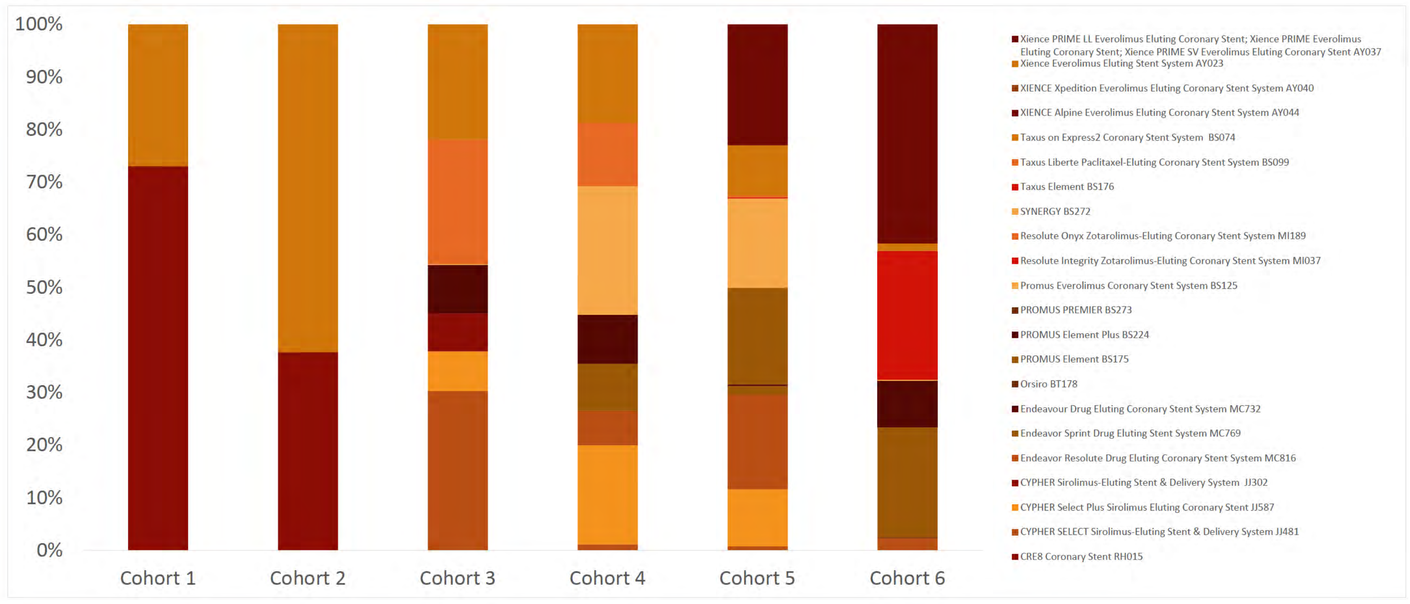


Figure 2: The “Drug” in the DES has changed rapidly

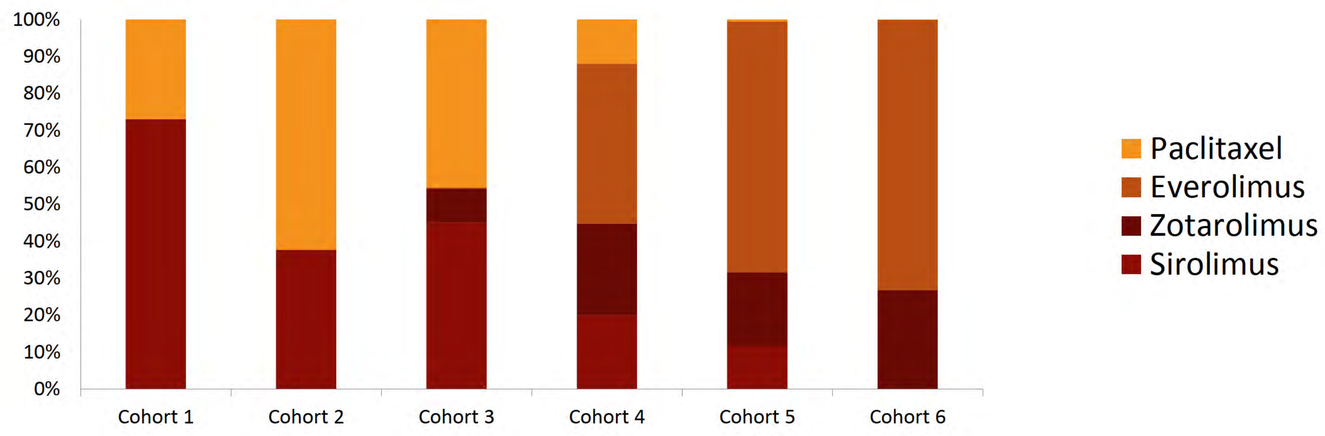


Figure 3: Use of clopidogrel within 6 weeks of DES insertion has increased

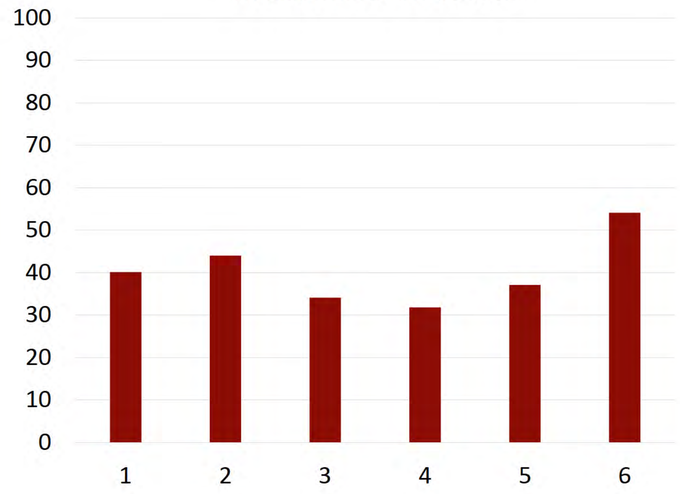


Figure 4: Use of aspirin in combination with clopidogrel has increased due to the fixed dose combination (FDC) product

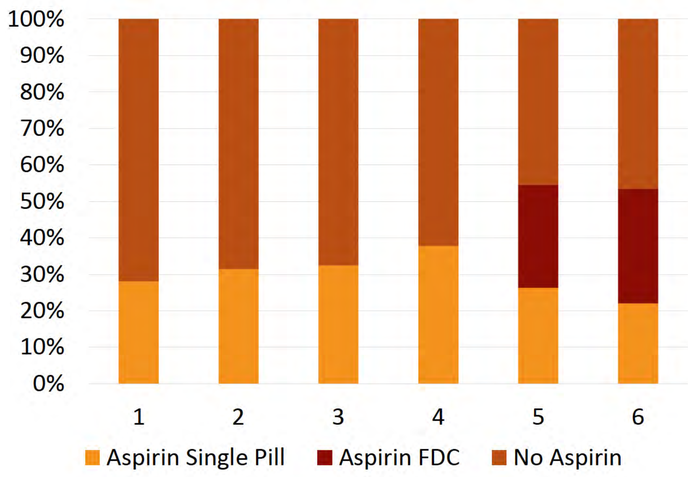


Figure 4: Time to cessation of clopidogrel after DES by cohort

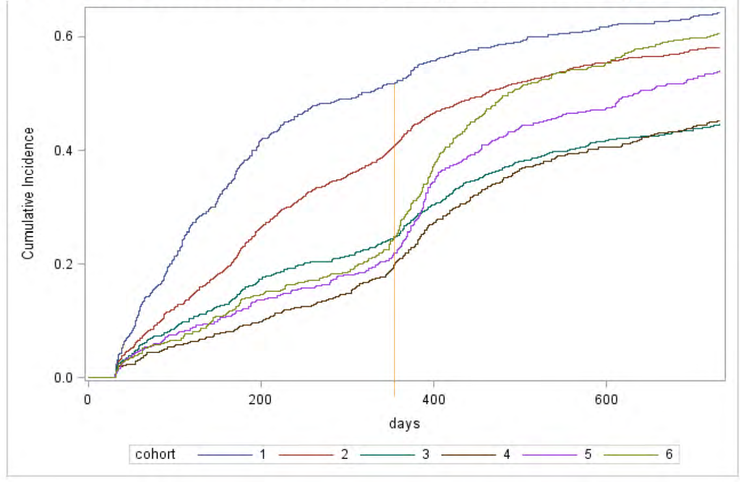


Figure 5: Time to re-hospitalisation for MI/Angina after DES

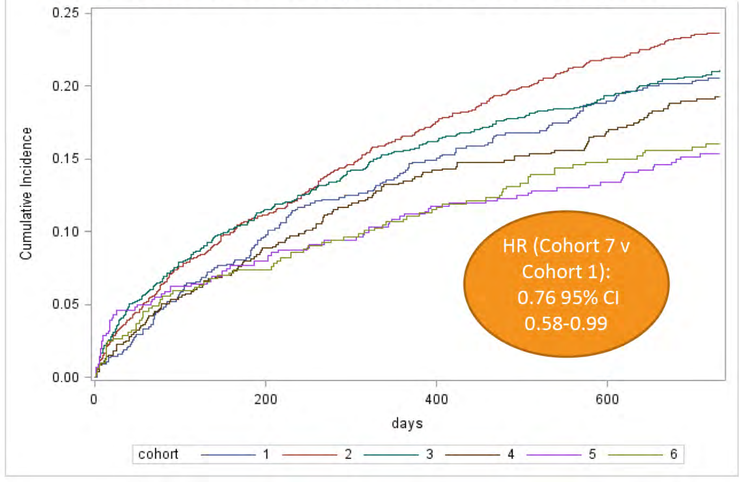
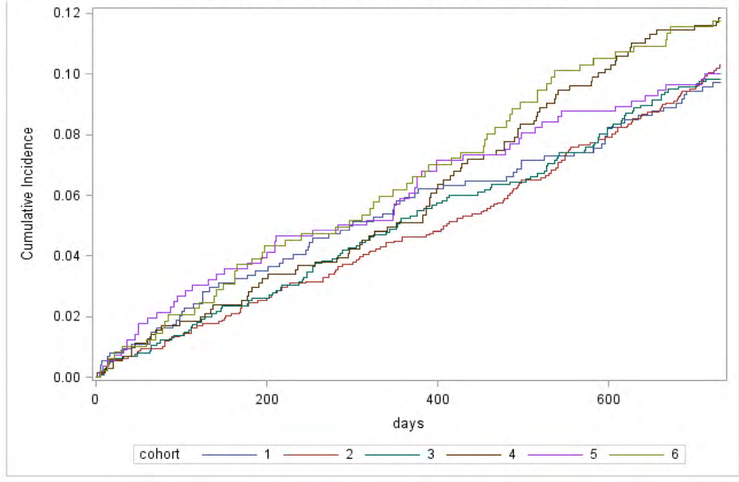
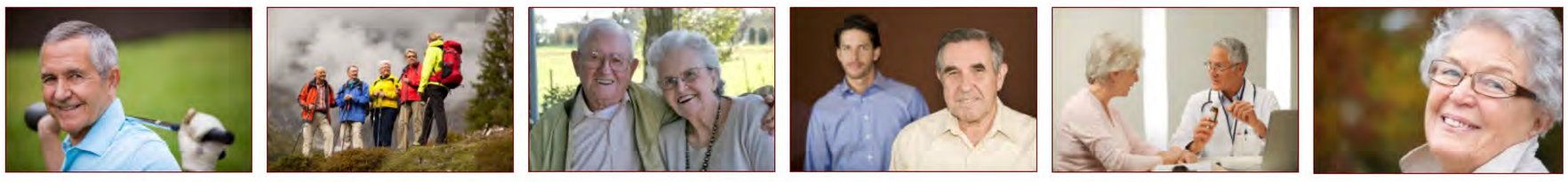


Figure 6: Time to death after DES





ACKNOWLEDGEMENTS: .This study was supported with funding from the Australian Government Department of Veterans’ Affairs for the Veterans’ MATES program.

WWW.VETERANSMATES.COM.AU

Multiple Psychotropic Medicines increase the Risk of Falls

Quality Use of Medicines

- Our research centre aims to improve the use of medicines and health outcomes in Australia and internationally through research and consultancy.
- Some of our projects include:
  - Veterans' MATES (Medicines Advice and Therapeutics Education Services)
  - Management and care of older people with multiple chronic conditions
  - Development of Australian clinical indicators for potentially preventable hospitalisations
  - Post market surveillance of medications and medical devices

http://www.unisa.edu.au/sansominstitute/qumprc/default.asp

Veterans'MATES project

- MATES (Medicines Advice and Therapeutics Education Services) project is sponsored by the Australian Government Department of Veterans' Affairs
  - Use administrative datasets to provide patient-specific feedback to general practitioners identifying their patients with potential medication related problems
  - Recommend process changes based on directed evidence-based clinical information
  - Results in improved health outcomes among veterans

http://veteransmates.net.au

Funding

This study was supported by the Australian Government Department of Veterans' Affairs (DVA) as part of the delivery of the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) project.

There are no conflicts of interest to declare.

Australian Government

Department of Veterans' Affairs

Veterans' MATES

Aim of this study:

"To identify the association between the numbers of psychotropic medicines and the risk of hospitalisation for a fall."

Background:

- Falls are a major public health problem and responsible for considerable immobility, morbidity, and mortality among the elderly population - Morley, J.E., *A fall is a major event in the life of an older person.* J Gerontol Med Sci, 2002. **57A**: p. M492-M495
- In the developed world, falls and fall-related complications are the fifth leading cause of death - Woolcott, J.C., et al., *Meta-analysis of the Impact of 9 Medication Classes on Falls in Elderly Persons.* Arch Intern Med, 2009. **169**(21): p. 1952-1960
- More than one third of community-dwelling older people have at least one fall each year - Australian Institute of Health and Welfare, *Australia's Health 1996*. 1996: Australia's health no. 5. Cat. no. AIHW 26. Canberra: AIHW

Background:

- The incidence of falls increases sharply with age with 58% of injury deaths at ages 65-74 years, 75% at ages 75-84 years and 86% at 85 years and older - National Public Health Partnership (NPHP). *The National Injury Prevention and Safety Promotion Plan: 2004-2014*. 2005 [cited 2011 30 November]; Available from: http://www.nphp.gov.au/publications/sipp/nipspp.pdf.
- The proportion of elderly people in the Australian population is expected to rise from 11.2% in 1990 to 20.4% in 2050, suggesting increased fall burden into the future - Australian Institute of Health and Welfare, *Australia's Health 1996*. 1996: Australia's health no. 5. Cat. no. AIHW 26. Canberra: AIHW

Background:

- Most falls results from interactions between intrinsic factors or extrinsic factors
- Medications, many having potential to increase the risk of falls, are one of the most easily reversible extrinsic risk factors to be considered in the falls assessment process
- Psychotropic medicines in particular have been associated with significant increase in the risk of falls
- Little is known of the impact of taking multiple psychotropic medicines on the risk of falling

Method - Datasets

- The Australian Government Department of Veterans' Affairs (DVA) administrative datasets for a treatment population of 290,000 veterans (at July 1 2008) contained:
  - 150 million pharmacy records coded according to WHO anatomical and therapeutic chemical classification (ATC) and Schedule of Pharmaceutical Benefits Codes (PBS)
  - 6 million hospitalisation records coded according to WHO international classification of diseases (ICD10)

Methods – Study design

- A retrospective cohort study in the Australian veteran population living in the community, aged 65 years and over who were dispensed at least one psychotropic medicine between July 1, 2008 to June 30, 2009.
- Subjects were censored at their first hospitalisation event during the study period or upon entering residential aged care facilities.
- Subjects who died during the study period were excluded (to reduce the chance that subjects were close to end of life).

Methods – Study design

- Psychotropic medicines studied included:
  - antipsychotics (N05A)
  - anxiolytics (N05B)
  - sedatives and hypnotics (N05C)
  - antidepressants (N06A and N06CA)
  - opioids (N02A)
  - anti-parkinson's medicines (N04)
- Exposure was defined as the total number of psychotropic medicines taken (time varying exposure)
- Periods of time when subjects were not taking any psychotropic medications was used as the reference period

Methods – Study design

- The effect of the number of medicines on the risk of falling was examined by stratifying the total number of medicines taken on each day of the study and the risk of fall on the subsequent day
- Compares the risk of hospitalisation in periods of exposure compared with non-exposure within the same person
- The estimated number of medicines was expressed in the following categories in the analysis; 0 (no medicines), 1, 2, 3- 4, and >=5 medicines.

Methods – Study design

- The main outcome measure was the rate of hospitalisation with a secondary diagnosis of fall from the same level
  - ICD-10AM: W18, W19 or W0
- Hospitalisation rates were calculated as the cumulative number of hospitalisations in each exposure category divided by the number of days at risk.
- Subjects were followed-up until the primary end-point or the end of the study period
- Demographic data was obtained for veterans at baseline (July 1 2008)
- All analysis performed using SAS 9.3

Methods – Study design

- Incidence rate ratios were calculated using poisson regression adjusting for
  - age at entry into the cohort
  - gender
  - residential area
  - number of co-morbidities
  - number of prescriptions, prescribers, dispensing pharmacies, GP visits, specialist visits, speech pathology and occupational therapy visits during follow-up, and
  - whether or not the veteran received medicines for palliative care or dementia.

Results

- Overall, 102,082 veterans were included in the cohort
- At the time of study entry, the average age of veterans was 83 years and 44% were male
- Veterans used on average 5 regular medicines, had on average 5 co-morbidities and visited only one or two prescribers and dispensing pharmacies

Medication exposure category	Person years	Number of falls	Adjusted* event rate per 10 person-years (95% CI)	Adjusted Rate Ratio* (95% CI)
0	38030	1805	0.47 (0.41 - 0.54)	1.00 (1.00 - 1.00)
1	33484	1794	0.50 (0.44 - 0.58)	1.07 (1.00 - 1.14)
2	11391	863	0.67 (0.58 - 0.78)	1.43 (1.31 - 1.55)
3-4	4528	453	0.86 (0.74 - 1.01)	1.83 (1.64 - 2.05)
5+	393	46	1.03 (0.75 - 1.42)	2.18 (1.61 - 2.95)

Table 1: Risk of hospitalisation for a fall vs concurrent psychotropic medication exposure

Medication exposure category	Person years	Number of falls	Adjusted* event rate per 10 person-years (95% CI)	Adjusted Rate Ratio* (95% CI)
0	38030	1805	0.47 (0.41 - 0.54)	1.00 (1.00 - 1.00)
1	33484	1794	0.50 (0.44 - 0.58)	1.07 (1.00 - 1.14)
2	11391	863	0.67 (0.58 - 0.78)	1.43 (1.31 - 1.55)
3-4	4528	453	0.86 (0.74 - 1.01)	1.83 (1.64 - 2.05)
5+	393	46	1.03 (0.75 - 1.42)	2.18 (1.61 - 2.95)

Table 1: Risk of hospitalisation for a fall vs concurrent psychotropic medication exposure

Medication exposure category	Person years	Number of falls	Adjusted* event rate per 10 person-years (95% CI)	Adjusted Rate Ratio* (95% CI)
0	38030	1805	0.47 (0.41 - 0.54)	1.00 (1.00 - 1.00)
1	33484	1794	0.50 (0.44 - 0.58)	1.07 (1.00 - 1.14)
2	11391	863	0.67 (0.58 - 0.78)	1.43 (1.31 - 1.55)
3-4	4528	453	0.86 (0.74 - 1.01)	1.83 (1.64 - 2.05)
5+	393	46	1.03 (0.75 - 1.42)	2.18 (1.61 - 2.95)

Table 1: Risk of hospitalisation for a fall vs concurrent psychotropic medication exposure

Discussion

- Previous studies have found an association between the use of psychotropic medicines and falls

Leipzig, R.M., R.G. Cumming, and M.E. Tinetti, *Drugs and falls in older people: a systematic review and meta-analysis: I. Psychotropic drugs.* J Am Geriatr Soc, 1999. **47**(1): p. 30-9

Campbell, A.J., et al., *Psychotropic medication withdrawal and a home-based exercise program to prevent falls: a randomized, controlled trial.* J Am Geriatr Soc,1999. **47**(7): p.850-3

- One study, in women only, found that the risk of falling rose with the number of medicines taken

Lawlor, D.A., R. Patel, and S. Ebrahim, *Association between falls in elderly women and chronic diseases and drug use: cross sectional study.* BMJ, 2003. **327**: p. 712-7

Discussion

- Results of our studies showed an increased risk of hospitalisation for fall amongst veterans taking multiple psychotropic medicines
- Together with the considerable overall increased risk, especially when using two or more psychotropic medicines, the prevalent use of these medicines will result in significant numbers of people at increased risk of harm.

Discussion

- The cohort selected in this study represents one third of the entire veteran cohort suggesting that a decrease in total number of these medicines is likely to translate into significant health benefit

Discussion - Limitations

- Although a large number of potential confounders were controlled in our studies, we were unable to control for all potential confounders
- The absence of diagnostic information in the data set means disease severity could not be taken into account
- The risk of falls was high in the time period where patients were not exposed to any medicines

Discussion - Wider application

- Results in the veteran population likely to be applicable to other elderly Australians
- DVA treatment card holders similar to wider Australian population (after adjustment for service related disability and age)
  - GP visits (rate ratio 0.99 $p<0.5$)
  - Hospitalisations (rate ratio 0.97 $p<0.05$)
- Medication-related hospitalisations for falls most common amongst elderly people on multiple medicines
- Veterans highly relevant study population

Conclusion

- Results of our studies suggest that reducing the number of psychotropic medicines is likely to be associated with a considerable reduction in risk of hospitalisation for fall.

Application

- Validated Australian falls risk assessment tools designed to simplify the assessment process are now available, and can be used by health practitioners to assess older people
- The DVA datasets can be used to facilitate completion of the risk assessment tools, by identifying those who have been dispensed medicines, such as psychotropics, that increase a person's risk of falls

Application

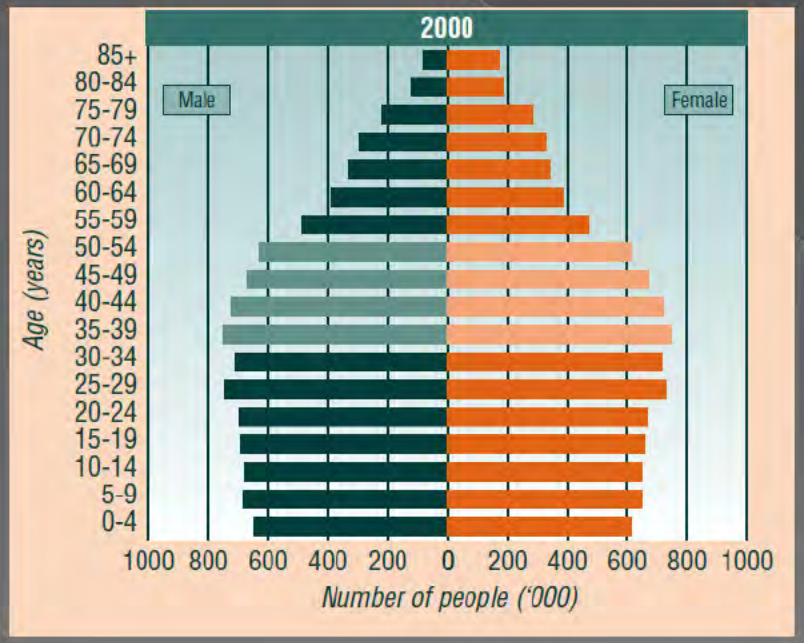
- Can identify patients at high risk of a hospitalisation for a fall
- Can direct primary care interventions to reduce medications responsible for hospitalisations for a fall
- Can save money
  - Average hospitalisation $4,471
- Reduce morbidity and mortality associated with medication-related hospitalisations for falls

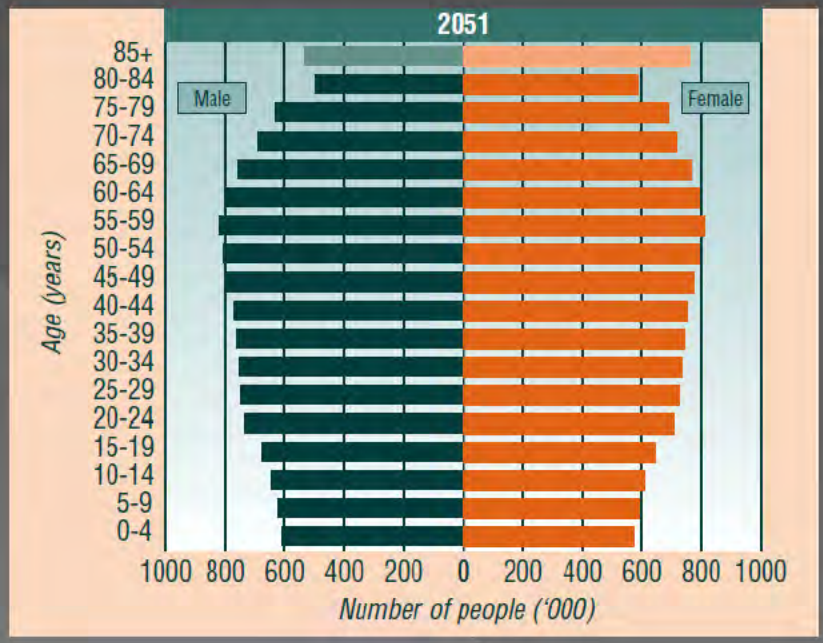
Acknowledgements

- Dr Nicole s 47F Emmae s 47F Dr Tuan s 47F Assoc Prof Libby s 47F and the team at QUMPRC
- Dr Gs 47F Ks 47F AO (DVA Principal Medical Advisor)
- Indian Pharmaceutical Association for the kind invitation to attend and present

Further information: john.s 47F unisa.edu.au

Spare slides


2000
Male
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
Age (years)
1000 800 600 400 200 0 200 400 600 800 1000
Number of people ('000)


2051
Male
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
Age (years)
1000 800 600 400 200 0 200 400 600 800 1000
Number of people ('000)

The impact of commonly used medicines on urinary incontinence:

An example of using administrative health claims data to improve primary care practice

CP s 47F LM s 47F NL s 47F JD s 47F VT s 47F G s 47F DS s 47F ,EE s 47F

Veterans' MATES

UniSA | Sansom Institute for Health Research

Veterans' Medication Advice and Therapeutics Education Services

- Veterans' MATES aims to improve medication use and health for veterans

What is Veterans' MATES?

- Provides patient specific feedback and educational material to general practitioners
- Supported by educational brochures to veterans encouraging them to talk to their doctor and pharmacist
- Educational materials to pharmacists and other health professionals on the topic
- Educational materials developed by a clinical panel, peer reviewed and overseen by a national editorial committee
- Topics sent every three months to approximately
  - 10,000 general practitioners
  - 8,500 pharmacies and accredited pharmacists
  - 35,000 veterans

Department of Veterans' Affairs health claims data

- Treatment population of approximately 233,800 veterans; mean age is 77 years, with 5 co-morbidities
- Prescription records
- Medical and allied health records (no diagnosis, includes GP visits, radiology, pathology etc)
- Hospital records (diagnosis and procedures)

Using the health claims data

Planning stage

- Medication-related problem analysis
- Module topic selected

Development & Implementation stages

- Patient specific feedback & evidence based information developed
- Topic implementation

- Evaluation

Evaluation stage

Planning Stage: Incontinence in the elderly

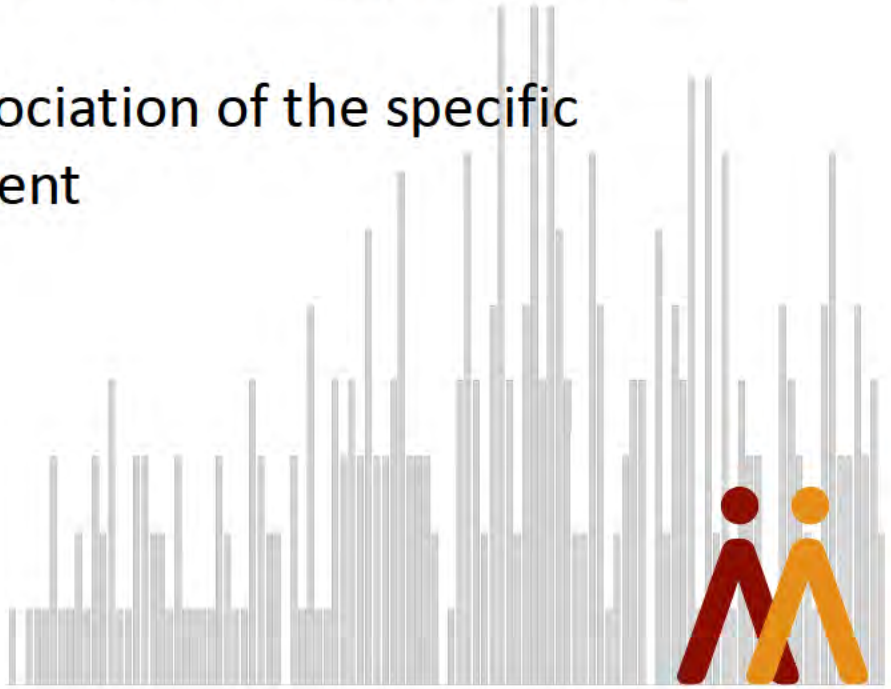
- Urinary incontinence affects up to 13% of Australian men and up to 37% of women
- Prevalence increases with age - 65% with urinary incontinence aged over 70 years
- Urinary incontinence is associated with :
  - poorer quality of life
  - decreased participation in social and daily activities
  - nursing home admissions
- The causes of incontinence are multifactorial
- Drug-induced incontinence is particularly common in the elderly - *AMH 2011*

Planning Stage: Method

- Retrospective analysis of the Australian Government Department of Veterans' Affairs database.
- Veterans dispensed a continence aid, oxybutynin or propantheline between 1st January to 31st December 2009 were included.
- Medicines with the potential to worsen urinary incontinence identified from - The Australian Medicines Handbook, Meyler's Side Effects of Drugs, MIMS online and published reviews.
- Prescription symmetry and event analyses used to determine the extent to which initiation of these medicines was associated with initiation of oxybutynin.

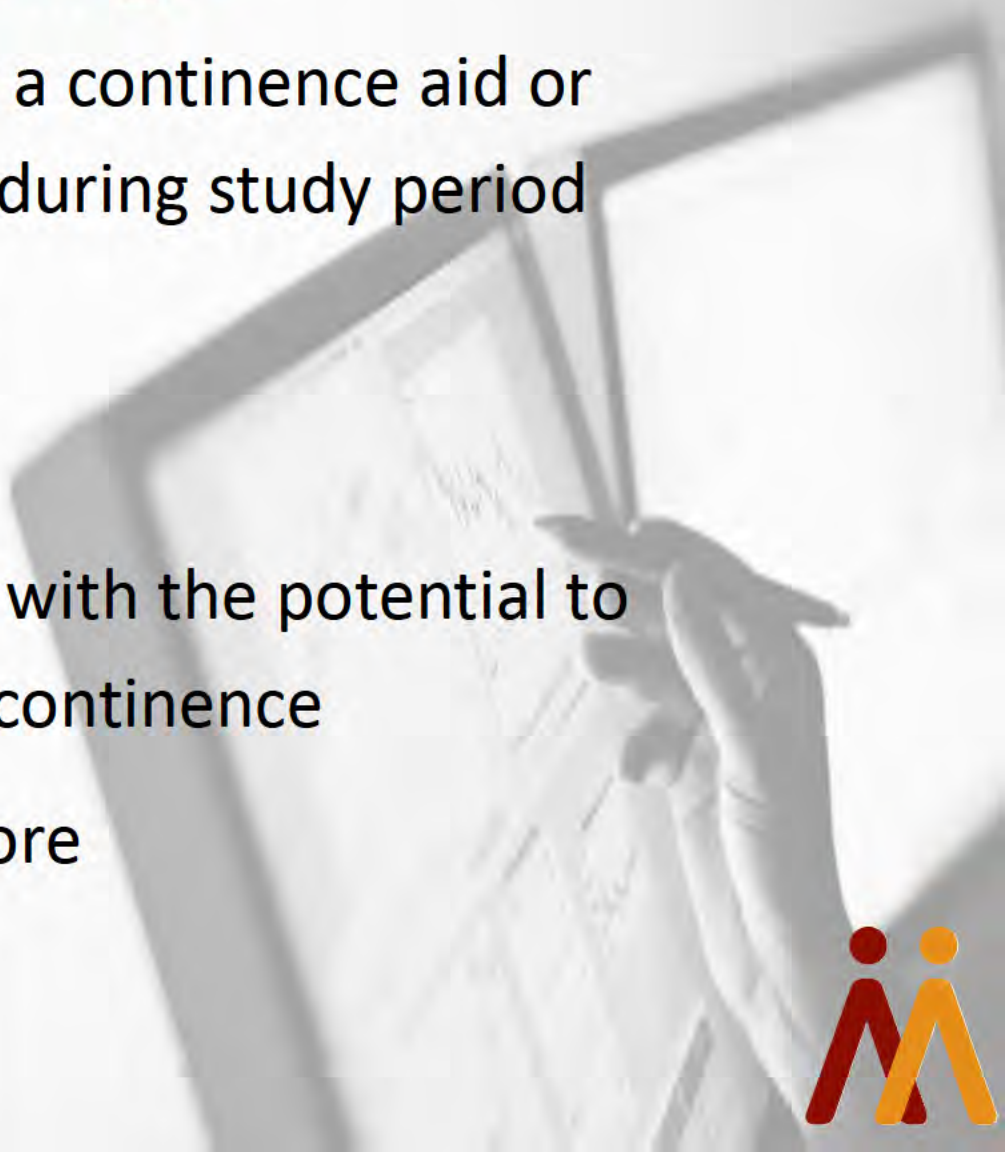
Prescription sequence symmetry analyses

- Examines asymmetry in the distribution of an incident event (either prescription of another medicine or hospitalisation)
- Asymmetry may indicate an association of the specific medicine of interest with the event



Planning Stage: Findings

- 25,301 veterans dispensed a continence aid or medicine for incontinence during study period
- 93% aged over 75 years
- 62% females
- 90% dispensed a medicine with the potential to cause or worsen urinary incontinence
- 47% dispensed three or more



Planning Stage: Findings

Veterans dispensed medicines with potential to cause or worsen incontinence

	All veterans N = 25,301
Veterans dispensed a medicine with potential to cause or worsen incontinence	90%
Most commonly dispensed:	
SSRI or venlafaxine	20%
Calcium channel blockers	31%
Sedative	35%
Diuretics	42%
ACE inhibitor/ARB	59%

So what happened to these veterans?

- Analysis shows increase in new prescriptions of oxybutynin after initiation of a number of these medicines

Agents acting on the nervous system

	Crude	Adjusted (95%CI)	Association found
Hypnotic/sedative - oxybutynin	1.19	1.16 (1.07 – 1.26)	Yes
SSRIs - oxybutynin	1.14	1.12 (1.03 – 1.23)	Yes
Anticholinesterase - oxybutynin	1.04	1.02 (0.85 – 1.23)	No

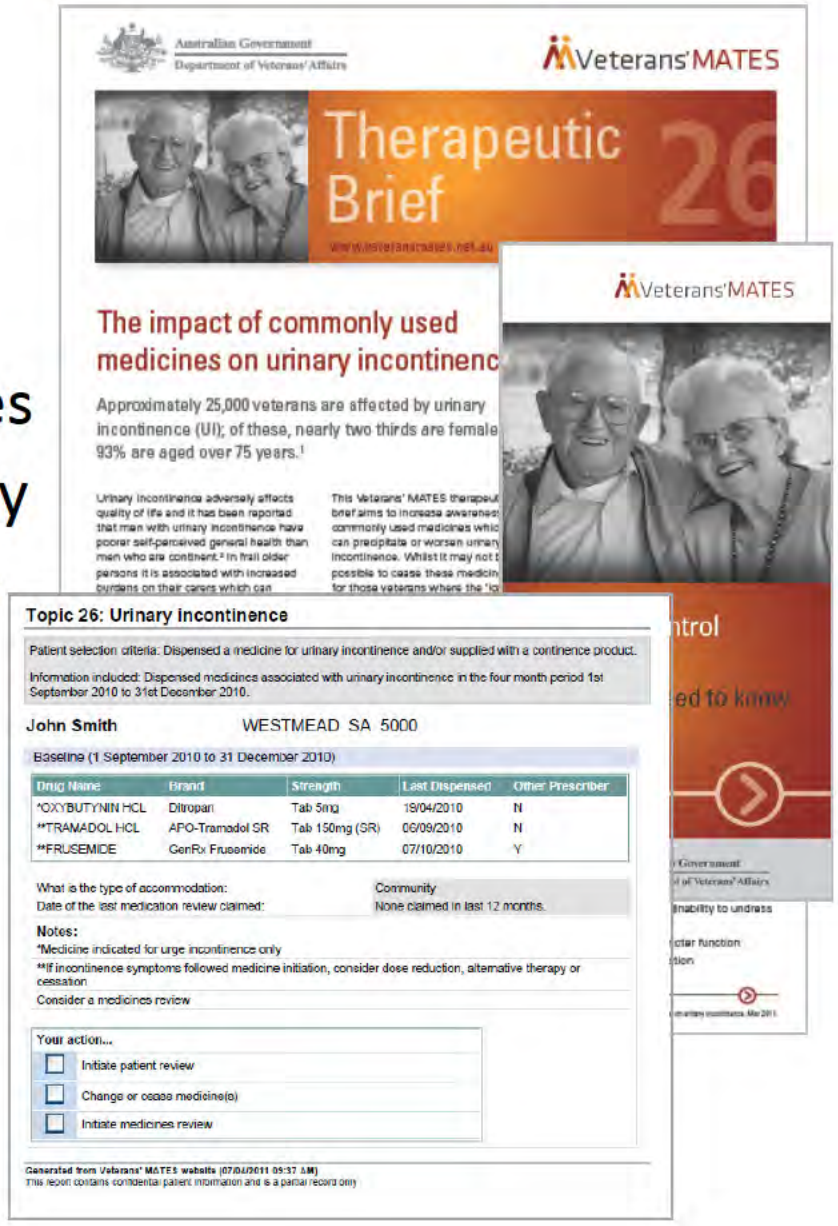
Agents acting on the cardiovascular system

	Crude	Adjusted (95%CI)	Association found
Calcium channel blockers			
Any CCB - oxybutynin	1.48	1.40 (1.28 – 1.55)	Yes
Agents acting on the renin – angiotensin system			
ACEI/ARB - oxybutynin	1.60	1.51 (1.40 – 1.63)	Yes
Selective alpha blockers			
Prazosin - oxybutynin	2.02	1.85 (1.61 – 2.13)	Yes

ACEI= angiotensin converting enzyme inhibitor
ARB = angiotensin 2 receptor blocker

Implementation Stage: Using health claims data to help address the problem

- Rolled-out topic in March 2011
- Aim: To reduce the use of medicines with the potential to worsen urinary incontinence in Australian veterans with incontinence
- Health claims data used to:
  - provide direct patient-based feedback to medical practitioners about the dispensed medicines
  - Identify veterans who meet target criteria

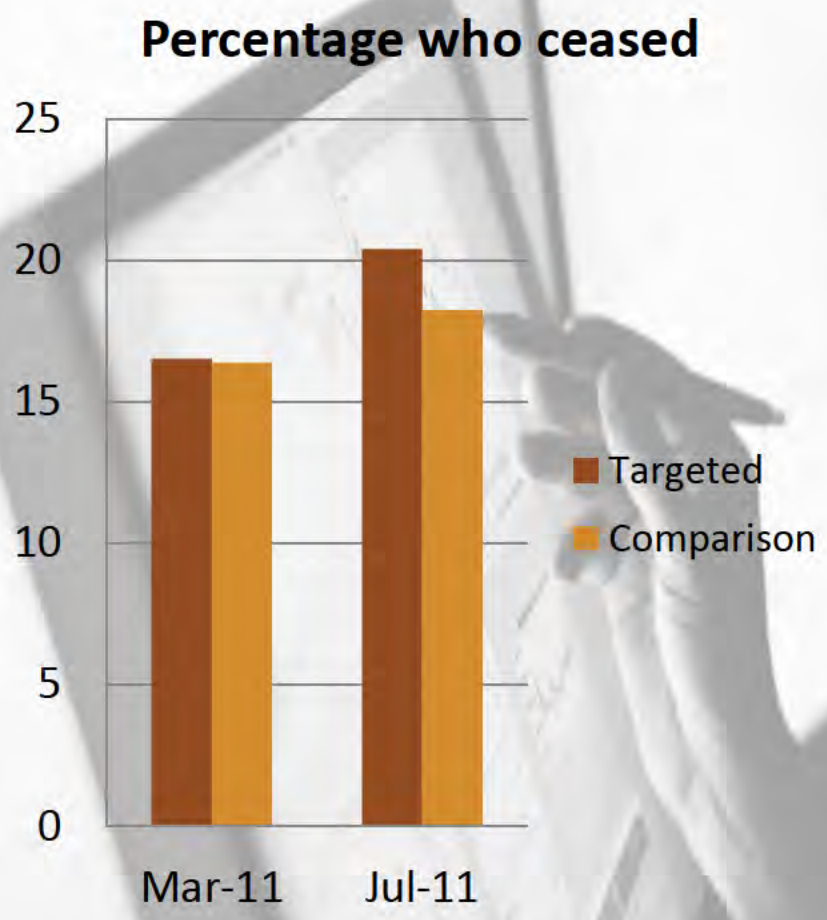


Implementation Stage

- 10,588 GPs received (March 2011)
  - Direct patient-based feedback
  - Supporting up-to-date clinical material
- 8,025 pharmacists & 285 continence nurse advisors received (March 2011)
  - Educational up-to-date clinical material
- 27,961 veterans received (April 2011)
  - Educational consumer material

Evaluation

- Discontinuation of medicines with the potential to aggravate urinary incontinence higher in targeted veterans.
- Discontinuation attributable to cessation of anticholinesterases and typical antipsychotics.
- 91% medical practitioners reported the material to be useful and 81% indicated that at least one of their identified patients required a review



Concluding note

- The use of pharmacoepidemiologic data can aid the design, delivery and evaluation of interventions to improve the use of medicines and health outcomes for patients.

- The program provides a model that could be replicated in other settings where bridging the evidence-practice gap is proving a challenge.

UniSA | Sansom Institute for Health Research

This work was funded by Department of Veterans' Affairs as part of the Veterans' MATES program

Veterans' MATES

www.veteransmates.net.au

Building healthy aged-care communities: Primary care in aged-care.

Veterans' Medicines Advice and Therapeutics Education Services Project

Information to support quality care initiatives in aged-care

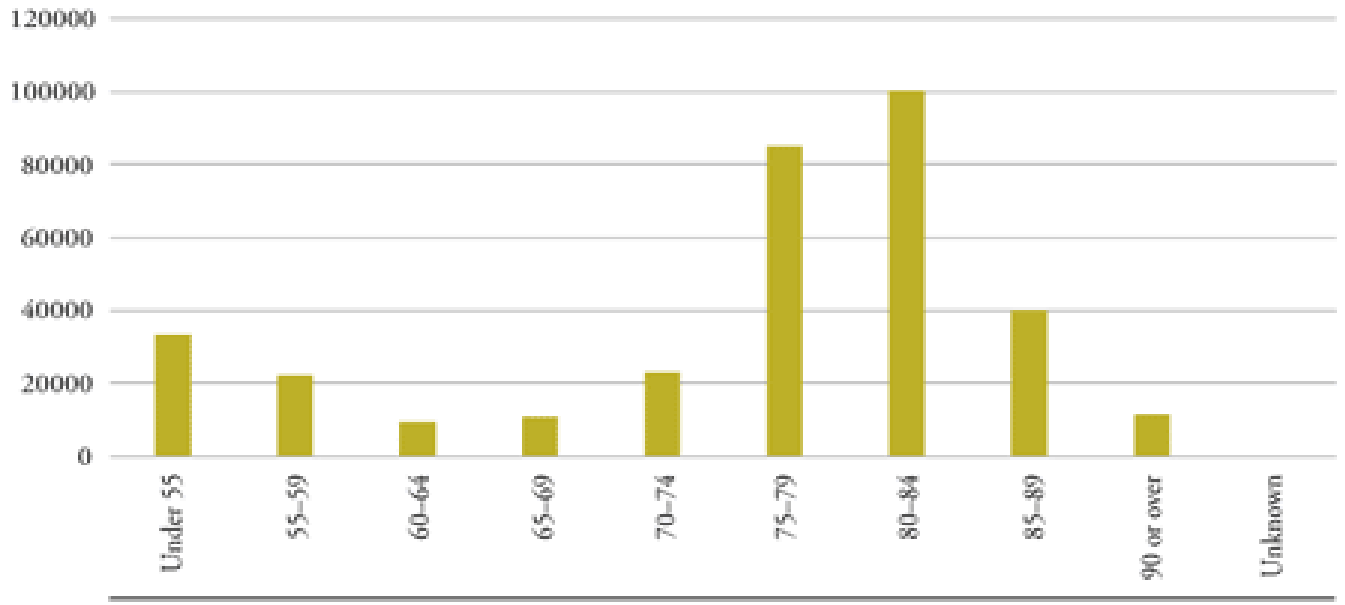
s 47F A, s 47F E, s 47F M.

Veterans' MATES:

Providing practical medicines advice and therapeutic education for health professionals and veterans:

- **Based on an analysis of linked health data provided through DVA;**
- **In an environment where current practice guidelines are often based on evidence from studies which do not include older people**

Veteran treatment population by age



DVA annual report 2003-4; p117

72% of veterans use 6 or more unique medicines concurrently

Unique Medicines	Veterans	% of Rx Population
1 to 5	92,792	28.0%
6 to 10	100,114	30.2%
11 to 15	70,509	21.3%
16 to 20	37,720	11.4%
21 to 25	17,325	5.2%
26+	12,951	3.9%
TOTAL	*331,411*	*100.0%*

DVA annual report 2003-4

- Approximately 16000 (5%) veterans live in aged-care facilities
  - of these 9000 (56%) are in high-care
- The number of veterans in aged-care is expected to grow from 16,205 to 28,777 by mid-2007*
- Veterans in low-care were dispensed an average of 8.7± 5.4 medicines
- Those in high-care an average of 7.8± 5.0 different medicines.

* Department of Veterans' Affairs, 2004, http://www.dva.gov.au/health/lastdebt/execsum.htm

For veterans in aged-care:

- In a recent examination of the DVA database we found NSAIDs, antithrombotics and some preventive cardiovascular medicines are used less by veterans with high-care needs, which may be an indicator of good practice.

- We also found high levels of use of some medicines (analgesics, psychotropics, antibacterials, laxatives and PPIs) which may be indicators of poor patient care practices.

There are however, few data to provide evidence to support these assumptions.

It is possible to use databases such as those maintained by DVA to offer information to health professionals, veterans and aged-care facilities on current management patterns and outcomes associated with those patterns of care for residents in aged-care facilities.

Routine provision of this information to aged-care may be useful to inform the discussion as aged-care panels examine quality improvement activities, preventive care initiatives and the development and implementation of protocols around primary health care in aged-care.

Key clinical areas such as:

- Diabetes
- Falls prevention,
- Bowel management
- Continence
- Behaviours of concern
- Pain management

could be targeted

For example:

- Data available from the suite of DVA databases, could be used to construct a DUE program for aged-care facilities with a large proportion of its residents who are veterans.
  - *The results could be used in an on-going quality improvement cycle*

- This type of data driven quality improvement approach could work at an individual facility or Divisional level.

Conclusion

- Residents of aged care require access to primary medical care
- Guidelines to support best practice medication management in this setting are lacking
- Data on current management strategies and their outcomes are critical to enable GPs to work with aged-care facilities on quality improvement strategies.

UniSA
Sansom Institute for Health Research
Quality Use of Medicines and Pharmacy Research Centre

People with multiple chronic diseases and the Australian health system

Lisa s 47F Andrew s 47F Elizabeth s 47F

Combinations of chronic illness are common in the elderly

- Among those aged 65 years or over
  - 4% no chronic conditions
  - 6% one chronic condition
  - 9% two chronic conditions
  - 81% three or more chronic conditions
- Increasing numbers of chronic diseases associated with poorer self-reported-health and increased difficulties with one or more activities of daily living

They all visit doctors and pharmacists

- Of those with three or more conditions and living in the community;
  - All will see a doctor and a pharmacist in the year
  - More than 80% will see a specialist, have a pathology test, have a radiology test
  - 40% will be hospitalised at least once in the year

UniSA

The combination of chronic conditions makes management harder

- 60% of those with diabetes will have a comorbidity that makes management difficult
- More than 90% of those with heart failure will have a comorbidity that makes management difficult
- 90% of those with depression will have a comorbidity that may complicate management

Diabetes and co-morbidity

- Total number of co-morbid conditions
  - Median 5 (3 – 8)
- Exclusion of related cardiovascular co-morbidities
  - Median 3 (2 – 5)
- GORD - 50%
- Depression - 25%
- Chronic pain - 20%
- Chronic airways disease - 20%
- Arthritis - 16%
- Chronic heart failure - 15%

Example of treatment conflicts: Diabetes

- 53% of those aged ≥85 dispensed metformin
- 3% dispensed long acting sulfonylurea
- 16% dispensed NSAIDs
- 9% dispensed systemic corticosteroid
  - 20% with co-morbid airways disease
- 10% with CHF dispensed 'glitazones'
- 25% with airways disease dispensed β-blockers

The elderly with multiple co-morbidities are at great risk of harm from their health care

- 90% will have at least one medicine related problem - of which 80% are likely to be resolvable
- One in five will be living with a current adverse drug reaction
- 10% will have experienced an error in their care
- These problems will be responsible for 30% of unplanned hospital admissions
  - of which 25% - 75% are potentially preventable

UniSA

- What are some of the contributing factors?

Lack of coordination of care

Interviews with chronically ill Australian adults

	Australia 2008 n =750
When you saw a specialist, did s/he have information about your medical history?	No: 19%
After you saw a specialist, did your regular doctor seem informed and up-to-date about care from the specialist?	No: 16%

Schoen C, Osborn R, How S et al. In chronic condition: experiences of patients with complex health care needs, in eight countries, 2008. Health Affairs 2009; 28(1): w1-w16.

Importance of good communication between GPs & specialists: Glaucoma

- 38% of veterans dispensed verapamil co-dispensed topical timolol for glaucoma
- 20% of veterans with glaucoma co-dispensed topical and systemic beta blockers
- 46% of veterans with CHF and glaucoma dispensed topical beta blockers
- 80% of veterans with glaucoma and airways disease dispensed an eye drop with potential to exacerbate airways disease
  - Evidence for harm: increased respiratory hospitalisations

Veterans' MATES Module 23: Impact of glaucoma medications on co-morbidities https://www.veteransmates.net.au/

Lack of coordination of care

Interviews with chronically ill Australian adults

When discharged from hospital:	Australia 2008 n = 352
The hospital made arrangements for follow-up visits with doctor or other care professional	No: 38%
Were given a written plan or instructions to manage your care at home	No: 42%

Schoen C, Osborn R, How S et al. In chronic condition: experiences of patients with complex health care needs, in eight countries, 2008. Health Affairs 2009; 28(1): w1-w16.

Lack of coordination of care:

Prompt provision of discharge information is important

- Small Australian studies: 44% - 68% of discharge summaries received by GPs within 1-2 weeks post discharge
  - 23% - 33% of GPs didn't receive them at all
  - ?pharmacist receipt of discharge summaries
- Median time to visit after hospital discharge
  - GP: 12 (4-31) days
  - Pharmacy: 6 (2-14) days

s 47F EE et al. Continuity of care: when do patients visit community healthcare providers after leaving hospital? Int Med J 2010; (in press).

Information not provided

Interviews with chronically ill Australian adults

	Australia 2005[1] n = 351	Australia 2008[2] n = 352
Given new medicine at discharge	Yes: 43%	Yes: 44%
Discussed medicines used before being admitted	No: 23%	No: 39%

1. Schoen C, Osborn R, Huynh P et al. Taking the pulse of health care systems: experiences of patients with health problems in six countries. Health Affairs – Web Exclusive 2005; W5-509 – 25.
2. 2. Schoen C, Osborn R, How S et al. In chronic condition: experiences of patients with complex health care needs, in eight countries, 2008. Health Affairs 2009; 28(1): w1-w16.

Information not provided

Interviews with chronically ill Australian adults

	Australia 2005 n = 515
Side effects of medicine explained	Always: 53% Sometimes/rarely/never: 36%

Schoen C, Osborn R, Huynh P et al. Taking the pulse of health care systems: experiences of patients with health problems in six countries. Health Affairs – Web Exclusive 2005; W5-509 – 25.

Information not provided:
Surveys with Australian veterans

- 40% not told medicine name
- 33% not told how to take it
- 25% not told what it was for
- 70% not told about side effects / interactions

s 47F T et al. Medicine information – what older people want and what they get. Medicines in People's Lives: National Medicines Symposium; Melbourne 2010.

UniSA

Looking to the future

- The problem is not going to go away
  - Increasing trend to treat single conditions with multiple medicines (e.g. high blood pressure, diabetes)
  - The ageing of the population means more people will be living longer with chronic diseases

Treating the person with multiple co-morbidities: how helpful are clinical trials?

- Evidence-based medicine relies mainly on evidence from randomised clinical trials
- However, clinical trials have limitations:
- Elderly people often excluded or under-represented
    - 1990 – 2002: 84 RCTs on drug therapy for those aged 80 years and over
        - even though >50,000 human RCTs in this period
- People with co-morbidities often excluded

Le Quintrec J et. al. Journal of Gerontology: Medical Sciences 2005; 60A(3): 340-4.

How generalisable are the results of clinical trials to elderly people with multiple co-morbidities?

- Assessment of 17 Australian guidelines
  - Only half of the guidelines addressed treatment for older patients and for patients with single comorbidities.
  - Only one discussed issues of elderly people with multiple conditions.
- The absence of guidance means that treatment decisions are left with individual practitioners

s 47F Al and s 47F Y. Quality of Australian clinical guidelines and relevance to the care of elderly people with multiple morbidities. Med J Aust 2008; 189 (7): 360-365.

Looking forward: leading causes of burden of disease in Australia 2023

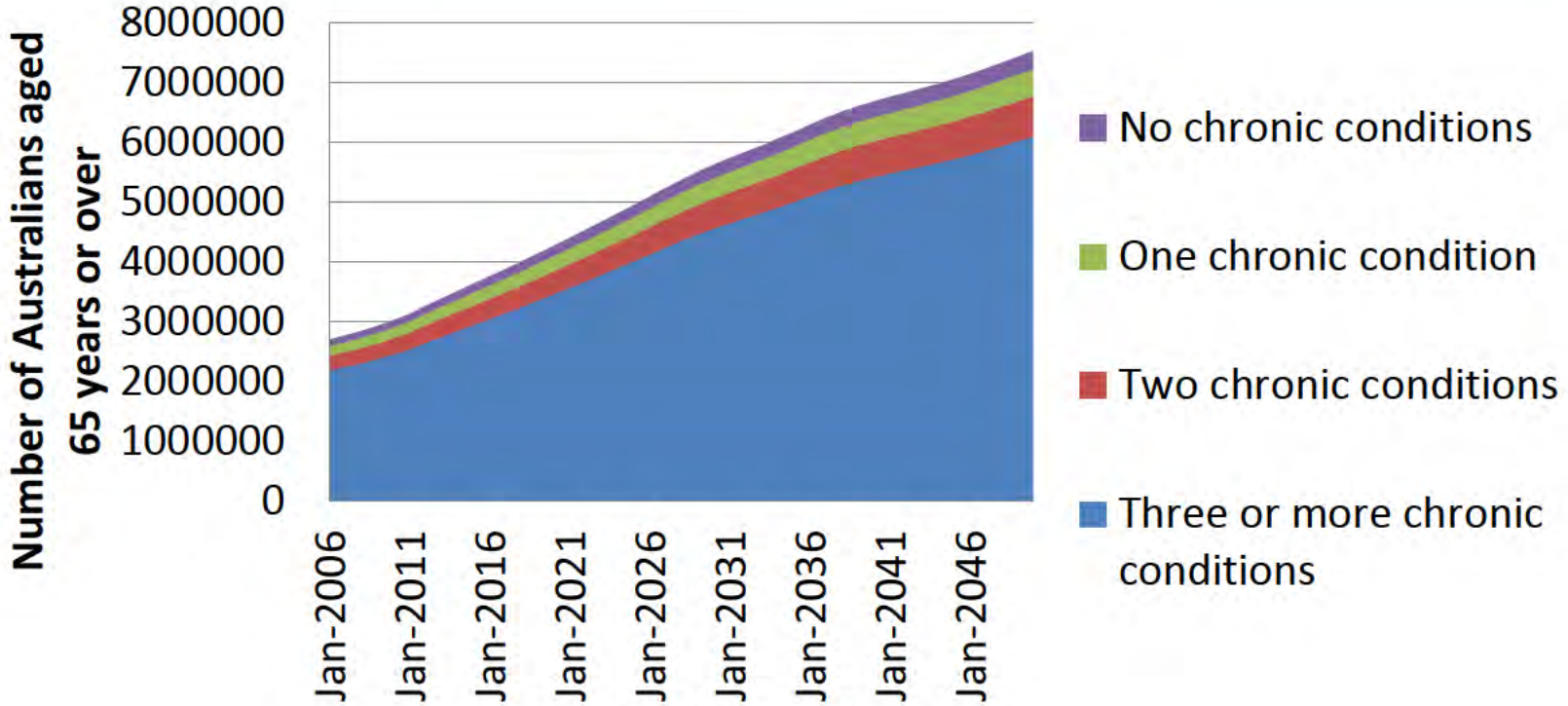
Men

- Diabetes
- Heart disease
- Depression / Anxiety
- Dementia
- Hearing loss
- Lung cancer
- Stroke

Women

- Depression / Anxiety
- Diabetes
- Dementia
- Heart disease
- Stroke
- Breast cancer
- Lung cancer

In 2050 6 million elderly Australians will be living with 3 or more chronic conditions

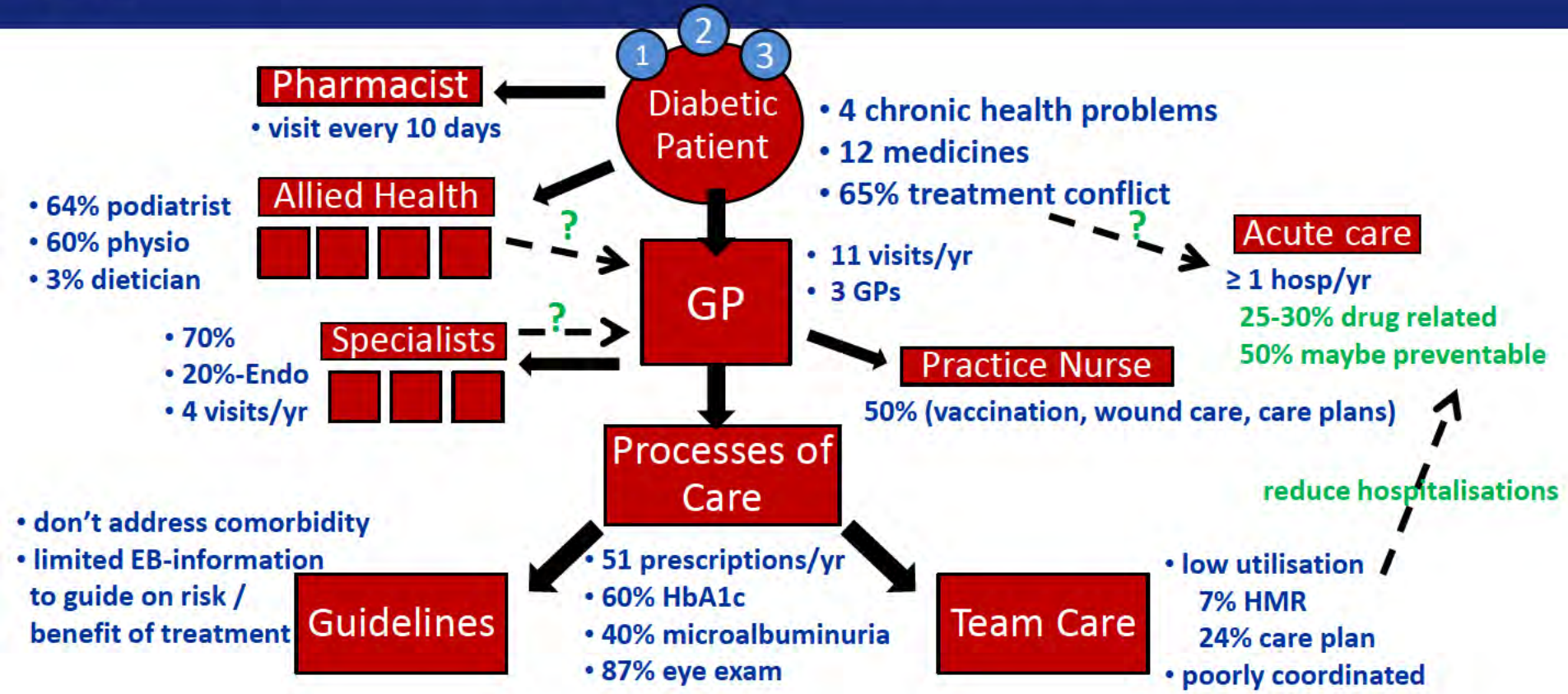


We need to find another way forward

Based on current use of health services the population with multiple comorbid conditions would require

- Over 72 million GP visits
- Over 360 million prescriptions
- But, more than 10 million medication-related problems
- 600,000 people living with adverse reactions
- More than 600,000 errors in care

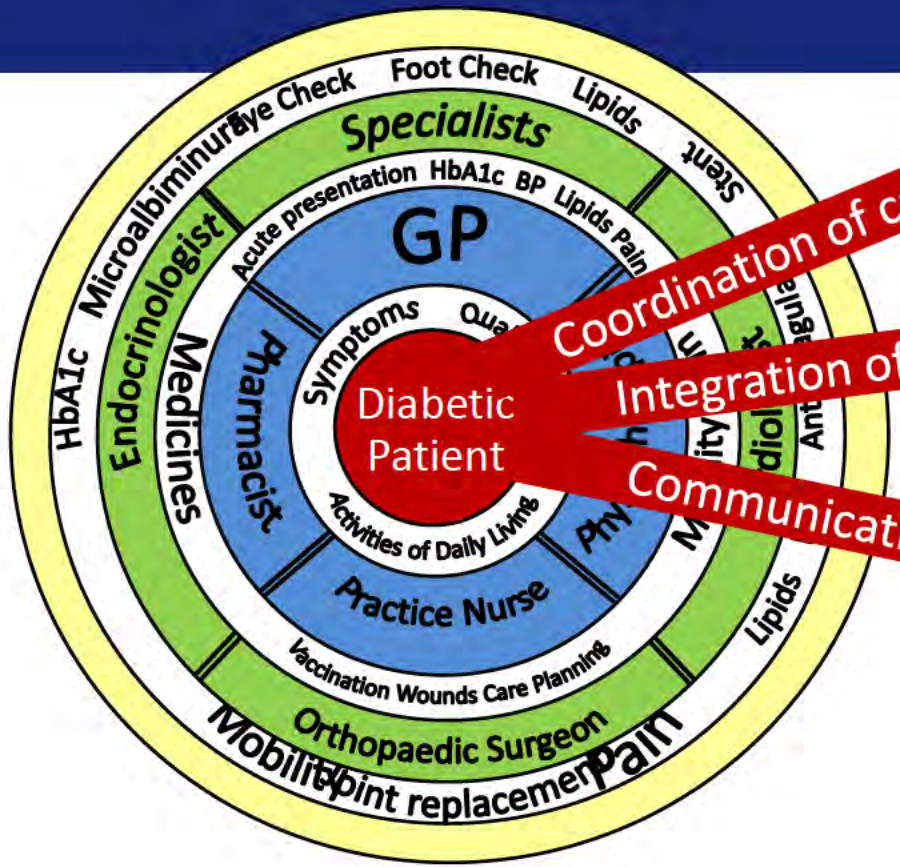
Case study: a patient with diabetes



The patient's perspective

- Emotional well being and social issues are the most pressing concern and although important, medicines and interactions with health practitioners are secondary
- Being diagnosed with diabetes "*overwhelming*" because:
  - You are being diagnosed with another disease that will "*never go away*"
  - Too many appointments and tests and responsibilities
  - You have to take in too much new information at one time
  - Another medicine to take, can't cope

UniSA



Coordination of care

Integration of care

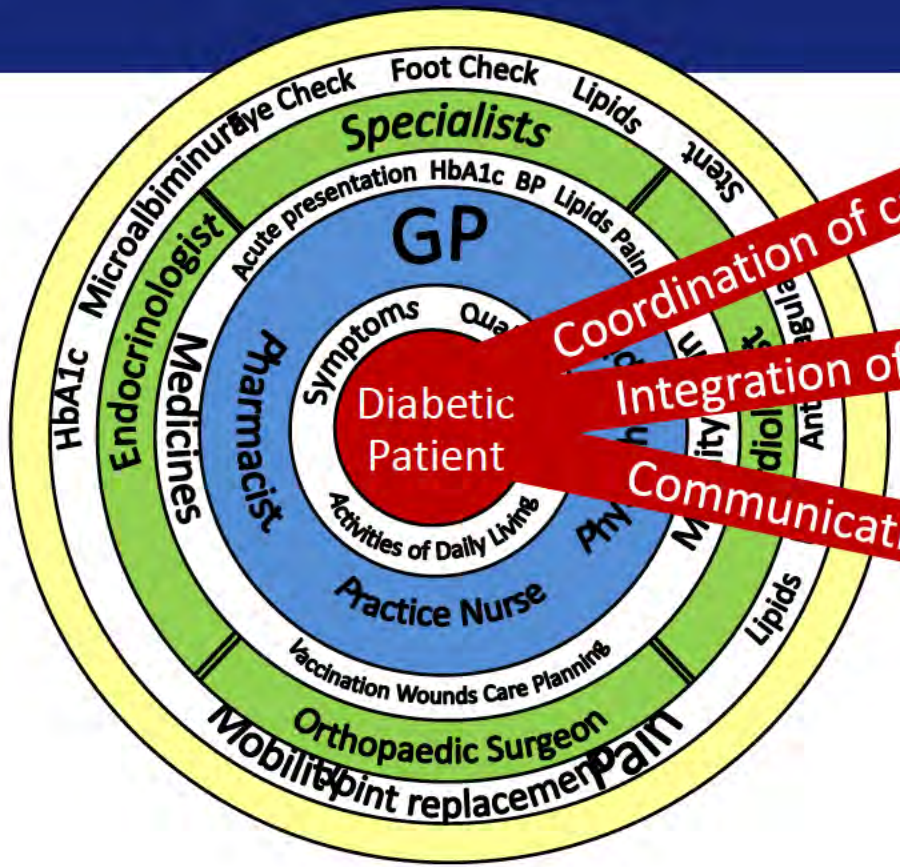
Communication

Primary Health Care Providers

Specialists

Health System

UniSA



Coordination of care

Integration of care

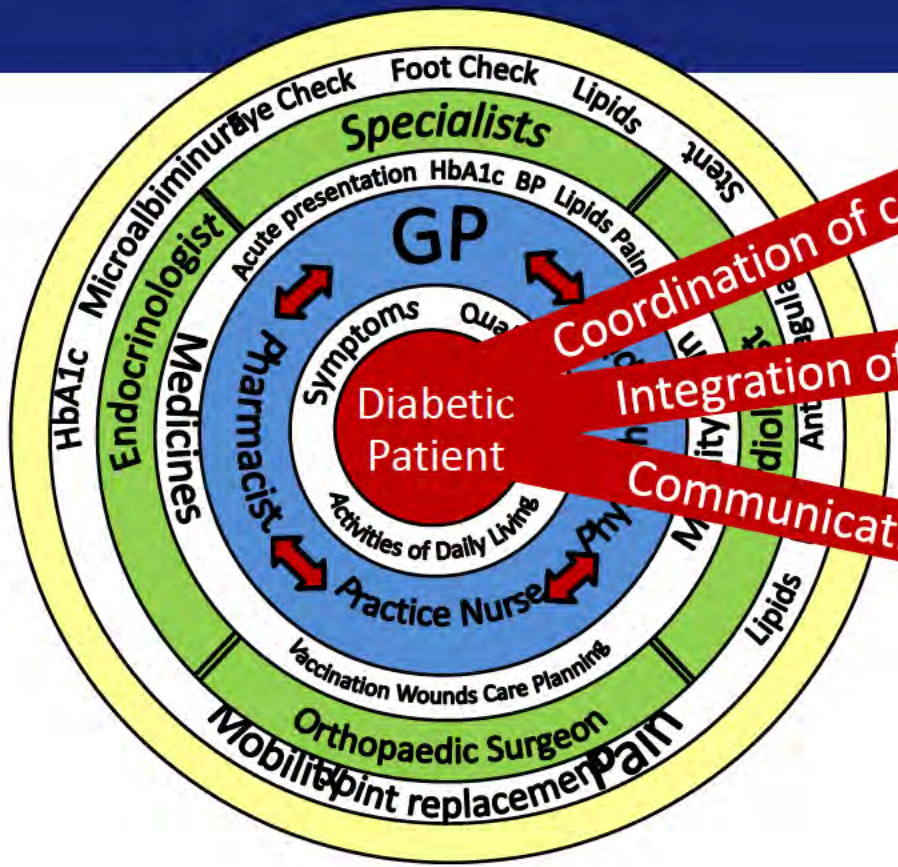
Communication

Primary Health Care Providers

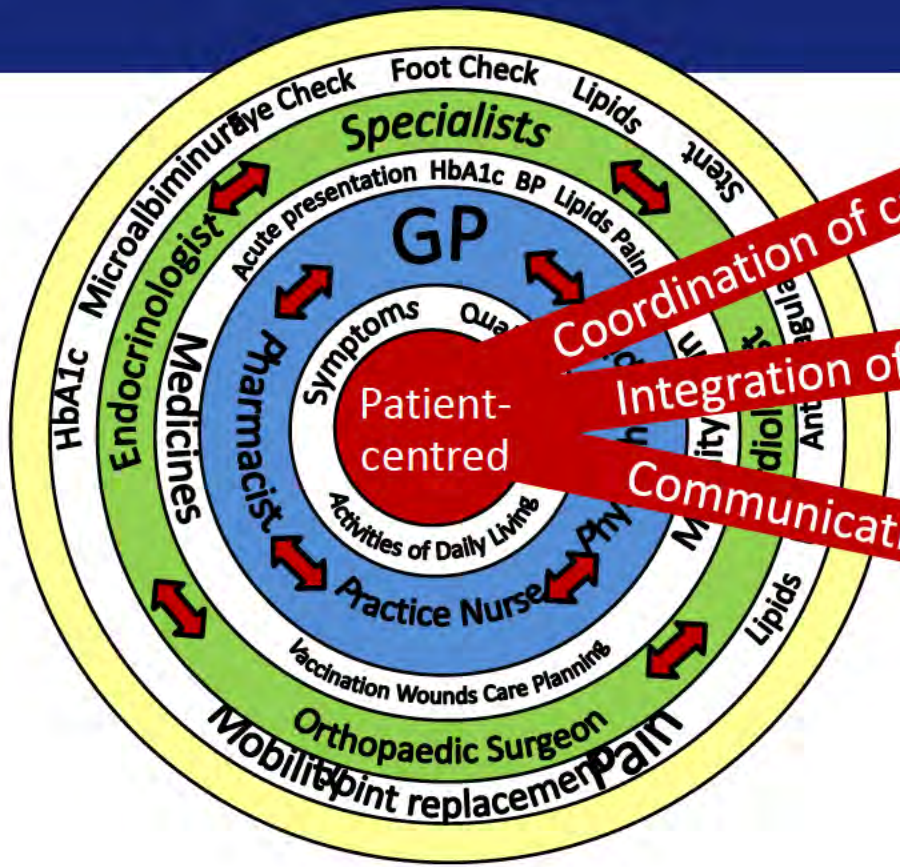
Specialists

Health System

UniSA


Specialists
Foot Check
Lipids
Microalbiminuria
Endocrinologist
Medicines
Pharmacist
GP
Acute presentation
HbA1c
BP
Lipids
Pain
Symptoms
Diabetic Patient
Activities of Daily Living
Practice Nurse
Vaccination
Wounds Care
Planning
Orthopaedic Surgeon
Pain
Lipids
HbA1c
Coordination of care
Integration of care
Communication
Primary Health Care Providers
Specialists
Health System

UniSA



Coordination of care

Integration of care

Communication

Primary Health Care Providers

Specialists

Health System

Co-morbidity and health reforms

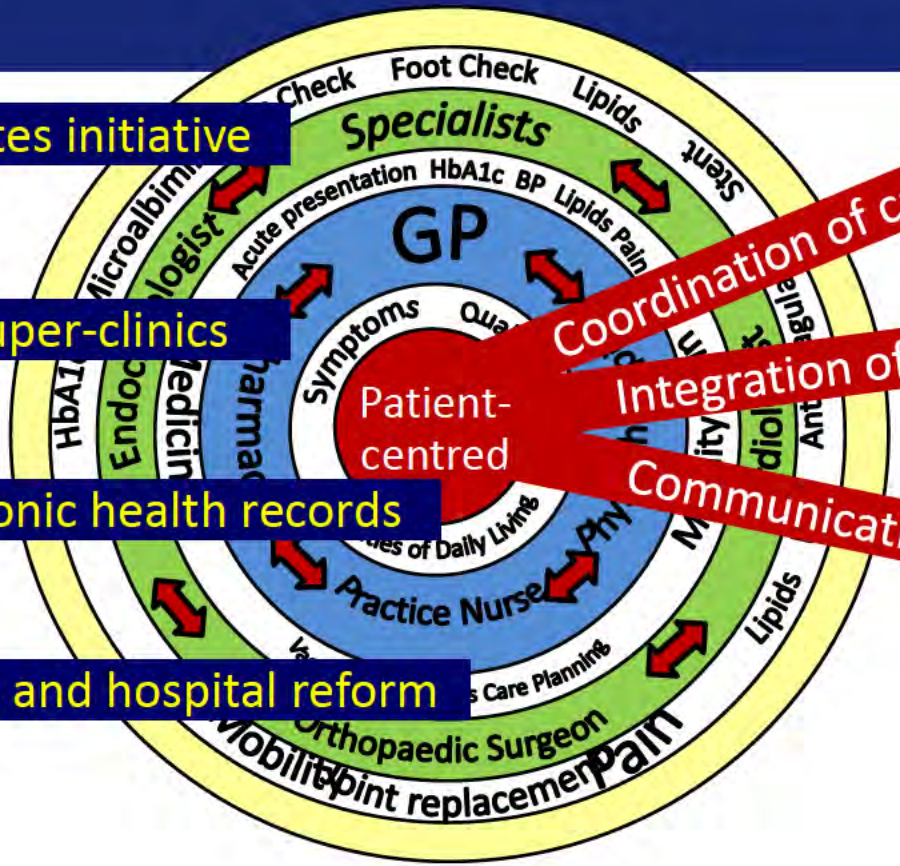
UniSA

Diabetes initiative

GP super-clinics

Electronic health records

Health and hospital reform



Considering a quality use of medicines framework in comorbidity

- Policy development
- Facilitation and co-ordination
- Objective information
- Education
- Services and interventions
- Routine data collection, evaluation and research

UniSA

- Examples of improved health outcomes associated with improved coordination of care

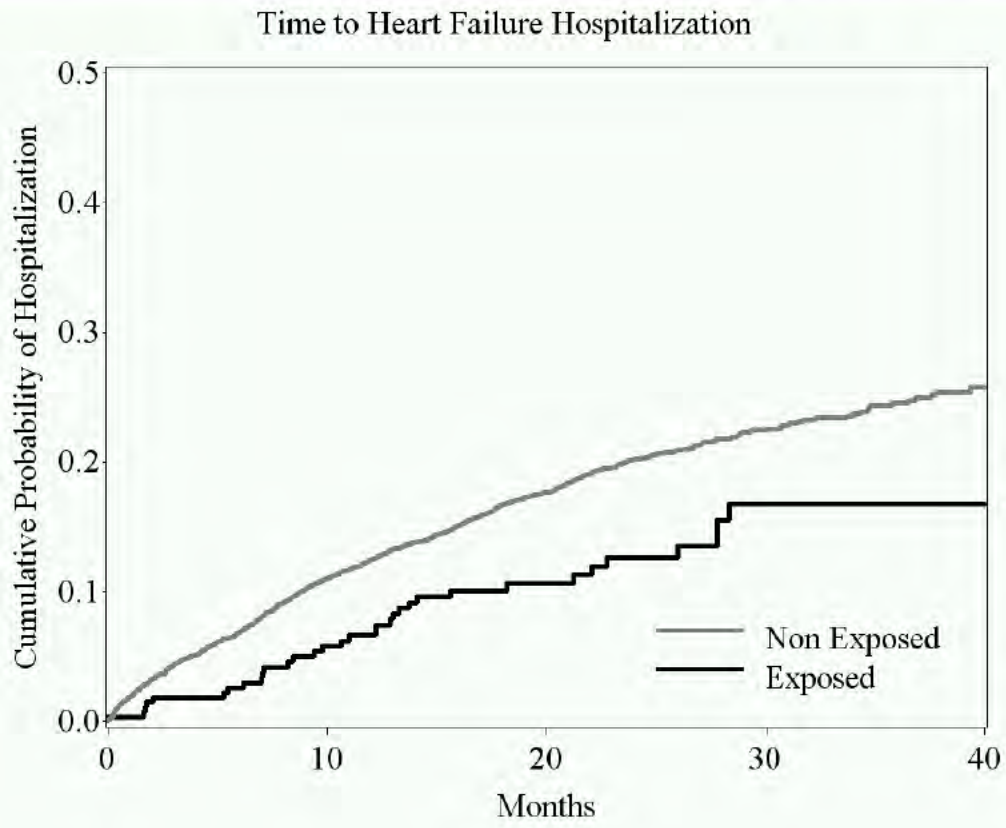
Coordination of care can improve outcomes: Home medicines review for warfarin users

- Retrospective cohort study
  - Cases = veterans dispensed warfarin, had a HMR
  - Controls = veterans dispensed warfarin, no HMR
- Follow-up until: first hospitalisation for a bleed, death or study end
- Confounders: age, gender, SEIFA, region of residence, season, co-morbidity, number of: Rx, medication changes, prescribers, pharmacies, hospitalisations for bleed, OT visits, speech therapy visits, palliative care meds

Home medicines review improves outcomes for those dispensed warfarin

Time since home medicines review (HMR)	Hazard ratio (95% CI)	P-value
0-2 months post HMR	1.13 (0.63 – 2.02)	p = 0.68
>2 to 6 months post HMR	0.21 (0.05 – 0.87)	p = 0.03
>6 to 12 months post HMR	1.07 (0.64 – 1.81)	p = 0.79
>12 months post HMR	1.61 (1.18 – 2.20)	p = 0.003

Home medicines review improves outcomes in heart failure



% of veterans hospitalised for heart failure at 12 months:

- 6% of veterans who had a HMR
- 14% of veterans who didn't have a HMR

i.e. 8% fewer veterans hospitalised for heart failure

UniSA

- Example of improved medication use and outcomes by considering multiple co-morbidities, rather than focussing on a single condition

Use of NSAIDs in those with co-morbid diabetes or heart failure

- For 10,000 people treated with NSAID for 30 days:
  - 20 additional hospitalisations amongst those with diabetes
  - 30 additional hospitalisations amongst those with CHF
  - Compared to 6 hospitalisations amongst those without diabetes or CHF
- Use of NSAIDs in those with diabetes or CHF similar to the general population
  - ?awareness of potential for harm in these co-morbidities

Patient specific prescriber feedback is effective in reducing use of NSAIDs in high risk patients

- Veterans' MATES module 4
  - Aimed to increase awareness of the risks of NSAID use in those with diabetes or CHF
  - Asked doctors to review clinical risk management of specific diabetes/CHF patients using NSAIDs
- Result: Cessation of NSAIDs
  - Over 800 patients with diabetes
  - Over 1000 patients with heart failure

UniSA

Conclusions

- As the health reforms develop we need to;
  - Raise the profile of management of co-morbidity
  - Prioritize development of the evidence base and education for health professionals
  - Further develop services concerning multiple morbidity, rather than single morbidities
  - Further develop data collection and evaluation to continually inform health care and policy development

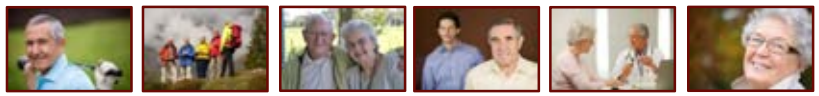
Acknowledgements

- Ageing Well, Ageing Productively team
- Veterans' MATES team

Australian Government
Department of Veterans' Affairs

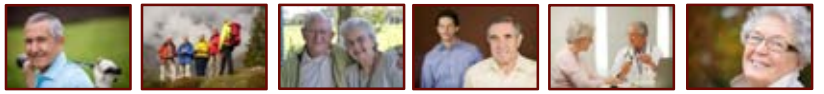
Veterans' MATES

Libby s 47F
University of South Australia



Veterans' MATES

- It is a data driven health promotion program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.



The approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material are sent to members of the veteran community for whom the health topic is relevant.

UNSTEADY ON YOUR FEET? TALK TO YOUR GP

Being unsteady on your feet can be worrying, particularly if you have fallen in the past. You might feel that there is nothing that can be done to help and that it's just one of those things that happen as you get older. By talking to your GP and working through things together, small changes can be made to help keep you steady on your feet and reduce your chance of having a fall.

Dr Name
Patient Name; date of birth
Address

GENDER: Female	ACCOMMODATION: Residential care

Medicine	Medicine class	Last Dispensed	Other Prescriber
Sertraline (Eleva 100) tab 100mg	SSRI	03/02/18	Yes
Oxycodone hydrochloride (OxyNorm) Cap 10mg	Opioid	20/02/18	No

Received medicines indicating osteoporosis:	Yes
Number of hospitalisations associated with a fall in last year:	2
Medicines Review (HMR or RMMR) claimed:	None claimed in last two years

Patient dispensed a combination of medicine classes that doubles the risk of falls and hip fractures

Consider the following:

- Ask the patient how steady they feel on their feet or if they have previously fallen Yes ☐
- Review medicines to see if any are suitable for tapering or ceasing Yes ☐
- Ask the patient if they would consider reducing the medicine Yes ☐
- Plan a reduction strategy and address other risk factors for falls Yes ☐
- Would the patient benefit from a Medicines Review (HMR or RMMR) Yes ☐

*An electronic PDF version of each individual patient's information is available at www.veteransmates.net.au

We use the Australian Government Department of Veterans' Affairs routinely collected health claims data to

- **Identify potential problems for veterans**
- **Develop the medication list for the doctors**
- **Evaluate each intervention**

1/2 BILLION

Contains over half a billion health claims records

10 YEARS

More than ten years of historical health data

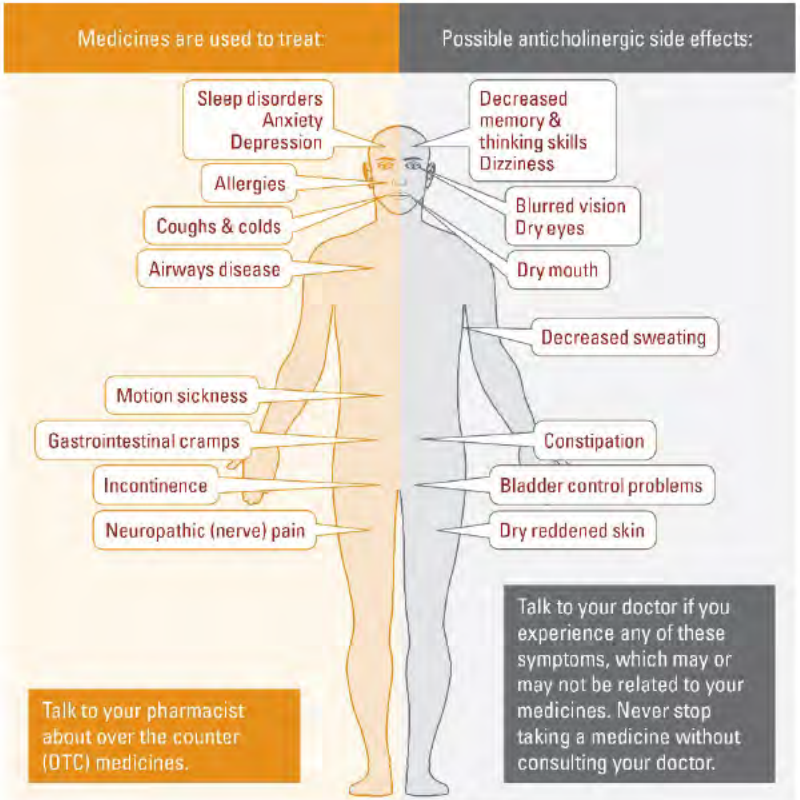
Contains hospital records including diagnosis and procedures

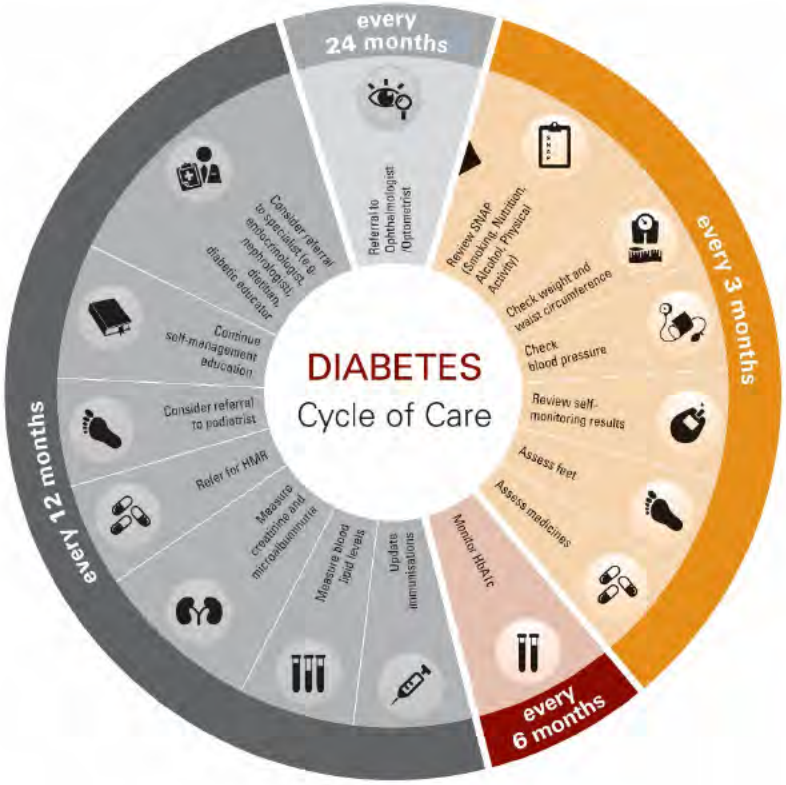
Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

To date 57 topics delivered reaching on average:

- 40,000 veterans
- 10,000 GPs
- 8,500 pharmacies and accredited pharmacists
- 2,600 Directors of Care, Residential Aged Care Facilities



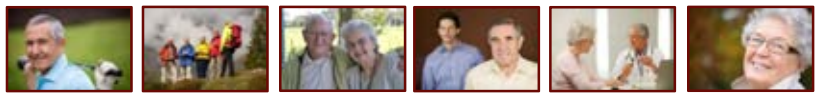


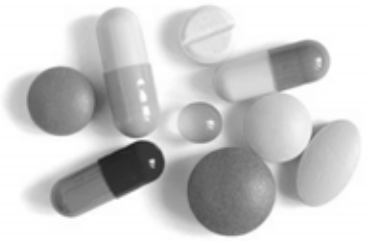
Each topic is either:

- Disease specific e.g. neuropathic pain, diabetes
- Medicine specific e.g. statins, antipsychotics
- Or about service delivery e.g. bone density tests, care planning

The educational material is tailored to identified problems and the process includes significant partnership

- A practitioner reference group and a veteran reference group meet twice yearly to provide advice
- Materials written by a medical writer supported by clinical reference group
- Peer-reviewed prior to publication
- Endorsed by a national, representative editorial committee
- DVA provide a national call centre staffed by pharmacists for veterans and health care practitioners to provide additional support





So what happens?



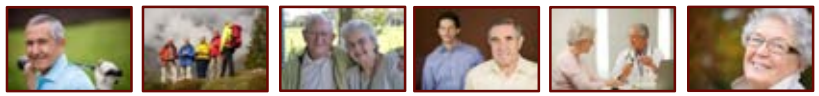


Improving osteoporosis management:

The planning stage

Identifying the problem: detection

- We assessed use of bone mineral density tests among older men and women
  - Less than 10% of women and men 80 years or over had had a bone mineral density test in the previous 5 years
  - Only 2% of older men and 10% of older women on medicines for osteoporosis, while up to 50% in the oldest age groups may have osteoporosis

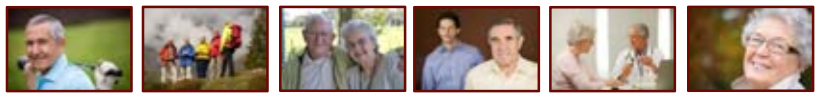


Improving osteoporosis management:

The planning stage

Identifying the problem: falls and fracture

- We assessed patients admitted to hospital for hip fracture
  - 1 in 6 women and 1 in 5 men had had a prior fracture but were not on medicines for osteoporosis
  - 1 in 15 were on corticosteroids and no medicines for osteoporosis
  - 84% on at least 1 medicine that increases risk of fall
  - 50% on 2 or more medicines that increase risk of falls
    - 1 in three were dispensed an antidepressant
    - 1 in four a benzodiazepine
    - 1 in ten an antipsychotic



Leach et al., JPPR; 2013

s 47F et al., 2012

Reducing the risk of falls & hip fractures

- Our fracture and falls prevention topics were implemented to assist appropriate medicine use and reduce risk of falls or fracture

Stopping osteoporotic fractures

In Australia, osteoporosis and osteopenia occurs in more than 66% of people 50 years and older.[1] Most people are not aware of their own fracture risk and most do not receive appropriate education, screening or management even after they have had a minimal trauma fracture (a fracture after falling from standing height or less).[2-5]

Most people at high-risk are NOT screened

79% MEN **54%** WOMEN

Most people are NOT aware of their fracture risk

60% UNAWARE

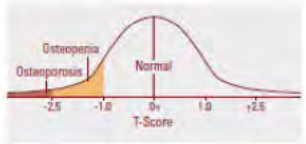
66% of people with osteopenia do not receive appropriate treatment

60% of people with osteoporosis do not receive appropriate treatment

70% of people with a prior fracture do not receive appropriate treatment

The mortality rate in the first 12 months after a hip fracture is 37% for men and 20% for women.[6] Vertebral fractures are associated with significant long-term disability, pain and kyphosis.[7] Early detection and appropriate treatment can reduce the risk of minimal trauma fractures in the future by as much as 70%.[7]

Discrepancies in information often make it unclear as to what is best practice for patients with osteoporosis or osteopenia. This therapeutic brief provides concise and practical information to help identify and treat high-risk patients to prevent a first or second minimal trauma fracture, and to help identify what is available for PBS and MBS reimbursement.



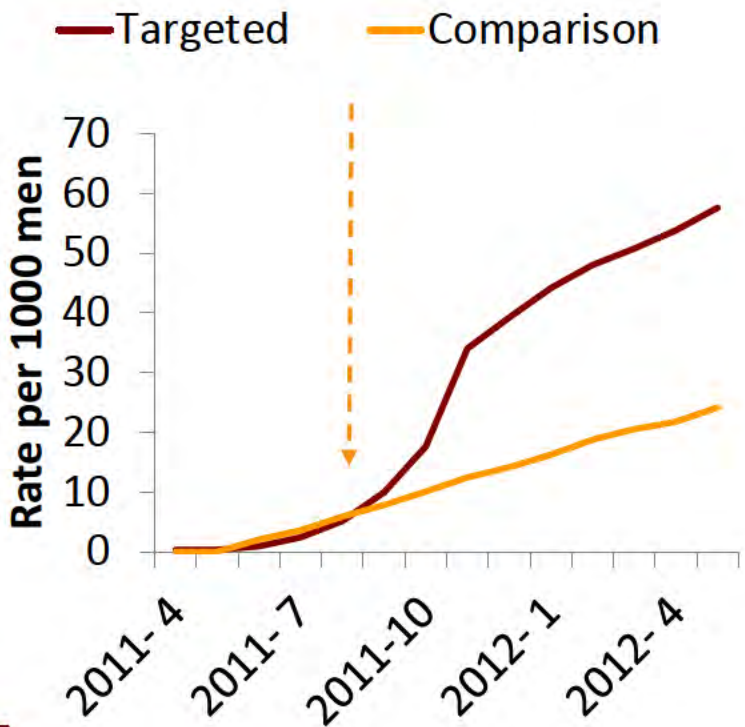
World Health Organisation **diagnostic criteria for osteoporosis, osteopenia and normal bone mineral density. Adapted with permission from *Osteoporosis Australia***

Reducing the risk of falls & hip fractures

What happened?

- ✓ 2.5 fold increase in bone mineral density tests to detect osteoporosis in women; 2.4 fold increase in men
- ✓ 40% relative increase in osteoporosis medicine use in men
- ✓ Similar rates in targeted women compared with older women

Rate of BMD testing (men)



s 47F s 47F et al. Arch Osteoporos. 2017 Dec;12(1)

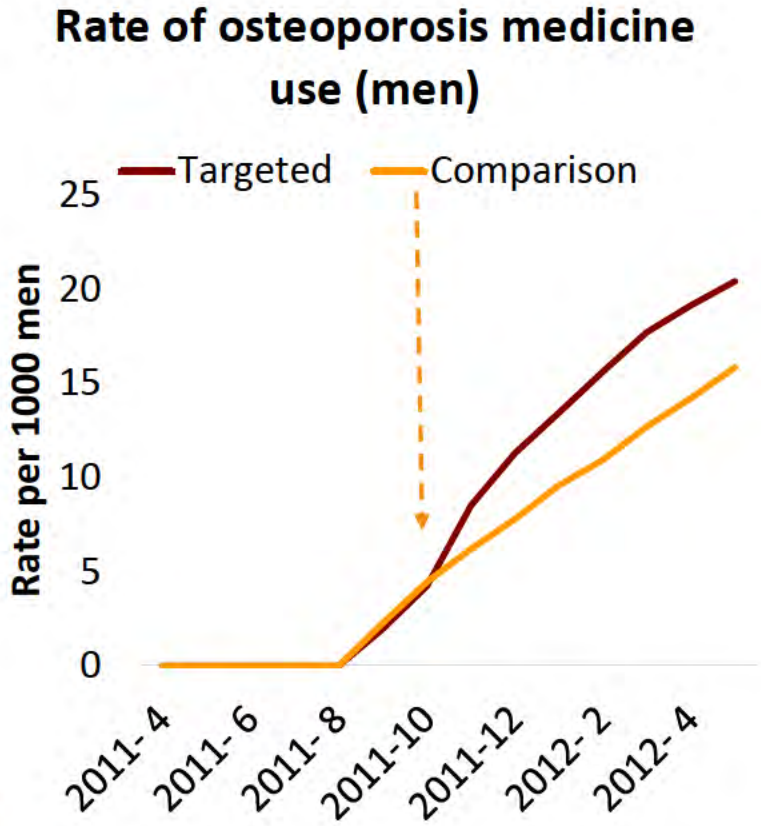
Reducing the risk of falls & hip fractures

What happened?

- 3871 additional veterans received tests for bone mineral density
- 25,832 additional patient months of treatment with medicines for osteoporosis

Health outcomes: Avoided,

- 80-150 fractures avoided^



s 47F s 47F et al. Arch Osteoporos. 2017 Dec;12(1)

Being an active partner in your care

www.veteransmates.net.au

UNSTEADY ON YOUR FEET? TALK TO YOUR GP

Being unsteady on your feet can be worrying, particularly if you have fallen in the past. You might feel that there is nothing that can be done to help and that it's just one of those things that happen as you get older. By talking to your GP and working through things together, small changes can be made to help keep you steady on your feet and reduce your chance of having a fall.

Dr J Howell

Grace Toogood (DOB 04/02/1926) **ADDRESS: 113 Kittyhawk Dr, CHERMSIDE QLD 4032**	**GENDER:** **Female**	**ACCOMMO** **Residential**

Medicine	Medicine class	Last Dispensed
Sertraline (Eleva 100) tab 100mg	SSRI	03/02/18
Oxycodone hydrochloride (OxyNorm) Cap 10mg	Opioid	20/02/18

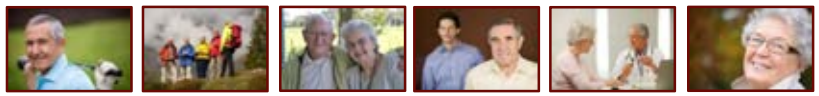
Received medicines indicating osteoporosis:	Yes
Number of hospitalisations associated with a fall in last year:	2
Medicines Review (HMR or RMMR) claimed:	None claimed in last two years

Patient dispensed a combination of medicine classes that doubles the risk of fa fractures

Consider the following:

- Ask the patient how steady they feel on their feet or if they have previously fallen Yes ☐
- Review medicines to see if any are suitable for tapering or ceasing Yes ☐
- Ask the patient if they would consider reducing the medicine Yes ☐
- Plan a reduction strategy and address other risk factors for falls Yes ☐
- Would the patient benefit from a Medicines Review (HMR or RMMR) Yes ☐

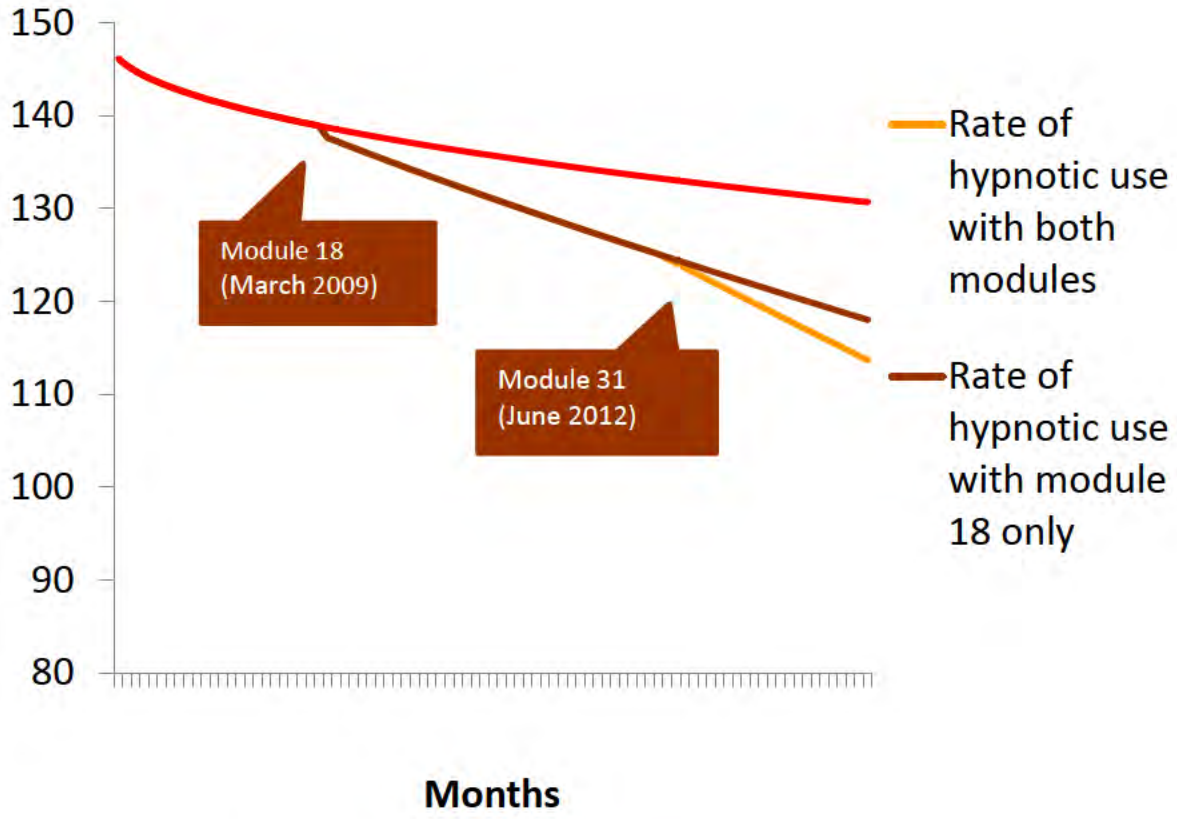
*An electronic PDF version of each individual patient's information is available at *www.veteransmates.net.au*



Reducing the use of sedative medicine use

What happened?

- 116,000 fewer patient-months of treatment with hypnotics



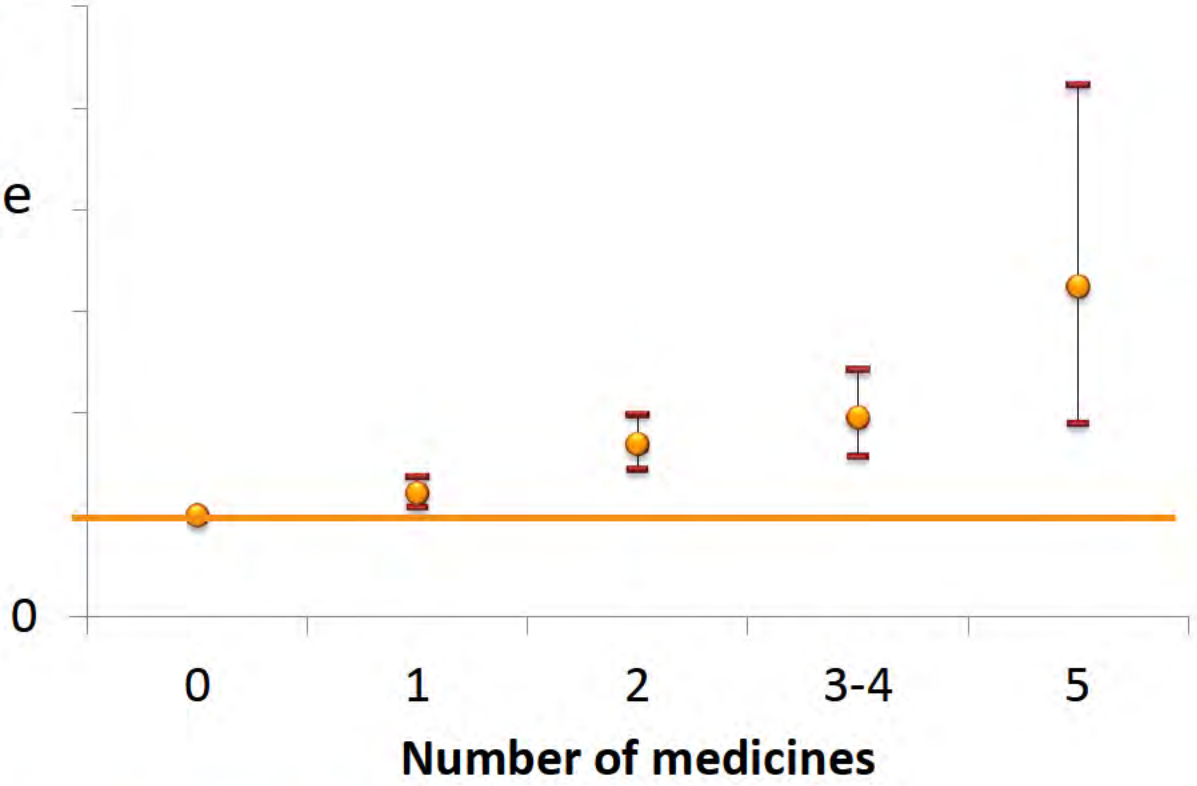
s 47F s 47F BMC Health Serv Res. 2018 Aug 9;18(1):626.

Quantifying outcomes: multiple sedative medicine use and risk of hospitalisation for fall

Health Outcomes:

Avoided,

- 80 hospital admissions due to falls



s 47F et al., Drug Saf. 2014

The factors contributing to our success

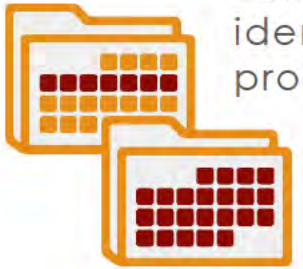
A multidisciplinary, collaborative approach

Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

Significant stakeholder engagement

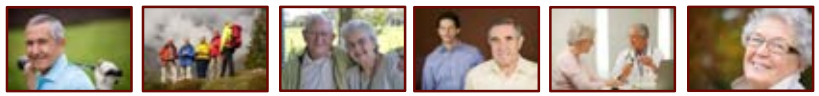


Only target identified problems

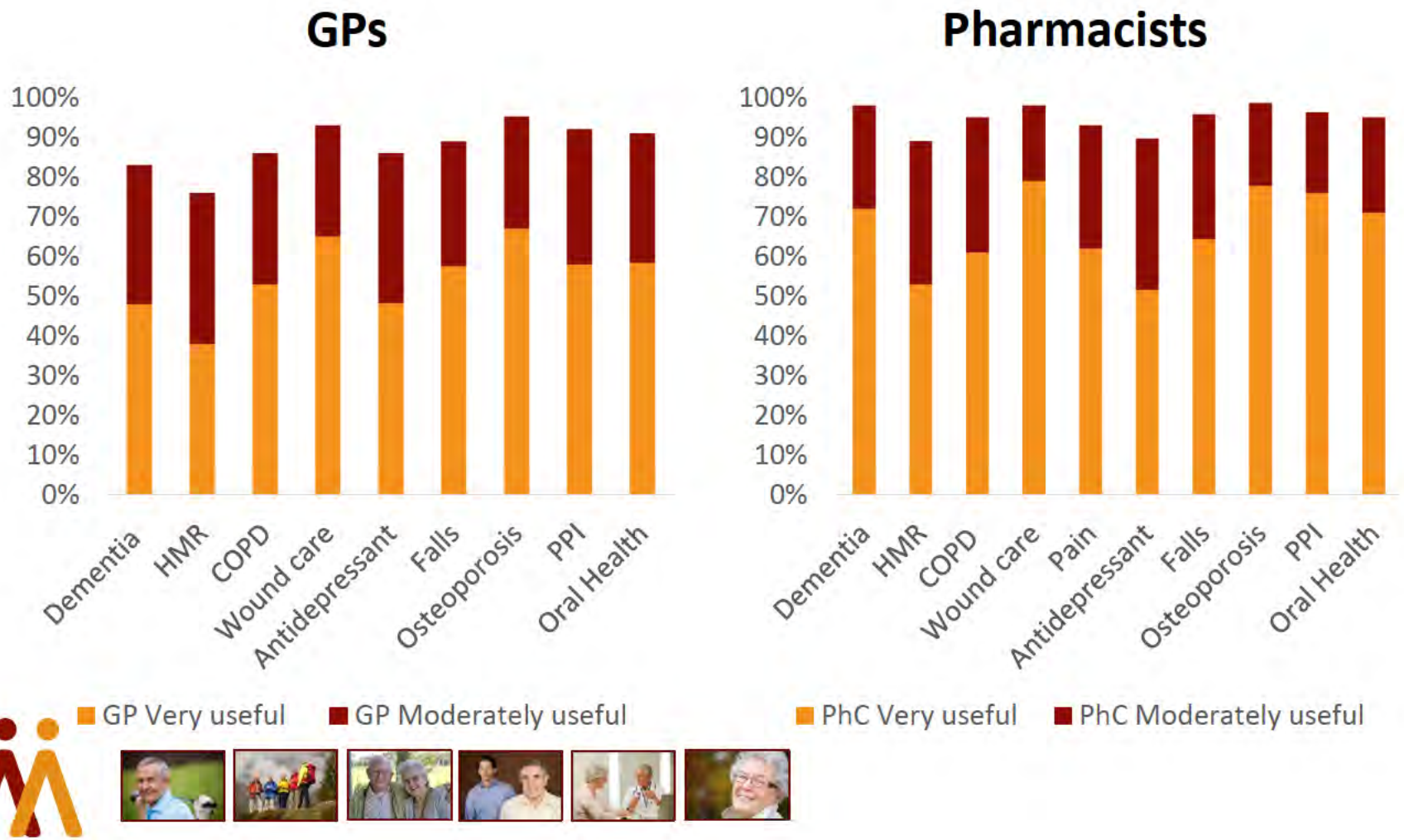
Grounded in behavioural theories and models

Interventions delivered

		Veterans	GPs	PhC	Other
Dementia and changes in behaviour	Sep 2016	(9471)	5032	8365	2510: RACF
Reviewing the medicine routine	Nov 2016	59022	15731	8339	
COPD: keeping well this winter	Mar 2017	13266	7847	8320	2504: RACF
Wound care	June 2017	52778	14178	8363	2504: RACF
Understanding chronic pain	Sep 2017	13968	8568	8370	689: Psychologist
Depression management	Nov 2017	13606	8170	8347	
Preventing falls	Mar 2018	19958	9298	8365	2502: RACF
Osteoporosis		54871	15749	8381	
PPI		35043	13494	7703	2501: RACF
Medicines and dry mouth		14334	8673	8444	8638: Dentists

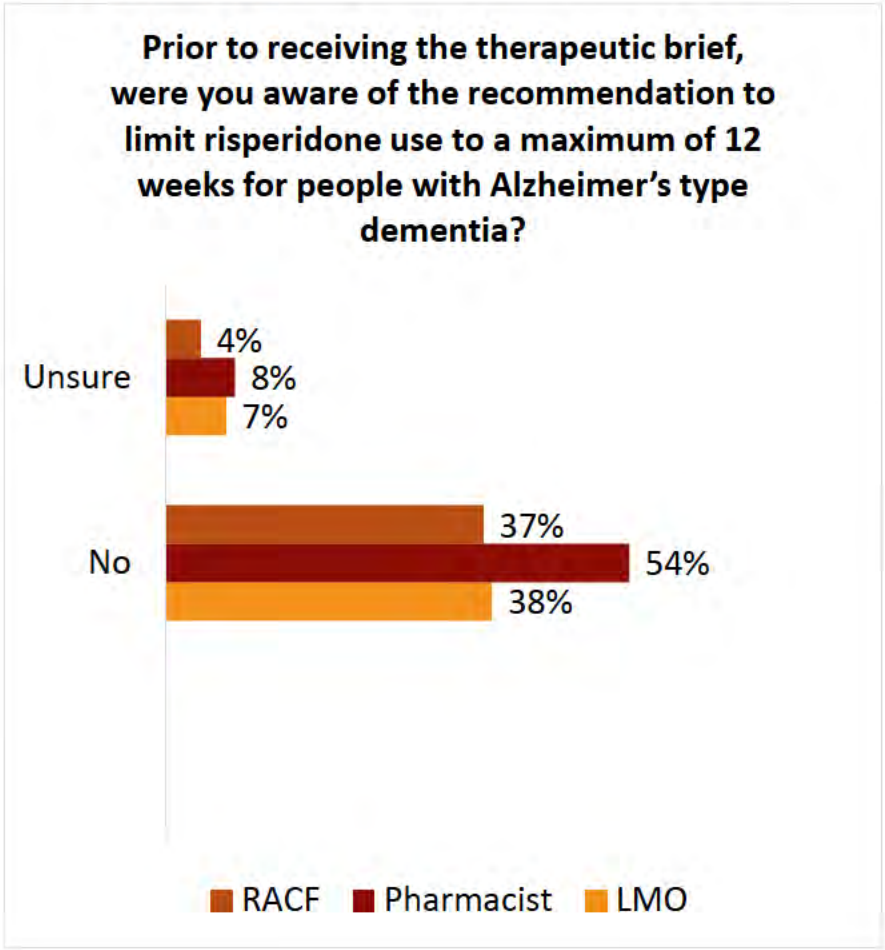


Health practitioners have found the materials useful

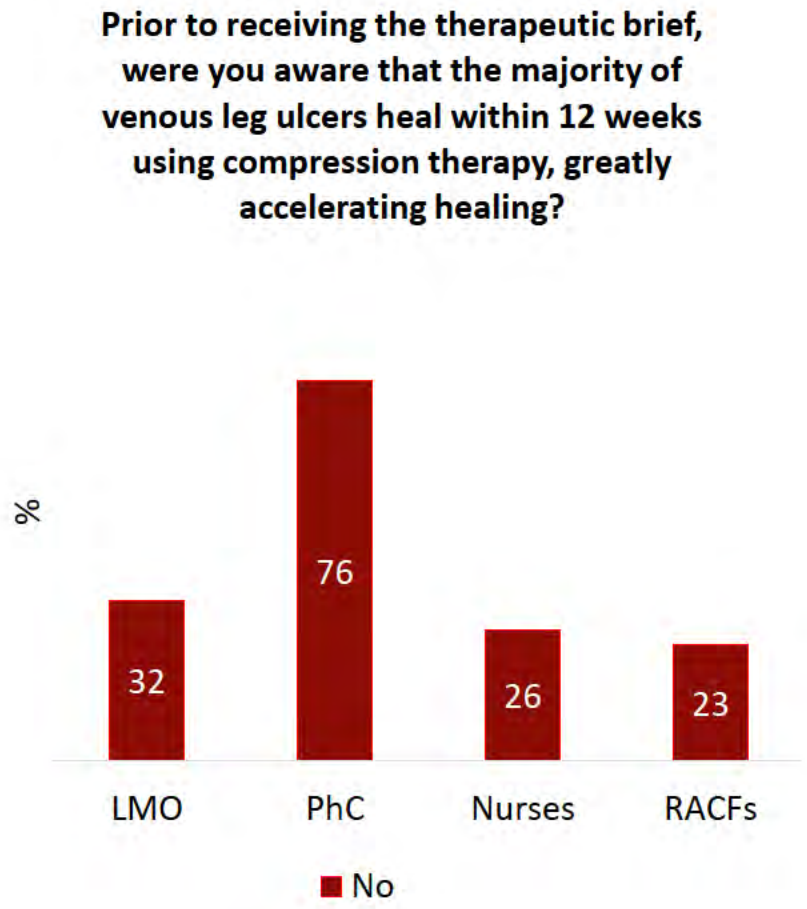


The materials have filled evidence practice gaps

Dementia



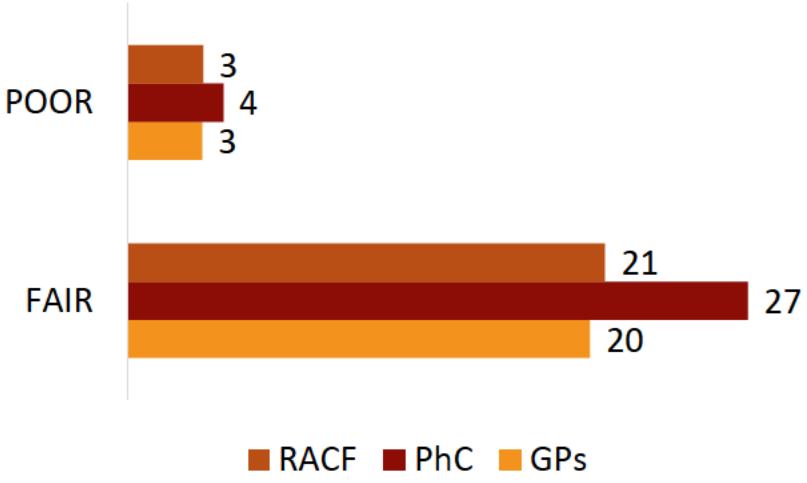
Wound care



The materials have filled evidence practice gaps

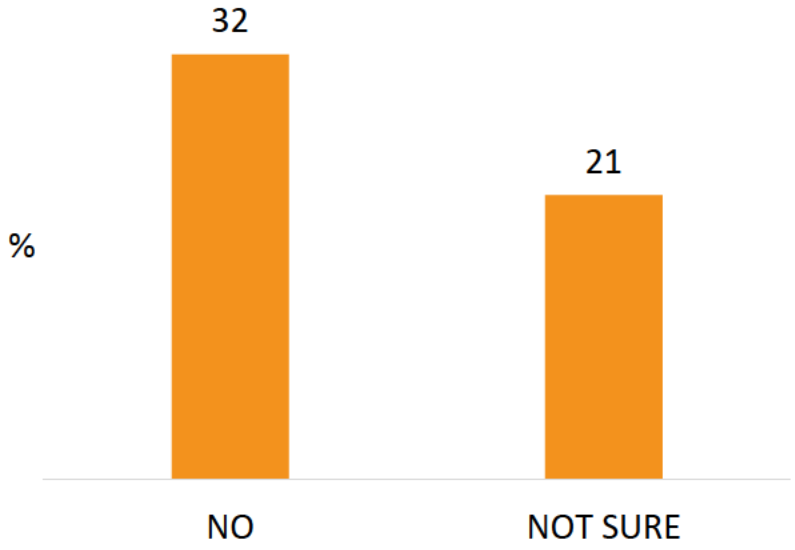
COPD

Prior to receiving the therapeutic brief, how would you rate your understanding of the multifaceted benefits of pulmonary rehabilitation for patients with COPD?



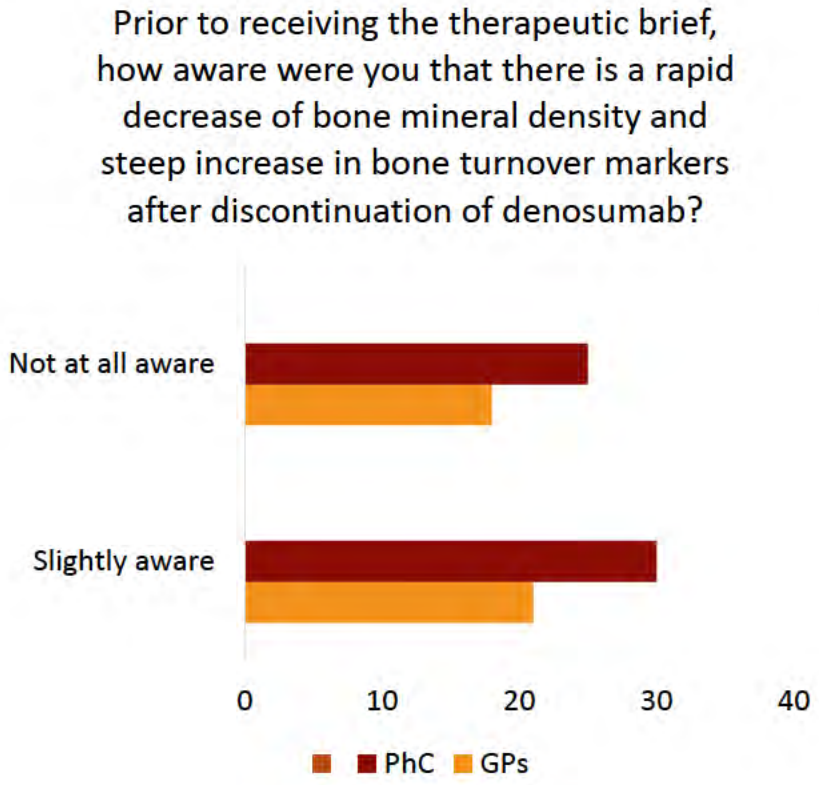
Pain: veteran response

Before you received this brochure, were you aware that persistent pain is not a good indicator of damage in your body?

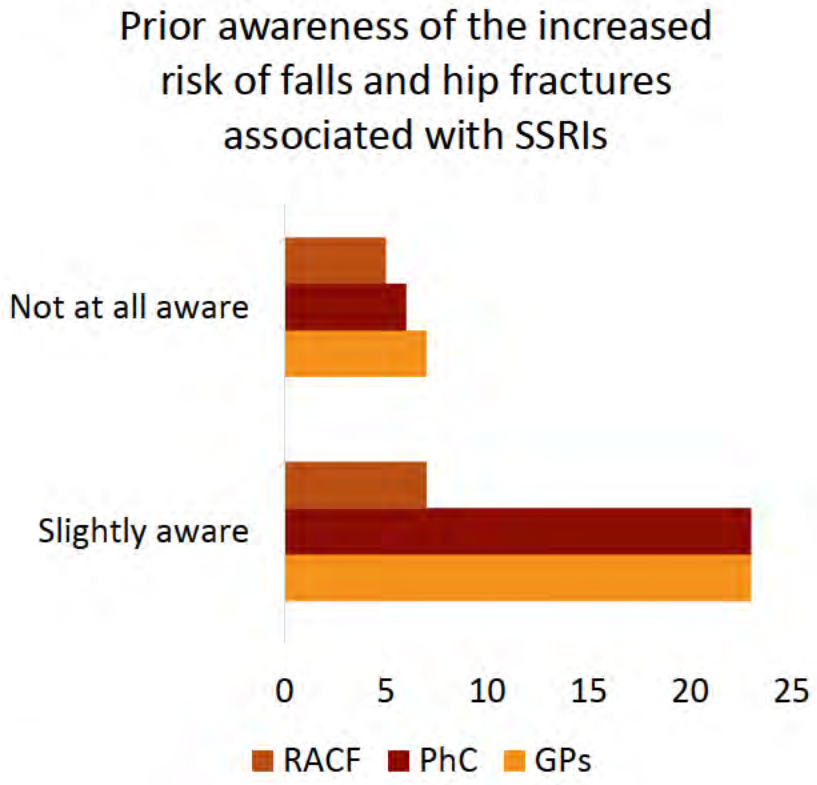


The materials have filled evidence practice gaps

Osteoporosis

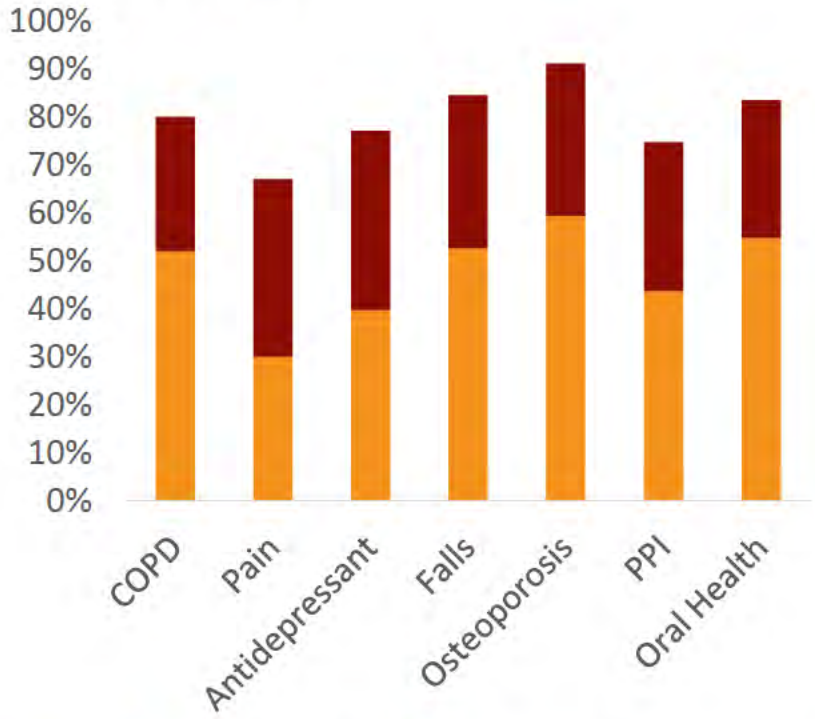


Falls

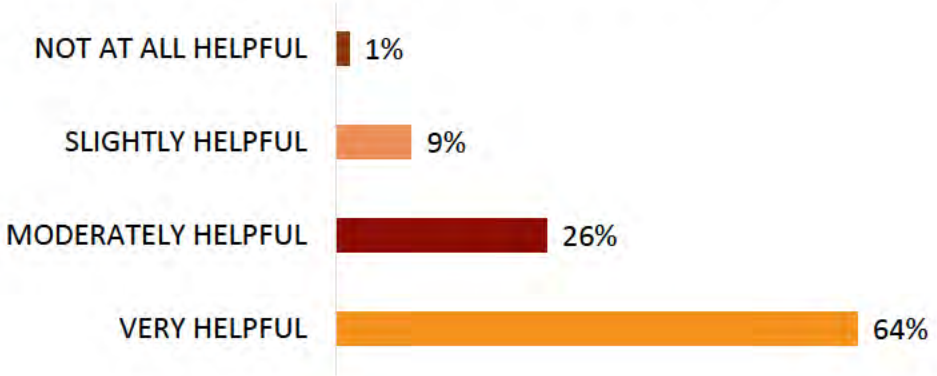


Veterans have found the materials useful

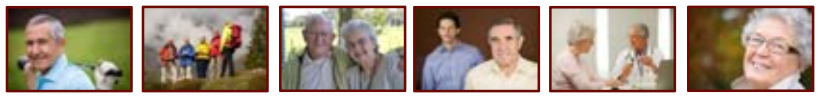
Usefulness



Veterans - The brochure and insert include practical tips for what you can do to prevent and treat skin tears. How helpful were these?



The interventions have been effective



Antipsychotics in dementia: August 2016

Aim: to reduce antipsychotic use in patients with dementia

Antipsychotic use in BPSD: limited benefits, high risks

Behavioural and psychological symptoms of dementia (BPSD), often referred to as 'behaviours of concern', are common in people with dementia.[1-3] They can be distressing and difficult to manage.

Inside

- Ways to manage behaviours of concern
  - Use non-pharmacological interventions for behaviours of concern
- The limited role antipsychotics play in BPSD
  - Points to consider when

Common be
that respond
with an antip
disruptions,

Australian Government
Department of Veterans' Affairs

Veterans' MATES

TOP 5

Share your practical tips

Research from the TOP5 program has shown that writing down and sharing up to five important tips such as those listed below, can help others to support and care for a person with dementia[1]

- Situations that might cause distress and what could help
- When the person is unsettled, the words or actions likely to help calm and settle them
- Routines and rituals that are reassuring
- Signs that indicate the person needs or wants something
- Names and photos of family, friends or pets that are important to the person

Example 1

Background/why:
Ken was a fireman for forty years.

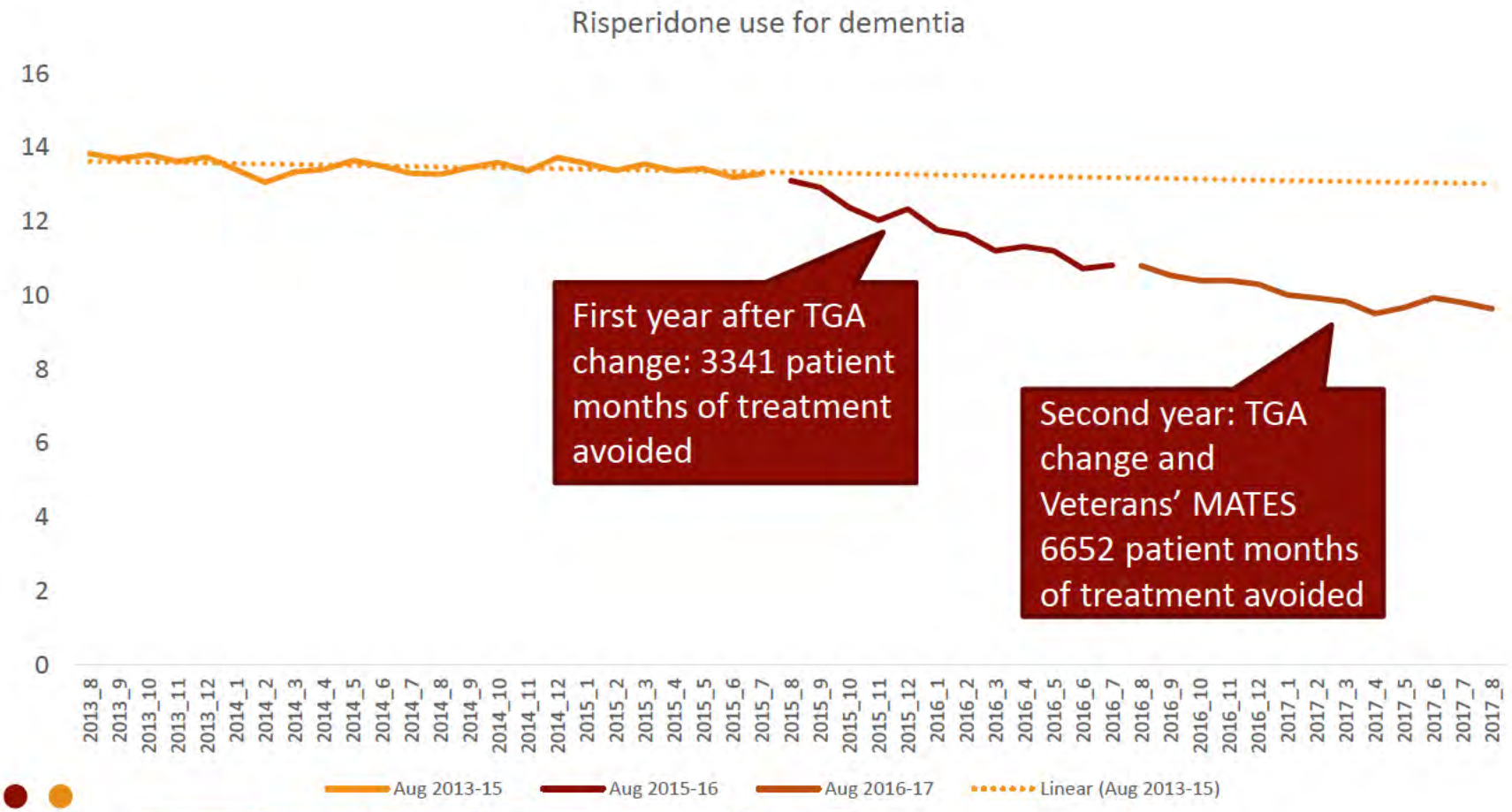
Practical tip:
If Ken hears an alarm or loud ringing he will become distressed. Let him know that the car has been sent.

What will happen when followed:
Ken will calm down. Offer him a cup of tea and he will forget about the alarm.

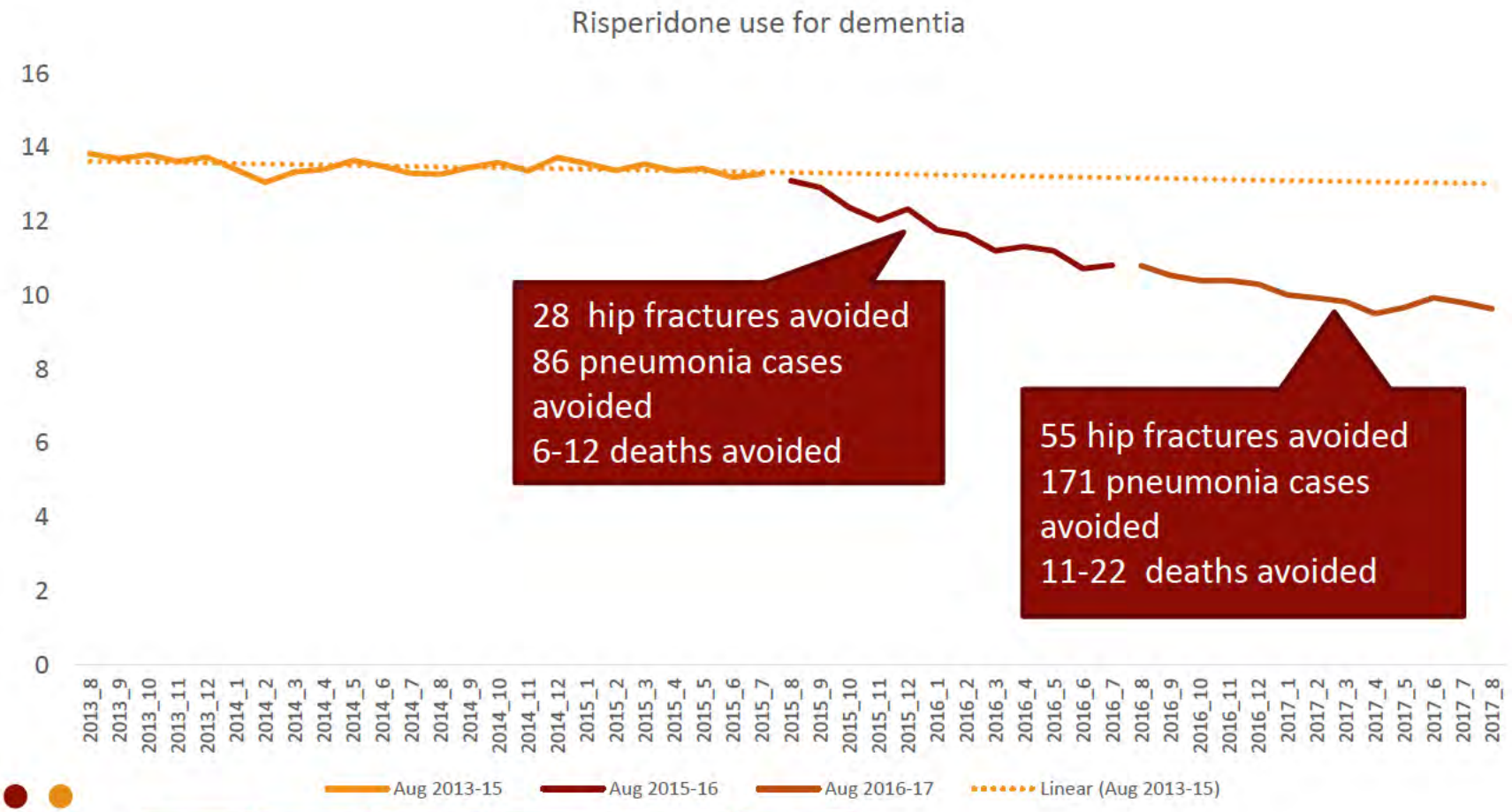
Why this topic?

- In August 2015, the Therapeutic Goods Administration limited the indication for antipsychotics in dementia
  - Only for Alzheimer's dementia. No longer indicated in other dementia types
  - Maximum of 12 weeks duration

Topic 1: Dementia and challenging behaviours further reduce risperidone use



Topic 1: Dementia and challenging behaviours further reduce risperidone use



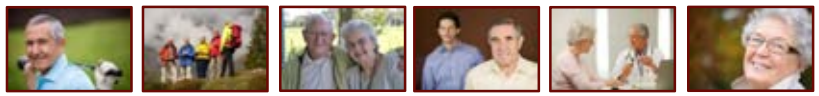
Reducing medicine complexity: November 2016

Aim: to encourage home medicines review to reduce medicine complexity

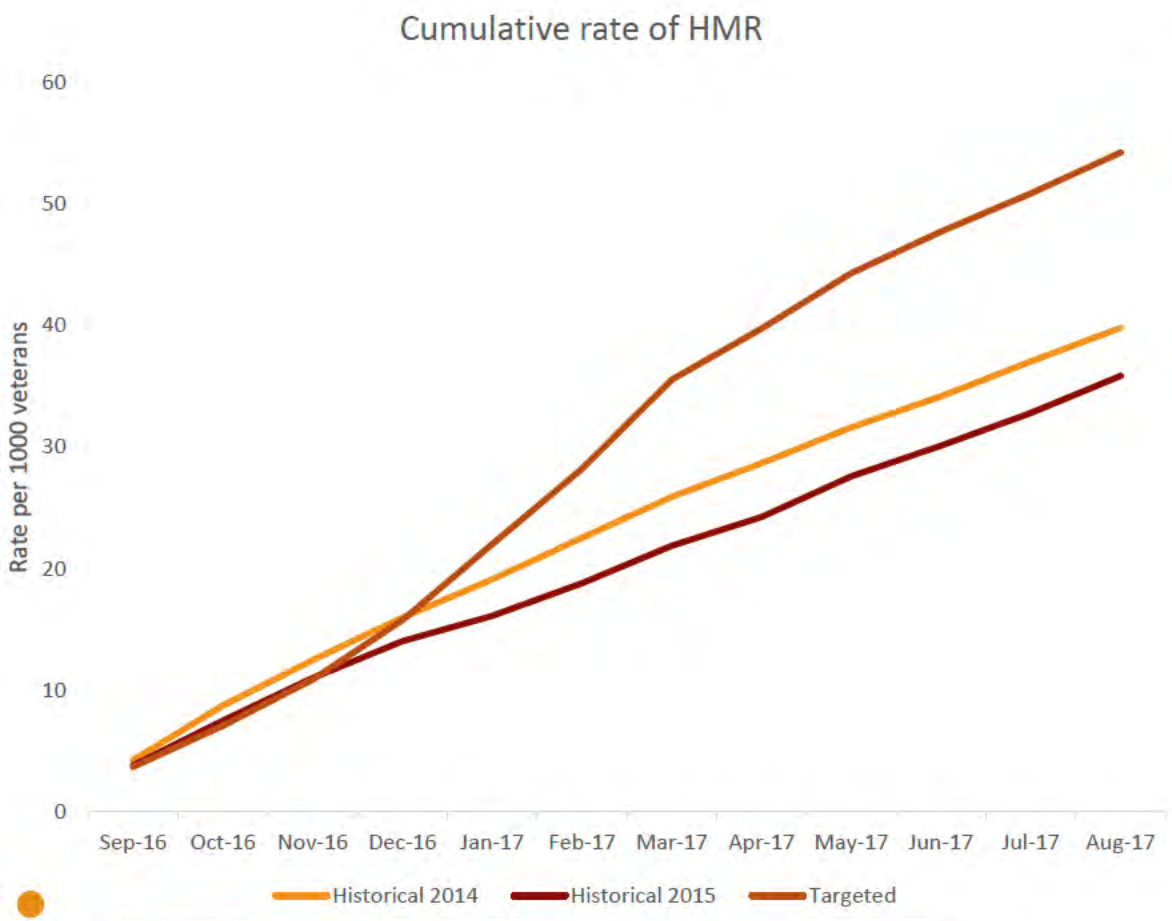
Medication review services

- Improved medication appropriateness
  - 4 points on the medication appropriateness index
- Improved adherence
  - ~4.6%
- Reduced medication dosing
  - mean difference, 2 less doses.
- Reduced medication costs
- For patients with diabetes mellitus or heart failure,
  - lowered the odds of hospitalization (diabetes: OR, 0.91 to 0.93); heart failure: 0.55; 95%CI, 0.39 to 0.77) and
- Reduced hospitalization costs
  - mean differences ranged from −$363.45 to −$398.98

JAMA Intern Med. 2015;175(1):76-87



Home medicine review rates increasing



- ~ 1000 additional home medicines reviews
  - At least 10 heart failure admissions avoided
  - At least 2 hospital admissions for bleeds avoided

COPD – Keeping well this winter: Mar 2017

- Aim: to improve the management of COPD and reducing exacerbations
- Particular emphasis on referring for pulmonary rehabilitation

Keeping your COPD patients well this winter

Acute exacerbations in people w
Pulmonary Disease (COPD) contr
in lung function, exercise perform
more frequent hospitalisation. Fo

Key points

Veterans'MATES

Australian Government
Department of Veterans' Affairs

Setting up a pulmonary rehabilitation program

Pulmonary rehabilitation is highly beneficial and strongly recommended for people with Chronic Obstructive Pulmonary Disease (COPD).[1,2] The core components of a program include individualised patient assessment, exercise training, education and evaluation. The structure and delivery can vary, depending on resources available, especially in rural and remote areas.[3] Even a pulmonary rehabilitation program with limited resources has been shown to be effective. If you are interested in setting up your own program using local resources available, the following information will help you.

What personnel and equipment do I need?

The exercise component

The minimum requirements include knowing how to conduct an exercise program for people with lung disease and being trained in cardiopulmonary resuscitation.[3]

The education component

The team can include a doctor, nurse, dietician, psychologist, exercise physiologist, physiotherapist, pharmacist or social worker, depending on locally available healthcare professionals.[1]

The equipment component

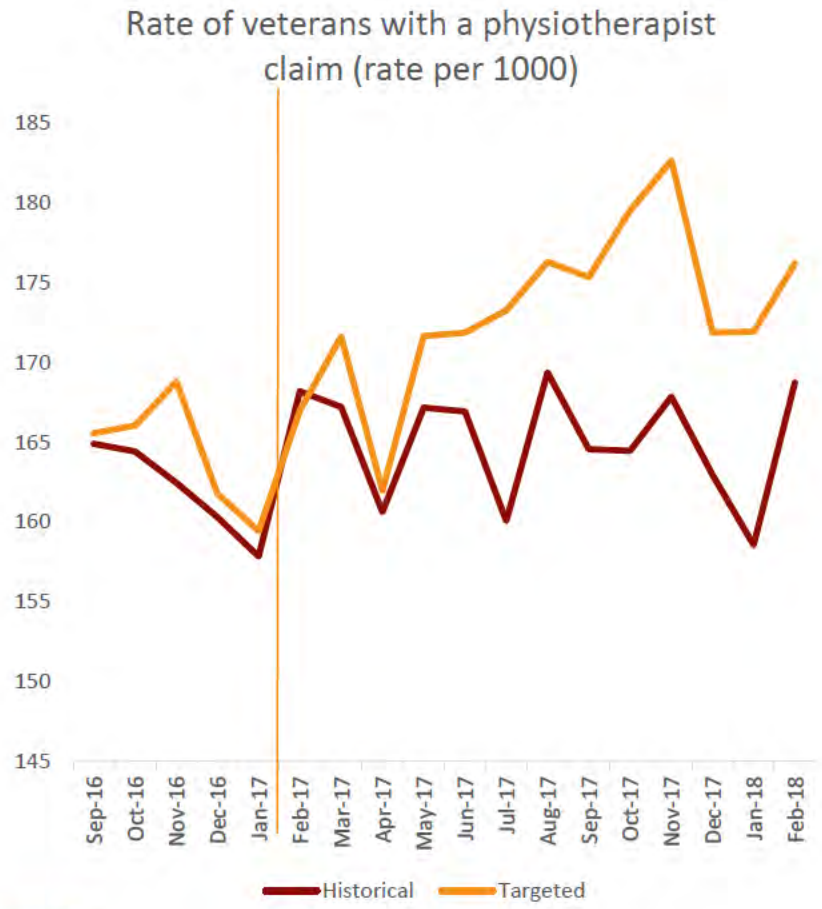
A minimum requirements list is available at: www.pulmonaryrehab.com.au/wp-content/uploads/2016/08/What_Equipment_Will_I_Need.pdf

How do I set up the program?

- Gold and white card holders might be eligible for services provided by health professionals. Details for DVA funded health services are available at: www.dva.gov.au/sites/default/files/files/health and wellbeing/healthservices.pdf
- Access the **Pulmonary Rehabilitation Toolkit**, an initiative of Lung Foundation Australia and the Australian Physiotherapy Association to be guided through the process of setting up a program. Components of the toolkit include 'Getting started, Patient assessment, Exercise training, Patient education and Program evaluation' and are available at: www.lungfoundation.com.au/health-professionals/clinical-resources/copd/pulmonary-rehabilitation-toolkit
- Access **Pulmonary Rehabilitation Training Online** to increase your knowledge, skills and confidence in delivering a program. Details are available at: www.lungfoundation.com.au/health-professionals/training-and-education/pulmonary-rehabilitation-training-online
- Another educational resource for patients and families is the **COPD Online Patient Education (C.O.P.E.)** available at: www.copelungfoundation.com.au
- **Resources to get started are available online** and include a program brochure, referral form, invitation and assessment letters and a patient survey available at: www.pulmonaryrehab.com.au/introduction/resources

Pulmonary rehabilitation use increased in targeted veterans

- Cochrane review showed pulmonary rehabilitation significantly reduced
  - hospital admissions: number needed to treat 4 [95% CI 3 to 8], over 25 weeks)
  - mortality: number needed to treat 6 [95% CI 5 to 30] over 107 weeks).
- The intervention resulted in an additional 820 patient months of treatment; which equates to a minimum of 35 hospital admissions and 6 premature deaths avoided



Wound management: June 2017

- Aim: to improve the management of skin tears and venous leg ulcers
- Particular emphasis on use of emollient and use of compression therapy
  - 73% of venous leg ulcers will be healed at 12 weeks with compression therapy, compared to 31% without
  - Use of emollient reduces the risk of skin tears by 50%


Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic Brief

www.veteransmates.net.au

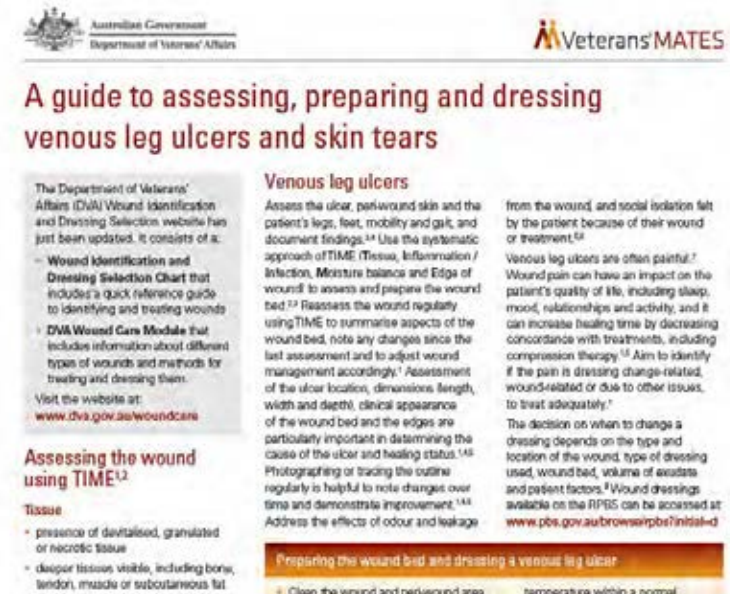
June 2017

Wound management: Putting the pressure on venous leg ulcers and reducing the risk of skin tears

Skin tears and venous leg ulcers are among the most common wounds treated in general practice.[1-5] They occur most often in older people, can be slow to heal, cause significant distress and greatly reduce a person's quality of life.[6-7]

Inside

- Venous leg ulcers
  - Compression therapy
- Skin tears
  - Assess the patient and the wound
  - Dress the skin tear
  - Talk with your patient about how they can reduce the risk of skin tears


Australian Government
Department of Veterans' Affairs

Veterans' MATES

A guide to assessing, preparing and dressing venous leg ulcers and skin tears

The Department of Veterans' Affairs (DVA) Wound Identification and Dressing Selection website has just been updated. It consists of a:

- **Wound Identification and Dressing Selection Chart** that includes a quick reference guide to identifying and treating wounds
- **DVA Wound Care Module** that includes information about different types of wounds and methods for treating and dressing them.

Visit the website at: www.dva.gov.au/woundcare

Assessing the wound using TIME[1,2]

Tissue

- presence of devitalised, granulated or necrotic tissue
- deeper tissues visible, including bone, tendon, muscle or subcutaneous fat

Venous leg ulcers

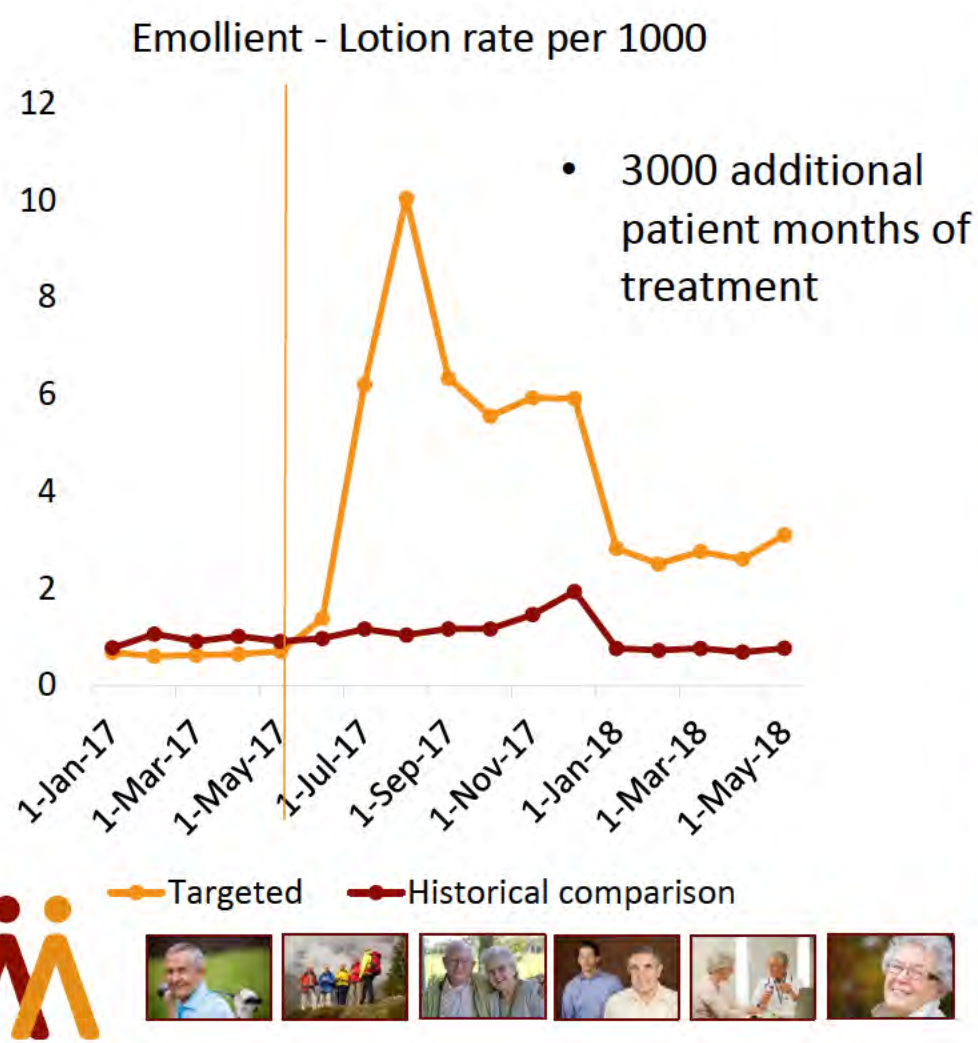
Assess the ulcer, peri-wound skin and the patient's legs, feet, mobility and gait, and document findings.[3,4] Use the systematic approach of TIME (Tissue, Inflammation / Infection, Moisture balance and Edge of wound) to assess and prepare the wound bed.[1,2] Reassess the wound regularly using TIME to summarise aspects of the wound bed, note any changes since the last assessment and to adjust wound management accordingly.[1] Assessment of the ulcer location, dimensions (length, width and depth), clinical appearance of the wound bed and the edges are particularly important in determining the cause of the ulcer and healing status.[1,5] Photographing or tracing the outline regularly is helpful to note changes over time and demonstrate improvement.[1,4,5] Address the effects of odour and leakage from the wound, and social isolation felt by the patient because of their wound or treatment.[1,2]

Venous leg ulcers are often painful.[7] Wound pain can have an impact on the patient's quality of life, including sleep, mood, relationships and activity, and it can increase healing time by decreasing concordance with treatments, including compression therapy.[1,2] Aim to identify if the pain is dressing change-related, wound-related or due to other issues, to treat adequately.[7]

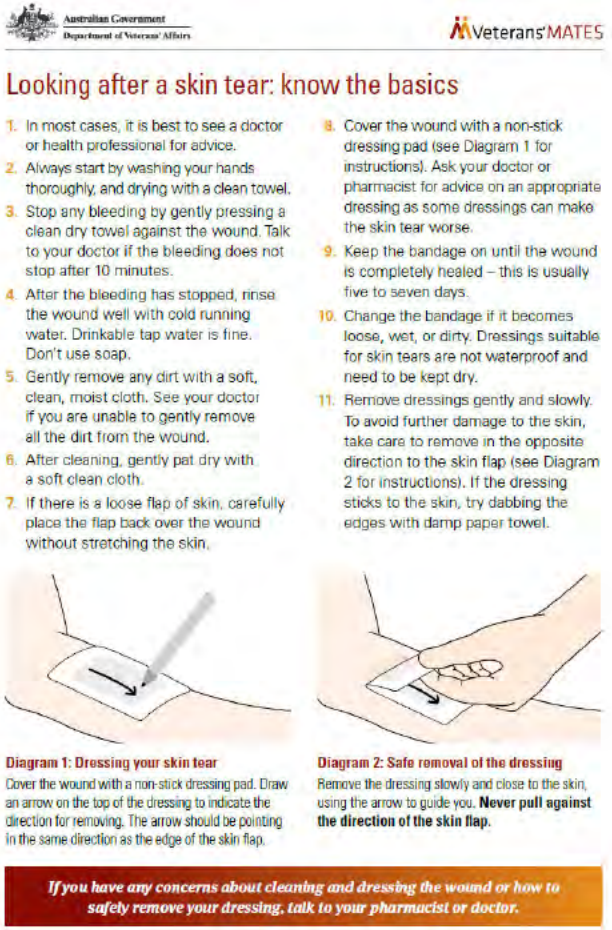
The decision on when to change a dressing depends on the type and location of the wound, type of dressing used, wound bed, volume of exudate and patient factors.[8] Wound dressings available on the RPBS can be accessed at: www.pbs.gov.au/browse/rpbs?initial=d

Preparing the wound bed and dressing a venous leg ulcer

Increased use of emollient to reduce the risk of skin tears



- 3000 additional patient months of treatment



Australian Government
Department of Veterans' Affairs

Veterans' MATES

Looking after a skin tear: know the basics

1. In most cases, it is best to see a doctor or health professional for advice.
2. Always start by washing your hands thoroughly, and drying with a clean towel.
3. Stop any bleeding by gently pressing a clean dry towel against the wound. Talk to your doctor if the bleeding does not stop after 10 minutes.
4. After the bleeding has stopped, rinse the wound well with cold running water. Drinkable tap water is fine. Don't use soap.
5. Gently remove any dirt with a soft, clean, moist cloth. See your doctor if you are unable to gently remove all the dirt from the wound.
6. After cleaning, gently pat dry with a soft clean cloth.
7. If there is a loose flap of skin, carefully place the flap back over the wound without stretching the skin.
8. Cover the wound with a non-stick dressing pad (see Diagram 1 for instructions). Ask your doctor or pharmacist for advice on an appropriate dressing as some dressings can make the skin tear worse.
9. Keep the bandage on until the wound is completely healed – this is usually five to seven days.
10. Change the bandage if it becomes loose, wet, or dirty. Dressings suitable for skin tears are not waterproof and need to be kept dry.
11. Remove dressings gently and slowly. To avoid further damage to the skin, take care to remove in the opposite direction to the skin flap (see Diagram 2 for instructions). If the dressing sticks to the skin, try dabbing the edges with damp paper towel.

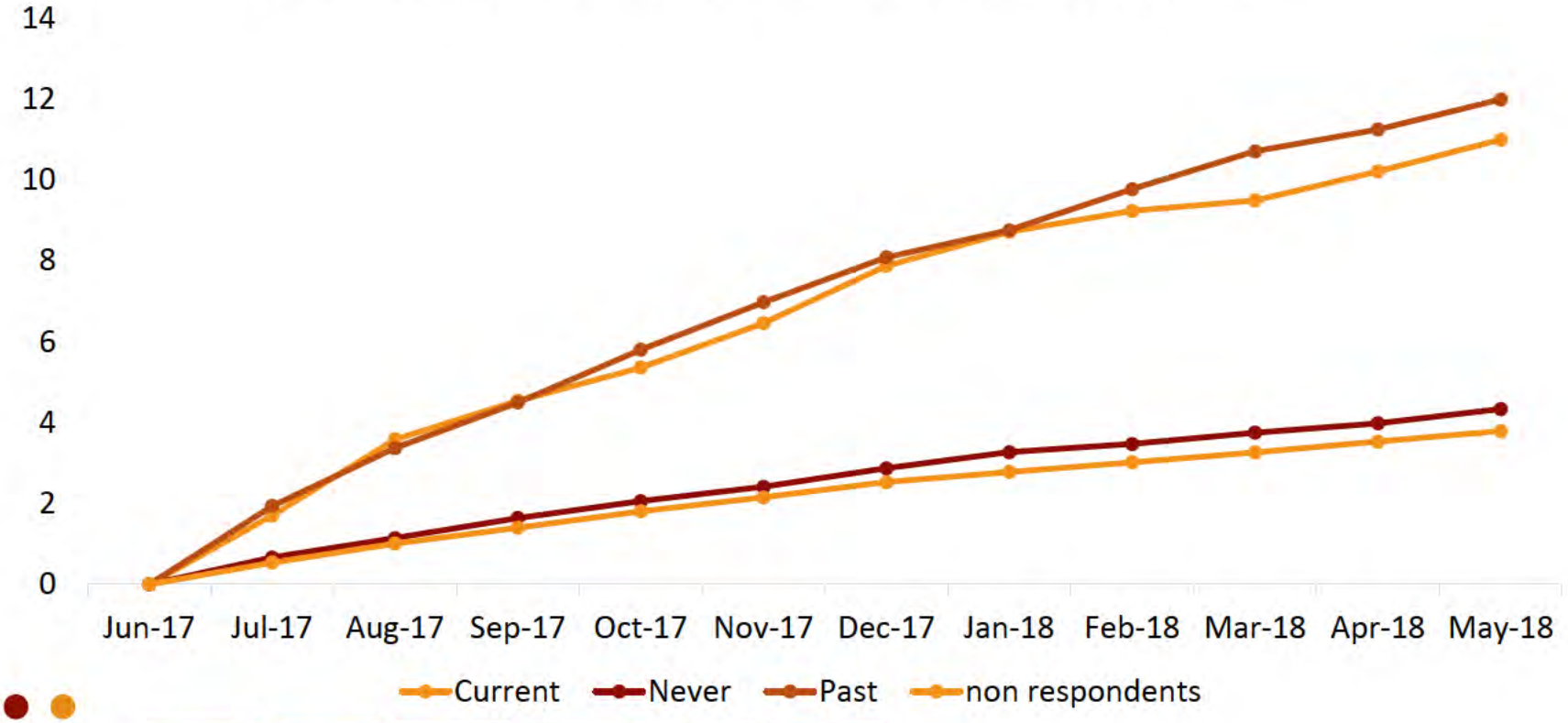
Diagram 1: Dressing your skin tear
Cover the wound with a non-stick dressing pad. Draw an arrow on the top of the dressing to indicate the direction for removing. The arrow should be pointing in the same direction as the edge of the skin flap.

Diagram 2: Safe removal of the dressing
Remove the dressing slowly and close to the skin, using the arrow to guide you. **Never pull against the direction of the skin flap.**

If you have any concerns about cleaning and dressing the wound or how to safely remove your dressing, talk to your pharmacist or doctor.

Increased use of compression hosiery

Cumulative percentage of targ veterans who have had a compression garment claim since July 2017 stratified by venous leg ulcer status



Pain management: Sep 2017

- Aim: To improve management and treatment of chronic pain
- Particular emphasis on referral to a psychologist and the explaining pain approach

Working out what might trigger, increase or reduce your pain, can help guide strategies to treat your pain. You will have pain when there is a greater sense of threat to your body tissues than there is sense of safety to your body tissues, and your brain decides that you need to be protected. This will be different for every person.

Sense of threat and safety

Doug talks about some of the things that increase his **sense of threat**:[1]

All of these things can increase Doug's pain, especially when multiple things are combined.

Things I hear, see, smell, taste, touch

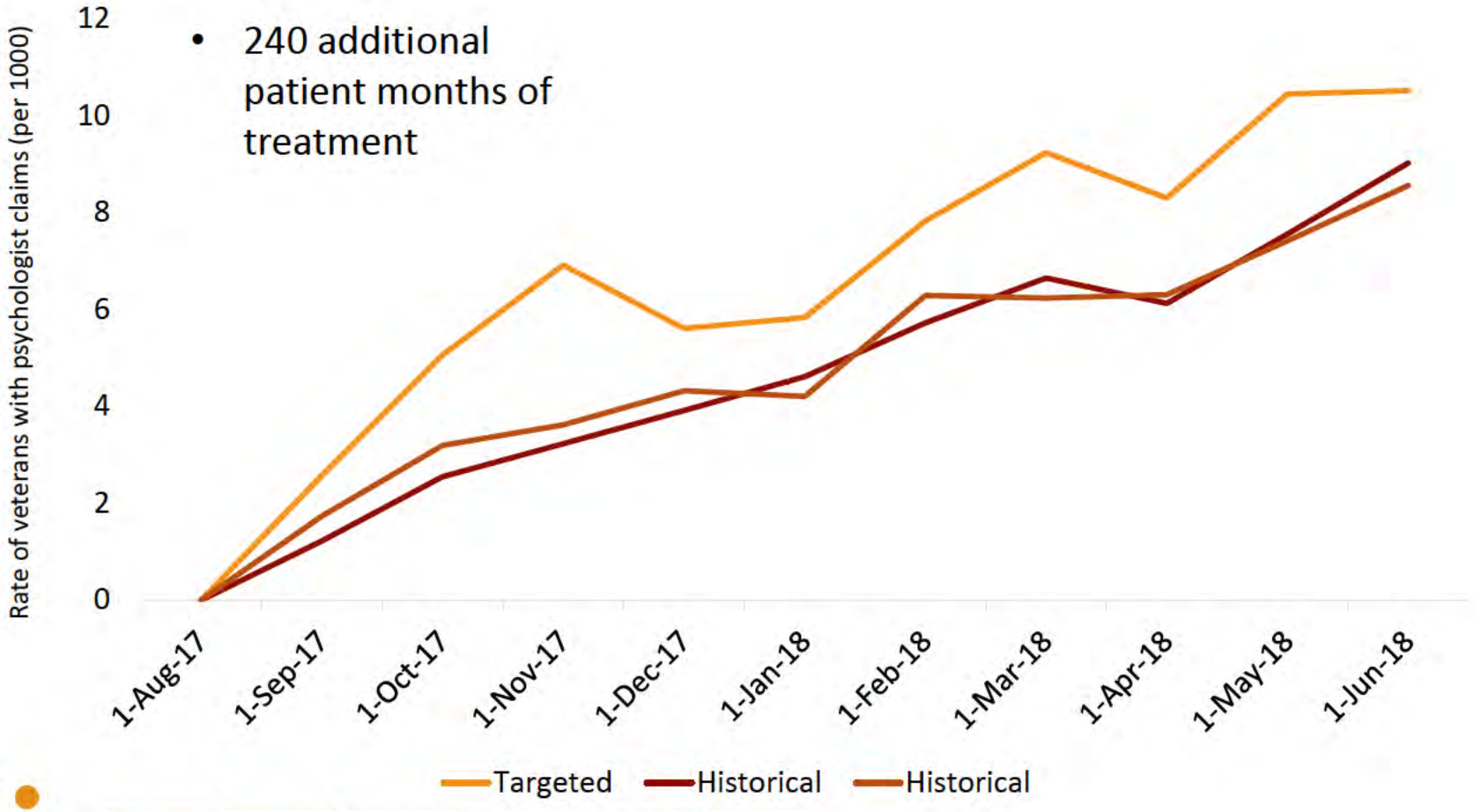
- My two teenage

Things I do

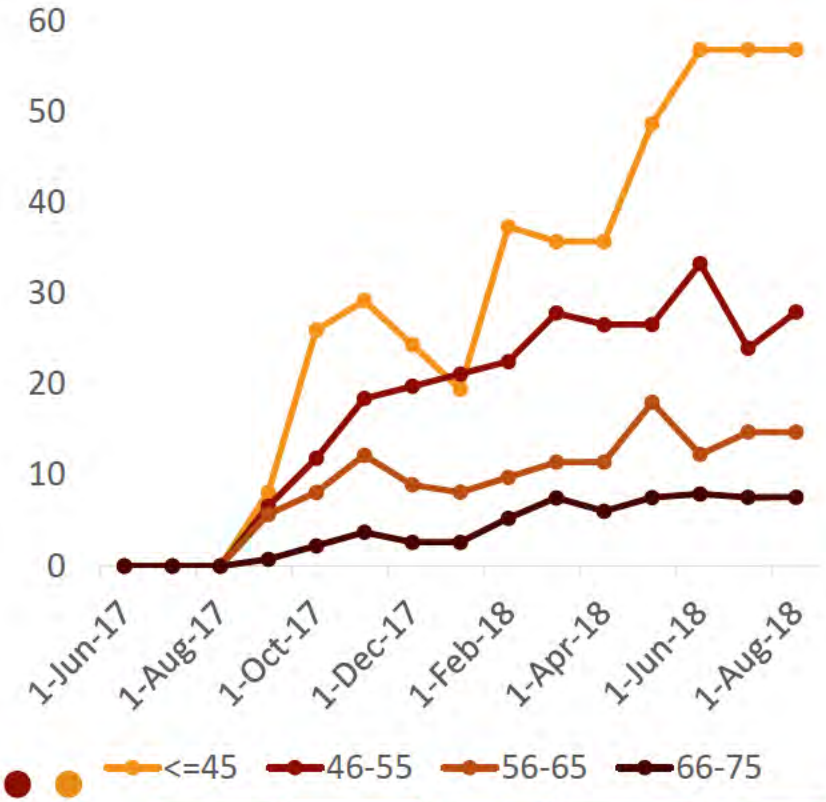
- Watching television all night as I can't sleep

Increasing numbers of veterans seeing psychologists

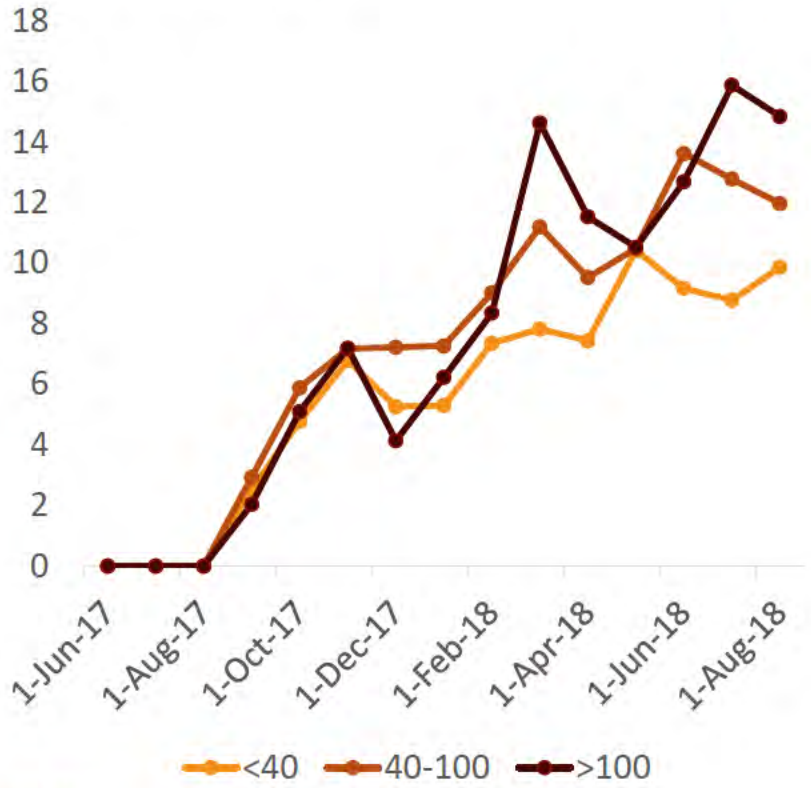
- 240 additional patient months of treatment



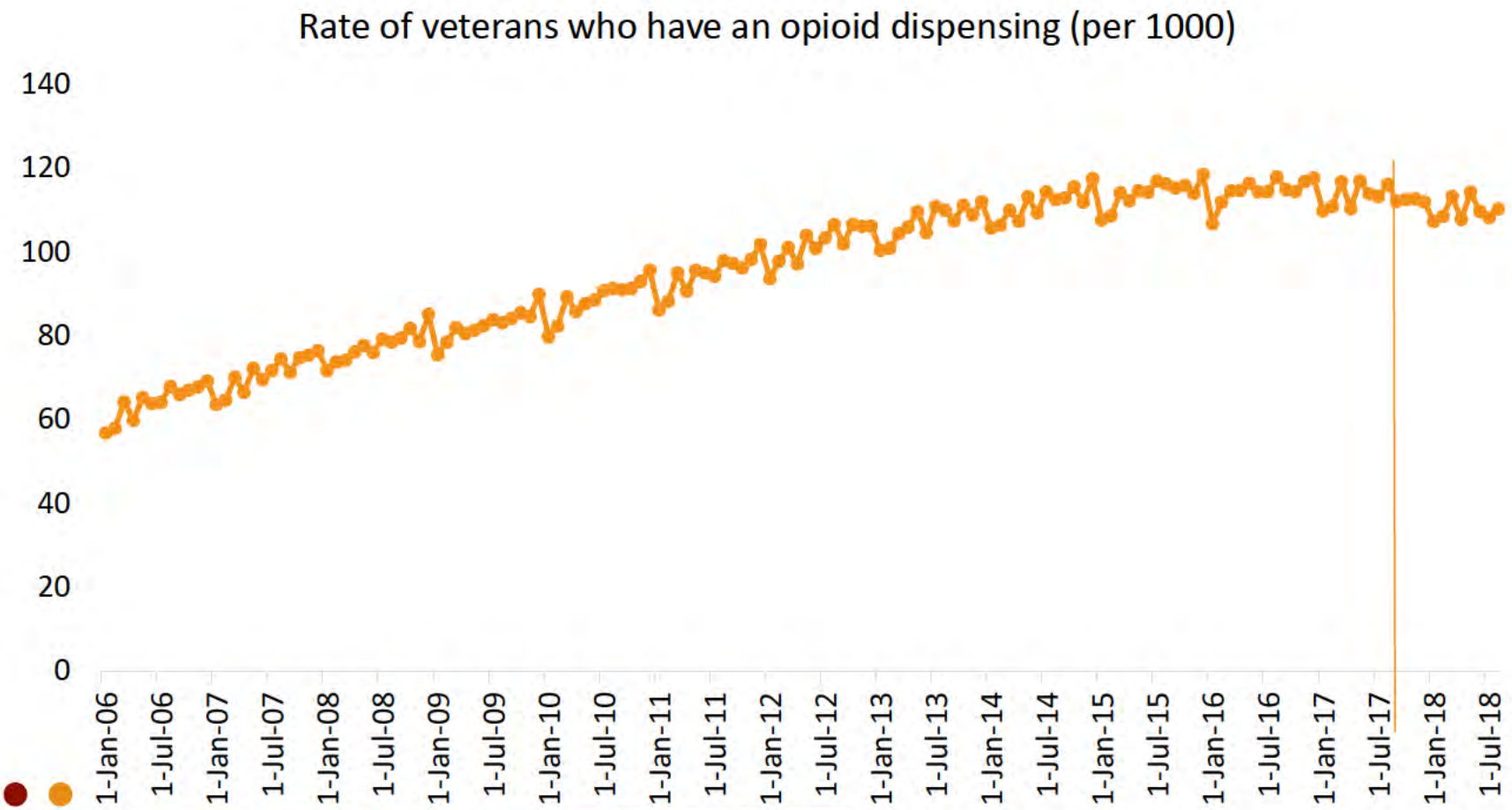
Psychologist claims by age



Psychologist claims by level of opioid use (oral morphine equivalents)

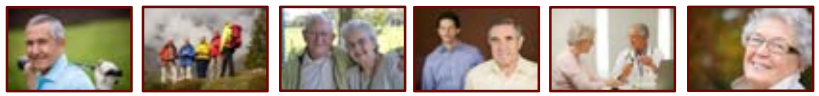


Opioid use beginning to decline

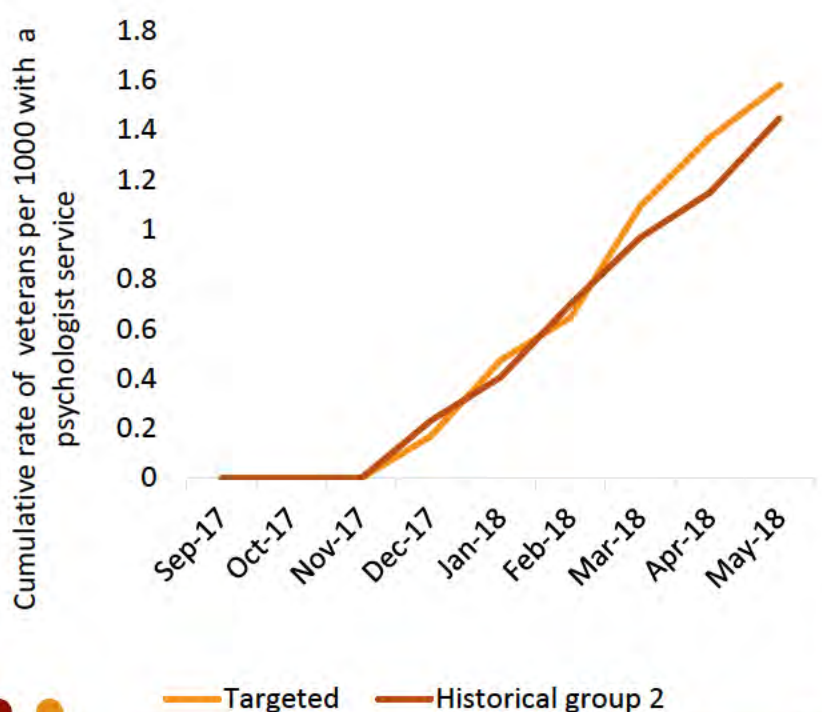


Depression management: Nov 2017

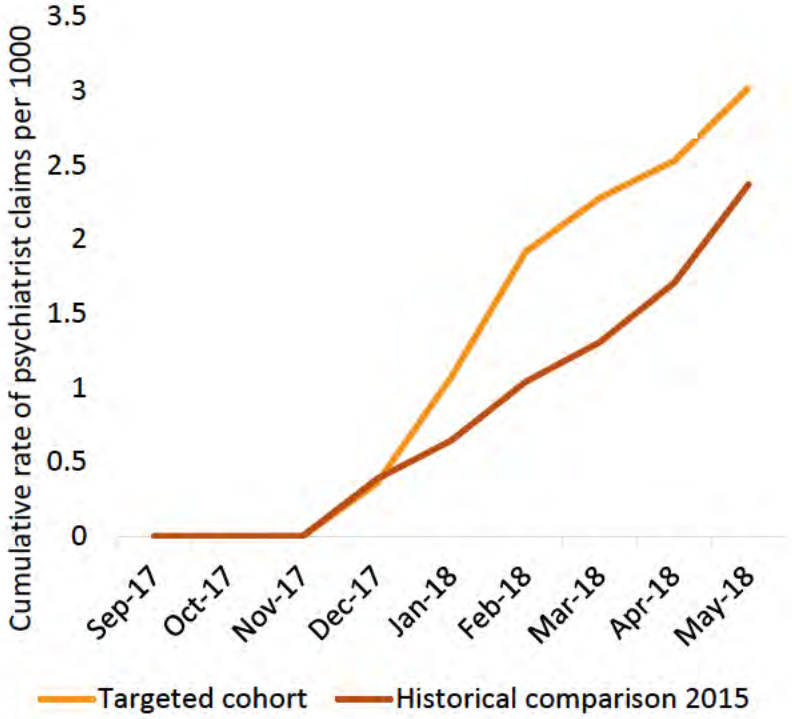
- Aim: To improve management depression in veterans with mild to moderate depression
- Particular emphasis on
  a) Refer new users of antidepressants to the psychologist
  b) Refer veterans who have changed antidepressants multiple times to a psychiatrists
  c) consider ceasing antidepressants in veterans who are well



Increase in psychologist claims in new antidepressant users



Increase in psychiatrist claims in veterans who had changed antidepressants

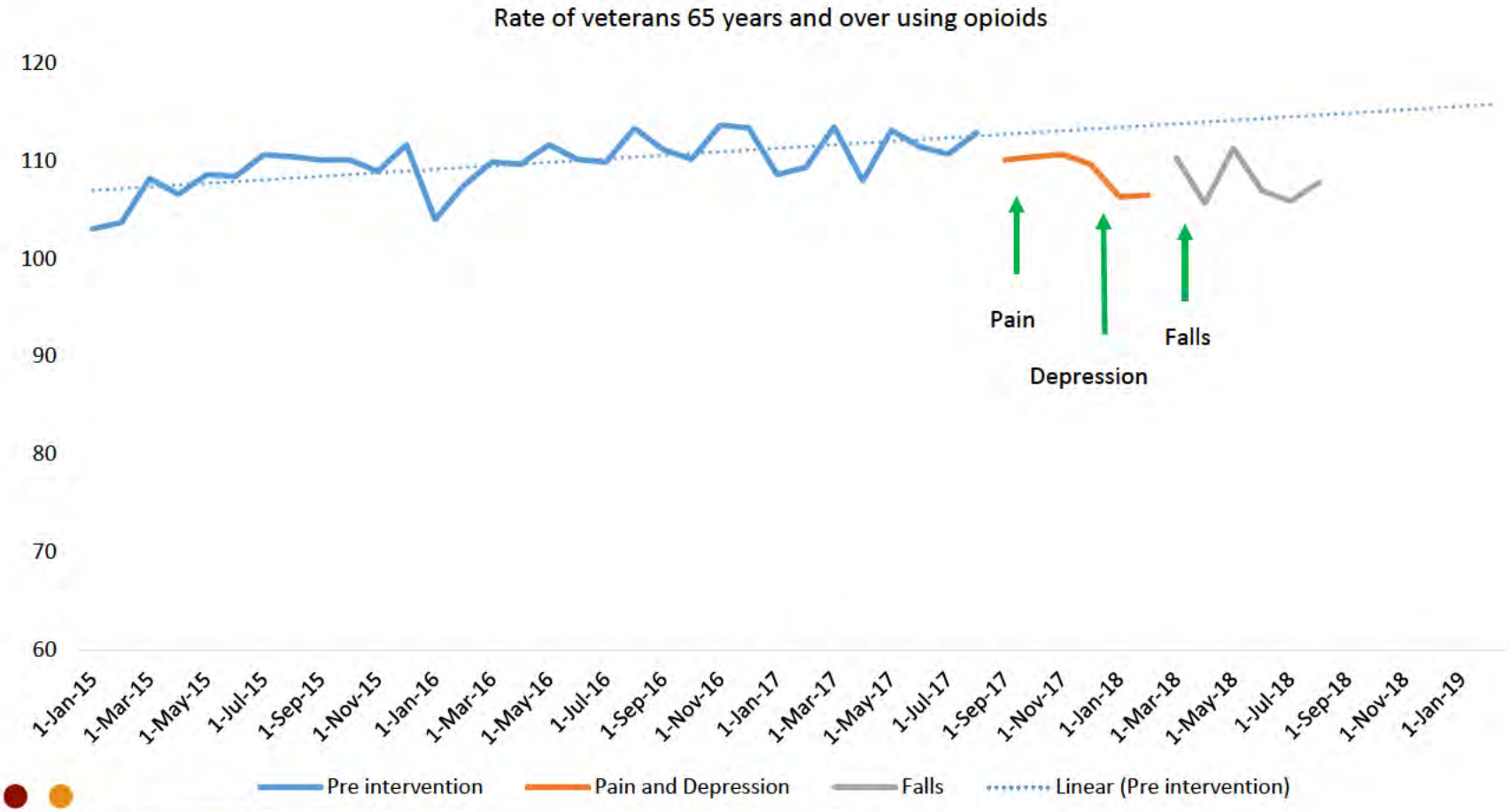


No change in antidepressant use

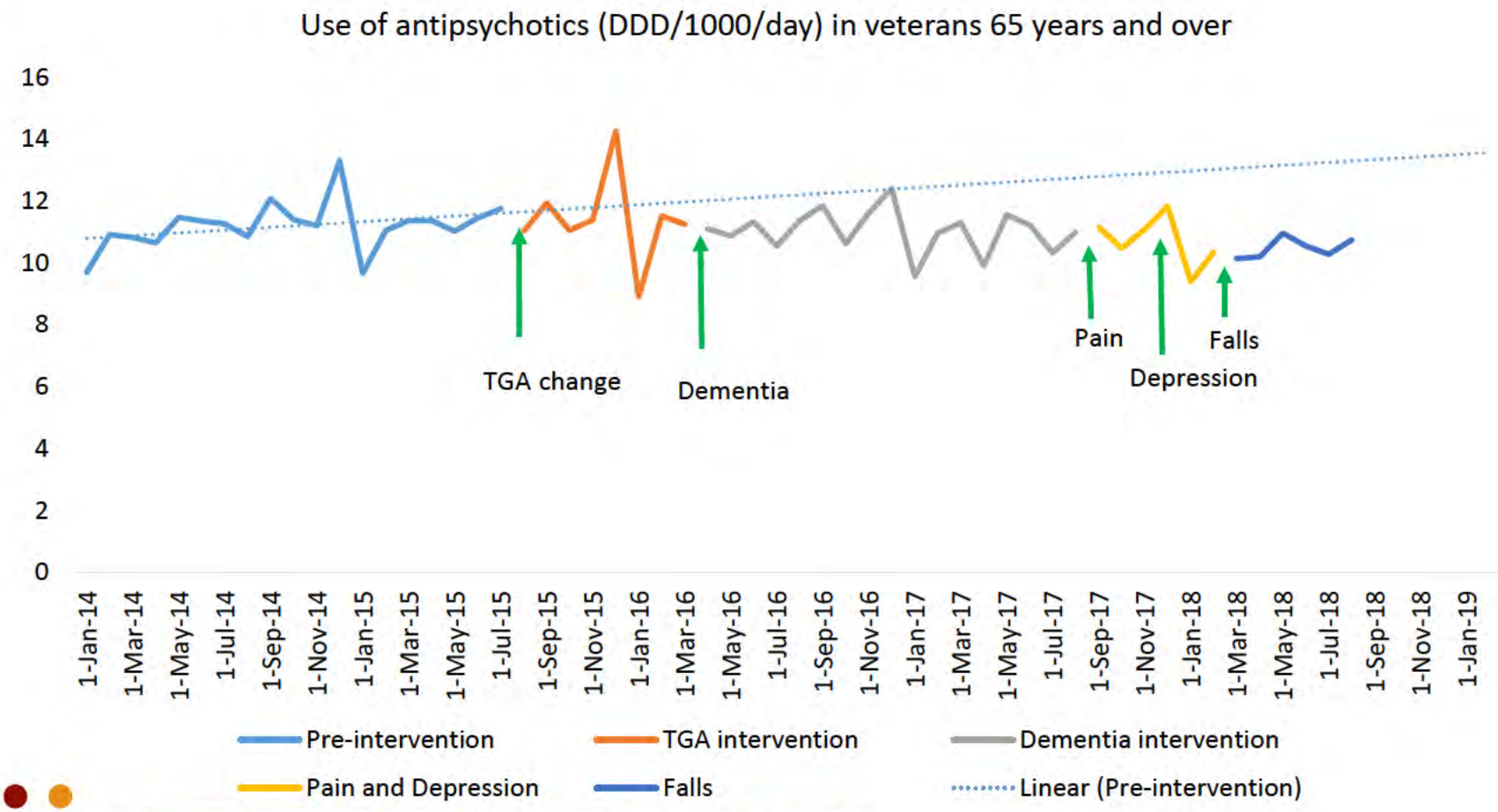
Falls prevention: Mar 2018

- Aim: To reduce use of medicines that place individuals at risk of falls
- New evidence that SSRIs and opioids are the two classes with highest risk of falls
- Numbers needed to treat to cause one additional hip fracture in patients 80 years and over
  - Starting an SSRI and benzodiazepine
    - 17
  - adding opioids to SSRIs:
    - 29
  - Adding antipsychotics to SSRIs
    - 49

Opioid use is falling

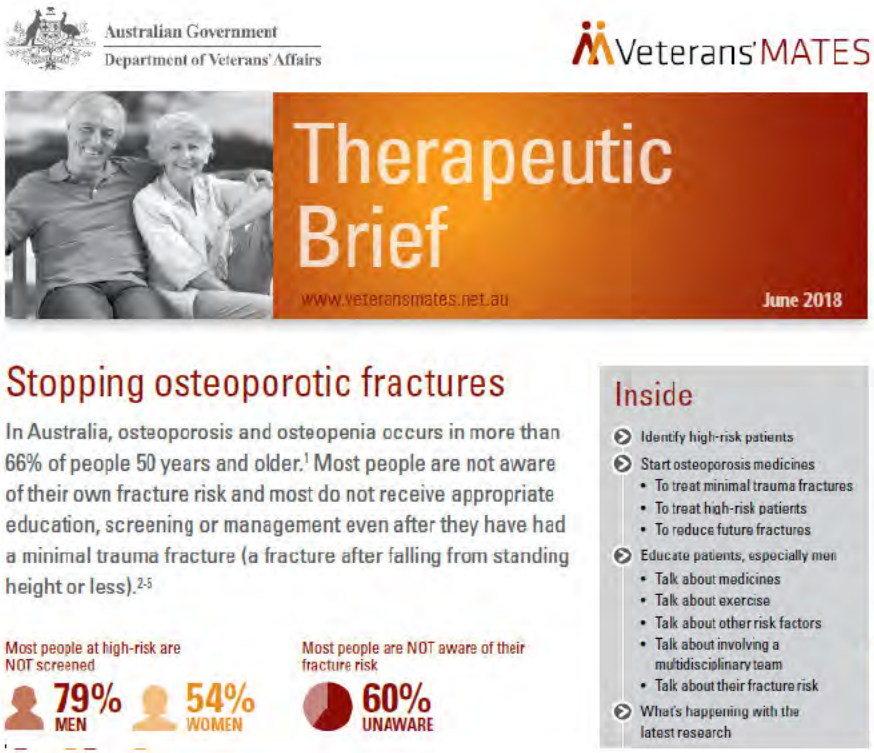


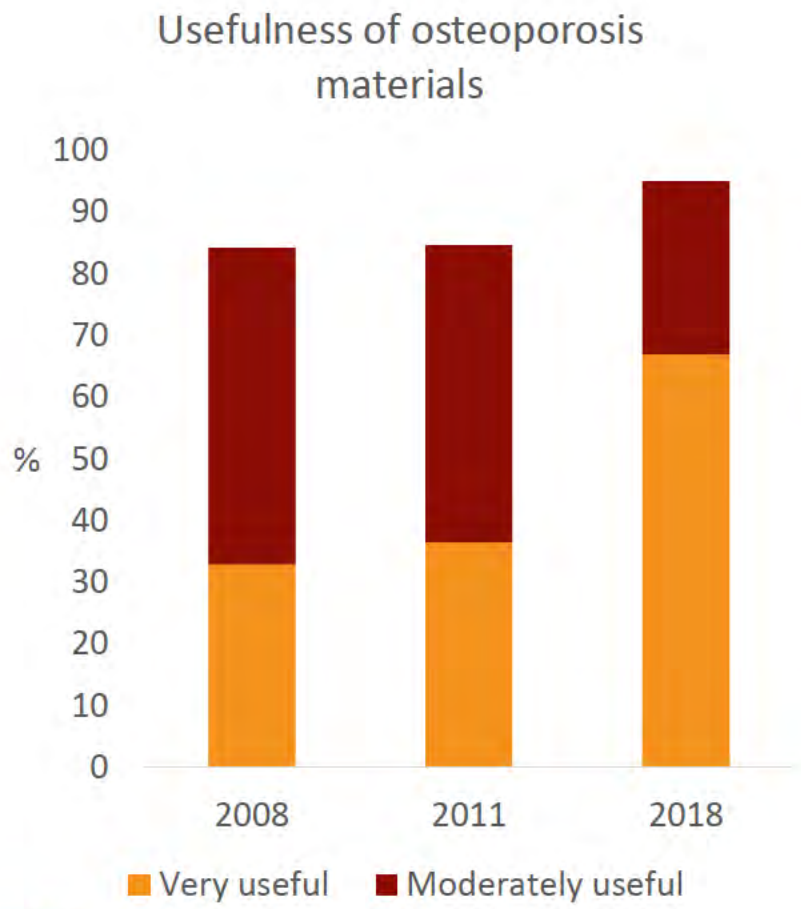
Antipsychotic use is falling



Osteoporosis: June 2018

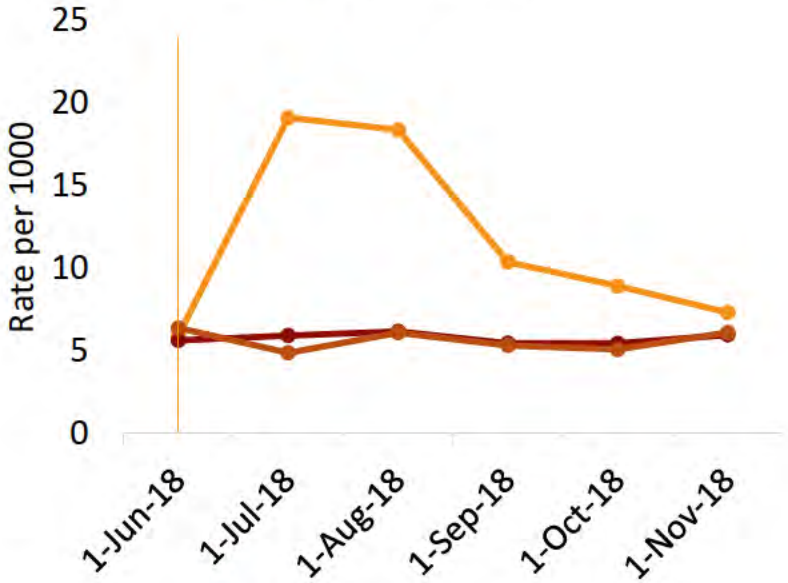
- Aim: To increase the use of osteoporosis treatment in persons at risk



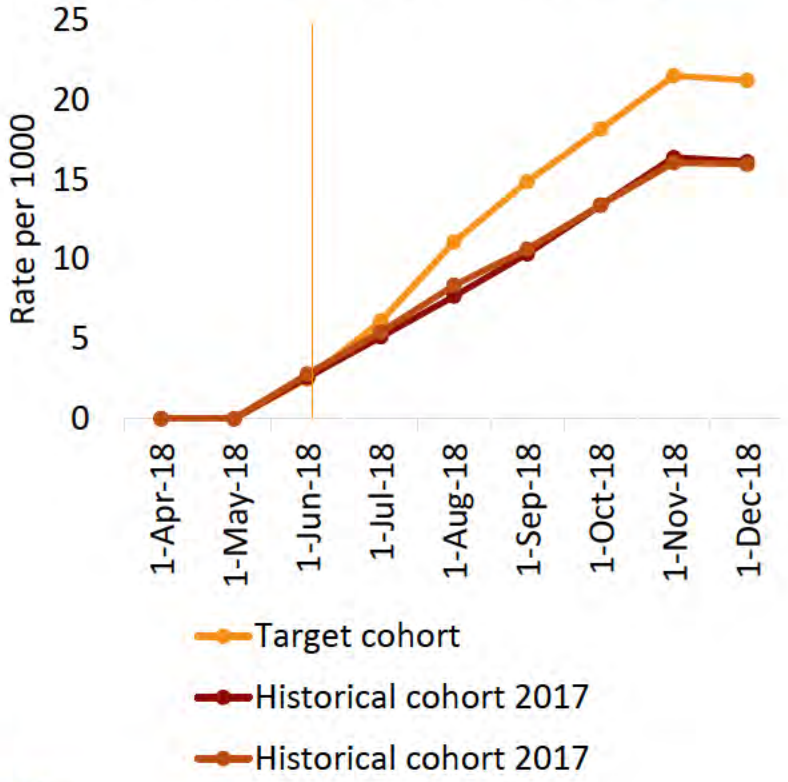


Rate of bone mineral density testing and osteoporosis medicines has increased

Rate of veterans with BMD test claims (per 1000)

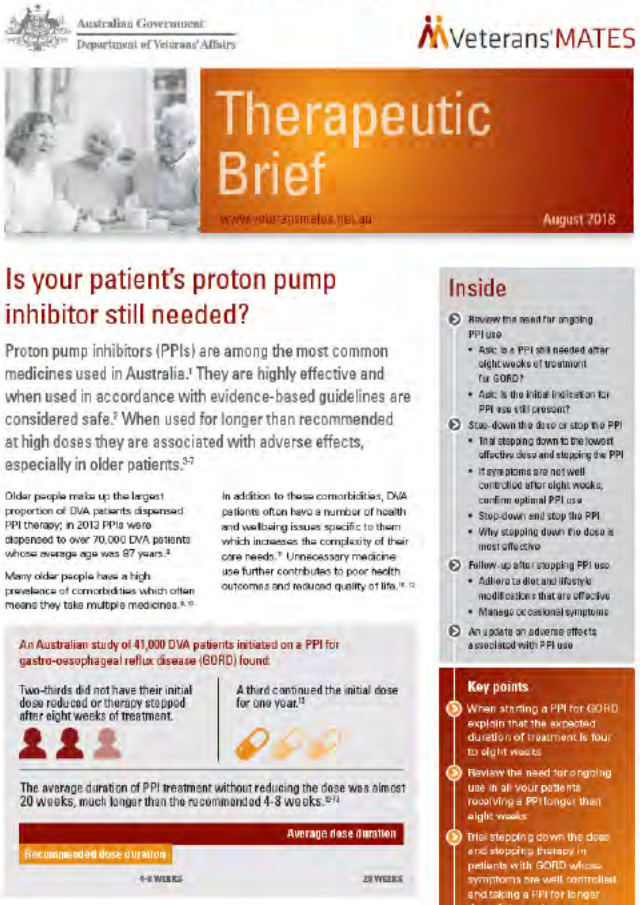


Rate of veterans treated with denosumab or bisphosphonates



Proton pump inhibitors: Sep 2018

- Aim: To encourage step down therapy for proton pump inhibitors



Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic Brief

www.veteransmates.net.au

August 2018

Is your patient's proton pump inhibitor still needed?

Proton pump inhibitors (PPIs) are among the most common medicines used in Australia.[1] They are highly effective and when used in accordance with evidence-based guidelines are considered safe.[2] When used for longer than recommended at high doses they are associated with adverse effects, especially in older patients.[3-7]

Older people make up the largest proportion of DVA patients dispensed PPI therapy; in 2013 PPIs were dispensed to over 70,000 DVA patients whose average age was 87 years.[3]

Many older people have a high prevalence of comorbidities which often means they take multiple medicines.[8-10]

In addition to these comorbidities, DVA patients often have a number of health and wellbeing issues specific to them which increases the complexity of their care needs.[11] Unnecessary medicine use further contributes to poor health outcomes and reduced quality of life.[8, 12]

An Australian study of 41,000 DVA patients initiated on a PPI for gastro-oesophageal reflux disease (GORD) found:

Two-thirds did not have their initial dose reduced or therapy stopped after eight weeks of treatment.

A third continued the initial dose for one year.[13]

The average duration of PPI treatment without reducing the dose was almost 20 weeks, much longer than the recommended 4-8 weeks.[8-10]

Average dose duration

Recommended dose duration

4-8 WEEKS

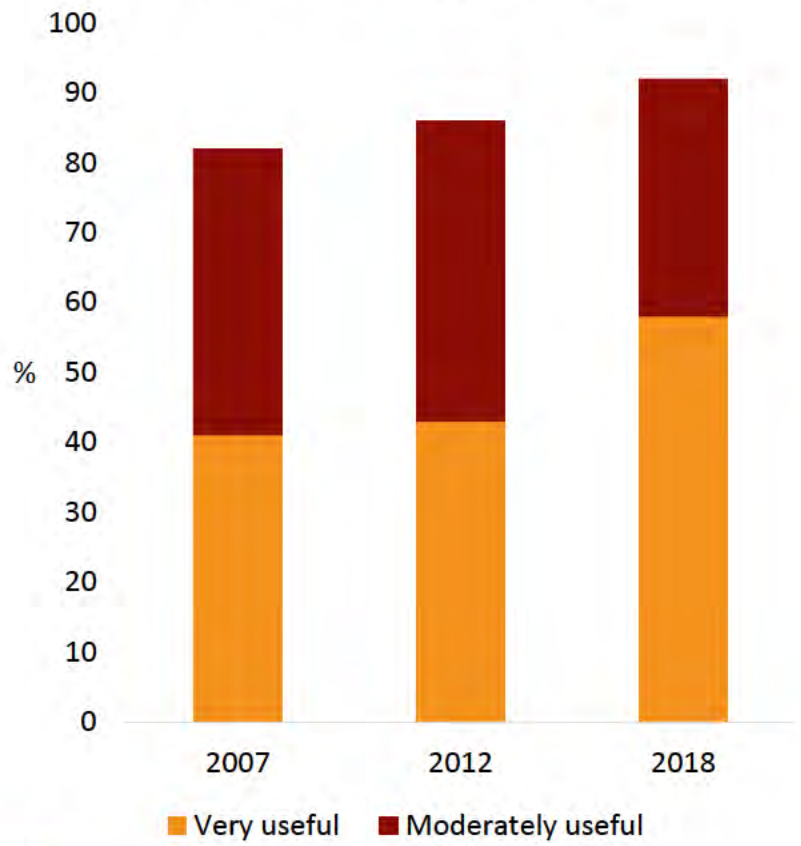
20 WEEKS

Inside

- Review the need for ongoing PPI use
  - Ask: Is a PPI still needed after eight weeks of treatment for GORD?
  - Ask: Is the initial indication for PPI use still present?
- Step down the dose or stop the PPI
  - Trial stopping down to the lowest effective dose and stopping the PPI
  - If symptoms are not well controlled after eight weeks, confirm optimal PPI use
  - Step down and stop the PPI
  - Why stopping down the dose is most effective
- Follow up after stopping PPI use
  - Adhere to diet and lifestyle modifications that are effective
  - Manage occasional symptoms
- An update on adverse effects associated with PPI use

Key points

- When starting a PPI for GORD explain that the expected duration of treatment is four to eight weeks
- Review the need for ongoing use in all your patients receiving a PPI longer than eight weeks
- Trial stepping down the dose and stopping therapy in patients with GORD whose symptoms are well controlled and taking a PPI for longer



Medicines and Dry Mouth: Nov 2018

- First time the program involved dentists

Dentist responses	
Very useful	64%
Moderately useful	31%
Slightly useful	5%
Not useful	0%

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic Brief

www.veteransmates.net.au

November 2018

Reducing the impact of medicine-induced dry mouth

Having a dry mouth from the use of medicines is common, particularly among older people.[1-4] If left untreated, dry mouth can interfere with oral health and function, affect general health and significantly impair quality of life.[4-6]

In 2017 the World Workshop on Oral Medicine VI documented a list of medicines that affect salivary gland function.[7]

This therapeutic brief focuses on medicines with strong evidence that cause salivary gland hypofunction (objectively measured decreased saliva) and xerostomia (subjective feeling of having a dry mouth) based on the World Workshop on Oral Medicine's list. The brief outlines strategies to reduce the impact of medicine-induced dry mouth.

An estimated 50,000 DVA patients were dispensed medicines that can cause dry mouth*

73%	22%	5%
73% were dispensed one medicine that can cause dry mouth	22% were dispensed two medicines that can cause dry mouth	5% were dispensed three medicines that can cause dry mouth

*Medicines are those included in the World Workshop on Oral Medicine's list categorised with a strong level of evidence.

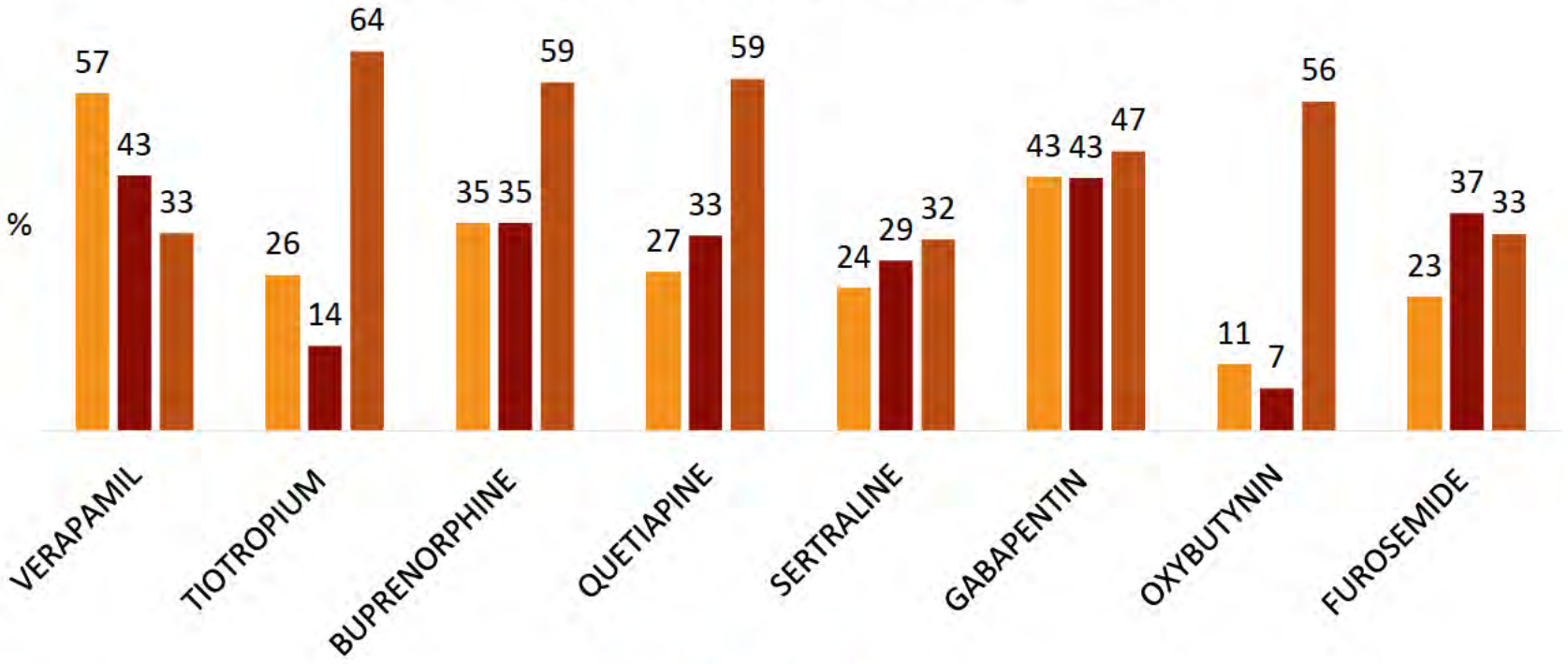
Inside

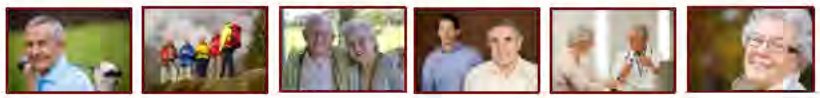
- Encourage your patients to have a dental check-up
- Ask your patient if they have dry mouth
- Review medicines that cause dry mouth
  - A guide to reducing the impact of medicine-induced dry mouth
- Talk to your patients about what they can do to reduce dry mouth
  - Oral health
  - Diet and lifestyle
  - Resources for patients

Key points

- Most DVA patients are eligible to receive a funded annual

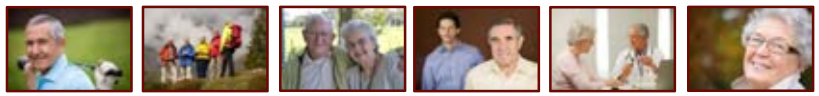
Percentage of respondents who were not aware that this medicine caused dry mouth prior to receiving the therapeutic brief





Conclusion

- Program continues to be effective in:
  - Providing needed education for veterans and health professionals,
  - Successfully targeting areas where there are knowledge gaps and gaps in care
  - Improving use of services and medicines
  - Improving health outcomes for veterans



Veterans' Medicines Advice and Therapeutic Education Services program

University of South Australia | Sansom Institute for Health Research

Veterans' MATES

Australian Government
Department of Veterans' Affairs

Selection of Veterans' MATES topics

- Veterans' MATES looks at:
  - Australia's national health priority areas
  - Australia's quality use of medicines framework
  - Medicine-related issues identified using DVA health claims data.

- Topics covered so far include:
  - Diabetes, Insomnia, Heart Failure, Falls, Gout, Incontinence, Home Medicines Review, Renal Function Monitoring, Dermatitis and Osteoporosis.

The Veterans' MATES approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material is sent to members of the veteran community for whom the health topic is relevant.

Australian Government
Department of Veterans' Affairs

The Veterans' MATES approach

Our materials include:

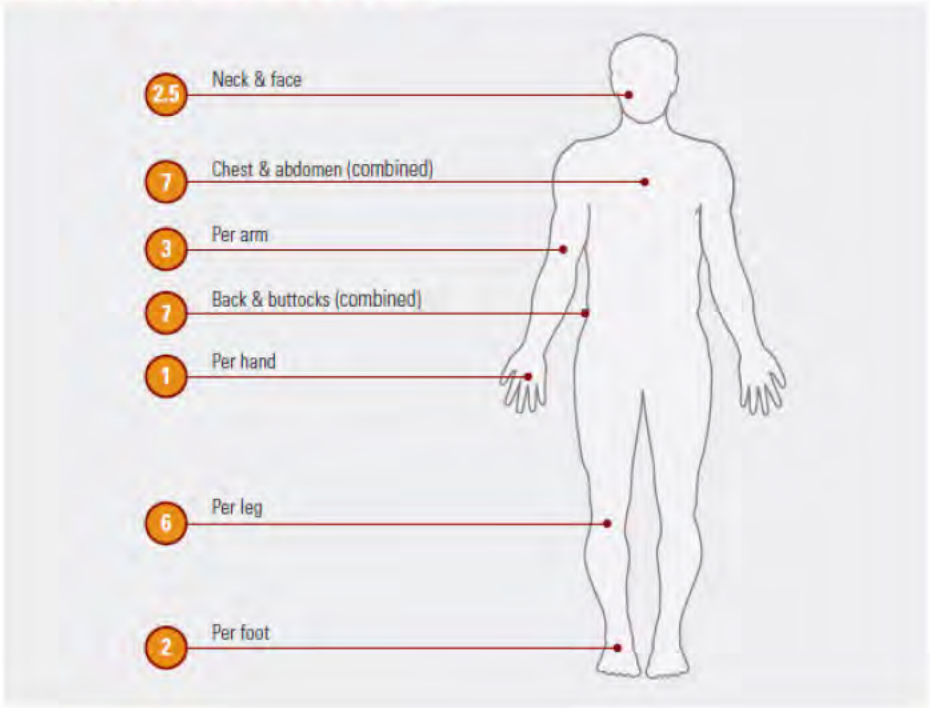
- 4 page 'quick read" up-to-date evidence based information for veterans and health professionals.
- Visual counselling tools and resources to help health professionals to communicate health messages to their patients.
- Suggestions about where to find further information on the topic.

How much topical corticosteroid should I use?

Figure 1: Fingertip unit. Picture supplied by AMH.

Visual tools from Topic 33: Topical Issues - emollients and corticosteroids (Nov 2012)

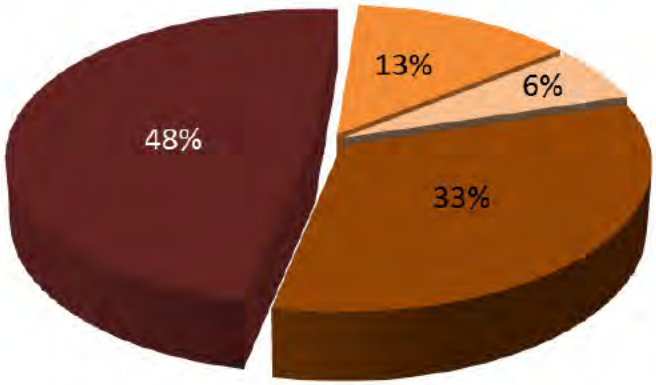
Figure 2: Number of fingertip units required to completely cover different areas of the body. Reduce as appropriate to cover smaller area of dermatitis.



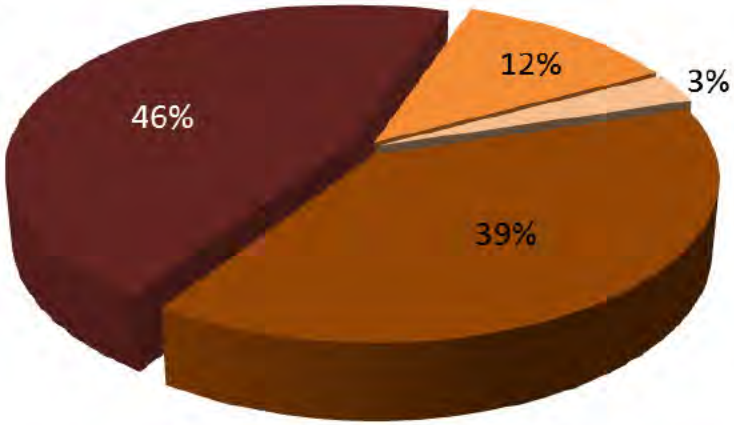
Australian Government
Department of Veterans' Affairs

What they say about Veterans' MATES

On average, 85% of LMOs, 97% of pharmacists and 81% of veterans report the material to be helpful



Veterans' feedback about the educational materials



Doctors' feedback about the educational materials

Veterans' MATES highlights

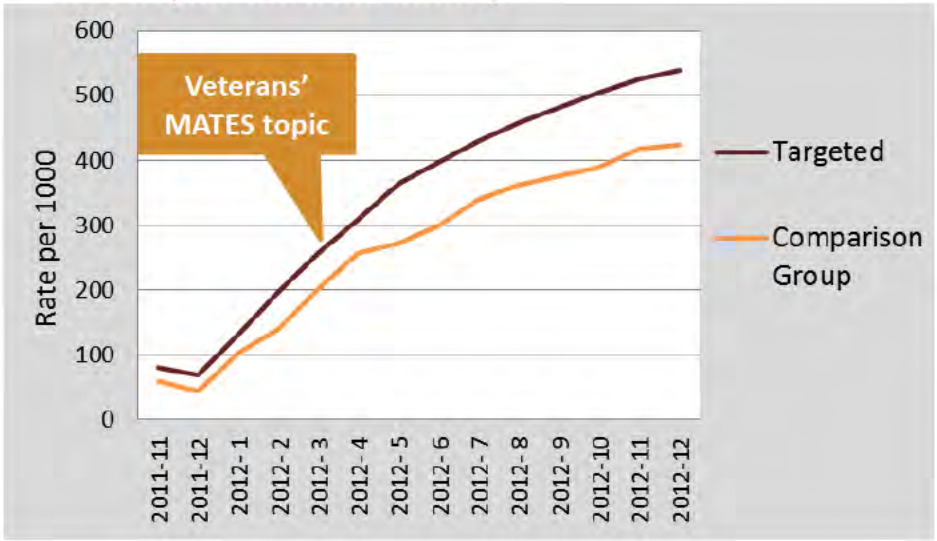
Improving the monitoring of renal function

So what happened?

- Increase in the rate of renal function tests in veterans taking medicines that require renal monitoring

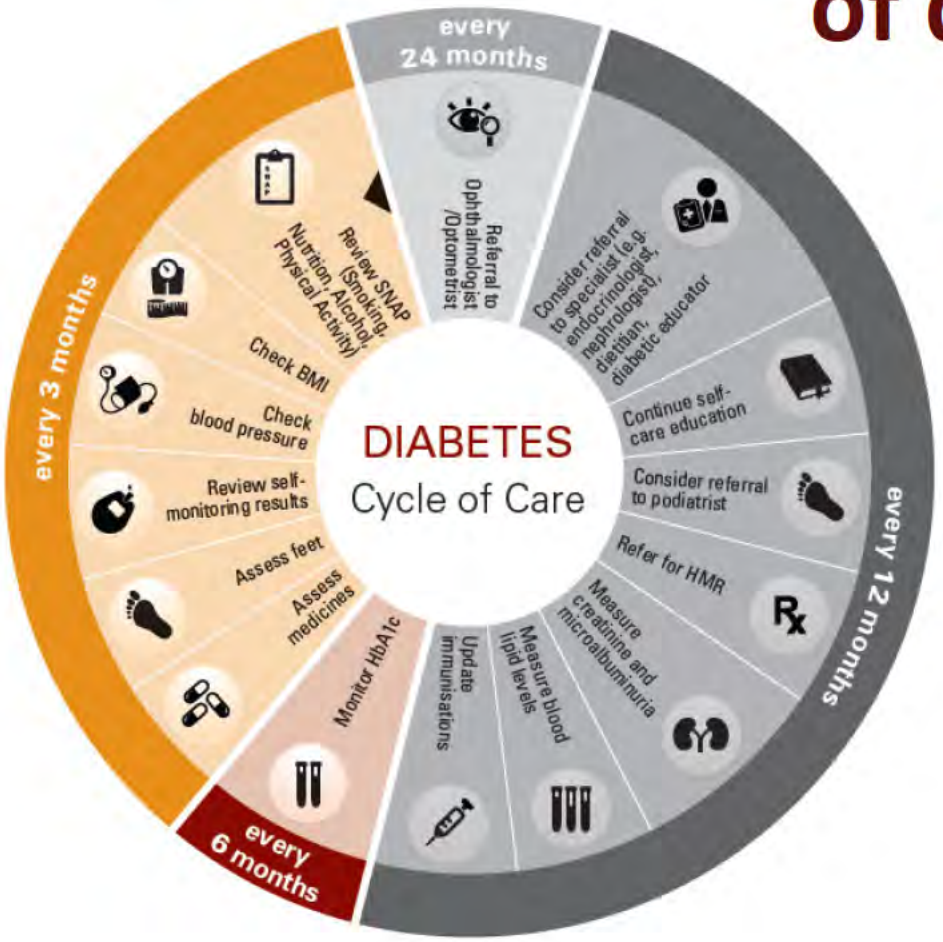
- Veterans who indicated they would talk to their doctor were more likely to receive a renal function test

Increase renal function test in veterans taking medicines that require renal monitoring



Veterans' MATES highlights

Improving the management of diabetes



- Diabetes is Australia's fastest growing disease
- Diabetes increases the risk of cardiovascular disease including heart attack and stroke
- Our latest diabetes topic distributed in 2013, aimed to improve management in those recently diagnosed with diabetes

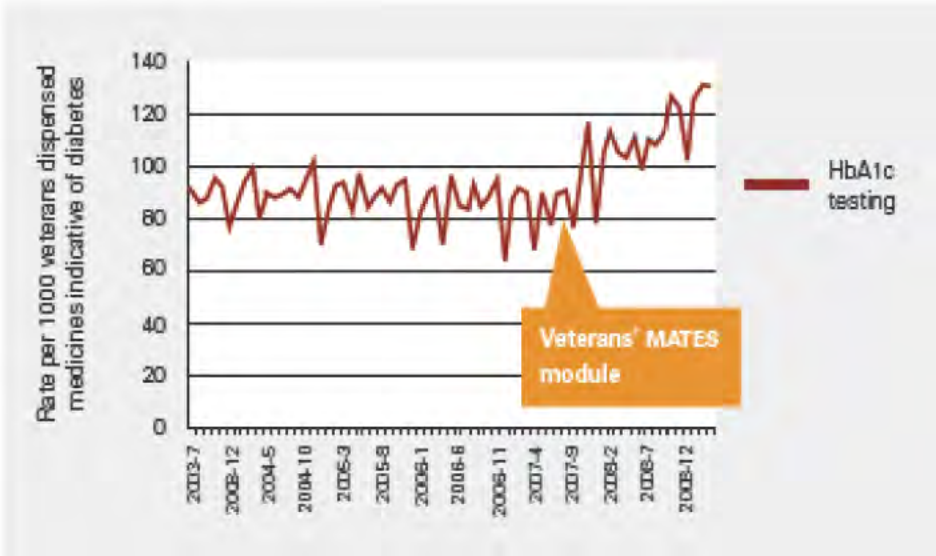
Veterans' MATES highlights

Improving the management of diabetes

So what happened?

Our latest diabetes topic will build on the success of previous topics focused on those with established diabetes which resulted in:

- ✓ Increase in Management plans and diabetes monitoring tests
- ✓ Decrease in use of potentially inappropriate medicines
- ✓ Increase in use of cardiovascular medicines



Beyond the veteran community

Veteran's MATES research has underpinned and led to innovative initiatives beyond the Australian veteran community:

- Establishment of the Australian Centre of Research Excellence in post-marketing surveillance of medicines and medical devices at the University of South Australia
- Australia as an active partner in the Asian Pharmacoepidemiological Network (ASPEN)
- Collaboration with Health Canada
- Collaboration with Korea Institute of Drug Safety and Risk management

www.veteransmates.net.au

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Print A+ A-

Main Menu
- Home
- Topics

Help Pages
- Forgotten Password
- Contact Us

Login for GPs

Username

Password

Login

Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES)

Latest Release: Topic 35, Managing neuropathic pain, is now available on secure web site

The Australian veteran population is on average 83 years of age with 5 or more chronic conditions.

Recognising that this results in veterans having complex medication needs, the Department of Veterans' Affairs has developed the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) to assist in managing medicine use in the veteran community.

Veterans' MATES provides up-to-date health and medicine information for health professionals and veterans. A team of clinical experts contribute to the writing of this information which is specifically tailored for veterans and their health professionals.

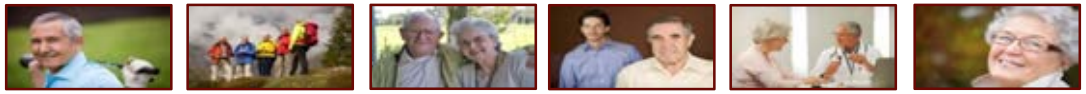
Useful Links

- Medicines Advice for Veterans
- Therapeutic Education for doctors and pharmacists
- Information for doctors about continuing education points
- Information for pharmacists about continuing professional development points
- A list of Veterans' MATES publications
- Veterans' MATES Report 2004 - 2010
- Further information on Veterans' MATES
- To download topic 35 pharmacist response form

The influence of PTSD on analgesic use in Vietnam veterans with musculoskeletal conditions

Lisa M Kalisch Ellett, Nicole L Pratt, Anna K Moffat, Elizabeth E Roughead,
Veterans' MATES Program
University of South Australia, Adelaide, Australia

Veterans'MATES

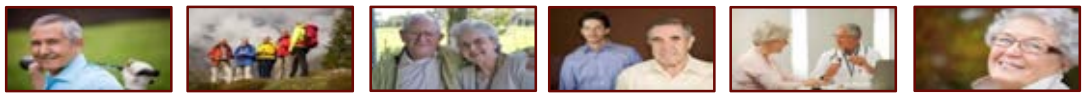


Australian Government
Department of Veterans' Affairs

Disclosures

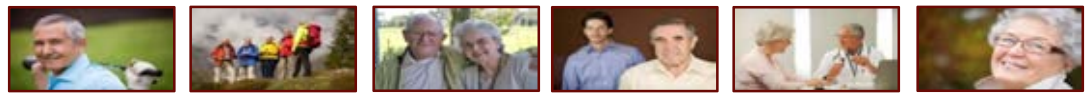
- This research was funded by the Australian Government Department of Veterans' Affairs

- All authors: no relationships to disclose



Background

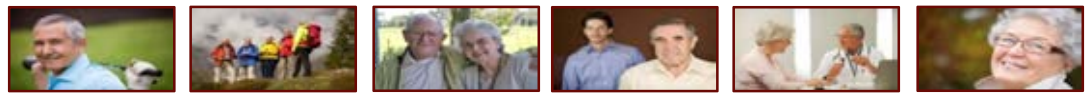
- Musculoskeletal pain and PTSD commonly concurrent
  - 80% of Vietnam veterans with PTSD had chronic pain[1] (US)
  - 14% of Gulf war veterans had PTSD + arthritis[2] (AUS)
    - 4.8% had PTSD but not arthritis
- Opioid analgesics
  - Use is higher in veterans with PTSD
  - High risk use is more common[3]



1. Higgins et al., *Pain Medicine*, 2014
2. Kelsall et al., *Pain,* 2014
3. Seal et al., JAMA, 2012

Why worry about analgesic use in PTSD?

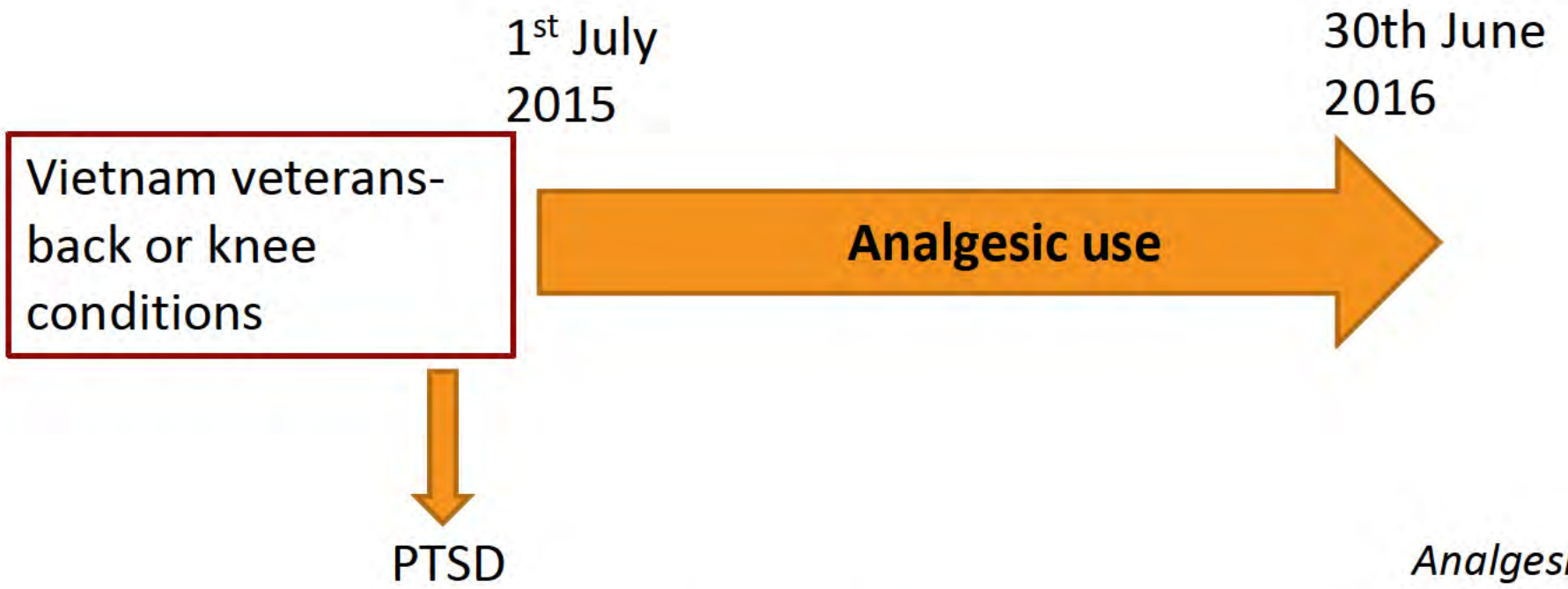
- No published studies for analgesic use in Australian veterans
  - Influence of PTSD on this use?
- No evidence to support long term opioid use
- Opioids associated with an increased risk of adverse clinical outcomes[4]
  - most pronounced in veterans with PTSD
- Opioids among patients with mental health problems may[5]:
  - result in or exacerbate substance abuse
  - worsen mental health symptoms over time



4. Seal et al., JAMA, 2102
5. Sullivan et al, Arch Intern Med, 2006

Study design

- Retrospective cohort study
  - Australian Government Department of Veterans' Affairs health claims data



Analgesics: paracetamol (alone or + codeine), opioid analgesics (paracetamol + 30mg codeine), NSAIDs

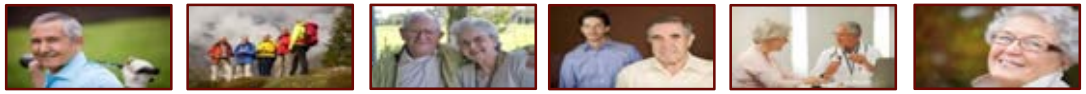
Cohorts

- Total veterans with back or knee condition= **10 318**

Cohort 1: Back or knee condition + **PTSD *N= 5909***	Cohort 2: Back or knee condition + **NO PTSD *N= 4909***
84% aged 65-74 years male, living in community	71% aged 64-74years male, living in community

Cohorts

	Back or knee condition + PTSD (N=5909)	Back or knee condition NO PTSD (N=4909)
Mental health hospitalisations	4%	2%
Psychiatrist consultations	35%	8%
Benzodiazepines	19%	14%
Antipsychotics	9%	5%
Antidepressants	50%	23%
SSRIs	27%	11%

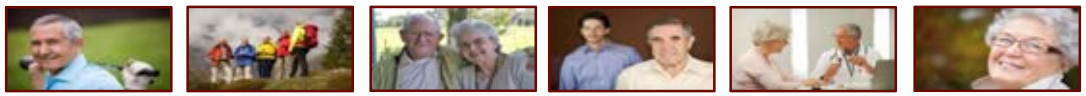


All differences significant at p<.0001

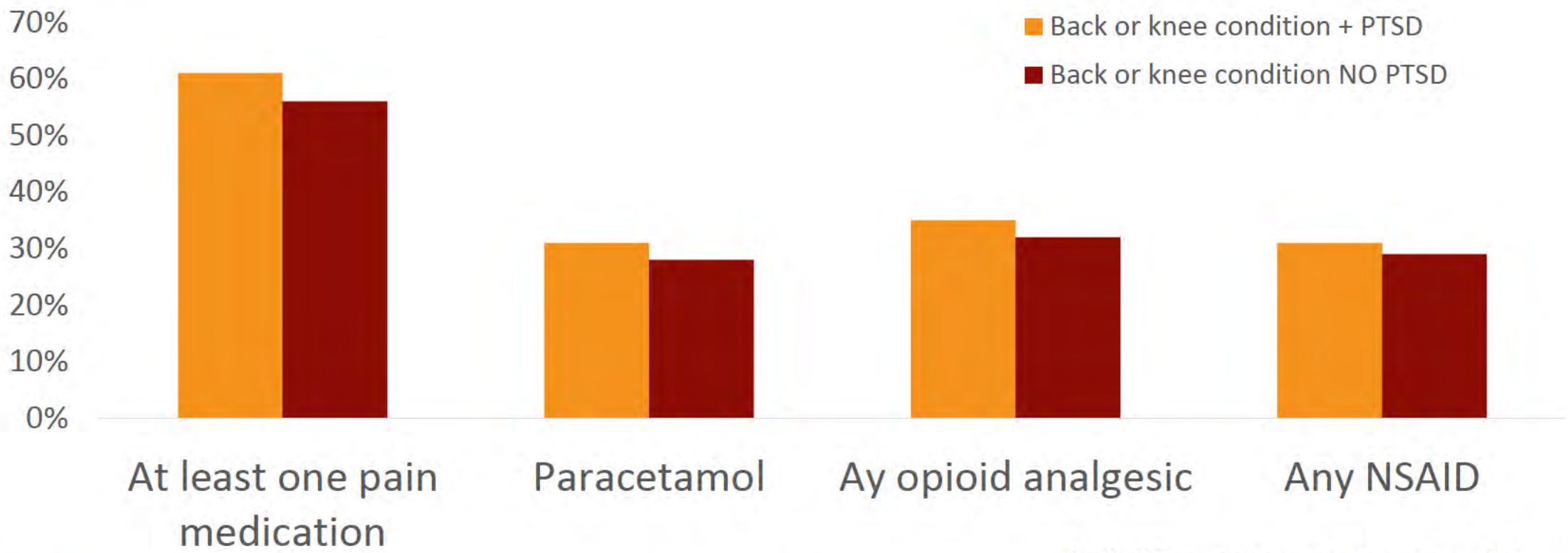
Results- dispensings

- 41% overall had no pain medications dispensed in study period

- Median different pain medicines per veteran
  - Back or knee condition + PTSD = 2 (IQR= 1-3)
  - Back or knee condition NO PTSD = 2 (IQR= 1-3)

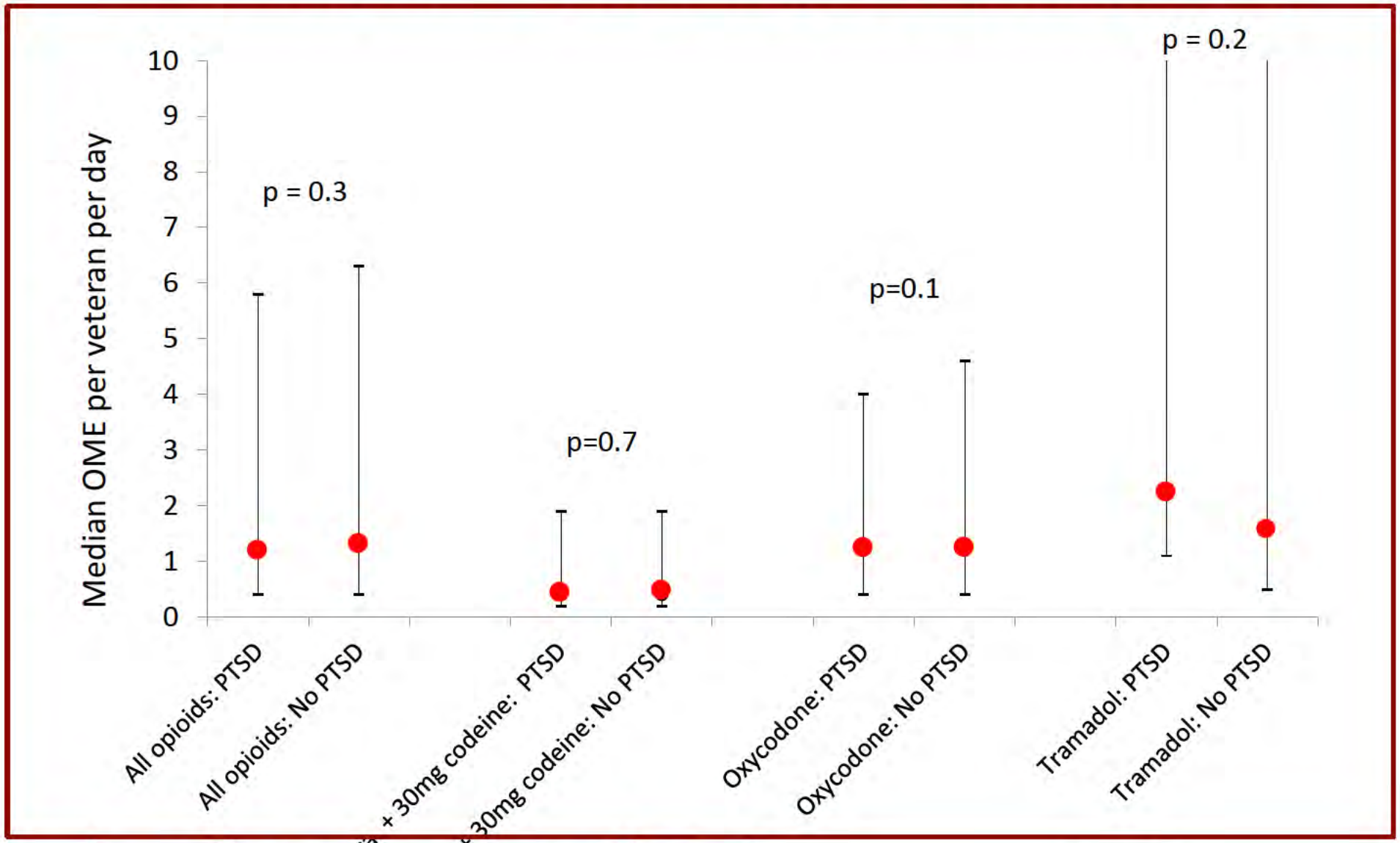


Pain medication dispensings

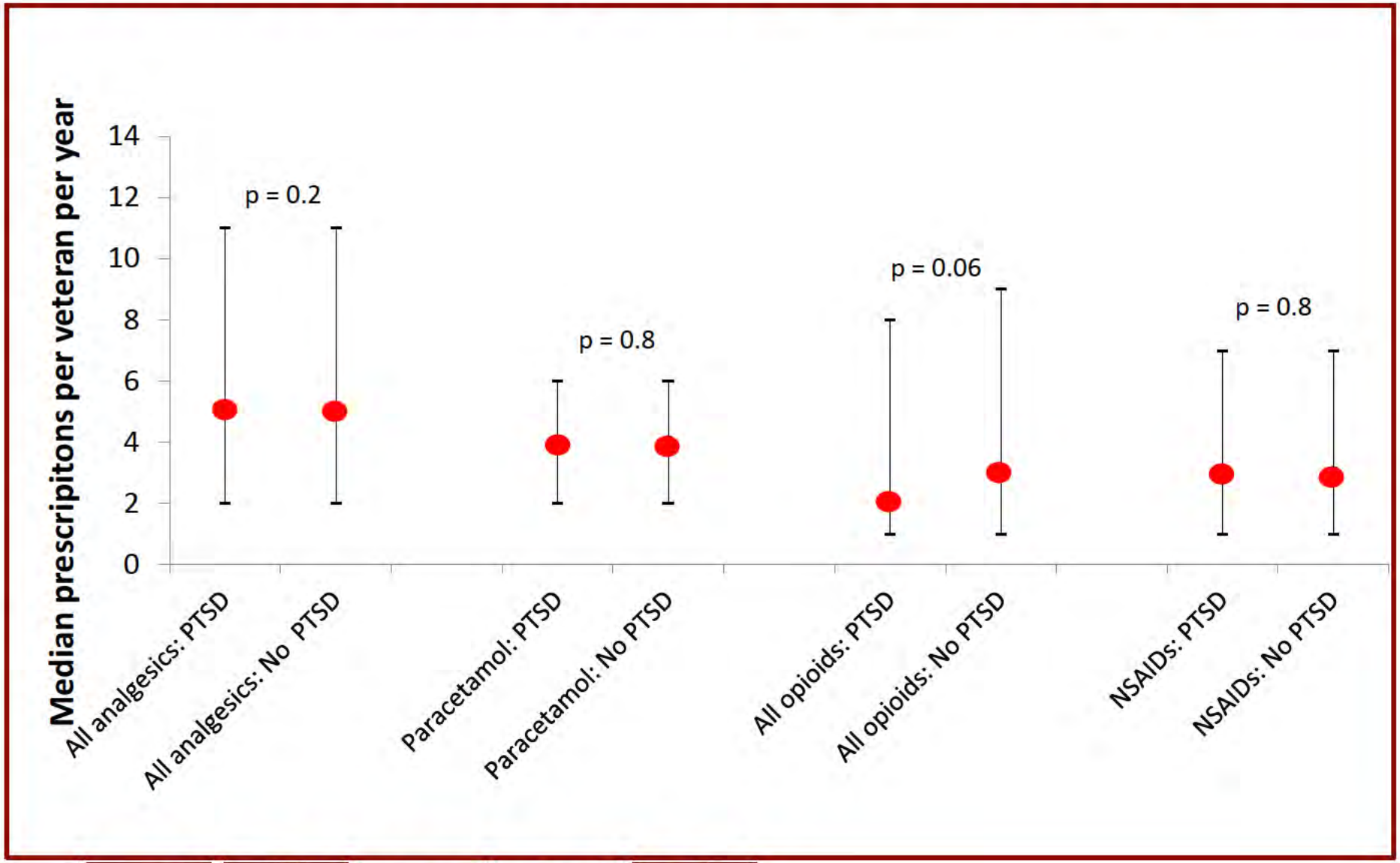


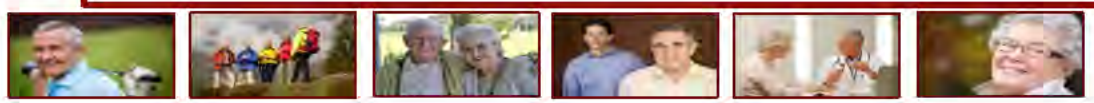
**all differences are sig. at p<=.01*

Oral Morphine Equivalent per veteran per day



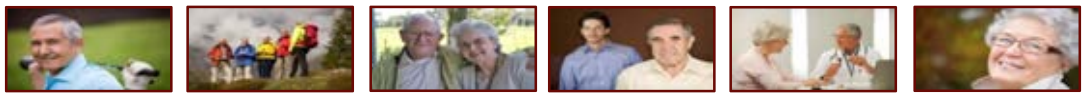
Number of prescriptions per veteran per year





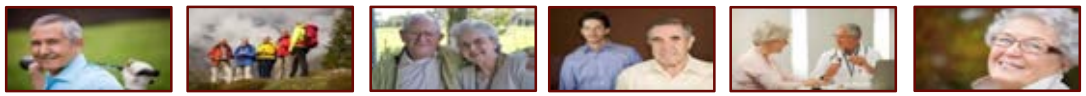
Comparison to previous research
General population

	Our study	**General practice** *(Henderson et al., Pain Med, 2013)*
N	10 318	5 793
Age	79% older than 65 years	75% <64 years
Gender	male	41% male
Paracetamol	30%	43%
NSAIDs	30%	22%
Opioids	34%	34%



Comparison to previous research
Veterans

	Our study	**US Study** *(Seal et al., JAMA, 2012)*
N	10 318	141 029
Conflict	Vietnam	Iraq and Afghanistan
Age	All over 55years	58% younger than 30 years
Gender	99% male	89% male
Highest OME quintile	10mg	33mg

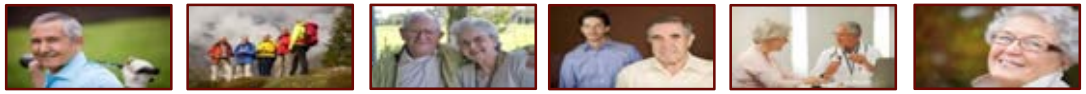


Conclusions

- When converted from OME:
  - Median daily dose 1.2- 1.3mg morphine
  - Equivalent to minimum recommended dose range for CNCP
    - (i.e. 5mg twice daily) for two months

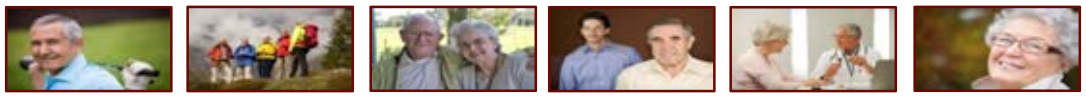
- Average daily dose much lower than US research

- Short term use in low dose range is the norm



Limitations

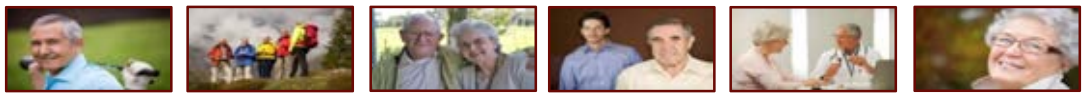
- Does not capture OTC medicines
  - Though NSAIDs much greater than general population



Acknowledgements

- Australian Government Department of Veterans' Affairs

- Veterans' MATES team www.veteransmates.net.au



Veterans' MATES

Using routinely collected administrative health claims data to improve health outcomes

Associate Professor Chris s 47F

University of South Australia | Sansom Institute for Health Research

Australian Government
Department of Veterans' Affairs





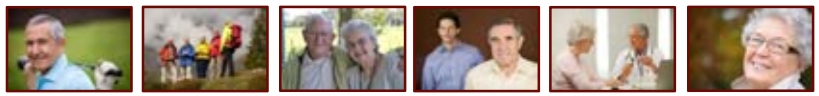

Chris s 47F , Andrew s 47F Tammy s 47F
Lisa s 47F Nicole s 47F John s 47F Emmae
s 47F Robert s 47F Graeme s 47F
Elizabeth s 47F

[1]Quality Use of Medicines Pharmacy Research Centre, University of South Australia, South Australia
[2]Repatriation General Hospital, Daw Park, South Australia
[3]Department of Veterans' Affairs, Canberra

What is Veterans' MATES?

Since 2004 the Australian Government Department of Veterans' Affairs (DVA) has provided Veterans' MATES.

Veterans' MATES provides up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team, and helps veterans to develop their health literacy.



Australian Government
Department of Veterans' Affairs

The Veterans' MATES approach

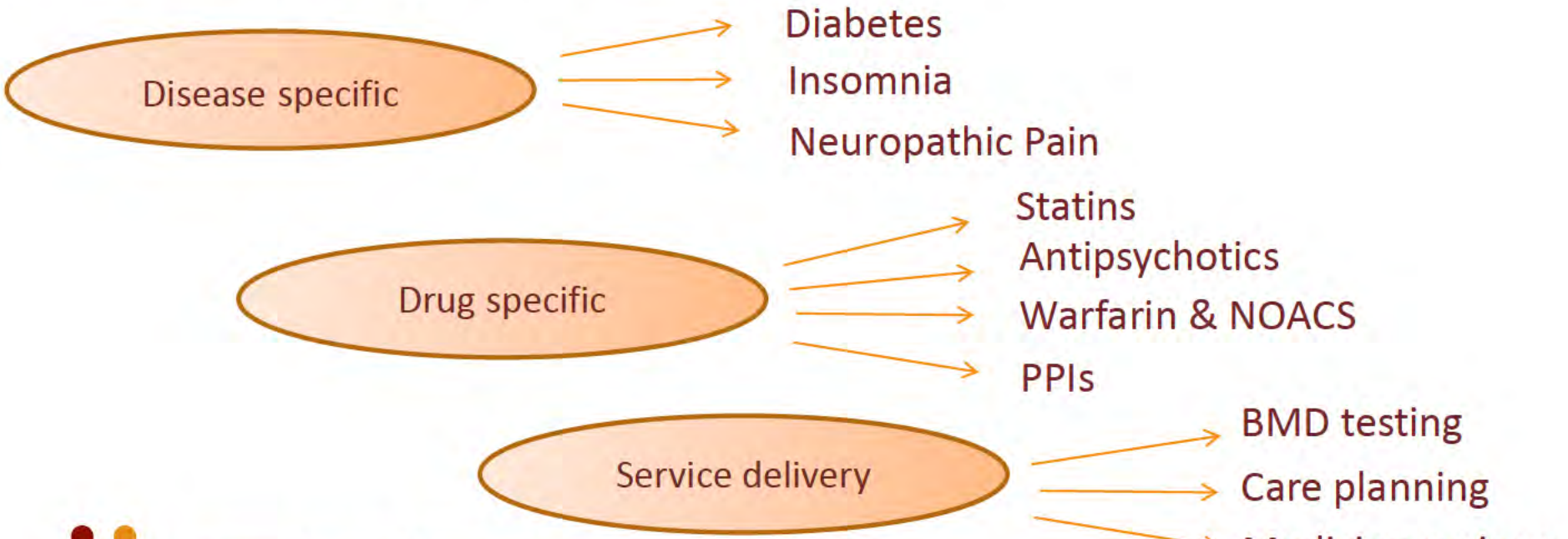
Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material is sent to members of the veteran community for whom the health topic is relevant.

The Veterans' MATES approach

- Veterans' MATES is delivering 42 educational topics over the 11 years, June 2004 to June 2015.

- To date 36 topics delivered:



The Veterans' MATES approach

Who has received the topics?

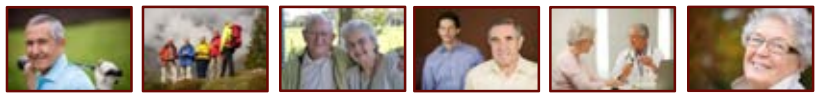
- Members of veteran community
- General Practitioners
- Specialists - Ophthalmologists
- Nursing - Directors of Residential Aged Care Facilities, Continence Nurse Advisors
- Pharmacists – accredited pharmacists

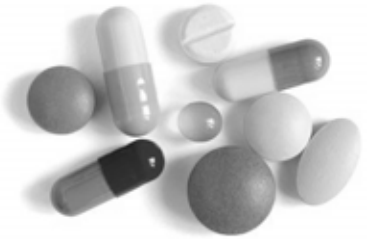
Sent every three months to approximately

- 10,000 general practitioners
- 8,500 pharmacies and accredited pharmacists
- 35,000 veterans

Australian Government Department of Veterans' Affairs Health Claims Data

- Treatment population of approximately 223,200 veterans; mean age is 76 years, with 5 co-morbidities
- Data over ten years – pharmacy, medical and allied health records (no diagnosis, includes GP visits, radiology, pathology etc)
- Hospital records (diagnosis and procedures)





Using the health claims data

Planning stage

- Medication-related problem analysis
- Module topic selected

Development & Implementation stages

- Patient specific feedback & evidence based information developed
- Topic implementation

Evaluation stage

- Evaluation

So what happens to our veterans?

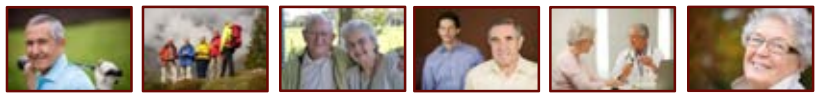
Evaluation has demonstrated:

- Changes in targeted medicines and services
- Improved health outcomes
- Stakeholder satisfaction

Veterans' MATES highlights

Improving the monitoring of renal function

- Renal function declines as we get older. Monitoring is important as up to 90% of renal function can be lost before symptoms become evident.
- Many medicines are cleared from the body via the kidneys and require dose adjustment in those with poor renal function.
- Topic distributed in March 2012 aimed to increase the monitoring of renal function.
- Materials sent to over 10,000 GPs, 8,000 pharmacist and 27,000 veterans taking medicines that require renal function monitoring.



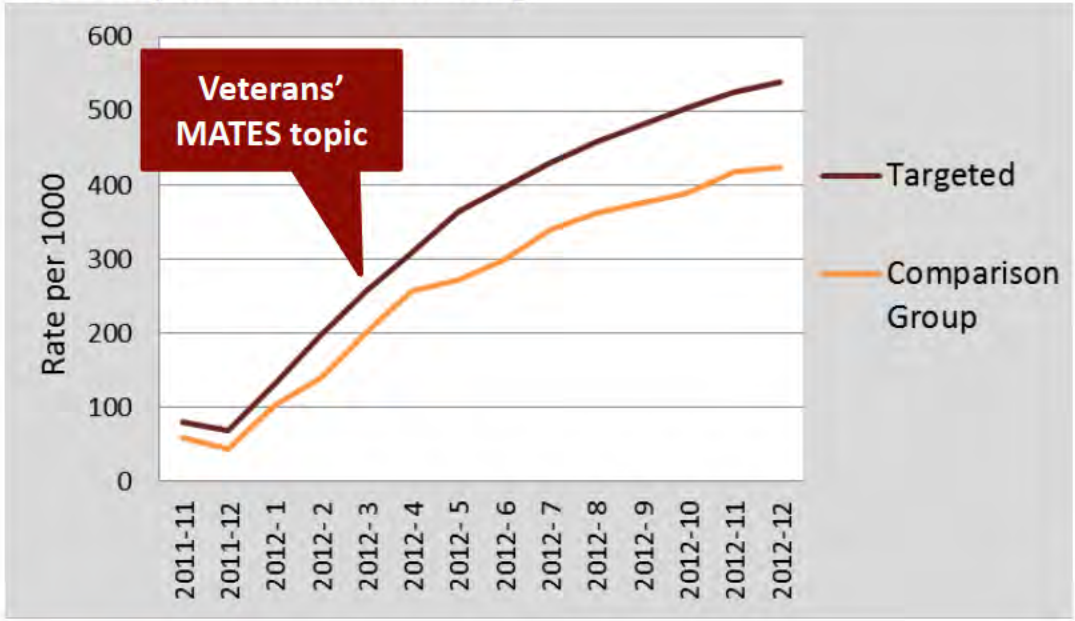
Veterans' MATES highlights

Improving the monitoring of renal function

So what happened?

- ✓ Increase in the rate of renal function tests in veterans taking medicines that require renal monitoring
- ✓ Veterans who indicated they would talk to their doctor were more likely to receive a renal function test

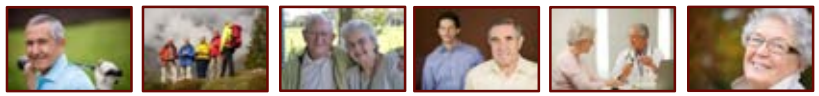
Increase renal function test in veterans taking medicines that require renal monitoring



Veterans' MATES highlights

Reducing the risk of falls & hip fractures

- Falls can impact lifestyle, confidence and independence and can result in major injuries including hip fractures
- Falls do not need to be a part of getting older
- Our latest falls prevention topic in 2012 aimed to assist appropriate medicine use and reduce risk of falls and fracture



Veterans' MATES highlights

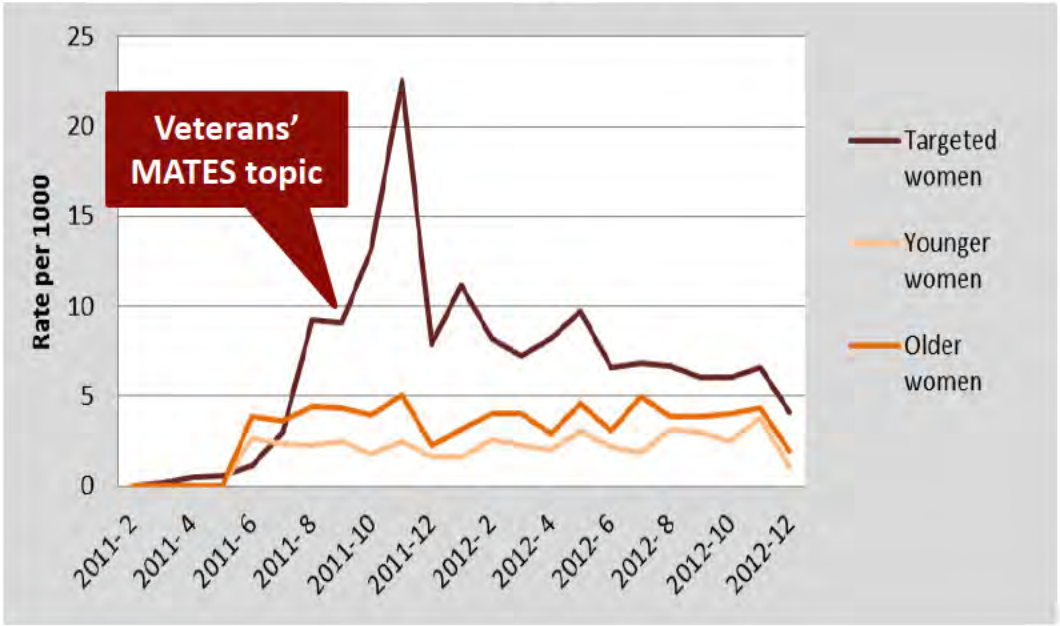
Reducing the risk of falls & hip fractures

So what happened?

Our latest topic on reviewing hypnotic use built on the success of previous falls prevention topics which had resulted in the:

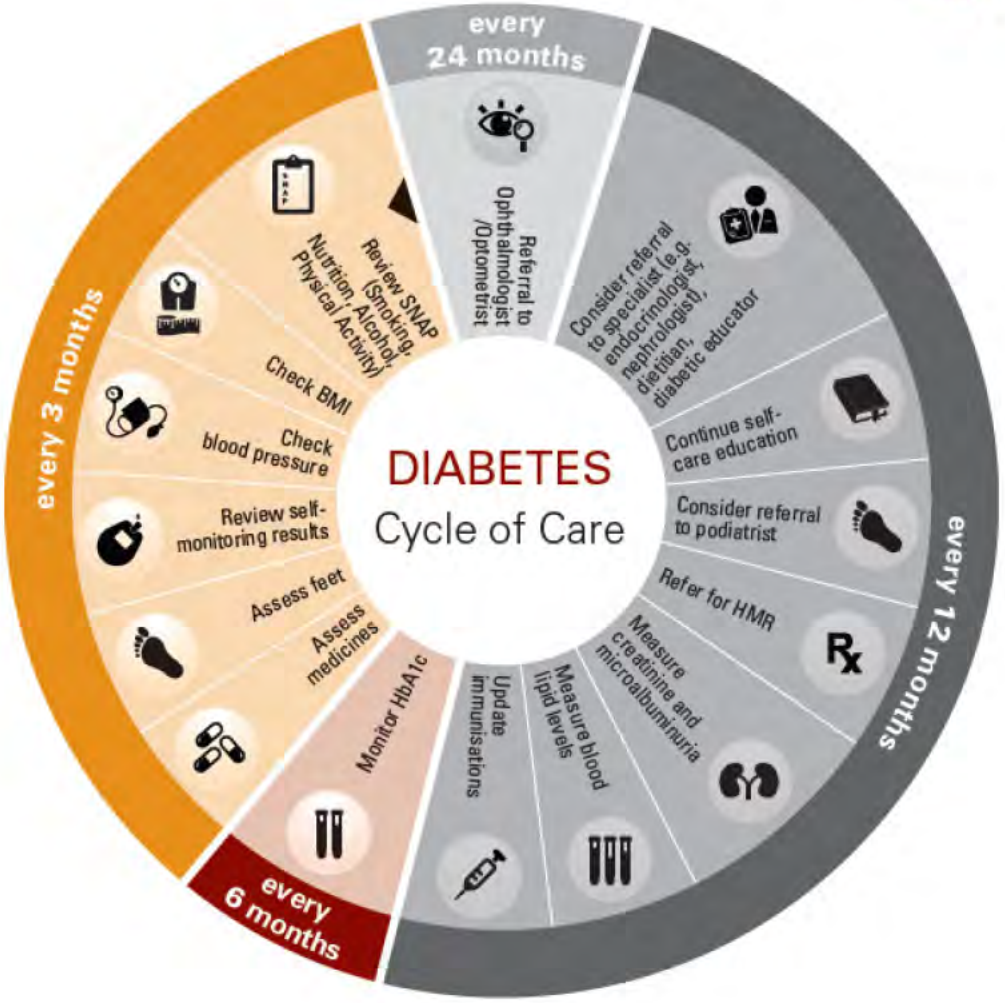
- ✓ Reduction in use of medicines that increase the risk of falls and hip fractures
- ✓ Increase in bone mineral tests to detect osteoporosis
- ✓ Increase in use of medicines to treat osteoporosis

Uptake of Bone Mineral Testing in women



Veterans' MATES highlights

Improving the management of diabetes



- Diabetes is Australia's fastest growing disease
- Diabetes increases the risk of cardiovascular disease including heart attack and stroke
- Our latest diabetes topic distributed in 2013, aimed to improve management in those recently diagnosed with diabetes

Veterans' MATES highlights

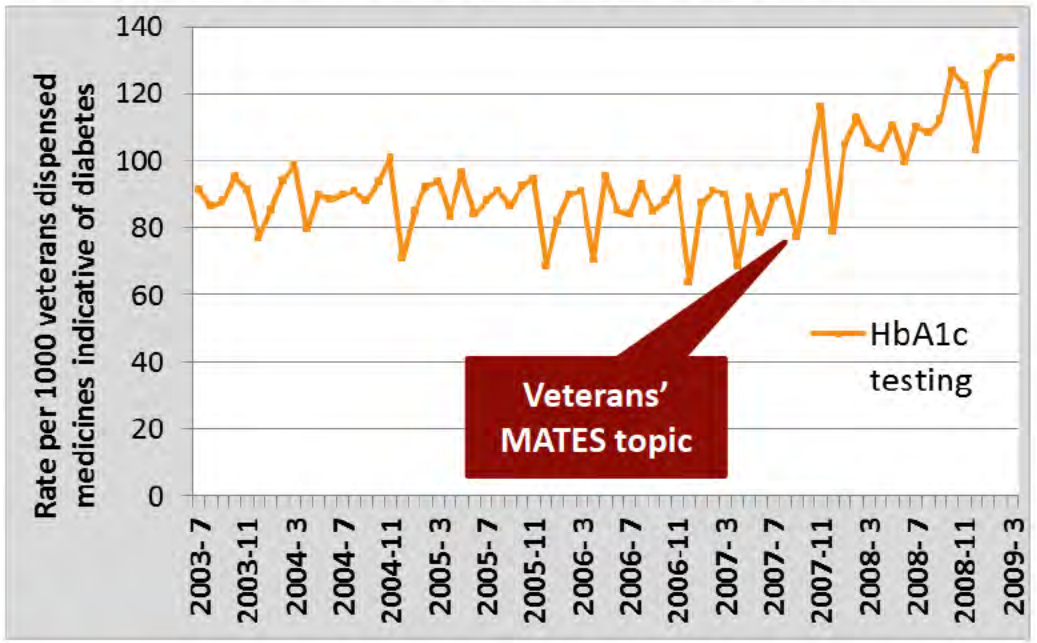
Improving the management of diabetes

So what happened?

Our latest diabetes topic built on the success of previous topics focused on those with established diabetes which had resulted in the:

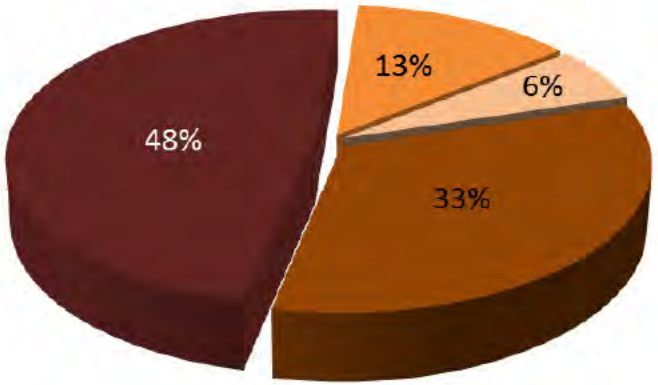
- ✓ Increase in Management plans and diabetes monitoring tests
- ✓ Decrease in use of potentially inappropriate medicines
- ✓ Increase in use of cardiovascular medicines

Increase in tests monitoring blood glucose control

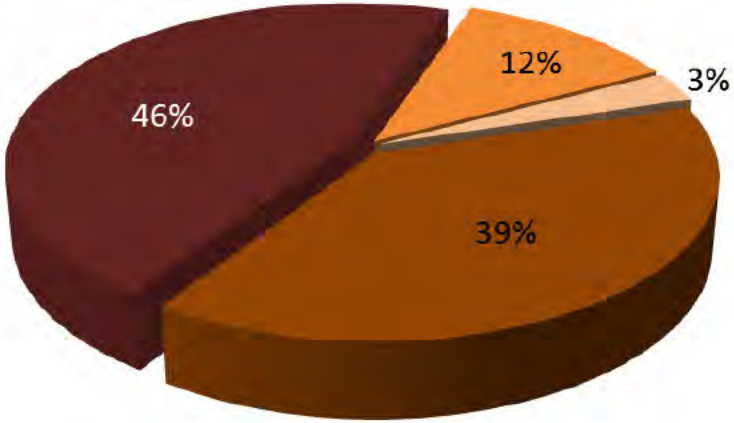


Feedback about Veterans' MATES

On average, 85% of LMOs, 97% of pharmacists and 81% of veterans report the material to be helpful



Veterans' feedback about the educational materials



Doctors' feedback about the educational materials

www.veteransmates.net.au

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Print A+ A-

Main Menu
- Home
- Topics

Help Pages
- Forgotten Password
- Contact Us

Login for GPs

Username

Password

Login

Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES)

Latest Release: Topic 36, Statins, is now available on secure web site

The Australian veteran population is on average 83 years of age with 5 or more chronic conditions.

Recognising that this results in veterans having complex medication needs, the Department of Veterans' Affairs has developed the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) to assist in managing medicine use in the veteran community.

Veterans' MATES provides up-to-date health and medicine information for health professionals and veterans. A team of clinical experts contribute to the writing of this information which is specifically tailored for veterans and their health professionals.

Useful Links

- Medicines Advice for Veterans
- Therapeutic Education for doctors and pharmacists
- Information for doctors about continuing education points
- Information for pharmacists about continuing professional development points
- A list of Veterans' MATES publications
- Veterans' MATES Report 2004 - 2010
- Further information on Veterans' MATES
- To download topic 36 pharmacist response form

Australian Government
Department of Veterans' Affairs

University of South Australia

Veterans' MATES

Antidepressant use in the Australian veteran population

Kerrie s 47F Mhairi s 47F Nicole s 47F V Tammy s 47F John s 47F Natalie s 47F Elizabeth E s 47F .[1]

[1]*Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, School of Pharmacy and Medical Sciences, University of South Australia, Adelaide, Australia*

Introduction

Australia has the second highest antidepressant use in the world; use has more than doubled since 2000, with sufficient antidepressants dispensed to treat 10% of Australian adults at standard doses (See Figure 1).[1]

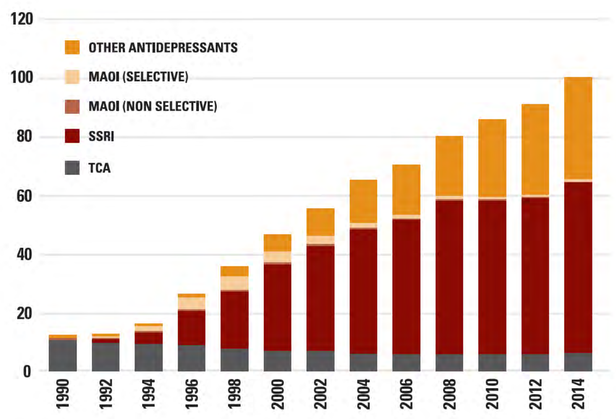


Figure 1. Antidepressant use in Australia from 1990 to 2014

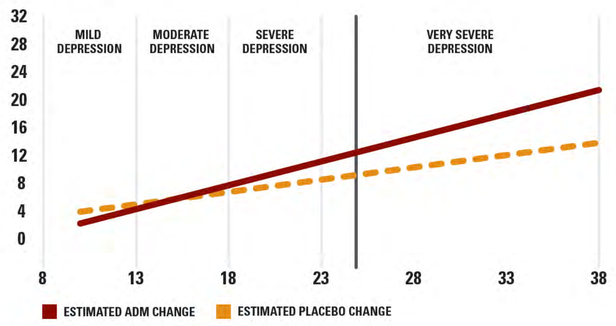


Figure 2: Estimated change in HDRS scores following antidepressant use. A meta-analysis of six studies indicates the mean change in depressive symptoms according to the Hamilton Depression Rating Scale (HDRS) for antidepressant medicine and placebo for mild, moderate, severe and very severe depression. The National Institute of Clinical Excellence threshold for clinical significance (a HDRS point difference of ≥3) was only met for HDRS scores of 25 or greater.[2]

Antidepressants are most beneficial for people with severe depression and provide only modest benefit for people with mild to moderate depression (See Figure 2).[2] A meta-analysis found you need to treat 16, 11 and four patients with mild to moderate, severe, or very severe depression respectively, to benefit from an antidepressant.[2]

When an antidepressant is used to treat a single episode of depression, continuation is recommended for at least six to nine months after recovery.[3,4] In people with two prior episodes and functional impairment, it is recommended that antidepressants are continued for at least two years.[3]

Objectives

The aim of this study was to determine the number of veterans who have been continuously dispensed the same antidepressant for two or more years, a time period beyond which treatment is recommended for a single episode of depression.

Methods

A retrospective, longitudinal study, using the Australian Government Department of Veterans' Affairs administrative claims database, was undertaken involving all veterans and their dependents aged 18 years and over in June 2015, who had been continuously supplied the same antidepressant for two years. To avoid targeting persons with active depression, all veterans who had had a psychiatric visit during the two year period were excluded. Veterans using amitriptyline only were excluded as amitriptyline is commonly used to treat other disorders including neuropathic pain, nocturnal enuresis, urinary urge incontinence or for migraine prevention.

Results

There were **17,239** persons who were supplied the same antidepressant over a two year period. Of these, **12,720** had been continuously dispensed the same antidepressant over the two years and had no claim for a psychiatrist service during that time.

Of those not having a psychiatry claim

53% VETERANS

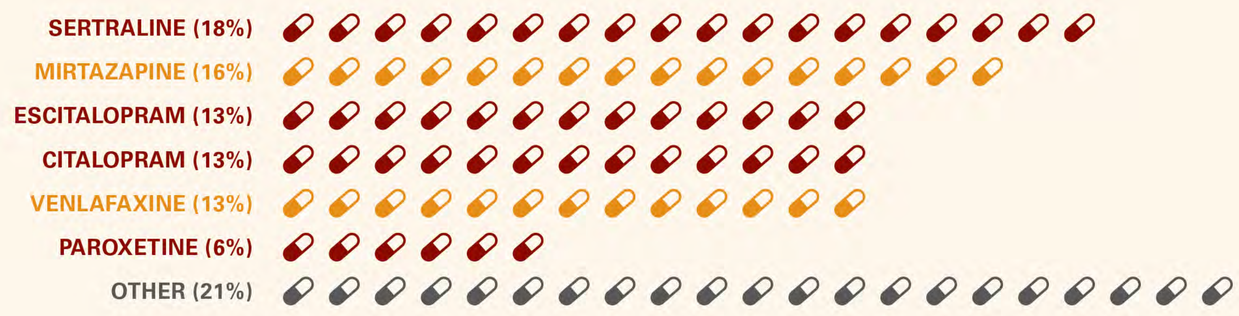
47% DEPENDENTS

Age of long-term antidepressants users

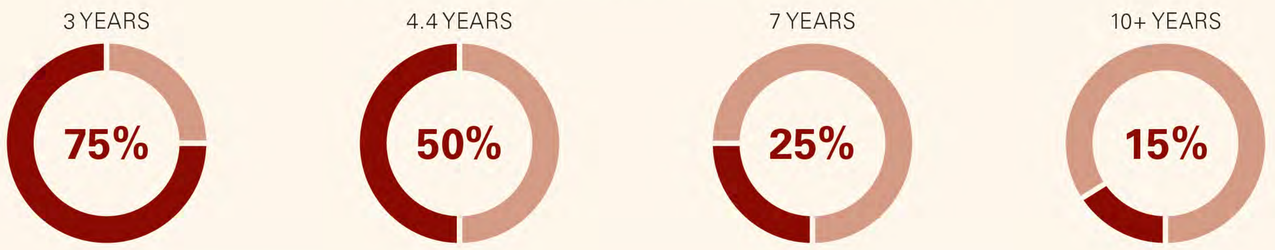
24% 65 TO 74 YEARS OF AGE

61% 75 YEARS OR OLDER

Antidepressants most commonly dispensed long term



Duration of continuous antidepressant use



186 persons in the cohort had been continuously dispensed an antidepressant for more than 15 years

Implications

Results of this study indicate there are a significant number of older veterans and their dependents not actively seeing a psychiatrist, who have been dispensed the same antidepressant for two or more years. A study conducted in the United Kingdom demonstrated that it is possible to safely reduce long term antidepressant dose or use.[5] One in four patients who were reviewed had their antidepressant therapy altered which resulted in an overall reduction in prescribing (7% had their antidepressant ceased, 13% had their dose reduced, 5% had their dose increased and 3% had their antidepressant changed).[5] While for some veterans, long term use of an antidepressant will be necessary, these data suggest that for other veterans, it may be appropriate to review their continued use of an antidepressant.

References

1. Organisation of Economic Co-operation and Development. Pharmaceutical Market, 2016. Available at: http://dx.doi.org/10.1787/data-00545-en [Accessed August 2016].
2. Fournier J, et al. Antidepressant drug effects and depression severity. A patient-level meta-analysis. JAMA. 2010; 303(1): 47-53.
3. Taylor D, Paton C, Kapur S. Maudsley Prescribing Guidelines in Psychiatry. Wiley Blackwell, 2015.
4. Keks N, Hope J, Keogh S. Switching and stopping antidepressants. Australian Prescriber. 2016; 39: 76-83.
5. Johnson C, et al. Reviewing long-term antidepressants can reduce drug burden: a prospective observational cohort study. British Journal of General Practice. 2012; 62(604): e773-e779.

Acknowledgement
This work was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of Veterans' MATES (www.veteransmates.net.au).

MEDINFO23

8 – 12 JULY 2023 | SYDNEY, AUSTRALIA

@AndradeAQ

Data-driven interventions for an emergency preparedness system: a national experience in Australia

Andre Andrade

Associate Research Professor

University of South Australia

Co-authors

Mhairi Kerr

Prof. Libby Roughead

@TheInstituteDH #MEDINFO23

AIDH

What is Veterans' MATES?

- A data driven **precision public health** program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.

- Funded by the Australian Government Department of Veterans' Affairs since 2004

- Provided by University of South Australia in partnership with
  - University of Adelaide
  - Australian Medicines Handbook
  - Drug & Therapeutics Information Service
  - HealthLink

We take a Big Data Source

To identify health care issues and trends

Pinpoint those who would benefit from an intervention and provide individually tailored recommendations

And then measure the impact of the intervention

Australian Government Department of Veterans' Affairs routinely collected health claims data

1 BILLION

Contains over a billion health claims records

18 YEARS

More than ten years of historical health data

Contains hospital records including diagnosis and procedures

Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

Elements for improved decision-making

Introductory header

Context* (time series chart)

Goal setting and rationale

Prompts (positive and negative)

Veterans' MATES

Dear DR P SURNAME

Date: 15/09/2020

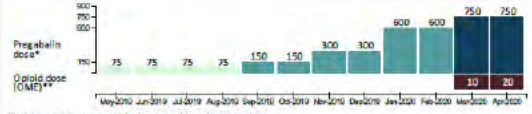
This Veterans' MATES information aims to assist you to review gabapentinoids (pregabalin or gabapentin) that may cause harmful side effects when used long term. It is advisory in nature. The information is based on DVA claims that indicate that a veteran has had 3 or more dispensings of pregabalin or gabapentin in a 12 month period, with at least 1 of the dispensings during the last 4 months of this period*.

Consider whether your patient will benefit from non-pharmacological pain therapy and, if warranted, whether adjusting the dose or ceasing gabapentinoids is appropriate. Please consider within the context of this patient's current treatment.

Educational material explaining the rationale for these recommendations can be found at the Veterans' MATES website

FIRST & SURNAME** DOB: <DD/MM/YYYY> Gender: <Male or Female> ACCOMMODATION: Community
<Residential address>

Relevant claims history for pain



*Daily average dose per month (mg), estimated from dispensing data
**Oral morphine equivalent daily average dose per month (mg), estimated from dispensing data

Notes	
Latest Home Medicines Review (HMR) claim	None claimed in the last 2 years
Latest Psychologist visit	None claimed in the last year

Medicine(s)	Last Dispensed	Other Prescriber
Pregabalin (Lyrica) Cap 75 mg	10/10/19	Yes
Tramadol hydrochloride (Tramal SR) controlled release Tab 50 mg	02/09/19	No
Oxycodone hydrochloride (OxyNorm) Cap 10 mg	02/10/19	No

Suggested actions:

- Review indication for use of medicine(s). Confirm pain is neuropathic
  Rationale: The majority of evidence for effectiveness of gabapentinoids is limited to diabetic neuropathic pain and post-herpetic neuralgia. There is limited evidence for effectiveness of gabapentinoids when a neuropathic component is not well established.
- Review duration of use, consider tapering and ceasing.
  Rationale: Recommended duration of use of gabapentinoids is no longer than 6 months.
- Check for side effects of medicine(s). Consider risks for driving or falling.
  Rationale: One-third to one-half of patients taking gabapentinoids suffer from dizziness or somnolence.
- Review need for therapy, consider potential for cessation.
  Rationale: Patient received doses of pregabalin of below 150 mg per day. Potentially subtherapeutic dose for neuropathic pain.
- Patient co-dispensed opioids. This increases the risk of side effects in a dose-dependent manner.
- Consider referral for a Home Medicines Review (HMR) for review of medicines for pain.

Consider DVA-funded services to support independent living	
Occupational therapist claim:	None claimed in the last five years
Cognitive, dementia, and memory assistive technology claim (DVA's National RAP schedule):	05/02/2017
DVA-funded dose administration aid claimed:	None claimed in the last two years
Home Medicines Review (HMR) claimed:	None claimed in the last two years
No. of unique medicines dispensed in last year:	5

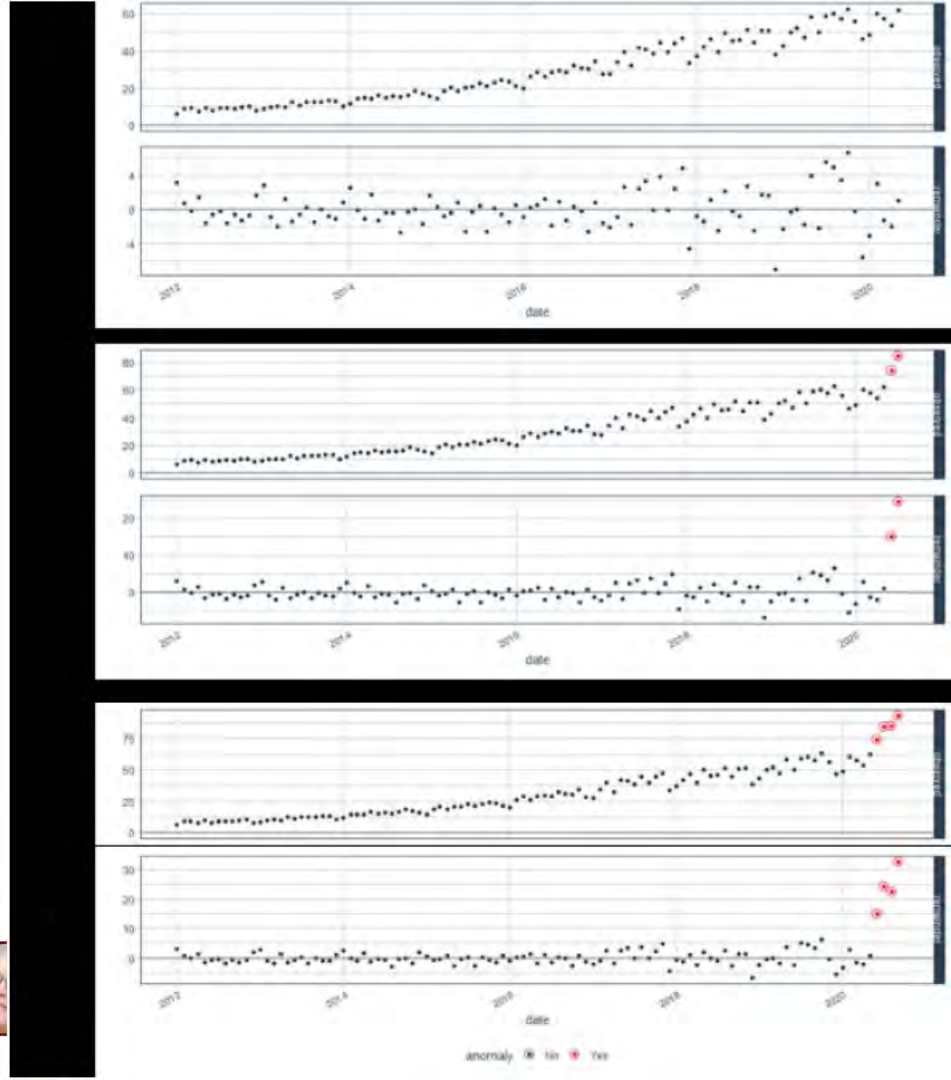
Actions:
Refer to an occupational therapist YES ☐
Refer for a Home Medicines Review and DVA-funded dose administration aid service YES ☐

*In this case, feedback on behaviour

Issue identification

Increased demand for psychologist visits

Database search for patients with evidence of mental conditions, focusing particularly on post-traumatic stress disorder (PTSD)



Promoting access to mental health services – July 2020

Veterans' MATES

Identifying high risk of mental health conditions

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME

Date: 25/06/2020

This Veterans' MATES information identifies your DVA clients with past claims indicative of mental health conditions, past or current. They may be at heightened risk of poor mental health outcomes during the COVID pandemic.

FIRST & SURNAME* **DOB: <DD/MM/YYYY>** **GENDER: <Male or Female>** **ACCOMMODATION: <Community>**
ADDRESS:

Mental health services or medicines	Current history (last claim in 2020)	Past history (last claim prior to 2020)
Antipsychotic medicine	12 May 2020	-
Hypnotic medicine	12 May 2020	-
Psychologist service	-	14 Feb 2017
Psychiatrist service	-	3 Jan 2018
Accepted disability for PTSD	Yes	

90-SECOND TOOL: Grounding technique

Patients with history of PTSD are at higher risk of emotional distress during the COVID pandemic. This grounding technique was developed for post-trauma recovery (provided by Phoenix Australia) as a way to modulate the amygdala response. It is about focusing on what is going on around you in the here and now. **Trial this emotion management technique by saying to your patient:**

- Sit down to do this exercise – or to hold onto something solid.
- Really feel the sensation of being connected to the floor, the chair, the wall.
- Take a moment
  your clothes on
- Take a moment
  the wall, or bird
- Take a moment
  like the leaves r
- Remind yourselt

Suggested actions for your consideration

- **At the next appointment, check for signs of distress for this patient.**
- **Review the use of medicines for mental health**
  Have a conversation with your patient about how they are taking their n
  continue their medicines as prescribed. Consider a referral for a Home I
  health, if appropriate. Home Medicines Reviews are also now available

Along with this letter, you will receive information about 4 other DVA clients. V
currently experiencing and hope we can help support your care of DVA clients

*The services and medicines for the identified patients are sourced from the DVA Health Clair
from RPBS, PBS or MBS claims in the past 5 years. The most recent claim date for each service
between service delivery and claim payment. In addition, not all services provided can be ide
75 years or younger who have received mental health services or multiple dispensings for a r

This information has been endorsed by the DVA Editorial Committee, which includes represer
For general comments and feedback please contact MATES.comments@unisa.edu.au

Australian Government Department of Veterans' Affairs

Veterans' MATES

HEALTH PROFESSIONAL FACT SHEET

Practical ways to help your patients manage distress during and after COVID-19

Changes brought about by COVID-19 to the way we work, communicate and connect every day have caused uncertainty, loneliness and distress for many people.[1,2] People are recovering[1] but, for some (see Box 1), COVID-19 and its flow-on effects (see Box 2) can be a trigger to the brain's 'emotional' and fear detection centre.[3] Distressing emotions and negative thoughts of past traumas and anxieties can be re-ignited and persist well after COVID-19 has diminished.[3,4,5]

Anticipate acute and continuing distress for some DVA patients.[1,4] At each consultation, ask your patient how they are going.

Help your patients experiencing distress to:

Understand the stress response

A good face-to-face to empathise (distress) is to acknowledge that it exists and know it is normal to feel distress during an event like COVID-19.[4] **Share this 90-second video by Phoenix Australia – Centre for Posttraumatic Mental Health with your patients to help them understand the stress response** (the first video at this link) www.recoveryonline.org.au/managing-emotions

Explain to your patient that simple techniques, such as controlled breathing and mindfulness or grounding can help calm the mind and body, especially when practised a few times every day.[3,4,5]

With your patients, work through the following techniques included in the suite of high Res SMART tools:

- **A 1-minute video and tool on controlled breathing:** www.openarms.gov.au/get-support/self-help-tools/show-all-tools/physical/controlled-breathing
- **A 2-minute video/tool or guided grounding techniques:** www.openarms.gov.au/get-support/self-help-tools/show-all-tools/physical/guided-grounding

Manage negative thoughts

Ruminating negative thoughts can fuel anxiety.[3] Recognising and managing these thoughts helps to control emotions and, ultimately, behaviours. Encourage your patients to:

- **click on 'start tool' to try the 'stop and swap thoughts' tool**

Box 1. Veterans most at risk of acute and continuing distress may have experienced:

- post-traumatic stress[4]
- anxiety disorders[4]
- depressive disorders[4]
- health anxiety[3,4]

Box 2. Flow-on effects from COVID-19 may include:

- anxiety, loneliness or a sense of isolation[3]
- family, unemployment and financial stress[3]

Teach your patients to recognise signs of distress so they can practise learn techniques well before they feel overwhelmed.[3]

Distressed patients may be:[3,4,5]

- anxious, worried or irritable
- sleeping less or more
- withdrawn or depressed
- feeling a loss of control or a sense of hopelessness
- finding it difficult to concentrate
- agitated, angry or vigilant
- using more alcohol leading to anti-social behaviours and violence
- having interpersonal relationship

Reach

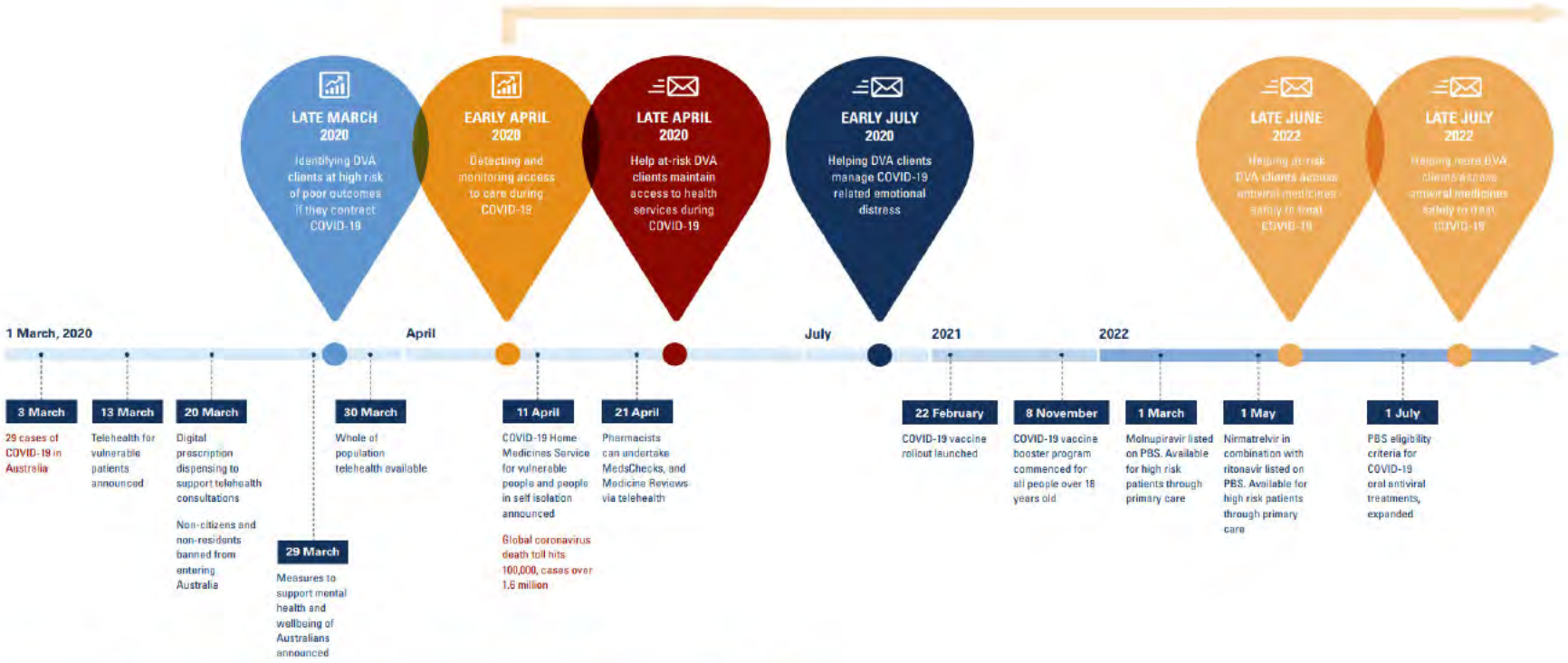
- 42,327 DVA-client specific messages for 15,588 GPs.
  - 24,532 digital messages direct to EHR
  - 17,795 delivered by post
  - All Australian states and territories

- Eligible DVA-clients received intervention by post

Evaluation and Results

- Pre-post comparison
  - Increase in the average number of psychologist services in the 3 months after the intervention when compared to the three months prior
    - digital: 0.51 prior to 0.56 post, $p<0.001$
    - post: 0.59 prior to 0.65 post, t-test $p<0.001$
  - There was no significant difference between digital and post groups (ordinary least squares regression $p=0.1$)

COVID response



Conclusion

- Clear opportunities for better data use in emergency preparedness systems
  - Algorithms to identify need urgent care
  - Intervention was developed, targeted, and delivered to GPs across Australia in 4-8 weeks
  - Secure delivery to the clinical desktop in real time interventions

Acknowledgements

Veterans' MATES

Veterans' MATES team

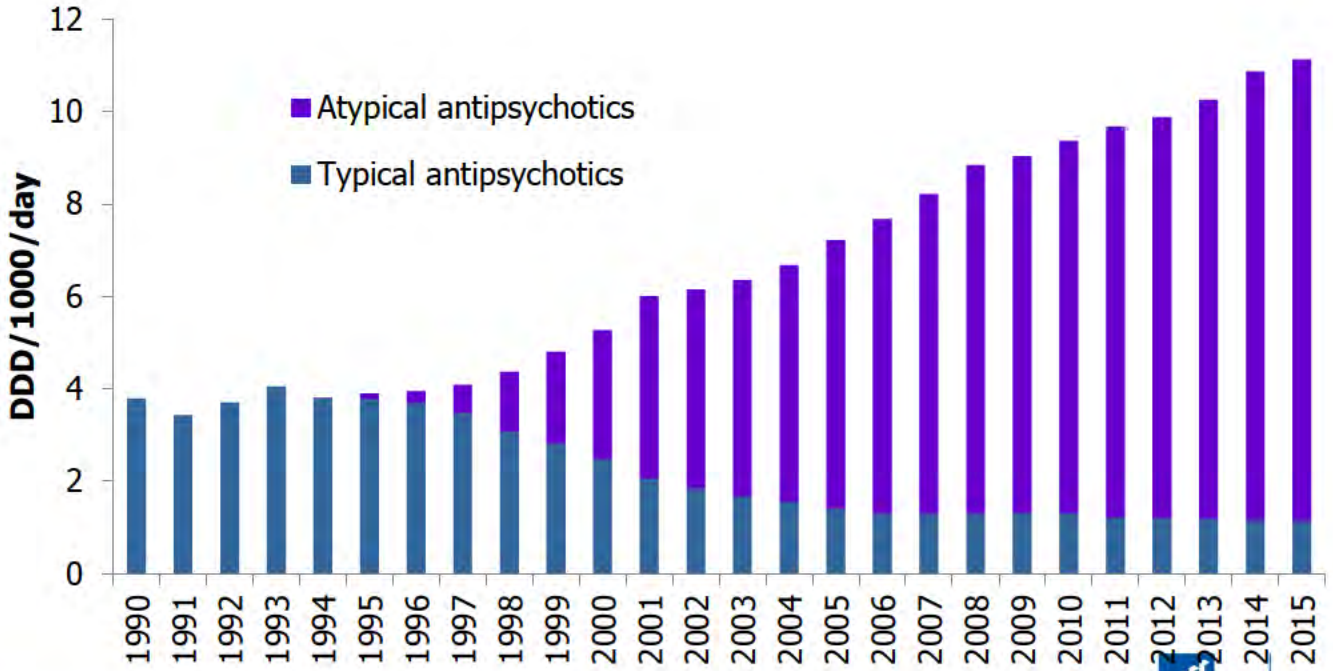
Co-authors
Mhairi Kerr
Prof. Libby Roughead

Antipsychotic use in dementia

Libby s 47F
University of South Australia

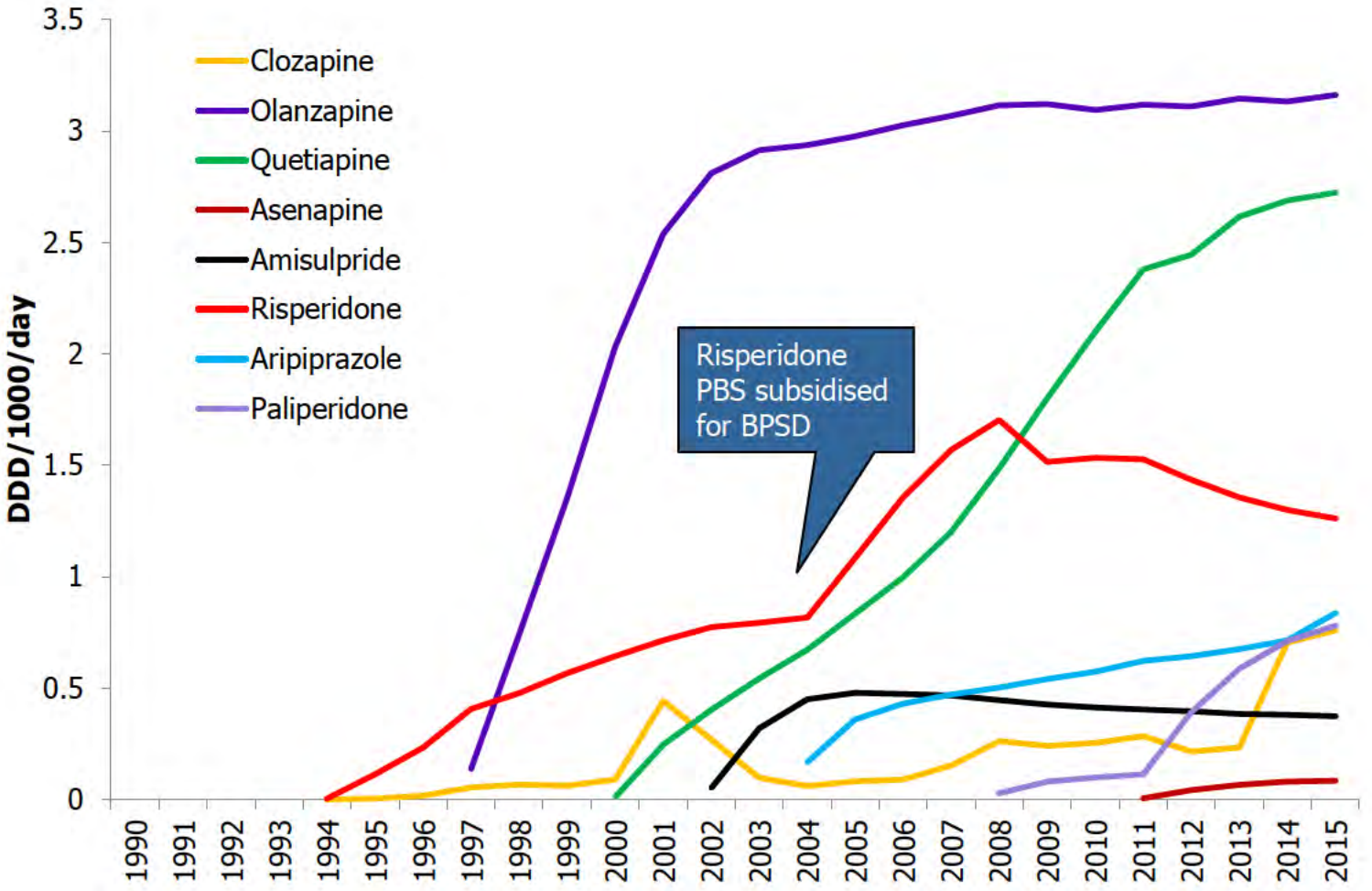
University of South Australia | Sansom Institute

Antipsychotic use: 1990-2015

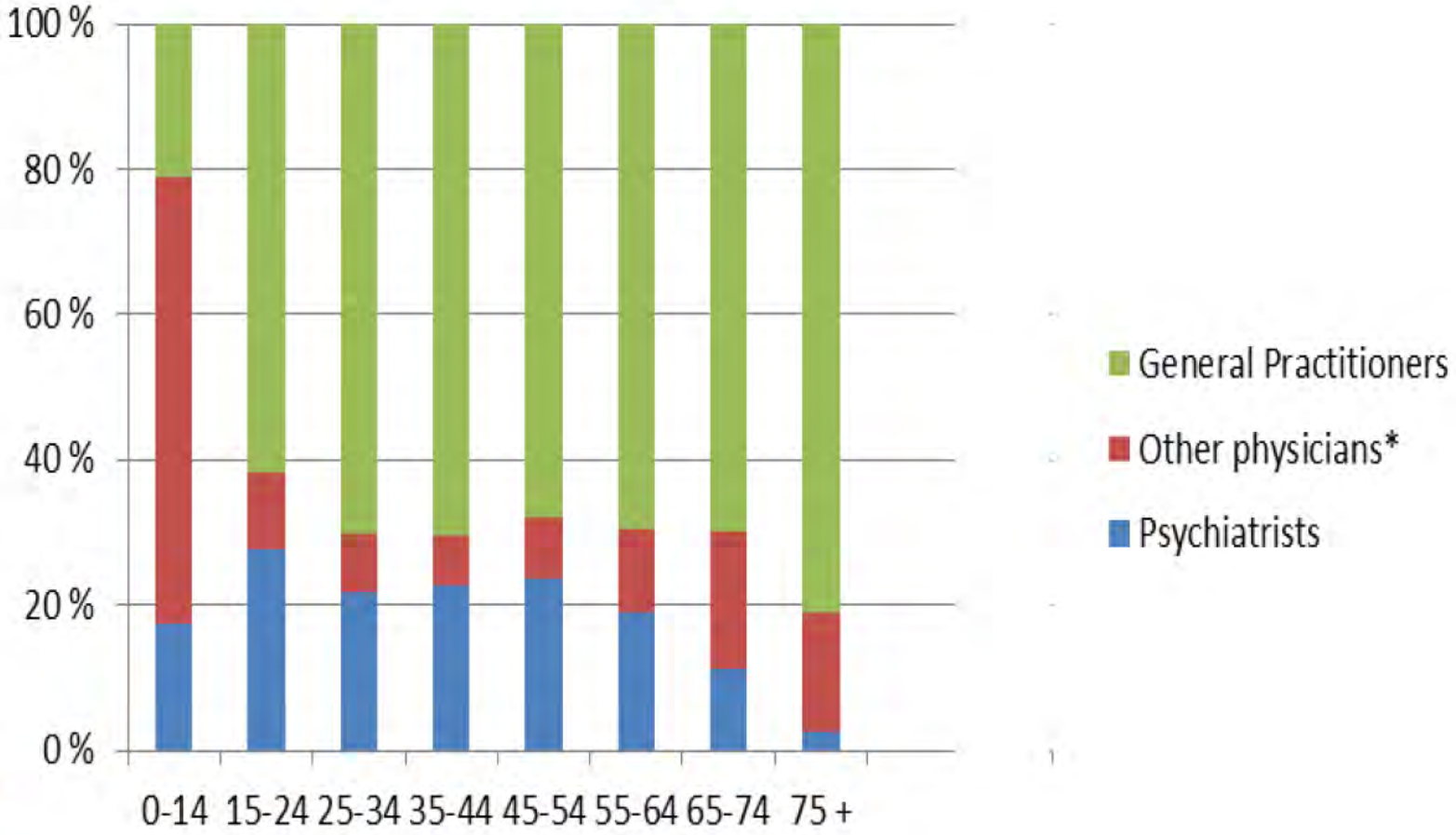


University of South Australia | Sansom Institute

Atypical antipsychotic use: 1990-2015

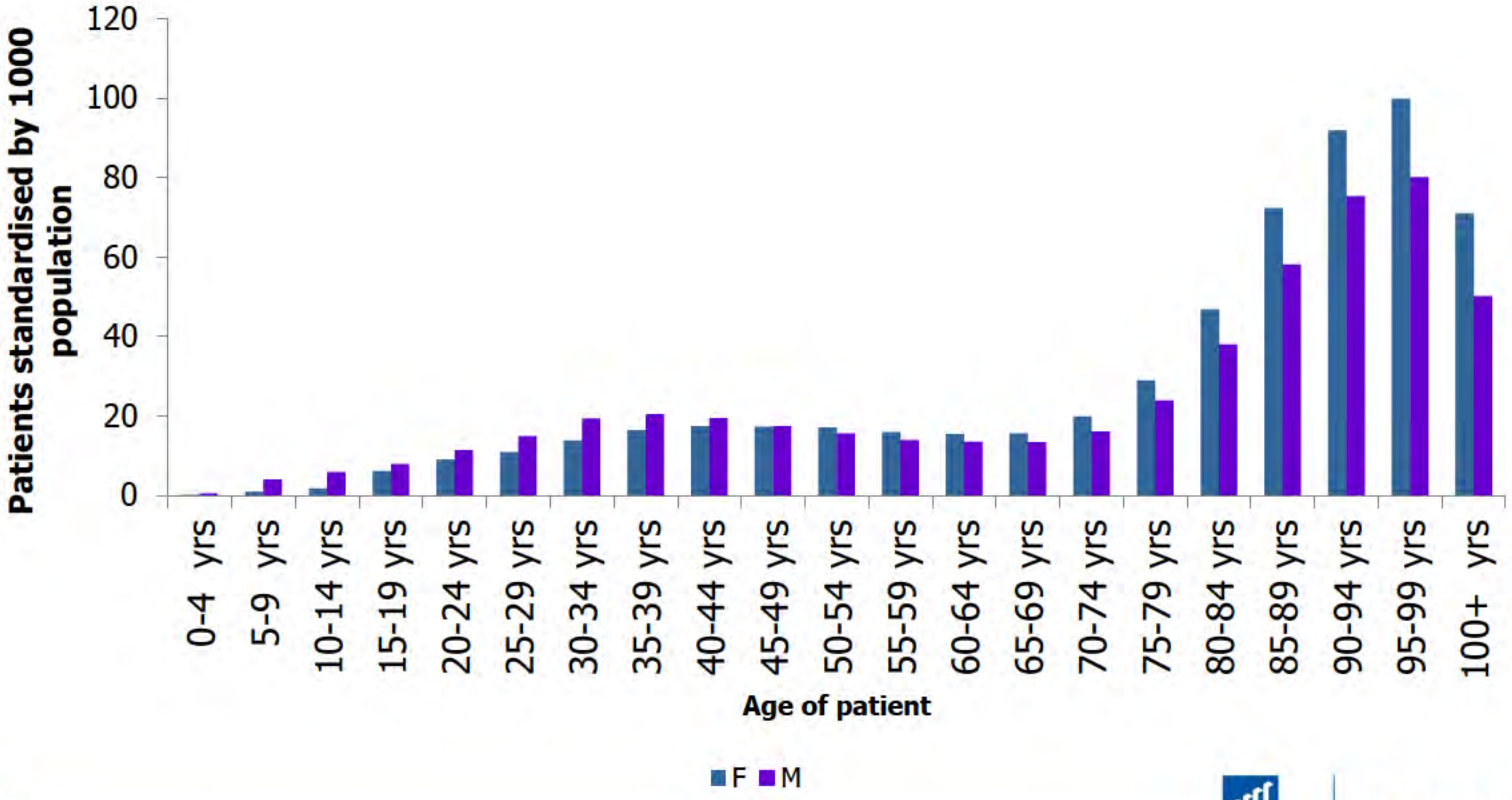


Predominantly GPs who initiate antipsychotics in the elderly



(PBS data, no hospital data)

More elderly women dispensed antipsychotics than elderly men



University of South Australia | Sansom Institute

How common is antipsychotic use in aged-care?

Sample size/Year	Any regular psychotropic	Regular antipsychotics	Regular antidepressants	Regular hypnotics	Regular anxiolytics
2009 (n=2465)	47.5%	28	26%	11%	5%
2003 (n=3093)	47%	24%	21%	11%	4%
1998 (n=1975)	49%	23%	16%	17%	6%
1993 (n=2414)	59%	27%	16%	27%	9%

Adapted from Snowdon, Galanos & Vaswani (2011).[11]

University of South Australia | Sansom Institute

How common is antipsychotic use in aged-care?

Authors/year & place study conducted	N	At least one psychotropic %	Antipsychotics %	Antidepressants %	Benzodiazepines %	Other (anxiolytics, hypnotics, sedatives)
Westbury, et al. (2011-12) National.[1]	9,503	70	27	43	40	
Somers et al. (date unknown) WA.[2]	351		33	48		47
O'Connor, et al (date unknown) Victoria.[3]	166	39	33	36		21
Taxi et al. (2009) National.[4]	1,560	38	38		14	14
Yin Lee et al. (2009) Victoria.[5]	77		13	33		31
Nishtala et al. (2008) NSW.[6]	500		23	33		16
Westbury, et al (2005-07) Tasmania.[7]	2,389	54	21		42	43
s 47F et al(2005) National.[8]	16,126	62	23	35	32	
Hien et al. (1999-2003) NSW.[9]	2,005	55	14	28		
Draper et al. (1996-97) NSW.[10]	647	52	24	20		10

How common is antipsychotic use in persons with dementia?

- Data were obtained from an individual patient unit dose packaging (Webster packs) database covering 40 residential aged care facilities in New South Wales, Australia.
- Residents receiving anti-dementia medicines between July 2008 and June 2013 were included.
- Prevalence of concurrent antipsychotic use was established. Incident antipsychotic use in people with dementia was identified.
- We examined initial antipsychotic dose, maximum titrated doses, type and duration of initial antipsychotic therapy and compared use with Australian guidelines.

- There were 291 people (4.5% of all residents) treated with anti-dementia medicines,
- 44% received concurrent antipsychotic at some time.
- 20% of dementia patients had incident antipsychotic,
  - Of these: 73% initiated risperidone, 12% quetiapine, 9% olanzapine
  - 35% of risperidone initiators had initial doses greater than 0.5 mg/day; 5% exceeded 2.0 mg/day as maximum dose.
- Half who started antipsychotics continued them for over six months. (no gaps even for 1 day)
- PRN antipsychotic use accounted for less than 1% of all antipsychotic use

What are the problems with using antipsychotics in dementia?

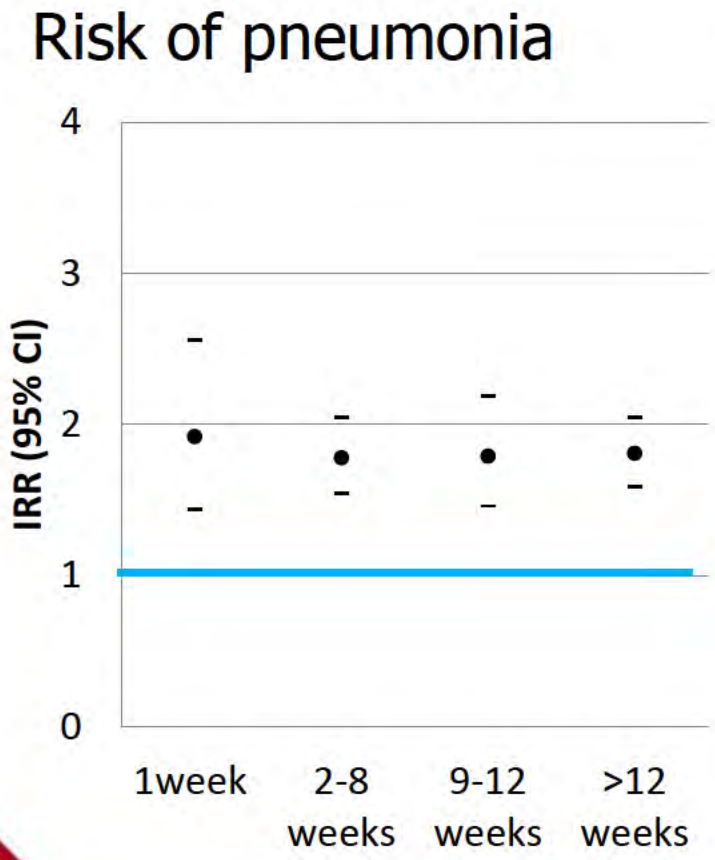
- Many antipsychotics have anticholinergic effects and so decrease the efficacy of the dementia medicine
- Antipsychotics also associated with significant harms

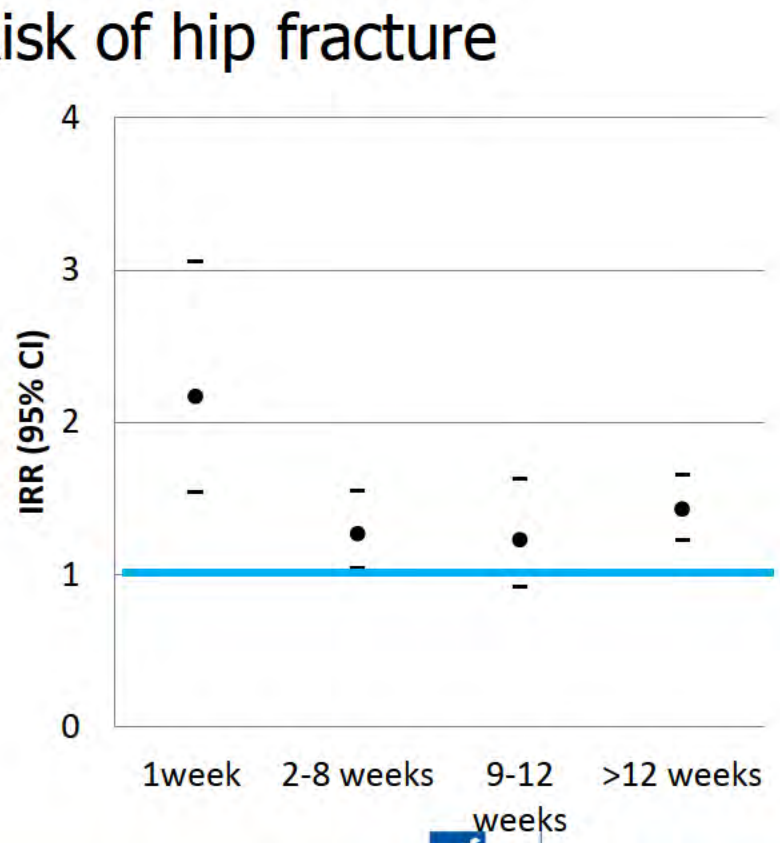
Antipsychotics and harm

- In August 2015, the Therapeutic Goods Administration limited the indication for antipsychotics in dementia
  - Only for Alzheimer's dementia. No longer indicated in other dementia types
  - Maximum of 12 weeks duration
- Risk of cerebrovascular adverse events for patients taking risperidone with vascular or mixed dementia
  - odds ratio 5.3, (1.2-48.1)
- Compared to patients taking risperidone with Alzheimer's
  - odds ratio 2.2, (0.9-6.9)

- Randomised controlled trial data shows that antipsychotics are associated with increased risk of death
- Adverse event reports had also suggested they may cause pneumonia and hip fracture. We use computerised datasets to identify how common these harms are

Antipsychotics also increase risk of pneumonia and hip fracture





University of South Australia | Sansom Institute

Pratt et al., Drug Saf. 2011

The benefit versus the harm

The benefit

- For every 3 to 9 persons treated, one will benefit

The risk-benefit ratio for antipsychotics

- 1 excess death for every 11 to 33 persons helped
- 1 excess cerebrovascular event for every 2 to 5 persons helped
- 1 excess hospitalisation for pneumonia for every 2 to 5 patients helped.
- 1 excess hospitalisation for hip fracture for every 4 to 12 patients helped
- Across all measures, conventional antipsychotics are worse

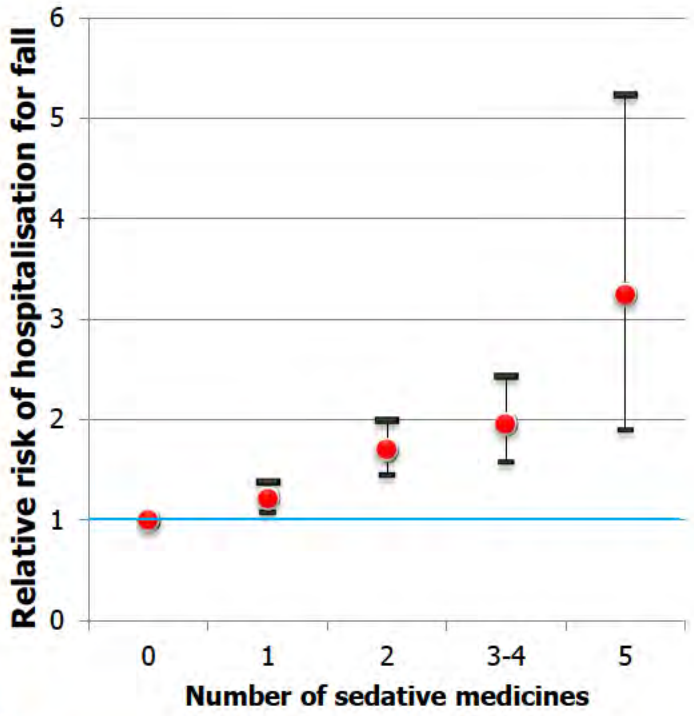
University of South Australia | Sansom Institute

Pratt et al., Drug Saf. 2011

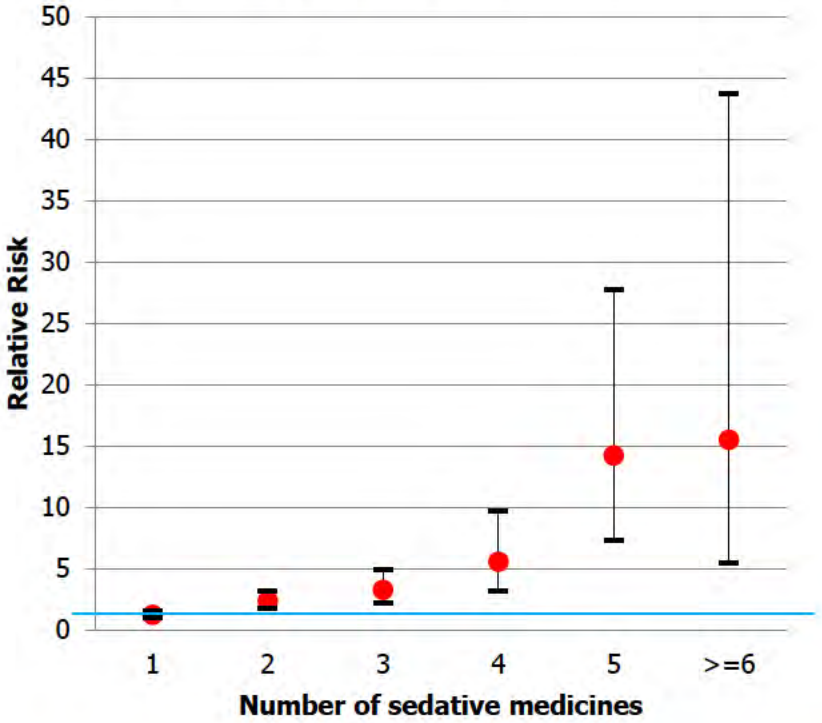
- Antipsychotics also commonly used with other sedative medicines which also increase the risk of harm

Multiple sedative medicine use associated with increased risk of harm

Risk of hospital admission for falls



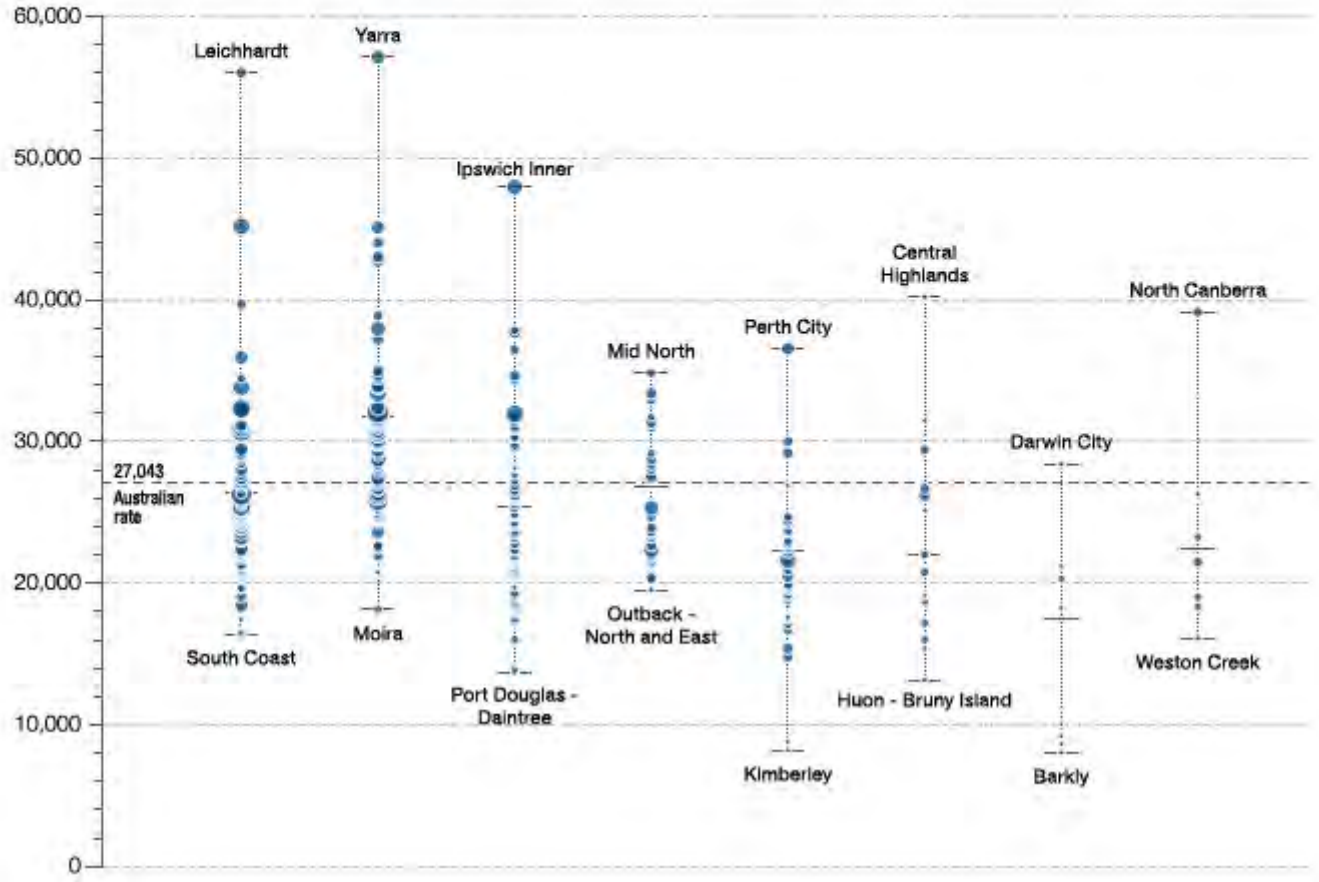
Risk of hospital admission for confusion, delirium



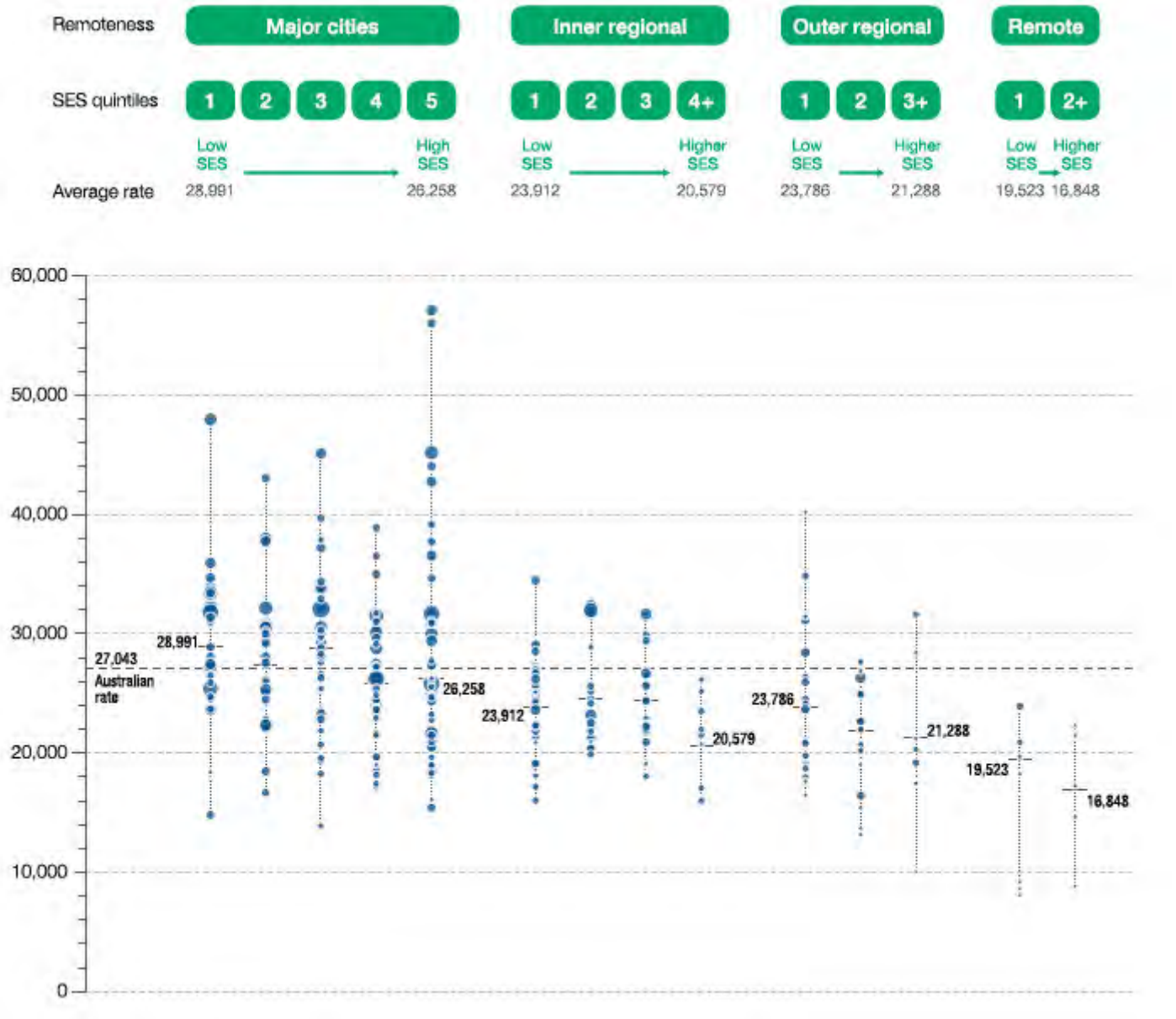
University of South Australia | Sansom Institute

The variation

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
Highest rate	56,034	57,130	47,976	34,831	36,555	40,197	28,426	39,145
State/territory	26,436	31,763	25,467	26,865	22,270	22,009	17,522	22,425
Lowest rate	16,418	18,130	13,682	19,520	8,209	13,165	8,043	16,108
No. prescriptions	305,145	273,268	160,524	78,255	70,092	19,561	2,270	9,684

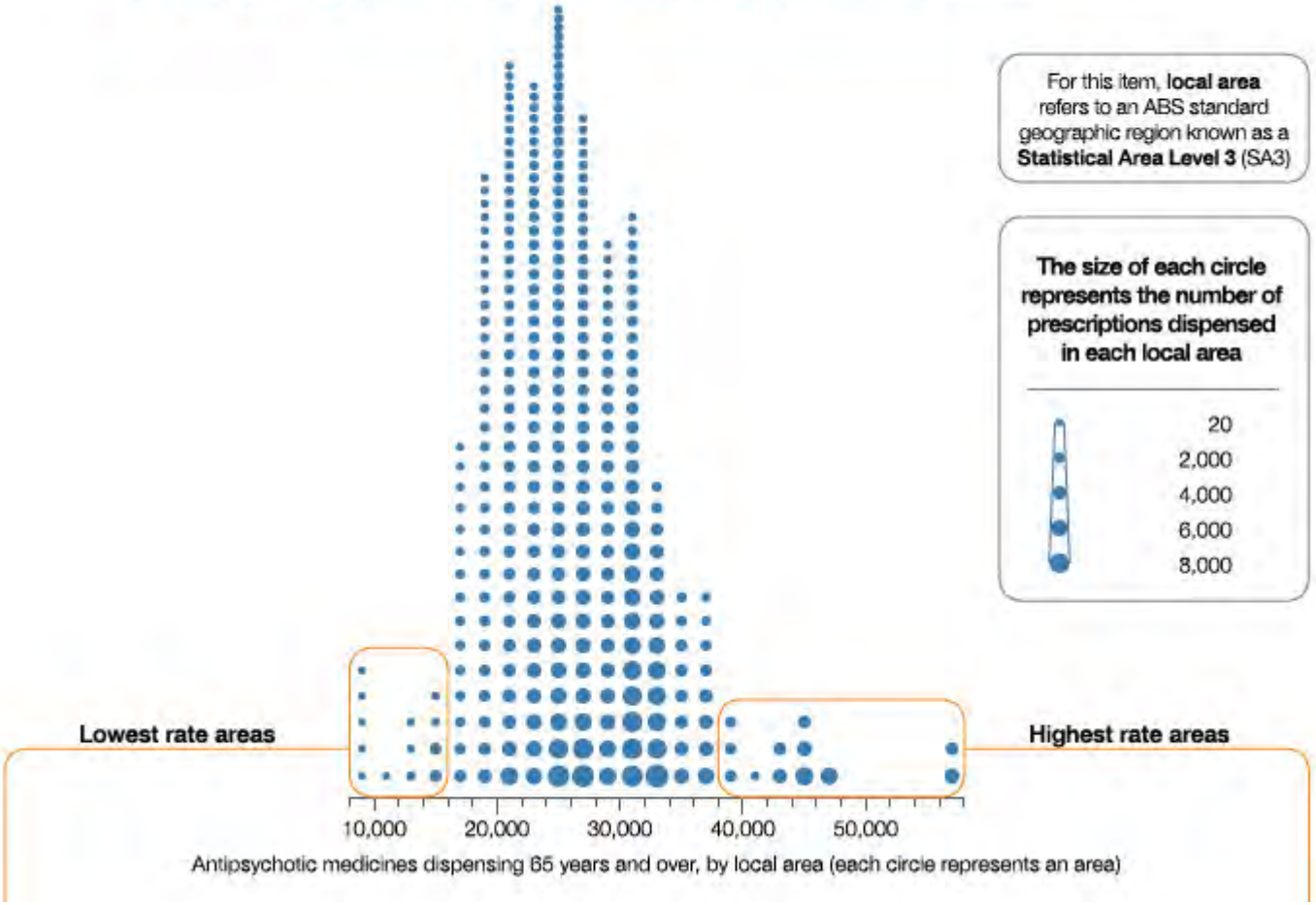


Measure is prescriptions dispensed per 100,000 people aged 65 years and over: 2013-2014



Measure is prescriptions dispensed per 100,000 people aged 65 years and over: 2013-2014

Figure 95: Number of PBS prescriptions dispensed for antipsychotic medicines per 100,000 people aged 65 years and over, age standardised, by local area, 2013–14



Measure is prescriptions dispensed per 100,000 people aged 65 years and over: 2013-2014

Veterans' Medicines Advice and Therapeutic Education Services program

University of South Australia | Sansom Institute for Health Research

Veterans' MATES

Australian Government
Department of Veterans' Affairs

What is Veterans' MATES?

Since 2004 the Australian Government Department of Veterans' Affairs (DVA) has provided Veterans' MATES. Veterans' MATES provides up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team, and helps veterans to develop their health literacy.

Australian Government
Department of Veterans' Affairs

The Veterans' MATES approach

DVA ensures the program has a strong focus on consultation, collaboration and active partnerships:

- **Veteran Reference Group**
- **Practitioner Reference Group**
- **Clinical Reference Group**

Australian Federation of Totally and Permanently Incapacitated Ex-Servicemen and Women

Australian Peacekeepers and Peacemakers Veteran's Association

Australian Veterans and Defence Services Council, NSW

Partners of Veterans Association of Australia

Returned and Services League of Australia

Vietnam Veterans Association of Australia

Vietnam Veterans Federation of Australia

War Widows' Guild of Australia

Legacy

The Veterans' MATES approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material is sent to members of the veteran community for whom the health topic is relevant.

Australian Government
Department of Veterans' Affairs

The Veterans' MATES approach

Our materials include:

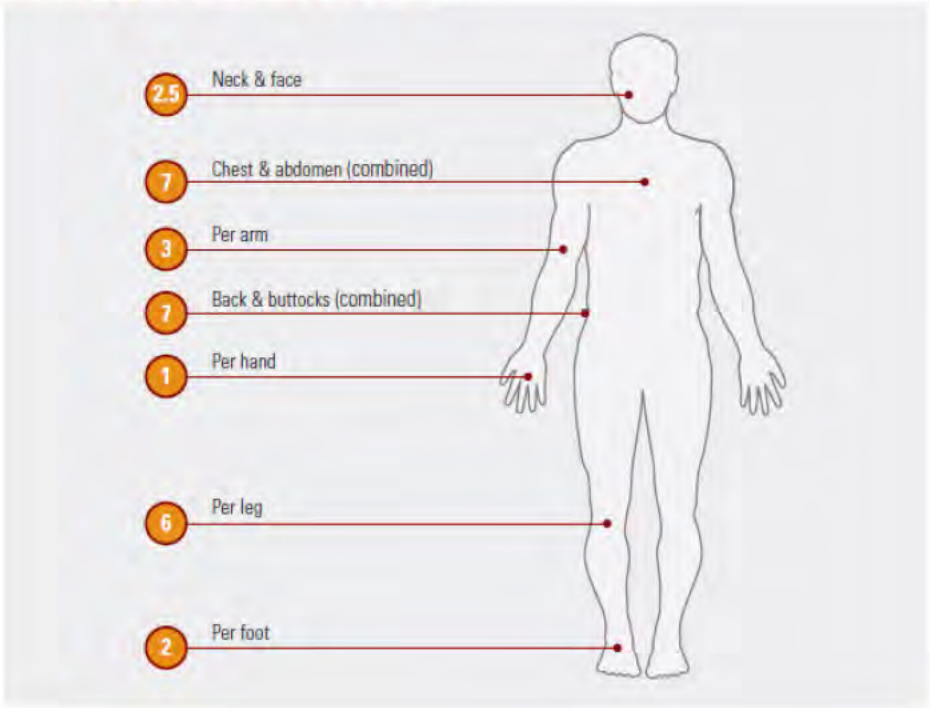
- 4 page 'quick read" up-to-date evidence based information for veterans and health professionals.
- Visual counselling tools and resources to help health professionals to communicate health messages to their patients.
- Suggestions about where to find further information on the topic.

How much topical corticosteroid should I use?

Figure 1: Fingertip unit. Picture supplied by AMH.

Visual tools from Topic 33: Topical Issues - emollients and corticosteroids (Nov 2012)

Figure 2: Number of fingertip units required to completely cover different areas of the body. Reduce as appropriate to cover smaller area of dermatitis.



Australian Government
Department of Veterans' Affairs

Selection of Veterans' MATES topics

- Veterans' MATES looks at:
  - Australia's national health priority areas
  - Australia's quality use of medicines framework
  - Medicine-related issues identified using DVA health claims data.

- Topics covered so far include:
  - Diabetes, Insomnia, Heart Failure, Falls, Gout, Incontinence, Home Medicines Review, Renal Function Monitoring, Dermatitis and Osteoporosis.

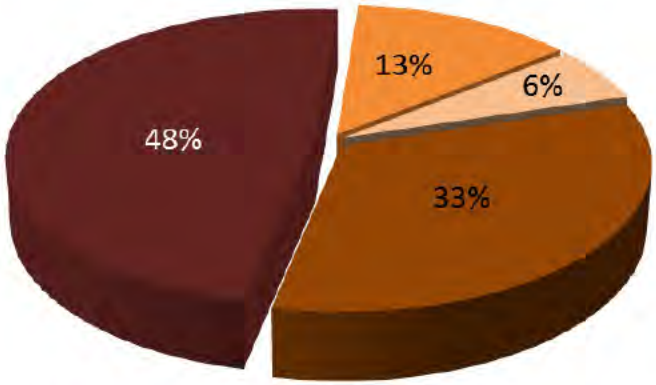
Who receives Veterans' MATES?

- Since 2004 the Veterans' MATES Program materials have been provided to:
  - Over 280,000 members of the veteran community
  - More than 30,000 GPs
  - Approximately 8,500 pharmacists

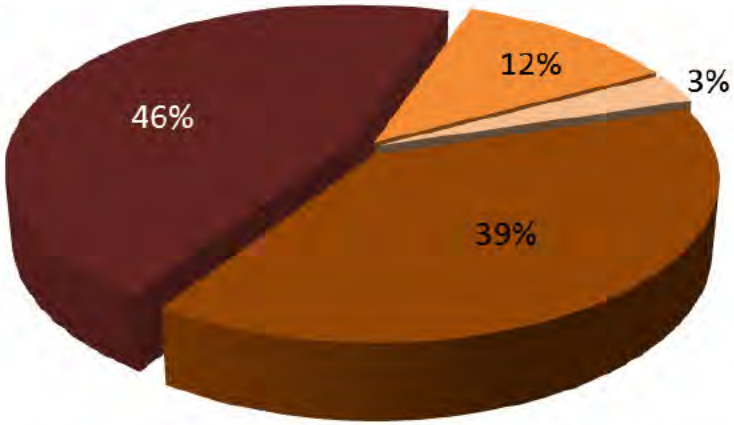
Australian Government
Department of Veterans' Affairs

What they say about Veterans' MATES

On average, 85% of LMOs, 97% of pharmacists and 81% of veterans report the material to be helpful



Veterans' feedback about the educational materials



Doctors' feedback about the educational materials

Veterans' MATES highlights

Improving the monitoring of renal function

- Renal function declines as we get older. Monitoring is important as up to 90% of renal function can be lost before symptoms become evident.
- Many medicines are cleared from the body via the kidneys and require dose adjustment in those with poor renal function.
- Topic distributed in March 2012 aimed to increase the monitoring of renal function.
- Materials sent to over 10,000 GPs, 8,000 pharmacist and 27,000 veterans taking medicines that require renal function monitoring.

Veterans' MATES highlights

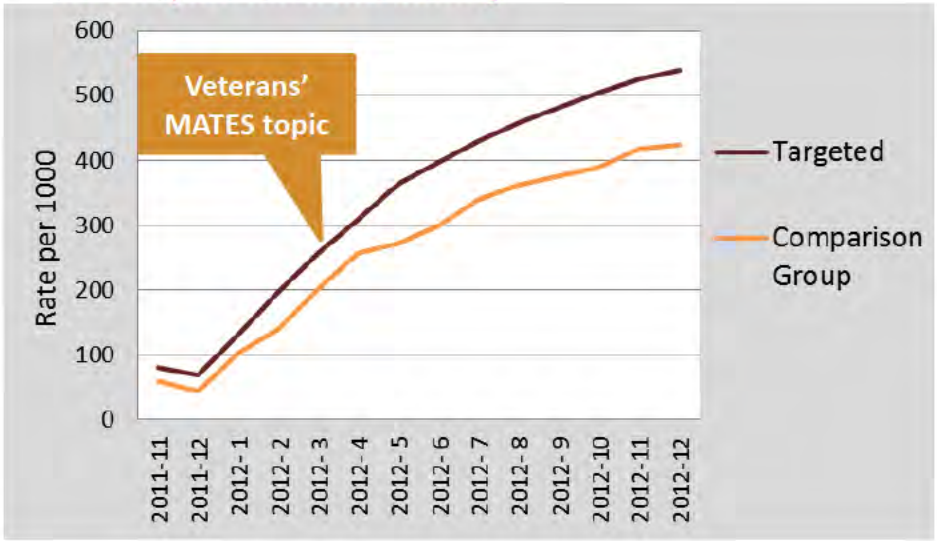
Improving the monitoring of renal function

So what happened?

- Increase in the rate of renal function tests in veterans taking medicines that require renal monitoring

- Veterans who indicated they would talk to their doctor were more likely to receive a renal function test

Increase renal function test in veterans taking medicines that require renal monitoring



Veterans' MATES highlights

Reducing the risk of falls & hip fractures

- Falls can impact lifestyle, confidence and independence and can result in major injuries including hip fractures
- Falls do not need to be a part of getting older
- Our latest falls prevention topic in 2012 aimed to assist appropriate medicine use and reduce risk of falls and fracture

Australian Government
Department of Veterans' Affairs

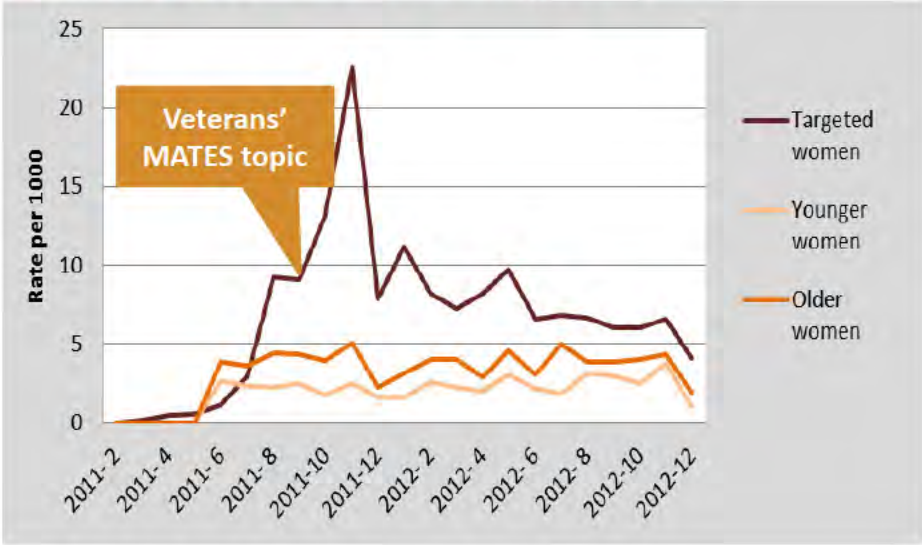
Veterans' MATES highlights

Reducing the risk of falls & hip fractures

So what happened?

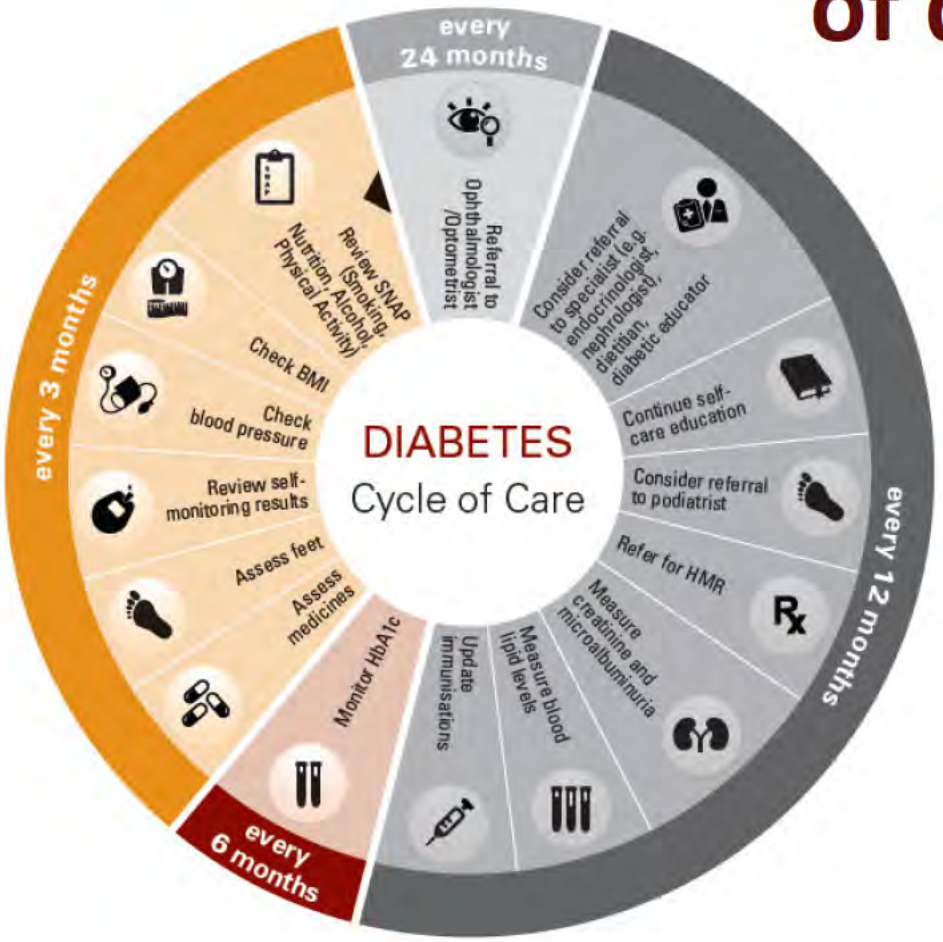
- Reduction in use of medicines that increase the risk of falls and hip fractures
- Increase in bone mineral tests to detect osteoporosis
- Increase in use of medicines to treat osteoporosis

Uptake of Bone Mineral Testing in women



Veterans' MATES highlights

Improving the management of diabetes



- Diabetes is Australia's fastest growing disease
- Diabetes increases the risk of cardiovascular disease including heart attack and stroke
- Our latest diabetes topic distributed in 2013, aimed to improve management in those recently diagnosed with diabetes

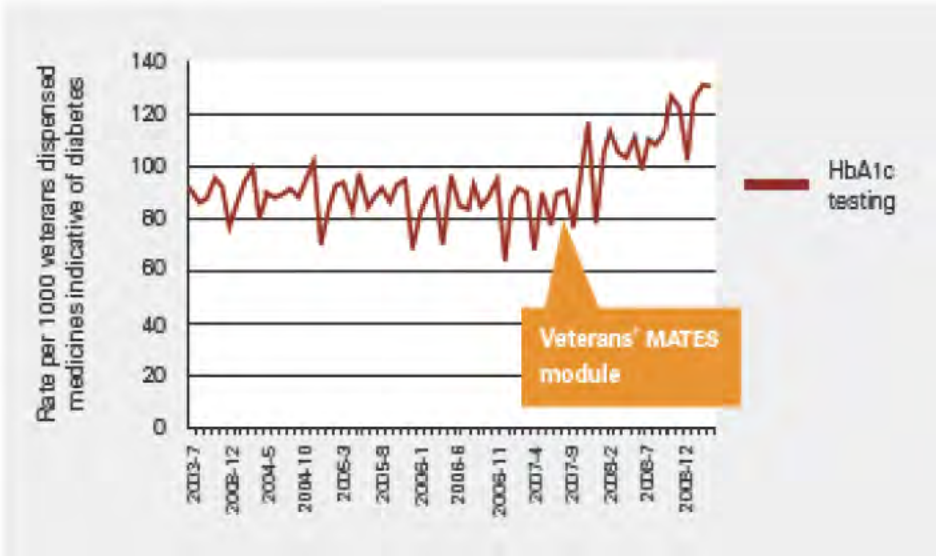
Veterans' MATES highlights

Improving the management of diabetes

So what happened?

Our latest diabetes topic will build on the success of previous topics focused on those with established diabetes which resulted in:

- ✓ Increase in Management plans and diabetes monitoring tests
- ✓ Decrease in use of potentially inappropriate medicines
- ✓ Increase in use of cardiovascular medicines

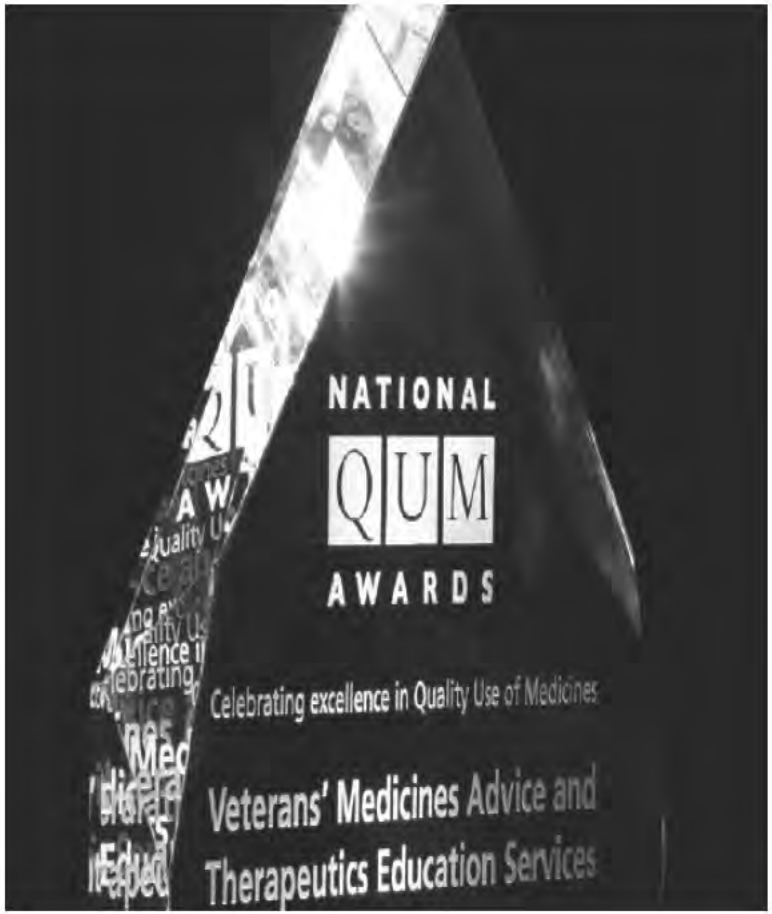


Beyond the veteran community

Veteran's MATES research has underpinned and led to innovative initiatives beyond the Australian veteran community:

- Establishment of the Australian Centre of Research Excellence in Post-marketing surveillance of medicines and medical devices at the University of South Australia
- Australia as an active partner in the Asian Pharmacoepidemiological Network (ASPEN)
- Collaboration with Health Canada
- Collaboration with Korea Institute of Drug Safety and Risk management

Beyond the veteran community



In 2008 Veteran's MATES was awarded the National Quality Use of Medicines Award for demonstrating best practice, leadership and collaboration in the promotion of Quality Use of Medicines in Australia.

University of South Australia | Sansom Institute for Health Research

Australian Government
Department of Veterans' Affairs

www.veteransmates.net.au

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Print A+ A-

Main Menu
- Home
- Topics

Help Pages
- Forgotten Password
- Contact Us

Login for GPs

Username

Password

Login

Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES)

Latest Release: Topic 35, Managing neuropathic pain, is now available on secure web site

The Australian veteran population is on average 83 years of age with 5 or more chronic conditions.

Recognising that this results in veterans having complex medication needs, the Department of Veterans' Affairs has developed the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) to assist in managing medicine use in the veteran community.

Veterans' MATES provides up-to-date health and medicine information for health professionals and veterans. A team of clinical experts contribute to the writing of this information which is specifically tailored for veterans and their health professionals.

Useful Links

- Medicines Advice for Veterans
- Therapeutic Education for doctors and pharmacists
- Information for doctors about continuing education points
- Information for pharmacists about continuing professional development points
- A list of Veterans' MATES publications
- Veterans' MATES Report 2004 - 2010
- Further information on Veterans' MATES
- To download topic 35 pharmacist response form

Australian Government
Department of Veterans' Affairs

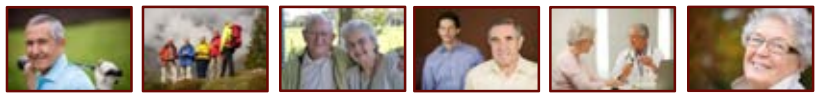
Veterans' MATES

Medicines, delirium and hospitalisation: Can we do better?

Gizat M s 47F Michael C Woodward[2], Lisa M Kalisch Ellett[1], Tuan A Nguyen[1], Elizabeth E Roughead[1]

1. Quality Use of Medicines and Pharmacy Research Centre, University of South Australia, SA

2. Aged Care Services, Austin Health, Heidelberg, Victoria.



Medicines, delirium and hospitalisation: – What do we know?

Delirium and hospitalisation

Delirium occurs in up to 50% of patients admitted to general medical wards

The incidence of delirium reached up to 80% among patients admitted to intensive care units

In a multicentre study, 12% of older patients admitted to ED developed delirium within 24 hours of admission

Praditsuwan R, et al. J Med Assoc Thai. 2012;95:S245-S250.
Emond M et al. BMJ Open. 2018;8:e018190.
Agarwal V et al. J Burn Care and Res 2010;31:706-715.

Medicines

German study found that 19% of delirium admissions were induced by medicines

Finland study showed medicines were a precipitating factor for 35% of delirium cases in nursing homes and geriatric wards

Systematic review found an association between anticholinergic activity of medicines and delirium

Holtta EH et al. Exp Gerontol. 2014;59:42-46.
Hufschmidt A et al. Acta Neurol Scand. 2009;120:436-438
Boustani M et al. Aging Health 2008;4:311–320

And our previous work has shown

Risk of hospitalisation for confusion, dementia or delirium significantly increases with increasing number of anticholinergics

Number of anticholinergics	Adjusted IRR (95% CI)
0	1.0 (1.0 - 1.0)
1	1.2 (1.0 - 1.4)
2	2.6 (1.9 - 3.5)
≥3	3.9 (1.8 - 8.2)

Demographics	Cohort (n=36,015)
Mean age	83 years
% Male	40%
Median no of medicines	23

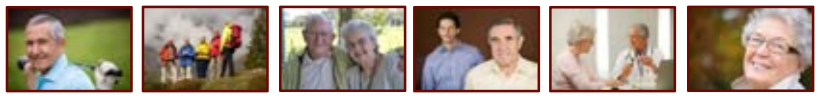
Kalisch Ellett LM et al. J Am Geriatr Soc. 2014;62:1916-1922.

Medicines, delirium and hospitalisation: – What don't we know?

What the prevalence of use of medicines associated with delirium in Australian hospital patients is.

SO.....

We aimed to assess the use of medicines associated with delirium in older hospitalised patients where a delirium diagnosis was recorded.



We used the Australian Government Department of Veterans' Affairs routinely collected health claims data

1/2 BILLION

Contains over half a billion health claims records

10 YEARS

More than ten years of historical health data

Client data are updated weekly, health claims data are updated monthly

Contains hospital records including diagnosis and procedures

Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Independently audited to ensure high data and security standards

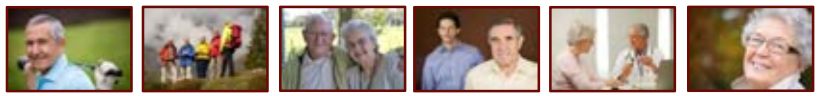
Method

Retrospective observational study of people aged 65 years or older with a hospital diagnosis of delirium between January 2010 and 31 December 2015.

Medicines associated with delirium were identified from two systematic reviews and categorised as medicines with a known risk of delirium and medicines suspected to be associated with delirium.

Exposure to medicine at the time of hospital admission was determined by prescription dispensing dates. Method to determine exposure has been used previously in pharmacoepidemiology research.*

Medicines associated with delirium at the time of hospital admission were assessed.



*Pottegård A, Hallas J. Pharmacoepidemiol Drug Saf. 2013;22:803-809.

Patient characteristics

23,900+

22,932 patients hospitalised with a diagnosis of delirium between 2010 and 2015

75% medical
18% surgical

89 YEARS

Median age at admission was 89 years
50% women

18% living in residential aged care

The findings

40%

40%(n=6812) of medical patients were taking one or more medicines with a known risk of delirium

37%

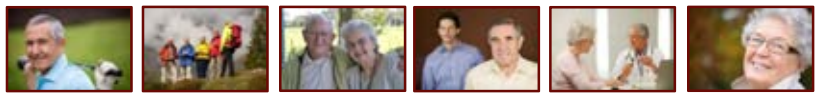
37% (n=6812) of surgical patients were taking one or more medicines with a known risk of delirium

Most frequently used medicines were psycholeptics, opioids and tricyclic antidepressants

62% using at least one anticholinergic medicine and 27% using two or more

Kassie GM et al. Australas J Ageing. 2019;00:1–8. https://doi.org/10.1111/ajag .12608

Number of medicines	Patients who used medicines with known risk, n (%)		Patients who used medicines with suspected risk, n (%)	
	Medical (n = 17 090)	Surgical (n = 4132)	Medical (n = 17 090)	Surgical (n = 4132)
None	10 278 (60)	2607 (63)	4646 (27)	1245 (30)
One	4538 (27)	1014 (25)	5201 (30)	1339 (32)
Two	1678 (10)	333 (8)	3908 (23)	896 (22)
Three	479 (3)	83 (2)	2153 (13)	433 (11)
Four	93 (1)	93 (2)	839 (5)	156 (4)
Five or more	24 (0)	2 (0)	343 (2)	63 (2)



Medications known to be associated with delirium (ATC codes)	Medical (n = 17 090)		Surgical (n = 4132), (%)
	Primary delirium diagnosis (n = 2883), (%)	Secondary delirium diagnosis (n = 14 207), (%)	
Antipsychotics (N05A excluding prochlorperazine [N05AB04] and lithium [N05AN01])	364 (13)	954 (7)	195 (7)
Anxiolytics, hypnotics and sedatives (N05B, N05C)	534 (19)	2422 (17)	682 (17)
Opioid analgesics (N02A, R05DA)	484 (17)	2435 (17)	591 (14)
Tricyclic antidepressants (N06AA)	203 (7)	857 (6)	257 (6)
Barbiturates and derivatives and clonazepam (N03AA and N03AE01)	12 (0)	55 (0)	9 (0)
Anticholinergic antiparkinsonian agents (N04A)	9 (0)	46 (0)	17 (0)
Anticholinergic first-generation antihistamines (R06AA02, R06AA09, R06AB02, R06AB05, R06AB51, R06AB54, R06AD02, R06AX02)	10 (0)	67 (1)	9 (0)
Anticholinergic medications for urinary frequency and incontinence (G04BD04, G04BD07, G04BD10)	165 (6)	291 (2)	86 (2)
Anticholinergic medications for functional gastrointestinal disorders (A03BA01, A03BA03, A03AB05, A03BB01, A04AD01)	3 (0)	17 (0)	6 (0)

Medicines, delirium and hospitalisation: – We can do better

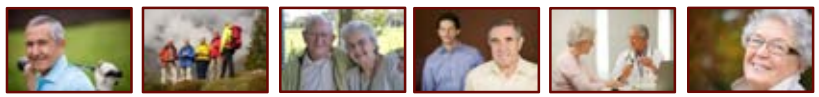
The take homes

1/3 of older hospitalised patients with a delirium diagnosis are taking medicines associated with delirium prior to admission

Minimising the use of medicines that precipitate delirium needs to be part of any strategy to prevent and manage delirium

Initiate medication reviews prior to hospitalisation or at the time of admission targeting high-risk medications suitable for ceasing or tapering to reduce delirium risk

Need to plan systematic interventions targeting patients' medication use, as medications are known precipitants of delirium



Veterans' MATES
is funded by the
Australian Government
Department of Veterans' Affairs
and provided by
The University of South Australia

www.veteransmates.net.au

How well do we monitor renal function in the elderly when prescribing?

MC Woodward[a] LM Kalisch Ellett[b] VT Le Blanc[b] EE Roughead[b]

[a] *Aged Care & Residential Services, Austin Health, Heidelberg, Victoria.*

[b] *Quality Use of Medicines Pharmacy Research Centre, University of South Australia, SA.*

Veterans' MATES

University of South Australia | Sansom Institute for Health Research

Veterans' MATES

Since 2004 Veterans' MATES has aimed to improve the health of the Australian veteran community.

Veterans' MATES provides:

- Patient specific feedback and educational material to general practitioners
- Educational brochures to veterans encouraging them to talk to their doctor and pharmacist
- Educational materials to pharmacists and other health professionals on the topic

Materials are sent every three months to approximately

- 10,000 general practitioners
- 8,500 pharmacies and accredited pharmacists
- 35,000 veterans

Topic area selection: Renal Function monitoring

- Medication-related problem analysis
- Module topic selected
- Patient specific feedback developed
- Module implementation
- Evaluation

Renal function in the elderly: what we know

- Over half of Australians older than 65 years have an estimated glomerular filtration rate (GFR) of less than 60mL/min
- On average, GFR declines by about 10mL/min every 10 years after 40 years of age
- Monitoring is important as up to 90% of renal function can be lost before symptoms become evident
- For many medicines a decline in renal function can profoundly impact upon the safety and efficacy of treatment
- Renal Impairment is often implicated in medicine-related hospitalisations

The question

- How well is renal function monitored amongst veterans dispensed medicines which require renal function monitoring?

Data Source: Australian Government Department of Veterans' Affairs health claims data

- Treatment population of approximately 233,800 veterans; mean age is 77 years, with 5 co-morbidities
- Data over ten years – pharmacy, medical and allied health records (no diagnosis, includes GP visits, radiology, pathology etc)
- Hospital records (diagnosis and procedures)

Method

- Retrospective analysis of the Australian Government Department of Veterans' Affairs database.
- Medicines requiring renal function monitoring were identified from the Australian Medicines Handbook.
- Veterans aged 65 years or older dispensed medicines which require renal function monitoring during 1 June 2009 – 30 September 2009 were included in the study.
- Identified claims for blood tests which include renal function tests in the 3, 6 and 12 months prior to dispensing of a medicine requiring renal function monitoring.

Findings

- 173,702 veterans aged 65 years or over dispensed one or more medicine requiring renal function monitoring
- 50% aged 85 years or older
- 12% had diabetes
- 2% had been hospitalised for renal failure in the past

Findings

Study population (Veterans aged 65 years and over dispensed a medicine requiring renal function monitoring between 1 June 2009 and 30 Sept 2009)

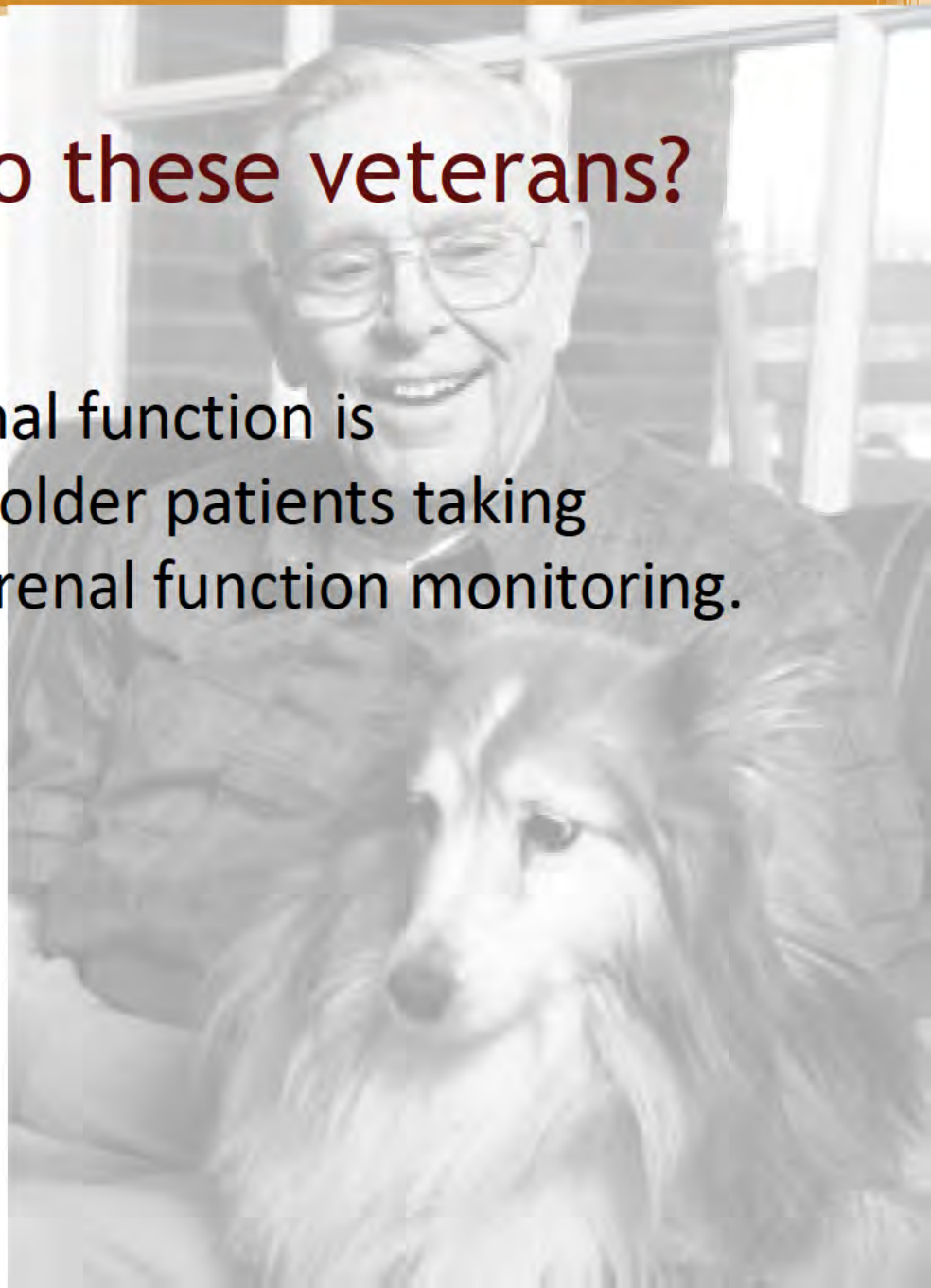
	n 173,702
Gender:	
Male	82,146 (47%)
Female	91,556 (53%)
Age group:	
65-74 years	16,777 (10%)
75-84 years	69,617 (40%)
≥85 years	87,308 (50%)
Residence:	
Community	150,366 (87%)
Aged care	23,336 (13%)
Co-existing diabetes*	20,435 (12%)
Co-existing renal disease**	2,934 (%)

*Measured by supply of medicines for diabetes in the 6mths prior to 1 June 2009

**Measured by prior hospitalisation for renal failure

So what happened to these veterans?

Analysis suggests that renal function is under-monitored among older patients taking medicines which require renal function monitoring.



Of the 173,702 veterans dispensed a medicine requiring renal function monitoring:

- 62% (n=107,284) had no claim for renal testing in the prior 3 months
- 74,935(43%) had no claim in the prior 6 months
- 26%(n=45,615) had no claim in the prior 12 months

Renal function testing amongst veterans dispensed medicines requiring renal function monitoring

		Renal function test in the time period:		
		3 months prior to first dispensing	6 months prior to first dispensing	12 months prior to first dispensing
Age group				
≥85 years (n = 87,308)	**Claim**	33,182 (38%)	49,134 (56%)	63,866 (73%)
	No claim	54,126 (62%)	38,174 (44%)	23,442 (27%)
Co-existing diabetes				
Veterans with diabetes (n = 20,435)	**Claim**	10,370 (51%)	14,664 (72%)	17,237 (84%)
	No claim	10,065 (49%)	5,771 (28%)	3,198 (16%)
Renal impairment hospitalisation				
Hospitalisation for renal impairment in year prior (n = 900)	**Claim**	724 (80%)	847 (94%)	893 (99%)
	No claim	176 (20%)	53 (6%)	7 (1%)

Renal function testing at medicine initiation

Of the 5,234 veterans initiated a new medicine that requires monitoring:

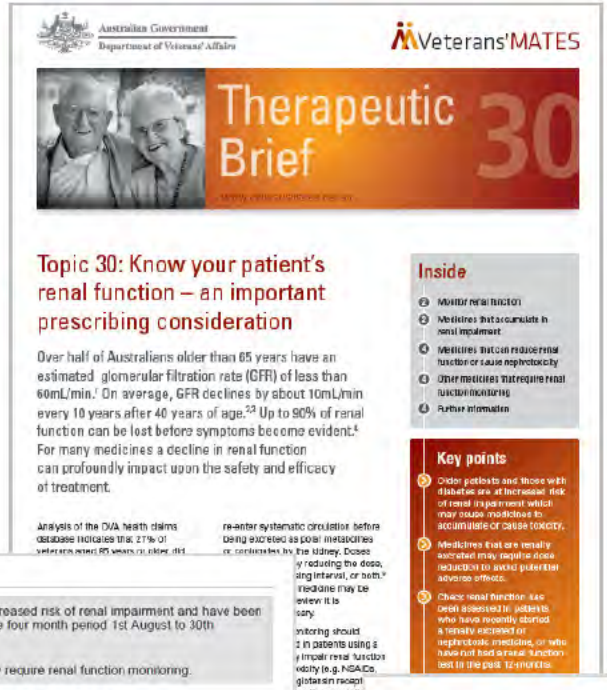
- 64% (n=3,327) had no claim in the 6 months prior to initiation.
- 59% had a no claim for a renal function test in the 6 months post initiation.

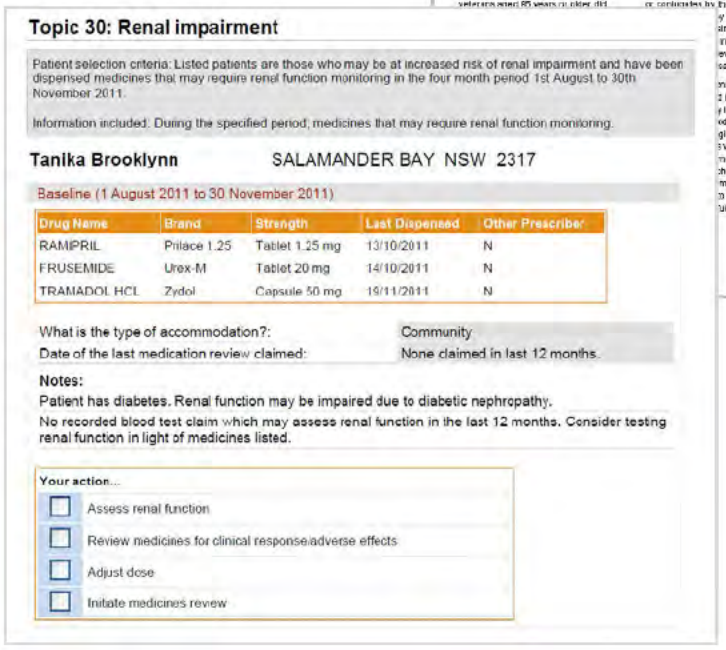
Renal function testing amongst veterans dispensed medicines requiring renal function monitoring

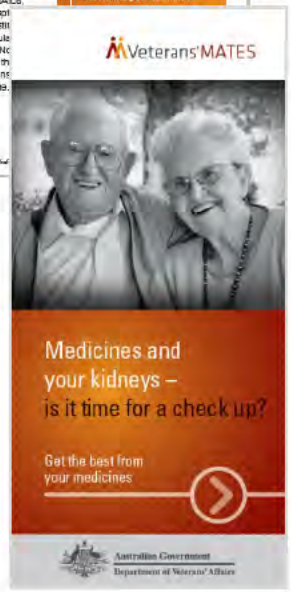
		Renal function test in the time period:	
		6 months prior to initiation	6 months post initiation
Age group			
≥85 years (n = 2,259)	**Claim**	909 (40%)	946 (42%)
	No claim	1,350 (60%)	1,313 (58%)
Co-existing diabetes			
Veterans with diabetes (n = 58)	**Claim**	44 (76%)	34 (59%)
	No claim	14 (24%)	24 (41%)

Veterans' MATES: helping to address the problem

- Rolled-out intervention in March 2012
- Aim: To raise awareness of medicines that require monitoring in veterans with poor renal function





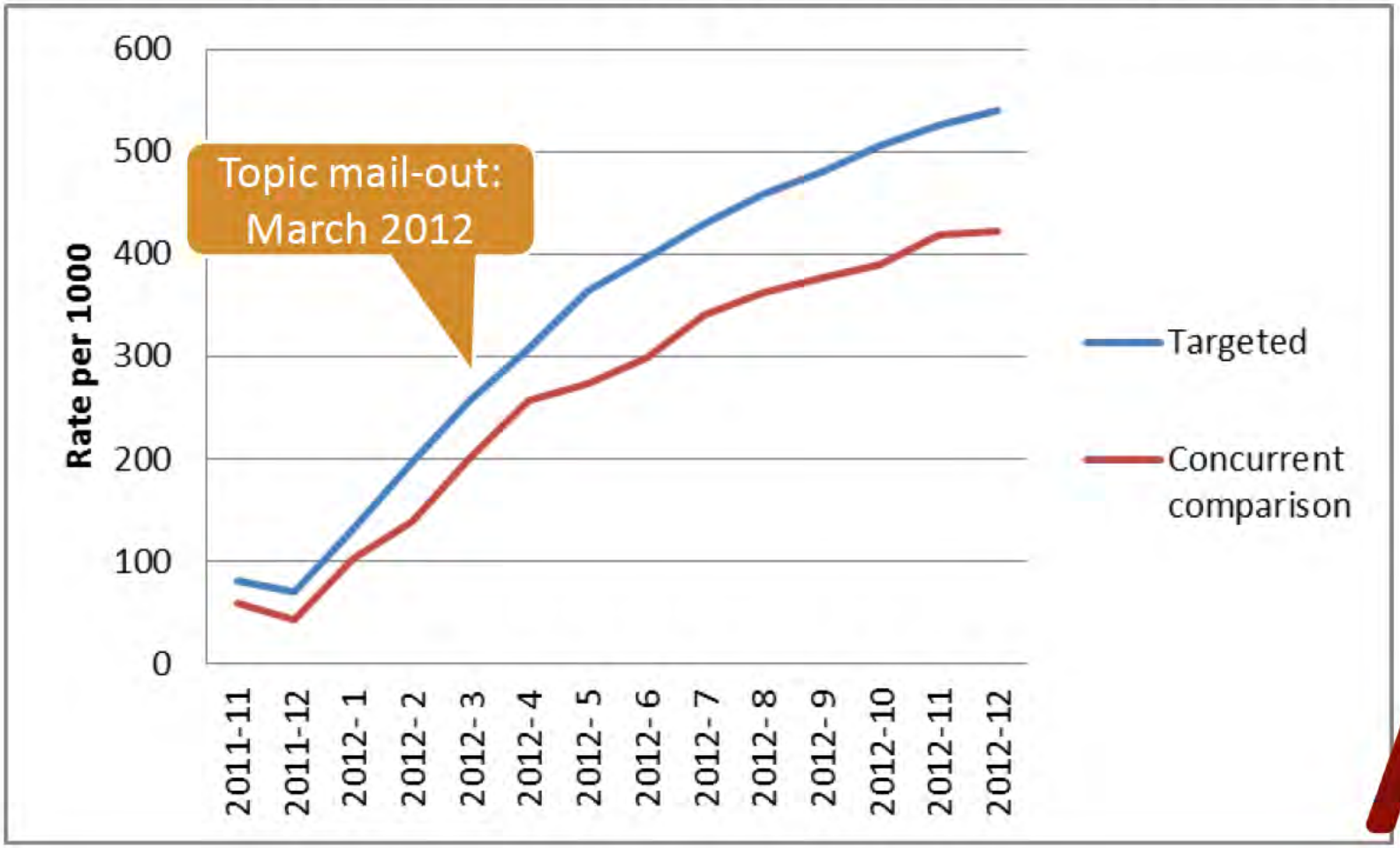


Veterans' MATES

- 10,300 GPs received (March 2012)
  - Direct patient-based feedback
  - Supporting up-to-date clinical information
- 8,300 pharmacists (March 2012)
  - Supporting up-to-date clinical information
- 27,400 veterans received (April 2012)
  - Supporting consumer information

Outcome: Increased rates of renal function testing

Rate of renal function tests amongst targeted veterans and comparison groups



This work was funded by the Australian Government Department of Veterans' Affairs as part of the Veterans' MATES program

Veterans' MATES

www.veteransmates.net.au

University of South Australia | Sansom Institute for Health Research

Calculating Cumulative Medicine Toxicity in General Practice

Russell s 47F Andre Andrade[2], and Gerard s 47F

1) GP and Medical Writer, Veterans' Medicines Advice and Therapeutics Education Service, University of South Australia
2) Associate Professor and Deputy Director, Veterans' Medicines Advice and Therapeutics Education Service, University of South Australia
3) Clinical Professor, Deakin University.

Introduction

- Medicines can provide many benefits to treat and prevent health problems but they come with risks. Medicines that were once helpful when first prescribed, may no longer be helpful or may become unsafe.
- GPs are faced with an ageing population, increasing comorbidities and treatment options. As specialised coordinators of patient care they have a unique and important (but admittedly challenging) role in an increasingly complex health system.
- Older adults are often more sensitive to medicines and disproportionately experience medicine-related harms. Their altered physiology (relative to younger adults) changes the way medicines are metabolised and excreted, most importantly via reduced renal and hepatic function, which increases the risk of adverse effects.
- 25% of older patients who are on multiple medicines have Adverse Effects (AEs) directly attributable to one or more medicines. Certain medicines are considered higher risk e.g. anticholinergics, antipsychotics, diuretics, antidepressants, opioids and Non-Steroidal Anti-Inflammatory Drugs (NSAIDS). The risk increases if any of the high risk medicines are taken together.
- **The greatest predictor of medicine adverse effects occurring is the number of medicines taken.**

A recent review suggests that 250,000 hospital admissions each year in Australia are related to medicine adverse effects and that two-thirds of these are potentially preventable.[5]

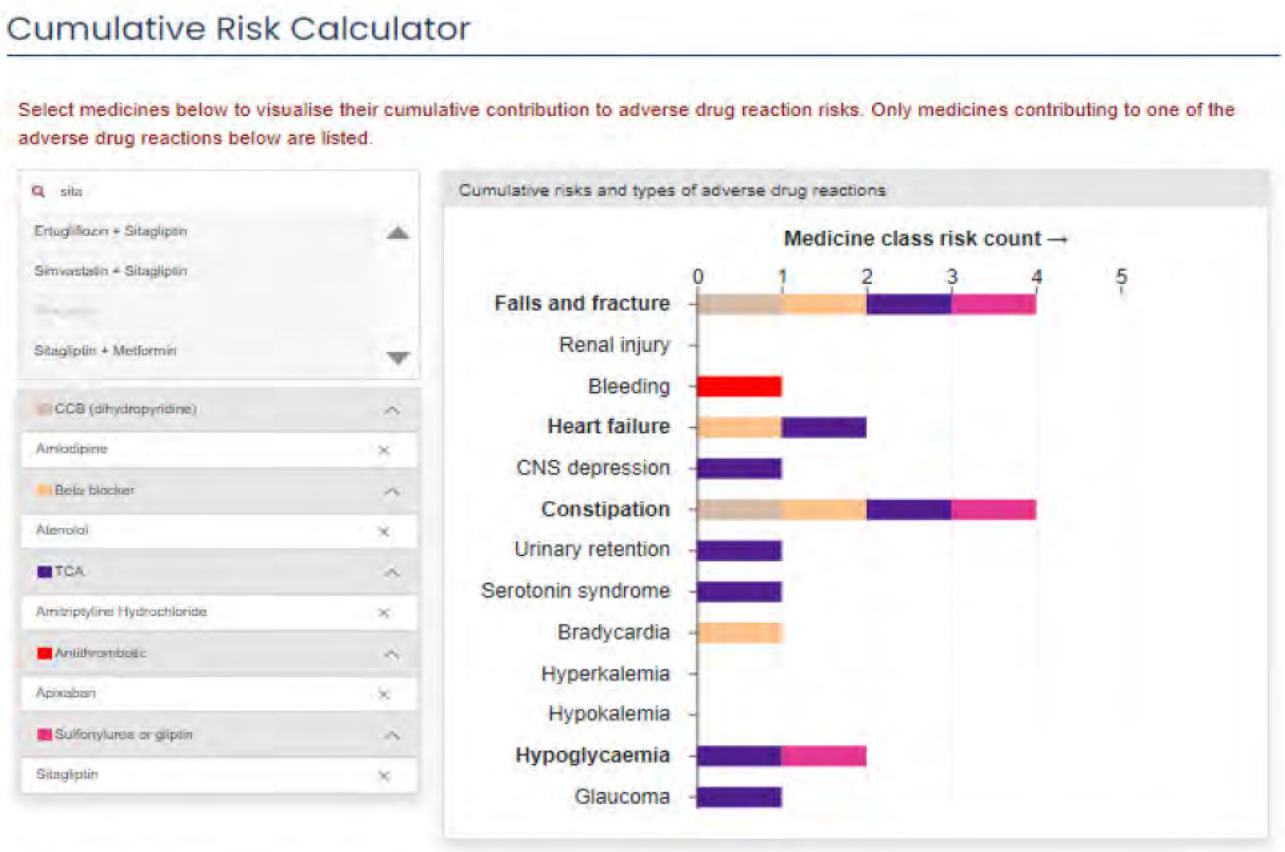
250,000
hospital admissions

2/3
potentially preventable

- Assessing cumulative medicine risk and deprescribing, if appropriate, is an important GP role that can improve health outcomes for their patients.

Intervention

- The Veterans' MATES (Medicines Advice and Therapeutics Education Services) program is funded by the Australian Government Department of Veterans' Affairs. It aims to improve the use of medicines and related health services in the veteran community.
- It provides targeted patient-specific prescriber feedback, education and advice to GPs and education to their veteran patients.
- As part of a module on cumulative medicines risk and deprescribing an interactive cumulative medicines tool was developed by the Veterans' MATES team. This was based on the Scottish polypharmacy guidelines and adapted for the Australian environment.
- www.veteransmates.net.au/cumulative-risk-calculator/
- The calculator allows entry of the patient's medicines and provides a graphic representation of the potential of common risks due to cumulative medicines use.



Practice Impact

GPs are encouraged to use the calculator and results to talk to their patient (and carer) about potential risks of their medicines and whether there may be an opportunity to deprescribe depending on continued clinical utility and patient preference.

Veterans' MATES

Australian Government
Department of Veterans' Affairs

University of South Australia

Veterans' Medicines Advice and Therapeutics Education Services: Health program planning in action

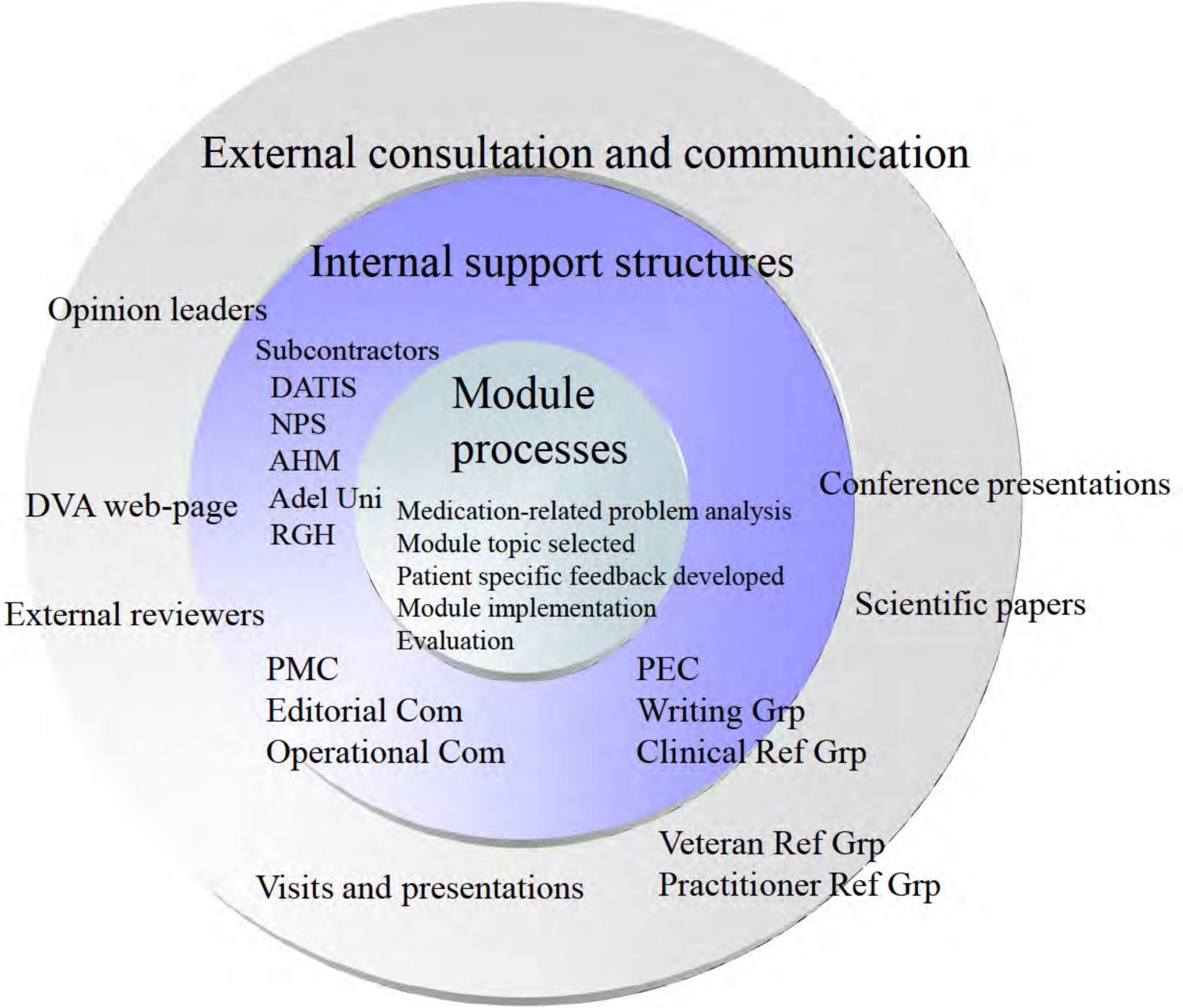
Andrew s 47F & Libby s 47F
Quality Use of Medicines & Pharmacy Research Centre
Sansom Institute, University of South Australia,
on behalf of the Veterans' MATES project team

Veterans' MATES aim:

- to improve medication use for veterans by delivering ten educational modules over the three years, June 2004 to May 2007

Method

- Providing patient specific feedback and educational material to Local Medical Officers (LMOs)
- Supported by educational brochures to veterans encouraging them to talk to their doctor and pharmacist
- Educational brochures to pharmacists on the topic
- Academic detailing and opinion leader education to selected groups


External consultation and communication
Internal support structures
Opinion leaders
Subcontractors
DATIS
NPS
AHM
Adel Uni
RGH
Module processes
Medication-related problem analysis
Module topic selected
Patient specific feedback developed
Module implementation
Evaluation
DVA web-page
Conference presentations
External reviewers
Scientific papers
PMC
Editorial Com
Operational Com
PEC
Writing Grp
Clinical Ref Grp
Veteran Ref Grp
Practitioner Ref Grp
Visits and presentations

Module Development Processes

Therapeutic area selected

→ Medication-related problem analysis

→ Module topic selected

→ Module materials, including patient specific feedback, developed

→ Module implementation

→ Evaluation

The data set: Pharmacy datamart

- All pharmacy claims over the last 5 years
  - Medicine dispensed, quantity, strength, doctor, pharmacy, patient, date of prescription, date of supply
- Client file
  - date of birth, date of death, location, card type,
- Provider file
  - Speciality codes, practice location

Enables

- Tracking patients, doctors or pharmacies
- Client and provider files enable identification of denominator population

Modules implemented to date

- Home medicines review services
- Beta-blocker use in patients taking medicines indicative of heart failure
- Cardiovascular medicine use in patients with diabetes
- Non-steroidal anti-inflammatory drug use in patients with heart failure or diabetes

Module 1: Flag veterans for medication review

Rationale:

- Polypharmacy is common
  - on average, male veterans over 70 years have 45 prescriptions dispensed per year
- Utilisation of home medicines review services in the Australian community is low
  - 5,161 medicines review services in 2002
  - 4,975 in 2003.

Module 1 aim: to increase home medicines reviews for those who take multiple medicines

- Patients aged over 65 years who were dispensed at least five unique medicines every month for four months

The intervention: prescriber feedback

The patients listed below were identified from an analysis of the pharmacy claims data for the Repatriation Pharmaceutical Benefits Scheme (RPBS) [1]. These patients received at least five different medicines every month between May and August 2004. Some of these prescriptions may have been written by other doctors. As the prescriber who has written the majority of prescriptions for these patients over this period, you have been identified as the doctor most likely to be responsible for their care. We ask you to consider, in consultation with the patient, whether they would benefit from a home medicines review [2].

DR F FLINTSTONE — Reporting period: May 2004 to Aug 2004

Veterans Name	Town/Suburb	Date of last medication review [3]	Average number of different medicines dispensed per month over last four months [4]
WILMA FLINTSTONE	MARGATE		6
BARNEY RUBBLE	CLONTARF		6

Number of veteran patients for whom information is reported	2
Total number of your veteran patients who met the criteria	2

Every effort has been made to identify patients most likely to benefit from a home medicines review. For this reason, all dispensings of shampoos, conditioners, skin emollients, sunscreens and wound dressings were excluded from the analysis.

If you are unfamiliar with one of the patients listed above, consider the following:

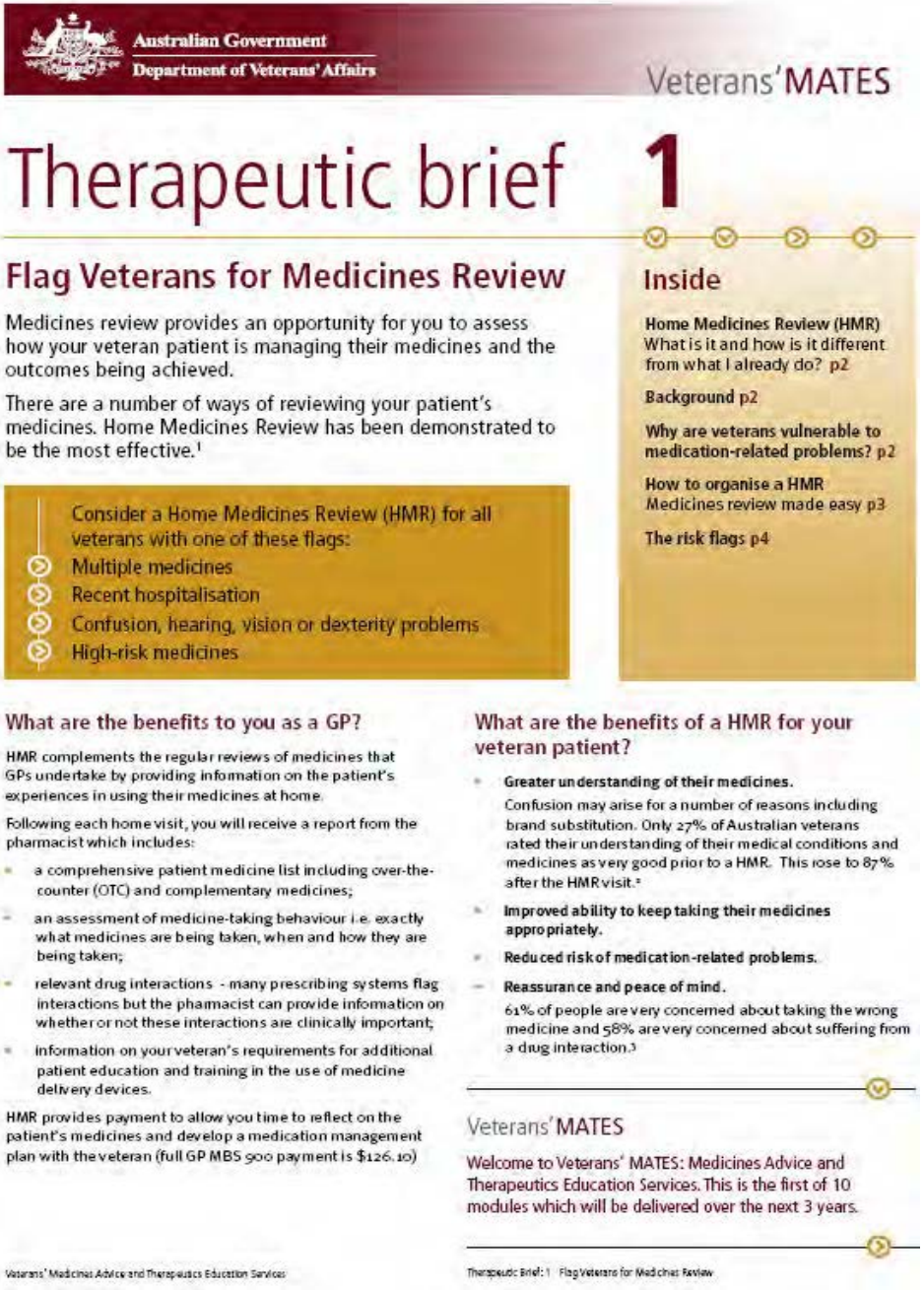
- errors can occur during the RPBS claiming process;
- patients may have moved and are no longer under your care but they may still be receiving repeats from the original prescription written by you; or
- your prescription pad may have been used by a locum or other doctors in your group practice and the pharmacy claims data has attributed the prescription to you.

1 Patients are selected from all sites at which you practice.

2 Patients resident in an aged-care facility are not eligible for a home medicines review. These data were not available to report.

3 The date of the last medication review is based on Medicare claims in the last twelve months for doctor only medication reviews or home medication reviews.

4 Products that had more than one dispensing per month, were only counted once in the analysis.



Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic brief 1

Flag Veterans for Medicines Review

Medicines review provides an opportunity for you to assess how your veteran patient is managing their medicines and the outcomes being achieved.

There are a number of ways of reviewing your patient's medicines. Home Medicines Review has been demonstrated to be the most effective.[1]

Consider a Home Medicines Review (HMR) for all veterans with one of these flags:

- Multiple medicines
- Recent hospitalisation
- Confusion, hearing, vision or dexterity problems
- High-risk medicines

Inside

What are the benefits to you as a GP?

HMR complements the regular reviews of medicines that GPs undertake by providing information on the patient's experiences in using their medicines at home.

Following each home visit, you will receive a report from the pharmacist which includes:

- a comprehensive patient medicine list including over-the-counter (OTC) and complementary medicines;
- an assessment of medicine-taking behaviour i.e. exactly what medicines are being taken, when and how they are being taken;
- relevant drug interactions - many prescribing systems flag interactions but the pharmacist can provide information on whether or not these interactions are clinically important;
- information on your veteran's requirements for additional patient education and training in the use of medicine delivery devices.

HMR provides payment to allow you time to reflect on the patient's medicines and develop a medication management plan with the veteran (full GP MBS 900 payment is $126.10)

What are the benefits of a HMR for your veteran patient?

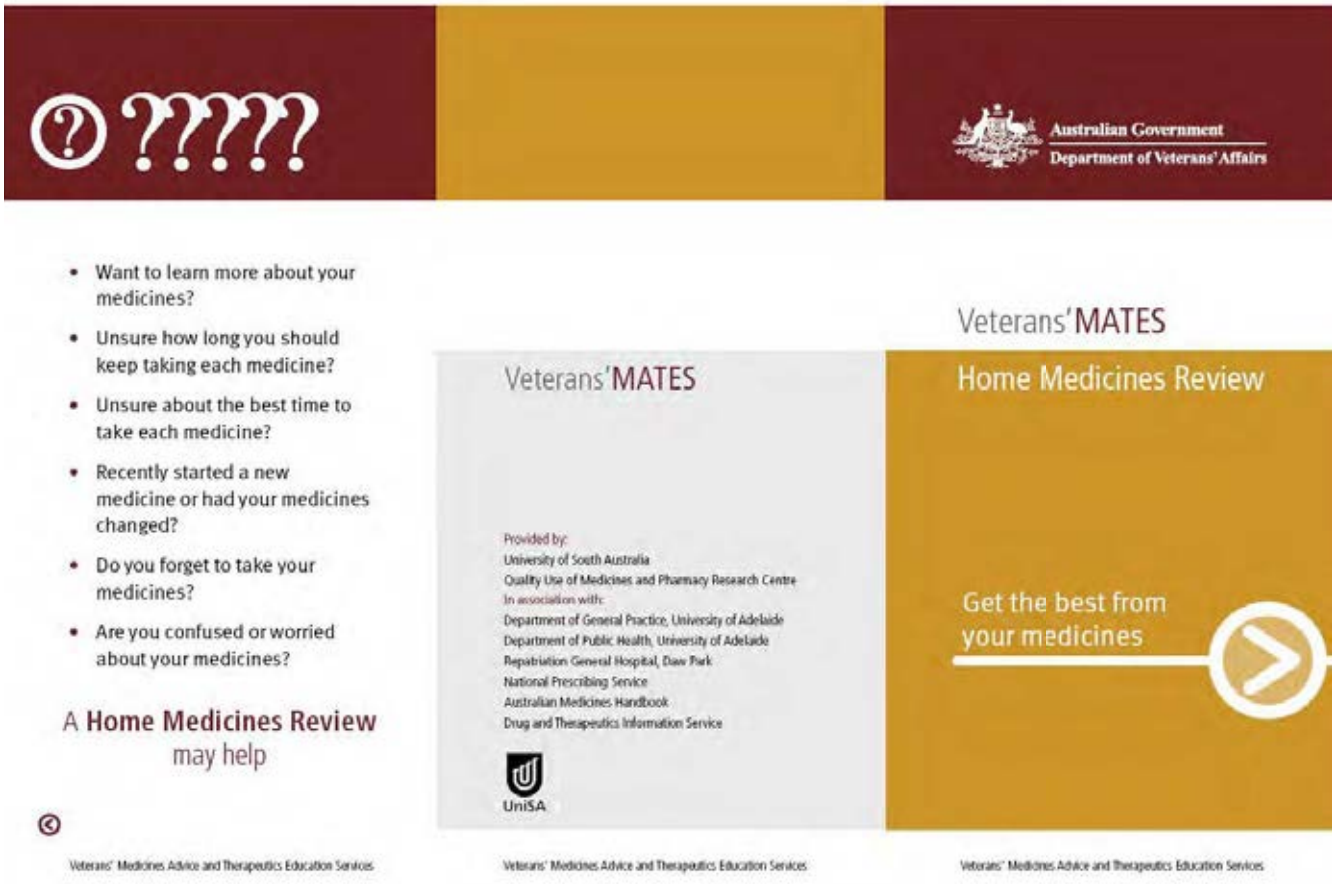
- **Greater understanding of their medicines.**
  Confusion may arise for a number of reasons including brand substitution. Only 27% of Australian veterans rated their understanding of their medical conditions and medicines as very good prior to a HMR. This rose to 87% after the HMR visit.[2]
- **Improved ability to keep taking their medicines appropriately.**
- **Reduced risk of medication-related problems.**
- **Reassurance and peace of mind.**
  61% of people are very concerned about taking the wrong medicine and 58% are very concerned about suffering from a drug interaction.[3]

Veterans' MATES

Welcome to Veterans' MATES: Medicines Advice and Therapeutics Education Services. This is the first of 10 modules which will be delivered over the next 3 years.

Supportive educational material

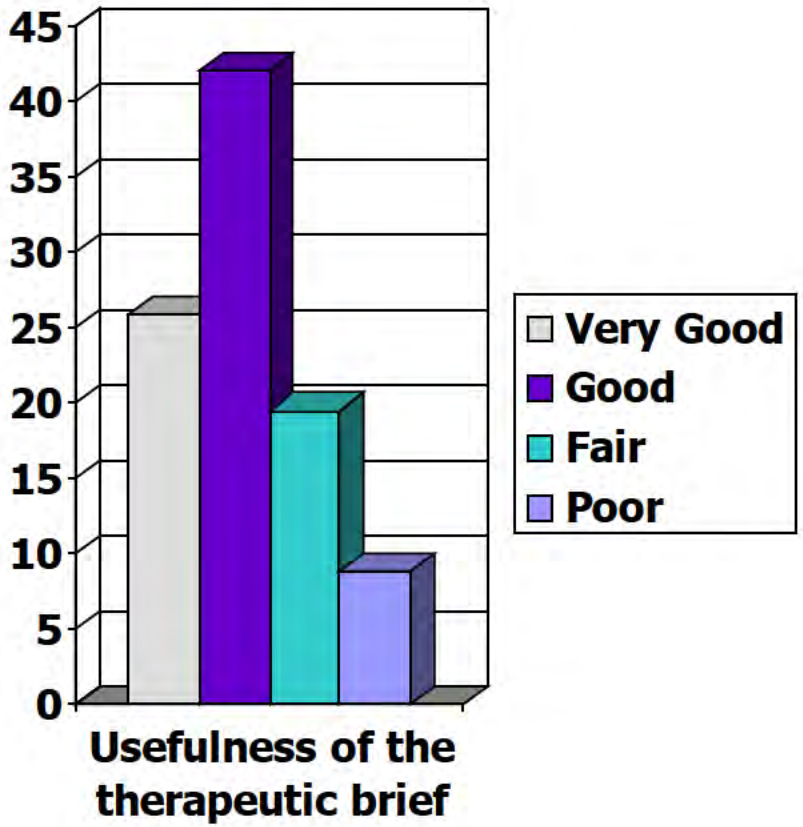
Supportive educational material for veterans



Evaluation: Module 1

- Stakeholder surveys
  - 1 page questionnaire distributed with the module material
- Veteran cohort study
- LMO cohort study

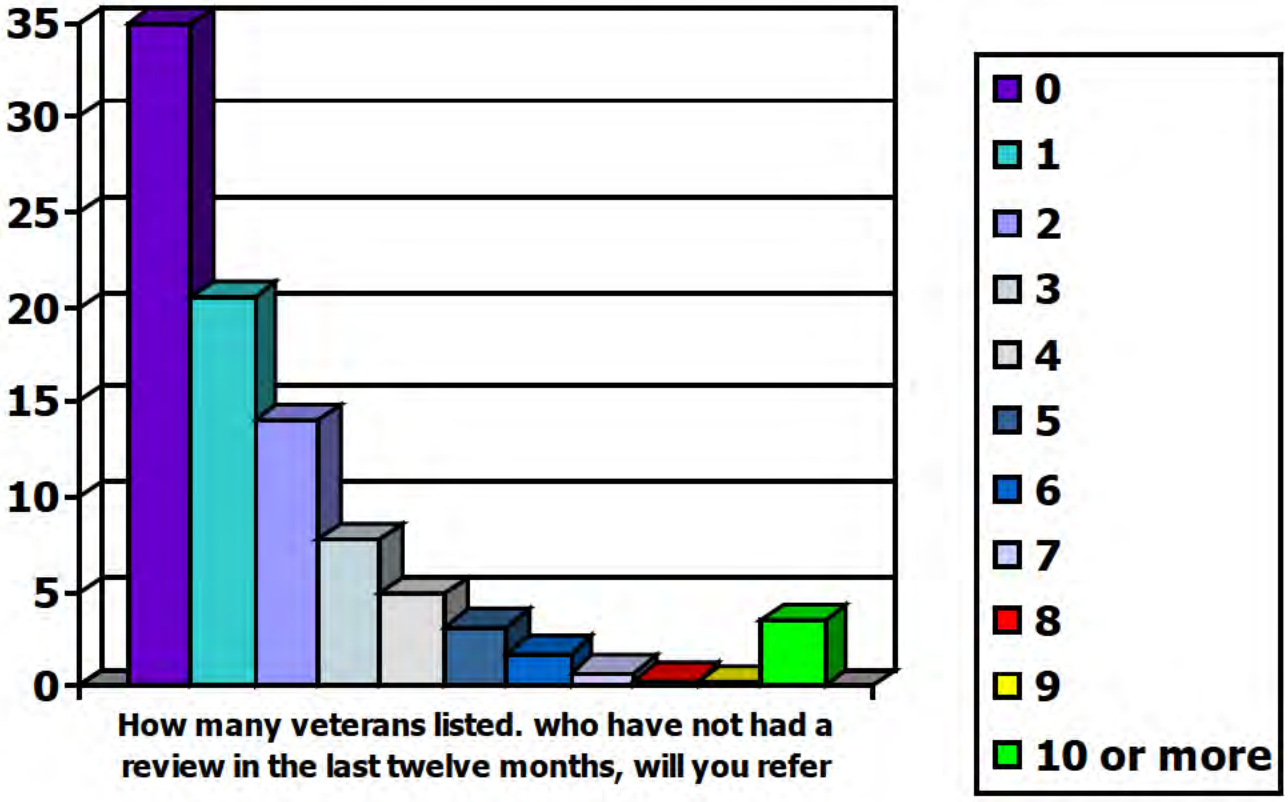
Doctors find the therapeutic information useful



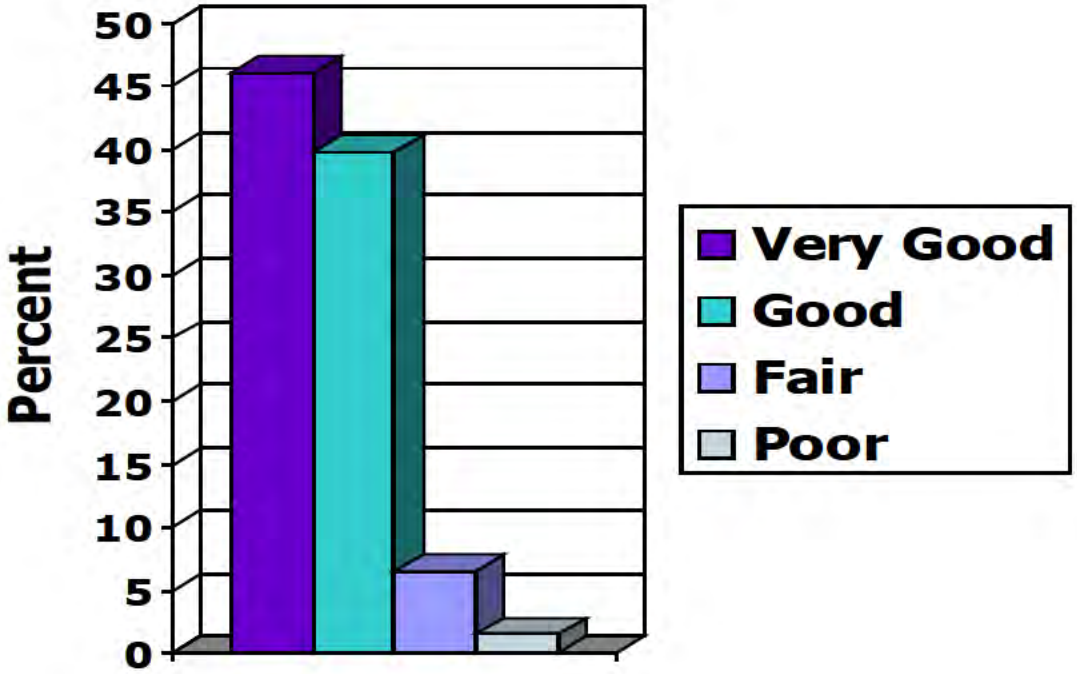
Doctors find the prescriber feedback helpful

- 50% of respondents indicated that the feedback provided them with new information

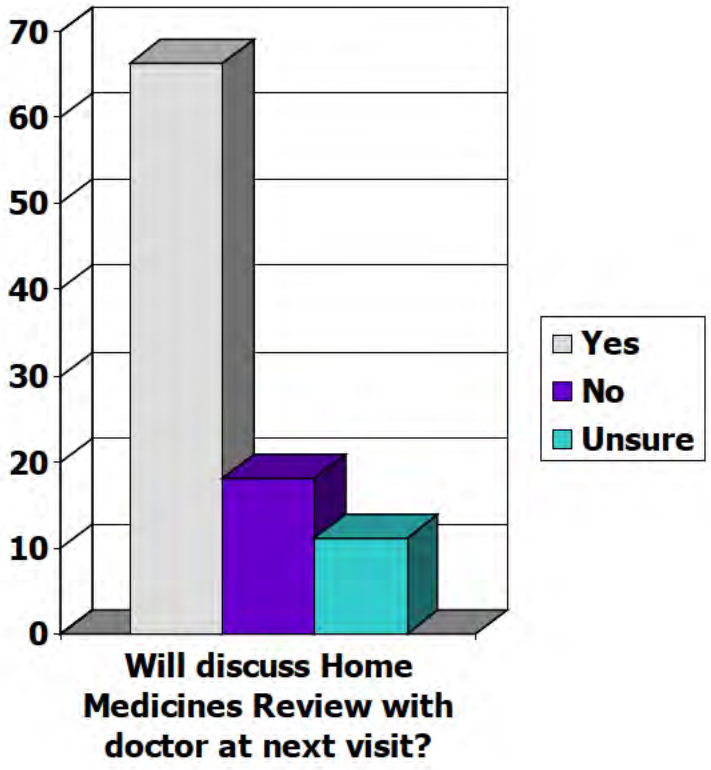
Doctors planned to act on the feedback information



Veterans find the educational material helpful



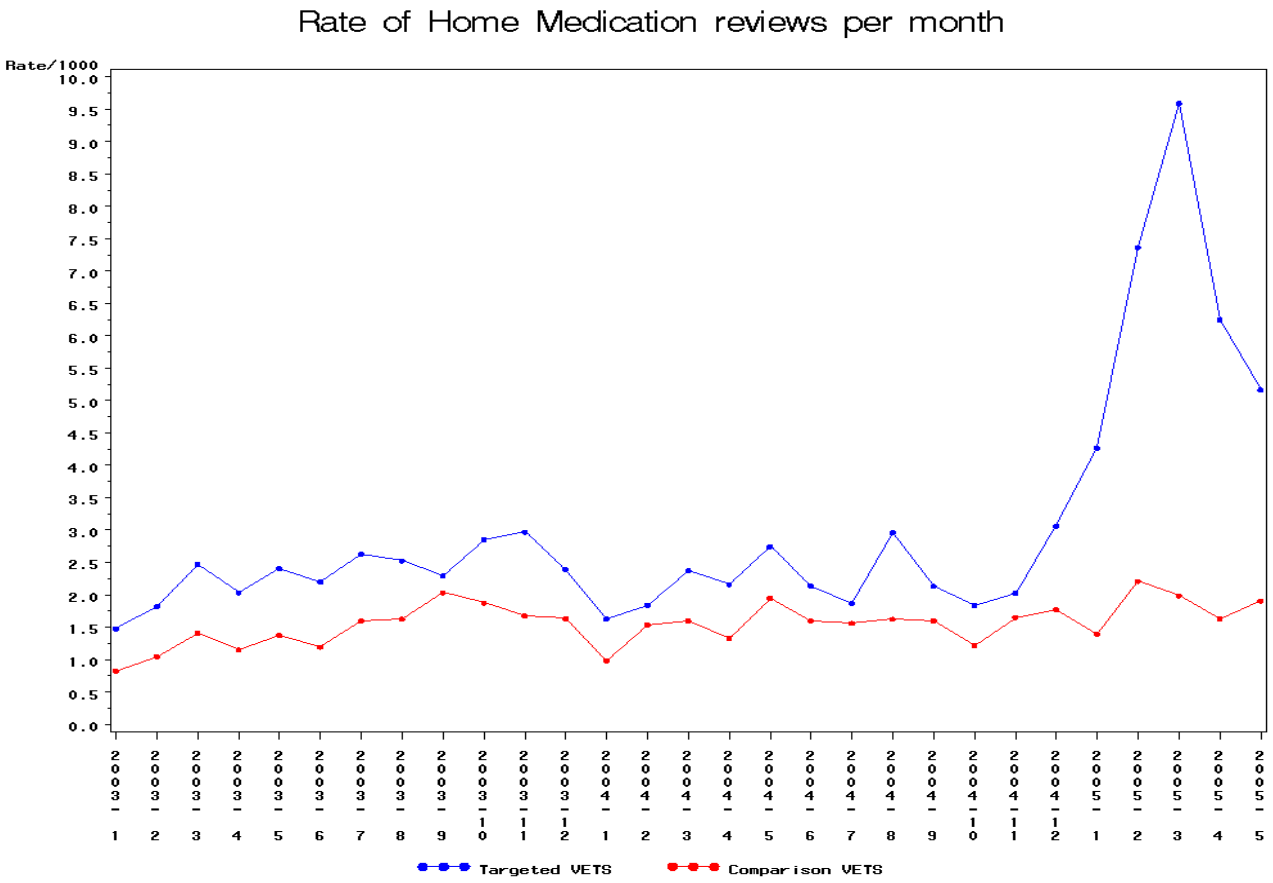
Veterans planned to discuss HMR with their doctor



Veteran cohort study

- Changes in rate of HMRs for targeted veterans and comparison group
  - Veterans who were dispensed five or more unique medicines each month for four consecutive months (n= 38,570)
  - Veterans who were dispensed five or more unique medicines over four months AND who had at least 20 dispensings in that four months AND who had at least one prescription dispensed each month (n=49,765)

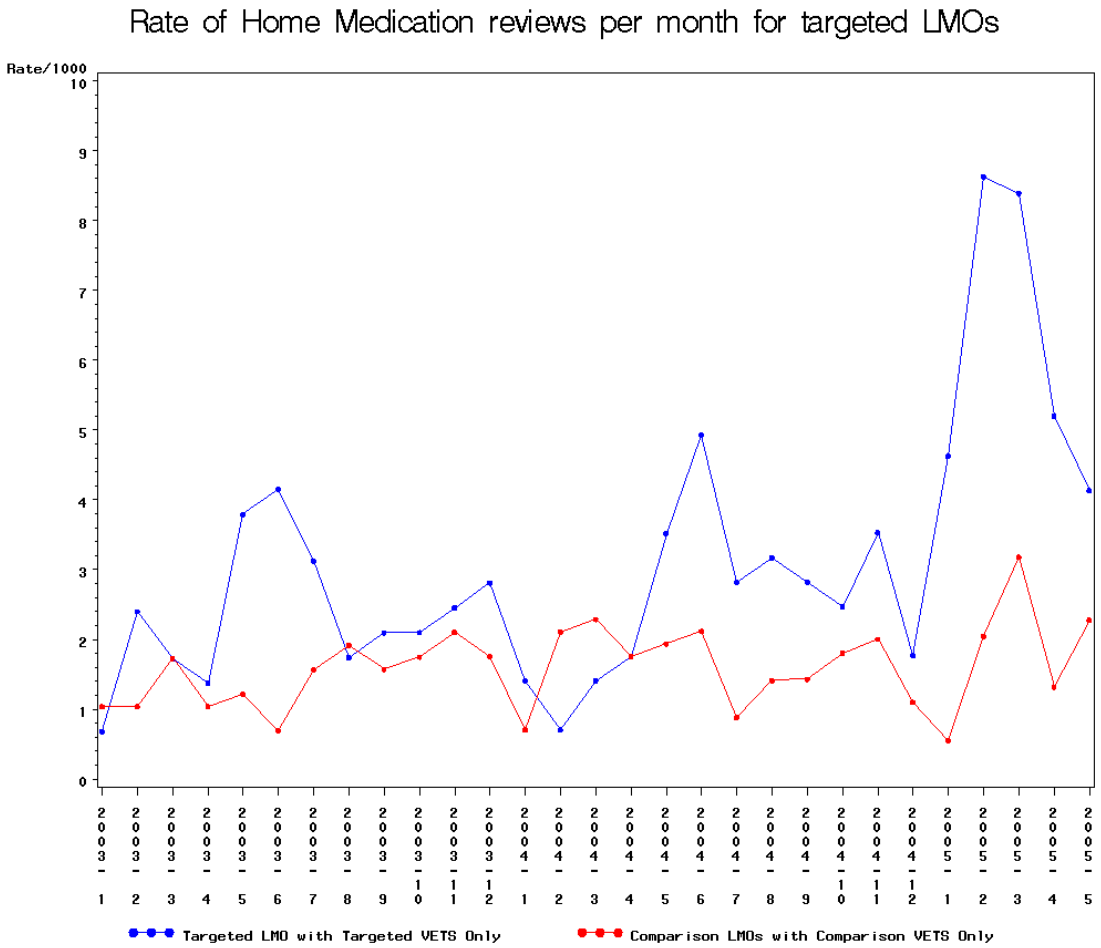
Changes in HMR rates



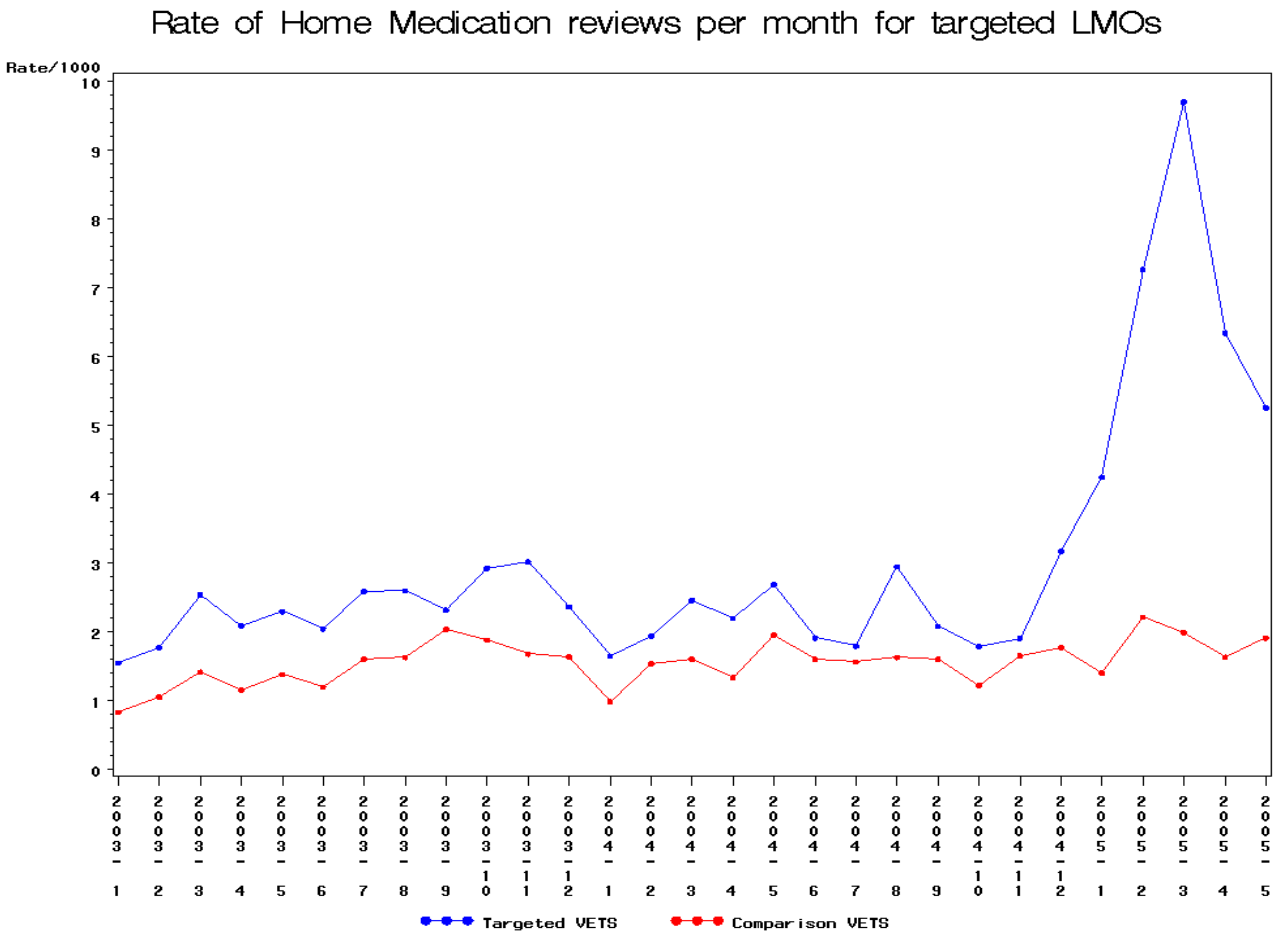
LMO cohort study

- Targeted LMOs
  - The primary provider for targeted veterans (i.e. those who had written the most prescriptions for the targeted veteran)
    - Targeted LMOs with targeted veterans (n=2097)
    - Targeted LMOs with targeted veterans and comparison veterans (n=9287)
- Comparison LMOs
  - the primary provider of veterans who met the criteria for the comparison group only (n=3630)

Targeted LMOs with targeted veterans only versus comparison LMOs with comparison veterans only



LMOs with targeted and comparison group veterans



Other planned endpoints

- Costs of medications
- Number of unique medicines
- Number of dispensings of medications
- Number of hospitalisations (any diagnosis)
- Number of general practitioner and specialist attendances

Conclusion

- Patient-specific prescriber feedback has been well received by general practitioners
- Supportive educational material to veterans has also been well received
- The intervention has increased the rate of home medication reviews among targeted veterans
- Claims data sets may be beneficial for improving health service delivery

Tools for Practice Research

National Health datasets: Leading practice-based research and improving practice.

Andy s 47F & Libby s 47F

Quality Use of Medicines and Pharmacy Research Centre,
Sansom Institute,
University of South Australia

Current themes in practice-based research

- How to bridge the evidence/practice gap.
- The management of complex patients with multiple chronic conditions.

Health Datasets as tools for research

- Australian health datasets are now being used as powerful pharmacoepidemologic tools to guide health service delivery and research.
- Health datasets enable an examination current care and patterns of care and assessment of health outcomes.
- This information can help select priority clinical areas for research, identify gaps in service provision or service coordination and highlight real world risks of adverse events.

The need for practice-based research

- While data can highlight medicines issues, it can not answer the question of why the issue arose.
- The evidence/practice gap is not always due to poor knowledge of guidelines or bad practice.
- Practice-based research is necessary:
  - to determine why the gap exists
  - to understand the nature of interactions between practitioners and patients,
  - to examine processes of care and
  - to explore patient knowledge and preferences.
- This presentation demonstrates the use of a national health dataset as a tool to support practice-based research using examples drawn from the Veterans' MATES project

The DVA health datasets allow identification of:

- under-use of medicines or services,
- use of the wrong/inappropriate medicine
- use of too much medicine
- persistence and compliance issues
- patients who use multiple medicines or see multiple providers
- issues surrounding monitoring of medications and adverse events (including adverse drug reactions, contraindicated therapy, drug interactions, duplication of therapy)
- continuity of care issues
- processes of care

Topic	Number of veterans	Number of doctors
Medicines review	38568	11384
CHF	12047	6954
Diabetes	16612	8573
NSAIDs	9885	11242
Antidepressants	42196	12472
Respiratory	28670	10720
PPIs	62460	13684
CI medicines	32484	11050
Medicines review	58081	12950
Constipation	29231	9825
Diabetes care	18340	9180
Dementia	6690	3885

Examples of findings from the database analyses: HMR

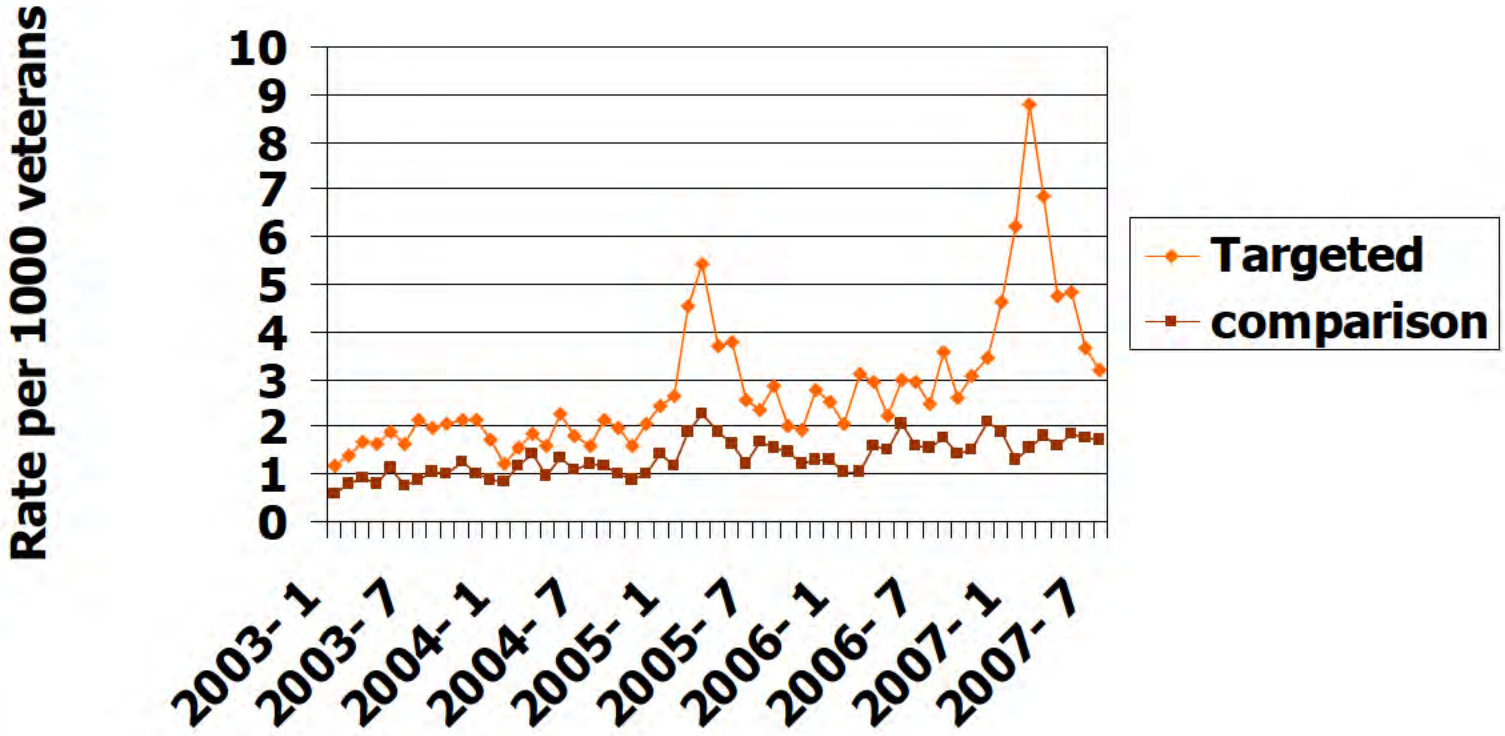
- Veterans are a group at high risk of medication problems;
  - 82% are 65+ years
  - 76% of veterans use 5 or more unique medicines
  - Male veterans over 70 years have on average 45 prescriptions dispensed per year.
- Utilisation of home medicines review among the veteran population is low
  - only 5,161 medicines review services being reimbursed for veterans in 2002 and 4,975 in 2003

Practice-based Research

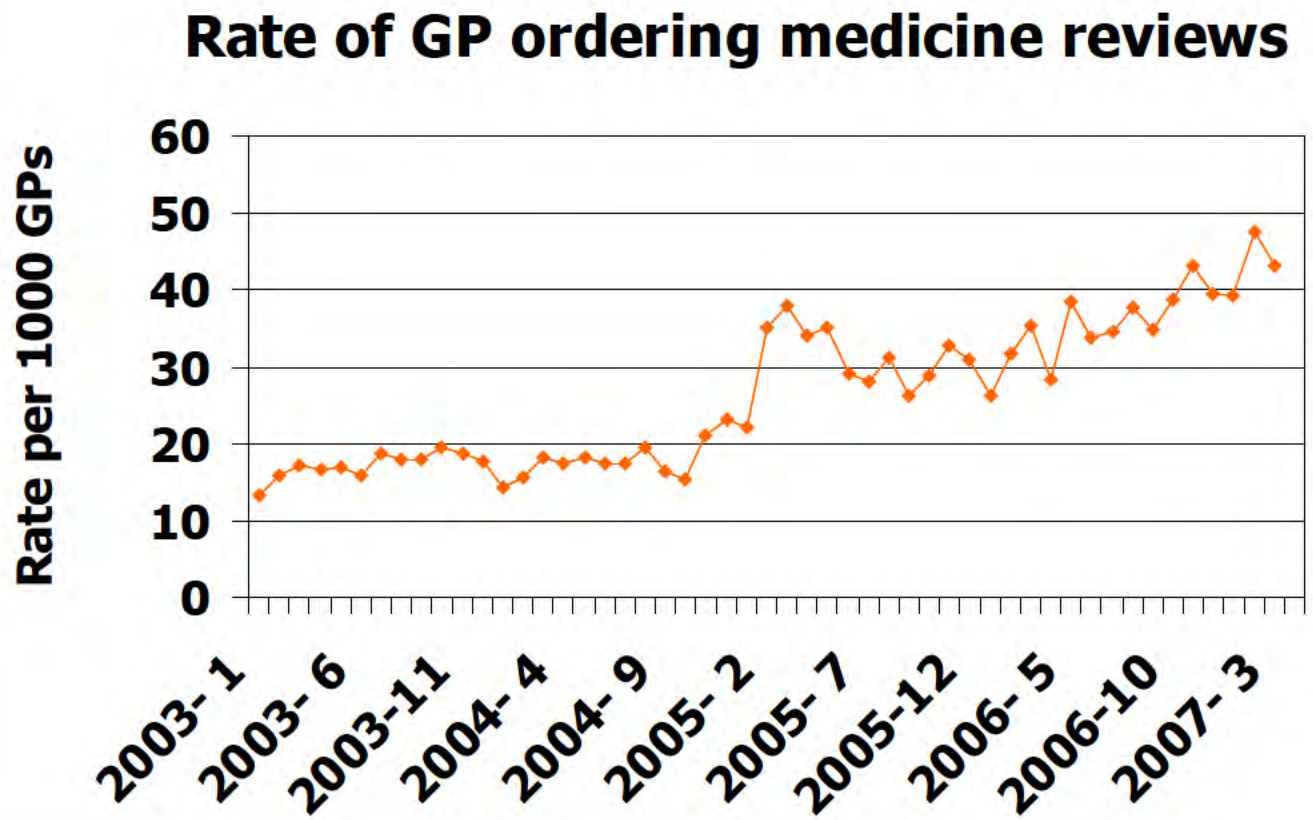
Aim: to increase the rate of home medicines reviews for veterans over 65 years on multiple medicines

Method: Patient specific prescriber feedback with information also provided to patients

Home medicine review rates



Number of GPs participating in medicine reviews increased



GP comments

- 32% of LMOs indicated they had referred at least one of their patients for an HMR or RMMR in the last month
  - 50% of LMOs indicated the most common reason for referring patients for a Medicines Review was patient confusion about their medications.
  - 27% considered multiple medicine use as the main reason to refer

Pharmacists comments

- 59% of pharmacists indicated they had referred at least one of their patients for a Medicines Review in the last month
- 66% of pharmacists indicated the most common reason for referring patients for a Medicines Review was patient confusion about their medications. 18% considered multiple medicine use as the main reason to refer
- 49% of pharmacists indicated there were enough accredited pharmacists in their area to cover demand

Veterans comments

- 54% of veterans indicated they use a pill box or blister pack to aid taking medicines
- Only 3% of veterans indicated they sometimes missed doses of their medicines. Overall, 95% reported never or hardly ever missing doses.
- 75% of veteran who admitted missing any medicine dose(s) indicated forgetfulness was the reason. Three percent saw no need for the regular doses of medicine

Focus on Diabetes care

19000 veterans are taking medicines indicative of diabetes

How are Australian war veterans with diabetes currently managed?

Appropriate management of cardiovascular risk in patients with diabetes

- Almost 65% of Australian war veterans dispensed medicines for diabetes have also had an ACE inhibitor or A2RB dispensed,
- Only 53% were dispensed lipid lowering therapy and
- Only 52% were dispensed antiplatelet agents

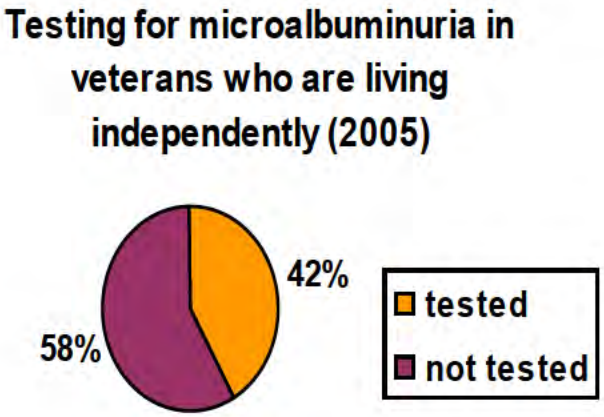
Use of Diabetes Cycle of Care

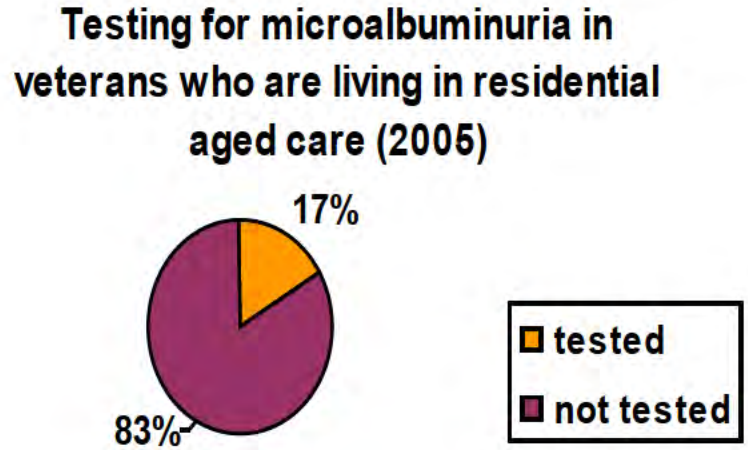
- 20% had claims for an annual diabetes care plan,
- 50% had a claim for any type of care plan, including a medication review, discharge plan, case conference, GP management plan or health care plan.

Elements of the Diabetes Cycle of care;

- 63% had at least one HbA1c claim per year
- 40% had a microalbuminuria test claim
- 24% an HDL claim
- 87% had a claim for ophthalmology or optometry appointments in the two years under review
- 66% had a claim for a podiatry service

Veterans resident in aged-care facilities were significantly less likely to have claims for any of these services apart from medication review.





Medication-related problems

- Patients with diabetes, and those aged over 65 years, are at particular risk of cardiovascular and renal adverse effects.
- 34% of veterans with diabetes were dispensed at least one NSAID in the year April 2004-March 2005
- Those dispensed a NSAID were more likely to be hospitalised
  - For every 1000 people with diabetes who are treated with an NSAID there are an extra 20 hospitalisations per year due to adverse events.

Diabetes population	**NSAID exposure** Rate per 1000 patient days of follow-up	**Non-exposed Group** Rate per 1000 patient days of follow-up	**Adjusted relative risk**	**95% CI, p**
All hospitalisations (CHF, GI ulcer, ARF, AMI or hypertension)	0.31	0.22	1.47	1.17-1.84
Congestive heart failure	0.20	0.13	1.53	1.16-2.03
Gastrointestinal ulcer	0.024	0.009	2.82	1.24-6.4
Acute renal failure	0.008	0.008	1.02	0.25-4.13
Acute myocardial infarct	0.076	0.061	1.26	0.80 – 1.99
Hypertension	0.004	0.005	0.768	0.11-5.53

What the evidence says about diabetes management

- Chronic disease management models, such as the Diabetes Cycle of Care, improve processes of care and health outcomes[1].
- Proactive and well informed teams can deliver better health outcomes[2].
- Early, intensive, long-term interventions targeting multiple risk factors for cardiovascular disease in people with type 2 diabetes, significantly reduce the risk of CVD and microvascular (nephropathy, neuropathy, retinopathy) complications[1].
- Patients with diabetes, and those aged over 65 years, are at particular risk of cardiovascular and renal adverse effects from NSAIDs[3].

1. Gaede P, et al. Multifactorial intervention and cardiovascular disease in patients with type 2 diabetes. N Engl J Med 2003; 348(5):383-393

2.Tsai AC, Morton SC, Mangione CM, Keeler EB. A meta-analysis of interventions to improve chronic illness care. American Journal of Managed Care 2005;11:478-488

3. Griffin MR, Yared A, Ray WA. Nonsteroidal antiinflammatory drugs and acute renal failure in elderly persons. Am J Epidemiol. 2000 Mar 1;151(5):488-96

Research

- Aims:
  - To increase the use of cardiovascular medicines in veterans with diabetes
  - To decrease the use of NSAIDs in veterans with diabetes
  - to increase;
    - the use of diabetes cycle of care and care plans
    - testing for
      - Microalbuminurea, particularly for those residing in residential aged care, and
      - glycaemic control.

Cessation rate of NSAIDs

62% of those in the cohort in Feb-May 2005 were no longer on NSAIDs in Feb-May 2006

Conclusions

- Conducting pharmacoepidemiologic studies in health data sets;
  - provides data on medication-related problems and service delivery.
  - informs the development of practice-based research
  - suggests aspects of the problems that could be amenable to change and
  - enables evaluation of interventions,

BUT

The contribution of experienced practitioners to the design and analysis of data from pharmacoepidemiologic studies is essential to ensure relevance of studies and outcomes in the current clinical environment.

Practice-based data can be used to replicate studies conducted in larger national data bases and to supplement information from them.

University of South Australia

Australian Government
Department of Veterans' Affairs

Persistence with opioids post-discharge from hospitalisation for surgery in an Australian adult cohort

Renly Lim

Elizabeth E. Roughead, Emmae Ramsay, Anna Moffat, Nicole Pratt

Quality Use of Medicines and Pharmacy Research Centre

University of South Australia

@DrRenly



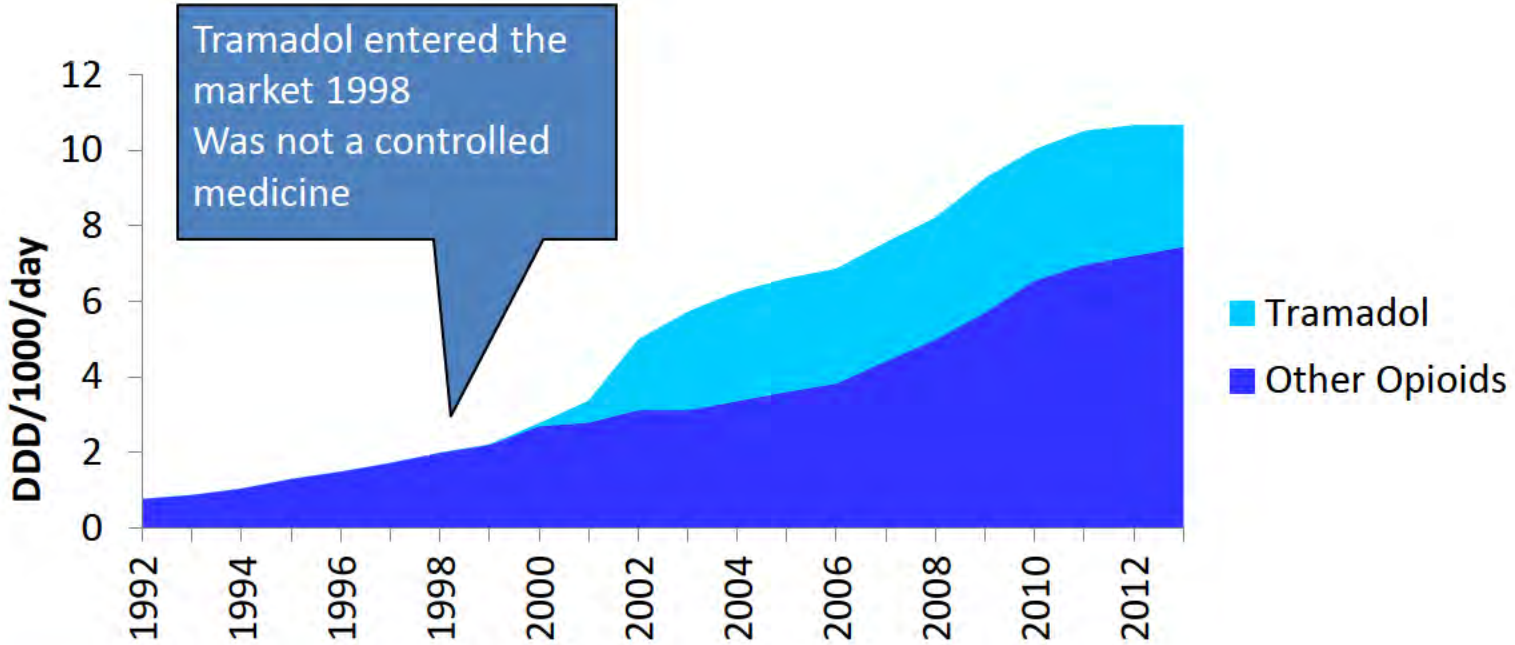



Opioid use in Australia

- Opioid use in Australia has risen significantly in the last fifteen years

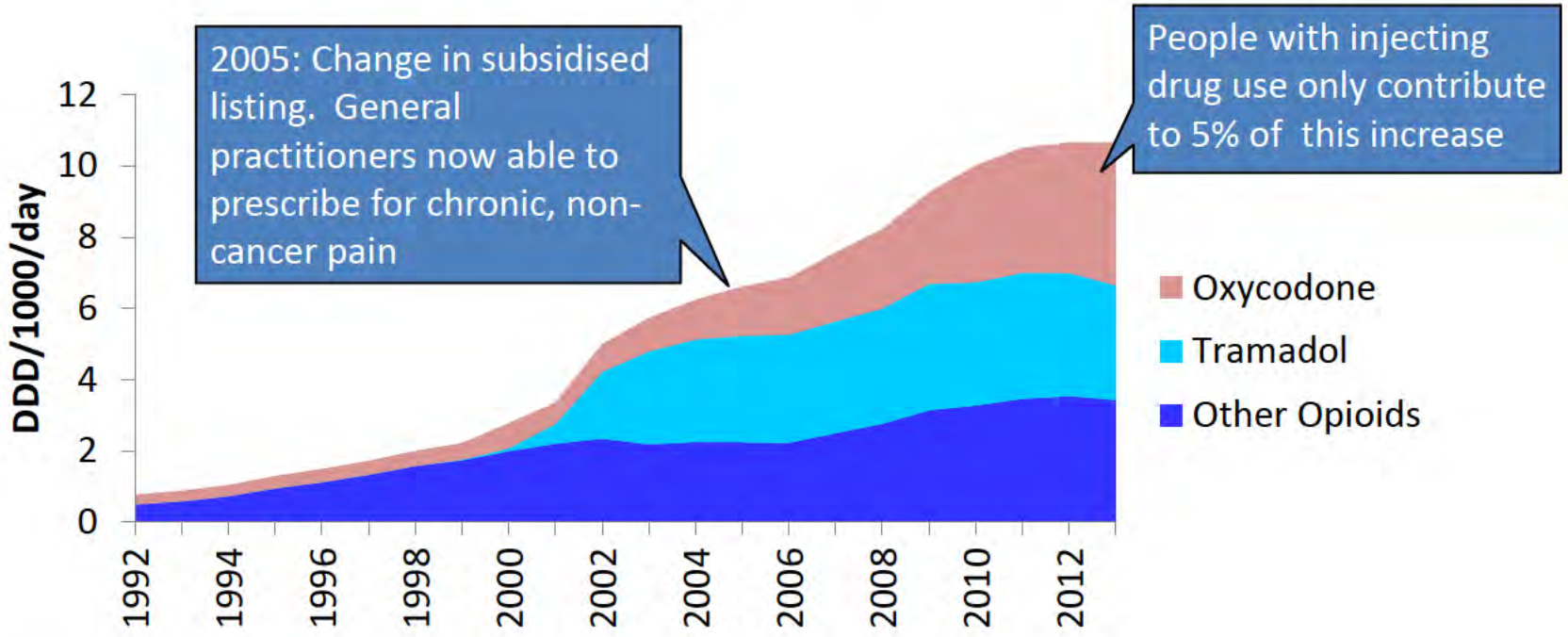
Source: Australian Government Drug Utilisation Subcommittee

Drivers of increased use



Source: Australian Government Drug Utilisation Subcommittee

Drivers of increased use



Source: Australian Government Drug Utilisation Subcommittee

Problem with opioid use

- Potential for **inadvertent transition** of initial opioid use for acute pain **to chronic use**
- Studies examining opioid use post-discharge from surgical hospital admissions
  - 3%-10% of people who were opioid naïve prior to surgery were still taking opioids at one year follow-up[1-3]

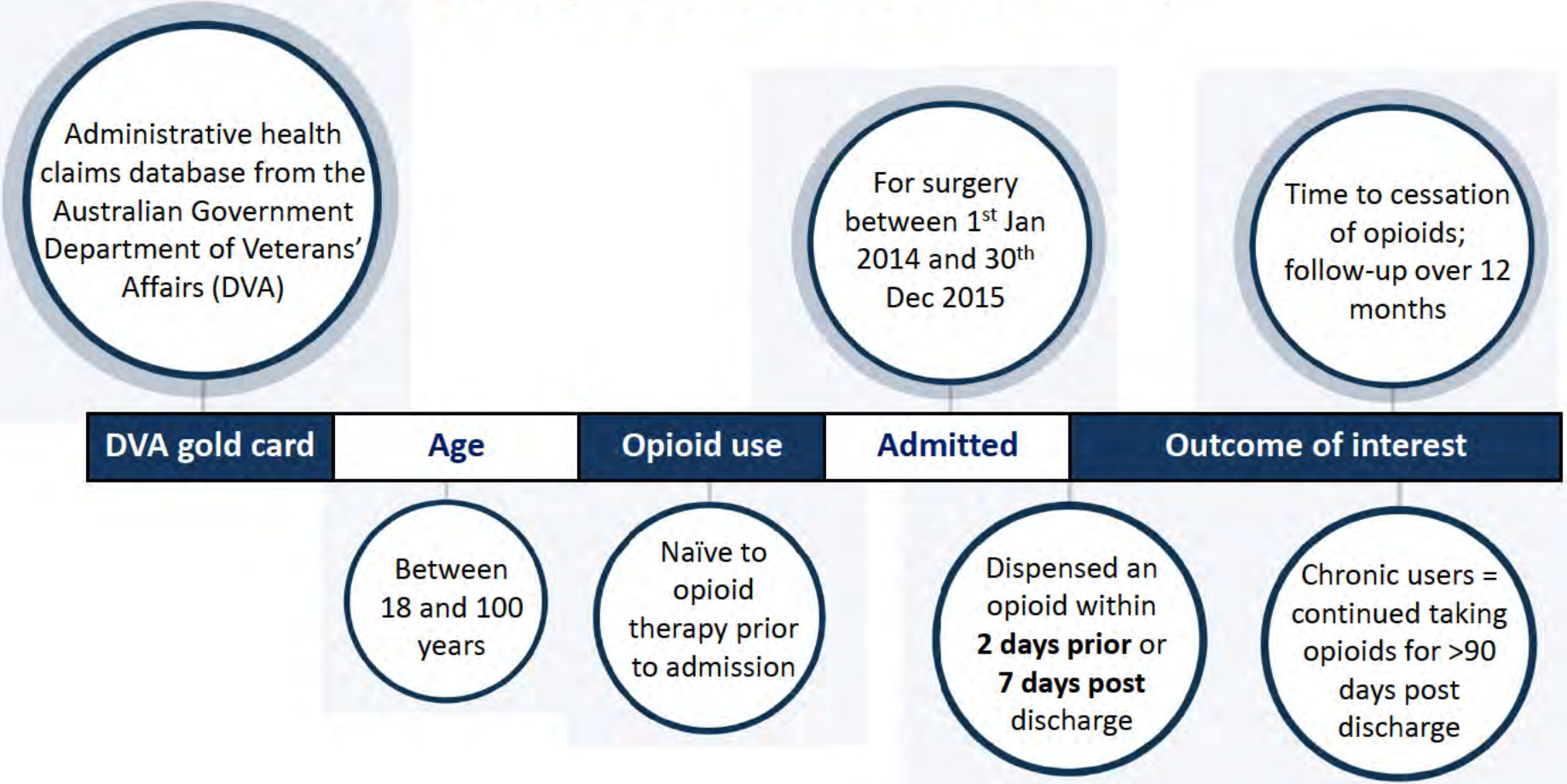
1. Calcaterra SL, Yamashita TE, Min SJ, et al. Opioid Prescribing at Hospital Discharge Contributes to Chronic Opioid Use. J Gen Intern Med. 2016; 31: 478-85.
2. Macintyre PE, Huxtable CA, Flint SL, et al. Costs and consequences: a review of discharge opioid prescribing for ongoing management of acute pain. Anaesth Intensive Care. 2014; 42: 558-74.
3. Lindestrand AG, Christiansen ML, Jantzen C, et al. Opioids in hip fracture patients: an analysis of mortality and post hospital opioid use. Injury. 2015; 46: 1341-5.

Aim

- In Australia, it is unclear whether initial opioid use to manage acute post-surgical pain leads to chronic opioid use

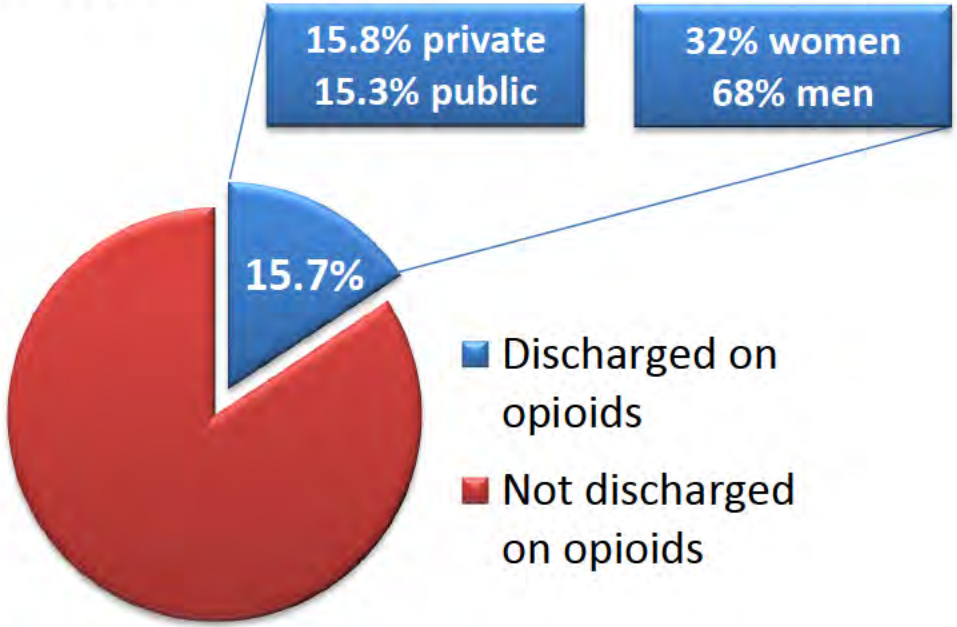
- To determine the time to opioid cessation post-discharge from hospital in persons who had been admitted to hospital for a surgical procedure who were previously naïve to opioids

Retrospective cohort study

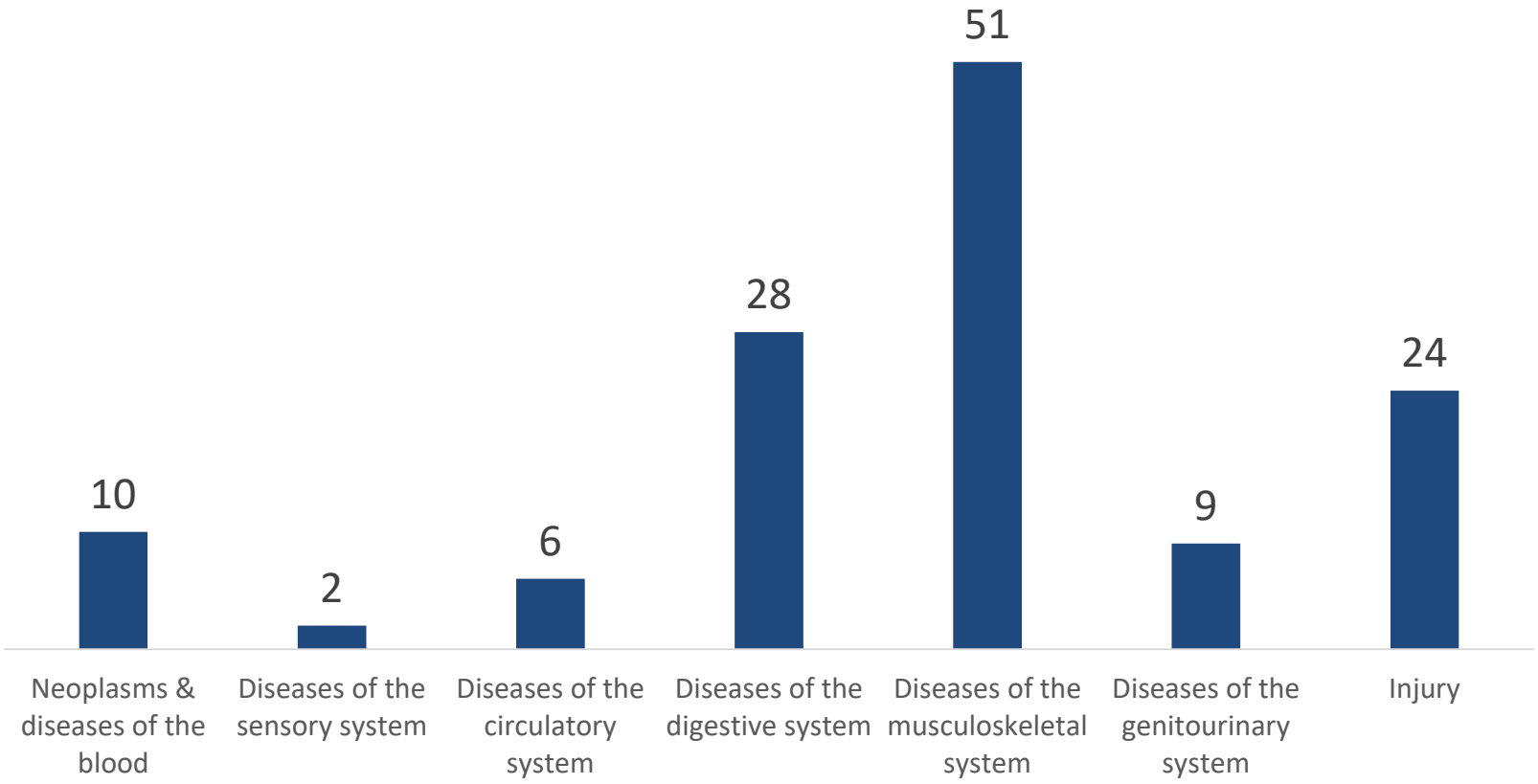


Results

- 24,854 persons were admitted to the hospital for a surgical admission
- 93% private hospital, 7% public hospital



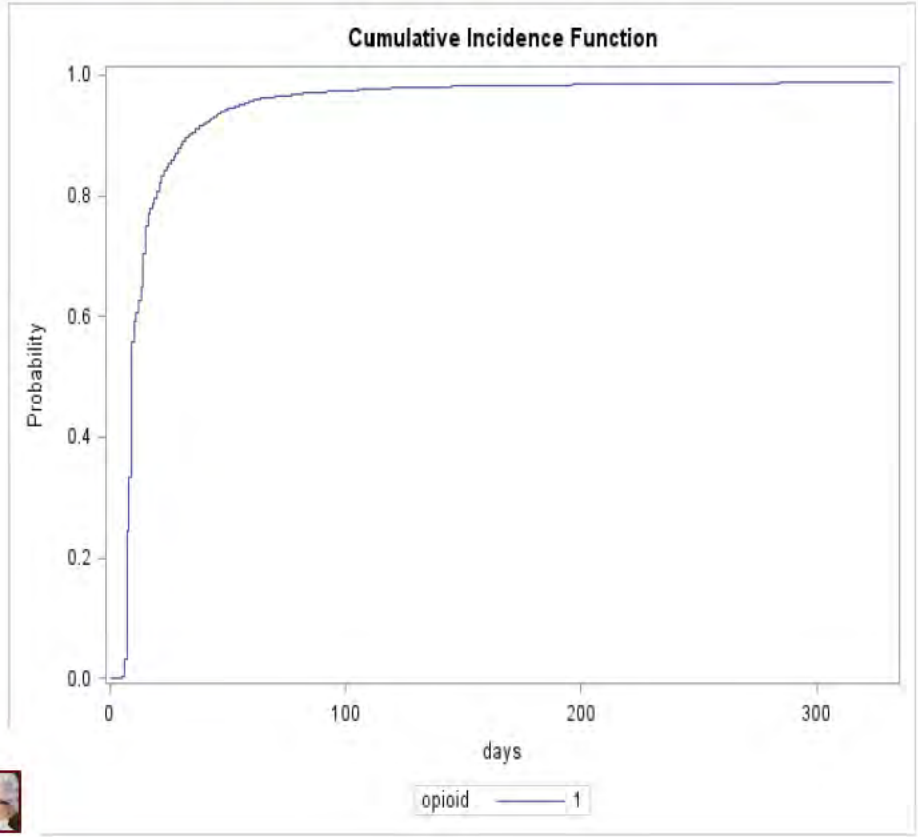
Percent discharged on opioid by type of admission



Cessation rates

- 25% ceased by 7 days
- 70% ceased by 14 days
- 86% ceased by 30 days
- 96% ceased by 60 days
- 97% ceased by 90 days
- 99% ceased by 1 year

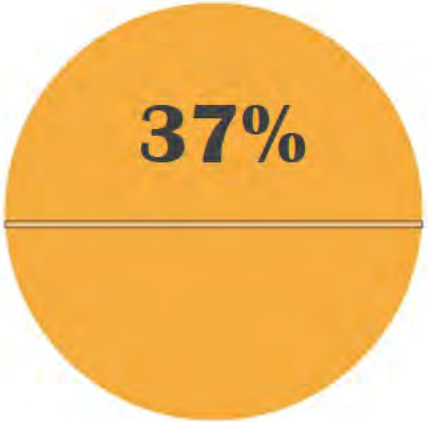
- Median time to cessation was 8 days



Patients most frequently discharged with….

OXYCODONE

- oxycodone alone accounted for 43%
- oxycodone with naloxone accounted for 8%



CODEINE WITH PARACETAMOL

TRAMADOL

Limitations

- Included only patients **naïve to opioid** therapy on admission to hospital.
- **Reliance on administrative health claims** data. Not able to determine the severity of pain.
- Data on consumption of opioids not available → whether all the opioids supplied were consumed is unknown.

Conclusions

- Opioid initiation post-surgical hospital admission leads to chronic use of opioids in a **small percentage of the population**.
- Given the frequency at which surgical procedures occur, this means **many people are affected**.
- Hospital analgesic policies should include strategies to support post-discharge assessment and follow-up of patients at risk of becoming chronic opioid users.

Pharmacovigilance responsibilities one year post-marketing

Libby s 47F
Sansom Institute for Health Research
University of South Australia

University of South Australia | Sansom Institute

What happens when people start new medicines

- Small Australian study
  - 119 persons who started a new long term medicine
  - 33% experienced an adverse event
  - Of which, 73% occurred in the first month
  - Of which, 73% ceased the medicine because of the adverse event

University of South Australia | Sansom Institute

- Poor management of adverse medicine reactions harms us all
  - Patients suffer the adverse event
  - Doctors are less likely to prescribe for the next patient after a serious adverse event
    - 21% decrease in use of warfarin for subsequent patients after a serious bleed
  - Governments and insurers pay costs
  - Industry loses markets

University of South Australia | Sansom Institute

Can we find better ways of bringing medicines to market safely

University of South Australia | Sansom Institute

Pharmacovigilance in 2012

- Historically, pharmacovigilance involved spontaneous reporting of suspected adverse drug events
- The method worked reasonably well, with many new adverse events detected
- However, a changing health environment means we have to consider how we might create new opportunities to identify safety issues

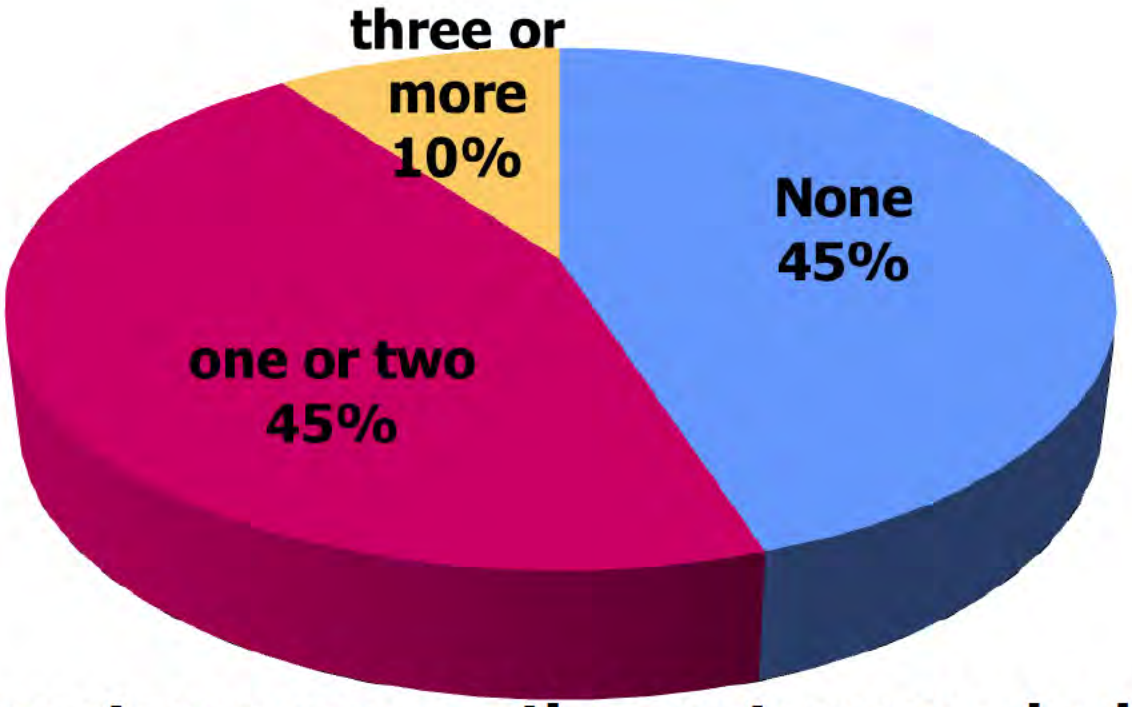
Some new challenges in the 21st century for safety surveillance

- More people now take more medicines

University of South Australia | Sansom Institute

In the 1980's

~ 10% of people had multiple chronic illnesses

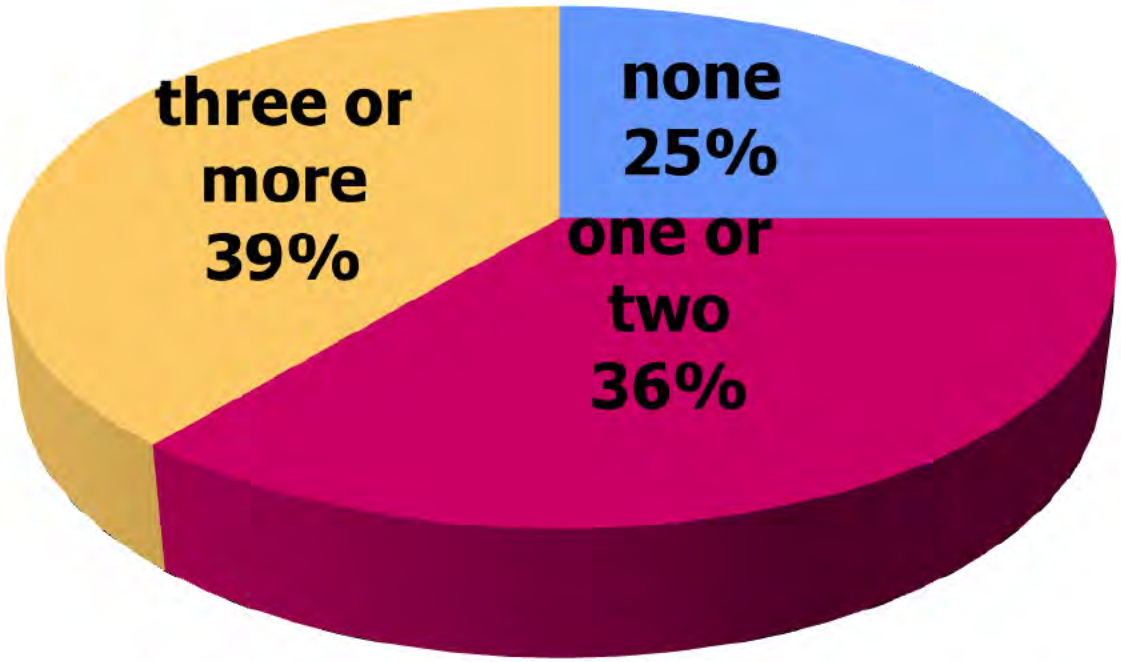


Spontaneous reporting systems worked well

University of South Australia | Sansom Institute

Now

~ 40% of people have multiple chronic illnesses



University of South Australia | Sansom Institute

- People with three or more conditions are likely to be taking 5 or more regular medicines
- This single phenomenon means that it is much harder for health professionals to suspect an adverse drug reaction

- How in this environment might we assist health professionals to be suspicious of a possible adverse event?

Some new challenges in the 21st century for safety surveillance

- Prescribing is no longer limited to medical practitioners
- Patients no longer see only one practitioner
  - On average those with multiple illnesses see 8 providers (4 prescribers) and have more than 60 health service encounters in a year
  - The person who prescribes the medicine may not be the one who treats the adverse event
- How do we facilitate suspicions of adverse events across the continuum of care?

Some new challenges in the 21st century for safety surveillance

- Signal detection is no longer limited to spontaneous reports

- Signals now generated from
  - Randomised controlled trials
    - Vigour study with rofecoxib
    - Rely trial with dabigatrin
  - Meta-analyses
  - Observational analyses
  - Spontaneous reports
- How do we make health professionals aware of potential signals?

At the time of marketing

- Industry knows more about suspected safety issues than anyone else
- How will you make your concerns known so that people can respond in a helpful way?

Some opportunities: New Prescribers

- New prescribers are only just establishing their practices and there is opportunity to develop a safety culture and reporting responsibility
- New prescribers are likely to report different types of adverse events
  - Doctors more serious events
  - Nurses less serious events

- If nurse practitioners in Australia establish practice as prescribers of repeat medicines are they the best group to target for spontaneous reports
- If complex patients are seeing pharmacists every 8 days, should we be establishing easier mechanisms for reporting by pharmacists

Some opportunities: Consumers

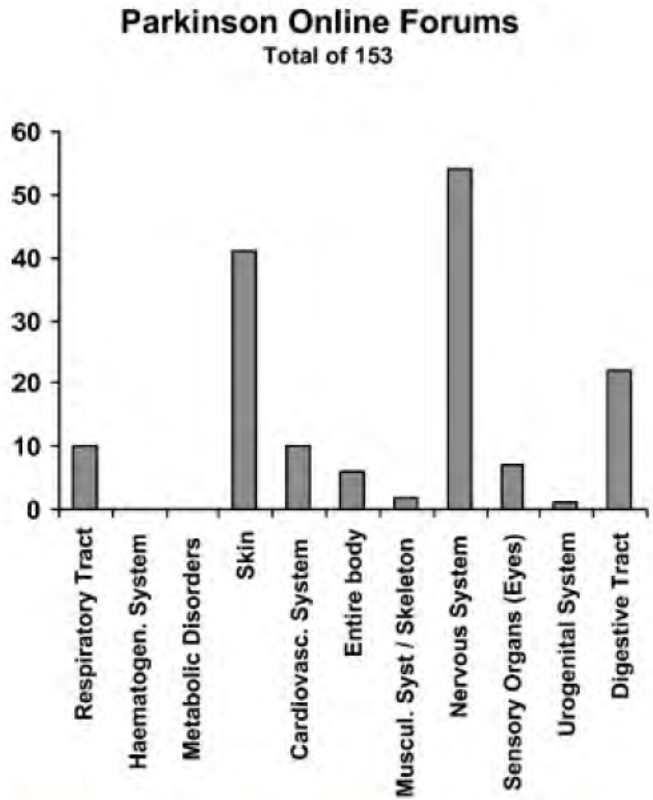
- Consumers are much more engaged in reporting adverse events
  - Consumers identify adverse events earlier than prescribers
  - Consumers identify different types of adverse events
  - Consumer reporting is now funded
  - Consumers are self-reporting via internet fora

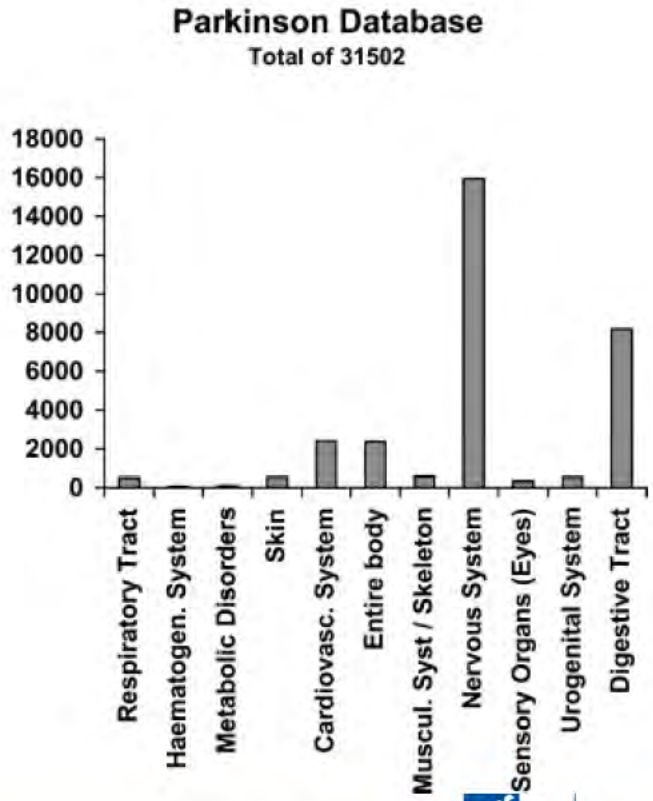
Some opportunities: additional data sources

- Many more data sources are now available for detecting adverse events?
  - Particularly electronic medical records and electronic health claims data
  - Consumer blogs and internet support sites
  - Smart devices?

- How might we encourage researchers to undertake analyses of suspected events?

Internet and database analysis of adverse reactions to AntiParkinson's medicines





University of South Australia | Sansom Institute

- Can we now enable tested methods of consumer reporting via smart devices?

Has anything been wrong or changed in any of the following since you started this medicine?

Your ears	○	Your hearing	○
Your eyes	○	Your sight	○
Your nose	○	Your smell	○
Your mouth/teeth	○	Your taste	○
Your throat	○	Your swallowing	○
Your chest	○	Your breathing	○
Your blood	○	Your weight	○
Your heart	○	Your bowel habits	○

Some opportunities: Funding

- Federal Government has provided $25 million funding for post-marketing surveillance (2011 budget initiative)
- NHMRC called for applications for a Centre of Research Excellence in post-marketing surveillance of medicines and devices to be funded in 2012 over 5 years

Some opportunities using electronic claims data

University of South Australia | Sansom Institute

Prescription Symmetry

- Examines the likelihood of one prescription being dispensed prior to another for the same person

  Medicine A ⟷ Medicine B

- Only uses incident cases for both events
- If Medicine A causes Medicine B, expect an excess of persons starting Medicine B second

  → An asymmetrical distribution of prescription order

Advantage

- Easy to calculate, using prescription data only
- Robust towards confounders
  - Within person design, over a short time
- Underlying seasonal or marketing trends adjusted for in the analysis

The data set required

(no more than three variables needed)

PBS Code	ATC code	Date supplied	Id
04179Y	B01AC04	03APR2006	201006
08333N	A02BC01	03APR2006	201006
08333N	A02BC01	10APR2006	201006
08333N	A02BC01	24APR2006	201006
04179Y	B01AC04	02MAY2006	201073
08333N	A02BC01	02MAY2006	201073

The Australian PBS code

The WHO international code

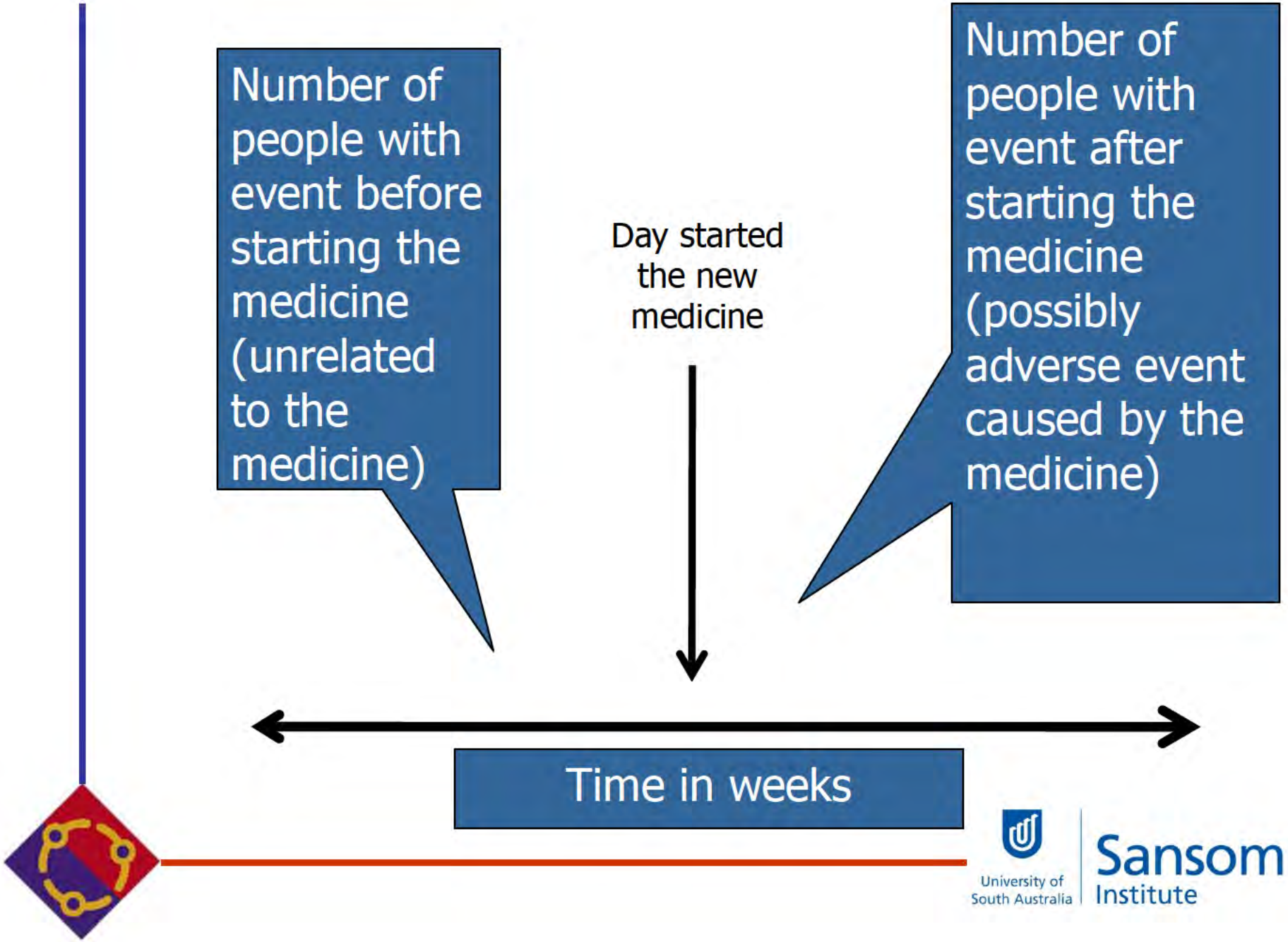
Scrambled identifier

The steps

- Determine incident populations
- *%overall_atcpat_first(C01BD01,Amiodarone,7);*

- Determine event sequence
- *%pssa(C01BD01,Amiodarone,H03AA01,Thyroxine,2000,2001,);*

University of South Australia | Sansom Institute

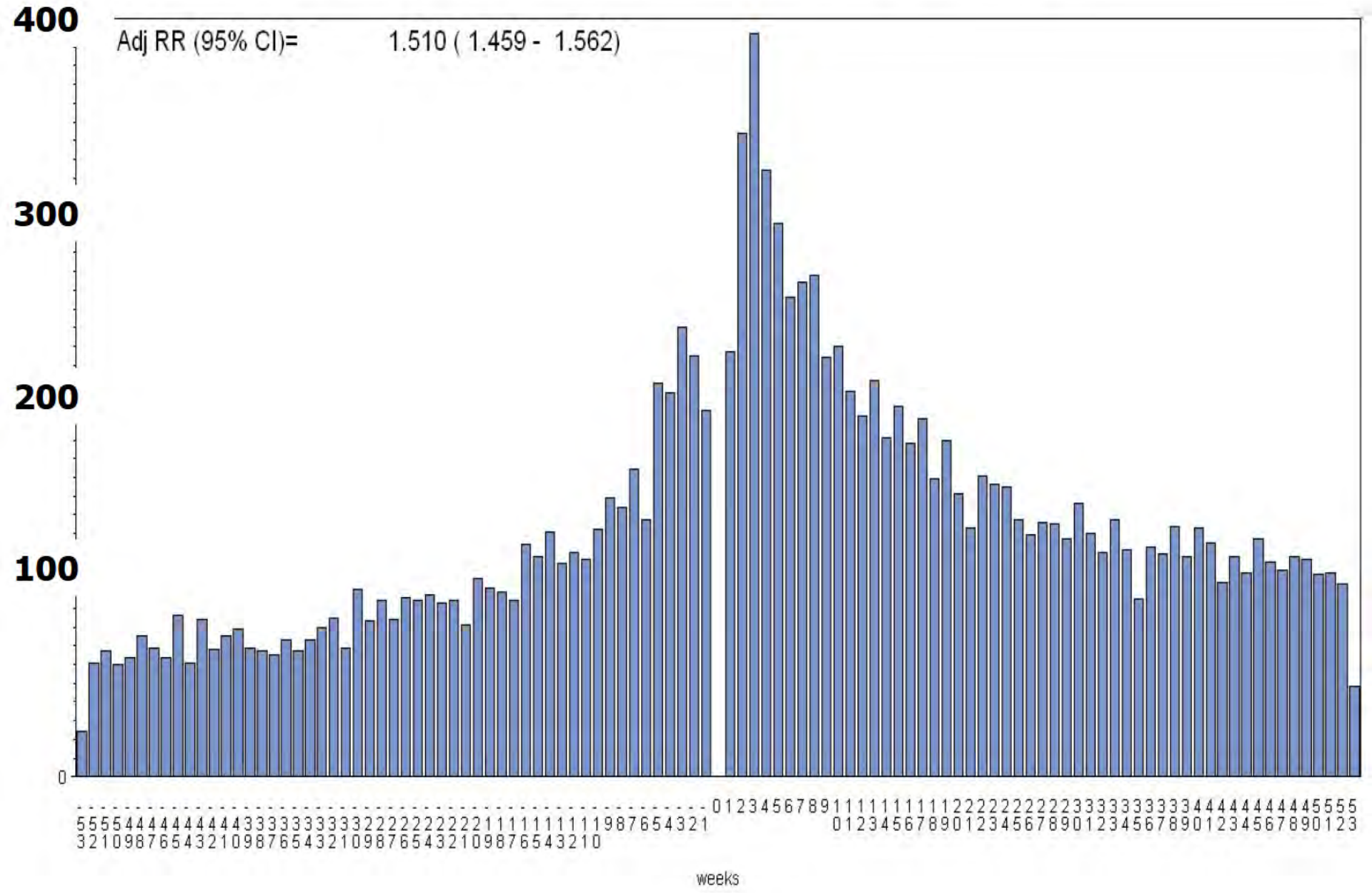


University of South Australia | Sansom Institute

- Examples
  - Do NSAIDs precipitate heart failure?
  - Do calcium channel blockers precipitate peripheral oedema
    - Loop diuretics are the indicator medicine

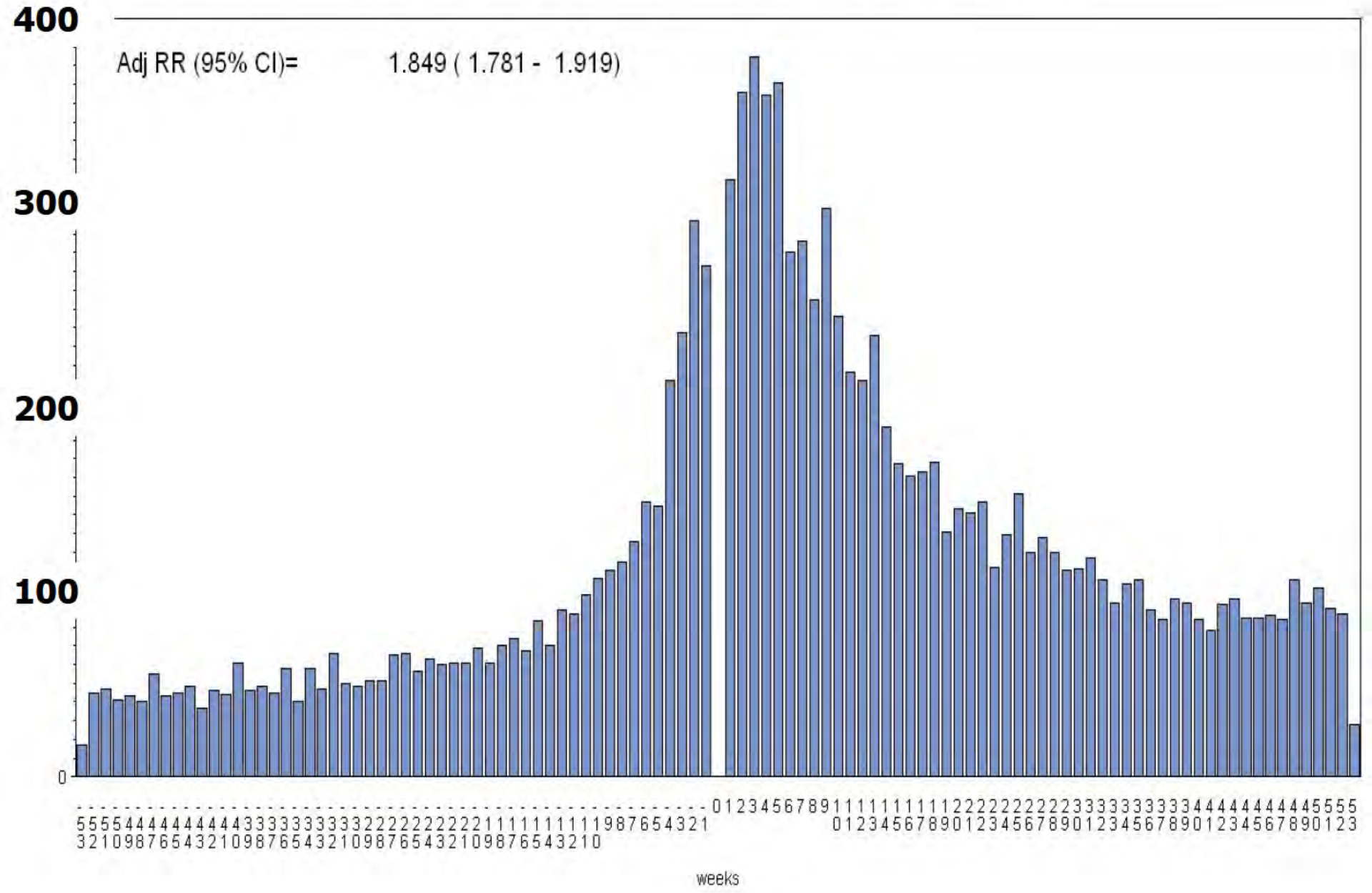
PSSA NSAIDs Frusemide 2001 - 2009

Non-causal Group (Frusemide --> NSAIDs) Causal Group (NSAIDs --> Frusemide)



PSSA Ca_Channel Frusemide 2001 - 2008

Non-causal Group (Frusemide --> Ca_Channel) Causal Group (Ca_Channel --> Frusemide)

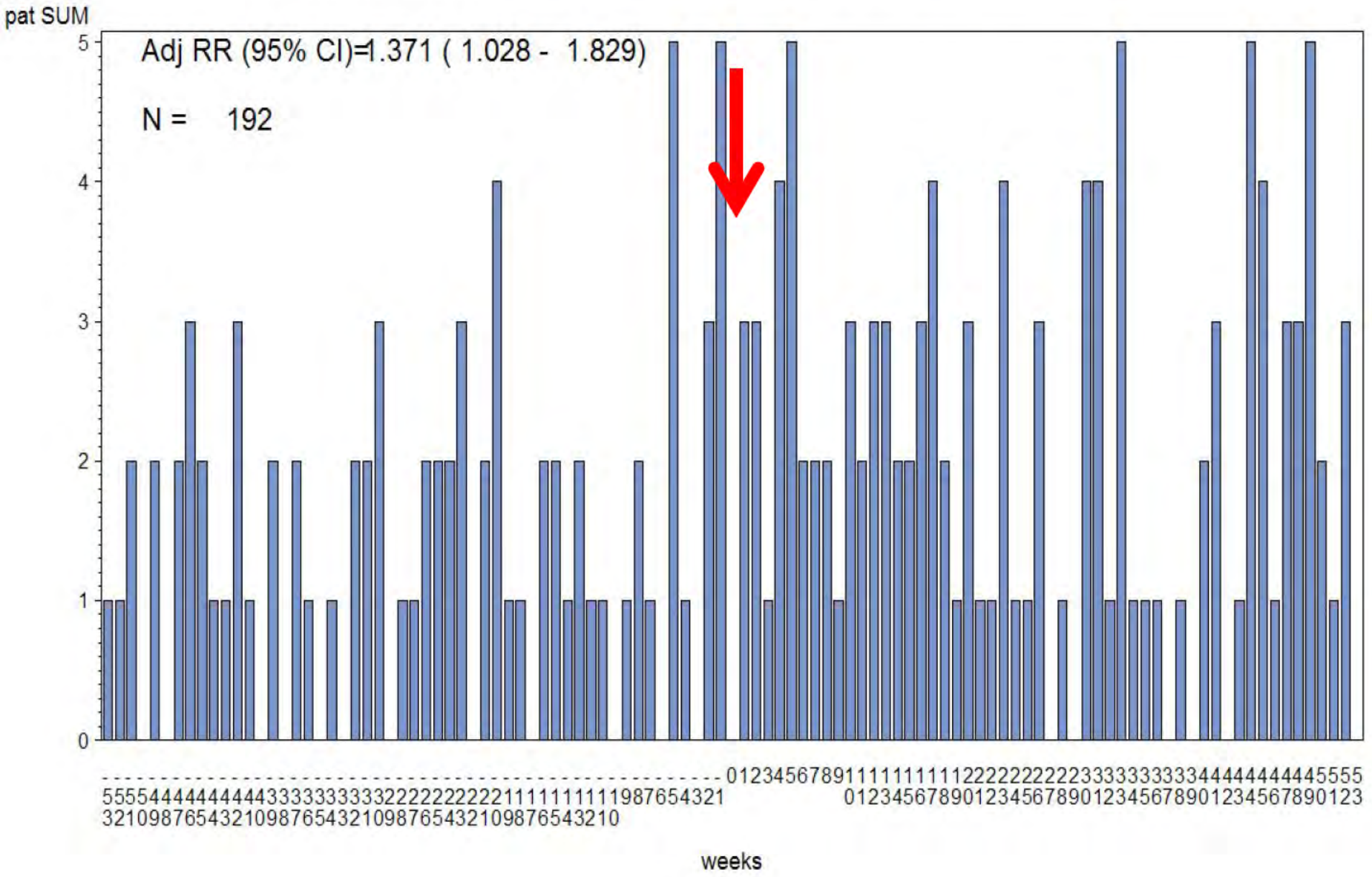


How might this help safety monitoring?

- Consider rofecoxib listing: Vigor study
  - *"Myocardial infarctions were less common in the naproxen group than in the rofecoxib group (0.1% vs. 0.4%; 95% CI for the difference, 0.1 to 0.6%; relative risk, 0.2; 95% CI, 0.1 to 0.7)"*
- Was this because naproxen was cardioprotective?
  - *"Naproxen inhibits the production of thromboxane by 95% and inhibits platelet aggregation by 88….. therefore, the effects of regular use of naproxen may be similar to those of aspirin.*

PSSA Naproxen MI 2000 - 2006

Non-causal Group (MI --> Naproxen) **Causal Group (Naproxen --> MI)**

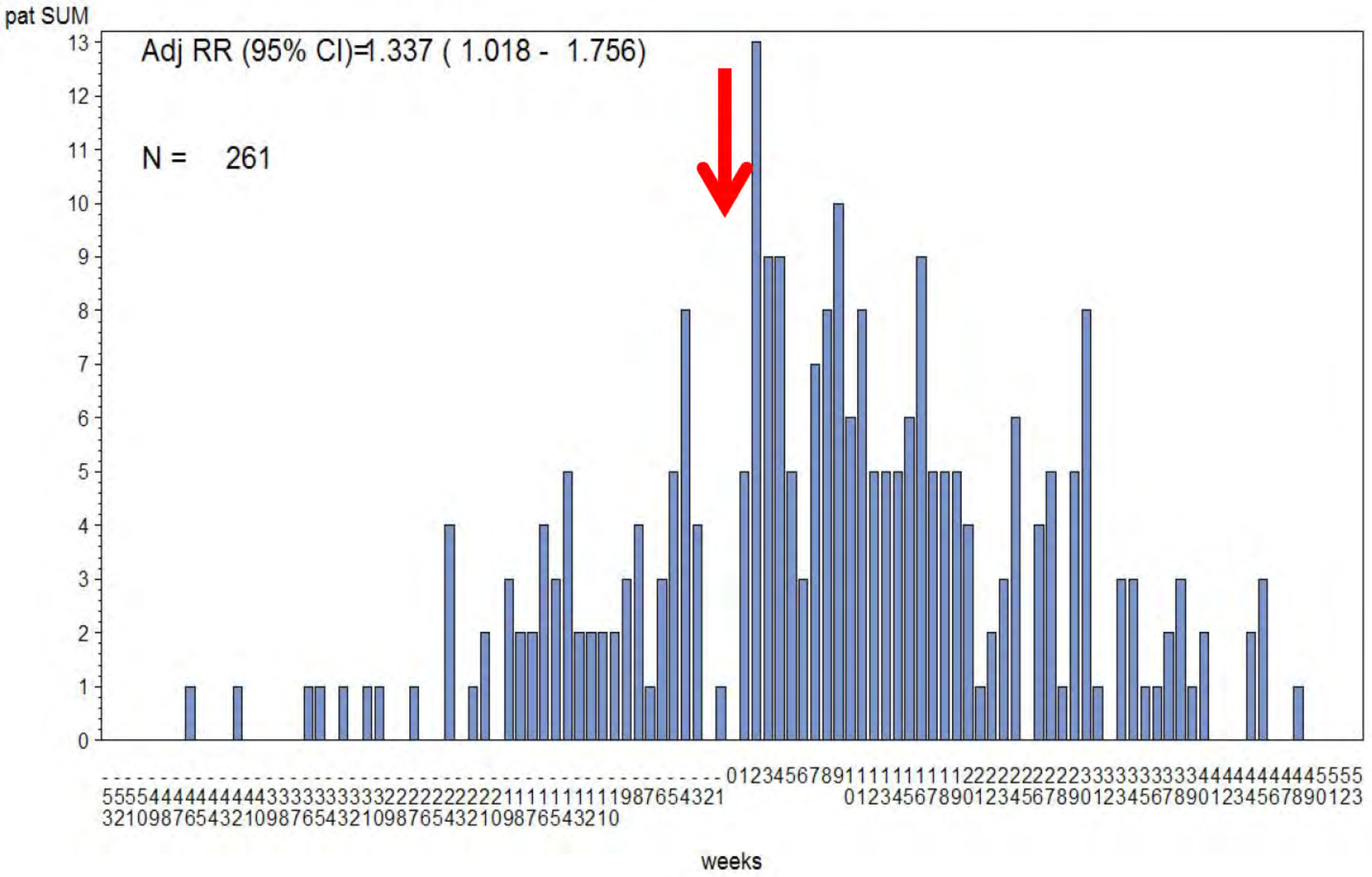


One year after marketing what did rofecoxib show?

University of South Australia | Sansom Institute

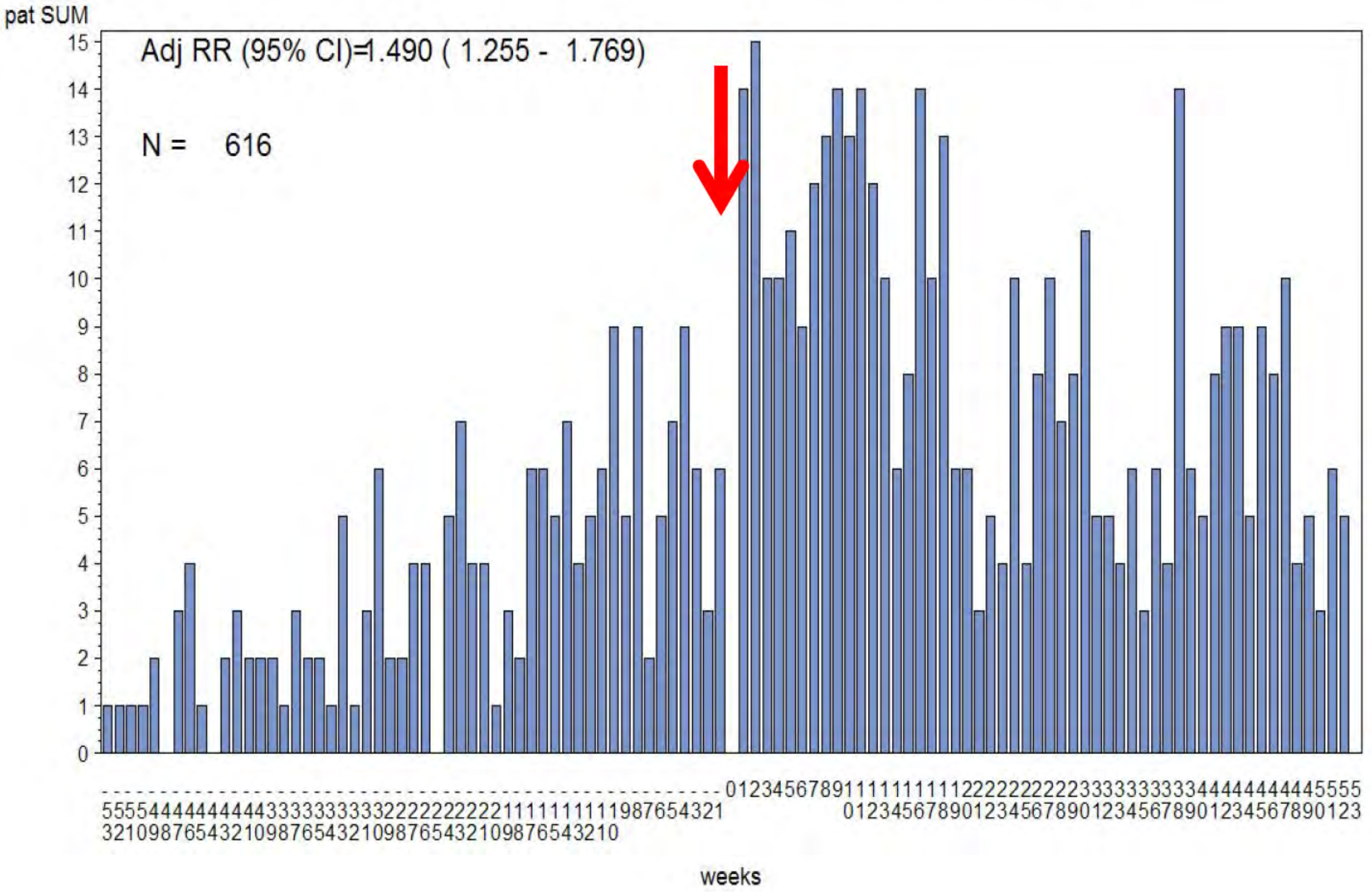
PSSA Rofecoxib MI 2001 - 2001

Non-causal Group (MI --> Rofecoxib) **Causal Group (Rofecoxib --> MI)**



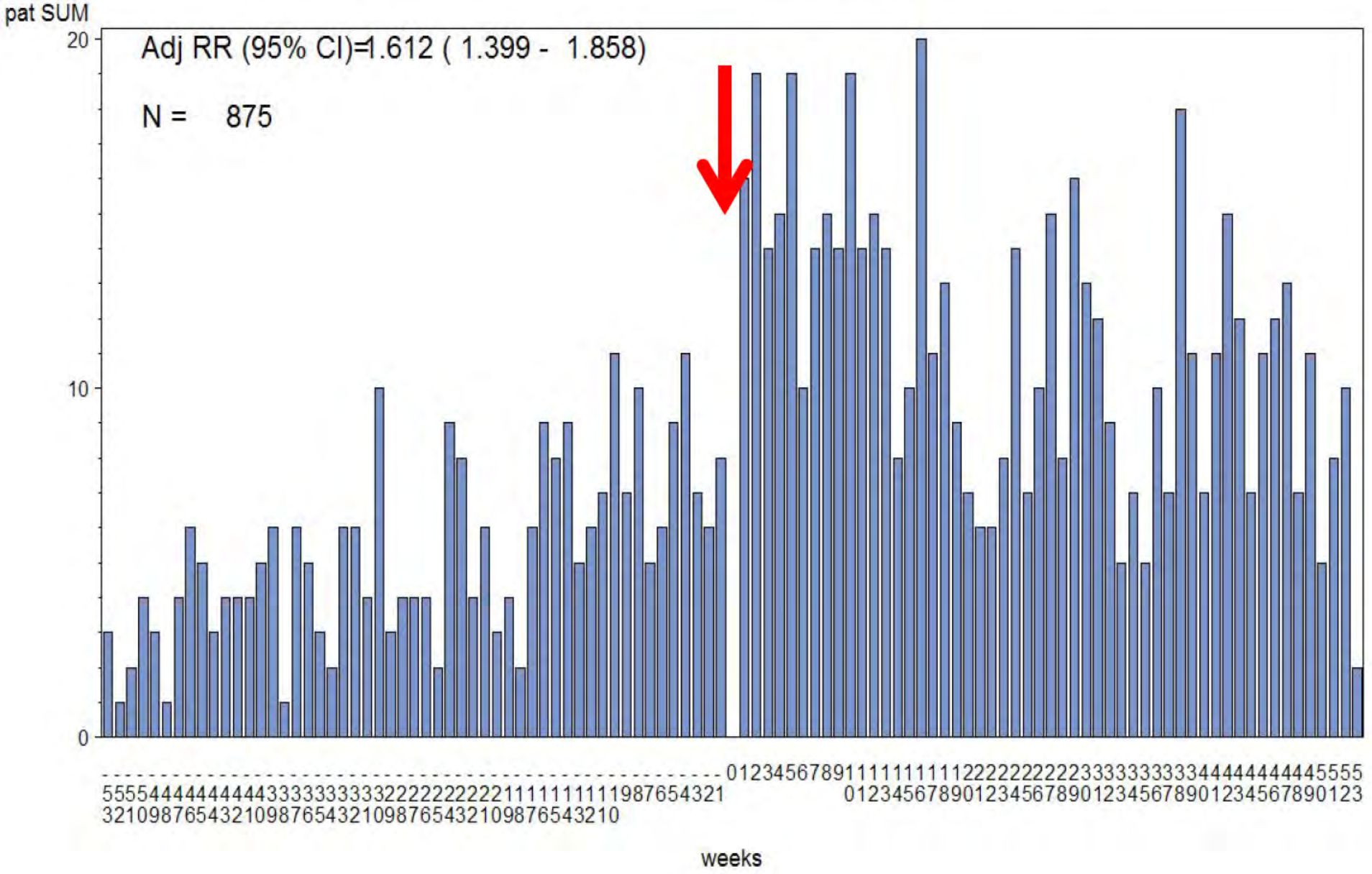
PSSA Rofecoxib MI 2001 - 2002

Non-causal Group (MI --> Rofecoxib) **Causal Group (Rofecoxib --> MI)**



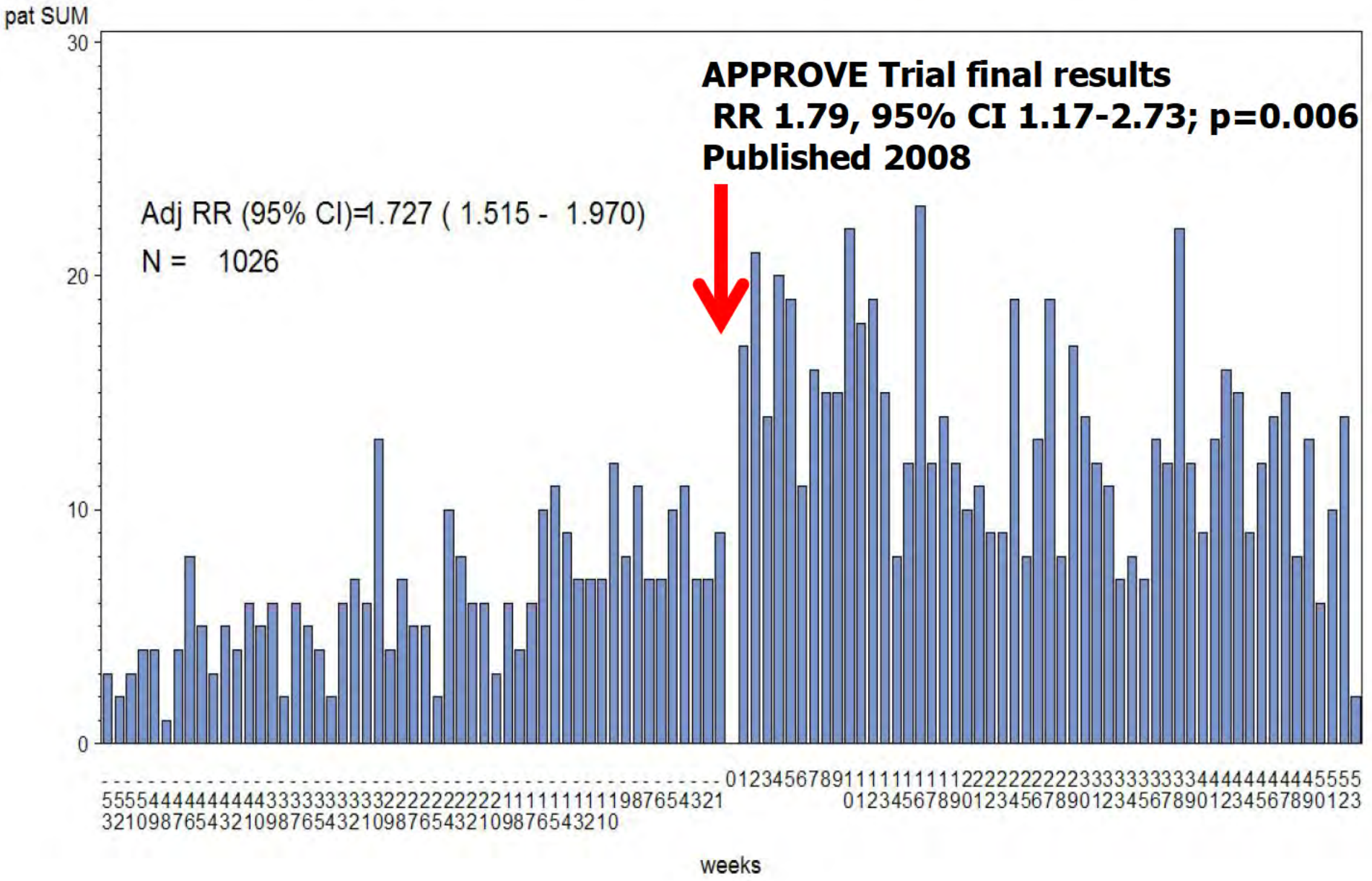
PSSA Rofecoxib MI 2001 - 2003

Non-causal Group (MI --> Rofecoxib) **Causal Group (Rofecoxib --> MI)**



PSSA Rofecoxib MI 2001 - 2004

Non-causal Group (MI --> Rofecoxib) Causal Group (Rofecoxib --> MI)

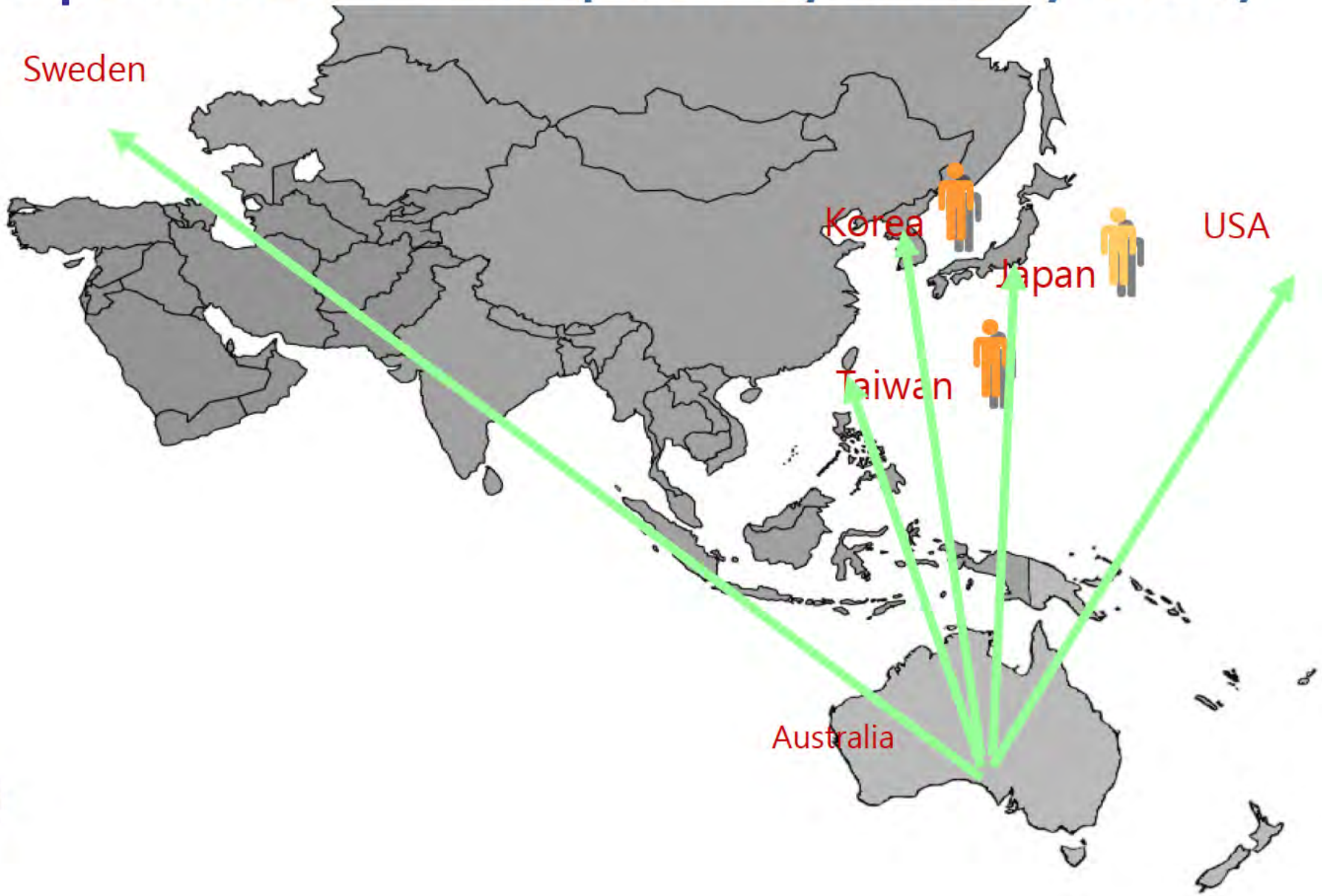


Caution

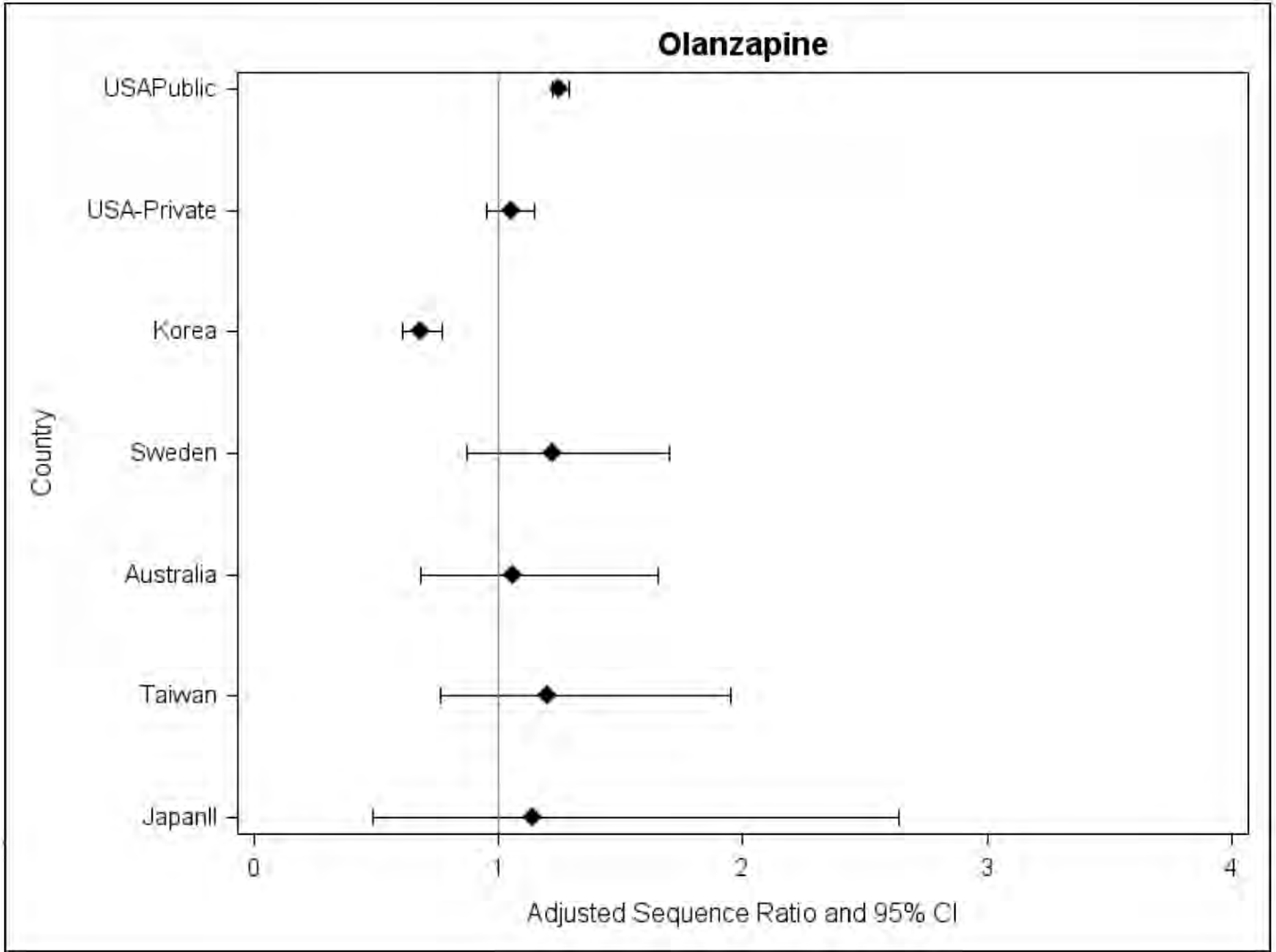
- Interpretation requires reading the graph and the statistic
- Criteria for use need to be developed
- Only suitable for acute events
- Not suitable where medicine initiation associated with the event (eg medicines commonly initiated in hospital for the condition under study)
- Likely to be more useful for exploratory hypothesis driven testing than data mining

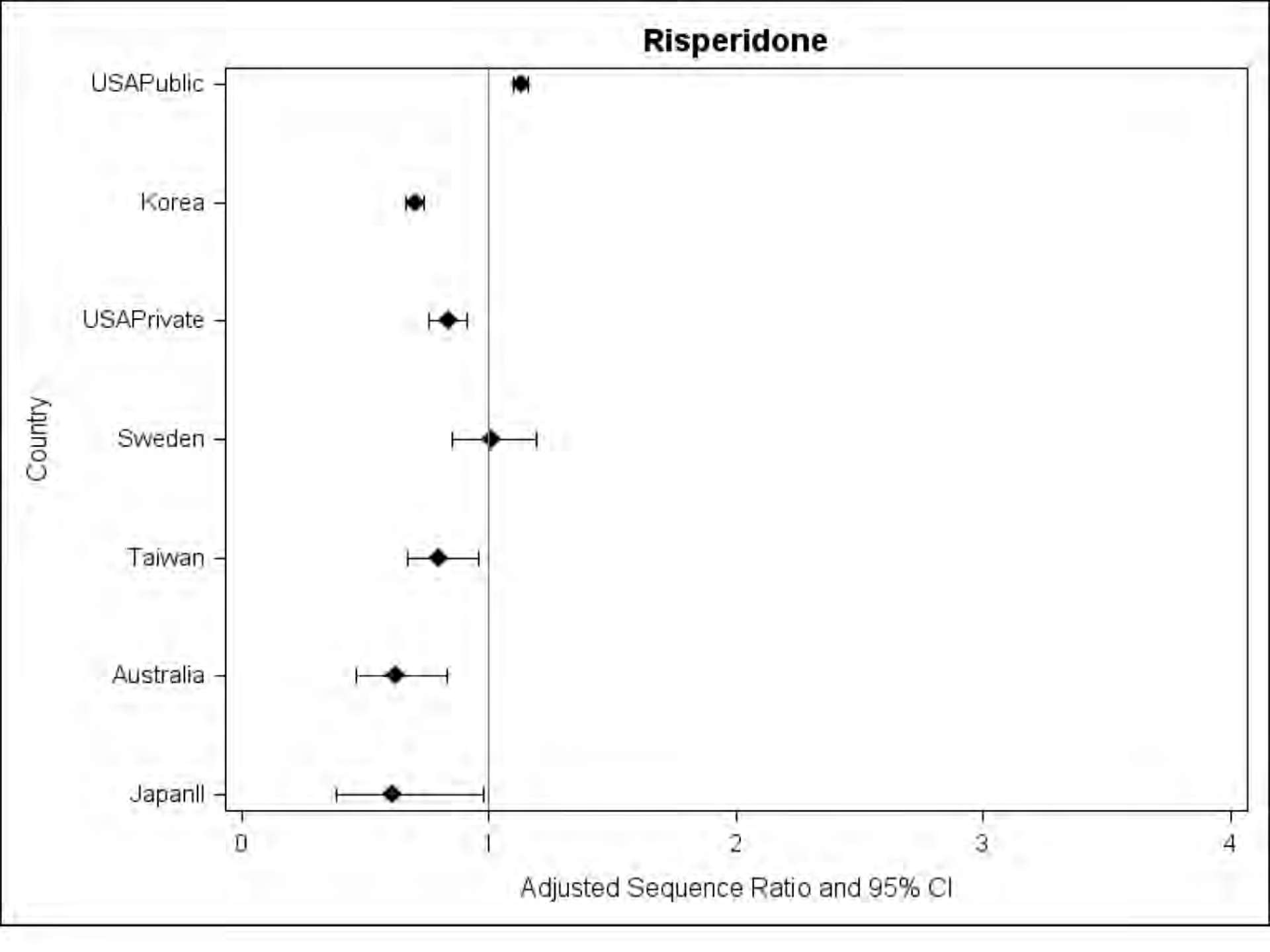
- The method is amenable to a distributive network model making multi-country or global surveillance possible

The AsPEN Prescription Symmetry study



Country:	Group covered	Population	start date	end date
Australia	Australian veterans and dependants	300,000	2001	2010
Japan (I)	Workers and family members of six health insurance unions operated by large firms	330,000	2005	2009
Japan (II)	Patients who visited Hamamatsu Medical hospital from 1999	200,000	1999	2010
Korea	Entire country.	50 million	2001	2010
Sweden	Entire country	9 million	2005	2009
Taiwan	Entire country	23 million	1997	2008
USA (II)	Medicaid eligible individuals.	87 million	2001	2005
USA (III)	Privately insured individuals from > 150 contributing employers and health plans.	51 million	2001	2007


Olanzapine
USAPublic
USA-Private
Korea
Sweden
Australia
Taiwan
JapanII
Country
0
1
2
3
4
Adjusted Sequence Ratio and 95% CI


Risperidone
USAPublic
Korea
USAPrivate
Sweden
Taiwan
Australia
JapanII
Country
0
1
2
3
4
Adjusted Sequence Ratio and 95% CI

- The future will require engagement with all stakeholders involved in quality use of medicines
- Proactive monitoring will become more important
- We must develop mechanisms to exploit all the potential opportunities for informing safety

UniSA | Sansom Institute for Health Research

Veterans' MATES

Personalising care for patients with dementia to encourage use of non-pharmacological strategies

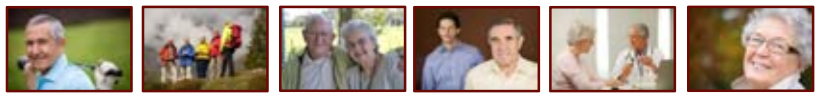
Natalie s 47F Kerrie s 47F Anna s 47F Jemisha s 47F
Mhairi s 47F Nicole L. s 47F Lisa M. s 47F s 47F
Vanessa T. s 47F John D. s 47F Elizabeth E. s 47F






What is Veterans' MATES?

- Veterans' MATES (Veterans' Medicines Advice and Therapeutics Education Services) provides tailored information on a quarterly basis for veterans and their health professionals with the aim of improving medicine use.
- Administrative claims data are used to provide direct patient-based feedback to GPs regarding medicines dispensed to their veteran patients.
- The national program is evaluated using surveys provided at the time materials are distributed, as well as observational studies using administrative claims data.



Aim: to reduce antipsychotic use in patients with dementia (August 2016)

The TOP5 program

- Developed by the Central Coast Local Health District, NSW to improve communication between the clinician and the carer.
- Implemented in 21 NSW hospitals by the Clinical Excellence Commission.
- Results indicated clinicians had increased confidence in caring for patients with dementia, carers and clinicians reported less agitation, and evidence of a reduction in the use of antipsychotic medicines.

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic Brief

www.veteransmates.net.au

Antipsychotic use in BPSD: limited benefits, high risks

Behavioural and psychological symptoms of dementia (BPSD), often referred to as 'behaviours of concern', are common in people with dementia.[1-3] They can be distressing and difficult to manage.

Common behaviours of concern that respond poorly to treatment with an antipsychotic include verbal disruptions, disinhibited behaviours, wandering, pacing, sleep disturbances and repetitive behaviours.[1,4] Despite their limited benefits and potential to cause significant harm, antipsychotics are being used for these wider behaviours of concern. An antipsychotic is only indicated for psychotic symptoms or severe and persistent agitation or aggression that is unresponsive to non-pharmacological interventions in people with Alzheimer's dementia.[3-7]

The Therapeutic Goods Administration, in August 2015, limited the indication of risperidone to 'treatment up to 12 weeks of psychotic symptoms, or persistent agitation or aggression unresponsive to non-pharmacological approaches in people with moderate to severe dementia of the Alzheimer's type' because of the increased risk of cerebrovascular adverse events, especially in patients with vascular or mixed dementia. Risperidone is no longer indicated for vascular or mixed dementia.[8] None of the other antipsychotics have indications for use in dementia.[9]

Debilitating effects of antipsychotic use can include increased sedation and confusion, cognitive decline, constipation, urinary retention, hypotension and extrapyramidal effects including parkinsonism.[8] Older people with dementia are particularly at an increased risk of falls and hip fracture, pneumonia, transient ischaemic attacks and stroke.[8-11] Antipsychotic use is also associated with an increased risk of death with long-term use in people with dementia.[10]

This therapeutic brief highlights the importance of:

- addressing environmental, physical and psychosocial factors to reduce BPSD before considering an antipsychotic
- initiating an antipsychotic only in select patients after a risk/benefit analysis has been undertaken and
- limiting the duration of an antipsychotic, with a plan to cease as soon as is clinically appropriate.

The Therapeutic Goods Administration, in August 2015, limited the indication of risperidone to 'treatment up to 12 weeks of psychotic symptoms, or persistent agitation or aggression unresponsive to non-pharmacological approaches in people with moderate to severe dementia of the Alzheimer's type'

In

prescribing an

Ceasing the antipsychotic

Family and carers need support too

Key points

- Personalise care and utilise non-pharmacological approaches to prevent or minimise BPSD
- Avoid using an antipsychotic as a first-line treatment for BPSD except in circumstances of severe distress or risk of self-harm
- Consider each person's individual circumstances, including risks in relation to benefits, before prescribing an antipsychotic for BPSD
- In consultation with your patient (if possible), family, carers and staff establish a safe way to taper and cease the antipsychotic

Carer's brochure included TOP 5 tips

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Share your practical tips

Research from the TOP5 program has shown that writing down and sharing up to five important tips such as those listed below, can help others to support and care for a person with dementia[1]

- Situations that might cause distress and what could help
- When the person is unsettled, the words or actions likely to help calm and settle them
- Routines and rituals that are reassuring
- Signs that indicate the person needs or wants something
- Names and photos of family, friends or pets that are important to the person
- Personal preferences for enjoyment such as music, radio, reading or gardening.

Think about the most important tips that will help others give reassuring and familiar care. Use the reverse of this page to write these down. Provide the 'why', followed by your practical tip and what will happen when this is followed (see examples).

Example 1

Background/why:
Ken was a fireman for forty years.

Practical tip:
If Ken hears an alarm or loud ringing he will become distressed. Let him know that the car has been sent.

What will happen when followed:
Ken will calm down. Offer him a cup of tea and he will forget about the alarm.

Example 2

Background/why:
Mary has always prided herself on looking well presented.

Practical tip:
Ensure her hair is brushed and tell her she looks lovely today.

What will happen when followed:
Mary will be less anxious and more likely to engage with staff.

Give a copy to anyone who helps support and care for your family member or friend including:

- Residential aged-care workers, if living in aged-care
- Home help, community groups, day care facilities, or respite care, if living in the community
- Paramedics, if using an ambulance
- Admitting nurse, if the person has a hospital stay
- Doctors, pharmacists and any other health professionals involved in the person's care

1 Luxford K et al. Improving clinician-carer communication for safer hospital care: a study of the "TOP 5" strategy in patients with dementia. International Journal for Quality in Health Care 2015; 1-8.

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Date: / /

Carer's name:

Carer's Phone No: ( )

Getting to know: .....
NAME OF PERSON

Practical tips on how to comfort and support them[2]

Background/why:

Practical tip:

What will happen when followed:

Background/why:

Practical tip:

What will happen when followed:

Background/why:

Practical tip:

What will happen when followed:

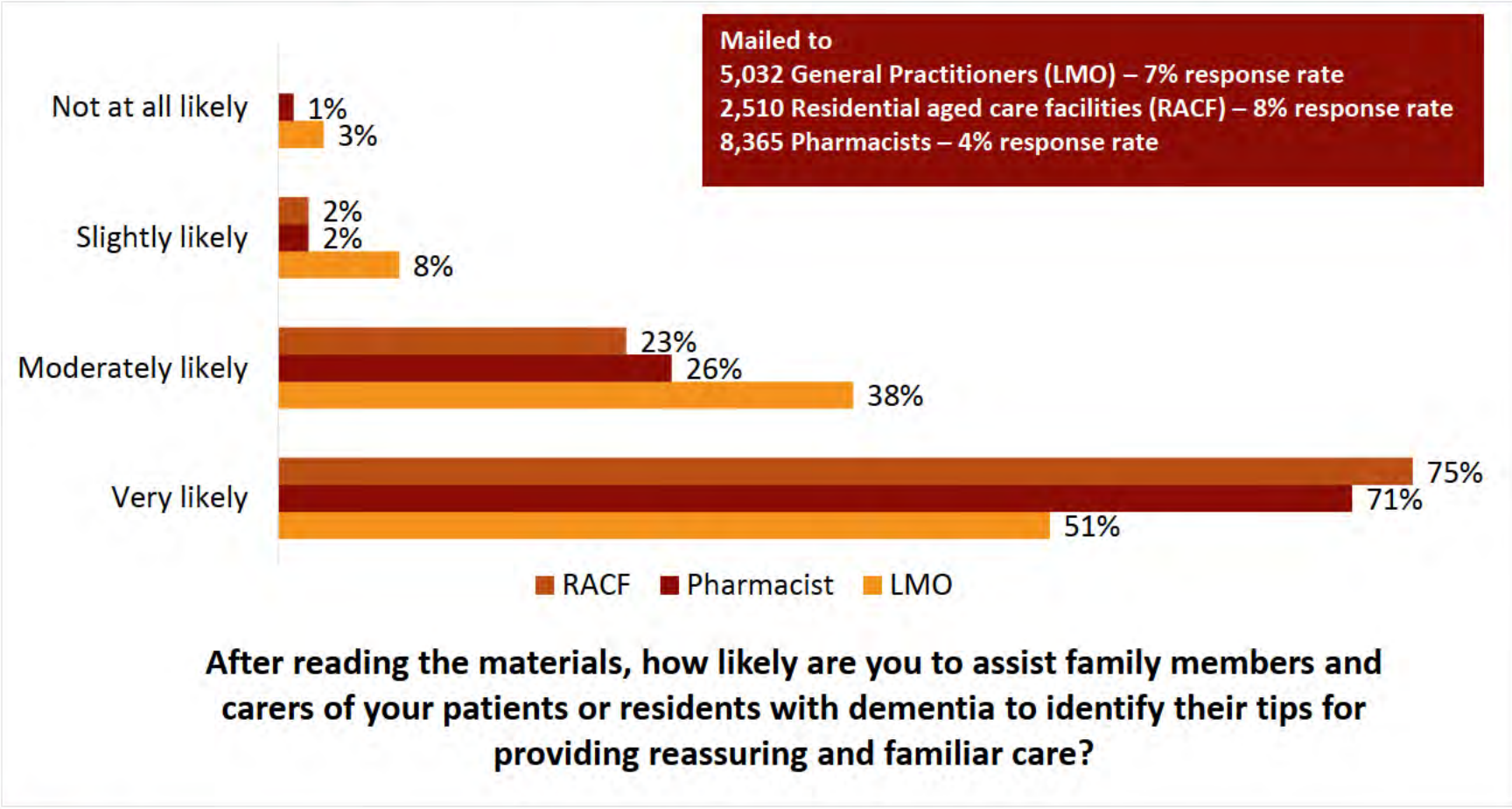
Background/why:

Practical tip:

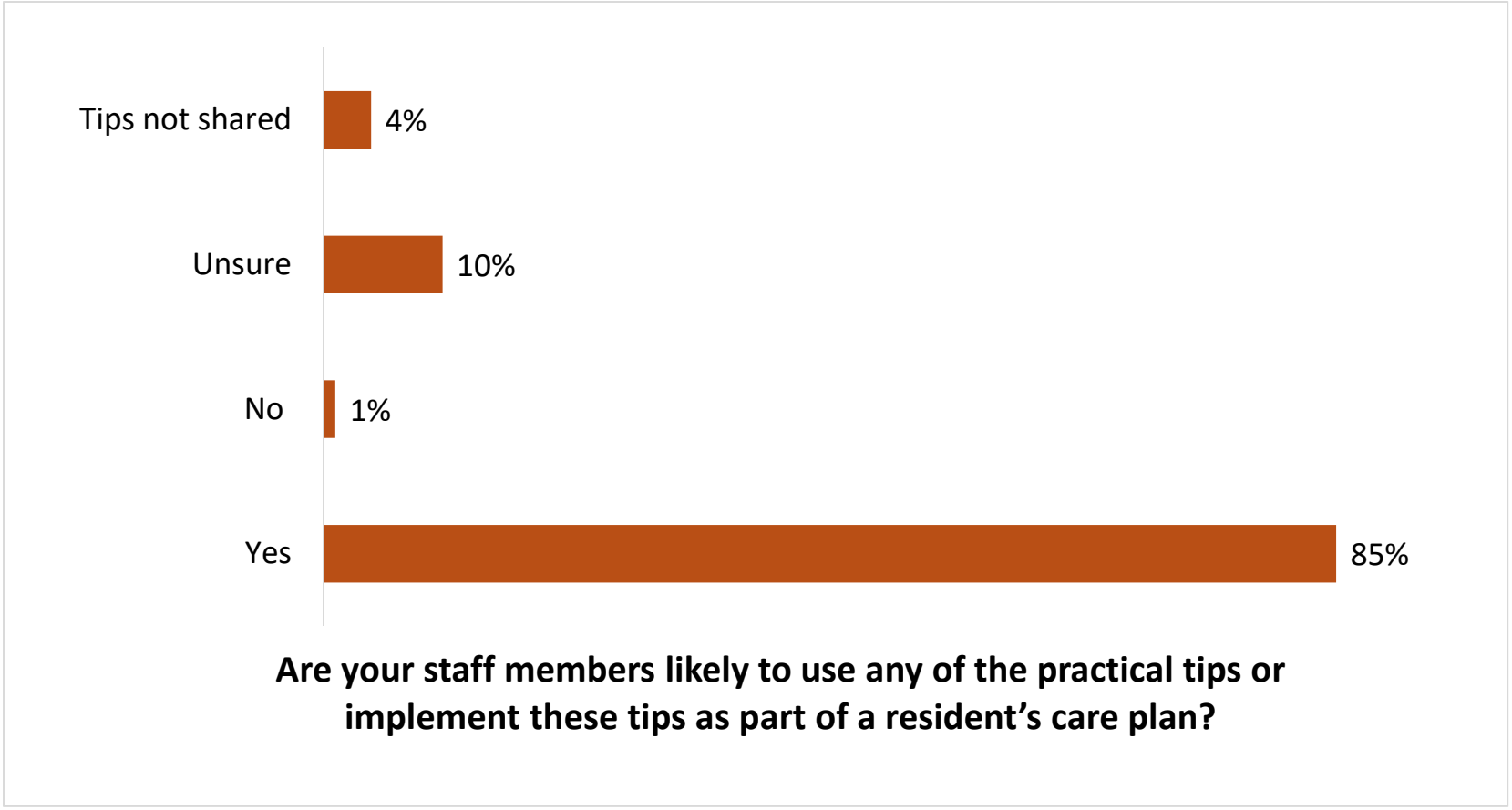
What will happen when followed:

2 This has been adapted from the TOP5 program developed by the Central Coast Local Health District, NSW. Further information for carers about the TOP5 program is available at http://www.cclhd.health.nsw.gov.au/patientsandvisitors/CarerSupport/top5/Pages/Carer-family.aspx

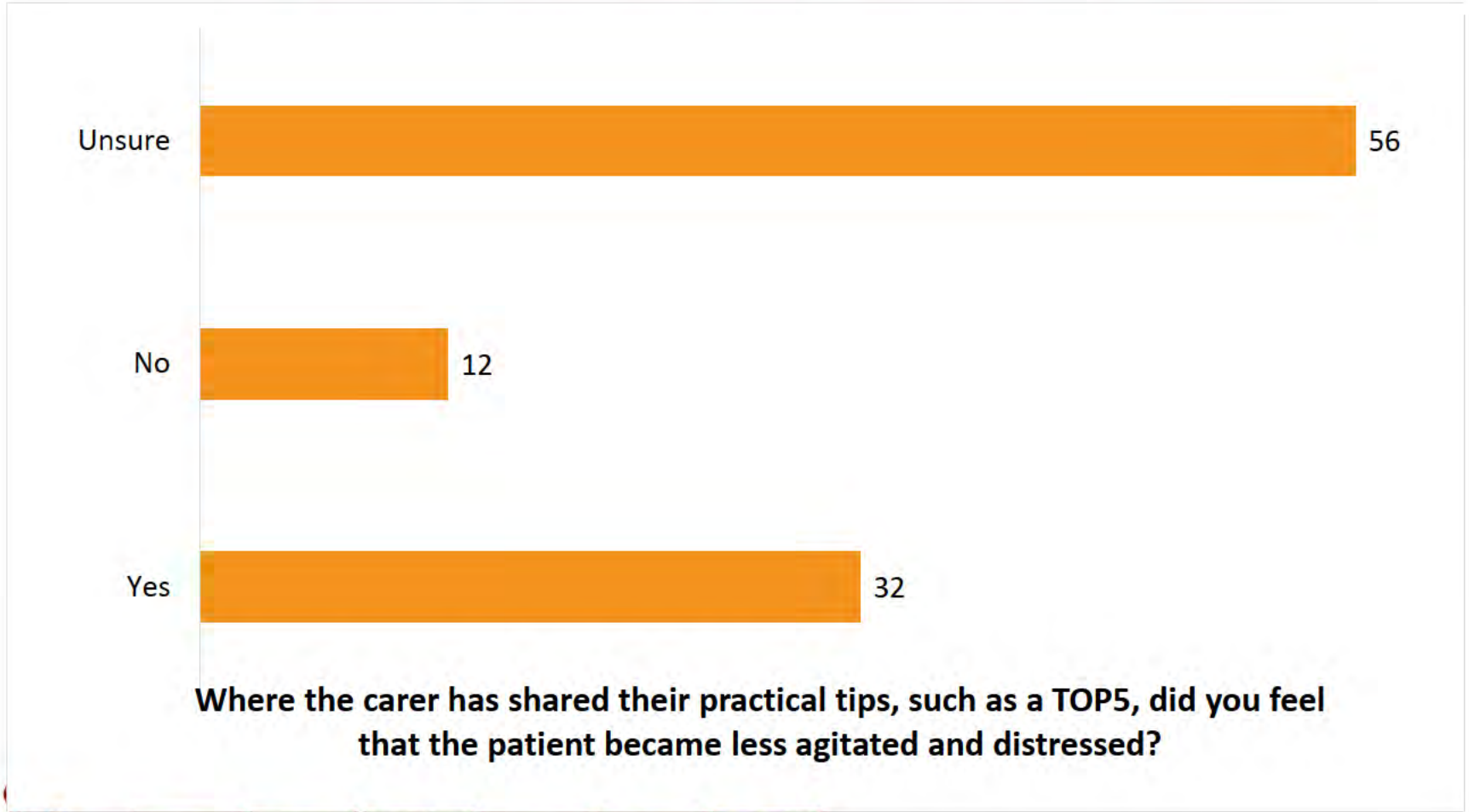
Over 90% of respondents indicated they were likely to assist family members and carers to identify their tips



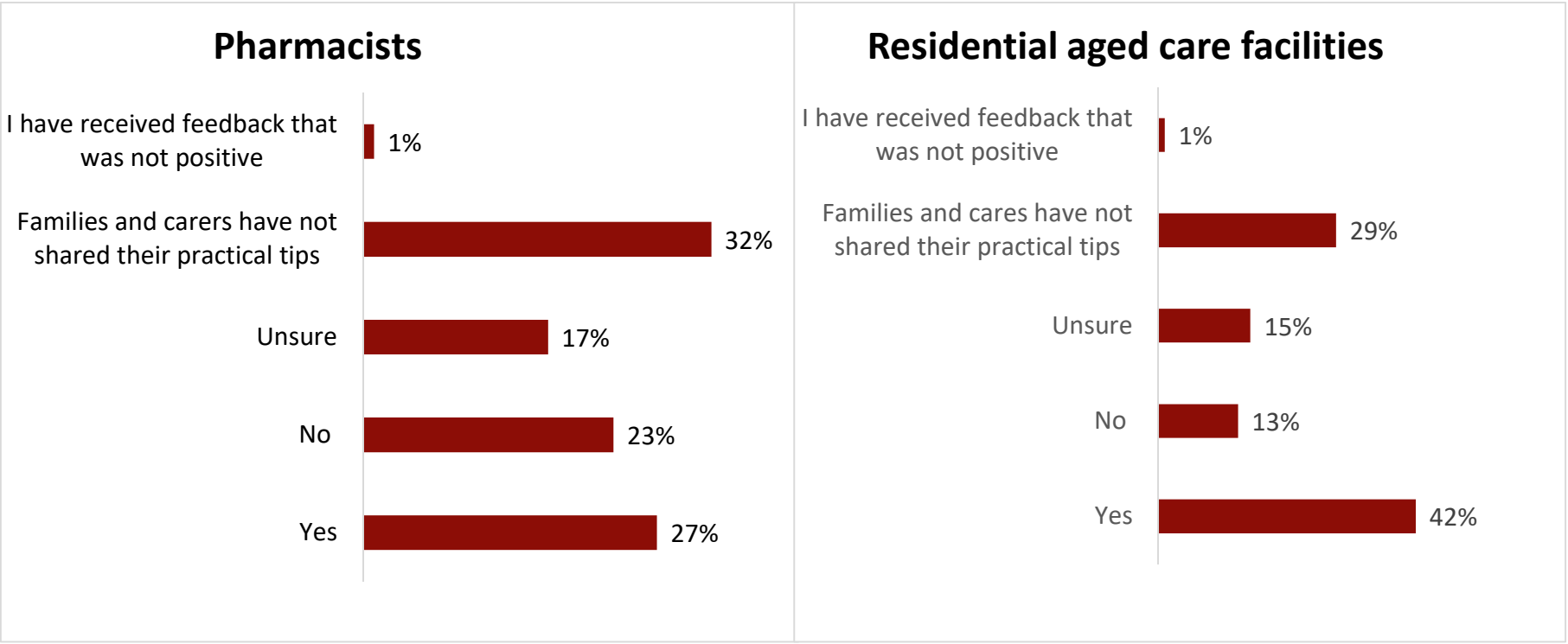
More than three quarters of aged care facility respondents indicated that their staff members were likely to implement tips as part of a resident's care plan



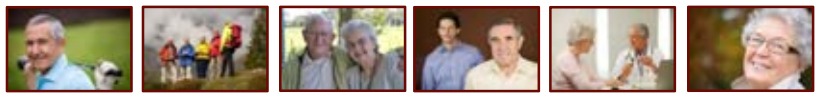
Over 30% of GPs felt their patient had become less agitated following the provision of tips



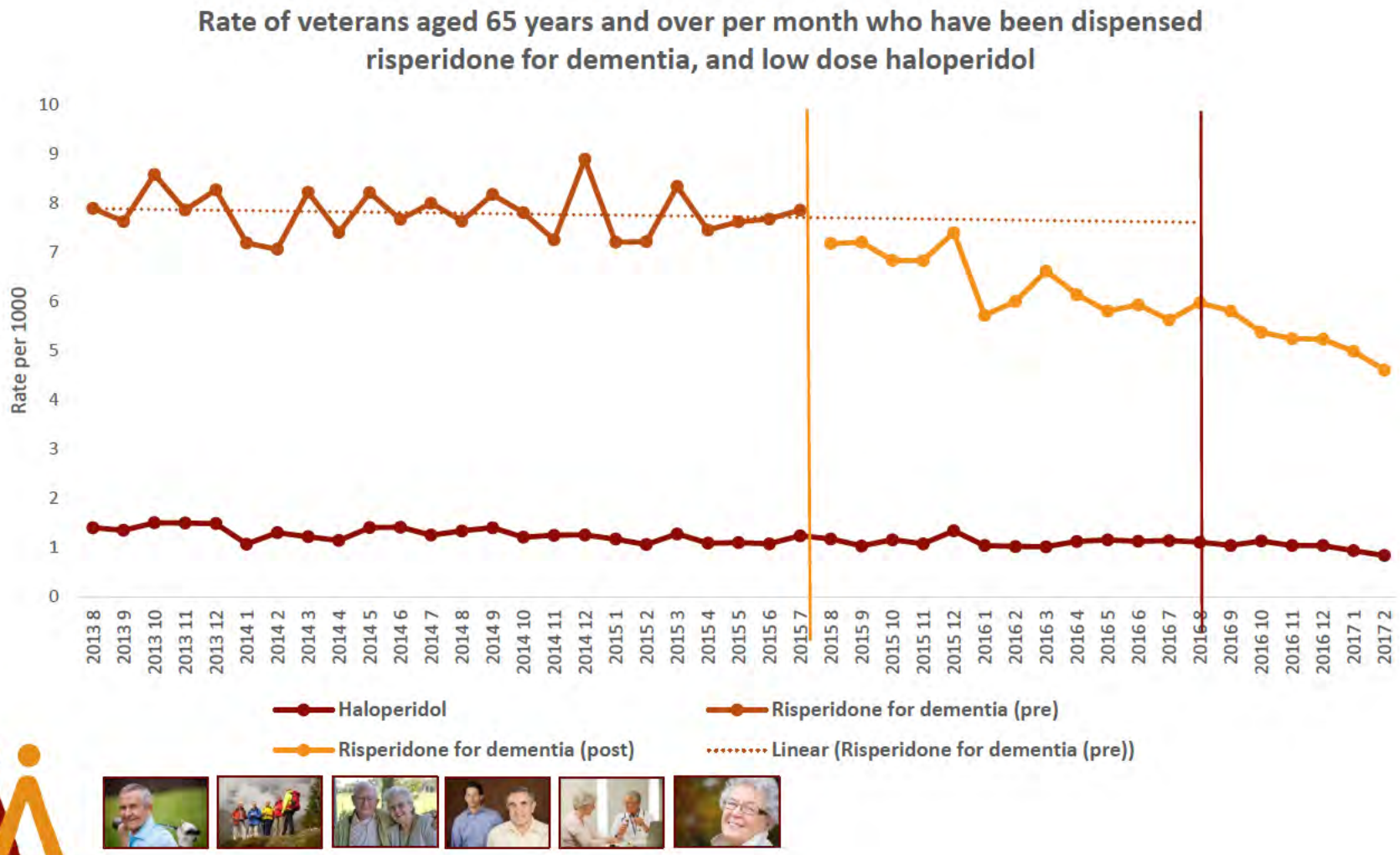
Pharmacist and aged care facilities indicated they had received positive feedback from families and carers regarding sharing of their practical tips



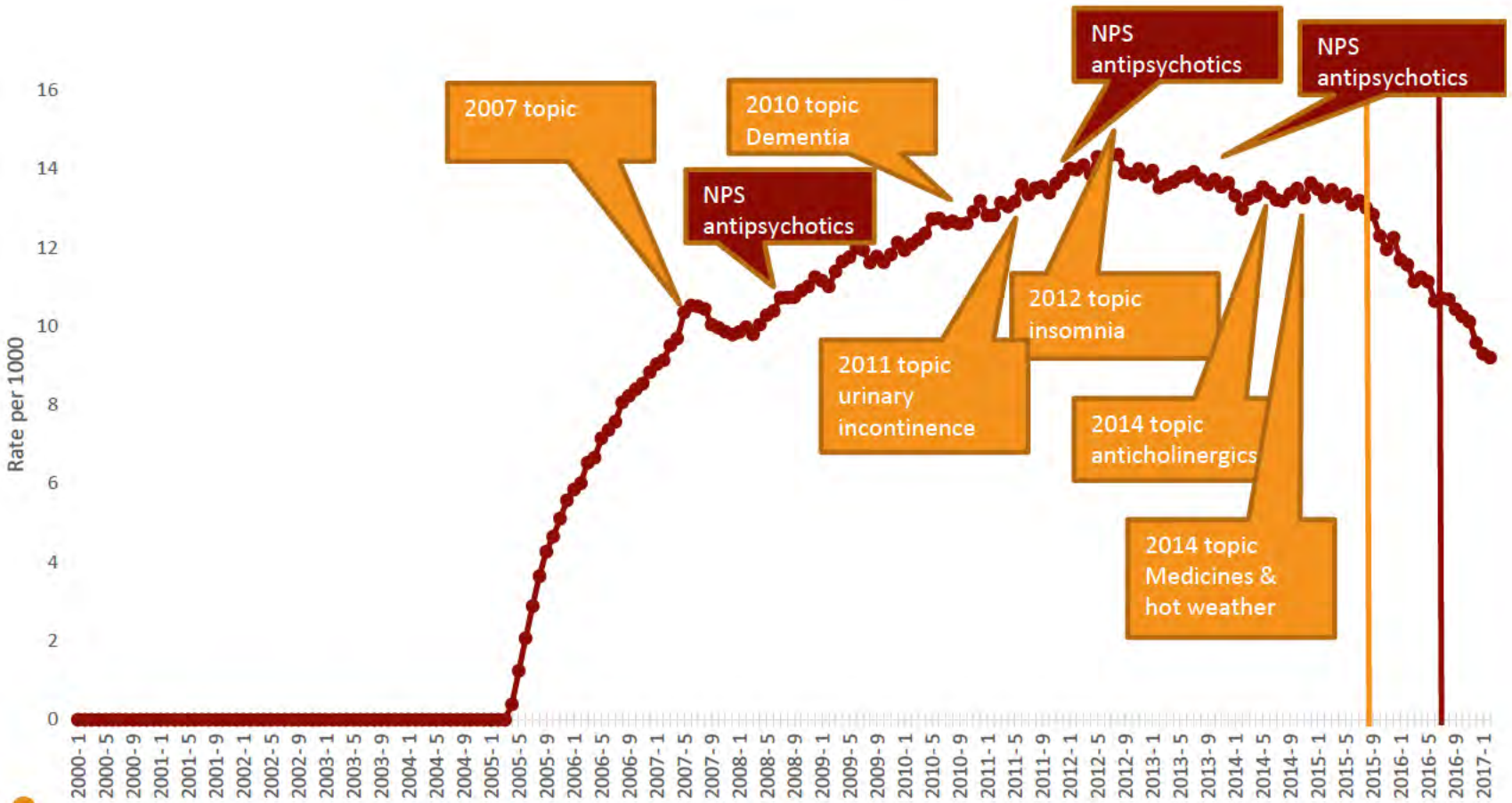
Have you received any positive feedback from families and carers regarding how helpful they have found either identifying or sharing their practical tips to personalise care for their loved one?



Risperidone use in dementia is declining



Rate of veterans dispensed risperidone for dementia



Conclusion

- Encouraging family members and carers to identify their tips for providing personalised care, was well received by both carers and health professionals.
- There has been a subsequent decrease in the use of antipsychotic medicines following the intervention.

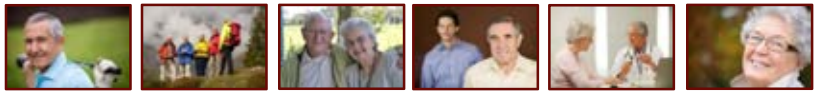
Veterans' MATES
An enterprising partnership improving medication safety






Veterans' MATES

- It is a data driven health promotion program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.



We use the Australian Government Department of Veterans' Affairs routinely collected health claims data to

- **Identify potential problems for veterans**
- **Develop the medication list for the doctors**
- **Evaluate each intervention**

1 BILLION

Contains over half a billion health claims records

10 YEARS

More than ten years of historical health data

Contains hospital records including diagnosis and procedures

Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

The approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material are sent to members of the veteran community for whom the health topic is relevant.

UNSTEADY ON YOUR FEET? TALK TO YOUR GP

Being unsteady on your feet can be worrying, particularly if you have fallen in the past. You might feel that there is nothing that can be done to help and that it's just one of those things that happen as you get older. By talking to your GP and working through things together, small changes can be made to help keep you steady on your feet and reduce your chance of having a fall.

Dr Name
Patient Name; date of birth
Address

GENDER: Female	ACCOMMODATION: Residential care

Medicine	Medicine class	Last Dispensed	Other Prescriber
Sertraline (Eleva 100) tab 100mg	SSRI	03/02/18	Yes
Oxycodone hydrochloride (OxyNorm) Cap 10mg	Opioid	20/02/18	No

Received medicines indicating osteoporosis:	Yes
Number of hospitalisations associated with a fall in last year:	2
Medicines Review (HMR or RMMR) claimed:	None claimed in last two years

Patient dispensed a combination of medicine classes that doubles the risk of falls and hip fractures

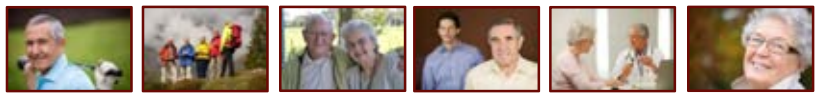
Consider the following:

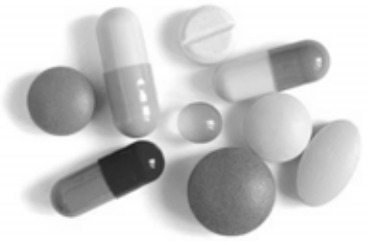
- Ask the patient how steady they feel on their feet or if they have previously fallen Yes ☐
- Review medicines to see if any are suitable for tapering or ceasing Yes ☐
- Ask the patient if they would consider reducing the medicine Yes ☐
- Plan a reduction strategy and address other risk factors for falls Yes ☐
- Would the patient benefit from a Medicines Review (HMR or RMMR) Yes ☐

*An electronic PDF version of each individual patient's information is available at www.veteransmates.net.au

The educational material is tailored to identified problems and the process includes significant partnership

- A practitioner reference group and a veteran reference group meet twice yearly to provide advice
- Materials written by a medical writer supported by clinical reference group
- Peer-reviewed prior to publication
- Endorsed by a national, representative editorial committee
- DVA provide a national call centre staffed by pharmacists for veterans and health care practitioners to provide additional support



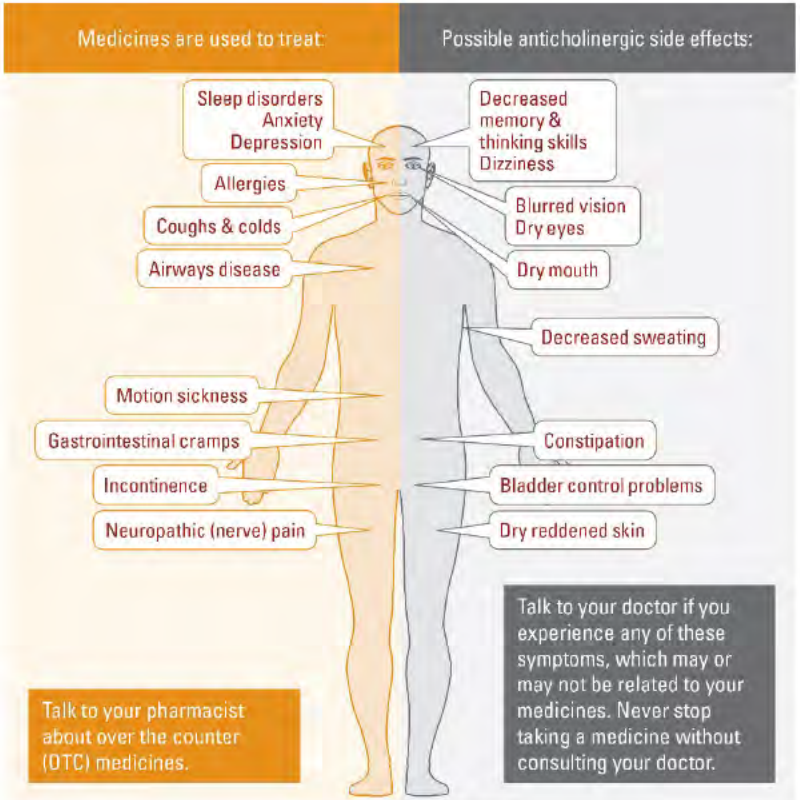


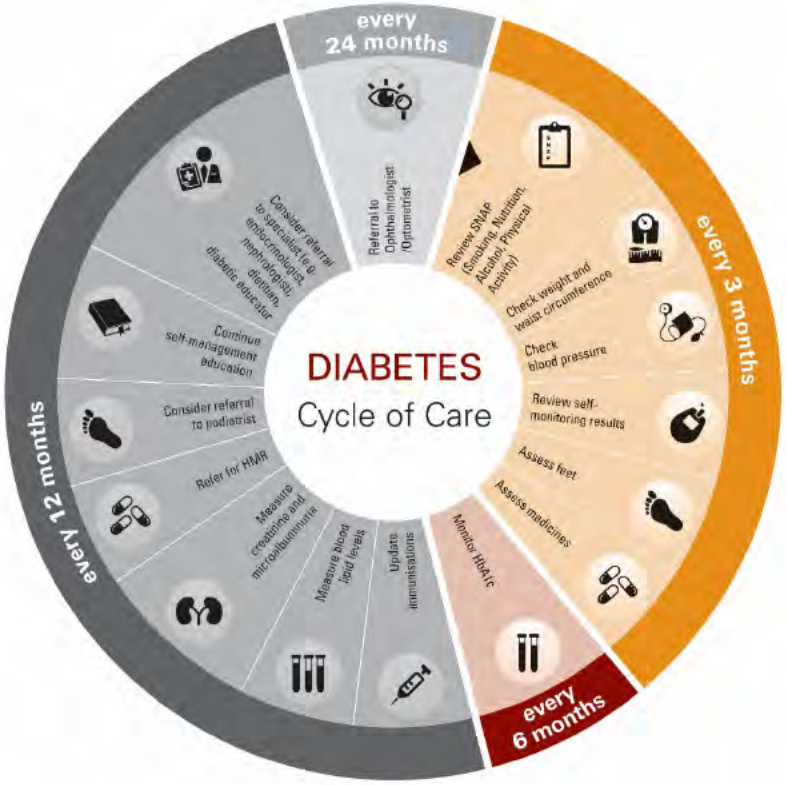
The importance of partnership

- The Australian Federation of Totally & Permanently Incapacitated Ex Servicemen & Women (TPI)
- Australian Veterans' and Defence Services Council
- Returned & Services League – National & State
- Vietnam Veterans' Federation of Australia
- Vietnam Veterans' Association of Australia
- Australian Peacekeepers & Peacemakers Association
- War Widows' Guild of Australia
- The Partners of Veterans Association Inc
- The Defence Force Welfare Association
- Airforce Association Ltd
- Mates for Mates
- Naval Association of Australia

To date 57 topics delivered reaching on average:

- 40,000 veterans
- 10,000 GPs
- 8,500 pharmacies and accredited pharmacists
- 2,600 Directors of Care, Residential Aged Care Facilities





Each topic is either:

- Disease specific e.g. neuropathic pain, diabetes
- Medicine specific e.g. statins, antipsychotics
- Or about service delivery e.g. bone density tests, care planning

So what happens?

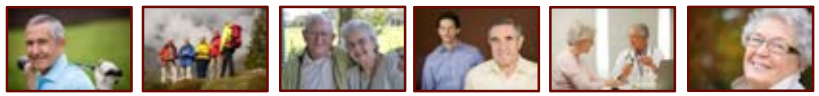
- Osteoporosis
- Pain management

Improving osteoporosis management:

The planning stage

Identifying the problem: detection

- We assessed use of bone mineral density tests among older men and women
  - Less than 10% of women and men 80 years or over had had a bone mineral density test in the previous 5 years
  - Only 2% of older men and 10% of older women on medicines for osteoporosis, while up to 50% in the oldest age groups may have osteoporosis

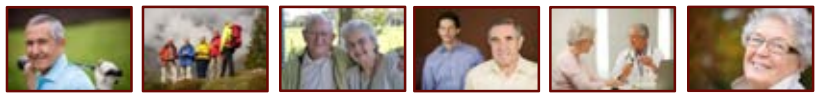


Improving osteoporosis management:

The planning stage

Identifying the problem: falls and fracture

- We assessed patients admitted to hospital for hip fracture
  - 1 in 6 women and 1 in 5 men had had a prior fracture but were not on medicines for osteoporosis
  - 1 in 15 were on corticosteroids and no medicines for osteoporosis
  - 84% on at least 1 medicine that increases risk of fall
  - 50% on 2 or more medicines that increase risk of falls
    - 1 in three were dispensed an antidepressant
    - 1 in four a benzodiazepine
    - 1 in ten an antipsychotic



Leach et al., JPPR; 2013

Kalisch et al., 2012

Reducing the risk of falls & hip fractures

- Our fracture and falls prevention topics were implemented to assist appropriate medicine use and reduce risk of falls or fracture

Stopping osteoporotic fractures

In Australia, osteoporosis and osteopenia occurs in more than 66% of people 50 years and older.[1] Most people are not aware of their own fracture risk and most do not receive appropriate education, screening or management even after they have had a minimal trauma fracture (a fracture after falling from standing height or less).[2-5]

Most people at high-risk are NOT screened

79% MEN **54%** WOMEN

Most people are NOT aware of their fracture risk

60% UNAWARE

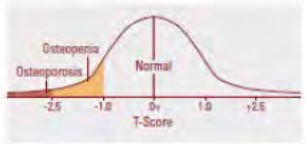
66% of people with osteopenia do not receive appropriate treatment

60% of people with osteoporosis do not receive appropriate treatment

70% of people with a prior fracture do not receive appropriate treatment

The mortality rate in the first 12 months after a hip fracture is 37% for men and 20% for women.[6] Vertebral fractures are associated with significant long-term disability, pain and kyphosis.[7] Early detection and appropriate treatment can reduce the risk of minimal trauma fractures in the future by as much as 70%.[7]

Discrepancies in information often make it unclear as to what is best practice for patients with osteoporosis or osteopenia. This therapeutic brief provides concise and practical information to help identify and treat high-risk patients to prevent a first or second minimal trauma fracture, and to help identify what is available for PBS and MBS reimbursement.



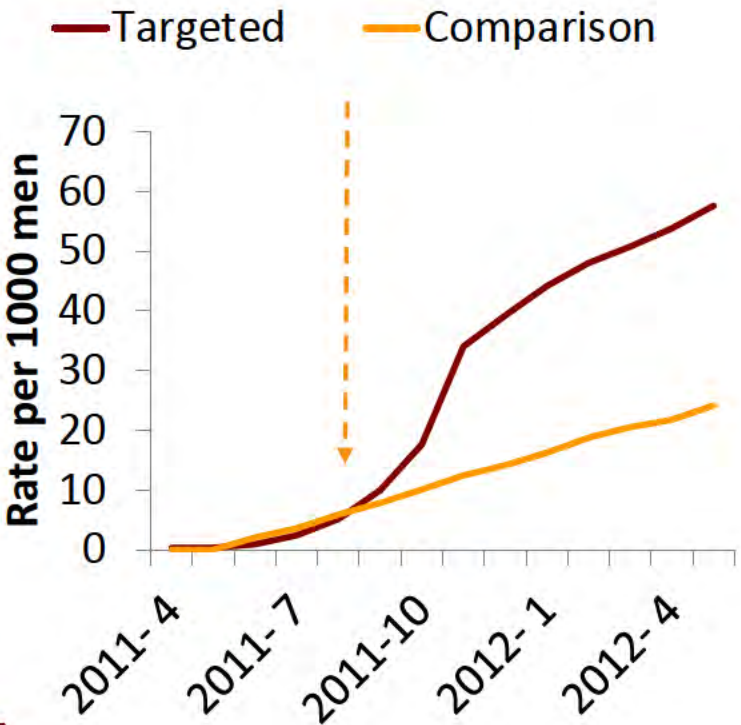
World Health Organisation **diagnostic criteria for osteoporosis, osteopenia and normal bone mineral density. Adapted with permission from *Osteoporosis Australia***

Reducing the risk of falls & hip fractures

What happened?

- ✓ 2.5 fold increase in bone mineral density tests to detect osteoporosis in women; 2.4 fold increase in men
- ✓ 40% relative increase in osteoporosis medicine use in men
- ✓ Similar rates in targeted women compared with older women

Rate of BMD testing (men)



Kalisch Ellett et al. Arch Osteoporos. 2017 Dec;12(1)

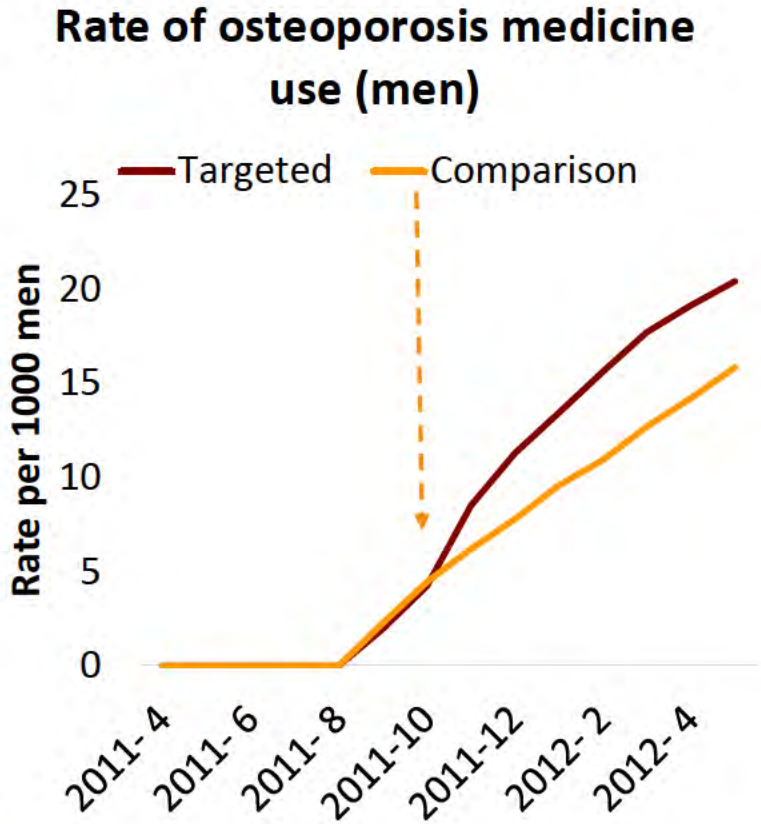
Reducing the risk of falls & hip fractures

What happened?

- 3871 additional veterans received tests for bone mineral density
- 25,832 additional patient months of treatment with medicines for osteoporosis

Health outcomes: Avoided,

- 80-150 fractures avoided^



Kalisch Ellett et al. Arch Osteoporos. 2017 Dec;12(1)

Pain management: Sep 2017

- Aim: To improve management and treatment of chronic pain
- Particular emphasis on referral to a psychologist and the explaining pain approach

Box 1. The Pain Catastrophising Scale (PCS)[14]

The PCS, a 13 item questionnaire that you can work through with your patient, can be completed in less than five minutes, and provides an insight into what your patient thinks about when they are in pain.[14]

A total score of 30 or more represents a clinically relevant level of catastrophising. If the score is high, consider referring your patient to a psychologist. A psychologist can talk to your patient about what this means and how it can influence perception of pain. They can help reduce fears and change the way the patient thinks about pain.

Research shows that catastrophic thinking associated with pain can be reduced using multimodal interventions, including education, instruction in active self-management strategies and physical activity.[14]

The PCS can be accessed at: https://www.worksafe.vic.gov.au/__data/assets/pdf_file/0018/10953/pain_catastrophizing_scale.pdf

Steps to tapering and ceasing opioid therapy[20, 25, 26, 38-39]

1. Negotiate and agree upon a plan for tapering and ceasing, including the tapering rate, with your patient before beginning, and set up regular appointments.
2. Re-evaluate rehabilitation strategies. Refer your patient to various healthcare professionals to learn active self-management skills, including distraction, goal setting, pacing, exercise, mindfulness meditation and relaxation techniques that are based on cognitive behavioural therapy (see insert *Teaming up against chronic pain*).
3. Be clear with your patient about why you are tapering their opioid dose and what they can expect during the process. Address their fears associated with reducing the dose or stopping, and reassure them you will be there to support them during the entire tapering process. Provide written and verbal information for your patient and their family. Take into consideration your patient's level of anxiety and reassure them you are working together with them to manage their pain.
4. Reduce the dose gradually, taking into consideration the individual person, their history and psychological comorbidities, social support, adverse effects as the opioid dose is reduced and their ability to self-manage.
5. For patients taking opioids long-term, reduce the daily dose by five to ten percent per week or ten to 25% of the starting dose per month according to their tolerance; this generally achieves cessation in three to nine months. Generally, the longer the patient has been taking opioids, the slower the tapering should be.
6. Consider advice from a pain medicine specialist if unsure about the process, or refer to an addiction specialist or a drug and alcohol service in your state if there is a dependency/addiction problem.
7. Review weekly or fortnightly.

Ann Temple	SUBURB: Mt Gravatt	ACCOMMODATION: Community

Medicine	Last Dispensed	Other Prescriber
Oxycodone hydrochloride (OxyContin) modified release tab 20mg	15/06/17	no
Hydromorphone hydrochloride (Jurnista) modified release tab 16mg	02/02/17	no
Oxycodone (Proladone) suppository 30mg	21/05/17	yes

Home Medicines Review claimed:	05/10/16

Daily average Oral Morphine Equivalent (OME) per month (mg)

July 16	Aug 16	Sept 16	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	March 17	April 17	May 17	June 17
17	25	15	28	32	45	45	35	32	32	102	48

PLEASE CONSIDER THE REVIEW POINTS BELOW:**

Patient received opioid therapy for longer than three months

Suggested actions:

- Review use of opioid, taper the dose and cease where appropriate ☐ Yes
- Help patient understand how pain works and consider referral to an appropriate allied healthcare team to support this ☐ Yes

Rationale: Current guidelines suggest that there is no evidence to support the long-term use of opioids as effective in resolving chronic pain or improving function. Opioid therapy for longer than 90 days is associated with continuing use, opioid use disorders, overdose and worse functional status.

Patient received more than the recommended maximum dose of 40mg OME per day

Suggested actions:

- Review use of opioid, taper the dose and cease where appropriate ☐ Yes
- Help patient understand how pain works and consider referral to an appropriate allied healthcare team to support this ☐ Yes

Rationale: Current guidelines suggest that 40mg of oral morphine equivalent (OME) per day is the recommended maximum dose. The risk of adverse effects rises as the opioid dose rises.

Dose of opioid has exceeded 100mg OME per day

Suggested action: Referral for a specialist pain evaluation ☐ Yes

Rationale: Current guidelines suggest that the risk of serious adverse events, including opioid use disorders, overdose and death, increases significantly as the dose exceeds 100mg OME per day.

*An electronic PDF version of each individual patient's information is available at *www.veteransmates.net.au*

** Based on dispensings of medicines in the 12 month period July 2016 to June 2017 according to the DVA Health Claims Database. See therapeutic brief for references.

Pain management: Sep 2017

PAIN GOES UP AS THE SENSE OF THREAT INCREASES

My Pain

Doug talks about some of the things that increase his **sense of safety**:

All of these things can reduce Doug's pain. The aim is to have more on this side.

My Pain

PAIN GOES DOWN AS THE SENSE OF SAFETY INCREASES

Things I hear, see, smell, taste, touch

- My GP explaining to me my scan is all clear
- My children laughing and playing footy

Things I do

- Going for a walk with the dog
- Learning about my pain

Things I say

- I understand my pain better
- I am going to get myself back to the things I enjoy

Things happening in my body

- Relaxed muscles
- Feeling optimistic
- Healthy diet
- Getting a good night's sleep

Places I go

- On a holiday
- Playing golf with my best friend

People in my life

- My wife, friends and family who understand me
- A supportive GP

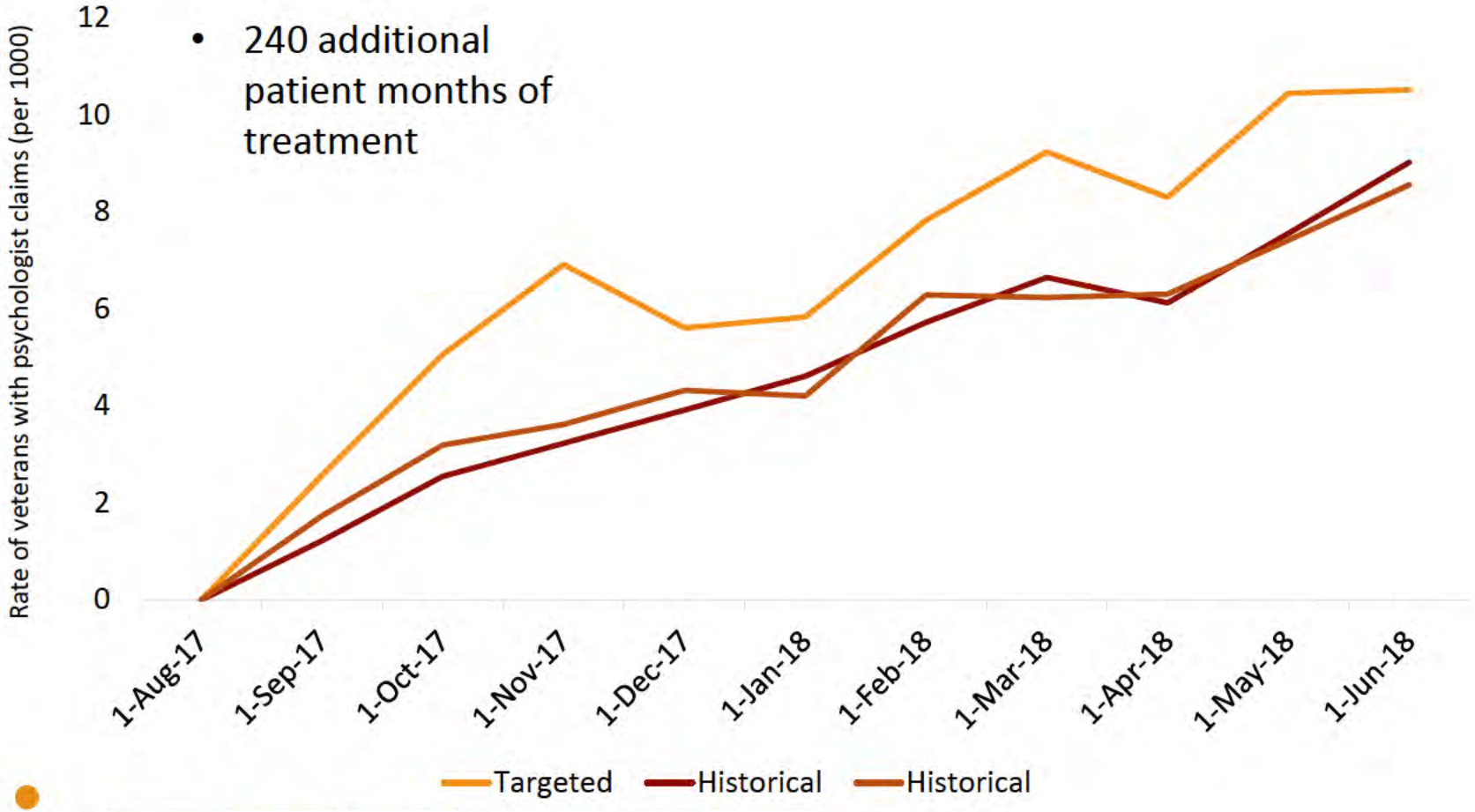
Things I think and believe

- I have a health team supporting me
- Exercise will not damage my body and will help me move more easily

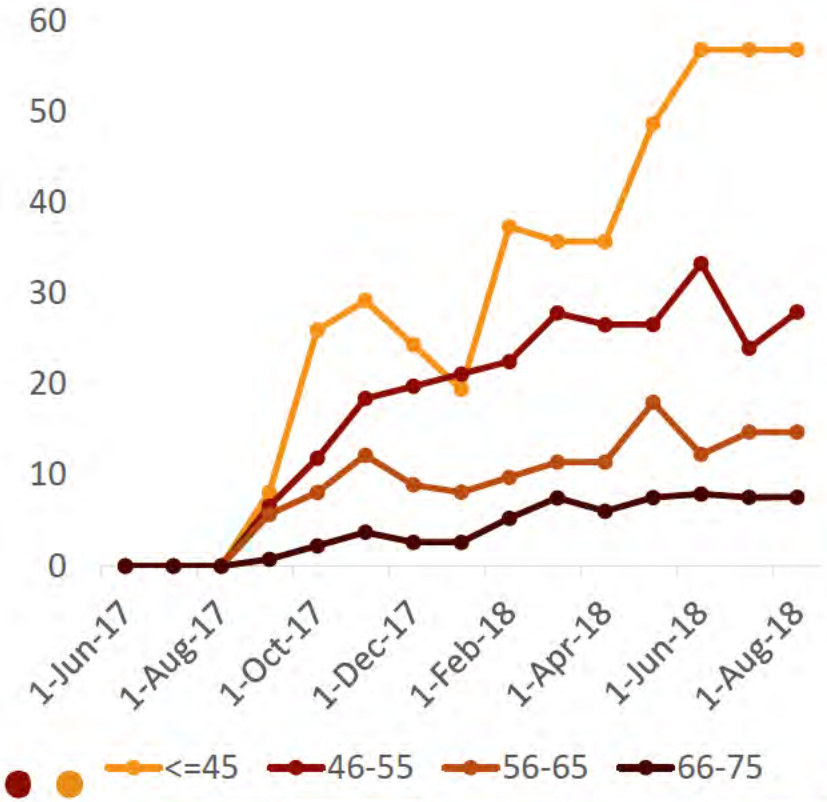
Factors that might influence your pain

Increasing numbers of veterans seeing psychologists

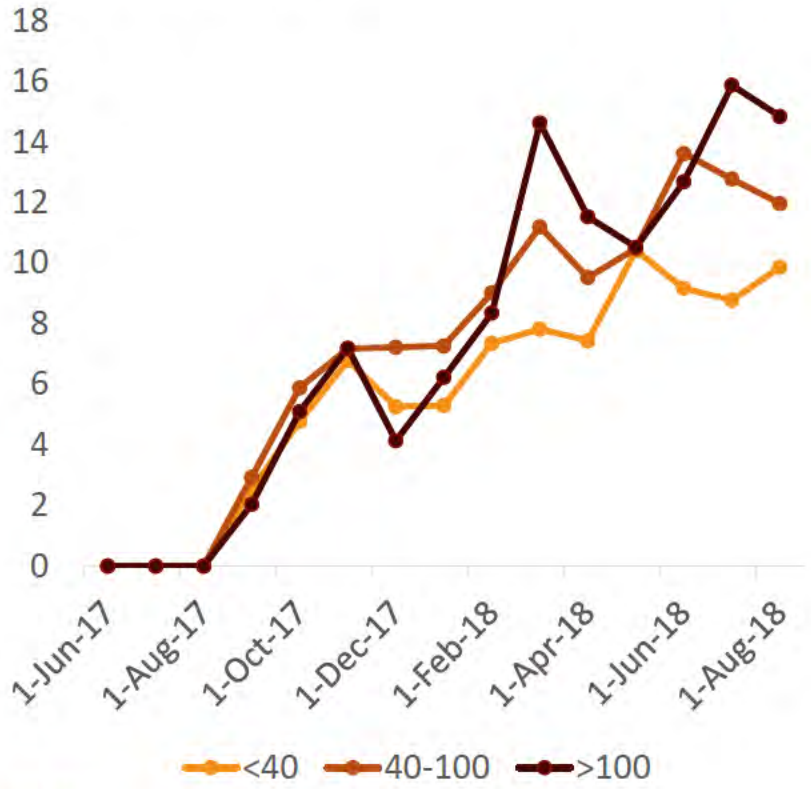
- 240 additional patient months of treatment



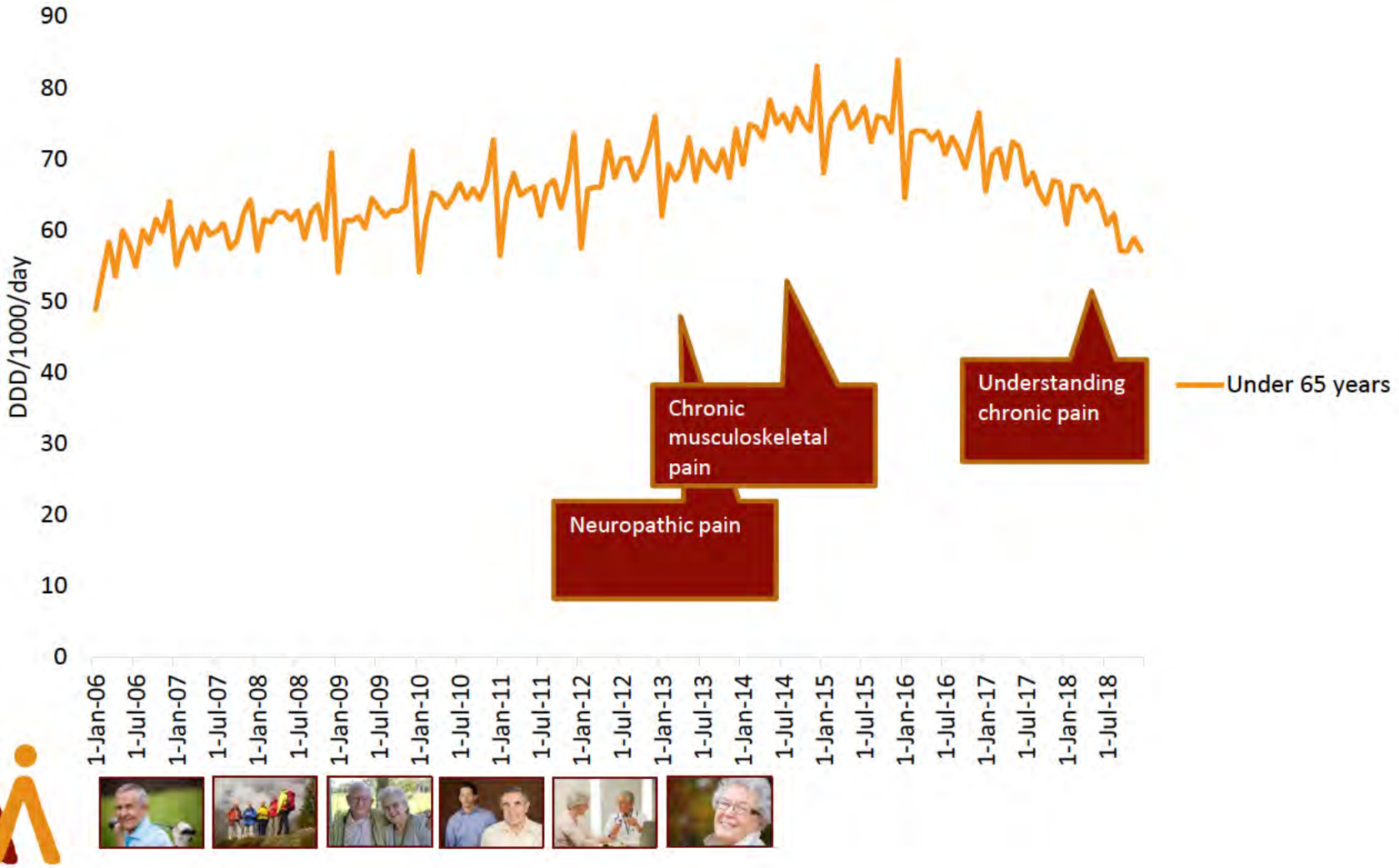
Psychologist claims by age

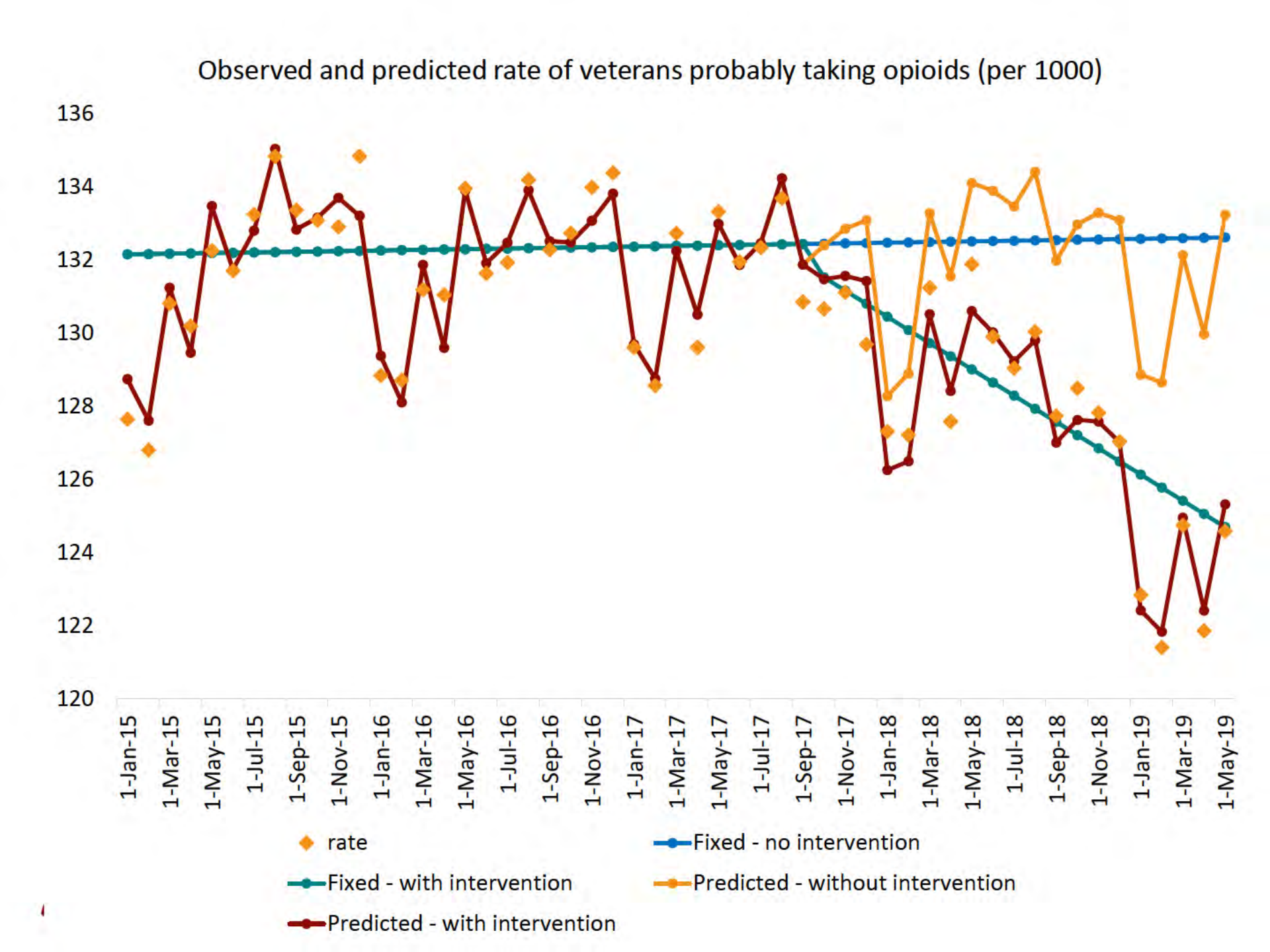


Psychologist claims by level of opioid use (oral morphine equivalents)

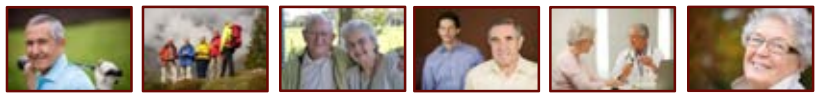


Opioid use is beginning to decline



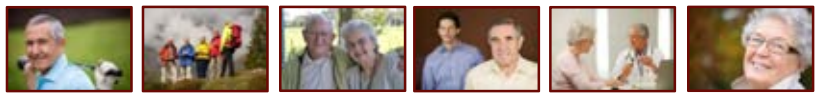

Observed and predicted rate of veterans probably taking opioids (per 1000)
136
134
132
130
128
126
124
122
120
1-Jan-15
1-Mar-15
1-May-15
1-Jul-15
1-Sep-15
1-Nov-15
1-Jan-16
1-Mar-16
1-May-16
1-Jul-16
1-Sep-16
1-Nov-16
1-Jan-17
1-Mar-17
1-May-17
1-Jul-17
1-Sep-17
1-Nov-17
1-Jan-18
1-Mar-18
1-May-18
1-Jul-18
1-Sep-18
1-Nov-18
1-Jan-19
1-Mar-19
1-May-19
rate
Fixed - no intervention
Fixed - with intervention
Predicted - without intervention
Predicted - with intervention

Our collective results

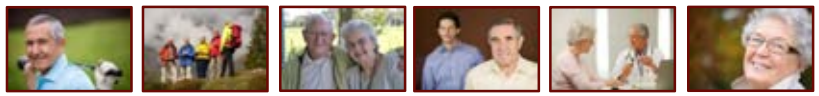


Our collective results

- between 2004 and 2013
  - 220,00 years of more appropriate treatment
  - 67,500 veterans receiving necessary tests and services 930 hospitalisations avoided
  - At least 140 premature deaths avoided
- > 70% of veterans and 80% of general practitioners report the program is useful



Moving to e-delivery



Inbox

File Edit Utilities View Help

ALMA DARLING.

31/07/2018 Test document

Full screen

Zoom: 198% Page: 1

Veterans'MATES

Australian Government
Department of Veterans' Affairs

THIS IS A TEST. ALL INFORMATION HERE WAS RANDOMLY GENERATED AND DOES NOT CORRESPOND TO CLINICAL FACTS

Dear DR N N BAKHILOVA **Date: 15/03/2019**

This Veterans' MATES information aims to support the care for veterans living in the community with mild cognitive impairment or dementia. It is advisory in nature. The information is based on claims to DVA that may indicate the patient has mild cognitive impairment or dementia based on either; prior medicine use, prior hospitalisation or prior community nursing services. Please note that the listed patient may have not had a formal diagnosis by yourself or another medical practitioner.*

Consider whether your patient will benefit from DVA-funded services designed to support independent living and whether a review of medicines to improve cognition is required. Please consider within the context of this patient's current treatment.

Educational material underpinning the rational for these recommendations can be found at the link below.

ALMA DARLING * **DOB 10/10/1910** **Gender: F**
ACCOMODATION: Community **ADDRESS: 2 TERRACE ST, PARTY N 2531**

DVA-funded services to support independent living	
Cognitive, dementia, and memory assistive technology claim (DVA's National RAP schedule):	None claimed
DVA-funded dose administration aid claim:	16/07/2018
Home Medicines Review (HMR) claim:	None claimed in last two years
No. of unique medicines dispensed in last year:	24
Occupational therapist claim:	None claimed in last year

Suggested actions:
Consider referral to an occupational therapist

Outstanding requests - tick if returned:

Comment:

Add to list Delete

This result is: Normal Abnormal Stable Acceptable Unacceptable Being treated Under specialist care

Action to be taken: No action Reception to advise Nurse to advise Doctor to advise Send routine reminder Non-urgent appointment Urgent appointment

Store result in: Investigations Correspondence in Clinical images

Store for location: QUMPRC

Include header Details

Send Message Add Reminder Add Past History Add INR Add Action Add CST result

< Previous Next > Skip Finish

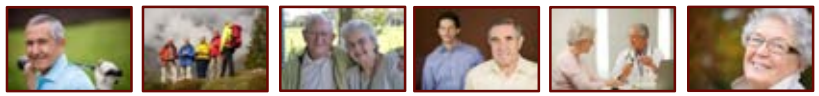
Friday 22/03/2019 04:33:03 PM

4:33 PM 22/03/2019

Our research

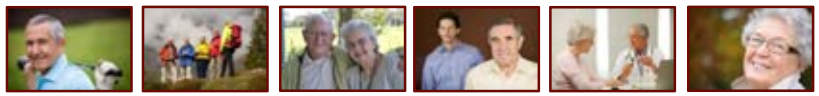
Collaborating with veterans to address issues of concern to them

- Veterans and DVA came to us with the question is post-traumatic stress disorder a risk for dementia in Australian veterans



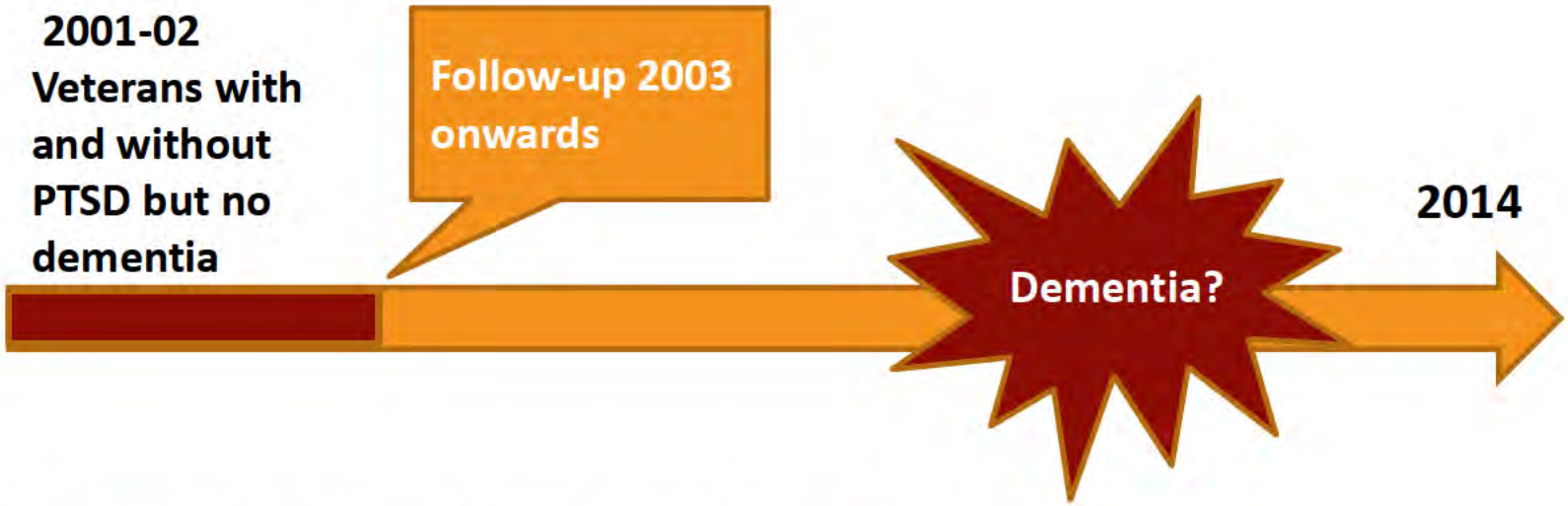
What was known?

- A number of US studies have suggested patients with PTSD had almost a doubling in risk of developing dementia
- The previous research included veterans 65 years and over, some of whom may have been in the early phases of dementia.

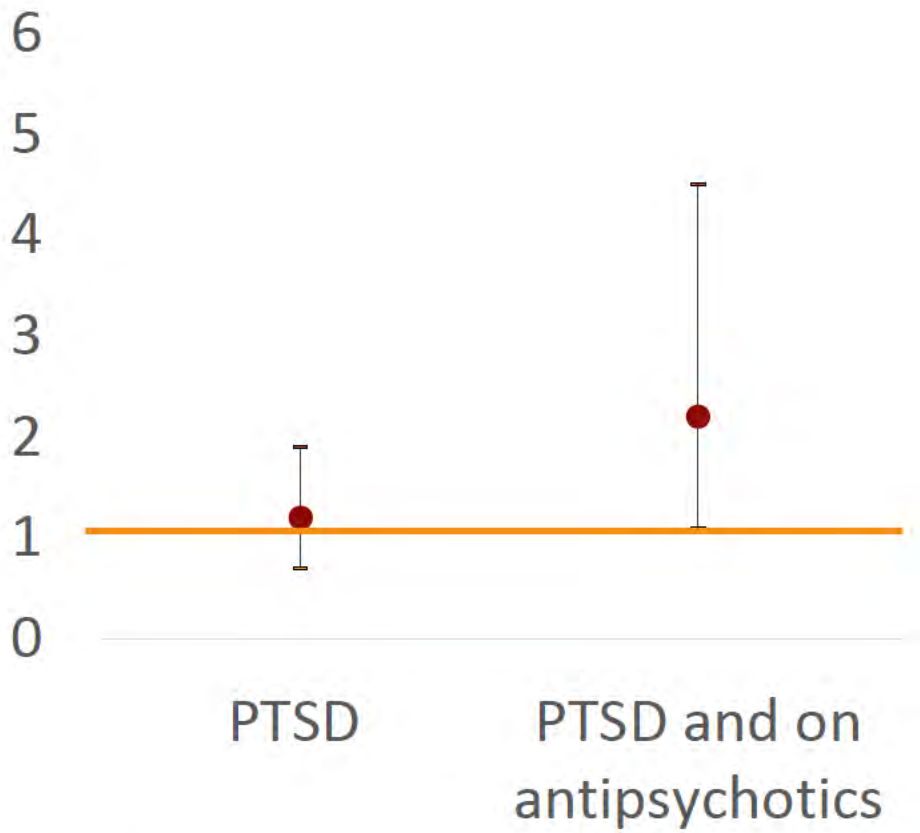


Clauston et al, Alzheimers Dement. 2016
Wang et al., J Affect Disord. 2016
Meziab et al., Alzheimers Dement 2014
Qureshi et al. JAGS 2010
Yaffe et al. Arch Gen Psychiatry 2010

What did we do?



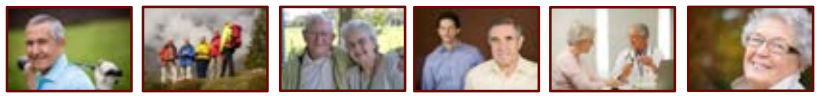
What did we find?



Roughead et al. J Am Geriatr Soc. 2017
Mawanda et al., J Am Geriatr Soc 2017

What does it mean?

- For the majority of veterans who suffer or have had post-traumatic stress there is no evidence of elevated risk of dementia



The factors contributing to our success

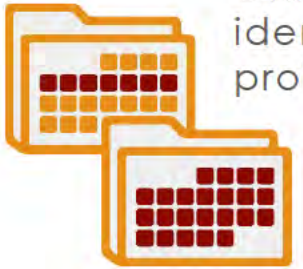
A multidisciplinary, collaborative approach

Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

Significant stakeholder engagement



Only target identified problems

Grounded in behavioural theories and models

UniSA | Sansom Institute for Health Research

Veterans' MATES

Helping your patients manage distress during and after COVID-19

Lisa s 47F s 47F Nicole s 47F Mafalda s 47F Kerrie s 47F
Andre s 47F Vanessa s 47F Elizabeth s 47F

Quality Use of Medicines and Pharmacy Research Centre

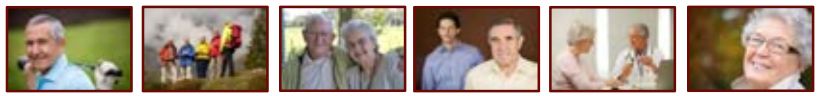
University of South Australia





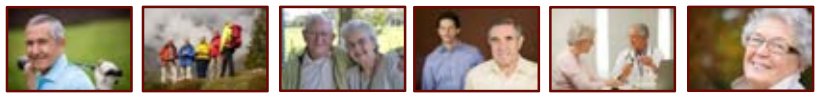

The practice challenge

Efforts to contain the COVID-19 outbreak have resulted in increased isolation, significant changes in financial circumstances and anxiety due to health concerns and risk of COVID-19 infection, all of which culminate in increased risk of mental distress and poor mental health outcomes.

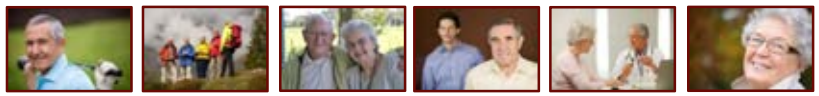


The practice challenge

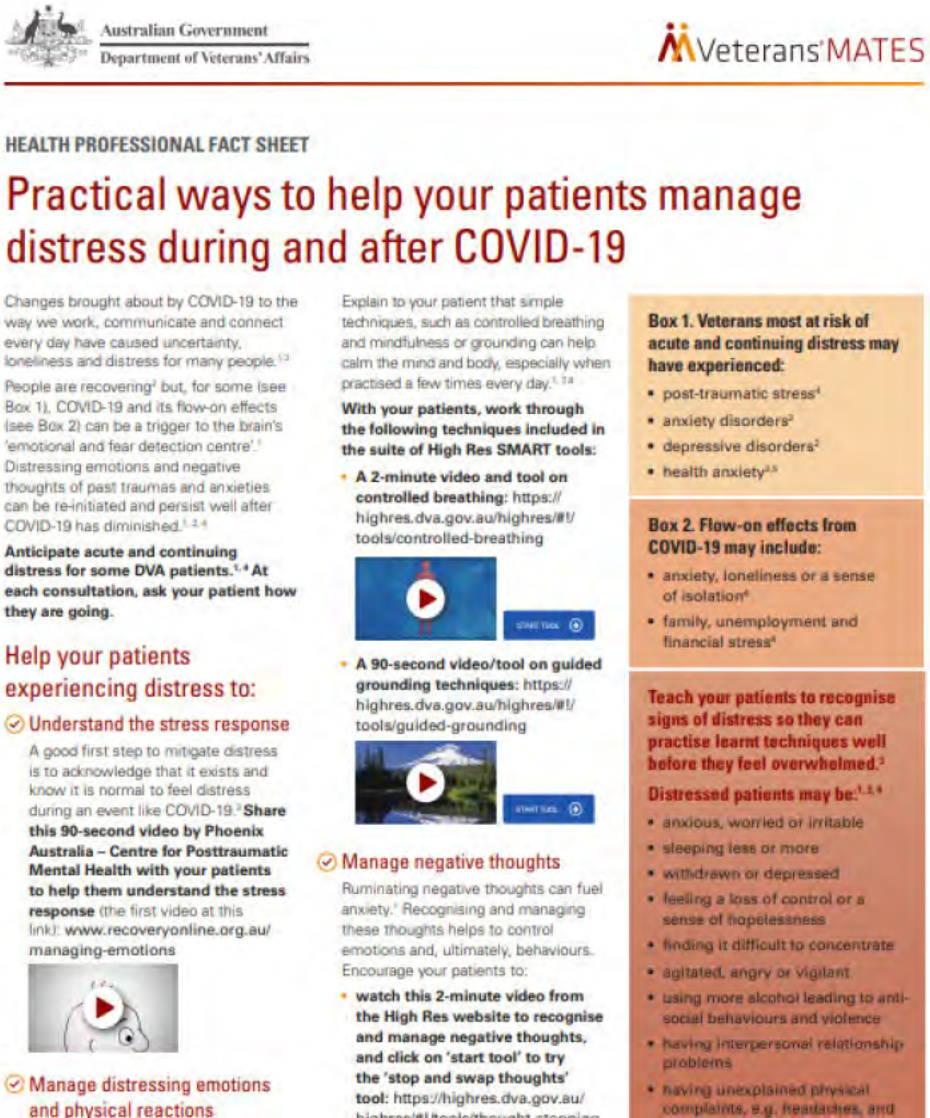
Mental distress during this time can range from mild to severe, with potential for exacerbation or relapse of mental ill-health in those with existing mental illness or prior history of mental illness.



- Pharmacists are the most accessible health professionals
- We saw an opportunity for pharmacists to help people who may not be getting the mental health support they needed during the pandemic



The practice solution



Australian Government
Department of Veterans' Affairs

Veterans' MATES

HEALTH PROFESSIONAL FACT SHEET

Practical ways to help your patients manage distress during and after COVID-19

Changes brought about by COVID-19 to the way we work, communicate and connect every day have caused uncertainty, loneliness and distress for many people.[1-3]

People are recovering[2] but, for some (see Box 1), COVID-19 and its flow-on effects (see Box 2) can be a trigger to the brain's 'emotional and fear detection centre'.[1] Distressing emotions and negative thoughts of past traumas and anxieties can be re-initiated and persist well after COVID-19 has diminished.[1, 2, 4]

Anticipate acute and continuing distress for some DVA patients.[1, 4] At each consultation, ask your patient how they are going.

Help your patients experiencing distress to:

Understand the stress response

A good first step to mitigate distress is to acknowledge that it exists and know it is normal to feel distress during an event like COVID-19.[2] **Share this 90-second video by Phoenix Australia – Centre for Posttraumatic Mental Health with your patients to help them understand the stress response** (the first video at this link): **www.recoveryonline.org.au/managing-emotions**

Manage distressing emotions and physical reactions

Explain to your patient that simple techniques, such as controlled breathing and mindfulness or grounding can help calm the mind and body, especially when practised a few times every day.[1, 7, 8]

With your patients, work through the following techniques included in the suite of High Res SMART tools:

- **A 2-minute video and tool on controlled breathing:** https://highres.dva.gov.au/highres/#!/tools/controlled-breathing
- **A 90-second video/tool on guided grounding techniques:** https://highres.dva.gov.au/highres/#!/tools/guided-grounding

Manage negative thoughts

Ruminating negative thoughts can fuel anxiety.[1] Recognising and managing these thoughts helps to control emotions and, ultimately, behaviours. Encourage your patients to:

- **watch this 2-minute video from the High Res website to recognise and manage negative thoughts, and click on 'start tool' to try the 'stop and swap thoughts' tool:** https://highres.dva.gov.au/

Box 1. Veterans most at risk of acute and continuing distress may have experienced:

- post-traumatic stress[4]
- anxiety disorders[2]
- depressive disorders[2]
- health anxiety[2,5]

Box 2. Flow-on effects from COVID-19 may include:

- anxiety, loneliness or a sense of isolation[4]
- family, unemployment and financial stress[4]

Teach your patients to recognise signs of distress so they can practise learnt techniques well before they feel overwhelmed.[3]

Distressed patients may be:[1, 3, 9]

- anxious, worried or irritable
- sleeping less or more
- withdrawn or depressed
- feeling a loss of control or a sense of hopelessness
- finding it difficult to concentrate
- agitated, angry or vigilant
- using more alcohol leading to anti-social behaviours and violence
- having interpersonal relationship problems
- having unexplained physical complaints, e.g. headaches, and

- Veterans' MATES intervention
- One page resource
  - For consumers
  - For health professionals
- Aim: to assist community pharmacists and other health professionals to support patients with distressing emotions, negative thoughts

The intervention reached veterans, pharmacists and doctors across Australia

29,125
DVA clients received the intervention

15,588
Total number of doctors who received the intervention

8,907
Doctors received the intervention via e-delivery

7,990
Doctors received the intervention via post

9,073
Pharmacists received the intervention

The intervention was sent to every pharmacy in the country, and all accredited pharmacists

29,125
DVA clients received the intervention

15,588
Total number of doctors who received the intervention

8,907
Doctors received the intervention via e-delivery

7,990
Doctors received the intervention via post

9,073
Pharmacists received the intervention

226 DVA clients
102 Doctors
73 Pharmacists

3,059 DVA clients
1,703 Doctors
982 Pharmacists

1,989 DVA clients
1,331 Doctors
734 Pharmacists

5,169 DVA clients
3,077 Doctors
2,150 Pharmacists

9,846 DVA clients
4,236 Doctors
1,832 Pharmacists

6,994 DVA clients
4,307 Doctors
2,887 Pharmacists

721 DVA clients
330 Doctors
150 Pharmacists

1,121 DVA clients
502 Doctors
265 Pharmacists

The practice solution

- Highlighted the importance of asking your patients how they are going each time they come in to the pharmacy
- Highlighted that:

Box 1. Veterans most at risk of acute and continuing distress may have experienced:

- post-traumatic stress[4]
- anxiety disorders[2]
- depressive disorders[2]
- health anxiety[2,5]

The practice solution

- Highlighted the importance of asking your patients how they are going each time they come in to the pharmacy
- Highlighted that:

Box 2. Flow-on effects from COVID-19 may include:

- anxiety, loneliness or a sense of isolation[4]
- family, unemployment and financial stress[4]




The practice solution

- Highlighted the importance of asking your patients how they are going each time they come in to the pharmacy
- Highlighted that:

Distressed patients may be:[1, 3, 4]

- anxious, worried or irritable
- sleeping less or more
- withdrawn or depressed
- feeling a loss of control or a sense of hopelessness
- finding it difficult to concentrate
- agitated, angry or vigilant
- using more alcohol leading to antisocial behaviours and violence
- having interpersonal relationship problems
- having unexplained physical complaints, e.g. headaches, and aches and pains
- thinking of self-harm or harming others

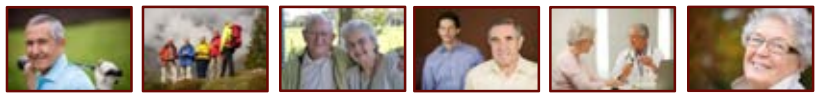



The practice solution

Explaining the stress response

Tools to help calm distressing emotions

Technique to manage negative thoughts



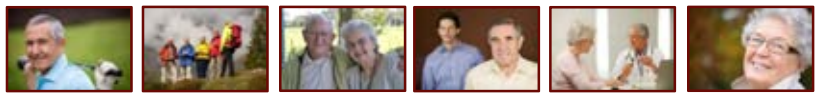
Pharmacists and other health professionals found the information useful

78%

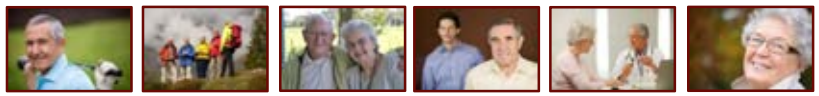
of pharmacists told us that the resource was useful

72%

of doctors told us that the resource was useful

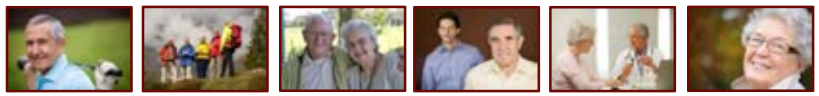


“Thank you for your recent Veterans’ MATES document. It made me feel that someone actually cares about my health and supplied tips to assist myself and wife, in control and handling the COVID-19 virus”



The techniques provided pharmacists with additional tools to support patients in distress at any time, for any reason.

- Resources developed for this Veterans' MATES intervention are available from: https://www.veteransmates.net.au/topic-60
- Health professional and consumer resources are available



Creating data analytic systems to drive change

Libby s 47F

University of South Australia

University of South Australia | Sansom Institute

Our work using health claims data

Veterans' MATES

Australian Government
Department of Veterans' Affairs

Australian Government
National Health and Medical Research Council

Medicine and Device Surveillance
Centre of Research Excellence

How to use data to improve health care practice

How to use data to undertake global surveillance of medication safety

Veterans' MATES

Funded since 2004 by the Australian Government Department of Veterans' Affairs (DVA),

- Aims to improve medicine use and health outcomes for veterans






The Veterans' MATES approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material is sent to members of the veteran community for whom the health topic is relevant.

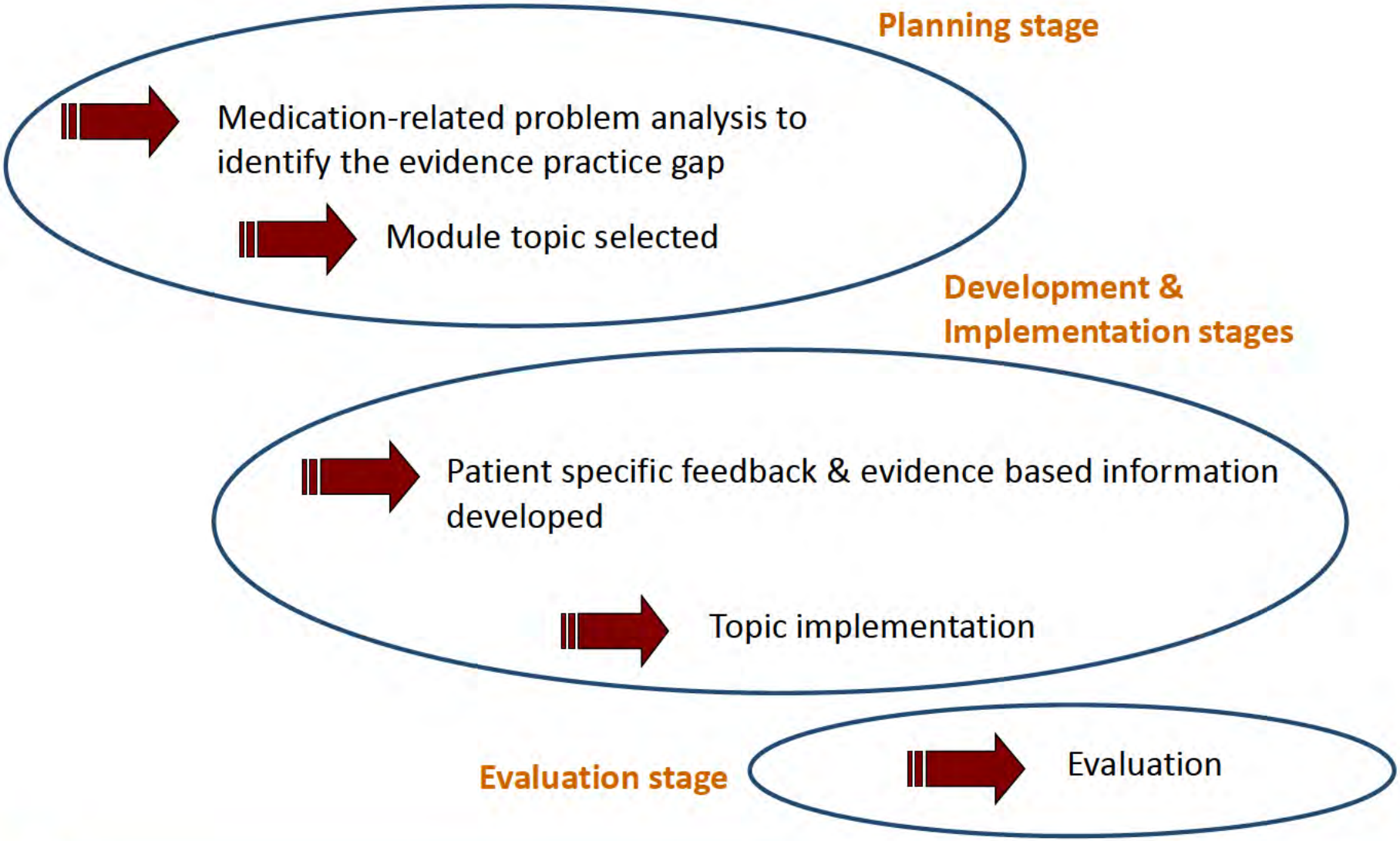
The behavioural theories underpinning Veterans' MATES

- Social cognitive theory and the Transtheoretical Model of change both inform the intervention with regards to individual behaviour change
  - Individuals at different states of change
  - Cognitive engagement, repetition, reinforcement, self efficacy and motivations
- Precede-Proceed Health Promotion Model informs the systems approach of the intervention
  - Needs assessment, both social and epidemiological
  - Barriers, reinforcers, enables
  - Process, impact and outcome measures of evaluation

The database underpinning Veterans' MATES

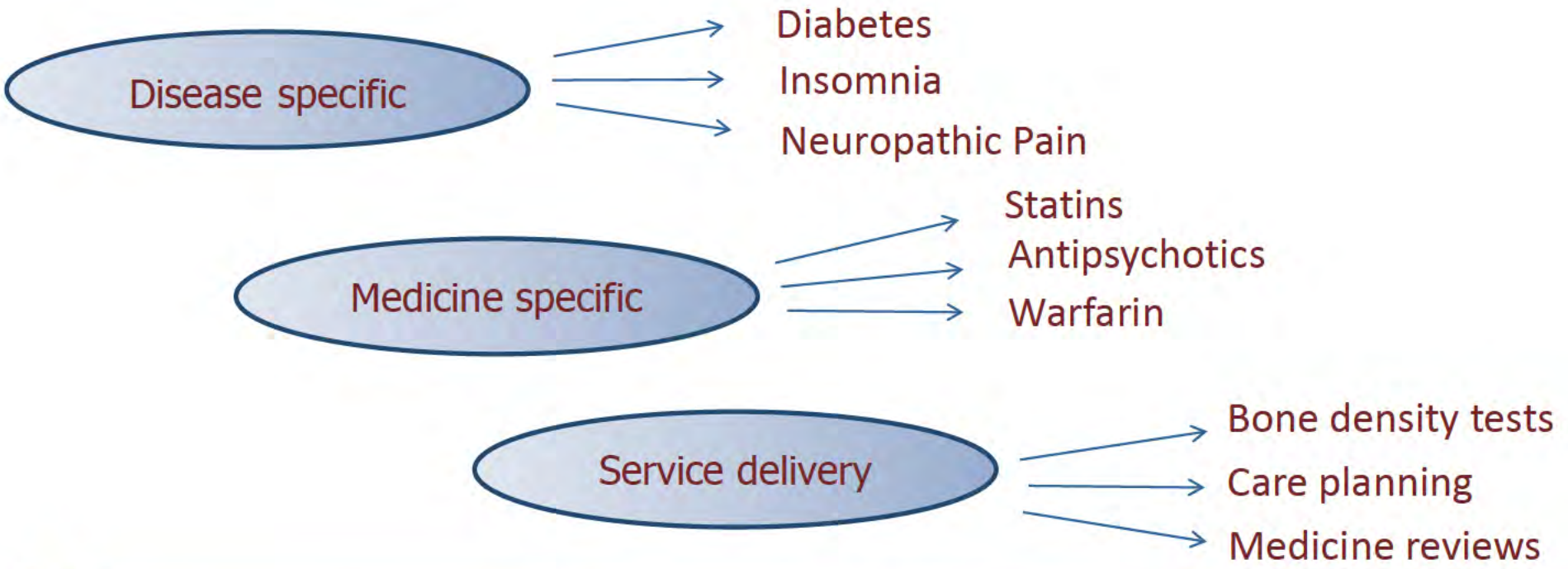
- Linked patient level data ~2000 to present
  - Pharmacy dispensing data
  - Medicare services
  - Allied health services
  - Public and Private hospitals
  - Community Nursing
  - Aged-Care
  - Rehabilitation aids and appliances
  - Home care
- Updated every month and covers 330,000 veterans at start, ~ 240,000 veterans now

Using the health claims data



The Veterans' MATES approach

- To date 43 topics delivered:



So what happens?

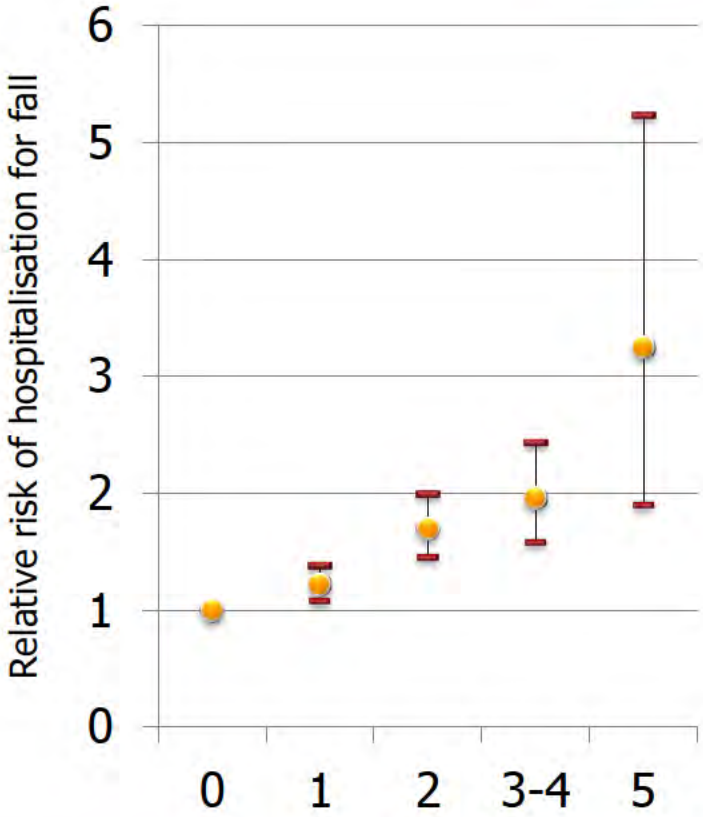
Identifying the problem: osteoporosis

- We assessed use of bone mineral density tests among older men and women
  - Less than 10% of women and men 80 years or over had had a bone mineral density test in the previous 5 years
  - Only 2% of older men and 10% of older women on medicines for osteoporosis, while prevalence may be up to 50% in the oldest age groups

Identifying the problem: falls and fracture

- We assessed patients admitted to hospital for hip fracture
  - 1 in 6 women and 1 in 5 men had had a prior fracture but were not on medicines for osteoporosis
  - 1 in 15 were on corticosteroids and no medicines for osteoporosis
  - 84% on at least 1 medicine that increases risk of fall
  - 50% on 2 or more medicines that increase risk of falls
    - 1 in three were dispensed an antidepressant
    - 1 in four a benzodiazepine
    - 1 in ten an antipsychotic

The problem of multiple sedative medicine use and risk of hospitalisation for fall



Number of sedative medicines	Adjusted Rate Ratio* (95% CI)
0	1.00
1	1.22 (1.08 - 1.38)
2	1.70 (1.45 - 1.99)
3-4	1.96 (1.58 - 2.43)
>=5	3.15 (1.90 - 5.23)

Implementing the interventions

Reducing the risk of falls & hip fractures

- Our fracture and falls prevention topics were implemented to assist appropriate medicine use and reduce risk of falls or fracture

Veterans' MATES

Australian Government
Department of Veterans' Affairs

Preliminary fall risk screening*

Risk Factor	Level	Risk Score
Recent falls (with or without hospitalisation)	none in last 12 months	2
	one or more between 3 and 12 months ago	4
	one or more in last 3 months	6
	one or more in last 3 months whilst inpatient/resident	8
Medications (Sedatives, Antidepressants, Antiparkinsonians, Diuretics, Antihypertensives, Hypnotics)	not taking any medications known to increase risk of falls	1
	taking one medication known to increase risk of falls	2
	taking two medications known to increase risk of falls	3
	taking three or more medications known to increase risk of falls	4
Psychological (Anxiety, Depression, ↓Cooperation, ↓Insight or ↓Judgement esp. re mobility)	does not appear to have any of these	1
	appears mildly affected by one or more	2
	appears moderately affected by one or more	3
	appears severely affected by one or more	4
Cognitive status	intact	1
	mildly impaired	2
	moderately impaired	3
	severely impaired	4

(Low Risk: 5-11 Medium Risk: 12-15 High Risk: 16-20) **RISK SCORE:** /20

Automatic High Risk Status: (if ticked then circle HIGH risk below)

☐ Recent change in functional status and/or recent change in medications affecting safe mobility (or anticipated)

☐ Dizziness/postural hypotension

FALL RISK STATUS: LOW / MEDIUM / HIGH

*The screening tool has been adapted from the Falls Risk Assessment Tool (FRAT) developed by Peninsula Health Falls Prevention Service. Tool validated in sub-acute and residential care setting (average age 79 years, 80% prediction accuracy of faller status).

Preventing falls and fractures

July 2008 → Osteoporosis

Mar 2009 → Insomnia management

Sep 2009 → Reducing falls risk

Nov 2010 → Dementia

Sep 2011 → Osteoporosis update (included falls risk screen)

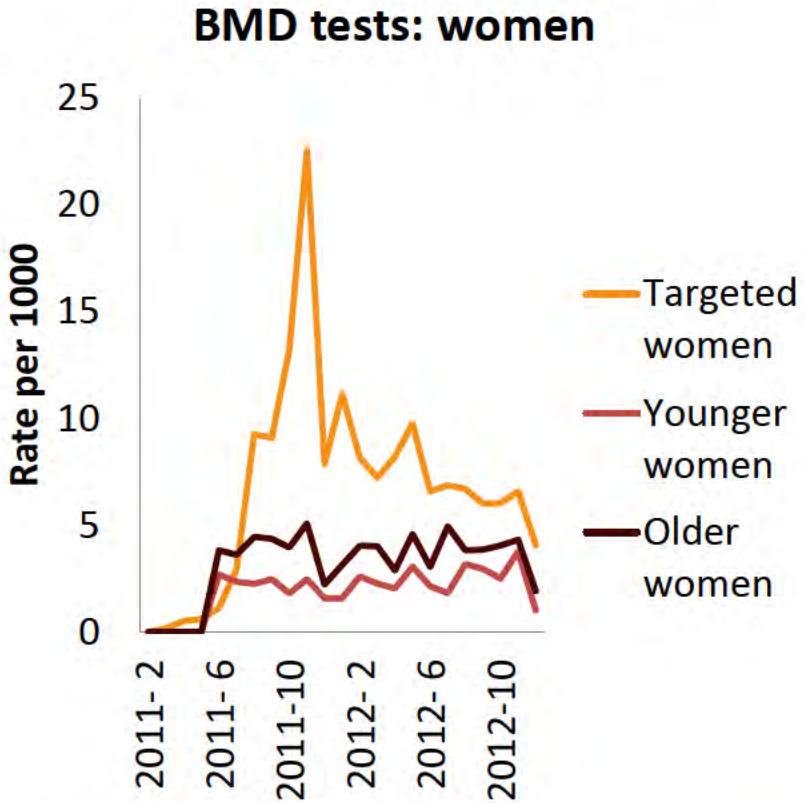
June 2012 → Insomnia update

Evaluating the results

Reducing the risk of falls & hip fractures

So what happened?

- ✓ 2.5 fold increase in bone mineral density tests to detect osteoporosis in women; 2.4 fold increase in men
- ✓ 40% relative increase in osteoporosis medicine use in men
- ✓ Similar rates in targeted women compared with older women

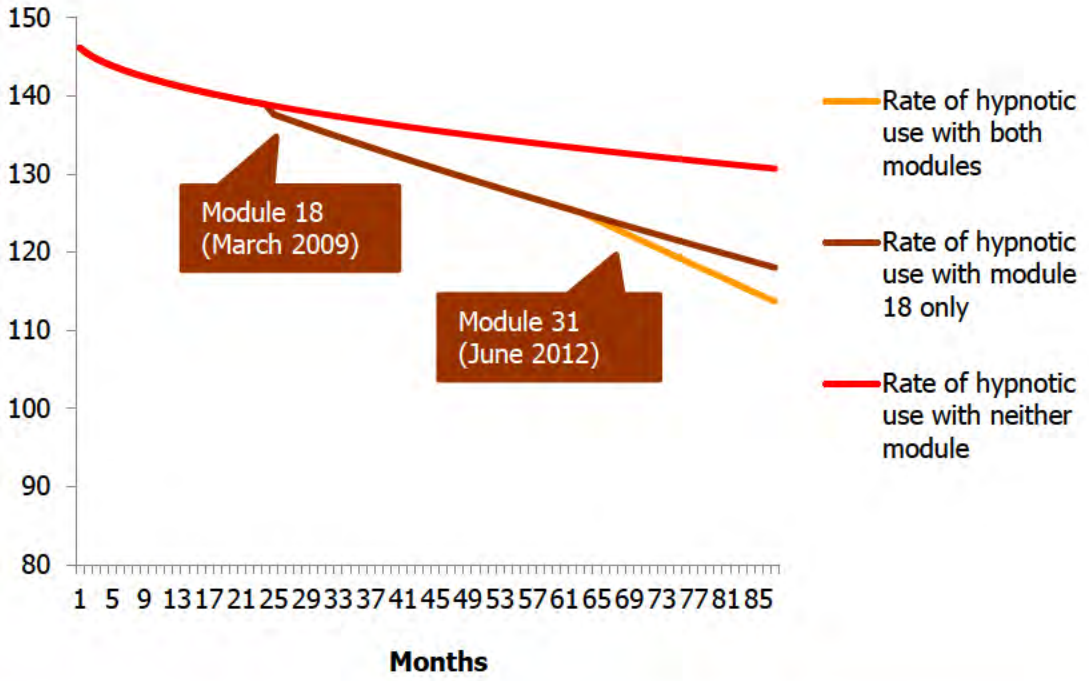


Evaluating the results

Reducing the use of sedative medicine use

So what happened?

- ✓ 20677 fewer patient months of treatment as a result of module 18
- ✓ 30,712 fewer patient-months of treatment with hypnotics as a result of Module 31
- ✓ 64,652 fewer patient months of hypnotic treatment due to the sustained effect of module 18



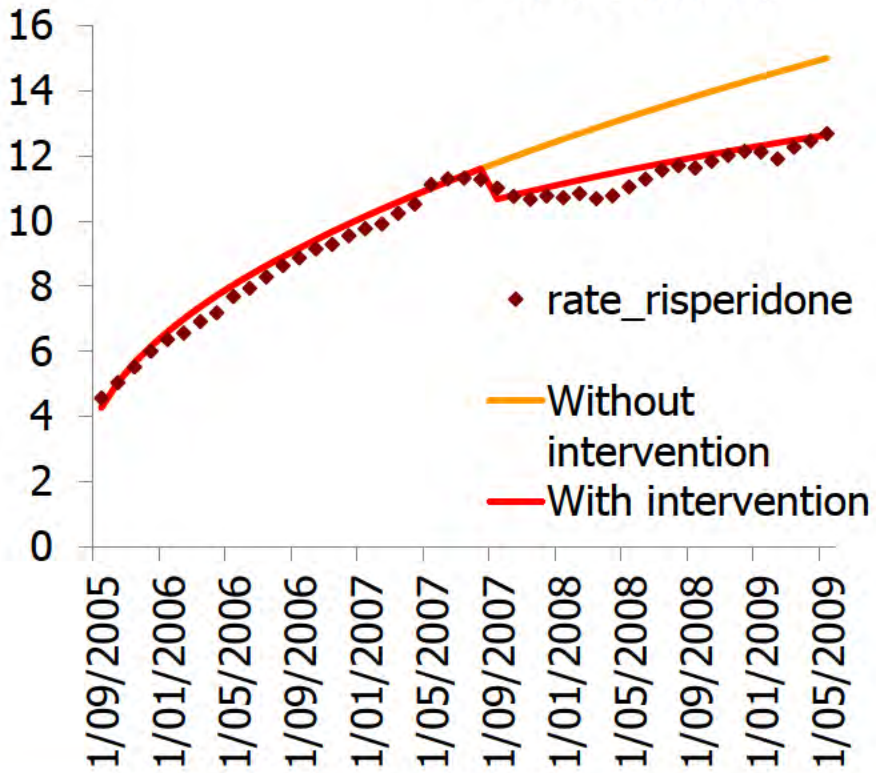
Evaluating the results

Reducing the use of antipsychotics

8750 fewer patient months of treatment

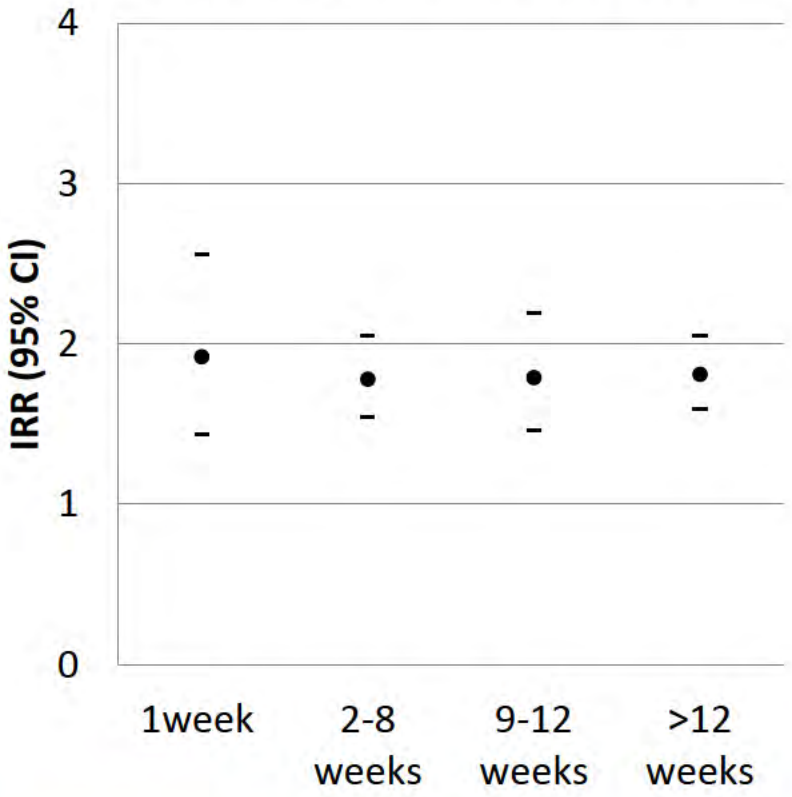
So what happened?

- ✓ 14.5% decrease at time of intervention
- ✓ Further 3% monthly decrease compared with trend prior to intervention

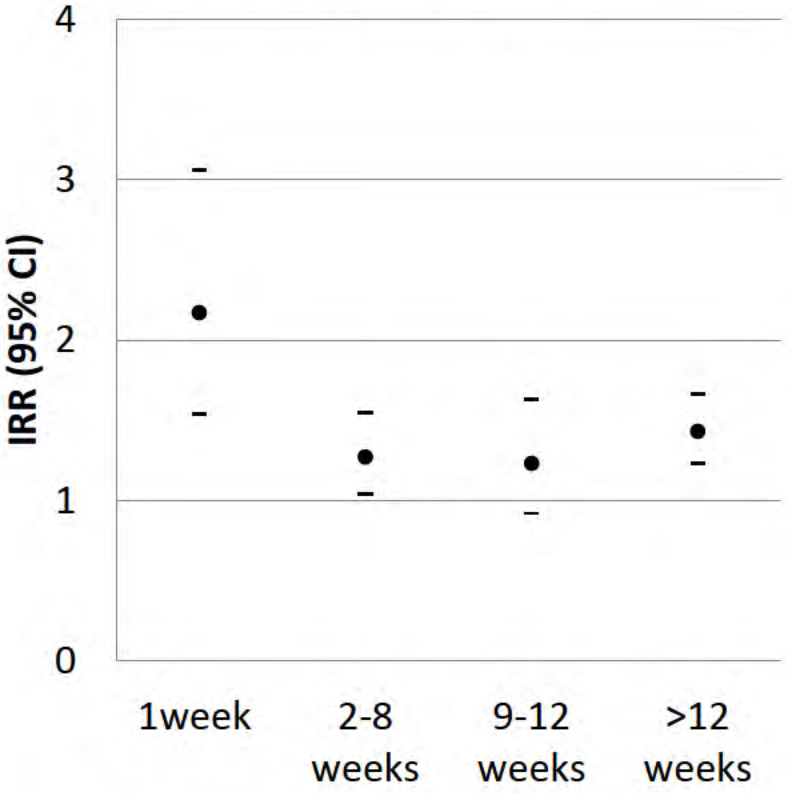


Quantifying other harms avoided from reduced antipsychotic use

Risk of pneumonia



Risk of hip fracture

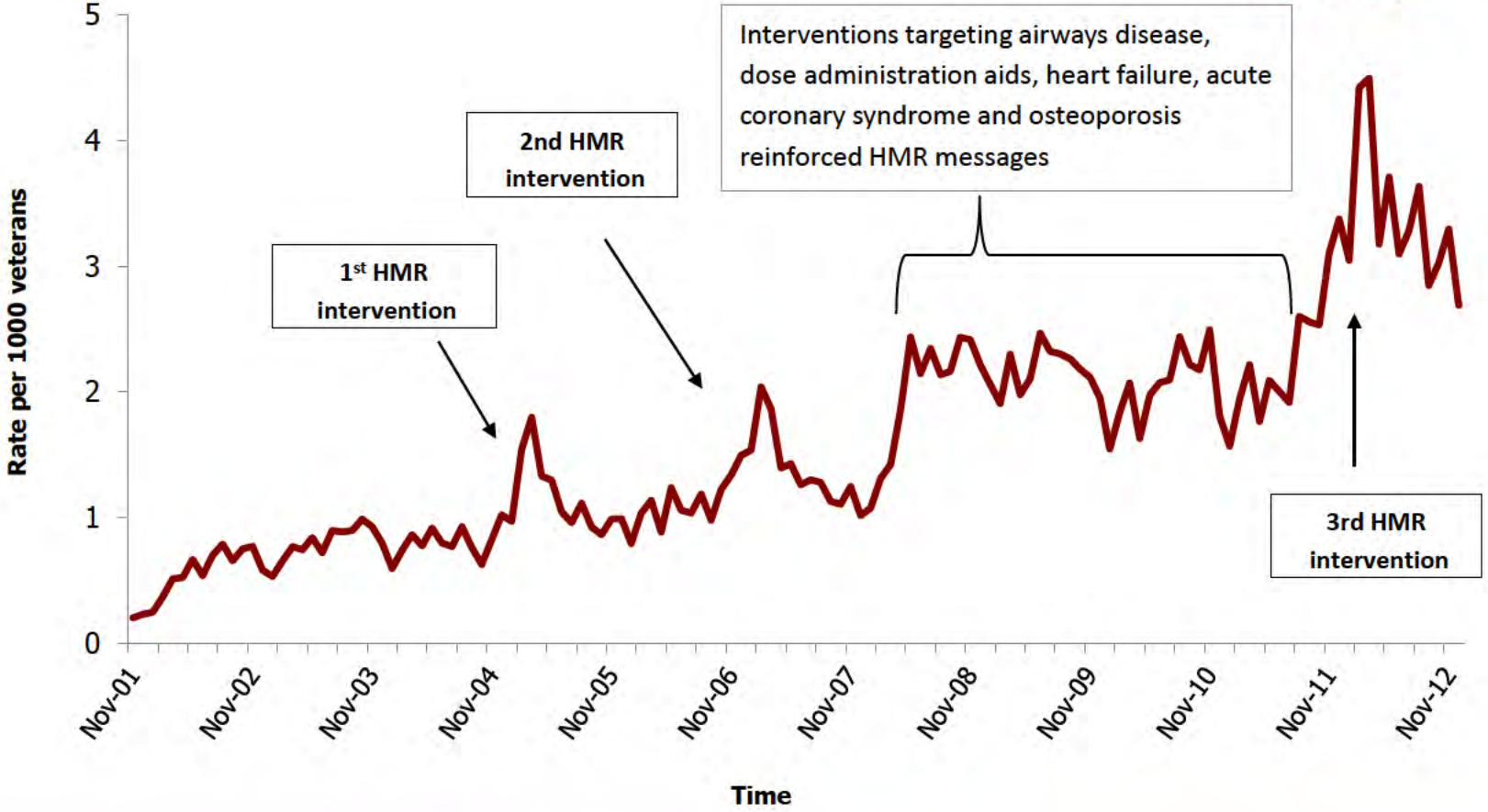


Evaluating the results
Quantifying the harm avoided

The risk-benefit ratio for antipsychotics:

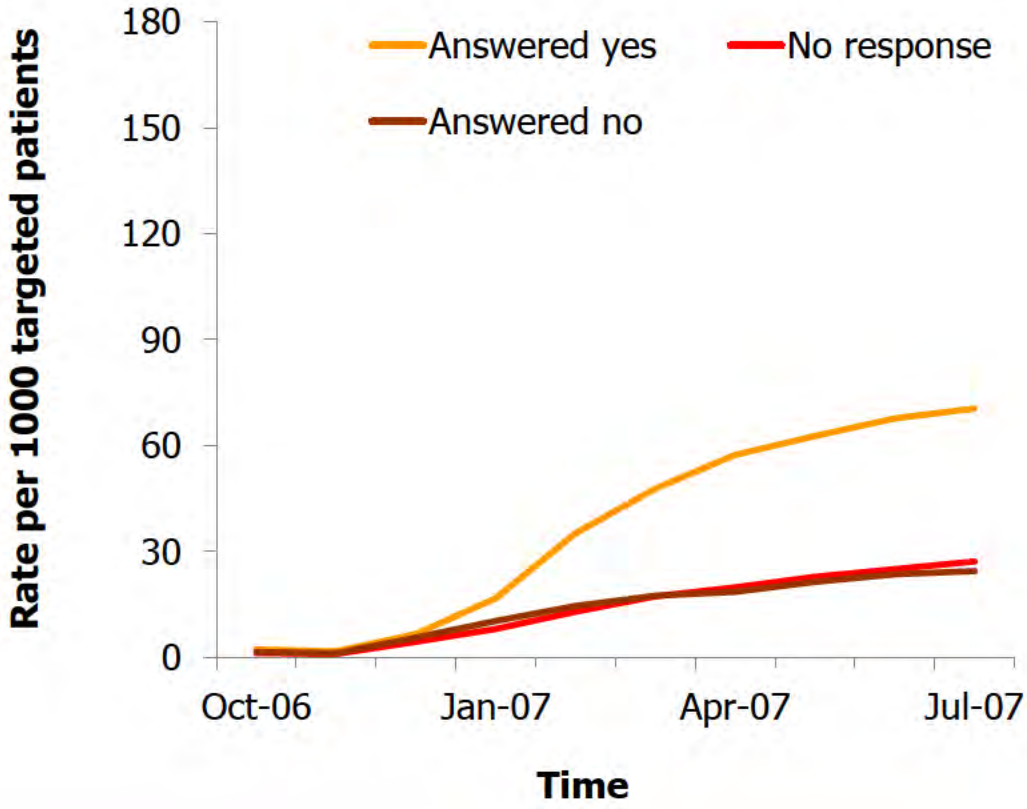
- 1 excess hospitalisation for hip fracture for every 4 to 12 patients helped with behavioural symptoms of dementia, and
- 1 excess hospitalisation for pneumonia for every 2 to 5 patients helped
  - These numbers enable cost-consequence to be calculated.
  - Intervention resulted in significant cost-savings due to hospitalisations avoided

The success of repetition: home medicines review



Evaluating the behavioural techniques: Commitment questions for veterans

- On the veteran questionnaire we often ask "commitment questions"
- After reading the brochure, do you think you will discuss an HMR with your doctor at your next visit?



Factors contributing to success

- Multidisciplinary, collaborative program
  - Clinicians, practitioners, veterans, health professional organisations, government
  - Biostatisticians, Behavioural Scientists, Pharmacists, General Practitioners, Epidemiologists, Computer programmers, Database managers, Security Manager
- Analytics are methodologically rigorous
- Clinical information is evidence based
- Independently audited data and security standards

Factors contributing to success

- Significant stakeholder engagement
  - National consultation
  - Veteran reference group
  - Practitioner reference group
  - National oversight committee representative of health professional organisations and veteran organisations
- Only target identified problems
- Interventions are grounded in behavioural theory; target one behaviour at a time
- Repeated interventions over-time

Studying medication safety issues globally

- In trying to identify what were the most pressing problems in medication safety, we began using prescription symmetry analysis
- Method that had been first suggested in 1992, further explored in 1996, then had sporadic use, but mostly lapsed

The method: Prescription Symmetry

- Examines the likelihood of one prescription being dispensed prior to another for the same person

  Drug A ☛☛ Drug B

- Only uses incident cases for both events
- If Drug A causes Drug B, expect an excess of persons starting Drug B second

  → An asymmetrical distribution of prescription order

University of South Australia | Sansom Institute

The data set required

(no more than three variables needed)

PBS Code	ATC code	Date supplied	Id
04179Y	B01AC04	03APR2006	201006
08333N	A02BC01	03APR2006	201006
08333N	A02BC01	10APR2006	201006
08333N	A02BC01	24APR2006	201006
04179Y	B01AC04	02MAY2006	201073
08333N	A02BC01	02MAY2006	201073

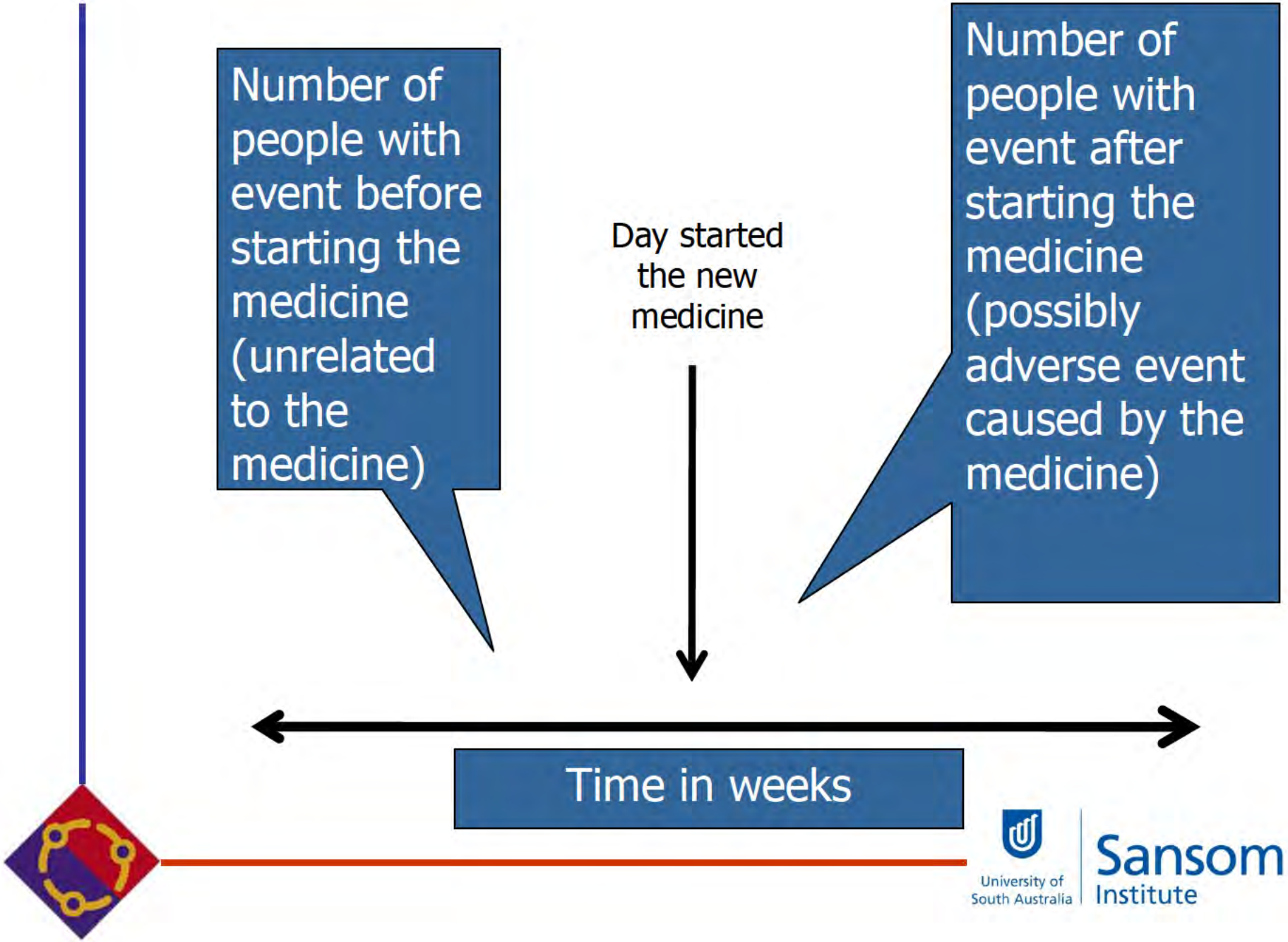
The Australian PBS code

The WHO international code

Scrambled identifier

Advantage

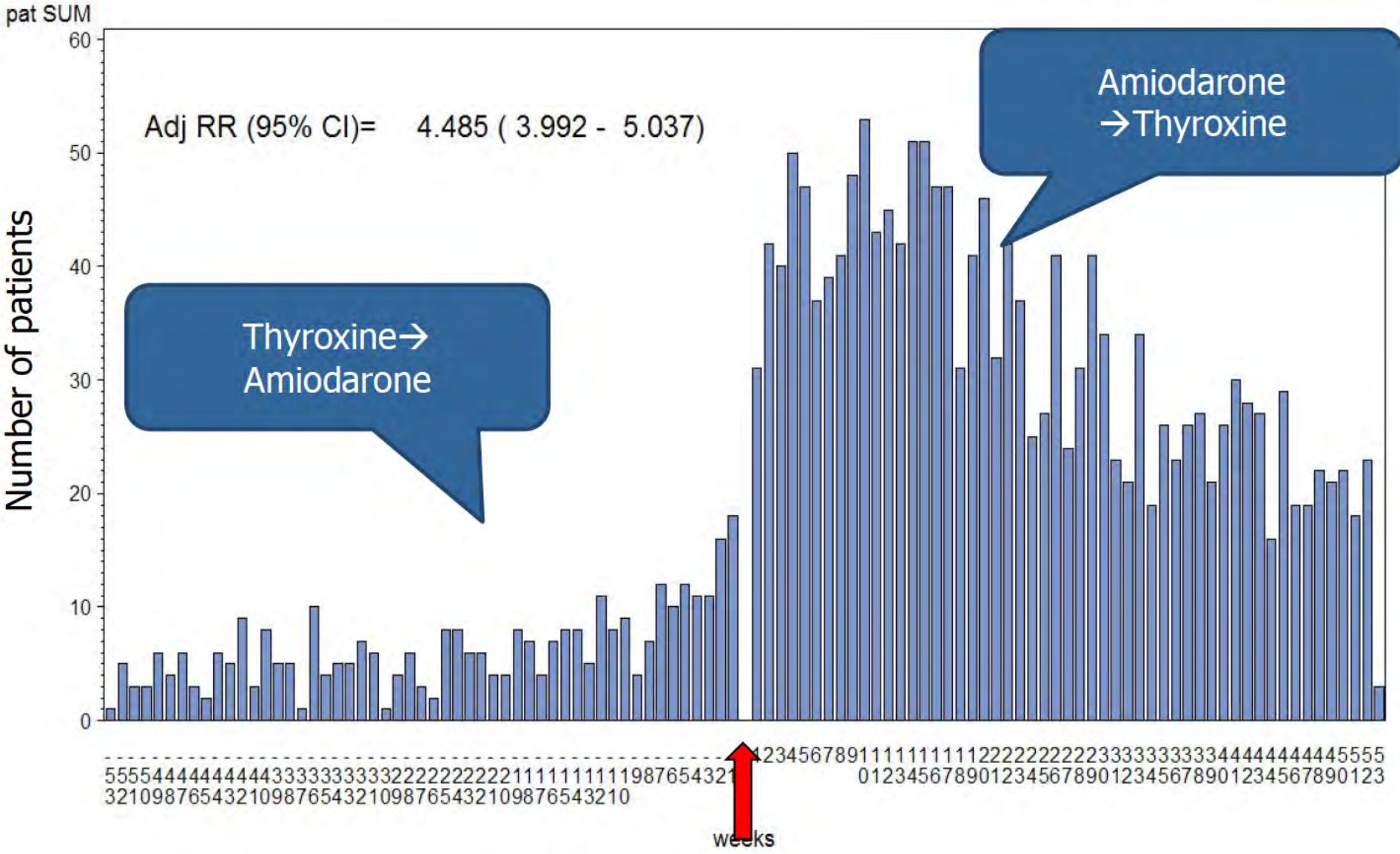
- Easy to calculate, using prescription data only
- Robust towards confounders
  - Within person design, over a short time
- Underlying seasonal or marketing trends adjusted for in the analysis



University of South Australia | Sansom Institute

PSSA Amiodarone Thyroxine 2000 - 2009

Non-causal Group (Thyroxine --> Amiodarone) **Causal Group (Amiodarone --> Thyroxine)**

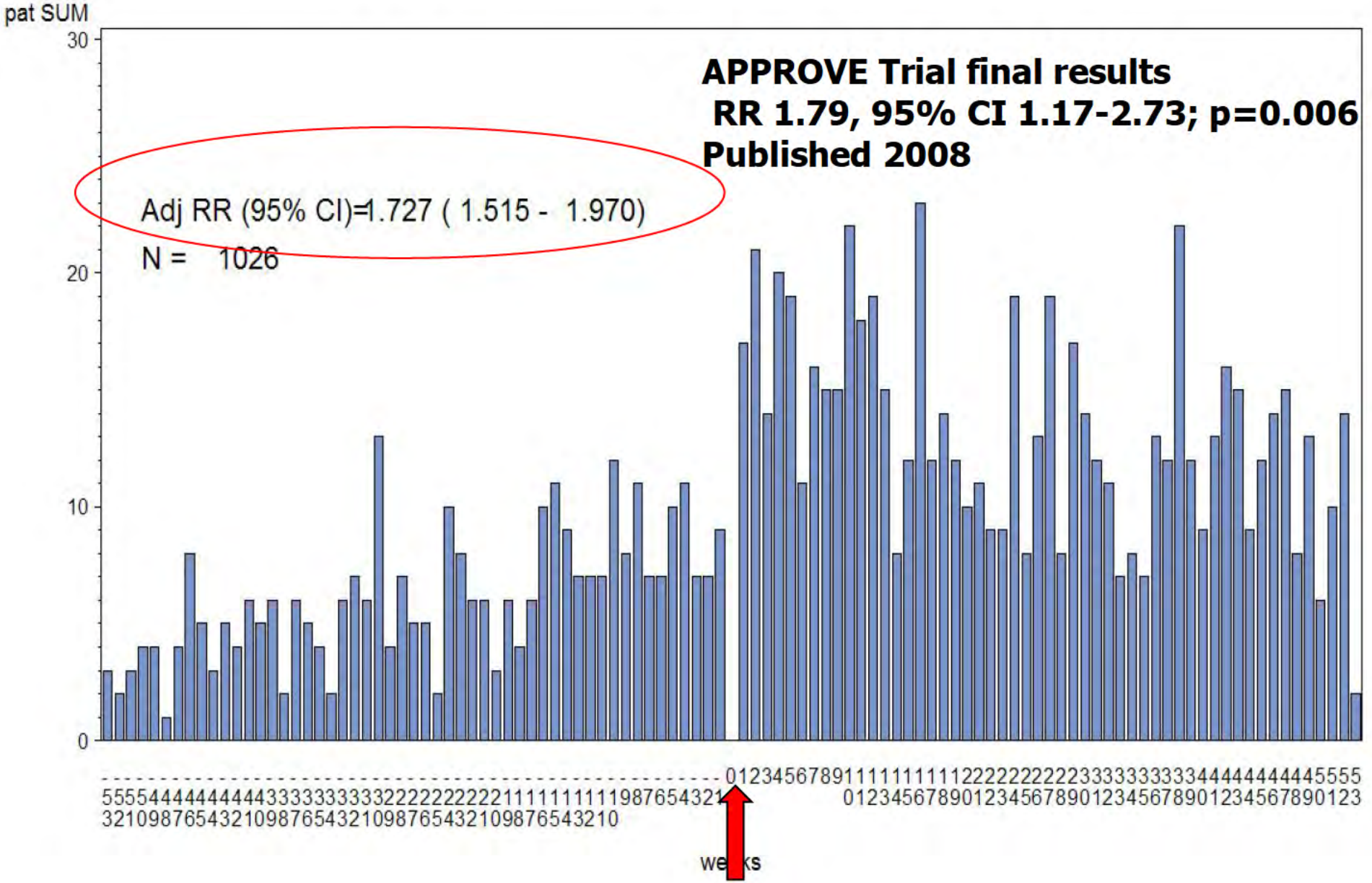


The example of rofecoxib

- Non-steroidal anti-inflammatory registered in 1999 for pain and inflammation
- At the time of marketing, uncertainty about a side effect – did it cause heart attack?
- Global market of more than 200 million people
- Global withdrawal in 2004, estimated in the US alone 88,000 excess heart attacks

PSSA Rofecoxib MI 2001 - 2004

Non-causal Group (MI --> Rofecoxib) Causal Group (Rofecoxib --> MI)



- Would we have been able to respond faster to the rofecoxib story had we had global surveillance (or could use the national data)
- Because of its simplicity it has the potential to be a global surveillance tool
  - Every developed country now has prescription dispensing data sets
- Could we make it work?

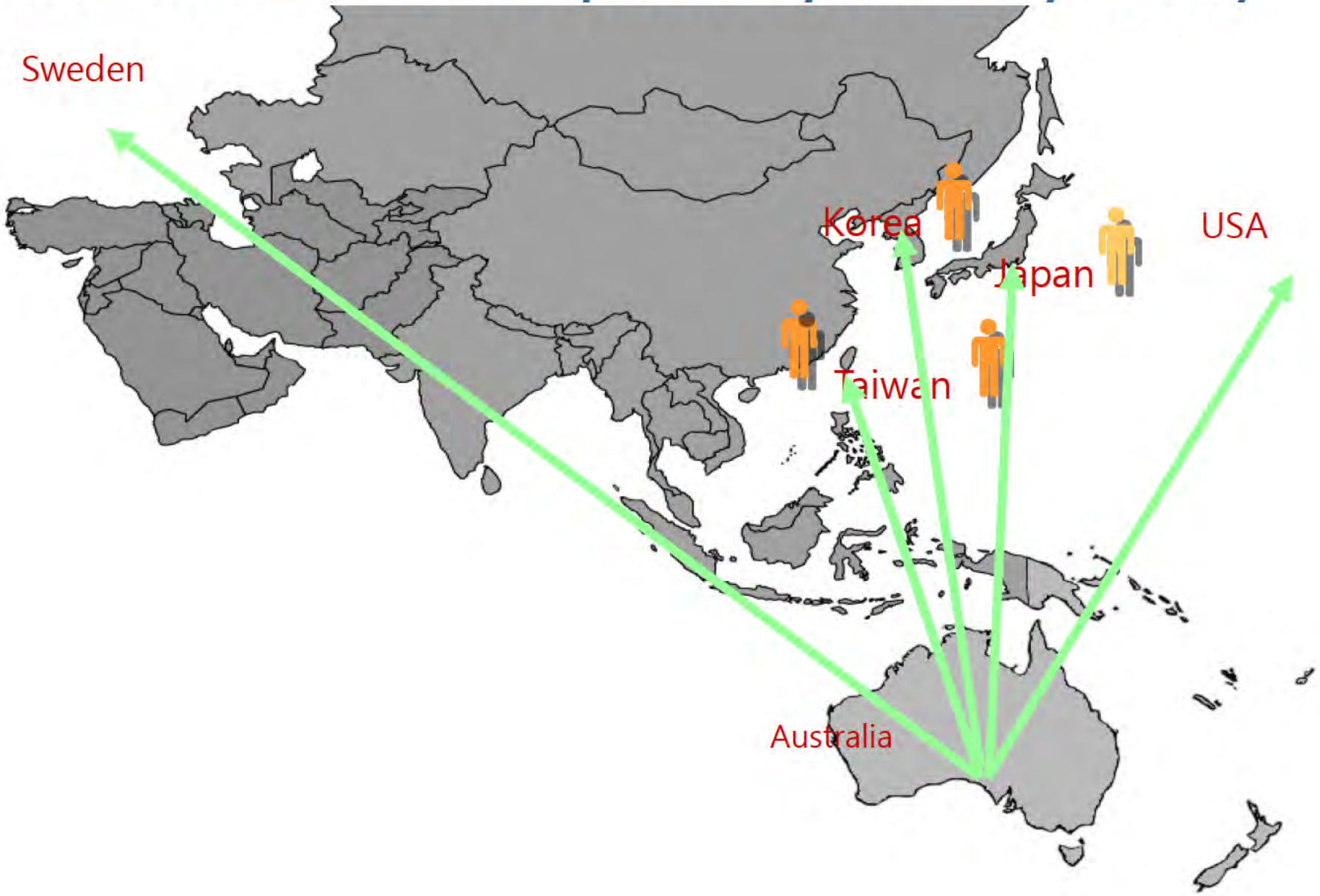
Asian Pharmacoepidemiology Network

- Survey undertaken in Jan 2010
- Sent to all persons who expressed interest in the AsPEN network in 2009
- Aim: to determine if data were available in countries to undertake an association study
  - Topic: antipsychotic use and potential association with diabetes
- 9 respondents

University of South Australia | Sansom Institute

Country:	Group covered	Population	start date	end date
Australia	Australian veterans and dependants	300,000	2001	2010
Japan (I)	Workers and family members of six health insurance unions operated by large firms	330,000	2005	2009
Japan (II)	Patients who visited Hamamatsu Medical hospital from 1999	200,000	1999	2010
Korea	Entire country.	50 million	2001	2010
Sweden	Entire country	9 million	2005	2009
Taiwan	Entire country	23 million	1997	2008
USA (II)	Medicaid eligible individuals.	87 million	2001	2005
USA (III)	Privately insured individuals from > 150 contributing employers and health plans.	51 million	2001	2007

The AsPEN Prescription Symmetry study



Distributed Network Model

- Common SAS code with global Macro variables

```
%let patientid=XXXXXXX;
%let medcde=XXXXXXX;
%let atccde=XXXXXXX;
%let supplydt=XXXXXXX;
%let country=JAPAN;
%let datea='01JAN1999'd;
%let dateb='31DEC2009'd;
```

- Macros

```
%macro wt(atc,x,include,exclude,label);
%macro pssa(atc1,atc2,days,label1,label2);
```

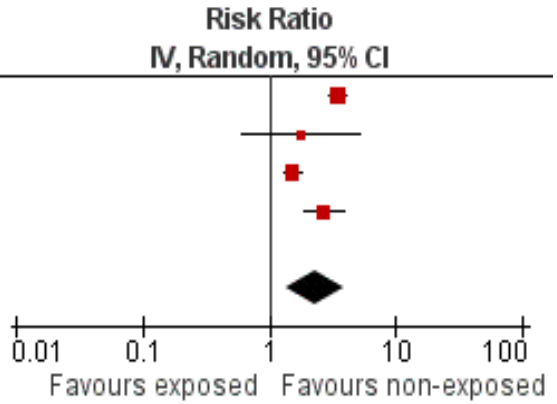
University of South Australia | Sansom Institute

Amiodarone and hypothyroidism: positive control

Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Australia	1.2363	0.0856	29.7%	3.44 [2.91, 4.07]
Japan	0.5687	0.5424	13.8%	1.77 [0.61, 5.11]
Korea	0.4187	0.0837	29.7%	1.52 [1.29, 1.79]
Taiwan	0.9761	0.1872	26.7%	2.65 [1.84, 3.83]
Total (95% CI)			**100.0%**	**2.30 [1.35, 3.92]**

Heterogeneity: $Tau^2 = 0.24$; $Chi^2 = 47.52$, df = 3 ($P < 0.00001$); $I^2 = 94\%$

Test for overall effect: $Z = 3.05$ ($P = 0.002$)

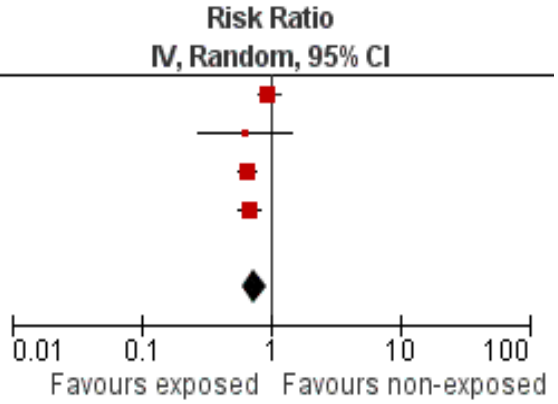


Amiodarone and allopurinol: negative control

Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Australia	-0.0305	0.0983	31.0%	0.97 [0.80, 1.18]
Japan	-0.4463	0.4218	5.7%	0.64 [0.28, 1.46]
Korea	-0.4005	0.0825	33.5%	0.67 [0.57, 0.79]
Taiwan	-0.3711	0.1065	29.7%	0.69 [0.56, 0.85]
Total (95% CI)			**100.0%**	**0.76 [0.61, 0.94]**

Heterogeneity: $Tau^2 = 0.03$; $Chi^2 = 9.46$, df = 3 ($P = 0.02$); $I^2 = 68\%$

Test for overall effect: $Z = 2.57$ ($P = 0.01$)



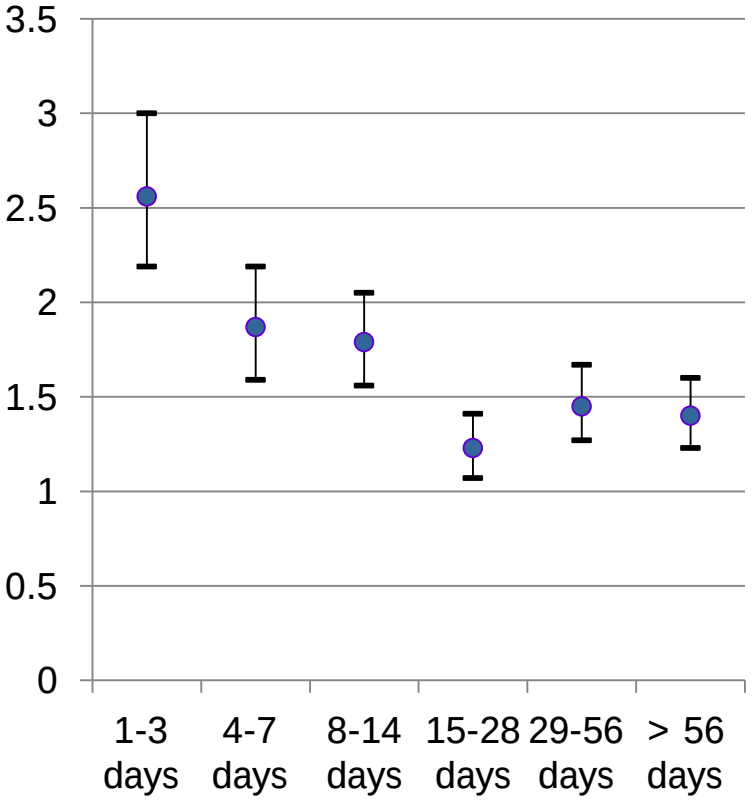
Now extended to more complex outcome studies and country exchanges

- Methylphenidate for attention deficit disorder in children and adverse cardiac outcomes
- Code written and tested here, sent to Korea for implementation

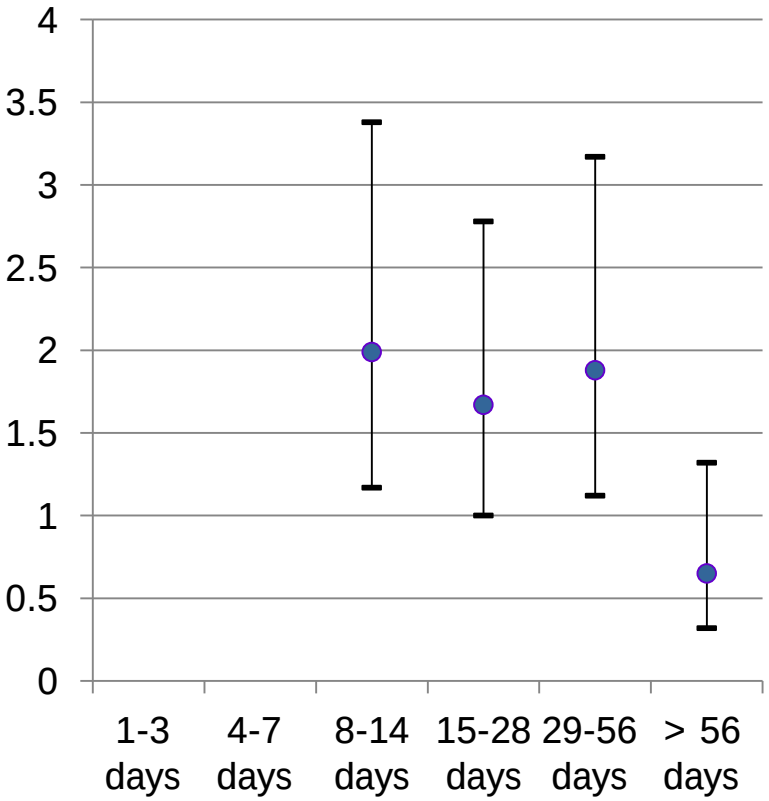
Australia Korea Foundation

Risk of adverse cardiovascular outcomes in children taking medicines for attention deficit disorder

Risk of arrhythmia



Risk of stroke



What's the relevance to health services research in Australia?

Distributed methods may enable an alternative method for national analyses

Statewide registers of controlled drugs which provide alerts to prescribers of potential problems

Conclusions

- Big data in health care is providing many opportunities to improve health care
- It's also providing opportunity to generate knowledge that will never be generated from clinical trials
- There is a great need to build capacity, improve data literacy and build multidisciplinary teams that support both data analytics and translation of research into practice

University of South Australia | Sansom Institute

Co-morbidity and the utilisation of health care for Australian veterans with diabetes

s 47F Y.[1], s 47F A.[2], s 47F G.[2], s 47F L.[2] and s 47F P.[1]

[1] Discipline of Public Health, Faculty of Health Sciences, University of Adelaide,

[2] Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

University of South Australia | Sansom Institute

FLINDERS UNIVERSITY ADELAIDE · AUSTRALIA

THE UNIVERSITY OF ADELAIDE AUSTRALIA

Background

- The quality of diabetes care may be suboptimal in Australian medical practice
- The prevalence of co-morbidities is high in Australia, with 80% of the elderly population having three or more chronic conditions
- The presence of co-morbidities may influence diabetes management and health outcomes
- Relevant studies in the Australian elderly are very few

University of South Australia | Sansom Institute

FLINDERS UNIVERSITY ADELAIDE · AUSTRALIA

THE UNIVERSITY OF ADELAIDE AUSTRALIA

Aims

This study examined health service utilization among Australian veterans with diabetes and co-morbid conditions in order to explore whether co-morbidities affect health care utilisation in the elderly diabetes population.

University of South Australia | Sansom Institute

FLINDERS UNIVERSITY ADELAIDE · AUSTRALIA

THE UNIVERSITY OF ADELAIDE AUSTRALIA

Research Questions

- Does the number of co-morbidities affect diabetic health utilisation for veterans?
- Does the severity of diabetes affect diabetic health utilization?
- Does the type of co-morbidity affect diabetic health utilization?

University of South Australia | Sansom Institute

FLINDERS UNIVERSITY ADELAIDE · AUSTRALIA

THE UNIVERSITY OF ADELAIDE AUSTRALIA

Methods

- **Dataset:**
  - Department of Veterans' Affairs (DVA) health claims database: 80 million pharmacy records, 200 million medical and allied health service records and over 6 million hospital records for a treatment population of 310,000 veterans.
- **Study design:**
  - A retrospective cohort study
- **Subjects:**
  - All veterans aged 65 years and over on 1 January 2006, who had an eligible gold card at this time, were still alive on 31 December 2006, &
  - Who had received at least two dispensings of an oral hypoglycaemic or at least one dispensing of insulin in the 6 months 1 July to 31 December 2005

Methods (cont')

- Outcomes:
  - At least one claim for one of the recommended diabetic health services: HbA_{1c} test, microabuminuria test, podiatry services, GP management plan, diabetes care plan, medication review, case conference in 12 months in 2006 and ophthalmology/optometry services in 24 months 2005-2006
- Measurements:
  - Number of co-morbidities: RxRisk-V index (42 categories)
  - A proxy indicator of more severe diabetes: at least one diabetes-related hospitalisation, using ICD-10 codes "E10-E14".
  - Type of co-morbidities: ischemic heart disease, cerebrovascular disease, renal failure, cancer, COPD/asthma, dementia and users of NSAIDs and antidepressants, using ICD-10 and/or ATC codes

Methods (cont')

- Data analysis:
  - Log binomial regression was used to calculate the Relative Risk (95% CIs), adjusting for age, sex, residential status and socio-economic status.
  - Multiple comparison adjustment was not applied given the size of the population studied.
  - Results are presented as effects of size rather than *p* value. Outcomes with a greater effect size (RRs greater than 1.1 or less than 0.9) were considered significant.

Main results(cont')

Table 1 Characteristics of the cohort

Sample size	17,095
Mean age (SD)	80.6 (5.6) years old
Gender	9,586 (56%) male and 7,509 (44%) female
Residential status	1,399(8%) lived in aged-care institutions
RxRiskV	RxRiskV1(diabetes without comorbidity):145 (0.9%) RxRiskV2(with 1 to 3 comorbidities):334 (19.4%) RxRiskV3(with 4 to 7 comorbidities):9310 (54.5%) RxRiskV4(with more than 8 comorbidities):4316 (25.3%)
Co-morbidity types	Ischemic heart disease-14%; Cerebrovascular disease-6%; Renal failure-7%; Cancer-7%; COPD/Asthma-19%; Dementia-4%; NSAIDs users-18%; Antidepressant users-23%

Main results(cont')

Table 2 Proportion of veterans with at least one claim for health care utilization by levels of RxRisk-V and adjusted RR

Health services	RxRiskV1 (n=145)	RxRiskV2 (n=3324)		RxRiskV3 (n=9310)		RxRiskV4 (n=4316)	
	%	%	Adjusted RRs	%	Adjusted RRs	%	Adjusted RRs
HbA_{1c} test	60.7	59.3	1.00(0.87-1.14)	60.9	1.02(0.90-1.17)	60.6	1.02(0.90-1.17)
Microalbuminuria test	33.8	38.9	1.15(0.92-1.45)	40.3	1.09(0.95-1.50)	36.1	1.07(0.85-1.35)
Podiatrist service	55.2	59.7	1.06(0.92-1.23)	69.0	1.22(1.06-1.41)	74.9	1.33(1.15-1.53)
Dietician service	2.1	2.7	1.26(0.40-3.95)	3.4	1.63(0.53-5.04)	4.3	2.07(0.67-6.41)
Endocrinologist service	9.7	8.8	0.94(0.57-1.55)	11.2	1.21(0.74-1.98)	14.0	1.49(0.91-2.45)
GP management plan	24.8	23.7	0.92(0.69-1.23)	25.8	1.02(0.77-1.35)	26.2	1.05(0.79-1.40)
Medication review service	4.2	3.3	0.77(0.35-1.68)	5.1	1.17(0.54-2.53)	7.7	1.65(0.77-3.57)
Any of the three services*	37.2	38.2	1.01(0.82-1.25)	39.5	1.05(0.85-1.29)	40.3	1.08(0.88-1.34)
Optometry/ ophthalmology service	79.3	83.1	1.05(0.97-1.15)	87.2	1.10(1.02-1.20)	89.3	1.13(1.04-1.23)

*Annual diabetes care plan, annual health assessment and case conference.

Main results(cont')

Table 3 Proportion of at least one claim for health services by hospitalization and adjusted RR

Health services	No diabetes-related hospitalization (n=15,111)	At least one diabetes-related hospitalization (n=1,984)	Adjusted RRs (95%CI)
HbA1c test	60.2%	63.0%	1.04(1.01-1.08)
Microalbuminuria test	38.2%	44.1%	1.15(1.09-1.21)
Optometry/ophthalmology service	86.2%	91.8%	1.05(1.04-1.07)
Podiatrist service	68.1%	72.2%	1.05(1.03-1.08)
Dietician service	3.6%	2.3%	0.65(0.49-0.88)
Endocrinologist service	11.4%	11.4%	1.03(0.90-1.17)
GP management plan	25.1%	28.4%	1.10(1.02-1.18)
Medication review service	5.4%	5.2%	1.03(0.84-1.25)
Any of the three services*	38.9%	43.8%	1.09(1.03-1.15)

*Annual diabetes care plan, annual health assessment and case conference.

Main results(cont')

Table 4 Proportion (%) of at least one claim for health care utilization by co-morbidity groups and adjusted RR

Defined co-morbidity	HbA1c test		Microalbuminuria test		Optometry/ ophthalmology service		Podiatrist service		Dietician service	
	%	Adjusted RR	%	Adjusted RR	%	Adjusted RR	%	Adjusted RR	%	Adjusted RR
Cancer +	62.4	1.02(0.98-1.07)	38.9	0.98(0.91-1.05)	89.2	1.02(0.97-1.04)	68.6	1.00(0.95-1.05)	3.9	1.15(0.86-1.54)
Cancer -	60.4		38.9		86.7		68.6		3.4	
COPD/asthma +	58.8	1.02(0.98-1.06)	37.3	0.91(0.85-0.97)	88.0	0.99(0.98-1.01)	72.8	1.08(1.04-1.11)	3.8	1.16(0.90-1.50)
COPD/asthma -	60.9		39.3		86.6		67.6		3.4	
NSAIDs +	57.1	0.91(0.87-0.95)	39.4	1.03(0.97-1.10)	89.2	1.02(1.00-1.04)	71.9	1.01(0.98-1.04)	3.5	0.88(0.67-1.15)
NSAIDs -	61.3		38.8		86.4		67.9		3.4	
Antidepressants +	58.3	0.98(0.95-1.01)	34.9	0.92(0.88-0.96)	85.4	1.00(0.99-1.01)	69.6	1.05(1.02-1.07)	4.1	1.27(1.07-1.53)
Antidepressants -	61.2		40.1		87.3		68.2		3.3	
Dementia +	45.5	0.83(0.77-0.90)	21.7	0.72(0.63-0.83)	71.0	0.87(0.83-0.91)	58.1	0.93(0.87-0.98)	2.7	0.90(0.58-1.41)
Dementia -	61.2		39.7		87.6		69.0		3.5	
Ischemic heart diseases+	62.0	1.01(0.97-1.04)	36.7	0.93(0.88-0.98)	88.3	1.01(1.00-1.03)	72.9	1.07(1.04-1.09)	4.0	1.13(0.91-1.41)
Ischemic heart diseases-	60.3		39.3		86.6		67.8		3.4	
Cerebrovascular diseases+	56.9	0.97(0.92-1.03)	28.8	0.82(0.74-0.90)	82.1	0.96(0.94-1.00)	68.9	1.03(1.00-1.07)	2.6	0.81(0.55-1.19)
Cerebrovascular diseases-	60.8		39.5		87.2		68.5		3.5	
Renal failure+	65.7	1.11(1.06-1.16)	33.7	0.91(0.83-0.99)	86.3	1.00(0.97-1.02)	75.0	1.09(1.06-1.13)	4.5	1.38(1.03-1.84)
Renal failure-	60.1		33.3		86.9		68.10		3.4	

Main results(cont')

Table 4 Continued

Defined co-morbidity	Endocrinologist service		GP management plan		Medication review service		Any of the three services*	
	%	Adjusted RR	%	Adjusted RR	%	Adjusted RR	%	Adjusted RR
Cancer +	11.0	0.94(0.79-1.11)	25.2	0.99(0.90-1.10)	6.16	1.16(0.93-1.46)	38.92	0.98(0.91-1.05)
Cancer -	11.4		25.5		5.35		39.49	
COPD/asthma +	12.2	1.30(1.14-1.49)	25.7	0.99(0.91-1.08)	5.82	1.23(1.02-1.50)	38.32	0.97(0.91-1.03)
COPD/asthma -	11.2		25.5		5.31		39.71	
NSAIDs +	10.6	0.73(0.63-0.84)	26.2	1.01(0.92-1.10)	4.74	0.81(0.65-1.01)	39.19	1.01(0.95-1.08)
NSAIDs -	11.6		25.4		5.55		39.51	
Antidepressants +	11.6	1.06(0.96-1.17)	24.8	1.01(0.95-1.07)	7.55	1.35(1.18-1.55)	37.41	0.98(0.93-1.02)
Antidepressants -	11.4		25.7		4.76		40.06	
Dementia +	8.2	0.80(0.63-1.03)	17.3	0.86(0.73-1.01)	10.87	1.14(0.91-1.42)	36.91	1.08(0.97-1.18)
Dementia -	11.6		25.9		5.16		39.57	
Ischemic heart diseases+	14.7	1.20(1.07-1.33)	26.6	1.07(0.99-1.15)	5.95	1.11(0.93-1.32)	39.08	1.00(0.95-1.05)
Ischemic heart diseases-	10.9		25.3		5.31		39.51	
Cerebrovascular diseases+	13.2	1.09(0.93-1.28)	20.2	0.88(0.78-1.00)	6.97	0.97(0.77-1.23)	35.72	0.94(0.87-1.03)
Cerebrovascular diseases-	11.3		25.9		5.30		39.69	
Renal failure+	17.6	1.43(1.25-1.64)	24.2	0.99(0.88-1.10)	6.85	1.14(0.91-1.44)	39.37	1.01(0.94-1.09)
Renal failure-	11.0		25.6		5.30		39.46	

*Annual diabetes care plan, annual health assessment and case conference.

University of South Australia | Sansom Institute

FLINDERS UNIVERSITY ADELAIDE · AUSTRALIA

THE UNIVERSITY OF ADELAIDE AUSTRALIA

Conclusions

- Significant under-utilisation of services for diabetes is apparent in all co-morbid groups.
- Even those who appear to have a more severe diabetes and more co-morbidities do not seem to be better managed.
- Apart from dementia, specific co-morbidities cannot be associated with the underuse of services.

Acknowledgement

This work was supported by funding from a National Health and Medical Research Council / Australian Research Council Ageing Well Ageing Productively (AWAP) Program grant.

University of South Australia | Quality Use of Medicines and Pharmacy Research Centre

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Digital innovation keeping veterans connected to healthcare during COVID-19

Assoc. Prof. Andre Andrade, MD. PhD.



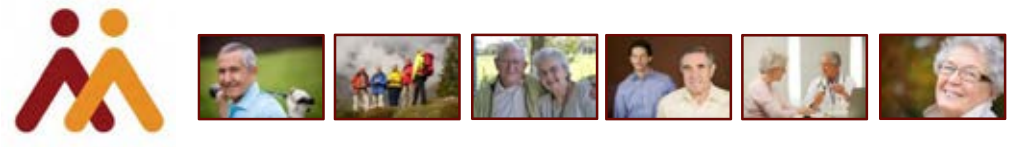



Acknowledgement of country

I'd like to begin by acknowledging the Traditional Owners of the land on which we meet today. I would also like to pay my respects to Elders past and present.

The building blocks

- Data – Veterans' MATES program
- Digital media – eDelivery project
- Emergency preparedness - COVID-19 and beyond



DATA

Veterans' MATES

What is Veterans' MATES?

- A data driven **precision public health** program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.

- Funded by the Australian Government Department of Veterans' Affairs since 2004

- Provided by University of South Australia in partnership with
  - University of Adelaide
  - Australian Medicines Handbook
  - Drug & Therapeutics Information Service
  - HealthLink

Leadership

Prof. Libby Roughead
Program Director

Assoc. Prof. Andre Andrade
Deputy Director

Prof. Nicole Pratt
Data and evaluation lead

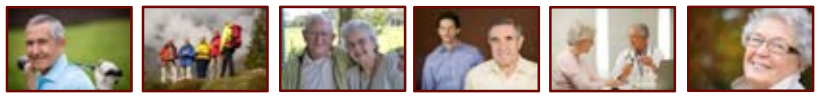
Ms. Tammy LeBlanc
Program Manager

We take a Big Data Source

To identify health care issues and trends

Pinpoint those who would benefit from an intervention and provide individually tailored recommendations

And then measure the impact of the intervention



Australian Government Department of Veterans' Affairs routinely collected health claims data

1 BILLION

Contains over a billion health claims records

18 YEARS

More than ten years of historical health data

Contains hospital records including diagnosis and procedures

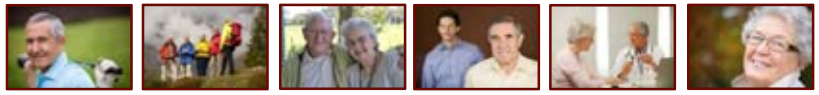
Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

Underpinned by frameworks that promote learning and behavior change

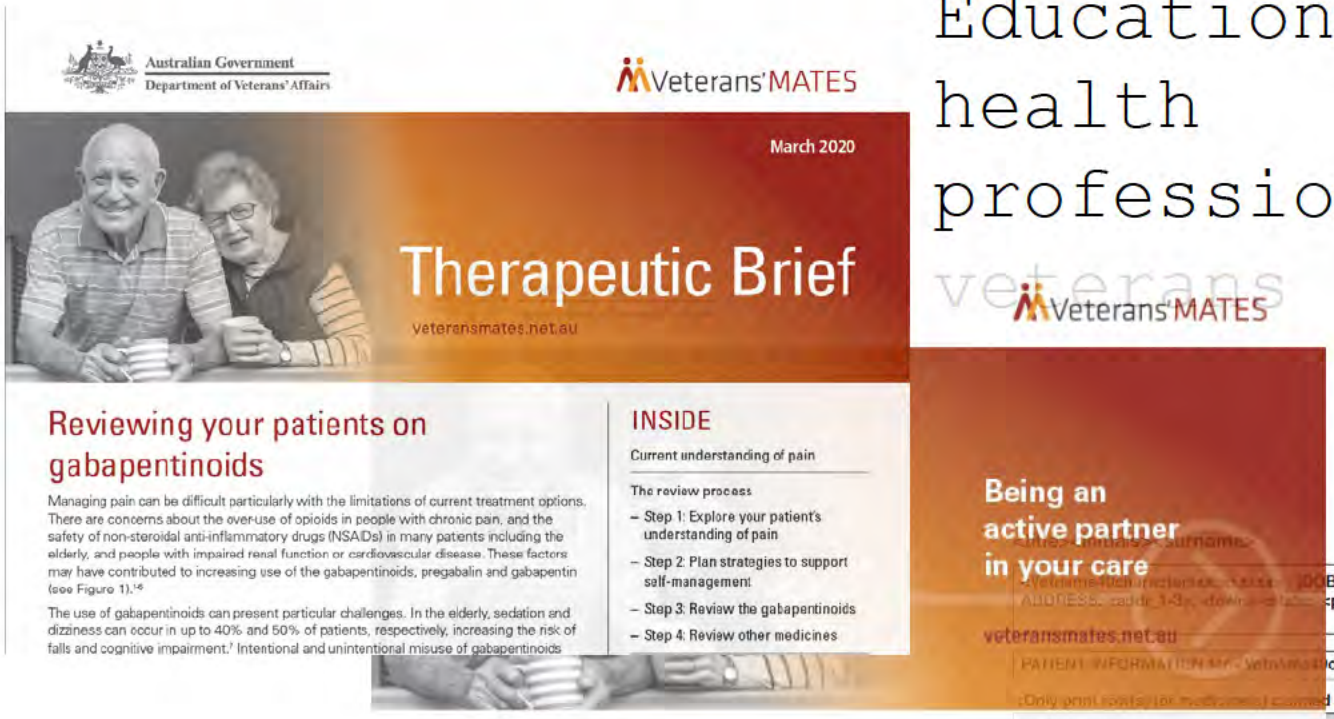
Social Cognitive Theory and the Transtheoretical Model of health behaviour change explain how individuals are likely to acquire and maintain new behavioural patterns over time

The PRECEDE-PROCEED health promotion model provides a framework that supports effective planning and implementation of the program within the wider environment

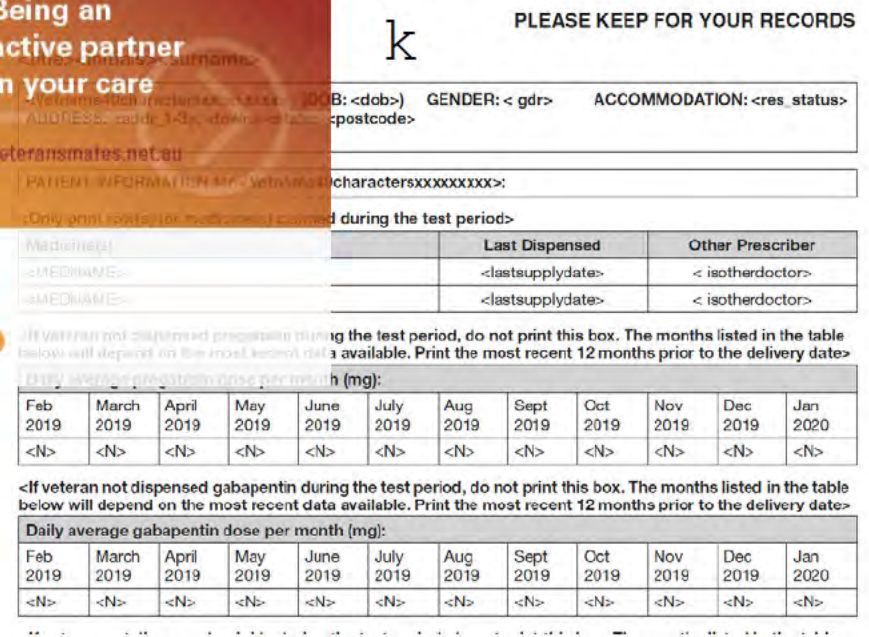


Multi-modal intervention, collaboratively developed

Education for health professionals and veterans



Audit/feedback


PLEASE KEEP FOR YOUR RECORDS

<GENDER: < gdr> ACCOUNTABILITY: <res_status>

<postcode>

during the test period>

	Last Dispensed	Other Prescriber
	<lastsupplydate>	< isotherdoctor>
	<lastsupplydate>	< isotherdoctor>

g the test period, do not print this box. The months listed in the table
available. Print the most recent 12 months prior to the delivery date>

h (mg):

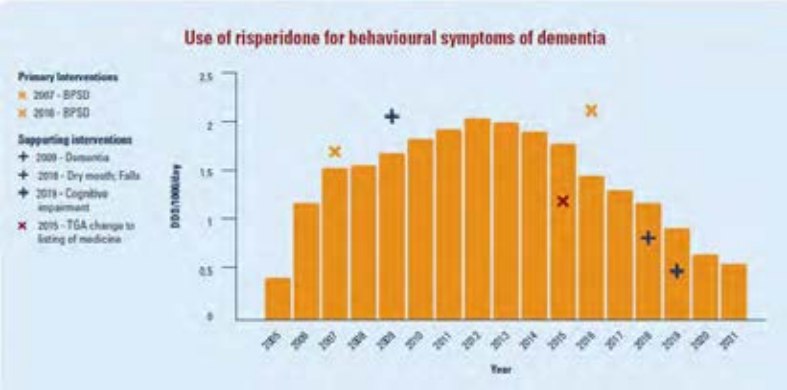
Feb 2019	March 2019	April 2019	May 2019	June 2019	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020
<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>

<If veteran not dispensed gabapentin during the test period, do not print this box. The months listed in the table below will depend on the most recent data available. Print the most recent 12 months prior to the delivery date>

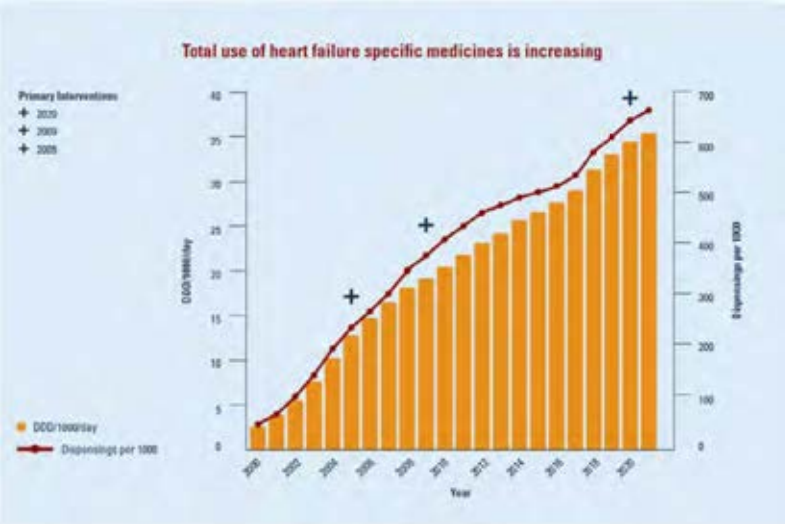
Daily average gabapentin dose per month (mg):

Feb 2019	March 2019	April 2019	May 2019	June 2019	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020
<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>

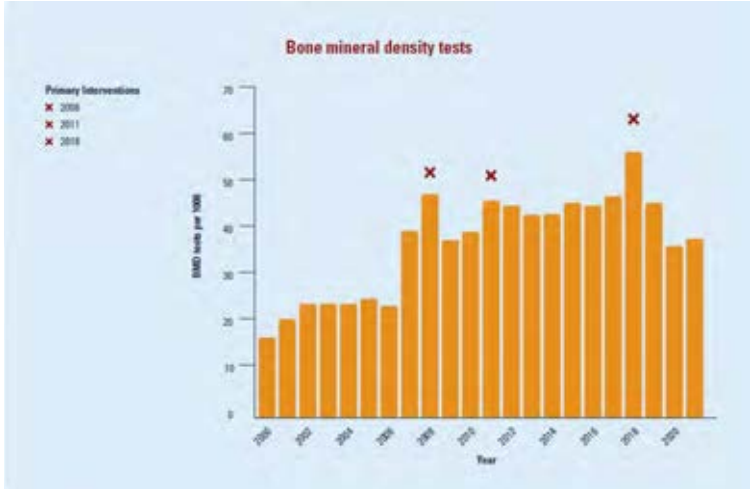
Evidence of effect



Medicine overuse



Medicine underuse



Uptake of preventative tests

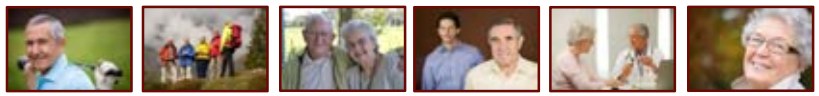
Digital media

The eDelivery project

The e-Delivery project

- Use digital media to replace postal delivery

- Main goals
  - Increase agility and capacity to respond to sudden public health demands
  - Incorporate into GP's workflow

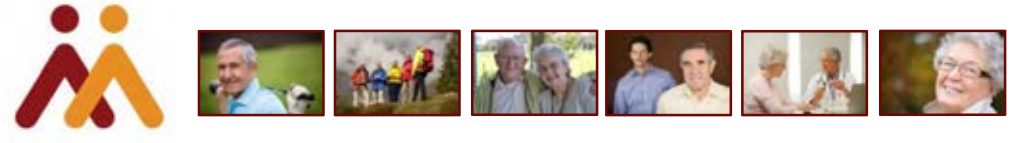


The opportunity to improve the improvement program

- Reliance on primary care provider
  - About 84% of Australians see a GP every year, and 77.3% of patients have a preferred GP[1]
- Technological readiness in primary care
  - Near universal use of electronic health records for more than 10 years[2]

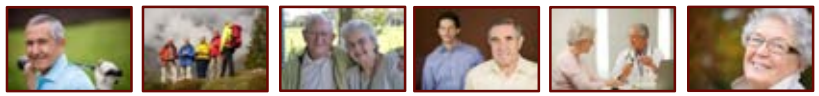
1) The Royal Australian College of General Practitioners. General Practice: Health of the Nation 2019. East Melbourne, Vic: RACGP, 2019.

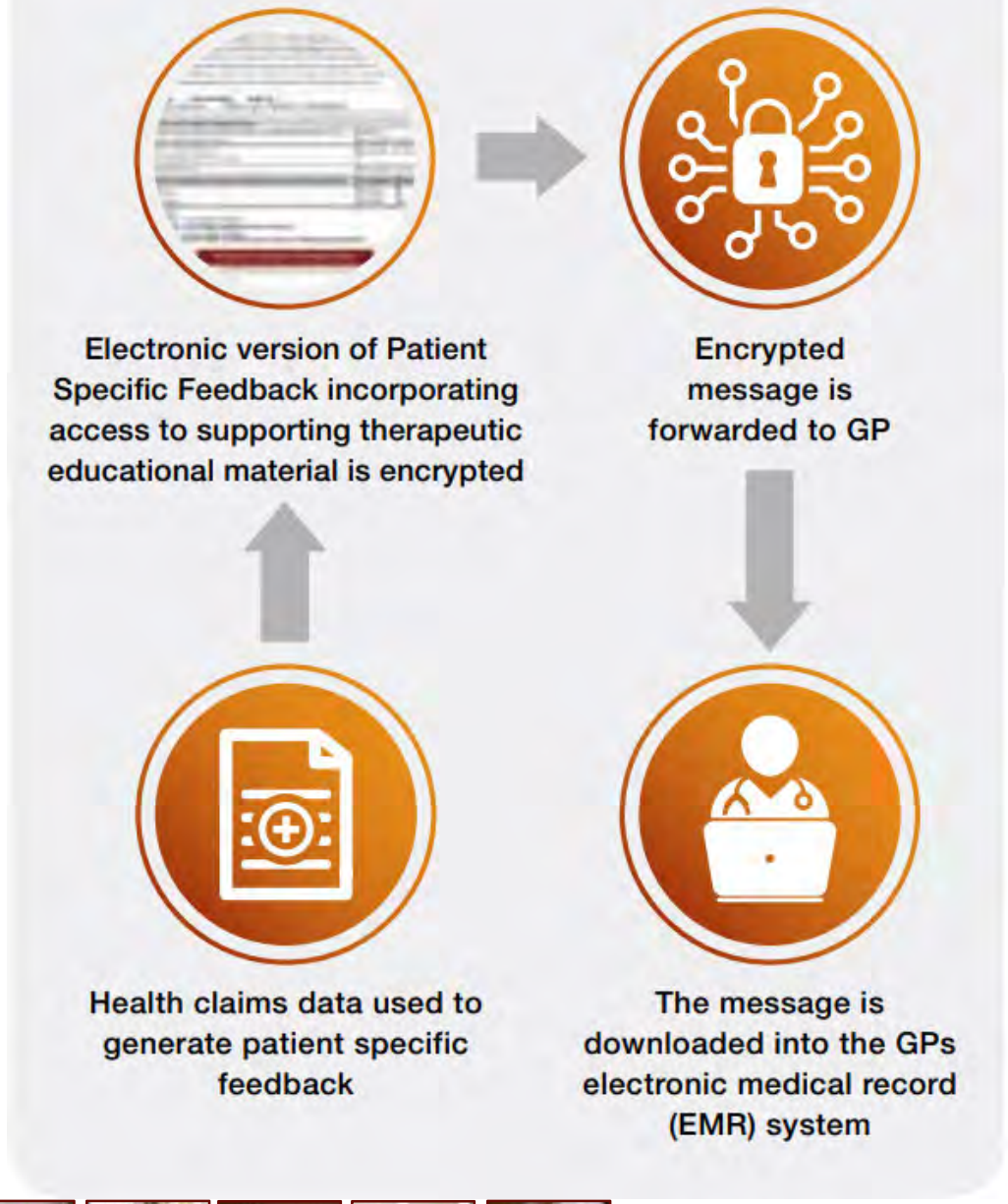
2) Jha AK, Doolan D, Grandt D, Scott T, Bates DW. The use of health information technology in seven nations. Int J Med Inform. 2008 Dec;77(12):848-54. PMID: 18657471.

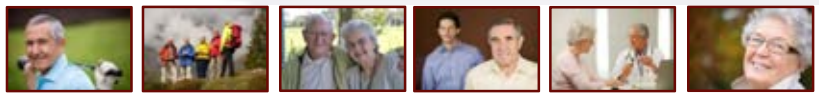


Challenges and solutions

- Technical challenges
  - Data integration with flexibility (quarterly topics)
- Implementation challenges
  - Product orientation vs service orientation
- What we did
  - Technology developed in-house




Electronic version of Patient Specific Feedback incorporating access to supporting therapeutic educational material is encrypted
Encrypted message is forwarded to GP
The message is downloaded into the GPs electronic medical record (EMR) system
Health claims data used to generate patient specific feedback



Elements for improved decision-making

Introductory header

Prompts (positive and negative)

Context* (time series chart)

Goal setting and rationale

*In this case, feedback on behaviour

Veterans' MATES

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME

Date: 15/03/2020

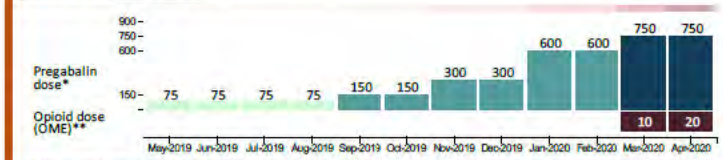
This Veterans' MATES information aims to assist you to review gabapentinoids (pregabalin or gabapentin) that may cause harmful side effects when used long term. It is advisory in nature. The information is based on DVA claims that indicate that a veteran has had 3 or more dispensings of pregabalin or gabapentin in a 12 month period, with at least 1 of the dispensings during the last 4 months of this period*.

Consider whether your patient will benefit from non-pharmacological pain therapy and, if warranted, whether adjusting the dose or ceasing gabapentinoids is appropriate. Please consider within the context of this patient's current treatment.

Educational material explaining the rationale for these recommendations can be found at the **Veterans' MATES website**

FIRST & SURNAME** **DOB: <DD/MM/YYYY>** **Gender: <Male or Female>** **ACCOMMODATION: Community**
<Residential address>

Relevant claims history for pain



*Daily average dose per month (mg), estimated from dispensing data
**Oral morphine equivalent daily average dose per month (mg), estimated from dispensing data

Consider DVA-funded services to support independent living	
Occupational therapist claim:	None claimed in the last five years
Cognitive, dementia, and memory assistive technology claim (DVA's National RAP schedule):	05/02/2017
DVA-funded dose administration aid claimed:	None claimed in the last two years
Home Medicines Review (HMR) claimed:	None claimed in the last two years
No. of unique medicines dispensed in last year:	5

Actions:
Refer to an occupational therapist YES ☐
Refer for a Home Medicines Review and DVA-funded dose administration aid service YES ☐

Notes	
Latest Home Medicines Review (HMR) claim	None claimed in the last 2 years
Latest Psychologist visit	None claimed in the last year

Medicine(s)	Last Dispensed	Other Prescriber
Pregabalin (Lyrica) Cap 75 mg	10/10/19	Yes
Tramadol hydrochloride (Tramal SR) controlled release Tab 50 mg	02/09/19	No
Oxycodone hydrochloride (OxyNorm) Cap 10 mg	02/10/19	No

Suggested actions:

- Review indication for use of medicine(s). Confirm pain is neuropathic
  Rationale: The majority of evidence for effectiveness of gabapentinoids is limited to diabetic neuropathic pain and post-herpetic neuralgia. There is limited evidence for effectiveness of gabapentinoids when a neuropathic component is not well established.
- Review duration of use, consider tapering and ceasing
  Rationale: Recommended duration of use of gabapentinoids is no longer than 6 months.
- Check for side effects of medicine(s). Consider risks for driving or falling.
  Rationale: One-third to one-half of patients taking gabapentinoids suffer from dizziness or somnolence.
- Review need for therapy, consider potential for cessation.
  Rationale: Patient received doses of pregabalin of below 150 mg per day. Potentially subtherapeutic dose for neuropathic pain.
- Patient co-dispensed opioids. This increases the risk of side effects in a dose-dependent manner.
- Consider referral for a Home Medicines Review (HMR) for review of medicines for pain.

Elements for improved decision-making

Feedback on behaviour

Embedded practical tools

Veterans'MATES

Identifying high risk of mental health conditions

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME

Date: 25/06/2020

This Veterans' MATES information identifies your DVA clients with past claims indicative of mental health conditions, past or current. They may be at heightened risk of poor mental health outcomes during the COVID pandemic.

FIRST & SURNAME* **DOB: <DD/MM/YYYY>** **GENDER: <Male or Female>** **ACCOMMODATION: <Community>**
ADDRESS:

Mental health services or medicines	Current history (last claim in 2020)	Past history (last claim prior to 2020)
Antipsychotic medicine	12 May 2020	-
Hypnotic medicine	12 May 2020	-
Psychologist service	-	14 Feb 2017
Psychiatrist service	-	3 Jan 2018
Accepted disability for PTSD	Yes	

90-SECOND TOOL: Grounding technique

Patients with history of PTSD are at higher risk of emotional distress during the COVID pandemic. This grounding technique was developed for post-trauma recovery (provided by Phoenix Australia) as a way to modulate the amygdala response. It is about focusing on what is going on around you in the here and now. **Trial this emotion management technique by saying to your patient:**

- Sit down to do this exercise – or to hold onto something solid.
- Really feel the sensation of being connected to the floor, the chair, the wall.
- Take a moment to notice three things you can feel – like the feeling of your clothes on your skin, or the sensation of your chair under your legs.
- Take a moment to notice three things you can see – like the picture on the wall, or birds eating crumbs on the ground.
- Take a moment to notice three things you can hear around you now – like the leaves rustling on trees, or laughter of children in the distance.
- Remind yourself where you are and what you are doing

Get more practical tools

(Opens in a new window)

Suggested actions for your consideration

- **At the next appointment, check for signs of distress for this patient.**
- **Review the use of medicines for mental health**
  Have a conversation with your patient about how they are taking their medicines for mental health and reinforce the need to continue their medicines as prescribed. Consider a referral for a Home Medicines Review for review of medicines for mental health, if appropriate. Home Medicines Reviews are also now available via telehealth.

Along with this letter, you will receive information about 4 other DVA clients. We appreciate the immense pressure GPs of Australia are currently experiencing and hope we can help support your care of DVA clients at this time.

*The services and medicines for the identified patients are sourced from the DVA Health Claims Database. Medicine and Medicare service use was identified from RPBS, PBS or MBS claims in the past 5 years. The most recent claim date for each service is shown. Claims data may be incomplete due to time differences between service delivery and claim payment. In addition, not all services provided can be identified from claims records. We have identified your patients aged 75 years or younger who have received mental health services or multiple dispensings for a mental health medicine in the last 5 years.

This information has been endorsed by the DVA Editorial Committee, which includes representatives from the AMA and RACGP.
For general comments and feedback please contact MATES.comments@unisa.edu.au

Medicines with sedative effects	Last dispensed	Other prescriber	Geriatric sedative load** 0 1 2 3 4 >5
PREGABALIN (Lyrica) Cap 150 mg	17/04/2020	No	
HALOPERIDOL (Serenace) Tab 500 mcg	07/02/2020	Yes	
TEMAZEPAM (Temaze) Tab 10 mg	17/04/2020	No	
TOTAL SEDATIVE LOAD			

Prior hospital admission for a fall	12/12/2019

Suggested actions for your consideration

Patient dispensed one or more medicine(s) with sedative effects. This increases the risk of impaired physical function and falls.

- **Ask your patient if they have noticed any changes in their mobility, in particular since the COVID-19 restrictions and associated disruptions to their social and physical activity routines**
- Review above medicines to see if any are suitable for tapering or ceasing, particularly those commenced during COVID-19 restrictions
- Explore with the patient actions they can take to rebuild social connections and physical activity safely as COVID-19 restrictions are lifted
- Refer your patient for a HMR/RMMR for review of medicines

Get more practical tools

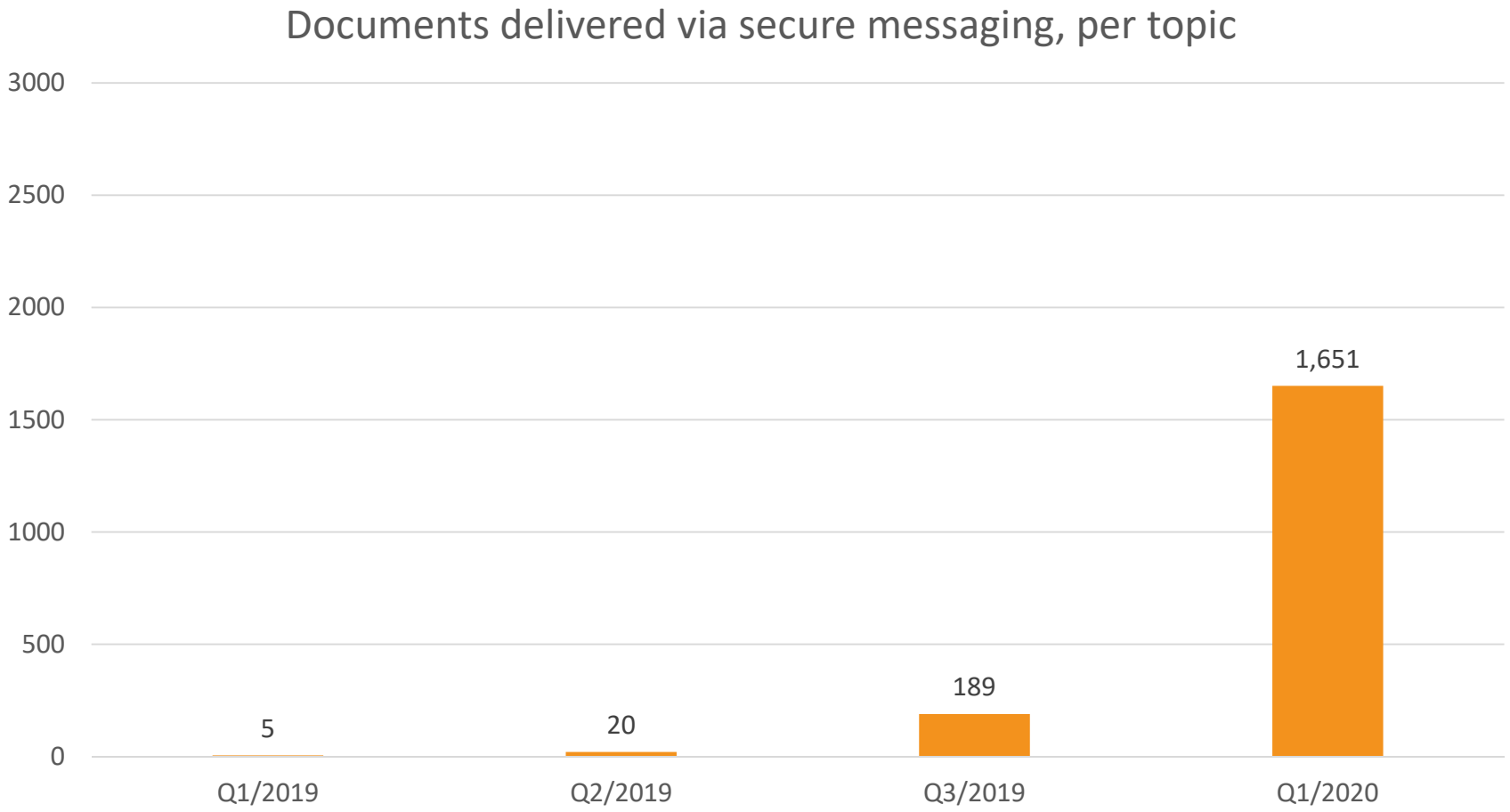
(Opens in a new window)

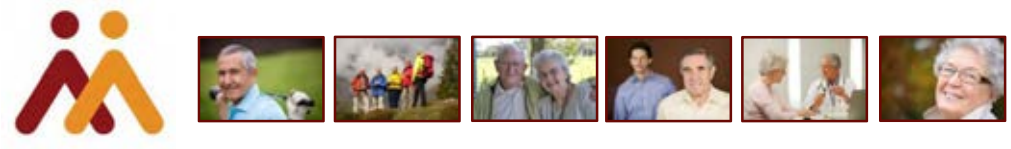
MEASURING FUNCTIONAL CAPACITY: Gait speed

Gait speed is a reliable measure of functional capacity. Older people with a slow gait speed are at a higher risk of falls, physical and cognitive functional decline, hospitalisation and poor quality of life. **To assess your patient's gait speed:**

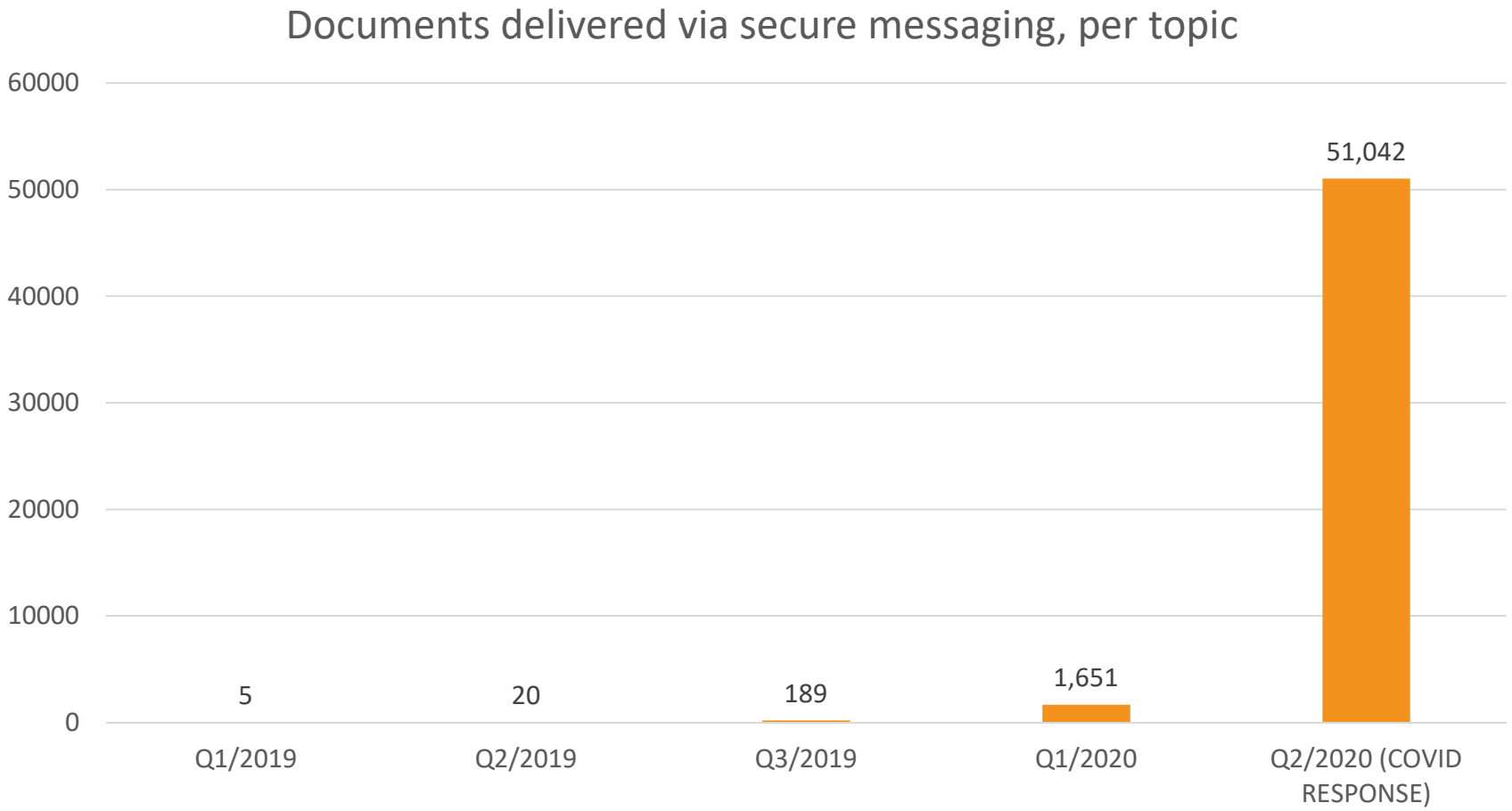
- Observe your patient's gait, stride length, postural stability and sway as they walk. Ask your patient or their partner/carer if there have been any noticeable changes in your patient's walking ability.
- Use the 'timed up and go' test which assesses your patient's ability to stand from a chair, walk three meters, turn around, return to the chair and sit down

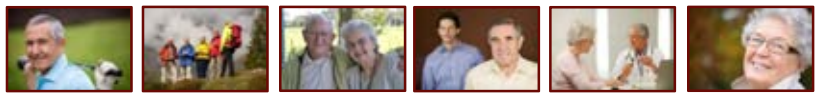
Prototype → Test → Iterate → Scale





Prototype → Test → Iterate → Scale





Emergency preparedness

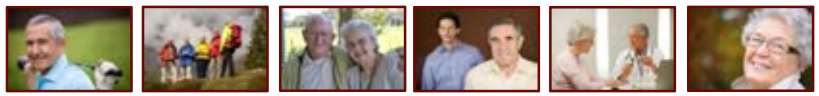
COVID-19

Quick recap

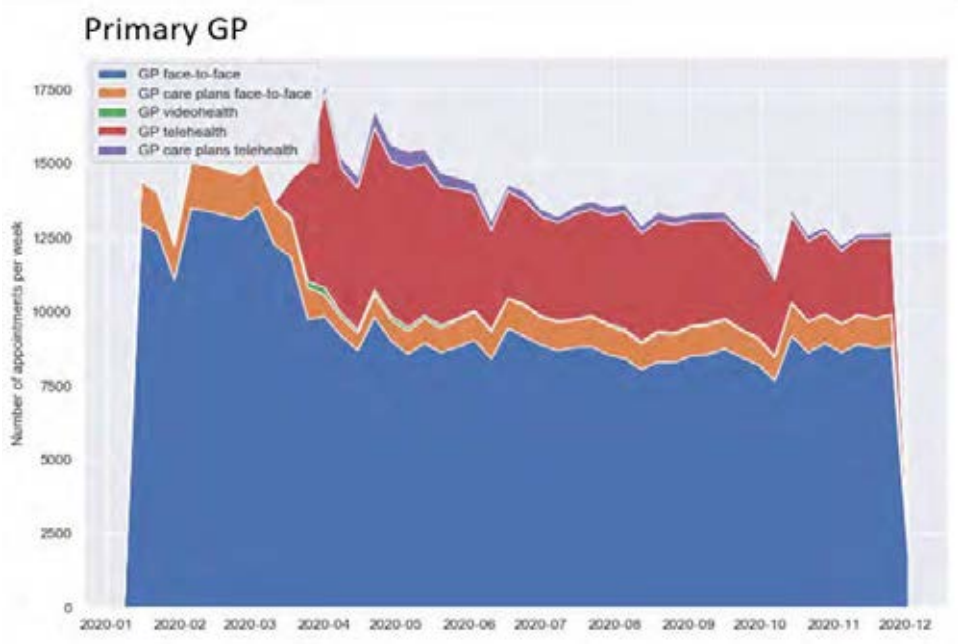
To identify health care issues and trends

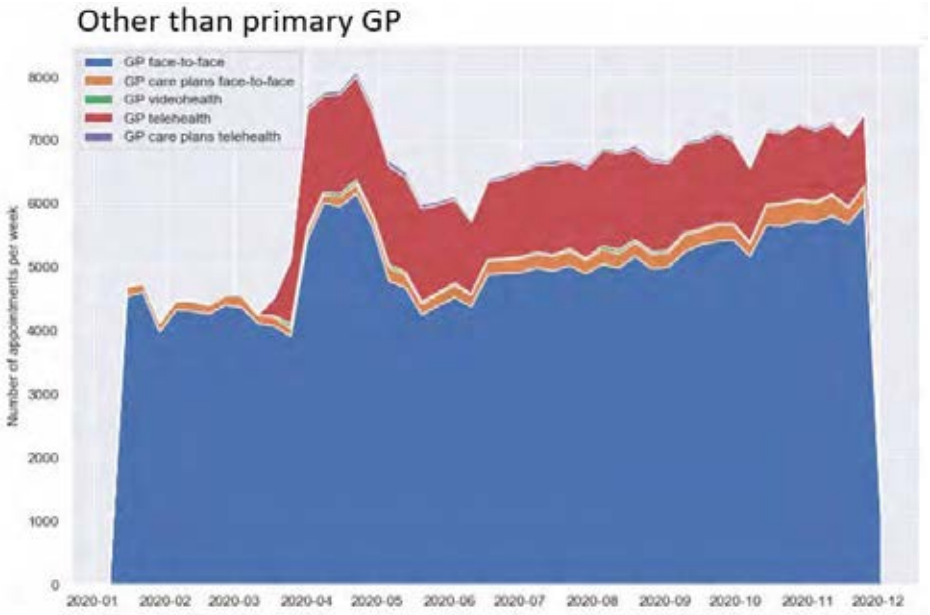
Pinpoint those who would benefit from an intervention and provide individually tailored recommendations

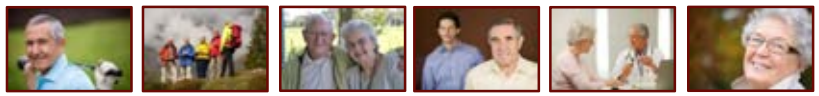
And then measure the impact of the intervention



Issue identification







Tailored recommendations and supportive evidence based educational material for health professional

Veterans'MATES **Identifying vulnerable DVA clients during the COVID-19 pandemic**

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME

Date: 15/03/2020

This Veterans' MATES information identifies your DVA clients who are at high risk of poor outcomes if they contract COVID-19. The risk factors for poor outcomes include older age, hypertension, chronic heart disease, diabetes, chronic airways disease, cerebrovascular disease, chronic liver disease, chronic renal failure, malignancy, and being immunocompromised or taking immune suppressing medicines.

You can access the summarised evidence on risk factors by clicking on COVID factsheets There, you will also find up-to-date information about medicine use during the COVID-19 pandemic.

FIRST & SURNAME* **DOB: <DD/MM/YYYY>** **GENDER: <Male or Female>** **ACCOMMODATION: <Community or RACF>**
ADDRESS:

Total number of risk factors in addition to older age: 3

Potential risk factors for poor outcomes with COVID-19	Last hospital admission or service	Last medicine dispensing
Hypertensive heart disease[3] or hypertension[2]	-	1 Feb 2020
Chronic obstructive pulmonary disease[1, 2], asthma[1, 2] or previous hospital admission for pneumonia or influenza[1]	-	1 Feb 2020
Recent cancer treatment, including hospital admission[1], radiotherapy[1, 3] or cytotoxic therapy[2, 3]	27 Jan 2020	-

[1]morbidity identified through hospital record of diagnosis
[2]morbidity identified through medicine claim for indication
[3]morbidity identified through MBS claim for service

Suggested actions:

- **Maintain contact with these vulnerable patients throughout the COVID-19 pandemic.**
  Ask your patients at high risk to contact your practice by phone if they develop respiratory symptoms. Ensure they are familiar with COVID-19 symptoms, what they can do to avoid contracting COVID-19 and who to contact if they are concerned.
  If you are caring for patients with COVID-19, closely monitor markers of clinical progression especially on days five to ten after onset of symptoms, the time point where rapid deterioration has frequently been observed.
- **Schedule appointments to ensure vulnerable patients are still receiving necessary care.**
  Discuss the options of telehealth and face-to-face consultations and identify the most appropriate option for you and your patient. Confirm their understanding of telehealth services, their preferred mechanism (e.g. telephone or video service) and their capability to participate in video telehealth services with you and their other health providers.
- **Administer flu and pneumococcal vaccinations, where the patient is unvaccinated or a further dose of Pneumovax is required.**
  The Australian Therapeutic Goods Administration advises that the adjuvanted quadrivalent influenza vaccine, Fluad Quad, is preferred in persons aged 65 years and over and is available through the National Immunisation Program (NIP) Schedule.

Along with this letter, you will receive information about 4 other DVA clients. We appreciate the immense pressure GPs of Australia are currently experiencing and hope we can help support your care of DVA clients at this time.

*Hospital admissions identified in claims data in the past five years. Medicine use identified in PBS claims, with the patient having at least two claims for a medicine in this class in the past year. Most recent claim date for each service is shown in the table. Patient's profile information is based on claims to DVA from all healthcare providers. Some of the medicines listed might have been prescribed by other doctors. You have been identified as the general practitioner who has written most of the recent prescriptions for this patient.

This information has been endorsed by the DVA Editorial Committee, which includes representatives from the AMA and RACGP.
For general comments and feedback please contact MATES.comments@unisa.edu.au

Australian Government Department of Veterans' Affairs

Veterans'MATES

FACT SHEET 1

Risk factors for poor outcomes with COVID-19

As more data becomes available from countries that have experienced a high rate of COVID-19, we are getting a clearer picture of which patients may be at heightened risk of poor outcomes if they contract COVID-19. We have identified risk factors from emerging observational data and epidemiological reports from China, Italy, Spain and the USA.

These data suggest patients aged 60 years or over, especially men, with one or more chronic conditions may be at heightened risk of severe or fatal outcomes if they contract COVID-19.

Risk factors

Older age

To date, all available evidence suggests

COVID-19 have one or more of the following chronic conditions:

- hypertension[2,3]

Australian Government Department of Veterans' Affairs

Veterans'MATES

FACT SHEET 2

What to tell patients about taking their routine medicines during COVID-19

These are stressful times for many people, especially for people with chronic illnesses, who are older or who are immunocompromised (see Fact Sheet 1). Many patients will be aware of social media and news stories about associations between some medicines and different health outcomes in the context of COVID-19. They will be concerned as to whether they should continue taking their medicines.

Research on interactions between specific medicines and COVID-19 is ongoing. Current guidance is based on observational data and theories; there is no clinical trial evidence to date.[1] The following recommendations are derived from professional societies who have examined the current evidence to answer some commonly asked questions about medicines use in the context of COVID-19.

Angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs)

There is currently no clinical evidence of harmful effects of ACE inhibitors or ARBs in the context of COVID-19, nor is there evidence to support stopping them because of COVID-19.[1,2] There are studies in animals that suggest these medicines may be protective against serious lung complications in patients with COVID-19, but to date there are no data in humans.[1]

What to tell your patients taking an ACE inhibitor or an ARB

Patients routinely taking an ACE inhibitor or an ARB for the treatment of hypertension, heart failure or cardiovascular disease should continue to do so as prescribed, unless otherwise advised by you or their specialist.[1,2]

Ibuprofen

To date, there is no clinical evidence to support a link between taking ibuprofen during COVID-19 and more severe outcomes if patients become infected.[4,5]

What to tell your patients taking ibuprofen

Medicines with immunosuppressive properties, including disease modifying agents

If managing patients with suspected mild COVID-19, do not change the dose or stop long-term immunosuppressive medicines, including high-dose corticosteroids, chemotherapy, biologics, or disease-modifying anti-rheumatic drugs (DMARDs).[4]

For patients with asthma or chronic obstructive pulmonary disease (COPD) requiring systemic corticosteroids for a severe flare-up, ensure the flare-up is due to the pre-existing lung disease and not COVID-19.[1]

There are no medicines that have been approved by the Therapeutic Goods Administration (TGA) for the treatment of COVID-19; **the TGA strongly discourages the use of hydroxychloroquine outside its current indications at this time.**[4] To limit the use of hydroxychloroquine to currently approved indications, restrictions have been placed on who can initiate therapy; from 24 March 2020 GPs can only prescribe repeats for hydroxychloroquine to patients in whom it was initiated by a specialist before this date.[4]

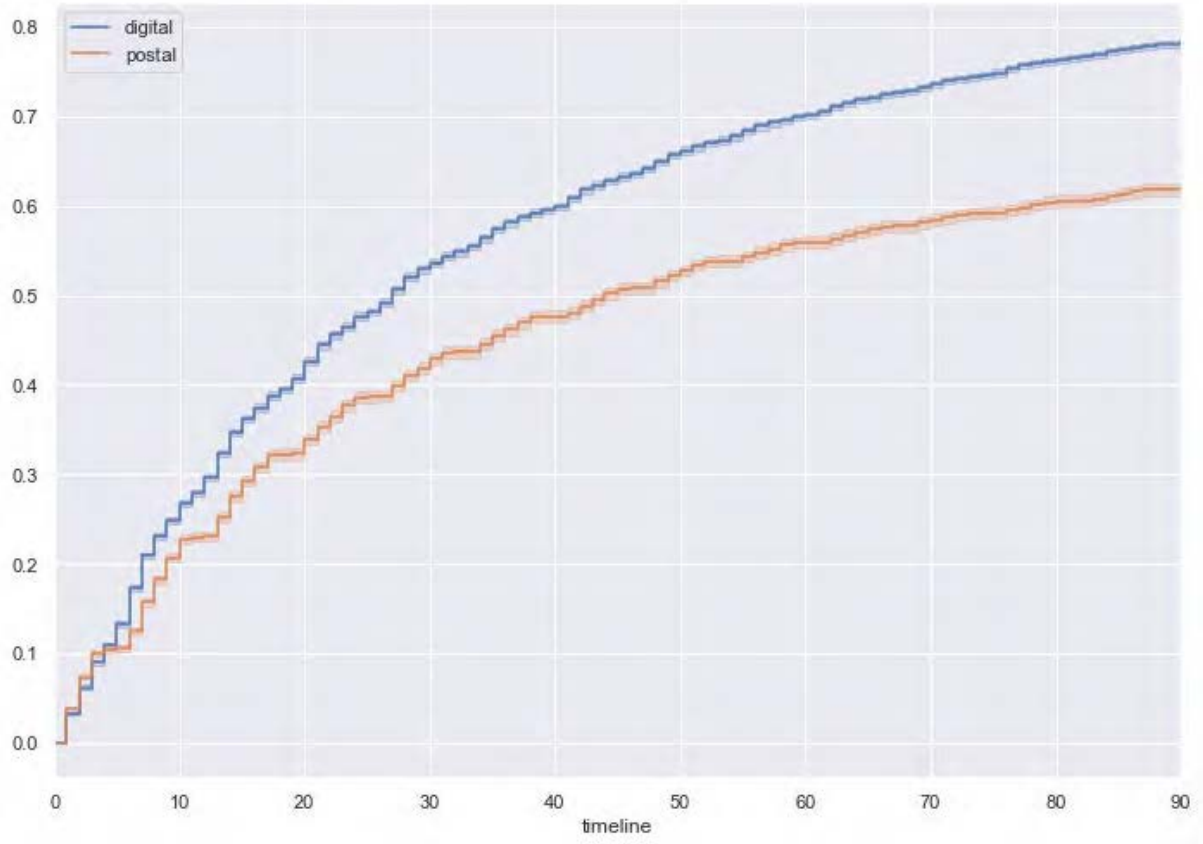


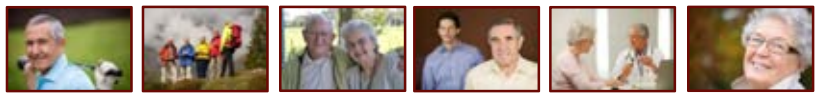



Scale and speed

- Scale
  - **Secure message:** 51,052 interventions to 11,375 GPs
  - **Postal mail:** 26,859 interventions to 7,202 GPs
  - All states and territories
- Speed
  - 4 weeks between initial idea and intervention delivery

Increased visits to GP from the digital group – HR 1.38 (CI 1.35, 1.4)





Promoting access to mental health services – July 2020

Veterans' MATES

Identifying high risk of mental health conditions

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME

Date: 25/06/2020

This Veterans' MATES information identifies your DVA clients with past claims indicative of mental health conditions, past or current. They may be at heightened risk of poor mental health outcomes during the COVID pandemic.

FIRST & SURNAME* **DOB: <DD/MM/YYYY>** **GENDER: <Male or Female>** **ACCOMMODATION: <Community>**
ADDRESS:

Mental health services or medicines	Current history (last claim in 2020)	Past history (last claim prior to 2020)
Antipsychotic medicine	12 May 2020	-
Hypnotic medicine	12 May 2020	-
Psychologist service	-	14 Feb 2017
Psychiatrist service	-	3 Jan 2018
Accepted disability for PTSD	Yes	

90-SECOND TOOL: Grounding technique

Patients with history of PTSD are at higher risk of emotional distress during the COVID pandemic. This grounding technique was developed for post-trauma recovery (provided by Phoenix Australia) as a way to modulate the amygdala response. It is about focusing on what is going on around you in the here and now. **Trial this emotion management technique by saying to your patient:**

- Sit down to do this exercise – or to hold onto something solid.
- Really feel the sensation of being connected to the floor, the chair, the wall.
- Take a moment to notice three things you can feel – like the feeling of your clothes on your skin, or the sensation of your chair under your legs.
- Take a moment to notice three things you can see – like the picture on the wall, or birds eating crumbs on the ground.
- Take a moment to notice three things you can hear around you now – like the leaves rustling on trees, or laughter of children in the distance.
- Remind yourself where you are and what you are doing

Get more practical tools

(Opens in a new window)

Suggested actions for your consideration

- **At the next appointment, check for signs of distress for this patient.**
- **Review the use of medicines for mental health**
  Have a conversation with your patient about how they are taking their medicines for mental health and reinforce the need to continue their medicines as prescribed. Consider a referral for a Home Medicines Review for review of medicines for mental health, if appropriate. Home Medicines Reviews are also now available via telehealth.

Along with this letter, you will receive information about 4 other DVA clients. We appreciate the immense pressure GPs of Australia are currently experiencing and hope we can help support your care of DVA clients at this time.

*The services and medicines for the identified patients are sourced from the DVA Health Claims Database. Medicine and Medicare service use was identified from RPBS, PBS or MBS claims in the past 5 years. The most recent claim date for each service is shown. Claims data may be incomplete due to time differences between service delivery and claim payment. In addition, not all services provided can be identified from claims records. We have identified your patients aged 75 years or younger who have received mental health services or multiple dispensings for a mental health medicine in the last 5 years.

This information has been endorsed by the DVA Editorial Committee, which includes representatives from the AMA and RACGP.
For general comments and feedback please contact MATES.comments@unisa.edu.au

Australian Government Department of Veterans' Affairs

Veterans' MATES

HEALTH PROFESSIONAL FACT SHEET

Practical ways to help your patients manage distress during and after COVID-19

Changes brought about by COVID-19 to the way we work, communicate and connect every day have caused uncertainty, loneliness and distress for many people.[1,2]

People are recovering[3] but, for some (see Box 1), COVID-19 and its flow-on effects (see Box 2) can be a trigger to the brain's 'emotional and fear detection centre'.[1] Distressing emotions and negative thoughts of past traumas and anxieties can be re-initiated and persist well after COVID-19 has diminished.[1,2,4]

Anticipate acute and continuing distress for some DVA patients.[1,4] At each consultation, ask your patient how they are going.

Help your patients experiencing distress to:

Understand the stress response

A good first step to mitigate distress is to acknowledge that it exists and know it is normal to feel distress during an event like COVID-19.[1] **Share this 90-second video by Phoenix Australia – Centre for Posttraumatic Mental Health with your patients to help them understand the stress response** (the first video at this link): www.recoveryonline.org.au/managing-emotions

Explain to your patient that simple techniques, such as controlled breathing and mindfulness or grounding can help calm the mind and body, especially when practised a few times every day.[1,2,5]

With your patients, work through the following techniques included in the suite of High Res SMART tools:

- **A 1-minute video and tool on controlled breathing:** www.openarms.gov.au/get-support/self-help-tools/show-all-tools/physical/controlled-breathing

- **A 2-minute video/tool on guided grounding techniques:** www.openarms.gov.au/get-support/self-help-tools/show-all-tools/physical/guided-grounding

Manage negative thoughts

Ruminating negative thoughts can fuel anxiety.[1] Recognising and managing these thoughts helps to control emotions and, ultimately, behaviours. Encourage your patients to:

- **click on 'start tool' to try the 'stop and swap thoughts' tool:**

Box 1. Veterans most at risk of acute and continuing distress may have experienced:

- post-traumatic stress[4]
- anxiety disorders[4]
- depressive disorders[4]
- health anxiety[4,5]

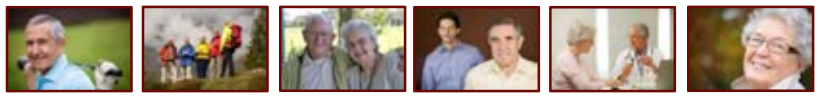
Box 2. Flow-on effects from COVID-19 may include:

- anxiety, loneliness or a sense of isolation[4]
- family, unemployment and financial stress[4]

Teach your patients to recognise signs of distress so they can practise learnt techniques well before they feel overwhelmed.[1]

Distressed patients may be:[1,3,4]

- anxious, worried or irritable
- sleeping less or more
- withdrawn or depressed
- feeling a loss of control or a sense of hopelessness
- finding it difficult to concentrate
- agitated, angry or vigilant
- using more alcohol leading to anti-social behaviours and violence
- having interpersonal relationship



COVID-19 oral therapy selection – Jun 2022

Australian Government
Department of Veterans' Affairs

Veterans'MATES Topics Resources Contact Us About A- A+

NIRMATRELVIR PLUS RITONAVIR INTERACTION CHECKER

Only medicines with a known interaction with nirmatrelvir plus ritonavir are listed. If a medicine is not listed below it cannot automatically be assumed it is safe to co-administer.

Select the medicines

Flecainide

Fluticasone/Salmeterol

Fosamprenavir

Reset Checker

Generate patient handout

Amiodarone

EFFECT ON CONCENTRATION	CONTRA-INDICATED
↑ Amiodarone	⚠ Consider alternative COVID-19 treatment

Co-administration of nirmatrelvir/ritonavir contraindicated due to potential for cardiac arrhythmias. Amiodarone product information states: The half-life of amiodarone is long and with chronic oral dosing can be from 14 to 110 days but is usually in the range 14 to 59 days.

Remove

Fluoxetine

EFFECT ON CONCENTRATION	FOLLOW UP
↑ Fluoxetine	🔍 Monitor

Careful monitoring of therapeutic and adverse effects is recommended when fluoxetine is concomitantly administered with antiretroviral doses of ritonavir (greater than 100mg daily).

Remove

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Plan now for when your DVA patient gets COVID-19

As the COVID-19 pandemic evolves, the role of GPs is becoming even more important for managing at-risk patients in the community.

An estimated 35,000 DVA patients are considered at risk of progressing to severe illness and needing hospitalisation if they develop COVID-19 infection.

Vaccination continues to be the most important and beneficial intervention to prevent severe illness.[1]

Two oral antiviral medicines may help prevent hospitalisation in such patients. Nirmatrelvir and ritonavir (Paxlovid®) and molnupiravir (Lagevrio®) have been listed on the PBS for use in non-pregnant patients 18 years and older who have at least one symptom and have tested positive by polymerase chain reaction (PCR) or rapid antigen test (RAT) for COVID-19 and meet eligibility criteria.[1,2,3]

PBS criteria
- **Nirmatrelvir and ritonavir** www.pbs.gov.au/medicine/item/12996B
- **Molnupiravir** www.pbs.gov.au/medicine/item/12910L

Covid antivirals are effective in reducing mortality.[4,5,6,7] Nirmatrelvir and ritonavir (Paxlovid®) was significantly more effective in clinical trials than molnupiravir (Lagevrio®) at reducing hospitalisation (84% compared to 43%).[1,4] Both medicines must be started within 5 days of diagnosis and should be taken twice a day for 5 days.[1,4,5,8]

Nirmatrelvir and ritonavir (Paxlovid®)

is the first choice in high-risk patients, but it has potential for significant drug interactions.[1,4,5,6,8,9,10]

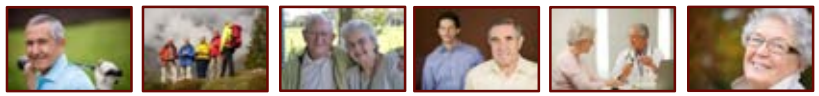
Potential interactions can be assessed using the COVID-19 medicine interaction checker **www.veteransmates.net.au/covid-checker**

Paxlovid® should not be used in severe hepatic and renal (eGFR < 30 mL/min) impairment and dosage must be reduced in moderate impairment (eGFR > 30 to 59 mL/min).[1]

Take a structured approach when considering these medicines:

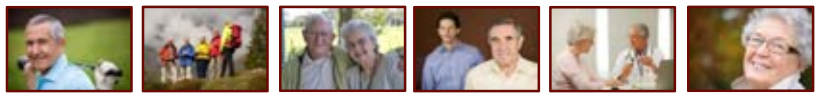
Identify, Prepare, Support, Assess and Prescribe

1. **Consider alternative COVID-19 treatment**



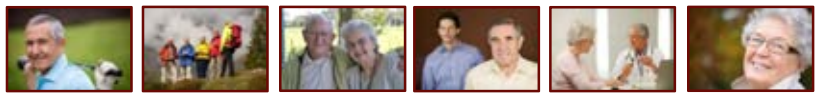
Emergency preparedness

Moving forward



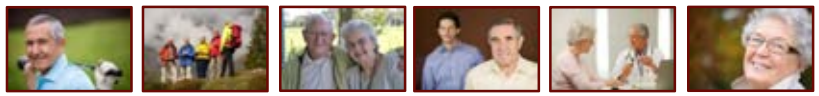
What did we learn?

- Digital health is effective in detecting AND responding to emergencies
  - National emergencies impact on chronic disease management
  - Centralised data, distributed coordination



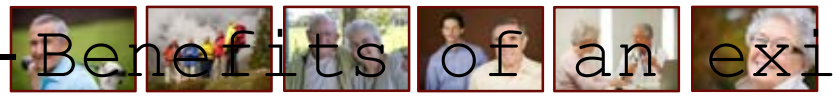
What did we learn?

- Digital health is effective in detecting AND responding to emergencies
  - Clinical expertise to enhance administrative data
  - Clinical expertise to tailor intervention



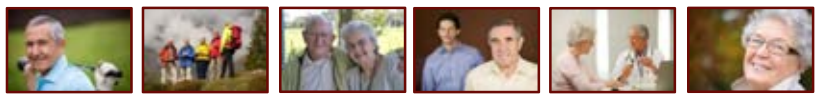
What did we learn?

- Strong stakeholder participation is required
  - Multiple rounds of review and editing
  - Endorsement by authorities and peers
  - Benefits of an existing structure



Thoughts and aspirations

- Formalise the strategy in a plan
  - Hierarchy of needs (e.g. oxygen at home)
  - Capacity to activate different services, including rescue services



  - Continuous monitoring of at risk

Thoughts and aspirations

- Share the experience so it can be extended to all Australians

University of South Australia | Quality Use of Medicines and Pharmacy Research Centre

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Thank you

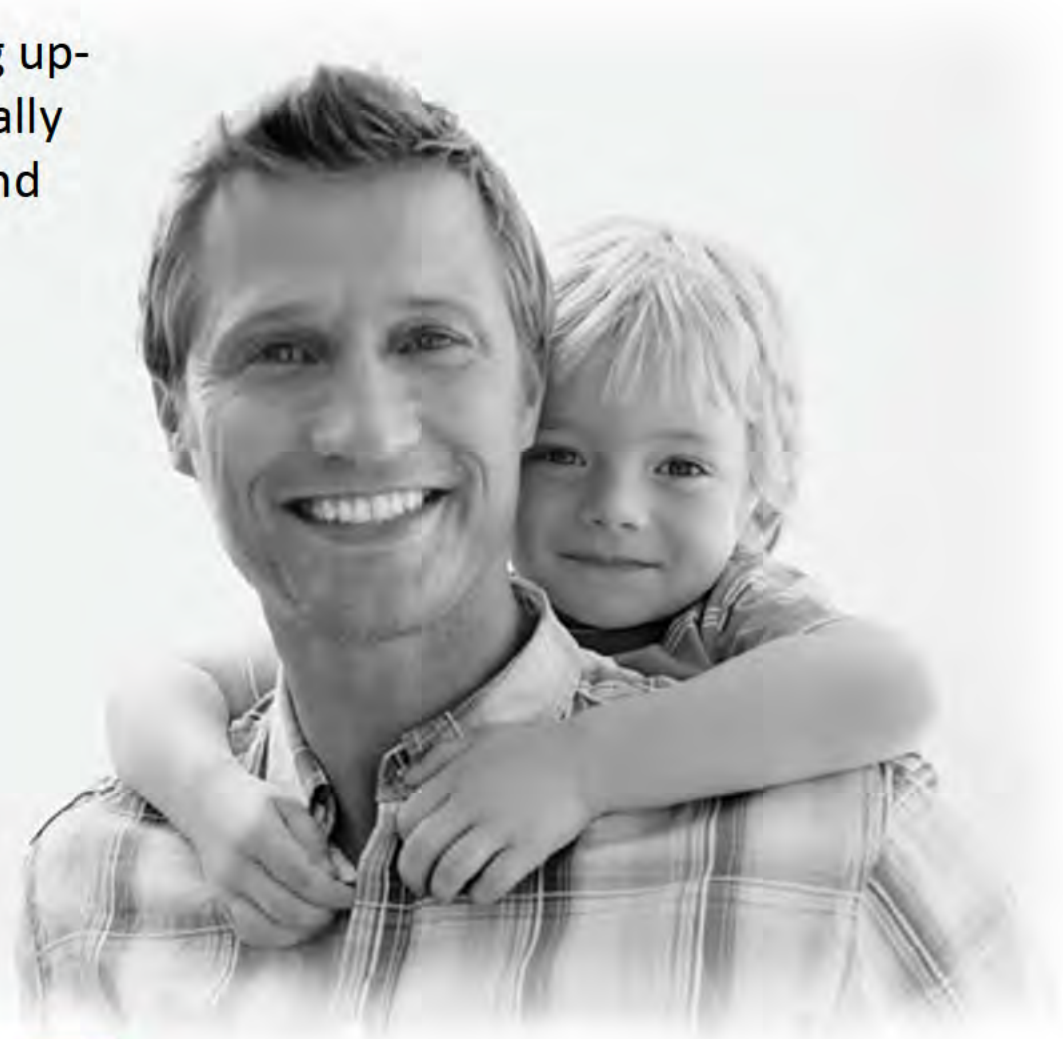
Andre Andrade, MD. PhD.
andre.andrade@unisa.edu.au






What is Veterans' MATES?

- A data driven health promotion program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.
- Funded by the Australian Government Department of Veterans' Affairs since 2004
- Provided by University of South Australia in partnership with
  - University of Adelaide
  - Australian Medicines Handbook
  - Drug & Therapeutics Information Service
  - NPS MedicinesWise
  - HealthLink



We take a Big Data Source

Identify health care trends and issues

Pinpoint those who would benefit

We use the Australian Government Department of Veterans' Affairs routinely collected health claims data

1 BILLION

Contains over half a billion health claims records

20 YEARS

More than ten years of historical health data

Contains hospital records including diagnosis and procedures

Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

Our model

PLANNING PHASE

Using the data, we determine the prevalence of a medication or health related problem

IMPLEMENTATION PHASE

The data are used to develop the patient-based feedback provided to doctors

EVALUATION PHASE

The data enable the impact and outcomes of the intervention to be measured

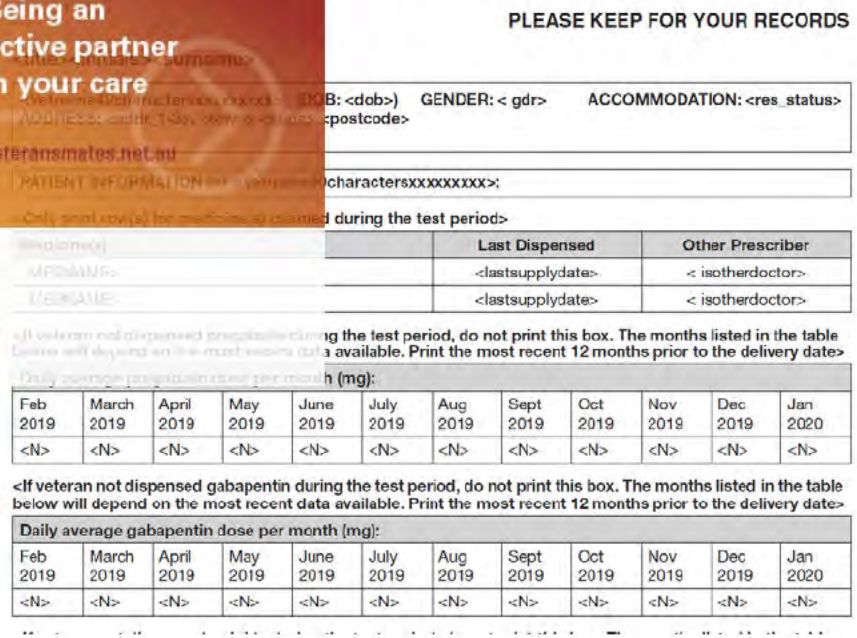
Veteran reference group

Practitioner reference group

Multi-modal intervention

Education for health professionals and veterans

Audit/feedback



PLEASE KEEP FOR YOUR RECORDS

DOB: <dob>) GENDER: < gdr> ACCOMMODATION: <res_status>
<postcode>

characters xxxxxxxxx>:

during the test period>

	Last Dispensed	Other Prescriber
	<lastsupplydate>	< isotherdoctor>
	<lastsupplydate>	< isotherdoctor>

g the test period, do not print this box. The months listed in the table
available. Print the most recent 12 months prior to the delivery date>

h (mg):

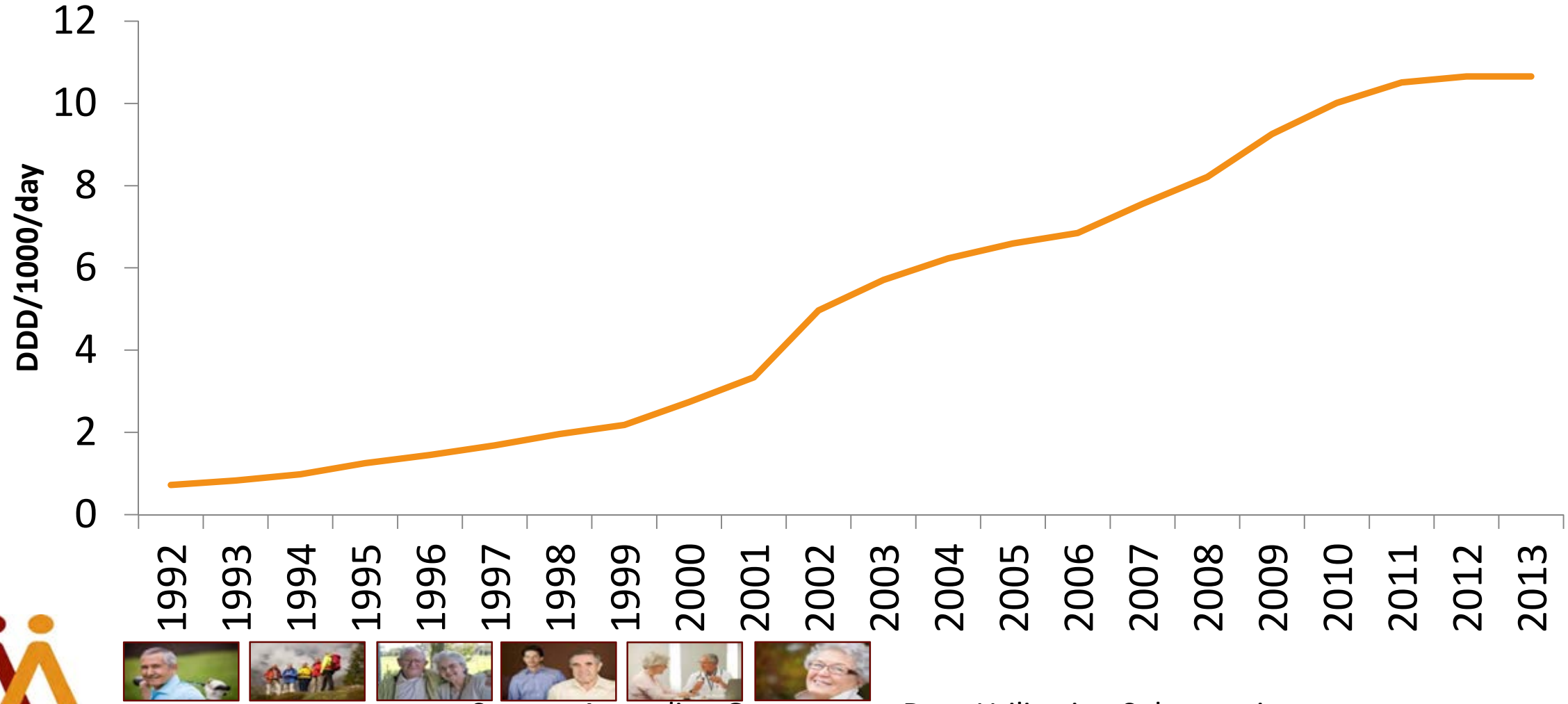
Feb 2019	March 2019	April 2019	May 2019	June 2019	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020
<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>

<If veteran not dispensed gabapentin during the test period, do not print this box. The months listed in the table below will depend on the most recent data available. Print the most recent 12 months prior to the delivery date>

Daily average gabapentin dose per month (mg):											
Feb 2019	March 2019	April 2019	May 2019	June 2019	July 2019	Aug 2019	Sept 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020
<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>	<N>

Translating the evidence into practice: Chronic Pain

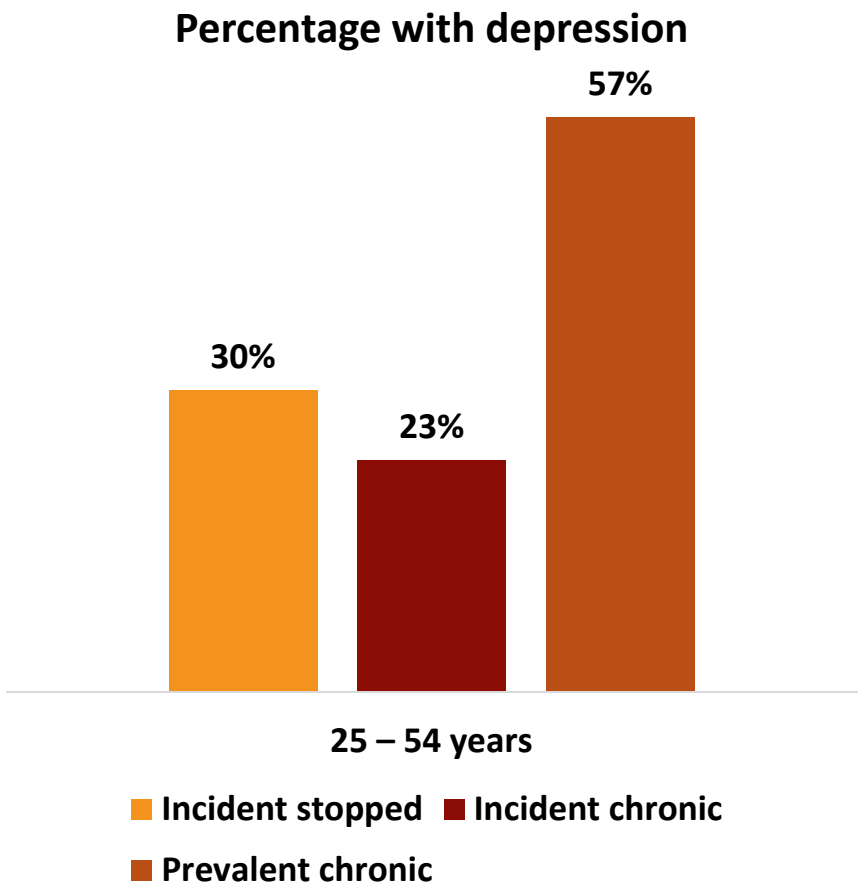
Opioid use: Australia

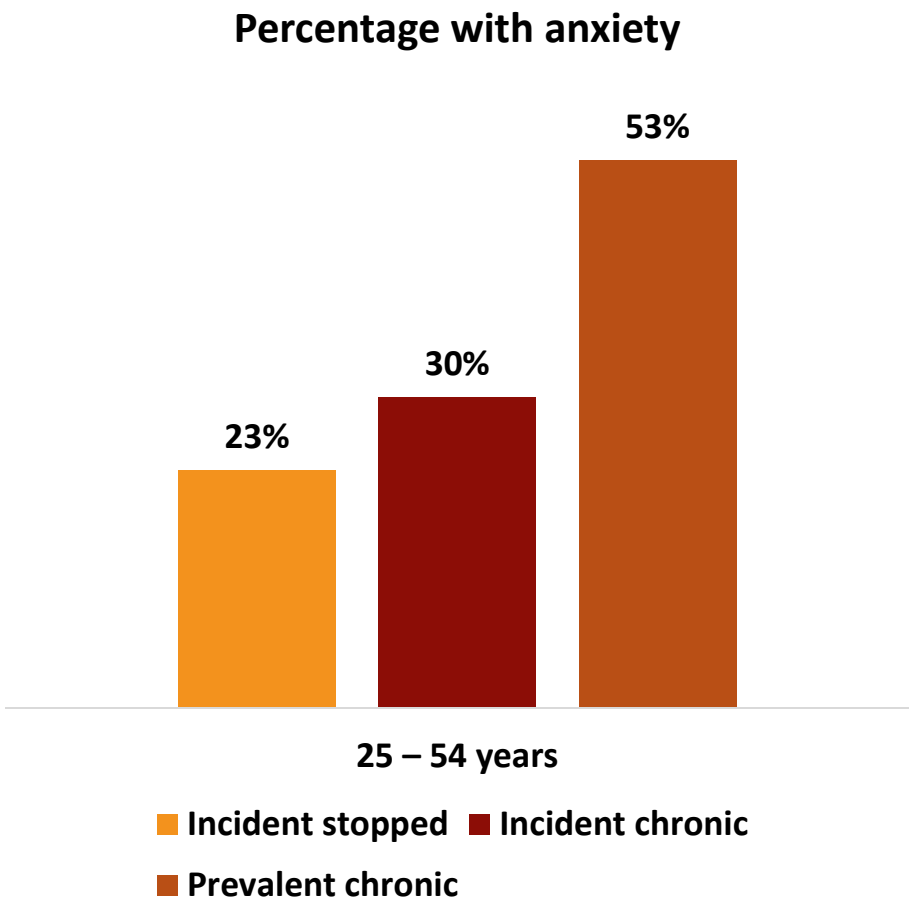


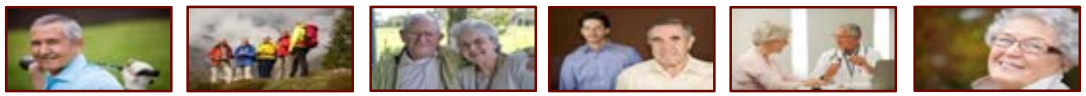
Source: Australian Government Drug Utilisation Subcommittee

Identifying the problem: how many veterans are chronic opioid users?

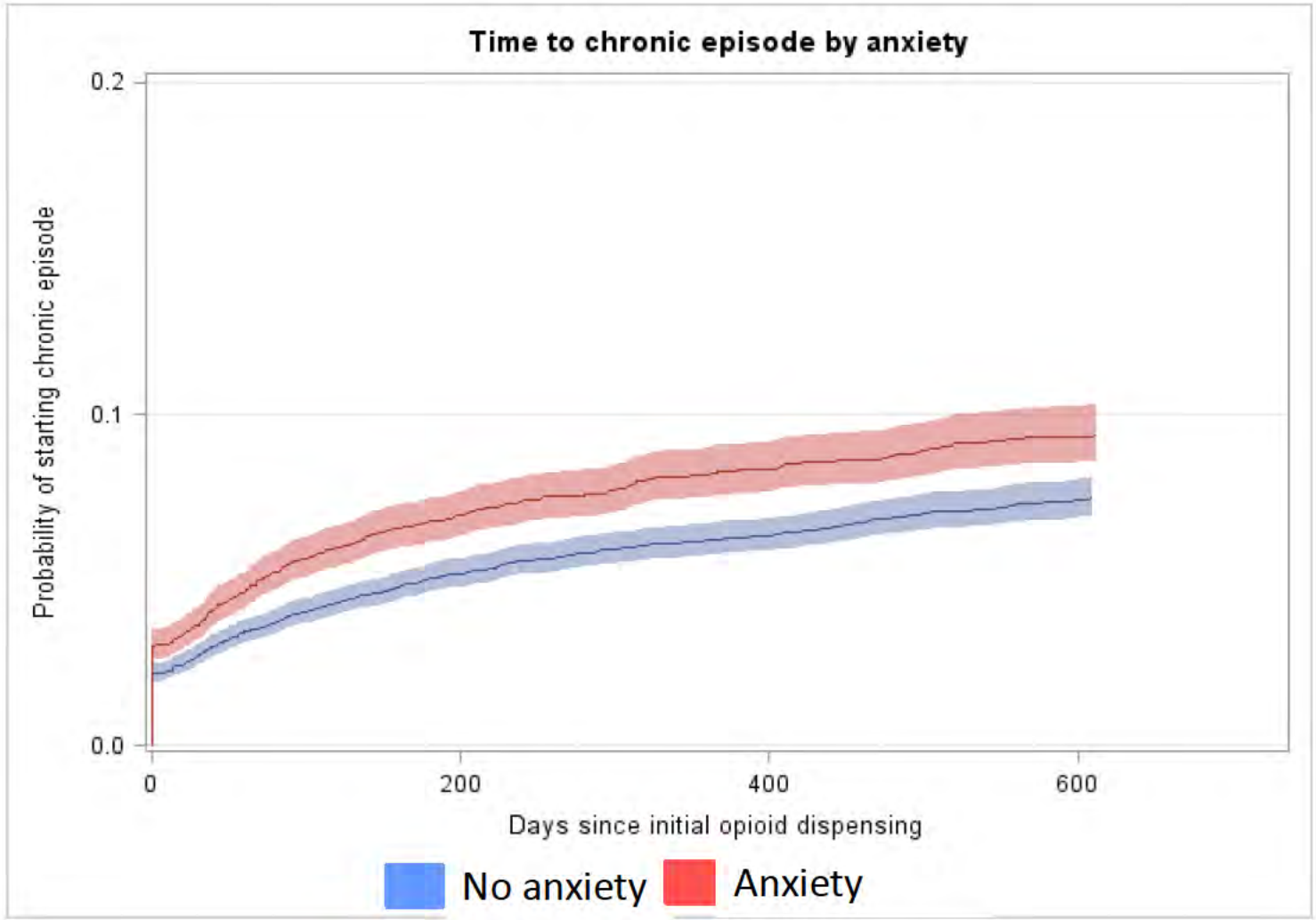
Identifying the problem: opioid use and comorbidity development

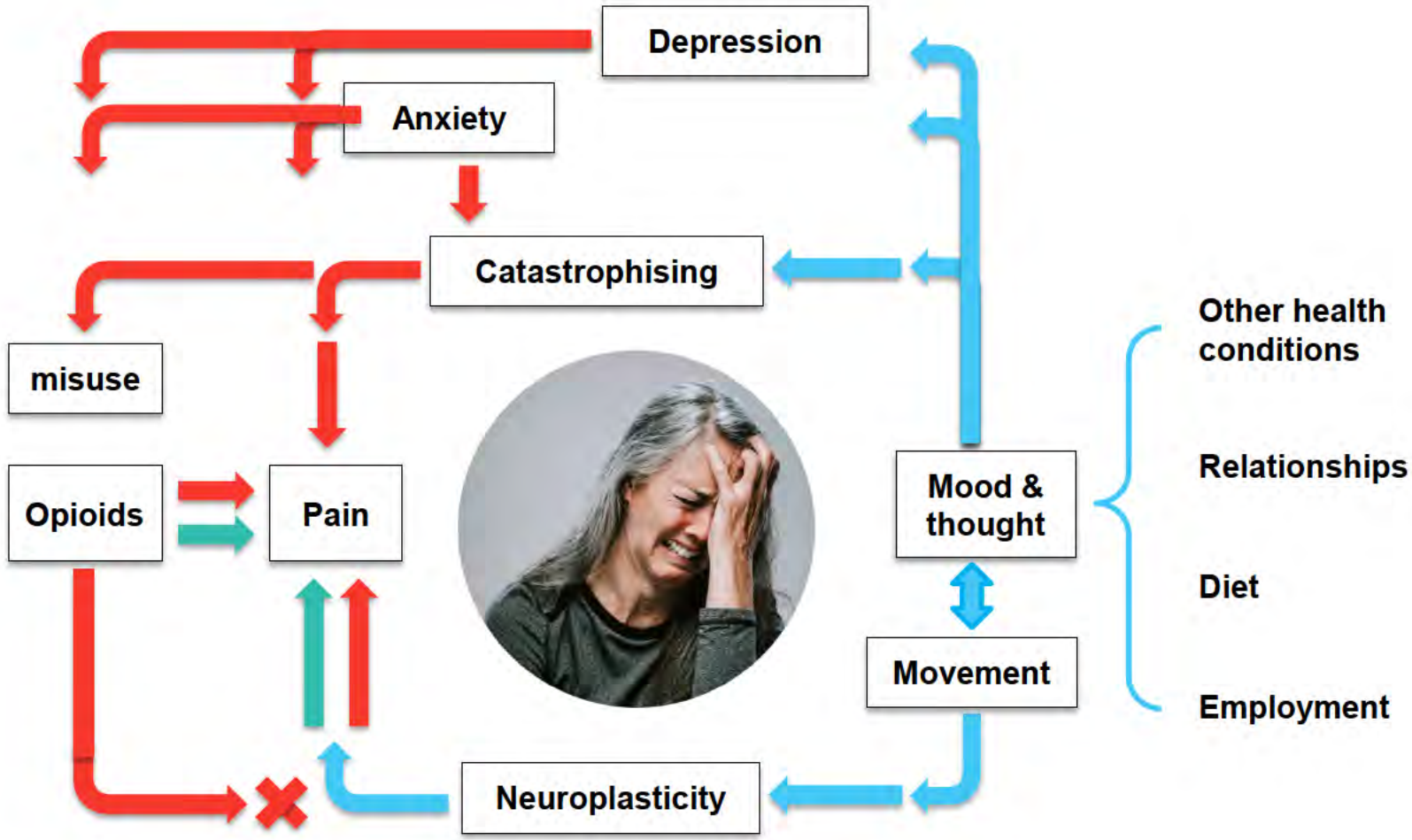






Identifying the problem: who is at risk of becoming a chronic user




Depression
Anxiety
Catastrophising
misuse
Opioids
Pain
Mood &
thought
Movement
Neuroplasticity
Other health
conditions
Relationships
Diet
Employment

Providing supportive evidence based educational material for veterans

Being an active partner in your care

www.veteransmates.net.au

PART 1: UNDERSTANDING YOUR PAIN CAN HELP TO EASE YOUR PAIN

Most people think of pain as a result of an injury or a disease, but pain can occur with or without either. Pain usually resolves before tissues have fully healed, but for some people pain persists even after tissues have healed - it's called chronic or persistent pain.

An estimated one in five Australians live with persistent pain. It can make daily life a struggle. But by understanding your pain and taking an active role in strategies tailored to you, daily life can improve. Don't give up; it might take some time to find out what works for you. The first step is to learn more about pain and how your pain is unique to you.

This is the first part of a two part series. Part 1 introduces you to how pain works, and to the people who can help you take an active approach to managing your pain. Part 2 helps you identify the things that impact on your pain, and how to change them.

Five key facts
understandin

Research has shov
about how pain wo
it and improve dail
key facts to help yo
pain better:

1. Pain is alv

Pain is always real
associated with ph
never 'all in your he
experience that ca
day-to-day life.

1. Louw A, Zimney K, Puentedu
and practice. 2016; 32:332
pubmed/27351541

Veterans' Medicines Advice and Therapeutic

Providing individually tailored recommendations and supportive evidence based educational material for health professionals

Steps to tapering and ceasing opioid therapy[20, 25, 26, 36-38]

1. Negotiate and agree upon a plan for tapering and ceasing, including the tapering rate, with your patient before beginning, and set up regular appointments.
2. Re-evaluate rehabilitation strategies. Refer your patient to various healthcare professionals to learn active self-management skills, including distraction, goal setting, pacing, exercise, mindfulness meditation and relaxation techniques that are based on cognit (see insert *Teaming up against chronic pain*).
3. Be clear with your patient about why you are tap they can expect during the process. Address the the dose or stopping, and reassure them you wi during the entire tapering process. Provide writte your patient and their family. Take into considerat and reassure them you are working together wit
4. Reduce the dose gradually, taking into conside their history and psychological comorbidities, as the opioid dose is reduced and their ability
5. For patients taking opioids long-term, reduce t percent per week or ten to 25% of the startin to their tolerance; this generally achieves cess Generally, the longer the patient has been taki tapering should be.
6. Consider advice from a pain medicine specialist if unsure about the process, or refer to an addiction specialist or a drug and alcohol service in your state if there is a dependency/addiction problem.
7. Review weekly or fortnightly.

Box 1. The Pain Catastrophising Scale (PCS)[14]

The PCS, a 13 item questionnaire that you can work through with your pat can be completed in less than five minutes, and provides an insight into w patient thinks about when they are in pain.[14]

A total score of 30 or more represents a clinically relevant level of catastroph If the score is high, consider referring your patient to a psychologist. A psych can talk to your patient about what this means and how it can influence perc of pain. They can help reduce fears and change the way the patient thinks ab

Research shows that catastrophic thinking associated with pain can be redu using multimodal interventions, including education, instruction in active sel management strategies and physical activity.[14]

The PCS can be accessed at: https://www.worksafe.vic.gov.au/__data/as pdf_file/0018/10953/pain_catastrophizing_scale.pdf






Veterans' MATES

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME **Date: 15/03/202**

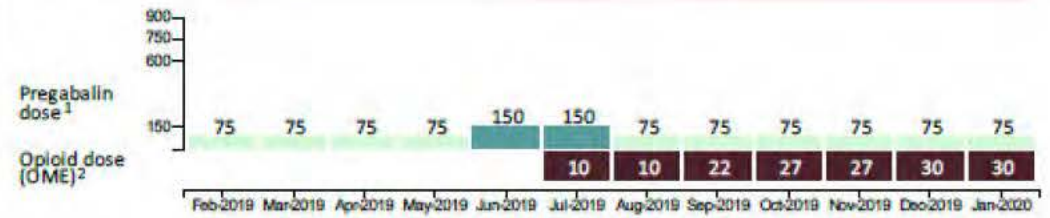
This Veterans' MATES information aims to assist you to review gabapentinoids (pregabalin or gabapentin) that may cause harmfu side effects when used long term. It is advisory in nature. The information is based on DVA claims that indicate that a veteran ha had multiple dispensings of pregabalin or gabapentin in a 12 month period.

Consider whether your patient will benefit from non-pharmacological pain therapy and, if warranted, whether adjusting the dose o ceasing gabapentinoids is appropriate. Please consider within the context of this patient's current treatment.

Educational material explaining the rationale for these recommendations can be found at **Veterans' MATES website**

FIRST & SURNAME* **DOB: <DD/MM/YYYY>** **Gender: <Male or Female>** **ACCOMMODATION: Community**
<Residential address>

Relevant claims history for pain



[1]Daily average dose per month (mg), estimated from dispensing data
[2]Oral morphine equivalent daily average dose per month (mg), estimated from dispensing data

Notes	
Latest Home Medicines Review (HMR) claim	None claimed in the last 2 years
Latest Psychologist visit	None claimed in the last year

Medicine(s)	Last Dispensed	Other Prescriber
Pregabalin (Lyrica) Cap 75 mg	04/01/20	Yes
Tramadol hydrochloride (Tramal SR) controlled release Tab 50 mg	02/01/20	No
Oxycodone hydrochloride (OxyNorm) Cap 10 mg	02/01/20	No

Suggested actions:

- Review indication for use of medicine(s). Confirm pain is neuropathic
  Rationale: The majority of evidence for effectiveness of gabapentinoids is limited to diabetic neuropathic pain and post-herpetic neuralgia. There is limited evidence for effectiveness of gabapentinoids when a neuropathic component is not well established.
- Review duration of use, consider tapering and ceasing.
  Rationale: Recommended duration of use of gabapentinoids is no longer than 6 months.
- Check for side effects of medicine(s). Consider risks for driving or falling.
  Rationale: One-third to one-half of patients taking gabapentinoids suffer from dizziness or somnolence.
- Review need for therapy, consider potential for cessation.
  Rationale: Patient received doses of pregabalin of below 150 mg per day. Potentially subtherapeutic dose for neuropathic pain

What happened to veterans with chronic pain?






Pain

8,500
general
practitioners

8,300
pharmacists

690
psychologists

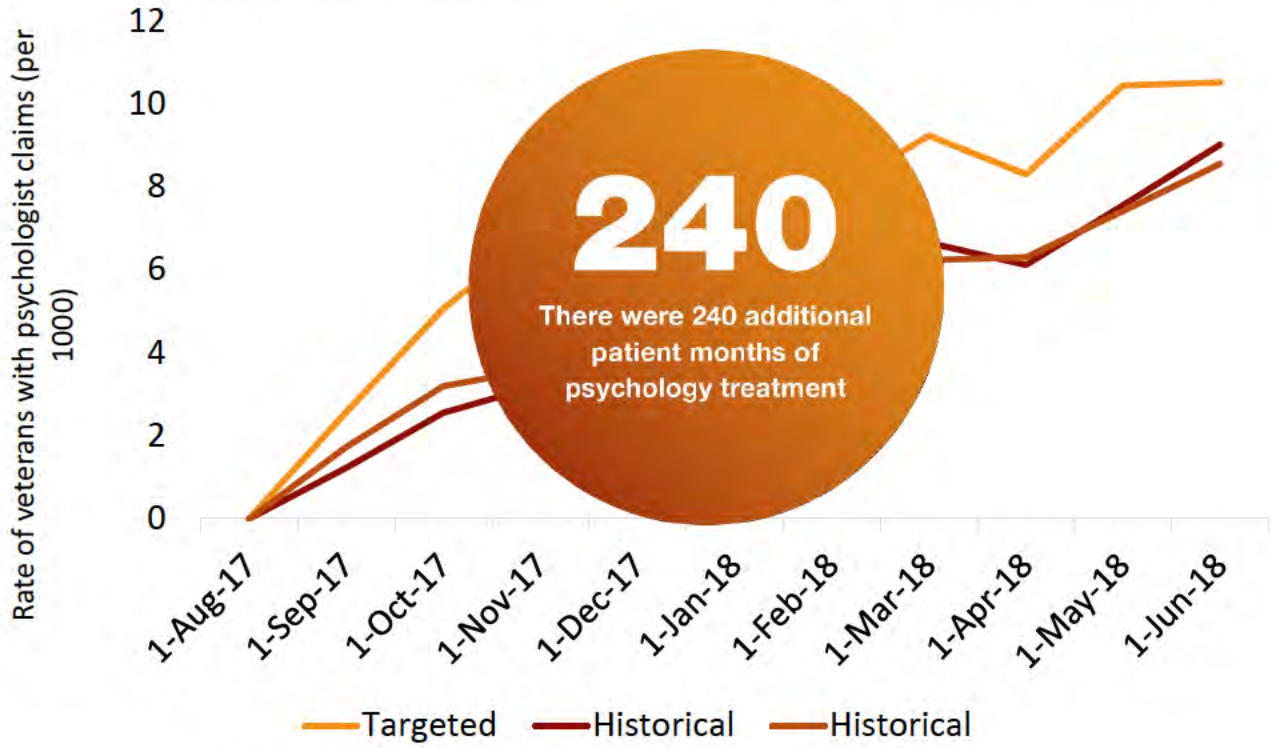
13,900
veterans

After the intervention, 7 out of 10 veterans said they would make an appointment with their doctor to review their pain medicines

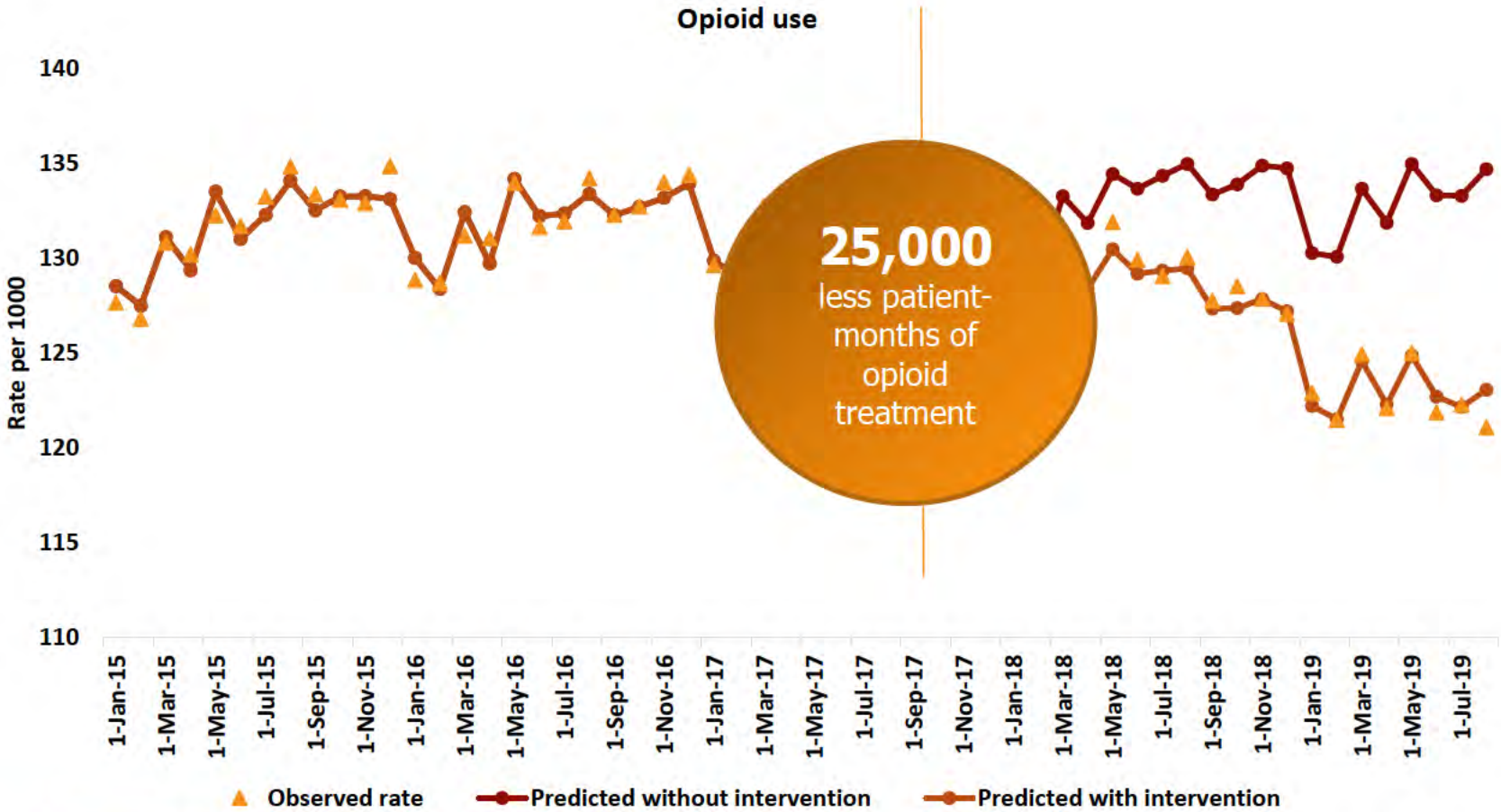
After the intervention, 7 out of 10 general practitioners said they were very likely to incorporate pain neuroscience education in a plan for their patient

Pain

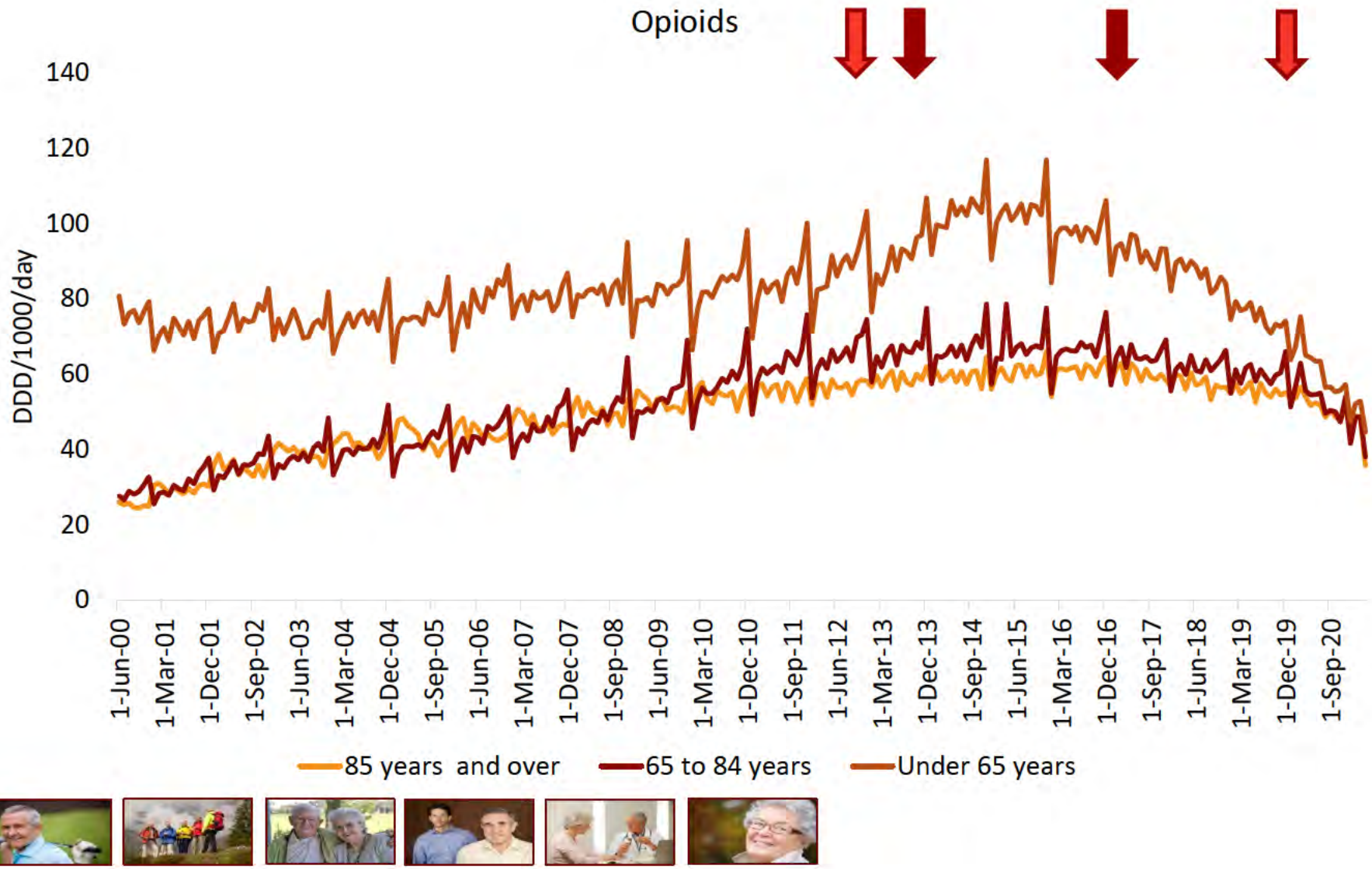
Increasing numbers of veterans seeing psychologists



Use of opioids decreased

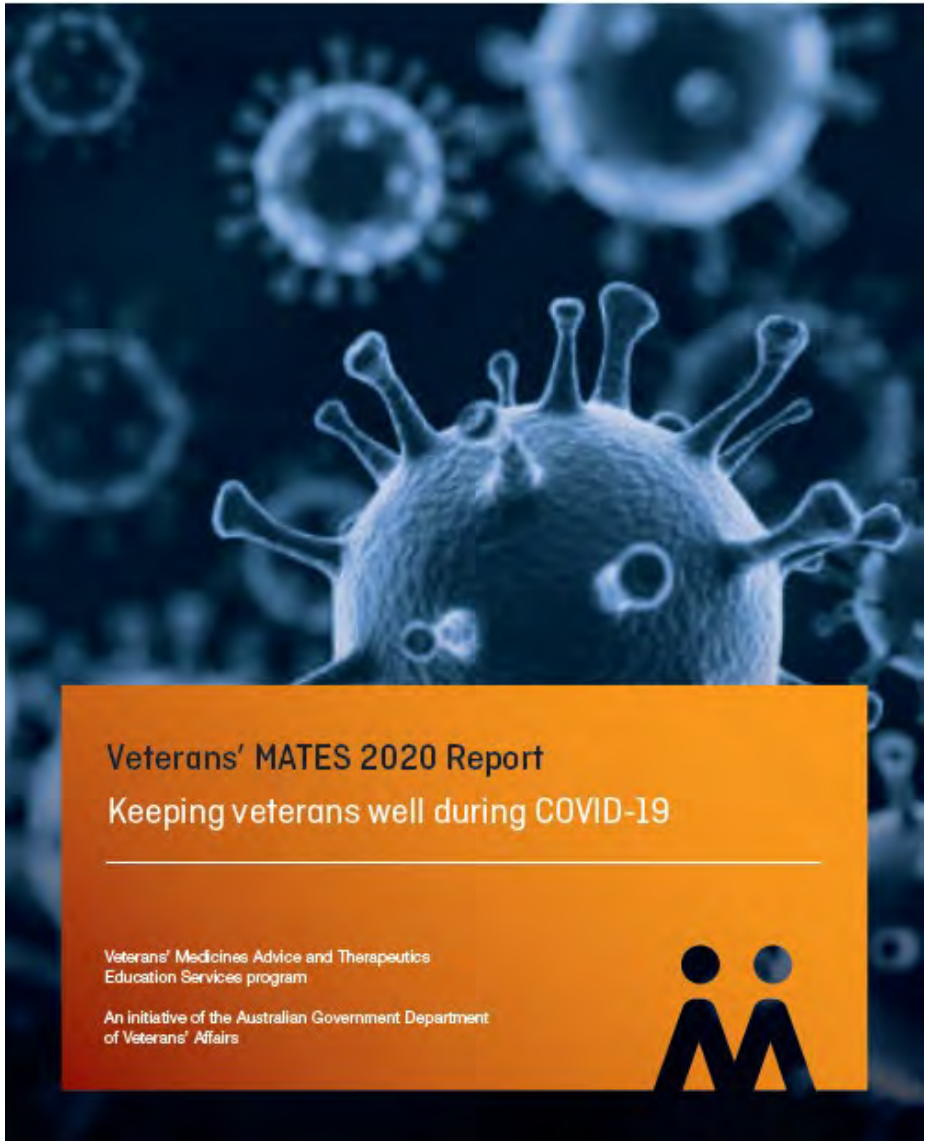


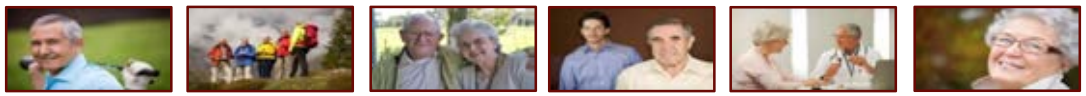
Pain


Opioids
140
120
100
80
60
40
20
0
DDD/1000/day
1-Jun-00
1-Mar-01
1-Dec-01
1-Sep-02
1-Jun-03
1-Mar-04
1-Dec-04
1-Sep-05
1-Jun-06
1-Mar-07
1-Dec-07
1-Sep-08
1-Jun-09
1-Mar-10
1-Dec-10
1-Sep-11
1-Jun-12
1-Mar-13
1-Dec-13
1-Sep-14
1-Jun-15
1-Mar-16
1-Dec-16
1-Sep-17
1-Jun-18
1-Mar-19
1-Dec-19
1-Sep-20
85 years and over
65 to 84 years
Under 65 years

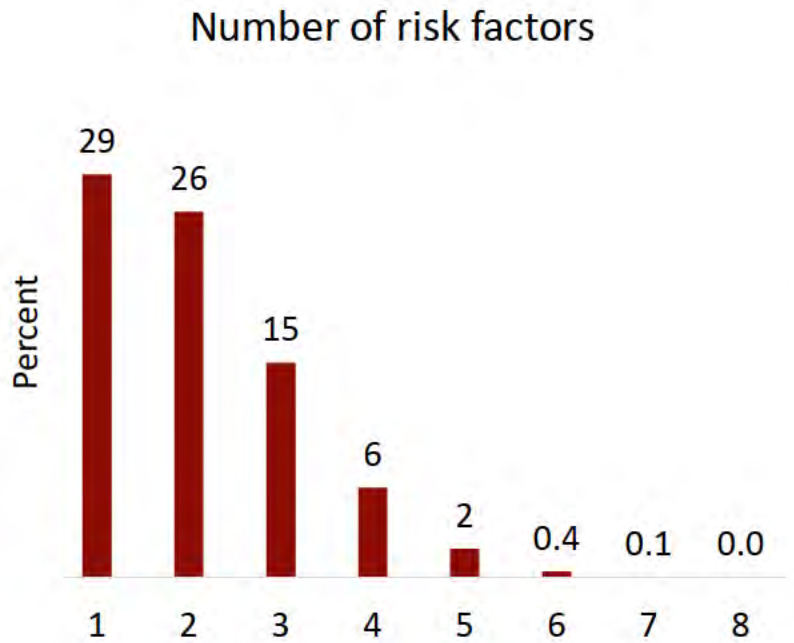
Veterans' MATES & COVID

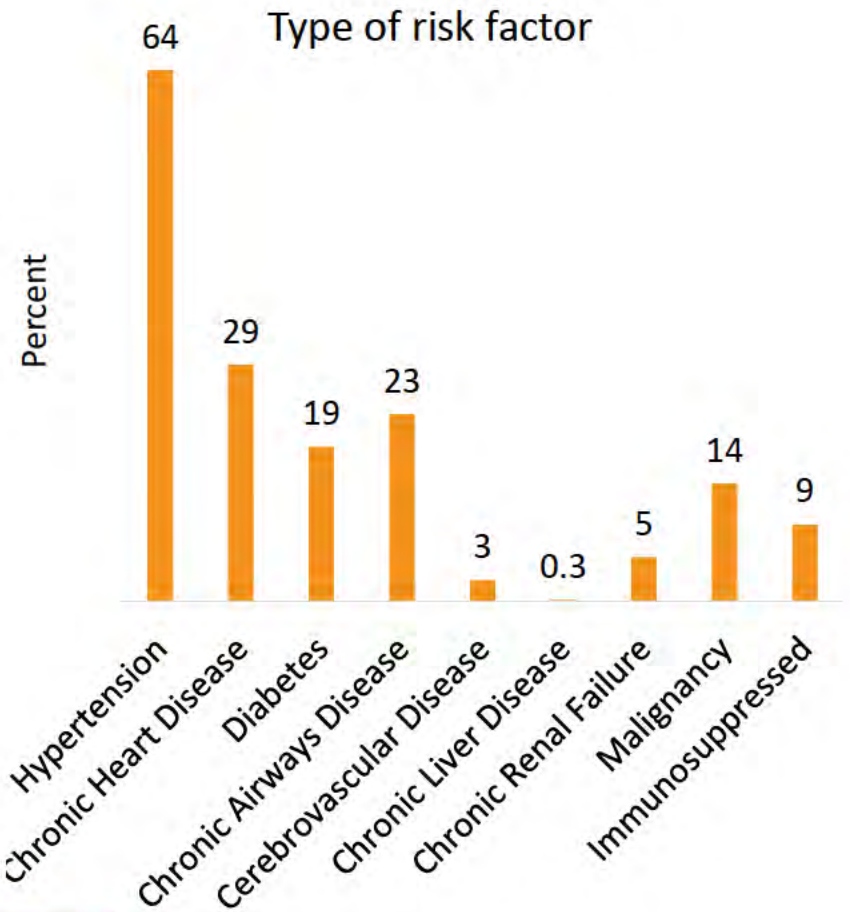
- During 2020 we focused on keeping people well during COVID-19





More than 100,000 DVA clients were aged 70 years or more: 80% had at least one additional risk factor to age for poor outcomes with COVID infection





We used the data to identify them for their treating doctors, and Developed resources to help DVA clients stay connected to their health care

Australian Government
Department of Veterans' Affairs

Veterans'MATES

FACT SHEET 1

Risk factors for poor outcomes with COVID-19

As more data becomes available from countries that have experienced a high rate of COVID-19, we are getting a clearer picture of which patients may be at heightened risk of poor outcomes if they contract COVID-19. We have identified risk factors from emerging observational data and epidemiological reports from China, Italy, Spain and the USA.

These data suggest patients aged 60 years or over, especially men, with one or more chronic conditions may be at heightened risk of severe or fatal outcomes if they contract COVID-19.

Risk factors

Older age

To date, all available evidence suggests that illness severity increases with age.[1,2] In all studies, people who have died from COVID-19 or who have had more severe symptoms were older than people with less severe symptoms. In Europe, the rate of hospitalisation increased markedly with age over 60 years.[3] The proportion of people diagnosed with COVID-19 who died followed a similar pattern, with deaths higher in those aged over 60 years and markedly higher in those aged over 80 years.[3]

Male gender

Current evidence from Italy[2] and China[1] indicates that a higher proportion of men than women die from COVID-19.

Current smoker

Evidence suggests that current smokers may be at an increased risk of severe illness if they contract COVID-19.[4]

Multiple chronic conditions

To date, people with severe or fatal COVID-19 have had more chronic conditions than people who have experienced less severe COVID-19.[1,2,3,5] In Italy, 49% of people who died from COVID-19 had three or more chronic conditions.[1] In the USA, 78% of people admitted to intensive care with COVID-19 had at least one chronic condition, compared to only 27% of people with COVID-19 who were not admitted to hospital.[6]

Type of chronic condition

The current available evidence indicates that a higher percentage of people who have poor outcomes with COVID-19 have one or more of the following chronic conditions:

- hypertension[1,2]
- chronic heart disease including heart failure, ischaemic heart disease[1,2,5]
- diabetes[1,2,6,10]
- chronic airways disease including COPD and asthma[1,2,5]
- cerebrovascular disease[1,2,5,10]
- chronic liver disease[5]
- chronic renal failure[1,2,5,7]
- malignancy[1,2,5,10]
- being immunocompromised or taking immune suppressing medicines.[5]

The prevalence of these chronic conditions in people with poor outcomes matches the prevalence for older age groups, so it is not yet clear whether people with these chronic conditions have worse outcomes due to the chronic conditions or due to their older age.

Living Guidelines: caring for people with COVID-19

An Australian national taskforce has developed evidence-based guidelines to support clinicians caring for people with COVID-19 in primary, acute and critical care settings.[8] These guidelines are continually being updated and expanded as emerging data becomes available.[8] To find out about disease severity and decision flowcharts for management of patients with COVID-19, go to: covid19evidence.net.au

For DVA patients with mild COVID-19 being managed in the community, and especially for those who are at

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Keeping well during the Coronavirus (COVID-19) pandemic: Three practical things you can do.

Looking after your everyday health during the COVID-19 pandemic is just as important as practising social distancing and good hygiene. Keeping up with your usual medical care including routine visits to your GP, tests and medicines, and seeking treatment early when needed, will help you stay well.

1. Maintain regular contact with your healthcare providers

Continue to see all your regular healthcare providers during this time, especially if you have an ongoing physical or mental health condition. Your appointments can be face to face or if appropriate via telehealth. If you are feeling unwell with cold-like symptoms make sure you phone your GP and advise them of your symptoms.

Telehealth is a telephone or video consultation. It enables you to access essential health services from your home via a telephone call or a video call using a computer or phone app such as FaceTime, Skype, Zoom or WhatsApp.

During the COVID-19 pandemic, GPs, some medical specialists and a wide range of other health professionals are able to provide telephone and video consultations. Mental health and chronic disease management, home medicines reviews, and services provided by allied health professionals or a nurse practitioner can also be provided via telehealth. If necessary, your doctor can provide an after-hours service or prescribe a medicine and arrange for the prescription to be sent directly to your pharmacy.

These appointments are bulk-billed to eligible DVA clients under DVA payment arrangements. The new telehealth arrangements are in place until 30 September 2020, when they will be reviewed.

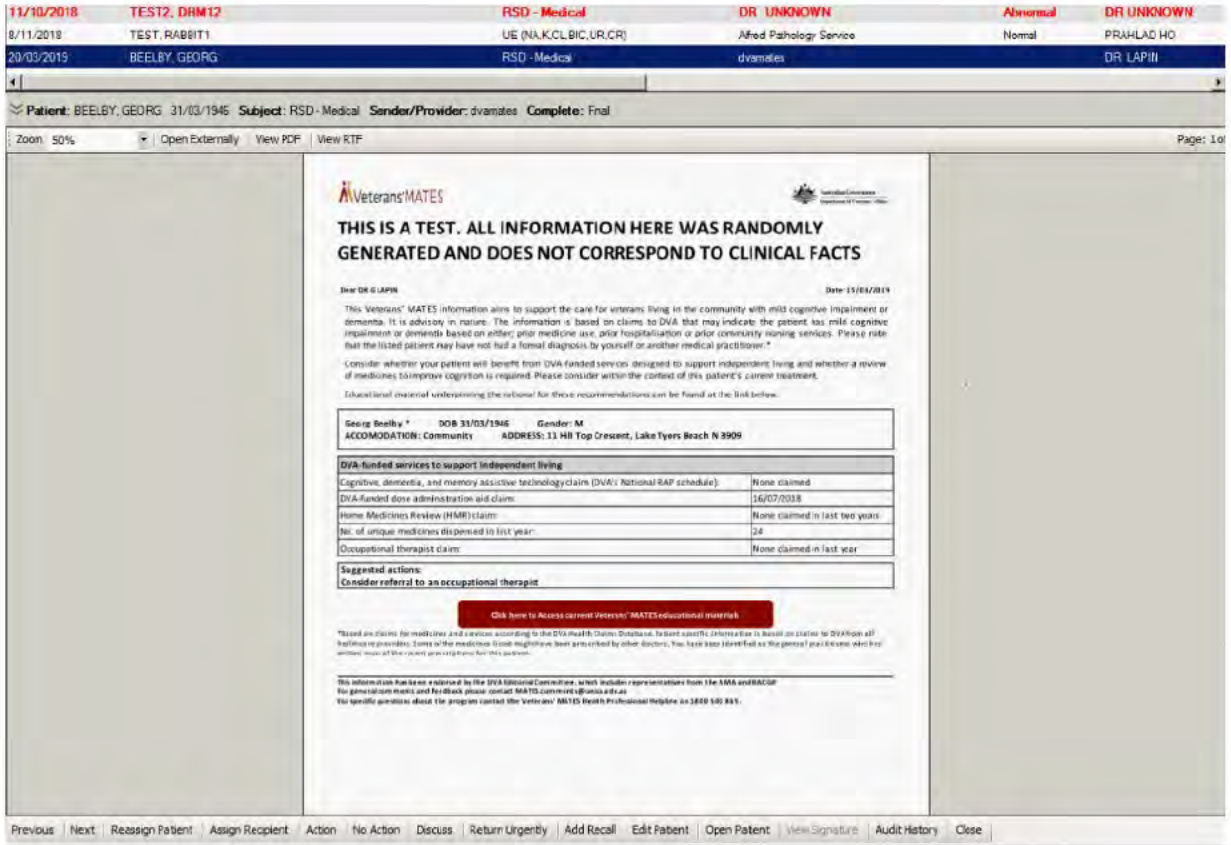
Talk to your regular healthcare providers about the most appropriate type of appointment for you, whether it should be via face-to-face or telehealth.

2. Continue taking your medicines as prescribed

Take your medicines as prescribed by your doctor. If you have any questions or concerns about your medicines talk to your doctor or local pharmacist. A good way to access your medicines during the COVID-19 pandemic is to have your medicines delivered to your home.

Your pharmacy may already provide a home delivery service. To make sure that home delivery of medicines is available to more people, the Home

E-delivery



- Rapid escalation because of Covid response, which was predominantly e-delivery
- 55,000 patients to 11,000 GPs
  - 95% acknowledgement
  - Patient-practice allocation appears very accurate with only a handful of persons queried. Most notifications are to inform us patient has left the practice

Long lockdowns also meant we had a cohort vulnerable to exacerbation of mental illness

So we used the data to identify them and provided direct mailed resources to support them





Australian Government
Department of Veterans' Affairs

Veterans' MATES

Three actions to enhance and protect your mental well-being during and after COVID-19

COVID-19 has changed how we live, work and connect with family and friends. This can make us feel distressed and overwhelmed. Understanding our stress response and learning simple techniques to calm distressing emotions and change negative thoughts, can help us feel more in control and less stressed. **Learning and practising these techniques before you experience distress can help you stay well during and after COVID-19.**

1. Understand the stress response

When we are faced with a stressful situation our heart beats faster, our breathing is quicker, our muscles tense up and we find it difficult to concentrate. This stress, or 'fight or flight', response is how we have evolved to react quickly to dangerous situations to keep safe.

Sometimes this response can stay activated even though it is no longer helpful. When this happens, it can be difficult to wind down and think clearly. We may also experience distressing emotions and negative thoughts.

Understanding this can be helpful in learning how to manage distress.

Find out more about the stress response in this 90-second video by Phoenix Australia – Centre for Posttraumatic Mental Health (the first video at this link): www.recoveryonline.org.au/managing-emotions

2. Calm distressing emotions

Often, the best ways to manage distressing emotions are the simplest.

Most people take fast, shallow breaths when they are feeling worried or anxious. A good way to help calm distressing emotions is to practise controlled breathing where you take slow, deep breaths. This can help calm your mind and body, so you feel in control and are able to think more clearly.

Watch this 2-minute video and try the controlled breathing tool by High Res, Australian Government Department of Veterans' Affairs (DVA): https://highres.dva.gov.au/highres/#!/tools/controlled-breathing

Another way to help manage distressing emotions is to practise grounding or mindfulness. This allows you to connect to what is happening right now, and be more aware of what you can see, hear and feel. This can help you develop a calmer mind and build resilience to stress.

Watch this 90-second video including a guided grounding tool by High Res, DVA: https://highres.dva.gov.au/highres/#!/tools/guided-grounding

At risk population

Mental Health population

Re-engaging population

Ongoing monitoring of DVA clients missing out on care

LATE MARCH 2020
Identifying DVA clients at high risk of poor outcomes if they contract COVID-19

EARLY APRIL 2020
Detecting and monitoring access to care during COVID-19

LATE APRIL 2020
Helping at-risk DVA clients maintain access to health services during COVID-19

EARLY JULY 2020
Helping DVA clients manage COVID-19 related emotional distress

Early Sep 2020

1 March

- **3 March** — 29 cases of COVID-19 in Australia; COVID-19 cases surpass 100,000 worldwide
- **13 March** — Telehealth for vulnerable patients announced
- **20 March** — Digital prescription dispensing to support telehealth consultations; Non-citizens and non-residents banned from entering Australia
- **25 March** — Australians encouraged to work from home. Non-essential businesses closed
- **29 March** — Measures to support mental health and wellbeing of Australians announced
- **30 March** — Whole of population telehealth available

1 April

- **2 April** — Australian COVID-19 cases hit 5,000
- Australia's first COVID-19 outbreak in long term care
- **11 April** — COVID-19 Home Medicines Service for vulnerable people and people in self isolation announced; Global coronavirus death toll hits 100,000, cases over 1.6 million
- **21 April** — Pharmacists can undertake MedsChecks, and Medicine Reviews via telehealth

1 May

- **1 May** — Australia begins to ease COVID-19 restrictions
- **25 May** — Active cases in Australia fall below 500

1 June

1 July

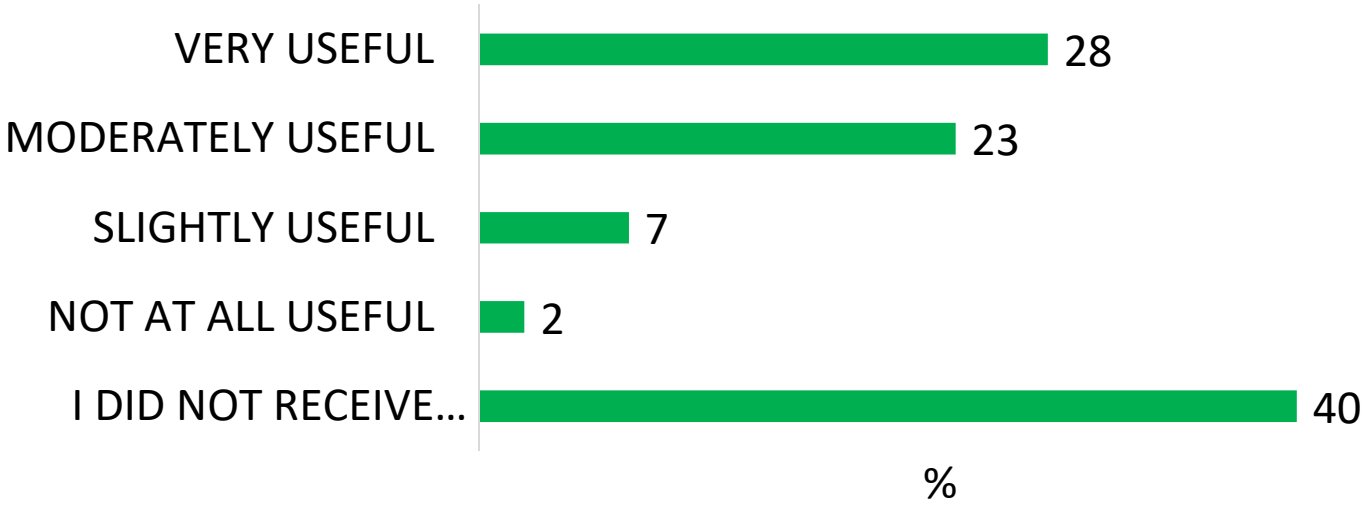
- **7 July** — Metropolitan Melbourne back into lockdown
- **14 July** — COVID-19 cases top 10,000 in Australia; Australian states re-tighten restrictions
- **22 July** — Australia records highest daily number of coronavirus cases
- **26 July** — 13,900 cases of COVID-19 in Australia; Worldwide cases surpass 16 million

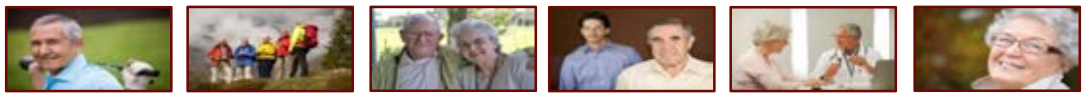





Veterans found the information useful

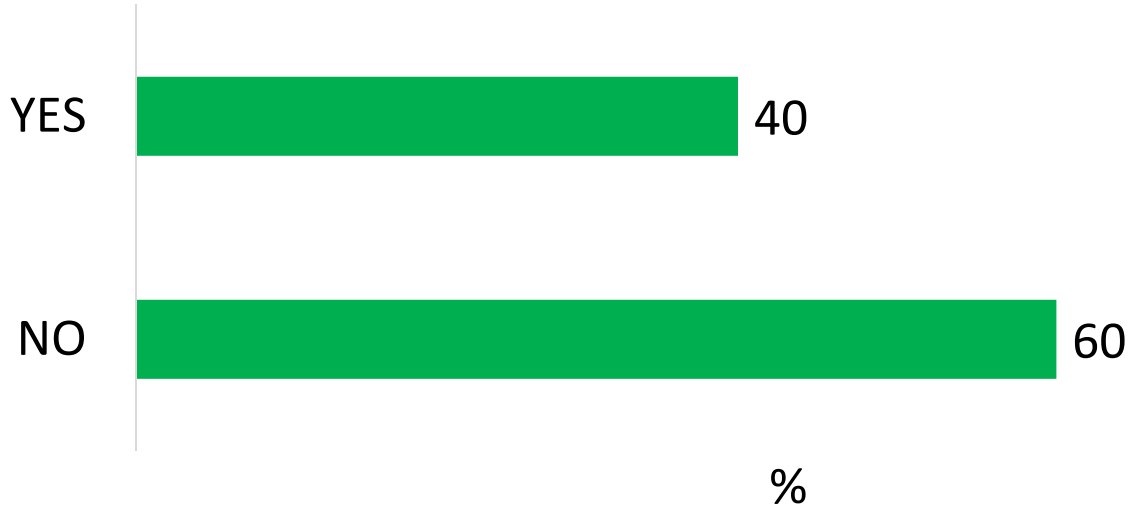
We recently provided some fact sheets to help support veterans through the COVID-19 pandemic. If you received these fact sheets, please indicate how useful you found them

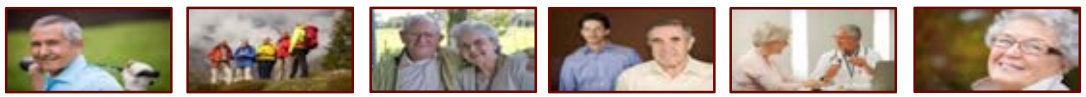




COVID – staying active

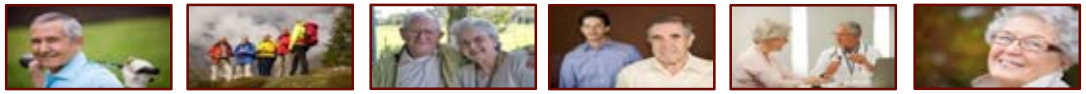
Veterans: Has your confidence in being physically and socially active decreased since the COVID-19 pandemic began?





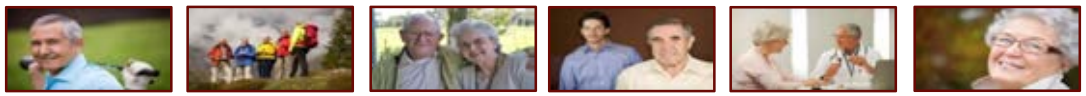
If you have recently found it difficult to be physically active, has reading the brochure encouraged you to ask your GP for advice to help you get moving again?

- *Thank you for your recent Veterans' MATES document. It made me feel that someone actually care about my health and supplied tips to assist myself and wife, in control and handling the COVID-19 virus.*
- *We found the information most useful – it made me or us feel that to the DVA department we are not just ABC….etc, not just another number. The personal touch even from such a large department makes us feel just that little more special, and respected as seniors in the community.*
- *Note: we have been quite concerned re the COVID-19 virus – as we are in the 70+ age group and have had to rely on family etc for assistance. Also on the …. I had surgery, … this also put more pressure on us to ensure we stayed healthy*



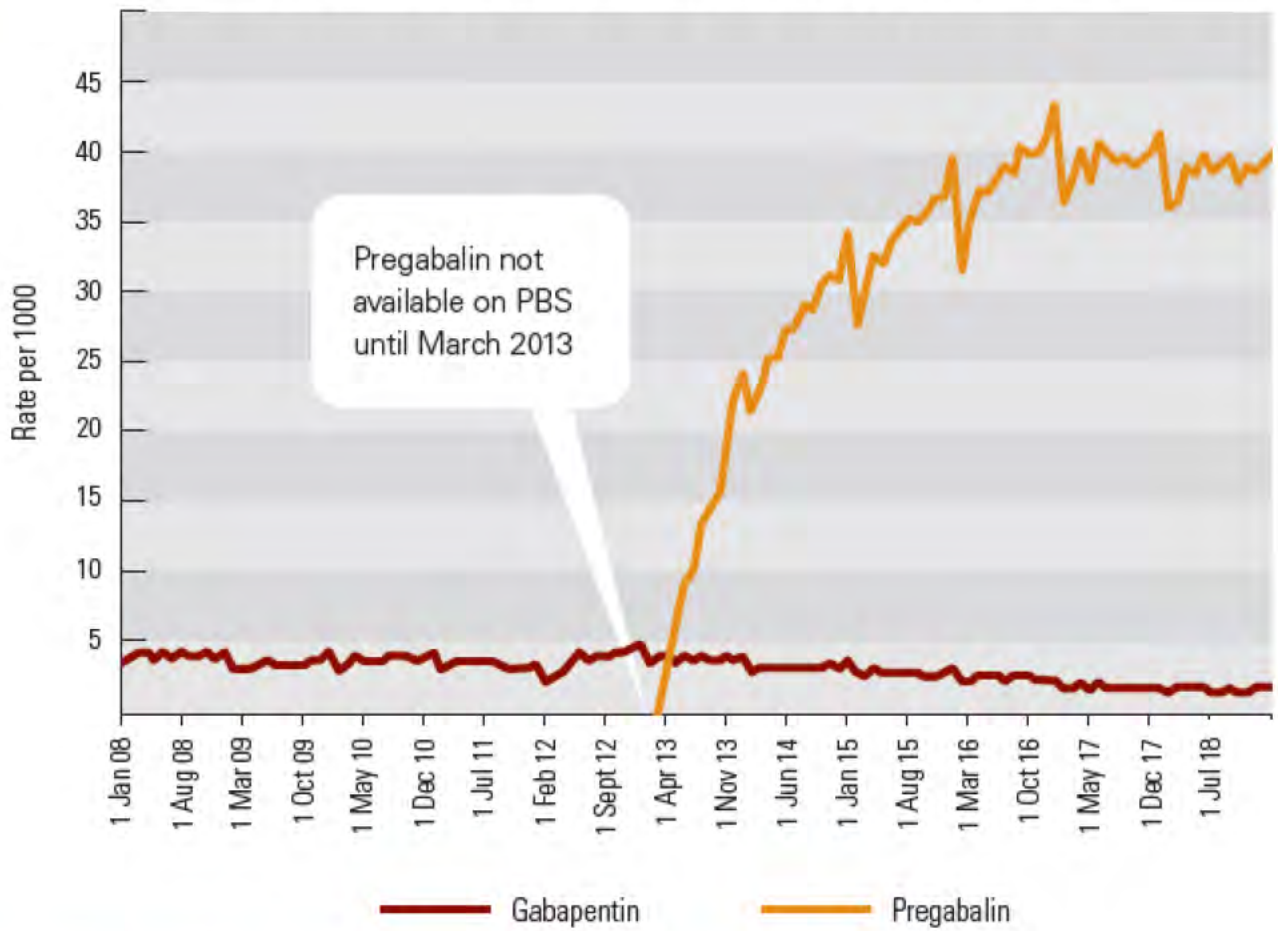
Rapid response to COVID was possible because

- Existing data infrastructure
- Strong stakeholder support
- Ability for e-delivery to the clinical desktop



DUE – Drug Use Evaluation

Figure 1. Rate of DVA patients dispensed gabapentin and pregabalin per 1000.[3]



Tailored recommendations and supportive evidence based educational material for health professionals

Table 1 Gabapentinoid dosing information

	Gabapentin	Pregabalin
Usual dose	Initially 100–300 mg at night, then increase gradually every 3–7 days to 0.9–2.4 g daily in 3 doses, maximum 3.6 g daily.[14,27] Allow sufficient time for the effectiveness of the dose to be determined. In older patients use lower initial doses, e.g. 100 mg daily.	Initially 25–75 mg at night for 3–7 days, at 7–14 day intervals as needed,[27,30,31,33] to 150 mg twice daily; maximum 300 mg time for the effectiveness of the dose to For older or frail patients, a lower initia or a slower dose titration may improve Giving a larger portion of the dose in th sedation.
Dose in renal impairment	Adjust maintenance dose according to creatinine clearance (CrCl):[14] **50–79 mL/minute:** 0.6–1.8 g daily in 3 doses **30–49 mL/minute:** 300–900 mg daily in 2 or 3 doses **15–29 mL/minute:** 300 mg once every 2 days up to 600 mg daily in 2 or 3 doses **<15 mL/minute:** 300 mg once every 2 days up to 300 mg once daily	Adjust dose according to CrCl:[14] **30–60 mL/minute:** initially 75 mg daily 1 or 2 doses **15–30 mL/minute:** initially 25–50 mg 1 or 2 doses **<15 mL/minute:** initially 25 mg daily; m
Stopping treatment	Reduce dose gradually over at least a week, e.g. by 300 mg daily every 4 days.[6,14,31]	Reduce dose gradually by 50–150 mg d starting from 600 mg, reduce to 450 mg 150 mg for 2 days, then cease.[6,14,31]
	Reassure the patient and explain the reasons for tapering and what to expect during the process. When starting t tapering and ceasing therapy that considers the individual, their medical history and psychological comorbidities, adverse effects and the patient's ability to self-manage. **For patients taking gabapentinoids long term**, consider a more gradual dose taper over 4–8 weeks; this enab symptoms that may have been controlled by the medicine, and may reduce withdrawal effects.	
	Consider referral to or advice from a pain medicine or addiction spec	

Veterans' MATES

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME

Date: 15/03/2020

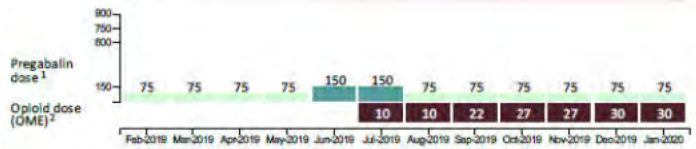
This Veterans' MATES information aims to assist you to review gabapentinoids (pregabalin or gabapentin) that may cause harmful side effects when used long term. It is advisory in nature. The information is based on DVA claims that indicate that a veteran has had multiple dispensings of pregabalin or gabapentin in a 12 month period.

Consider whether your patient will benefit from non-pharmacological pain therapy and, if warranted, whether adjusting the dose or ceasing gabapentinoids is appropriate. Please consider within the context of this patient's current treatment.

Educational material explaining the rationale for these recommendations can be found at **Veterans' MATES website**

FIRST & SURNAME* **DOB: <DD/MM/YYYY>** **Gender: <Male or Female>** **ACCOMMODATION: Community**
<Residential address>

Relevant claims history for pain



[1]Daily average dose per month (mg), estimated from dispensing data
[2]Oral morphine equivalent daily average dose per month (mg), estimated from dispensing data

Notes	
Latest Home Medicines Review (HMR) claim	None claimed in the last 2 years
Latest Psychologist visit	None claimed in the last year

Medicine(s)	Last Dispensed	Other Prescriber
Pregabalin (Lyrica) Cap 75 mg	04/01/20	Yes
Tramadol hydrochloride (Tramal SR) controlled release Tab 50 mg	02/01/20	No
Oxycodone hydrochloride (OxyNorm) Cap 10 mg	02/01/20	No

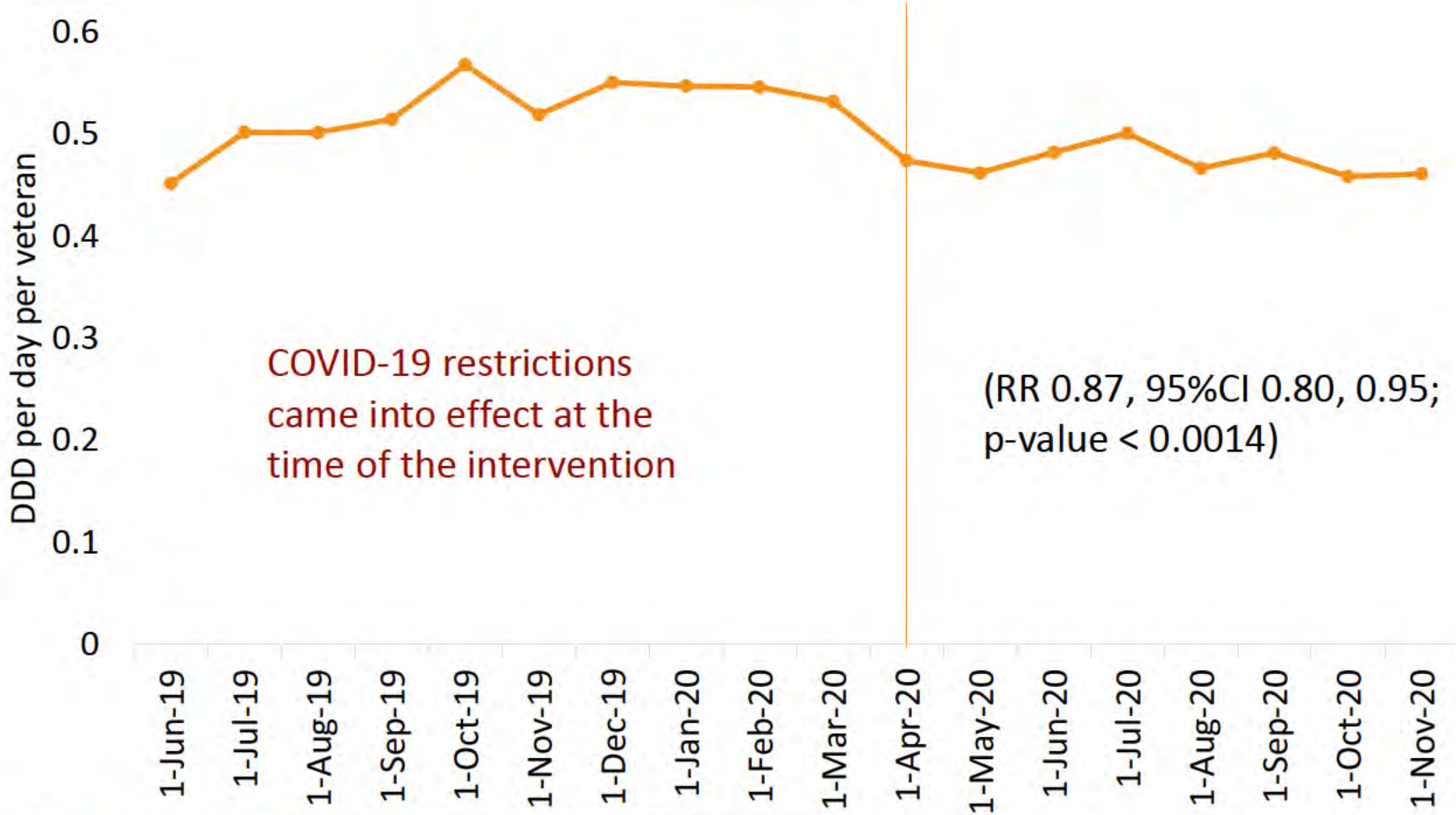
Suggested actions:

- Review indication for use of medicine(s). Confirm pain is neuropathic
  Rationale: The majority of evidence for effectiveness of gabapentinoids is limited to diabetic neuropathic pain and post-herpetic neuralgia. There is limited evidence for effectiveness of gabapentinoids when a neuropathic component is not well established.
- Review duration of use, consider tapering and ceasing.
  Rationale: Recommended duration of use of gabapentinoids is no longer than 6 months.
- Check for side effects of medicine(s). Consider risks for driving or falling.
  Rationale: One-third to one-half of patients taking gabapentinoids suffer from dizziness or somnolence.
- Review need for therapy, consider potential for cessation.
  Rationale: Patient received doses of pregabalin of below 150 mg per day. Potentially subtherapeutic dose for neuropathic pain.
- Patient co-dispensed opioids. This increases the risk of side effects in a dose-dependent manner.
- Consider referral for a Home Medicines Review (HMR) for review of medicines for pain.

Along with this letter, you will receive information about 4 other patients eligible for this module. If you wish to be involved with RACGP CPD or ACRRM PDP for this clinical audit activity please follow this link to view the requirements. Note: This activity is only available until 25 June 2020. **Claim CPD points**

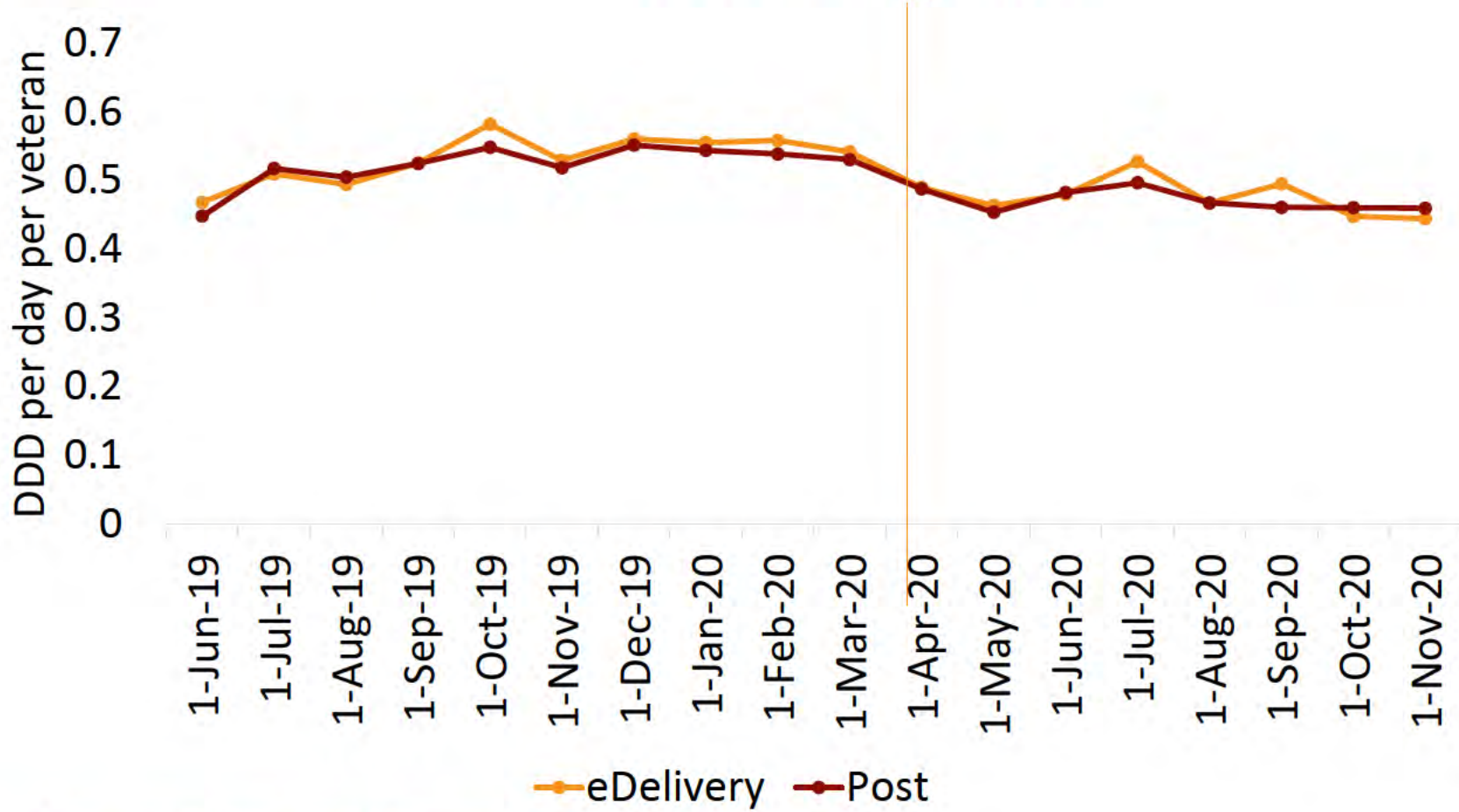
*Based on claims for medicines and services according to the DVA Health Claims Database. Patient specific information is based on claims to DVA from all healthcare providers. Some of the medicines listed might have been prescribed by other doctors. You have been identified as the general practitioner who has written most of the recent prescriptions for this patient.

13% fall in gabapentinoid use

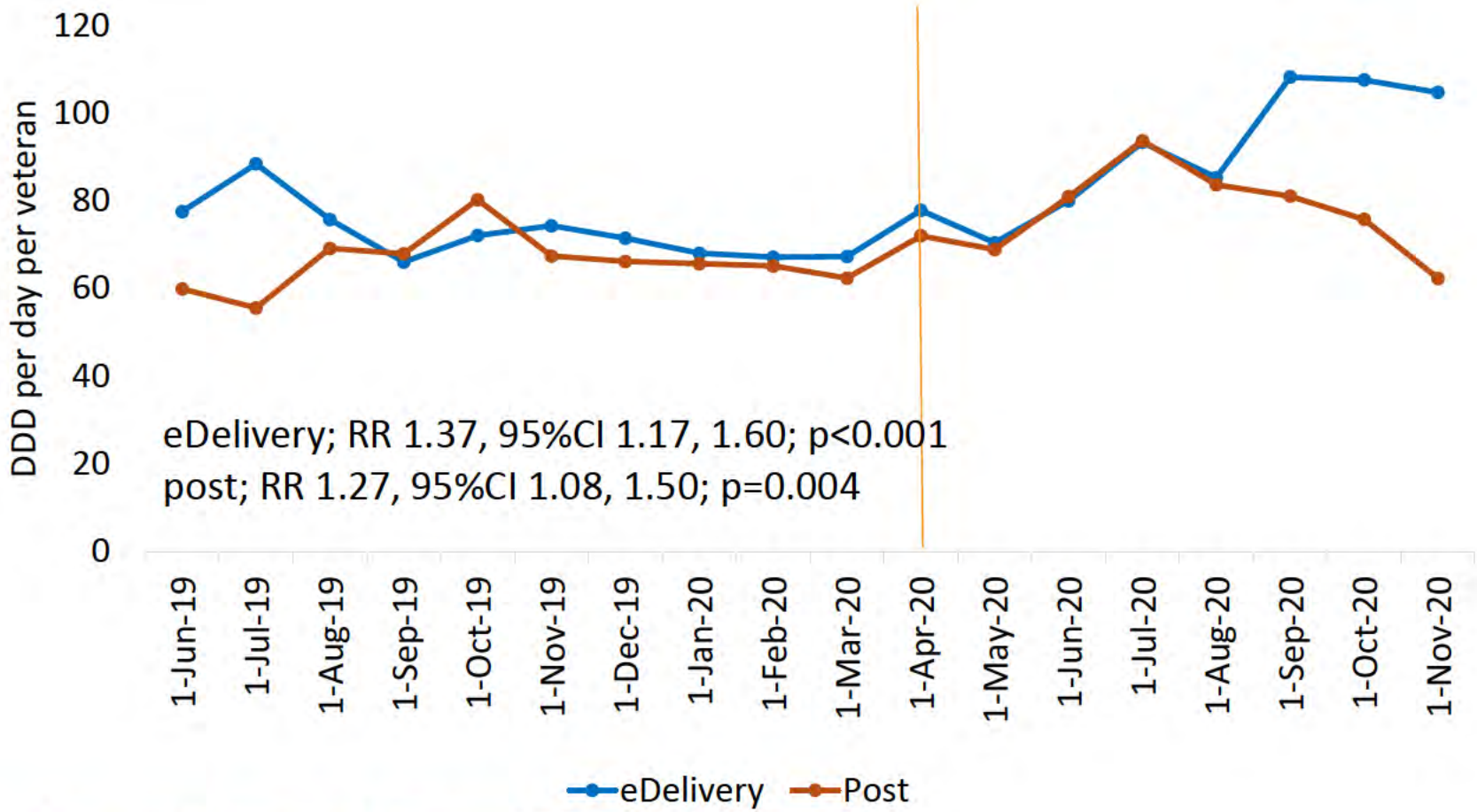


$$Average\ daily\ DDD = \frac{Total\ mass\ amount\ of\ a\ medicine\ in\ study\ period}{Standard\ medicine\ DDD * number\ of\ days\ in\ study\ period}$$

Fall in use was similar for post and digital



Psychologist claims increased



University of South Australia | Quality Use of Medicines and Pharmacy Research Centre

Australian Government
Department of Veterans' Affairs

www.veteransmates.net.au

libby.s 47F unisa.edu.au






Veterans' MATES: health promotion planning and evaluation to improve medicine use

Libby s 47F Andrew s 47F

Sansom Institute

University of South Australia

Veterans' MATES aim:

- to improve medication use for veterans by delivering eighteen educational modules over the five years, June 2004 to May 2009
- Administrative health claims data underpins this program; pharmacy claims, Medicare claims, allied health service claims and hospital services

Method

- Providing patient specific feedback and educational material to general practitioners
- Supported by educational brochures to veterans encouraging them to talk to their doctor and pharmacist
- Educational brochures to pharmacists on the topic
- Sent every three months to approximately
  - 10,000 GPs
  - 8,500 pharmacies and accredited pharmacists
  - 35,000 veterans

- To date 15 modules delivered
- Disease specific: Heart failure, Diabetes, COPD
- Drug Specific: Antidepressants, Contraindicated medicines, NSAIDS
- Service delivery: Medicines Review, Care Planning
- Overall
  - 175000 veterans
  - 21,000 doctors
  - 8,500 pharmacies and accredited pharmacists
- > 50% of doctors have received 6 mailings or more

Module	Number of veterans	Number of medical practitioners
Medicines review	38568	11384
CHF	12047	6954
Diabetes	16612	8573
NSAIDs	9885	11242
Antidepressants	42196	12482
Respiratory	28670	10720
PPIs	62460	13684
CI medicines	32484	11050
Medicines review	58081	12950
Constipation	29231	9825
Diabetes care	18340	9103
Dementia	(6690)	3884
Clopidogrel	16867	8279
COPD	18096	8785

Therapeutic area selected

Medication-related problem analysis

Module topic selected

Patient specific feedback developed

Module implementation

Evaluation

Project planning

Who do we need to involve?

- Department of Veterans' Affairs
- Veterans' Organisations
- Royal Australian College of General Practitioners
- Australian Medical Association
- Pharmacy Organisations

Project planning

WHAT are we aiming to do?

- **Identification of target condition or medication**

- To increase utilisation of medicines review services amongst veterans over 65 years of age who are dispensed four or more medicines concurrently.

Project planning

Why we aiming to do it?

- Veterans over 70 years have 45 prescriptions dispensed per year.
- over 90% of community-dwelling, elderly people on multiple medicines had a least one problem with their medicines, with most people having 3 problems.
- One quarter to one third of unplanned hospital admissions in the elderly are medicines related.
- Only 4% of the population likely to benefit have received an HMR in the last year

Project planning

- **Target groups**
  - Veterans over the age of 65 years who are dispensed four or more unique medicines concurrently over a four month period; and
  - General practitioners, who are the primary providers for the veterans targeted.

Project planning: Key Messages

For Doctor

- Provide medicine review for those on multiple medicines
- Medicines review delays time to next hospitalisation

For the veteran brochure

- Medicines review can help you manage your medicines
- Talk to your doctor or pharmacist

Expected behaviour change

- Increase in medication review rates for persons on multiple medicines.

Project planning: Objectives

- **What are the specific objectives?**
- Objectives could relate to changing:
  - Awareness
  - Attitudes
  - Knowledge
  - Skills
  - Behaviour
- It is best if the objectives are **SPECIFIC, MEASURABLE, ACHIEVABLE, REALISTIC, TIME-BOUND**

Project planning: Objectives (1)

- To provide useful information to LMOs about medicine review services
- To increase LMOs' knowledge of the veterans they treat who are dispensed four or more medicines concurrently, the average number of unique medicines the veteran is dispensed per month and whether or not the veteran has had a medicines review in the last two years.

Project planning: Objectives (2)

- To provide useful information to veterans about medicine review service.
- To increase the annual medicine review rate amongst veterans who are dispensed four more medicines concurrently.
- To increase the number of LMOs who have participated in at least one medicines review in the last 12 months.

Project planning: the intervention

- A letter and Therapeutic Brief explaining the need for medicines review, what puts veterans at risk of medication problems, HMR, its benefits and how to access the services;
- Prescriber Feedback indicating to the GPs:
  a) the veterans they treat who are dispensed four or more medicines concurrently,
  b) the average number of unique medicines the veteran is dispensed per month and
  c) whether or not the veteran has had a medicines review in the last twelve months.

Project planning: the intervention (2)

- 4 weeks after the letter and prescriber feedback to general practitioners, a letter and educational brochure will be sent to veterans alerting them to the medicines review service.

Make sure the strategies and objectives link

- Objective: To provide LMOs with useful information about the home medicine review service.
  - Strategy: Information will be provided in the Therapeutic Brief
- Objective: To increase LMOs' knowledge of the veterans they treat who are dispensed four or more medicines concurrently
  - Strategy: Information provided by veteran-specific prescriber feedback letter.

Evaluation planning

- **Evaluate all the objectives**
- **Process**
  - Are the structures in place?
  - Are the structures utilised?
- **Impact**
  - What is the impact of the strategies on Awareness? Attitudes? Knowledge? Skills? Behaviour?
  - What is the impact on medication use?
- **Outcome**
  - What is the change in health outcomes?

Evaluation planning (1)

- Objective: To provide LMOs with useful information about medicines review service.
  - Indicator: the percentage of LMOs reporting the information in the therapeutic brief was useful.
  - Source: Response form distributed with print material.

☒ Please cross the appropriate selection with a black or blue pen.
Mark one box only.

1. Please rate the usefulness of the ***Clinical Risk Management: NSAIDs*** Therapeutic brief.

- ☐ Very Useful
- ☐ Useful
- ☐ Fairly Useful
- ☐ Not Useful

2. Please indicate which one of the following statements applies to the information provided about your patients and their medicines.

- ☐ The information was helpful. It made it easier to determine which of my patients may benefit from a review of their medication.
- ☐ Some of the information was helpful. It made it easier to determine for some of my patients, who might benefit from a review of their medication.
- ☐ The information was not helpful. It did not assist me to review my veteran patients.

- ☐ Risk of cardiovascular event

4. Thinking of the veteran patients listed in the covering letter, how many do you estimate require either your review of their medicines or a home medicines review?

☐ Nil	☐ 4	☐ 8
☐ 1	☐ 5	☐ 9
☐ 2	☐ 6	☐ 10 or more
☐ 3	☐ 7	

5. RACGP QA&CPD points are available for completion of two Veterans' MATES modules. Do you want your participation in this module to be recorded for QA&CPD points?

- ☐ Yes ▶ Please provide your RACGP QA&CPD reference number
- ☐ No

If you would like to make further comments on this material or the Veterans' MATES program, e-mail us at MATES.comments@unisa.edu.au or to make an enquiry or comment phone our Veterans' MATES Helpline on 1800 500 869.

Please post in the reply paid envelope provided. No stamp is required.
Thank you for participating in the Veterans' MATES[1] program.

[1]Medicines Advice and Therapeutics Education Services

041 <Mates_Prscr_id>

123456-123456

Evaluation planning (2)

- Objective: To increase the annual medicines review rate amongst veterans who are dispensed four more medicines concurrently.
  - Indicator: the number of veterans targeted who have had a medication review pre and post the intervention.
  - Source: DVA claims database

The intervention

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic brief 1

Flag Veterans for Medicines Review

Medicines review provides an opportunity for you to assess how your veteran patient is managing their medicines and the outcomes being achieved.

There are a number of ways of reviewing your patient's medicines. Home Medicines Review has been demonstrated to be the most effective.[1]

Consider a Home Medicines Review (HMR) for all veterans with one of these flags:

- Multiple medicines
- Recent hospitalisation
- Confusion, hearing, vision or dexterity problems
- High-risk medicines

Inside

What are the benefits to you as a GP?

HMR complements the regular reviews of medicines that GPs undertake by providing information on the patient's experiences in using their medicines at home.

Following each home visit, you will receive a report from the pharmacist which includes:

- a comprehensive patient medicine list including over-the-counter (OTC) and complementary medicines;
- an assessment of medicine-taking behaviour i.e. exactly what medicines are being taken, when and how they are being taken;
- relevant drug interactions - many prescribing systems flag interactions but the pharmacist can provide information on whether or not these interactions are clinically important;
- information on your veteran's requirements for additional patient education and training in the use of medicine delivery devices.

HMR provides payment to allow you time to reflect on the patient's medicines and develop a medication management plan with the veteran (full GP MBS 900 payment is $126.10)

What are the benefits of a HMR for your veteran patient?

- **Greater understanding of their medicines.**
  Confusion may arise for a number of reasons including brand substitution. Only 27% of Australian veterans rated their understanding of their medical conditions and medicines as very good prior to a HMR. This rose to 87% after the HMR visit.[2]
- **Improved ability to keep taking their medicines appropriately.**
- **Reduced risk of medication-related problems.**
- **Reassurance and peace of mind.**
  61% of people are very concerned about taking the wrong medicine and 58% are very concerned about suffering from a drug interaction.[3]

Veterans' MATES

Welcome to Veterans' MATES: Medicines Advice and Therapeutics Education Services. This is the first of 10 modules which will be delivered over the next 3 years.

Some of the prescriptions listed below may have been ordered by other doctors. As the prescriber most likely to be responsible for their care.

<Primary LMO>

PLEASE KEEP FOR YO

Veterans Name	Suburb	No. of unique medicines probably able to be packed in a DAA	No. of hospital admissions in the last 12 mths	No. of prescribers during last 12 mths	Date of last HMR claimed	DAA Service claimed
ANNE T SAMPLE	Torrens Park	6	1	2	No claim	No claim

Total number of prescriptions dispensed in 4 mths: 24

COMMENT: Large number of prescriptions dispensed suggesting complex medicine regimen.
COMMENT: No HMR claim in last 12 mths. Consider HMR (item 900) to assess suitability for DAA Service.

JOHN E CITIZEN	Parkside	5	2	3	No claim	No claim

Total number of prescriptions dispensed in 4 mths: 28

COMMENT: Anti-dementia medication dispensed. Patient is likely to benefit from DAA Service.
COMMENT: Large number of prescriptions dispensed suggesting complex medicine regimen.
COMMENT: No HMR claim in last 12 mths. Consider HMR (item 900) to assess suitability for DAA Service.

JACK T JAMES	Glenside	4	0	1	19/07/06	No claim

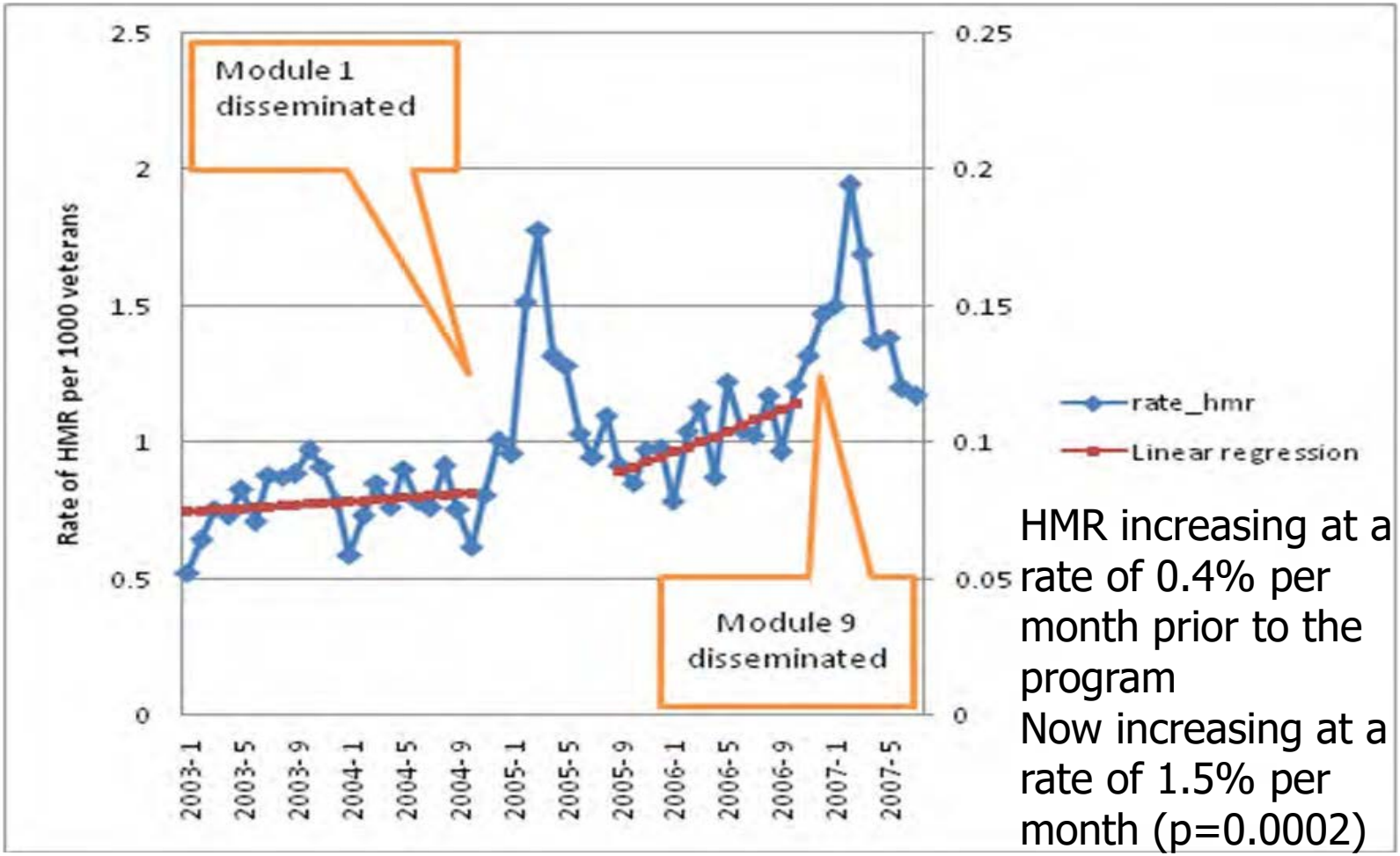
The results: Process evaluation

Was the intervention distributed as intended?	GP letter sent Nov 30th 2004 Veteran letter sent Jan 17th 2005
How many GPs were sent program?	**11383**
How many GP mailings were returned unopened?	1189 (10%)
How many veterans were sent letters?	**38570**
How many veteran letters were returned unopened?	713 (2%)
How many response forms were received from GPs?	1,085 (11%)
How many response forms were received from veterans?	11,150 (29%)

Did the intervention work? Impact evaluation

- Aim: to increase the rate of home medication reviews for veterans over 65 years on multiple medicines
- Method:
  - time series analysis

Time series medicine review rates



HMR increasing at a rate of 0.4% per month prior to the program

Now increasing at a rate of 1.5% per month (p=0.0002)

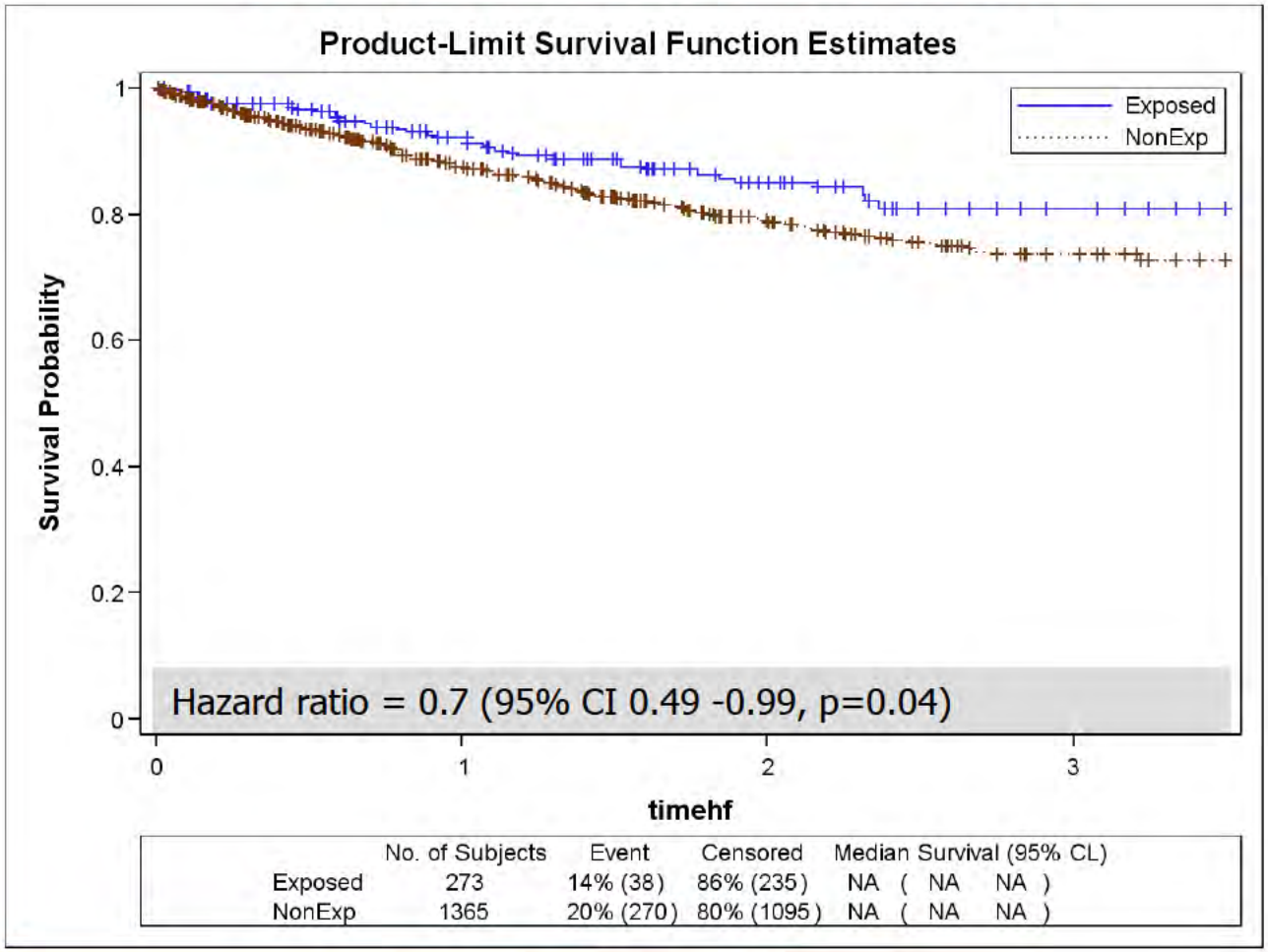
Outcome evaluation: did it make a difference to health outcomes?

Home medicines review in the heart failure population

- Veterans who were
  - Gold card holders,
  - aged 65 or over
  - been dispensed a beta-blocker listed for heart failure
- Cases = those with home medicine review
- Controls = no home medicine review

- Endpoint = time to next hospitalisation for heart failure
- Confounders: age, gender, co-morbidity, aged-care status, socioeconomic index, season, number of prescriptions, number of prescribers, number of pharmacies, number of hospitalisations, number of occupational therapy visits, number of speech therapy visits, targeted by Veterans' MATES project, number of accredited pharmacists in region, palliative care medicines

Increased time to next hospitalisation for those with an HMR



Veterans' Medicines Advice and Therapeutics Education Services Project

s 47F A, s 47F E, s 47F J, s 47F R.

Veterans' MATES:

Providing practical medicines advice and therapeutic education for health professionals and veterans:

- **Based on an analysis of linked health data provided through DVA;**
- **In an environment where current practice guidelines are often based on evidence from studies which do not include older people**

Veterans' MATES:

In the veteran population, because of age and poly-morbidity, objective, evidence-based information is often non-existent or difficult to obtain.

- Older people and people with poly-morbidities are systematically excluded from medicines trials.
- Guidelines for managing individual chronic conditions may not be useful when applied to individuals with poly-morbidity.
- Younger veterans with mixed mental and physical health problems associated with their experiences in service present unique treatment problems.

Gurwitz J. Polypharmacy: A new paradigm for quality drug therapy in the elderly (Editorial). *Arch Intern Med 2004; 164: 1957-9*.

Veterans' MATES:

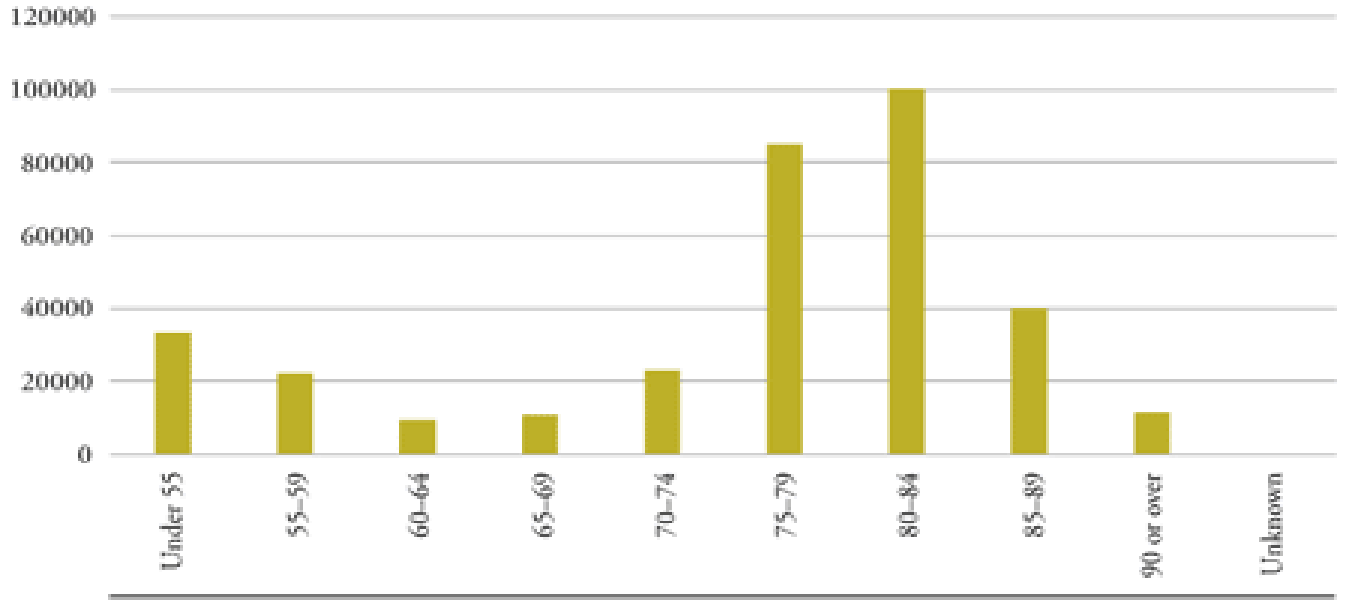
Poly-morbidity and poly-pharmacy is common in older people.

- In Australia, 60% of 65 year olds have >2 chronic conditions, while 80% of 85 year olds have >4 chronic conditions.
- 89% are taking one or more medications, with 26% taking ≥ 5 medications concurrently.

Gilbert A, Luszcz M, Owen N. Medication use and its correlates among the elderly. *Aust J Public Health 1993;17:18-22*.

Veteran treatment population by age

DVA annual report 2003-4; p117



Veterans' MATES:

- Medication-related problems are common and sometimes under-recognised in older, poly-morbid patients*
- The question then arises; In the absence of direct evidence-based treatment guidelines what does the evidence say about consumer and provider services that provide some protection for the patient against medication-related problems?

* Gilbert A, Roughead E, Mott K, Barratt J. Collaborative Medication management services; improving patient care. *Med J Aust 2002;177:189-192.*

Veterans' MATES:

- We selected;
  - Patient-specific prescriber feedback
  - Supporting information to medical practitioners
  - Academic detailing and opinion leader support
  - Supporting information to targeted veterans
  - Supporting information to pharmacies

Veterans' MATES:

Services with the potential to protect patients from medication-related problems include:

- Improved communication between health professionals and patients
- Greater use of CMI as part of the consultation
- Regular collaborative medicines review

Roughead et al. MJA 2006;184: 315-316

Method

Every 13 weeks we develop a new module and provide :

- Patient specific feedback and educational material to GPs (~ 12,000) in Australia;
- Educational brochures to veterans (~20,000 veterans) encouraging them to talk to their doctor and pharmacist;
- Educational brochures to pharmacies (~ 5000) and
- Academic detailing (150 GPs) and opinion leader (30) education in selected geographic areas.

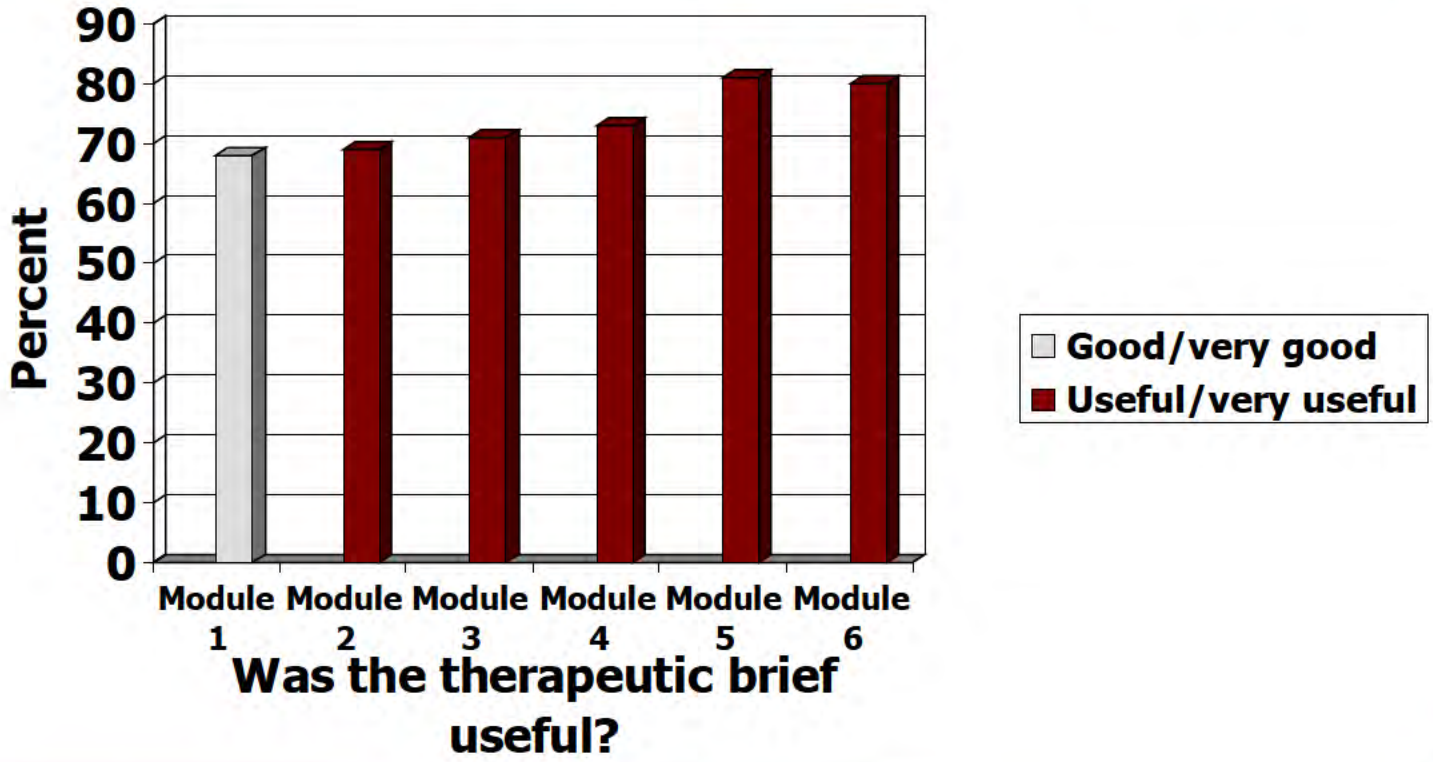
Participation in each module

Module	Number of veterans	Number of medical practitioners
Medicines review	38570	11384
CHF	12047	6954
Diabetes	16612	8668
NSAIDs	9885	11419
Antidepressants	42199	12472
Respiratory	28670	10910
In total we have contacted	113584 veterans at least once	17301 doctors at least once

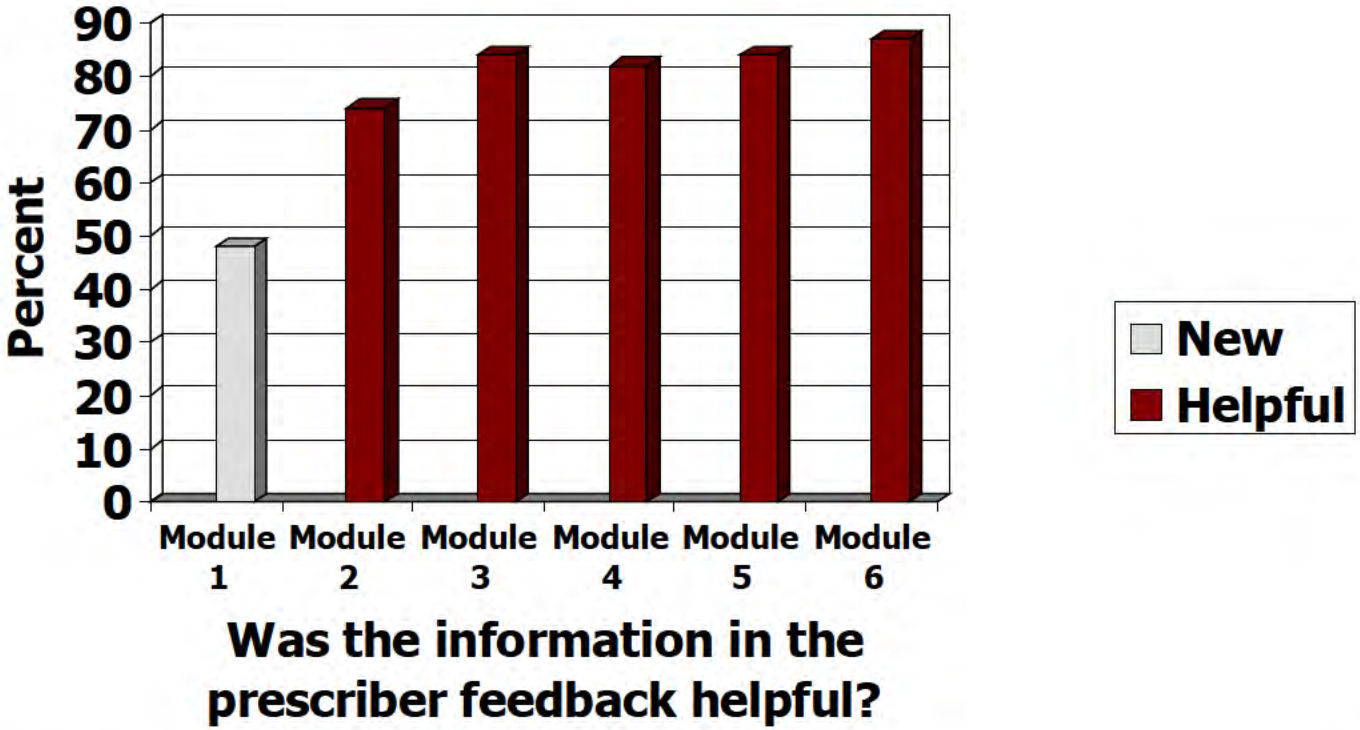
Results

- Survey responses
  - ~ 10% from GPs
  - ~ 30% from veterans
  - ~ 15% from pharmacists

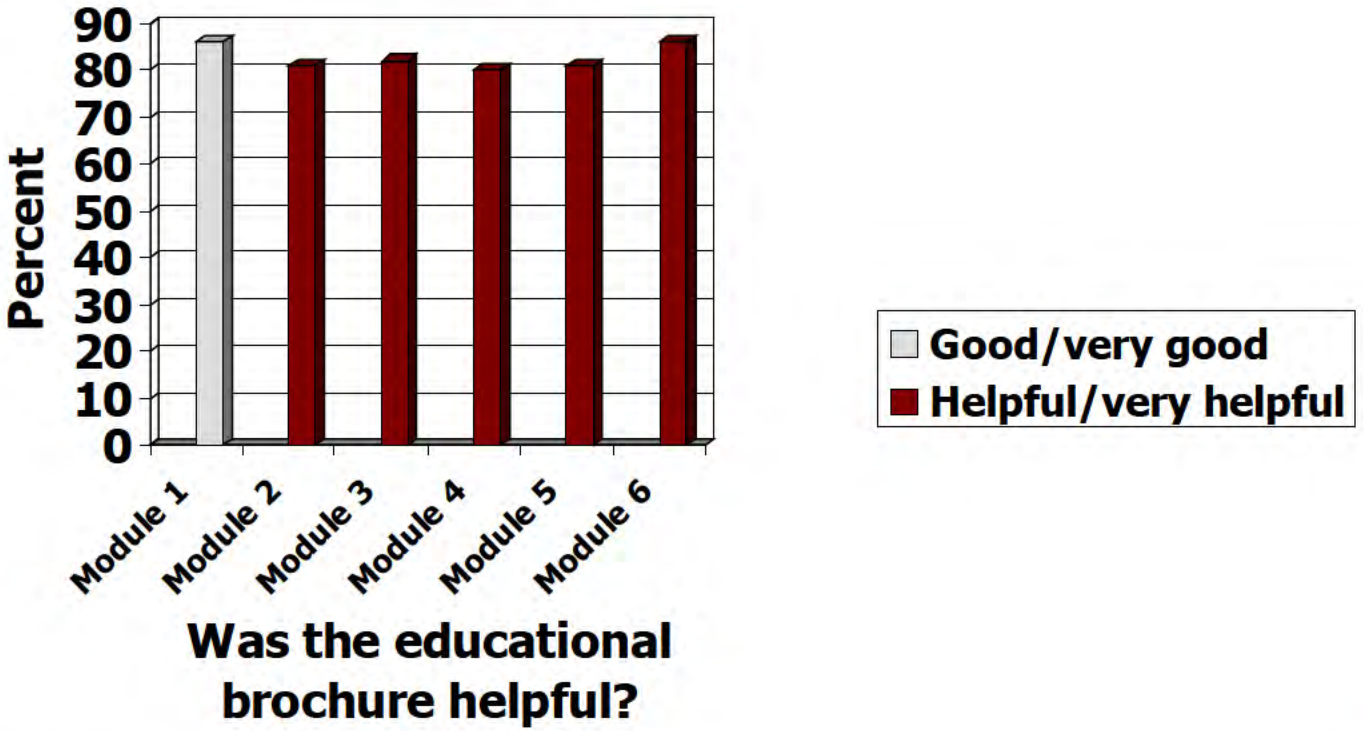
What have we achieved?
We have designed therapeutic information that doctors find useful



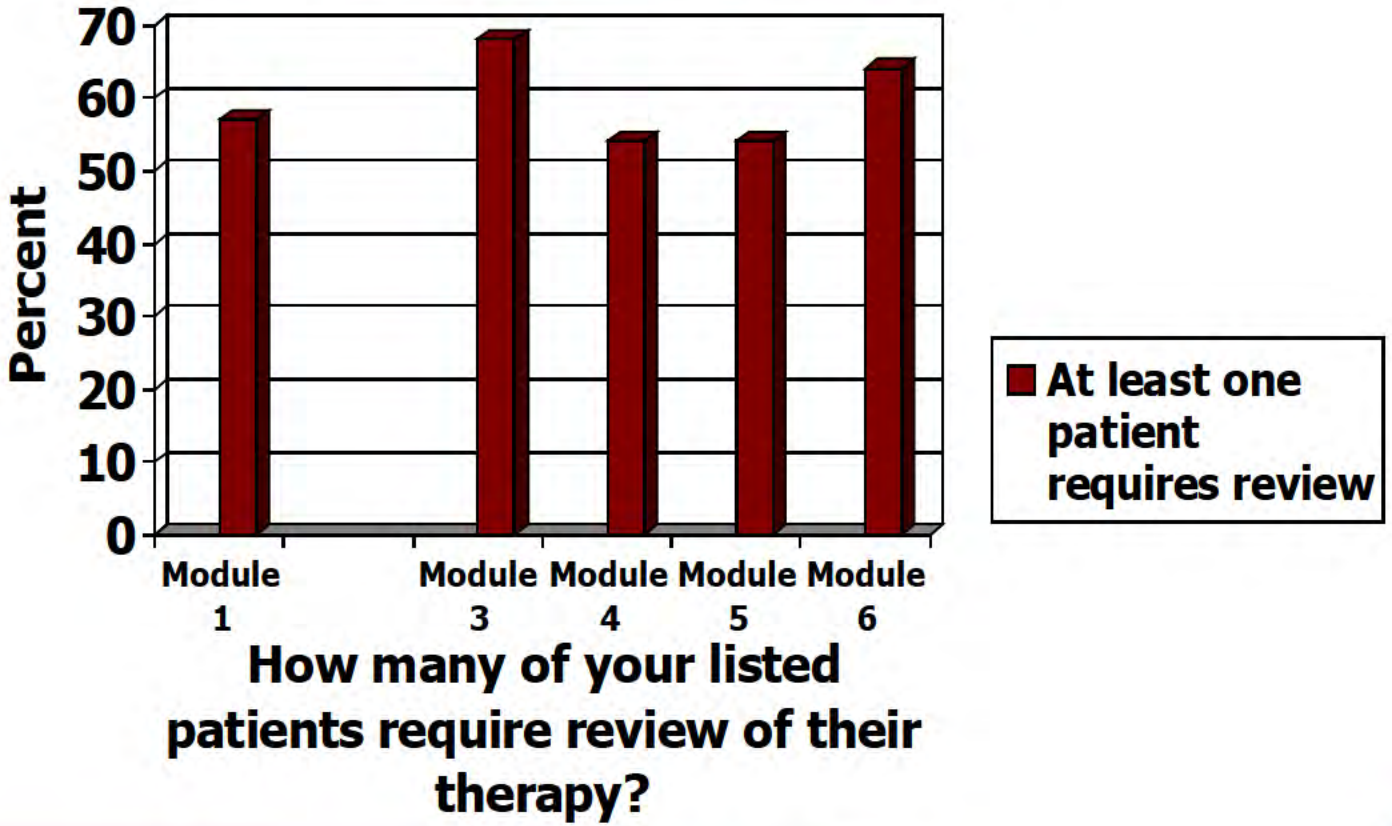
Doctors also find the prescriber feedback helpful



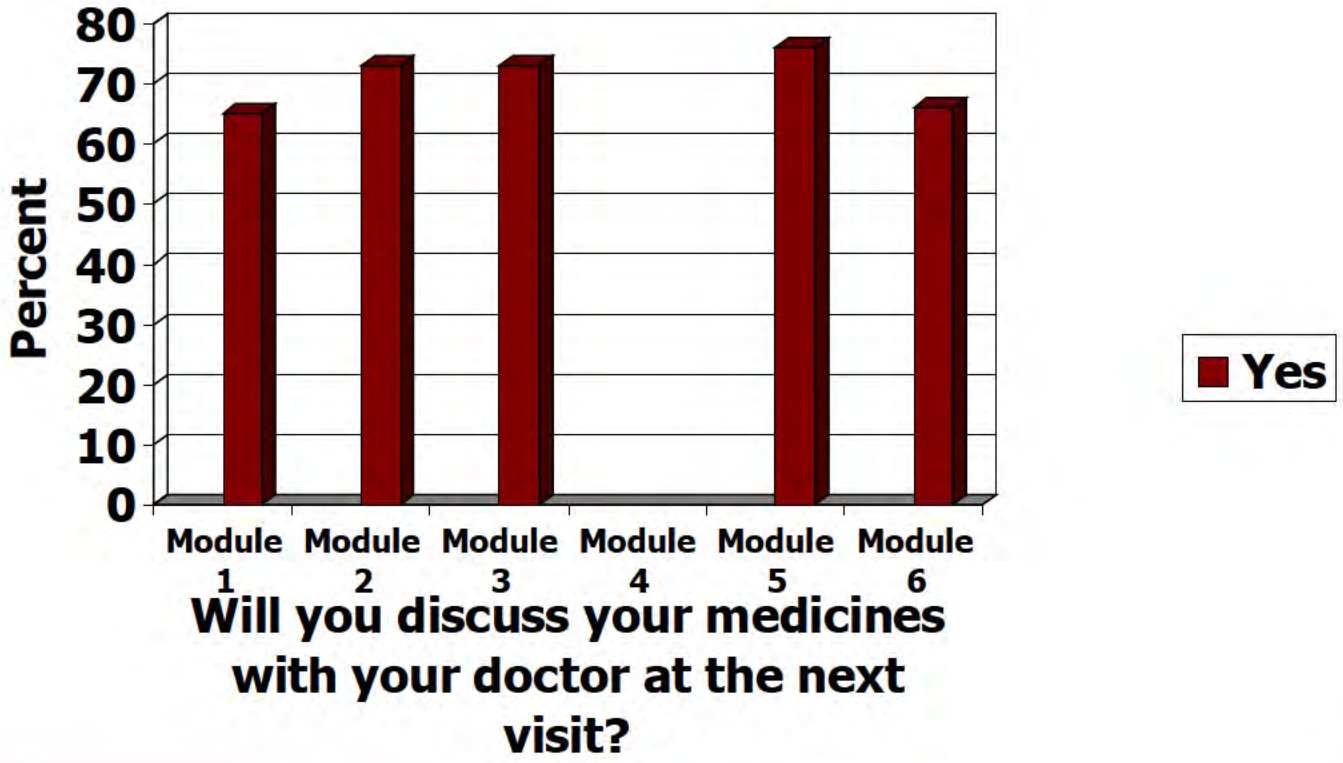
Veterans find the educational material helpful



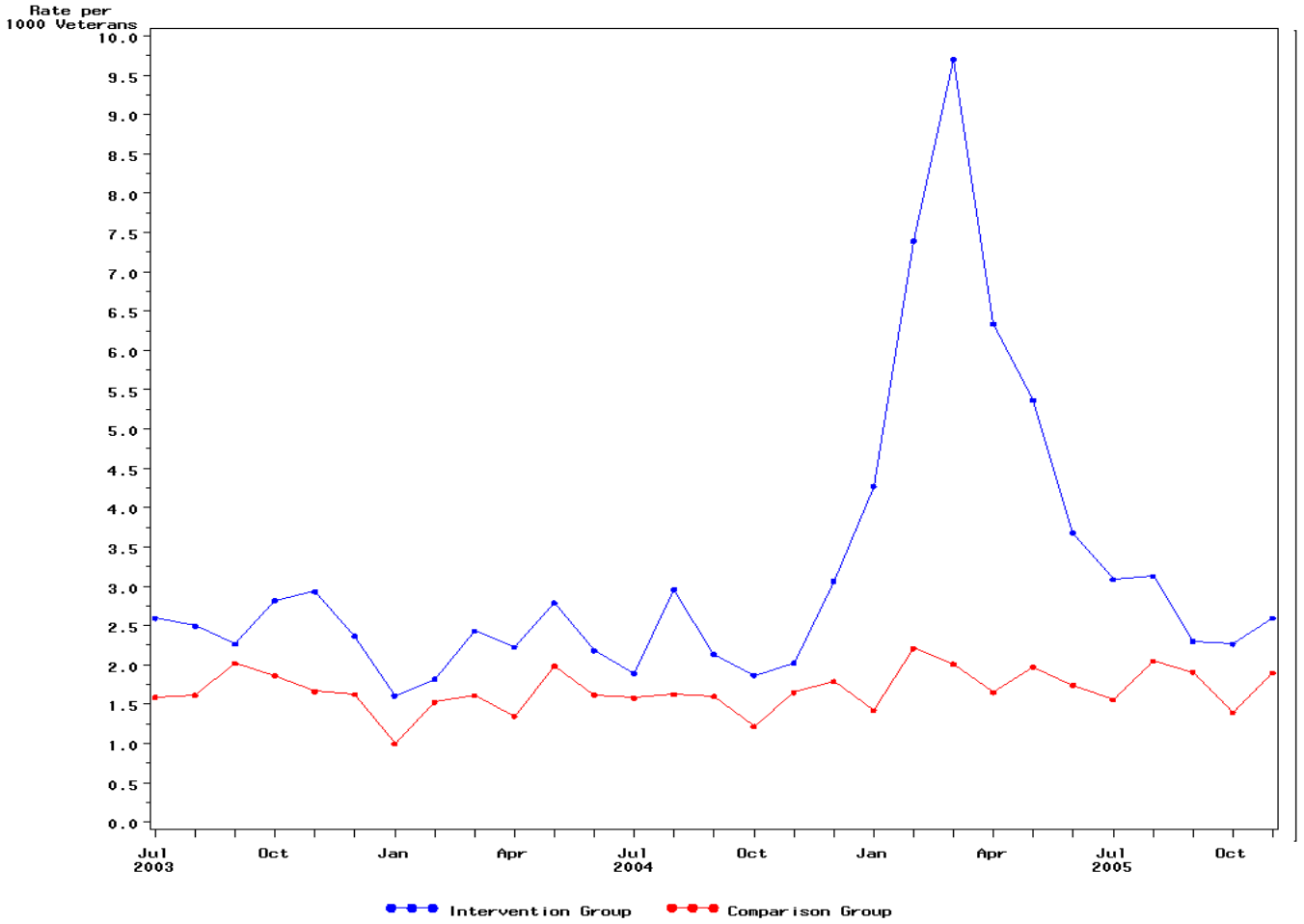
Doctors indicate they are likely to review their patients



Veterans indicate they are likely to discuss the issues with their doctor



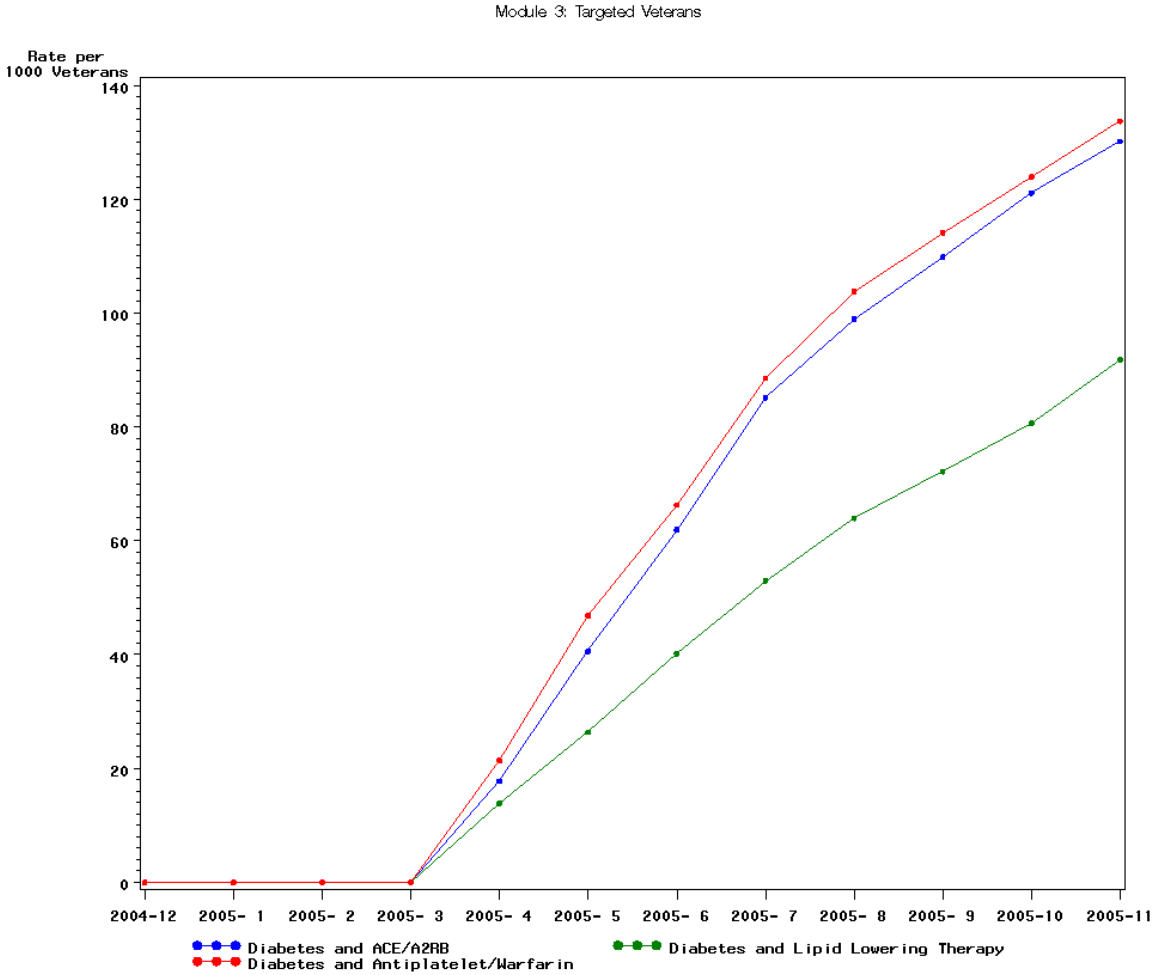
Module 1:Changes in HMR rates



Module 2: B-blockers and HF

- number of veterans with HF who weren't dispensed a beta-blocker and have now been dispensed a beta-blocker in the period since the intervention (March 05)

Module 3: Diabetes and Cardiovascular medicine



Conclusion

- The Veterans' MATES project has been well received by general practitioners and veterans.
- The patient specific feedback has been successful in helping doctors review listed patients and has led to changes to some patient's management.
- The list of patients for the GP to consider, and a brief discussion of the issues, appears to be useful to the GP as a practice management tool.

Where to from here?

- Extension of the Veterans' MATES contract
- There are many research questions which arise as we do that work;
  - What form of delivery of the information from Veterans' MATES project is preferred by GPs, other health professionals and veterans?
  - How, when current practice guidelines are often based on evidence from studies which do not include older people, can we support health professionals to discuss risks and benefits with older veteran patients?
  - How can patient preference be built into discussions between GP, pharmacist and patient?
- International opportunities for collaboration eg WHO

Ageing Well; Ageing Productively
A $2M NHMRC/ARC program grant

For older people, evidence-based information is often difficult to obtain or non-existent.

- Older people and people with multiple chronic conditions are systematically excluded from medicines trials.
- Guidelines for managing individual chronic conditions may not be useful when applied to individuals with multiple chronic conditions

Gurwitz J. Polypharmacy: A new paradigm for quality drug therapy in the elderly (Editorial). *Arch Intern Med 2004; 164: 1957-9*.

Le Couteur DG. Prescribing in older people: Evidence based medicine or pharmaco-memetics? *Proceedings of the joint meeting of ASCEPT and APSA.* Melbourne, 2005

Ageing Well; Ageing Productively

- Determine the prevalence and patterns of common poly-morbidity.
- Review current treatment and management strategies.
- Determine the concordance of management strategies with available disease specific guidelines
- Examine the prevalence of conflicting treatment recommendations in individual patients.
- Examine expected and actual outcomes in selected poly-morbid cohorts.

University of South Australia | Sansom Institute

NHMRC/ARC
AGEING WELL, AGEING PRODUCTIVELY PROGRAM

Australian Government
Department of Veterans' Affairs

Concomitant Chronic Medication Prescribing in the Elderly

Gillian s 47F Agnes s 47F
Andrew s 47F Libby s 47F

Quality Use of Medicines and Pharmacy Research Centre,
Sansom Institute, University of South Australia.

University of South Australia | Sansom Institute

Chronic Diseases

- Chronic diseases are the leading cause of illness and disability in those aged 65 years and over
- In 2000-01 accounted for nearly 70% of all health system expenditure in Australia (over $AUS 35 billion)

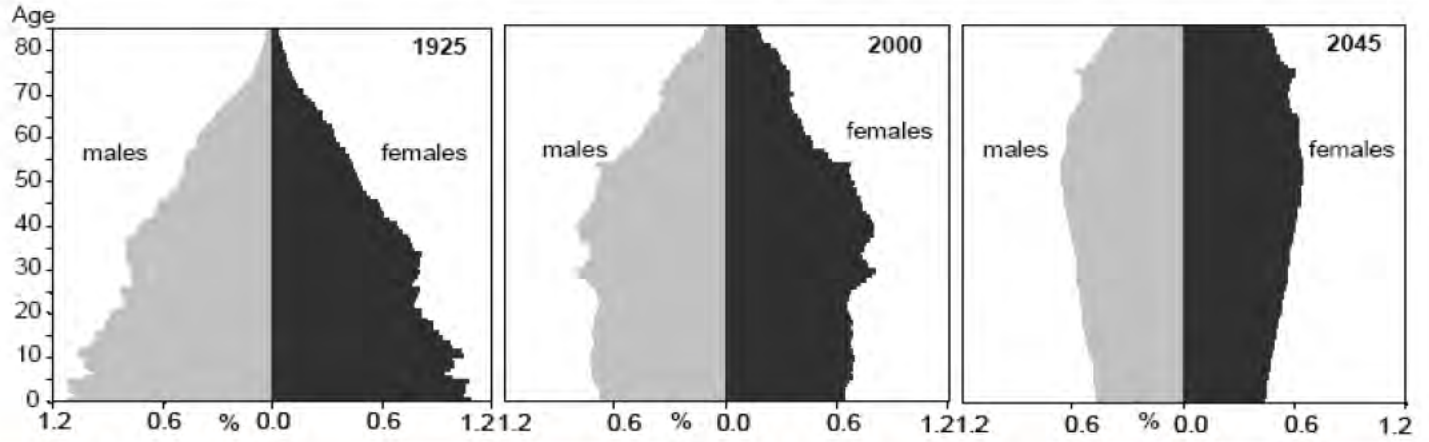
University of South Australia | Sansom Institute

The Australian Ageing Population

- The proportion of Australians aged ≥65 years old is projected to increase from 2.6 million in 2004 to over 6.5 million by 2051 (ABS, 2006)

Figure 1 **From pyramid to coffin**

Changing age structure of the Australian population, 1925-2045



Productivity Commission Research Report, Economic Implications of an Ageing Australia, 2005

University of South Australia

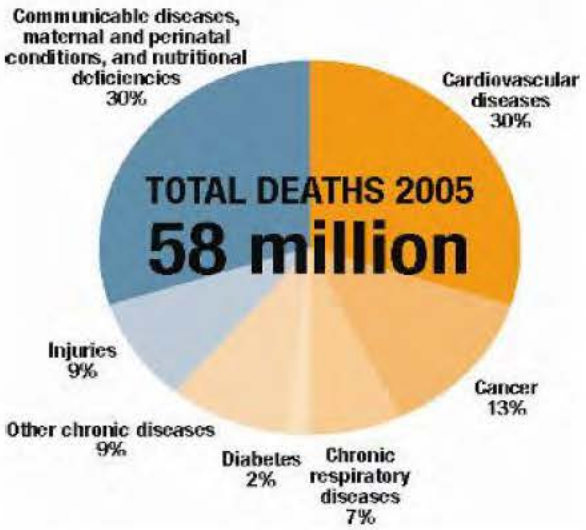
Preventing CHRONIC DISEASES

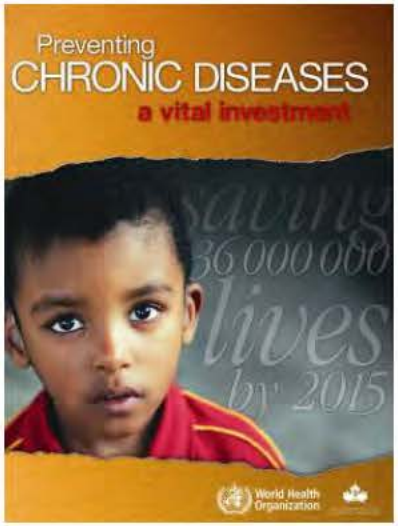
a vital investment

Chronic disease accounts for 60% of deaths worldwide

World Health Organization

Projected main causes of death, worldwide, all ages, 2005





Quality Use of Medicines and Pharmacy Research Centre
Sansom Institute, University of South Australia

University of South Australia | Sansom Institute

Multi-morbidity

- The prevalence of multimorbidity of chronic diseases is common in the elderly

- 2004-05 NHS reported almost all Australians aged 65 years or older have at least one chronic condition, with 80% reported as having 3 or more chronic conditions

University of South Australia | Sansom Institute

Consequences of Multimorbidity

- Multimorbidity is associated with a decline in many health outcomes
  - quality of life
  - functional ability
  - mobility
- and increases
  - hospitalisations
  - psychological distress
  - use of health care resources
  - mortality

University of South Australia | Sansom Institute

Evidence based guidelines

- Many current evidence based guidelines recommend several drugs in the treatment of a single condition
- Can lead to potentially very complex regimens in those with multimorbidity
- The relevance of these guidelines to the care of those with multiple chronic diseases is a growing concern

University of South Australia | Sansom Institute

Australian Government
National Health and Medical Research Council

Polypharmacy in the elderly is common

- Almost 88% ≥ 65 years use at least one prescription
- 43-55% take 4 or more medications regularly
- ↑ numbers of medications

  =

  ↑ risk of adverse drug events

→ 10% risk of ADE – 1 medicine

75% risk of ADE – ≥ 5 medicine

University of South Australia | Sansom Institute

Australian Government
National Health and Medical Research Council

Our Broad Aim…

- To provide a better understanding of the complex issues surrounding the management of multimorbidity of chronic diseases in older Australians

"It is more important to know what sort of person has a disease than to know what sort of disease a person has".

Hippocrates (*c.*460 BC – *c.*370 BC)

University of South Australia | Sansom Institute

Aims

- To describe the point prevalence of polypharmacy in the elderly
- To examine the most common chronic medication combinations
- To identify the characteristics of those particularly susceptible to polypharmacy.

University of South Australia | Sansom Institute

Methods

- Prescription dispensing data were retrieved from the Department of Veterans' Affairs, Repatriation PBS pharmacy claims database.

- This database holds prescription dispensing records for all prescriptions listed on the PBS or RPBS dispensed to eligible veterans.

University of South Australia | Sansom Institute

Methods

Inclusion Criteria

- Subjects who were aged ≥ 65 years old at the start date of the study (1st April 2007)
- Remained alive at end of study (31st July 2007)
- Gold card holders
- Had been dispensed at least one prescription medicine in the last five years

University of South Australia | Sansom Institute

Methods

University of South Australia | Sansom Institute

Results

The Study Cohort

n=198,681

Mean age= 81.9 ± 5.7 yrs

49% male

50% were veterans

11% residential aged care

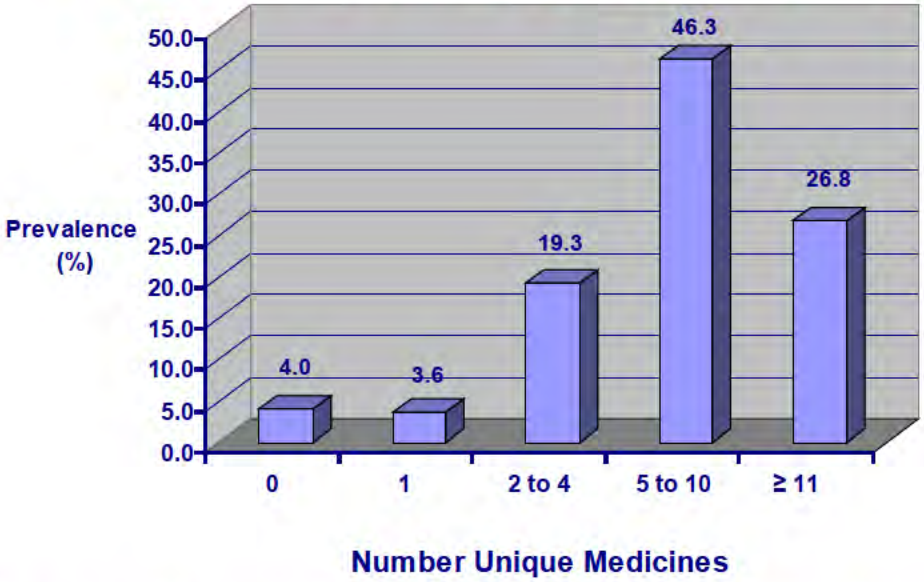
University of South Australia | Sansom Institute

What are the most commonly prescribed chronic disease medicines in the elderly?

Medicine Class (ATC Code)	Proportion of study population (%)
C09 - Agents acting on the renin-angiotensin system	52.4
B01 - Anti-thrombotic agents	44.5
A02 - Drugs for acid related disorders	43.8
C10 - Lipid modifying agents	41.0
N02 - Analgesics	39.8
N05 - Psycholeptics	28.9
C08 - Calcium channel blockers	26.6
C07 - Beta blocking agents	25.4
C03 - Diuretics	23.5
N06 - Antidepressants	22.5
R03 - Drugs for obstructive airways disease	18.7
M01 - Anti-inflammatory, anti-rheumatic products	16.6
M05 – Drugs for treatment of bone diseases	14.5
A10 - Anti-diabetic therapy	10.0

University of South Australia | Sansom Institute

Polypharmacy in the Elderly



- No difference between numbers of unique medicine groups in terms gender, age or residential aged care status
- Almost half of the elderly population (≥65yrs) are on 5 to 10 unique medicines
- Over 25% are on 11 or more unique medicines
- Almost 75% of the elderly population (≥65yrs) are on 5 or more unique medicines

University of South Australia | Sansom Institute

How similar is the veteran population to the Australian community?

	Males	Females	Persons
GP visits	1.21	1.11	1.17
Prescriptions	1.27	0.95	1.13
Hospitalisations	1.24	1.13	1.21

- After adjusting for age, marital status & service related disability ➡ Usage is similar

Source: AIHW 2002

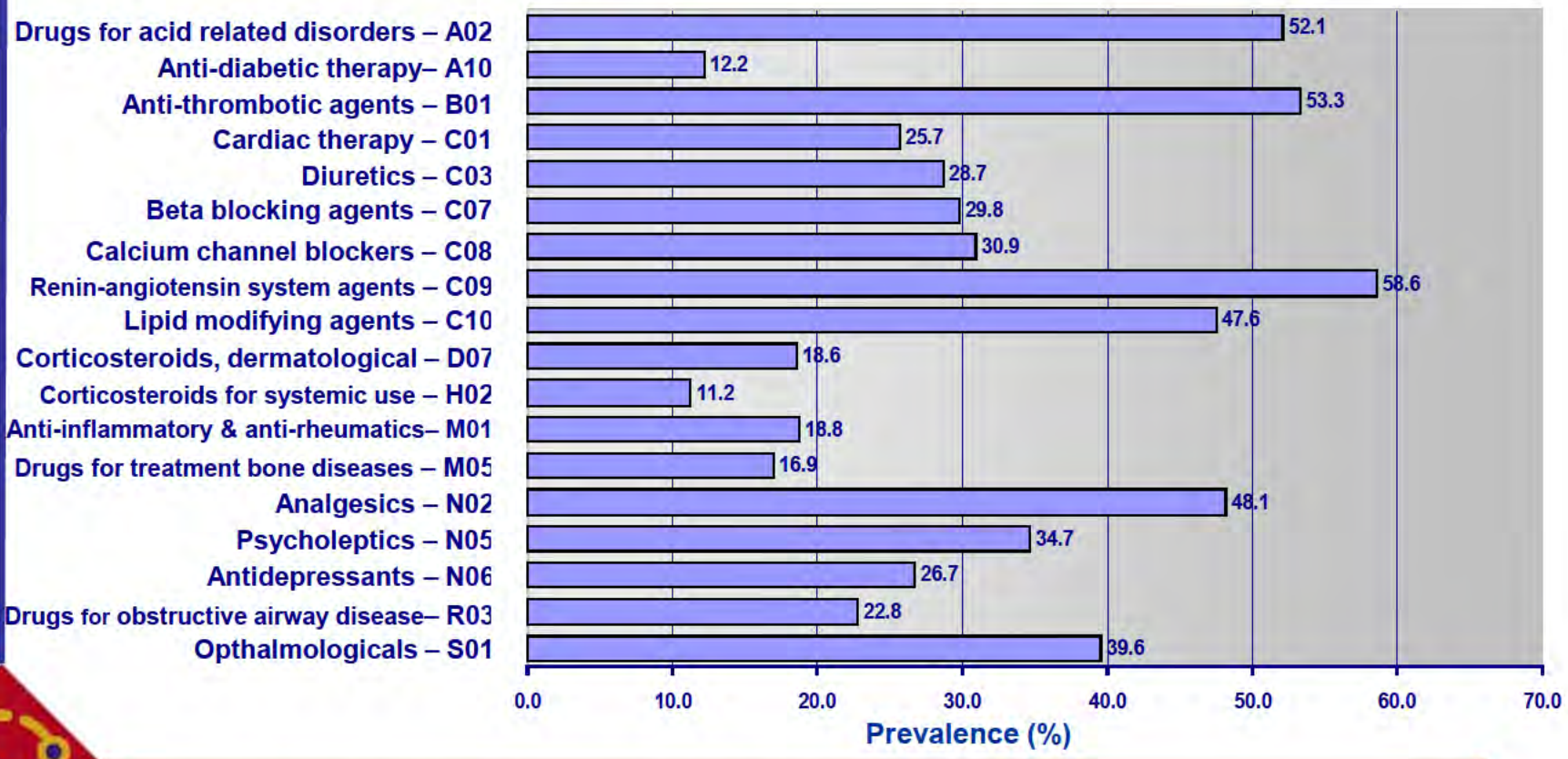
University of South Australia | Sansom Institute

What does this mean for the Australian elderly population?

- Current ABS figures (June 2007) estimate that there are 2.75 million people aged ≥65yrs
- Based on the results from our study, there are potentially 2 million elderly people in Australia on 5 or more medicines
- The risk of adverse drug events increases significantly with increasing numbers of concurrent medications
  - → 75% chance with ≥5 medicines

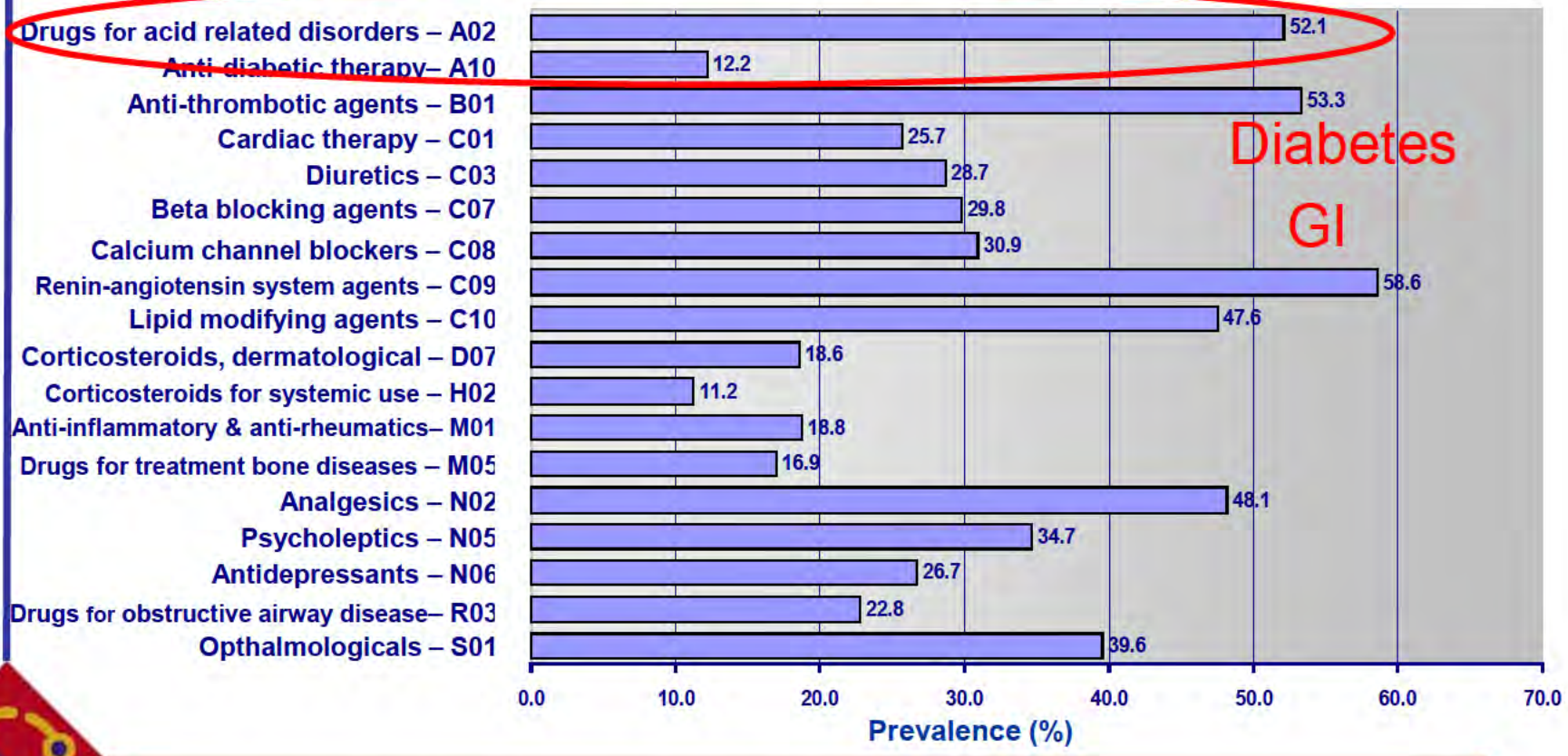
University of South Australia | Sansom Institute

What are the most commonly prescribed chronic disease medicines in the elderly who are on ≥ 5 unique medicines?



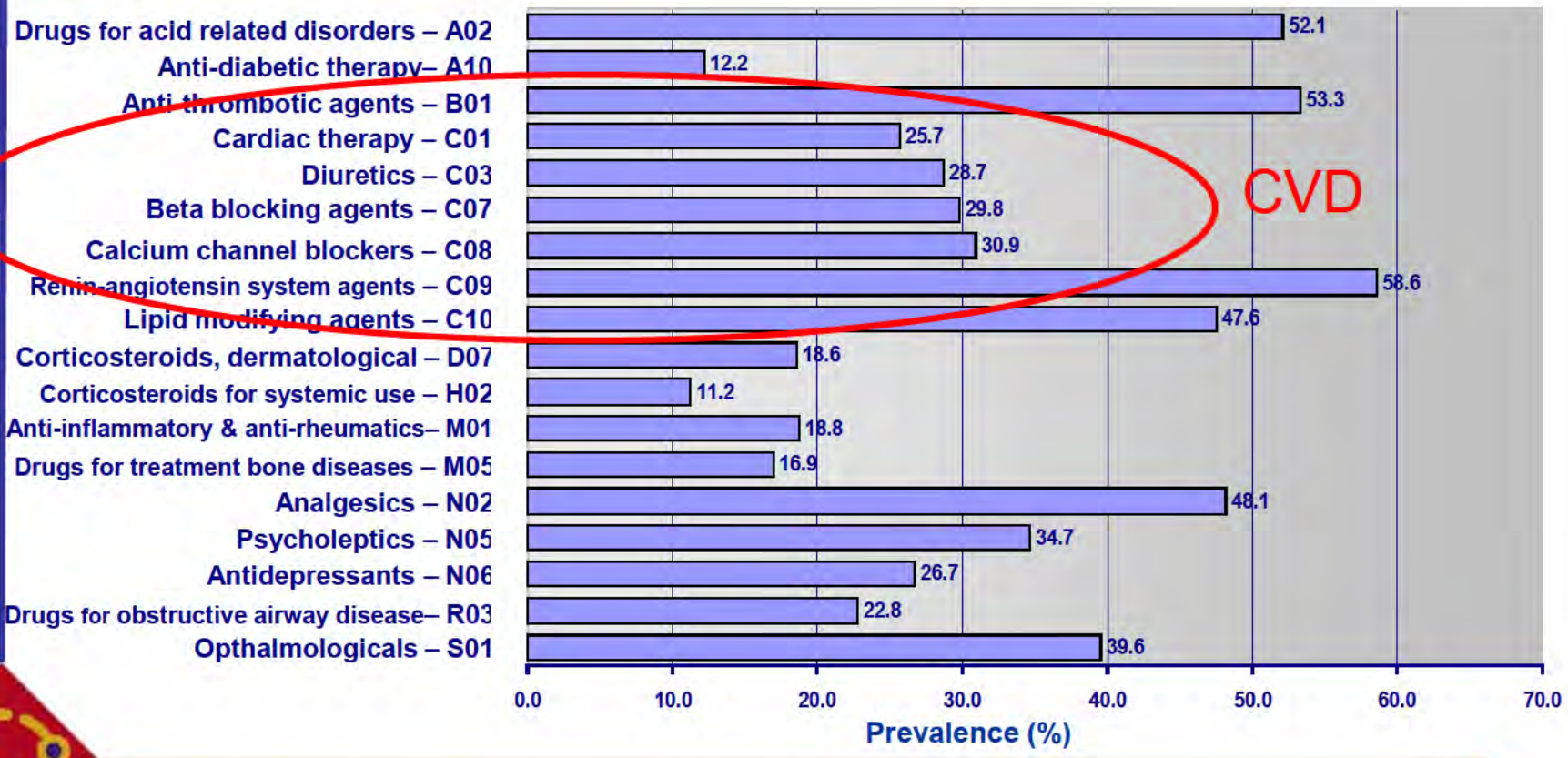
University of South Australia | Sansom Institute

What are the most commonly prescribed chronic disease medicines in the elderly who are on ≥ 5 unique medicines?



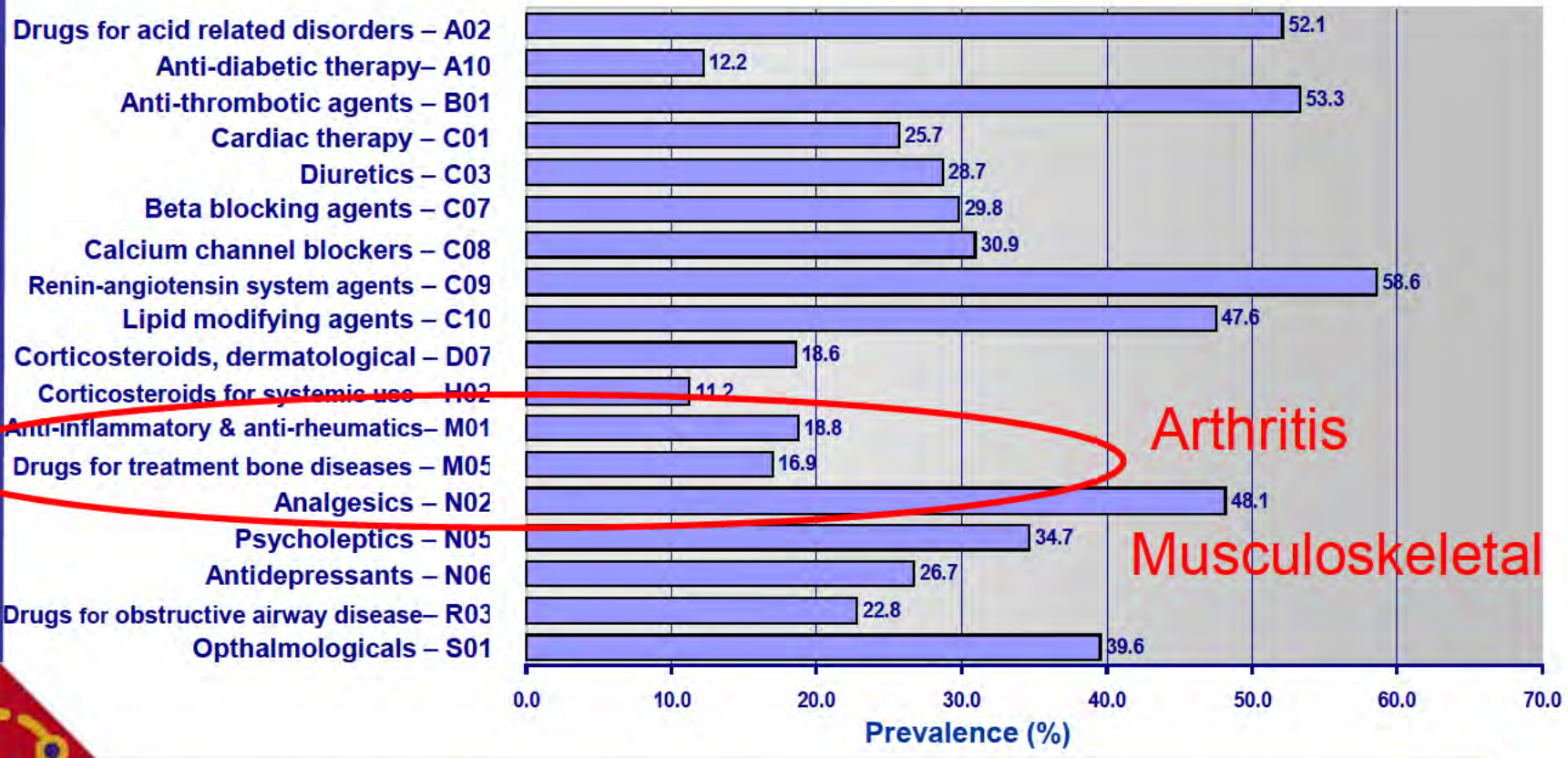
University of South Australia | Sansom Institute

What are the most commonly prescribed chronic disease medicines in the elderly who are on ≥ 5 unique medicines?



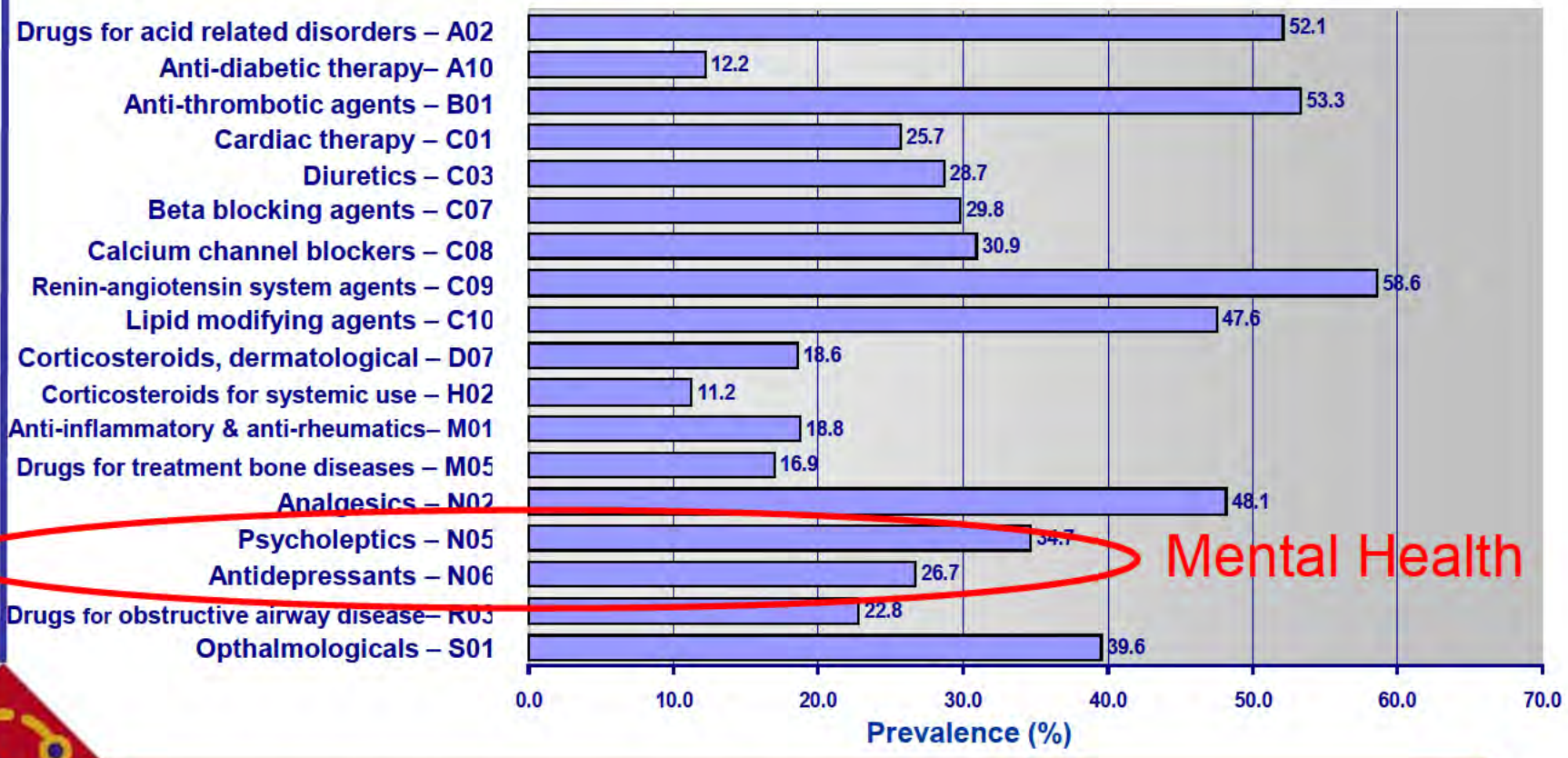
University of South Australia | Sansom Institute

What are the most commonly prescribed chronic disease medicines in the elderly who are on ≥ 5 unique medicines?



University of South Australia | Sansom Institute

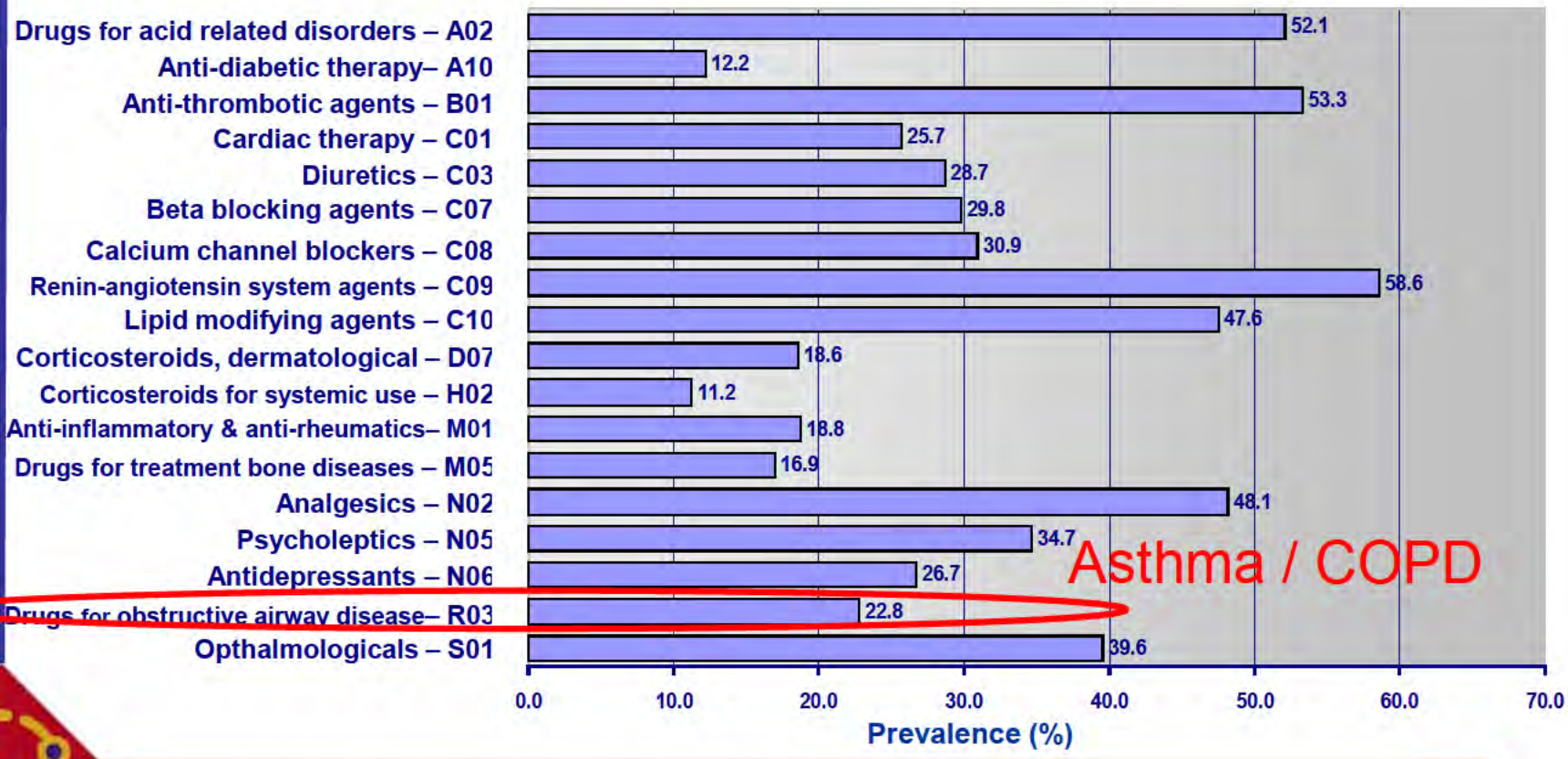
What are the most commonly prescribed chronic disease medicines in the elderly who are on ≥ 5 unique medicines?



Quality Use of Medicines and Pharmacy Research Centre
Sansom Institute, University of South Australia

University of South Australia | Sansom Institute

What are the most commonly prescribed chronic disease medicines in the elderly who are on ≥ 5 unique medicines?



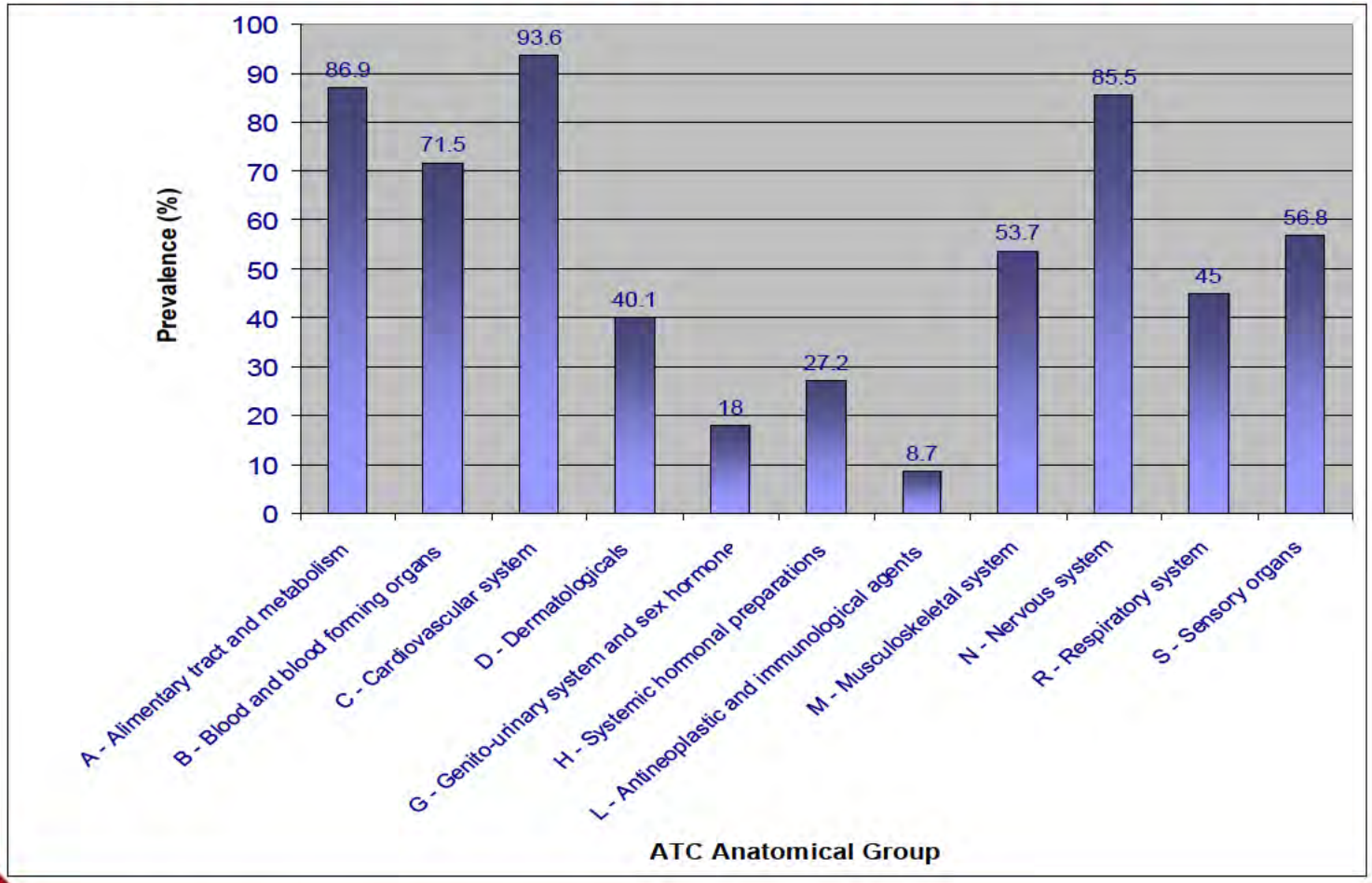
University of South Australia | Sansom Institute

Polypharmacy in the elderly across ATC anatomical groups

	Number of ATC Anatomical Groups (1st level classification) (n=189,099)				
	1	**2**	**3**	**4**	**≥5**
Prevalence (%)	7.5%	13.7%	19.0%	20.8%	38.9%
Age (Mean ± SD)	81.5 (6.2)	82.0 (5.9)	82.5 (5.8)	82.7 (5.5)	82.9 (5.3)
Gender (% Male)	50.4%	49.9%	49.0%	48.1%	47.6%
Residential Aged Care (%)	5.3%	7.2%	9.7%	11.9%	13.4%
Number unique medicines (Median (IQR))	2 (IQR 1-3)	4 (IQR 3-5)	6 (IQR 4-7)	8 (IQR 6-10)	12 (IQR 9-15)

University of South Australia | Sansom Institute

What are the most common ATC anatomical classes in those with ≥ 5?



University of South Australia | Sansom Institute

Conclusions

- Almost 75% of the elderly are on ≥ 5 or more unique medicines

- Almost 40% are on medicines across ≥ 5 body systems
  - ⇒ receiving a median of 12 unique medicines

- Alimentary, Blood, Cardiovascular, Nervous system, Sensory and Musculoskeletal all major body systems

University of South Australia | Sansom Institute

The Big Picture……

- This research will provide a better understanding of the complex issues surrounding the management of multimorbidity in older Australians

- Will better enable health care professionals in consultation with their elderly patient to ensure best quality of health and quality of life

University of South Australia | Sansom Institute

Australian Government
National Health and Medical Research Council

"At your age, good health is pretty much a thing of the past. My advice is, find an illness you enjoy."

The Veterans' MATES Program - sustained engagement of key stakeholders

s 47F T[1], s 47F E[1], s 47F J[1], s 47F A[1].
1. Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Introduction

The Department of Veterans' Affairs (DVA) Veterans' Medicines Advice and Therapeutics Education Services (***Veterans' MATES***) provides an integrated Quality Use of Medicines (QUM) program, which involves the development of educational modules, including patient-specific prescriber feedback, to improve health outcomes for veterans through improved medication management. Since 2004 over 171,000 veterans, 20,000 GPs and 8,500 pharmacists have received at least one of the thirteen modules developed to date.

The integrated QUM program is based on the four processes of **consultation and engagement** of key stakeholders, **needs analysis**, **implementation** and **evaluation**. Previous studies have shown that the application of these processes produced desired behaviour change in relatively short-term projects[1,2]. This study aims to examine the long-term effectiveness of the integrated QUM program.

Objective

To examine the effectiveness of the integrated QUM program used in the ***Veterans' MATES*** module development process in engaging general practitioners, pharmacists and veterans in module activities over the first four years of this QUM initiative.

Method

A new therapeutics module is produced every 13 weeks. Response forms to evaluate the effectiveness of the engagement processes are sent out with each module. To date, 35% (59,226) of veterans and 24% (4,855) of GPs who have received a module have returned at least one response form.

The four processes of the integrated QUM program are applied to the development of each module.

Stage 1 – Consultation and Engagement

Each module sits within a strong consultative framework. Concept advice, discussion and review is achieved via input from:

- Practitioner and veterans' reference groups
- An Editorial Committee comprising medical, pharmacy and consumer experts in matters of veterans' health, and
- Program consultations and workshops with veterans, medical, pharmacy and government bodies.

Stage 2 – Needs Analysis: Topic selection

The topic must be:

- problematic in the veteran community of Australia
- specific to medication management
- amenable to change through patient-specific prescriber feedback
- suitable for repeat messages over time, and
- fall within one of the National Health Priority areas.

Suggested topics are refined by undertaking a drug utilisation study in the DVA pharmacy dataset. Dispensing, patterns of health service delivery and demographic data for entitled veterans are used to further refine the topic.

Stage 3 – Implementation: Module Writing

The data analysis assist a 'writing group' to:

- critically appraise the literature
- consider the practicalities of the desired action
- develop key messages
- consider the measurability of practice changes, and scan the environment to ensure consistency of messages.

The outcomes are:

- an individualised patient-specific prescriber feedback
- a therapeutic brief providing current clinical evidence
- a veteran brochure encouraging communication between stakeholders
- a covering letter, and recipient response form.

The writing group consists of experts from UniSA - *Veterans' MATES* project team, AMH, Discipline of General Practice (Adelaide University), DATIS, NPS and Repatriation General Hospital (SA).

Module materials are externally reviewed by the multidisciplinary DVA Editorial Committee and individual 'topic' experts.

Stage 4 – Evaluation: Ongoing Quality Improvement

Ongoing quality improvement is achieved through feedback and review via:

- Continued input from Reference Groups and the Editorial Committee
- Stakeholder responses to 'satisfaction with materials' and 'intent to-act' statements in Module Response Forms
- Feedback through a Telephone Helpline for GPs, pharmacists and veterans, and
- Observational Studies utilising the DVA datasets

Module Dissemination

For each module the recipients are:

- Veterans who meet specified module criteria
- GPs who are the primary providers for the specified veterans
- All pharmacies and accredited pharmacists.

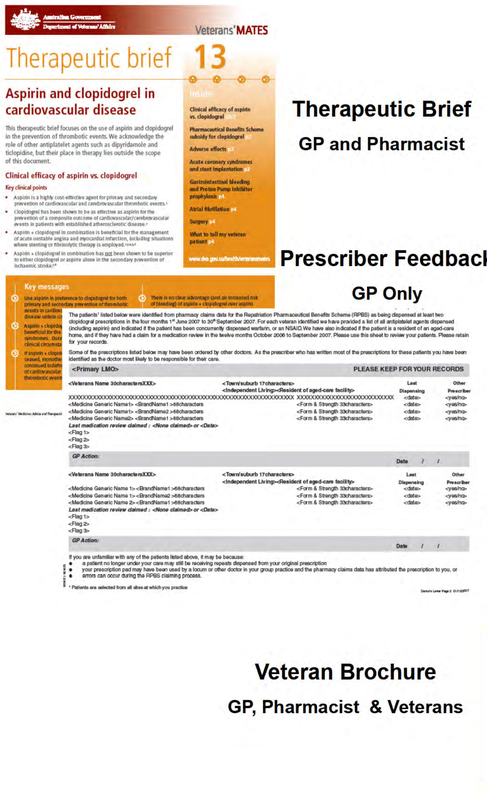
Each module is mailed to approximately 33,000 veterans, 10,800 GPs and 8,000 pharmacies and accredited pharmacists. 53% of doctors have received six or more modules. 55% of veterans have received more than one module. Figure 1 details the numbers of veterans and GPs targeted in each module.

Number of Modules	Vets (n)	GPs (n)
Module 1: Flag veterans for medicines review	38568	11384
Module 2: Beta-blockers, take the next step for heart failure	12047	6954
Module 3: Diabetes triple check	16612	8573
Module 4: Clinical risk management: NSAIDs	9885	11242
Module 5: Antidepressants: three steps towards safer use	42196	12482
Module 6: Inhaled respiratory medicines: optimising use in COPD	28670	10720
Module 7: PPIs in GORD: Reduce the dose – keep the benefits	62460	13684
Module 8: Reducing adverse drug events for your veteran patients	32484	11050
Module 9: Medicines reviews for multiple medicines	58081	12950
Module 10: Constipation: a quality of life issue for veteran patients	29231	9825
Module 11: Comprehensive care cycle for veterans with diabetes	18340	9103
Module 12: Antipsychotics in dementia	(6690)*	3884
Module 13: Aspirin and clopidogrel in cardiovascular disease	16867	8279

** The identified veterans were not contacted directly through this module*

Figure 1: Participation in Veterans' MATES modules

Example of materials and designated recipients for Module 13 (Aspirin and clopidogrel in cardiovascular disease)



Results

To date, responses from modules one to twelve have been analysed, with consistent positive findings persisting over 4 years (June 2004-June 2008). For all three stakeholder groups, satisfaction with the therapeutic brief, prescriber feedback and veteran brochure rated highly over the twelve modules. (Figures 2 & 3).

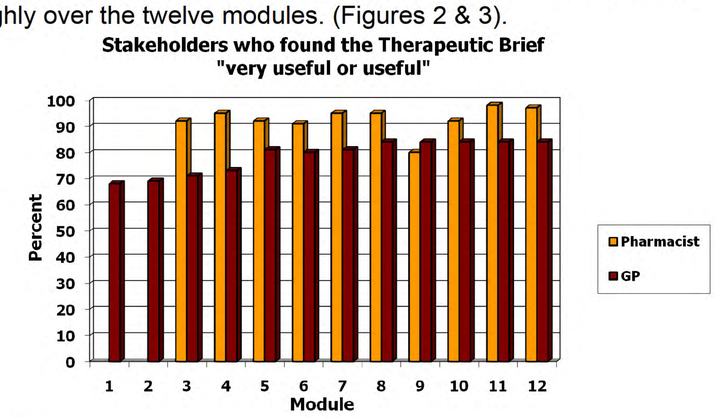


Figure 2

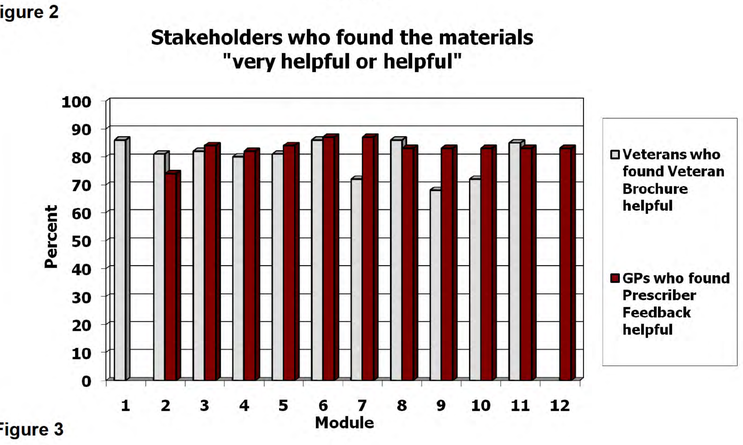


Figure 3

The module material also appears to encourage both GPs and veterans to consider changing their behaviour, further demonstrating the successful engagement of stakeholders. (Figure 4 & 5)

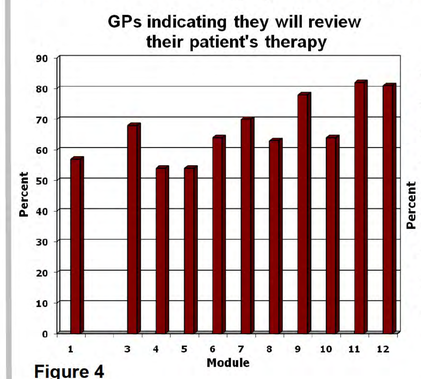


Figure 4

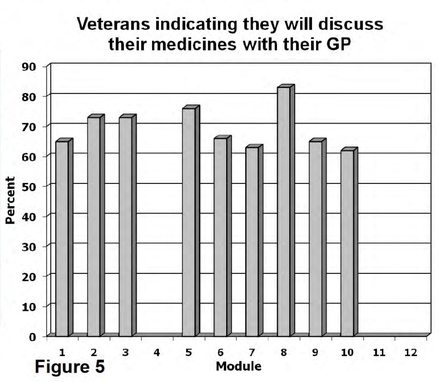


Figure 5

Conclusion

The integrated QUM process utilised in the *Veterans'* MATES program has been successful in achieving sustainable, long-term engagement of GPs, pharmacists and veterans when measured by levels of satisfaction and intention to change behaviour. Consultation with all key stakeholders, needs analysis using pharmaco-epidemiologic data, implementation using strategies of patient-specific prescriber feedback and written educational material tailored for each stakeholder group and evaluation appear to be key processes for sustained engagement of health professionals and veterans.

References

1. Dollman WB, Leblanc VT, Stevens L, O'Connor PJ Roughead EE, Gilbert AL. Achieving a sustained reduction in benzodiazepine use through implementation of an area-wide multi-strategic approach. Journal of Clinical Pharmacy and Therapeutics 2005;30(5):425-3

2. Dollman WB, LeBlanc VT, Stevens L, O'Connor P, Turnidge J. A community-based intervention to reduce antibiotic use for upper respiratory tract infections in regional South Australia. Medical Journal of Australia 2005; 182: 617-612

University of South Australia | Sansom Institute
Quality Use of Medicines and Pharmacy Research Centre
Australian Government Department of Veterans' Affairs
Veterans' MATES

Effect of NPS program for heart failure management

Dr Svetla s 47F , A/Prof Libby s 47F Dr Neil s 47F Judith s 47F
Joint research between UniSA and NPS

Introduction

The Joint Heart Failure Program*, a major program to improve management of chronic heart failure, commenced in October 2004 [1]. In March 2005 Veterans' MATES project also focused on improvement of heart failure management [2]. This research is conducted to determine how the NPS intervention affected the treatment management for veterans with heart failure.

Method

De-identified administrative claims data from the Department of Veterans' Affair was used to conduct a 3-year comparison study on non-equivalent groups of veterans with heart failure. The year of the NPS intervention was compared with the previous two years and the cohort group for each year was defined as:

- Veterans dispensed angiotensin converting enzyme inhibitors and frusemide, and
- Not dispensed beta-blockers (BB) specific for heart failure in the previous four months before the beginning of each year under investigation.

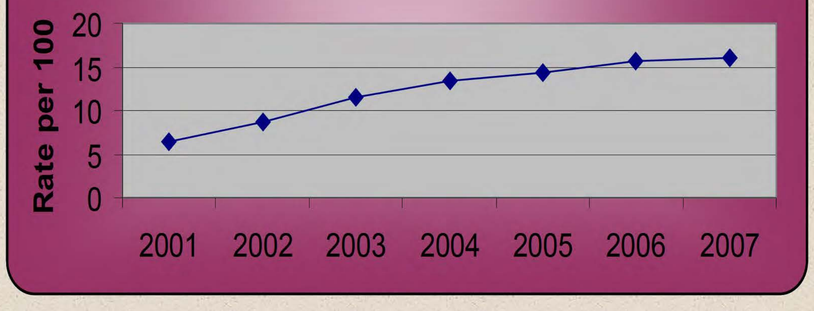
Changes in the monthly rate of those treated with BB specific for heart failure were compared. A Poisson regression model accounting for over-dispersion in the data was used to compare the trend lines.

A trend in the use of highest strength renin-angiotensin system medicines (ACEi/ARBs) in veterans with heart failure was also investigated.

Results

The overall trend shows increasing use of heart failure specific beta-blockers in veterans with heart failure – Figure 1.

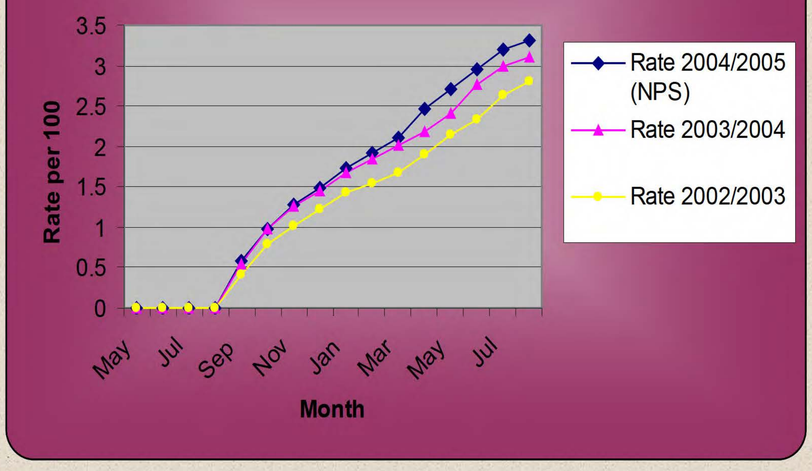
Figure 1. Age-standardised rate of veterans dispensed medicines indicative of heart failure who are concurrently dispensed beta-blockers specific for hearth failure



The results from the comparison study are presented in Figure 2 and show a:

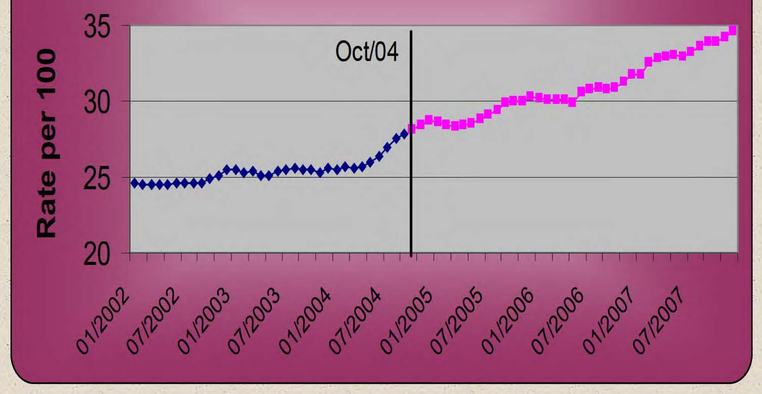
- 6% increase, non-significant, in the rate per 100 veterans treated with any specific beta-blocker from the year before to the year of the NPS intervention ($p=0.19$), and
- 19% increase in the rate from two years prior to the year of intervention ($p<0.0001$).

Figure 2. Rate of use of BB specific for heart failure in a cohort of veterans with heart failure



The trend in the use of highest strength ACEi or ARBs for heart failure shows an increasing use of the highest strength - Figure 3.

Figure3. Trend in the use of highest strength ACEi/ARBs in veterans with heart failure



Conclusions

Analysis of trends in dispensing medications in veterans with heart failure suggest changes consistent with Quality Use of Medicine programs. The rate of uptake of beta-blockers specific for heart failure and the rate in the use of highest strength ACEi/ARBs for heart failure appears to be higher after the NPS intervention (Oct/2004). However, further analysis is required to be able to directly attribute this to NPS activity rather than other general secular trends in the prescribing of these medications.

References

[1] NPS. Evaluation report No10. Progress, achievements and future directions, December 2007.

[2] Veterans' MATES; URL: www.dva.gov.au/health/veteransmates

Acknowledgements

*The *Joint Heart Failure* program is an initiative of the National Prescribing Service Ltd. (NPS), National Health and Medical Research Council-National Institute of Clinical Studies (NICS) and National Heart Foundation of Australia (NHFA).

This study is funded by the National Prescribing Service.

Contact Details

Quality Use of Medicines and
Pharmacy Research Centre, Sansom Institute
UniSA, GPO Box 2471, Adelaide SA 5001
Svetla.s 47F unisa.edu.au

Electronic health records for informed health care: Australia's experience

Libby s 47F

Quality Use of Medicines and Pharmacy Research Centre

University of South Australia

University of South Australia | Sansom Institute

The Australian Health System

- Provides universal health care for the population of 23.5 million persons
  - Pharmaceuticals, pathology and radiology, medical practitioners, and hospital care
  - Funding is from both Federal and State Governments.
  - Private health insurance also available for hospital and allied health care

Data availability

- Prescription dispensing, national data from 1990 onwards available, patient linked since 2003
  - Medicine, quantity, strength, doctor, pharmacist, patient age, gender and geographic area
  - ~90% of all prescription medicines utilised in Australia
- Medical services; national patient linked data from 1993 onwards.
  - Doctor visits, doctor speciality, type of pathology service, type of radiology service, optometrist claims,
  - does not include diagnosis or test result

Data availability

- Public hospital data funded by state governments held by each state, patient linked
  - Includes diagnoses associated with admission (up to 50); procedures, length of stay, place of discharge
- Private hospital data held by individual private health insurance companies
  - Includes similar data to public hospitals

Linked datasets: medical, pharmaceutical and hospital

- Not available nationally
- Available at state level in some states
  - Rarely include pharmaceuticals or doctor visits
- Available for selected cohorts of patients
  - eg veterans and their dependents

Use of electronic health data to inform pharmaceutical policy in Australia

- Support submissions for listing products on the Pharmaceutical Benefits Scheme
- Support budget impact assessments prior to listing products

Industry initiated

- Assess budget impact post-listing
- Assess if use in accord with funded listing
- Implement risk-sharing agreements
- Evaluate policy and regulatory changes
- Drug utilisation studies

Government initiated

University of South Australia | Sansom Institute

Use of electronic health data to inform pharmaceutical policy in Australia

- Improve medicine use
- Safety signalling
- Pharmacovigilance studies

Data uses:
Supporting listing medicines on the Pharmaceutical Benefits Scheme

- Electronic health data increasingly used to determine the likely eligible population for the new listing
  - Prescription data use to assess the population currently using the comparator
  - May include assessment of duration of use (compliance or persistence)
  - May include assessments of concurrent use of medicines or technologies

Data uses:
Budget impact assessments

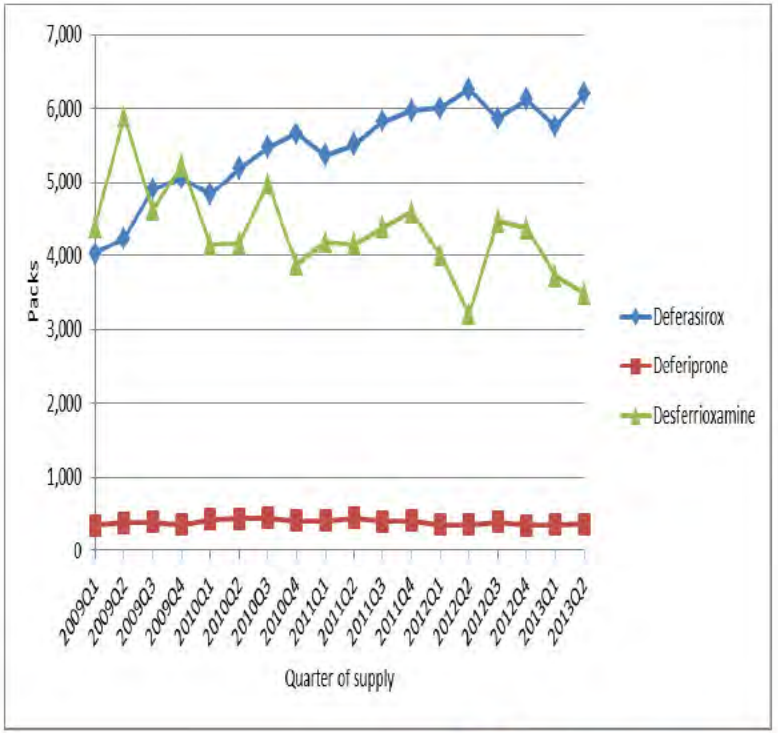
- All medicines subsidised under the pharmaceutical benefits scheme have a budget impact assessment prior to listing
  - 24 months after listing, drug utilisation reviews are undertaken by government to assess the budget impact

Budget impact assessment
Deferasirox: Predicted versus actual review

- Deferasirox was listed on 1 December 2006 for the treatment of chronic iron overload in adults, adolescents and children 6 years and older associated with disorders of erythropoiesis;
- The submission used a market share approach to estimate utilisation.
- The submission assumed that 4 years after listing, 80 to 90% of the estimated patients currently on desferrioxamine would switch to deferasirox.

Budget impact assessment
Deferasirox: Predicted versus actual review

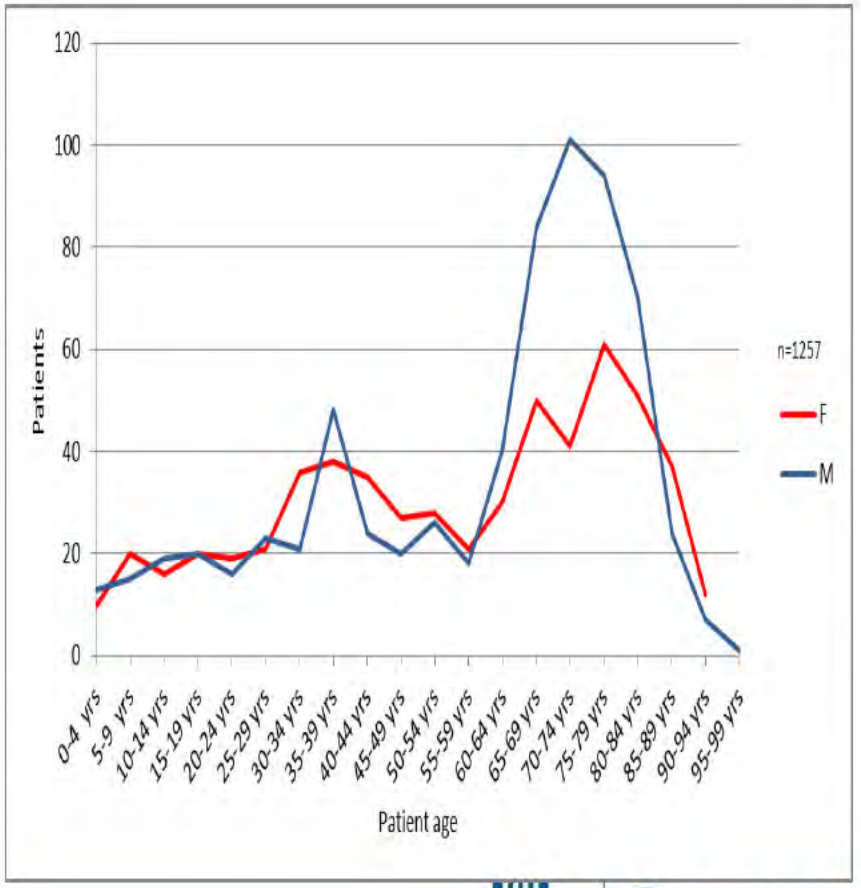
- Switching was much less than expected. Most use was additional use
- The submission estimated expenditure in the first year to be
  - less than $5 million
  - actual expenditure was $9.5 million.



University of South Australia | Sansom Institute

Budget impact assessment
Deferasirox: Predicted versus actual review

- Most patients treated with deferasirox are over 55 years.
- Much of this use is likely to be for myelodysplastic syndrome.
- The incremental cost-effectiveness ratio of iron chelating agents used in myelodysplastic syndrome has not been established.



University of South Australia | Sansom Institute

Data uses:
Improving medicine use

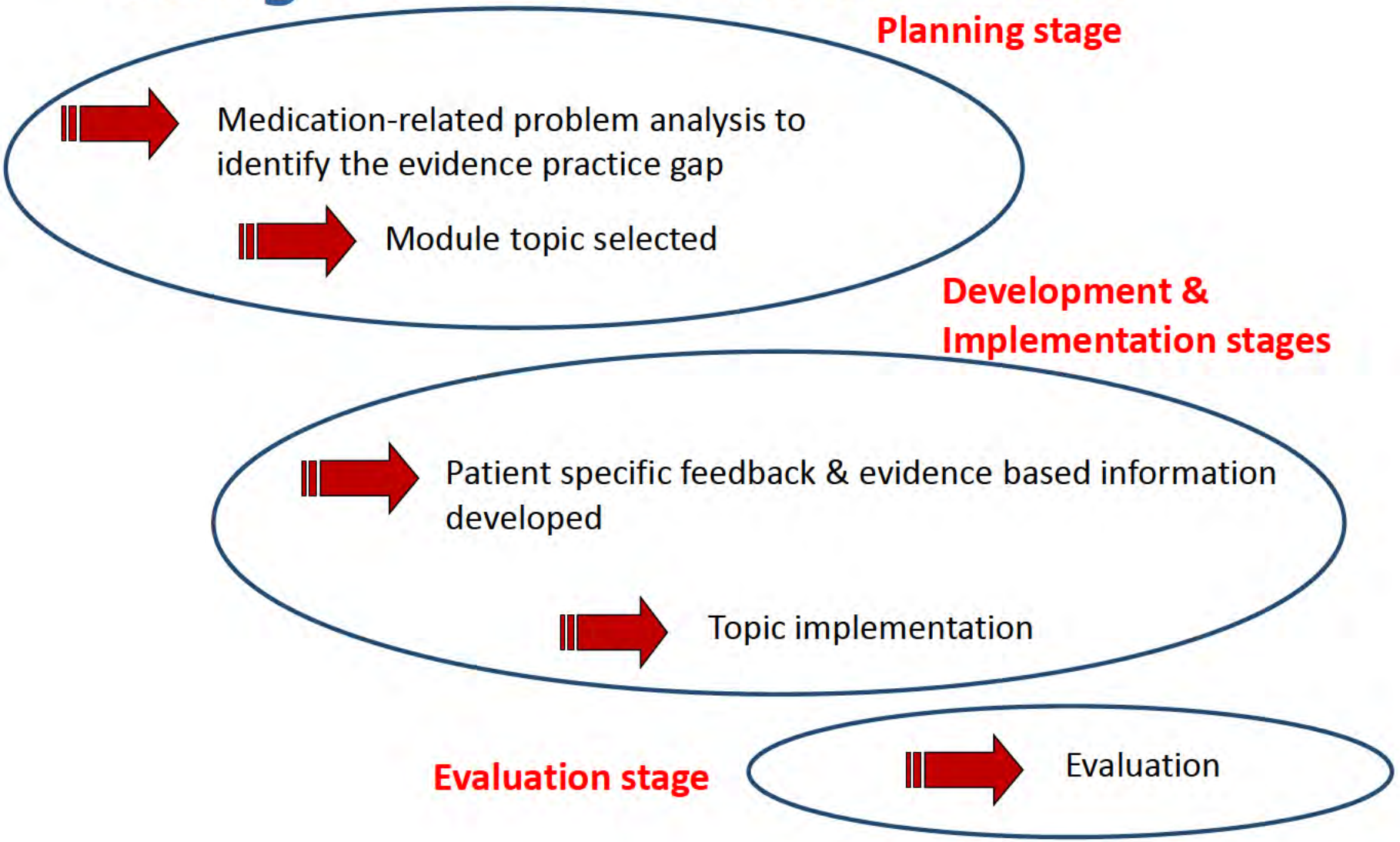
- NPS Medicine Wise (www.nps.org.au)
  - Independent not-for profit organisation in Australia responsible for implementing quality use of medicines initiatives
- Veterans' MATES (www.veteransmates.net.au)
  - Funded by the Australian Government Department of Veterans' Affairs to improve use of medicines for veterans
- Both organisations use data to electronic health data as part of the intervention and to evaluate the effects of the program

Data uses:
Improving medicine use: Veterans' MATES

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material is sent to members of the veteran community for whom the health topic is relevant.

Using the health claims data



The planning stage
Identifying the problem: admissions for acute confusion

- We assessed patients admitted to hospital for acute confusion
  - 61% on 3 or more sedative medicines
    - 3 sedative medicines increases risk over three fold (RR 3.3 (95% CI 2.19 - 4.89))
  - 36% on highly anticholinergic medicines
    - 2 anticholinergic medicines more than doubles risk (RR 2.6 (95% CI 1.9 - 3.5))

University of South Australia | Sansom Institute

Kalisch et al., 2012

Implementing the interventions

Reducing the risk of hospital for acute confusion

Janice McMarden NELSON BAY NSW 2315

Baseline (1 April 2010 to 30 September 2010)

Drug Name	Brand	Strength	Risk	Last Dispensed	Other Prescriber
CARBAMAZEPINE	Carbamazepine Sandoz	Tablet 200 mg	A2 S	27/04/2010	N
OXAZEPAM	Alepam 15	Tablet 15 mg	S	20/07/2010	N
RISPERIDONE	Rixadone	Tablet 0.5 mg	A2 S	23/07/2010	N
MIRTAZAPINE	Mirtazon	Tablet 30 mg	A2	18/08/2010	N

What is the type of accommodation:	Community
Date of the last medication review claimed:	None claimed in last 12 months.

Notes:

Dementia medicine dispensed in the past

Anticholinergic effect of medicine/s can worsen cognition. Reduce dose or number of medicines to minimise anticholinergic load

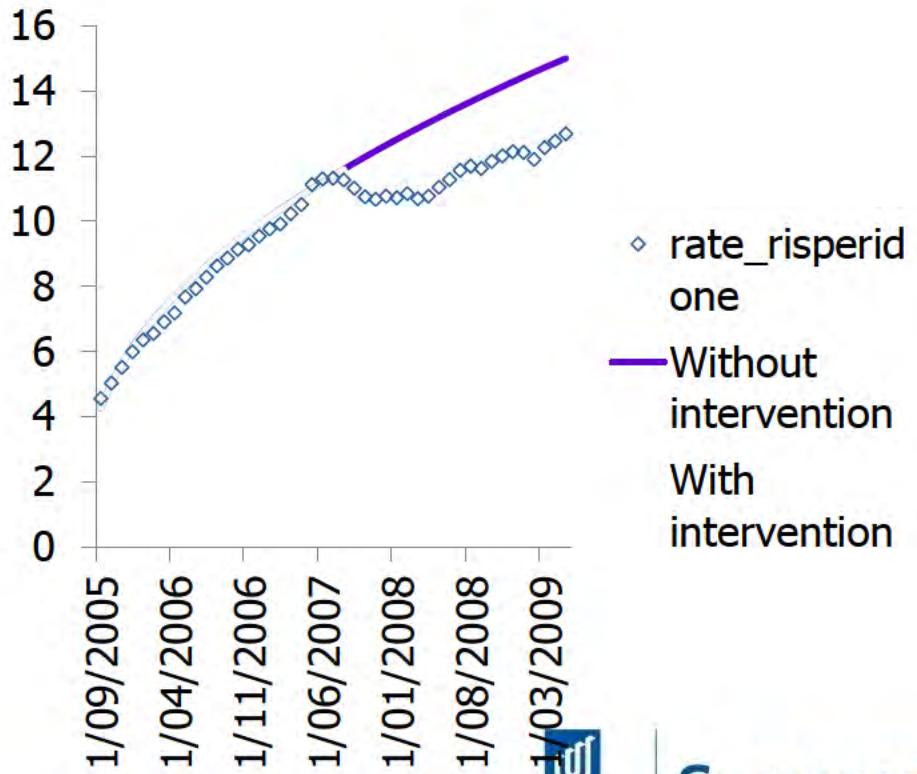
Sedative effect of medicine/s can worsen cognition. Reduce dose or number of medicines to minimise sedative load

Evaluating the intervention

Reduced use of antipsychotics in people with dementia

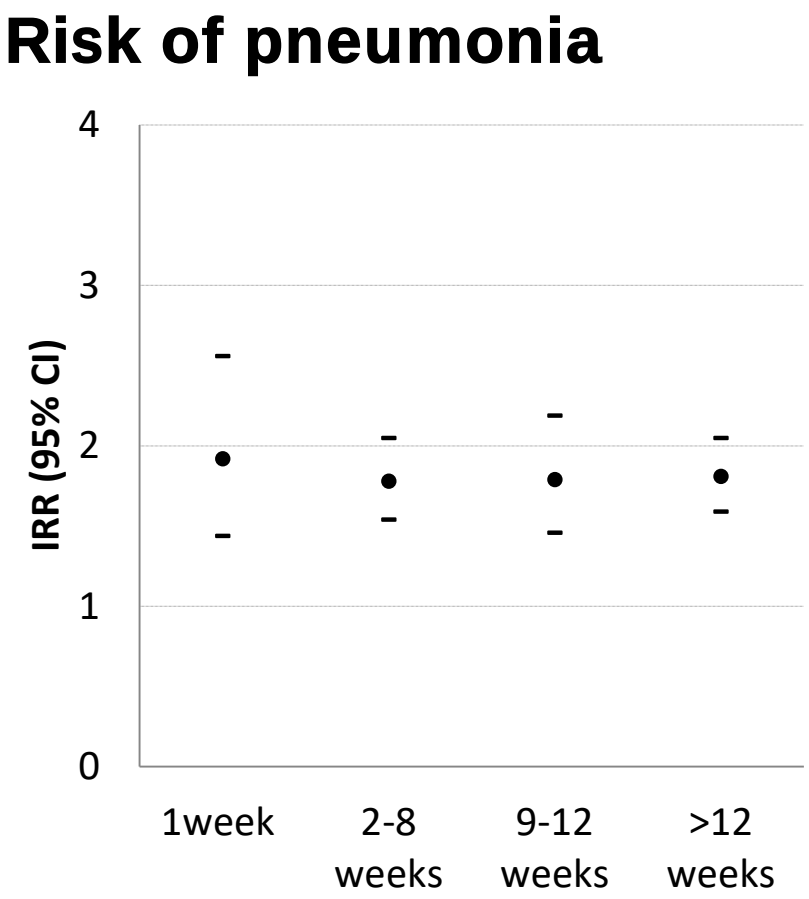
So what happened?

- ✓ 14.5% decrease at time of intervention
- ✓ Further 3% monthly decrease compared with trend prior to intervention



University of South Australia | Sansom Institute

Evaluating the results
Quantifying the harm avoided



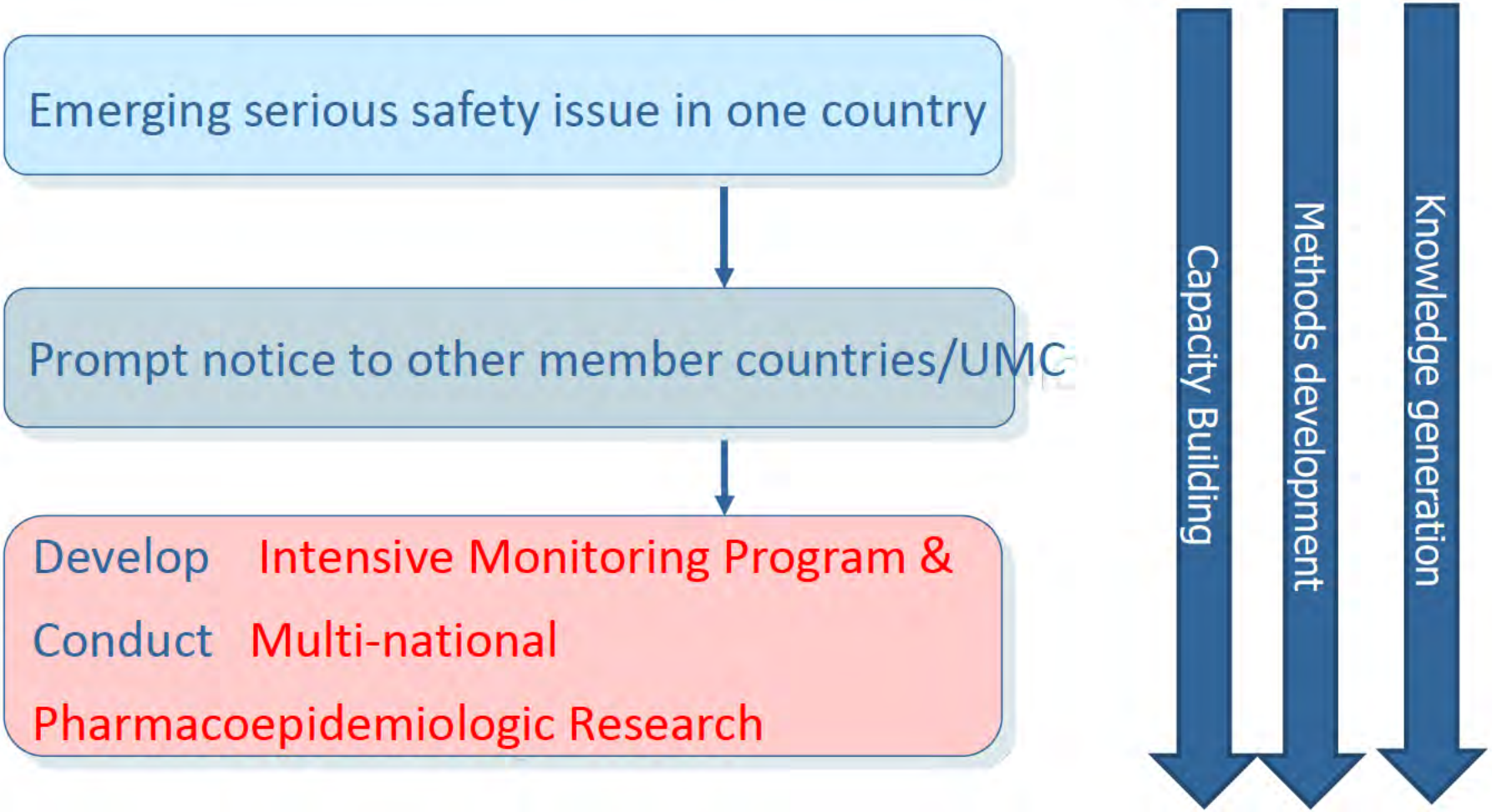
- 1 excess hospitalization for pneumonia for every 2 to 5 patients helped.
- 1 excess hospitalization for hip fracture for every 4 to 12 patients helped
  - These numbers enable cost-consequence to be calculated.
  - Intervention resulted in significant cost-savings due to hospitalisations avoided

Pratt et al., Drug Saf. 2011

Building research and collaboration across the region

- The Asian Pharmacoepidemiology Network
- http://aspennet.asia/aboutus.html

The Asian Pharmacoepidemiology Network (AsPEN) Concept



Emerging serious safety issue: Thiazolidinediones and heart failure

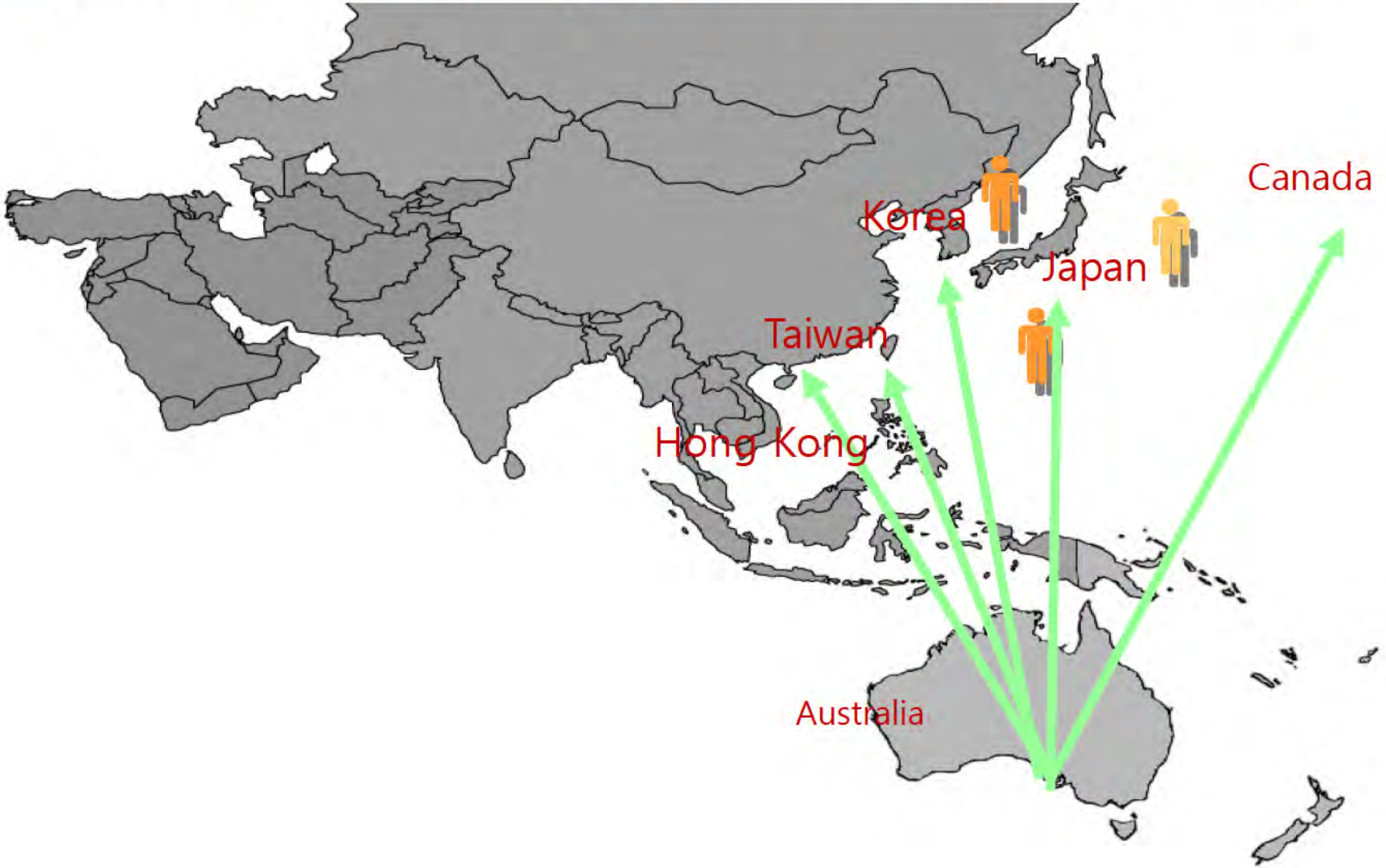
- Observational studies; predominantly in Caucasian populations
  - Risk of heart failure hos
    - Rosiglitazone RR = 2
    - Pioglitazone HR = 1.
  - Rosiglitazone appears t
    pioglitazone.
    - OR=1.2 (95% CI 1.1-1.3)[3]
- Is the risk the same in Asian populations?

CYP 2C8 and PPARγ polymorphisms not common in Asians

University of South Australia | Sansom Institute

1. Singh S., et al JAMA 2007
2. Lincoff A.M., et al JAMA 2007
3. Loke Y.K., et al BMJ 2011

Distributed network model using prescription symmetry method (signal detection method)

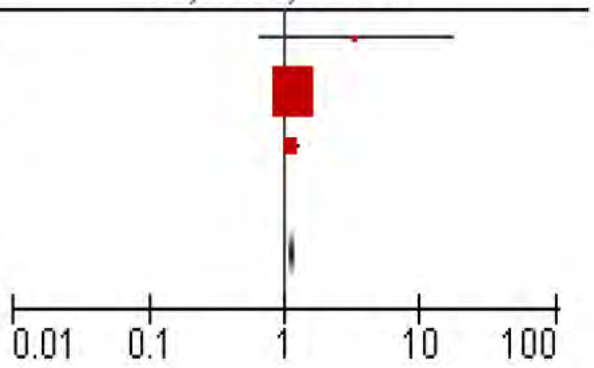


Rosiglitazone and heart failure risk

Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Fixed, 95% CI
Hong Kong	1.2149	0.8397	0.1%	3.37 [0.65, 17.47]
Korea	0.1354	0.0298	79.6%	1.14 [1.08, 1.21]
Taiwan	0.1089	0.0591	20.3%	1.12 [0.99, 1.25]
			100.0%	**1.14 [1.08, 1.20]**

= 0%

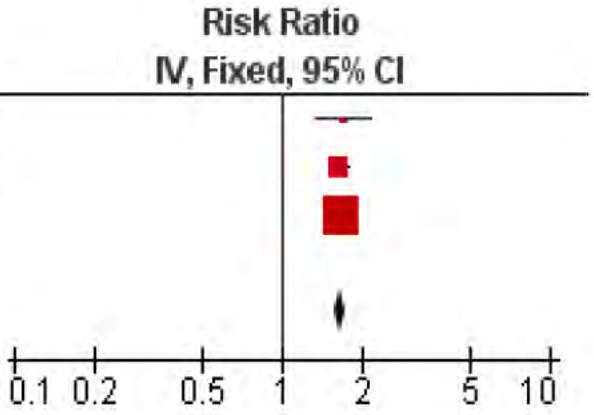
Hong Kong, Korea, Taiwan



Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Fixed, 95% CI
Aust (DVA)	0.5277	0.1218	2.9%	1.70 [1.34, 2.15]
Australia	0.4855	0.0381	29.9%	1.62 [1.51, 1.75]
Cananda	0.5008	0.0254	67.2%	1.65 [1.57, 1.73]
			100.0%	**1.64 [1.58, 1.71]**

0%

Australia and Canada



(frusemide as proxy indicator of heart failure)

Conclusions

- Significant opportunity to use electronic health claims data to inform and improve health care
- Significant opportunities for collaboration across the region to support health care improvement and further build the research network

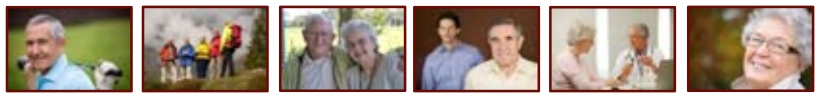
Veterans' MATES
An enterprising partnership improving medication safety





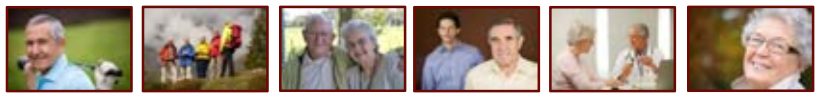

Tonight's talk

- Part 1: Explain Veterans' MATES
- Part 2: Talk about all the associated research and research partners that has happened as a secondary outcome of Veterans' MATES



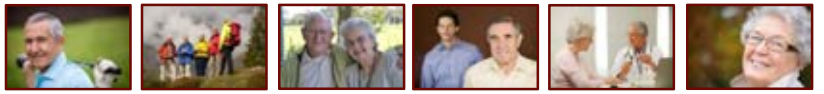
The beginning

- In 2004, the Australian Government Department of Veterans' Affairs let a tender for continuation of its prescriber feedback intervention program
- The original program had run between 1998 and 2002 and had used DVA's health claims data to provide information to doctors about their veteran patients where there were concerns about inappropriate prescribing
- The University of South Australia led a consortium to run the Veterans' Medication Advice and Therapeutics Education Service (MATES) program.
    - Discipline of General Practice University of Adelaide,
    - Discipline of Public Health University of Adelaide,
    - NPS Medicine Wise,
    - Drug and Therapeutics Information Service,
    - Australian Medicines Handbook,
    - Repatriation Hospital Daw Park
- The initial contract was awarded for 3 years



Veterans' MATES

- It is a data driven health promotion program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.
- It:
  - has been provided by the Australian Government Department of Veterans' Affairs (DVA) since 2004.
  - uses DVA routinely collected administrative health claims data to identify 'real life' problems with medicine use and health care among members of the veteran community.
  - provides timely targeted patient specific feedback to general practitioners supported by evidence-based information for veterans, their general practitioners, allied health care providers and directors of care of residential aged care facilities.
  - includes significant stakeholder engagement and is underpinned by behavioural theory.
  - Has reached over 300 000 veterans and 33 000 general practitioners, as well as all pharmacies and age-care facilities to date.



The approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material are sent to members of the veteran community for whom the health topic is relevant.

We use the Australian Government Department of Veterans' Affairs routinely collected health claims data to

- Identify potential problems for veterans
- Develop the medication list for the doctors
- Evaluate each intervention

1/2 BILLION

Contains over half a billion health claims records

10 YEARS

More than ten years of historical health data

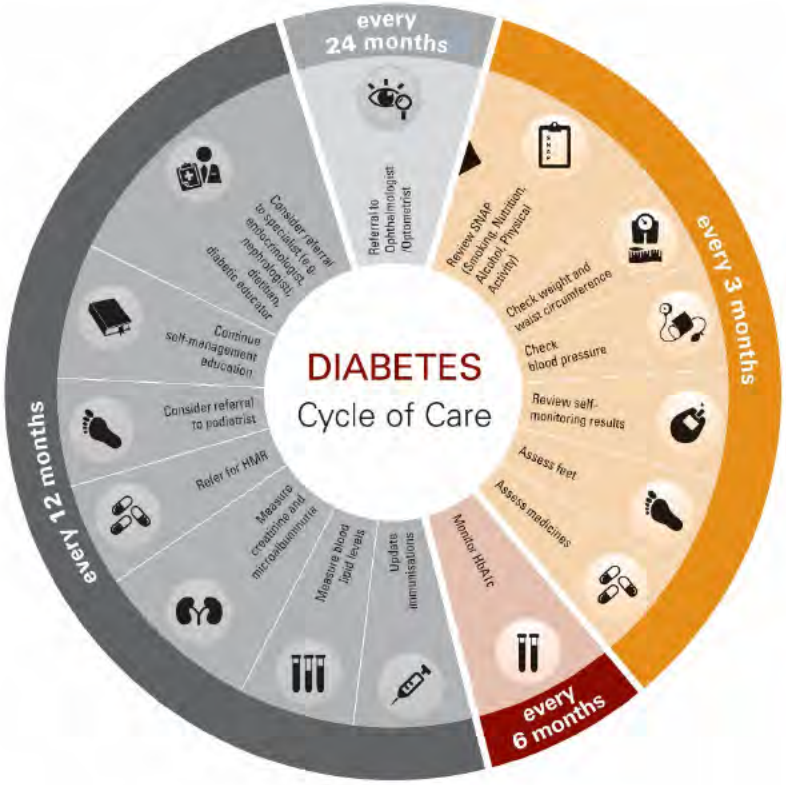
Contains hospital records including diagnosis and procedures

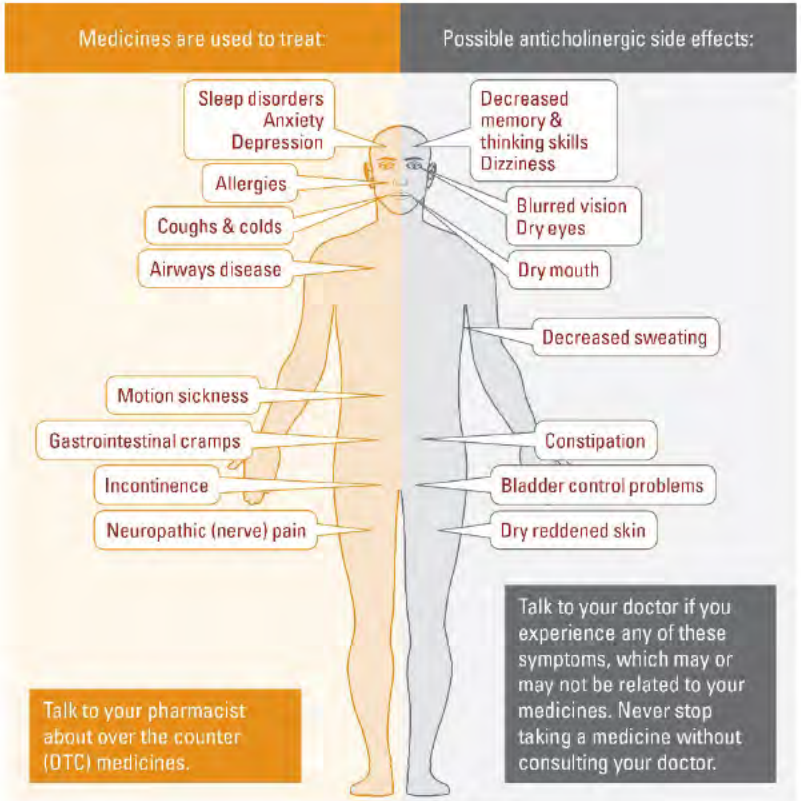
Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

To date 50 topics delivered reaching on average:

- 40,000 veterans
- 10,000 GPs
- 8,500 pharmacies and accredited pharmacists
- 2,600 Directors of Care, Residential Aged Care Facilities



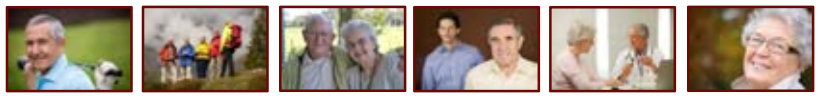


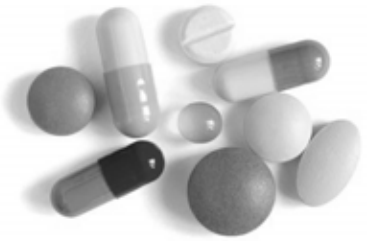
Each topic is either:

- Disease specific e.g. neuropathic pain, diabetes
- Medicine specific e.g. statins, antipsychotics
- Or about service delivery e.g. bone density tests, care planning

The educational material is tailored to identified problems and the process includes significant stakeholder engagement

- Program is underpinned by behavioural theory
- A practitioner reference group and a veteran reference group meet twice yearly to provide advice
- Materials written by a medical writer supported by clinical reference group
- Peer-reviewed prior to publication
- Endorsed by a national, representative editorial committee
- DVA provide a national call centre staffed by pharmacists for veterans and health care practitioners to provide additional support





So what happens?



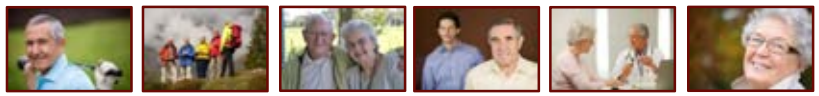


Improving osteoporosis management:

The planning stage

Identifying the problem: detection

- We assessed use of bone mineral density tests among older men and women
  - Less than 10% of women and men 80 years or over had had a bone mineral density test in the previous 5 years
  - Only 2% of older men and 10% of older women on medicines for osteoporosis, while up to 50% in the oldest age groups may have osteoporosis

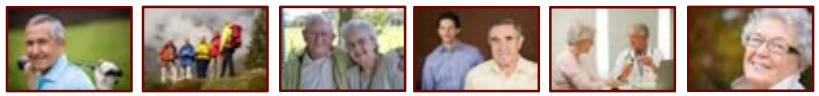


Improving osteoporosis management:

The planning stage

Identifying the problem: falls and fracture

- We assessed patients admitted to hospital for hip fracture
  - 1 in 6 women and 1 in 5 men had had a prior fracture but were not on medicines for osteoporosis
  - 1 in 15 were on corticosteroids and no medicines for osteoporosis
  - 84% on at least 1 medicine that increases risk of fall
  - 50% on 2 or more medicines that increase risk of falls
    - 1 in three were dispensed an antidepressant
    - 1 in four a benzodiazepine
    - 1 in ten an antipsychotic



Leach et al., JPPR; 2013

Kalisch et al., 2012

Reducing the risk of falls & hip fractures

- Our fracture and falls prevention topics were implemented to assist appropriate medicine use and reduce risk of falls or fracture

Stopping osteoporotic fractures

In Australia, osteoporosis and osteopenia occurs in more than 66% of people 50 years and older.[1] Most people are not aware of their own fracture risk and most do not receive appropriate education, screening or management even after they have had a minimal trauma fracture (a fracture after falling from standing height or less).[2-5]

Most people at high-risk are NOT screened

79% MEN **54%** WOMEN

Most people are NOT aware of their fracture risk

60% UNAWARE

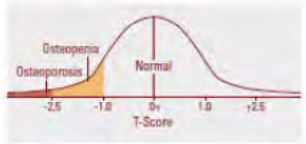
66% of people with osteopenia do not receive appropriate treatment

60% of people with osteoporosis do not receive appropriate treatment

70% of people with a prior fracture do not receive appropriate treatment

The mortality rate in the first 12 months after a hip fracture is 37% for men and 20% for women.[6] Vertebral fractures are associated with significant long-term disability, pain and kyphosis.[7] Early detection and appropriate treatment can reduce the risk of minimal trauma fractures in the future by as much as 70%.[7]

Discrepancies in information often make it unclear as to what is best practice for patients with osteoporosis or osteopenia. This therapeutic brief provides concise and practical information to help identify and treat high-risk patients to prevent a first or second minimal trauma fracture, and to help identify what is available for PBS and MBS reimbursement.



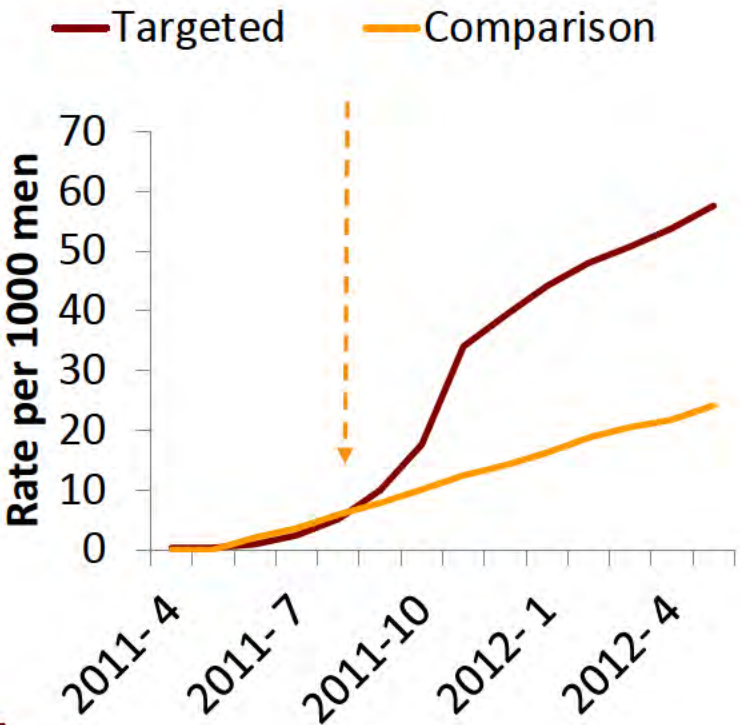
World Health Organisation **diagnostic criteria for osteoporosis, osteopenia and normal bone mineral density. Adapted with permission from *Osteoporosis Australia***

Reducing the risk of falls & hip fractures

What happened?

- ✓ 2.5 fold increase in bone mineral density tests to detect osteoporosis in women; 2.4 fold increase in men
- ✓ 40% relative increase in osteoporosis medicine use in men
- ✓ Similar rates in targeted women compared with older women

Rate of BMD testing (men)



Kalisch Ellett et al. Arch Osteoporos. 2017 Dec;12(1)

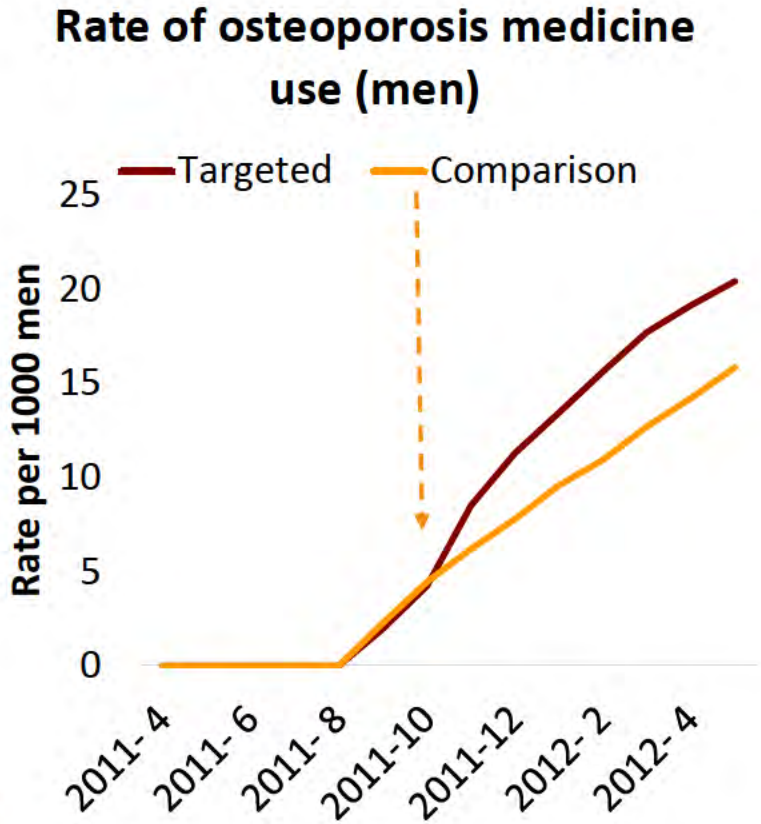
Reducing the risk of falls & hip fractures

What happened?

- 3871 additional veterans received tests for bone mineral density
- 25,832 additional patient months of treatment with medicines for osteoporosis

Health outcomes: Avoided,

- 80-150 fractures avoided^



Kalisch Ellett et al. Arch Osteoporos. 2017 Dec;12(1)

Being an active partner in your care

www.veteransmates.net.au

UNSTEADY ON YOUR FEET? TALK TO YOUR GP

Being unsteady on your feet can be worrying, particularly if you have fallen in the past. You might feel that there is nothing that can be done to help and that it's just one of those things that happen as you get older. By talking to your GP and working through things together, small changes can be made to help keep you steady on your feet and reduce your chance of having a fall.

Dr J Howell

Grace Toogood (DOB 04/02/1926) **ADDRESS: 113 Kittyhawk Dr, CHERMSIDE QLD 4032**	**GENDER:** **Female**	**ACCOMMO** **Residential**

Medicine	Medicine class	Last Dispensed
Sertraline (Eleva 100) tab 100mg	SSRI	03/02/18
Oxycodone hydrochloride (OxyNorm) Cap 10mg	Opioid	20/02/18

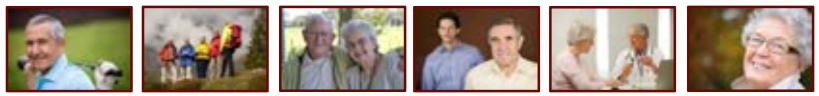
Received medicines indicating osteoporosis:	Yes
Number of hospitalisations associated with a fall in last year:	2
Medicines Review (HMR or RMMR) claimed:	None claimed in last two years

Patient dispensed a combination of medicine classes that doubles the risk of fa fractures

Consider the following:

- Ask the patient how steady they feel on their feet or if they have previously fallen Yes ☐
- Review medicines to see if any are suitable for tapering or ceasing Yes ☐
- Ask the patient if they would consider reducing the medicine Yes ☐
- Plan a reduction strategy and address other risk factors for falls Yes ☐
- Would the patient benefit from a Medicines Review (HMR or RMMR) Yes ☐

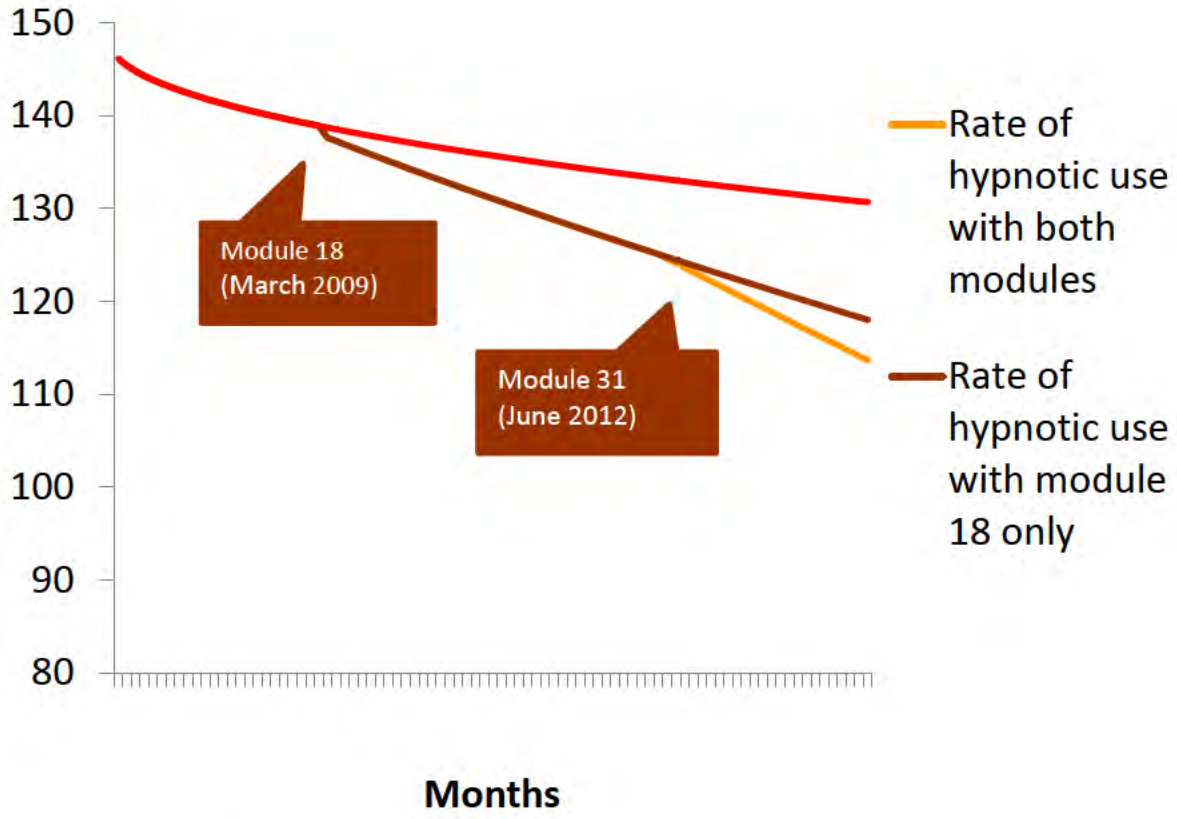
*An electronic PDF version of each individual patient's information is available at *www.veteransmates.net.au*



Reducing the use of sedative medicine use

What happened?

- 116,000 fewer patient-months of treatment with hypnotics



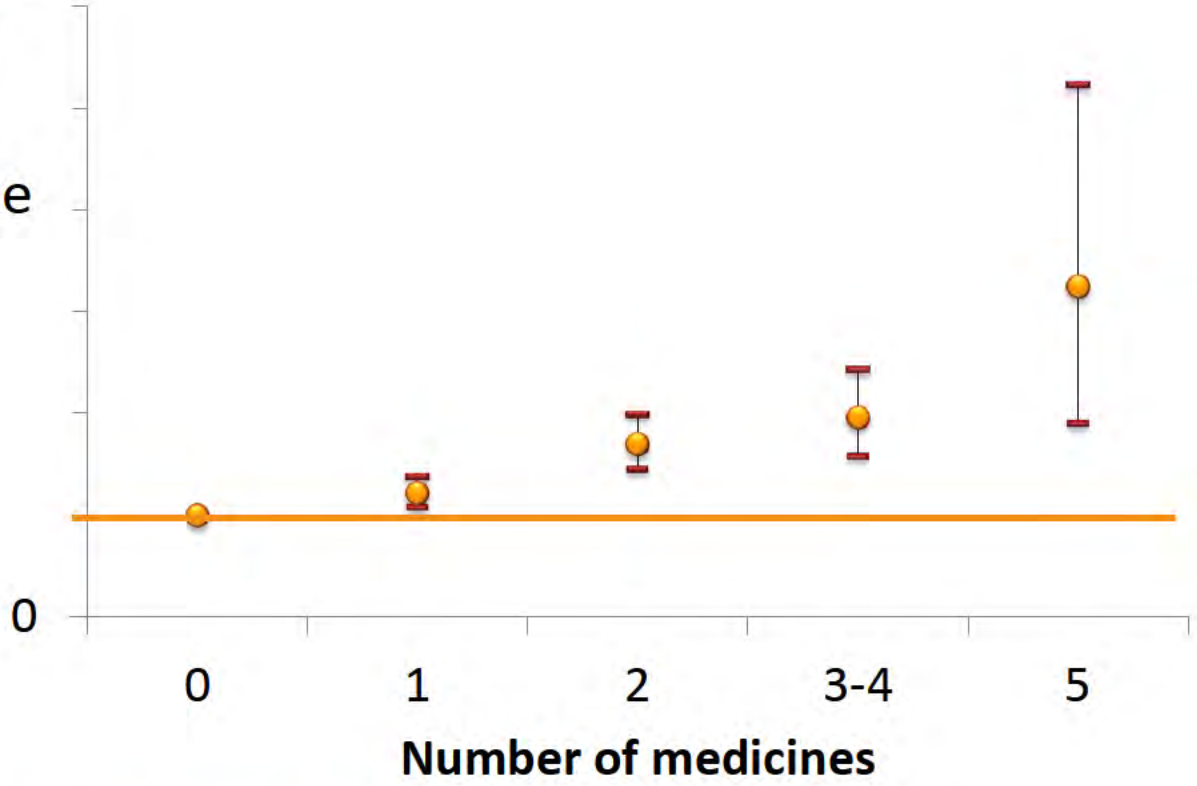
Kalisch Ellett, BMC Health Serv Res. 2018 Aug 9;18(1):626.

Quantifying outcomes: multiple sedative medicine use and risk of hospitalisation for fall

Health Outcomes:

Avoided,

- 80 hospital admissions due to falls



Pratt et al., Drug Saf. 2014

The factors contributing to our success

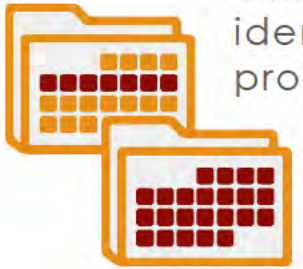
A multidisciplinary, collaborative approach

Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

Significant stakeholder engagement



Only target identified problems

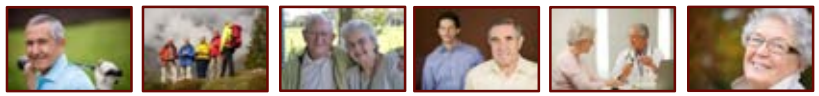
Grounded in behavioural theories and models

The importance of partnership

Australian Government

Department of Veterans' Affairs

- Visited every state DVA office as well as the national office
- Established a data reference group and visited DVA at least twice a year to learn from them about their data



The importance of partnership

- Australian General Practice Network Ltd
- Australian General Practice Accreditation Ltd
- Australian Medical Association (National & State)
- Royal Australian College of General Practitioners (National & State)
- Royal Australasian College of Physicians
- Royal College of Nursing Australia

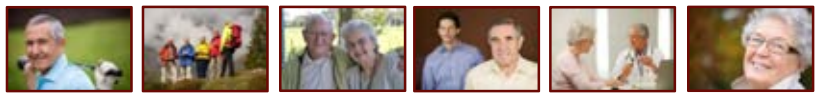
- Pharmacy Guild of Australia (National & State)
- Pharmaceutical Society of Australia (National & State)
- Australian Association of Consultant Pharmacy
- Society of Hospital Pharmacists of Australia

The importance of partnership

- The Australian Federation of Totally & Permanently Incapacitated Ex Servicemen & Women (TPI)
- Australian Veterans' and Defence Services Council
- Returned & Services League – National & State
- Vietnam Veterans' Federation of Australia
- Vietnam Veterans' Association of Australia
- Australian Peacekeepers & Peacemakers Association
- War Widows' Guild of Australia
- The Partners of Veterans Association Inc
- The Defence Force Welfare Association
- Airforce Association Ltd

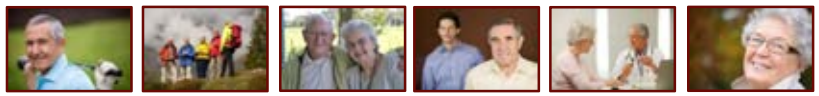
The unexpected bonuses

- The database held by DVA is still unique in Australia in that it provides whole of healthcare information for veterans
- As part of the initial Veterans' MATES contract and with the assistance of DVA, UniSA had developed the skills and methods to use the data for knowledge generation
- DVA supported use of the data for research in medicine safety
- Many additional partners were interested in the potential of using data to improve health care and health outcomes
- Databases of health care data becoming more and more available



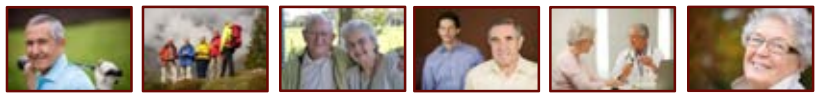
Collaborating with veterans to address issues of concern to them

- Veterans and DVA came to us with the question is post-traumatic stress disorder a risk for dementia in Australian veterans



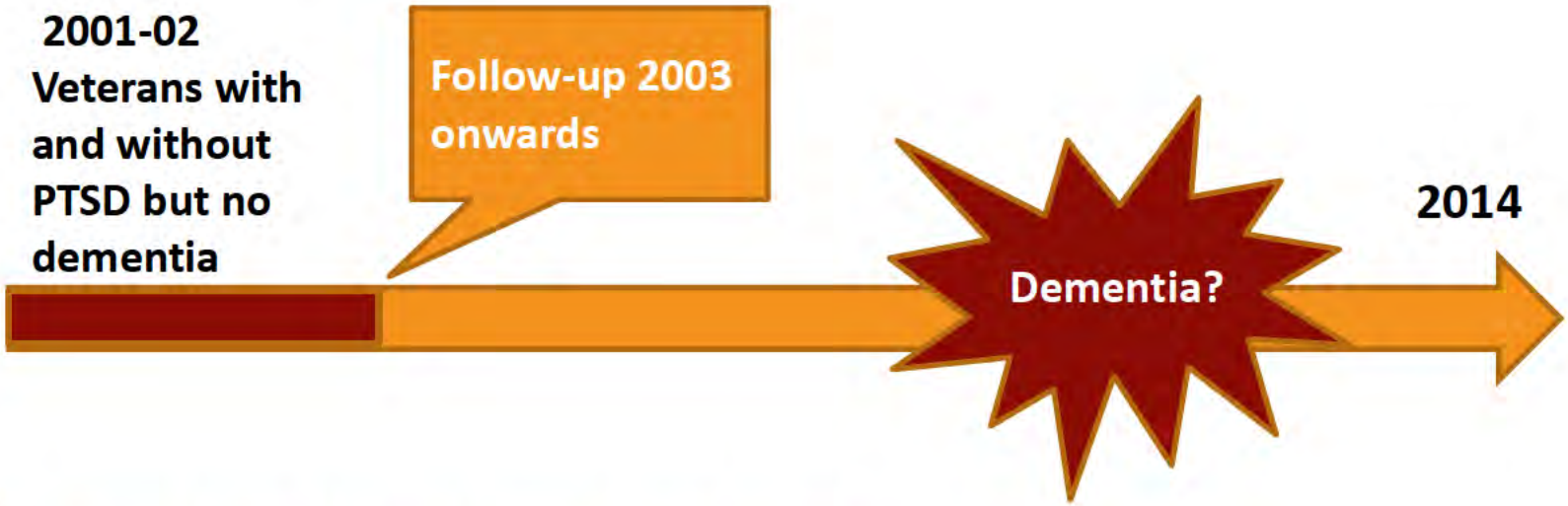
What was known?

- A number of observational studies have suggested almost a doubling in risk of developing dementia for patients with PTSD
- The previous research included veterans 65 years and over, some of whom may have been in the early phases of dementia.
- None of the previous research examined the influence of medicine use.

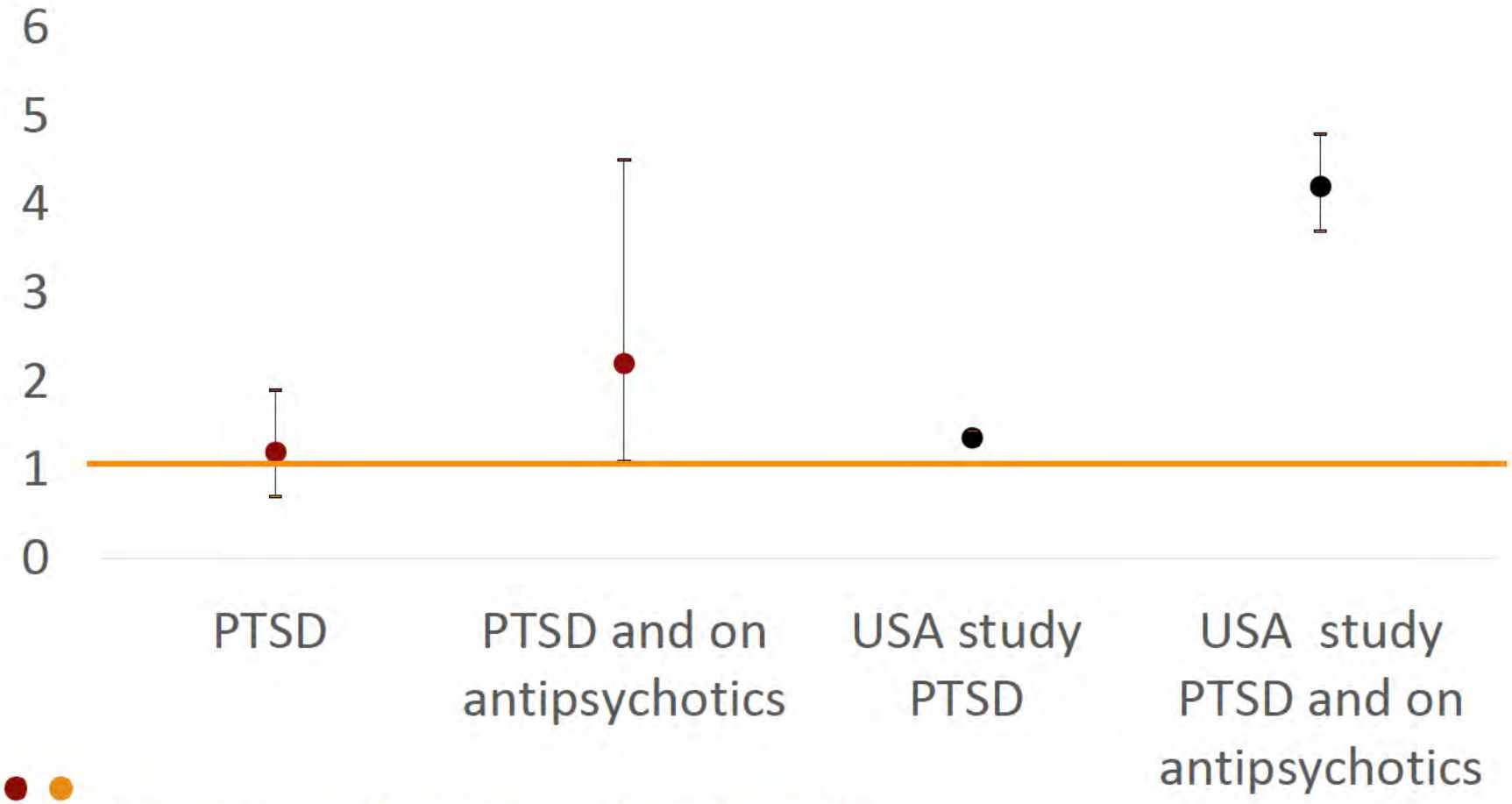


Clauston et al, Alzheimers Dement. 2016
Wang et al., J Affect Disord. 2016
Meziab et al., Alzheimers Dement 2014
Qureshi et al. JAGS 2010
Yaffe et al. Arch Gen Psychiatry 2010

What did we do?

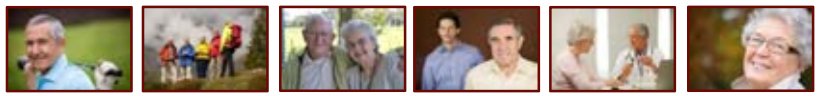


What did we find?



What does it mean?

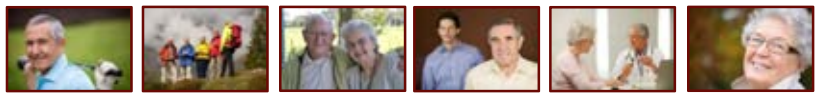
- For the majority of veterans who suffer or have had post-traumatic stress there is no evidence of elevated risk of dementia



Collaborating with the Australian Government Department of Health

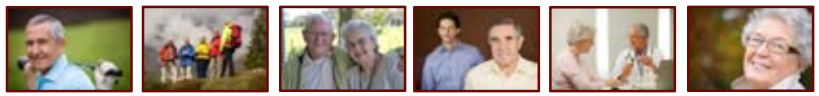
- As a result of the Veterans' MATES work, DVA staff spoke with the Department of Health on the potential of using data for health service improvement.
- This led to UniSA being invited to present to the Department of Health and Chief Medical Officer in 2009, 2010 and 2011

- *"The Government will provide $25.8 million over four years to enhance post-market surveillance of Pharmaceutical Benefits Scheme (PBS) and Repatriation Pharmaceutical Benefits Scheme (RPBS) medicine use…*

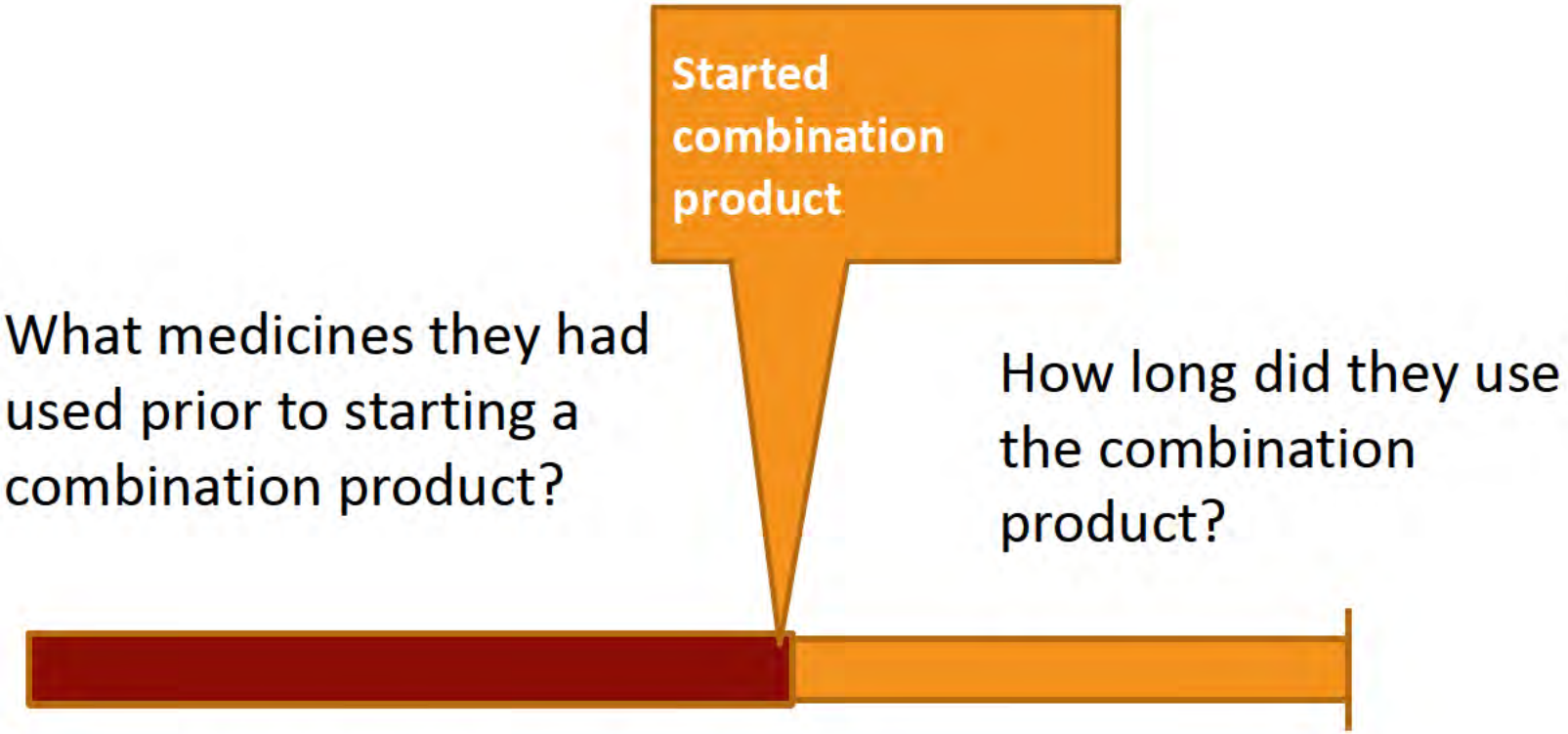


The asthma post-market review
What was known?

- The Paediatric Medicines Advisory Group was concerned that children were being supplied with a combination product containing two medicines (of LABA and ICS) without trialling a single ingredient product first



What did we do?



What did we find?

83%

Not used preferred therapy prior to starting the combination product

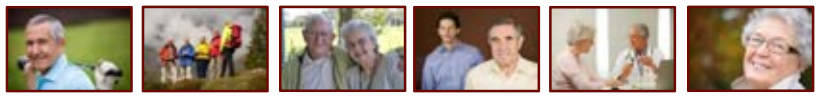
Started combination product

>60%

Only got one prescription of the combination product, which suggests inappropriate use

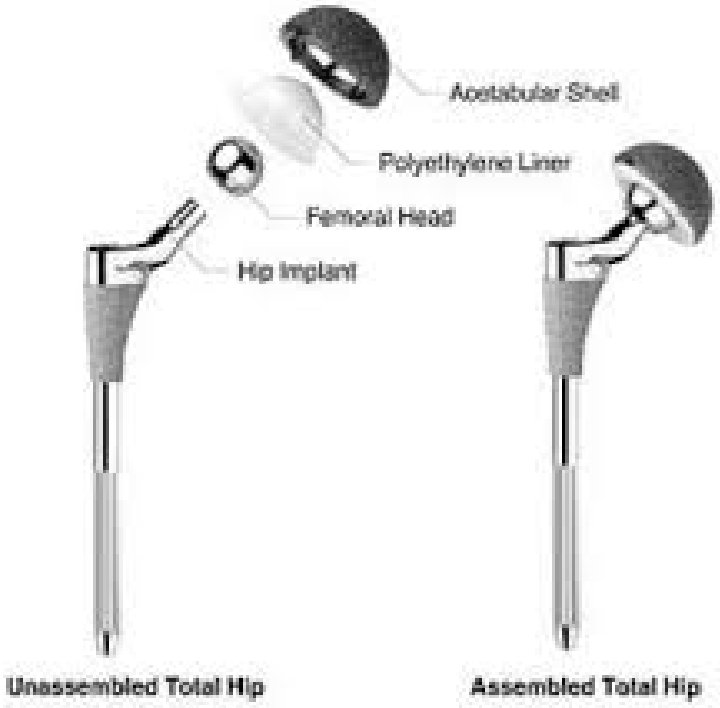
What was the outcome?

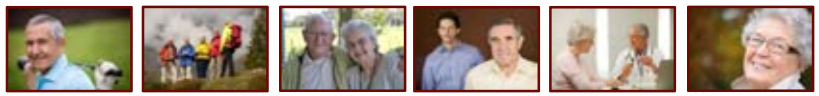
- Government advisory committee endorsed further NPS MedicineWise educational programs targeting quality use of medicines in children with asthma.



Collaborating with the Australian Therapeutic Goods Administration (TGA) to improve medicine & medical device safety

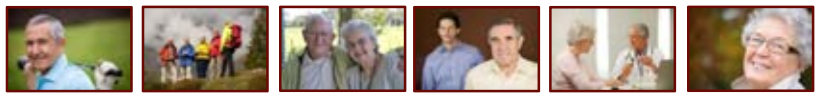
- Metal-on-metal (MOM) hip prostheses are associated with increased risk of revision compared to hip prostheses with bearings of other material
  - Articular Surface Replacement (ASR) was recalled from the Australian market in December 2009 after the Australian Orthopaedic Association National Joint Replacement Registry (AOA NJRR) documented a comparatively high risk of revision.



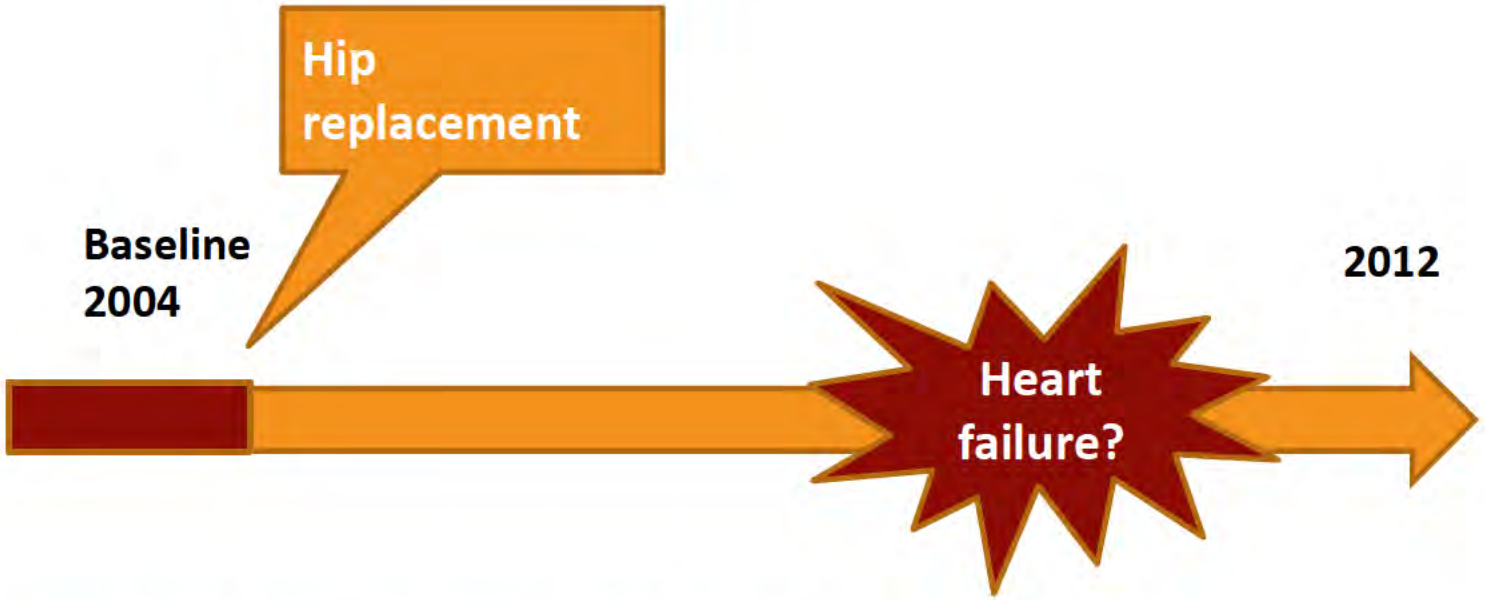


What was known?

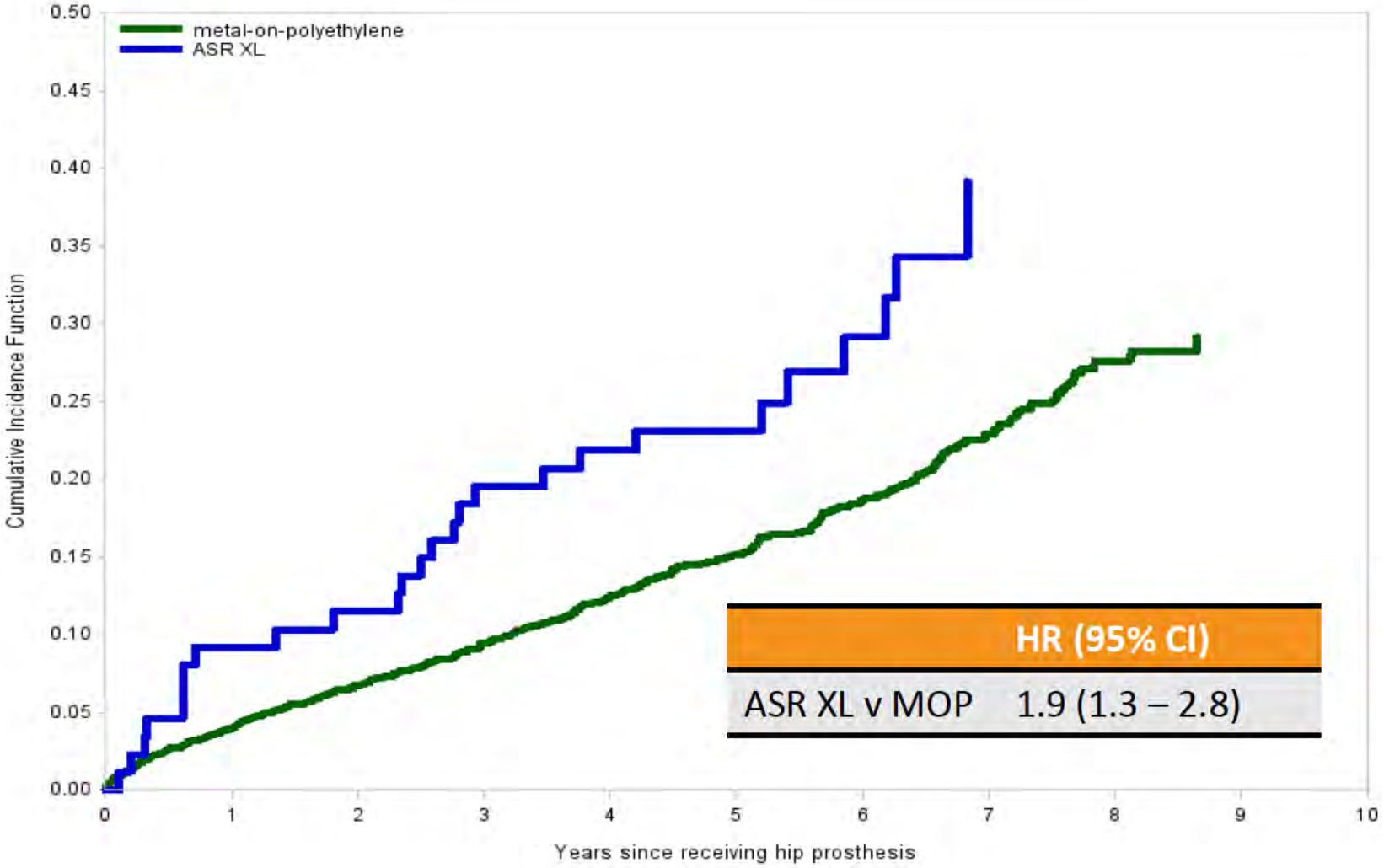
- Metal on Metal hips may produce metallic particles due to mechanical wear and metal corrosion
- The metallic particles may cause local adverse effects and dissolve to metal ions
- Increased blood levels of metal ions (especially cobalt) may also have systemic adverse effects
- TGA were interested to know if there was an evidence of heart problems in patients with metal on metal hips



What did we do?

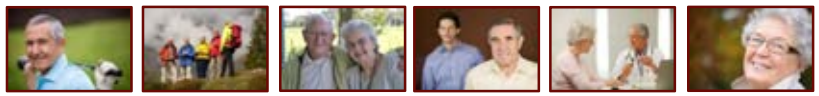


What did we find?



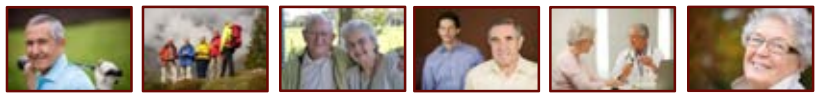
What was the outcome?

- Our results formed part of an evidence base used by TGA to inform doctors about patient care
  - *At this time, there is insufficient evidence to conclusively demonstrate that MoM hip implants produce side effects beyond those that may occur at the site of implantation.*
  - *On balance, the TGA recommends that patients with MoM implants **be followed up regularly** and ….that the follow-up include blood tests for cobalt and chromium.*
- TGA requested linkage of the national data to answer this question more conclusively



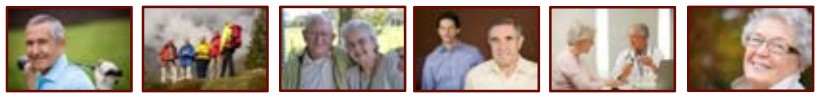
Collaborating with international partners to improve medication safety

- Many countries around the world have developed datasets like that held by DVA
- Working with these countries gives us the potential to identify problems with medicines much earlier than can be achieved by using data from Australia alone



Why worry about medicines safety?

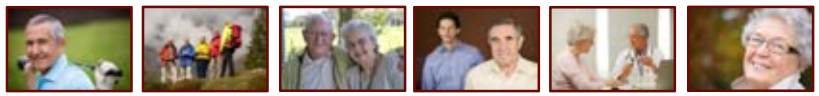
- Before we bring a medicine to treat a chronic disease to market, we test the medicine for a year in about 1700 people
  - Insufficient number to know if there are rare side effects or problems for people with multiple illnesses
- Only 50% of the harms from medicines are known when they are first marketed
- We often need very large databases to identify rare but serious problems



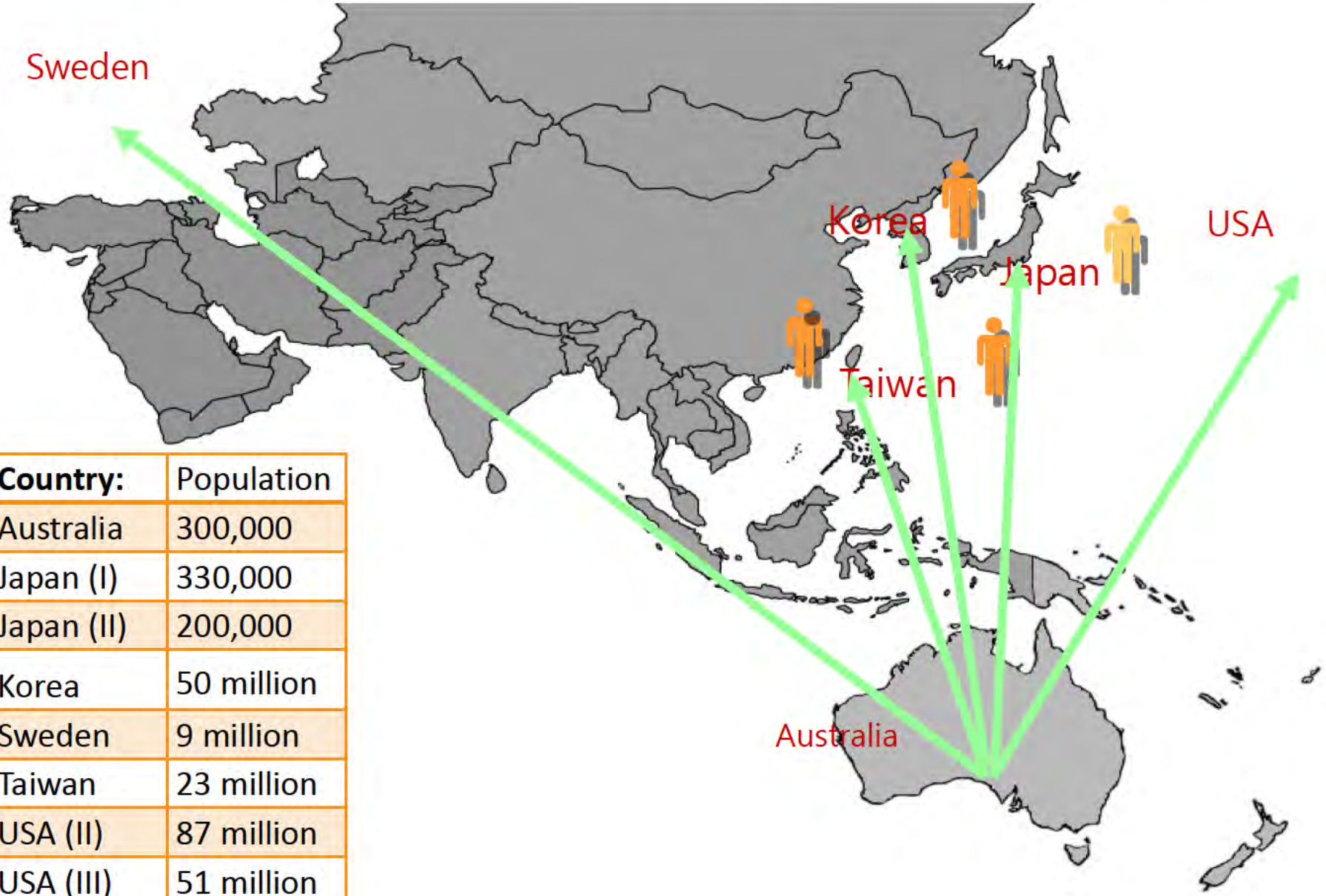
Ujeyl et al. Dtsch Arztebl Int. 2012

Studying medication safety issues globally

- One of the methods we had been using to assess medication safety for veterans was prescription symmetry analysis
- Due to the simplicity of the method, we realised this would be an ideal method for global safety studies to rapidly identify a potential problem



The AsPEN Prescription Symmetry study

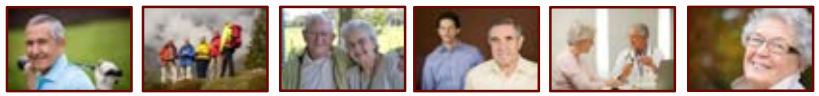


Country:	Population
Australia	300,000
Japan (I)	330,000
Japan (II)	200,000
Korea	50 million
Sweden	9 million
Taiwan	23 million
USA (II)	87 million
USA (III)	51 million

Thiazolidinediones and heart failure

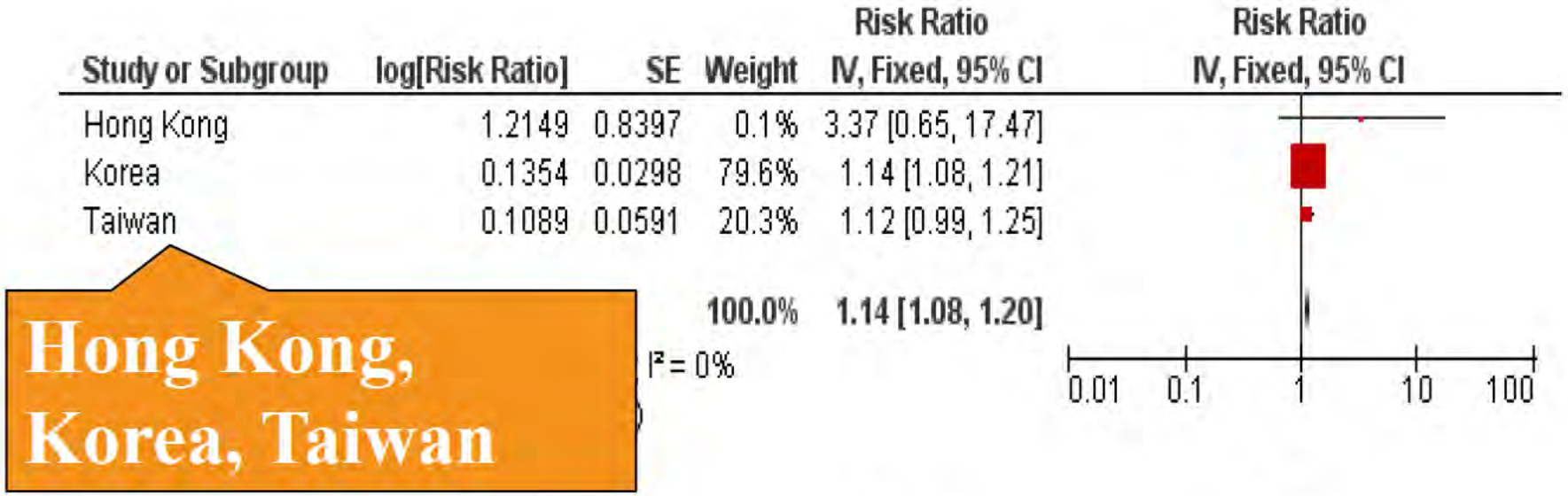
- Observational studies; predominantly in Caucasian populations
  - Risk of heart failure hospitalisation
    - Rosiglitazone RR = 2.1 (95% CI 1.5-2.9) [1]
    - Pioglitazone HR = 1.4 (95% CI 1.1-1.8) [2]
  - Rosiglitazone appears to have a higher risk than pioglitazone.
    - OR=1.2 (95% CI 1.1-1.3)[3]
- Is the risk the same in Asian populations?

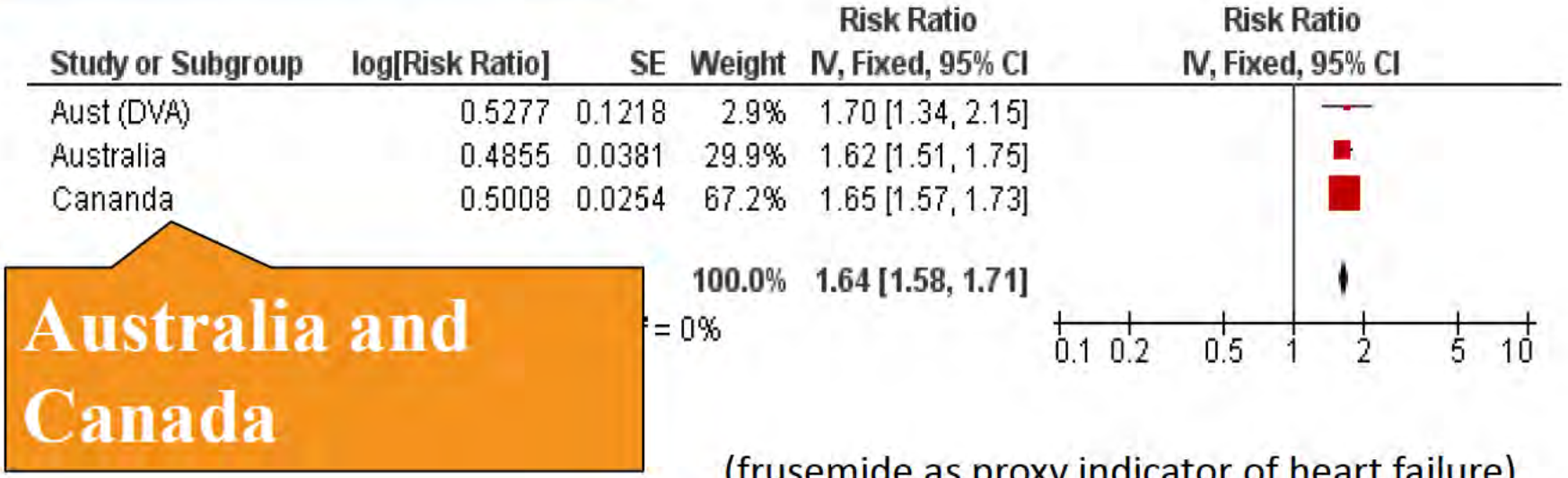
1. Singh S., et al JAMA 2007
2. Lincoff A.M., et al JAMA 2007
3. Loke Y.K., et al BMJ 2011



Differences in the genes that metabolise the medicine may mean the side effect is different. CYP 2C8 and PPARγ

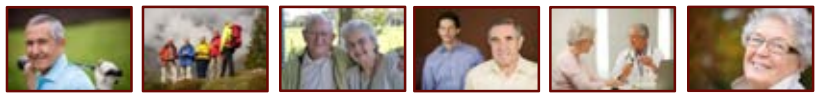
Rosiglitazone and heart failure risk





(frusemide as proxy indicator of heart failure)

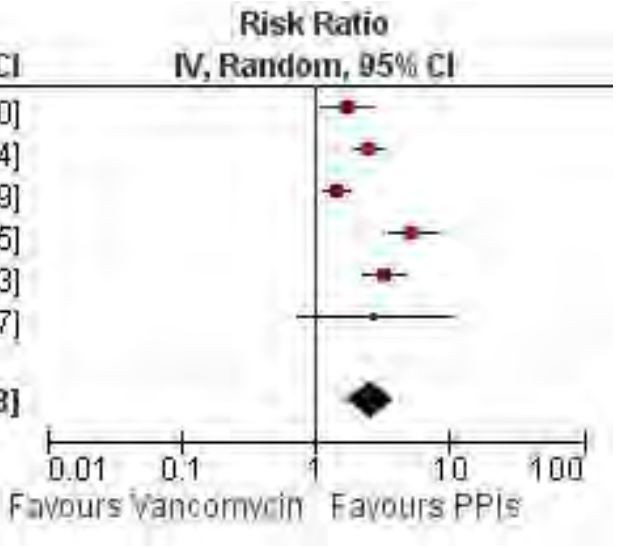
Could the regulators use it?



Health Canada initiated risk of clostridium difficile infections with proton pump inhibitors

Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Australia DVA	0.566	0.236	16.9%	1.76 [1.11, 2.80]
Australia PBS	0.9096	0.1205	20.3%	2.48 [1.96, 3.14]
Canada	0.3685	0.1103	20.5%	1.45 [1.16, 1.79]
Japan	1.6865	0.2283	17.1%	5.40 [3.45, 8.45]
JapanII	1.1658	0.1763	18.8%	3.21 [2.27, 4.53]
Taiwan	0.9925	0.677	6.5%	2.70 [0.72, 10.17]
Total (95% CI)			**100.0%**	**2.53 [1.69, 3.78]**

Heterogeneity: Tau² = 0.19; Chi² = 36.54, df = 5 (P < 0.00001); I² = 86%
Test for overall effect: Z = 4.52 (P < 0.00001)



Clostridium difficile (C. difficile) causes life-threatening diarrhea. These infections mostly occur in people who have had both recent medical care and antibiotics. Often, *C. difficile* infections occur in hospitalized or recently hospitalized patients.

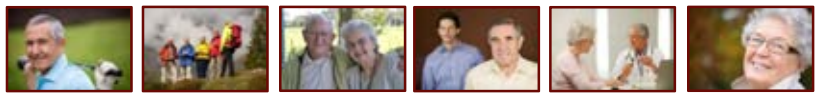
RESISTANCE OF CONCERN

PUBLIC HEALTH THREAT

- 250,000 infections per year requiring hospitalization or affecting already hospitalized patients.
- 14,000 deaths per year.
- At least $1 billion in excess medical costs per year.
- Deaths related to *C. difficile* increased 400% between 2000 and 2007, in part

What was the outcome?

- Australian Therapeutic Goods Administration are now trialling implementation of the method to support post-market surveillance of medicines in Australia



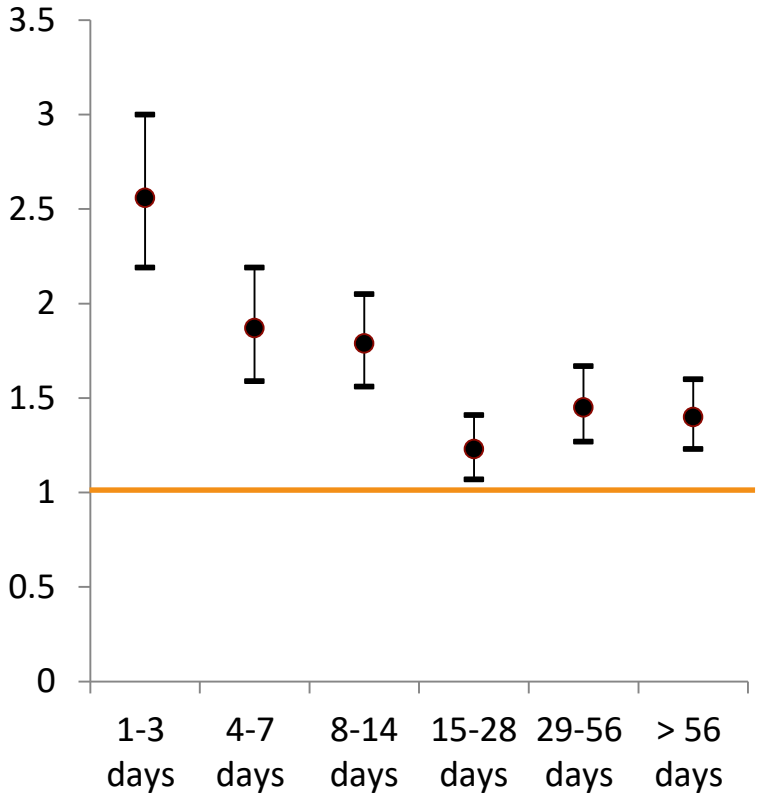
Now extended to more complex outcome studies and country exchanges

- Methylphenidate for attention deficit disorder in children and adverse cardiac outcomes
- Code written and tested here, sent to Korea for implementation

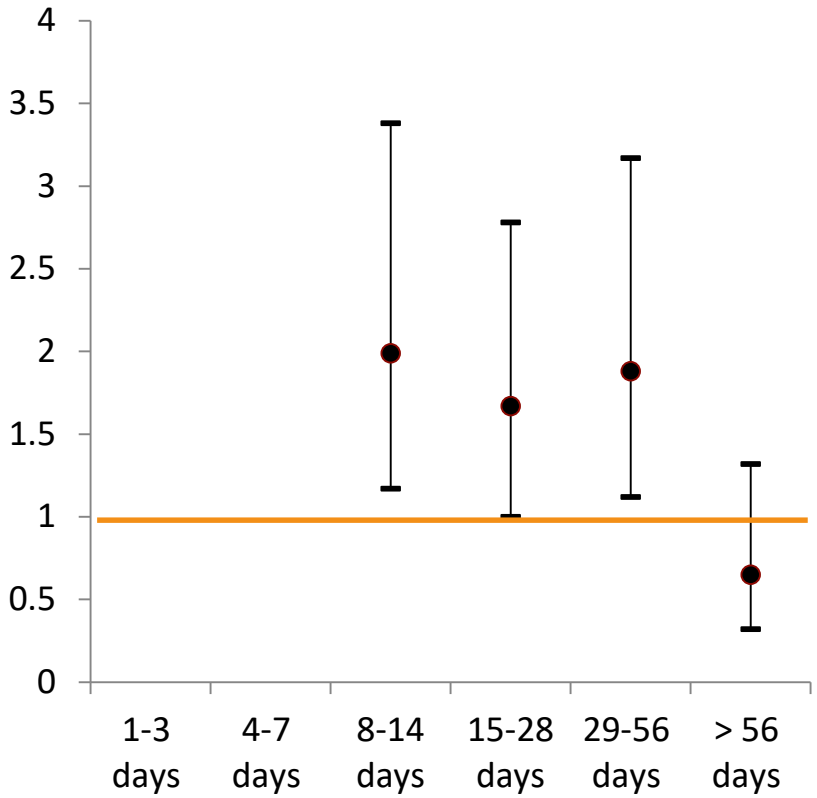
Australia Korea Foundation

Risk of adverse cardiovascular outcomes in children taking medicines for attention deficit disorder

Risk of arrhythmia



Risk of stroke

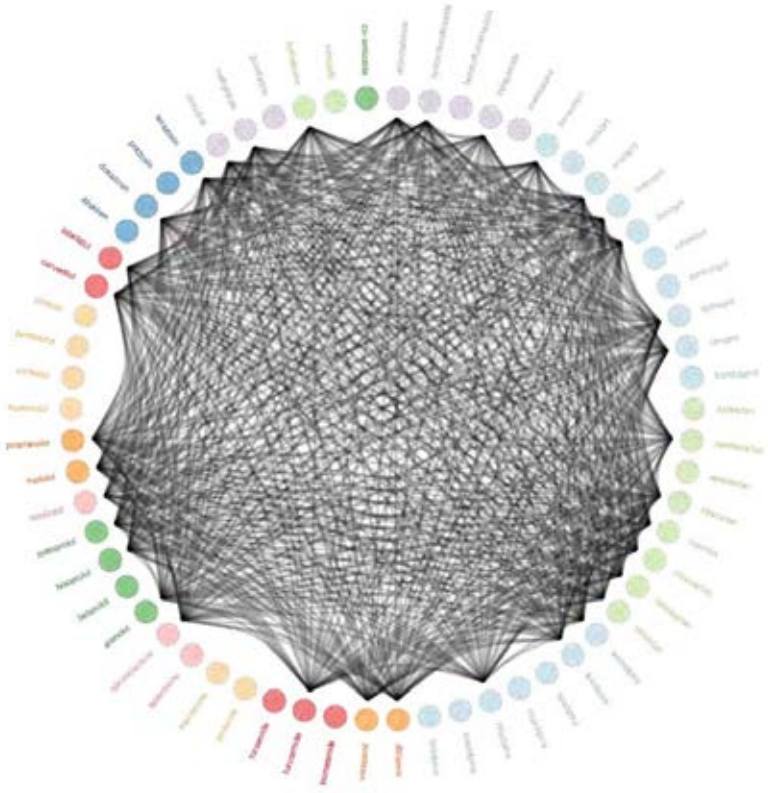


The potential for improving our understanding of health care using health data sets

Current evidence of the effectiveness of antihypertensives

The lines show the studies comparing antihypertensive medicines

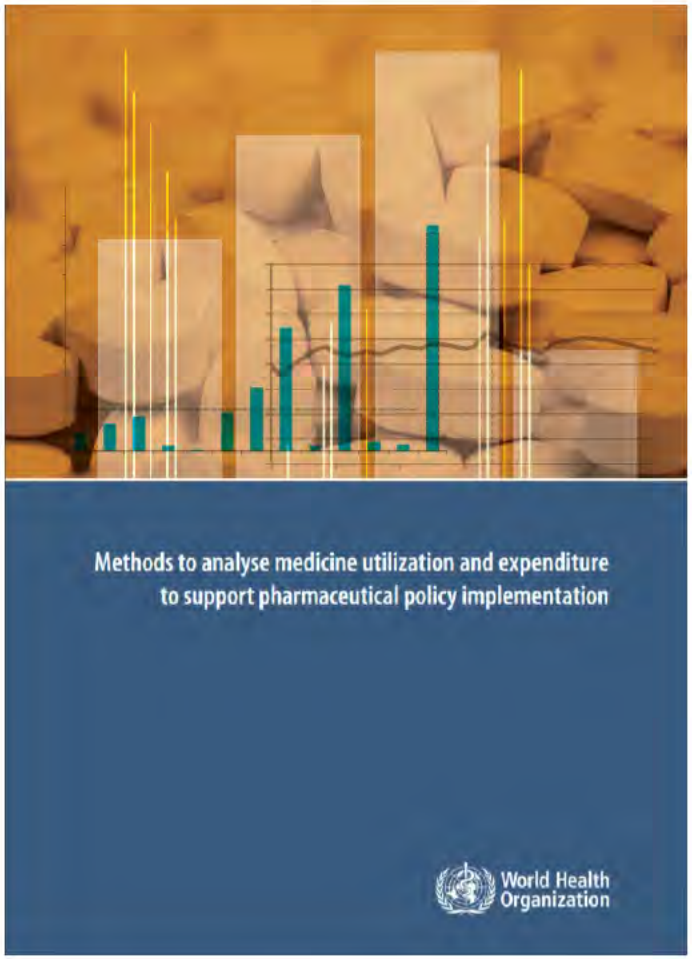
9 linked data sets from 4 different countries have now been used to compare them all



https://github.com/OHDSI/LEGEND

Collaborating with the World Health Organization to develop medicine utilisation capacity

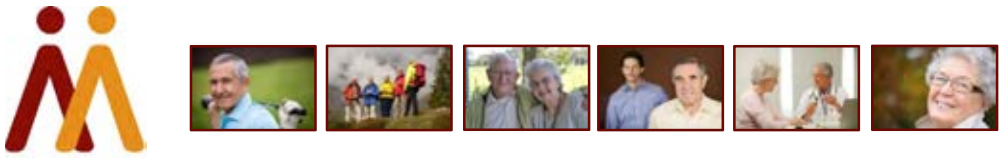
- In 2006, UniSA was invited to present the Veterans' MATES program and its potential to the World Health Organisation
- Today, as a result of our work with DVA and the Australian Government Department of Health we have an ongoing invitations to work with WHO to build capacity in medicine utilisation assessment using data bases



Roughead, Kemp-Casey, Nguyen and Pratt. 2018

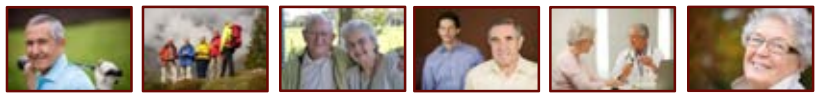
Conclusion

- The ongoing partnership with DVA has enabled improvements in health care for veterans,
  - With more appropriate medicine use and hospitalisations avoided for bleeds, stroke, pneumonia, fractures, confusion, heart failure, renal failure
- It has also enabled significant research opportunities with additional partners that benefit many people across the globe.
  - Implementation of a medicine safety signal detection method by TGA and Health Canada
  - Post-marketing surveillance of medicines within the Australian Government Department of Health
  - Replication trials of Veterans' MATES in New Zealand
  - Multi-national research collaborations



Acknowledgements

- Emeritus Professor Andy s 47F
- Mr Bob s 47F DVA
- Dr Graeme s 47F DVA
- The Veterans' MATES collaborators (past and present)



Australian Government
Department of Veterans' Affairs

transforming DVA

Veterans' Medical and Therapeutic Education Service (VETERANS' MATES)

ESORT

14 June 2022

Veterans' MATES

A data driven health promotion program providing up-to-date health and medicines information specifically tailored for veterans and their healthcare team, with the goal of improving health outcomes for the veteran community

- Aims to:
  - increase use of under-used medicines, reduce use of unnecessary medicines
  - reduce adverse medicine events
  - improve the use of related health services
- A 17-year program established 2004
- Being delivered by University of South Australia in collaboration with:
  - Discipline of General Practice, Adelaide University
  - Discipline of Public Health, Adelaide University
  - Drug and Therapeutics Education Services
  - NPS MedicineWise
  - Australian Medicines Handbook
  - Health Link

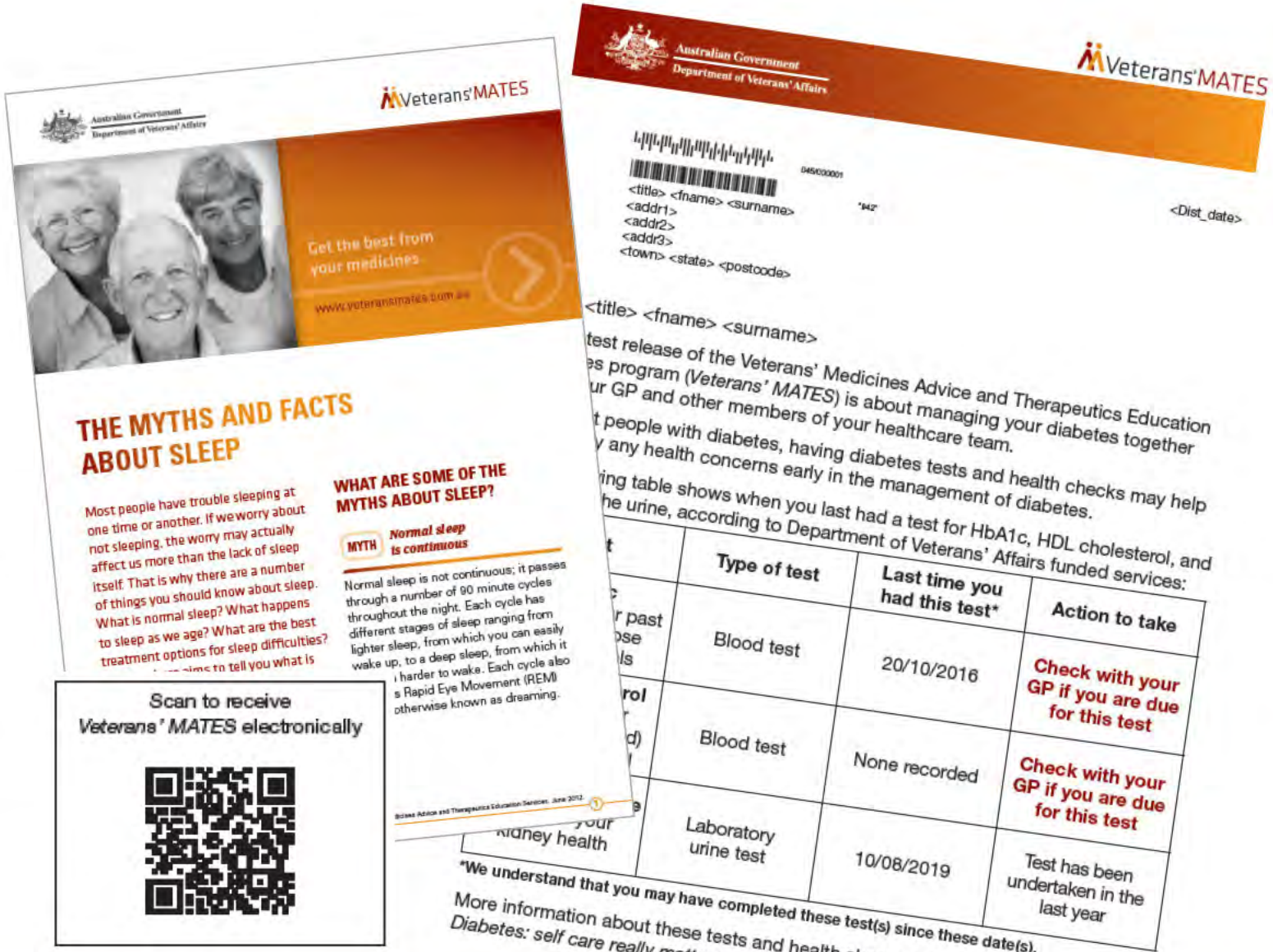
Why Veterans' MATES?

- Around 150,000 DVA clients access pharmaceuticals each year
- Veterans' MATES has been supporting these clients for 17 years to achieve:
    1. Positive health outcomes: early interventions that support quality use of medicines, strengthen coordinated care and increase uptake of supportive health services
    2. Improved understanding and utilisation of medicines and health services: in, and about the veteran community
    3. Data-based medicine prescribing research: relevant to RPBS listings and other dept policy/program areas
    4. Reduction in costs through improved pharmaceutical access and program delivery

The approach

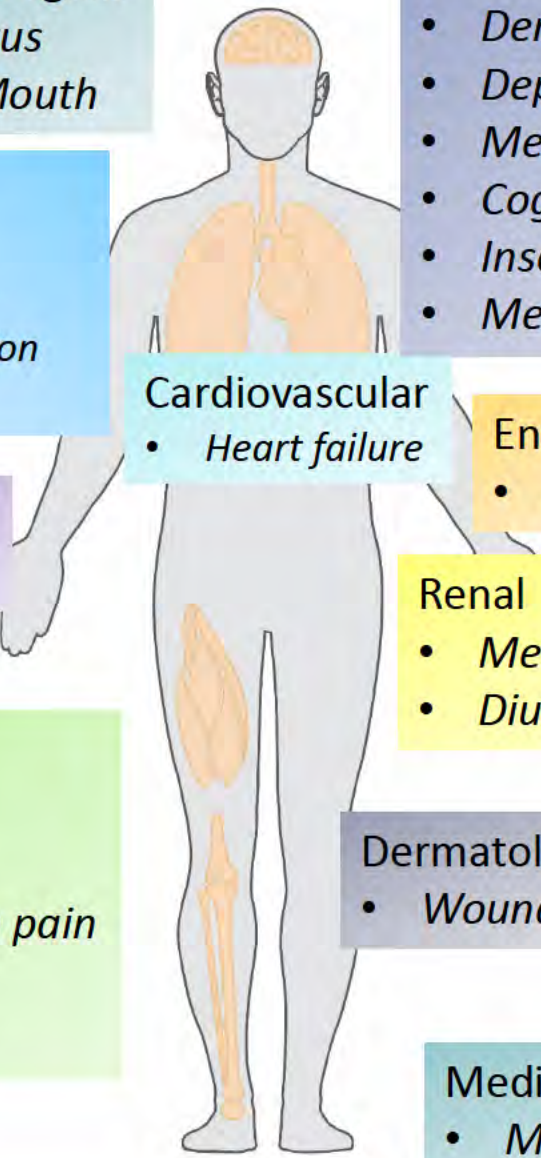
4 health topics a year are distributed.

- Veterans (eligible to the topic): personalised letter & educational information about their health care management
- Veteran's GP: tailored information on their prescribing & educational material
- Veteran's pharmacist (and any other health professionals relevant to the topic): letter & educational material



Identifying 'real life' health care problems among veterans to target interventions....

23 topics since 2016



Sensory Organs
- *Tinnitus*
- *Dry Mouth*

Mental Health
- *Dementia*
- *Depression*
- *Mental Wellbeing & COVID*
- *Cognitive impairment*
- *Insomnia*
- *Mental Well Being*

Respiratory
- *COPD*
- *Pulmonary Rehabilitation*
- *COVID*

Cardiovascular
- *Heart failure*

Endocrine
- *Diabetes*

Gastrointestinal
- *GORD*

Renal
- *Medicines & your kidneys*
- *Diuretics*

Musculoskeletal
- *Osteoporosis*
- *Chronic Pain*
- *Recovering from pain*
- *Falls*
- *Staying active*

Dermatology
- *Wound Care*

Medicines Services
- *Medicine Complexity*

The model

Using DVA routinely collected health claims data

PLANNING PHASE

Using the data, we determine the prevalence of a medication or health related problem

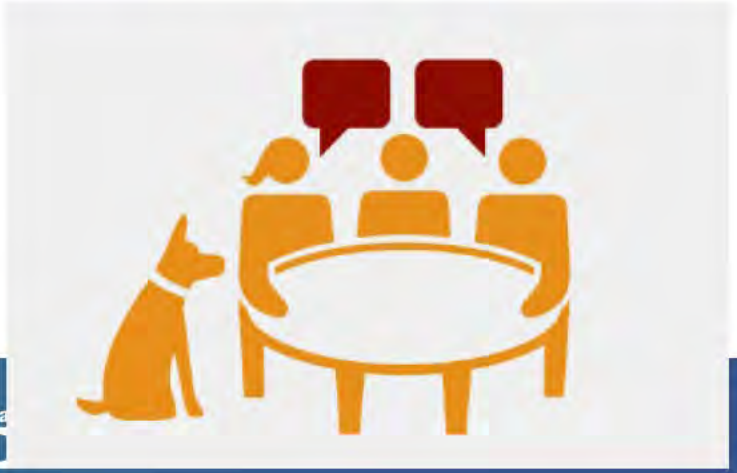
IMPLEMENTATION PHASE

The data are used to develop the patient-based feedback provided to doctors

EVALUATION PHASE

The data enable the impact and outcomes of the intervention to be measured

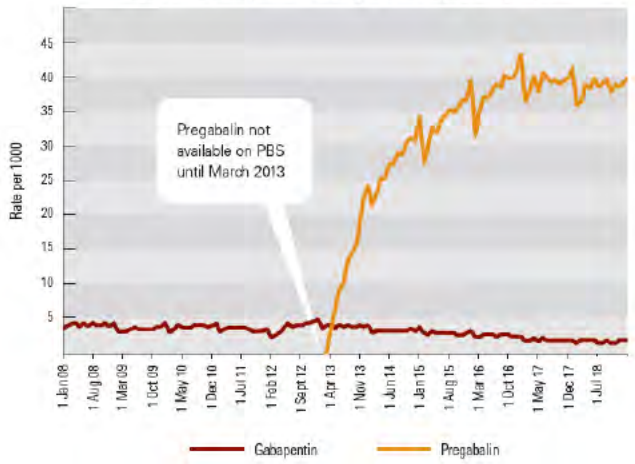
Veteran reference group



Practitioner reference group

Provide DVA data trending information

Figure 1. Rate of DVA patients dispensed gabapentin and pregabalin per 1000.[3]



Foster research expertise

Public promotion

The reach

600,000 tailored, patient specific care messages to doctors
570,000 educational brochures to DVA clients

170,000 unique DVA clients

3500 Psychologists

8700 Dentists

2300 Exercise Physiologists

Materials have reached

30,100 unique Doctors

9300 Pharmacists

9600 Physiotherapists

2700 Directors of Care of Aged-Care

Collection of tools for veterans

Useful tools for veterans

Diabetes tests and health checks you need

Cognitive Behaviour Therapy for Insomnia – How it works

Looking after a skin tear: know the basics

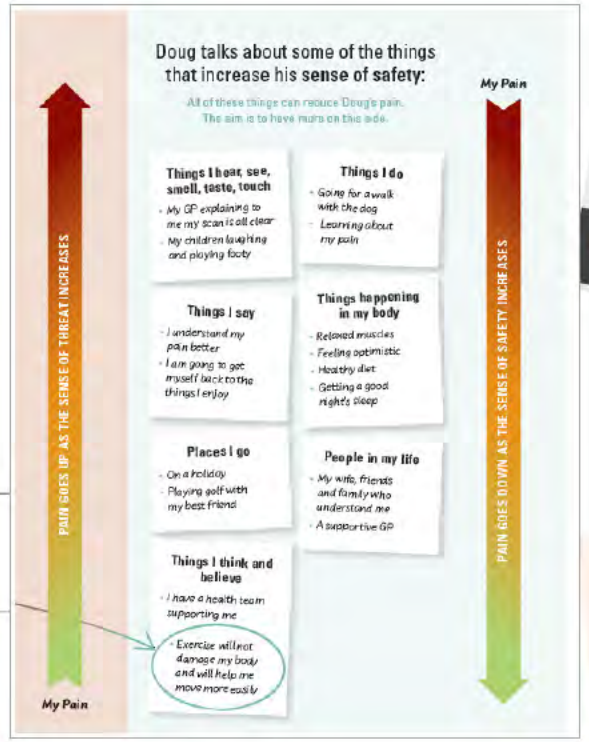


Diagram 1: Dressing your skin tear
Cover the wound with a non-stick dressing pad. Draw an arrow on the top of the dressing to indicate the direction for removing. The arrow should be pointing in the same direction as the edge of the skin flap.

Diagram 2: Safe removal of the dressing
Remove the dressing slowly and close to the skin, using the arrow to guide you. **Never pull against the direction of the skin flap.**

And tools for GPs and pharmacists

Veterans' MATES / Resources / Tools /

Deprescribing tools for GPs and pharmacists

Gabapentinoid dosing information

A guide to tapering hypnotic use

A guide to deprescribing in polypharmacy

Step down the dose or stop the PPI

Tapering and ceasing an antidepressant

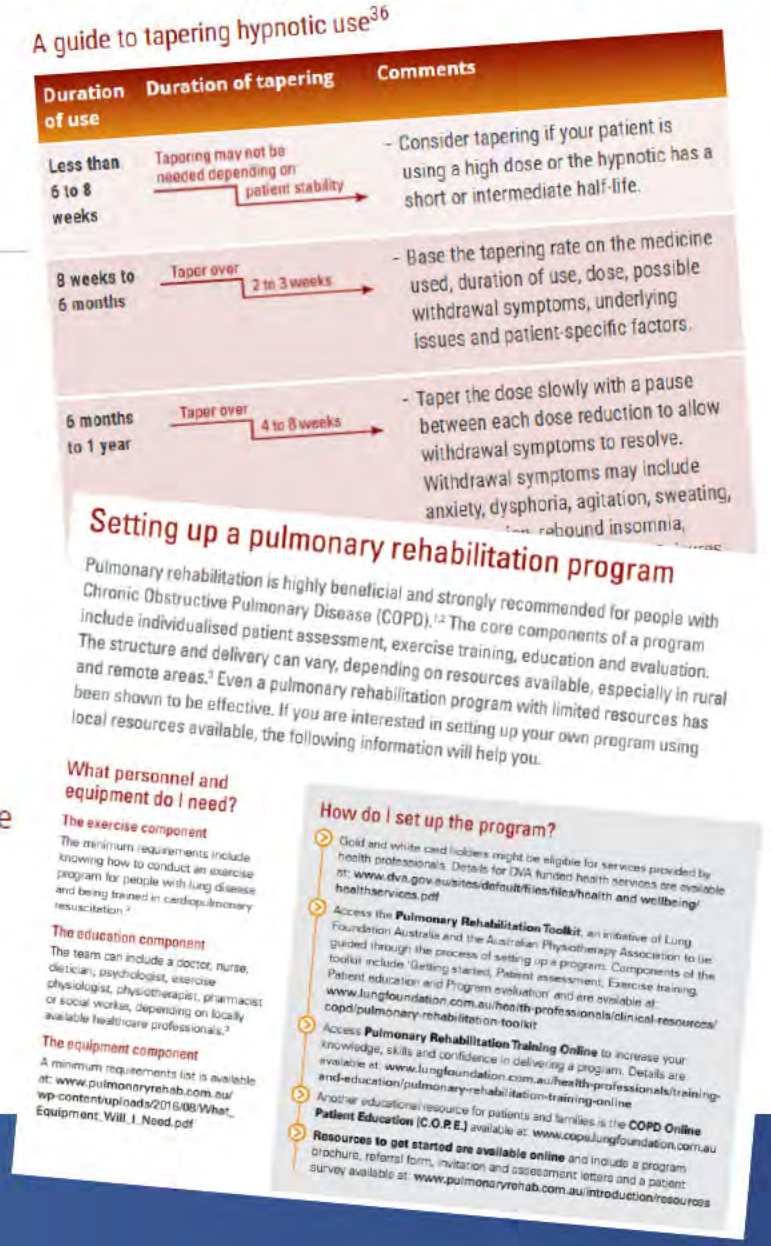
Steps to tapering and ceasing opioid therapy

Not sure of the Home Medicines Review Process?

Simplify the dosing schedule: the pharmacist's role

Reviewing the number of medicines used – a guide for the GP

How to taper and cease an antipsychotic



A guide to tapering hypnotic use[36]

Duration of use	Duration of tapering	Comments
Less than 6 to 8 weeks	Tapering may not be needed depending on patient stability	- Consider tapering if your patient is using a high dose or the hypnotic has a short or intermediate half-life.
8 weeks to 6 months	Taper over 2 to 3 weeks	- Base the tapering rate on the medicine used, duration of use, dose, possible withdrawal symptoms, underlying issues and patient-specific factors.
6 months to 1 year	Taper over 4 to 8 weeks	- Taper the dose slowly with a pause between each dose reduction to allow withdrawal symptoms to resolve. Withdrawal symptoms may include anxiety, dysphoria, agitation, sweating, rebound insomnia,

Setting up a pulmonary rehabilitation program

Pulmonary rehabilitation is highly beneficial and strongly recommended for people with Chronic Obstructive Pulmonary Disease (COPD).[1,2] The core components of a program include individualised patient assessment, exercise training, education and evaluation. The structure and delivery can vary, depending on resources available, especially in rural and remote areas.[3] Even a pulmonary rehabilitation program with limited resources has been shown to be effective. If you are interested in setting up your own program using local resources available, the following information will help you.

What personnel and equipment do I need?

The exercise component

The minimum requirements include knowing how to conduct an exercise program for people with lung disease and being trained in cardiopulmonary resuscitation.[3]

The education component

The team can include a doctor, nurse, dietician, psychologist, exercise physiologist, physiotherapist, pharmacist or social worker, depending on locally available healthcare professionals.[3]

The equipment component

A minimum requirements list is available at: www.pulmonaryrehab.com.au/wp-content/uploads/2016/08/What_Equipment_Will_I_Need.pdf

How do I set up the program?

- Gold and white card holders might be eligible for services provided by health professionals. Details for DVA funded health services are available at: www.dva.gov.au/sites/default/files/files/health and wellbeing/healthservices.pdf
- Access the **Pulmonary Rehabilitation Toolkit**, an initiative of Lung Foundation Australia and the Australian Physiotherapy Association to be guided through the process of setting up a program. Components of the toolkit include 'Getting started, Patient assessment, Exercise training, Patient education and Program evaluation' and are available at: www.lungfoundation.com.au/health-professionals/clinical-resources/copd/pulmonary-rehabilitation-toolkit
- Access **Pulmonary Rehabilitation Training Online** to increase your knowledge, skills and confidence in delivering a program. Details are available at: www.lungfoundation.com.au/health-professionals/training-and-education/pulmonary-rehabilitation-training-online
- Another educational resource for patients and families is the **COPD Online Patient Education (C.O.P.E.)** available at: www.copelungfoundation.com.au
- **Resources to get started are available online** and include a program brochure, referral form, invitation and assessment letters and a patient survey available at: www.pulmonaryrehab.com.au/introduction/resources

Other useful tools for GPs and pharmacists

Minimum requirements for the Annual Diabetes Cycle of Care and suggested management goals

Medicines most commonly dispensed to DVA patients that require attention in reduced kidney function

Resources for helping veterans learn to sleep well

A guide to reducing the impact of medicine-induced dry mouth

How to reduce the adverse impact of medicines

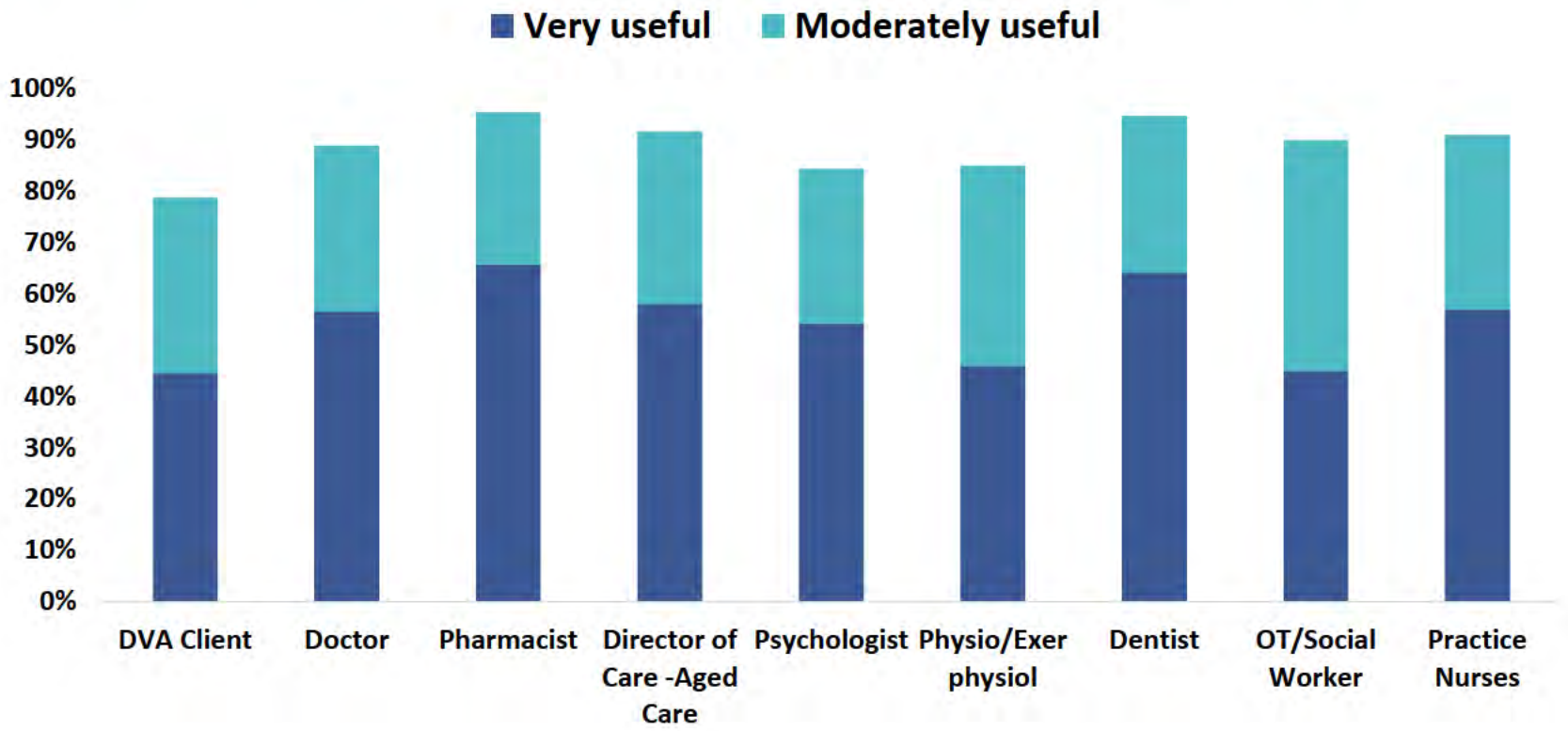
E-Mental Health resources available to DVA patients

A guide to assessing, preparing and dressing venous leg ulcers and skin tears

Setting up a pulmonary rehabilitation program

Not sure of the Home Medicines Review Process?

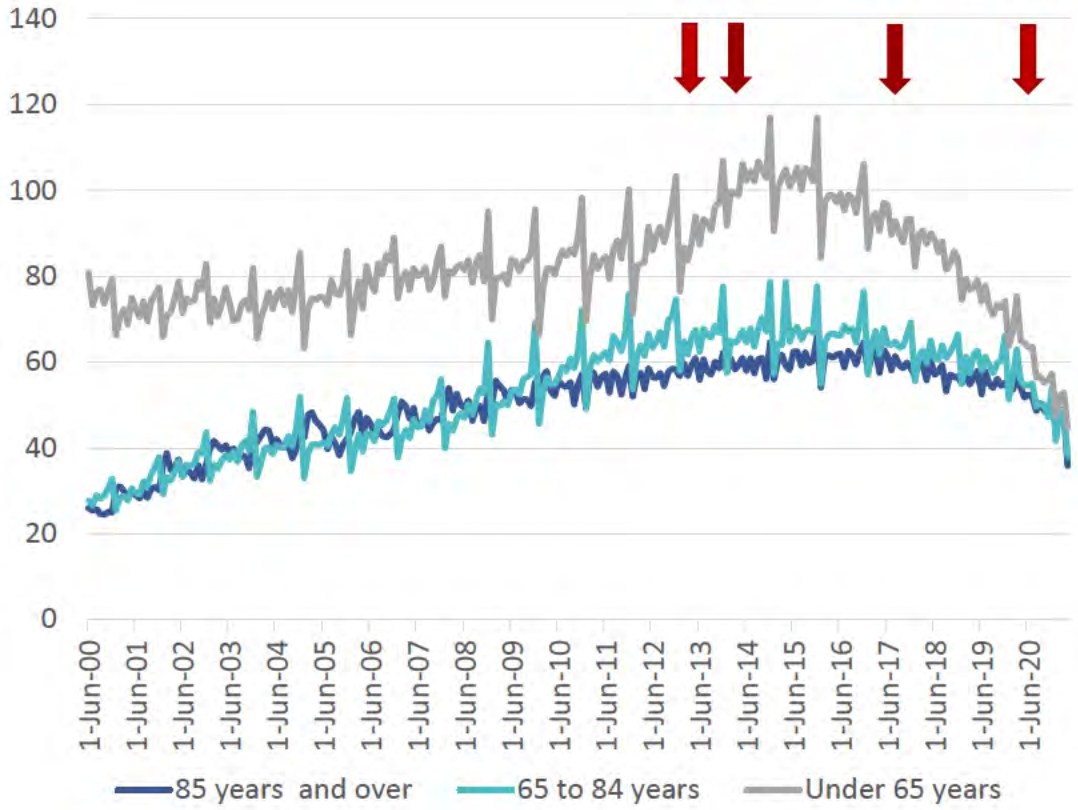
Program participant satisfaction levels



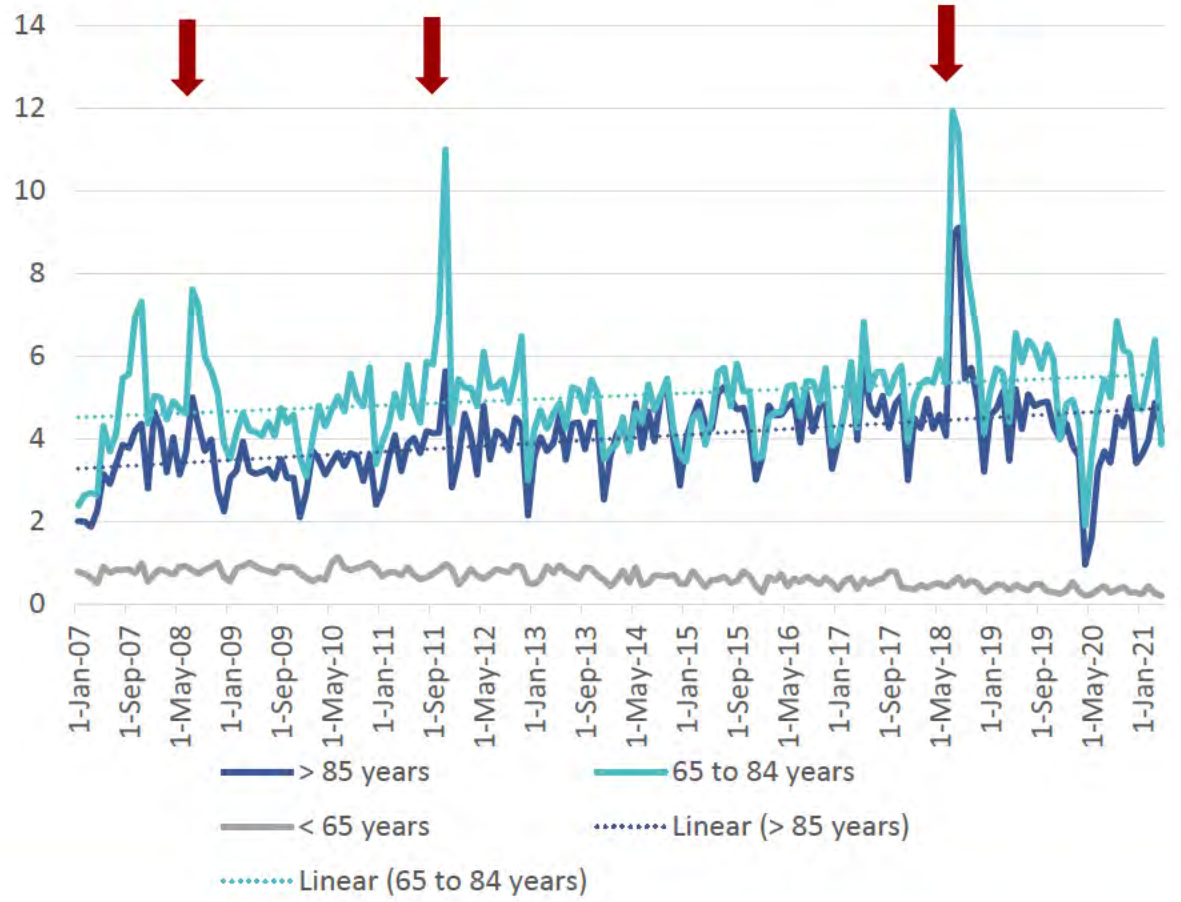
*Feedback and evaluation responses:
33% of veterans and 14% of doctors targeted have responded at least once

The impacts – topics build on each other over time

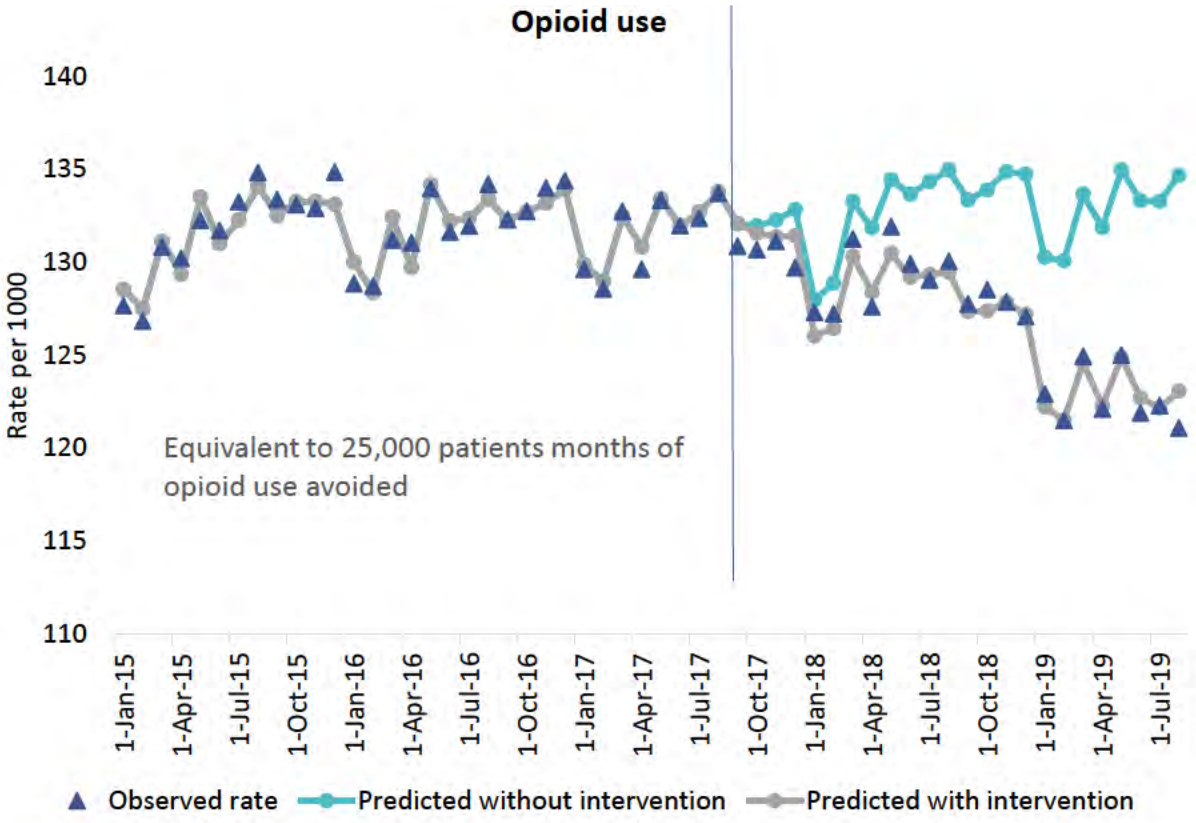
Use of opioids trending down

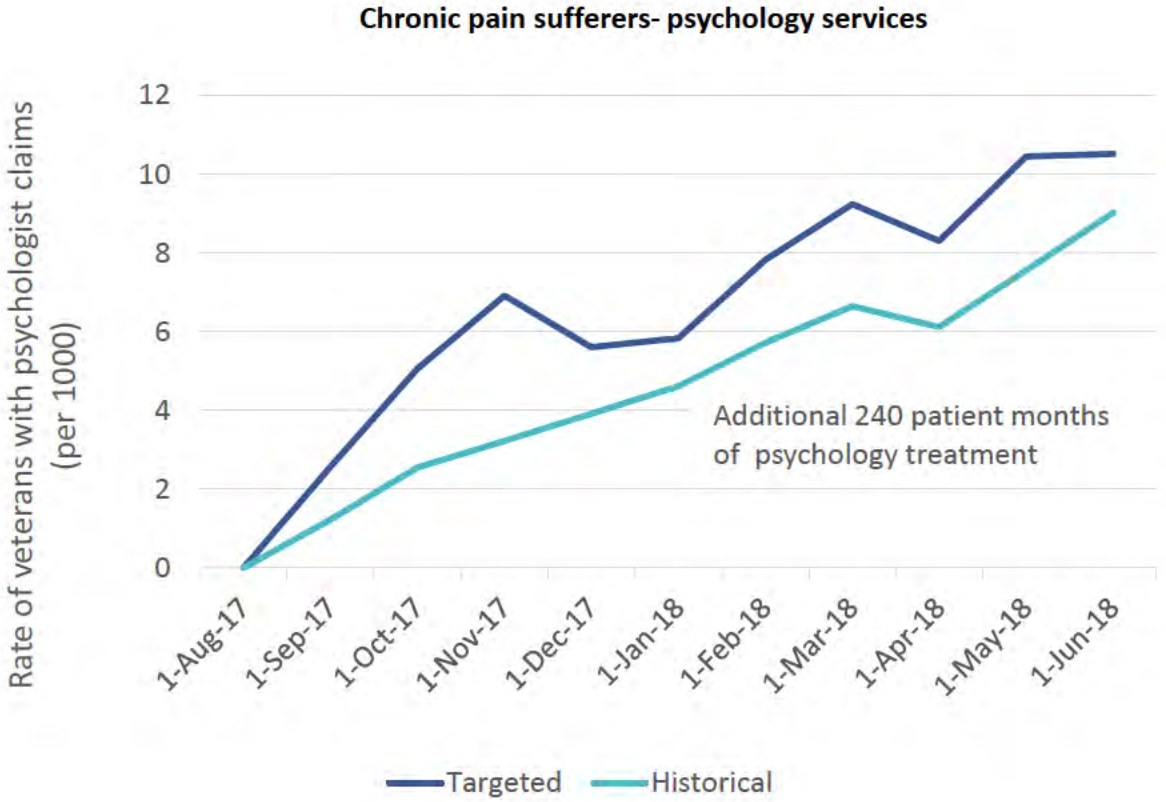


Use of bone density tests for osteoporosis trending up

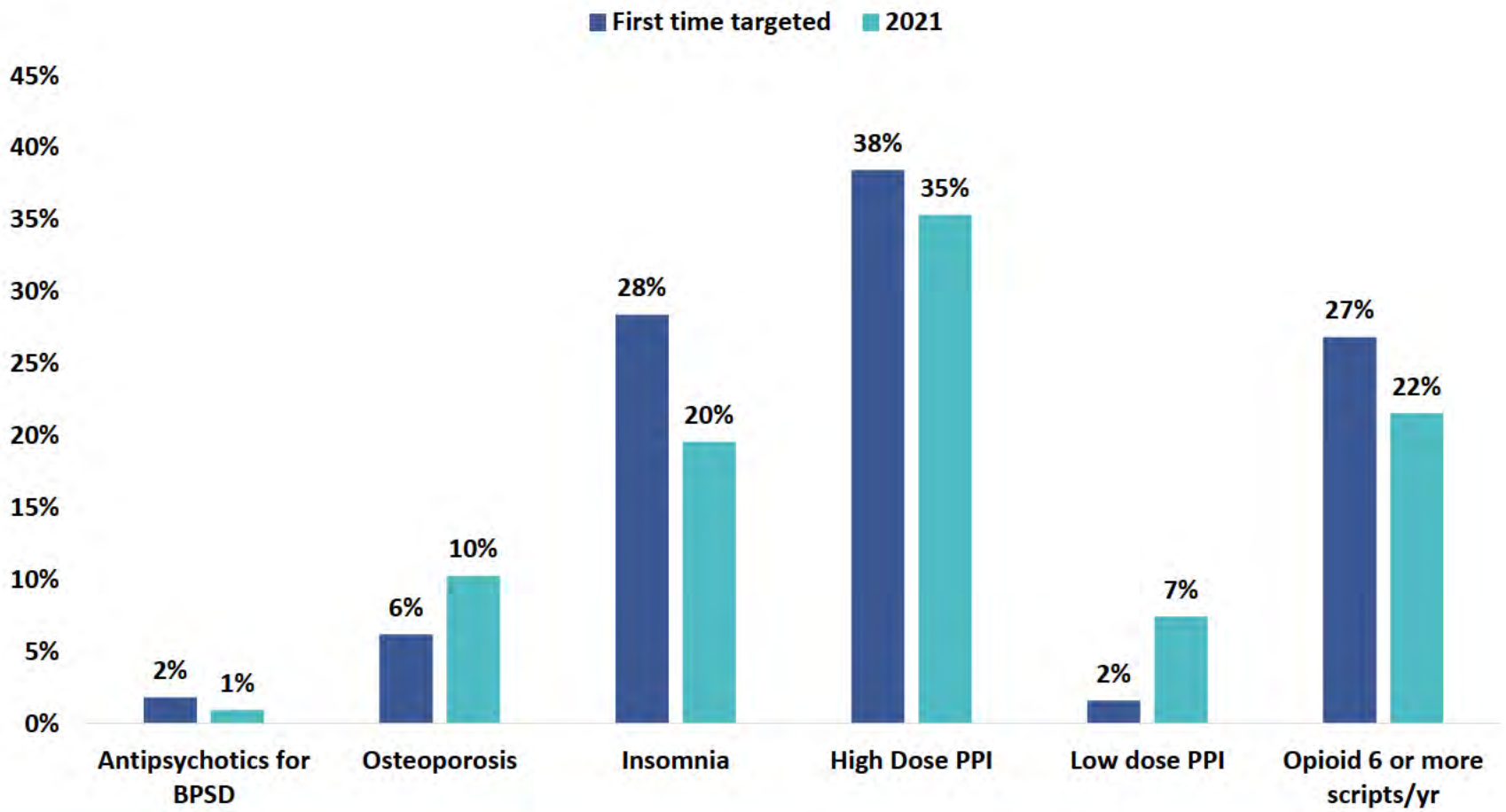


The impact – comparatively

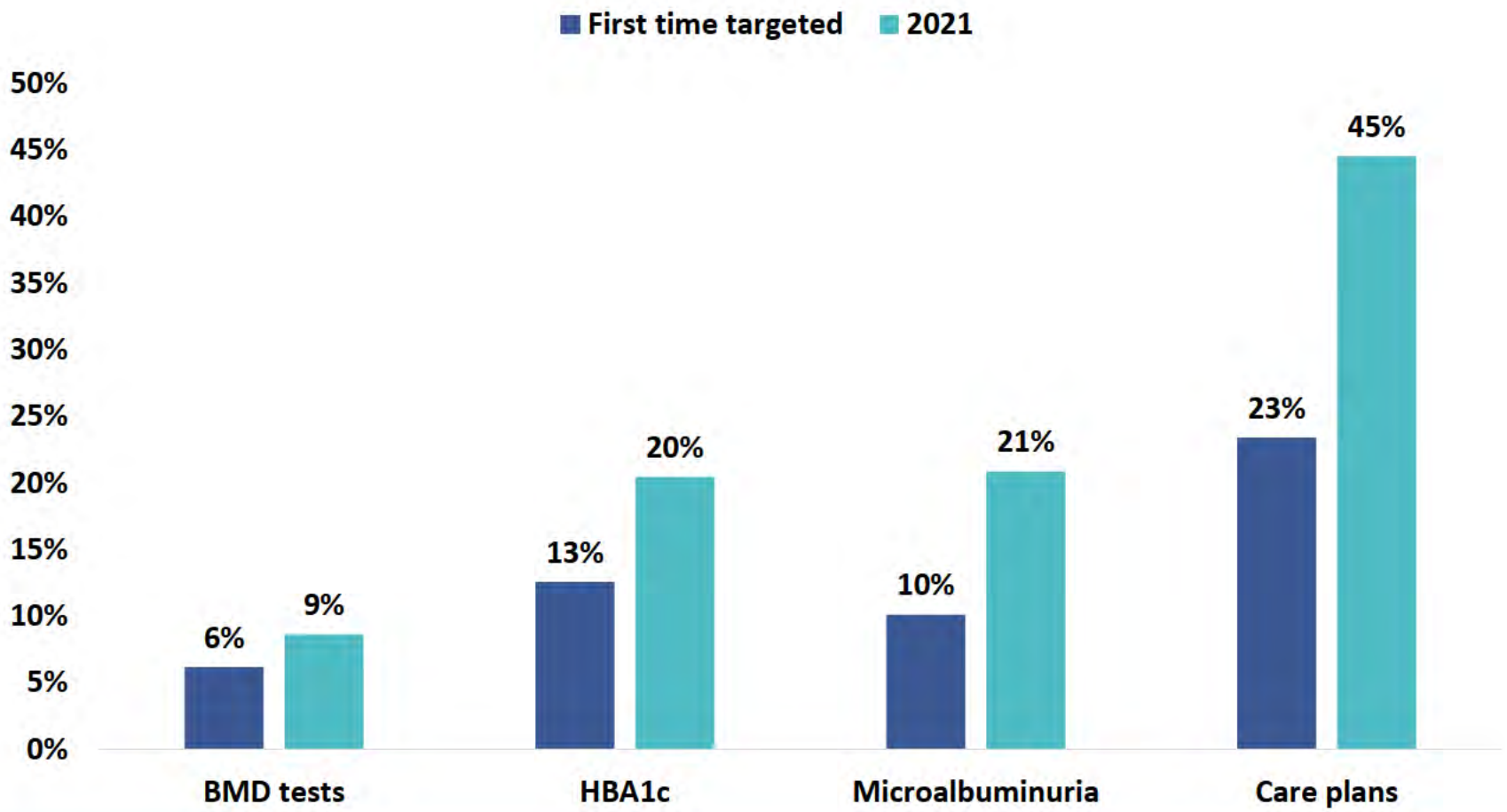




Impact: overall summary changes in medicine use



Impact: overall summary changes in service use



The reach beyond Veterans' MATES

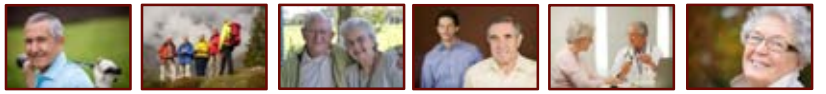
Veterans' MATES
An enterprising partnership improving medication safety






Veterans' MATES

- It is a data driven health promotion program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.



The approach

Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material are sent to members of the veteran community for whom the health topic is relevant.

UNSTEADY ON YOUR FEET? TALK TO YOUR GP

Being unsteady on your feet can be worrying, particularly if you have fallen in the past. You might feel that there is nothing that can be done to help and that it's just one of those things that happen as you get older. By talking to your GP and working through things together, small changes can be made to help keep you steady on your feet and reduce your chance of having a fall.

Dr Name
Patient Name; date of birth
Address

GENDER: Female	ACCOMMODATION: Residential care

Medicine	Medicine class	Last Dispensed	Other Prescriber
Sertraline (Eleva 100) tab 100mg	SSRI	03/02/18	Yes
Oxycodone hydrochloride (OxyNorm) Cap 10mg	Opioid	20/02/18	No

Received medicines indicating osteoporosis:	Yes
Number of hospitalisations associated with a fall in last year:	2
Medicines Review (HMR or RMMR) claimed:	None claimed in last two years

Patient dispensed a combination of medicine classes that doubles the risk of falls and hip fractures

Consider the following:

- Ask the patient how steady they feel on their feet or if they have previously fallen Yes ☐
- Review medicines to see if any are suitable for tapering or ceasing Yes ☐
- Ask the patient if they would consider reducing the medicine Yes ☐
- Plan a reduction strategy and address other risk factors for falls Yes ☐
- Would the patient benefit from a Medicines Review (HMR or RMMR) Yes ☐

*An electronic PDF version of each individual patient's information is available at www.veteransmates.net.au

We use the Australian Government Department of Veterans' Affairs routinely collected health claims data to

- **Identify potential problems for veterans**
- **Develop the medication list for the doctors**
- **Evaluate each intervention**

1 BILLION

Contains over half a billion health claims records

10 YEARS

More than ten years of historical health data

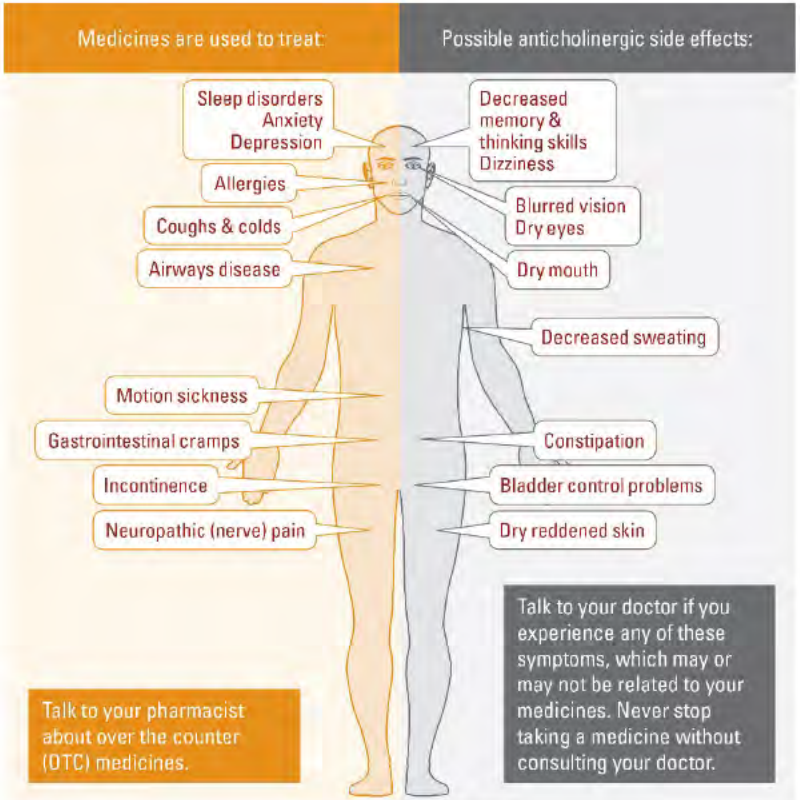
Contains hospital records including diagnosis and procedures

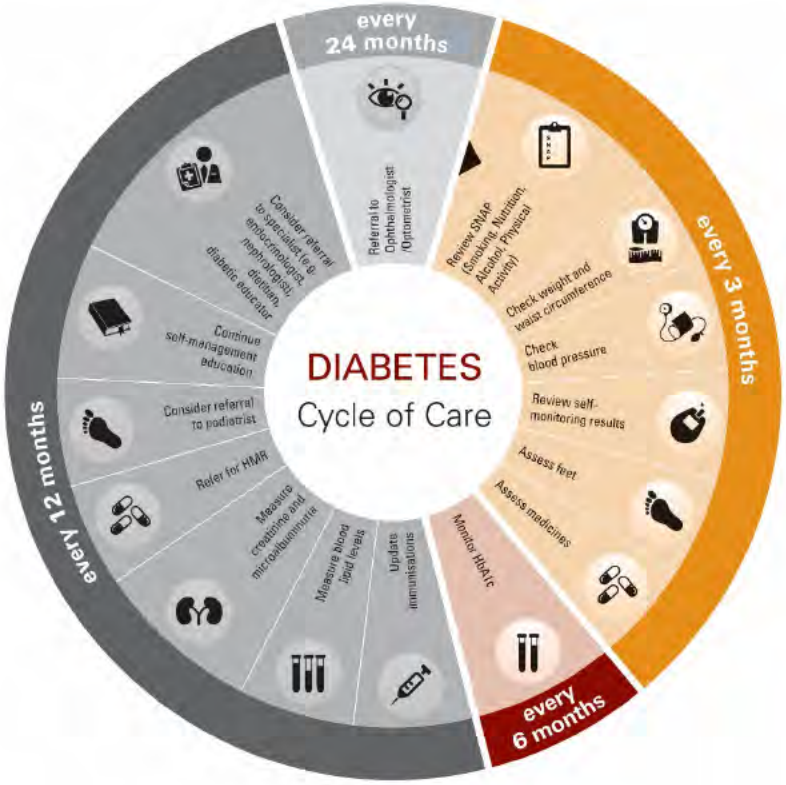
Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

To date 57 topics delivered reaching on average:

- 40,000 veterans
- 10,000 GPs
- 8,500 pharmacies and accredited pharmacists
- 2,600 Directors of Care, Residential Aged Care Facilities



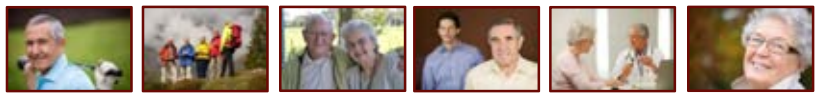


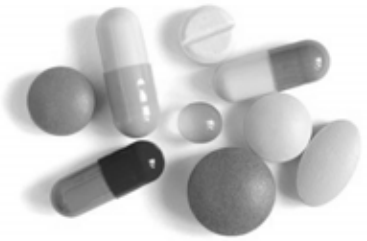
Each topic is either:

- Disease specific e.g. neuropathic pain, diabetes
- Medicine specific e.g. statins, antipsychotics
- Or about service delivery e.g. bone density tests, care planning

The educational material is tailored to identified problems and the process includes significant partnership

- A practitioner reference group and a veteran reference group meet twice yearly to provide advice
- Materials written by a medical writer supported by clinical reference group
- Peer-reviewed prior to publication
- Endorsed by a national, representative editorial committee
- DVA provide a national call centre staffed by pharmacists for veterans and health care practitioners to provide additional support





The importance of partnership

- The Australian Federation of Totally & Permanently Incapacitated Ex Servicemen & Women (TPI)
- Australian Veterans' and Defence Services Council
- Returned & Services League – National & State
- Vietnam Veterans' Federation of Australia
- Vietnam Veterans' Association of Australia
- Australian Peacekeepers & Peacemakers Association
- War Widows' Guild of Australia
- The Partners of Veterans Association Inc
- The Defence Force Welfare Association
- Airforce Association Ltd
- Mates for Mates
- Naval Association of Australia

So what happens?

- Pain management
- Osteoporosis

What is happening in the veteran community?

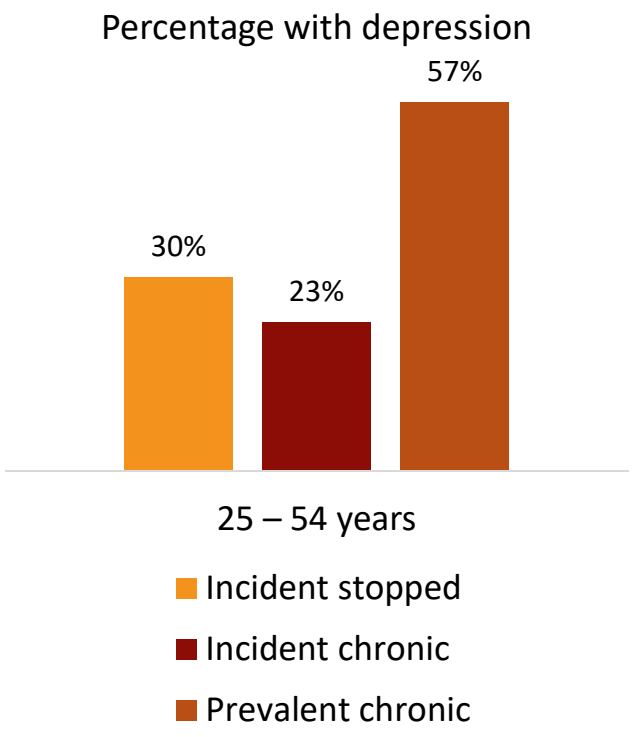
The planning stage

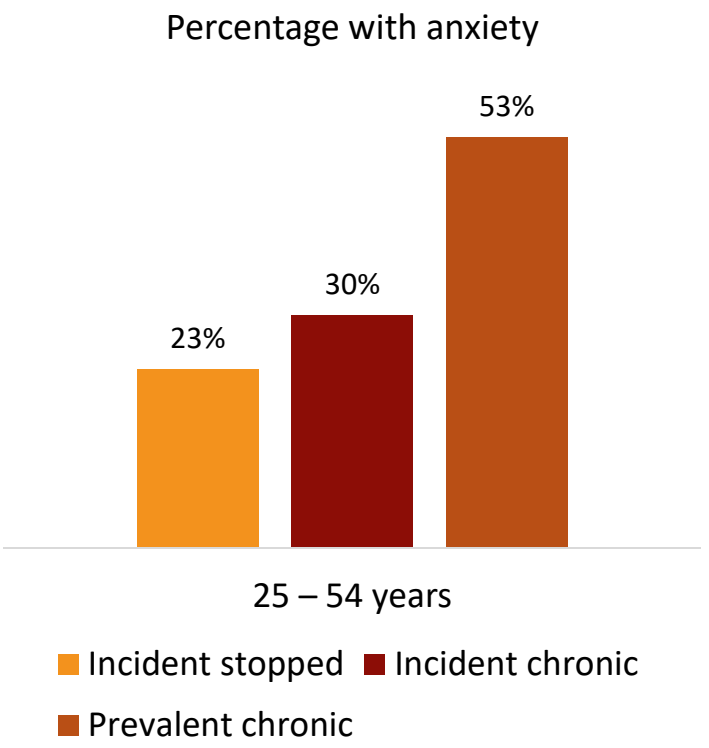
Identifying the problem: how many veterans are chronic opioid users?

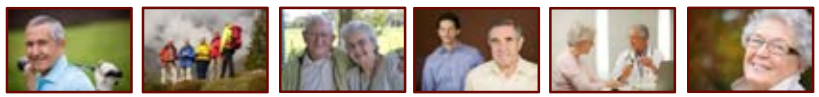
Improving pain management:

The planning stage

Identifying the problem: opioid use and comorbidity development







Pain management: Sep 2017

- Aim: To improve management and treatment of chronic pain
- Particular emphasis on referral to a psychologist and the explaining pain approach

Pain management: Sep 2017

Aim: To improve management and treatment of chronic pain

Box 1. The Pain Catastrophising Scale (PCS)[14]

The PCS, a 13 item questionnaire that you can work through with your patient, can be completed in less than five minutes, and provides an insight into what your patient thinks about when they are in pain.[14]

A total score of 30 or more represents a clinically relevant level of catastrophising. If the score is high, consider referring your patient to a psychologist. A psychologist can talk to your patient about what this means and how it can influence perception of pain. They can help reduce fears and change the way the patient thinks about pain.

Research shows that catastrophic thinking associated with pain can be reduced using multimodal interventions, including education, instruction in active self-management strategies and physical activity.[14]

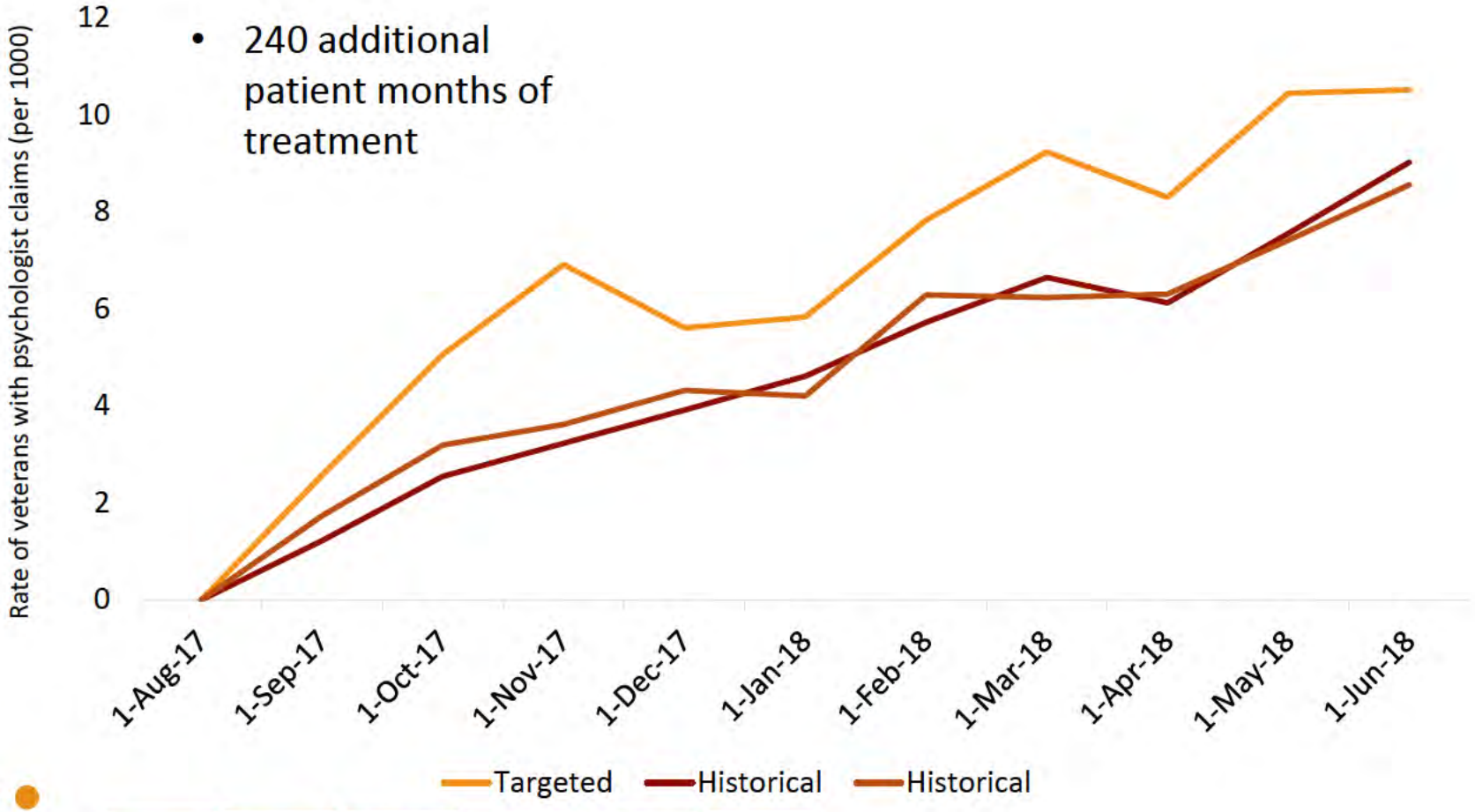
The PCS can be accessed at: https://www.worksafe.vic.gov.au/__data/assets/pdf_file/0018/10953/pain_catastrophizing_scale.pdf

Steps to tapering and ceasing opioid therapy[20, 25, 26, 38-39]

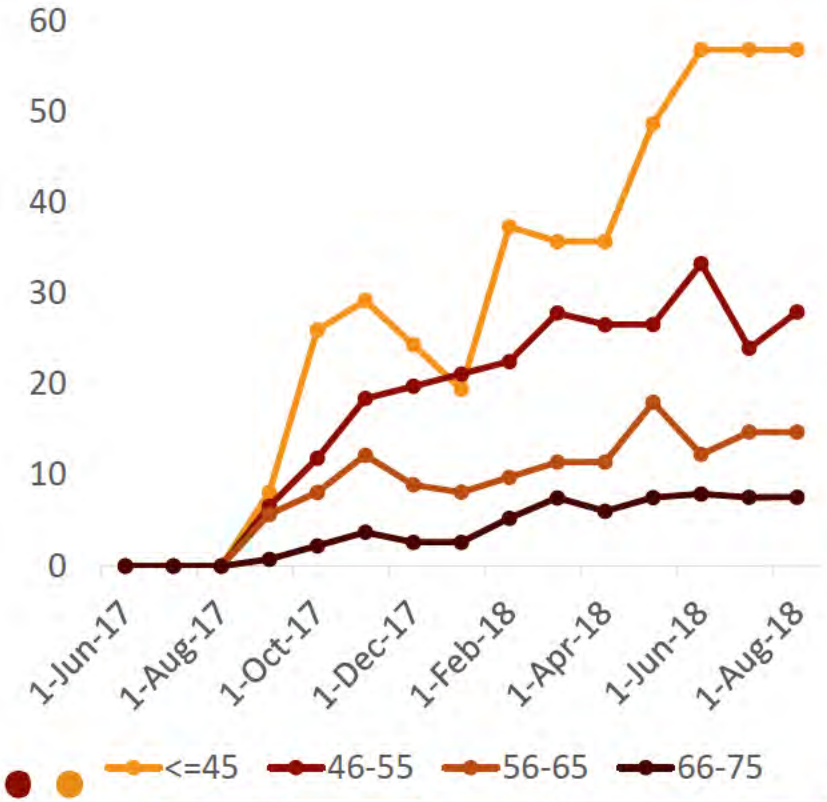
1. Negotiate and agree upon a plan for tapering and ceasing, including the tapering rate, with your patient before beginning, and set up regular appointments.
2. Re-evaluate rehabilitation strategies. Refer your patient to various healthcare professionals to learn active self-management skills, including distraction, goal setting, pacing, exercise, mindfulness meditation and relaxation techniques that are based on cognitive behavioural therapy (see insert *Teaming up against chronic pain*).
3. Be clear with your patient about why you are tapering their opioid dose and what they can expect during the process. Address their fears associated with reducing the dose or stopping, and reassure them you will be there to support them during the entire tapering process. Provide written and verbal information for your patient and their family. Take into consideration your patient's level of anxiety and reassure them you are working together with them to manage their pain.
4. Reduce the dose gradually, taking into consideration the individual person, their history and psychological comorbidities, social support, adverse effects as the opioid dose is reduced and their ability to self-manage.
5. For patients taking opioids long-term, reduce the daily dose by five to ten percent per week or ten to 25% of the starting dose per month according to their tolerance; this generally achieves cessation in three to nine months. Generally, the longer the patient has been taking opioids, the slower the tapering should be.
6. Consider advice from a pain medicine specialist if unsure about the process, or refer to an addiction specialist or a drug and alcohol service in your state if there is a dependency/addiction problem.
7. Review weekly or fortnightly.

Increasing numbers of veterans seeing psychologists

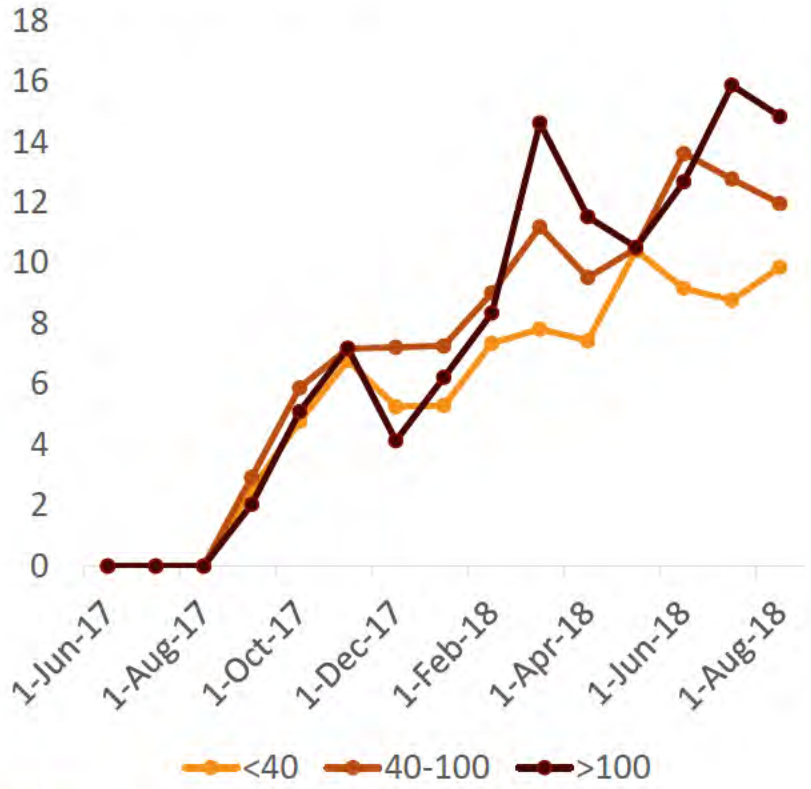
- 240 additional patient months of treatment



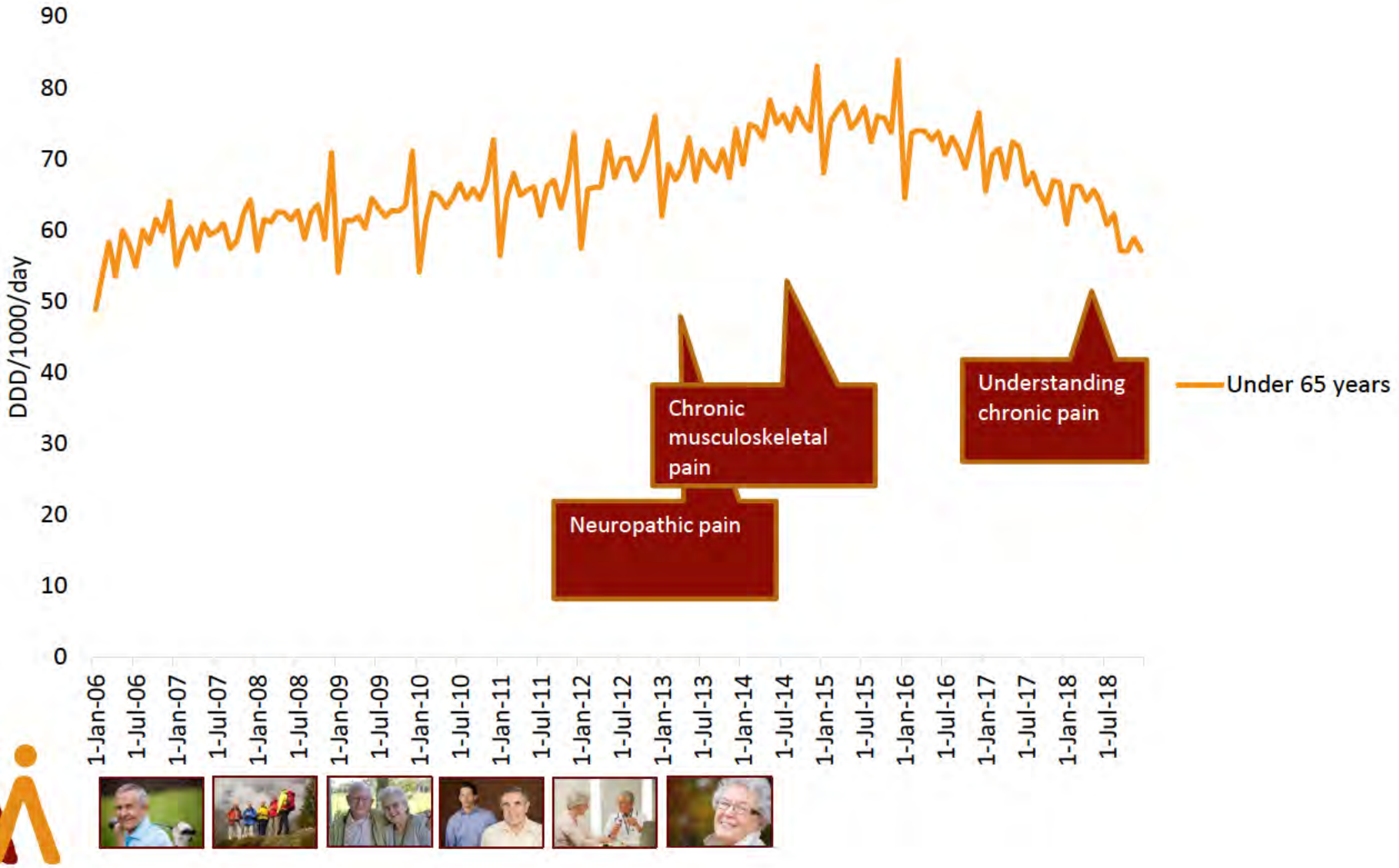
Psychologist claims by age



Psychologist claims by level of opioid use (oral morphine equivalents)



Opioid use is beginning to decline

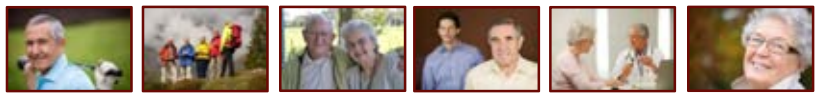


Improving osteoporosis management:

The planning stage

Identifying the problem: detection

- We assessed use of bone mineral density tests among older men and women
  - Less than 10% of women and men 80 years or over had had a bone mineral density test in the previous 5 years
  - Only 2% of older men and 10% of older women on medicines for osteoporosis, while up to 50% in the oldest age groups may have osteoporosis

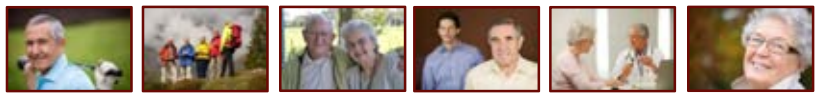


Improving osteoporosis management:

The planning stage

Identifying the problem: falls and fracture

- We assessed patients admitted to hospital for hip fracture
  - 1 in 6 women and 1 in 5 men had had a prior fracture but were not on medicines for osteoporosis
  - 1 in 15 were on corticosteroids and no medicines for osteoporosis
  - 84% on at least 1 medicine that increases risk of fall
  - 50% on 2 or more medicines that increase risk of falls
    - 1 in three were dispensed an antidepressant
    - 1 in four a benzodiazepine
    - 1 in ten an antipsychotic



Leach et al., JPPR; 2013

Kalisch et al., 2012

Reducing the risk of falls & hip fractures

- Our fracture and falls prevention topics were implemented to assist appropriate medicine use and reduce risk of falls or fracture

Stopping osteoporotic fractures

In Australia, osteoporosis and osteopenia occurs in more than 66% of people 50 years and older.[1] Most people are not aware of their own fracture risk and most do not receive appropriate education, screening or management even after they have had a minimal trauma fracture (a fracture after falling from standing height or less).[2-5]

Most people at high-risk are NOT screened

79% MEN **54%** WOMEN

Most people are NOT aware of their fracture risk

60% UNAWARE

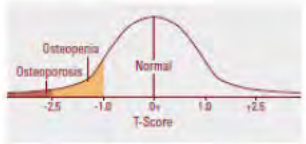
66% of people with osteopenia do not receive appropriate treatment

60% of people with osteoporosis do not receive appropriate treatment

70% of people with a prior fracture do not receive appropriate treatment

The mortality rate in the first 12 months after a hip fracture is 37% for men and 20% for women.[6] Vertebral fractures are associated with significant long-term disability, pain and kyphosis.[7] Early detection and appropriate treatment can reduce the risk of minimal trauma fractures in the future by as much as 70%.[7]

Discrepancies in information often make it unclear as to what is best practice for patients with osteoporosis or osteopenia. This therapeutic brief provides concise and practical information to help identify and treat high-risk patients to prevent a first or second minimal trauma fracture, and to help identify what is available for PBS and MBS reimbursement.



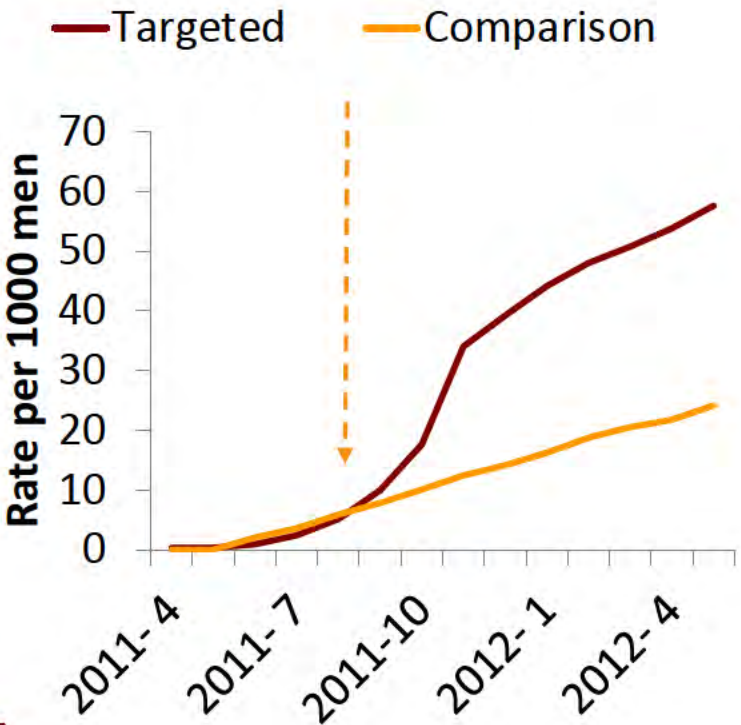
World Health Organisation **diagnostic criteria for osteoporosis, osteopenia and normal bone mineral density. Adapted with permission from *Osteoporosis Australia***

Reducing the risk of falls & hip fractures

What happened?

- ✓ 2.5 fold increase in bone mineral density tests to detect osteoporosis in women; 2.4 fold increase in men
- ✓ 40% relative increase in osteoporosis medicine use in men
- ✓ Similar rates in targeted women compared with older women

Rate of BMD testing (men)



Kalisch Ellett et al. Arch Osteoporos. 2017 Dec;12(1)

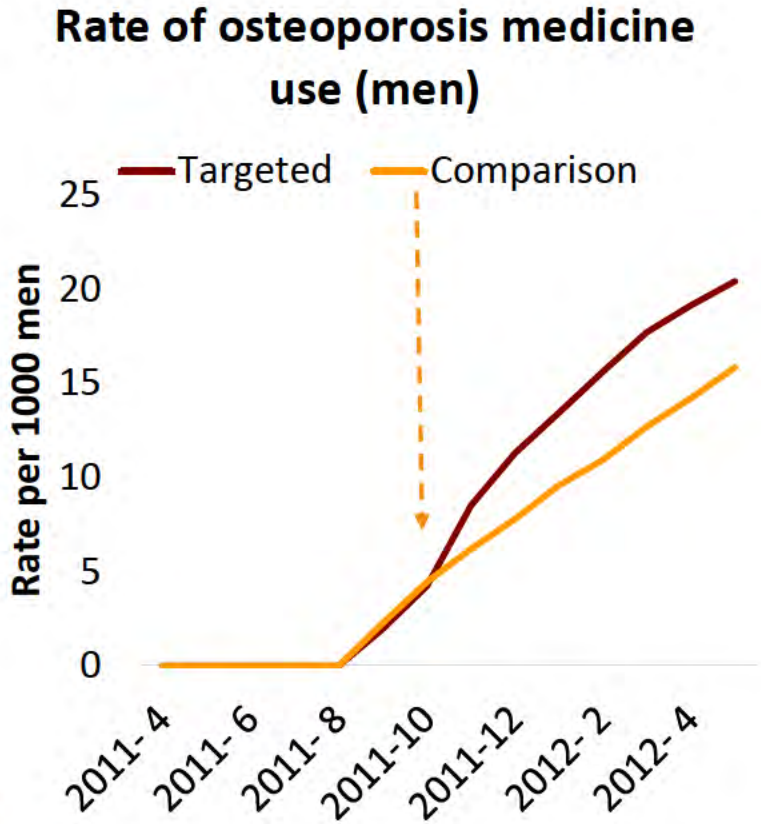
Reducing the risk of falls & hip fractures

What happened?

- 3871 additional veterans received tests for bone mineral density
- 25,832 additional patient months of treatment with medicines for osteoporosis

Health outcomes: Avoided,

- 80-150 fractures avoided^



Kalisch Ellett et al. Arch Osteoporos. 2017 Dec;12(1)

Insomnia management: June 2019

SLEEP WELL, FEEL WELL

Our overall health needs a good night's sleep - we feel less stress, are better able to concentrate and remember things, have lower blood pressure, and healthier immunity. An occasional bad night's sleep isn't a problem; it happens to us all. When we have trouble sleeping for more than a week or two, it can start to affect our day-to-day life.

There are effective treatments for insomnia and other sleep-related problems, and many veteran specific supports available to you if you are having trouble sleeping.

This brochure gives you information to help you understand what healthy sleep is, when it's best to seek help for a sleeping problem and which treatments are most helpful.

Insomnia is when you have trouble falling asleep, staying asleep or you wake early in the morning and have trouble going back to sleep. Chronic insomnia is when this happens on at least 3 nights a week for 3 months.

What is healthy sleep?

Healthy sleep occurs in a series of 90 to 120 minute cycles. Each cycle has different stages of sleep ranging from a light sleep to a deep sleep. Each cycle includes rapid eye movement (REM) sleep, when dreaming is more likely. It is normal to be awake for a short period of time between each cycle. You may or may not remember being awake.

The amount of sleep we need changes with age. Most adults need 7 to 9 hours of sleep each night. Sleeping less is normal as we get older. The sleep cycles also include less deep sleep and more light sleep. Despite these changes, older people are able to function well in daily life.

Resources for veterans

Cognitive behavioural therapy for insomnia (CBTi)

- 'The Healthy Sleeping tool' provides advice and tips for improving sleep, and is available on the DVA *High Re*
  https://at-ease.dva.gov.au/highres/#!/tools/healthy-sleeping
- *Open Arms – Veterans and Families Counselling*
  - veterans and their immediate family members may access free confidential mental health support service
    1800 011 046 or go to: www.openarms.gov.au
  - the webinar 'Sleep Disturbance – Getting a good night's sleep' can be viewed at:
    https://www.youtube.com/watch?v=AKlSyfXTlxM&
  - The 'Sleeping Better program' aims to assist DVA patients understand the sleep process and how to effect
    sleep disturbances at: www.vvcs.gov.au/Services/GroupPrograms/sleeping-better.htm
- *Sleep Health Foundation* provides a range of factsheets about sleep and how to overcome sleep disturbance
  www.sleephealthfoundation.org.au

Apps that may be helpful

- *CBTi Coach* is a free smartphone app developed by the US Department of Veterans Affairs, designed to be us
  conjunction with face-to-face therapy. It is available from iTunes on the App Store for iOS devices and from G
- The *High Res* App helps veterans and families manage daily stresses and transition to civilian life, available on t
  website at: http://at-ease.dva.gov.au/veterans/resources/mobile-apps/high-res-app/

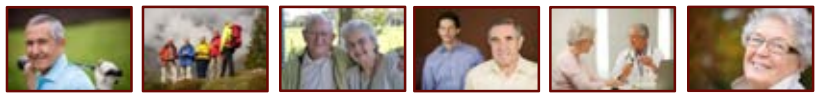
Veterans' MATES

https://www.veteransmates.net.au/cbti-health

Our research

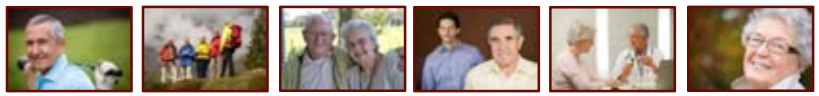
Collaborating with veterans to address issues of concern to them

- Veterans and DVA came to us with the question is post-traumatic stress disorder a risk for dementia in Australian veterans



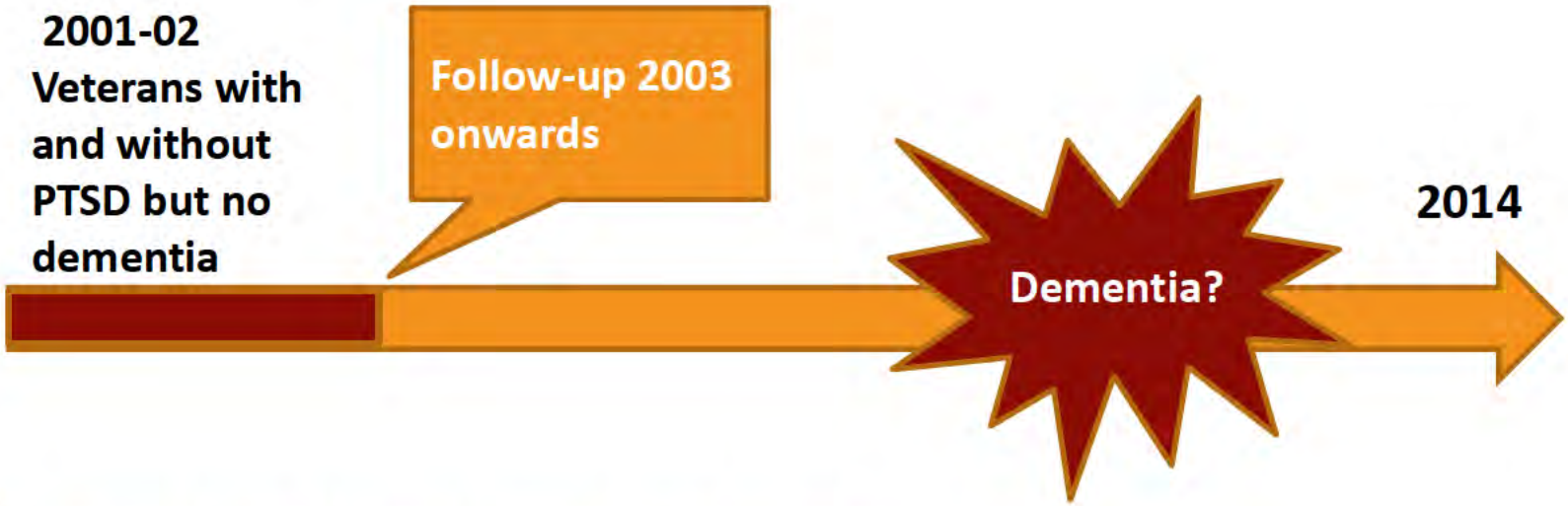
What was known?

- A number of US studies have suggested patients with PTSD had almost a doubling in risk of developing dementia
- The previous research included veterans 65 years and over, some of whom may have been in the early phases of dementia.

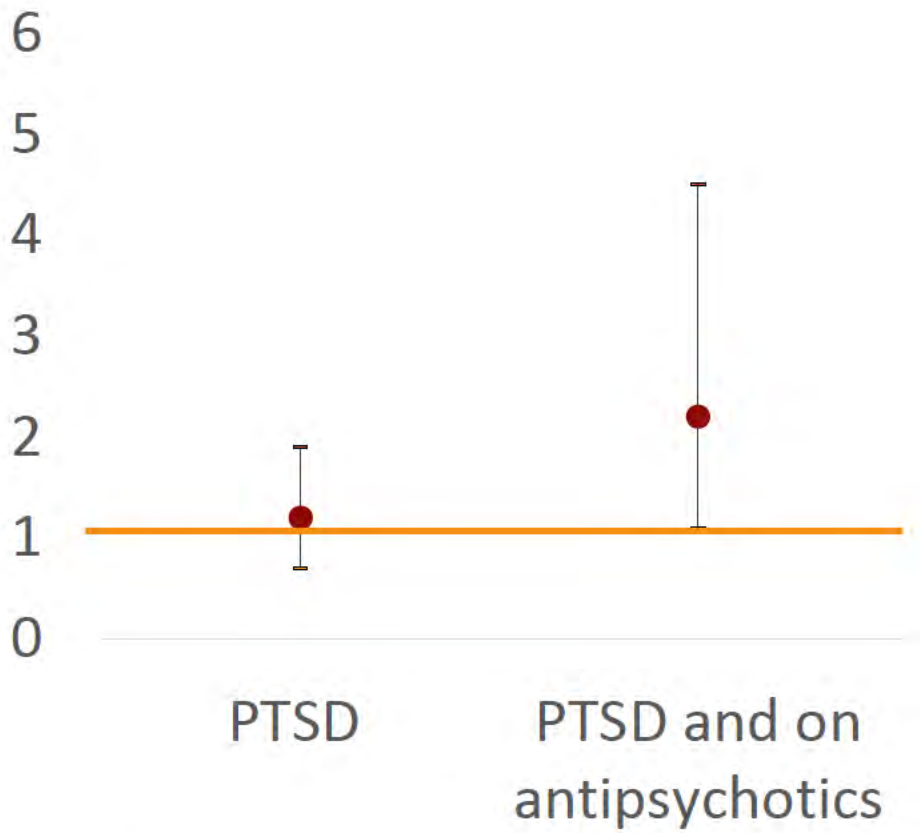


Clauston et al, Alzheimers Dement. 2016
Wang et al., J Affect Disord. 2016
Meziab et al., Alzheimers Dement 2014
Qureshi et al. JAGS 2010
Yaffe et al. Arch Gen Psychiatry 2010

What did we do?



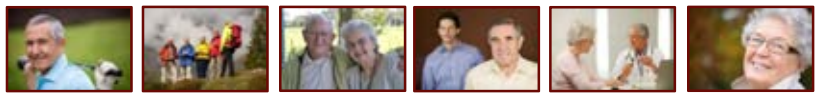
What did we find?



s 47F et al. J Am Geriatr Soc. 2017
Mawanda et al., J Am Geriatr Soc 2017

What does it mean?

- For the majority of veterans who suffer or have had post-traumatic stress there is no evidence of elevated risk of dementia



The factors contributing to our success

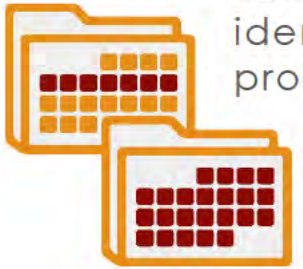
A multidisciplinary, collaborative approach

Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

Significant stakeholder engagement



Only target identified problems

Grounded in behavioural theories and models

Australian Government
Department of Veterans' Affairs

Veterans' MATES

15 years of translating the evidence into practice:

s 47F

VTs 47F NS 47F AS 47F JS 47F Ms 47F Ks 47F JS 47F Es 47F Ns 47F
Ls 47F s 47F As 47F Es 47F

Quality Use of Medicines and Pharmacy Research Centre, University of South Australia, SA

What is Veterans' MATES?

- A data driven health promotion program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.

- Funded by the Australian Government Department of Veterans' Affairs since 2004

- Provided by University of South Australia in partnership with

  University of Adelaide
  Australian Medicines Handbook
  Drug & Therapeutics Information Service
  NPS MedicinesWise
  HealthLink

Translating the evidence into practice: The Veterans' MATES approach

We take a Big Data Source

To identify health care issues and trends

Pinpoint those who would benefit from an intervention and provide individually tailored recommendations

And then measure the impact of the intervention

Australian Government Department of Veterans' Affairs routinely collected health claims data

1/2 BILLION

Contains over half a billion health claims records

10 YEARS

More than ten years of historical health data

Contains hospital records including diagnosis and procedures

Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

Client data are updated weekly, health claims data are updated monthly

Add ongoing community consultation and engagement

Veteran and practitioner reference groups provide advice and feedback

A multidisciplinary clinical reference group provides clinical expertise and refines the evidence-based message

A national representative editorial committee provides guidance and endorsement

And ensure everything we do is underpinned by frameworks that promote learning and behavior change

Social Cognitive Theory and the Transtheoretical Model of health behaviour change explain how individuals are likely to acquire and maintain new behavioural patterns over time

The PRECEDE-PROCEED health promotion model provides a framework that supports effective planning and implementation of the program within the wider environment

Translating the evidence into practice: The Veterans' MATES process

Four times a year GPs receive information about the veterans they treat who may have the targeted medication or health-related problem. The information includes:

A list of the patient's relevant medicines and health services

Notes identifying the potential problems

The opportunity for GPs to note the actions they will take

Supportive evidence based educational material

Access to a clinical support phone line staffed by pharmacists, and the Veterans' MATES website www.veteransmates.net.au

Veterans receive information specifically tailored for the veteran community

Supportive veteran tailored educational material and tools. Information is also available online

+

Access to a clinical support phone line staffed by pharmacists, and the Veterans' MATES website www.veteransmates.net.au

And pharmacists and other members of the health care team receive supportive evidence based information

Translating the evidence into practice: Chronic Pain

Identifying the problem: how many veterans are chronic opioid users?

Pinpointing those who would benefit from an intervention

40%

More than 40% of younger veterans who were continuous users of opioid medicines were also being treated for depression

40%

More than 40% were also being treated for anxiety

1 in 5

Less than 1 in 5 had a psychologist consultation in the last year

Providing individually tailored recommendations and supportive evidence based educational material for health professionals

Steps to tapering and ceasing opioid therapy[20, 25, 26, 36-38]

1. Negotiate and agree upon a plan for tapering and ceasing, including the tapering rate, with your patient before beginning, and set up regular appointments.
2. Re-evaluate rehabilitation strategies. Refer your patient to various healthcare professionals to learn active self-management skills, including distraction, goal setting, pacing, exercise, mindfulness meditation and relaxation techniques that are based on cognitive behavioural therapy (see insert *Teaming up against chronic pain*).
3. Be clear with your patient about why you are tapering their opioid dose and what they can expect during the process. Address their fears associated with reducing the dose or stopping, and reassure them you will be there to support them during the entire tapering process. Provide writ your patient and their family. Take into considera and reassure them you are working together w
4. Reduce the dose gradually, taking into consi their history and psychological comorbidities, as the opioid dose is reduced and their ability
5. For patients taking opioids long-term, reduce percent per week or ten to 25% of the starti to their tolerance; this generally achieves ces Generally, the longer the patient has been ta tapering should be.
6. Consider advice from a pain medicine specia or refer to an addiction specialist or a drug ar if there is a dependency/addiction problem.
7. Review weekly or fortnightly.

Box 1. The Pain Catastrophising Scale (PCS)[14]

The PCS, a 13 item questionnaire that you can work thr can be completed in less than five minutes, and provide patient thinks about when they are in pain.[14]

A total score of 30 or more represents a clinically relevan If the score is high, consider referring your patient to a ps can talk to your patient about what this means and how i of pain. They can help reduce fears and change the way t

Research shows that catastrophic thinking associated wi using multimodal interventions, including education, inst management strategies and physical activity.[14]

The PCS can be accessed at: https://www.worksafe.vic.gov.au/__data/assets/pdf_file/0018/10953/pain_catastrophizing_scale.pdf

Doctor Name

Veteran name	**SUBURB:**	**ACCOMMODATION: Community**

Medicine	Last Dispensed	Other Prescriber
Oxycodone hydrochloride (OxyNorm) Cap 10mg	12/06/17	no
Tramadol hydrochloride (Tramal SR 50) modified release tab 50mg	30/05/17	no
Nitrazepam (Mogadon) Tab 5mg	25/04/17	yes

Home Medicines Review claimed:	none claimed in the last two years

Daily average Oral Morphine Equivalent (OME) per month (mg)

July 16	Aug 16	Sept 16	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	March 17	April 17	May 17	June 17
0	0	0	0	0	10	10	22	27	30	30	27

PLEASE CONSIDER THE REVIEW POINTS BELOW:**

Patient received opioid therapy for longer than three months

Suggested actions:

- Review use of opioid, taper the dose and cease where appropriate ☐ Yes
- Help patient understand how pain works and consider referral to an appropriate allied healthcare team to support this ☐ Yes

Rationale: Current guidelines suggest that there is no evidence to support the long-term use of opioids as effective in resolving chronic pain or improving function. Opioid therapy for longer than 90 days is associated with continuing use, opioid use disorders, overdose and worse functional status.

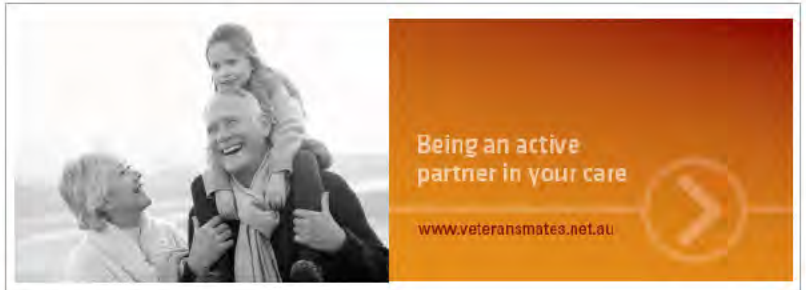
Patient co-prescribed a benzodiazepine

Suggested actions:

- Review use of opioid ☐ Yes
- Review use of benzodiazepine ☐ Yes

Rationale: Current guidelines suggest that this combination can depress the central nervous system and increases the risk of death by 15 fold compared to taking neither medicine.

Providing supportive evidence based educational material for veterans



Being an active partner in your care

www.veteransmates.net.au

PART 1: UNDERSTANDING YOUR PAIN CAN HELP TO EASE YOUR PAIN

Most people think of pain as a result of an injury or a disease, but pain can occur with or without either. Pain usually resolves before tissues have fully healed, but for some people pain persists even after tissues have healed - it's called chronic or persistent pain.

An estimated one in five Australians live with persistent pain. It can make daily life a struggle. But by understanding your pain and taking an active role in strategies tailored to you, daily life can improve. Don't give up; it might take some time to find out what works for you. The first step is to learn more about pain and how your pain is unique to you.

This is the first part of a two part series. Part 1 introduces you to how pain works, and to the people who can help you take an active approach to managing your pain. Part 2 helps you identify the things that impact on your pain, and how to change them.

Five key facts in understanding pain

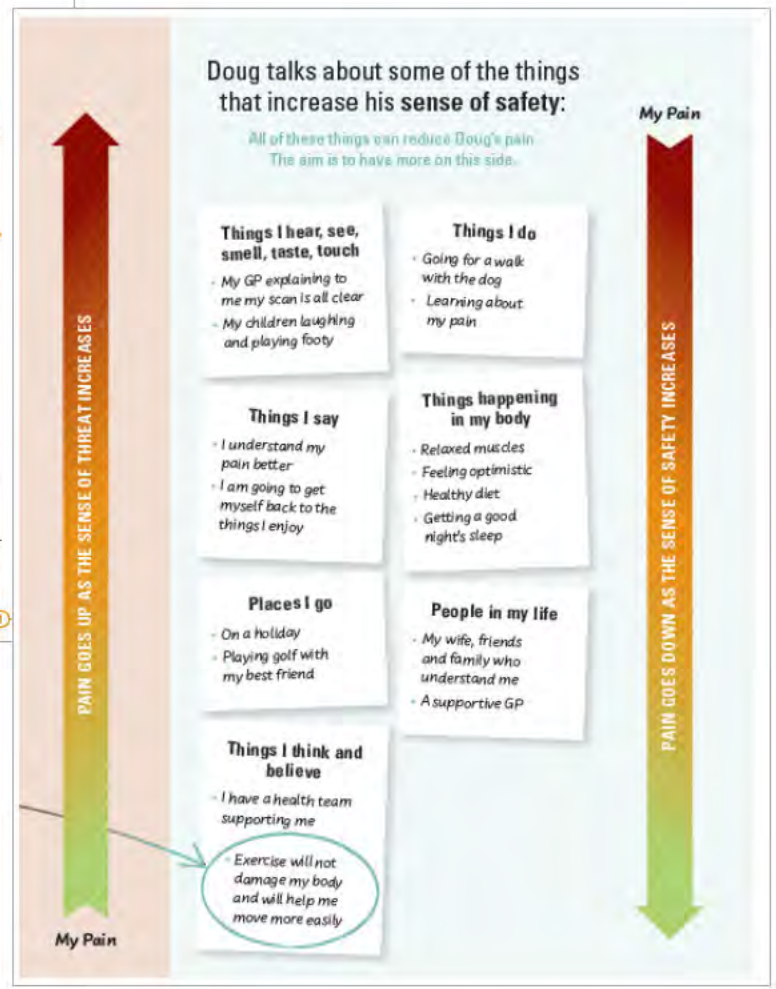
Research has shown that by learning about how pain works, you can reduce it and improve daily life.[1] Here are five key facts to help you understand your pain better:

1. Pain is always real

Pain is always real whether or not it is associated with physical damage. Pain is never 'all in your head'. It is always a real experience that can have a big impact on day-to-day life.

1. Louw A, Zimney K, Puentedura E, Diener I. Physiotherapy theory and practice. 2016; 32: 332-355. https://www.ncbi.nlm.nih.gov/pubmed/27351541

Veterans' Medicines Advice and Therapeutics Education Services. September 2012



What happened to veterans with chronic pain?

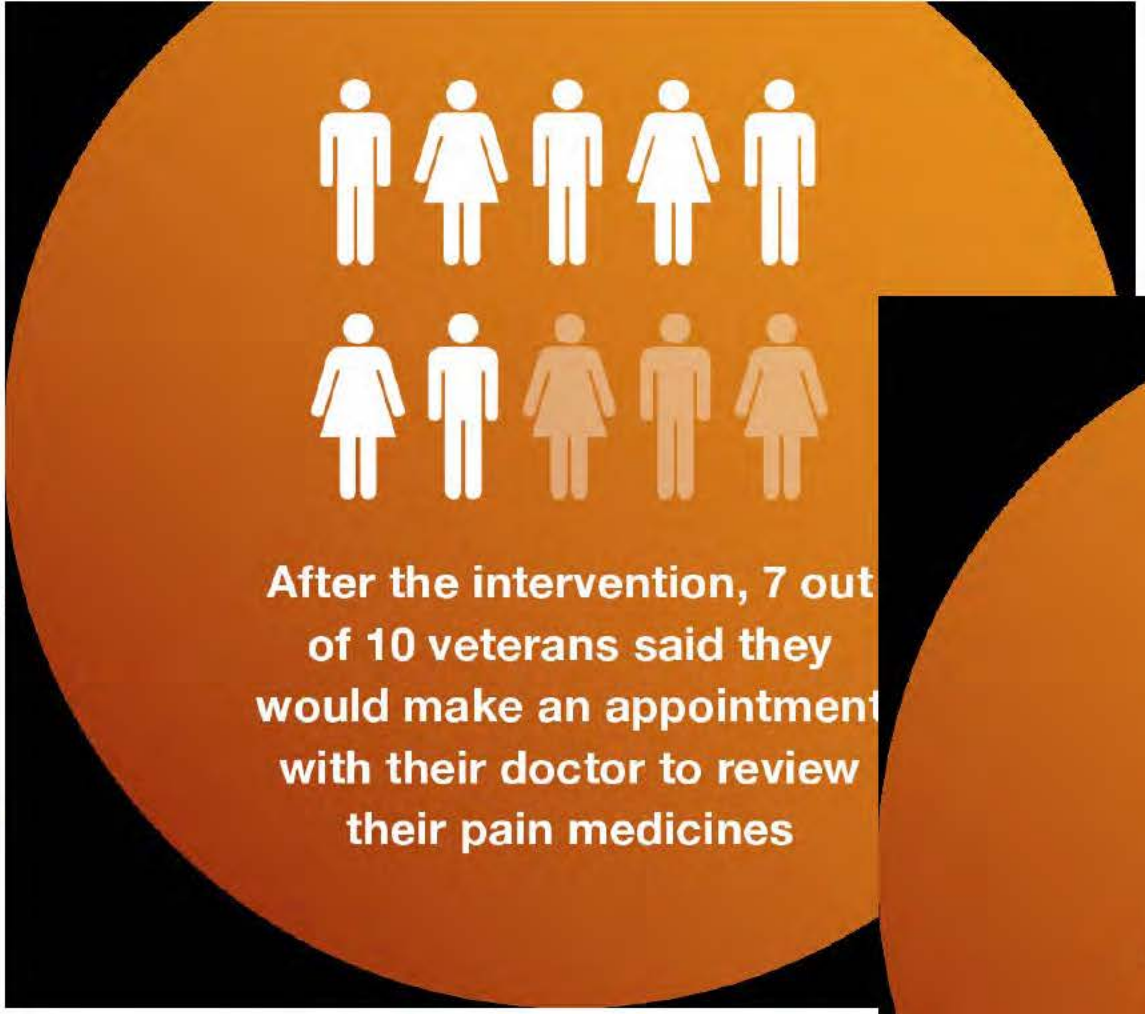
Pain

8,500
general
practitioners

8,300
pharmacists

690
psychologists

13,900
veterans

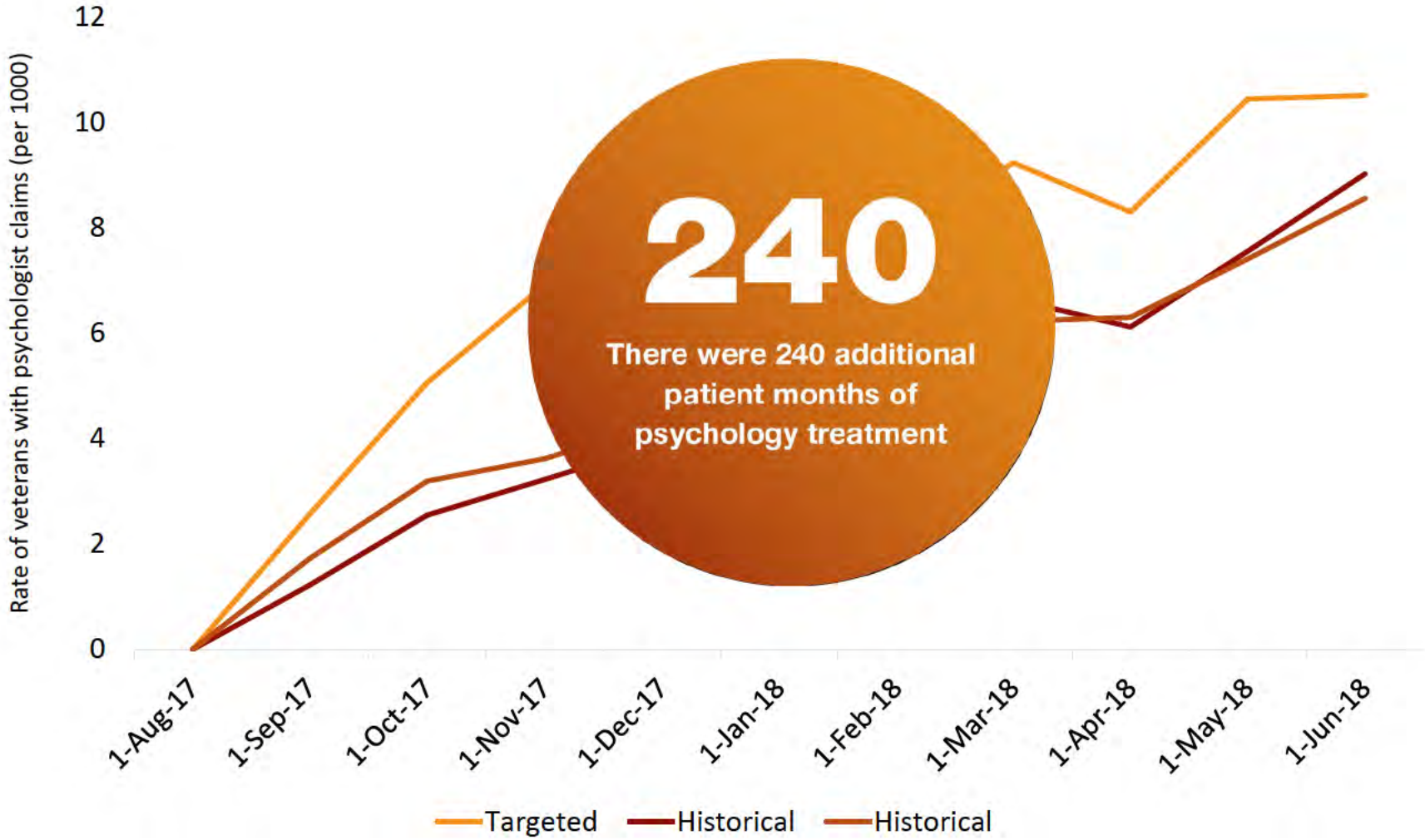


After the intervention, 7 out of 10 veterans said they would make an appointment with their doctor to review their pain medicines

After the intervention, 7 out of 10 general practitioners said they were very likely to incorporate pain neuroscience education in a plan for their patient

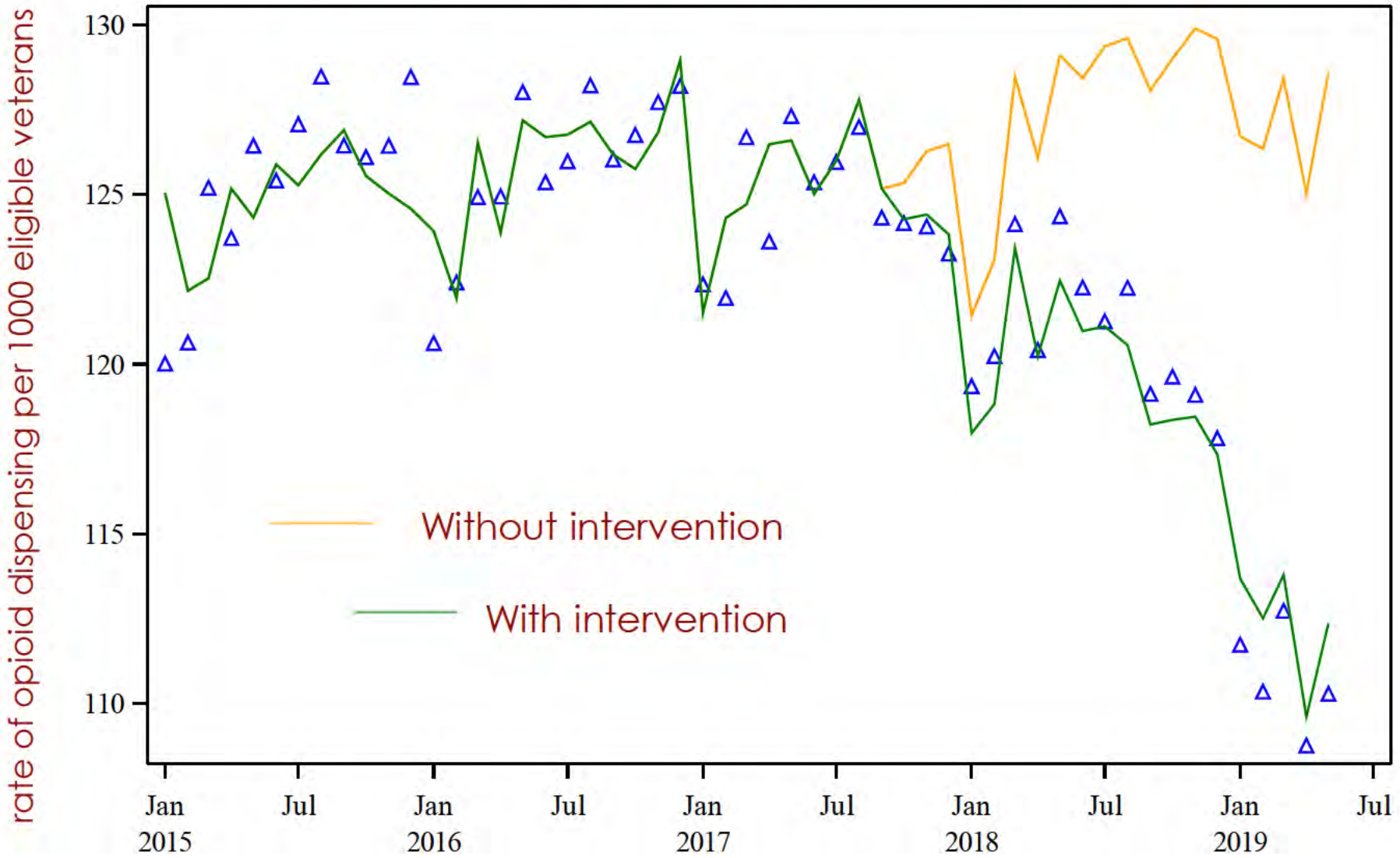
Pain

Increasing numbers of veterans seeing psychologists



Pain

Rate of opioid dispensing reduced



What happened to veterans in other targeted interventions?

Osteoporosis

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Therapeutic Brief

www.veteransmates.net.au

June 2018

Stopping osteoporotic fractures

In Australia, osteoporosis and osteopenia occurs in more than 66% of people 50 years and older.[1] Most people are not aware of their own fracture risk and most do not receive appropriate education, screening or management even after they have had a minimal trauma fracture (a fracture after falling from standing height or less).[2-5]

Most people at high-risk are NOT screened

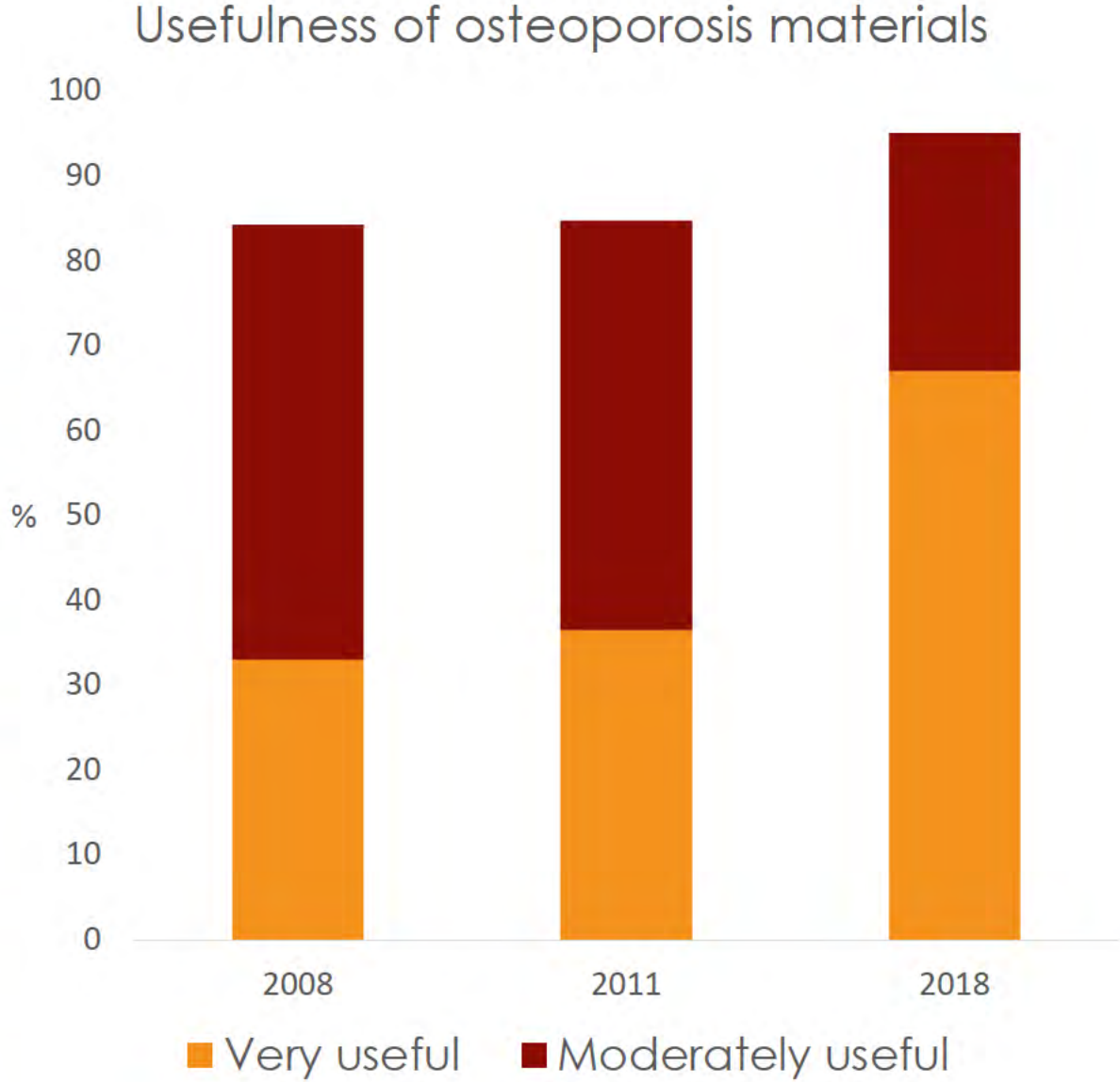
79% MEN **54%** WOMEN

Most people are NOT aware of their fracture risk

60% UNAWARE

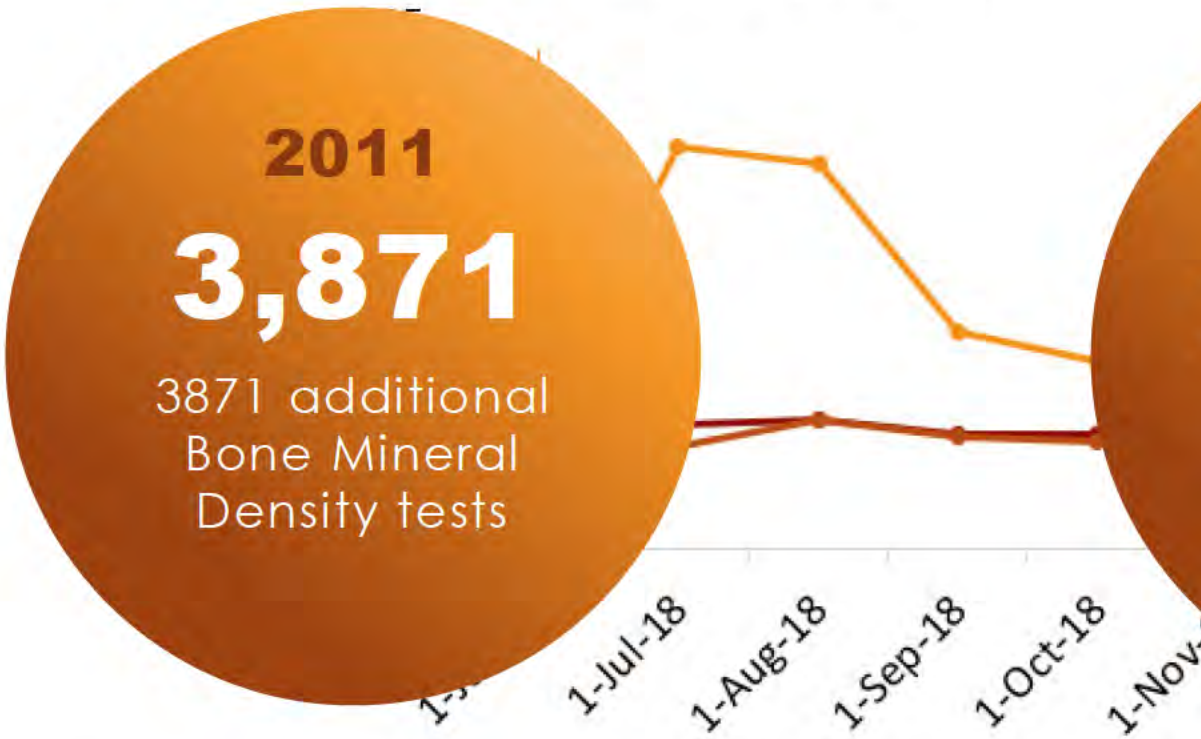
Inside

- Identify high-risk patients
- Start osteoporosis medicines
  - To treat minimal trauma fractures
  - To treat high-risk patients
  - To reduce future fractures
- Educate patients, especially men
  - Talk about medicines
  - Talk about exercise
  - Talk about other risk factors
  - Talk about involving a multidisciplinary team
  - Talk about their fracture risk
- What's happening with the latest research

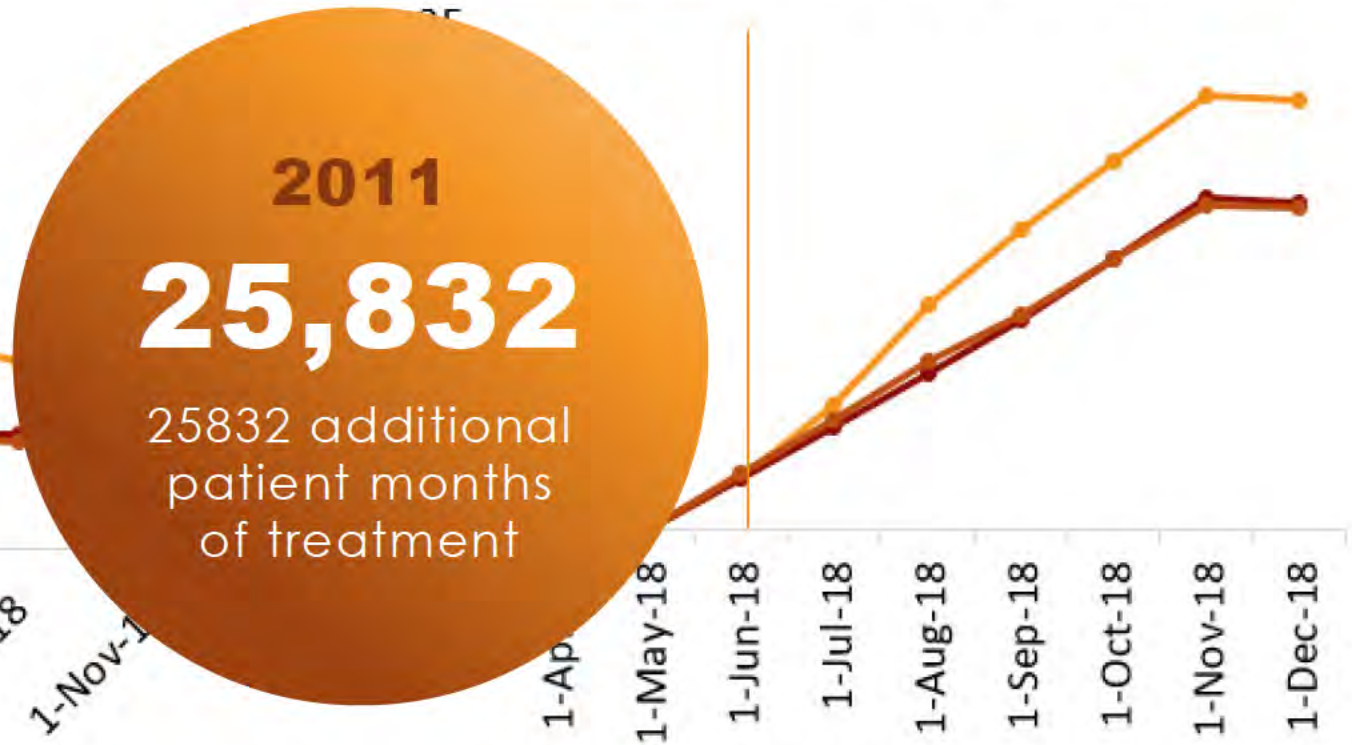


Osteoporosis

Rate of veterans with BMD test claims (per 1000)

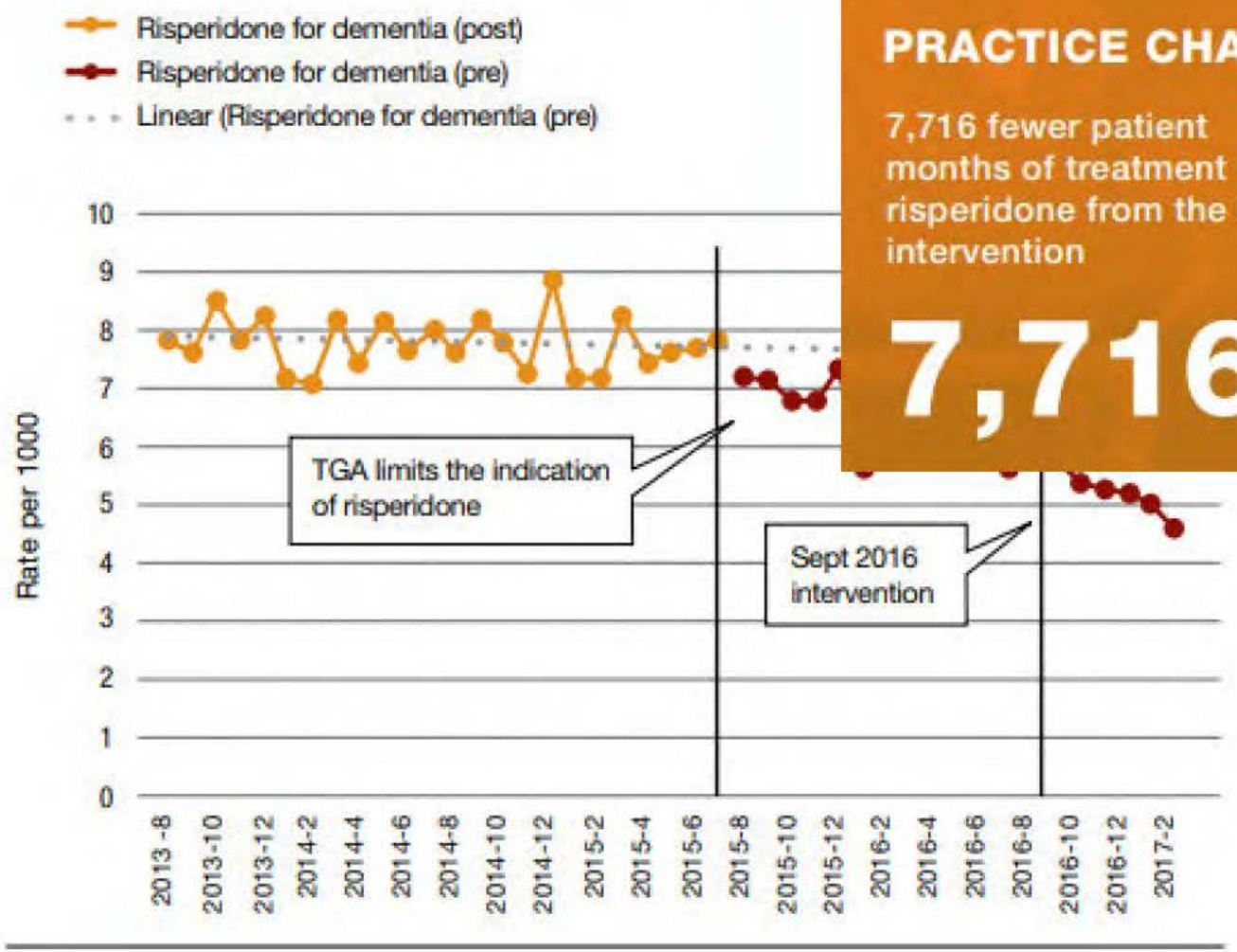


Rate of veterans treated with denosumab or bisphosphonates



Antipsychotics in dementia

RATE OF VETERANS AGED 65 YEARS AND OVER PER MONTH WHO HAVE BEEN DISPENSED RISPERIDONE FOR DEMENTIA



PRACTICE CHANGE

7,716 fewer patient months of treatment with risperidone from the initial intervention

7,716

HEALTH OUTCOMES AVOIDED*

216 hospital admissions for pneumonia

216

70 hip fractures

70

70 cerebrovascular events

70

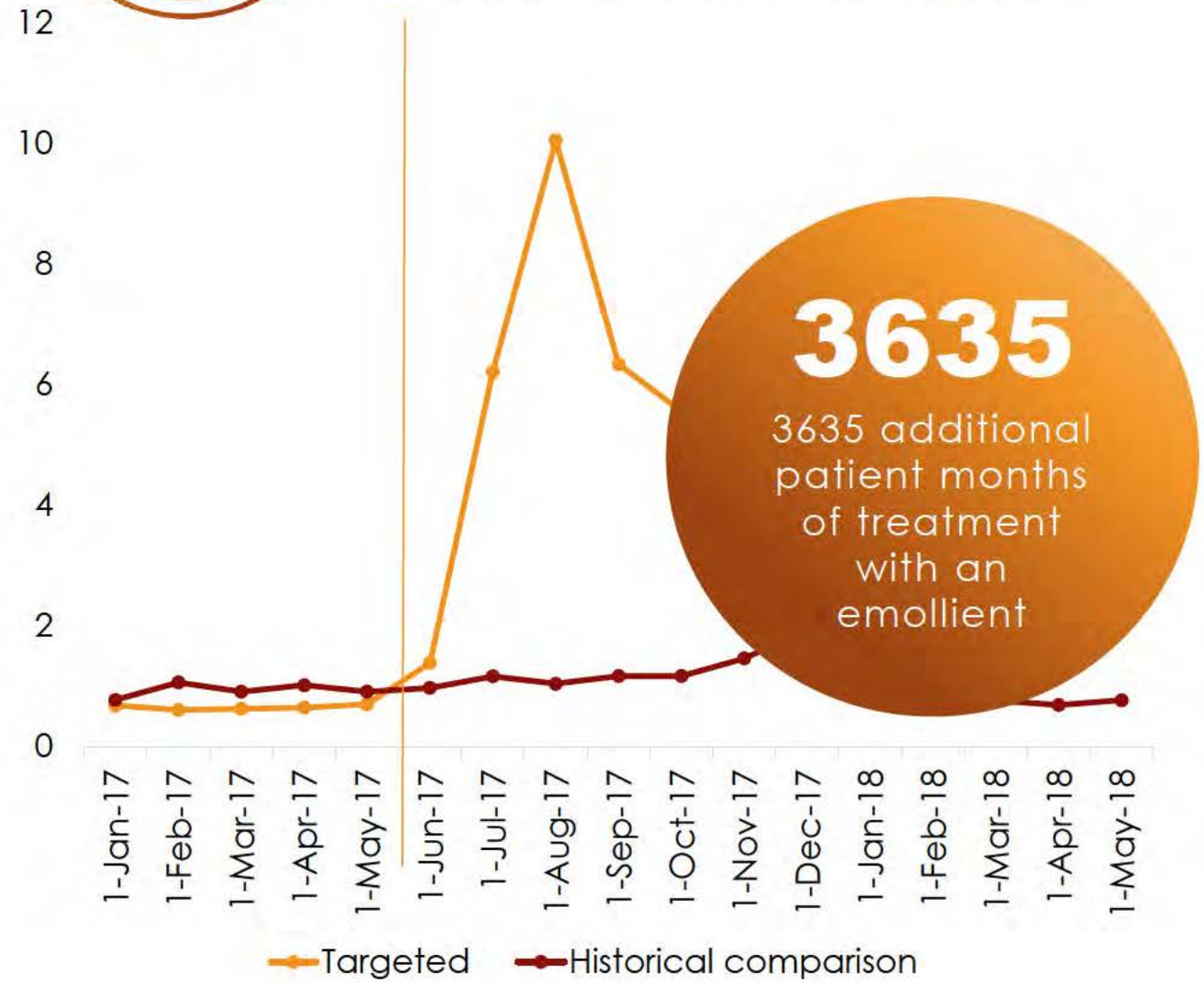
41 premature deaths

41

*Numbers based on Veterans' MATES analysis and published literature.

Skin tears in the elderly

Emollient - Lotion rate per 1000



Looking after a skin tear: know the basics

1. In most cases, it is best to see a doctor or health professional for advice.
2. Always start by washing your hands thoroughly, and drying with a clean towel.
3. Stop any bleeding by gently pressing a clean dry towel against the wound. Talk to your doctor if the bleeding does not stop after 10 minutes.
4. After the bleeding has stopped, rinse the wound well with cold running water. Drinkable tap water is fine. Don't use soap.
5. Gently remove any dirt with a soft, clean, moist cloth. See your doctor if you are unable to gently remove all the dirt from the wound.
6. After cleaning, gently pat dry with a soft clean cloth.
7. If there is a loose flap of skin, carefully place the flap back over the wound without stretching the skin.
8. Cover the wound with a non-stick dressing pad (see Diagram 1 for instructions). Ask your doctor or pharmacist for advice on an appropriate dressing as some dressings can make the skin tear worse.
9. Keep the bandage on until the wound is completely healed – this is usually five to seven days.
10. Change the bandage if it becomes loose, wet, or dirty. Dressings suitable for skin tears are not waterproof and need to be kept dry.
11. Remove dressings gently and slowly. To avoid further damage to the skin, take care to remove in the opposite direction to the skin flap (see Diagram 2 for instructions). If the dressing sticks to the skin, try dabbing the edges with damp paper towel.

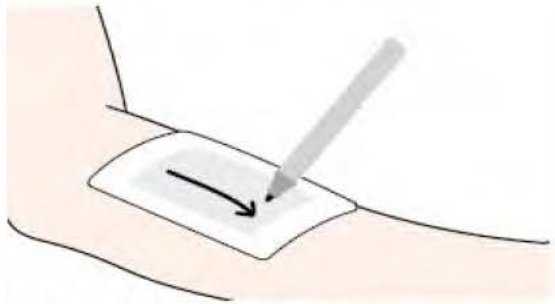


Diagram 1: Dressing your skin tear

Cover the wound with a non-stick dressing pad. Draw an arrow on the top of the dressing to indicate the direction for removing. The arrow should be pointing in the same direction as the edge of the skin flap.

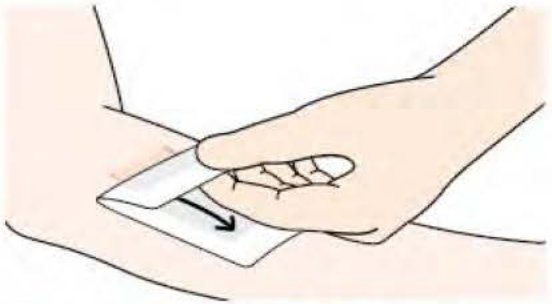
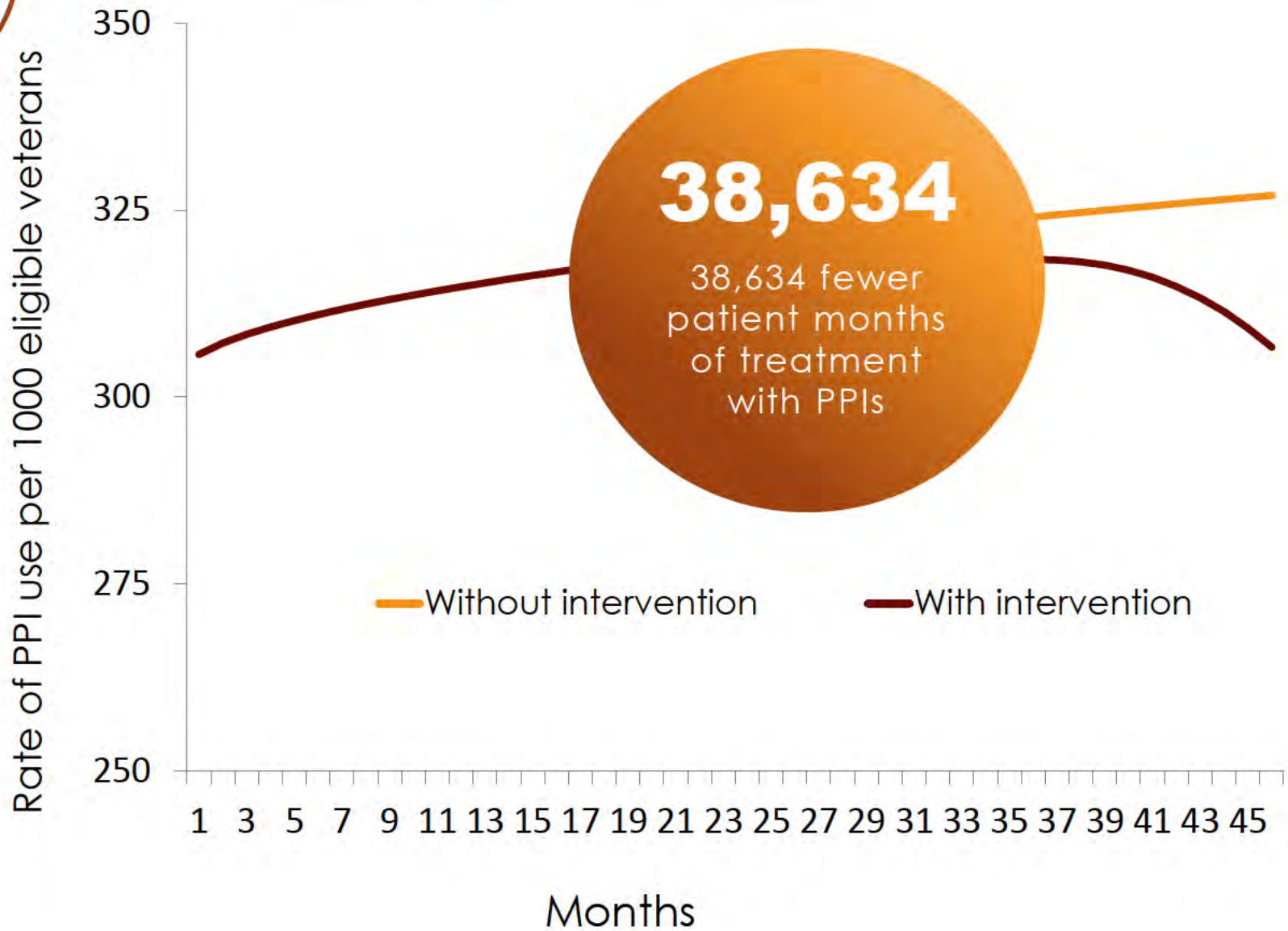


Diagram 2: Safe removal of the dressing

Remove the dressing slowly and close to the skin, using the arrow to guide you. **Never pull against the direction of the skin flap.**

Proton Pump Inhibitors



So what have we learned?

The factors that contribute to Veterans' MATES success

A multidisciplinary, collaborative approach

Clinical information is evidence based

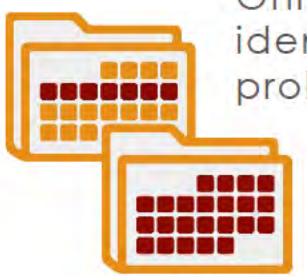
Methodologically rigorous analytics

Independently audited data and security standards

Continuous Research & Innovation

Significant stakeholder engagement

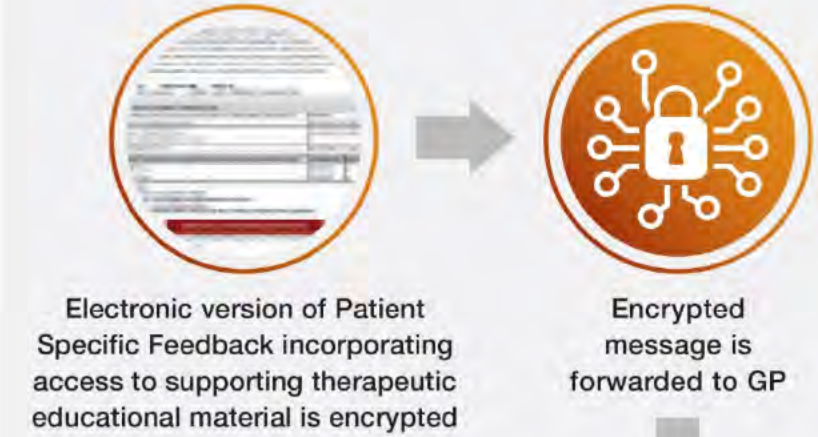
Grounded in behavioural theories and models



Only target identified problems

In 2019 we have investigated...

Electronic delivery to General Practitioners



Implementation techniques on engagement

Doctor's name

Veteran's name	SUBURB: XXXX	ACCOMMODATION: Community

Medicine	Last Dispensed	Other Prescriber
Oxycodone hydrochloride (OxyNorm) Cap 10mg	12/06/17	no
Tramadol hydrochloride (Tramal SR 50) modified release tab 50mg	30/05/17	no
Nitrazepam (Mogadon) Tab 5mg	25/04/17	yes

Home Medicines Review claimed:	none claimed in the last two years

Daily average Oral Morphine Equivalent (OME) per month (mg)

July 16	Aug 16	Sept 16	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	March 17	April 17	May 17	June 17
0	0	0	0	0	10	10	22	27	30	30	27

PLEASE CONSIDER THE REVIEW POINTS BELOW:*

Patient received opioid therapy for longer than three months

Suggested actions:

- Review use of opioid, taper the dose and cease where appropriate ☐ Yes
- Help patient understand how pain works and consider referral to an appropriate allied healthcare team to support this ☐ Yes

Rationale: Current guidelines suggest that there is no evidence to support the long-term use of opioids as effective in resolving chronic pain or improving function. Opioid therapy for longer than 90 days is associated with continuing use, opioid use disorders, overdose and worse functional status.

Patient co-prescribed a benzodiazepine

Suggested actions:

- Review use of opioid ☐ Yes
- Review use of benzodiazepine ☐ Yes

Rationale: Current guidelines suggest that this combination can depress the central nervous system and increases the risk of death by 15 fold compared to taking neither medicine.

*An electronic PDF version of each individual patient's information is available at www.veteransmates.net.au
** Based on dispensings of medicines in the 12 month period July 2016 to June 2017 according to the DVA Health Claims Database. See therapeutic brief for references.

The inclusion of goal setting strategies

The use of prompts

Veterans' MATES
is funded by the
Australian Government
Department of Veterans' Affairs
and provided by
The University of South Australia

www.veteransmates.net.au

Veterans' MATES

Bridging the evidence practice gap to improve medicine use and health outcomes for veterans

Libby Roughead

University of South Australia | Sansom Institute for Health Research

Australian Government
Department of Veterans' Affairs





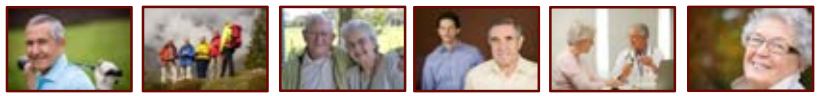

What is Veterans' MATES?

Funded since 2004 by the Australian Government Department of Veterans' Affairs (DVA),

- Veterans' MATES provides up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team.

Collaborative partnership between

- University of South Australia,
- Discipline of General Practice University of Adelaide,
- Discipline of Public Health University of Adelaide,
- NPS Medicine Wise,
- Drug and Therapeutics Information Service,
- Australian Medicines Handbook,
- Repatriation Hospital Daw Park.



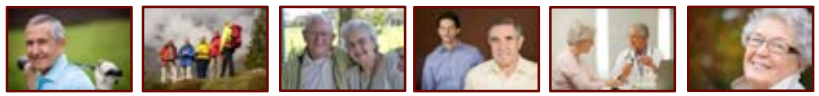
The Veterans' MATES approach

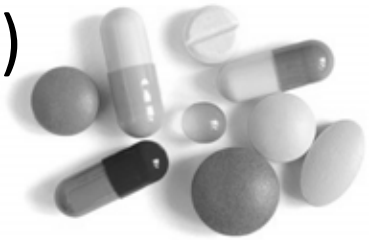
Every three months a chosen health topic is distributed:

- A letter, patient-based feedback and educational material are sent to the veteran's main GP.
- A letter and educational material are sent to pharmacists and other relevant health professionals.
- A letter and educational material is sent to members of the veteran community for whom the health topic is relevant.

Health claims data are central to the program

- Australian Government Department of Veterans' Affairs health claims data
- Treatment population of approximately 215,000 veterans; mean age is 76 years, with five co-morbidities
- Data over ten years – pharmacy, medical and allied health records (no diagnosis, includes GP visits, radiology, pathology etc)
- Hospital records (diagnosis and procedures)





Using the health claims data

Planning stage

- Medication-related problem analysis to identify the evidence practice gap
  - Module topic selected

Development & Implementation stages

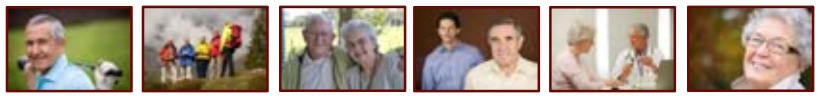
- Patient specific feedback & evidence based information developed
  - Topic implementation

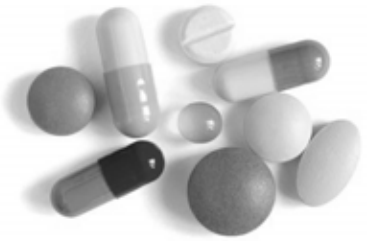
Evaluation stage

- Evaluation

Evidence is tailored to the practice change gap and process includes significant stakeholder engagement

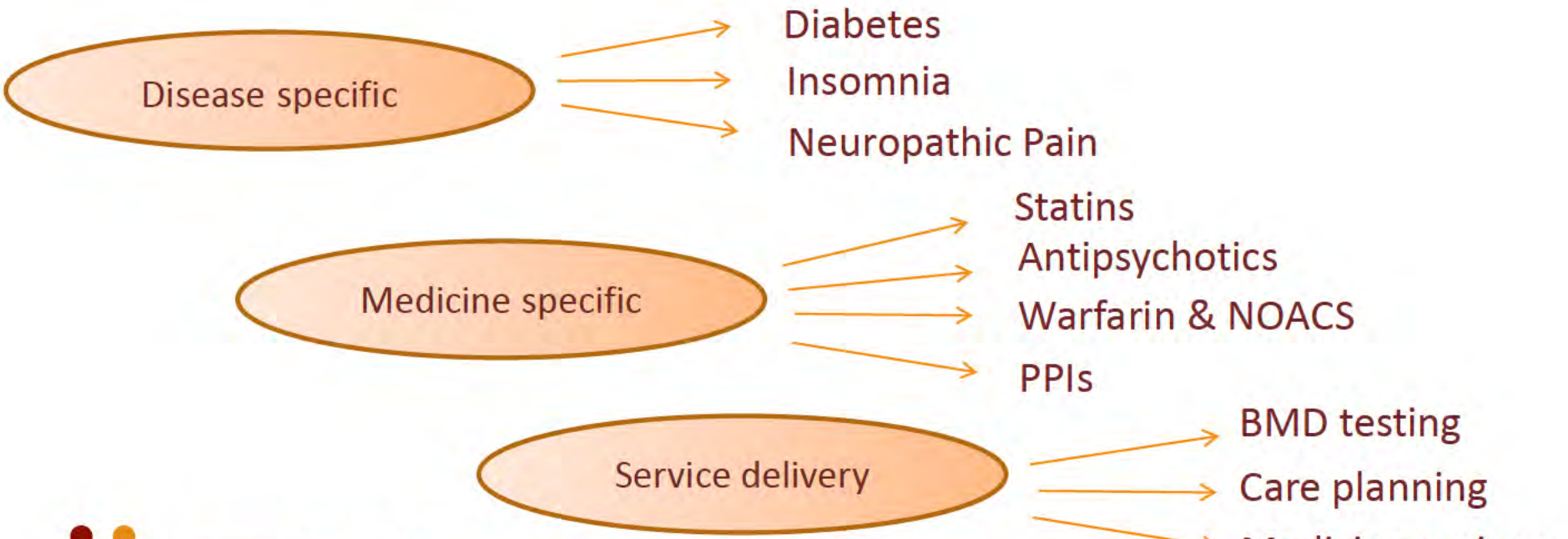
- Program is underpinned by behavioural theory
- Practitioner reference group and Veteran reference group meet twice yearly to provide advice
- Materials written by a medical writer supported by clinical reference group
- Peer-reviewed prior to publication
- Endorsed by a national, representative editorial committee
- National call centre available for follow-up with health practitioners and veterans





The Veterans' MATES approach

- To date 38 topics delivered:



So what happens to our veterans?

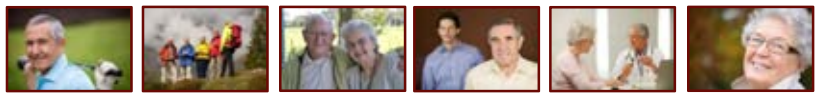




Veterans' MATES highlights

Reducing the risk of falls & hip fractures

- Falls can impact lifestyle, confidence and independence and can result in major injuries including hip fractures
- Our medication-related problem analyses had highlighted a number of issues
  - Potential under-treatment of osteoporosis
  - Potential overuse of sedative medicines and antipsychotics
- Our fracture and falls prevention topics were implemented to assist appropriate medicine use and reduce risk of falls or fracture

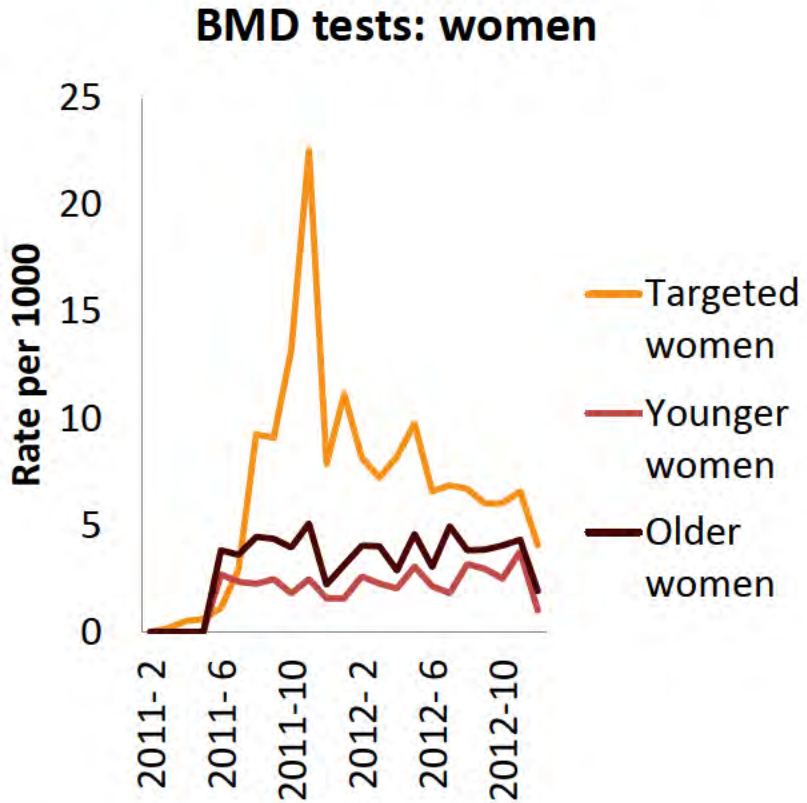


Veterans' MATES highlights

Reducing the risk of falls & hip fractures

So what happened?

- ✓ 2.5 fold increase in bone mineral density tests to detect osteoporosis in women; 2.4 fold increase in men
- ✓ 40% relative increase in osteoporosis medicine use in men
- ✓ Similar rates in targeted women compared with older women

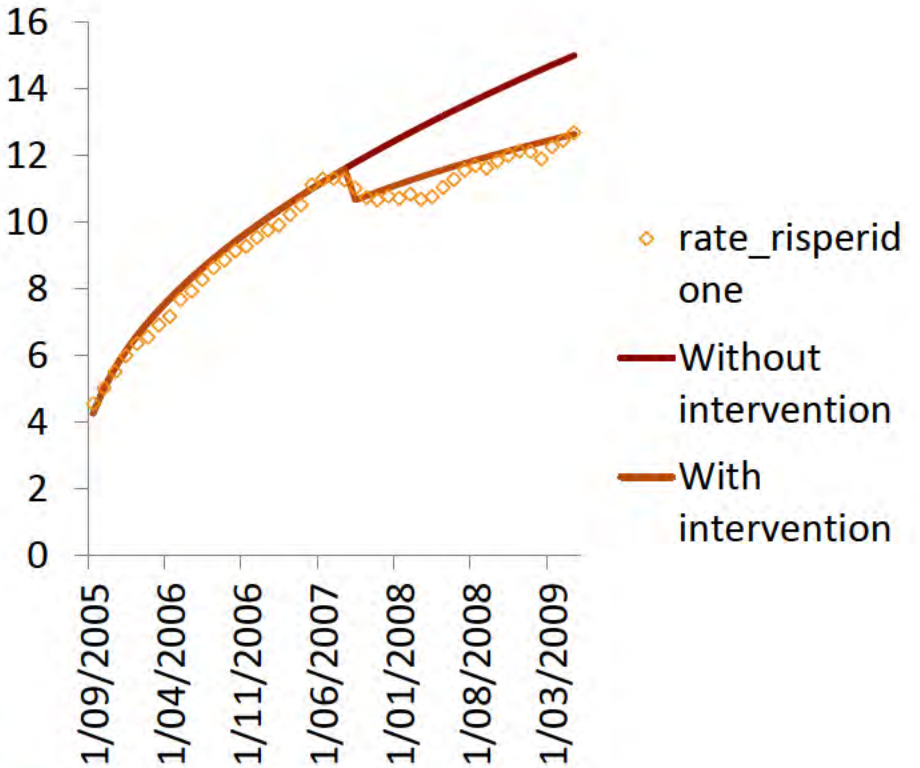


Veterans' MATES highlights

Reducing the use of antipsychotics in dementia

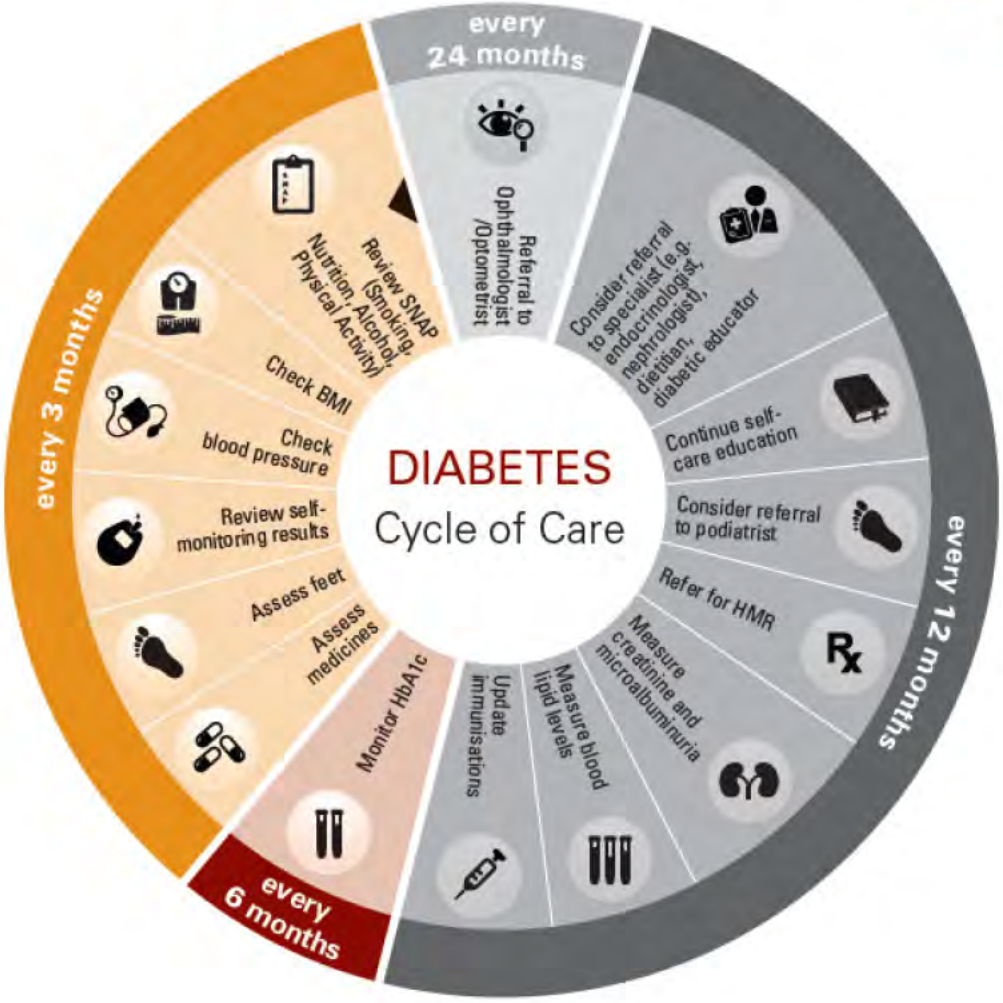
So what happened?

- ✓ 14.5% decrease at time of intervention
- ✓ Further 3% monthly decrease compared with trend prior to intervention



Veterans' MATES highlights

Improving the management of diabetes



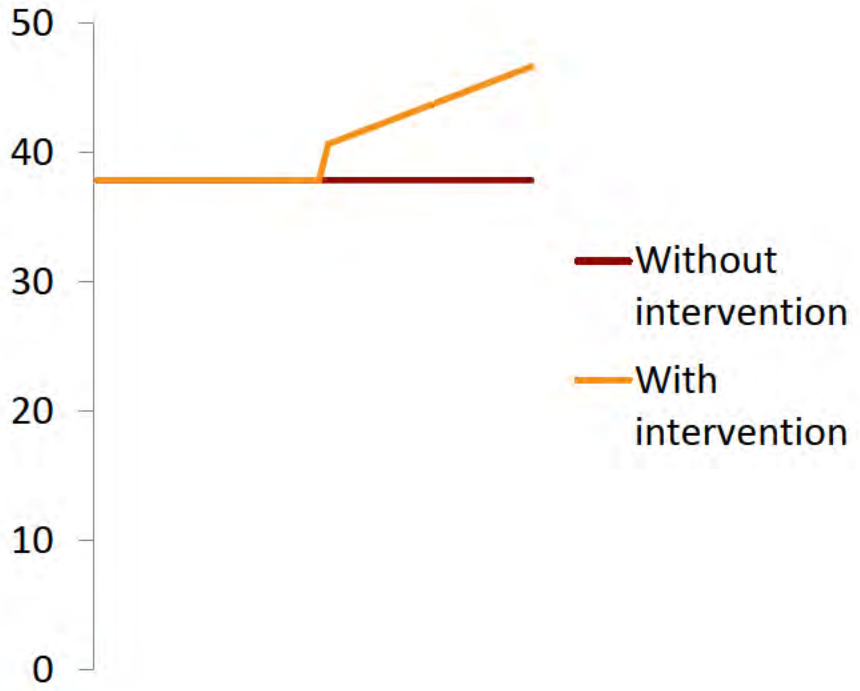
- Diabetes increases the risk of cardiovascular disease including heart attack and stroke
- Our medication-related problem analyses had demonstrated under-use of services and medicines
- Our diabetes topics aimed to improve management in those with diabetes

Veterans' MATES highlights

Improving the management of diabetes

So what happened?

- ✓ 17% relative increase in HbA1c tests
- ✓ Further 2% monthly increase
- ✓ 7% relative increase in microalbuminurea testing at time of intervention
- ✓ Further 1% monthly increase

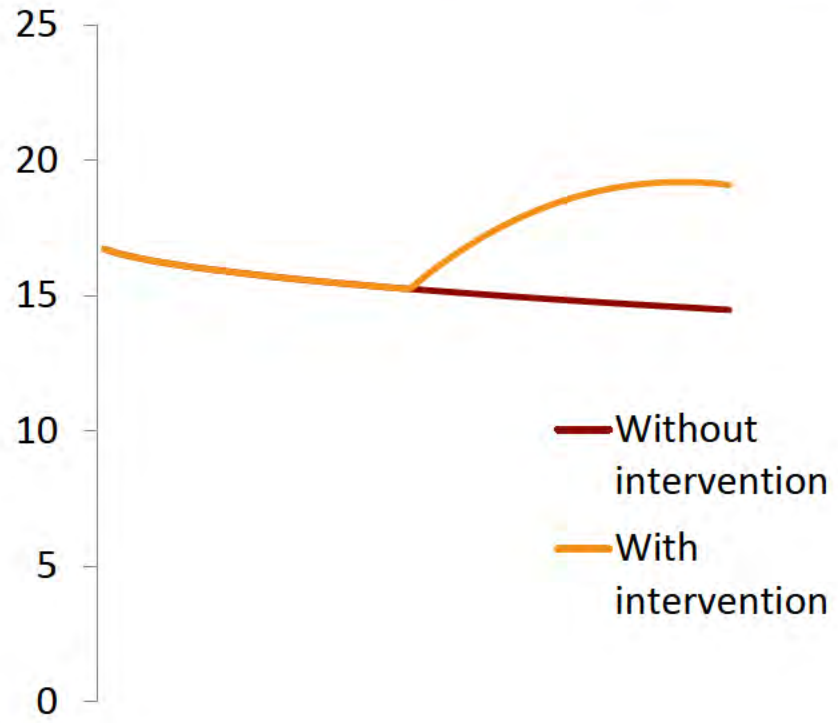


Veterans' MATES highlights

Improving the management of diabetes

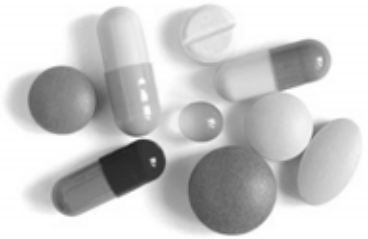
So what happened?

- ✓ 21% relative increase in general practitioner management plans at time of intervention

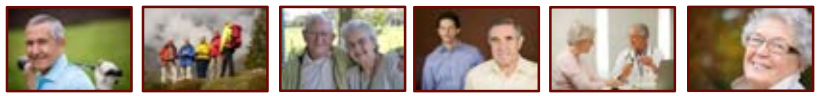


Veterans' MATES highlights

Improving medicines management



- Medication-related problems are common in patients on multiple medicines. Home medicines review has been shown to resolve these problems.
- Topics promoting home medicines review were distributed in 2004, 2006 2008, 2011
- DVA fund dose administration aids for veterans. A topic promoting dose administration aids was distributed in 2008

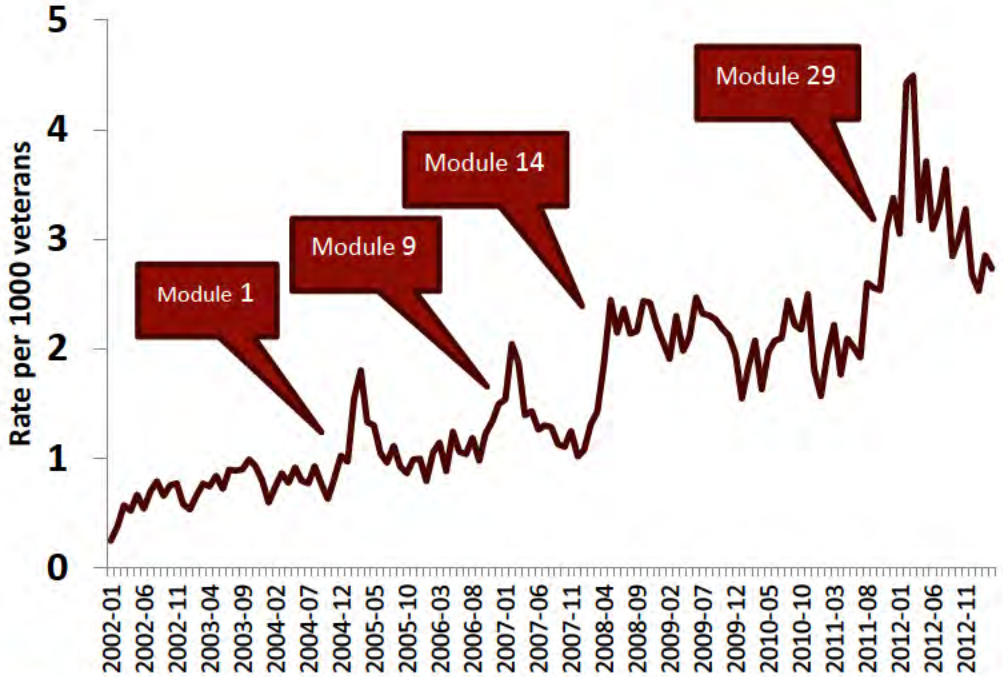


Veterans' MATES highlights

Increasing home medicine review use

So what happened?

- ✓ Four fold increase in home medicine review rates
- ✓ Three fold increase in dose administration aid rates

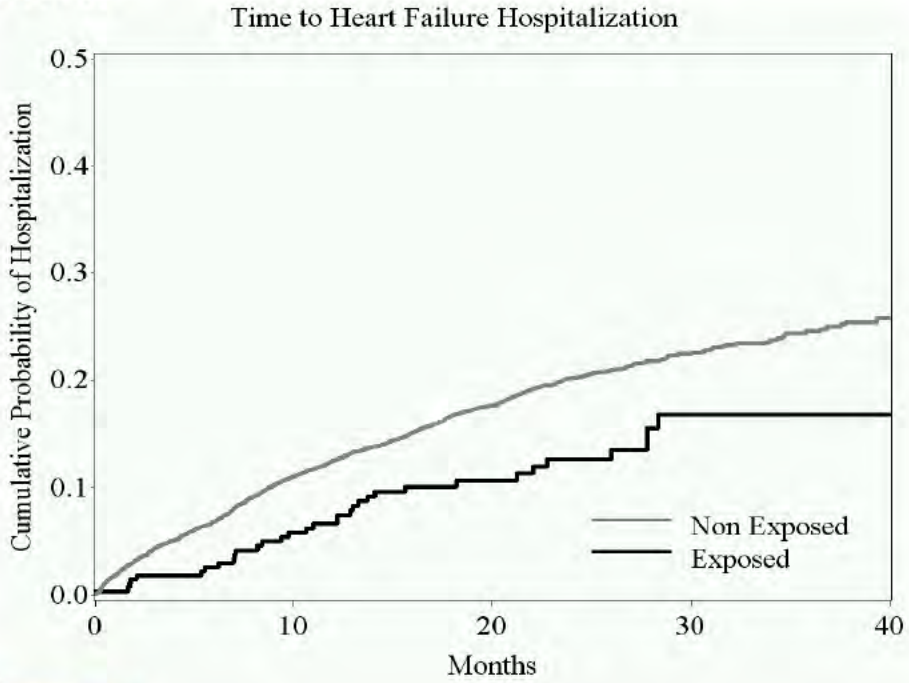


Veterans' MATES highlights

Increasing home medicine review use

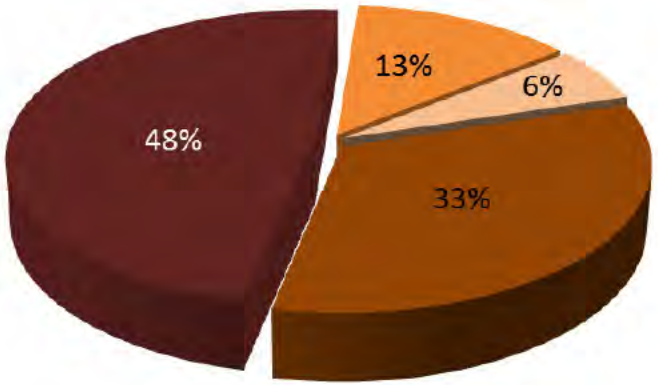
So what happened?

- ✓ Increased time to next hospitalisation for those who had a home medicines review and who had
  - ✓ Heart failure
  - ✓ Were taking warfarin

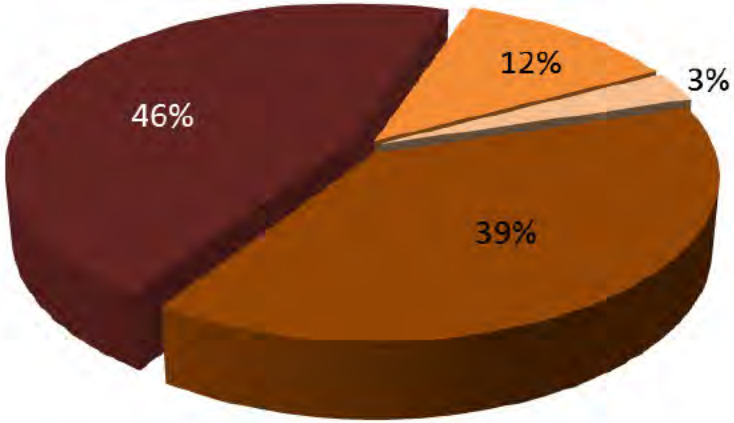


Feedback about Veterans' MATES

On average, 85% of LMOs, 97% of pharmacists and 81% of veterans report the material to be helpful



Veterans' feedback about the educational materials



Doctors' feedback about the educational materials

www.veteransmates.net.au

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Print A+ A-

Main Menu
- Home
- Topics

Help Pages
- Forgotten Password
- Contact Us

Login for GPs

Username

Password

Login

Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES)

Latest Release: Topic 36, Statins, is now available on secure web site

The Australian veteran population is on average 83 years of age with 5 or more chronic conditions.

Recognising that this results in veterans having complex medication needs, the Department of Veterans' Affairs has developed the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) to assist in managing medicine use in the veteran community.

Veterans' MATES provides up-to-date health and medicine information for health professionals and veterans. A team of clinical experts contribute to the writing of this information which is specifically tailored for veterans and their health professionals.

Useful Links

- Medicines Advice for Veterans
- Therapeutic Education for doctors and pharmacists
- Information for doctors about continuing education points
- Information for pharmacists about continuing professional development points
- A list of Veterans' MATES publications
- Veterans' MATES Report 2004 - 2010
- Further information on Veterans' MATES
- To download topic 36 pharmacist response form

The impact of repeated interventions on improving the use of medicines and health services: Successes from the Veterans' Medicines Advice and Therapeutics Education Services program

Elizabeth E. s 47F Vanessa s 47F Gizat M. s 47F Andre Q s 47F Mhairi s 47F
Emmae s 47F Natalie s 47F Nicole L. s 47F
Quality Use of Medicines and Pharmacy Research Centre, Clinical and Health Sciences, University of South Australia

Introduction

- The ongoing nature of the Veterans' Medicines Advice and Therapeutics Education Services (MATES) programs enables repeat interventions to build health literacy and skills over time.
- Veterans' MATES implemented primary interventions on pain management in 2014 and 2017, with supportive interventions in 2013, 2019 and 2020.
- Two interventions on dementia were implemented in 2007 and 2016 with the primary aim of reducing the use of antipsychotics for behavioural symptoms of dementia (BPSD). This was supported by other interventions in 2009, 2015, 2018 and 2019 on topics targeting to reduce the use of medicines associated with dry mouth, cognitive impairment and falls.

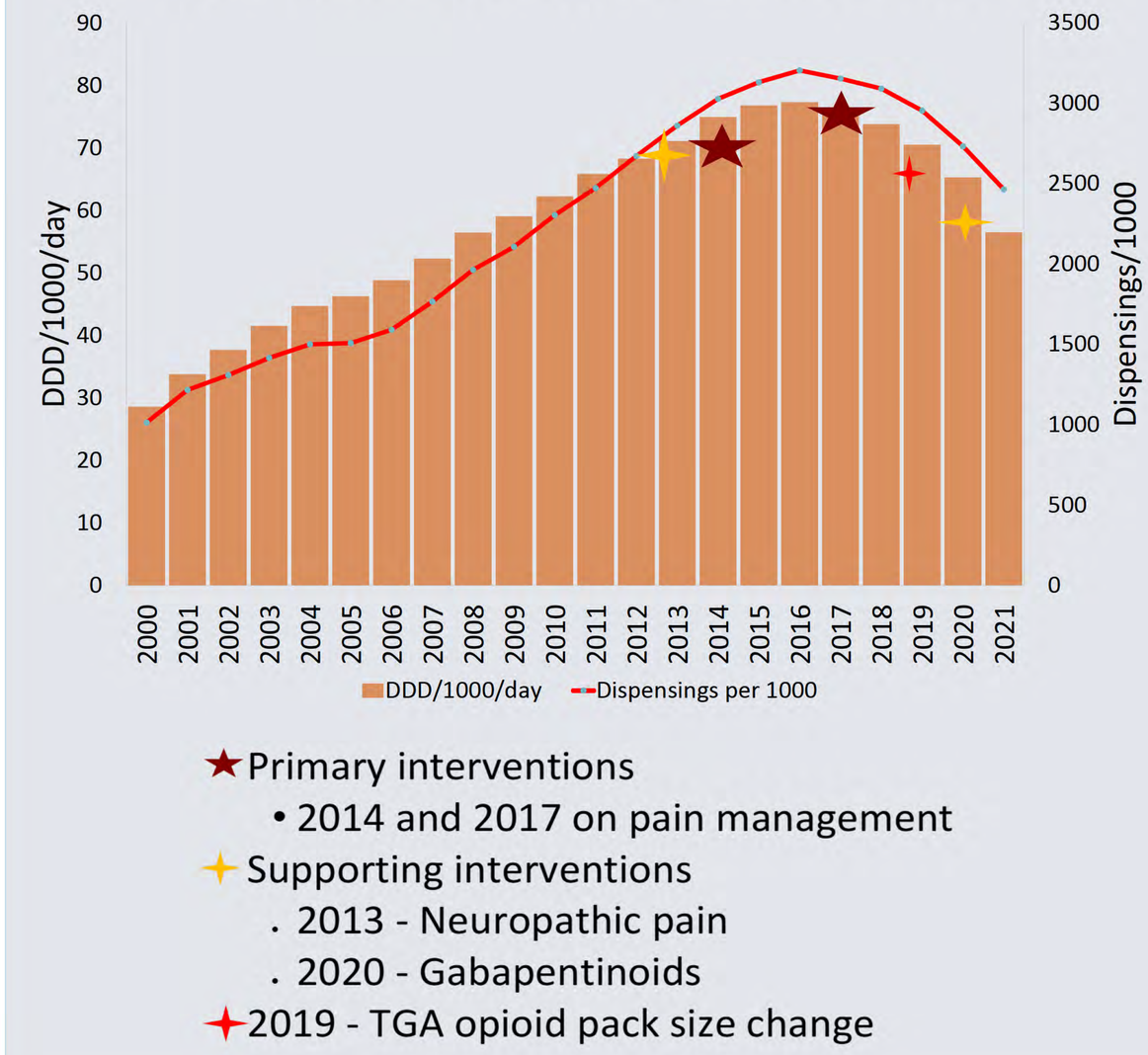
Methods

- Multifaceted interventions informed by Social Cognitive Theory, the Transtheoretical Model, and the health promotion model PRECEDE-PROCEED were implemented.
- Interventions included patient specific feedback to general practitioners (GPs) and educational materials to GPs, veterans, pharmacists and allied health professionals.
- The educational materials on the respective topics were developed by practising clinicians, researchers, medical writers and veterans and were mailed by post or electronically. [1,2]
- We present an ecological analysis of changes in rates of dispensings and volume of medicines in defined daily doses (DDD) using administrative claims data from The Australian Government Department of Veterans' Affairs.

Results

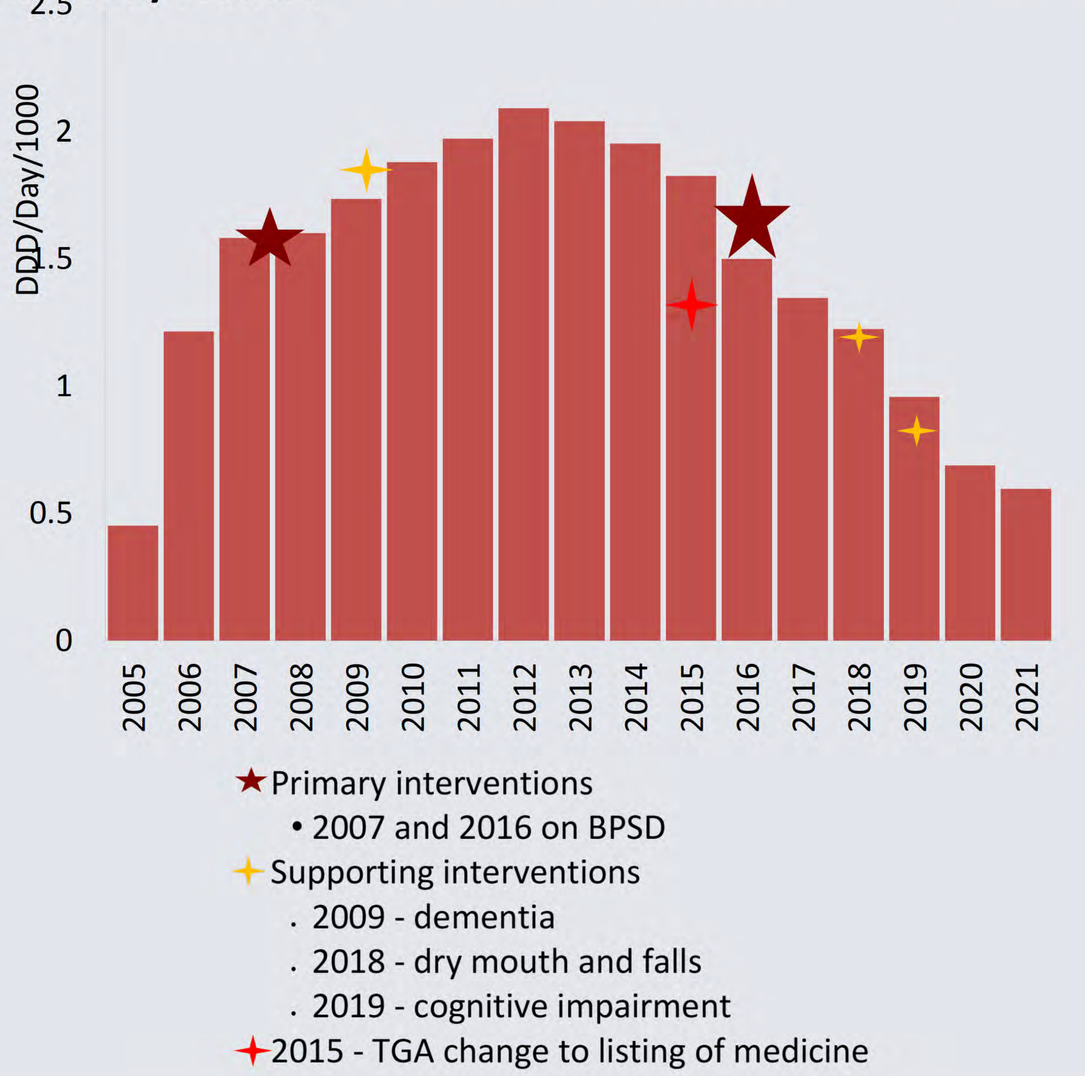
Pain

Use of opioids for persistent pain has decreased



Dementia

Risperidone use for behavioural symptoms of dementia consistently reduced



Immediate impacts after the primary interventions

- Opioid use has fallen from a high of 77 DDD/1000/day in 2016 to 56 DDD/100/day in 2021
- Risperidone use for BPSD has reduced from 2.2 DDD/100/day in 2012 to 0.6 DDD/100/day in 2021

Further details:

- Pain intervention: BMJ Qual Saf. 2023 Apr 27:bmjqs-2022-015716. doi: 10.1136/bmjqs-2022-015716.
- Dementia intervention: Pharmacy (Basel). 2019 Jul 22;7(3):100. doi: 10.3390/pharmacy7030100.

Conclusion

- Repeated Veterans' MATES interventions and policy changes to reduce overused medicines including opioids and antipsychotics resulted in declines in use thereby decreasing the risk of harm from these medicines.

References

1. Antipsychotic use in BPSD: limited benefits, high risks (https://www.veteransmates.com.au/topic-44)
2. Understanding chronic pain (https://www.veteransmates.com.au/topic-48)

These interventions were supported with funding from the Australian Government Department of Veterans' Affairs for the Veterans' MATES program.

www.veteransmates.net.au

Prescriber Feedback to Improve the Quality Use of Medicines in Older People: The Veterans' MATES Program

J Simon Bell,[1] Tammy LeBlanc,[1] Natalie s 47F [1] John D Barratt,[1] Nicole L Pratt,[1] Philip s 47F [2] Graeme s 47F [3] Elizabeth E Roughead,[1] Andrew L Gilbert[1]

1. Sansom Institute, University of South Australia, Adelaide
2. Data Management and Analysis Centre, University of Adelaide, Adelaide
3. Department of Veterans' Affairs, Canberra

UniSA | Sansom Institute for Health Research

The Veterans' MATES approach

The focus is on consultation, collaboration and active partnerships:

- Veteran Reference Group
- Practitioner Reference Group
- Clinical Reference Group

Australian Federation of Totally and Permanently Incapacitated Ex-Servicemen and Women

Australian Peacekeepers and Peacemakers Veterans Association

Australian Veterans and Defence Services Council, NSW

Partners of Veterans' Association of Australia

Returned and Services League of Australia

Vietnam Veterans Association of Australia

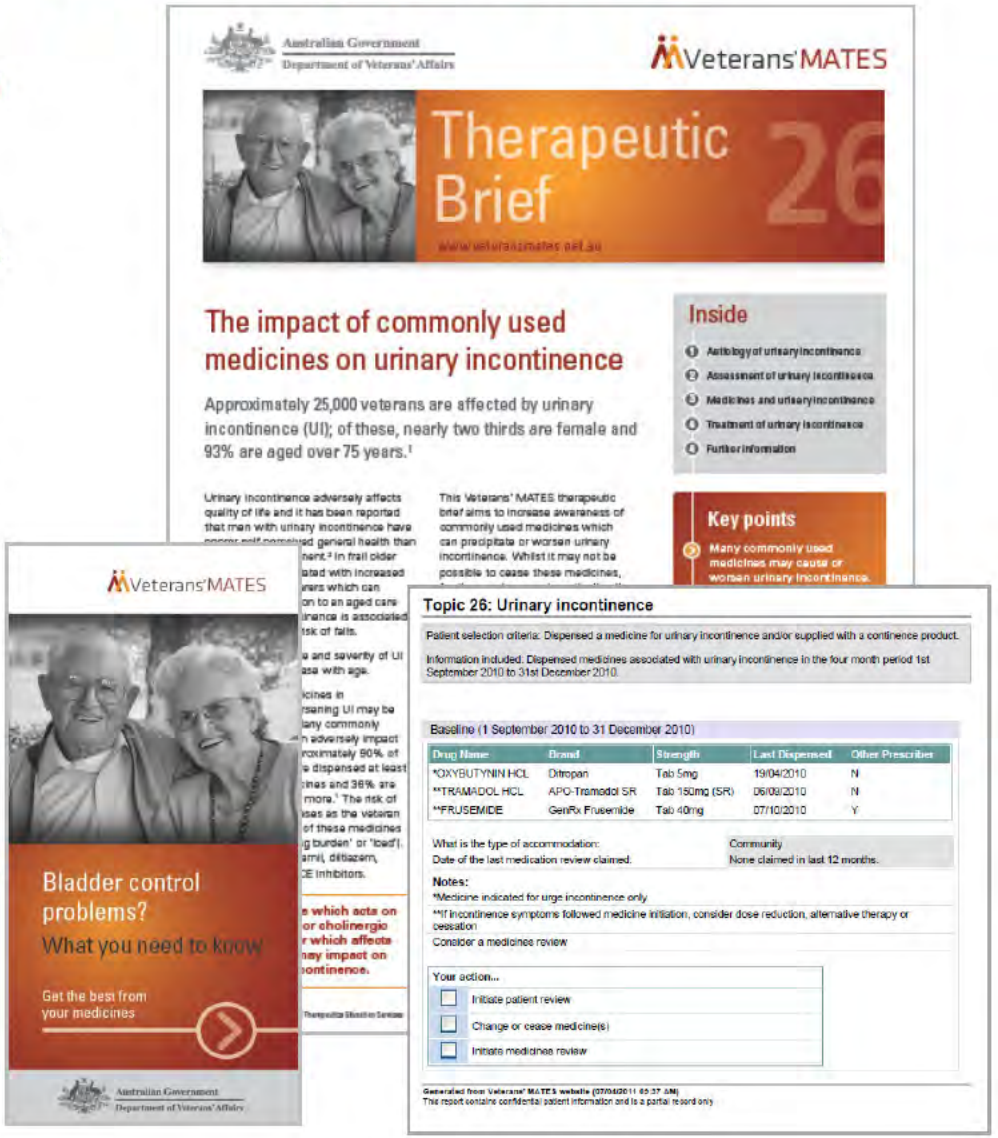
Vietnam Veterans Federation of Australia

War Widows' Guild of Australia

The Veterans' MATES approach

Every three months a chosen health topic is distributed:

- a letter, patient-specific feedback and educational material are sent to the veteran's main GP;
- a letter and educational material are sent to pharmacists and other relevant health professionals; and
- a letter and educational material is sent to members of the veteran community for whom the health topic is relevant.



Selection of Veterans' MATES topics

- Veterans' MATES looks at:
  - Australia's national health priority areas;
  - Australia's quality use of medicines framework; and
  - medicine-related issues identified using Department of Veterans' Affairs (DVA) data.

- Topics covered so far include:
  - Diabetes, Insomnia, Heart Failure, Falls, Gout, Incontinence, Home Medicines Review and Osteoporosis.

Recent topics


Australian Government Department of Veterans' Affairs

Veterans' MATES

Therapeutic Brief 26

The impact of commonly used medicines on urinary incontinence

Approximately 25,000 veterans are affected by urinary incontinence (UI); of these, nearly two thirds are female and 93% are aged over 75 years.[1]

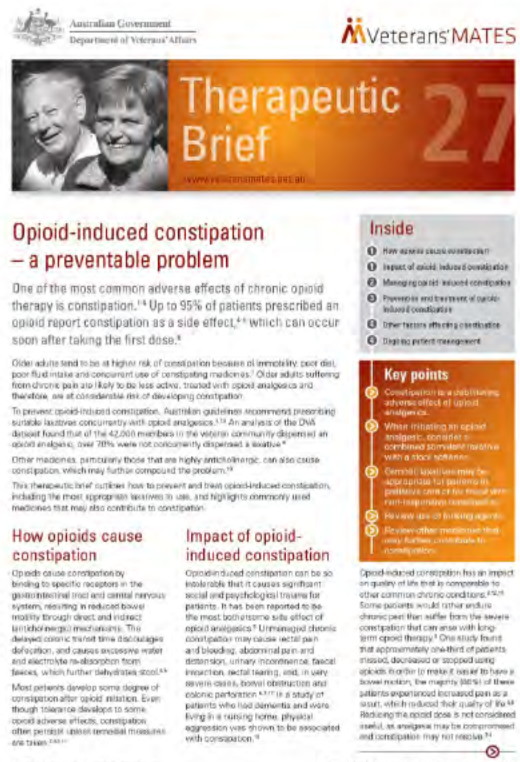
Inside

Key points

Aetiology of urinary incontinence[3,4,5]

Any medicine which acts on adrenergic or cholinergic receptors, or which affects cognition may impact on urinary continence.

March 2011 Urinary incontinence


Australian Government Department of Veterans' Affairs

Veterans' MATES

Therapeutic Brief 27

Opioid-induced constipation – a preventable problem

One of the most common adverse effects of chronic opioid therapy is constipation.[1-4] Up to 95% of patients prescribed an opioid report constipation as a side effect,[4,5] which can occur soon after taking the first dose.[6]

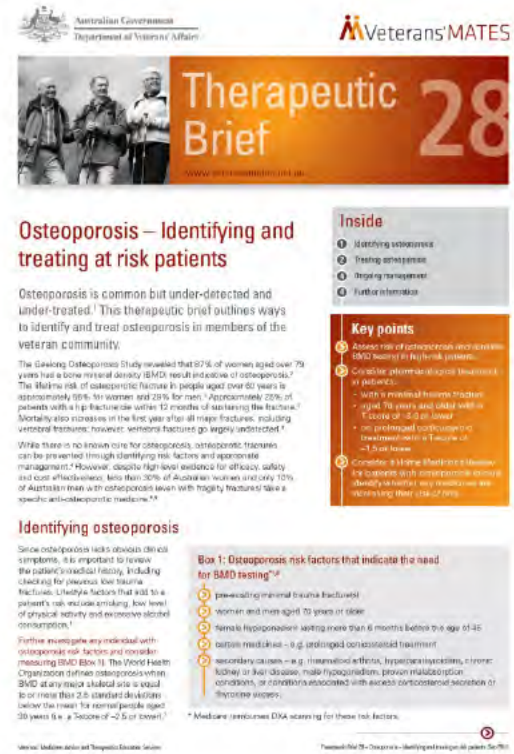
Inside

Key points

How opioids cause constipation

Impact of opioid-induced constipation

June 2011 Opioid-induced constipation


Australian Government Department of Veterans' Affairs

Veterans' MATES

Therapeutic Brief 28

Osteoporosis – Identifying and treating at risk patients

Osteoporosis is common but under-detected and under-treated.[1] This therapeutic brief outlines ways to identify and treat osteoporosis in members of the veteran community.

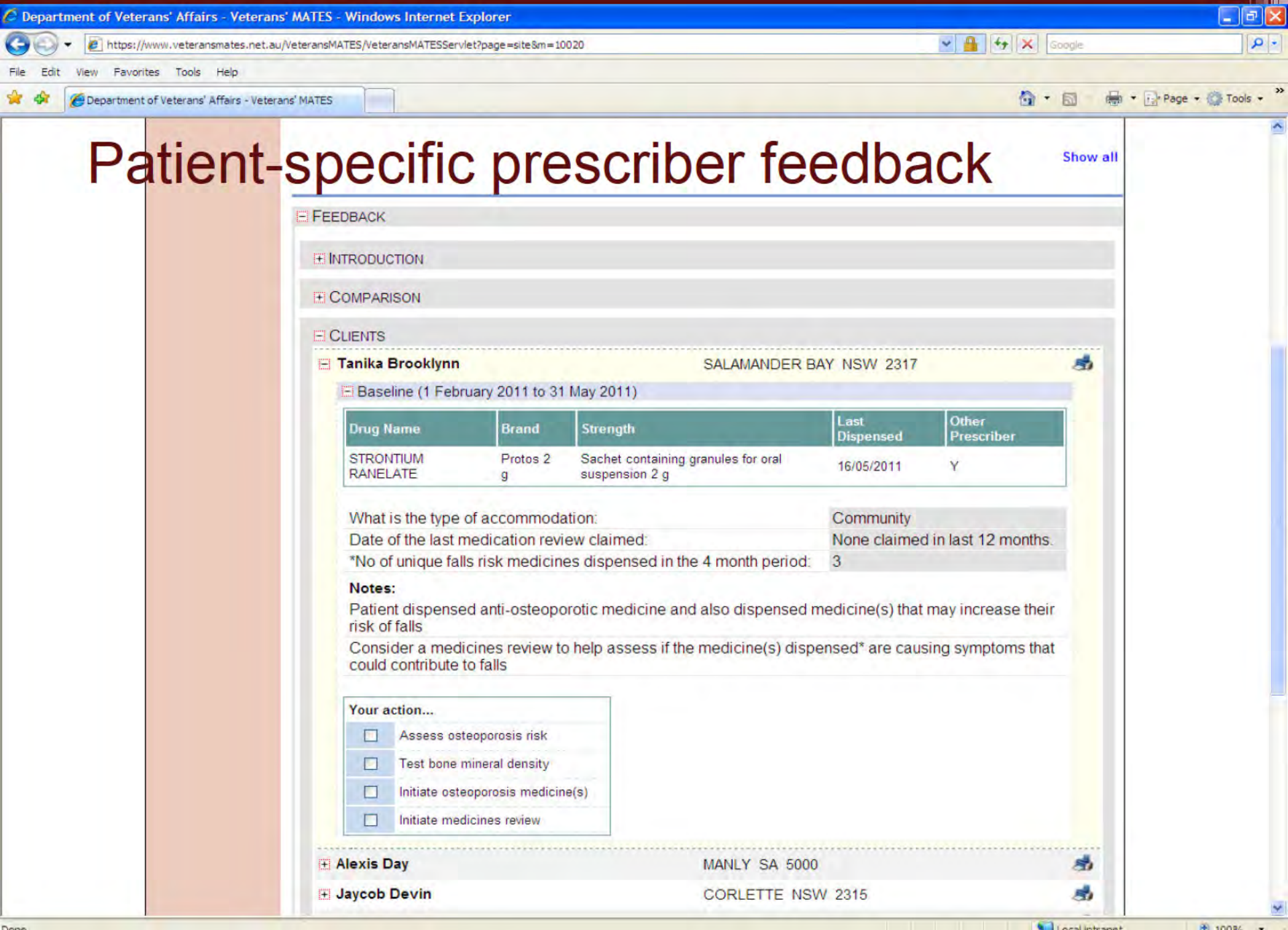
Inside

Key points

Identifying osteoporosis

Box 1: Osteoporosis risk factors that indicate the need for BMD testing

September 2011 Osteoporosis


Department of Veterans' Affairs - Veterans' MATES - Windows Internet Explorer
https://www.veteransmates.net.au/VeteransMATES/VeteransMATESServlet?page=site&m=10020
File Edit View Favorites Tools Help
Department of Veterans' Affairs - Veterans' MATES
Page Tools
Patient-specific prescriber feedback
Show all
FEEDBACK
INTRODUCTION
COMPARISON
CLIENTS
Tanika Brooklynn
SALAMANDER BAY NSW 2317
Baseline (1 February 2011 to 31 May 2011)
Drug Name
Brand
Strength
Last Dispensed
Other Prescriber
STRONTIUM RANELATE
Protos 2 g
Sachet containing granules for oral suspension 2 g
16/05/2011
Y
What is the type of accommodation:
Community
Date of the last medication review claimed:
None claimed in last 12 months.
*No of unique falls risk medicines dispensed in the 4 month period:
3
Notes:
Patient dispensed anti-osteoporotic medicine and also dispensed medicine(s) that may increase their risk of falls
Consider a medicines review to help assess if the medicine(s) dispensed* are causing symptoms that could contribute to falls
Your action...
Assess osteoporosis risk
Test bone mineral density
Initiate osteoporosis medicine(s)
Initiate medicines review
Alexis Day
MANLY SA 5000
Jaycob Devin
CORLETTE NSW 2315

Australian Government
Department of Veterans' Affairs

Veterans' MATES

YOUR RESPONSE WILL HELP IMPROVE THE CARE OF ALL VETERANS

Module 25
Reducing the load: Medicines best avoided in patients with dementia

RACGP QA & CPD and ACRRM PDP points are available to participants submitting this response form. RACGP and ACRRM requirements are available at www.veteransmates.net.au. If you wish your participation in this module to be recorded, please provide your reference number in the appropriate boxes on the questionnaire.

PLEASE TURN OVER

LMO Response Form M25

UniSA
Veterans' MATES
Provided by: University of South Australia | Quality Use of Medicines and Pharmacy Research Centre
In association with: Discipline of General Practice, The University of Adelaide | Discipline of Public Health, The University of Adelaide | Repatriation General Hospital, Daw Park | National Prescribing Service | Australian Medicines Handbook | Drug and Therapeutics Information Service

Please complete this form. Your responses help us gain greater insight into the factors impacting on the care of veterans and will guide us in future work in this area.

Note: This response form can now be completed online. For details please see the accompanying letter.

X Please cross the appropriate selection with a black or blue pen.
Mark one box only for each question.

Questions 1 to 5 look at the management of medicines in veteran patients with dementia

1. Prior to prescribing a new medicine to a veteran patient with dementia, how often do you consider the cognitive impact this may have on the patient?

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

2. In your experience, the addition of an anticholinergic medicine to the medicine regime of a veteran patient with dementia causes:

☐ Significant cognitive decline ☐ Mild cognitive decline
☐ Moderate cognitive decline ☐ No cognitive decline

3. In your experience, the addition of a sedative medicine to the medicine regime of a veteran patient with dementia causes:

☐ Significant cognitive decline ☐ Mild cognitive decline
☐ Moderate cognitive decline ☐ No cognitive decline

4. In your experience, how easy is it to avoid the use of anticholinergic medicines for a veteran patient with dementia?

☐ Very easy ☐ Easy ☐ Slightly easy ☐ Not easy

5. In your experience, how easy is it to avoid the use of sedative medicines for a veteran patient with dementia?

☐ Very easy ☐ Easy ☐ Slightly easy ☐ Not easy

Questions 6 to 8 help us to evaluate the usefulness of this module

6. How useful have you found the *Reducing the load: Medicines best avoided in patients with dementia* therapeutic brief?

☐ Very useful ☐ Useful ☐ Slightly useful ☐ Not useful

7. To what degree has the list of patients provided assisted you to review your veteran patients with dementia?

☐ Greatly assisted ☐ Assisted ☐ Slightly assisted ☐ Did not assist

8. Of the veterans listed, how many do you estimate require a review of their medicines?

☐ Nil ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 or more

Please refer to www.veteransmates.net.au for RACGP and ACRRM requirements.

RACGP QA & CPD reference number

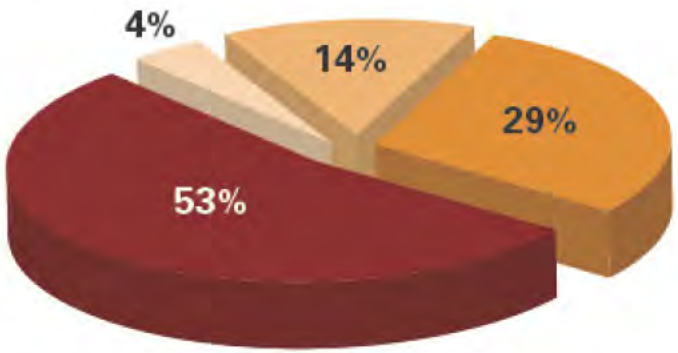
ACRRM PDP reference number

Thank you for your support.
Please return in the REPLY PAID envelope provided:
Veterans' MATES Reply Paid 10279 ADELAIDE BC SA 5000.

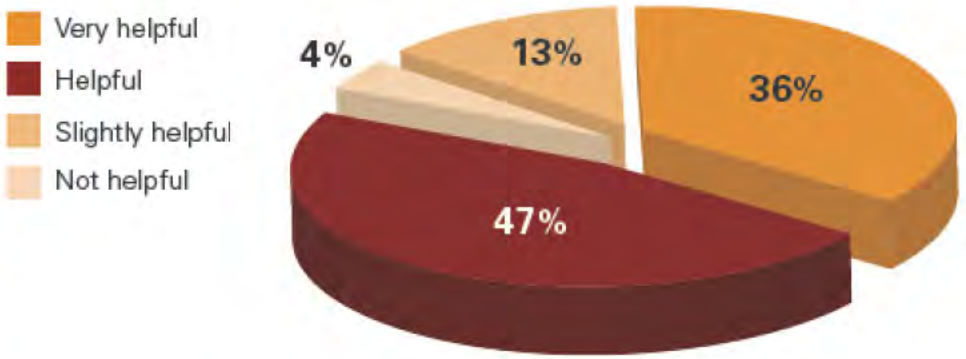
LMO Response M25

Stakeholder feedback

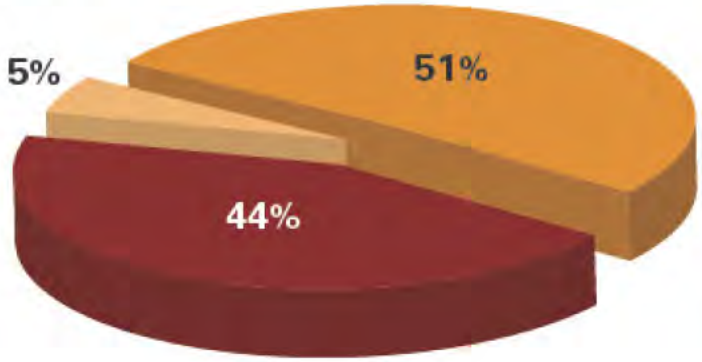
81% of veterans reported the educational material to be helpful



83% of general practitioners considered the educational material useful



95% of pharmacists considered the educational material use



Improvements in quality use of medicines

Aim	Effect	Comparator
Increase beta-blocker use in those with heart failure	RR 1.29, (95% CI 1.23-1.35)	Historical
Increase lipid-lowering therapy in those with diabetes	RR 1.16, (95% CI 1.1, 1.23)	Historical
Increase antiplatelet therapy in those with diabetes	RR 1.15, (95% CI 1.08, 1.22)	Historical
Increase osteoporosis medicine use in specified age groups	RR 1.07 (women) (95% CI 1.0, 1.14) RR 1.24 (men) (95% CI 1.15, 1.33)	Concurrent

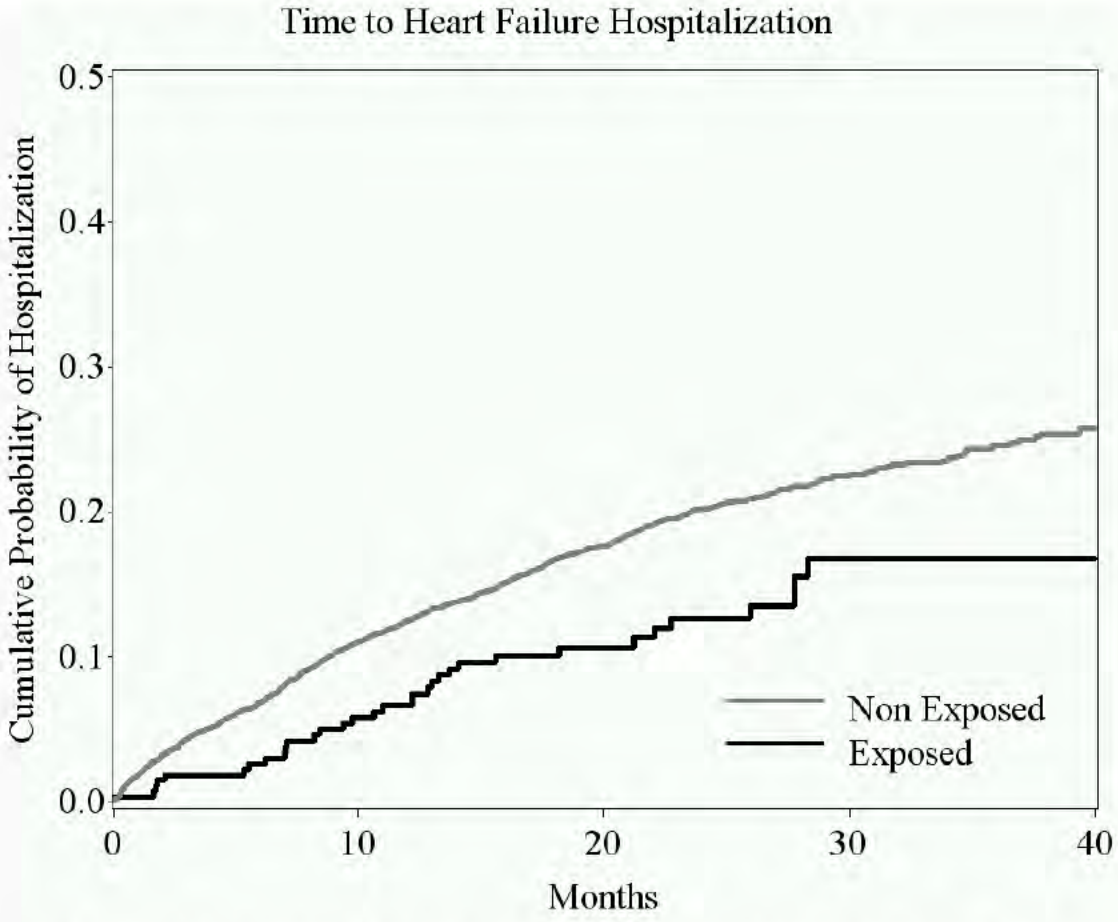
Aim	Effect	Comparator
Reduce NSAID use in those with diabetes or heart failure	RR 1.44, (95% CI 1.42, 1.46)	Concurrent
Reduce potentially interacting medicines with antidepressants	No difference (95% CI 0.97-1.10) (95% CI 0.97-1.04)	Historical comparison
Reduce multiple device use	↓3 or more devices P<0.004	Time series
Reduce high dose proton pump inhibitor use	RR 1.15 (95% CI 1.10 - 1.19)	Time series
Reduce contact laxative use and increase osmotic laxative use	No difference	Historical comparison
Reduce use of risperidone for dementia symptoms	RR 1.11, (95% CI 1.06- 1.15)	Historical comparison
Reduce clopidogrel and NSAIDs	RR 1.06, (95% CI 1.00- 1.13)	Historical comparison
Reduce nebuliser use	RR 0.96 (95% CI 0.94 -0.99)	Historical comparison

Improvements in health outcomes: Home Medicines Review for those dispensed warfarin

Time since Home Medicines Review (HMR)	Hazard ratio (95% CI)	P-value
0-2 months post HMR	1.13 (0.63 – 2.02)	p = 0.68
>2 to 6 months post HMR	0.21 (0.05 – 0.87)	p = 0.03
>6 to 12 months post HMR	1.07 (0.64 – 1.81)	p = 0.79
>12 months post HMR	1.61 (1.18 – 2.20)	p = 0.003

Roughead EE et al. J Clin Pharm Ther 2011;36(1):27-32

Improvements in health outcomes: Home Medicines Review for those with heart failure



Roughead EE et al. Circ Heart Fail 2009;2(5):424-8

Veterans' MATES resources and patient-specific prescriber feedback www.veteransmates.net.au

Supporting general practitioners to manage complex medicine regimens: the Veterans' MATES program

V Tammy s 47F Amanda s 47F [2], Gerard s 47F John D s 47F Nicole L s 47F Natalie s 47F Philip s 47F Graeme s 47F J Simon s 47F
Andrew L s 47F Elizabeth E s 47F

[1]Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, School of Pharmacy and Medical Sciences, University of South Australia, Adelaide
[2]Australian National University Medical School, Canberra, Australia
[3]School of Medicine, Deakin University, Geelong, Australia
[4]Data Management and Analysis Centre, Discipline of Public Health, University of Adelaide, Adelaide
[5]Department of Veterans' Affairs, Canberra

BACKGROUND

Medicines are responsible for up to one third of unplanned hospital admissions in people aged 75 years and older, and up to three-quarters of these admissions may be preventable. [1]

The aim of the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) program is to optimise medicine and health service use among members of the Australian veteran community. The Veterans' MATES program offers support to general practitioners (GPs) to manage their veteran patients. The activities of the Veterans' MATES program are consistent with Australia's National Strategy for the Quality Use of Medicines.

METHODS

Veterans' MATES is funded by the Australian Government Department of Veterans' Affairs (DVA). The program utilises routinely collected health claims data to identify possible medicine-related problems.

The Veterans' MATES program provides quarterly targeted patient-specific feedback to veterans' primary GPs. The feedback comprises a list of relevant medicines dispensed to targeted veterans and notes about possible medicine-related problems. GPs are also provided with a peer-reviewed therapeutic brief highlighting key clinical issues.

An educational brochure is also mailed to targeted veterans encouraging them to speak with their doctor.

Data utilised in each stage of program development

Planning Stage
- Medicine-related problems analysis
- Topic selection

↓

Development & Implementation Stage
- Patient specific feedback & evidence based information developed
- Feedback & educational materials distributed

↓

Evaluation Stage
- Survey and observational studies

RESULTS

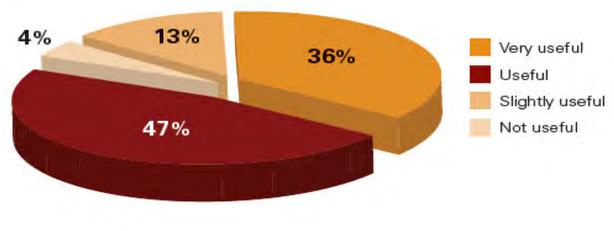
To date, 32 educational topics targeting more than 250,000 veterans, 34,000 GPs and 8,300 pharmacies and accredited pharmacists have been implemented.

Evaluation has demonstrated
- Stakeholder satisfaction
- Improved health outcomes

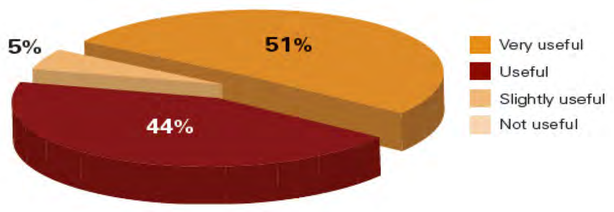
Stakeholder satisfaction

GPs, pharmacists and veterans consistently reported the material was helpful.

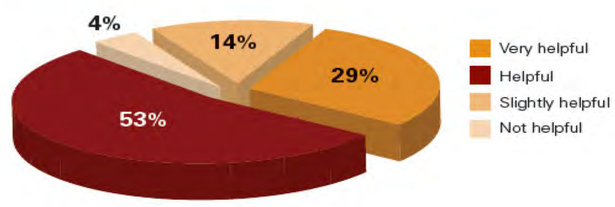
83% of general practitioners considered the educational material useful



95% of pharmacists considered the educational material useful



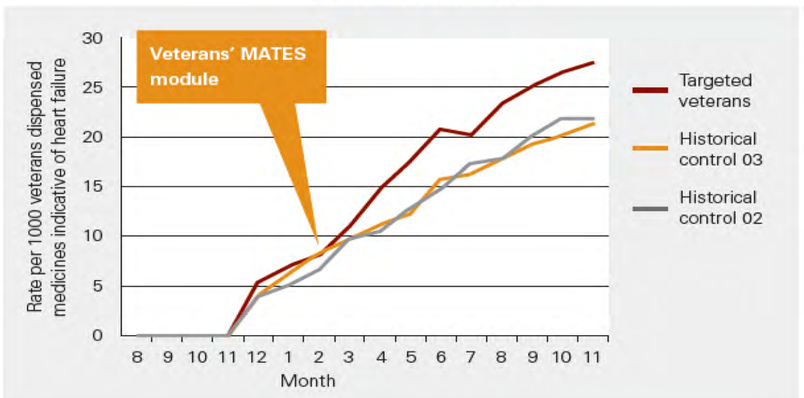
82% of veterans reported the educational material to be helpful



Improved health outcomes

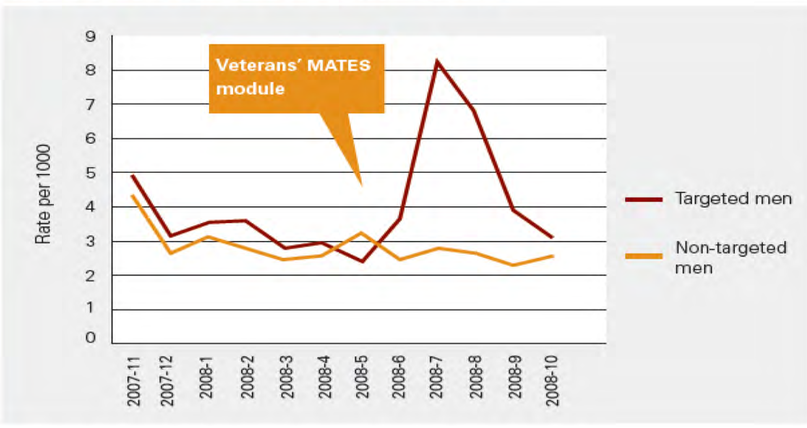
☑**Improved management of heart failure**
- 46% reduction in likelihood of hospitalisation for heart failure in those who received a medicines review
- Increase in the use of beta blocker medicines
- Decrease in the use of NSAIDS

Increased beta-blocker medicine use in those with heart failure who were previously untreated



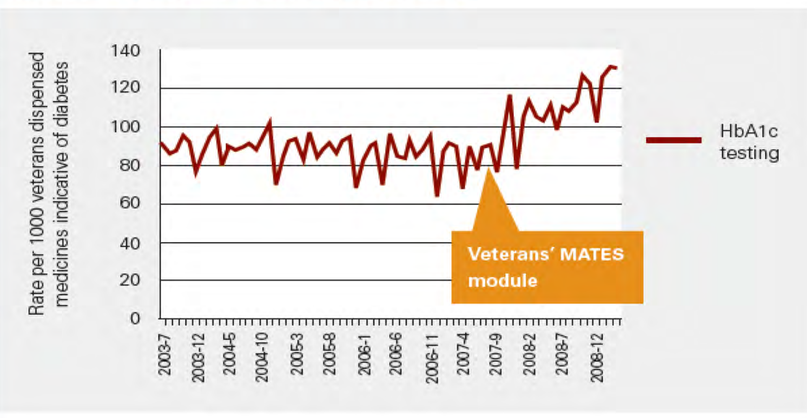
☑**Reduced risk of falls & hip fractures**
- Reduction in use of medicines that increase the risk of falls and hip fractures:
  - Risperidone (antipsychotic)
  - Benzodiazepines (sleeping pills)
  - "Z drugs" (sleeping pills)
- Increase in Bone Mineral Density Tests to detect osteoporosis
- 24% increase in use of medicines to treat osteoporosis in male veterans

Uptake of Bone Mineral Density Testing in men



☑**Improved management of diabetes**
- Increase in the number of diabetes monitoring tests and management plans:
  - ↑ GP management plans
  - ↑ Glycosylated haemoglobin tests
  - ↑ Microalbuminuria tests
- Decrease in use of NSAIDS
- Increase in cardiovascular medicines

Increased glycosylated haemoglobin testing

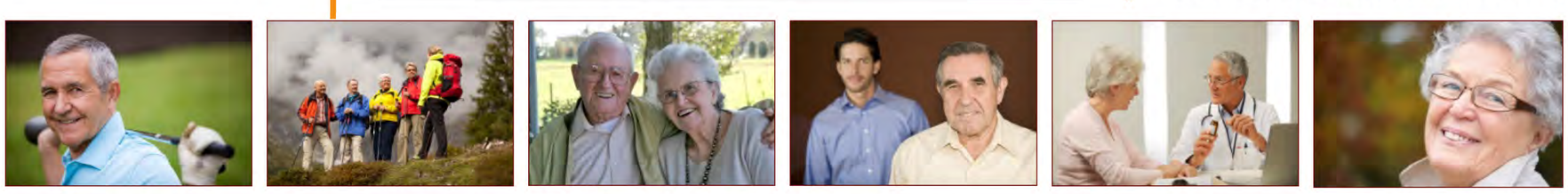


CONCLUSION

The Veterans' MATES program has successfully provided support to GPs and veterans to optimise medicine use. This has resulted in clinically significant improvements in medicine and health service use. Ongoing engagement of stakeholders has ensured that behaviour changes associated with the program have not lessened over time.

www.veteransmates.net.au

ACKNOWLEDGEMENTS: .This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of Veterans' MATES.



1. s 47F EE, Semple SJ. Medication safety in acute care in Australia: where are we now? Part 1: a review of the extent and causes of medication problems 2002-2008. Aust N Z Health Policy 2009;6:18

UniSA | Sansom Institute for Health Research

Veterans' MATES

Know your patient's renal function – an important prescribing consideration

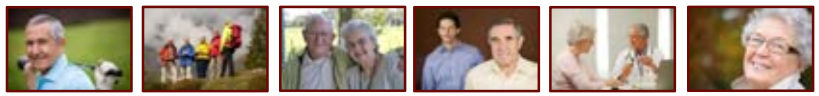
A s 47F D s 47F G s 47F A s 47F






Workshop facilitators

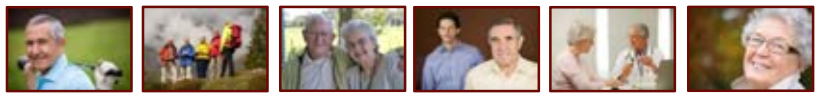
- Andrew s 47F
- Debra s 47F
- Gerard s 47F
- Amanda s 47F



- Why a workshop on monitoring renal function?

Study

- Retrospective analysis of the Australian Government Department of Veterans' Affairs health claims database.
- Medicines requiring renal function monitoring were identified from the Australian Medicines Handbook.
- Veterans aged 65 years or older dispensed medicines which require renal function monitoring during June 2009 – 30 September 2009 were included in the study.
- Identified claims for blood tests which include renal function tests in the 3, 6 and 12 months prior to dispensing of a medicine requiring renal function monitoring.



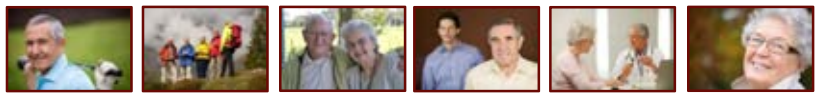
Findings

Study population (Veterans aged 65 years and over dispensed a medicine requiring renal function monitoring between 1 June 2009 and 30 Sept 2009)

	n 173,702
Gender:	
Male	82,146 (47%)
Female	91,556 (53%)
Age group:	
65-74 years	16,777 (10%)
75-84 years	69,617 (40%)
≥85 years	87,308 (50%)
Residence:	
Community	150,366 (87%)
Aged care	23,336 (13%)
Co-existing diabetes*	20,435 (12%)
Co-existing renal disease**	2,934 (%)

*Measured by supply of medicines for diabetes in the 6mths prior to 1 June 2009

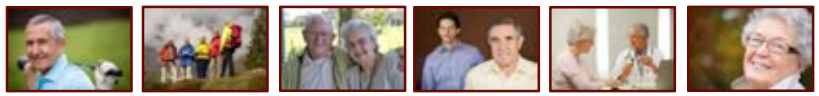
**Measured by prior hospitalisation for renal failure



Findings

Of the 173,702 veterans dispensed a medicine requiring renal function monitoring:

- 62% (n=107,284) had no claim for renal testing in the prior 3 months
- 43%(74,935) had no claim in the prior 6 months
- 26%(n=45,615) had no claim in the prior 12 months
- 26% of those aged 85 years or older (n=87,308) had no claim in the previous 12 months

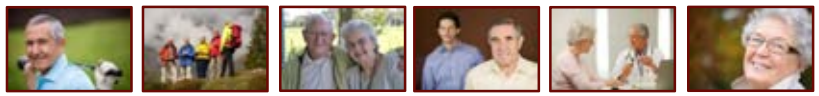


Findings

Renal function testing at medicine initiation

Of the 5,234 veterans who initiated a new medicine that requires monitoring:

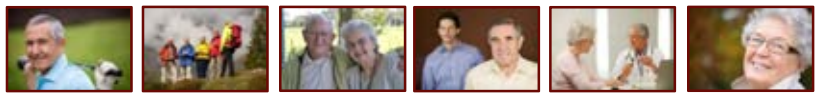
- 64% (n=3,327) had no claim in the 6 months prior to initiation.
- 59% had a no claim for a renal function test in the 6 months post initiation.



Feedback from GPs

- 40% of responding doctors find adjusting doses of medicines in renal impairment difficult or very difficult.
- a further 47% have some difficulty.

*Veterans' MATES Topic 30: Renal function monitoring Therapeutic Brief, Prescriber Feedback and Questionnaire mailed to 10,360 GPs
*Responses were received from 763 (7.4%)

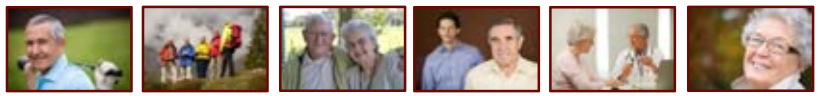


At the end of this workshop, you should be able to:

1. Determine when renal function monitoring is required

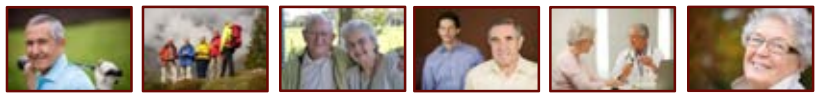
2. Estimate renal function, taking into account limitations of tests and equations

3. Adjust medicines accordingly



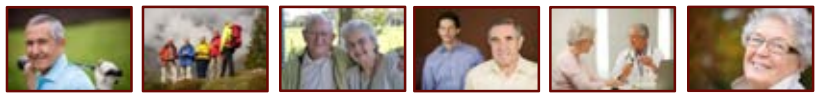
Overview of workshop

- Three cases will be used to highlight
  - the importance of renal function monitoring
  - when renal function monitoring should be considered
  - how to estimate renal function
  - the role of tests and equations used to estimate glomerular filtration rate
  - provide guidance on the adjustments required when prescribing medicines.



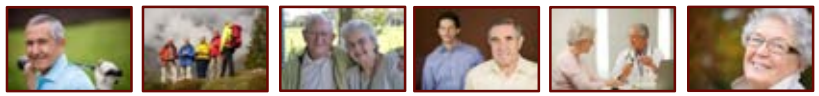
How the workshop will work

- Quick overview – Facts and issues to consider
- Participants will split into three groups
  - facilitated by A/Prof s 47F Prof s 47F and Prof s 47F
- Each facilitator will lead a different topic of discussion:
  - Facilitators will provide background information and then each group will discuss a case study relating to the background information
- After 20 minutes, presenters will move to a new table and repeat their topic.
- Time permitting 10 minute short panel discussion



Topics

- **Debra** s 47F How to estimate renal function, tests and equations to estimate GFR, dose adjustments
- **Amanda** s 47F Considerations for renal function monitoring and use of renal medicines in the rural setting.
- **Gerard** s 47F The fluctuating course of an older person and their renal function. When to be alert for renal impairment (e.g. acute on chronic) and when renal function testing should be conducted



GP14
THE RACGP CONFERENCE
FOR GENERAL PRACTICE

RACGP

Adelaide Convention Centre
9–11 October 2014
www.gpconference.com.au

Background
The Australian Context

Veterans' MATES

Australian Government
Department of Veterans' Affairs

Lead. Inspire.

Anticoagulants and AF

- Increasing incidence and prevalence
- Multiple concomitant medications
- Polymorbidity
- Long term use

Anticoagulants and AF

- Atrial fibrillation is the most common sustained cardiac arrhythmia to affect humans, with a prevalence of ~2% in the unselected adult population.
- Current estimates suggest twenty five percent of adults aged > 40 years will be diagnosed with AF in their lifetime
- Increasing incidence of AF – multifactorial

Atrial Fibrillation

►AF increases a person's risk for ischaemic stroke by about five-fold, irrespective of whether symptoms of AF are present (paroxsymal, persistent, permanent)

Anticoagulants and AF

- The most common anticoagulant used for stroke risk reduction in people with AF has been warfarin
- Warfarin has been shown in over 20 RCTs to reduce risk of stroke in AF patients by approximately 65%
- Warfarin developed in 1948 by Paul Link, University of Wisconsin as a rodent poison - hence acronym WARF, for Wisconsin Alumni Research Fund + -arin for coumarin

Anticoagulants and AF

- Warfarin needs to be closely monitored using INR testing to ensure appropriate level of anticoagulant control and bleeding risk
- Its response is variable within and between individuals
- INR has formed the cornerstone to the effective management of patients receiving warfarin.
- INR monitoring helps compensate for the complex pharmacokinetics of warfarin, especially the high inter- and intrapatient variability and multiple food and drug interactions

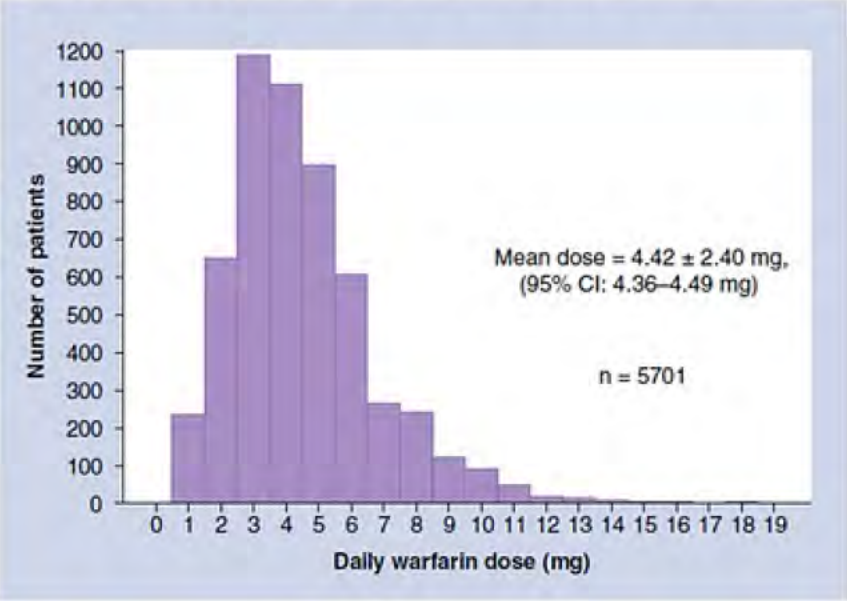
Anticoagulants and AF

The main sources of variability for warfarin response may be anticipated to relate to the following:

- body weight
- diet (Vit K supply, inhibitors/inducers of CYP enzymes)
- smoking
- genetics of CYP enzymes -particularly CYP2C9 for S-warfarin, also other CYP enzymes involving R warfarin.
- genetics of Vit K breakdown
- drug interaction with CYP enzymes

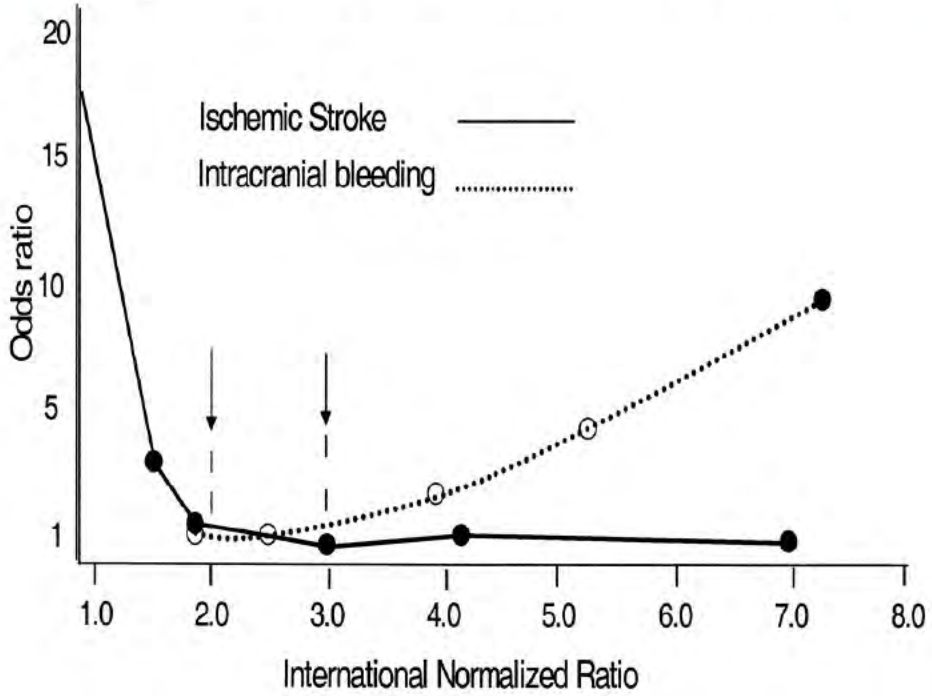
Anticoagulants and AF

Frequency distribution of warfarin daily dose requirement



Pharmacogenomics. 2009, 10 (12) :1955-1965

INR target for non-valvular atrial fibrillation



Adjusted odds ratios for ischaemic stroke and intracranial bleeding in relation to intensity of anticoagulation.

Hylek EM, Singer DE. Risk factors for intracranial haemorrhage in outpatients taking warfarin. Ann Intern Med 1994;120:897–902.

Adelaide Stroke Incidence Study

Declining Stroke Rates but Many Preventable Cardioembolic Strokes

James M. Leyden, MBBS; Timothy J. Kleinig, MBBS, PhD; Jonathan Newbury, MBBS, MD; Sally Castle, MA, BA, RN; Jennifer Cranefield, RN; Craig S. Anderson, MBBS, PhD; Maria Crotty, PhD; Deirdre Whitford, PhD; Jim Jannes, MBBS, PhD; Andrew Lee, MBBS; Jennene Greenhill, PhD

Background and Purpose—Stroke incidence rates are in flux worldwide because of evolving risk factor prevalence, risk factor control, and population aging. Adelaide Stroke Incidence Study was performed to determine the incidence of strokes and stroke subtypes in a relatively elderly population of 148 000 people in the Western suburbs of Adelaide.

Methods—All suspected strokes were identified and assessed in a 12-month period from 2009 to 2010. Standard definitions for stroke and stroke fatality were used. Ischemic stroke pathogenesis was classified by the Trial of ORG 10172 in Acute Stroke Treatment criteria.

Results—There were 318 stroke events recorded in 301 individuals; 238 (75%) were first-in-lifetime events. Crude incidence rates for first-ever strokes were 161 per 100 000 per year overall (95% confidence interval [CI], 141–183), 176 for men (95% CI, 147–201), and 146 for women (95% CI, 120–176). Adjusted to the world population rates were 76 overall (95% CI, 59–94), 91 for men (95% CI, 73–112), and 61 for women (95% CI, 47–78). The 28-day case fatality rate for first-ever stroke was 19% (95% CI, 14–24); the majority were ischemic (84% [95% CI, 78–88]). Intracerebral hemorrhage comprised 11% (8–16), subarachnoid hemorrhage 3% (1–6), and 3% (1–6) were undetermined. Of the 258 ischemic strokes, 42% (95% CI, 36–49) were of cardioembolic pathogenesis. Atrial fibrillation accounted for 36% of all ischemic strokes, of which 85% were inadequately anticoagulated.

Conclusions—Stroke incidence in Adelaide has not increased compared with previous Australian studies, despite the aging population. Cardioembolic strokes are becoming a higher proportion of all ischemic strokes. (***Stroke.*** **2013;44:1226-1231.)**

AF and Cardioembolic Stroke

A history of previous AF or PAF was identified in 78 stroke events. New onset AF was diagnosed at presentation in 26 events, and another 11 events were diagnosed with new onset PAF with cardiac monitoring.

Of 109 cardioembolic strokes, 81 were attributed to AF and 11 to PAF by the diagnostic panel. Of all AF-related strokes, 57 (70%) patients had been diagnosed before then event. Of these, 14 were therapeutically anticoagulated, 11 patients were subtherapeutically anticoagulated, and 32 patients were not anticoagulated. All 32 had a $CHADS_2$ score ≥2 before the event.[8] Of those 32, 16 had no contraindication to warfarin. Of the remaining 16, 2 had a history of gastrointestinal bleeding. For the remaining 14, treating doctors cited an unacceptably high risk of falling.

Stroke. 2013;44:1226-1231.

Anticoagulants and AF

- Challenges associated with warfarin therapy have prompted the development of a number of novel oral anticoagulants (NOACs)

- dabigatran, apixaban and rivaroxaban are available in Australia and listed on the Pharmaceutical Benefits Scheme (PBS).

Australian Government

Department of Health and Ageing

Review of Anticoagulation Therapies in Atrial Fibrillation

Table 1: Comparison of novel oral anticoagulants and warfarin

	dabigatran (Pradaxa)[4,5,8]	apixaban (Eliquis)[4,6,8]	rivaroxaban (Xarelto)[4,7,8]	warfarin (Coumadin, Marevan)[8]
Actions	Direct thrombin inhibitor	Direct and selective inhibitor of factor Xa	Direct and selective inhibitor of factor Xa	Inhibits synthesis of vitamin K-dependent clotting factors II, VII, IX, X and antithrombotic factors protein C and S
Indications	Prevention of: • VTE in total hip or knee replacement • stroke and systemic embolism in non-valvular AF and at least one additional risk factor for stroke	Prevention of: • VTE in total hip or knee replacement • stroke and systemic embolism in non-valvular AF and at least one additional risk factor for stroke	Prevention of: • VTE in total hip or knee replacement • stroke and systemic embolism in non-valvular AF and at least one additional risk factor for stroke • treatment of DVT/PE and for prevention of recurrent DVT/PE	Prevention of: • VTE and treatment for VTE • VTE in patients with prosthetic heart valves • stroke and systemic embolism in AF
Onset of action/ Half-life	Onset of action within 30 minutes. Half-life is 7-9 hours in young adults and 12-14 hours in elderly people. Half-life is prolonged in renal impairment	Onset of action within 30 minutes. Half-life is approximately 12 hours	Onset of action within 30 minutes. Half-life is approximately 5-9 hours in young adults and 11-13 hours in elderly people	Onset of action within 36-72 hours. Half-life is 20-60 hours
Dosage	Fixed according to clinical indication	Fixed according to clinical indication	Fixed according to clinical indication	Individualised and dose adjusted according to INR result

Fixed according to indication – example

Indication	VTE prevention			Stroke prevention NVAF		
Creatinine Clearance	rivaroxaban TKR 14 days THR 35 days	apixaban TKR 10-14 days THR 32-38 days	dabigatran TKR 10 days THR 28-35 days	rivaroxaban	apixaban	dabigatran
≥ 50 mL/min	10 mg once daily	2.5 mg twice daily	220 mg (2 x 110 mg) once daily	20 mg once daily	5 mg twice daily	150 mg twice daily
30–49 mL/min	10 mg once daily	2.5 mg twice daily	150 mg (2 x 75 mg) once daily	15 mg once daily	2.5 mg twice daily if ≥ 80 years or ≤ 60 kg	110 mg or 150 mg twice daily
15–29 mL/min	10 mg once daily (use with caution)				Contraindicated ≤ 25 mL/min	Contraindicated
Special considerations					2.5 mg twice daily if ≥ 80 years and ≤ 60 kg	110 mg twice daily if ≥ 75 years

Anticoagulants and AF

Doses of newer anticoagulants require adjustment in renal impairment. The recommendations are based on the Therapeutic Goods Administration (TGA) approved product information in Australia.

Calculation of creatinine clearance should be determined using the Cockcroft-Gault equation and ideal body weight as this is a more accurate estimate of renal function than eGFR for older people and those with a low or high body weight.

Anticoagulants and AF

Two safety advisories from the Therapeutic Goods Administration (TGA) in May and September 2013 informed health professionals of the importance of renal function monitoring in patients prescribed apixaban, dabigatran or rivaroxaban.

The TGA advisory on 23 May 2013 regarding dabigatran stated:

Kidney function should be estimated using the Cockcroft-Gault estimation in all patients

- before commencing therapy
- in clinical situations likely to result in a change in a patient's kidney function (for example, dehydration)
- after the addition or discontinuation of medicines that may impact kidney function.

Which of my patients may do better by continuing with warfarin?

Patients currently taking warfarin most likely to benefit from continuing with warfarin

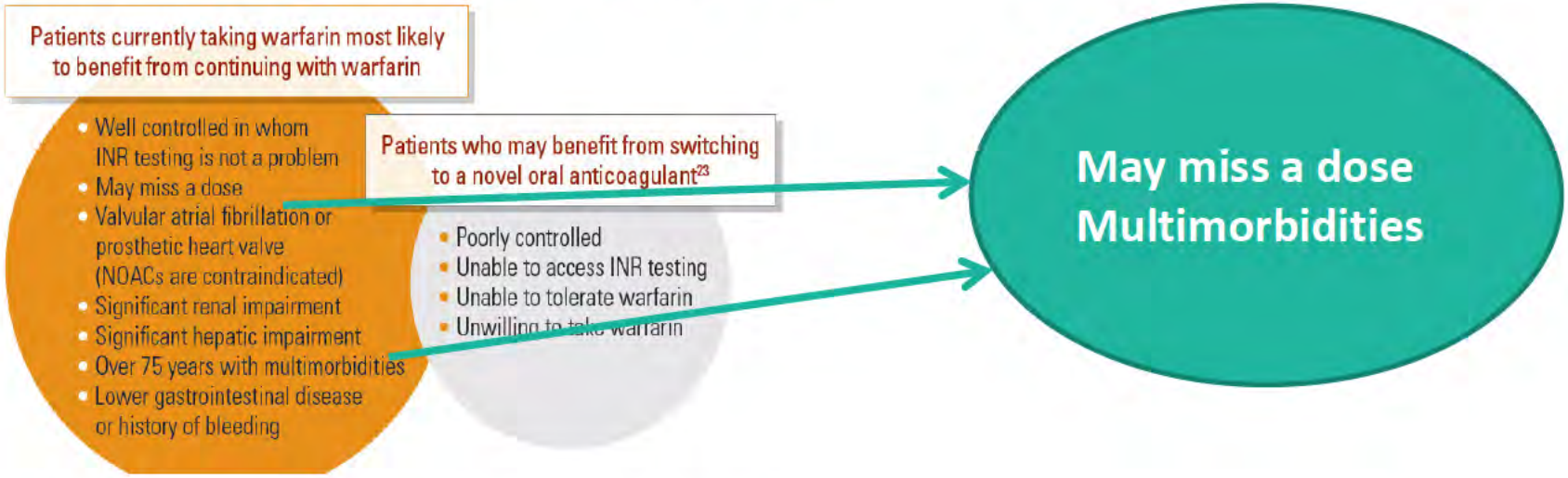
- Well controlled in whom INR testing is not a problem
- May miss a dose
- Valvular atrial fibrillation or prosthetic heart valve (NOACs are contraindicated)
- Significant renal impairment
- Significant hepatic impairment
- Over 75 years with multimorbidities
- Lower gastrointestinal disease or history of bleeding

Patients who may benefit from switching to a novel oral anticoagulant[23]

- Poorly controlled
- Unable to access INR testing
- Unable to tolerate warfarin
- Unwilling to take warfarin

Topic 37: The oral anticoagulant dilemma Nov 2013.

Which of my patients may do better by continuing with warfarin?

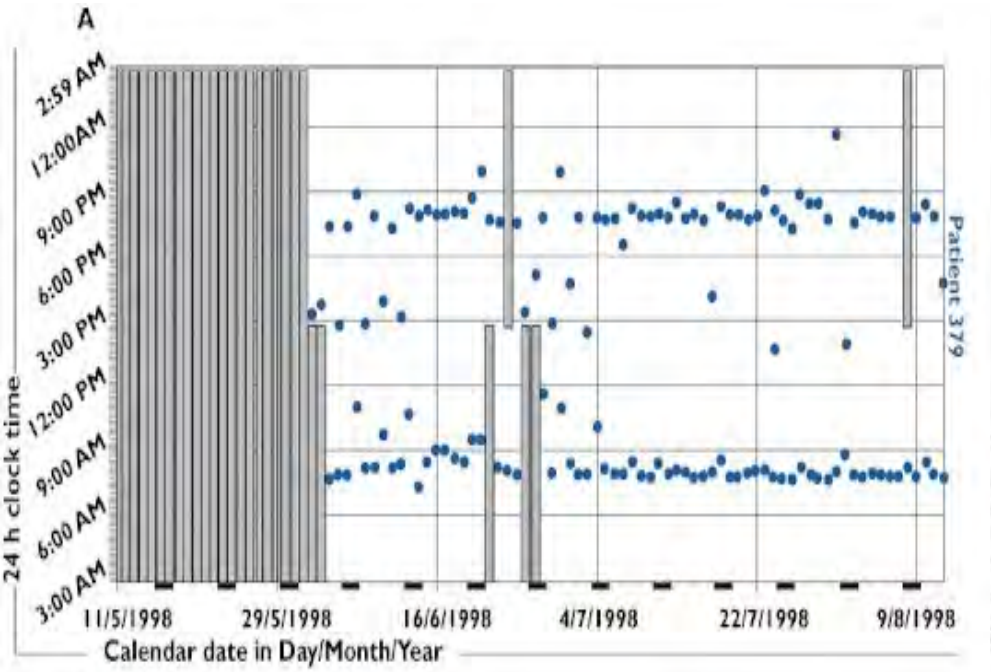


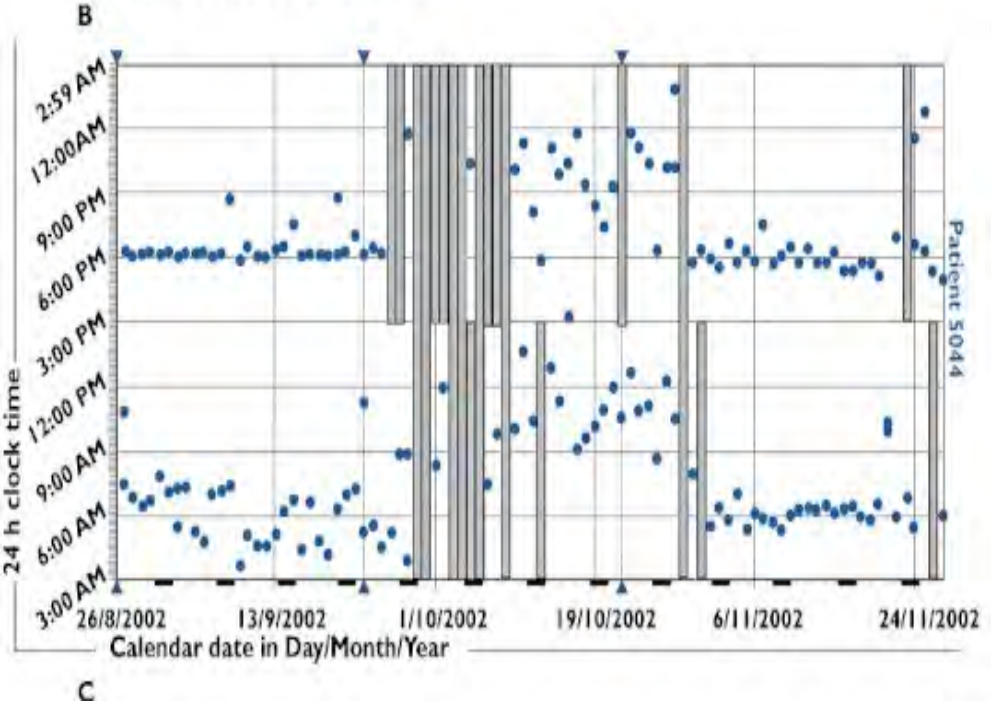
Topic 37: The oral anticoagulant dilemma Nov 2013.

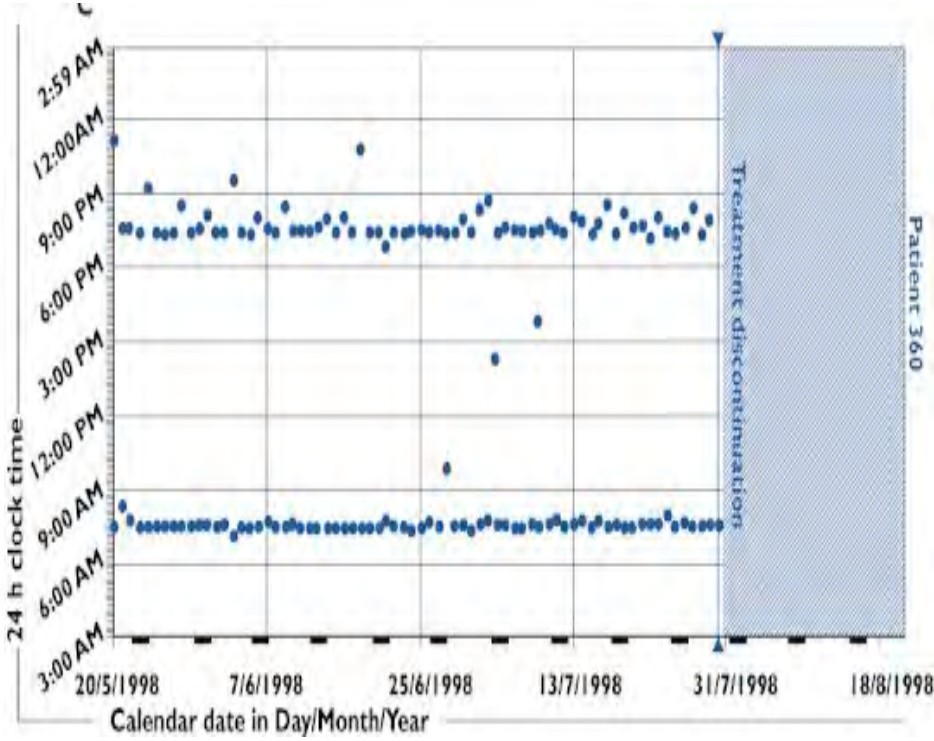
The non-adherent patient

Patients taking warfarin who have difficulty in maintaining correct dosing regimens should not be switched to a novel oral anticoagulant. Because of the shorter half-life of the novel oral anticoagulants, a missed dose is more likely to cause a significant or complete loss of antithrombotic effect.[13,14]

Topic 37: The oral anticoagulant dilemma Nov 2013.







Patient medication adherence not always what you think

And there may be good reasons

A new taxonomy for describing and defining adherence to medications. Vrijens B, De Geest S, Hughes DA, et al. Br J Clin Pharmacol. 2012 May;73(5):691-705.

GP 14
THE RACGP CONFERENCE FOR GENERAL PRACTICE

RACGP

Adelaide Convention Centre
9–11 October 2014
www.gpconference.com.au

What to discuss with your patient asking about novel oral anticoagulants[10,13,14]

- The risks and benefits of treatment options
- Safety issues involved with switching medicines
- The importance of continued clinical monitoring no matter what anticoagulant is prescribed
- Blood tests are a good way to monitor safety, e.g. renal function
- The importance of strict adherence
- Reporting of any unexpected adverse effects
- There is no benefit in switching for most patients who are well controlled taking warfarin.

Topic 37: The oral anticoagulant dilemma Nov 2013.
Veterans' Medicines Advice and Therapeutics Education Services

Lead. Inspire.

New Anticoagulants

Fewer interactions?

substrates for cytochrome P (CYP) 450 isozyme 3A4 and the cellular efflux pump P-glycoprotein.

Potential for interactions

There is little doubt that warfarin is more prone to interactions than newer agents, but oral anticoagulant therapy involves interaction risk.

Drug-Drug Interactions

Emerging number of drug interactions

St John's Wort

Induce cytochrome P450 isoenzymes e.g. CYP 3A4 (also in gut wall), 2C19, possibly 2E1, 1A2, 2C9 increases CYP P450 isoenzymes in liver, increases rate of metabolism of some drugs and decrease blood concentration with decrease in clinical response.

Drug-Drug Interactions

P glycoprotein inhibitors include ritonavir, cyclosporine, verapamil, erythromycin, ketocoanzole, itraconazole, quinidine

Interactions with amiodarone, clarithroymicin

And others……

Contraindications and cautions with novel oral anticoagulants

Contraindications

- All novel oral anticoagulants are contraindicated in patients:
  - with a known hypersensitivity or condition/s associated with a significant increased risk of bleeding[5-7]
  - with valvular atrial fibrillation, (including rheumatic valvular disease or a prosthetic heart valve)[8]
  - with significant hepatic disease[5-7]
  - undergoing dialysis.[6,7,11]
- dabigatran is contraindicated in patients with a creatinine clearance less than 30mL/minute.[5]
- rivaroxaban is contraindicated in patients with a creatinine clearance less than 30mL/minute for 15mg and 20mg tablets and in patients with a creatinine clearance less than 15mL/minute for 10mg tablets.[7]
- apixaban is contraindicated in patients with a creatinine clearance less than 25mL/minute.[6]

NOTE: for further details on contra-indications, see Product Information for each novel oral anticoagulant.

Cautions

The renally impaired and elderly patient

- Exercise caution in patients with mild to moderate renal impairment especially if considering the use of dabigatran as it is predominantly excreted via the kidneys.[5,10,20]
- Careful consideration in the elderly is advised as renal function commonly declines with increasing age and the risk of incurring a major bleed increases in those people 75 years of age and over.[5-8,20]
- Consider a reduced dose if your patient has moderate renal impairment (creatinine clearance 30-50mL/minute), is 75 years or older or has a potentially higher risk of major bleeding.[5-7]

The low body weight patient

- Patients with low body weight may be at an increased risk of bleeding.[21]

The patient with a history of GI bleeding

- Bleeding in the lower gastrointestinal tract, gastritis and dyspepsia are all more common in patients receiving dabigatran or rivaroxaban, compared with warfarin, especially in people over the age of 75 years.[5,7,20]
- Older people who have a history of lower gastrointestinal disease or bleeding may be at an increased risk of harm with the use of dabigatran or rivaroxaban.[14]

The patient with mild to moderate hepatic disease

- Caution is advised in patients taking apixaban with mild to moderate hepatic dysfunction.[6]
- Use rivaroxaban with caution in cirrhotic patients with moderate hepatic dysfunction.[7]

No reversal agent

- It is difficult to manage bleeding associated with the novel oral anticoagulants. As there is no specific pharmacological antidote currently available for any of the new agents, their actions are not able to be effectively and rapidly reversed. Thus management is largely supportive.[5-7,14]
- This is particularly hazardous in patients experiencing an overdose, major bleeding such as intracranial/extracranial or gastrointestinal bleeding, and during emergency invasive procedures.[2,14]

Increased risk of myocardial infarction

- There is evidence to link the use of dabigatran with a small increased risk of myocardial infarction or acute coronary syndrome.[22]

Go to NPS MedicineWise for information on how to safely switch your patient from warfarin to a novel oral anticoagulant: www.nps.org.au/medicines/switching-between-oral-anticoagulants

GP14
THE RACGP CONFERENCE
FOR GENERAL PRACTICE

RACGP

Adelaide Convention Centre
9–11 October 2014
www.gpconference.com.au

Topic 37: The oral anticoagulant dilemma is funded by the Australian Government Department of Veterans' Affairs as part of the Veterans' MATES program

Veterans' MATES
www.veteransmates.net.au

Australian Government
Department of Veterans' Affairs

University of South Australia | Sansom Institute for Health Research

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Oral corticosteroids: Minimising adverse effects

Background






Presenters

- Dr Russell s 47F
  - General Practitioner, SA
  - Veterans' MATES Clinical Reference Group
- Professor Gerard s 47F
  - School of Medicine, Deakin University, Geelong, Victoria
  - Veterans' MATES Editorial Committee
- Professor Amanda s 47F
  - Australian National University Medical School, Canberra
  - Veterans' MATES Editorial Committee

Format

- The clinical considerations (10 minutes)
- Case study (15 minutes)
  - Present case study (5 minutes).
  - Group discussion (5 minutes)
  - Summary (5 minutes)
- Time permitting 5 minute short panel & audience discussion
- Close

Corticosteroids

An old drug class, can be very useful..

But some potentially nasty side effects……

- When used for longer than 3 months, particularly at doses higher than the equivalent of prednisolone 5 mg per day, corticosteroids are associated with a high incidence of adverse effects ranging from bothersome to life threatening
- Often difficult to separate the effects of the therapy from the underlying disease/s they are used to treat - especially in older people with multi-morbidity and prescribed multiple medicines.
- **This presentation** will highlight the adverse effects associated with oral corticosteroid use and will attempt to provide strategies to minimise those effects.

Practice points

To reduce the risk of adverse effects:

- Lowest therapeutic dose for the shortest possible time to achieve the desired clinical outcome
- consider the dose of all steroids prescribed including inhaled and topical steroids
- consider the individual needs of the patient to balance risks, burdens, benefits and quality of life, especially in older patients with multi-morbidity
- And **monitor**…….

Monitor for…

- Fracture risk
- Hyperglycaemia
- Weight gain/Cushingoid change
- Cardiovascular disease
- Neuropsychiatric problems
- Eye issues – cataracts/glaucoma
- GIT
- Skin

Monitor for……

Fracture Risk

- Fracture risk is increased by bone loss and muscle weakness and atrophy
- Instigate early preventive measures

Fracture Risk

- ***When are symptoms most likely to appear?***
  - Bone loss
    - Increases rapidly in the first 3-6 months, then continues at a lesser rate. Decreases substantially after ceasing therapy.
  - Muscle weakness and atrophy
    - Classic: develops slowly over several weeks to months after prolonged use
    - Acute (less common): occur abruptly 5 to 7 days after initiation of high-dose
- ***Who is most likely to be affected?***
  - Bone loss
    - >5mg oral prednisolone per day for longer than 3 months
    - Those receiving frequent short courses
  - Muscle weakness and atrophy
    - Those taking high doses
    - sedentary lifestyle
    - women

Fracture Risk

- ***How to monitor and minimise effects?***
  - Bone loss
    - Assess fracture risk,
    - Diet, exercise, minimise alcohol intake and stop smoking
    - Vit D, Calcium
    - Bisphosphonates
    - Ongoing review of corticosteroid dose with reduction or cessation if clinically appropriate
    - Use of inhaled or topical corticosteroids where possible
  - Muscle weakness and atrophy
    - Ascertain if patient is having progressive difficulty rising from a chair, climbing stairs or performing overhead reaching activities
    - Encourage patient to report any symptoms
    - Emphasise the benefits of weight bearing exercise
    - Symptoms generally improve with dose reduction and resolve on cessation of treatment

Monitor for……

Hyperglycaemia

- Corticosteroids may increase BGLs in both diabetic and non diabetic patients
- Risk of developing new onset diabetes more than doubles in the elderly after initiation of oral corticosteroids.

Hyperglycaemia

- ***When are symptoms most likely to appear?***
  - Within hours or days after initiating therapy
- ***Who is most likely to be affected?***
  - Patients taking high doses or with prolonged therapy
  - Patients prone to diabetes or those who already have diabetes
  - Taking corticosteroids for the first time in conditions such as, polymyalgia rheumatica, giant cell arteritis or disseminated malignancy
- ***How to monitor and minimise effects?***
  - Monitor BGLs from the start of therapy
  - Be aware blurred vision may indicate acute hyperglycaemia
  - Often improves with dose reduction and reverses with cessation of therapy

Monitor for……

Weight gain and Cushingoid features

- Often the most distressing adverse effect for many patients
- May lead to non-adherence of therapy
- Patients treated with corticosteroids and develop cushingoid features are at a high risk of cardiovascular disease and features of metabolic syndrome (↑ blood pressure, ↑ triglycerides and ↑ blood glucose and ↑ cholesterol levels)

Weight gain and Cushingoid features

- ***When are symptoms most likely to appear?***
  - Within the initial 2-3 months of therapy
- ***Who is most likely to be affected?***
  - Patients taking high dose, long term therapy
  - Women, people <50 years, high BMI and high calorie intake
- ***How to monitor and minimise effects?***
  - Monitor weight and observe for signs
  - Encourage a low calorie diet and physical exercise
  - Assess cardiac risk and monitor lipid profile, blood pressure and BGLs
  - Dose reduction or cessation if clinically appropriate

Weight gain and Cushingoid features

- ***When are symptoms most likely to appear?***
  - Within the initial 2-3 months of therapy
- ***Who is most likely to be affected?***
  - Patients taking high dose, long term therapy
  - Women, people <50 years, high BMI and high calorie intake
- ***How to monitor and minimise effects?***
  - Monitor weight and observe for signs
  - Encourage a low calorie diet and physical exercise
  - Assess cardiac risk and monitor lipid profile, blood pressure and BGLs
  - Dose reduction or cessation if clinically appropriate

Monitor for……

Cardiovascular disease

- Corticosteroid daily doses greater than 7.5 mg prednisolone or the equivalent are associated with a significantly increased risk of cardiovascular events
- Hypertension and heart failure may also be worsened due to sodium and fluid retention

Cardiovascular disease

- ***When are symptoms most likely to appear?***
  - Fluid retention can occur soon after initiation of therapy
  - MI, heart failure, TIA and stroke – within the first year
- ***Who is most likely to be affected?***
  - Patients taking doses greater than the equivalent of 7.5mg of prednisolone per day
  - Those taking corticosteroids continuously for prolonged periods
- ***How to monitor and minimise effects?***
  - Assess cardiac risk, monitor lipid profile, BP and BGLs
  - Dose reduction or cessation if clinically appropriate

Monitor for……

Neuropsychiatric effects

- Mild neuropsychiatric effects appear to be common
- Serious adverse effects occur in approx. 6% of those receiving oral corticosteroids.

Neuropsychiatric effects

- ***When are symptoms likely to emerge?***
  - At any time (even after cessation), but typically during the first few weeks
  - Progression from mild to severe may only be a short time
- ***What is the effect?***
  - Varied and unpredictable. May include:
    - insomnia or vivid dreams, irritability with mood swings depression/anxiety, mania or hypomania, catatonia and depersonalisation
    - Delirium and psychosis less common
  - euphoric effect and general feeling of wellbeing may lead your patient to resist dose reduction and cessation of therapy
- ***How to monitor and minimise effects?***
  - Be alert to early symptoms
  - Refer to psychiatrist immediately if acute psychosis develops
  - Dose reduction or cessation if clinically appropriate

Monitor for……

Cataracts and glaucoma

- Posterior subcapsular cataracts are relatively common in prolonged corticosteroid use
- Corticosteroid induced glaucoma is much less common

Cataracts and glaucoma

- ***When are they most likely to occur?***
  - Posterior subcapsular cataracts develop slowly and are relatively common
  - Glaucoma is rare and unpredictable
- ***Who is most likely to be affected?***
  - Patients taking high doses and prolonged use
  - Glaucoma: Patients with a family history of open angle glaucoma, diabetes, high myopia or connective tissue disease
- ***How to monitor and minimise effects?***
  - Review dose with reduction or cessation if clinically appropriate.
  - Refer your patient annually to an optometrist or ophthalmologist for a comprehensive assessment (earlier if symptoms of cataracts are present)

Monitor for……

Gastrointestinal effects

- can include:
  - gastritis
  - dyspepsia
  - ulcers with perforation and bleeding,
  - abdominal distention
  - oesophageal ulceration

Gastrointestinal effects

- ***Who is most likely to be affected?***
  - Patients taking bisphosphonates, NSAIDs, calcium channel blockers, nitrates may be at risk of developing dyspepsia, reflux or ulcers
  - Patients taking NSAIDs and corticosteroids together are at an increased risk of gastric ulceration and bleeding
  - The effect of warfarin is increased when taken with corticosteroids
  - Patients with high alcohol intake may be at an increased risk of gastrointestinal ulceration or bleeding
- ***How to monitor and minimise effects?***
  - Take corticosteroids with food
  - Avoid NSAIDs if possible (If not possible, consider a PPI)
  - Advise patients with a high alcohol intake to limit consumption
  - Monitor INR closely if taking warfarin and corticosteroids together, decreasing warfarin dose as required

Monitor for……

Dermatological effects

- Thinning of the skin, skin tears and bruising are common especially in the elderly

Dermatological effects

- ***Who is most likely to be affected?***
  - Taking equivalent of 7.5 mg of prednisolone or more per day for several months
  - Older people
- ***What are the potential adverse effects?***
  - skin atrophy, easy bruising, rosacea, acne and facial flushing, striae to the thighs, buttocks and shoulders, purpura and hirsutism
  - Impaired wound healing
- ***How to monitor and minimise effects?***
  - Advise your patients to take extra care to avoid injuries and to promptly seek medical attention after an injury
  - Apply an emollient twice daily
  - Consider preventive strategies

A final note……

Tapering or withdrawing therapy

- Lack of clinical evidence to support any particular regimen of tapering
- Rate of tapering will depend on:
  - underlying disease
  - previous dose
  - duration of therapy
  - individual response
- Watch for symptoms of underlying disease and adrenal suppression and slow tapering if necessary
- Loss of euphoric effects may cause resistance to tapering

Improving health outcomes for Australian war veterans with diabetes and heart failure

Andrew s 47F

Quality Use of Medicines and Pharmacy Research Centre

Sansom Institute

University of South Australia

May 2009

Introduction

- The Department of Veterans' Affairs (DVA), operates a national QUM program: *Veterans' MATES*.
- Aim: To optimise the use of medicines to improve health outcomes for veterans
- Cardiovascular disease is a major health burden in the veteran population.
- Over 12000 veterans have heart failure (HF) and 18000 diabetes. We report on outcomes of this service.

Methods

- We use DVA's database, covering 300,000 veterans, to provide
  - patient-specific-prescriber-feedback,
  - therapeutic updates and
  - information for veterans

  to assist veterans and their health practitioners improve health outcomes.

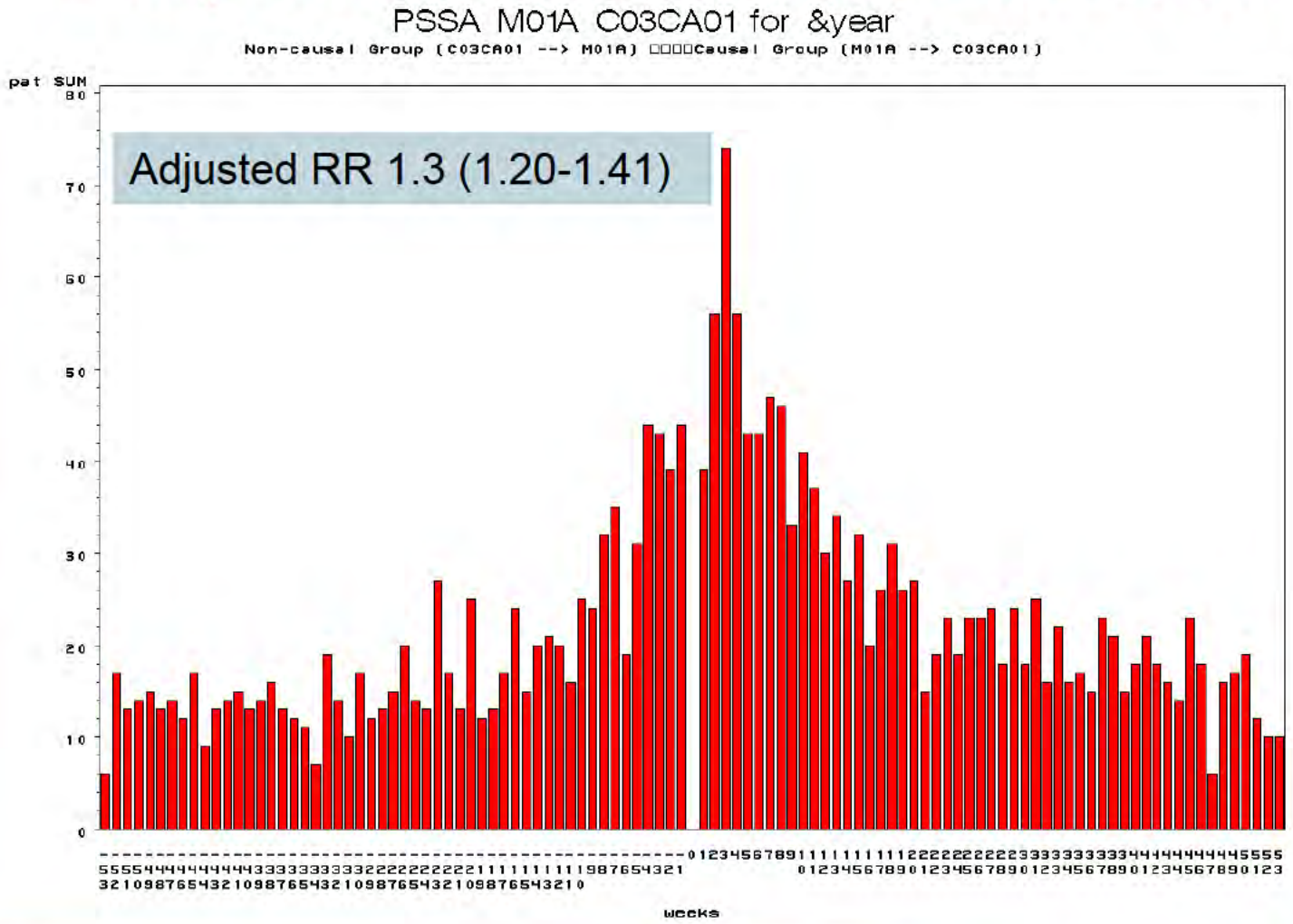
Therapeutic area selected from analyses in databases and National Health Priority areas

- Medication-related problem analysis
- Module topic selected
- Patient specific feedback developed
- Module implementation
- Evaluation

Identifying adverse drug reactions using simple signalling methods

- Prescription symmetry analysis
  - Do NSAIDs precipitate heart failure?
- Drug Utilisation/Health Services Reviews
  - Uptake of NSAIDs in patients with heart failure
- Cohort studies
  - Hospitalisations for these patients

There is a 30% increase in likelihood of starting a loop diuretic after initiation of an NSAID



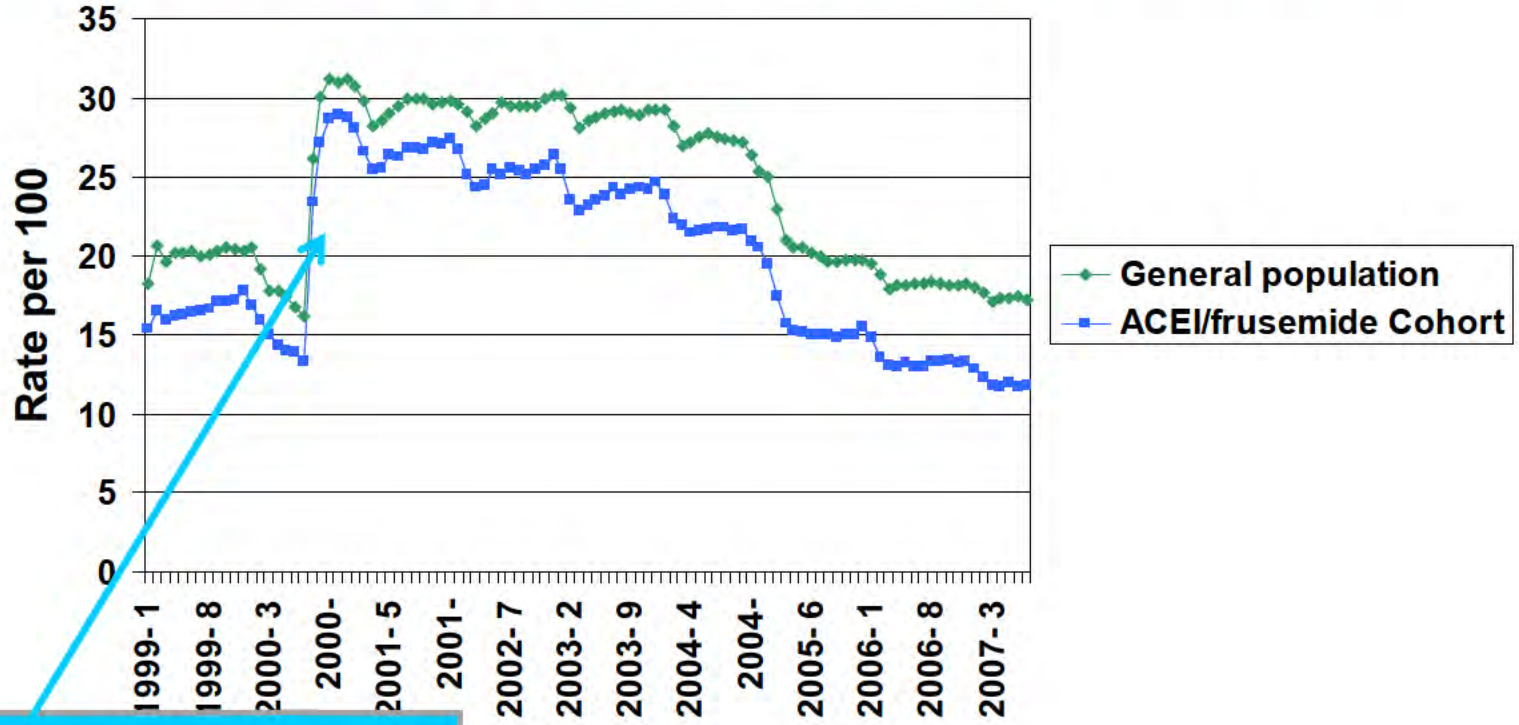
Hospitalisation for heart failure increases dispensings of recommended therapy

N=3277	Pre-hosp	Post-hosp	Percent change
ACE or A2RB	59.5%	72.0%	12.5%
Lipid lowering	37.3%	40.8%	3.5%
Calcium channel blockers	26.4%	21.3%	-5.1%
Beta blockers	31.7%	43.6%	11.9%
Beta blockers for CHF	11.6%	25.5%	13.8%
Diuretics	12.6%	11.0%	-1.6%
Loop Diuretics	47.0%	71.4%	24.4%
Aldosterone diuretics	8.4%	22.9%	14.5%
Digoxin	18.3%	27.2%	8.9%
Aspirin or other antiplatelets	33.4%	41.8%	8.4%

Use of care planning services by veterans hospitalised for heart failure

	n=3277
Annual health assessment	25.5%
GP management plan	17.6%
Medicine review	5.6%
Case conference	4.5%
Ave number of different GPs	3.1

NSAID use in ACE /frusemide population (high risk of adverse renal events)



49% increase in use in the heart failure population with launch of celecoxib

Consequence of NSAID use in Heart Failure population

	NSAID exposure Rate per 1000 days of patient follow-up	**Non-exposed Group** Rate per 1000 days of patient	**Adjusted relative risk**	**95% CI, p**
All hospitalisations (CHF, GI ulcer, ARF, AMI or hypertension)	0.57	0.39	1.48	1.25 - 1.75,
Congestive heart failure	0.39	0.3	1.32	1.08 – 1.62
Gastrointestinal ulcer	0.04	0.009	4.49	2.35-8.56
Acute renal failure	0.04	0.02	2.03	1.08 – 3.81
Acute myocardial infarct	0.08	0.05	1.56	0.997 – 2.43
Hypertension	0.01	0.006	1.91	0.60-6.06

Patient-specific prescriber feedback

- Topics are mailed to
  - GPs who have veteran patients identified in the topic cohort,
  - Pharmacists and
  - the cohort of veterans.
- Topic aims were to
  - increase use of *B*-blockers in veterans treated for HF,
  - to reduce the use of NSAIDs in veterans with either HF and
  - to increase Home Medicines Review (HMR) rates.

Increasing beta-blocker use in heart failure

- Method: targeted cohort compared to historical comparison groups

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Therapeutic brief 2

Beta-blockers: take the next step for heart failure

Heart failure is a common reason for attendance at general practitioner clinics. It affects 4% of Australians (aged 45 years or more) with the prevalence increasing from about 1% at age 50 to 59 years, to over 50% above age 84[1]. Heart failure is likely to be prevalent amongst veterans of whom 82% are over 65 years of age[1].

Key Points

- Beta-blockers are recommended therapy for all patients with systolic heart failure, unless not tolerated or contraindicated.
- Even patients with mild symptoms, who appear clinically stable on an ACE inhibitor and a loop diuretic, with or without digoxin, should benefit from the addition of a beta-blocker.
- Long-term use improves left ventricular function, reduces disease progression, and reduces risk of death and hospitalisation.
- Regular follow-up is important for all patients on beta blockers.
- Slowly withdraw beta blockers, should it become necessary, and monitor closely.
- Good communication between healthcare professionals and patients and carers is essential for the best management of heart failure.

Content

The management of patients with heart failure is increasing in the primary care setting, and the emphasis of new national programs on early recognition of signs and diagnosis of heart failure suggest that this trend will continue[2].

The focus of this second module of the Veterans' MATES program is on recent evidence for the role of beta-blockers in managing heart failure. This module will address how to initiate and monitor beta-blockers, particularly in the primary care setting, as well as concerns about adverse effects, contraindications and co-morbidities.

Veterans'MATES

Welcome to Veterans' MATES: Medicines Advice and Therapeutics Education Services. This is the second of 10 modules which will be delivered over the next 3 years.

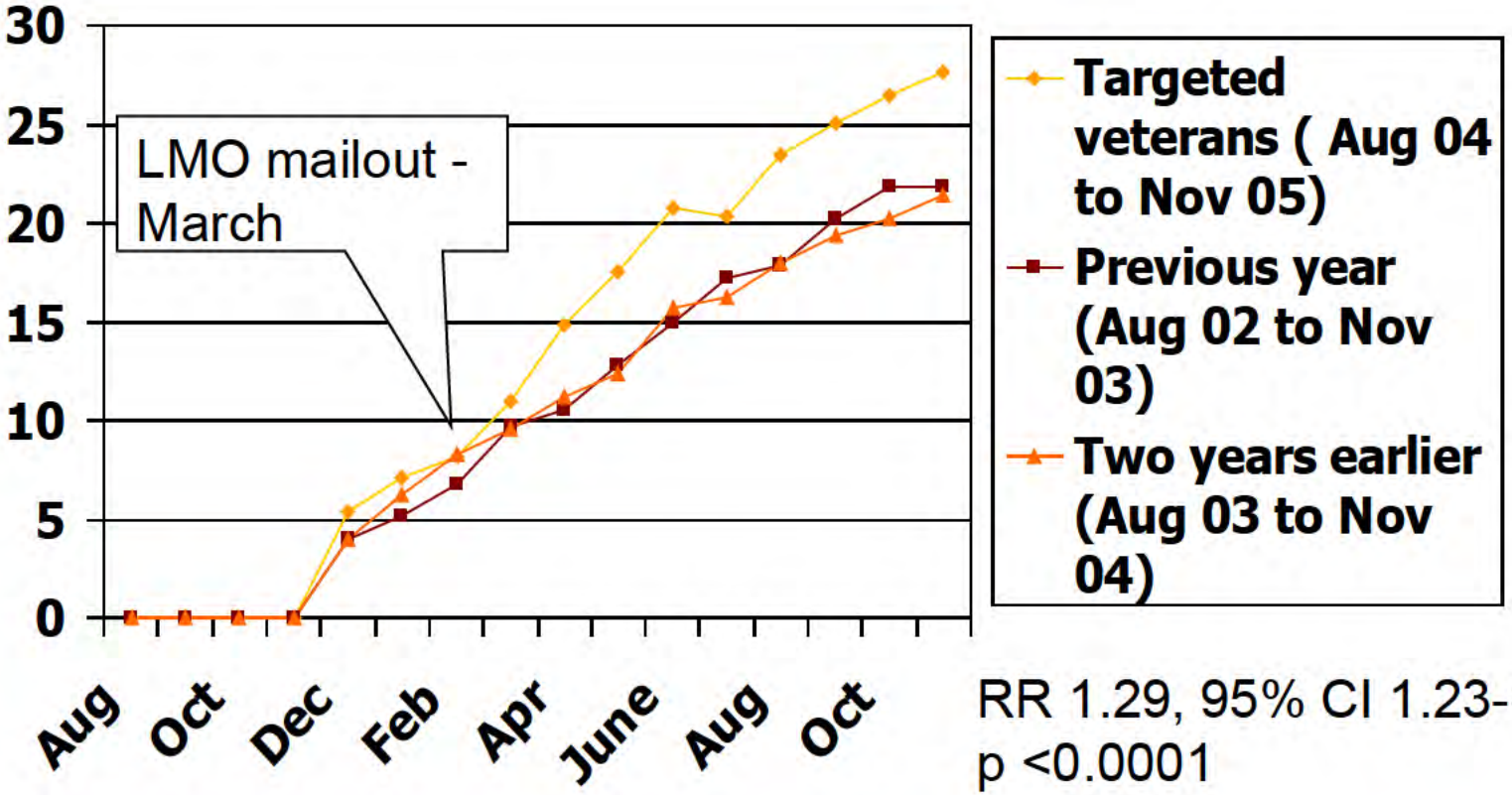
Evidence for beta-blockers in heart failure

Patients who have mild symptoms or who appear clinically stable may not seem to require additional treatment. These patients are however at high risk for morbidity and mortality and are likely to deteriorate during the ensuing 12 months even if treated with loop diuretics[3] and ACE inhibitors with or without digoxin. Therefore, even if they do not benefit symptomatically because they have little disability, patients with mild symptoms should receive treatment with a beta-blocker to reduce the risk from disease progression, future clinical deterioration and sudden death[4].

Gradual up-titration of beta-blockers improves left ventricular function and reduces risk of death and hospitalisation for patients with all grades of systolic heart failure[5-6-7]. These benefits are in addition to those achieved with ACE inhibitors[4-6-7].

To obtain these additional benefits it is recommended that you *take the next step* in managing your veteran's heart failure by considering the careful addition of a beta-blocker after achieving the highest tolerated dose of an ACE inhibitor.

Increased rate of beta-blocker listed for heart failure in population taking ACEI & frusemide



RR 1.29, 95% CI 1.23-1.35, p <0.0001

Increasing the use of care planning in veterans

- Aim: to increase the rate of home medication reviews for veterans over 65 years on multiple medicines
- Method:
  - time series analysis

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Therapeutic brief 1

Flag Veterans for Medicines Review

Medicines review provides an opportunity for you to assess how your veteran patient is managing their medicines and the outcomes being achieved.

There are a number of ways of reviewing your patient's medicines. Home Medicines Review has been demonstrated to be the most effective.[1]

Consider a Home Medicines Review (HMR) for all veterans with one of these flags:
- Multiple medicines
- Recent hospitalisation
- Confusion, hearing, vision or dexterity problems
- High-risk medicines

Inside

Home Medicines Review (HMR)
What is it and how is it different from what I already do? p2

Background p2

Why are veterans vulnerable to medication-related problems? p2

How to organise a HMR
Medicines review made easy p3

The risk flags p4

What are the benefits to you as a GP?

HMR complements the regular reviews of medicines that GPs undertake by providing information on the patient's experiences in using their medicines at home.

Following each home visit, you will receive a report from the pharmacist which includes:
- a comprehensive patient medicine list including over-the-counter (OTC) and complementary medicines;
- an assessment of medicine-taking behaviour i.e. exactly what medicines are being taken, when and how they are being taken;
- relevant drug interactions – many prescribing systems flag interactions but the pharmacist can provide information on whether or not these interactions are clinically important;
- information on your veteran's requirements for additional patient education and training in the use of medicine delivery devices.

HMR provides payment to allow you time to reflect on the patient's medicines and develop a medication management plan with the veteran (full GP MBS 900 payment is $126.10)

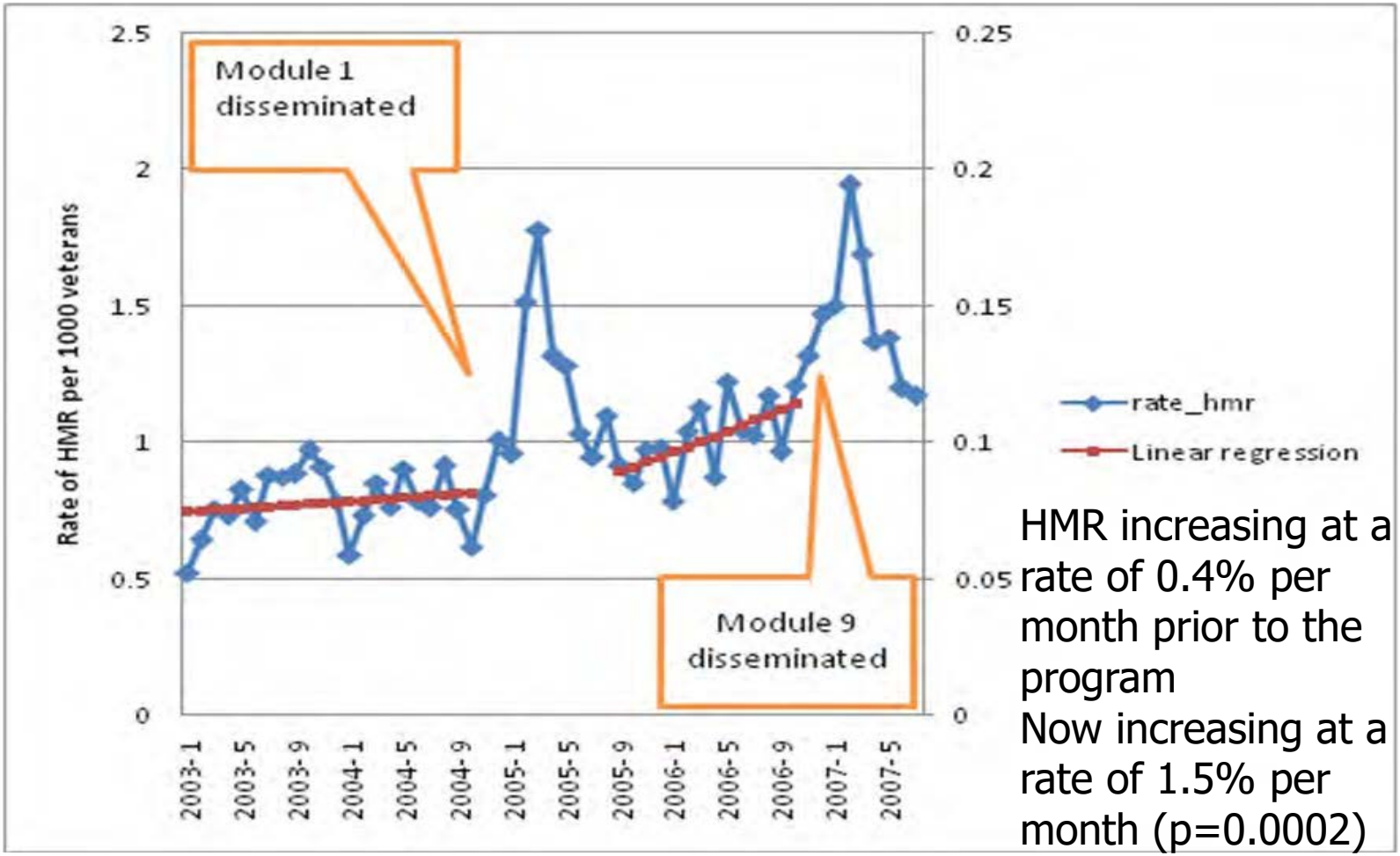
What are the benefits of a HMR for your veteran patient?

- **Greater understanding of their medicines.**
  Confusion may arise for a number of reasons including brand substitution. Only 27% of Australian veterans rated their understanding of their medical conditions and medicines as very good prior to a HMR. This rose to 87% after the HMR visit.[1]
- **Improved ability to keep taking their medicines appropriately.**
- **Reduced risk of medication-related problems.**
- **Reassurance and peace of mind.**
  65% of people are very concerned about taking the wrong medicine and 56% are very concerned about suffering from a drug interaction.[2]

Veterans'MATES

Welcome to Veterans' MATES: Medicines Advice and Therapeutics Education Services. This is the first of 10 modules which will be delivered over the next 3 years.

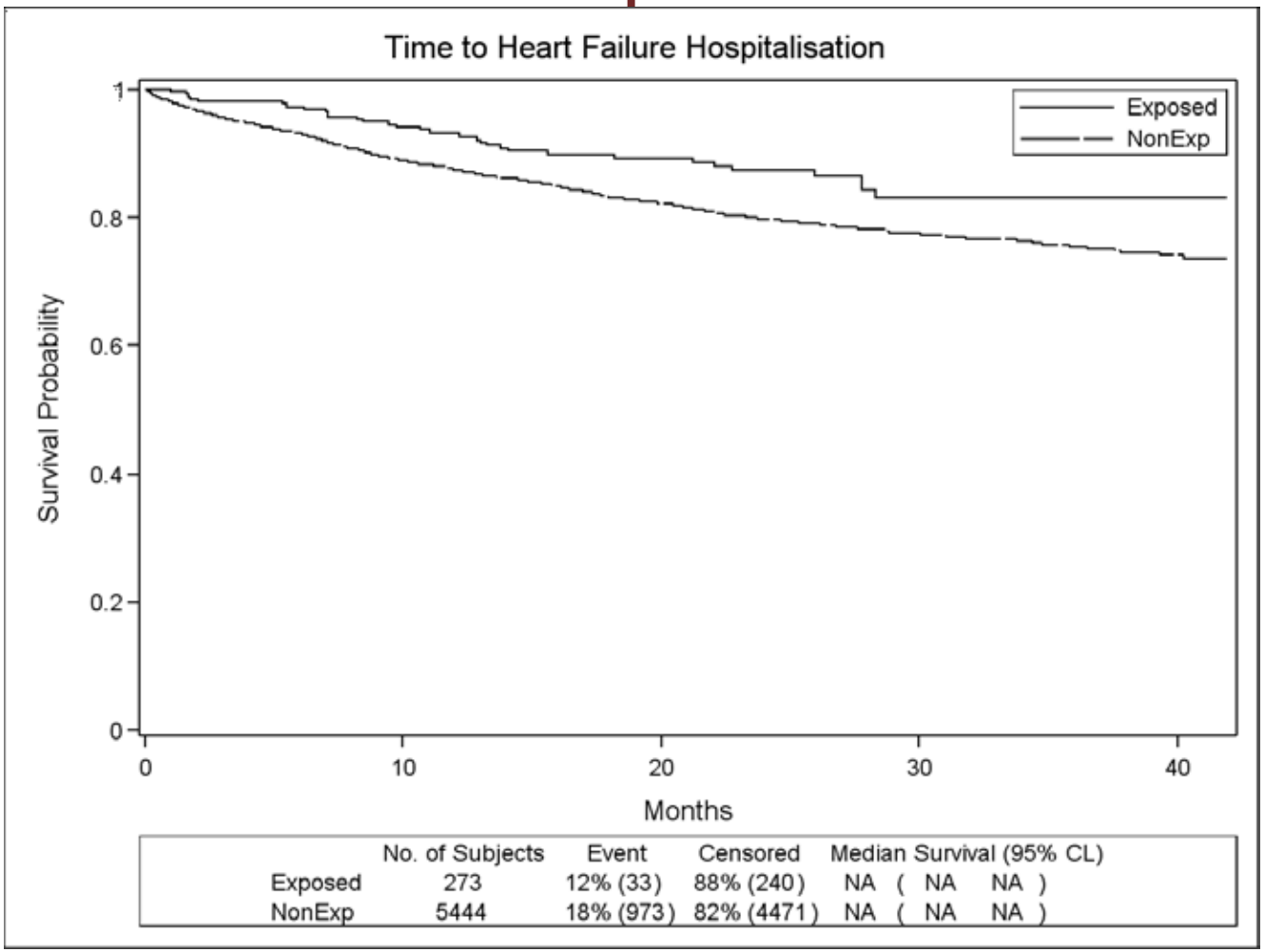
Time series medicine review rates



HMR increasing at a rate of 0.4% per month prior to the program

Now increasing at a rate of 1.5% per month (p=0.0002)

Did home medicines review have an impact?



Increased time to next hospitalisation for HF patients who received an HMR

- For those who received a home medicines review there was a 46% reduction in the likelihood of hospitalisation for heart failure at any time (HR, 0.54 95% CI, 0.38-0.77).

- For a subset of the population, this delay equated to 7 months.

Can we reduce potentially inappropriate NSAID use?

- Aim: to reduce NSAID use in those with heart failure
- Method: rate of NSAID cessation in targeted veterans versus comparison group

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Veterans' MATES

Therapeutic brief 4

Clinical Risk Management: NSAIDs

The withdrawal of rofecoxib (Vioxx®) in September 2004 ignited debate regarding the safety of all non-steroidal anti-inflammatory drugs (including selective COX-2 and non-selective NSAIDs). Drug regulatory agencies[1,2] have since formulated recommendations on appropriate use of NSAIDs.

This therapeutic brief asks you to review the clinical risk management of your veteran patients who use NSAIDs (excluding low dose aspirin), particularly those with diabetes and heart failure.

NSAIDs: Think clinical risk management of high risk patients

- Choice of NSAID
- Review dose and duration of use regularly
- Consider a gastroprotective agent
- Assess & monitor renal, cardiovascular and gastrointestinal risk

Inside

NSAIDs have effective analgesic and anti-inflammatory properties but their potential to cause serious adverse effects is well known. Patients with heart failure, diabetes, and those aged over 65 years are at particular risk of cardiovascular and renal adverse effects.

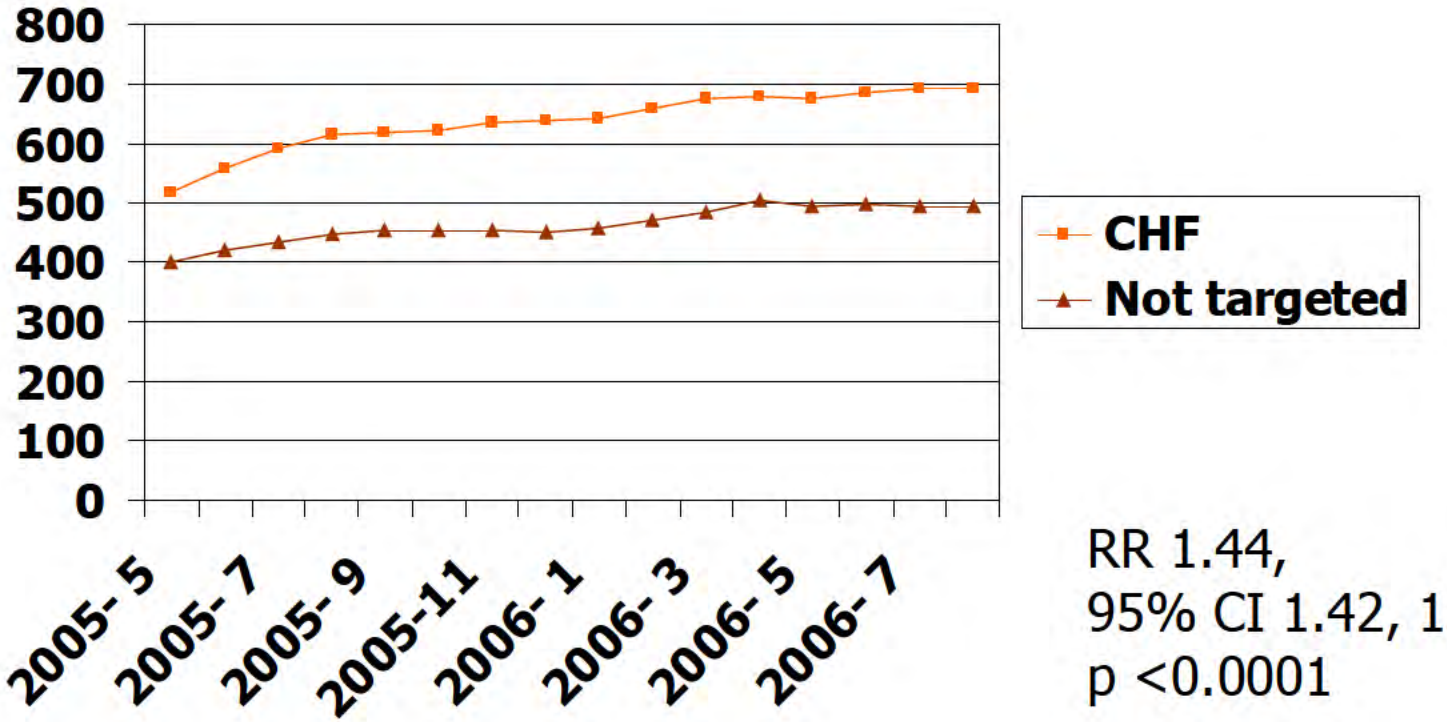
In the year April 2004 to March 2005, 105,476 of the 317,908 veterans who were dispensed at least one medicine also received a NSAID (33%).[3] 34% of veterans dispensed medicines for diabetes and 33% of veterans dispensed medicines for heart failure were also dispensed at least one NSAID.[3]

Osteoarthritis is a common reason for use of NSAIDs. Paracetamol is first-line pharmacological treatment for osteoarthritis.[4] For patients whose pain is not adequately relieved by regular paracetamol, NSAIDs may be considered.

Key Points

- Many veterans are at increased risk of an NSAID adverse effect due to their age (>65 years).
- Veterans with heart failure and/or diabetes are at particular risk of the cardiovascular and renal adverse effects from NSAIDs.
- Both selective COX-2 and non-selective NSAIDs can exacerbate heart failure and hypertension.
- Selective COX-2 NSAIDs show an increased risk of thrombotic events such as heart attack and stroke, particularly when used in high doses.
- Selective COX-2 NSAIDs are no more effective than non-selective NSAIDs for the treatment of inflammatory conditions.
- NSAIDs should only be considered for treating osteoarthritis after a trial of regular paracetamol.

Cessation of NSAIDs occurred at a faster rate in targeted veterans



RR 1.44,
95% CI 1.42, 1.46
p <0.0001

Same results achieved in diabetes population

- Lipid lowering (RR1.16, CI 1.1-1.23) and antiplatlet prescribing increased (RR1.15, CI 1.08-1.22) in diabetics;
- Home Medicine Review rates increased.
- Use of NSAIDs in diabetics led to increased hospitalisations (RR 1.47, CI 1.17-1.84);
- cessation rates of NSAIDs increased in diabetic cohort (RR 1.44, CI 1.42-1.46) and

Conclusion

Veterans' MATES has made a considerable contribution to improving management of cardiovascular health and to health outcomes in veterans.

Trends in antipsychotic dispensing among community and aged-care dwelling veterans

Dr Svetla s 47F Dr Malcolm s 47F A/Prof Libby s 47F Dr Yeqin s 47F

Joint research between UniSA and NPS

Introduction

Antipsychotics, while modestly efficacious at reducing some behavioural and psychological symptoms of dementia [1], have been associated with increased risk of hip fracture, pneumonia, stroke and death [2] and so should be reserved for individuals with severe symptoms who have not responded adequately to non-drug strategies.

This research examined prescribing patterns in the use of antipsychotics in the Australian veteran population.

Method

De-identified administrative claims data from the Department of Veterans' Affairs was used to conduct a retrospective observational study on veterans aged 65 years and over who were dispensed antipsychotics between Jan 2002 and May 2010.

The outcome measure was aged-standardized drug utilization of antipsychotics in alive veteran population aged 65 and over. The results were stratified by antipsychotic type (typical / atypical) , veteran's residential status and gender.

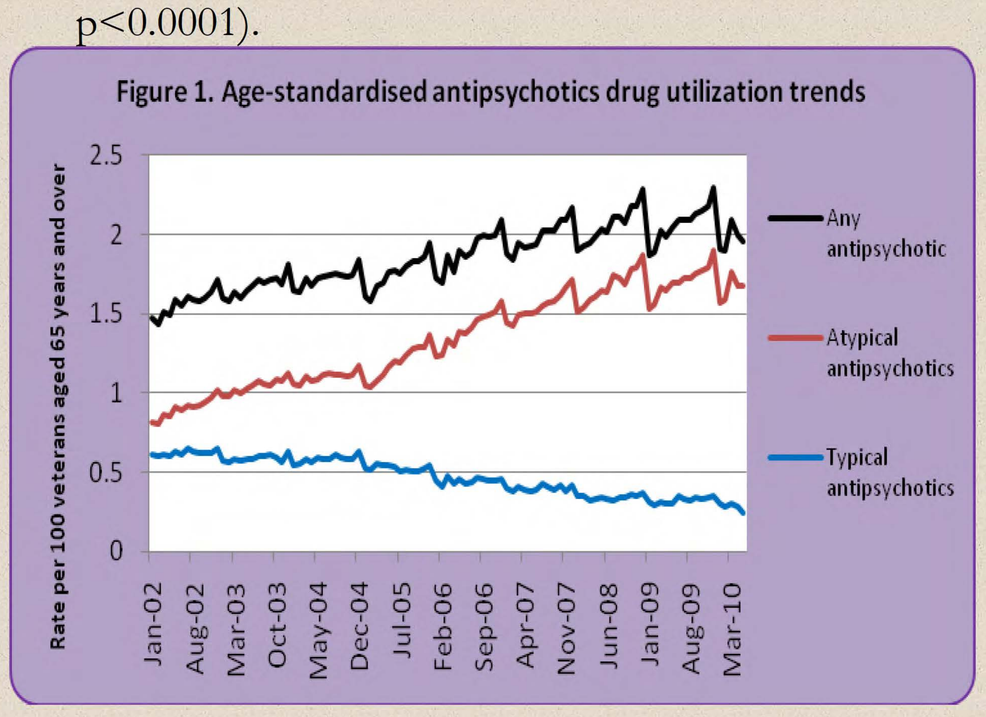
Repeat dispensing patterns were also examined for the 12 months following an index script with antipsychotic.

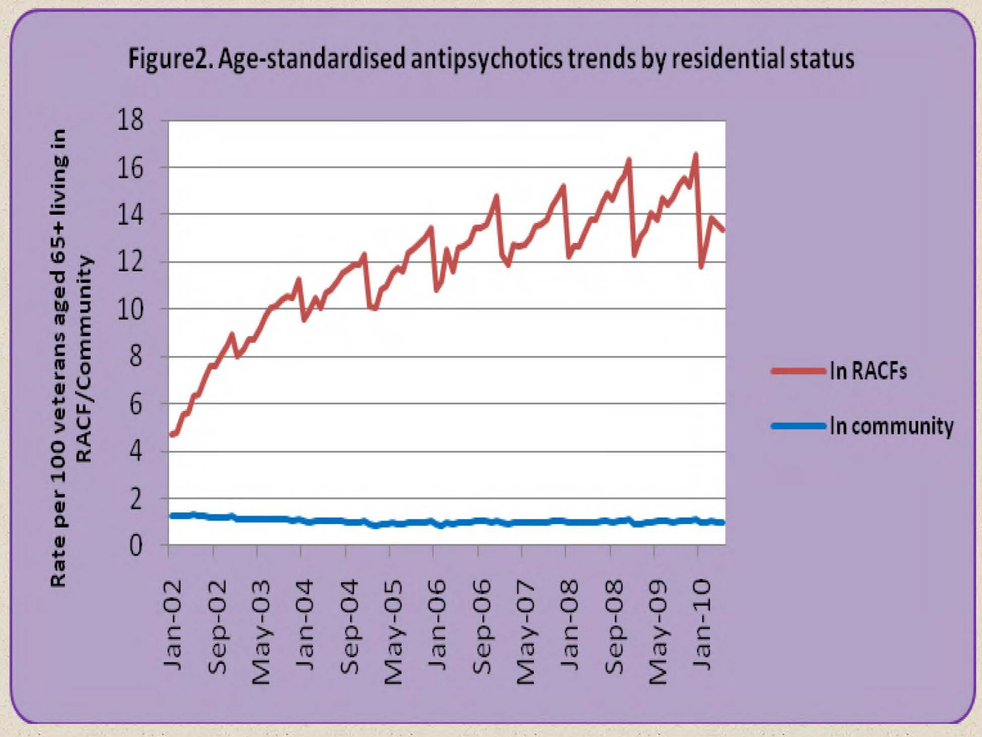
Results

The utilisation trends presented in Figure1 show:

- an increased overall use of antipsychotics from 1.5% in January 2002 to 2.0% in May 2010 (Pearson chi square, $p<0.0001$);
- an increase in the use of atypical antipsychotics from 0.8% in Jan 2002 to 1.7% in May 2010 (Pearson chi square, $p<0.0001$);
- a decline in the use of typical antipsychotics from 0.6% in Jan 2002 to 0.2% in May 2010 (Pearson chi square, $p<0.0001$);

Figure 2 demonstrates the use of antipsychotics by community and residential aged-care facilities (RACFs) veterans. It shows a stable rate of less than 2% of community living veterans receiving antipsychotics, compared to an increasing rate of veterans living in RACFs (from 4.7% in Jan 2002 to 13.4% in May 2010; Pearson chi square, $p<0.0001$).





Conclusions

There is an increasing use of antipsychotics in the elderly, veterans especially of atypical antipsychotics. Olanzapine dispensing was most common for community living veterans, followed by risperidone. In RACFs, risperidone was the most commonly prescribed atypical antipsychotic.

After an antipsychotic initiation, around 40% of the users would receive four or more repeats in the next 12 months., suggesting continuing use.

While the rates of prescribing among females and males were similar for community living veterans, in RACFs females were receiving more antipsychotics than males.

Antipsychotics were dispensed at increasing and much higher rates for veterans living in aged-care facilities compared to those living in the community. Some of the difference is likely to be due to the higher number of veterans in RACFs with dementia (Rate Ratio of 4.6 : 1 of veterans using anti - dementia agents in RACFs to veterans using anti-dementia agents in community). In light of increasing use in RACFs and a suggestion of frequent continuous use, a greater emphasis on regular review is needed.

References

[1] Schneider LS, et al, Am J Geriatr Psychiatry 2006; 14: 191-210.

[2] Mittal V, at al. Am J of Alzheimers Dis Other Demen 2011; 26: 10-28

[3] Therapeutic Guidelines: Psychotropic. 6th ed, 2008

Acknowledgements

The study is funded by the National Prescribing Service.

We acknowledge the support of Department of Veterans' Affairs which provided data for this study.

Contact Details

Quality Use of Medicines and
Pharmacy Research Centre,
UniSA, GPO Box 2471, Adelaide SA 5001
Svetla.s 47F unisa.edu.au

UniSA

NPS Better choices ▸ Better health

University of South Australia | Sansom Institute for Health Research

Australian Government Department of Veterans' Affairs

Veterans' MATES

Encouraging the use of non-pharmacological strategies in the management of dementia

Anna s 47F Natalie s 47F Kerrie s 47F Jemisha s 47F Mhairi s 47F Nicole s 47F Lisa s 47F s 47F Vanessa T. s 47F John s 47F Elizabeth s 47F

Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia, Australia.

BACKGROUND

Veterans' MATES

The Australian Government Department of Veterans' Affairs Veterans' MATES program aims to improve medicine use in the veteran community.

The program provides tailored information on a quarterly basis for veterans and their health professionals.

Administrative claims data are used to provide direct patient-based feedback to GPs regarding medicines dispensed to their veteran patients.

The national program is evaluated using surveys provided at the time materials are distributed, as well as observational studies using administrative claims data.

Dementia

Behavioural and psychological symptoms of dementia (BPSD), often referred to as 'behaviours of concern', are common in people with dementia. They can be distressing and difficult to manage.

Verbal disruptions, disinhibited behaviours, wandering, pacing, sleep disturbances and repetitive behaviours all respond poorly to treatment with antipsychotics.

Despite the limited benefits of antipsychotics and potential to cause significant harm, antipsychotics are widely used.

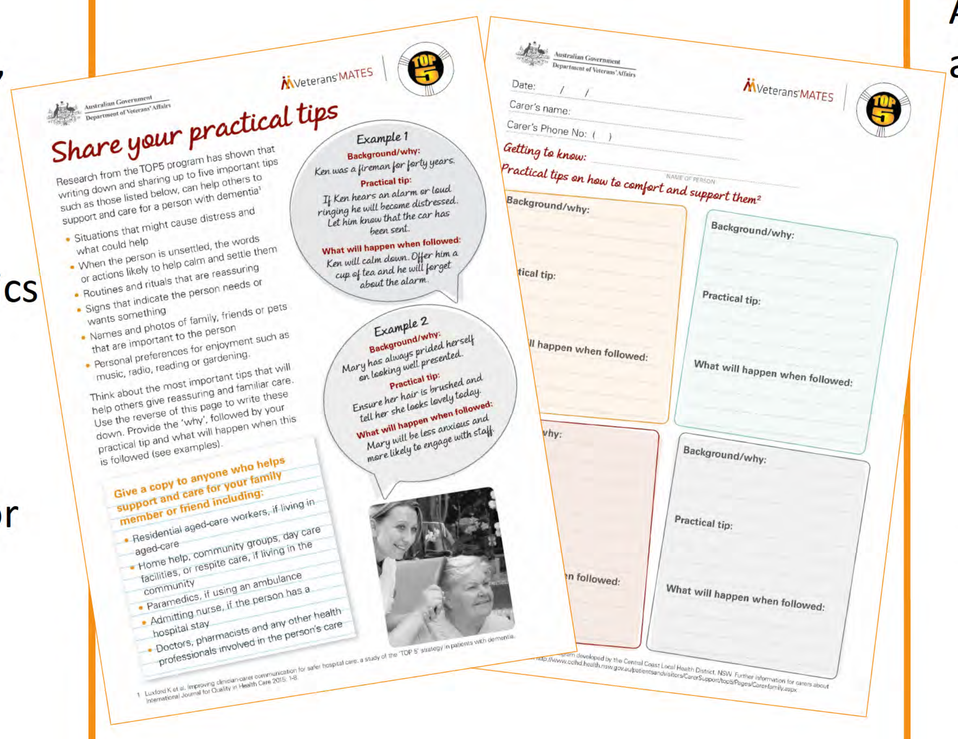
Non-pharmacological treatments are recommended prior to antipsychotic use for BPSD.

METHODS

In September 2016 GPs, pharmacists, and residential aged-care facilities targeted in the Veterans' MATES intervention were sent a letter and supporting materials encouraging them to provide educational material to families and carers of veterans with dementia.

Adapted from the TOP5 program, the educational material asked carers to share their practical tips for providing reassuring and familiar care.

TOP5 was developed by the Central Coast Local Health District, NSW to improve communication between the clinician and the carer. Evaluation of the TOP5 program in the hospital setting demonstrated that asking carers for their strategies to help personalise care improves communication between the patient and their health professionals, subsequently reducing agitation and distress for the patient.



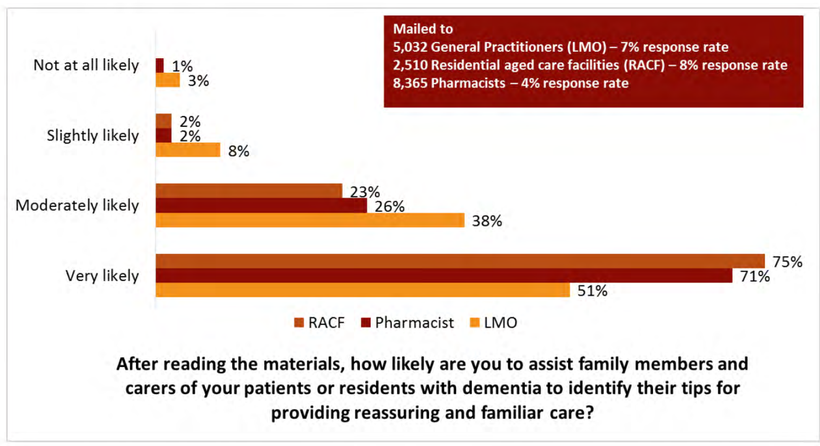
Evaluation Methods

One-page response forms were used to evaluate whether sharing practical tips improves care.

Observational studies were used to determine if the intervention was effective in reducing the use of antipsychotics in veterans with dementia.

RESULTS

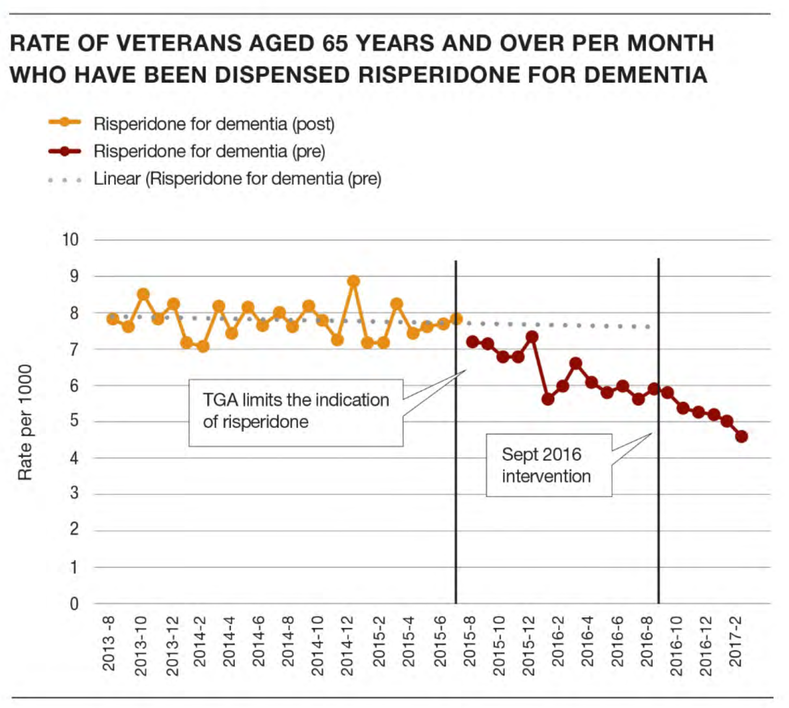
Over 90% of respondents indicated they were likely to assist family members and carers of their patients with dementia to identify their tips.



More than three quarters of responding residential aged-care facilities indicated they were likely to implement these tips as part of a resident's care plan.

Approximately 35% of GPs felt their patient had become less agitated following the provision of tips. Pharmacists and aged-care facilities indicated they had received positive feedback from families.

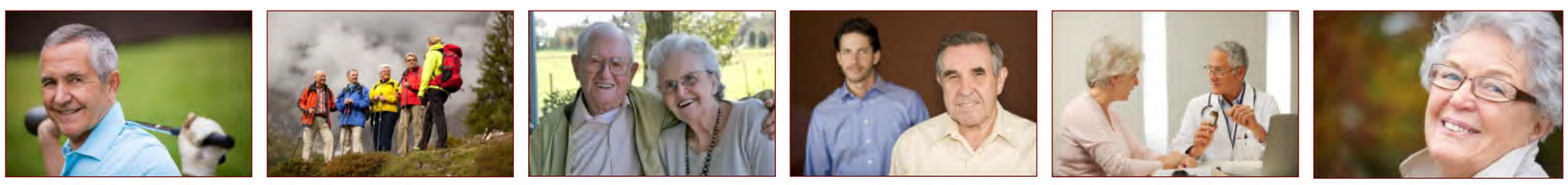
Analysis indicated a reduction in the use of antipsychotics post intervention.



CONCLUSIONS

Targeted interventions that encourage family members and carers to identify their tips for providing care, are well received by both carers and health professionals.

There has been a subsequent decrease in the use of antipsychotic medicines following the intervention.



ACKNOWLEDGEMENTS: This work was supported with funding from the Australian Government Department of Veterans' Affairs, for the establishment of Veterans' MATES, www.veteransmates.net.au

University of South Australia | Sansom Institute for Health Research

Veterans' MATES

Using 'call to action' questions to facilitate behaviour change

Kerrie s 47F **Lisa** s 47F s 47F **Natalie** s 47F **Mhaire** s 47F **Nicole** s 47F **and Elizabeth** s 47F
Quality Use of Medicines and Pharmacy Research Centre, University of South Australia

INTRODUCTION

Transferring research findings into clinical practice has traditionally been challenging and unpredictable.[1] The Veterans' Medicines Advice and Therapeutic Education Services (MATES) Program aims to facilitate behaviour change by providing up-to-date health and medicines information to veterans and their local medical officers (LMOs). The program, which is underpinned by behaviour change theories, incorporates 'call to action' or 'commitment' questions in response forms to facilitate the transfer of research findings into clinical practice.

Behavioural theory shows that consistency is a formidable factor in directing human action. The use of commitment questions is a way to engage the consistency principal.[2] People who make an initial commitment which is active, public or freely chosen are more likely to be behave consistently with their initial commitment.[2, 3] 'Call to action' questions, a form of a commitment question, are used as an active strategy in the Veterans' MATES response forms to influence behaviour change.

OBJECTIVES

In the Veterans' MATES topic targeting renal function testing a 'call to action' question was used. We evaluated the impact of the 'call to action' question on rates of renal function testing.

RESULTS

Educational materials and response forms were mailed to 27,432 veterans. Responses were received from 6,129 (22.3%).

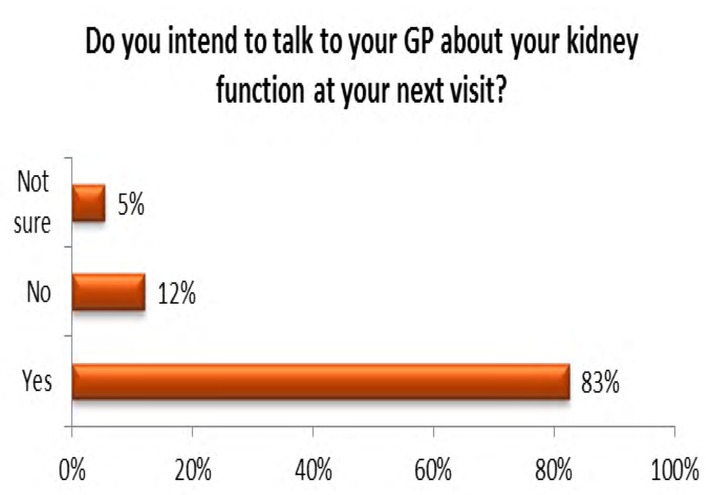


Figure 1 provides responses received from veterans.

Veterans who responded 'yes', were 18% (95% CI 1.13 - 1.23) more likely to have a renal function test than those who didn't respond (p<0001). Those who responded 'yes' were 18% (95%CI 1.06 -1.31) more likely to have a renal function test than those who said 'no' or were 'unsure' (p=0.0016).

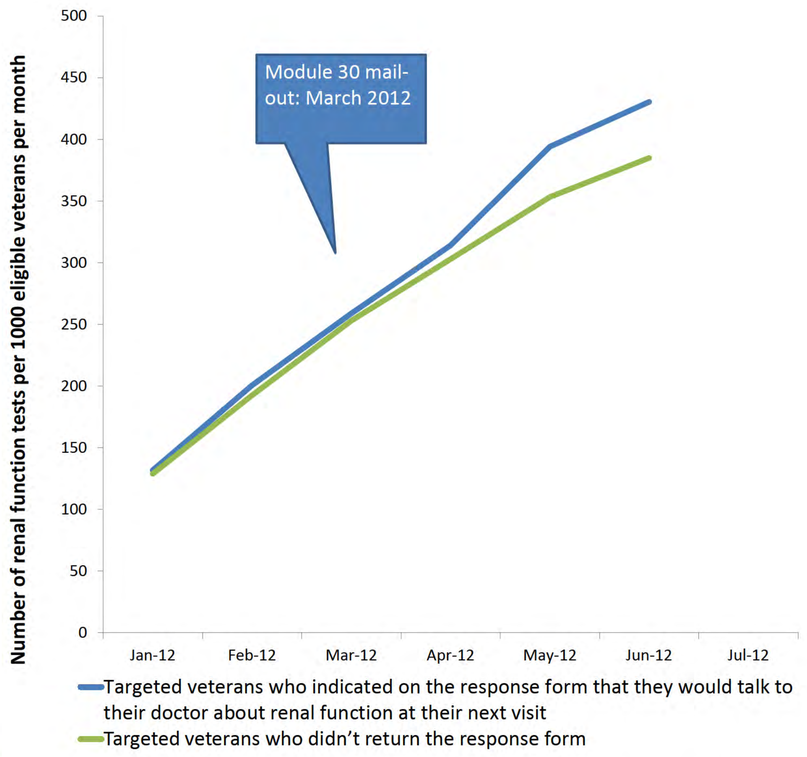


Figure 2 shows the rate of renal function tests amongst veterans who indicated on their response form they would talk to their doctor about renal function at their next visit compared with veterans who didn't return the response form.

IMPLICATIONS

The 'call to action' question in the veterans' response form appears to have facilitated behaviour change; analysis of the data indicated the intervention was effective in significantly increasing the rate of renal function testing in veterans.

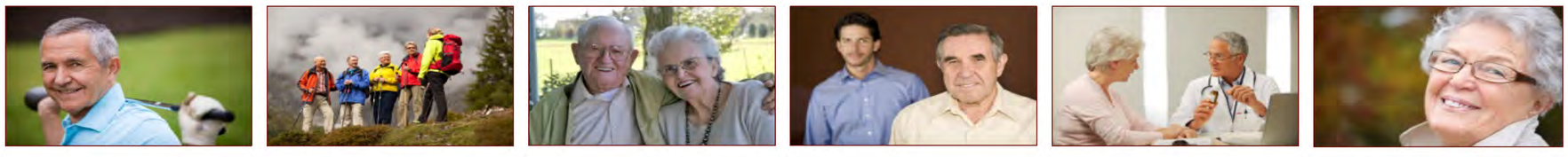
Employing the consistency/commitment principle is one strategy to help facilitate the transfer of research findings into clinical practice. This model could be applied in other healthcare settings where bridging the evidence-practice gap is proving a challenge.

METHODS

Response forms sent out at the same time as the educational materials included a question for veterans that asked whether, after reading the veterans' brochure, they intended to talk to their doctor about their kidney function at their next visit. Rates of renal function testing in veterans who answered 'yes' compared with veterans who answered 'no' or 'unsure' and with those who did not respond were compared. Analysis of the data was conducted nine months after the mail out date. A log binomial regression was used to calculate relative risks.

References
1. Eccles M., Grimshaw J., Walker A. et al. Changing the behaviour of healthcare professionals: the use of theory in promoting the uptake of research findings. Journal of Clinical Epidemiology, 2005; 58: 107-112.
2. Persuasion: psychological insights and perspectives. 2nd ed. 2005, California: Sage Publications Ltd. p. 151-155.
3. Cialdini R. & Goldstein N. Social influence: compliance and conformity. Annu Rev Psychol, 2004; 55: 591-621.

ACKNOWLEDGEMENTS: This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of Veterans' MATES, www.veteransmates.net.au



VETERANS' MEDICINES ADVICE AND THERAPEUTICS EDUCATION SERVICES (VETERANS' MATES) – PROMOTING COLLABORATION IN THE QUALITY USE OF MEDICINES

Natalie s 47F Tammy s 47F John s 47F Chris s 47F Elizabeth s 47F Andrew s 47F

Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia, Australia

Background

The Veterans' MATES program has improved the health of veterans by providing up-to-date health and medicines information specifically tailored for veterans, their General Practitioners (GPs), and other members of the health care team. The program incorporates the principles of the National Strategy for the Quality Use of Medicines which promotes the healthcare team and consumers working collaboratively to achieve quality use of medicines.

Objectives

The objective of this research was to evaluate how participants use the material to improve collaboration.

Methods

Utilising the Department of Veterans' Affairs' (DVA) health claims data, Veterans' MATES provides quarterly interventions to GPs, pharmacists and veterans to support appropriate medicine use. Patient-specific feedback is provided to GPs, supported by educational material. Pharmacists and veterans receive supporting educational material.

Materials have also been provided to other members of the health care team where their participation would assist the intervention. Topics on insomnia management, dementia and bowel management in chronic pain have involved directors of care at residential aged-care facilities. Continence nurse advisors received materials on urinary incontinence and ophthalmologists were sent materials on glaucoma management.

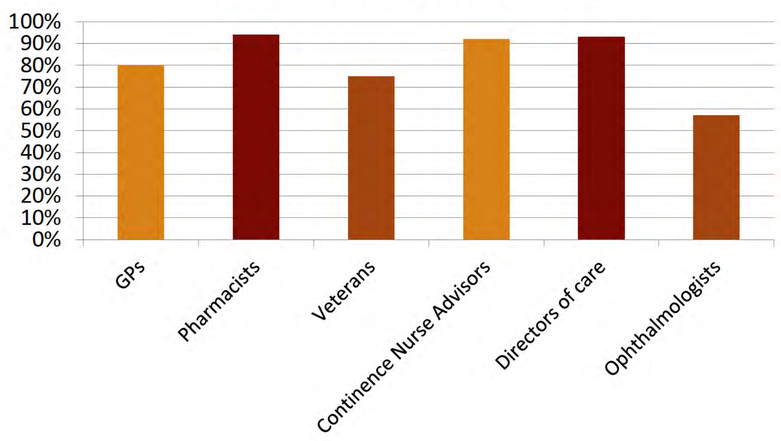
One-page reply paid response forms evaluate participant satisfaction and intended use of the materials.

Results

The materials have been provided to 250,000 veterans, 35,000 GPs and 8,500 pharmacists. Materials have also been provided to 2,500 directors of care, 300 continence nurse advisors and 800 ophthalmologists.

The majority of respondents have found the materials useful

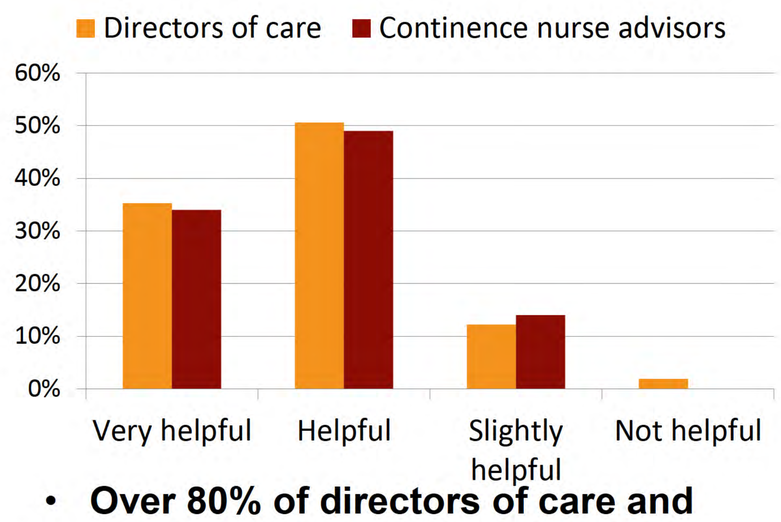
Usefulness of materials



- **Across the modules, on average 80% of GPs, 94% of pharmacists and 75% of veterans found the materials useful.**
- **Where other health professional have been included, over 90% of continence nurse advisors and directors of care and 57% of ophthalmologists found the materials useful.**

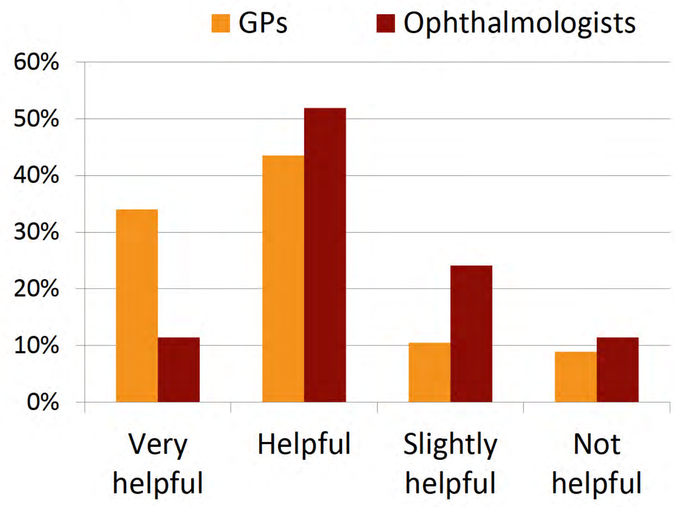
The interventions have encouraged collaboration as measured by intent to communicate

Helpfulness of materials when communicating with patient's GP



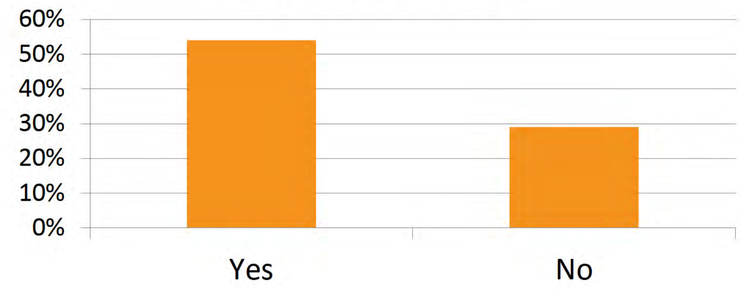
- **Over 80% of directors of care and continence nurse advisors who responded indicated the materials would help them communicate with a patient's GP.**

Helpfulness of both GPs and Ophthalmologists receiving information



- **Over 60% of GPs and ophthalmologists who responded reported it was helpful that both medical groups received the information.**

After reading the brochure, do you intend to talk to your doctor or pharmacist about your medicines at your next visit?



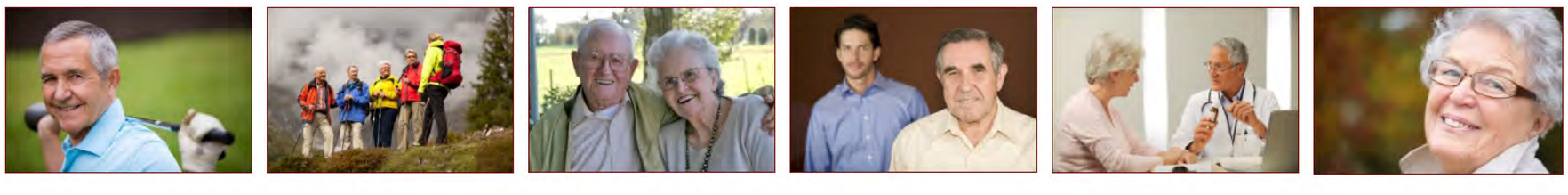
- **More than half the veterans who responded indicated they would talk to their doctor or pharmacist at their next visit.**

Conclusion

The Veterans' MATES program has successfully encouraged collaboration between veterans and their healthcare team. This program assists multidisciplinary management of older Australian's with chronic and complex care needs.

www.veteransmates.net.au

ACKNOWLEDGEMENTS: The Veterans' Medicines Advice and Therapeutics Education Service (Veterans' MATES) project team. This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of the Veterans' MATES.



Positive responses to commitment questions improve health behaviour outcomes

Anna s 47F Natalie s 47F Kerrie s 47F Jemisha s 47F Nicole s 47F Vanessa T. s 47F John s 47F Elizabeth s 47F
Quality Use of Medicines and Pharmacy Research Centre, University of South Australia, Australia.

BACKGROUND

Uptake of target behaviors in health interventions can be increased by asking participants about their commitment to perform certain behaviours[1].

Positive responses to commitment questions have been shown to increase uptake of target behaviors in various health domains[1].

Commitment questions may increase target behaviours in accordance with the principles of consistency, where people aim to maintain a certain approach across their words, beliefs, attitudes and actions[1].

To our knowledge, the use of commitment questions has not been trialed in an intervention where both patients and health professionals are included in the intervention.

We aimed to investigate whether patient responses to commitment questions in a targeted national intervention increased claims of moisturiser for the prevention of skin tears.

Emollient for skin tears

Skin tears can cause significant pain, result in infection and become chronic wounds in vulnerable populations[2].

Twice daily application of skin emollient moisturiser can significantly reduce skin tear incidence[3].


Australian Government
Department of Veterans' Affairs

Veterans' MATES

Being an active partner in your care

www.veteransmates.net.au

PRACTICAL TIPS FOR LOOKING AFTER YOUR SKIN

As we get older, our skin becomes more delicate and dry, and skin tears are common. However, the simple step of moisturising twice a day can help prevent skin tears in the first place.

This brochure has tips on how to take care of your skin to prevent skin tears and what you should do if you have a skin tear. It also highlights the importance of using compression therapy for venous leg ulcers and when to seek treatment for a wound.

What you need to know about skin tears

With a skin tear, the outer layer of skin peels back and can look like a loose flap of skin. Skin might be torn in incidents like knocking your leg on a chair, or catching your arm on a plant or stake in the garden.

Skin tears can be bothersome and might stop you from doing the things you enjoy such as gardening or playing golf.

Research has found that men and women who apply an appropriate moisturiser twice a day halve their chance of having a skin tear.[1] There are many different types of moisturisers and some of these are better than others. Alpha Keri® lotion is an example of an appropriate moisturiser that DVA gold and white card holders might be eligible to receive on the RPBS.[2] Ask your doctor or pharmacist which moisturiser might suit you best.

1. Carville K, Leslie G, Osseiran-Moisson R, Newall N, Lewin G. International Wound Journal. 2014; 11: 446-452.
2. Repatriation Pharmaceutical Benefits Scheme

Follow these tips to help prevent skin tears:

- **Apply moisturiser to your arms and legs twice a day** – it only takes a minute or two. Make it part of your daily routine by moisturising at the same time each day, e.g. after showering in the morning and before bedtime at night. Be careful not to get moisturiser on the soles of your feet. It might make them slippery.
- Use a soap substitute cleanser when bathing. Soap can make your skin dry out. For example your doctor may prescribe Hamilton® Skin Therapy Wash. Take care as soap substitute cleansers may make surfaces slippery.
- Keep limbs protected by wearing long sleeves and pants.
- Eat a healthy balanced diet and drink plenty of fluids, unless otherwise instructed by your doctor.
- Reduce the chance of falling over; wear good practical footwear, and glasses where prescribed, and keep the house and garden clutter free and well lit.

What should I do if I have a skin tear?

If you do have a skin tear, even a small one, it is a good idea to see your doctor. Your doctor, or a nurse, can check that the wound is clean and give you advice about how to look after it. Your doctor can talk to you about what might have caused the skin tear. For example if you felt dizzy and fell over, your doctor might review your medicines, to make sure one of them isn't the cause. If you would like to know the basics of how to care for a skin tear, see the insert *Looking after a skin tear: know the basics.*

Make an appointment to see your doctor if you have a wound and notice any of the following:

- the wound has not healed within two weeks
- increased or new pain
- swelling, or redness around the wound
- the wound is weeping a lot
- the wound becomes black or yellow
- bleeding in or around the wound
- a foul odour is coming from the wound
- you feel unwell or have a temperature.

Veterans' Medicines Advice and Therapeutics Education Services June 2017

METHODS

The Veterans' MATES intervention was disseminated in July 2017 and targeted 52,778 persons aged 65 years or older who had risk factors for wound development. The primary GP for each patient also received intervention materials and prescriber feedback.

The intervention included educational materials that provided practical tips on how to look after your skin, including the application of an appropriate moisturiser to reduce the risk of skin tears.

One-page self-report questionnaires were used to obtain responses to a commitment question.

Do you intend to talk with your doctor about which moisturiser to use?

Evaluation Methods

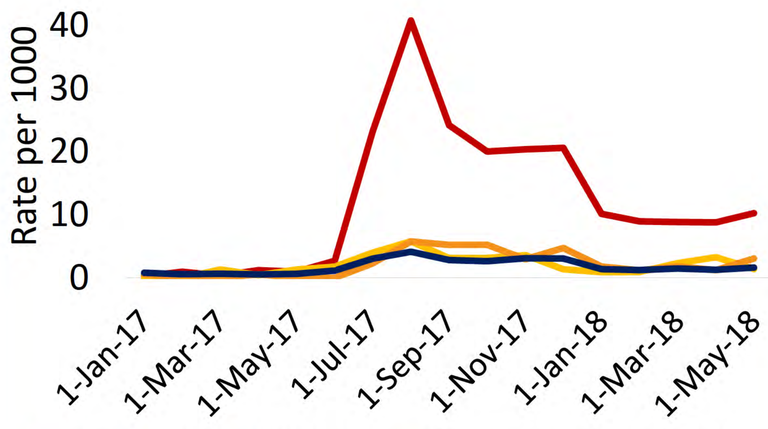
The rate of claims for emollients was compared across responses regarding patient intention to speak to their doctor about which moisturiser to use.

Follow up continued for 23 months after the intervention.

RESULTS

- 12,139 (22%) of patients responded overall
- 8162 patients responded that they would talk to their GP about which moisturiser to use
- 3977 patients indicated that they would not talk to their GP or that they were unsure whether they would talk to their GP

Rate of moisturiser dispensing by commitment question response



Positive responses to the commitment question were associated with a **six fold increase** in the rate of dispensing of emollients (rate ratio= 6.2, 95% CI 4.4 to 8.7)

Patients who did not respond had similar rates of emollient dispensing to those who responded that they would not talk to their GP or were unsure (rate ratio=1.09, 95% CI 0.8 to 1.5).

REFERENCES

[1]Pratt NL,, et al. Commitment questions targeting patients promotes uptake of under-used health services: Findings from a national quality improvement program in Australia. *Soc Sci Med* 2015; 145: 1-6.

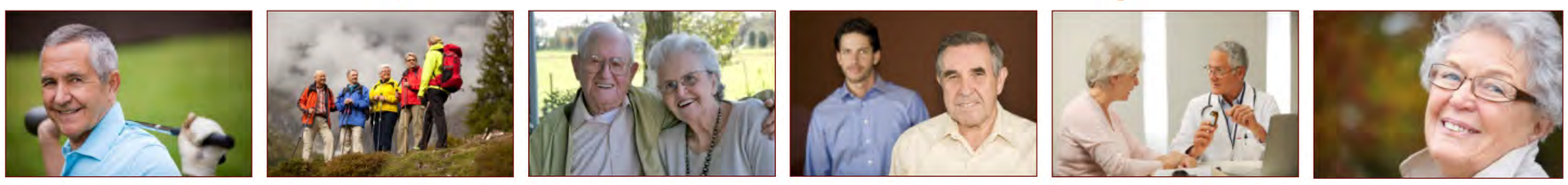
[2] Rayner R, et al. A review of patient and skin characteristics associated with skin tears. *Journal of Wound Care* 2015; 24(9): 406-414.

[3]Carville K, et al. The effectiveness of a twice-daily skin-moisturising regimen for reducing the incidence of skin tears. *Int Wound J* 2014; 11: 446-53.

CONCLUSIONS

Commitment questions are effective in increasing behavioural outcomes when applied at the population level in large-scale national health interventions.

Interventions that simultaneously target health professionals and patients may benefit from the inclusion of commitment questions in participant evaluations.



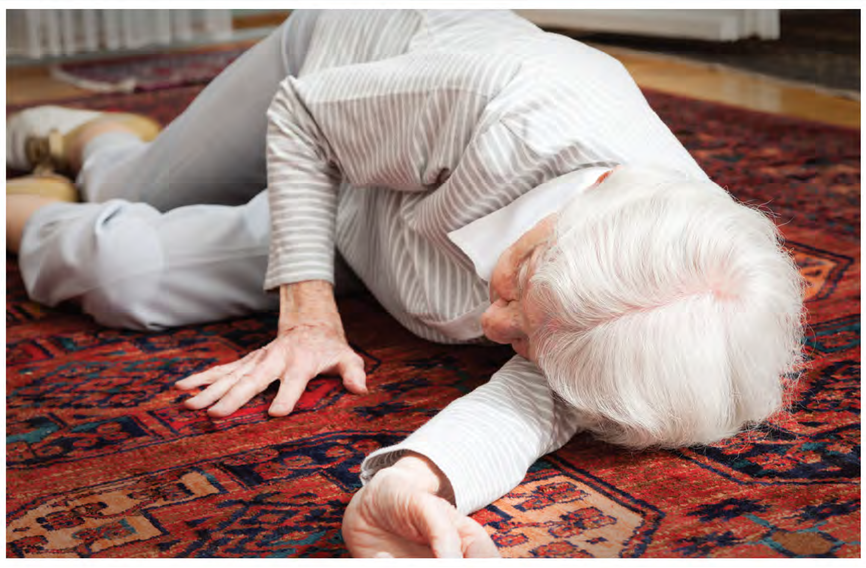
ACKNOWLEDGEMENTS: This work was supported with funding from the Australian Government Department of Veterans' Affairs, for the establishment of Veterans' MATES, www.veteransmates.net.au

Hip fracture in older people when switching between mirtazapine and other antidepressants: cross-taper cautiously

Michael J Leach[1,2,3,] Nicole L Pratt[1], Elizabeth E Roughead[1].

1. Quality Use of Medicines and Pharmacy Research Centre (QUMPRC), Sansom Institute, School of Pharmacy and Medical Sciences, University of South Australia, Adelaide, Australia
2. Loddon Mallee Integrated Cancer Service (LMICS), Bendigo, Australia
3. School of Rural Health, Monash University, Bendigo, Australia

Michael J Leach was supported by a PhD scholarship provided by the Australian Government Department of Veterans' Affairs.



Background

Antidepressants are associated with sedation and hypotension, which can result in falls and fractures. Mirtazapine has significant sedative properties. No studies have assessed whether the risk of hip fracture is higher in patients when switching antidepressants involving mirtazapine.

Objectives

This study aimed to examine the risk of hip fracture in older people using mirtazapine, either alone or when switching from or to other antidepressants.

Methods

A matched case-control study was conducted. Cases were people aged over 65 years and eligible for Australian Government Department of Veterans' Affairs benefits who sustained a hip fracture between 2009 and 2012. Cases were matched with up to four randomly selected controls of the same age (± 2 years) and sex. Multivariate conditional logistic regression was used to estimate associations between antidepressant use and hip fracture. Results were adjusted for number of comorbidities, socio-economic status, and use of other psychoactive medicines. To assess whether combined antidepressant effects as a result of switching differed from the sum of individual effects, the relative excess risk due to interaction (RERI) was calculated.

Results

There were 8,828 cases and 35,310 controls. The median age was 88 years and 63% were women. The risk of hip fracture was increased for mirtazapine use (Figure 1). Risk was also increased for switching to TCAs, switching to SSRIs, and using SSRIs and mirtazapine together (Figure 2). The 95% CI around each RERI value overlapped with 0 (results not shown), suggesting that the effect of each antidepressant pair equalled the sum of the effects of individual antidepressant use. The overlapping use of antidepressants may reflect switching from mirtazapine to other antidepressants or add-on therapy.

Figure 1: Effect Estimates for Individual Antidepressants

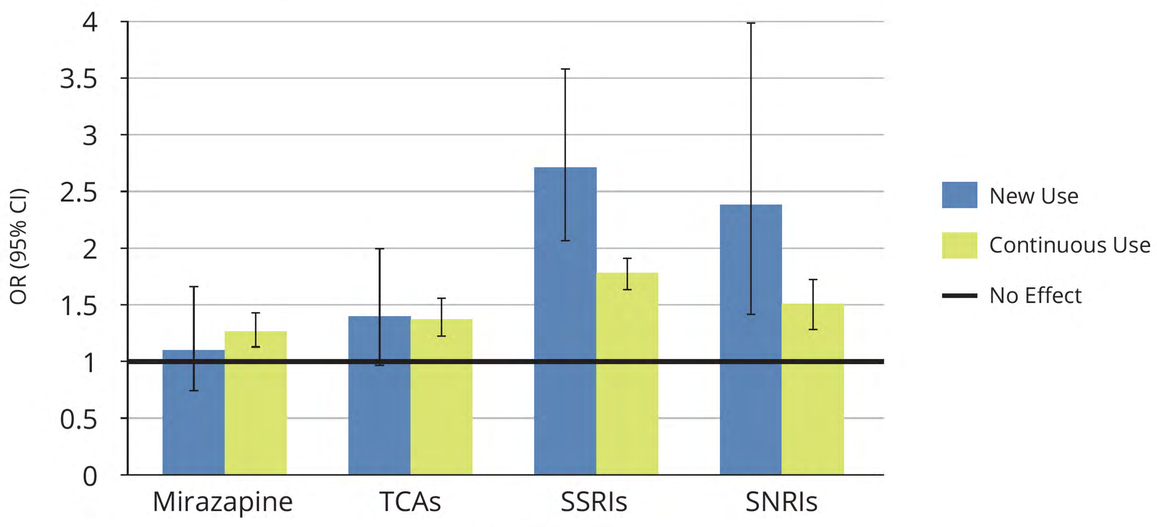
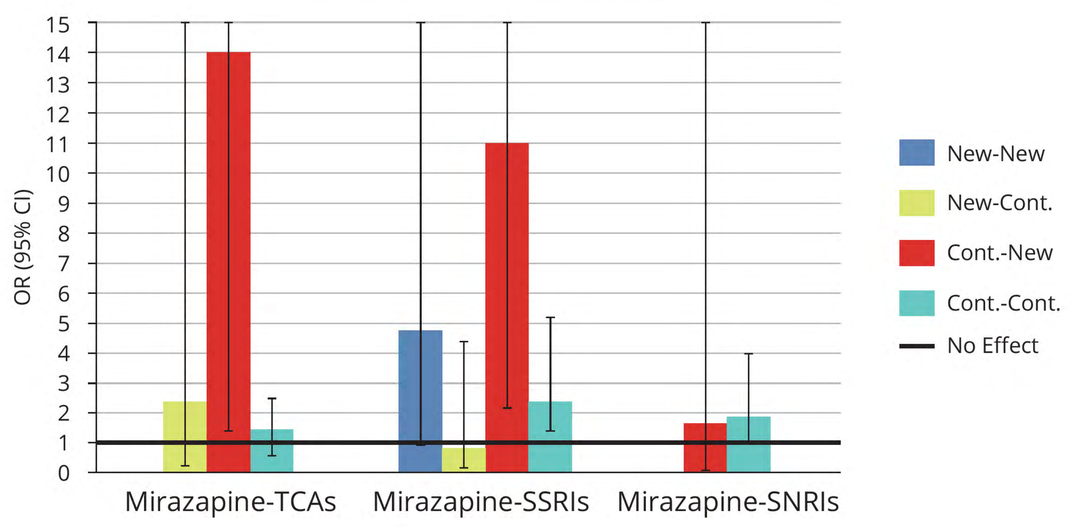


Figure 2: Effect Estimates for Antidepressant Combinations



Conclusions

Our results provide further evidence to support cautious cross-tapering where switching between antidepressants is required.

University of South Australia | Sansom Institute for Health Research

For further information about this poster contact
michael.leach@mymail.unisa.edu.au

Australian Government
Department of Veterans' Affairs

Topical beta-blocker timolol and the risk of bradycardia and respiratory hospitalisation: A self-controlled case series analysis

Nicole s 47F , Emmae s 47F John s 47F ,
Tuan s 47F Libby s 47F

a Sansom Institute, University of South Australia.
b Data Management & Analysis Centre, Discipline of Public Health, University of Adelaide.

Veterans'MATES

UniSA | Sansom Institute for Health Research

- No conflicts of interest to declare

Background

- Glaucoma is one of the leading causes of vision loss
- The prevalence of glaucoma increases with age
- Topical eye drops (β-blockers e.g. Timolol)
  - Used to reduce intraocular pressure
  - Although administered topically, there is potential for systemic absorption and therefore potential for systemic adverse events including bradycardia and respiratory function[1,2]

1. Novack GD, et al. New glaucoma medications in the geriatric population: efficacy and safety. *J Am Geriatr Soc* 2002
2. Waldcock A, et al. Effects og glaucoma medication on the cardiorespiratory and intraocular pressure status of newly diagnosed glaucome patients, *Br J Opthalmol* 2000

Safety of Timolol eye drops

- Timolol is associated with lowered pulse rates (bradycardia) and reductions in spirometry measurements (respiratory function) [2]
- Meta-analysis of RCTs[3] identified that Timolol was associated with a significant reduction in heart rate (HR) of 4 beats / minute (95% CI, 2-6)
- Spontaneous reports attributed to timolol eye drops (FDA database)
  - 450 serious respiratory and cardiovascular reports
  - 32 deaths (13 from cardiac implications, 12 from pulmonary implications, 1 from drug interaction and 6 unknown)

2. Waldcock A, et al. Effects og glaucoma medication on the cardiorespiratory and intraocular pressure status of newly diagnosed glaucome patients, *Br J Opthalmol* 2000
3. Zhang WY, et al. Meta-analysis of randomised controlled trials comparing latanoprost with timolol in the treatment of patients with open angle glaucoma or ocular hypertension. *Br J Ophthalmol* 2001

Objective

- To determine whether initiation of topical beta-blockers was associated with an increased risk of hospitalisation for bradycardia or chronic lower respiratory conditions

Data Source: Australian Government Department of Veterans' Affairs administrative claims data

- Current treatment population of 233,800 veterans; median age is 82 years, with 5 co-morbidities
- Approximately 150 million prescription records over 10 years
- 200 million Medicare and allied health records (GP visits, radiology, pathology etc)
- 6 million hospital records (public and private)

Methods

- Patients were included if they were
  - Eligible for all health services subsidised by the Australian Government Department of Veterans' Affairs
  - Aged 65 years or over at the start of the study (1/1/2003)
  - Dispensed at least one medicine in the year prior to study start

- Self-controlled case series (SCCS) studies method for each outcome
  - Hospitalisation for bradycardia (ICD10: primary diagnosis ICD-10AM: R001, I440, I441, I442, I443, I495)
  - Hospitalisation for chronic lower respiratory disease (ICD10: primary diagnosis ICD-10AM: J4)
  - Study period: 2003-2009

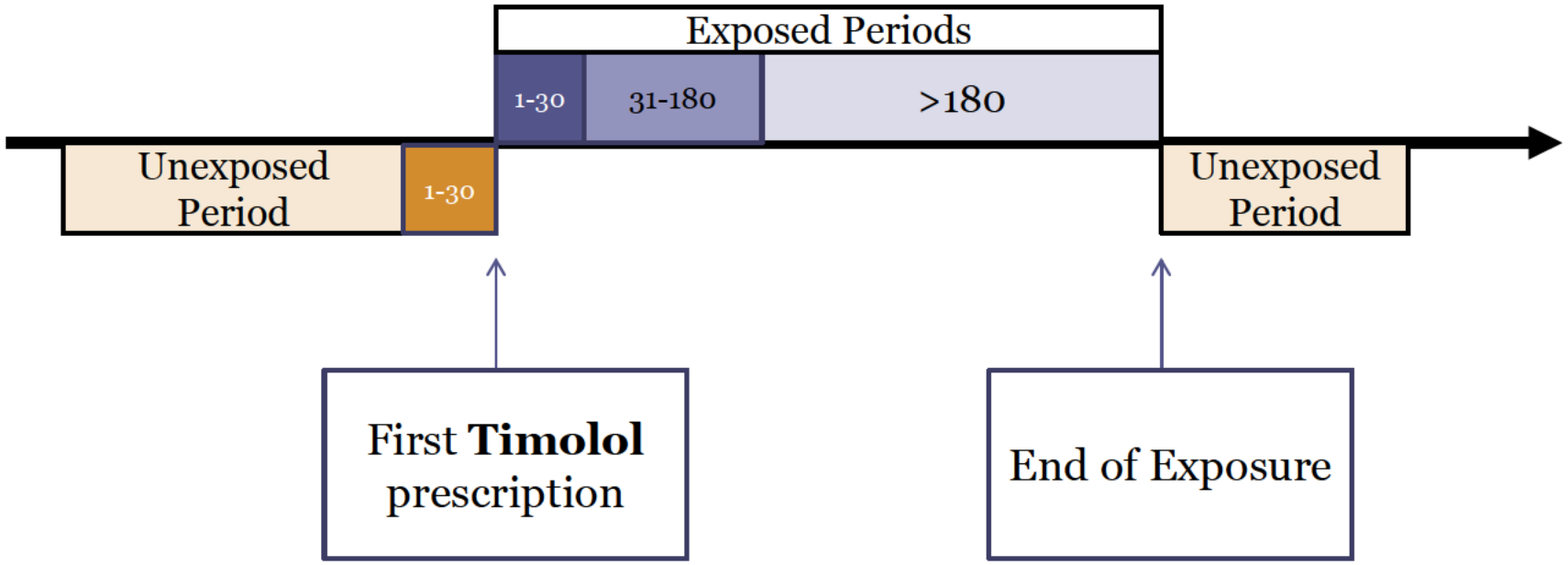
Self-controlled Case-series Design (SCCS)

- Case-only study design
  - Includes only those patients with the event of interest eg patients hospitalised for bradycardia or chronic lower respiratory conditions

- Use patient as their own control
  - Incidence of events in periods after an exposure compared to incidence of events in non-exposed periods
  - Controls implicitly for fixed patient specific confounders, even those that are unmeasured

3. Whitaker, H.J., et al., *Tutorial in Biostatistics: The self-controlled case series method.* Statistics in Medicine, 2005:p. 1-31

Representation of the SCCS Design



Timolol exposure risk periods were defined as:

1-30 days, 31-180 day, and >180 days after timolol initiation

Pre exposure risk period – 30 days BEFORE timolol initiation to account for the possibility of increased/decreased risk of treatment initiation after a hospitalisation event

Methods – Statistical Analysis

- Conditional poisson regression was used to calculate the incidence rate ratio (IRR) of hospitalisation exposure risk periods compared to the unexposed risk period

- All analyses were adjusted for
  - Age at hospitalisation and calendar year

- Sensitivity analyses were performed to investigate the robustness of the SCCS design
  - Including exposed patients only
  - Adjusting for potential time-varying confounding due to changes in co-existing conditions

Results: Characteristics of cohorts

	Bradycardia hospitalisation cohort n = 6,164	Chronic lower respiratory hospitalisation cohort n = 10,354
Exposed N (%)	269 (4.4)	354 (3.4)
Age at hospitalisation Mean (SD)	84 (4.7)	82.4 (5.1)
Gender Male N (%)	4,081 (66.2)	6,704 (64.8)

Results: Bradycardia Outcome

Days after starting timolol eye drops	N Hosp	Person-years	Incidence Rate Ratio (95% CI)
Unexposed	6272	32231	1.00
30 days prior	4	31	0.74 (0.36, 1.49)
1-30	5	30	0.92 (0.49, 1.73)
31-180	31	101	1.70 (1.27, 2.27)
>180	63	273	1.32 (1.0, 1.74)

Results: Respiratory Outcome

Days after starting timolol eye drops	N Hosp	Person-years	Incidence Rate Ratio (95% CI)
Unexposed	19042	46091	1.00
30 days prior	11	41	1.04 (0.85, 1.27)
1-30	14	41	1.07 (0.70, 1.62)
31-180	46	117	1.37 (1.05, 1.78)
>180	107	272	1.37 (1.09, 1.73)

Sensitivity Analysis:

- Bias due to unmeasured time varying confounding
  - Adjusting for the presence of other conditions that may impact on the risk of hospitalisation for bradycardia and may influence the probability of treatment with timolol

Results: Bradycardia Outcome

Days after starting timolol eye drops	Incidence Rate Ratio* (95% CI)	Incidence Rate Ratio** 95% CI)
Unexposed	1.00	1.00
30 days prior	0.74 (0.36, 1.49)	0.72 (0.36, 1.46)
1-30	0.92 (0.49, 1.73)	0.90 (0.48, 1.69)
31-180	1.70 (1.27, 2.27)	1.68 (1.25, 2.24)
>180	1.32 (1.0, 1.74)	1.29 (0.98, 1.70)

* Adjusted for Age, Calendar year

** Adjusted for Age, Calendar year, Oral β-blocker use, calcium-channel blockers, digitalis glycosides, antiarrhythmics

Limitations:

- This study was performed in the elderly only
  - Studies suggest that beta-blockade may be stronger and last longer in older patients[5]
- Patients with existing airways disease were not excluded
  - Studies have indicated that β-blocking effect may be more severe in those with a history of airways obstruction[6]
- Patients on varapamil for bradycardia were not excluded
  - Timolol is contraindicated in these patients

5. Vuori, M.L. et al, *Plasma kinetics and antagonist activity of topical ocular timolol in elderly patients*. Graefe's *Arch Clin Exp Ophthalmol*, 1995
6. Diggory, P., et al., *Unsuspected bronchospasm in association with topical timolol--a common problem in elderly people: can we easily identify those affected and do cardioselective agents lead to improvement?* Age and Ageing, 1994.

Conclusions:

- This study has identified that there is an increased risk of hospitalisation for bradycardia and chronic lower respiratory conditions after initiation of timolol eye drops

- Monitoring of patients after treatment initiation with topical non-selective beta-blocker eye drops is important to identify potential cardio-pulmonary adverse events

UniSA | Sansom Institute for Health Research

This work was funded by Department of Veterans' Affairs as part of the Veterans' MATES program

Veterans' MATES

www.veteransmates.net.au

Improving quality use of medicines and patient outcomes: results from the Veterans' MATES program

Lisa s 47F

Quality Use of Medicines

and Pharmacy Research Centre

Veterans' MATES aim:

- to improve medication use for veterans by delivering educational modules

Method:

- Providing patient specific feedback and educational material to general practitioners
- Supported by educational brochures to veterans
- Educational brochures to pharmacists

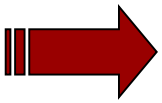
Method

- Brochures sent every three months to approximately
  - 10,000 general practitioners
  - 8,500 pharmacies and accredited pharmacists
  - 35,000 veterans

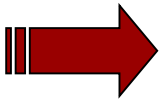
Department of Veterans' Affairs claims data

- Treatment population of approximately 260,000 veterans; median age 80 years
- 120 million prescription records over 9 years
- 200 million Medicare and allied health records (GP visits, radiology, pathology etc)
- 6 million hospital records (public and private)

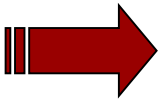
Therapeutic area selected



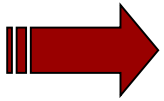
Medication-related problem analysis



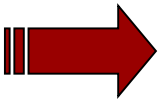
Module topic selected



Patient specific feedback developed



Module implementation



Evaluation

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Therapeutic brief 1

Flag Veterans for Medicines Review

Medicines review provides an opportunity for you to assess how your veteran patient is managing their medicines and the outcomes being achieved.

There are a number of ways of reviewing your patient's medicines. Home Medicines Review has been demonstrated to be the most effective.[1]

Consider a Home Medicines Review (HMR) for all veterans with one of these flags:

- Multiple medicines
- Recent hospitalisation
- Confusion, hearing, vision or dexterity problems
- High-risk medicines

Inside

What are the benefits to you as a GP?

HMR complements the regular reviews of medicines that GPs undertake by providing information on the patient's experiences in using their medicines at home.

Following each home visit, you will receive a report from the pharmacist which includes:

- a comprehensive patient medicine list including over-the-counter (OTC) and complementary medicines;
- an assessment of medicine-taking behaviour i.e. exactly what medicines are being taken, when and how they are being taken;
- relevant drug interactions - many prescribing systems flag interactions but the pharmacist can provide information on whether or not these interactions are clinically important;
- information on your veteran's requirements for additional patient education and training in the use of medicine delivery devices.

HMR provides payment to allow you time to reflect on the patient's medicines and develop a medication management plan with the veteran (full GP MBS 900 payment is $126.10)

What are the benefits of a HMR for your veteran patient?

- **Greater understanding of their medicines.**
  Confusion may arise for a number of reasons including brand substitution. Only 27% of Australian veterans rated their understanding of their medical conditions and medicines as very good prior to a HMR. This rose to 87% after the HMR visit.[2]
- **Improved ability to keep taking their medicines appropriately.**
- **Reduced risk of medication-related problems.**
- **Reassurance and peace of mind.**
  61% of people are very concerned about taking the wrong medicine and 58% are very concerned about suffering from a drug interaction.[3]

Veterans'MATES

Welcome to Veterans' MATES: Medicines Advice and Therapeutics Education Services. This is the first of 10 modules which will be delivered over the next 3 years.

www.veteransmates.net.au

Some of the prescriptions listed below may have been ordered by other doctors. As the prescriber who was written most of the prescriptions listed below, you have been identified as the doctor most likely to be responsible for their care.

<Primary LMO>

PLEASE KEEP FOR YO

Veterans Name	Suburb	No. of unique medicines probably able to be packed in a DAA	No. of hospital admissions in the last 12 mths	No. of prescribers during last 12 mths	Date of last HMR claimed	DAA Service claimed
ANNE T SAMPLE	Torrens Park	6	1	2	No claim	No claim

Total number of prescriptions dispensed in 4 mths: 24

COMMENT: Large number of prescriptions dispensed suggesting complex medicine regimen.
COMMENT: No HMR claim in last 12 mths. Consider HMR (item 900) to assess suitability for DAA Service.

JOHN E CITIZEN	Parkside	5	2	3	No claim	No claim

Total number of prescriptions dispensed in 4 mths: 28

COMMENT: Anti-dementia medication dispensed. Patient is likely to benefit from DAA Service.
COMMENT: Large number of prescriptions dispensed suggesting complex medicine regimen.
COMMENT: No HMR claim in last 12 mths. Consider HMR (item 900) to assess suitability for DAA Service.

JACK T JAMES	Glenside	4	0	1	19/07/06	No claim

- To date 24 modules delivered
  - Disease specific: Heart failure, Diabetes, COPD
  - Drug Specific: Antidepressants, Contraindicated medicines, NSAIDS
  - Service delivery: Medicines Review, Care Planning

- Participation
  - 229,000 veterans
  - 25,000 doctors
  - 8,500 pharmacies and accredited pharmacists
- > 50% of doctors have received 6 mailings or more

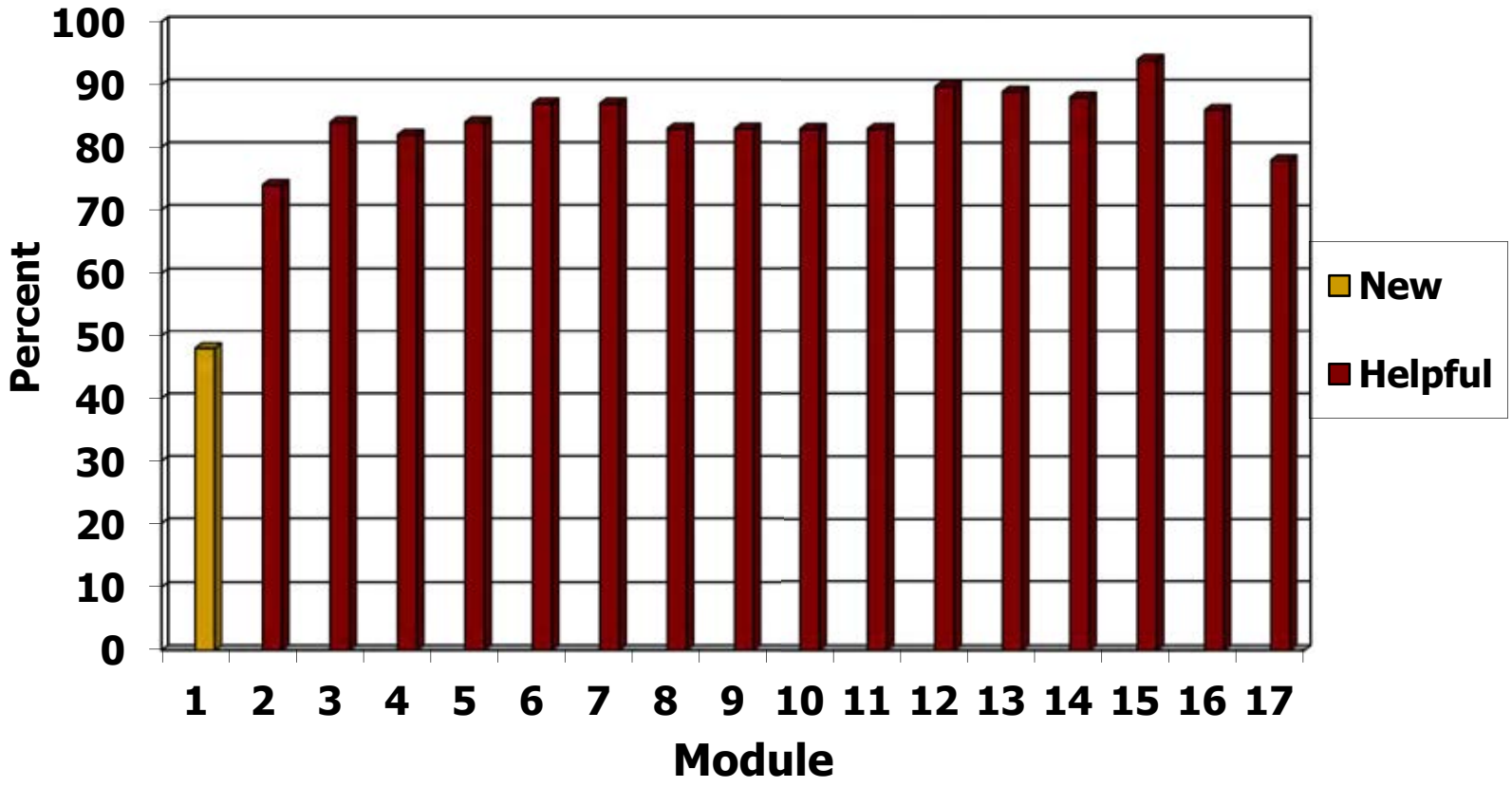
Participation per module

Module	veterans	LMOs
Medicines review	38568	11384
Heart Failure	12047	6954
Diabetes	16612	8573
Medicines for arthritis	9885	11242
Antidepressants	42196	12482
Respiratory	28670	10720
Medicines for heart burn	62460	13684
Contraindicated medicines	32484	11050
Medicines review	58081	12950
Constipation	29231	9825
Diabetes care	18340	9103
Dementia	(6690)	3884
Clopidogrel	16867	8279
COPD	18096	8785
Osteoporosis	83110	16876
Dose Admin Aids	27707	10237
Warfarin	15656	8226
Insomnia	52863	13568

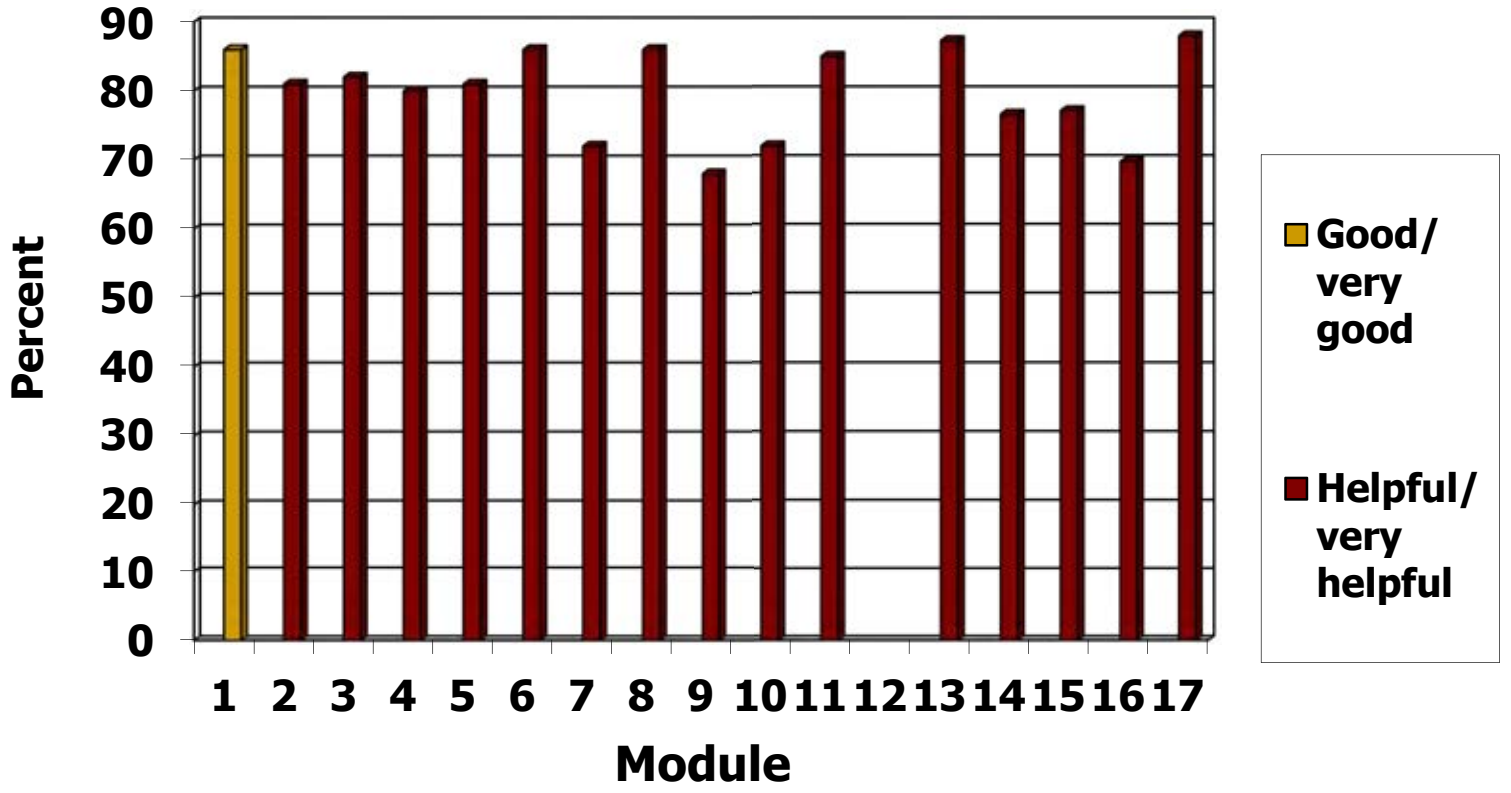
Evaluation: Participant satisfaction

- One page response form mailed with each module
  - 24% of all general practitioners who received a mailing have responded
  - 40% of all veterans who received a mailing have responded

Doctors find the prescriber feedback helpful



Veterans find the educational material helpful



Evaluation: Practice change

- Changes in medication or service use
  - Three methods
    - Interrupted time series
    - Cohort with historical comparison
    - Cohort with concurrent comparison
- Most programs have improved medication use

Programs aiming to increase medication use

Aim	Effect	Comparator
Increase beta-blocker use in those with heart failure	RR 1.29, (95% CI 1.23-1.35)	Historical
Increase lipid-lowering therapy in those with diabetes	RR 1.16, (95% CI 1.1, 1.23)	Historical
Increase antiplatelet therapy in those with diabetes	RR 1.15, (95% CI 1.08, 1.22)	Historical
Increase osteoporosis medicine use in specified age groups	RR 1.07 (women) (95% CI 1.0, 1.14) RR 1.24 (men) (95% CI 1.15, 1.33)	Concurrent (adjacent age groups)

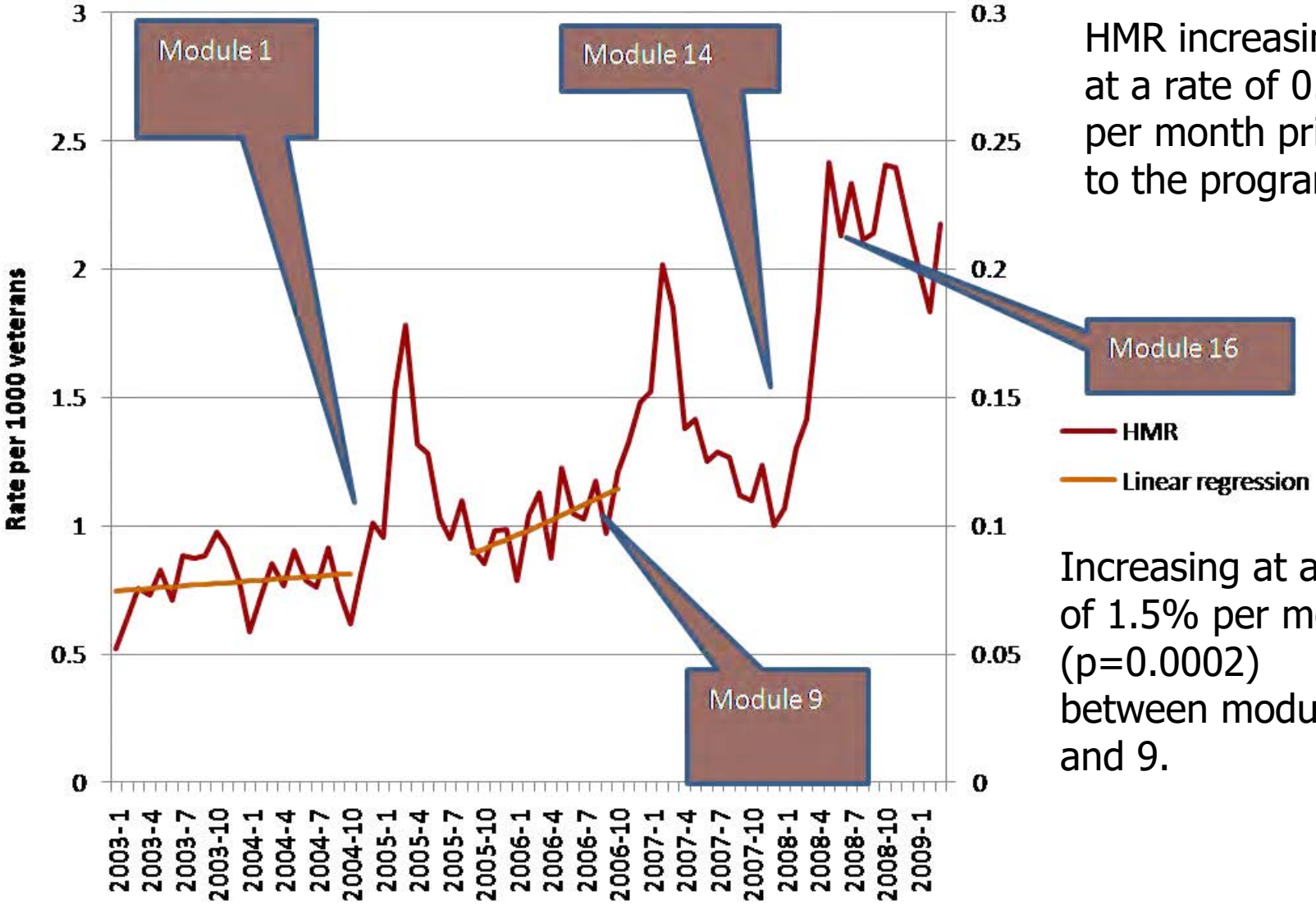
Programs aiming to reduce inappropriate medication use

Aim	Effect	Comparator
Reduce NSAID use in those with diabetes or heart failure	RR 1.44, (95% CI 1.42-1.46)	Concurrent (non-diabetes, CHF)
Reduce high dose proton pump inhibitor use	RR 1.15 (95% CI 1.10-1.19)	Time series
Reduce potentially interacting medicines with antidepressants	No difference	Historical comparison
Reduce use of risperidone for dementia symptoms	RR 1.11, (95% CI 1.06-1.15)	Historical comparison

Programs aiming to increase service use

Topic	Effect	Comparator
Increase GP management plans in those with diabetes	1.21 (95% CI 1.13, 1.29)	Time series
Increase HbA1c testing in those with diabetes	1.17 (95% CI 1.14,1.19)	Time series
Increase microalbuminuria testing in those with diabetes	1.075 (95% CI 1.04, 1.11)	Time series
Increase home medicine review services (Nov 04, Nov 06, Mar 08, Sep 08)	RR 1.79 (95% CI 1.58, 2.02)	Concurrent (non-targeted)

Overall home medicine review rates



HMR increasing at a rate of 0.4% per month prior to the program

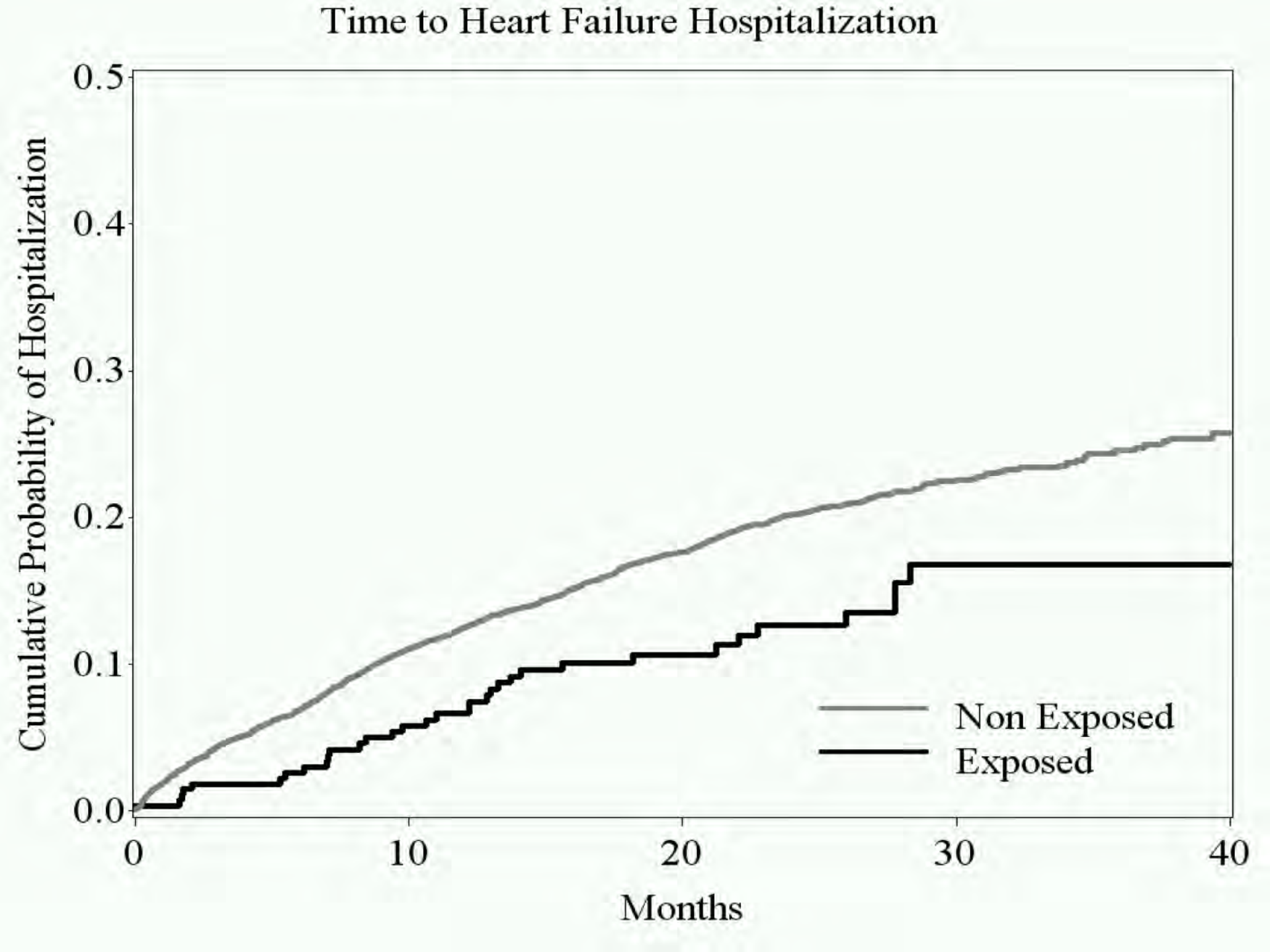
Increasing at a rate of 1.5% per month (p=0.0002) between modules 1 and 9.

Evaluation: patient outcomes

Improvements in outcomes observed: Home medicines review

- Veterans aged ≥ 65 dispensed medicines indicative of heart failure
- Retrospective cohort study
  - Cases = veterans with HMR
  - Controls = veterans with no HMR
- Endpoint: time to next heart failure hospitalisation
- Confounders: age, gender, co-morbidity, aged-care, SEIFA, season, number of: Rx, prescribers, pharmacies, hospitalisations, occupational therapy visits, speech therapy visits, accredited pharmacists in region, palliative care meds

	Exposed N=273	Unexposed N=5444	p-value
Male gender	70%	74%	0.11
Age (years)	81.6 (SD 4.8)	81.6 (SD 4.8)	0.87
# co-morbidities	7.6 (SD 2.2)	6.7 (SD 2.4)	<0.0001
# prescriptions	95 (69-123)	76 (54-104)	<0.0001
# prescribers	5 (3-6)	4 (3-6)	0.002
# pharmacies	2 (1-3)	2 (1-3)	0.43
Prior hospitalisations			
0	27%	34%	0.03
1	23%	23%	
2	22%	17%	
>2	28%	25%	


Time to Heart Failure Hospitalization
Cumulative Probability of Hospitalization
0.5
0.4
0.3
0.2
0.1
0.0
0
10
20
30
40
Months
Non Exposed
Exposed

Improvements in outcomes: Home medicines review for those dispensed warfarin

- Veterans aged ≥ 65 dispensed warfarin
- Retrospective cohort study
  - Cases = veterans with HMR
  - Controls = veterans with no HMR

Time since home medicines review (HMR)	Hazard ratio (95% CI)	P-value
0-2 months post HMR	1.13 (0.63 – 2.02)	p = 0.68
>2–6 months post HMR	0.21 (0.05 – 0.87)	p = 0.03
>6–12 months post HMR	1.07 (0.64 – 1.81)	p = 0.79
>12 months post HMR	1.61 (1.18 – 2.20)	p = 0.003

Improvements in medication use and outcomes: Glaucoma

Use of glaucoma eye drops in those with co-morbidities

- 11% of veterans dispensed glaucoma eye drops

- Systemic absorption – up to 80% drains through nasolacrimal duct, crosses nasal mucosa and bypasses liver
- Glaucoma occurs in patients with significant co morbidities
  - Most common: cardiovascular conditions, gastric acid disorders, airways disease, depression

Amongst veterans with glaucoma and airways disease:

- 3 in 10 dispensed topical non selective beta blockers
- 4% dispensed pilocarpine
  - contraindicated
- 6 in 10 dispensed latanoprost
  - potentially problematic

- Overall, 80% co-dispensed a glaucoma medication that may aggravate bronchoconstriction

Evidence for harm? Prescription sequence symmetry analyses

- Examines asymmetry in the distribution of an incident event (either prescription of another medicine or hospitalisation)
- Is the likelihood of one prescription being dispensed prior to another for the same person
- Drug A ⟷ Drug B

If Drug A causes Drug B, expect an excess of persons starting Drug B second

Prescription sequence symmetry analyses

- An asymmetry distribution of prescription order may indicate an association of the specific medicine of interest with the event

- Advantage
  - Within person

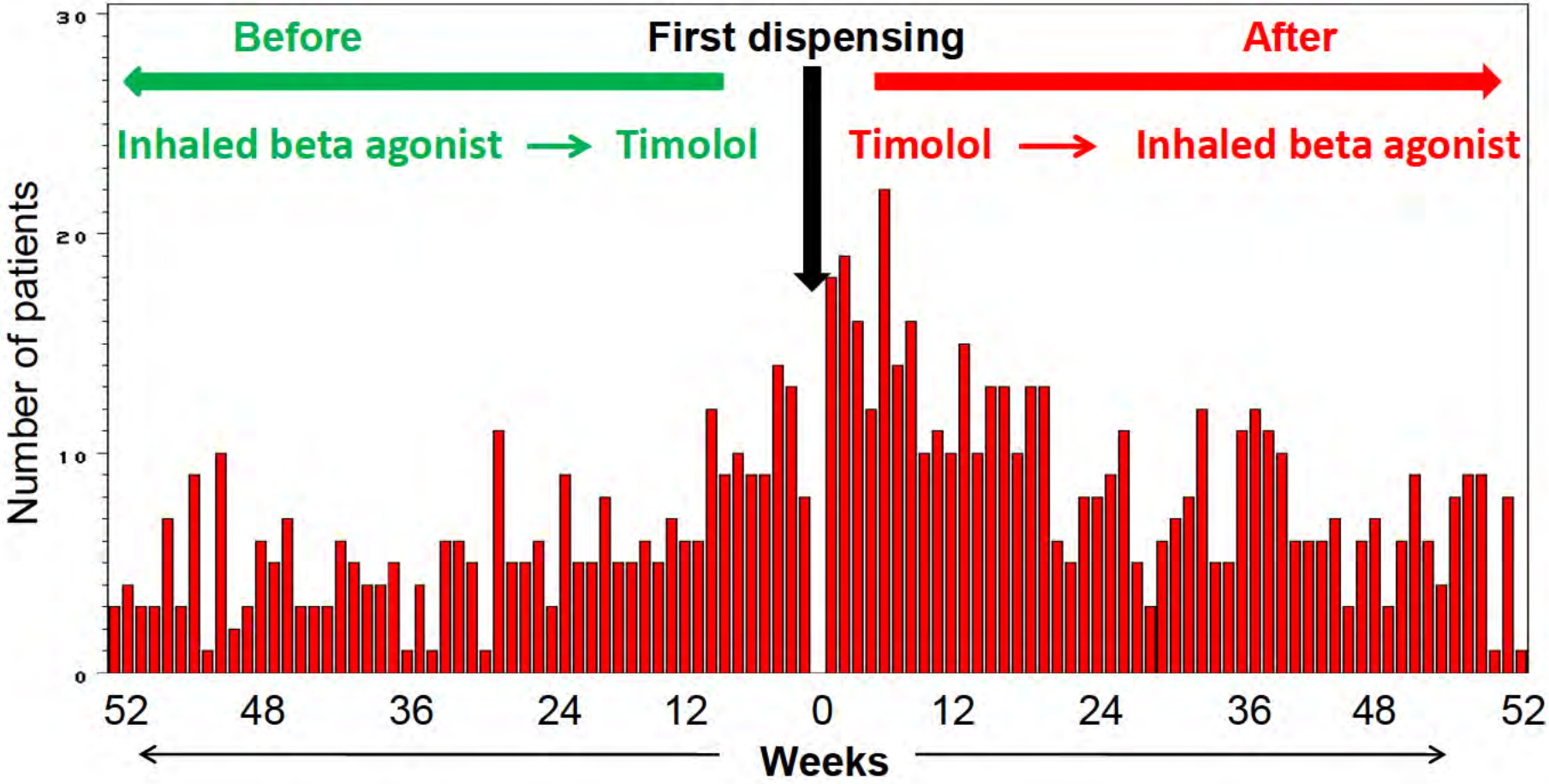
Prescription / event symmetry analysis

- Medicines for glaucoma contraindicated / use with caution in airways disease identified
- Medicines for asthma/airways disease identified
- Database searched for all incident dispensings of glaucoma eye drops, along with incident dispensings of asthma medicine or hospitalisation for airways disease
- For those patients with incident prescriptions of both medicines within a 12 month period, the sequence of prescription was determined

Results:

Adj RR (95% CI) 1.48 (1.28 – 1.71);

i.e. **There is a 48% increase in likelihood of starting inhaled beta agonist after initiation of timolol eye drops**



Eye drop use and association with inhaled respiratory medicine use

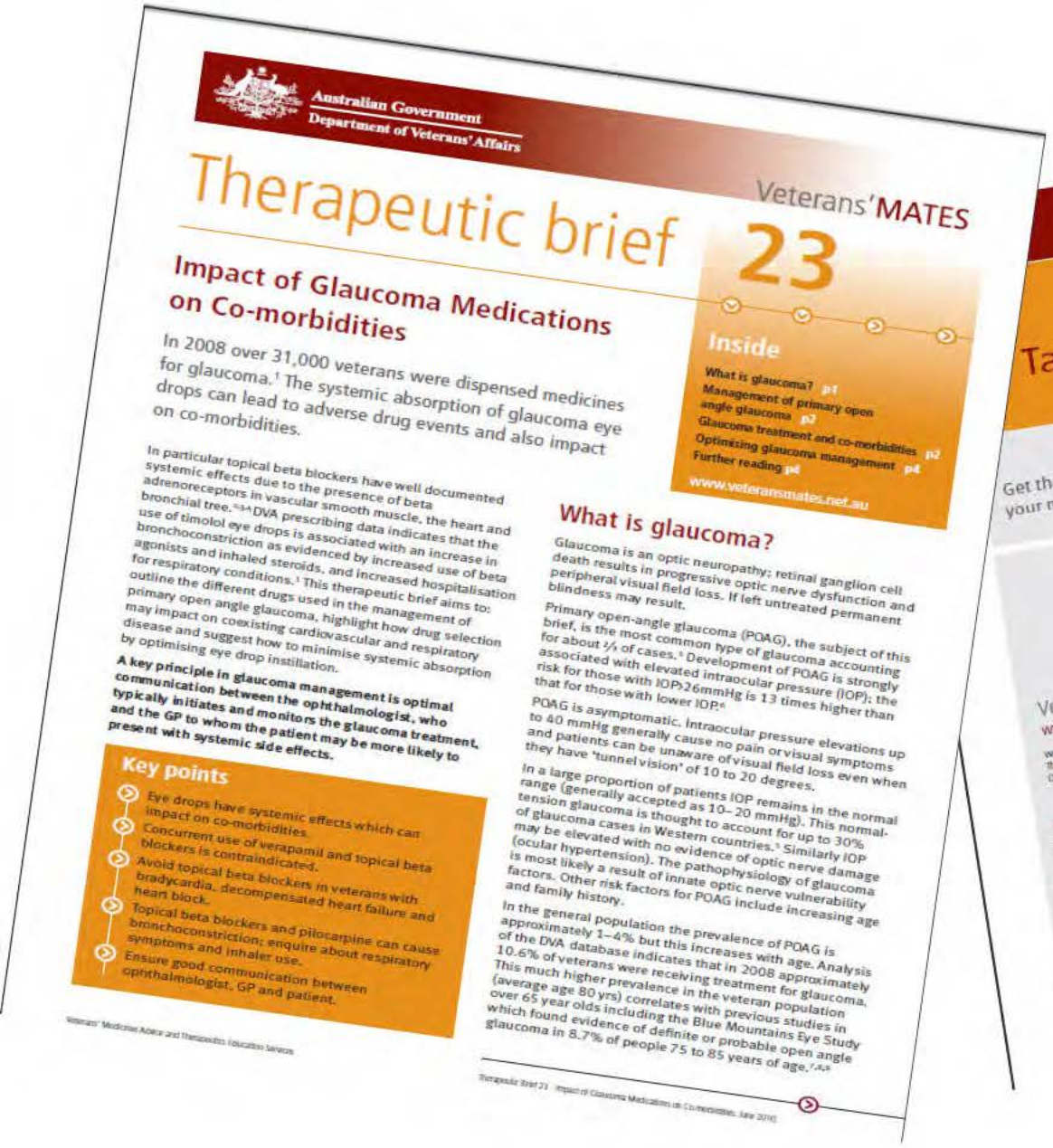
	Adjusted RR (95%CI)	Association found?
Timolol – inhaled β-agonist	1.48 (1.28-1.71)	Yes
Timolol – inhaled corticosteroid	1.43 (1.19-1.71)	Yes
Pilocarpine – inhaled β-agonist	1.33 (1.05-1.69)	Yes
Pilocarpine – inhaled steroid	1.23 (0.92-1.64)	No
Latanoprost – Inhaled β-agonist	1.24 (1.14-1.35)	Yes
Latanoprost – Inhaled steroid	1.13 (1.00-1.28)	Yes
Bimatoprost –Inhaled β-agonist	0.95 (0.79-1.12)	No
Bimatoprost – Inhaled steroids	1.13 (0.92-1.39)	No

Eye drop use and association with inhaled respiratory medicine use

	Adjusted RR (95%CI)	Association found?
Timolol – respiratory hospitalisation	1.57 (1.07-2.29)	Yes
Pilocarpine – respiratory hospitalisation	1.45 (0.90-2.34)	No
Latanoprost – respiratory hospitalisation	0.99 (0.77-1.29)	No
Bimatoprost – respiratory hospitalisation	1.13 (0.77-1.68)	No

Module 24: Impact of glaucoma management on co-morbidities

- Provide useful information about optimal use of glaucoma medications in patients with co-morbidities
  - Airways disease, IHD, depression
- Decrease use of beta blockers and pilocarpine in airways disease
- Decrease topical beta blockers for patients dispensed verapamil
- Increase optimal eye drop insertion to decrease systemic absorption


Australian Government
Department of Veterans' Affairs

Therapeutic brief

Veterans' MATES

23

Impact of Glaucoma Medications on Co-morbidities

In 2008 over 31,000 veterans were dispensed medicines for glaucoma.[1] The systemic absorption of glaucoma eye drops can lead to adverse drug events and also impact on co-morbidities.

In particular topical beta blockers have well documented systemic effects due to the presence of beta adrenoreceptors in vascular smooth muscle, the heart and bronchial tree.[2,3,4] DVA prescribing data indicates that the use of timolol eye drops is associated with an increase in bronchoconstriction as evidenced by increased use of beta agonists and inhaled steroids, and increased hospitalisation for respiratory conditions.[1] This therapeutic brief aims to: outline the different drugs used in the management of primary open angle glaucoma, highlight how drug selection may impact on coexisting cardiovascular and respiratory disease and suggest how to minimise systemic absorption by optimising eye drop instillation.

A key principle in glaucoma management is optimal communication between the ophthalmologist, who typically initiates and monitors the glaucoma treatment, and the GP to whom the patient may be more likely to present with systemic side effects.

Key points

- Eye drops have systemic effects which can impact on co-morbidities.
- Concurrent use of verapamil and topical beta blockers is contraindicated.
- Avoid topical beta blockers in veterans with bradycardia, decompensated heart failure and heart block.
- Topical beta blockers and pilocarpine can cause bronchoconstriction; enquire about respiratory symptoms and inhaler use.
- Ensure good communication between ophthalmologist, GP and patient.

Veterans' Medicines Advice and Therapeutics Education Services

Inside

www.veteransmates.net.au

What is glaucoma?

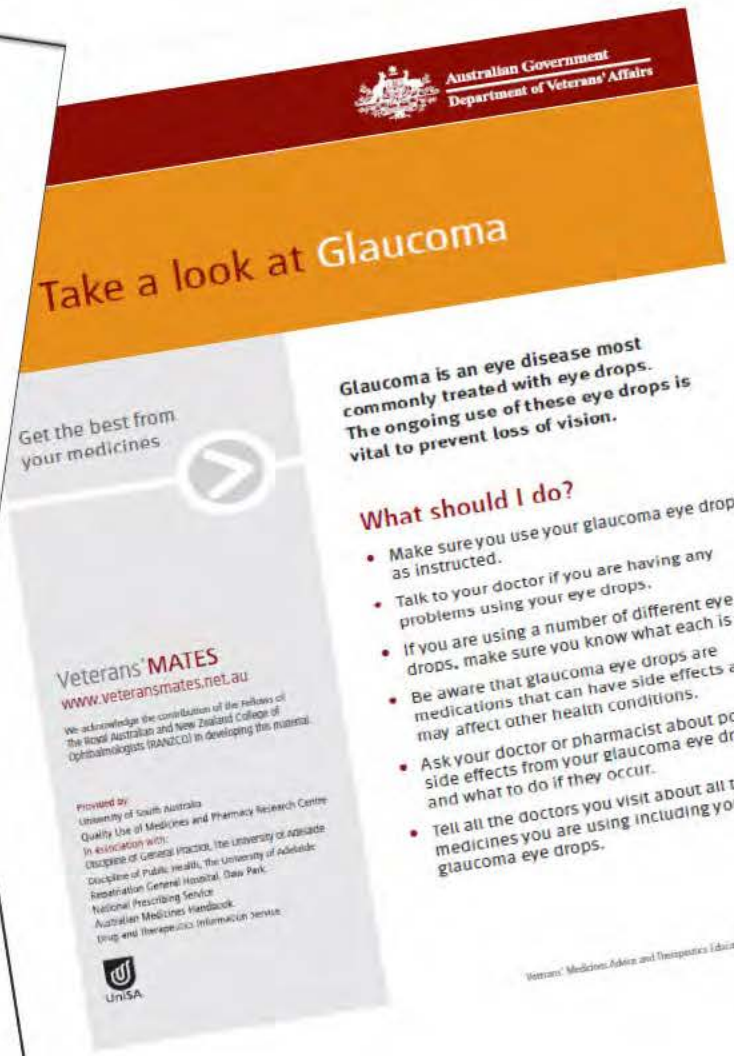
Glaucoma is an optic neuropathy; retinal ganglion cell death results in progressive optic nerve dysfunction and peripheral visual field loss. If left untreated permanent blindness may result.

Primary open-angle glaucoma (POAG), the subject of this brief, is the most common type of glaucoma accounting for about ⅔ of cases.[5] Development of POAG is strongly associated with elevated intraocular pressure (IOP); the risk for those with IOP>26mmHg is 13 times higher than that for those with lower IOP.[6]

POAG is asymptomatic. Intraocular pressure elevations up to 40 mmHg generally cause no pain or visual symptoms and patients can be unaware of visual field loss even when they have "tunnel vision" of 10 to 20 degrees.

In a large proportion of patients IOP remains in the normal range (generally accepted as 10–20 mmHg). This normal-tension glaucoma is thought to account for up to 30% of glaucoma cases in Western countries.[5] Similarly IOP may be elevated with no evidence of optic nerve damage (ocular hypertension). The pathophysiology of glaucoma is most likely a result of innate optic nerve vulnerability factors. Other risk factors for POAG include increasing age and family history.

In the general population the prevalence of POAG is approximately 1–4% but this increases with age. Analysis of the DVA database indicates that in 2008 approximately 10.6% of veterans were receiving treatment for glaucoma. This much higher prevalence in the veteran population (average age 80 yrs) correlates with previous studies in over 65 year olds including the Blue Mountains Eye Study which found evidence of definite or probable open angle glaucoma in 8.7% of people 75 to 85 years of age.[7,8,9]


Australian Government
Department of Veterans' Affairs

Take a look at Glaucoma

Get the best from your medicines

Veterans' MATES
www.veteransmates.net.au

We acknowledge the contribution of the Fellows of the Royal Australian and New Zealand College of Ophthalmologists (RANZCO) in developing this material.

Provided by:
University of South Australia
Quality Use of Medicines and Pharmacy Research Centre
In association with:
Discipline of General Practice, The University of Adelaide
Discipline of Public Health, The University of Adelaide
Repatriation General Hospital, Daw Park
National Prescribing Service
Australian Medicines Handbook
Drug and Therapeutics Information Service

UniSA

Glaucoma is an eye disease most commonly treated with eye drops. The ongoing use of these eye drops is vital to prevent loss of vision.

What should I do?

- Make sure you use your glaucoma eye drops as instructed.
- Talk to your doctor if you are having any problems using your eye drops.
- If you are using a number of different eye drops, make sure you know what each is for.
- Be aware that glaucoma eye drops are medications that can have side effects and may affect other health conditions.
- Ask your doctor or pharmacist about possible side effects from your glaucoma eye drops and what to do if they occur.
- Tell all the doctors you visit about all the medicines you are using including your glaucoma eye drops.

Veterans' Medicines Advice and Therapeutics Education Services, June 2010.

Conclusion

- Well targeted patient-specific prescriber feedback is effective in improving use of medicines when used routinely for practice improvement
- The service also improves health outcomes as measured by reduced hospitalisations

Acknowledgements

- Veterans' MATES project team:
  - Andrew s 47F Libby s 47F Nicole s 47F Emmae s 47F John s 47F Tammy s 47F Natalie s 47F Chris s 47F Bill s 47F Jane s 47F
  - Gillian s 47F

What is the impact of taking multiple psychotropic medicines on the risk of falling?

NL Pratt,[a] MC Woodward,[b] JD Barratt,[a] EN Ramsay,[a] TA Nguyen,[a] EE Roughead[a]

[a]. *Quality Use of Medicines Pharmacy Research Centre, University of South Australia, SA.*

[b] *Aged Care & Residential Services, Austin Health, Heidelberg, Victoria.*

Veterans' MATES

University of South Australia | Sansom Institute for Health Research

Veterans' MATES

Since 2004 Veterans' MATES has aimed to improve the health of the Australian veteran community.

For each therapeutic topic targeted, Veterans' MATES provides:

- Patient specific feedback and educational material to general practitioners
- Educational brochures to veterans encouraging them to talk to their doctor and pharmacist
- Educational materials to pharmacists and other health professionals on the topic

Materials are sent every three months to approximately

- 10,000 general practitioners
- 8,500 pharmacies and accredited pharmacists
- 35,000 veterans

Topic area selection: Risk of falling

Medication-related problem analysis

Module topic selected

Patient specific feedback developed

Module implementation

Evaluation

Falls in the elderly: what we know

- Falls are a major public health problem and responsible for considerable immobility, morbidity, and mortality among the elderly population
- Falls and fall-related complications are the fifth leading cause of death in developed countries
- More than 30% of people over 65 year have at least one fall each year

Woolcott, J.C., et al., Meta-analysis of the Impact of 9 Medication Classes on Falls in Elderly Persons. Arch Intern Med, 2009. ***169****(21): p. 1952-1960*

Falls in the elderly: what we know

- Most falls results from interactions between intrinsic factors or extrinsic factors
- Medicines are one of the most easily reversible extrinsic risk factors
- Psychotropic medicines in particular have been associated with significant increase in the risk of falls
- Little is known of the impact of taking multiple psychotropic medicines on the risk of falling

The question

- Is there an association between the numbers of psychotropic medicines and the risk of hospitalisation for a fall?

Data Source: Australian Government Department of Veterans' Affairs health claims data

- Current treatment population of approximately 225,800 veterans; mean age is 76 years, with 5 co-morbidities
- Data over ten years – pharmacy, medical and allied health records (no diagnosis, includes GP visits, radiology, pathology etc.)
- Hospital records (diagnosis and procedures)

Method

- Retrospective analysis of the Australian Government Department of Veterans' Affairs database.
- Veterans living in the community aged 65 years or older dispensed at least one psychotropic medicine between July 1, 2008 to June 30, 2009 were included in the study.
- Psychotropic medicines included:
  - antipsychotics (N05A)
  - sedatives and hypnotics (N05C)
  - antidepressants (N06A and N06CA)
  - opioids (N02A)
  - anti-parkinson's medicines (N04)

Method

- The effect of the number of psychotropic medicines on the risk of falling was examined by stratifying the total number of psychotropic medicines taken on each day of the study and the risk of fall on the subsequent day
- The main outcome measure was the rate of hospitalisation with a secondary diagnosis of fall from the same level
- Periods of time when subjects were not taking any psychotropic medications was used as the reference period

Method

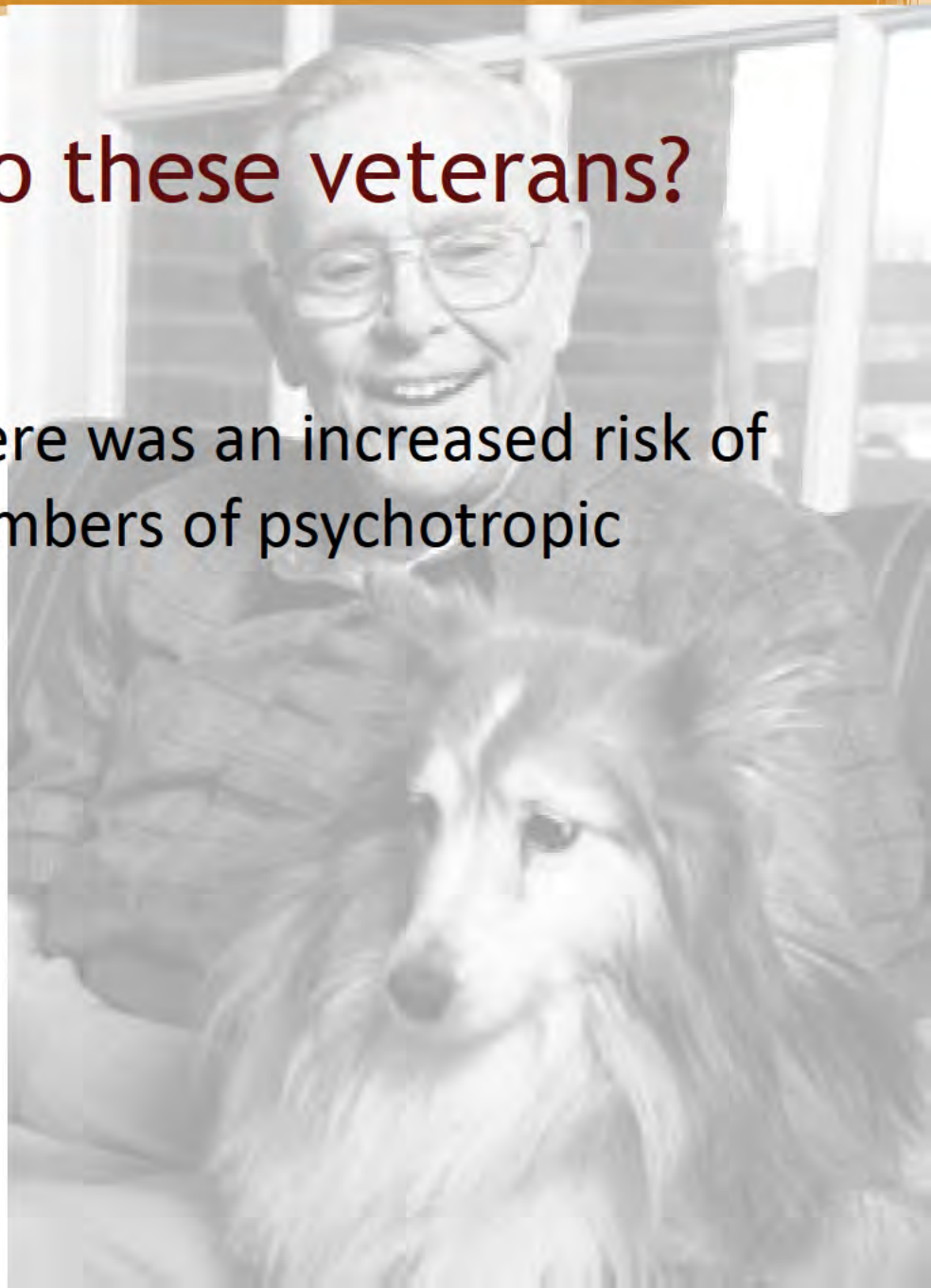
- Incidence rate ratios were calculated using poisson regression adjusting for:
  - Age at entry into the cohort
  - Gender
  - Residential area
  - Number of co-morbidities
  - Number of prescriptions, prescribers, dispensing pharmacies, GP visits, specialist visits, and speech pathology, physiotherapy and occupational therapy visits during follow-up
  - Whether or not the veteran received medicines for palliative care or dementia.

Findings

- 102,082 veterans aged 65 years or over were dispensed at least one psychotropic medicine during the 12 month period
- average age was 83 years and 44% were male
- used on average 5 regular medicines, had on average 5 co-morbidities and visited only one or two prescribers and dispensing pharmacies

So what happened to these veterans?

Analysis suggests that there was an increased risk of falling with increasing numbers of psychotropic medicines



Adjusted results showed:

- An increased risk of hospitalisation for fall with increased number of psychotropic medicines taken concurrently
- Compared to days where no psychotropic medicines were taken, veterans on two psychotropic medicines had a Relative Risk of falling of 1.43 (95% CI 1.31 – 1.55)
- Those on three or four psychotropic medicines had a Relative Risk of falling of 1.83 (95%CI 1.64-2.05)
- The highest risk was found for veterans who had 5 or more psychotropic medicines per day (Relative Risk=2.18, 95% CI 1.61 - 2.95).

Risk of hospitalisation for a fall in veterans taking psychotropic medicines

No of concurrent psychotropic medicines	Person years	Number of falls	Adjusted event rate per 10 person-years (95% CI)	Adjusted Rate Ratio (95% CI)
0	38030	1805	0.47 (0.41 - 0.54)	1.00 (1.00 - 1.00)
1	33484	1794	0.50 (0.44 - 0.58)	1.07 (1.00 - 1.14)
2	11391	863	0.67 (0.58 - 0.78)	1.43 (1.31 - 1.55)
3-4	4528	453	0.86 (0.74 - 1.01)	1.83 (1.64 - 2.05)
5+	393	46	1.03 (0.75 - 1.42)	2.18 (1.61 - 2.95)

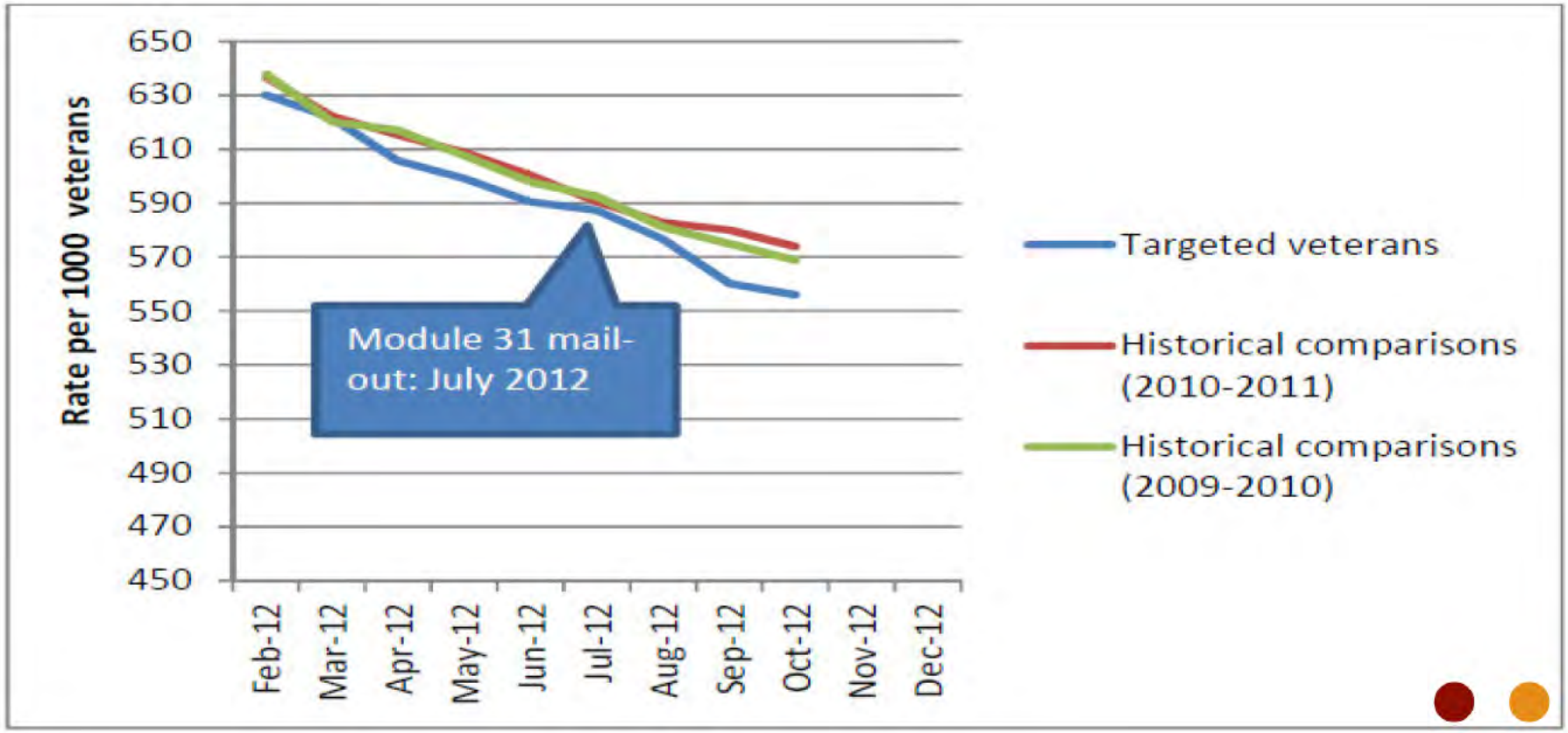
Veterans' MATES: helping to address the problem

- Rolled-out latest topic to reduce psychotropic medicine use in 2012
- Aim: To reduce risks associated with hypnotics

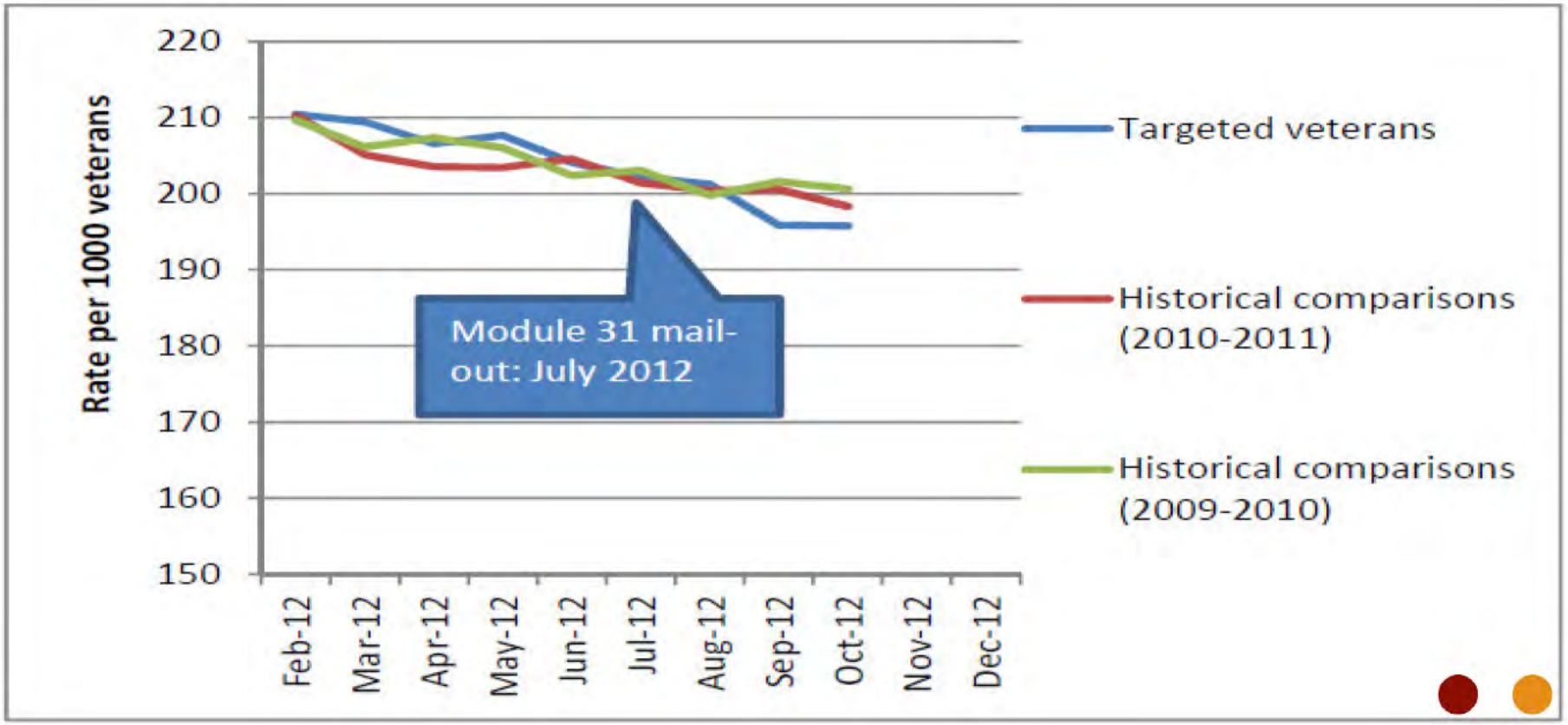
Veterans' MATES

- 9,200 GPs received (June 2012)
  - Direct patient-based feedback
  - Supporting up-to-date clinical information
- 8,300 pharmacists & 2,600 residential aged care facilities (June 2012)
  - Supporting up-to-date clinical information
- 21,300 veterans received (July 2012)
  - Supporting consumer information

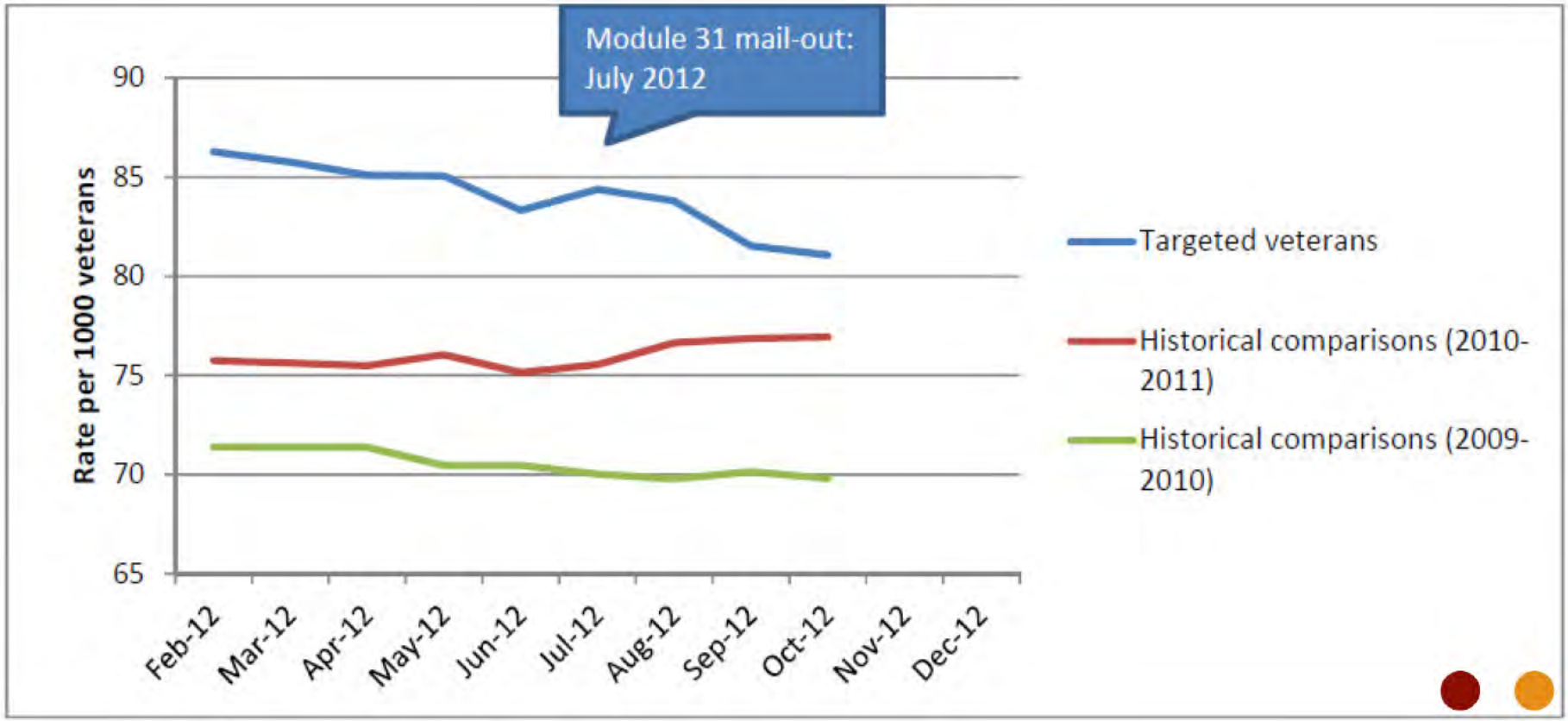
Outcome: Reduced rate of short acting hypnotic dispensing



Outcome: Reduced rate of long acting hypnotic dispensing



Outcome: Reduced rate of 'Z' drug (zopiclone & zolpidem) dispensing



This work was funded by the Australian Government Department of Veterans' Affairs as part of the Veterans' MATES program

Veterans' MATES

www.veteransmates.net.au

Australian Government
Department of Veterans' Affairs

University of South Australia | Sansom Institute for Health Research

Glaucoma eye drops in patients with airways disease: evidence for harm and implications for GPs: results from the Australian Veterans' MATES program

Elizabeth s 47F **Amanda** s 47F **Lisa** s 47F **Robert** s 47F

1. Sansom Institute, School of Pharmacy and Medical Sciences, University of South Australia, Australia;
2. Medical School, Australian National University, Canberra, Australia;
3. Department of Veterans' Affairs, Canberra, Australia

Veterans' MATES

- Australian context- veterans receive primary care from GPs.
- Majority of GPs care for veterans
- Program aim: to improve medication use for veterans by delivering twenty-two educational modules over the six years, June 2004 to June 2010

Department of Veterans' Affairs claims data

- Treatment population of approximately 300,000 veterans; median age is 80 years, with 7 co-morbidities
- 120 million prescription records over 9 years
- 200 million medicare and allied health records (GP visits, radiology, pathology etc)
- 6 million hospital records (public and private)

What Veterans' MATES does

- Provides patient specific feedback and educational material to general practitioners
- Supported by educational brochures to veterans encouraging them to talk to their doctor and pharmacist
- Educational brochures to pharmacists on the topic
- Sent every three months to approximately
  - 10,000 general practitioners
  - 8,500 pharmacies and accredited pharmacists
  - 35,000 veterans

- To date 20 modules delivered
  - Disease specific: Heart failure, Diabetes, COPD
  - Drug Specific: Antidepressants, Contraindicated medicines, NSAIDS
  - Service delivery: Medicines Review, Care Planning
- Participation
  - 229,000 veterans
  - 25,000 doctors
  - 8,500 pharmacies and accredited pharmacists
- > 50% of doctors have received 6 mailings or more

Glaucoma in the veteran population and co-morbidities

- In 2008 -10.6% of veteran population were receiving treatment for glaucoma
- Systemic absorption – up to 80% drains through nasolacrimal duct, crosses nasal mucosa and bypasses liver
- Glaucoma occurs in patients with significant co-morbidities
- Most common co-morbidities for veterans with glaucoma are cardiovascular conditions, gastric acid disorders and airways disease (23.8%)

Recommendations for glaucoma treatment

- Recommendations: Topical prostaglandin analogue or beta blocker as first line, carbonic anhydrase inhibitors as second line
- NHMRC systematic review- prostaglandin analogues more effective.
- Veterans – prostaglandin most commonly prescribed but significant numbers using non selective beta blockers, most commonly timolol

Methods

- Retrospective analysis of the Australian Government Department of Veterans' Affairs database.
- Veterans dispensed glaucoma eye-drops between January-April 2008 were identified and their subsequent prescriptions in May-August 2008 examined
- Veterans dispensed inhaled respiratory medicines were considered to have airways disease
- Potential harms associated with use of glaucoma medicines were identified using prescription symmetry and prescription event analyses.

Contraindicated medications and respiratory co-morbidity

- 3 in 10 veterans treated for airways disease and glaucoma were dispensed topical non selective beta blockers for glaucoma
- 4% dispensed pilocarpine – contraindicated
- 6 in 10 dispensed latanoprost, potentially a problem in asthma
- Overall, 80% of those on medicines for respiratory disease were co-dispensed a glaucoma medication that may aggravate bronchoconstriction

So what happens to these veterans?

- Analysis shows increase in new prescriptions of inhaled respiratory medicine after glaucoma therapy

- Also shows positive association of specific eye drop use and hospitalization for bronchitis, asthma or COPD.

Eye drop use and association with inhaled respiratory medicine use

	n	causal	Non-causal	Crude ratio	Adjusted (95%CI)	Year of analysis	Association found
Timolol – inhaled β-agonist	786	482	304	1.59	1.48 (1.28-1.71)	2002-2008	Yes
Timolol – inhaled corticosteroid	494	297	197	1.51	1.43 (1.19-1.71)	2002-2008	Yes
Pilocarpine – inhaled β-agonist	285	168	117	1.44	1.33 (1.05-1.69)	2002-2008	Yes
Pilocarpine – inhaled steroid	186	104	82	1.27	1.23 (0.92-1.64)	2002-2008	No
Latanoprost – Inhaled β-agonist	2251	1267	984	1.29	1.24 (1.14-1.35)	2003-2008	Yes
Latanoprost – Inhaled steroid	1062	569	493	1.15	1.13 (1.00-1.28)	2003-2008	Yes
Bimatoprost – Inhaled β-agonist	513	242	271	0.89	0.95 (0.79-1.12)	2003-2008	No
Bimatoprost – Inhaled steroids	350	190	160	1.19	1.13 (0.92-1.39)	2003-2008	No

Eye drop use and association with hospitalisation for bronchitis, asthma or COPD

	n	Causal	Non-causal	Crude ratio	Adjusted (95%CI)	Year of analysis	Association found
Timolol – respiratory hosp'n	115	72	43	1.67	1.57 (1.07-2.29)	2001-2006	Yes
Pilocarpine – respiratory hosp'n	72	45	27	1.67	1.45 (0.90-2.34)	2001-2006	No
Carbonic anhydrase inhibitor - respiratory hosp	254	136	118	1.15	1.12 (0.87-1.43)	2001-2006	No
Latanoprost – respiratory hosp'n	226	115	111	1.04	0.99 (0.77-1.29)	2003-2006	No
Bimatoprost – respiratory hosp'n	101	55	46	1.20	1.13 (0.77-1.68)	2003-2006	No

Aims of Module –

- Provide useful information to GPs , ophthalmologists and pharmacists about optimal use of glaucoma medications in patients with co morbidities (including IHD and depression)
- Decrease use of beta blockers and pilocarpine for veterans with airways disease
- Decrease topical beta blockers for patients dispensed verapamil
- Increase optimal eye drop insertion to decrease systemic absorption

Key messages (module June 2010)

- Asthma or COPD? – beta blockers or pilocarpine may aggravate disease
- Review airways response early after initiating a new glaucoma medication
- Double DOT technique for eye drop insertion

What this means for GPs

- Veterans' MATES program – important in identifying and personalising key issues
- Relevant to all geriatric populations and patients with co-morbidities
- More than just theoretical risk
- Elderly – difficulties of drop administration -?overdosing
- Medications initiated 'elsewhere' – importance of good communication

Prescriber feedback as a driver of practice change in pharmacy

Andrew s 47F Libby s 47F

ACKNOWLEDGEMENTS

The Veterans' MATES team: Department of Veterans' Affairs, Canberra; Australian Medicines Handbook; Department of General Practice and Public Health, University of Adelaide; Drug and Therapeutics Information Service; NPS – Better Health, Better Choice; Pharmacy Department, Repatriation General Hospital, Daw Park, SA;

This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of the Veterans' Medicines Advice and Therapeutics Education Service (Veterans' MATES).

Practice change is hard

- Attempt to change a pharmacist's practice from product-based transaction to patient centred pharmaceutical care consultation.

Product-based Transactions → Patient-centred consultations

Practice change is hard

- Even when:
  - Patient-centred pharmaceutical care is endorsed by many pharmacist organisations;
  - Third party payers may be willing to pay pharmacists for this service;
  - Patients and other health professionals like the service and
  - Evidence demonstrates that the service improves health outcomes for consumers

Improvements in outcomes: Collaborative medicines review for those dispensed warfarin

Time since collaborative medicines review (CMR)	Hazard ratio (95% CI)	P-value
0-2 months post CMR	1.13 (0.63 – 2.02)	p = 0.68
>2 to 6 months post CMR	0.21 (0.05 – 0.87)	p = 0.03
>6 to 12 months post CMR	1.07 (0.64 – 1.81)	p = 0.79
>12 months post CMR	1.61 (1.18 – 2.20)	p = 0.003

Roughead E. et al. Journal of Clinical Pharmacy and Therapeutics (2010) doi:10.1111/j.1365-2710.2009.01149.x

Collaborative medicines reviews delay time to hospital admission for bleeding amongst those dispensed warfarin

Collaborative medicines review requires the referral of a patient by a doctor to a pharmacist.

Promoting practice change

- The usual approach to practice change has been through *change management* methods; with little success.
- We attempted to drive pharmacists practice change by increasing demand for collaborative medicines reviews.
- Increased demand for reviews was stimulated by providing the doctor with a list of their patients who would benefit from a collaborative medicines review.

Method

- Dispensing data were used to identify patients at high risk of adverse drug event (n=89497).
- Intervention doctors (n=11,384) were provided with a list of their patients (n=40270) who could benefit from a CMR.
- Comparison groups of patients (n=49,227) and doctors (n=3630) were randomly selected.
- Outcome measures: Rate of CMR/ month, pre/post intervention; number of new doctors/month ordering CMR.

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic brief 17

The S.A.F.E approach to warfarin therapy

Warfarin is effective in preventing thrombo-embolism in a range of conditions, including stroke associated with atrial fibrillation (AF).[1] During 2006-2007, five percent of veterans were prescribed warfarin.[2] Warfarin therapy presents several challenges arising from its bleeding risk and other complex issues. This therapeutic brief aims to optimise warfarin therapy, by considering:

- (S) Selection of patients for warfarin therapy by assessing individual risk/benefit.
- (A) Awareness of factors influencing warfarin effect.
- (F) Frequent monitoring of international normalised ratio (INR).
- (E) Education for patients - essential for safe and effective warfarin therapy.

Inside

www.dva.gov.au/health/veteransmates

Key points

- Warfarin is recommended in patients with AF at moderate to high risk of ischaemic stroke, unless contraindicated. Target INR is usually 2 to 3.
- Age alone is not a contraindication to warfarin but older patients often require lower doses to achieve a therapeutic level of anticoagulation, and more frequent monitoring of INR.
- Older patients, especially those over 75 years, are at increased risk of AF and related stroke, but at the same time are at increased risk of warfarin-associated bleeding. Individual risk/benefit must be considered.
- Starting, stopping or changing the dose of many other medicines, changing diet, and the effects of acute or chronic illness necessitate more frequent INR testing.
- The need for anticoagulation should be re-evaluated regularly, as individual risk factors change over time.
- Patients need systematic education about the risks and benefits, adverse effects and monitoring requirements.

(S)election of patients

Patient selection for warfarin therapy must assess the risks of a thromboembolic event, such as stroke, and of major bleeding.[3] Factors such as relative and absolute contraindications to warfarin, patient preference and ability to comply with treatment and monitoring should also be taken into account.

Assessing stroke risk in AF

One of the most frequent indications for anticoagulation is reducing the risk of stroke related to non-valvular AF. In this setting, warfarin has been shown to confer a relative risk reduction of 64% compared with control. Without anticoagulation, the overall risk of stroke in this setting is about 5% per year, but is also influenced by increasing age and accumulates with the presence of additional risk factors.[3,4] Stroke risk in patients with AF should be regularly reassessed to guide appropriate therapy.

Safe ...
Veterans' Medicines Advice and Therapeu...

Australian Government
Department of Veterans' Affairs

...formation?
...r pharmacist
...edicines Review
...out your warfarin
...mation including the
...subsidy call 1300 556 906

...S' MATES
...gov.au/health/veteransmates

Veterans' MATES

8 steps to taking warfarin

Get the best from your medicines

7

...vided by:
...versity of South Australia
Quality Use of Medicines and Pharmacy Research Centre
In association with:
Discipline of General Practice, The University of Adelaide
Discipline of Public Health, The University of Adelaide
Repatriation General Hospital, Daw Park
National Prescribing Service
Australian Medicines Handbook
Drug and Therapeutics Information Service

UniSA

...Veterans' Medicines Advice and Therapeutics Education Services, Nov 2008.

...Veterans' Medicines Advice and Therapeutics Education Services, Nov 2008.

www.veteransmates.net.au

For each veteran identified we have indicated the **number of unique solid oral medicines (tablets and capsules)** and the **total number of prescriptions** also indicated whether the patient has had a hospital admission, Home Medicines Review or Dose Administration Aid claim.

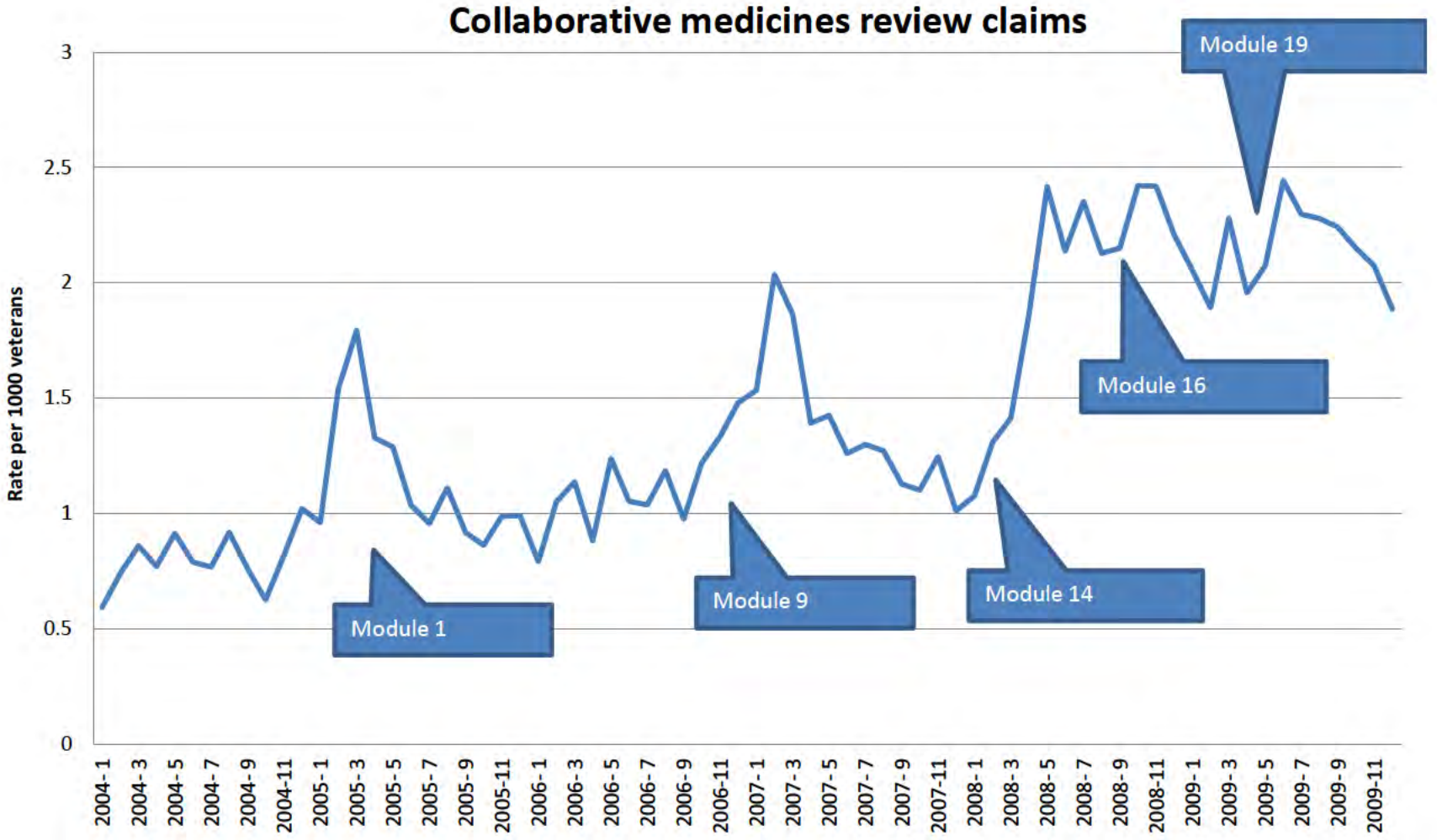
Some of the prescriptions listed below may have been ordered by other doctors. As the prescriber who has written most of the prescriptions for these patients you have been identified as the doctor most likely to be responsible for their care.

<Primary LMO>

PLEASE KEEP FOR YOUR RECORDS

Veterans Name	Suburb	No. of unique medicines probably able to be packed in a DAA	No. of hospital admissions in the last 12 mths	No. of prescribers during last 12 mths	Date of last HMR claimed	DAA Service claimed	Your action
ANNE T SAMPLE	Torrens Park	6	1	2	No claim	No claim	
Total number of prescriptions dispensed in 4 mths: 24							
COMMENT: Large number of prescriptions dispensed suggesting complex medicine regimen. *COMMENT: No HMR claim in last 12 mths. Consider HMR (item 900) to assess suitability for DAA Service.*							*HMR required* ☐ *DAA service* ☐
JOHN E CITIZEN	Parkside	5	2	3	No claim	No claim	
Total number of prescriptions dispensed in 4 mths: 28							
COMMENT: Anti-dementia medication dispensed. Patient is likely to benefit from DAA Service. *COMMENT: Large number of prescriptions dispensed suggesting complex medicine regimen.* *COMMENT: No HMR claim in last 12 mths. Consider HMR (item 900) to assess suitability for DAA Service.*							*HMR required* ☐ *DAA service* ☐
JACK T JAMES	Glenside	4	0	1	19/07/06	No claim	
Total number of prescriptions dispensed in 4 mths: 16							
COMMENT: No HMR claim in last 12 mths. Consider HMR (item 900) to assess suitability for DAA Service.							*HMR required* ☐ *DAA service* ☐

Collaborative medicine review claims



Results

- Collaborative Medicines Review rates increased in intervention patient group:
  - 2.2/1000 pre- to 4.6/1000/month post-intervention

    (Rate Ratio 2.06, 95% CI (1.90, 2.22), p <0.0001).
  - Intervention doctors had higher referral rates than the control group

    (Rate Ratio 1.79, 95% CI (1.58, 2.02), p <0.0001).

Conclusion

- This work goes to the core of what is required of pharmacist practitioners:
  - Working in collaboration with doctors, other health professionals and patients;
  - Preventing and resolving medication-related problems in vulnerable patients;
  - Adding value to the health system.
- No matter what health system you work in as a pharmacist, you should be able to identify a list of patients who's medication management you would like to discuss with them and their doctor.

- In this project, demand for pharmacist services was driven by the project team.

However

- You could offer your local doctor a list of patients at high risk of medication misadventure
- You could work with those patients to ensure that you prevent or resolve their MRPs.
- You could use our data to show that this service keeps patients out of hospital and saves money.
- You may be able to charge a consultation fee for these services.

Prescriber feedback as a driver of practice change in pharmacy

Andrew s 47F Libby s 47F

Quality Use of Medicines

& Pharmacy Research Centre

Australian Government Department of Veterans' Affairs

Veterans'MATES

University of South Australia

Sansom Institute for Health Research

Practice change is hard

Attempts to change a pharmacist's practice from product-based transactions to patient-centred pharmaceutical care consultations have had little success.

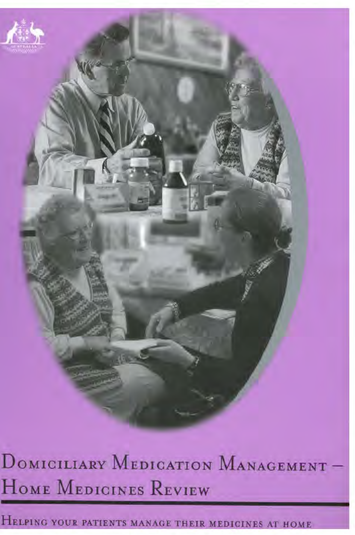
Practice change is slow even when:

- **Patient-centred pharmaceutical care is endorsed by many pharmacist organisations;**
- **Third party payers may be willing to pay pharmacists for this service, some already are;**
- **Patients and other health professionals like the service and**
- **Evidence demonstrates that the service improves health outcomes for consumers**

In Australia Collaborative Medicines Reviews (CMR), are delivered by accredited pharmacists and are based on pharmaceutical care practice principles. They require a referral of a patient from a doctor to a pharmacist. The pharmacist and doctor are each paid approx $A200 per review.

Recent Australian studies have shown how effective these collaborative medicines reviews are in avoiding preventable hospitalisations[1,2]. Data from one of those studies, involving patients using warfarin are presented below[1].

Time since collaborative medicines review (CMR)	Hazard ratio (95% CI) for bleeding-related hospitalisation	P-value
0-2 months post CMR	1.13 (0.63 – 2.02)	p = 0.68
>2 to 6 months post CMR	0.21 (0.05 – 0.87)	p = 0.03
>6 to 12 months post CMR	1.07 (0.64 – 1.81)	p = 0.79



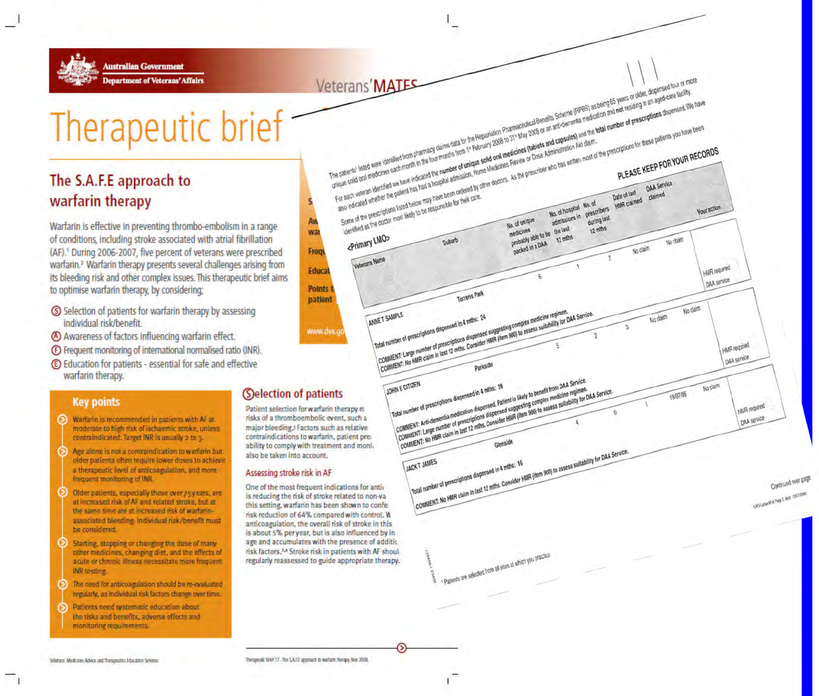
Collaborative medicines reviews delay time to the next hospital admission for bleeding amongst those dispensed warfarin, by seven months.
Less than 5% of eligible patients have received a Collaborative Medicines Review

The usual approach to practice change uses *change management* methods; with little success. In this study we attempted to drive pharmacists practice change by increasing doctor demand for collaborative medicines reviews.
Increased demand for reviews was stimulated by providing the doctor with a list of their patients who would benefit from a collaborative medicines review.

Method

Dispensing data were used to identify patients at high risk of adverse drug event (n=89497).

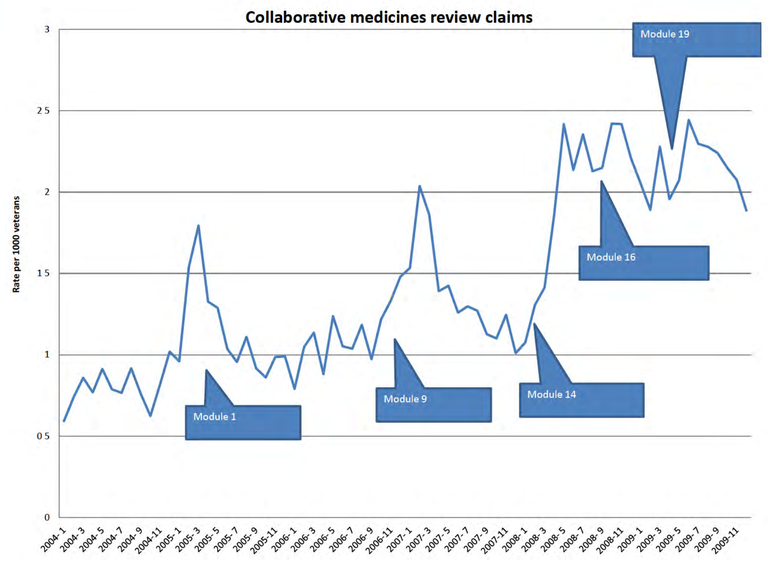
Intervention doctors (n=11,384) were provided with a list of their patients (n=40270) who could benefit from a CMR and an information brochure supporting Collaborative Medicines Reviews.



Comparison groups of patients (n=49,227) and doctors (n=3630) were randomly selected.

Outcome measures:

1. **Rate of CMR/ month, pre/post intervention**
2. **Rate of doctors/month ordering CMR in intervention and comparison groups.**



Results

Collaborative Medicines Review rates increased in intervention patient group:
2.2/1000 pre- to 4.6/1000/month post-intervention
(Rate Ratio 2.06, 95% CI (1.90, 2.22), p <0.0001).

Intervention doctors had higher referral rates than the control group
(Rate Ratio 1.79, 95% CI (1.58, 2.02), p <0.0001).

Conclusion

This work goes to the core of what is required of pharmacist practitioners:
- **Working in collaboration with doctors, other health professionals and patients;**
- **Preventing and resolving medication-related problems in vulnerable patients;**
- **Adding value to the health system.**

No matter what health system you work in as a pharmacist, you should be able to identify a list of patients whose medication management you would like to discuss with the patient and their doctor

In this project, demand for pharmacist services was driven by dispensing data available to the project team.

You could, from your practice:
- **Offer your local doctor a list of patients at high risk of medication misadventure;**
- **Work with those patients to ensure that you prevent or resolve their medication-related problems;**
- **Generate data to show that this service keeps patients out of hospital and saves money;**
- **Charge a consultation fee for these services.**

References

1. E. E. Roughead, J. D. Barratt, E. Ramsay, N. Pratt, P. Ryan, R. Peck, G. Killer, A. L. Gilbert. **Collaborative home medicines review delays time to next hospitalization for warfarin associated bleeding in Australian war veterans.** Journal of Clinical Pharmacy and Therapeutics (2010) doi:10.1111/j.1365-2710.2009.01149.x
2. E. **Roughead**, John D. Barratt, Emmae Ramsay, Nicole Pratt, Philip Ryan, Robert Peck, Graeme Killer, and Andrew L. Gilbert. **The Effectiveness of Collaborative Medicine Reviews in Delaying Time to Next Hospitalization for Patients With Heart Failure in the Practice Setting: Results of a Cohort Study.** Circ **Heart** Fail, Sep 2009; 2: 424 - 428.

Acknowledgements

The Veterans' MATES team: Department of Veterans' Affairs, Canberra; Australian Medicines Handbook; Department of General Practice and Public Health, University of Adelaide; Drug and Therapeutics Information Service; National Prescribing Service; Pharmacy Department, Repatriation General Hospital, Daw Park, SA;
This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of the Veterans' Medicines Advice and Therapeutics Education Service (Veterans' MATES).

Disclosure

Funding for the projects used in this paper was provided by the Australian Government Department of Veterans' Affairs.

Using pharmacoepidemiology to target interventions by pharmacists, drive practice change and assess patient outcomes

Andrew s 47F ***Elizabeth*** s 47F

John s 47F

Quality use of medicines & Pharmacy Research Centre

University of South Australia | Sansom Institute for Health Research

Background:

Data from pharmacist computing systems and the development of national health databases provides opportunities to improve care. This paper presents the results from a 6 year program using PE to target interventions by doctors and pharmacists.

Aim:

Use pharmacoepidemiology to target pharmaceutical care interventions.

Objective:

To improve pharmaceutical care (PC) of patients.

Setting:

Community; Australian war veterans.

Methods:

Drug utilisation studies in dispensing data are used to identify clinical issues. Data driven patient-specific prescriber feedback is provided with alerts to doctors, pharmacists and patients. Time series analyses and cohort studies in a national health database are used to evaluate outcomes.

Results:

22 therapeutic modules delivered over 6 years.

Involved:

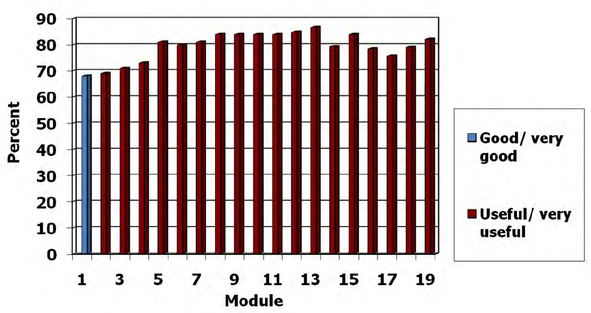
226,000 veterans (median age 80 years),
24,000 doctors and
8,500 community pharmacies.

On average, more than 80% of participants report the information useful.

Of the 16 Therapeutic modules that have been fully evaluated, 12 have improved patient care.

There has been greater pharmacist participation in collaborative pharmaceutical care services, with a sustained 3% monthly rate of increase ($p<0.001$).

This has resulted in improvements in health outcomes with a:
• 46% reduction in hospitalisation for heart failure amongst heart failure patients and
•79% reduction in hospitalisation for bleed amongst patients using warfarin who received collaborative medicines reviews.



Percentage of doctors who find the therapeutic information useful

Module	Veterans	Pharmacists/ Pharmacies	Doctors
Medicines review	38568	8500	11384
Heart Failure	12047	8500	6954
Diabetes	16612	8500	8573
Medicines for arthritis	9885	8500	11242
Antidepressants	42196	8500	12482
Respiratory	28670	8500	10720
Medicines for heart burn	62460	8500	13684
Contraindicated medicines	32484	8500	11050
Medicines review	58081	8500	12950
Constipation	29231	8500	9825
Diabetes care	18340	8500	9103
Dementia	(6690)	8500	3884
Clopidogrel	16867	8500	8279
COPD	18096	8500	8785
Osteoporosis	83110	8500	16876
Dose Admin Aids	27707	8500	10182
Warfarin	15656	8500	8086
Insomnia	52863	8500	13203
Heart failure	25557	8500	10151
Falls	55800	8500	7648

Pharmaceutical Care interventions

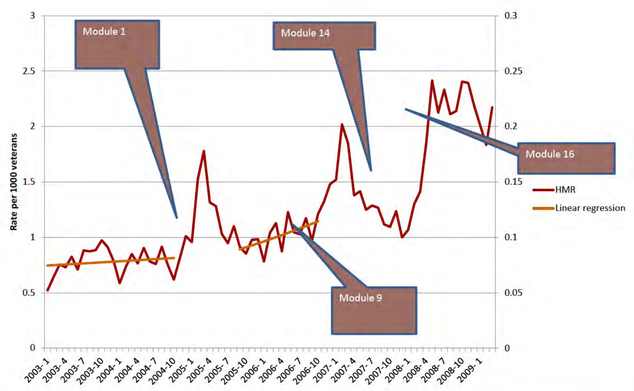
1. Additional medication needed

Aim	Effect	Comparator
Increase beta-blocker use in those with heart failure	RR 1.29, (95% CI 1.23-1.35)	Historical
Increase lipid-lowering therapy in those with diabetes	RR 1.16, (95% CI 1.1, 1.23)	Historical
Increase antiplatelet therapy in those with diabetes	RR 1.15, (95% CI 1.08, 1.22)	Historical
Increase osteoporosis medicine use in specified age groups	RR 1.07 (women) (95% CI 1.0, 1.14) RR 1.24 (men) (95% CI 1.15, 1.33)	Concurrent (adjacent age groups)

2. Inappropriate medication therapy

Aim	Effect	Comparator
Reduce NSAID use in those with diabetes or heart failure	RR 1.44, (95% CI 1.42, 1.46)	Concurrent
Reduce potentially interacting medicines with antidepressants	No difference (95% CI 0.97-1.10) (95% CI 0.97-1.04)	Historical comparison
Reduce multiple device use	3 or more devices $P<0.004$	Time series
Reduce high dose proton pump inhibitor use	RR 1.15 (95% CI 1.10 - 1.19)	Time series
Reduce use of risperidone for dementia symptoms	RR 1.11, (95% CI 1.06- 1.15)	Historical comparison
Reduce clopidogrel and NSAIDs	RR 1.06, (95% CI 1.00- 1.13)	Historical comparison
Reduce nebuliser use	RR 0.96 (95% CI 0.94 - 0.99)	Historical comparison

3. Improving medicines review rates in at risk patients



Topic	Effect	Comparator
Increase medicine review services (Nov 04, Nov 06, Mar 08)	RR 1.79, (95% CI 1.58, 2.02) RR 1.28 (95% CI 1.01-1.63) RR 1.34 (95% CI 1.14, 1.58)	Concurrent (non-targeted)

Improved Patient Outcomes

Aim	Effect	Source of evidence
Reduce NSAID use in those with diabetes or heart failure	30 hospital admissions prevented	DVA data
Reduce potentially interacting medicines with antidepressants	38 hospital admissions avoided	DVA data
Reduce high dose proton pump inhibitor use	400 respiratory infections avoided, including hospitalisation for pneumonia	DVA data
Reduce use of risperidone for dementia symptoms	**10 strokes avoided, 6 deaths avoided, 1 hip fracture avoided, 45 pneumonia cases avoided**	**DVA data**
Reduce clopidogrel and NSAIDs		DVA data
Home medicines reviews	65 hospitalisations for heart failure avoided 5 hospitalisations for bleed avoided	DVA data

Conclusions:

Use of dispensing data and nationally collected administrative health data in pharmacoepidemiology analyses:
• Provides a powerful tool for targeting interventions by health professionals,
•drives an increase in Pharmaceutical Care services by pharmacists and
•delivers improved health outcome for patients

Acknowledgements and Disclosure

The Veterans' MATES team: Department of Veterans' Affairs, Canberra; Australian Medicines Handbook; Department of General Practice and Public Health, University of Adelaide; Drug and Therapeutics Information Service; NPS Better Choices – Better Health; Pharmacy Department, Repatriation General Hospital, SA

This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of the Veterans' Medicines Advice and Therapeutics Education Service (Veterans' MATES).

Patients with multiple chronic conditions: Using Department of Veterans' Affairs (DVA) dispensing data to guide medication reviews.

John s 47F *Elizabeth* s 47F *Andrew* s 47F

Australian Government Department of Veterans' Affairs | Veterans'MATES

Quality Use of Medicines & Pharmacy Research Centre

University of South Australia | Sansom Institute for Health Research

Background:

Multiple chronic conditions are common in those aged ≥65 years.

Treatment of one chronic disease will often interfere with the management of co-morbid conditions.

Collaborative medicines review has been shown to prevent or resolve medication-related problems[1,2].

Glaucoma is used as an example of a common condition in the elderly to examine the effects of glaucoma management on co-morbid conditions.

Aim:

Use dispensing data to identify medication-related problems.

Objective:

Provide better guidance for collaborative medicines reviews.

Setting:

War Veteran community; Australia

Methods:

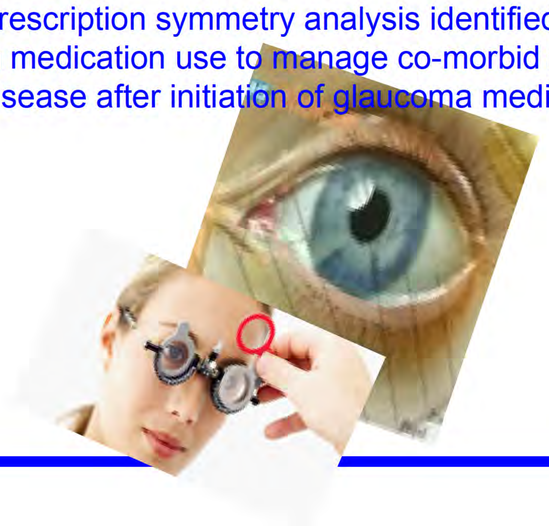
Current recommended management strategies for glaucoma, including management in those with co-morbidity, were identified from the NHMRC systematic review (2009)[3].

We compared current prescribed therapies for glaucoma in the veteran population with those recommended in the review

All veterans dispensed anti-glaucoma medicines from Jan-Apr 2008 were included.

Airways disease was identified from dispensing of respiratory medicine subsequent to prescriptions of glaucoma medicines from May-Sep 2008.

Prescription symmetry analysis identified changes in medication use to manage co-morbid airways disease after initiation of glaucoma medicines



Results:

Pharmacoepidemiologic methods can be used with dispensing data to guide medication reviews.

Management of glaucoma:

25,479 veterans included ;
- 66% had one medicine for glaucoma dispensed
- 26% had two glaucoma medicines
- 6% had three
- 1.5% had four or more

98% of veterans received recommended first line therapy: Prostaglandin analogues alone or in combination product with beta blocker or topical beta-blocker alone.

27% received second line therapy, alpha-agonist or carbonic-anhydrase inhibitor, alone of in combination with other glaucoma medication.

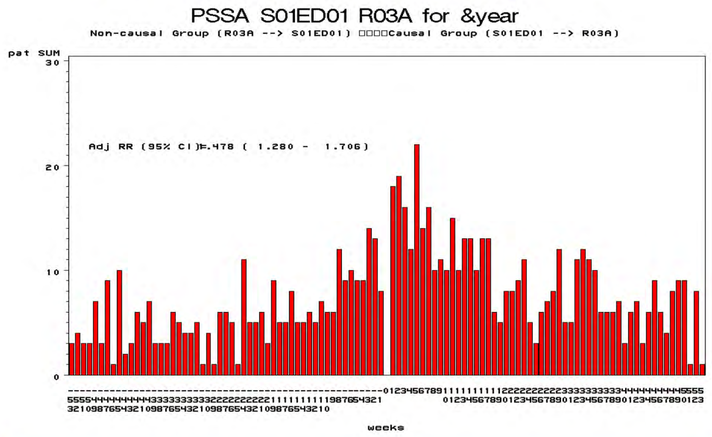
3% were using non- recommended pilocarpine eye drops.

Co-management of respiratory conditions

Guideline recommendations:	**Results**
Asthma	
Contraindicated: pilocarpine	4% dispensed pilocarpine
Administer with caution: timolol, levobunolol, betaxolol, latanoprost	29% dispensed topical beta-blockers
	60% dispensed latanoprost
COPD	
Contraindicated: topical beta-blockers, timolol, levobunolol, betaxolol	

Overall, 80% of veterans dispensed a medicine that may aggravate respiratory conditions via broncho-constriction.

Eye drop use is associated with increased inhaled respiratory medicine use:



Inhaled beta-agonist use rose following initiation of timolol (ASR 1.48; 95% CI 1.28-1.71), latanoprost (ASR 1.24 95% CI1.14-1.35) and pilocarpine (ASR 1.33 95% CI 1.05-1.69).

Inhaled corticosteroid use rose following initiation of timolol (ASR 1.43, 95% CI 1.19-1.71) and latanoprost (ASR 1.13 95% CI 1.00-1.28).

Eye drop use associated with hospitalisation for bronchitis, asthma or Chronic Obstructive Pulmonary Disease:

The risk of hospitalisation for airways disease rose following timolol initiation (ASR 1.57 95%CI 1.04-2.38).

Guidance for medication reviews

Key findings were:

1.Management of glaucoma was inline with Australian treatment guidelines; however, when these patients had respiratory conditions there was:

2.A 48% increased risk of initiating an inhaled beta agonist after timolol initiated.

3.A 43% increased risk of inhaled corticosteroid when timolol initiated for glaucoma management.

4.A 57% increased risk of hospitalisation because of an exacerbation of airways disease.

Patients being treat for glaucoma and airways disease require careful assessment for signs of increase respiratory distress such as increased use of inhalers.

References

1. E. E. Roughead, J. D. Barratt, E. Ramsay, N. Pratt, P. Ryan, R. Peck, G. Killer, A. L. Gilbert. **Collaborative home medicines review delays time to next hospitalization for warfarin associated bleeding in Australian war veterans.** Journal of Clinical Pharmacy and Therapeutics (2010) doi:10.1111/j.1365-2710.2009.01149.x
2. E. **Roughead**, John D. Barratt, Emmae Ramsay, Nicole Pratt, Philip Ryan, Robert Peck, Graeme Killer, and Andrew L. Gilbert. **The Effectiveness of Collaborative Medicine Reviews in Delaying Time to Next Hospitalization for Patients With Heart Failure in the Practice Setting: Results of a Cohort Study.** Circ **Heart** Fail, Sep 2009; 2: 424 - 428.
3. http://www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses/cp113.pdf

Acknowledgements

The Veterans' MATES team: Department of Veterans' Affairs, Canberra; Australian Medicines Handbook; Department of General Practice and Public Health, University of Adelaide; Drug and Therapeutics Information Service; NPS Better Choices - Better Health; Pharmacy Department, Repatriation General Hospital, Daw Park, SA;
This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of the Veterans' Medicines Advice and Therapeutics Education Service (Veterans' MATES).

Disclosure

Funding for the projects used in this paper was provided by the Australian Government Department of Veterans' Affairs.

Cumulative risk of harm from multiple medicines use in the older population

Imaina Widagdo and Libby s 47F
Quality Use of Medicines and Pharmacy Research Centre,
Clinical Health Science, University of South Australia
Contact: Imaina.Widagdo@unisa.edu.au

Australian Government
Department of Veterans' Affairs

Veterans' MATES

University of South Australia

Introduction

Multiple medicine use and medicine-related harm are common in older people. Age related pharmacokinetic and pharmacodynamic changes alter the risk benefit balance: medicines that were once helpful when first prescribed may no longer be helpful or become unsafe.[1] Therefore, it is important for health professionals to be able to recognise the cumulative risk of Adverse Drug Reactions (ADRs) from use of multiple medicines in the older population.

Aims

To examine the prevalence of potential risk of ADR from use of multiple medicines in older Australians. A second aim was to examine the impact on cumulative ADR risk by hypothetically removing potentially inappropriate medicines (PIMs).

Methods

Data from the Australian Government Department of Veterans' Affairs (DVA) administrative health claims database were used. This study included all persons aged 65 years or older at 19 August 2022. Pharmacy claims data between 19 August 2021 and 19 August 2022 were used to identify current use of medicines. The 2018 Scottish cumulative toxicity tool[2] was used to identify common ADR risks (e.g., falls or fractures, bleeding, renal injury, constipation, and urinary retention). PIMs were identified using the 2019 Beers Criteria[3]. Total cumulative ADR risk was calculated for each person with and without PIMs. A non-parametric Wilcoxon test was used to examine the difference in the distribution of the cohort by their total type of ADR risks with and without PIMs.

Results

80,506 people; 46,096 (57.3%) males; median age: 78 years old (interquartile range (IQR): 74-90)

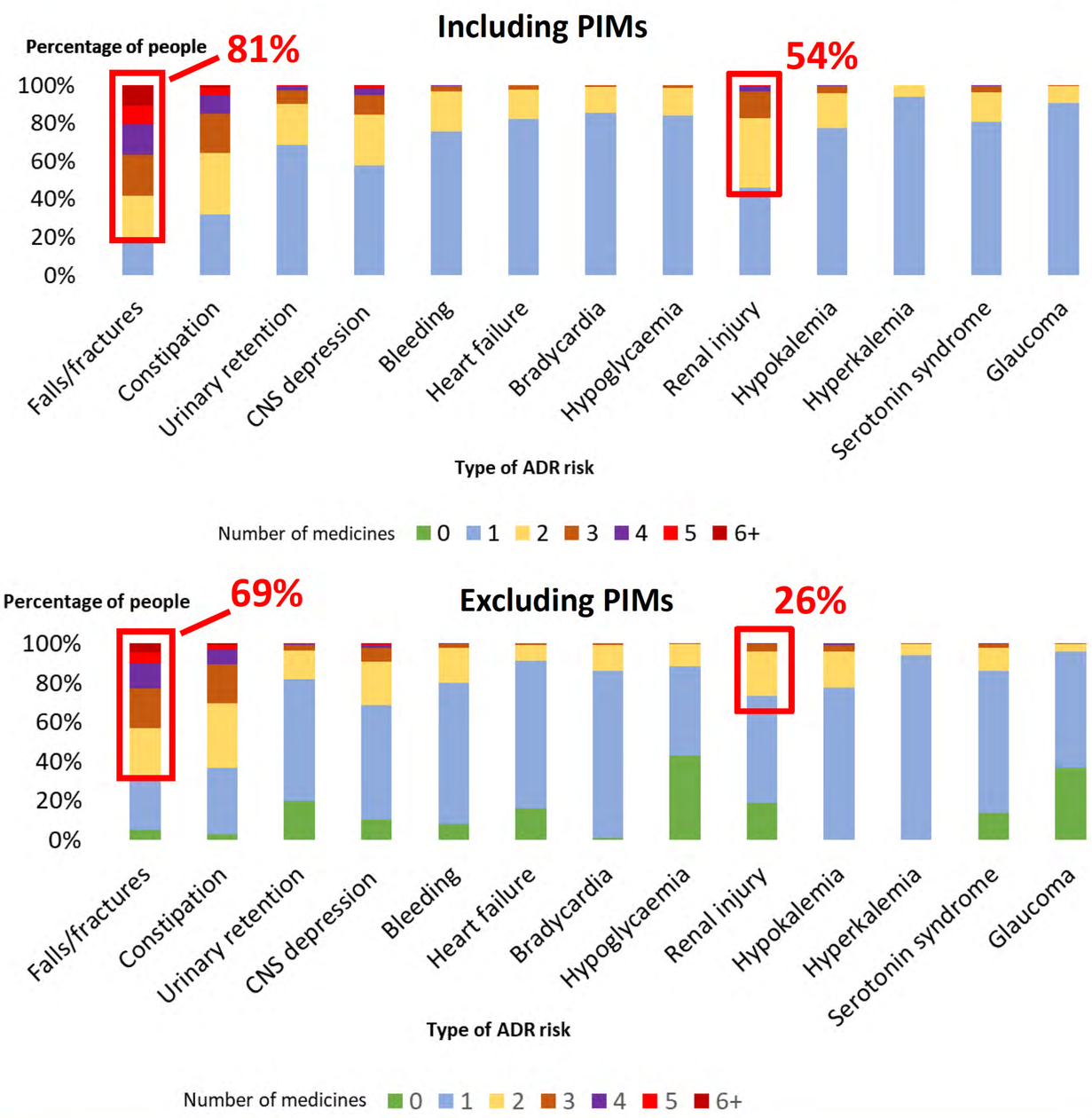
Cohort characteristics

93% on at least one medicine with ADR risk

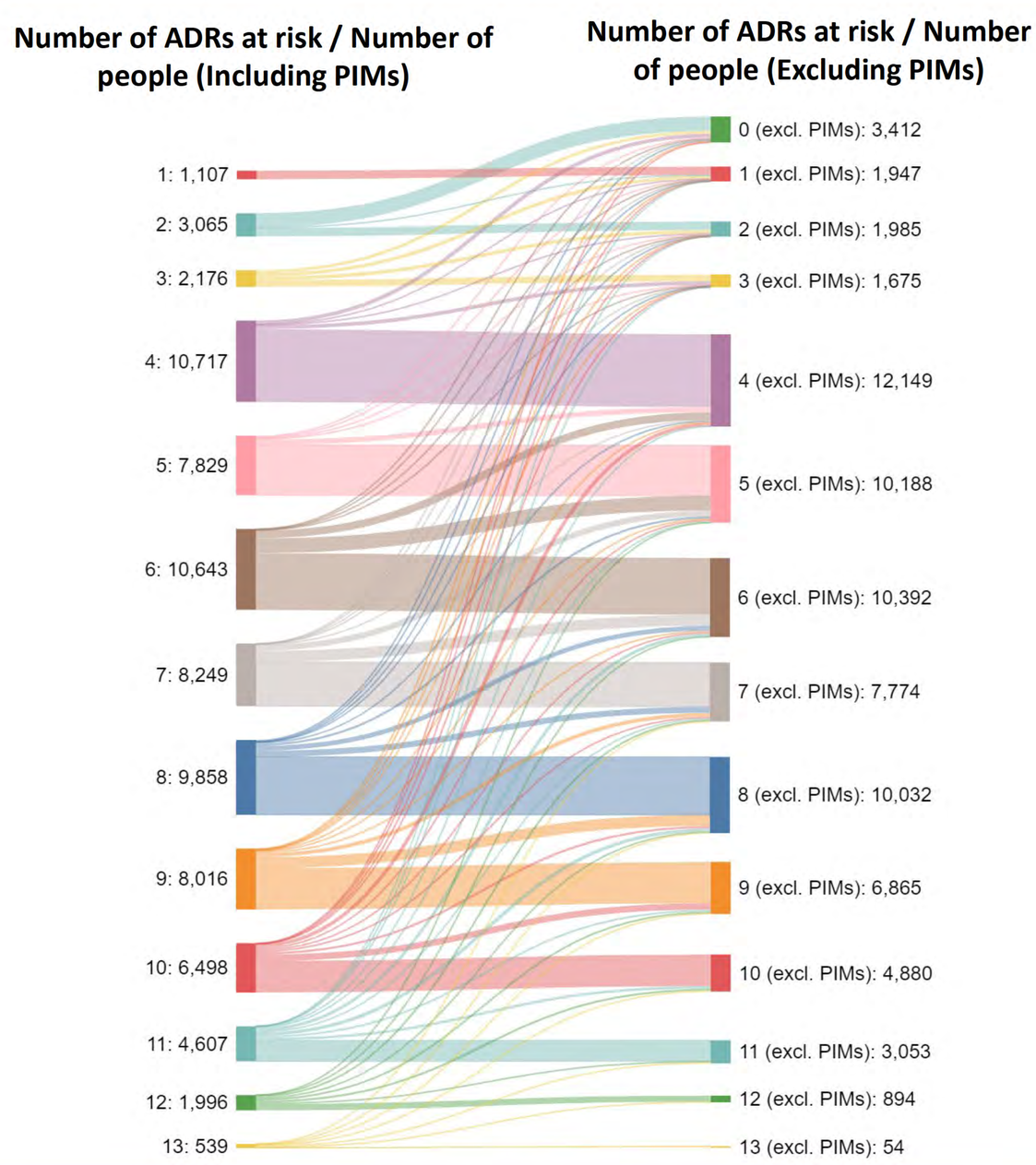
74% had 2 or more medicines with falls or fractures risk

Median number of medicines use: 6 (IQR): 3-9

Number of medicines used in people at potential ADR risk



Number of ADRs for which an individual is at risk



Removing PIMs resulted in **28% fewer people** who had 2 or more medicines with potential **renal injury risk;** from 54% to 26%

Removing PIMs significantly **reduced** the **number of ADRs**, from a median of 7 risks (IQR: 5-9) to 6 (IQR: 4-8), p-value <0.0001

Conclusions

Risk of multiple ADRs is common with multiple medicines use. Removing PIMs was hypothetically shown to reduce risk of multiple ADRs. This analysis highlights the importance of understanding the potential cumulative harm from use of multiple medicines.

Practice implications

Regular medicines review is essential to ensure quality use of medicines and medicines safety. Clinicians need to consider cumulative risk of harm from use of multiple medicines and identify potential deprescribing opportunities to reduce risk of potential harm.

Useful tool

The Australian Department of Veterans' Affairs Veterans' MATES program developed an online cumulative risk calculator to help clinicians assess and identify risk of cumulative harm
www.veteransmates.net.au/cumulative-risk-calculator
This tool has been developed and adapted from the Scottish polypharmacy guidelines[2] and can be used to see how adjustments to your patient's medicines might reduce their cumulative risk of adverse effects.

References

1. Liacos M, Page A, Etherton-Beer C. Deprescribing in older people. Aust Prescr. 2020; 43(4): 114-120.
2. Scottish Government Polypharmacy Model of Care Group. Polypharmacy guidance, realistic prescribing. Scottish Government. 3rd edn. 2018.
3. 2019 American Geriatrics Society Beers Criteria® Update Expert Panel, Fick DM, Semla TP, Steinman M, Beizer J, Brandt N, Dombrowski R, DuBeau CE, Pezzullo L, Epplin JJ, Flanagan N. American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society. 2019 Apr;67(4):674-94.

Using drug data to guide planning and evaluation of Quality Use of Medicines interventions

• Prof Andrew s 47F •Assoc Prof Libby s 47F •Prof Jerry s 47F

Quality Use of Medicines and Pharmacy Research Centre

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Table of Contents

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Executive summary

The faculty, Libby s 47F Andy s 47F and Jerry s 47F welcome you to this Advanced Drug Utilization Research workshop.

In this workshop you will have the opportunity to examine data from a Drug Utilization Evaluation and to plan an intervention to improve drug use in patients. Pre-workshop reading material is provided in the work book. These papers will be critically reviewed during the workshop as you consider how best to design and evaluate your intervention.

The Glaucoma Drug Utilization Study provided was used in the design of an intervention for the Veterans Medicines Advise and Therapeutics Education Service (Veterans' MATES). This Service uses administrative health data to provide feedback to medical practitioners and advice to patients with the aim of improving health outcomes for Australian war veterans. Libby and Andy are Directors of the Veterans' MATES program and have been responsible for designing the Planning and Evaluation Template offered in this workshop.

The Template is based on evidence that is summarized in the Pre-workshop reading material. PLEASE READ THESE PAPERS PRIOR TO THE WORKSHOP. You will work in small groups to systematically address each of the research questions. A nominated speaker within each group will present the groups views on each area. We want you to focus on the specific issues in the Glaucoma Drug Utilization Study to enable a rigorous and focused debate as you put forward your views on each question. Of course we encourage you at the same time to be considering the relevance and applicability of this approach to your own projects or work. The faculty will support you as you develop your plans and offer comment and critique when you present your work to the workshop. Jerry will bring his extensive practical experience in developing and implementing medicines interventions and raise questions such as the cost-effectiveness of proposed interventions.

We hope you have some *serious fun* at our workshop.

Libby s 47F

Andy s 47F

Jerry s 47F

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Workshop Plan

Thursday 19th August 2010: 1.30pm-6pm

Session 1:

1.30-1.35pm Introductions, workshop objectives, and plan: **Andy** s 47F

1.35-3.00pm

Andy s 47F Behaviour change; moving theory into practice

Jerry s 47F The evidence-base for behaviour change interventions in health

s 47F Planning effective interventions

Session 2:

3.00-4-15pm Over to you:

You have been provided with drug use evaluation data to review and consider the question: Is there a problem with Glaucoma management? Planning the intervention: you will work in a small group to consider;

a. What you are aiming to do?
b. Why you are doing this intervention?
c. How are you going to intervene?

4.15-4.30pm **Afternoon tea**

Session 3:

4.30-5.30pm In your small groups:

You will work through a stepped approach to consider and developing the an evaluation plan;

d. How will they evaluate their intervention?
e. What they will do with the results?
f. Where to now?

Session 4:

5.30-6.00pm

Panel discussion of data needs and methods for better intervention planning

Jerry s 47F Reflections:

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Background

Interventions to improve use of medicines need to be grounded in behavioural theory, as they ultimately aim to change behaviour, in an attempt to address an identified medicines-related problem.

We have provided you with four articles: The article by Libby s 47F summarizes the major behavioural theories and their application to enhancing uptake of initiatives which aim to improve medicines use. The three short articles explore the developing field of "Implementation Research", again suggesting the use of behavioural theory to design strategies to bridge the evidence-practice gap.

Short presentations by the faculty at the start of the workshop will help link the material in these articles to the workshop activities.

In 2009, the Australian National Health and Medical Research Council published a systematic review on the management of glaucoma. In response to the evidence contained in this review, a drug utilization evaluation was undertaken in the Australian war veteran population to determine if an intervention was required. The results of the drug utilization evaluation are reported below.

Workshop participants are asked to critically consider the behavioural theories offered in the attached papers, and select key principles arising from these theories, to develop an appropriate intervention and evaluation plan to improve management of glaucoma.

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Session 1: Faculty presentations

Copy of presentation slides provided separately

Notes on the presentations

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Session 2:

Drug use evaluation data to review and consider the question: Is there a problem with Glaucoma management?

DUE Method

Data for this study were sourced from the Department of Veterans Affairs' (DVA) claims databases. The DVA claims databases contain details of all prescription medicines, medical and allied health services and hospitalizations provided to veterans for which DVA pay a subsidy. The data file contains 130 million pharmacy records, 200,000 million medical and allied health service records and over 6 million hospital records for a treatment population of 310,000 veterans. The DVA maintain a client file, which includes data on gender, date of birth, date of death and family status. Medicines are coded in the dataset according to the World Health Organization (WHO), anatomical and therapeutic chemical (ATC) classification and the Schedule of Pharmaceutical Benefits item codes. Hospitalizations are coded according to the WHO International classification of diseases (ICD).

Veterans with glaucoma were identified from dispensings of topical adrenergic agonists (ATC code S01EA), topical beta blockers (S01ED),topical prostaglandin derivatives (S01EE), topical carbonic anhydrase inhibitors (ATC code S01EC) or topical cholinergic agonists (ATC code S01EB).

All veterans who had been dispensed at least one prescription for topical glaucoma medicines (ATC codes S01E, excluding pilocarpine) between 1 Jan 2008 and 30 Apr 2008 were included. Dispensings of glaucoma medicines following from April across the four month period from May to Aug 2008 were analysed as a measure of current medication use for all veterans who were still alive at 1st Sept 2008. Veterans who solely received prescriptions for topical pilocarpine or oral acetazolamide were excluded from the initial selection as these medicines are sometimes used for indications other than glaucoma.

Glaucoma commonly occurs in patients with significant co-morbidities. For this reason the most frequent co-morbidities observed in the population treated for glaucoma were also examined. Glaucoma treatment by co-morbid status was then examined. For each veteran in the study, their current comorbidities were determined using the comorbidity profile, Rx-Risk-V, and using all prescriptions dispensed in 2008. Contraindicated medicines by co-morbid profile were based on those identified in the Australian Medicines Handbook and the National Health and Medical Research Council (NHMRC) *Systematic Literature Review on the Detection, Diagnosis, Management and Prevention of Glaucoma.*[1] All analyses were undertaken using SAS for windows, V9.1.3 SP4 (SAS institute, Cary, North Carolina, USA). This study of veterans dispensed medicines for glaucoma was intended to determine the types of medicines dispensed and the appropriateness of medicine use in the presence of different co-morbidities.

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Prescription symmetry and prescription event analyses were undertaken to determine if there was any evidence of potential harm associated with the use of glaucoma medicines in co-morbid conditions.

Table 1 highlights the effectiveness of treatments for glaucoma as identified in the Australian Medicines Handbook[2] and the NHMRC systematic review. Prostaglandin analogues appear to be most effective. The NHMRC report states, "*Several recent systematic reviews tested the effectiveness of betablockers versus prostaglandins, and reported consistent evidence to support the greater effectiveness of the prostaglandins in terms of clinical and administrative outcomes, and adverse events.*"[1]

Topical carbonic anhydrase inhibitors are recommended second line. The NHMRC systematic review states, *"[Brinzolamide] can be used in patients who are unresponsive to, intolerant of, or unable to receive, ophthalmic beta-blockers. Brinzolamide, either as monotherapy or adjunctive therapy with topical beta-blockers, should be regarded as a sound second choice option in the medication management of POAG [primary open angle glaucoma] or OH [ocular hypertension], and may be preferred over Dorzolamide because of significantly less ocular discomfort."*[1]

The side effect profile of medicines must also be considered particularly, when considering co-morbid status. Common side effects as identified in the NHMRC systematic review[1] are shown in Table 2. The NHMRC systematic review states, "*Certain medications used commonly in glaucoma management may have significant, even life threatening, side effects in the elderly (Royal College of Ophthalmologists 2004). This has lead [sic] to recommendations from the Japan Glaucoma Society (2004) that carbonic anhydrase inhibitors (oral and injection preparations) and hyperosmotics (mannitol) should be administered with caution. Non selective beta-blockers have been shown to increase falls in an elderly group of subjects (South-East Asia Glaucoma Interest Group 2003)*".[1]
It also notes, *"Some side effects occur immediately but most occur over time. Thus management of glaucoma patients should include regular monitoring and revision of treatment regimens."*[1]

The review further highlights the limited data available for the elderly population. "*There is a paucity of information regarding vulnerable elderly groups such as those in nursing homes and residential care facilities. There is limited information regarding management practices in elderly populations, and the literature generally fails to detail the exact age range under consideration. Outcomes of interventions may alter dependant on age.*"[1]

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Table 1: Relative benefits of glaucoma medicines in terms of their efficacy in reducing intraocular pressure and how often they need to be administered in order to be effective

Class	Effect (AMH)[2]	Effect (NHMRC)[1]	Doses per day
Beta-blocker	+++	+++ (20%-25%)	1-2
Cholinergic	++	+++ (20%-25%)	2-4
Topical carbonic anhydrase inhibitor	++	+to++ (15%-20%)	2-3
Alpha agonists	+++	+to++ (15%-20%) Dipivefrin, Brimonidine ++ to+++ (20%-25%) Apraclonidine	2-3
Systemic carbonic anhydrase inhibitor	+++		2-4
Prostaglandin analogue	+++	++++ (25%-30%)	1

Table 2: Side effects reported from taking any of the main families of medicines for glaucoma management[1]

	Beta-blockers	Alpha agonists	Prosta-glandins	Topical carbonic anhydrase inhibitors	Pilocarpine	Dipivefrine
Bradyarrhythmias/ hypotension	+					
Tachycardia/ hypertension						+
Bronchoconstriction	+++				++	
Elevated serum lipids	+++					
Increased falls (in elderly)	++					
Drowsiness/ anergy/ fatigue	++	+++				
Dry mouth	+	+ to +++				

"NB: The use of + is representative of increased risk of occurrence, with a blank cell meaning no evidence of risk, and + through to +++ indicating increasing risk of side effects related to taking one of the main families of anti-glaucomic drugs (EGS 2003)." [1]

Results

Use of glaucoma medicines in the veteran population

There were 25,479 veterans included in the study. Sixty-six percent had only one medicine for glaucoma dispensed, 26% had two medicines for glaucoma dispensed, 6% had three and 1.5% had four or more medicines for glaucoma dispensed (Table 3). Prostaglandins were most commonly used, with latanoprost accounting for the majority of use. Analysis over the dataset showed that 80% of newly diagnosed patients had their first prescription written by a medical specialist.

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Table 3: Medicine dispensings to veterans with glaucoma

Medicine	Veterans N = 25479		Type of medicine and potential issues in the elderly
	n	%	
Dipivefrin	79	0.3	Non-selective adrenergic agonist. No longer subsidised
Brimonidine	1957	7.7	Alpha 2 agonist. May worsen heart disease in those with severe disease
Apraclonidine	54	0.2	Alpha 2 agonist Recommended for short term use only as effect is not maintained
Timolol	4464	17.5	Non-selective beta-blocker, caution in respiratory disease, not to be used with verapamil, may increase risk of falls
Betaxolol	1445	5.7	Cardioselective beta-blocker, possible use in airways disease, not to be used with verapamil, may increase risk of falls. Stings on installation
Levobunolol	159	0.6	Non-selective beta-blocker, caution in respiratory disease, not to be used with verapamil, may increase risk of falls
Dorzolamide with timolol	2174	8.5	Timolol non-selective, caution in respiratory disease, not to be used with verapamil, may increase risk of falls.
Brimonidine with timolol	941	3.7	Timolol non-selective, caution in respiratory disease, not to be used with verapamil, may increase risk of falls.
Latanoprost with timolol	3198	12.6	Timolol non-selective, caution in respiratory disease, not to be used with verapamil, may increase risk of falls.
Travoprost with timolol	644	2.5	Timolol non-selective, caution in respiratory disease, not to be used with verapamil, may increase risk of falls
Latanoprost	12476	49.0	Prostaglandin analogue: avoid duplication
Bimatoprost	2312	9.1	Prostaglandin analogue: avoid duplication
Travoprost	1128	4.4	Prostaglandin analogue: avoid duplication
Acetazolomide	285	1.1	Oral carbonic anhydrase inhibitor
Dorzolamide	724	2.8	Topical carbonic anhydrase inhibitor
Brinzolamide	1728	6.8	Topical carbonic anhydrase inhibitor
Pilocarpine	820	3.2	Cholinergic

The next section of this report examines medicine use in glaucoma by co-morbid status where there are recommendations about contraindicated medicines and medicines to be administered with caution for each co-morbidity. The recommendations have been extracted from the NHMRC *Systematic Literature Review on the Detection, Diagnosis, Management and Prevention of Glaucoma,*[1] excluding medicines not marketed in Australia, or from the Australian Medicines Handbook.[2]

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Diabetes

Glaucoma medications implicated in interactions with diabetic medications
Contraindicated: dipivefrin
Administer with caution: timolol, levobunolol, betaxolol
Glaucoma medications implicated in adverse events in diabetics:
Contraindicated: topical beta-blockers, dipivefrin
Administer with caution: timolol, levobunolol ,betaxolol

Dipivefrin was dispensed to 0.3%, but has since been withdrawn from the market. Co-administration of non-selective beta-blockers in the diabetic population is common (43%). This may be problematic for veterans co-dispensed insulin; the latter which represents approximately 15% of the diabetic population. For further detail see Table 2, Appendix 1.

Asthma and Chronic Obstructive Pulmonary Disease (COPD)

Glaucoma medications implicated in interactions with asthma medications
Contraindicated: pilocarpine
Administer with caution: timolol, levobunolol, betaxolol, latanoprost
Glaucoma medications implicated in interactions with COPD medications
Contraindicated: topical beta-blockers, timolol, levobunolol, betaxolol

Twenty-nine percent of those treated for airways disease and glaucoma were dispensed topical non-selective beta-blockers for glaucoma management which may cause bronchoconstriction. Four percent were dispensed pilocarpine which is contraindicated and more than six in ten were dispensed latanoprost, which is also potentially problematic in asthma. Overall, 80% of those on medicines for respiratory disease were co-dispensed a glaucoma medicine that may aggravate bronchoconstriction. For further details see Table 3, Appendix 1.

Heart and vascular disease

Glaucoma medications implicated to interact with heart disease
Administer with caution: apraclonidine, dipivefrin, timolol, levobunolol, betaxolol.
Beta-blockers are contraindicated in bradycardia and hypotension.

Brimonidine, which may worsen heart disease was dispensed to 8% of those with ischaemic heart disease, 8% of those with congestive heart failure and 8% of those dispensed lipid-lowering therapy. Forty-four percent of those with co-morbid heart failure were dispensed topical beta-blockers, which may affect heart failure management. Thirty-seven percent of those dispensed verapamil and treated for glaucoma were treated with topical timolol; a contraindication, which may worsen bradycardia. For further details see Table 4 and 5, Appendix 1.

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Depression

Glaucoma medications implicated in adverse events in people with depression

Administer with caution: dipivefrin, brimonidine.
Beta-blockers can aggravate depression.

"The review … reported a small number of cases of acute attacks of glaucoma occurring during treatment with selective serotonin reuptake inhibitors (SSRIs). Whilst causality is not specified, the relationship between SSRIs and ocular adverse event is strongly implied. In a small clinical study assessing the effect of a single dose of fluoxetine on IOP [intraocular pressure], the drug was shown to increase IOP, although the effect was asymptomatic.."[1]

Eleven percent were treated with alpha-agonists that are likely to aggravate depression; 47% were treated with topical beta-blockers, which may aggravate depression. Overall, 52% were treated with some medicine that had the potential to aggravate depression. For further details review Table 6, Appendix 1.

Prescription symmetry analyses

Use of timolol does appear to be associated with increased bronchoconstriction, as evidenced by increased use beta-agonists, inhaled corticosteroids and hospitalisation for respiratory conditions (table 4). Pilocarpine and latanoprost were also associated with increased use of inhaled beta-agonists, but not inhaled corticosteroids or hospitalisations for airways disease. There was a trend to increased hospitalisations for airways disease, but numbers are small. Bitamoprost was not found to be associated with increased use of medicines for airways disease.

Timolol, brimonidine and latanoprost were also found to be associated with increased likelihood of antidepressant use post initiation. This same association was not observed with bitamoprost (table 4).

Table 4a: Prescription symmetry and event analyses for glaucoma medicines

	n	causal	Non-causal	Crude Risk Ratio	Adjusted Risk Ratio (95%CI)	Year of analysis	Association found
Eye drop use and association with inhaled respiratory medicine use							
Timolol – inhaled beta-agonist	786	482	304	1.59	1.48 (1.28-1.71)	2002-2008	Yes
Timolol – inhaled corticosteroid	494	297	197	1.51	1.43 (1.19-1.71)	2002-2008	Yes
Pilocarpine – inhaled beta-agonist	285	168	117	1.44	1.33 (1.05-1.69)	2002-2008	Yes
Pilocarpine – inhaled corticosteroid	186	104	82	1.27	1.23 (0.92-1.64)	2002-2008	No
Latanoprost – Inhaled beta-agonist	2251	1267	984	1.29	1.24 (1.14-1.35)	2003-2008	Yes
Latanoprost – Inhaled corticosteroids	1062	569	493	1.15	1.13 (1.00-1.28)	2003-2008	Yes

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Bitamoprost – Inhaled beta-agonist	513	242	271	0.89	0.95 (0.79-1.12)	2003-2008	No
Bitamoprost – Inhaled corticosteroids	350	190	160	1.19	1.13 (0.92-1.39)	2003-2008	No

Table 4b: Prescription symmetry and event analyses for glaucoma medicines

	n	**causal**	**Non-causal**	**Crude Risk Ratio**	**Adjusted Risk Ratio (95%CI)**	**Year of analysis**	**Association found**
Eye drop use and association with hospitalisation for bronchitis, asthma or COPD							
Timolol – respiratory hosp'n	115	72	43	1.67	1.57 (1.07-2.29)	2001-2006	Yes
Pilocarpine – respiratory hosp'n	72	45	27	1.67	1.45 (0.90-2.34)	2001-2006	No
Carbonic anhydrase inhibitors	254	136	118	1.15	1.12 (0.87-1.43)	2001-2006	No
Latanoprost – respiratory hosp'n	226	115	111	1.04	0.99 (0.77-1.29)	2003-2006	No
Bimatoprost – respiratory hosp'n	101	55	46	1.20	1.13 (0.77-1.68)	2003-2006	No
Eye drop use and association with antidepressant use							
Timolol – antidepressant	1253	704	549	1.28	1.24 (1.10-1.38)	2002-2008	Yes
Timolol – SSRI	791	459	332	1.38	1.30 (1.13-1.50)	2002-2008	Yes
Brimonidine – antidepressant	741	401	340	1.18	1.16 (1.00-1.34)	2002-2008	Yes
Brimonidine – SSRI antidepressant	497	278	219	1.27	1.24 (1.04-1.48)	2002-2008	Yes
Latanoprost – antidepressants	1871	1017	854	1.19	1.16 (1.06-1.27)	2003-2008	Yes
Latanoprost – SSRIs	1155	639	516	1.24	1.20 (1.06-1.34)	2003-2008	Yes
Bitamoprost – antidepressant	582	285	297	0.96	0.98 (0.83-1.15)	2003-2008	No
Bitamoprost – SSRI	392	200	192	1.04	1.02 (0.84-1.24)	2003-2008	No

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

1. WHAT are you aiming to do?

Identify the target conditions or medications

2. WHY are you doing this intervention?

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

2.

a) Who do you need to involve?

b) What else is going on in the wider environment that may have an impact?

i. On the intervention

ii. On the evaluation

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

3. How are you going to intervene?

a) What are the specific objectives?

Objectives should relate to changing awareness, attitudes, knowledge, skills or behaviour. It is best if the objectives are specific, measurable, achievable, realistic, time-bound

Objective 1

Objective 2

Objective 3

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

3b) Who are the target groups?

3c) What are the key messages?

3d) What is the expected behaviour change?

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

3e) What are the strategies for the intervention?

3f) What is the timing for the strategies?

3g) Check how the strategies link to the objectives

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Session 3:

4. EVALUATION: What was the effect?

Development of measurement instruments and criteria

You need to consider how you will evaluate all objectives.

List each objective and then for each objective list at least one indicator and the data source for that indicator. Indicators should be related to process, impact and outcome

Process Are the structures in place to enable strategy implementation?
Are the structures utilised?

Impact What is the impact of the strategies on:

- Awareness?
- Attitudes?
- Knowledge?
- Skills?
- Behaviour?

What is the impact on medication use?

Outcome What is the change in health outcomes?

Objective 1:

Indicator:

Data source:

Objective 2

Indicator:

Data source:

Objective 3

Indicator:

Data source:

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Session 4: Panel discussion and reflections

Notes:

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Appendices

1. **DUE Report**
2. **Intervention Results**
3. **Papers for reading Pre-workshop**

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Appendix 1: DUE Report

Prevalence of comorbidities in the glaucoma population

Table 1: Co-morbidity profile of veterans who have been dispensed glaucoma medicine in 2008

Co-morbidity	Number of Veterans	%
Hypertension	13661	53.6
Gastric Acid Disorder	12448	48.9
Ischaemic heart disease /Hypertension	12084	47.4
Hyperlipidaemia	11704	45.9
Antiplatelets	11367	44.6
Pain	6572	25.8
Depression	6534	25.6
Reactive airways disease	6075	23.8
Inflammation / Pain	5503	21.6
Ischaemic heart disease / Angina	4283	16.8
Anticoagulants	4024	15.8
Osteoporosis / Pagets	4012	15.7
Steroid responsive diseases	3676	14.4
Anxiety	3379	13.3
Allergies	3336	13.1
Congestive heart failure	3244	12.7
Diabetes	3190	12.5
Arrhythmia	2978	11.7
Gout	2633	10.3
Hyperthyroidism	2277	8.9
Epilepsy	1470	5.8
Psychotic illness	1380	5.4
Liver Failure	1276	5.0
Malignancies	1207	4.7
Dementia	757	3.0
Parkinson's disease	707	2.8
Benign prostatic hypertrophy	661	2.6

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Glaucoma medicine dispensing in those with diabetes and glaucoma

Table 2: Eye drop use by veterans with glaucoma and diabetes

Medicine	Veterans dispensed glaucoma medicines		Potential Issues
	N=3190	%	
Dipivefrin	8	0.3	No longer subsidised
Brimonidine	258	8.1	May worsen heart disease in those with severe disease
Apraclonidine	9	0.3	Recommended for short term use only as effect is not maintained
Timolol	576	18.1	Non-selective beta-blocker, may mask signs of hypoglycaemia in insulin dependent diabetes
Betaxolol	168	5.3	Cardioselective beta-blocker
Levobunolol	17	0.5	Non-selective beta-blocker, may mask signs of hypoglycaemia in insulin dependent diabetes
Dorzolamide with timolol	261	8.2	Timolol non-selective, may mask signs of hypoglycaemia in insulin dependent diabetes
Brimonidine with timolol	126	3.9	Timolol non-selective, may mask signs of hypoglycaemia in insulin dependent diabetes
Latanoprost with timolol	391	12.3	Timolol non-selective, may mask signs of hypoglycaemia in insulin dependent diabetes
Travoprost with timolol	76	2.4	Timolol non-selective, may mask signs of hypoglycaemia in insulin dependent diabetes
Latanoprost	1543	48.4	
Bimatoprost	313	9.8	
Travoprost	150	4.7	
Acetazolomide	41	1.3	
Dorzolamide	100	3.1	
Brinzolamide	201	6.3	
Pilocarpine	79	2.5	

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Glaucoma medicine dispensing in those with reactive airways disease and glaucoma

Table 3: Eye drop use by veterans with glaucoma and reactive airways disease

Medicine	Veterans dispensed glaucoma medicines		Potential issues
	N=6075	%	
Dipivefrin	33	0.5	No longer subsidised
Brimonidine	632	10.4	Alpha 2 agonist. May worsen heart disease in those with severe disease
Apraclonidine	17	0.3	Recommended for short term use only as effect is not maintained.
Timolol	705	11.6	Non-selective beta-blocker, caution in respiratory disease
Betaxolol	366	6.0	Cardioselective beta-blocker, caution in respiratory disease
Levobunolol	28	0.5	Non-selective beta-blocker, caution in respiratory disease
Dorzolamide with timolol	346	5.7	Timolol non-selective, caution in respiratory disease
Brimonidine with timolol	163	2.7	Timolol non-selective, caution in respiratory disease
Latanoprost with timolol	497	8.2	Timolol non-selective, caution in respiratory disease
Travoprost with timolol	101	1.7	Timolol non-selective, caution in respiratory disease
Latanoprost	3353	55.2	Caution in asthma
Bimatoprost	676	11.1	
Travoprost	307	5.1	
Acetazolomide	73	1.2	
Dorzolamide	269	4.4	
Brinzolamide	619	10.2	
Pilocarpine	212	3.5	Cholinergic, may cause bronchoconstriction

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Glaucoma medicine dispensing in those with ischemic heart disease and glaucoma

Table 4: Eye drop use by veterans with glaucoma and ischemic heart disease

Medicine	Veterans dispensed glaucoma medicines		Potential issues
	N=13425	%	
Dipivefrin	42	0.3	No longer subsidized
Brimonidine	1057	7.9	May worsen heart disease in those with severe disease. Hypotension in those predisposed
Apraclonidine	35	0.3	Recommended for short term use only as effect is not maintained. Hypotension in those predisposed
Timolol	2261	16.8	Non-selective beta-blocker
Betaxolol	808	6.0	Cardioselective beta-blocker
Levobunolol	77	0.6	Non-selective beta-blocker
Dorzolamide with timolol	1114	8.3	Timolol non-selective
Brimonidine with timolol	522	3.9	Timolol non-selective
Latanoprost with timolol	1632	12.2	Timolol non-selective
Travoprost with timolol	309	2.3	Timolol non-selective
Latanoprost	6693	49.9	
Bimatoprost	1233	9.2	
Travoprost	592	4.4	
Acetazolomide	135	1.0	
Dorzolamide	383	2.9	
Brinzolamide	930	6.9	
Pilocarpine	424	3.2	Cholinergic

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Glaucoma medicine dispensing in those with congestive heart failure and glaucoma

Table 5: Eye drop use by veterans with glaucoma and congestive heart failure

Medicine	Veterans dispensed glaucoma medicines		Potential Issues
	N=3244	%	
Dipivefrin	13	0.4	No longer subsidised
Brimonidine	262	8.1	May worsen heart disease in those with severe disease
Apraclonidine	7	0.2	Recommended for short term use only as effect is not maintained. May cause hypotension
Timolol	496	15.3	Non-selective beta-blocker
Betaxolol	220	6.8	Cardioselective beta-blocker
Levobunolol	19	0.6	Non-selective beta-blocker
Dorzolamide with timolol	241	7.4	Timolol non-selective
Brimonidine with timolol	104	3.2	Timolol non-selective
Latanoprost with timolol	357	11.0	Timolol non-selective
Travoprost with timolol	74	2.3	Timolol non-selective
Latanoprost	1679	51.8	
Bimatoprost	271	8.4	
Travoprost	167	5.1	
Acetazolomide	40	1.2	
Dorzolamide	107	3.3	
Brinzolamide	246	7.6	
Pilocarpine	97	3.0	Cholinergic

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Glaucoma medicine dispensing in those with depression and glaucoma

Table 6: Eye drop use by veterans with glaucoma and depression

Medicine	Veterans dispensed glaucoma medicines		Potential Issues
	N=6534	%	
Dipivefrin	21	0.3	No longer subsidised
Brimonidine	514	7.9	Probable aggravation of depression if present
Apraclonidine	13	0.2	Recommended for short term use only as effect is not maintained. Probable aggravation of depression if present
Timolol	1126	17.2	Possible aggravation of depression
Betaxolol	383	5.9	Possible aggravation of depression
Levobunolol	40	0.6	Possible aggravation of depression
Dorzolamide with timolol	535	8.2	Possible aggravation of depression
Brimonidine with timolol	205	3.1	Probable aggravation of depression
Latanoprost with timolol	748	11.4	Possible aggravation of depression
Travoprost with timolol	165	2.5	Possible aggravation of depression
Latanoprost	3267	50.0	
Bimatoprost	597	9.1	
Travoprost	287	4.4	
Acetazolomide	81	1.2	Possible depression
Dorzolamide	201	3.1	
Brinzolamide	445	6.8	
Pilocarpine	200	3.1	Cholinergic. Tricyclic antidepressants have anticholinergic effects

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

Appendix 2: Intervention Results

I. Process measurements

Intervention date	/ /

Target group 1

Number of people in the target group	
Number of people who received the intervention	
Number of people who participated in the evaluation	

Target group 2

Number of people in the target group	
Number of people who received the intervention	
Number of people who participated in the evaluation	

II. Impact measurements

	Pre-intervention	***Post-intervention***

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

III. Outcome measurements

	Pre-intervention	*Post-intervention*

Authors: Assoc Prof Libby s 47F Prof Andrew s 47F Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia

ELSEVIER

Journal of Clinical Epidemiology 58 (2005) 107–112

Journal of Clinical Epidemiology

VARIANCE AND DISSENT

Changing the behavior of healthcare professionals: the use of theory in promoting the uptake of research findings

Martin Eccles[a,*], Jeremy Grimshaw[b], Anne Walker[c], Marie Johnston[d], Nigel Pitts[e]

[a]*Centre for Health Services Research, University of Newcastle upon Tyne, 21 Claremont Place, Newcastle upon Tyne, NE2 4AA, UK*
[b]*Clinical Epidemiology Programme, Ottawa Health Research Institute, 1053 Carling Avenue, C-403, Ottawa, Canada*
[c]*Health Services Research Unit, University of Aberdeen, Medical School, Foresterhill, Aberdeen AB25 2ZD, UK*
[d]*School of Psychology, University of Aberdeen, Aberdeen, AB24, 2UB, UK*
[e]*Dental Health Services Research Unit, University of Dundee, Dental School, 2 Park Place, Dundee, DD1 4HR, UK*

Accepted 12 September 2004

Abstract

Objective: The uptake of research findings into routine health care is a haphazard and unpredictable process. The usefulness of the results of implementation studies is limited, due in part to the lack of an underlying framework of the important dimensions of research studies in this area and the healthcare settings within which they are conducted and may subsequently be used.

Study Design and Setting: We explore the role for a theory-based framework and suggest some of the methods that would be needed to operationalize the framework in the context of designing and conducting interventions aimed at improving the use of research findings by individual healthcare professionals or teams.

Conclusions: This research offers a framework for those who would seek to use the results of such studies in routine healthcare settings.

Keywords: Implementation research; Behavior change; Theory

Clinical and health services research is continually producing new findings that may contribute to effective and efficient patient care. Despite the considerable resources devoted to such research, a consistent finding is that the transfer of research findings into practice is unpredictable and can be a slow and haphazard process. Studies in the United States and the Netherlands suggest that about 30% to 40% of the patients do not receive care according to current scientific evidence and that about 20% to 25% of care provided is not needed or is potentially harmful [1]. There are a number of areas of uncertainty in this situation. There are the methodologic problems in producing clear guidance [2,3] and the applicability of guidance to clinical areas [4]. More problematically, there are problems in the concepts underlying attempts to change professional behavior [5].

Implementation research is the scientific study of methods to promote the uptake of research findings and hence to reduce inappropriate care [6]. It includes the study of influences on healthcare professionals' behavior and methods to enable them to use research findings more effectively.

There have been a number of reviews of implementation research [7–10] that have consistently shown that the majority of interventions can achieve moderate improvements in care with considerable variation in the observed effects within and across interventions. Because few studies provided any rationale for their choice of intervention and only limited contextual data, there may be important differences in the context and barriers between studies that assessed supposedly homogenous interventions; for example, the characteristics of behavior (a simple behavior or a complex one, increasing a desirable behavior or decreasing an undesirable one) may be an effect modifier as may the attributes of recommendations [11–13].

The UK Medical Research Council has proposed a framework for the development and evaluation of complex interventions [14], such as interventions designed to enhance the uptake of research findings. This framework recognizes the need to establish the theoretical basis of interventions and undertake exploratory studies to choose and refine interventions. This optimizes interventions to be evaluated in definitive trials and increase understanding of the generalizability

* Corresponding author. Tel.: +44 (0) 191 222 8674; fax: +44 (0) 191 222 6043.
E-mail address: martin.eccles@ncl.ac.uk (M. Eccles).

0895-4356/05/$ – see front matter
doi: 10.1016/j.jclinepi.2004.09.002

Table 1
Stages in evaluation

Evaluation of drugs	Pre-clinical	Phase I	Phase II	Phase III	Phase IV
Evaluation of implementation strategies	Theory	Modeling	Exploratory trial	Definitive randomized control trial	Long-term implementation

of the findings of such studies. Using this framework, Table 1 compares the stages in the evaluation of complex interventions to stages of drug evaluation.

Although it provides an idealistic framework for evaluating complex interventions, reviews of implementation studies [10] suggest that the "Definitive RCTs" reviewed have not undergone preclinical/theory, modeling/phase I, and exploratory/phase II phases, building instead on investigator interpretation of other empirical studies. Thus, the current position in implementation research is akin to exploring the clinical role of an antihypertensive drug (1) without any understanding of the pharmacology of the drug, the physiology of blood pressure control, or the pathophysiology of hypertension and (2) without phase I trials of the pharmacodynamics of the drug in animal models or healthy human volunteers. This is an expensive version of trial-and-error, with no a priori reason to expect success or to have confidence of being able to replicate success if it is achieved.

Generalizing from the findings of these studies to routine healthcare settings is problematic because of our limited understanding of the characteristics of the targeted behavior, professionals, and environment that might influence the effectiveness of different interventions. Thus, for those working in a service delivery setting, they provide little information to guide the choice or optimize the components of such complex interventions in practice. This is problematic because all healthcare systems have limited resources for their activities, including implementation, and they need to understand what will best achieve their intended effect, how this will happen, over what time period, and at what cost.

1. Toward a theoretical framework

The assumption that clinical practice is a form of human behavior and can be described in terms of general theories relating to human behavior offers the basis for a generalizable model. Factors mediating the effectiveness of interventions could include the attitudes of the healthcare professional or their perceived ability to control generalizable concepts that can be used across different interventions, settings, and individuals.

A theory is "a coherent and non-contradictory set of statements, concepts or ideas that organises, predicts and explains phenomena, events, behavior, etc." [15]. Theories are prominent in the social sciences (psychology, sociology) and are commonly used in clinical medicine to organize understanding of basic and clinical sciences. For instance, in the field of general medicine, phase I and II drug trials are the definitive test of a number of inter-related theories from physiology (enzymatic function), pathology (disease pathways), and pharmacology.

2. Description or explanation?

There are many theories from a range of disciplines that describe behavior and behavior change [16–19]. However, there are few that explain behavior change. Although descriptive theories can be helpful in anticipating situations and processes, such theories may not explain what determines change or may identify determinants that are not modifiable (e.g., age, intelligence). When one needs to reliably produce change, it is important to work with theories that explain change and how it can be effected. Therefore, theories that identify modifiable predictors or explain how to change behavior are most likely to be useful in implementation research.

3. Current use of theory in implementation research

Within the most recent review of guideline implementation [10], the authors of included studies provided an explicit theoretical rationale for their intervention in less than 10% of studies [20]. Given this absence of a theoretical underpinning and interventions attempting to explicitly and prospectively modify theoretical constructs, it is difficult to interpret why interventions have had positive or negative effects. For example, social cognition theories [19] suggest that audit and feedback is an effective behavior change intervention only in motivated populations who have agreed that the change in behavior is desirable; its application as a one-size-fits-all intervention has produced only a limited effect [21].

4. Choosing theories

Ferlie and Shortell [22] have suggested four levels at which interventions to improve the quality of health care might operate: (1) the individual health professional, (2) health care groups or teams, (3) organizations providing health care (e.g., NHS trusts), and [4] the larger health care system or environment in which individual organizations are embedded. Different theories may be relevant to interventions at different levels; for example, theories of individual behavior are more relevant to interventions directed at individuals and teams, whereas theories of organizational change may be more relevant to interventions directed at hospitals or trusts. A full scientific rationale for interventions to translate

research findings into clinical practice requires exploration of theories relevant to interventions directed at each of these four levels.

Given the large number of potentially relevant theories [16], it is helpful to have a rationale for choosing between them. In Box 1 we suggest a number of desirable attributes of theories explaining behavior change at the level of the individual healthcare professional or healthcare groups or teams.

4.1. How to use theories

Although there are a number of methods for using theory in designing and understanding the impact of implementation interventions, we offer an illustration of how we have approached using theory when looking at individual or team behaviors. There are two possible ways to use theory that are inter-related and build on each other. One is to develop an understanding of the theory-based factors that underlie clinical practice to identify the processes, or theoretical constructs, that are important in current patterns of care and therefore should be the appropriate target of an implementation intervention. The second follows on from this and is to develop and test interventions knowing what theoretical constructs are being targeted and design interventions to enhance the processes supporting change in them.

4.2. Theory-based factors underlying clinical practice

When working to change individual behavior, relevant theories can be drawn from health psychology and may be categorized in groupings such as motivational theories (which explain how individuals come to wish/intend/decide to change behavior), action theories (which explain how individuals move from intention to actual behavior change), and stage theories (which propose an orderly progression through discrete stages toward behavior change). Having identified theories to work with, there are a series of steps to apply them to healthcare settings. For some theories, there are standard methods of measuring constructs and developing measurement scales [23]. To identify which theoretical constructs predict clinical practice, these variables have to be used to predict motivational or behavioral outcomes. Examples of how theories could be developed in this way are shown in Table 2, and the sort of information that it produces is shown in Box 2.

In some circumstances it may be possible only to measure dependent variables that are theoretically proposed to mediate between predictor variables and actual behavior (e.g., behavioral intention). Given the current limited state of empirical testing of any theory with healthcare professionals, it is more informative to measure actual behavior whenever this is possible.

In an ideal situation, the sequence of stages in the development and evaluation of an intervention would follow those in Table 1. There are exceptions to this, such as the need to evaluate a preformed intervention that is going to be disseminated and would not otherwise be rigorously evaluated. In this situation, a trial can be conducted but with theory-based measures forming an integrated evaluation of the process to allow a better understanding of the main trial results. For example, in a trial of the implementation of guidelines for third molar extractions, theory-based measures offered an explanation of the lack of success of the interventions [24]. On the one hand, the interventions had enhanced knowledge, but knowledge did not predict evidence-based practice; on the other, the interventions had not changed the beliefs that actually did predict evidence-based practice. If such methods are routinely used before and after the delivery of interventions in implementation trials, they allow an understanding of whether or not the interventions have changed the underlying theoretical constructs, providing a view into

Box 1. Desirable attributes of theories explaining behavior change at the level of the individual healthcare professional or healthcare groups or teams

1. They should have demonstrated effectiveness in predicting and explaining behavior change in other settings (e.g., health promotion in community populations).
2. They should explain behavior in terms of factors that are changeable (e.g., knowledge, beliefs, attitudes, motivation, actual or perceived external constraints). Some factors are difficult or impossible to change (e.g., age, personality, and intelligence), even though they may be important modifiers of behavior.
3. They should include nonvolitional components (i.e., they should assume that individuals working in healthcare do not always have complete control over their actions and allow an examination of the influence of individuals' perceptions of external factors, such as patient preferences or organizational barriers and facilitators, on their behavior).

Table 2
Example of using theory

Theory of planned behavior	
Theoretical constructs	Behavioral intention, perceived behavioral control, attitude toward the behavior and subjective norm
Measures	The strength of behavioral intention, perceived behavioral control, attitude toward the behavior and subjective norm (plus the subcomponents of these constructs)
Example questions (scored on Likert scale agree to disagree)	"I feel under social pressure from NHS colleagues to use dental sealants in the next month" (subjective norm); "I would like to avoid prescribing norethisterone for patients, but I don't really know if I can" (perceived behavioral control)
Behavior	Rates of use of dental sealants Rates of prescription of norethisterone

Box 2. A study using the theory of planned behavior to investigate factors associated with prescribing antibiotics for patients with uncomplicated sore throat among general practitioners

Literature reviews, nonparticipant observation, and interviews with general practitioners were used to develop a questionnaire that was distributed to a 1 in 2 random sample of general practitioners in Grampian. Using the Theory of Planned Behavior, we explored the relationships between GPs' beliefs and the strength of their intention to prescribe antibiotics for adult patients presenting with an uncomplicated sore throat. This allowed us to:

- Identify whether GPs intended to prescribe antibiotics for these patients or not. The majority indicated that they intended to prescribe for less than half of patients presenting with uncomplicated sore throat in the next 2 weeks.
- Estimate the overall impact of individual beliefs and perceptions on the strength of their intention to prescribe. Potentially modifiable beliefs accounted for 48% of the variance in GPs' intentions to prescribe.
- Identify the beliefs that had the strongest relationship with behavioral intention
- Identify the beliefs that distinguished GPs who intended to prescribe from those who did not.

(*From* Walker AE, Grimshaw JM, Armstrong EM. Salient beliefs and intentions to prescribe antibiotics for patients with a sore throat. Br J Health Psychol 2001;6:347–60.)

the "black box" of understanding why a trial intervention has or has not worked.

4.3. Designing interventions

Having identified the relevant components of a behavior that should be targeted, the next step is to develop an appropriate intervention. This involves choosing a technology and a method of delivery. There are a number of technologies that have been demonstrated to change behavior (or its antecedents) in other settings and that therefore have a reliable record of effective behavior change, which one can reasonably expect to generalize. Thus, if we are trying to change the underlying process of "beliefs," we could use the technology of reinforcement delivered using audit and feedback. The most consistently successful behavioral methods involve contingent consequences (normally reward) with a subject being rewarded if the behavior is performed appropriately. Other methods that increase the ease of performance (e.g., developing an action plan, creating environmental triggers) have been developed and can be used to increase the likelihood of a behavior being performed. Most of the behavioral technologies have been developed for use with individuals who have been motivated to seek help with a specific problem and may require some adaptation for use with healthcare professionals who may be unmotivated or even unaware of the desired behavior change.

There are three additional characteristics that are important to consider in addition to the theoretical considerations: (1) plausibility (of the technology and the method of delivery), (2) feasibility (in a development experiment and in service settings), and (3) the efficiency of the method of delivery. Consideration of plausibility may mean that more recognizable methods of delivery (e.g., audit and feedback) are used but that the range of relevant theoretical constructs (e.g., beliefs, social norms) are studied alongside to allow an understanding of what constructs are mediating any effect. Feasibility and efficiency could be explored through considerations such as method of delivery of an intervention (e.g., written materials, interactive DVD) and methods of delivery of the experiment (e.g., postal questionnaire survey, face-to-face interview).

Issues such as these can be systematically explored in modeling experiments where elements of an intervention are manipulated, within a randomized controlled design, in a manner that simulates a real situation as much as possible. In these experiments, interim endpoints (e.g., behavioral intention) are measured rather than changes in professional behavior or healthcare outcome. This offers experimental control and the opportunity to vary elements of an intervention to understand better intervening variables and the effect on different outcomes and to maximize the impact of an intervention before trialling. An example is shown in Box 3.

For the method to be useful, interim endpoints must be predictive of real-world outcomes. This is the case for behavioral intention, self-efficacy, recall, and understanding of information. Behavioral intention and self efficacy have been incorporated into virtually all social cognition models of health behavior as the two best predictors of subsequent

Box 3. Can psychologic models bridge the gap between clinical guidelines and clinicians' behavior? A randomized controlled trial of an intervention to influence dentists' intention to implement evidence-based practice

This study examined the effect of an intervention (rehearsing alternative actions) to change dentists' intention to implement evidence-based practice for third molar (TM) management; evidence-based practice is weighted against TM extraction. Based on behavioral techniques for reducing the frequency of a behavior, increasing the likelihood of an incompatible behavior is a potentially effective method. Rehearsing alternative actions should increase the availability of alternatives to extraction and thus decrease extraction intention.

Community dentists were randomly selected (from the Scottish Dental Practice Board Register), allocated to intervention or control groups, and sent a postal questionnaire within a randomized controlled trial design. The intervention group was asked to list management alternatives to TM extraction before recording their TM extraction intention, and the control group was not.

Dentists in the intervention group had significantly weaker intention to extract third molars than did those in the control group despite similar knowledge of management alternatives.

(From Bonetti D, Johnston M, Pitts N, Deery C, Ricketts I, Bahrami M, Ramsay C, Johnston J. Can psychological models bridge the gap between clinical guidelines and clinicians' behavior? A randomised controlled trial of an intervention to influence dentists' intention to implement evidence-based practice. BDJ, in press.)

health behavior [25]. In interventions providing information, recall of that information has been shown to be important in achieving behavior change [26].

5. Conclusions

We have suggested that the science of implementation research could be significantly improved by a more systematic approach to the use of theory. Although we have illustrated our arguments with examples from psychology, this is not an attempt to deny the importance of other disciplinary perspectives. These arguments form a useful structure for others to elaborate on or to argue against. It is possible that some or all of the steps we have suggested will turn out to be unhelpful or ineffective, but this is a position that should be reached from a process of scientific scrutiny, not scientific neglect.

Once the elements of a framework for study design are in place, it also offers the prospect of a checklist that potential users of the results of such studies can work with to match the important characteristics of their situation and needs (e.g., trying to change hand washing practices in a 200-bed district general hospital) against available evidence. Such a checklist could require knowledge of the nature and complexity of the behavior(s) (hand washing by nurses and doctors), important moderators (the ready availability of soap and towels), the important modifiable mediators of the behavior (e.g., knowledge, attitudes), and the impact of interventions to change these.

Our current level of knowledge and experience of the application of theory in implementation research is limited, and it is important not to underestimate the time and investment that is required to raise implementation research to the level of other clinical sciences. The cycle of development of cognitive behavioral therapy from theory to routine clinical intervention took somewhere between 20 and 80 years, depending on where you draw the start line. The development of a new drug from identifying a novel chemical to launching the drug on the market can take up to 10 years. Because implementation research lives in a policy-relevant context where clinicians, managers, and policy makers may erroneously believe that they already know what is best to do, it will always be prey to the demands for a quick fix and the political solution. Without a coherent attempt to address the issues raised in this article, we can look forward to reaching 2020 knowing little more than we do today.

Acknowledgments

This work was supported by the UK Medical Research Council Health Services Research Collaboration. The Health Services Research Unit and the Dental Health Research Unit are funded by the Chief Scientist Office of the Scottish Executive. Jeremy Grimshaw holds a Canada Research Chair in Health Knowledge Transfer and Uptake. The views expressed in this paper are those of the authors and may not be shared by the funding bodies.

References

[1] Schuster M, McGlynn E, Brook RH. How good is the quality of health care in the United States? Milbank Q 1998;76:563.
[2] Battista RN, Hodge MJ, Vineis P. Medicine, practice and guidelines: the uneasy juncture of science and art. J Clin Epidemiol 1994;48: 875–80.
[3] Eccles M, Grimshaw J. Clinical guidelines: from conception to use. Oxon, UK: Radcliffe Medical Press; 2000.
[4] Graham RP, James PA, Cowan TM. Are clinical practice guidelines valid for primary care? J Clin Epidemiol 2000;53:949–54.
[5] Grol R. Successes and failures in the implementation of evidence-based guidelines for clinical practice. Med Care 2001;39:1154.
[6] Foy R, Eccles M, Grimshaw J. Why does primary care need more implementation research? Fam Pract 2001;18:353–5.
[7] Bero L, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson MA. Closing the gap between research and practice: an overview of systematic reviews of interventions to promote implementation of research findings by health care professionals. BMJ 1998;317:465–8.
[8] Oxman AD, Thomson MA, Davis DA, Haynes B. No magic bullets: a systematic review of 102 trials of interventions to improve professional practice. Can Med Assoc J 1995;153:1423–31.
[9] Grimshaw JM, Shirran L, Thomas RE, Mowatt G, Fraser C, Bero L, Grilli R, Harvey E, Oxman A, O'Brien MA. Changing provider behavior: an overview of systematic reviews of interventions. Med Care 2001;39:II2–II45.
[10] Grimshaw JM, Thomas RE, MacLennan G, Fraser C, Ramsay CR, Vale L, Whitty P, Eccles M, Matowe L, Shirren L, Wensing M, Dijkstra R, Donaldson C. Effectiveness and efficiency of guideline dissemination and implementation strategies. Health Technol Assess 2004; 8:1–72.
[11] Grilli R, Lomas J. Evaluating the message: the relationship between compliance rate and the subject of practice guideline. Med Care 1994; 32:202–13.
[12] Grol R, Dalhuijsen J, Thomas S, Veld C, Rutten GMH. Attributes of clinical guidelines that influence use of guidelines in general practice: observational study. BMJ 1998;317:858–61.
[13] Foy R, MacLennan G, Grimshaw J, Penney G, Campbell M, Grol R. Attributes of clinical recommendations that influence change in practice following audit and feedback. J Clin Epidemiol 2002;55:717–22.
[14] A framework for development and evaluation of RCTs for complex interventions to improve health. London: Medical Research Council; 2005.
[15] Bem, S and Looren-de-Jong H. Theoretical issues in psychology. London: Sage; 1997.
[16] Ashford AJ. Behavioral change in professional practice: supporting the development of effective implementation strategies. Newcastle upon Tyne: Centre for Health Services Research; 1998.
[17] Rogers EM. Diffusion of innovations. New York: Free Press; 1995.
[18] Bandura A. Self-efficacy: the exercise of control. New York: Freeman; 1997.
[19] Conner M, Norman P. Health behavior. In: Johnston DW, Johnston M, editors. Health psychology. Oxford: Elsevier; 1998.
[20] Davies P, Walker A, Grimshaw J. Theories of behavior change in studies of guideline implementation. Proc Br Psychol Soc 2003; 11:120.
[21] Thomson-O'Brien MA, Oxman AD, Davis DA, Haynes RB, Freemantle N, Harvey EL. Audit and feedback to improve health professional practice and health care outcomes: part I. In: Bero L, Grilli R, Grimshaw J, Oxman A, editors. Collaboration on effective professional practice module of the Cochrane Database of systematic reviews (updated 01 December 1997). Oxford: Cochrane; 1997.

[22] Ferlie EB, Shortell SM. Improving the quality of health care in the United Kingdom and the United States: a framework for change. Milbank Q 2001;79:281–315.
[23] Fishbein M, Ajzen I. Belief, attitude, intention and behavior: an introduction to theory and research. London: Addison-Wesley; 1975.
[24] Bonetti D, Johnston M, Pitts N, Deery C, Ricketts I, Bahrami M, Ramsay C, Johnston J. Can psychological models bridge the gap between clinical guidelines and clinicians' behavior? A randomised controlled trial of an intervention to influence dentists' intention to implement evidence-based practice. Br J Dentistry 2003;195:602–6.
[25] Connor M, Norman P, editors. Predicting health behavior. Buckingham: Open University Press; 1996.
[26] Ley P. Communicating with patients: improving communication, satisfaction and compliance. London: Chapman Hall; 1988.

Is evidence-based implementation of evidence-based care possible?

Jeremy M Grimshaw and Martin P Eccles

ABSTRACT

- Traditional approaches to disseminating research findings have failed to achieve optimal healthcare.
- In a systematic review of 235 studies of guideline dissemination and implementation strategies, we observed the following:
  - ► there was a median 10% improvement across studies, suggesting that it is possible to change healthcare provider behaviour and improve quality of care;
  - ► most dissemination and implementation strategies resulted in small to moderate improvements in care;
  - ► multifaceted interventions did not appear more effective than single interventions.
- The interpretation of our systematic review is hindered by the lack of a robust theoretical base for understanding healthcare provider and organisational behaviour.
- Future research is required to develop a better theoretical base and to evaluate further guideline dissemination and implementation strategies.

MJA 2004; 180: S50–S51

THE DISSEMINATION of new research knowledge into healthcare has largely depended on publication of research in peer-reviewed journals and on continuing medical education programs. However, the effectiveness of these approaches has been questioned. Studies in the United States and the Netherlands suggest that 30%–40% of patients do not receive care complying with current scientific evidence and 20%–25% of the care provided is not needed or potentially harmful.[1,2]

Over the past decade, the consistent evidence that these dissemination methods do not result in optimal levels of care has led to increased efforts by policymakers and professionals to identify more effective implementation strategies. The Clinical Research Roundtable at the US Institute of Medicine recently suggested that failure to translate new knowledge into clinical practice and healthcare decision making was one of the two major barriers preventing human benefit from advances in biomedical sciences.[3] In 1997, Grol observed that many current approaches to implementation are based on participants' beliefs rather than evidence about the likely effectiveness of different approaches.[4] He challenged healthcare systems to develop and use a robust evidence base to support the choice of implementation strategies, arguing that "evidence-based medicine should be complemented by evidence-based implementation".[4] How far are we from meeting this challenge?

Outcomes of implementation research

National implementation research programs have been conducted in the Netherlands, the United Kingdom and the United States.[5,6] We have recently completed a systematic review of 235 rigorous evaluations of different guideline dissemination and implementation strategies published up to 1998.[7] The good news is that our review suggests that it is possible to change healthcare provider behaviour. Eighty-six per cent of studies observed improvements in process-of-care indicators (eg, percentage compliance with guidelines), with the median effect size across all studies showing an absolute improvement of about 10% in process-of-care indicators. While these effect sizes may be considered modest, from a population-health perspective they are likely to be clinically important.

Most dissemination and implementation strategies resulted in small to moderate improvements in care. For example, the median absolute improvement in performance across interventions was 14.1% in 14 cluster-randomised controlled trials (C-RCTs) of reminders, 8.1% in four C-RCTs of dissemination of educational materials, 7.0% in five C-RCTs of audit and feedback, and 6.0% in 13 C-RCTs of multifaceted interventions involving educational outreach. There was considerable variation in the observed effects within interventions: for example, the absolute improvements in performance across the C-RCTs of reminders ranged from –1.0% to +34.0%. Multifaceted interventions did not appear to be more effective than single interventions. Furthermore, we found the generalisability of the reported findings to other behaviours and settings to be uncertain, as most studies provided no rationale for their choice of intervention and gave only limited descriptions of the interventions and contextual data. Less than a third of studies reported any data on the resources required for the implementation strategy.

The UK Medical Research Council recently proposed a sequential framework for evaluating complex interventions such as implementation strategies.[8] This scheme involves:

- development of the theoretical basis for an intervention;
- definition of components of the intervention (using modelling or simulated techniques and qualitative methods);

Clinical Epidemiology Programme, Ottawa Health Research Institute, Ottawa, ON, Canada.
Jeremy M Grimshaw, PhD, MBChB, FRCGP, Director.
Centre for Health Services Research, School of Population and Health Sciences, University of Newcastle upon Tyne, Newcastle upon Tyne, UK.
Martin P Eccles, MD, FMedSci, FRCGP, Professor of Clinical Effectiveness.
Reprints will not be available from the authors. Correspondence: Professor Jeremy M Grimshaw, Clinical Epidemiology Programme, Ottawa Health Research Institute, 1053 Carling Avenue, Ottawa, ON K1Y 4E9, Canada. jgrimshaw@ohri.ca

- exploratory studies to further develop the intervention and plan a definitive evaluative study (using a variety of methods); and
- a definitive evaluative study (preferably an RCT).

The framework recognises the benefits of establishing the theoretical basis of interventions and conducting exploratory studies to choose and refine interventions in order to minimise the number of costly "definitive" RCTs.

Although most of the studies included in our systematic review of guideline dissemination and implementation strategies could be considered "definitive" evaluations, there was little evidence that the investigators had developed a theoretical model to guide their choice of intervention. As a result, in many of the studies it was unclear why investigators had chosen a particular intervention, and we were not sure how to interpret the study results or how to assess their generalisability to different targeted behaviours, providers and contexts.

Most of the theoretical research on implementation has attempted to develop broad frameworks that capture all factors that may influence behaviour. The resulting frameworks have usually been descriptive, identifying factors that have facilitated or hindered the adoption of evidence-based practice. However, these frameworks provide little information about what are the most important factors facilitating or hindering change or what interventions may be useful in specific settings.

The future

An important focus for future research should be to develop a better theoretical understanding of professional and organisational behaviour change. Ferlie and Shortell[9] have suggested four levels at which interventions to improve the quality of healthcare might operate:

- the individual health professional;
- healthcare groups or teams;
- organisations providing healthcare; and
- the larger healthcare system or environment in which individual organisations are embedded.

To develop a full scientific rationale for interventions to produce behaviour change in healthcare, we need to consider educational, behavioural, social and organisational theories relevant to each of these four levels. There are many such theories, but their applicability to healthcare professional and organisational behaviour has yet to be established. Further research is needed to test the applicability of such theories in healthcare settings and to rigorously evaluate different dissemination and implementation strategies.

Thus, we are currently some way from meeting Grol's challenge.[4] Decision makers still need to use considerable judgement about which interventions are most likely to succeed, after considering the feasibility, costs and benefits that particular interventions are likely to yield. Nevertheless, there are grounds for optimism; it is possible to achieve clinically important practice changes with current interventions that appear to be largely based on the considered "gut instincts" of investigators.

We believe that establishing an empirically tested theoretical base for healthcare professional and organisational behaviour is likely to lead to incrementally more effective interventions. This task will require sustained investment and support from research funders, the development of interdisciplinary research teams, and the support of healthcare systems and professionals, but does not seem any more inherently difficult or problematic than other challenges facing the health research enterprise.

Acknowledgement

Jeremy Grimshaw holds a Canada Research Chair in Health Knowledge Transfer and Uptake funded by the Canadian Foundation for Innovation.

Competing interests

The authors received honoraria from the National Institute of Clinical Studies for participation in the workshop "Development of strategies to encourage adoption of best evidence into practice in Australia".

References

1. Schuster M, McGlynn E, Brook RH. How good is the quality of health care in the United States? *Milbank Q* 1998; 76: 517-563.
2. Grol R. Successes and failures in the implementation of evidence-based guidelines for clinical practice. *Med Care* 2001; 39(8 Suppl 2): II46-II54.
3. Song NS, Crowley WF, Genel M, et al. Central challenges facing the national clinical research enterprise. *JAMA* 2003; 289: 1278-1287.
4. Grol R. Beliefs and evidence in changing clinical practice. *BMJ* 1997; 315: 418-421.
5. Hanney S, Soper B, Buxton M. Evaluation of the NHS R&D Implementation Methods Programme. London: Health Economics Research Group, Brunel University, 2003.
6. Agency for Health Research and Quality. Translating research into practice II (TRIP II). Washington, DC: AHRQ, 2001.
7. Grimshaw JM, Thomas RE, MacLennan G, et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technol Assess* 2004. In press.
8. Medical Research Council. A framework for development and evaluation of RCTs for complex interventions to improve health. London: Medical Research Council, 2000. Available at: www.mrc.ac.uk/pdf-mrc_cpr.pdf (accessed Jan 2004).
9. Ferlie EB, Shortell SM. Improving the quality of health care in the United Kingdom and the United States: a framework for change. *Milbank Q* 2001; 79: 281-315. ❑

Implementation Science

BioMed Central

Editorial

Open Access

An implementation research agenda

Martin P Eccles*[1], David Armstrong[2], Richard Baker[3], Kevin Cleary[4], Huw Davies[5], Stephen Davies[6], Paul Glasziou[7], Irene Ilott[8], Ann-Louise Kinmonth[9], Gillian Leng[10], Stuart Logan[11], Theresa Marteau[12], Susan Michie[13], Hugh Rogers[14], Jo Rycroft-Malone[15] and Bonnie Sibbald[16]

Address: [1]Institute of Health and Society, Newcastle University, Newcastle upon Tyne, UK, [2]Division of Health and Social Care Research, Kings College, London, UK, [3]Department of Health Sciences, University of Leicester, Leicester, UK, [4]National Patient Safety Agency, London, UK, [5]School of Management, University of St Andrews, St Andrews, UK, [6]National Institute for Health Research Service Delivery and Organisation Programme, London School of Hygiene and Tropical Medicine, London, UK, [7]Centre for Evidence-Based Medicine, Department of Primary Health Care, University of Oxford, Oxford, UK, [8]Institute of Work Psychology, University of Sheffield, Sheffield, UK, [9]General Practice and Primary Care Research Unit, University of Cambridge, Cambridge, UK, [10]National Institute for Health and Clinical Excellence, London, UK, [11]NIHR PenCLAHRC, Peninsula College of Medicine and Dentistry, Universities of Exeter and Plymouth, UK, [12]Institute of Psychiatry, Kings College, London, UK, [13]Centre for Outcomes Research and Effectiveness, Department of Psychology, University College London, London, UK, [14]Service Transformation, NHS Institute for Innovation and Improvement, Coventry House, University of Warwick Campus, Coventry, UK, [15]School of Healthcare Sciences, Bangor University, Bangor, UK and [16]National Primary Care Research and Development Centre, University of Manchester, Manchester, UK

Email: Martin P Eccles* - martin.eccles@ncl.ac.uk; David Armstrong - david.armstrong@kcl.ac.uk; Richard Baker - rb14@leicester.ac.uk; Kevin Cleary - kevin.cleary@npsa.nhs.uk; Huw Davies - hd@st-andrews.ac.uk; Stephen Davies - stephen.davies@addenbrookes.nhs.uk; Paul Glasziou - paul.glasziou@dphpc.ox.ac.uk; Irene Ilott - irene.Ilott@sheffield.ac.uk; Ann-Louise Kinmonth - alk25@medschl.cam.ac.uk; Gillian Leng - gillian.leng@nice.org.uk; Stuart Logan - stuart.logan@pms.ac.uk; Theresa Marteau - theresa.marteau@kcl.ac.uk; Susan Michie - s.michie@ucl.ac.uk; Hugh Rogers - hugh.rogers@institute.nhs.uk; Jo Rycroft-Malone - j.rycroft-malone@bangor.ac.uk; Bonnie Sibbald - bonnie.sibbald@manchester.ac.uk

* Corresponding author

Published: 7 April 2009

Implementation Science 2009, **4**:18 doi:10.1186/1748-5908-4-18

Received: 17 February 2009
Accepted: 7 April 2009

This article is available from: http://www.implementationscience.com/content/4/1/18

Abstract

In October 2006, the Chief Medical Officer (CMO) of England asked Professor Sir John Tooke to chair a High Level Group on Clinical Effectiveness in response to the chapter 'Waste not, want not' in the CMOs 2005 annual report 'On the State of the Public Health'. The high level group made recommendations to the CMO to address possible ways forward to improve clinical effectiveness in the UK National Health Service (NHS) and promote clinical engagement to deliver this. The report contained a short section on research needs that emerged from the process of writing the report, but in order to more fully identify the relevant research agenda Professor Sir John Tooke asked Professor Martin Eccles to convene an expert group – the Clinical Effectiveness Research Agenda Group (CERAG) – to define the research agenda. The CERAG's terms of reference were 'to further elaborate the research agenda in relation to pursuing clinically effective practice within the (UK) National Health Service'. This editorial presents the summary of the CERAG report and recommendations.

Background

In October 2006, the Chief Medical Officer (CMO) of England asked Professor Sir John Tooke to chair a High Level Group on Clinical Effectiveness in response to the chapter 'Waste not, want not' in the CMOs 2005 annual report 'On the State of the Public Health'. The High level group made recommendations to the CMO to address possible ways forward to improve clinical effectiveness in the UK National Health Service (NHS) and promote clinical engagement to deliver this. The report contained a short section on research needs that emerged from the process of writing the report, but in order to more fully identify the relevant research agenda Professor Sir John Tooke asked Professor Martin Eccles to convene an expert group – the Clinical Effectiveness Research Agenda Group (CERAG) – to define the research agenda. The CERAG's terms of reference were 'to further elaborate the research agenda in relation to pursuing clinically effective practice within the (UK) National Health Service'.

Terminology is a problem in both the practice of, and researching into, clinical effectiveness. The high level group uses the term 'clinical effectiveness' as it built on the terminology used within the CMO's report. However, a study of 33 applied research funding agencies across nine countries identified 29 terms used to refer to some aspect of the processes around clinically effective practice [1]. This confusion has been compounded by the recent prominence of 'Translational Research', and the description of the first and second translation gaps. Given the balance of scientific endeavour and funding, the term 'Translational Research' is mainly thought of as the T1 bench to bedside process of transferring basic science knowledge into new drugs and technologies. Attracting about 1% of the research funding devoted to T1 research the T2 Translational Research is the process of taking current scientific knowledge and ensuring it is applied in routine clinical care [2].

Within the UK, the terms 'Implementation' and 'Implementation Research' seem to be the best recognised. Therefore, as a focus for its deliberations the CERAG adopted the following definition:

> 'Implementation Research is the scientific study of methods to promote the systematic uptake of clinical research findings and other evidence-based practices into routine practice, and hence to improve the quality (effectiveness, reliability, safety, appropriateness, equity, efficiency) of health care. It includes the study of influences on healthcare professional and organisational behaviour.' (adapted from Implementation Science http://www.implementationscience.com/info/about/ accessed 10 February 2009).

This editorial presents the summary of the group's report and recommendations; the full report is available as Additional File 1.

The importance of Implementation Research and its funding

The findings from clinical and health services research can not change population health outcomes unless health care systems, organizations, and professionals adopt them in practice [3]. A consistent finding is that the transfer of research findings into practice is unpredictable and can be a slow and haphazard process. The relative inattention to implementing what we know is costing lives. There is an imbalance between investment in the development of new drugs and technologies versus improving the fidelity with which care is delivered.

In a structured review of healthcare professionals views on clinician engagement in quality improvement, Davies *et al*. identified 86 empirical reports relevant to the review [4]. They report that the literature suggests: healthcare professionals are heterogeneous in relation to their definition of quality; their perception of the need for quality improvement; their attitudes to quality improvement initiatives; their attitudes to clinical guidelines and evidence-based practice. In addition, they have a limited understanding of the concepts and methods of quality improvement, and quality improvement is often the scene of turf battles. Under the heading of perceived barriers, they also stated that 'many of the identified barriers arise from the well-documented problems of working effectively between and across health professions. This means that although more time and more resources may be necessary or helpful (directly and in their explicit recognition of healthcare professionals' concerns), they are unlikely to be sufficient on their own to overcome the substantial barriers to clinicians' active engagement in successful quality improvement'. Healthcare professionals are an important part of the organisation in which they work (and are subject to organisational policies, procedures, and cultures); this review offers a partial explanation for the persistent quality gaps and also supports the contention that it is unlikely that this will change spontaneously.

Recognition of quality gaps has led to increased interest in more active implementation strategies. Over the past 10 years, a body of Implementation Research has developed [5-7]. This demonstrates that interventions can be effective, but provides less information to guide the choice or optimise the components of such complex interventions in practice [8]. While the effectiveness of interventions varies across different clinical problems, contexts, and organizations, studies provide scant theoretical or conceptual rationale for their choice of intervention [9], and only limited descriptions of the interventions and contextual data [6]. Research on economic and political approaches to change is scarce [10], and it is therefore not surprising that little is known about how best to integrate disease and case management interventions into existing healthcare at the system level. Thus, the science of Implementa-

tion Research is still a work in progress, largely due to the fact that it is a relatively young science.

Internationally, Implementation Research is a recognised area of funding within other healthcare systems; this is not the case in the UK. The Cooksey Report [11] suggested a UK annual research budget (Public sector and major charities) of just over £2 billion. The proportion spent on health services (as opposed to biomedical or clinical) research in general is small. While there have been a number of previous funding programmes for Implementation Research within the UK, none are current. The proportion of annual research money devoted to Implementation Research is impossible to quantify; it is likely to be of the order of a maximum of a few millions pounds per year.

The Cooksey Report [11], having identified the need for implementation and Implementation Research, offers a sound basis on which to elaborate the Implementation Research agenda as a core part of a research agenda of key relevance to the NHS.

One of the major problems with not having a clearly identified, named Implementation Research funding stream is that the whole area loses 'profile'; the issues become blurred and the central focus of the routine uptake of findings, from clinical research programmes into routine care, becomes lost to research enquiry. In countries where there is a named, dedicated, funding stream (*e.g.*, Canada, Australia) the research area has a higher profile with both researchers and with clinicians. There is the potential for senior researchers to establish programmes of research (rather than doing one-off studies), junior researchers to make it a career choice, and clinicians to become willing collaborators, thereby facilitating the spread of knowledge and the improvement of methods.

Specific considerations for an Implementation Research agenda

In elaborating the Implementation Research agenda the, CERAG identified five important overarching considerations that should influence thinking about, and commissioning of, Implementation Research.

First, it is important to consider the multiple levels at which healthcare is delivered and the interplay between them in their cultural context [12].

Second, Implementation Research centrally involves the study of changing behaviour and maintaining change – in organizations, and the groups and individual healthcare professionals within them.

Third, the use of theory in Implementation Research offers (at least) three important potential advantages. Theories offer a generalisable framework that can apply across differing settings and individuals; they offer the opportunity for the incremental accumulation of knowledge; and they offer an explicit framework for analysis. The CERAG agreed that appropriate consideration of theory was an important element of Implementation Research. As well as a more thoughtful use of theory, there is a need to work through the various stages of using theory and resolving such apparently simple issues as what it means for an intervention to be theory-based or what is the theoretical basis of behaviour change.

Fourth, frameworks are potentially useful tools for considering the issues that a research agenda needs to address [13]. Inevitably there is no one ideal, universally accepted framework that will fit all purposes; different frameworks will often reflect different purposes, disciplinary, or philosophical standpoints, and so will appeal to different groups or individuals.

Fifth, a general complaint of implementation studies (often trials) is that the need for experimental control, maximising internal validity, compromises external validity. As ever, the balance of considering these two dimensions of validity depends on the question that is being answered at the time [14].

Who is this research agenda aimed at?

This discussion of the research agenda is aimed primarily at commissioners of research, but will also be of relevance to a broader range of policy makers and researchers. While this report has been discussed and written in the context of the UK National Health Service and the National Institute for Health Research (NIHR) it is possible that a variety of other research-commissioning organisations could use it to identify areas that are a priority for them. However, it has been considered in its entirety and, in terms of programmatic commissioning, a piecemeal approach to addressing it could leave important areas unaddressed.

A Research Agenda

Research areas

Many of these research areas are interlinked. The CERAG offered exemplar questions within each of them in order to illustrate key issues. The processes suggested in the subsequent recommendations will further elaborate and prioritise the content of this agenda.

Context

The impact of context on implementation is important, and systematic study of the attributes of context (and their role and modifiability) that form barriers or facilitators to implementation is needed. The responsiveness of context is important in order to understand (and influence) culture and other attributes of organisations as well as the individuals within them and their interests related to

implementation of new knowledge. The role of context in intervention development needs to be better understood.

Behavioural determinants and evaluation of change strategies

Successful implementation of new knowledge should be built on an understanding of the determinants of behavioural change and maintenance of behavioural change in individuals and organisations. Such understanding would allow the rational development and testing of implementation interventions. This should include the systematic development of interventions and trials across a range of conditions and NHS settings. These could include the study of the organisational embedding of new interventions, the effectiveness of healthcare system interventions, as well as evaluation of delivering new models and methods of care. There is a need for studies examining the methods of optimising the content and methods of delivery of interventions.

Evaluations should use a range of (and often a combination of) research designs and methods (*e.g.*, cluster randomized trials, quasi-experimental designs, and qualitative studies).

Testing of theory in Implementation Research

Theory is underused in Implementation Research. There needs to be considerable work on understanding available theories, on the testing and development of theories, and on how to operationalise theory. This work should not be restricted by disciplinary perspectives, worldview, or area of application.

Knowledge attributes and knowledge generation – features related to uptake

Research is needed on the important attributes of new knowledge and how these influence its uptake (or not). This would include the attributes of and applicability of what is regarded as evidence by different individuals and in different contexts.

Decision makers have problems accessing, appraising, adapting, and applying research evidence. The increasing recognition that implementation of evidence from individual studies may be misleading, either due to bias in their conduct or random variations in findings, has led to greater emphasis on knowledge syntheses as the basic unit of implementation. Knowledge syntheses interpret the results of individual studies within the context of global evidence thus increasing the 'signal to noise ratio' of implementation activities and increasing the likelihood of their success. Knowledge syntheses provide the evidence base for other implementation vehicles such as patient decision aids, clinical practice guidelines, or policy briefs.

Systematic review activities (guided by relevant theory) need to be supported systematically to ensure their continued development. Important areas activity include: compiling and maintaining a register of systematic reviews of Implementation Research; updating overviews of reviews of professional behaviour change interventions; conducting systematic reviews of methods to improve the implementation of clinical research findings in routine settings; workshops on conduct and use of knowledge syntheses targeted to different stakeholders.

Cross-cutting issues

Methodology

Across all of the areas above there will be important methodological issues that need to be identified, investigated, and resolved. These include:

1. The area of Implementation Research needs a common understanding of terms. Important areas of research include: the development of one or more taxonomies of barriers to implementation, mediating mechanisms and pathways; standardised measurement approaches for key elements of the taxonomy; a suite of reporting guidelines for different types of Implementation Research.

2. All of the areas pose measurement challenges, such as the development of process and outcome methods and measures for relevant constructs.

3. Is there a 'core set' of measures that will be applicable to most settings, or is each combination of patient team and organisation conceptually unique? The idea of a core set of measures offers greater potential for accumulation of knowledge.

4. What are the pros and cons of using proxies for behaviour, such as written or web-based vignettes that simulate clinical behaviours?

5. The incorporation of economic analysis within Implementation Research is not necessarily methodologically challenging, but it is very uncommon and should be encouraged and supported.

6. An explicit examination of the pros and cons of the use of routinely available data to assess implementation. This would include the availability of data and the specificity of data in relation to the implementation of research evidence. Are there situations where there is sufficient routinely available data for economic modelling to demonstrate the viability or otherwise of certain behaviour change strategies? How complex can and should such modelling become?

Implementation Research across different areas of clinical practice

Implementation Research will be conducted in a range of clinical areas. This needs to be done in a way that ensures contribution to an incremental understanding of implementation. Research in one clinical area should generate ideas and understanding that can be drawn on in other clinical areas.

Knowledge infrastructure for Implementation

This links to 'knowledge attributes', (above) and is addressed in the UK by initiatives such as the NHS National Library for Health, the Cochrane Collaboration and Social Care Online. Nonetheless, the process recommended below could formally set out the knowledge infrastructure for implementation. This would be an important exercise in making explicit the content of an infrastructure (staff, skills, and resources), its scale, and its degree of current (and future) integration into routine healthcare.

Sustainability

The consideration of sustainability permeates the research agenda. It is important to have a healthcare workforce that can sustain implementation in the clinical setting as a matter of routine. It is important that we learn more about the organisational/contextual factors that enable the sustained use of evidence in practice. It is also important to have a research workforce that can sustain the area of Implementation Research.

Within research itself it is important to examine attributes of sustainability (within individuals, teams, and organizations) and to develop methods to examine whether the effects of interventions are sustained over time.

Communication strategy/engagement with the NHS

As part of integrating implementation and Implementation Research within the NHS it will be vital to develop an explicit communication and engagement strategy.

Workforce issues

Capacity to do implementation

How should the NHS workforce (clinicians/practitioners and managers) be trained (at both undergraduate and postgraduate levels) in order to optimise their ability to implement new knowledge (without doing harm, overspending, giving more to one patient than another, while also stopping ineffective practices)?

What are effective engagement strategies to involve the workforce in implementation?

What are the important attributes of the workforce that enhance knowledge use and implementation in healthcare settings?

How can these attributes be sustained both within individuals and organisations?

Capacity to do Implementation Research

Capacity to do research into implementation is limited both within the UK and internationally. The NIHR needs a strategy of building capacity at all levels of the researcher career. Given the time that it takes to build experience in this area NIHR needs a cadre of experienced senior investigators who can direct programmes of research.

A funding strategy should also train junior researchers to be capable of developing into independent researchers (this should be linked with experience Implementation Researchers). This could involve a mix of PhD studentships and fellowship awards.

Attributes of research teams addressing this agenda

Addressing this research agenda will be an inherently multi- and inter-disciplinary endeavor. No one practice or academic group or discipline will bring all the necessary attributes to address the research agenda. The range of required disciplines will vary within and across the various areas of the research agenda, but is likely to include some of Implementation Research, sociology, health psychology, health economics, and statistics.

Implementation and evidence of benefit from clinical and public health interventions

It will most often be the case that the Implementation Research agenda will be applied to areas where there is a clear understanding of appropriate clinical care or public health practice. In some areas there will be insufficient published evidence to inform a clear, shared understanding of optimum practice; in such instances the research agenda should address the need for evidence of efficient clinical and public health practice.

Recommendations

1. NIHR should initiate a process to establish a research programme within NIHR with an explicit dedicated, protected, funding stream for funding Implementation Research.

a. This process should detail issues such as:

i. the scope and prioritization of topics for such a programme.

ii. the potential overlap with current national research programmes within and outwith NIHR.

iii. the potential overlap with other NIHR funded initiatives – National Library for Health, Collaborations for Leadership in Applied Health Research and Care (CLAHRCs), Cochrane Collaboration.

iv. the relevant stakeholders in the process.

v. the appropriate configuration of such a programme of research – either as a single entity (maximising focus, scarce researcher resources, and critical mass), or as a dimension of each of the current national programmes (more diffuse, but

probably more administratively straightforward to establish).

vi. the establishment of a commissioning group with appropriate expertise to evaluate proposals.

vii. the timescale for establishing launching and commissioning research within such a programme.

viii. relevant indicators of success for such a programme to allow its evaluation.

b. Given the scale for return on investment and potential to save lives, this should aim to achieve a steady-state annual budget of 2 to 3% of NIHR total research budget. With total budget estimates at £750 million, this equates to approximately £15 to 22 million.

c. Spending on this scale will not be achievable immediately, and so the process should consider an escalating funding process starting at a lower level and incrementally rising to the steady-state figure over a number of years.

d. Long-term commitment is needed to deal with the issue of creating a climate conducive to conducting Implementation Research and the closely linked area of using research findings in routine settings. Without this being seen as both central and important, it is unlikely to be sustained.

e. Consideration should be given to the idea of establishing one or more Centers of Implementation Research Excellence along the lines of the Public Health Centers of Excellence.

2. A mix of project and programme funding would allow studies of a shorter and more 'worked through' nature, as well as series of interlinked conceptual, methodological work that is needed in the area.

3. The process of commissioning should be a mix of commissioner-defined and curiosity-driven. In such a relatively young area, it is unlikely to be possible for a commissioned research process to fully cover all relevant areas, particularly in the areas of methodological and conceptual work.

4. In order to enhance capacity development, a proportion of the funding should be directed towards studentships, fellowships, and bursaries.

5. There should be consideration of the development of training programmes for Implementation Researchers. Although not a research budget cost, there should also be consideration of the development of (pre- and post-registration) training programmes for clinicians and non-clinicians within the NHS around building capacity to better use implementation (and clinical) research in daily practice.

6. Implementation Research and Implementation Researchers need to be embedded within the NHS. One way to achieve this would be to consider further strengthening and extending the Implementation Research dimensions of the Collaboration in Applied Health Research and Care centers. This should also consider how to closely ally those researching implementation with those doing implementation on a daily basis.

7. In order to advance the research area, funding should be directed towards providing opportunities for scientists and clinicians to meet to discuss relevant issues – akin to the UK Economic and Social Research Council Seminar Series Grants.

8. NIHR should give consideration to establishing a standing advisory group, with appropriate expertise, to continue to develop, oversee, and advise on Implementation Research within the NHS. Such a body could also make links with other national centers to form an international network.

Competing interests

The CERAG members are researchers, policy makers, or research funders in areas in some way allied to Implementation Research.

Authors' contributions

MPE convened and chaired the CERAG. All group members contributed to the content of the report through either face to face meeting or comment on sequential drafts. MPE drafted the report and this article. All Group members agreed the submitted version of the report and this article.

Additional material

Additional File 1

***CERAG Report**. A report prepared for the High Level Group on Clinical Effectiveness by the Clinical Effectiveness Research Agenda Group.*
Click here for file
[http://www.biomedcentral.com/content/supplementary/1748-5908-4-18-S1.pdf]

Acknowledgements

The CERAG are grateful to Deidre Feehan and Sue Parker for administrative support. The development and writing of the report was supported by the Department of Health of England. We are grateful to Professor Ian Gra-

ham and Professor Jeremy Grimshaw for their helpful discussions during the writing of the report.

References

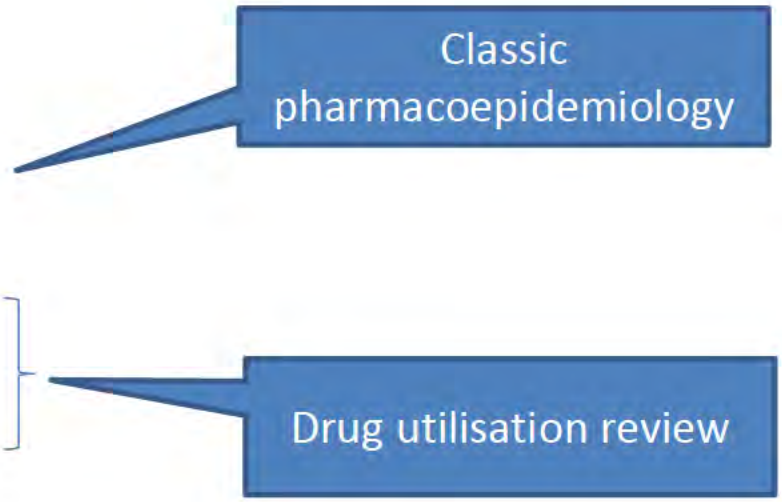
1. Tetroe JM, Garaham ID, Foy R, Robinson N, Eccles MP, Ward J, Wensing M, Durieus P, Légaré F, Palmhoj NC, *et al.*: **Health Research Funding Agencies' Support and Promotion of Knowledge Translation: an International Study.** *Millbank Quarterly* 2008, **86:**125-155.
2. Woolf SH: **The Meaning of Translational Research and Why it Matters.** *JAMA* 2008, **299:**211-213.
3. Grimshaw J, Ward J, Eccles M: **Getting research into practice.** In *Oxford handbook of public health practice* Edited by: Penchon D, Guest C, Melzer D, Muir, Gray JA. Oxford: Oxford University Press; 2001.
4. Davies H, Powell A, Rushmer R: **Healthcare professionals' views on clinician engagement in quality improvement: A literature review.** The Health Foundation; 2007.
5. Bero L, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson MA: **Closing the gap between research and practice: an overview of systematic reviews of interventions to promote implementation of research findings by health care professionals.** *BMJ* 1998, **317:**465-468.
6. Grimshaw JM, Thomas RE, MacLennan G, Fraser C, Ramsay CR, Vale L, Whitty P, Eccles MP, Matowe L, Shirran L, *et al.*: **Effectiveness and efficiency of guidline dissemination and implementation strategies.** *Health Technol Assess* 2004, **8(6):**1-84.
7. Grimshaw JM, Shirran L, Thomas RE, Mowatt G, Fraser C, Bero L, Grilli R, Harvey EL, Oxman AD, O'Brien MA: **Changing provider behaviour: an overview of systematic reviews of interventions.** *Med Care* 2001, **39(Suppl 2):**II-2-II-45.
8. Foy R, Eccles M, Jamtvedt G, Grimshaw J, Baker R: **What do we know about how to do audit and feedback?** *BMC Health Services Research* 2005, **5:**50.
9. Davies P, Walker A, Grimshaw J: **Theories of behaviour change in studies of guideline implementation.** *Proceedings of the British Psychological Society* 2003, **11(1):**120.
10. Grol R, Grimshaw J: **From best evidence to best practice: effective implementation of change in patients' care.** *Lancet J1 -Lancet* 2003, **362:**1225-1230.
11. Cooksey D: **A review of UK health research funding.** Norwich: HMSO; 2006.
12. Ferlie EB, Shortell SM: **Improving the quality of health care in the United Kingdom and the United States: a framework for change.** *The Milbank Quarterly* 2001, **79(2):**281-315.
13. Graham ID, Tetroe J, KT Theories Research Group: **Some theoretical underpinnings of knowledge translation.** *Acad Emerg Med* 2007, **14(11):**936-941.
14. Shadish , Cook A, Campbell : *Experimental and quasi-experimental designs for general causal inference* Boston: Houghton Mifflin; 2002.

Methods for identifying and managing problems with medicines use in practice

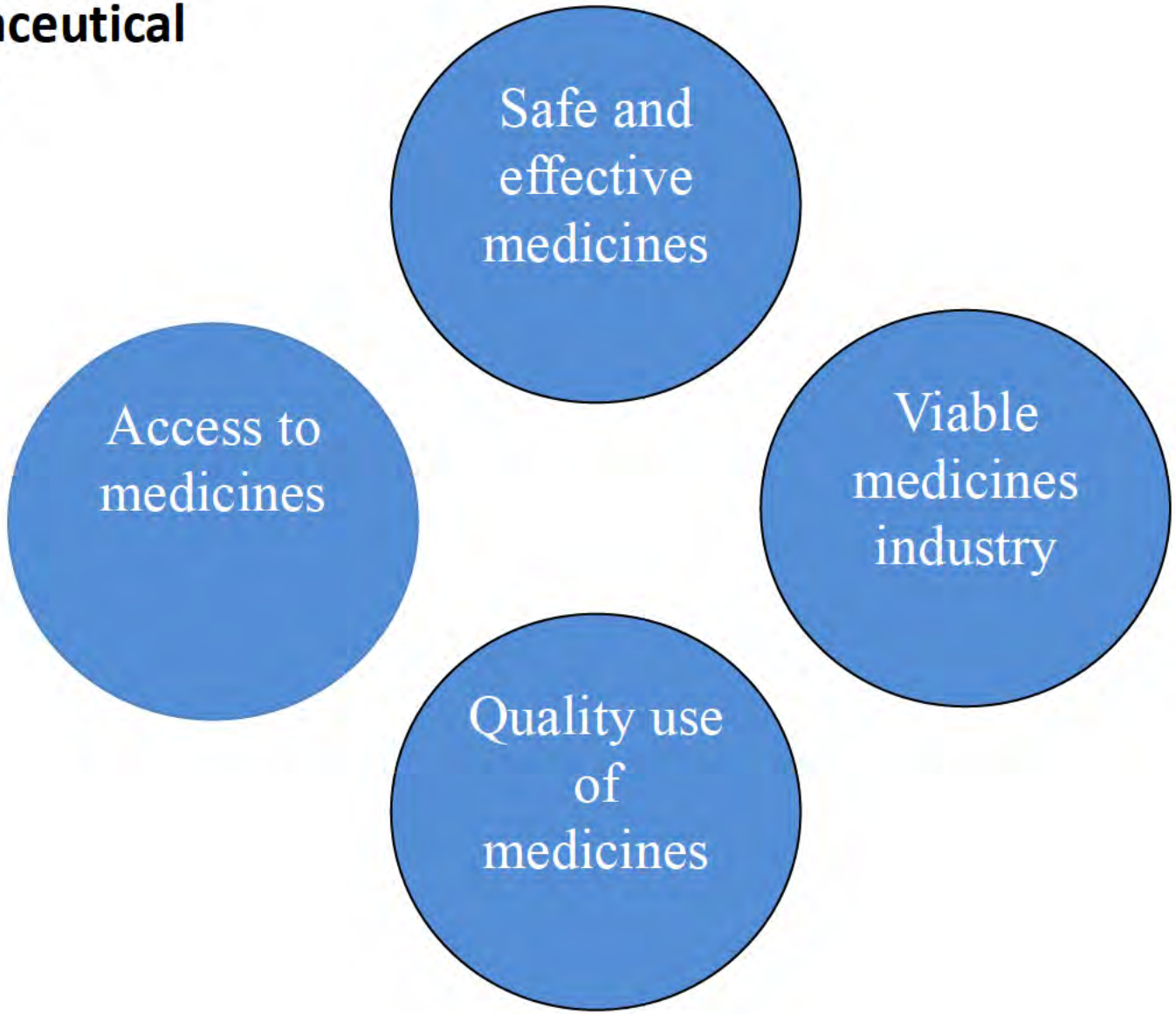
Libby Roughead
Sansom Institute for Health Research
University of South Australia

Pharmacoepidemiology

- Supporting
  - The medicine
  - The people/practice
  - The policy



The Pharmaceutical System



Challenges: regulatory

- Coverage with evidence development
- Provisional registration
- All mean there is potential for medicines to be used where uncertainty exists
  - Safety, efficacy or cost-effectiveness
  - Also creates the challenge of how do we minimise use in at risk groups

Challenges: access and utilization

- If you are managing the formulary, you might have more than 2000 formulations
  - How can we monitor use consistent with listing in a timely manner?
  - How can we identify where to focus quality use of medicines activities in a timely manner?

How to identify target areas or potential problems

- Literature
- National health priorities
- Health Technology Assessments and Regulatory agency decisions (risk plans)
- Health Technology decision recommendations
- Stakeholder groups (health professional, industry or consumer feedback)
- Rapid analyses

Drug Utilisation Review in Australia

- Australian government funds drug utilisation review nationally
  - Recent and Current Review topics:
    - Fixed dose combination products in children
    - Statin use
    - Diabetes medicines and self-monitoring blood glucose
    - http://www.pbs.gov.au/info/reviews/subsidised-medicines-reviews
- Also has a national Drug Utilisation Subcommittee
  - Meets three times per year
  - Assesses use of all recently listed medicines at 12 and 24 months post-listing which have been identified as potential for use outside listing, or use greater than expected, also reviews other topics as identified
  - Outcome statements published
    - **http://www.pbs.gov.au/info/industry/listing/elements/dusc-meetings/dos**

- We run a national program to improve use of medicine in Australian veterans and their dependents
- Every three months, we plan, develop, implement and evaluate an intervention targeting an identified therapeutic problem
- On average, every three months we target 10,000 GPs, 8,500 pharmacists and 35,000 veterans
- We have to identify problems in a very timely manner
- We undertake a drug utilisation study prior to every intervention, but we often use rapid assessment to help target the drug utilisation study and then undertake confirmatory study

Veterans' MATES

Veterans' Medicines Advice and Therapeutic Education Services program

www.veteransmates.net.au

UniSA | Sansom Institute for Health Research

- To enable timely identification of medicines related problems many of our initial analyses use rapid assessment methods
  - The majority based on methods outlined in the paper

PHARMACOEPIDEMIOLOGY AND DRUG SAFETY 2005; **14**: 455–463
Published online 12 January 2005 in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/pds.1063

ORIGINAL REPORT

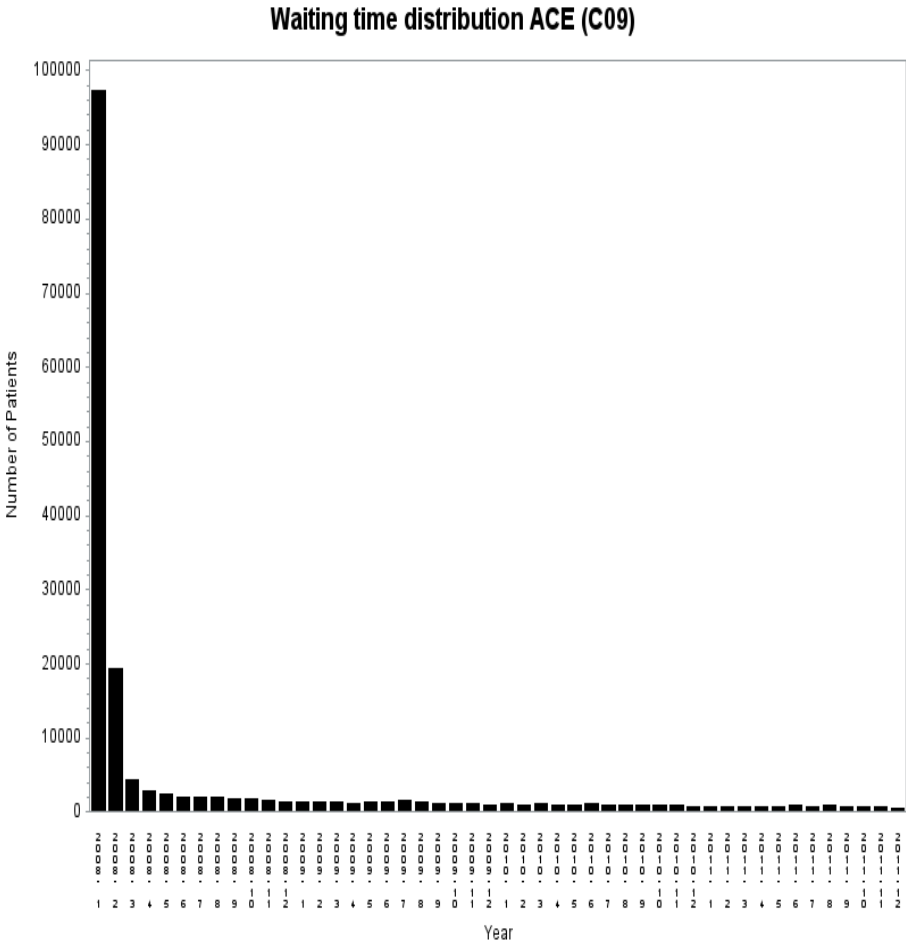
Drug utilization statistics for individual-level pharmacy dispensing data†

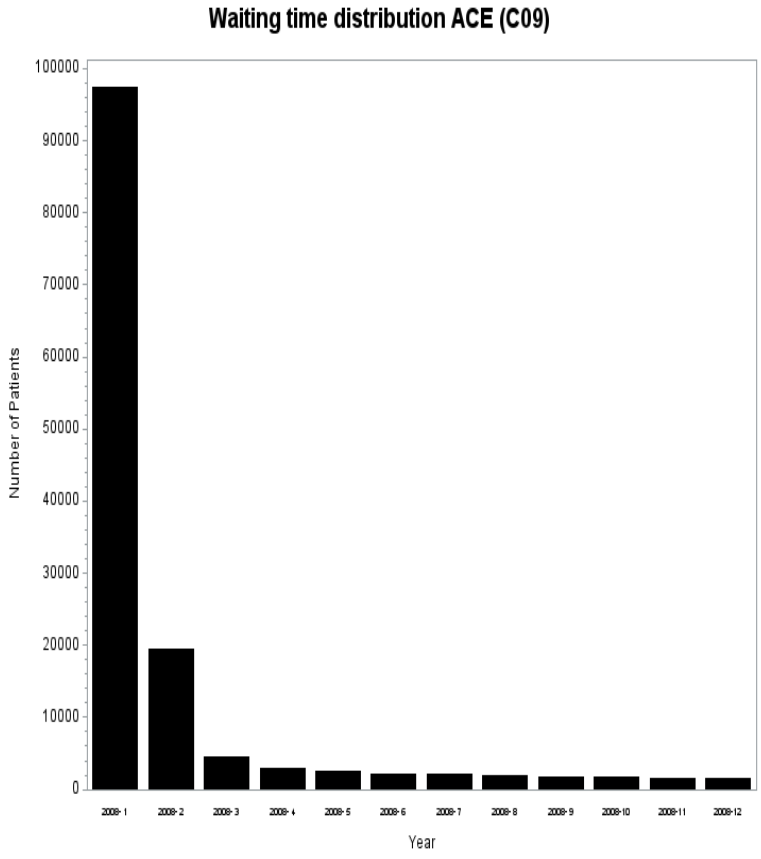
Jesper Hallas MD, PhD*

Department of Clinical Pharmacology, University of Southern Denmark, Denmark; Department of Internal Medicine, Odense University Hospital, Odense, Denmark

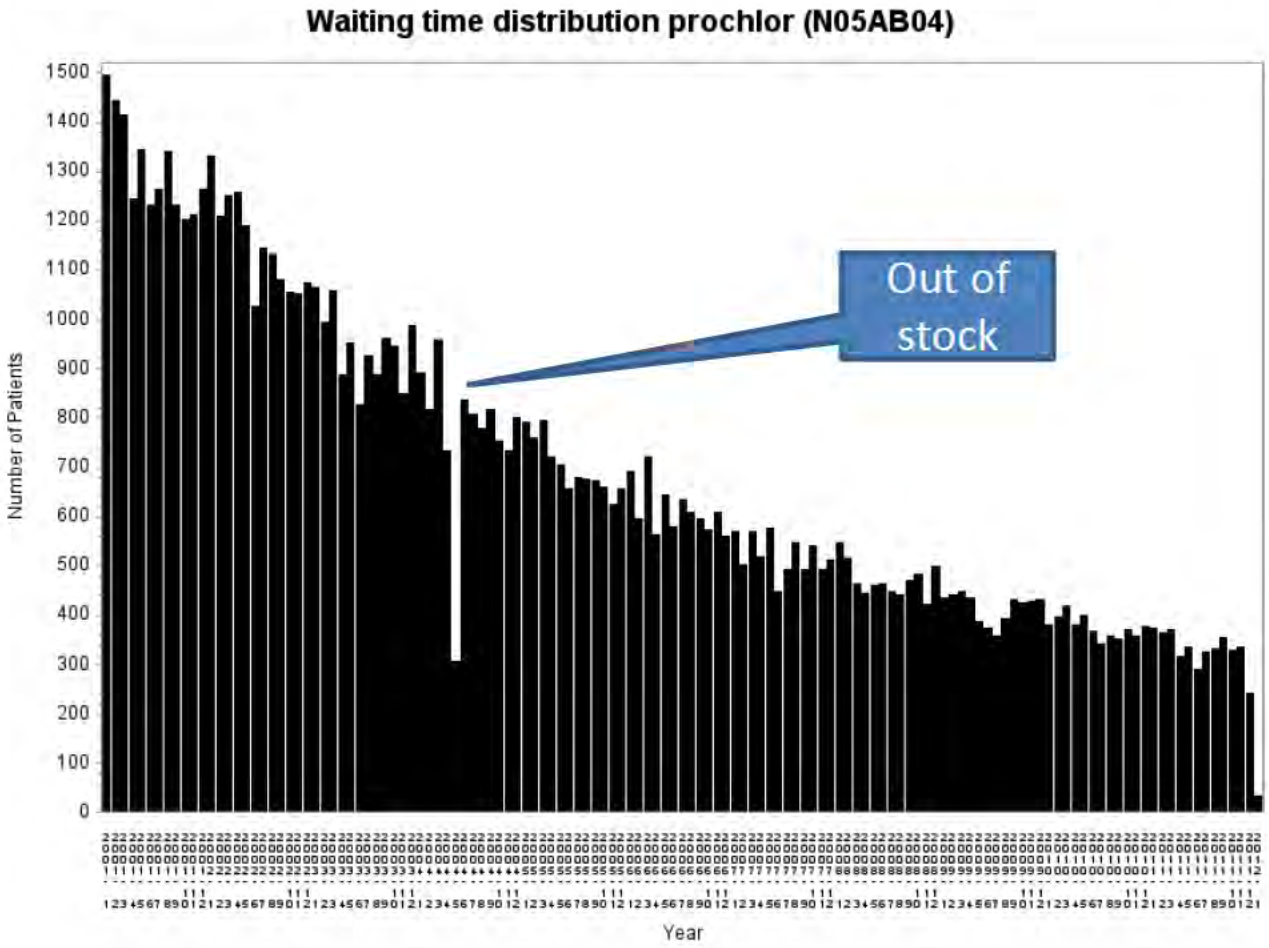
Waiting time distribution

- Simple counts (or rates) of the first prescription in the data set for an individual person of either a product, medicine or class plotted across time

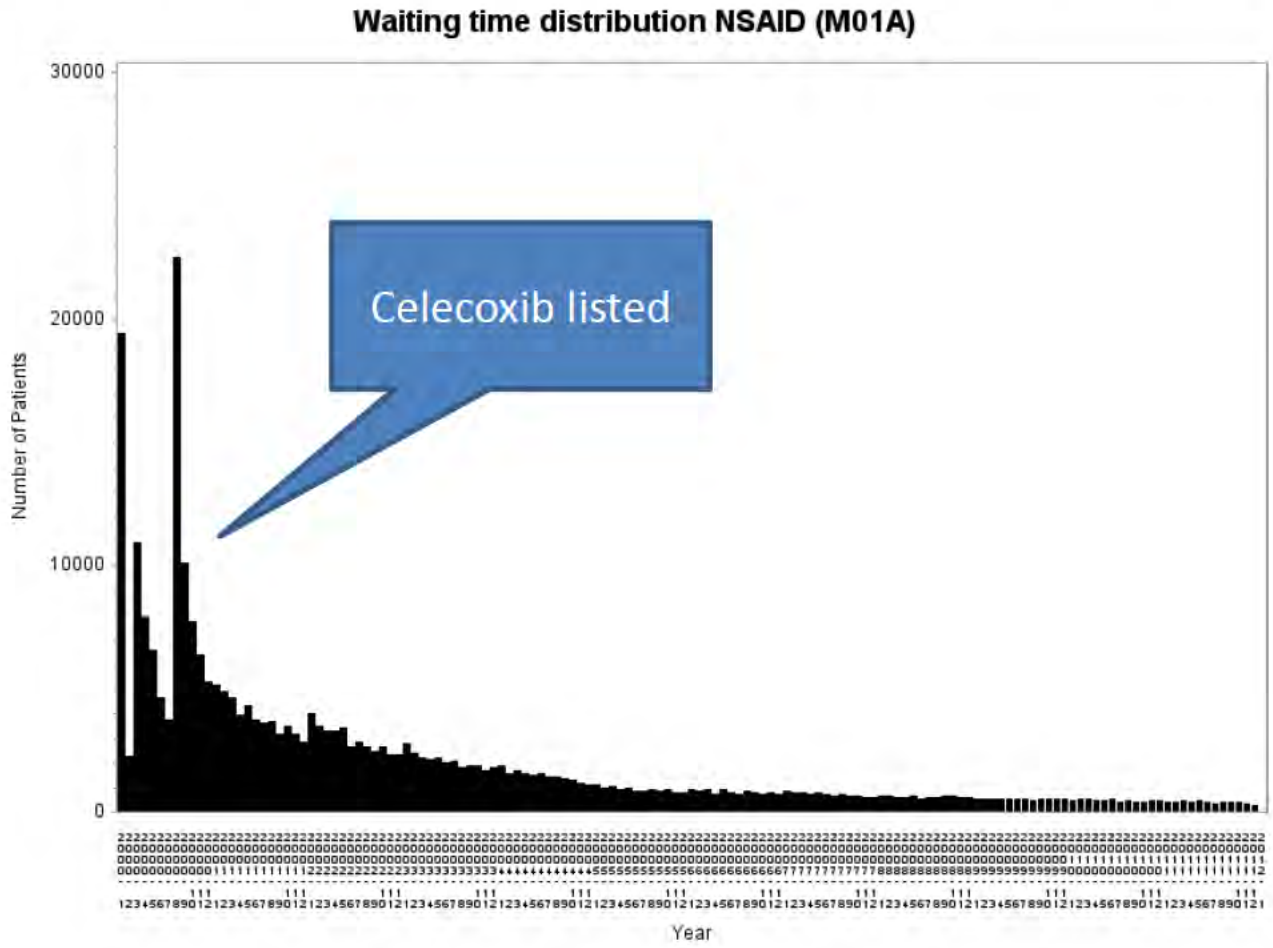

Waiting time distribution ACE (C09)
Number of Patients
Year


Waiting time distribution ACE (C09)
Number of Patients
2008-1
2008-2
2008-3
2008-4
2008-5
2008-6
2008-7
2008-8
2008-9
2008-10
2008-11
2008-12
Year

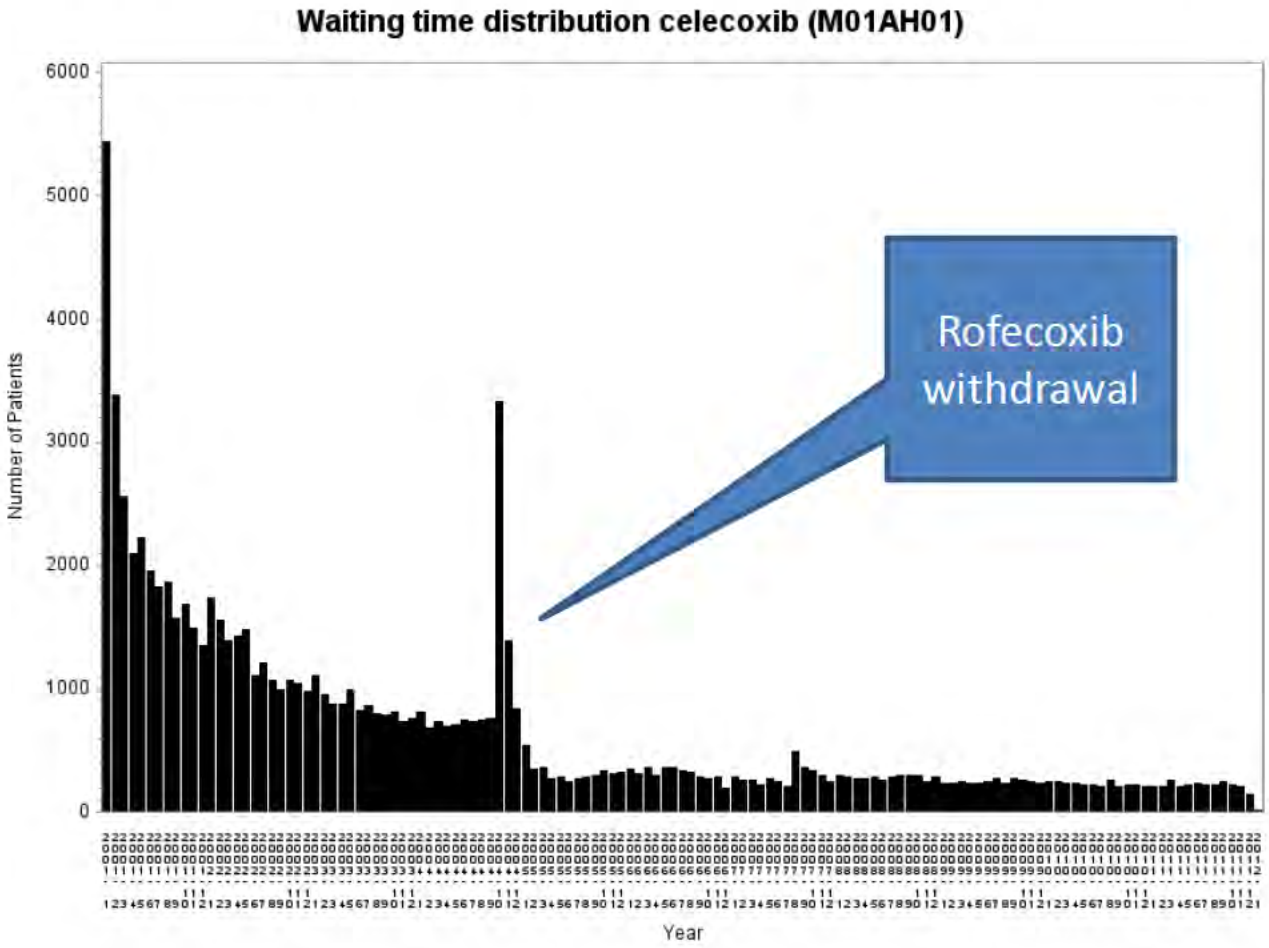
Identifying problems in practice



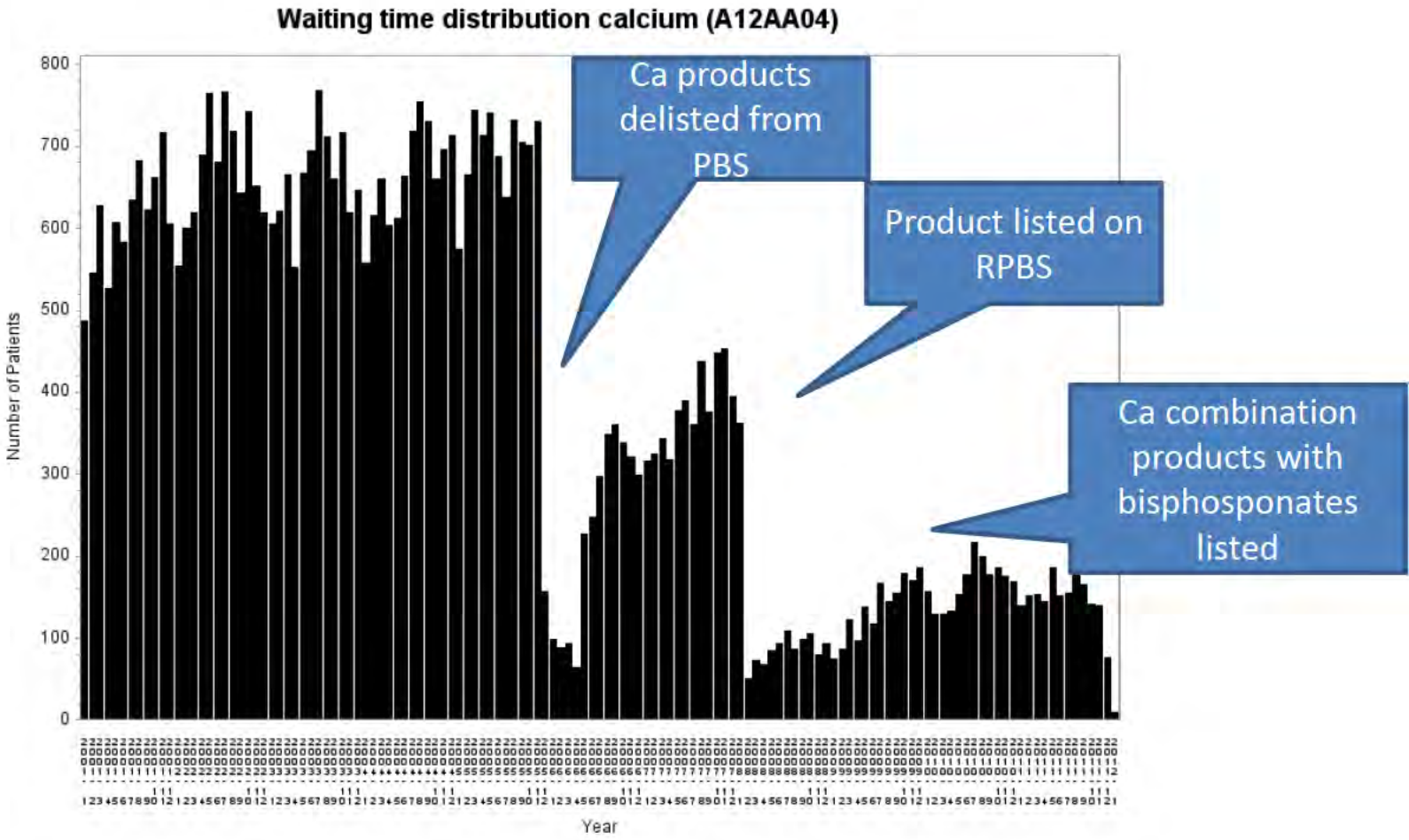
Identifying rapid changes in practice



Waiting time: celecoxib



Identifying rapid changes in practice



Prescription Symmetry

- Examines the likelihood of one prescription being dispensed prior to another for the same person

Drug A ⟷ Drug B

- Only uses incident cases for both events
- If Drug A causes Drug B, expect an excess of persons starting Drug B second

→ An asymmetrical distribution of prescription order

Advantage

- Easy to calculate, using prescription data only
- Robust towards confounders
  - Within person medicine use, over a short time
- Underlying seasonal or marketing trends adjusted for in the analysis

The data set required

(no more than three variables needed)

PBS Code	ATC code	Date supplied	Id
04179Y	B01AC04	03APR2006	201006
08333N	A02BC01	03APR2006	201006
08333N	A02BC01	10APR2006	201006
08333N	A02BC01	24APR2006	201006
04179Y	B01AC04	02MAY2006	201073
08333N	A02BC01	02MAY2006	201073

The Australian PBS code

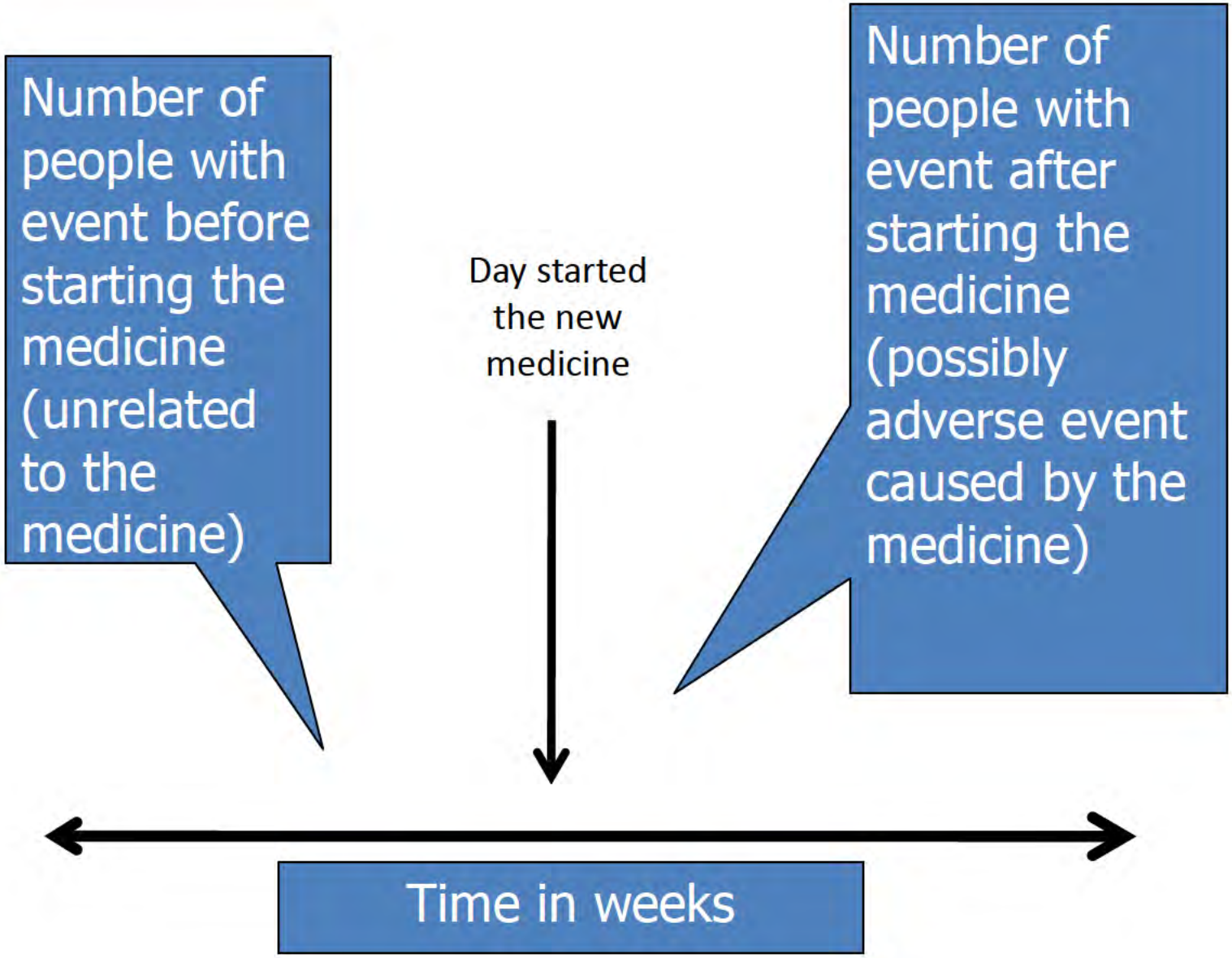
The WHO international code

Scrambled identifier

The steps

- Determine waiting time distribution for each medicine
- %***overall_atcpat_first(C01BD01,Amiodarone,7);***

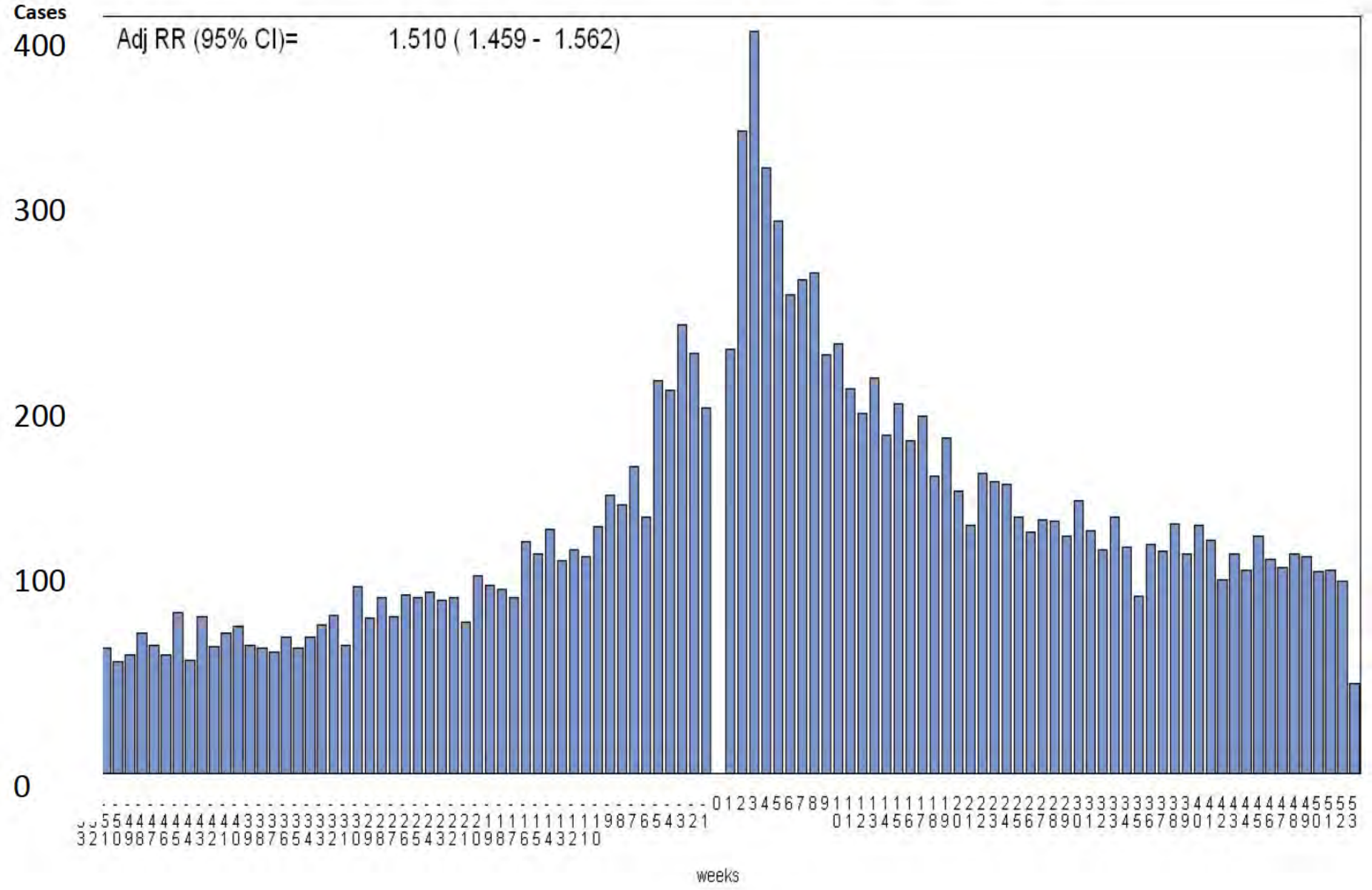
- Determine event sequence
- %***pssa(C01BD01,Amiodarone,H03AA01,Thyroxine,2000,2001,);***


Number of people with event before starting the medicine (unrelated to the medicine)
Day started the new medicine
Number of people with event after starting the medicine (possibly adverse event caused by the medicine)
Time in weeks

- Examples
  - Do NSAIDs precipitate heart failure?
  - Do calcium channel blockers precipitate peripheral oedema
    - Loop diuretics are the indicator medicine

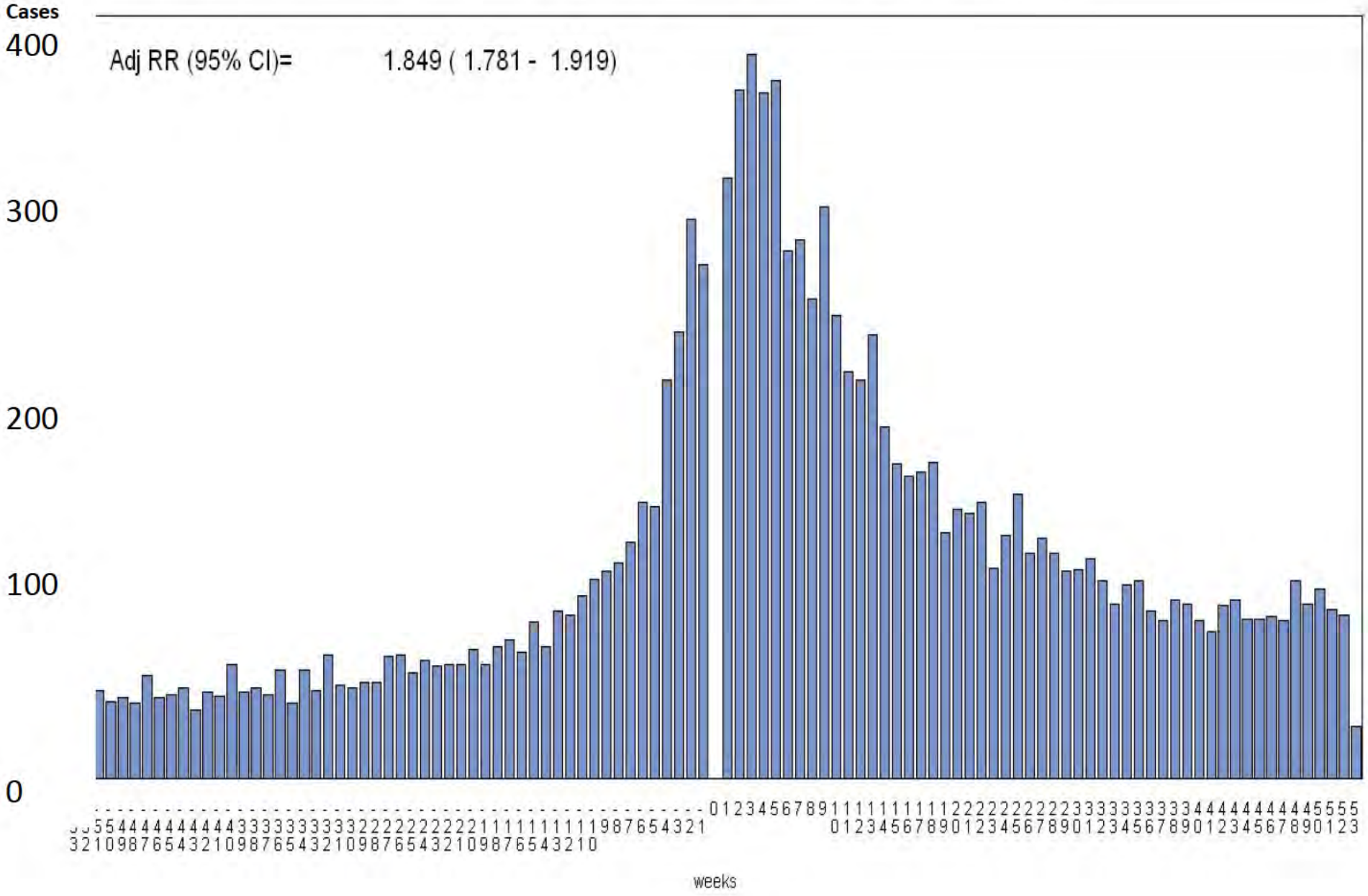
PSSA NSAIDs Frusemide 2001 - 2009

Non-causal Group (Frusemide --> NSAIDs) Causal Group (NSAIDs --> Frusemide)



PSSA Ca_Channel Frusemide 2001 - 2008

Non-causal Group (Frusemide --> Ca_Channel) Causal Group (Ca_Channel --> Frusemide)



Is the method valid?

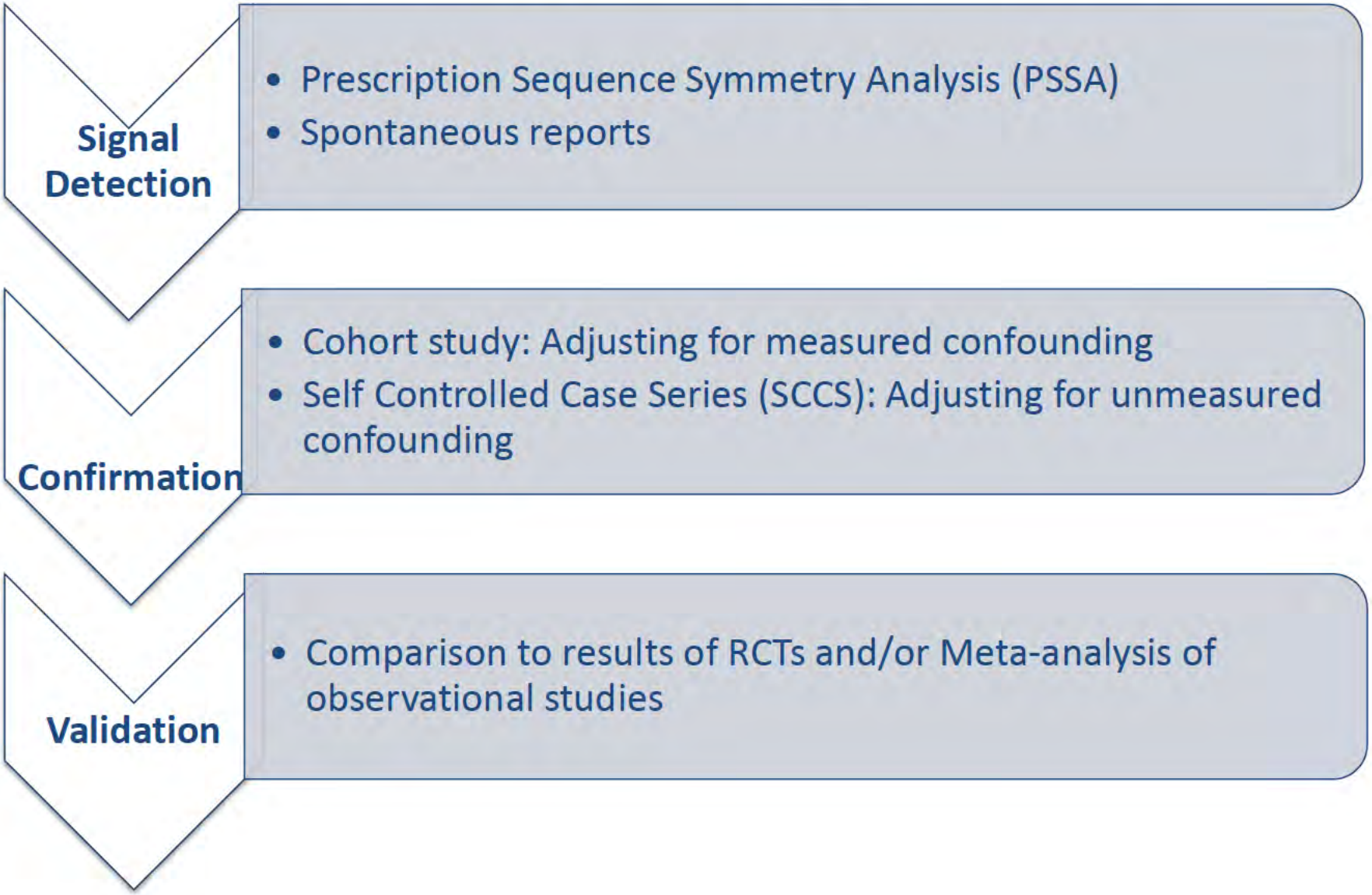
- We tested the sensitivity and specificity of the method
- 19 medicines; 165 adverse event pairs
  - 44 positive events (known adverse reactions); 121 negative events (unlikely events)
  - Sensitivity 61% (percent of times it correctly identified a positive event)
  - Specificity 93% (percent of times it correctly identified a negative event)

How does its validity compare to existing methods?

	Dispensing data method	Spontaneous reports methods		
Methods	Sequence Symmetry Analysis (SSA)	Proportional reporting ratio (PRR)	Reporting odds ratio (ROR)	Bayesian Confidence Propagation Neural Network (BCPNN)
Sensitivity (%)	65	49	49	51
Specificity (%)	90	92	92	89

- Where the result is positive, it is quite likely to be valid
- Interpretation requires reading the graphic and the statistic
- Only suitable for acute events
- Not suitable where medicine initiation associated with the event (eg medicines commonly initiated in hospital for the condition under study). This often results in an apparent protective association which does not indicate safety

Potential place in safety assessment



Potential place in drug utilisation research

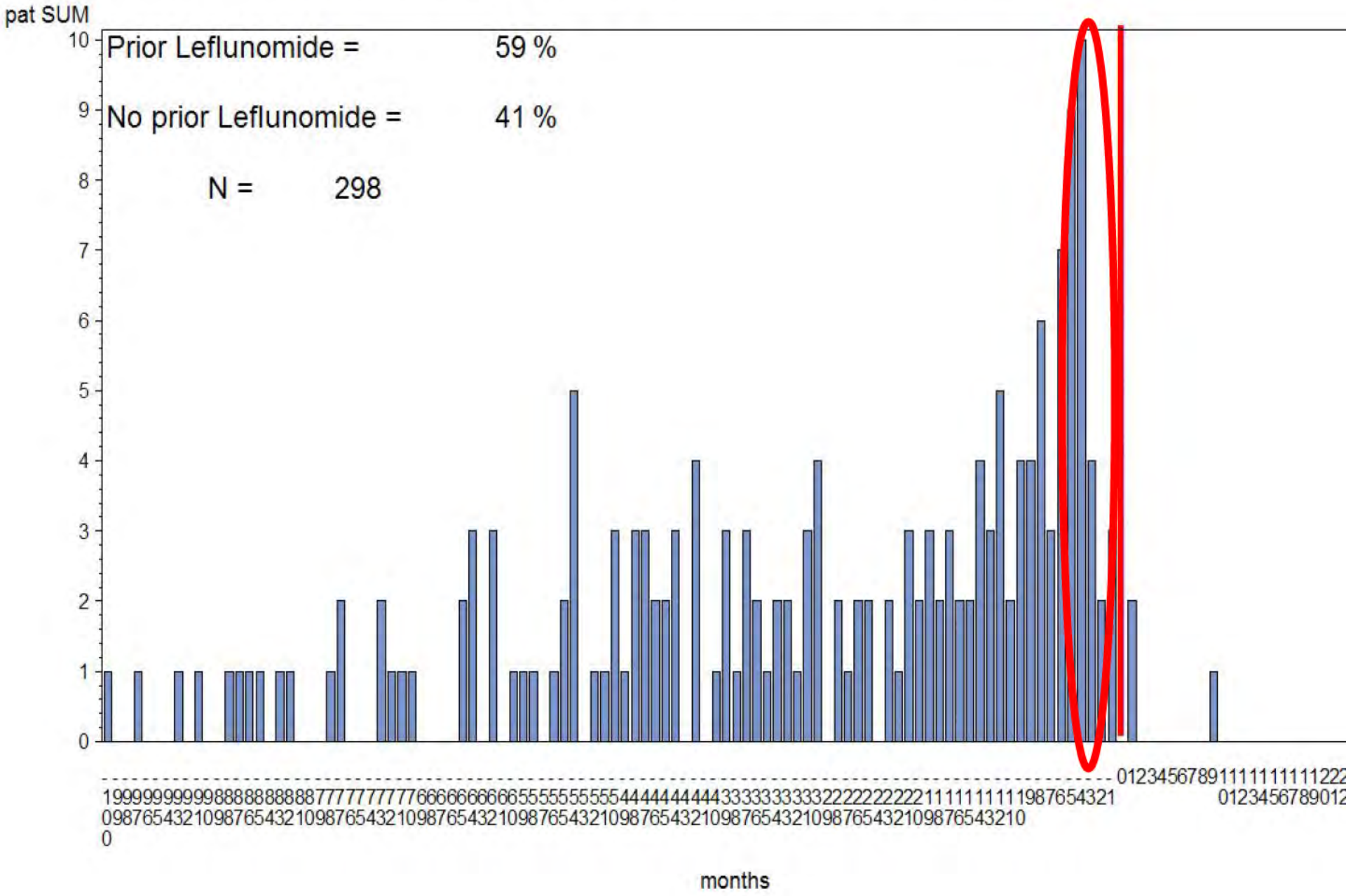
- We have used these types of analyses to underpin studies and then subsequent interventions targeting
  - Appropriate use of medicines for glaucoma in those with comorbidity
  - Medicines potentially contributing to worsening incontinence

Quality measures

Prior use listings

- Modification of the PSSA algorithm to run across the entire time frame of the data set enables assessment of utilisation of co-dependent technologies
- It was an Australian subsidy requirement that leflunomide was trialed (for at least three months) prior to initiation of TNF alphas for rheumatoid arthritis

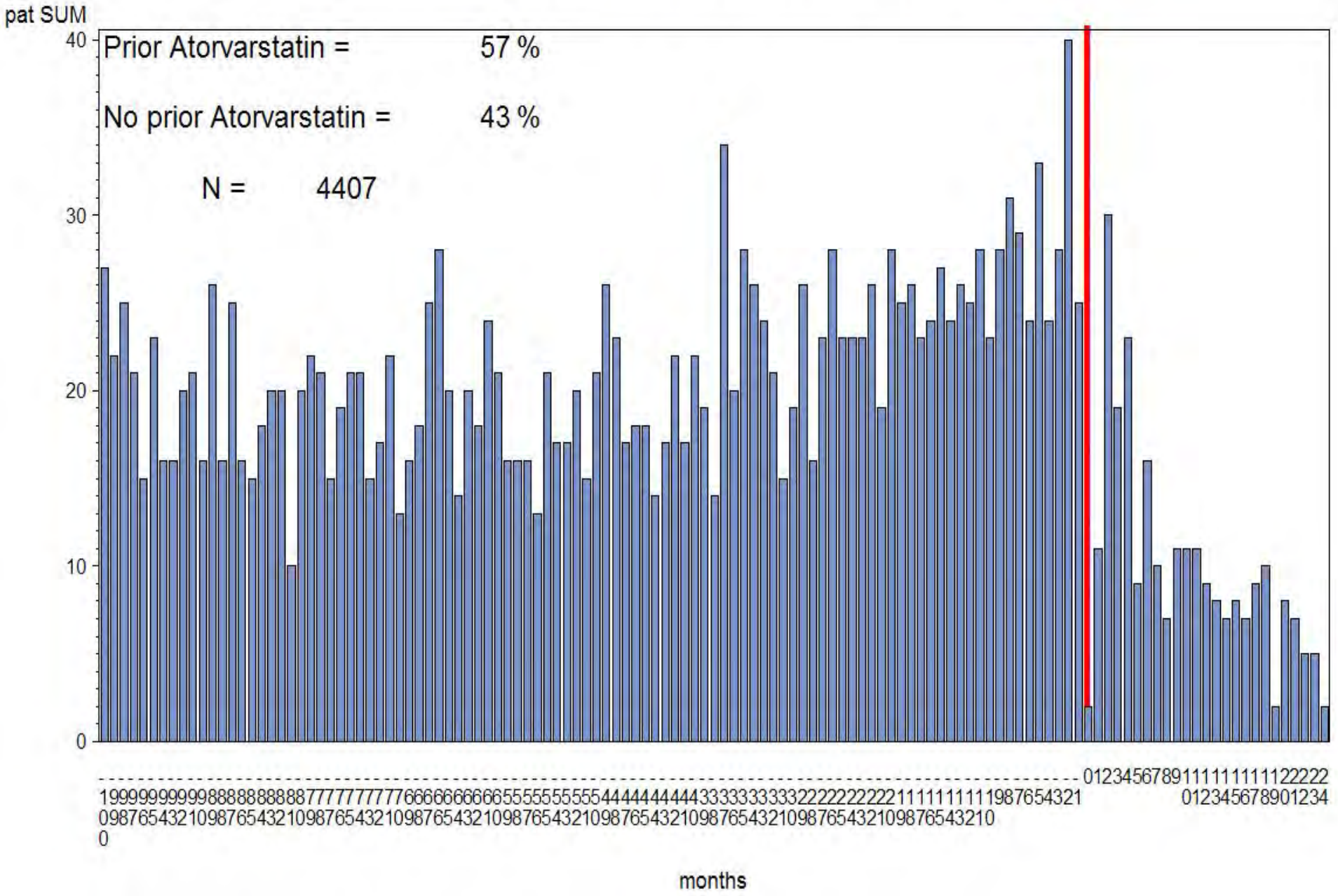
Leflunomide prior to TNFalpha



Combination product use

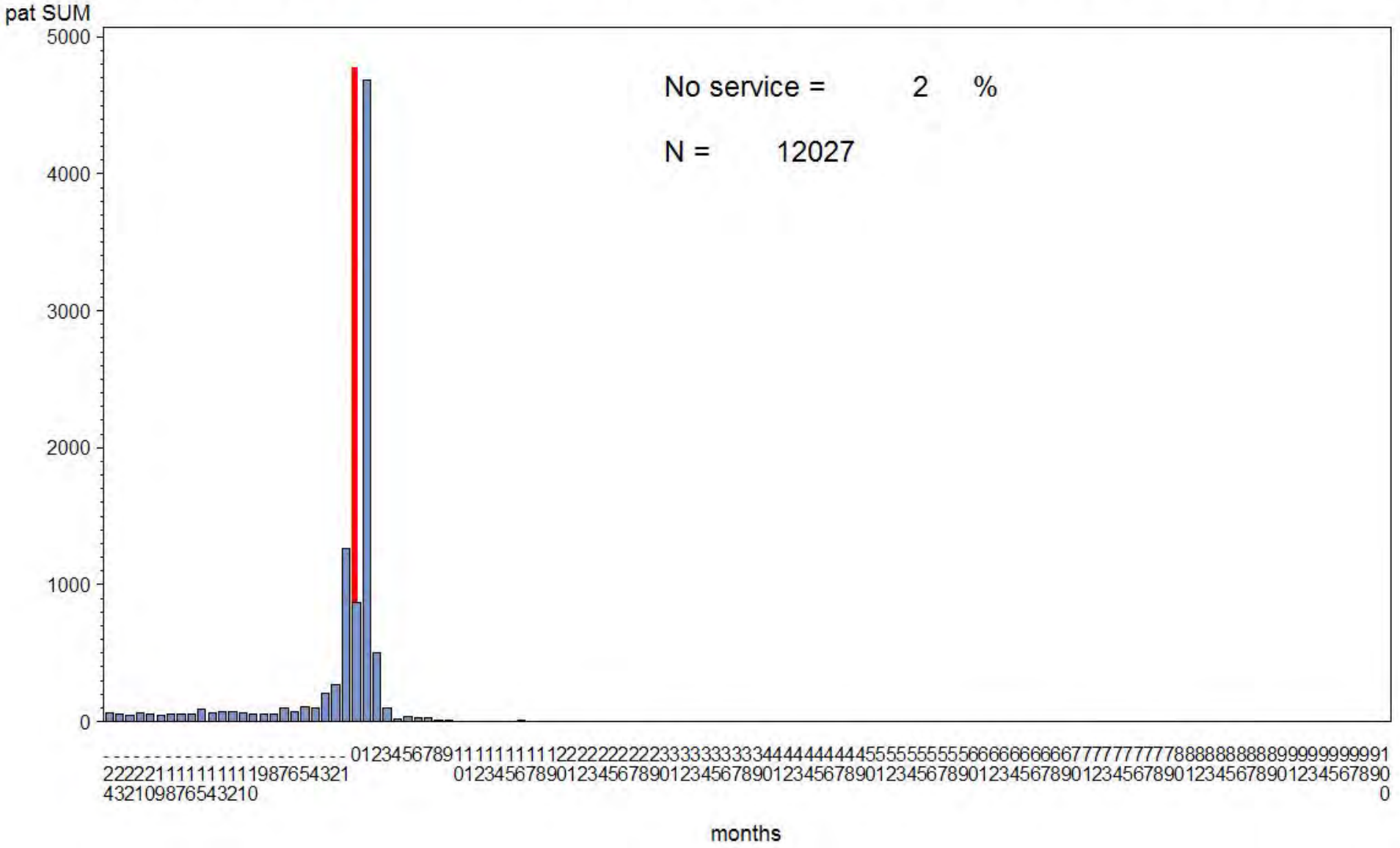
- Are single agents used prior to the initiation of combination products?

Atorvarstatin prior to Atorvastatin-Amlod

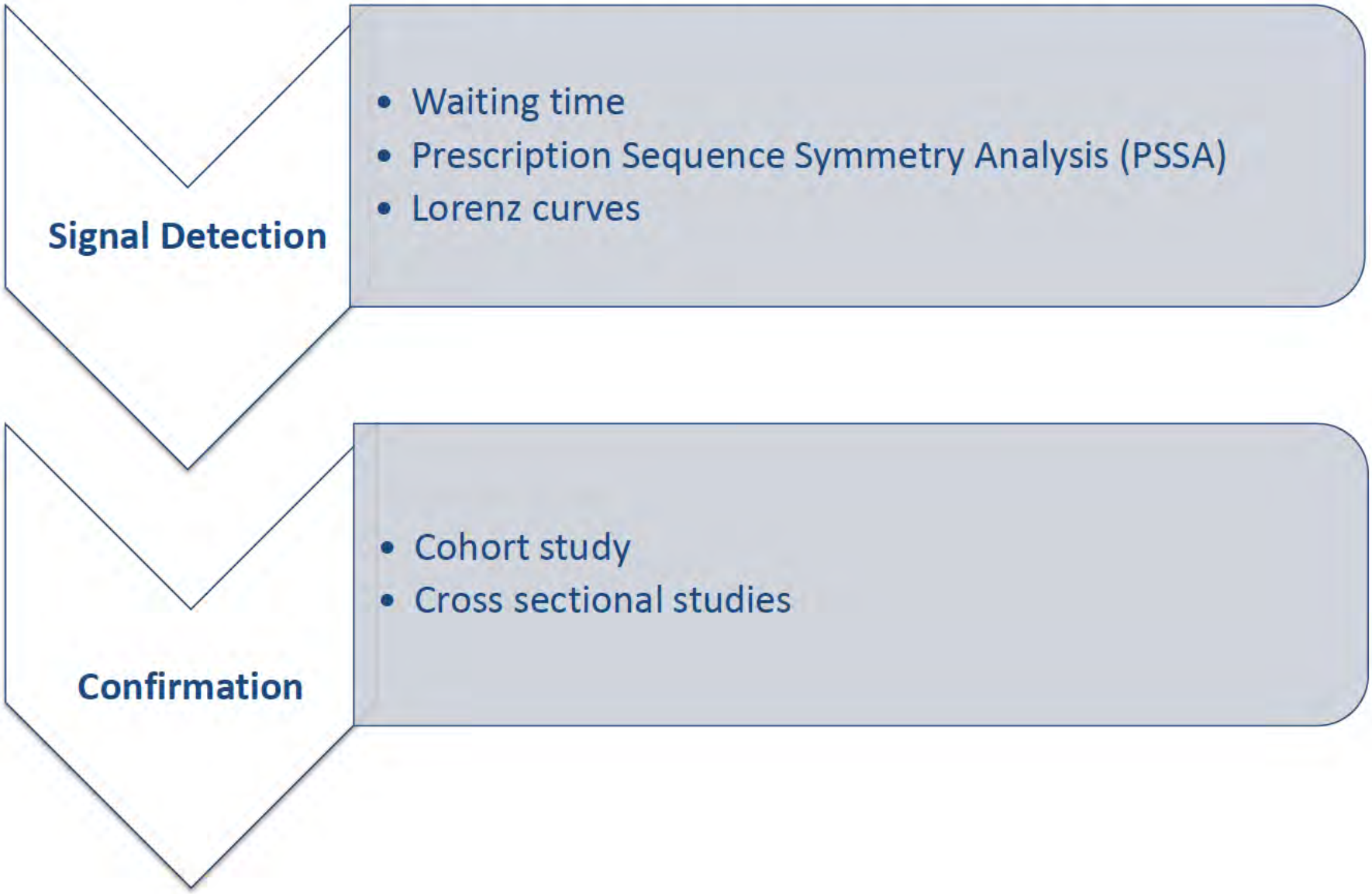


Listing dependent on service use

clopidogrel for those with drug_eluting_stent in 2004 - 2008



Potential place in medicine utilisation



Cohort studies

- Compliance studies
  - Measurement: does it differ when measuring for local practice (primary care) or national programs?

Compliance studies

- Most duration studies are limited to new users of medicines and limited to their first episode of use
- Focus on the people/practice
  - For chronic therapies we need to know this over their life time of use
  - To what extent can this be improved?

Why does studying compliance matter?

- Application for funding products/programs that improve compliance
- Determining need for quality use of medicines programs (at the public health level)
- Evaluating improvements in programs

How long do people stay on bisphosphonates?

- 2007 systematic review
- 14 studies
- Persistence rates at one year varied between 18% and 78%, with the majority finding 43% and 55% persistent at one year
  - All but one study only included new users
  - Most only followed patients for a year
- But people stop and start, what is the measure of compliance overall

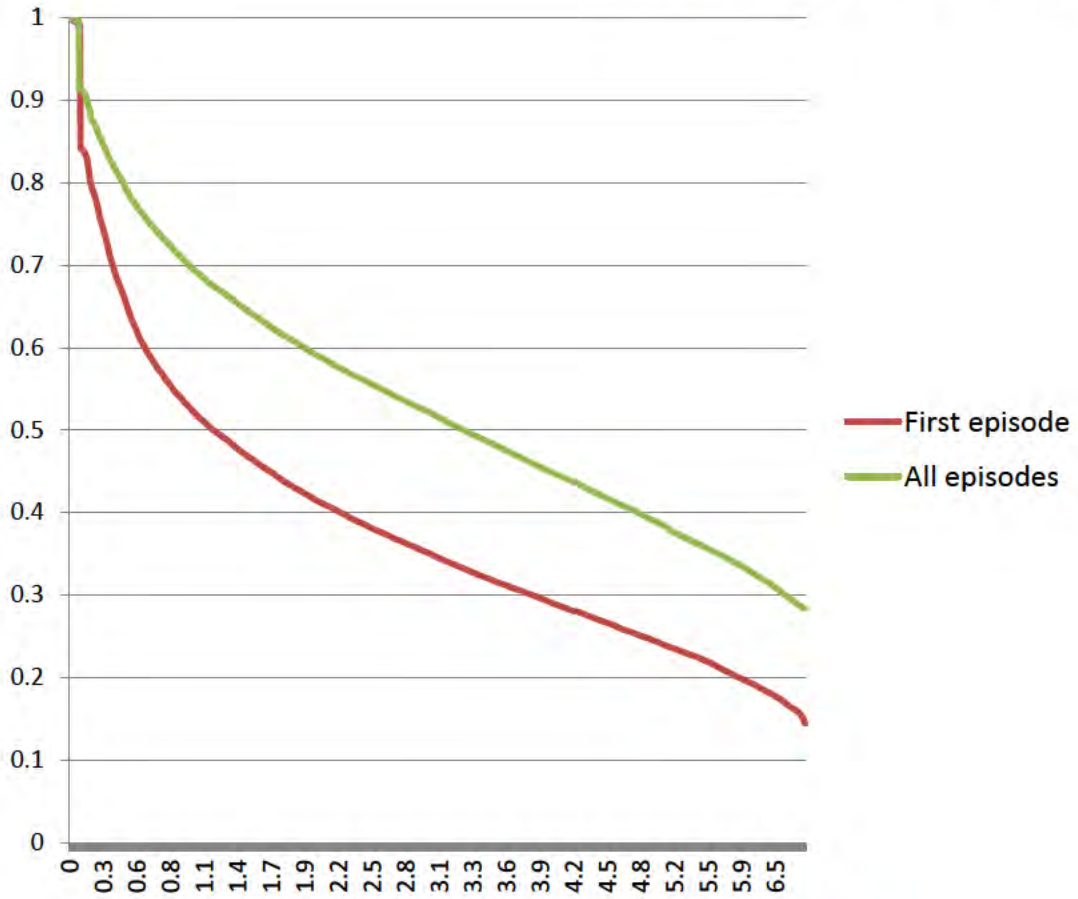
Can we measure overall duration?

- DVA study
- Study period 7 years
- Veterans, gold card holders, with at least one dispensing of a bisphosphonate
- Followed until death or study end
  - Sub group analysis by new and existing users

Results

- 42,885 veterans
- For new users,
- 47% of subjects had discontinued treatment at the end of the first year.
    - international results; 43% and 55%
- Medication possession ratio 0.66
    - international studies 0.66-0.70
- These results are consistent with the earlier studies
- However, overall duration gives a different estimate

Overall use:



Median duration of 3.3 years

Existing users median duration of 5.6 years

81% adherent for total duration of use

37% no gaps in treatment

Median gap = 1.7 years

Australian Government
Department of Veterans' Affairs

Veterans' MATES

- Need for compliance studies for chronic therapies to reflect use in practice
- Methods development still required

Conclusion

- There are challenges in targeting drug utilisation research to areas of need
- Health technology decision makers and regulatory agencies increasingly identifying issues to target for drug utilisation research
- Rapid assessment methods have the potential to help target areas of concern
- Need to be supported by more rigorous methods
- There is still a need for advanced methods development in drug utilisation research

- We wish to acknowledge the Department of Veterans' Affairs, which provided all data in these analyses

Veterans' MATES: Using routinely collected administrative health claims data to improve the uptake of primary healthcare services

V Tammy s 47F Andrew L s 47F Lisa M s 47F s 47F Nicole s 47F John D s 47F Emmae N s 47F Mhairi s 47F Robert s 47F Graeme s 47F Elizabeth E s 47F

[1]Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, School of Pharmacy and Medical Sciences, University of South Australia, Adelaide

[3]Department of Veterans' Affairs, Canberra

BACKGROUND

The Veterans' Medicine Advice and Therapeutic Education Services (MATES) program, is an Australian health based, quality improvement program that uses administrative health claims data to improve the health and well-being of the veteran population.

Every three months a health topic is chosen and the administrative health claims data are used to identify members of the veteran community that may be at risk of medication misadventure. Medical practitioners are then provided with patient-specific feedback. The feedback is supported with educational material developed by a clinical panel and overseen by a national editorial committee.

OBJECTIVE

To evaluate the impact of the veterans' MATES interventions targeting healthcare services that were known to be under-utilised; one targeted bone mineral density testing, two targeted Home Medicines Reviews (HMRs), one targeted dose administration aids, and one targeted tests and care plans associated with diabetes care.

METHOD

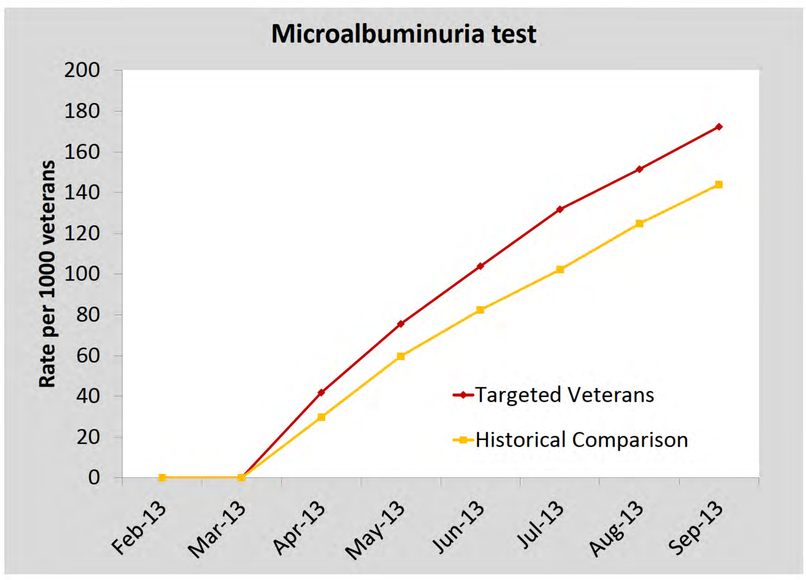
Log binomial regression models were used to compare the uptake of services in the eligible targeted patients compared to a suitable control group, with adjustment for number of months since the intervention.

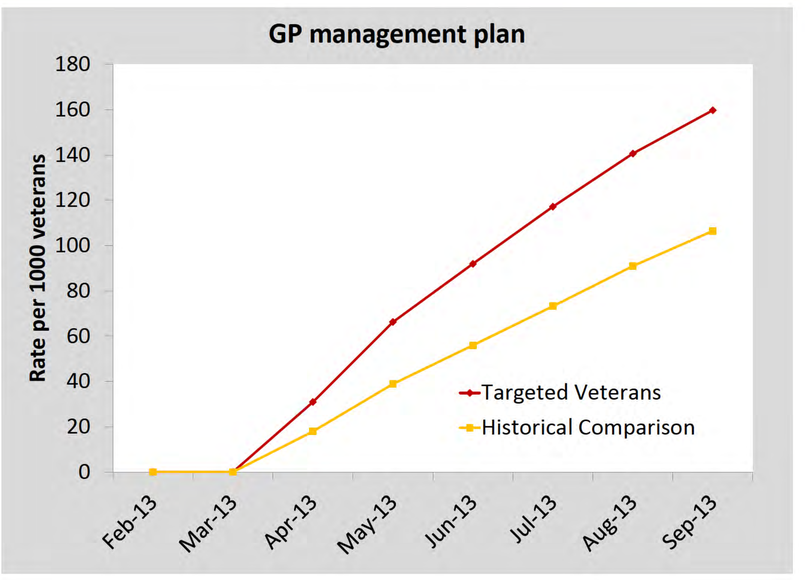
Segmented regression analysis was used to assess the effect of the interventions on the uptake of home medicine reviews. Log binomial regression models with generalised estimating equations were used.

RESULTS

☑ **Early adoption of annual diabetes cycle of care.**

- Increase in HbA1c testing RR 1.08 (95% CI 1.03, 1.14) and microalbuminuria testing RR 1.20 (95% CI 1.11, 1.30)
- Increased uptake of GP management plans RR 1.47 (95% CI 1.36, 1.59)



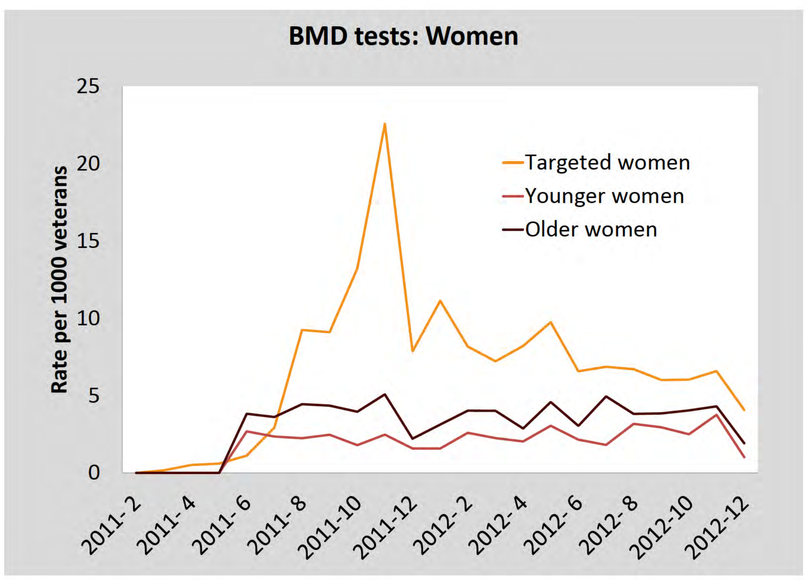


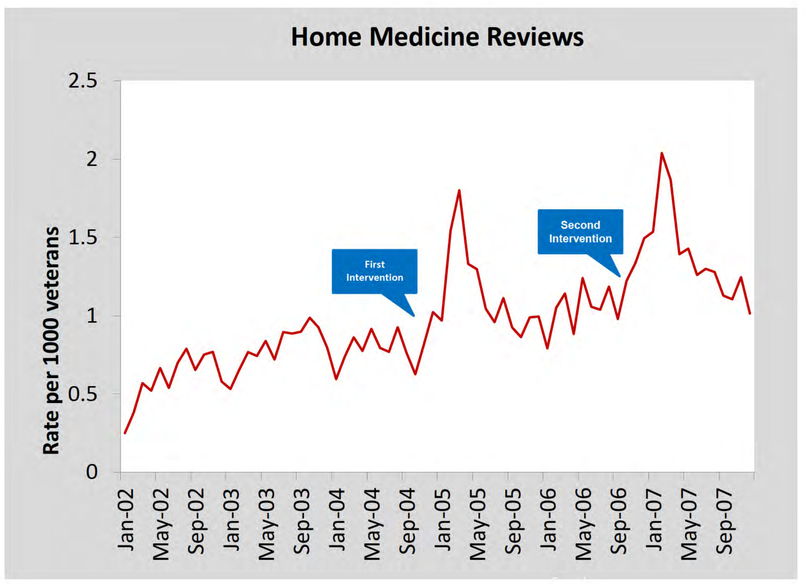
☑**Increase the uptake of Home Medicine Reviews.**

- 10% increase in the use of Home Medicine Reviews was observed in 2004
- This was followed up by a 41% increase in 2006.

☑**Improve the management of osteoporosis**

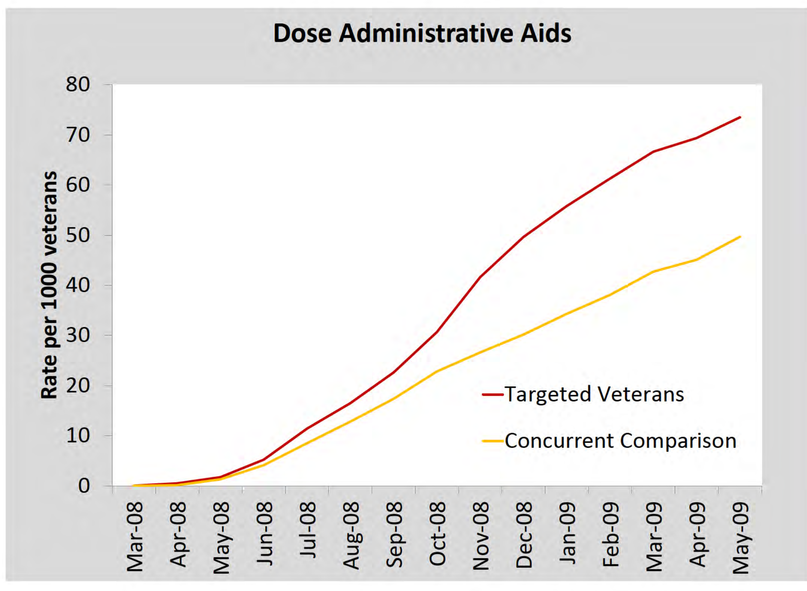
- Two fold increase in Bone Mineral Density tests to detect osteoporosis in both males and females





☑**Increase the uptake of dose administrative aids.**

- Increase in the use of dose administrative aids RR 1.54 (95% CI 1.43, 1.65)

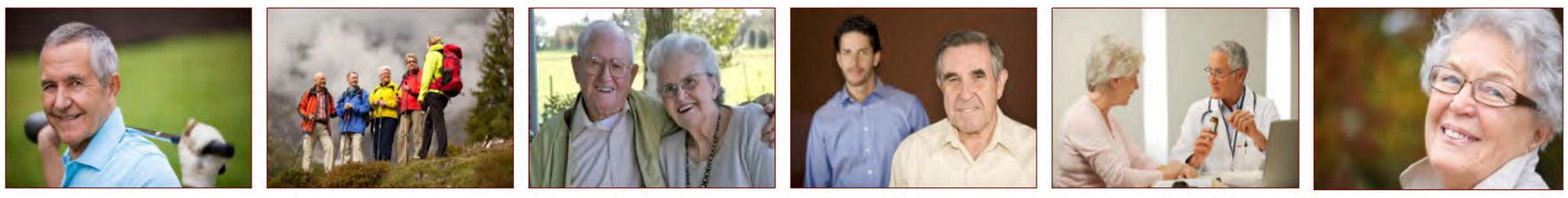


CONCLUSION

The Veterans' MATES program has successfully increased the use of under-utilised health services through the use of routinely collected health claims data.

www.veteransmates.net.au

ACKNOWLEDGEMENTS: This study was supported with funding from the Australian Government, Department of Veterans' Affairs, for the establishment of Veterans' MATES.



Effectiveness of collaborative medicine reviews in reducing hospitalisations for heart failure patients in the ambulatory setting: Results of a cohort study.

Andrew Gilbert
Quality Use of Medicines and Pharmacy Research Centre
Sansom Institute
University of South Australia

Disclosure

- The research to prepare this paper was conducted under a Contract Research Grant between the University of South Australia and the Australian Government's Department of Veterans' Affairs (DVA) to deliver the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES). DVA provides the Veterans' MATES project team at the University of South Australia with identified PBS/RPBS and Medicare data on all Australia veterans and war widows/widowers. The Veterans' MATES project team undertook all study design, data analysis and interpretation and writing and publication of this paper.

- Elizabeth Roughead, John Barratt, Emmae Ramsay, Nicole Pratt, Phil Ryan and Andrew Gilbert all declare that they no have competing interest.

- Robert Peck and Graeme Killer are employees of the Department of Veterans' Affairs, the funder of the research.

Introduction

- The Department of Veterans' Affairs (DVA), operates a national program: *Veterans' MATES*.
- We use DVA's database, covering 300,000 veterans, to provide
  - patient-specific-prescriber-feedback,
  - therapeutic updates and
  - Medicines and health care information for veterans

  to assist veterans and their health practitioners improve health outcomes.
- Over 12000 veterans are being treated for heart failure.

Background

- Medicines play a significant role in the management of heart failure[1].
- 44% of patients with heart failure will be re-hospitalised within six months of discharge[1].
- Home Medicines Reviews are effective in preventing medication-related problems[2].
    - Some systematic reviews indicate limited effects on patient outcomes, such as reduction in hospitalisations[3].

1. National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand. Guidelines on the contemporary management of the patient with chronic heart failure in Australia. Sydney: Cardiac Society of Australia and New Zealand, 2002.
2. Gilbert AL, Roughead EE, Beilby J, Mott K, Barratt JD. Collaborative medication management services: improving patient care. *Med J Aust* 2002;177(4):189-92.
3. Holland R, Desborough J, Goodyer L, Hall S, Wright D, Loke YK. Does pharmacist-led medication review help to reduce hospital admissions and deaths in older people? A systematic review and meta-analysis. *Br J Clin Pharmacol* 2008;65(3):303-16.

.

- Randomised controlled trials demonstrate that the effectiveness of medicines reviews in influencing health outcomes appears to depend on the type of review and disease characteristics[3,4]
- Australia has funded a collaborative Home Medicines Review services since 2001.
- We aimed to determine if the results from randomised controlled trials for the heart failure population translated into practice as it is currently funded in Australia.

3. Koshman SL, Charrois TL, Simpson SH, McAlister FA, Tsuyuki RT. Pharmacist care of patients with heart failure: a systematic review of randomized trials. *Arch Intern Med* 2008;168(7):687-94.
4. Holland R, Brooksby I, Lenaghan E, Ashton K, Hay L, Smith R, et al. Effectiveness of visits from community pharmacists for patients with heart failure: HeartMed randomised controlled trial. *BMJ* 2007;334(7603):1098.

Objective

To determine the impact of general medical practitioner & pharmacist collaborative Home Medicines Review (HMR)[5] on time to hospitalisation for heart failure in the population with heart failure

HMR
Home Medicines Review

5. Medicare Australia. Home Medicines Review. Canberra: Australian Government, 2009.

Method

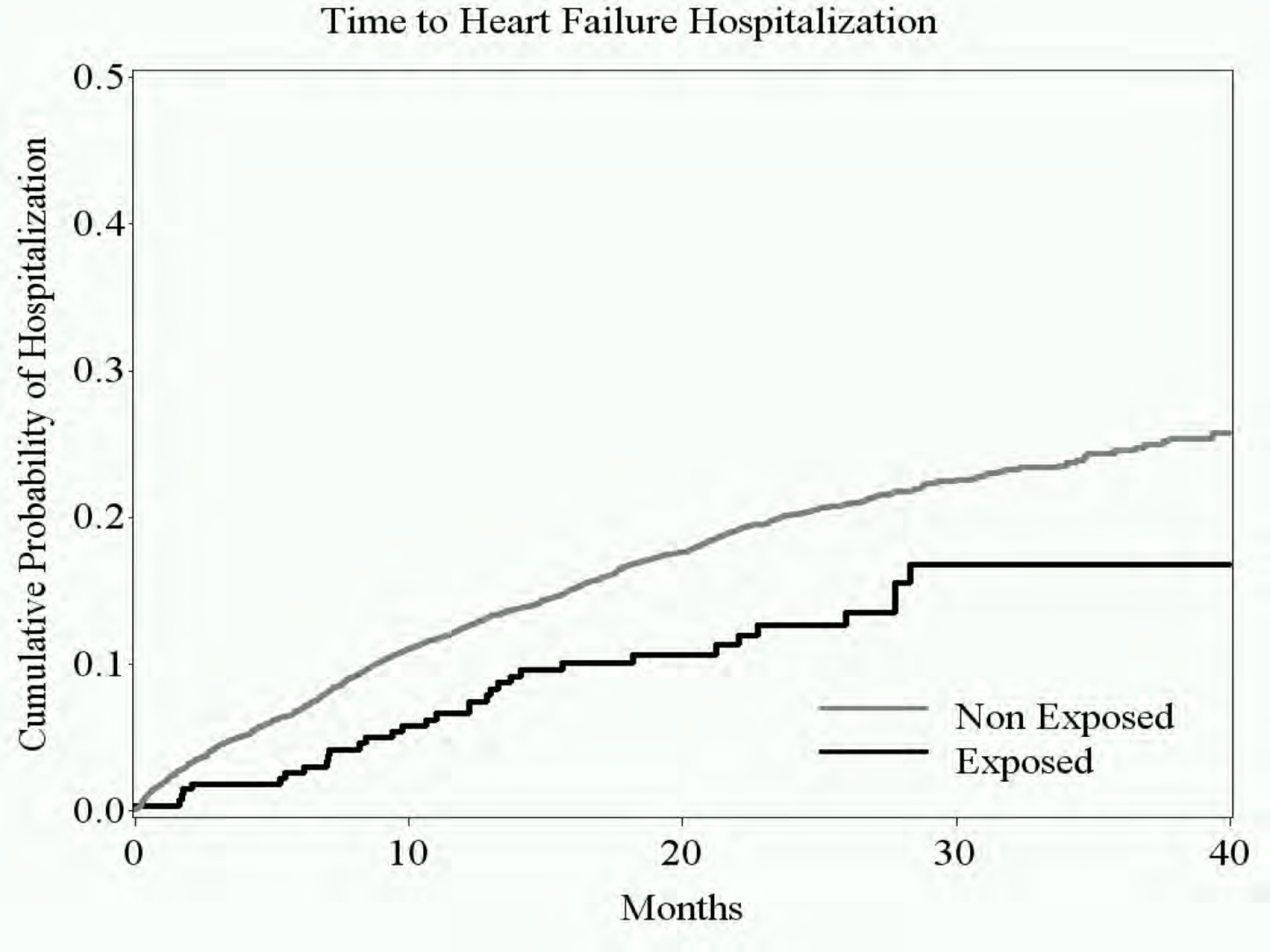
- Design: Retrospective cohort study using administrative claims data. Cox proportional hazards models were used to compare time to next hospitalisation for heart failure between the HMR exposed and unexposed groups.
- Setting: The ambulatory veteran and war widow population, Australia
- Time period 1 Jan 2004 until 1 July 2006
- Participants: Veterans ≥65 years receiving beta-blockers subsidised for heart failure
- Exposure: General medical practitioner and pharmacist collaborative HMR

Method; continued

- Exposed group: Veterans who;
  - had received a home medicines review,
  - were gold card status (i.e. were eligible for all health services) in the 12 months prior to the home medicines review,
  - had been dispensed a beta-blocker subsidized for heart failure in the six months prior to the home medicines review,
  - were aged 65 years or over at the time of the review.
- Unexposed group: Veterans who;
  - were gold card holders,
  - had been dispensed a beta-blocker subsidized for heart failure,
  - aged 65 years and over,
  - who but had not had a home medicines review.
- Exclusions: Veterans resident in aged-care facilities
- Main outcome measure: Time to next hospitalisation for heart failure

Results

- There were 273 veterans exposed to a home medicines review and 5444 unexposed patients.
- Average age 81.6 years; 7 to 8 co-morbidities.
- Unadjusted results showed a 37% reduction in likelihood of hospitalisation for heart failure at any time (HR 0.63; 95%CI 0.44-0.89).
- Adjusted results showed a 46% reduction (HR, 0.54; 95% CI, 0.38-0.77) amongst those who had received a HMR compared to unexposed patients.


Time to Heart Failure Hospitalization
Cumulative Probability of Hospitalization
0.5
0.4
0.3
0.2
0.1
0.0
0
10
20
30
40
Months
Non Exposed
Exposed

Demographics of study participants	**Exposed N=273**	**Unexposed N=5444**	**p-value**
Male gender	70% male	74% male	0.11
Age	81.6 years (SD 4.8)	81.6 years (SD 4.8)	0.87
Number of co-morbidities	7.6 (SD 2.2)	6.7 (SD 2.4)	<0.0001
Number of prescriptions in year prior	95 (69-123)	76 (54-104)	<0.0001
Number of changes in medicines over 6 month period in year prior	3 (2-6)	3 (1-5)	<0.0001
Number of prescribers	5 (3-6)	4 (3-6)	0.002
Number of pharmacies	2 (1-3)	2 (1-3)	0.43
Number of occupational therapy visits	0 (0-0)	0 (0-0)	0.16
Number of speech therapy visits	0 (0-0)	0 (0-0)	0.4
Previously targeted by Veterans' MATES	7%	6%	0.47
Socio-economic index of disadvantage Lowest disadvantage Med/low disadvantage Med/high disadvantage Highest disadvantage	 31% 25% 24% 20%	 25% 25% 25% 25%	0.01
Prior hospitalisations 0 1 2 >2	 27% 23% 22% 28%	 34% 23% 17% 25%	0.03
Region Remote Outer regional Inner regional Major city	 0% 12% 29% 59%	 1% 9% 31% 59%	0.86

Cox proportional hazards model results for time to hospitalisation for heart failure

Parameter	Para-meter Estimate	Standard Error	Chi-Square	P value	Hazard Ratio	95% Hazard Ratio Confidence Limits	
Unadjusted: exposed to home medicines review	-0.47	0.18	7.0035	0.008	0.63	0.44	0.89
Adjusted: exposed to home medicines review	-0.61	0.18	11.96	0.0005	0.54	0.38	0.77

Increased time to next hospitalisation for HF patients who received an HMR

- Unadjusted results: HMR group; 37% reduction in likelihood of hospitalisation for heart failure at any time (HR 0.63; 95%CI 0.44-0.89).
- Adjusted results: HMR group; 46% reduction in the likelihood of hospitalisation for heart failure at any time (HR, 0.54 95% CI, 0.38-0.77).
- For a subset of the population, this delay equated to 7 months.

Study limitations

- Only 5% of veterans with heart failure have received a HMR, despite all veterans in this treatment population being eligible for the service.
- The focus of this study on veterans.
  - Veterans are treated in the same way as non-veteran patients in both the primary and tertiary care sectors.
  - Veterans receive the same health services, and they are delivered by the same practitioners, as those visited by non-veterans.
  - The veteran population have slightly more general practice visits (rate ratio 1.17; $p < 0.05$) and hospitalisations (rate ratio 1.21; $p < 0.05$) per year than other Australians aged 40 years and over.
  - Similar numbers of prescription per general practitioner visit are observed between the veteran population and the Australian population; however, because of the higher rate of GP visits, veterans receive slightly more prescriptions annually than other Australians (rate ratio 1.13; $p < 0.05$).

Conclusion

- Home Medicines Review, in the heart failure population, was effective in delaying time to hospitalisation for heart failure.
- The effect is clinically significant with a delay in time to hospitalisation of over 200 days (~7 months) for the 5th percentile of the population.
- The results observed in our study are consistent with those reported randomised control trials of collaborative medicines review in the heart failure population.
- The results are also consistent with findings demonstrating medication-related problems are contributors to admissions for heart failure.
- With hospitalisations in Australia for heart failure estimated to cost $140 million per annum these delays to next hospitalisation will contribute to significant cost savings to the health system.

Authors and affiliations

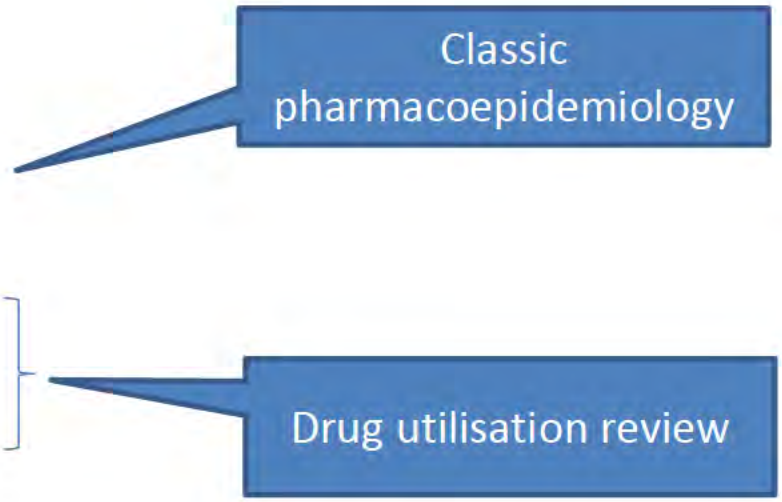
- Authors:
  - Andrew L Gilbert, PhD[1], Elizabeth E Roughead, PhD[1], John D Barratt, B. Pharm. Grad Dip C[1], Emmae Ramsey, B. App Sc; Grad Dip[2], Nicole Pratt, BSc (hons)[2], Phillip Ryan, MBBS[2], Robert Peck, B. Pharm[3] and Graeme Killer, MBBS[3].
- Affiliations
  1. Sansom Institute, University of South Australia, Adelaide, South Australia, Australia, 5000;
  2. Data Management & Analysis Centre, Adelaide University, Adelaide, South Australia, Australia, 5000 and
  3. Department of Veterans' Affairs, Australian Government, Canberra, Australian Capital Territory, Australia, 2600.

Methods for identifying and managing problems with medicines use in practice

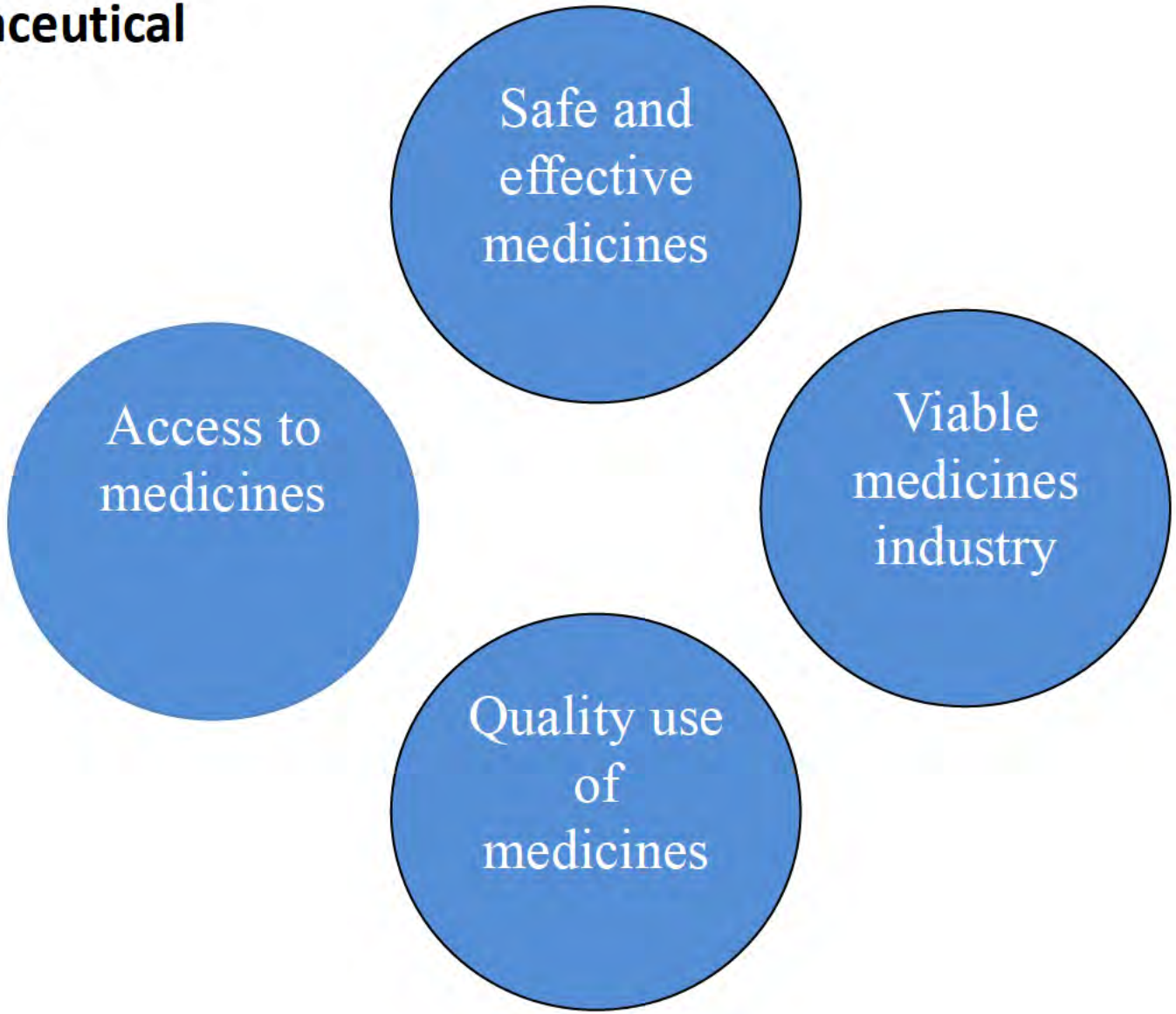
Libby Roughead
Sansom Institute for Health Research
University of South Australia

Pharmacoepidemiology

- Supporting
  - The medicine
  - The people/practice
  - The policy



The Pharmaceutical System



Challenges: regulatory

- Coverage with evidence development
- Provisional registration
- All mean there is potential for medicines to be used where uncertainty exists
  - Safety, efficacy or cost-effectiveness
  - Also creates the challenge of how do we minimise use in at risk groups

Challenges: access and utilization

- If you are managing the formulary, you might have more than 2000 formulations
  - How can we monitor use consistent with listing in a timely manner?
  - How can we identify where to focus quality use of medicines activities in a timely manner?

How to identify target areas or potential problems

- Literature
- National health priorities
- Health Technology Assessments and Regulatory agency decisions (risk plans)
- Health Technology decision recommendations
- Stakeholder groups (health professional, industry or consumer feedback)
- Rapid analyses

Drug Utilisation Review in Australia

- Australian government funds drug utilisation review nationally
  - Recent and Current Review topics:
    - Fixed dose combination products in children
    - Statin use
    - Diabetes medicines and self-monitoring blood glucose
    - http://www.pbs.gov.au/info/reviews/subsidised-medicines-reviews
- Also has a national Drug Utilisation Subcommittee
  - Meets three times per year
  - Assesses use of all recently listed medicines at 12 and 24 months post-listing which have been identified as potential for use outside listing, or use greater than expected, also reviews other topics as identified
  - Outcome statements published
    - **http://www.pbs.gov.au/info/industry/listing/elements/dusc-meetings/dos**

- We run a national program to improve use of medicine in Australian veterans and their dependents
- Every three months, we plan, develop, implement and evaluate an intervention targeting an identified therapeutic problem
- On average, every three months we target 10,000 GPs, 8,500 pharmacists and 35,000 veterans
- We have to identify problems in a very timely manner
- We undertake a drug utilisation study prior to every intervention, but we often use rapid assessment to help target the drug utilisation study and then undertake confirmatory study

Veterans' MATES

Veterans' Medicines Advice and Therapeutic Education Services program

www.veteransmates.net.au

UniSA | Sansom Institute for Health Research

- To enable timely identification of medicines related problems many of our initial analyses use rapid assessment methods
  - The majority based on methods outlined in the paper

PHARMACOEPIDEMIOLOGY AND DRUG SAFETY 2005; **14**: 455–463
Published online 12 January 2005 in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/pds.1063

ORIGINAL REPORT

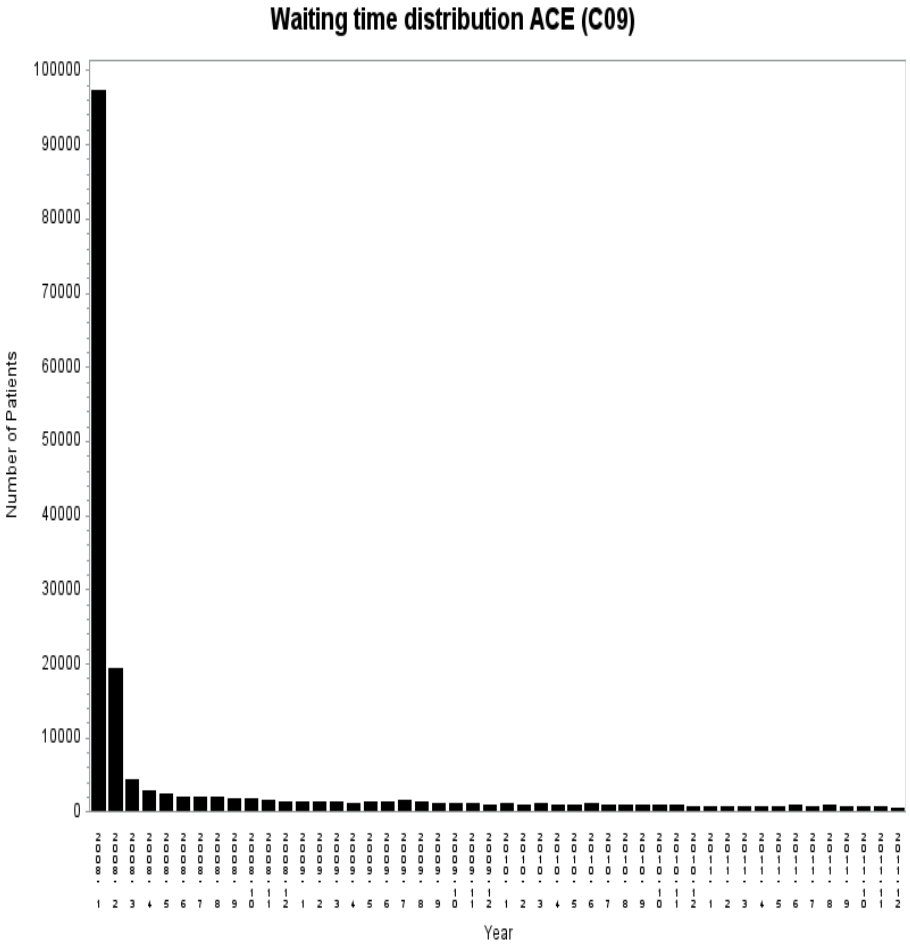
Drug utilization statistics for individual-level pharmacy dispensing data†

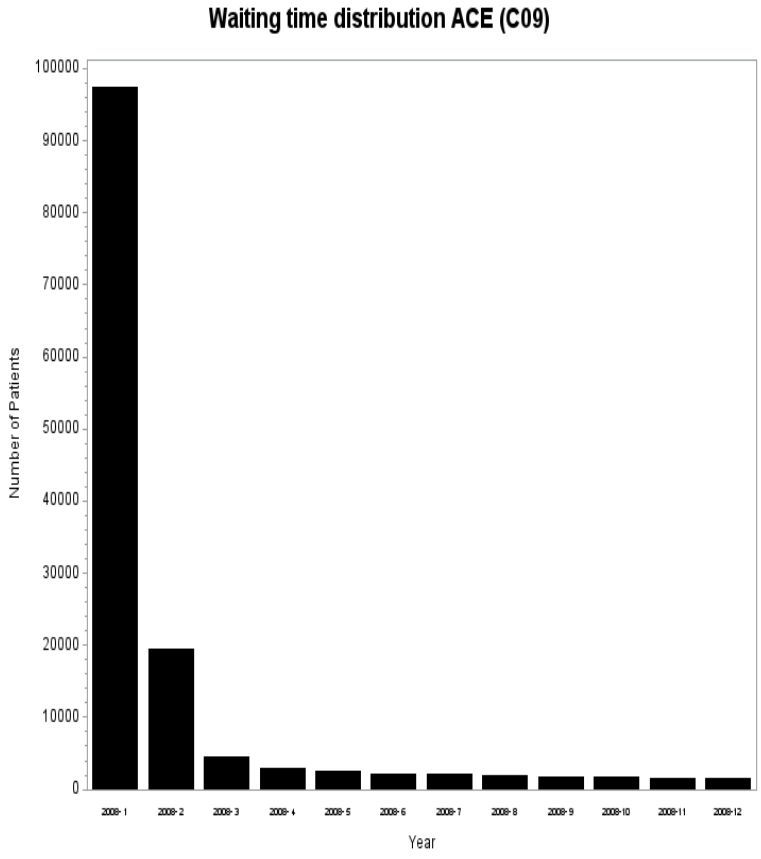
Jesper Hallas MD, PhD*

Department of Clinical Pharmacology, University of Southern Denmark, Denmark; Department of Internal Medicine, Odense University Hospital, Odense, Denmark

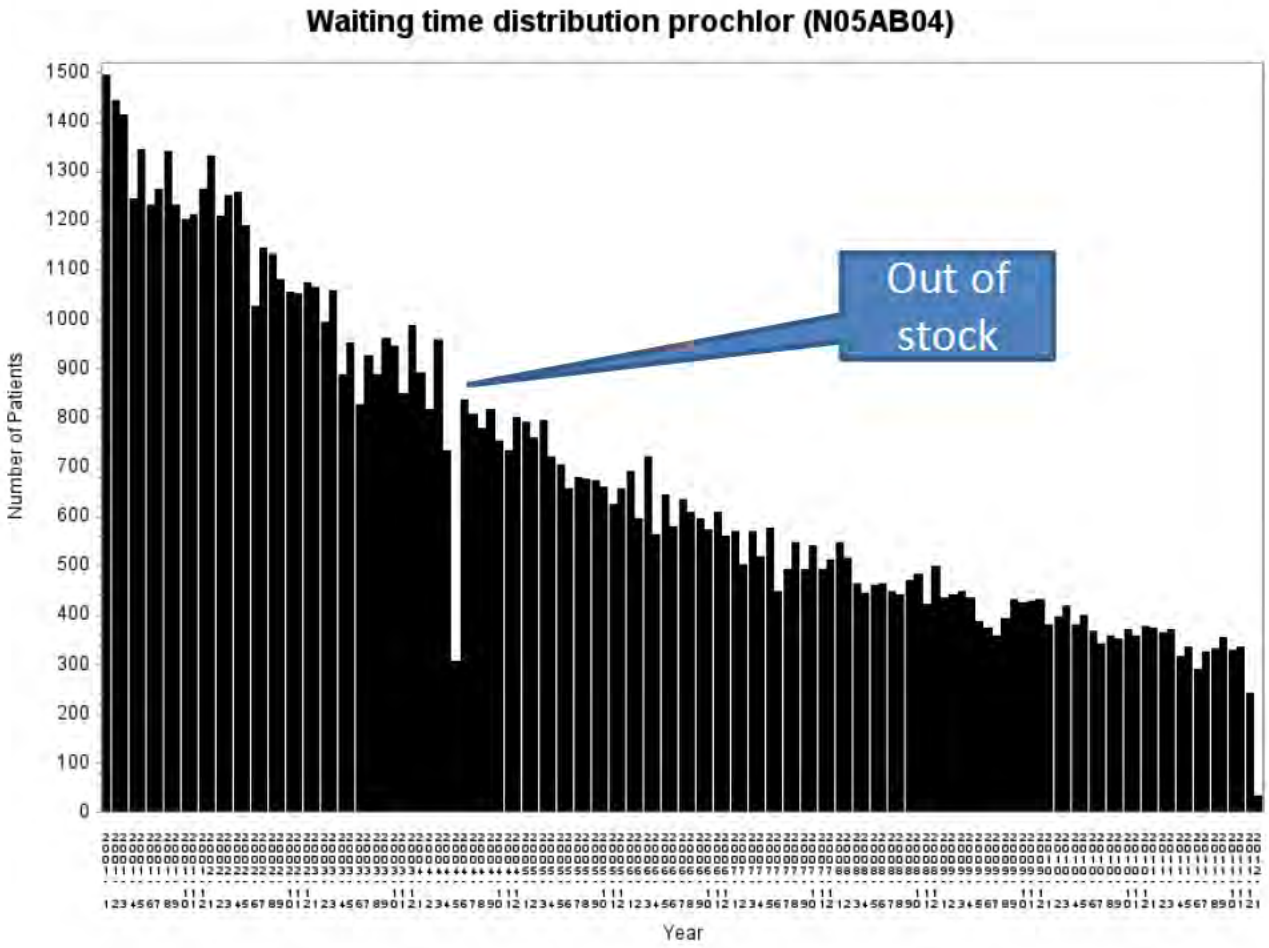
Waiting time distribution

- Simple counts (or rates) of the first prescription in the data set for an individual person of either a product, medicine or class plotted across time

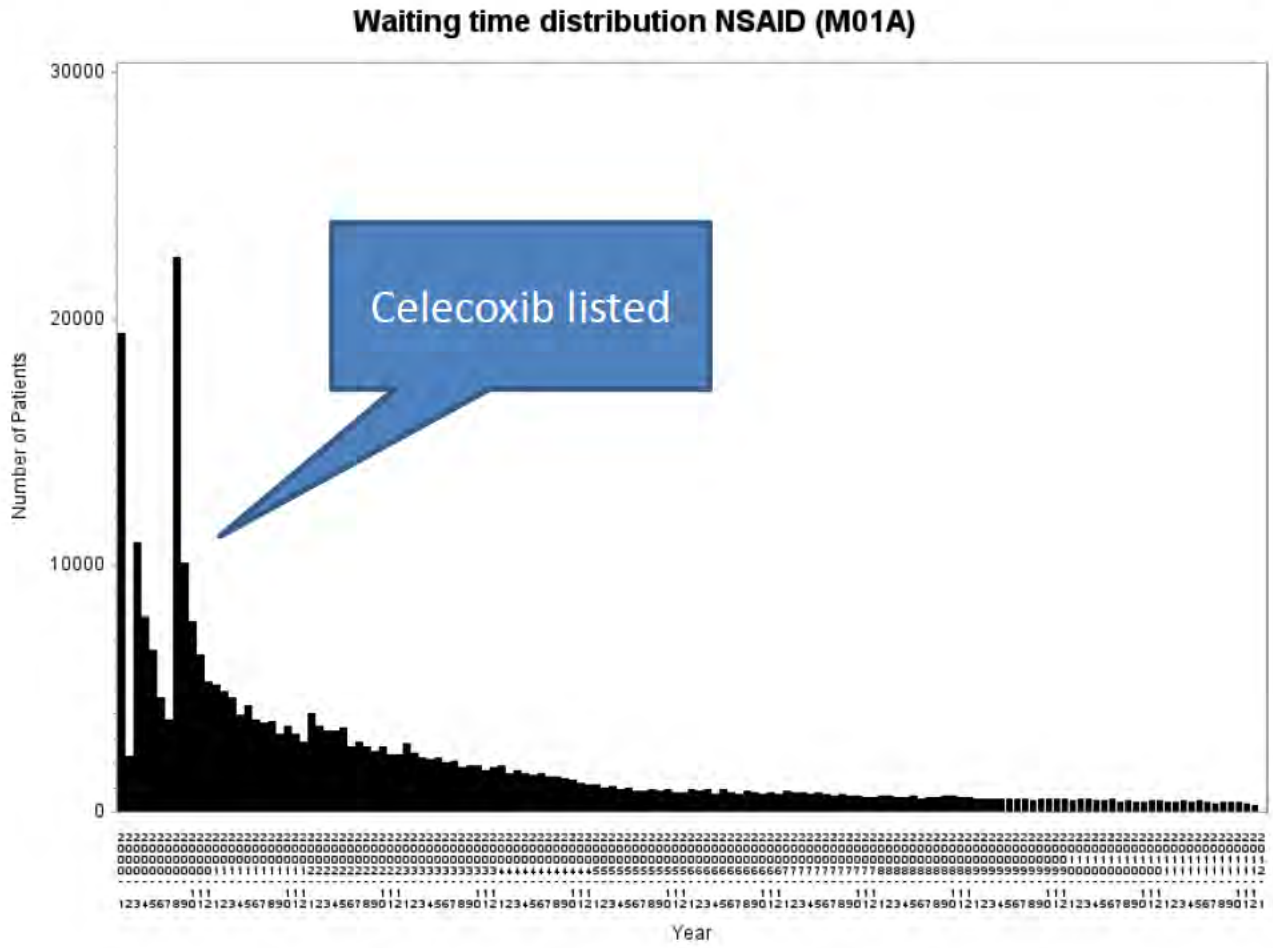

Waiting time distribution ACE (C09)
Number of Patients
Year


Waiting time distribution ACE (C09)
Number of Patients
2008-1
2008-2
2008-3
2008-4
2008-5
2008-6
2008-7
2008-8
2008-9
2008-10
2008-11
2008-12
Year

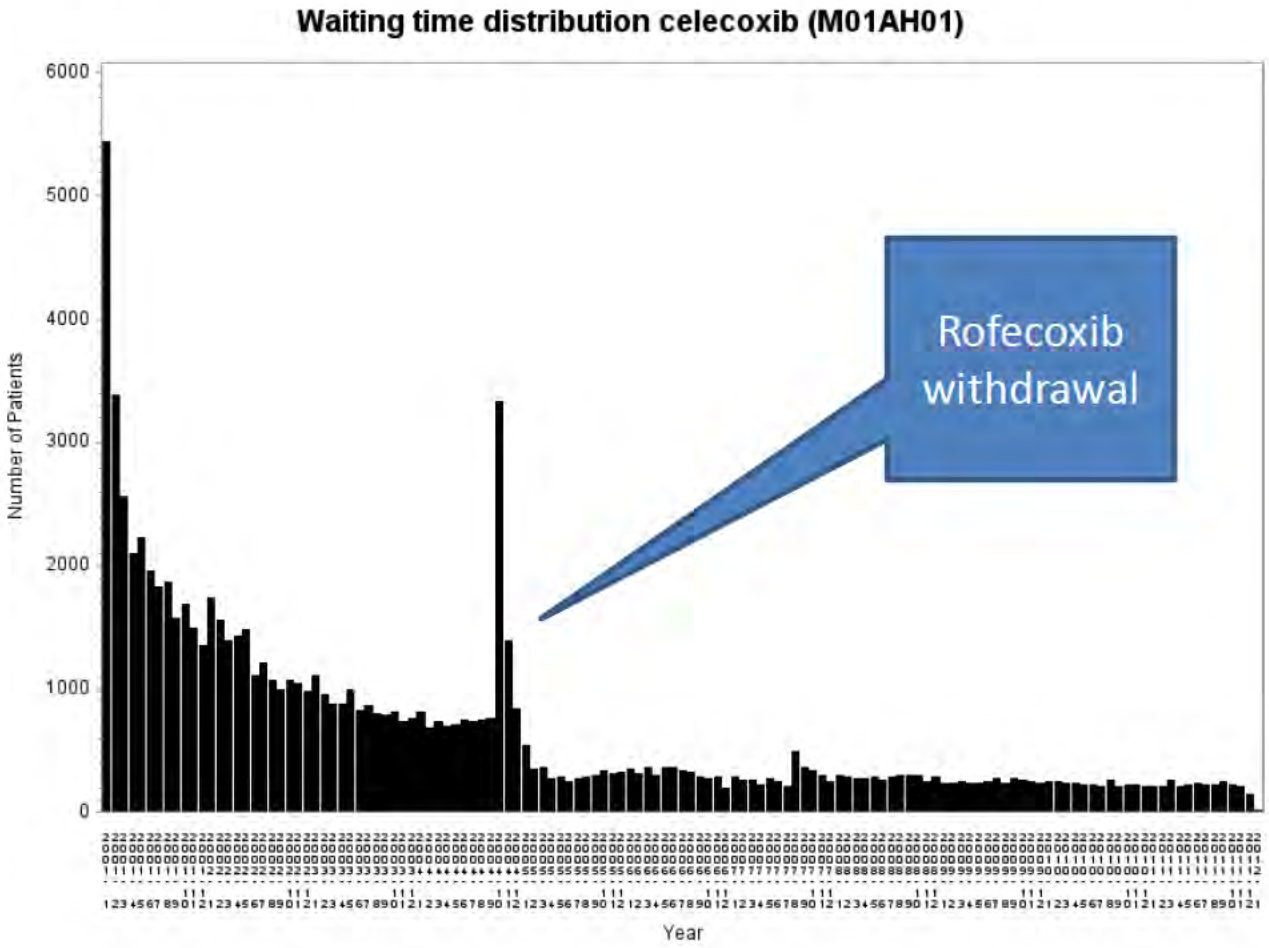
Identifying problems in practice



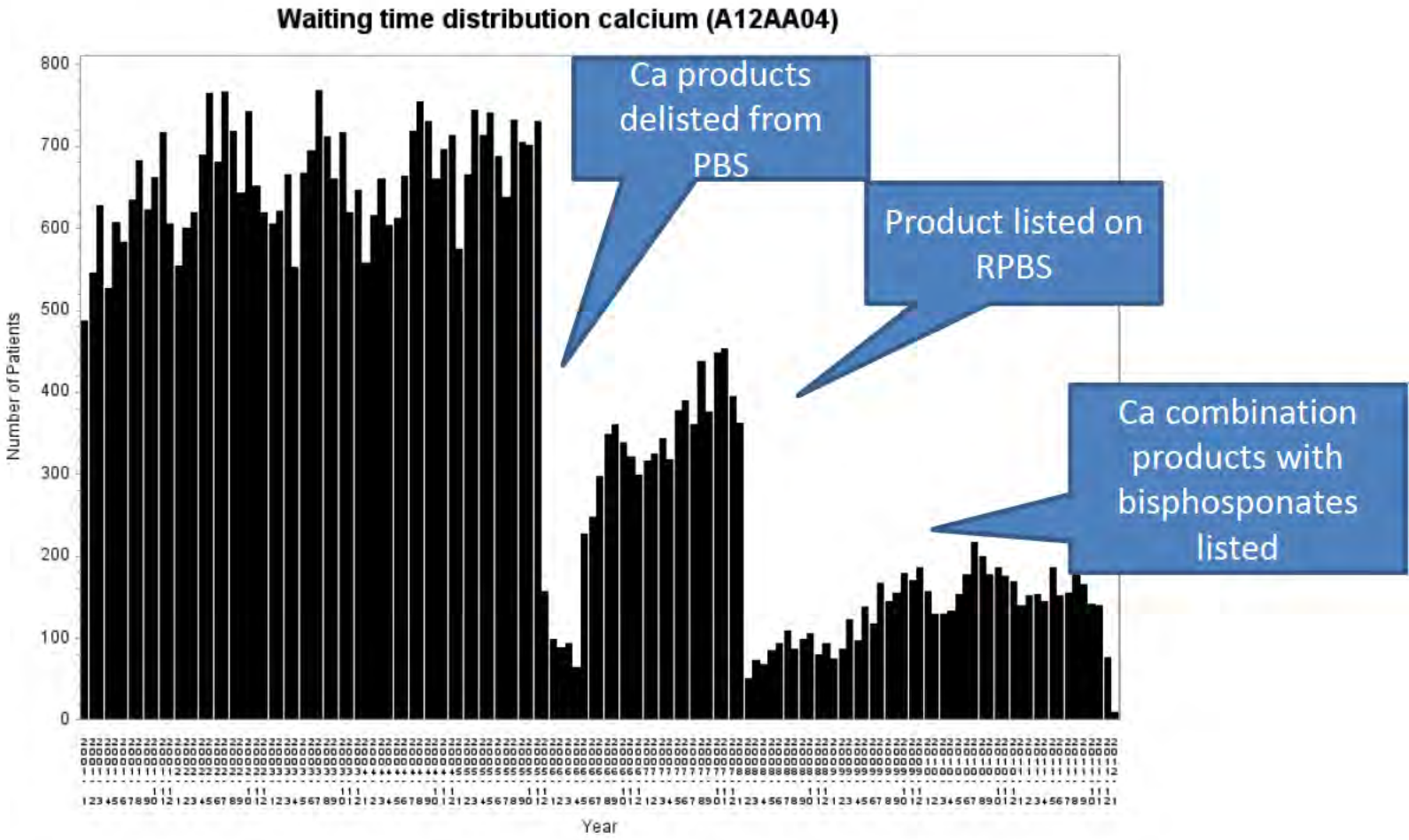
Identifying rapid changes in practice



Waiting time: celecoxib



Identifying rapid changes in practice



Prescription Symmetry

- Examines the likelihood of one prescription being dispensed prior to another for the same person

Drug A ⟷ Drug B

- Only uses incident cases for both events
- If Drug A causes Drug B, expect an excess of persons starting Drug B second

→ An asymmetrical distribution of prescription order

Advantage

- Easy to calculate, using prescription data only
- Robust towards confounders
  - Within person medicine use, over a short time
- Underlying seasonal or marketing trends adjusted for in the analysis

The data set required

(no more than three variables needed)

PBS Code	ATC code	Date supplied	Id
04179Y	B01AC04	03APR2006	201006
08333N	A02BC01	03APR2006	201006
08333N	A02BC01	10APR2006	201006
08333N	A02BC01	24APR2006	201006
04179Y	B01AC04	02MAY2006	201073
08333N	A02BC01	02MAY2006	201073

The Australian PBS code

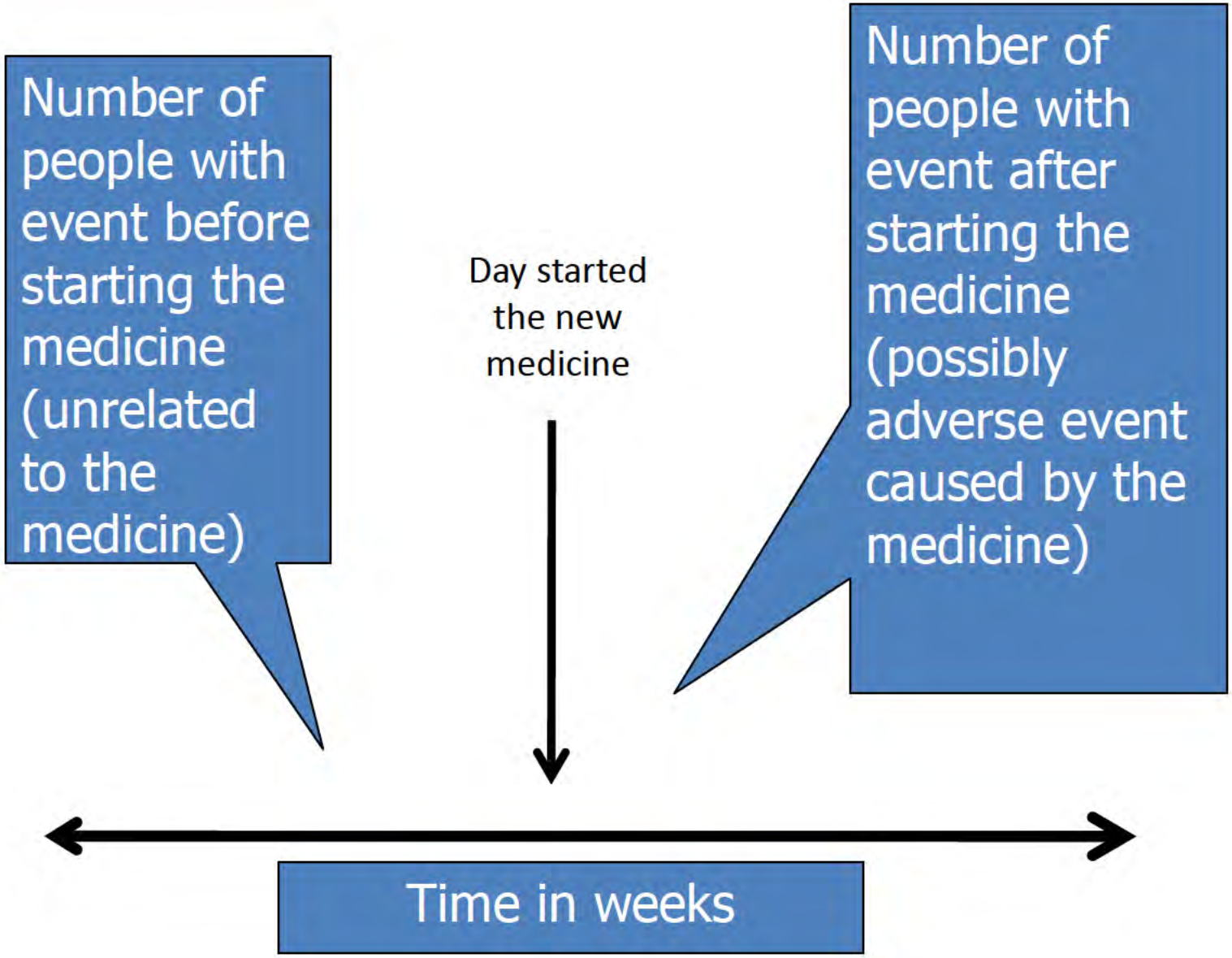
The WHO international code

Scrambled identifier

The steps

- Determine waiting time distribution for each medicine
- %***overall_atcpat_first(C01BD01,Amiodarone,7);***

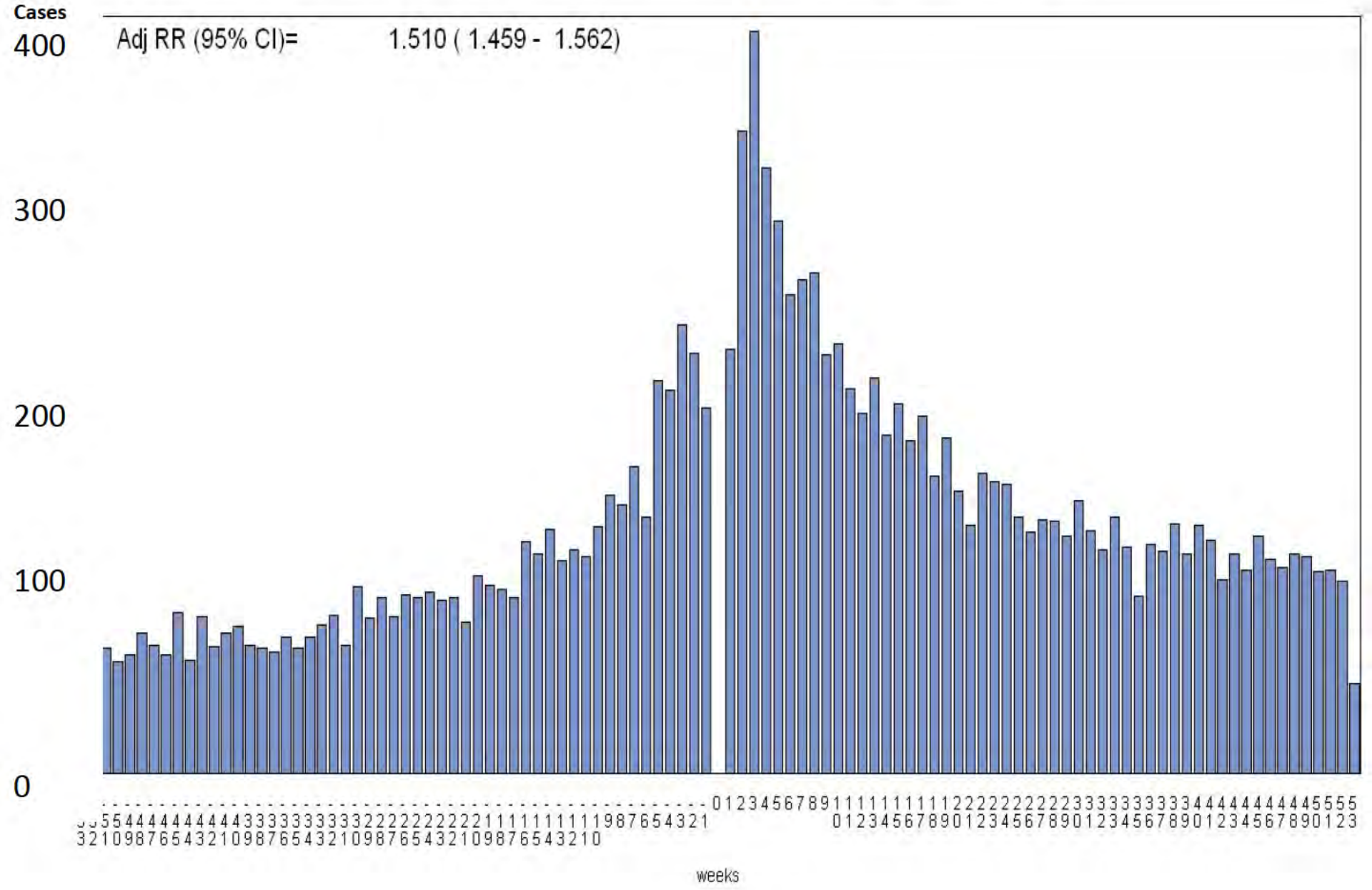
- Determine event sequence
- %***pssa(C01BD01,Amiodarone,H03AA01,Thyroxine,2000,2001,);***


Number of people with event before starting the medicine (unrelated to the medicine)
Day started the new medicine
Number of people with event after starting the medicine (possibly adverse event caused by the medicine)
Time in weeks

- Examples
  - Do NSAIDs precipitate heart failure?
  - Do calcium channel blockers precipitate peripheral oedema
    - Loop diuretics are the indicator medicine

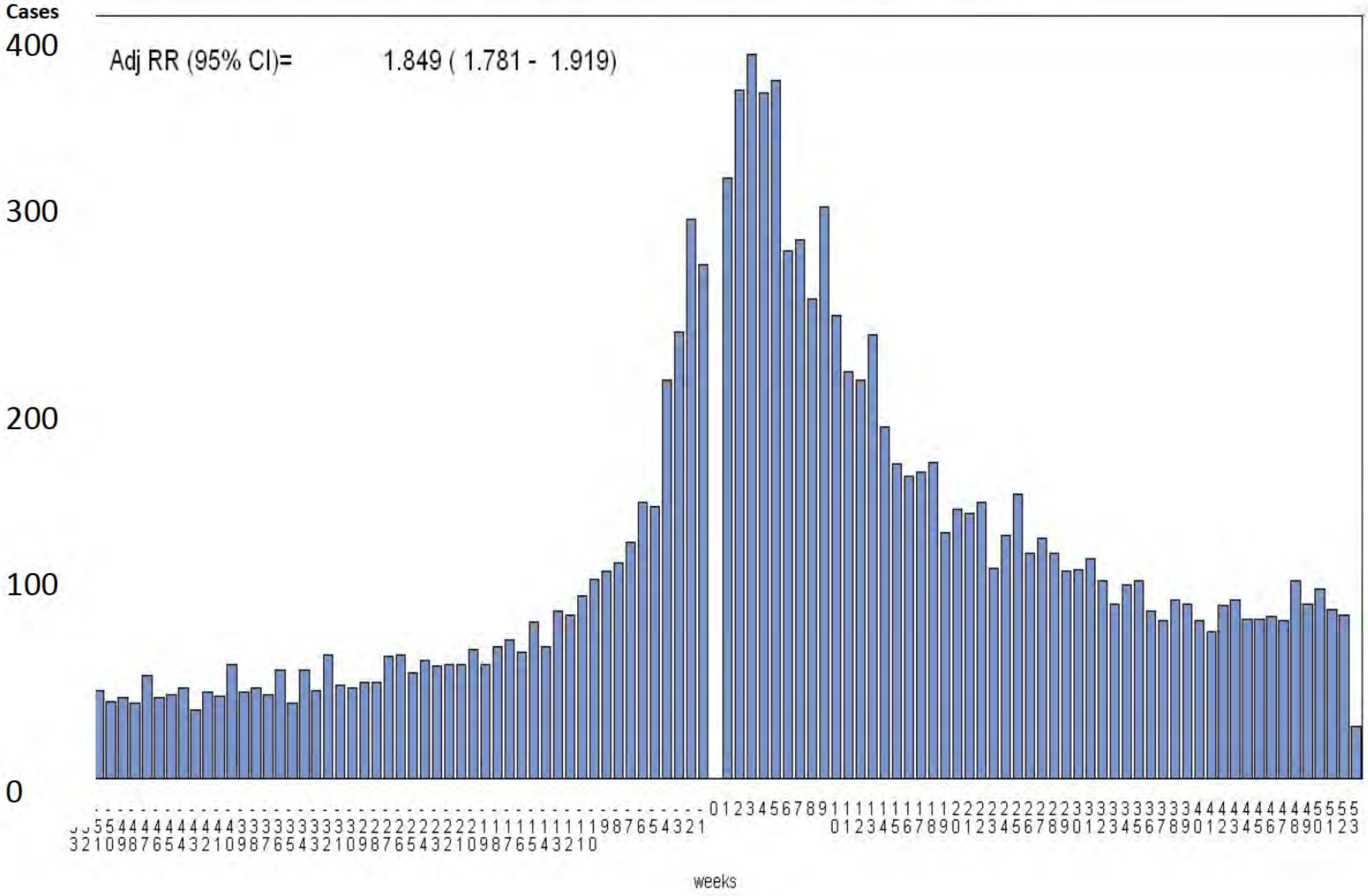
PSSA NSAIDs Frusemide 2001 - 2009

Non-causal Group (Frusemide --> NSAIDs) Causal Group (NSAIDs --> Frusemide)



PSSA Ca_Channel Frusemide 2001 - 2008

Non-causal Group (Frusemide --> Ca_Channel) Causal Group (Ca_Channel --> Frusemide)



Is the method valid?

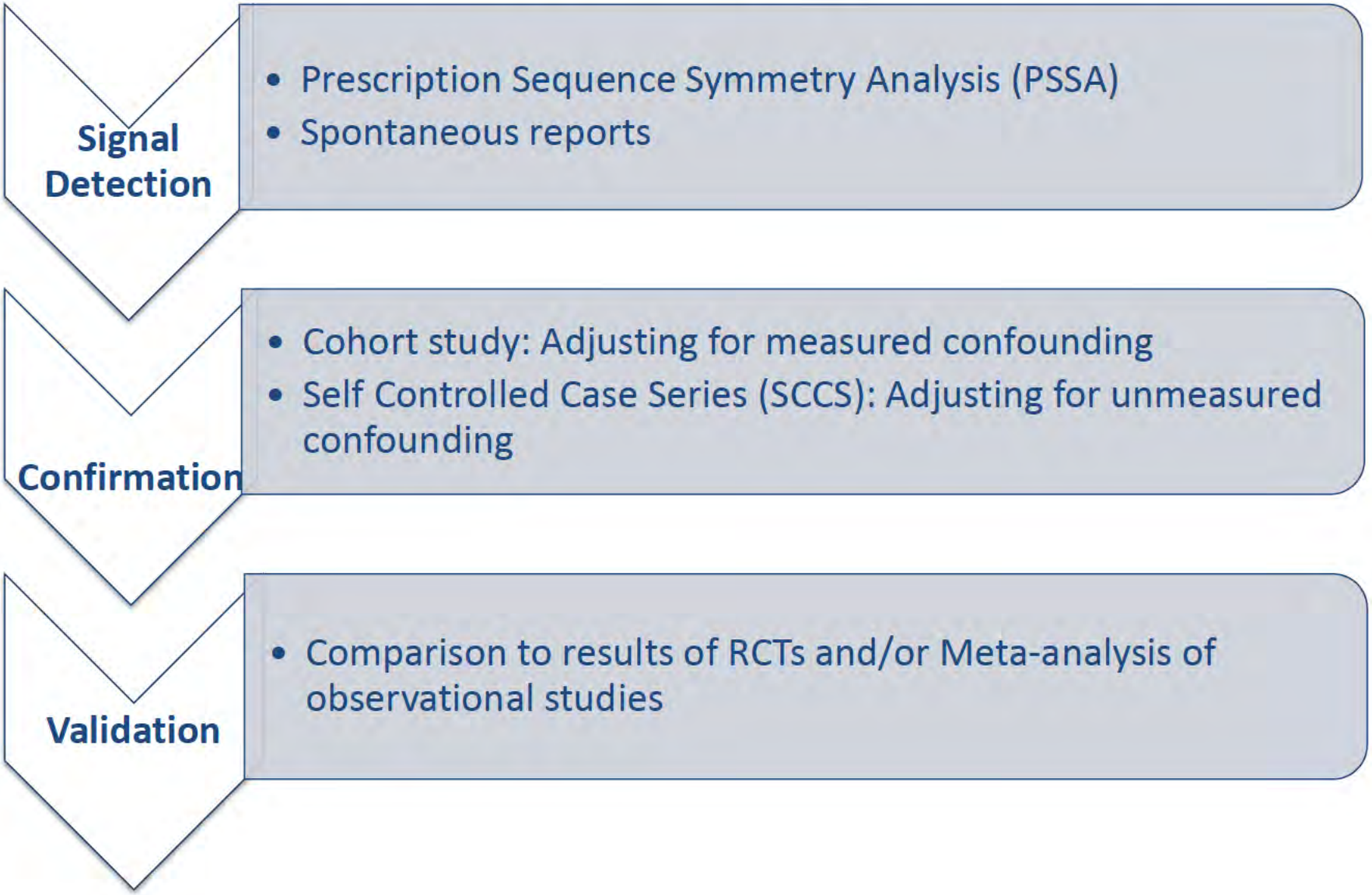
- We tested the sensitivity and specificity of the method
- 19 medicines; 165 adverse event pairs
  - 44 positive events (known adverse reactions); 121 negative events (unlikely events)
  - Sensitivity 61% (percent of times it correctly identified a positive event)
  - Specificity 93% (percent of times it correctly identified a negative event)

How does its validity compare to existing methods?

	Dispensing data method	Spontaneous reports methods		
Methods	Sequence Symmetry Analysis (SSA)	Proportional reporting ratio (PRR)	Reporting odds ratio (ROR)	Bayesian Confidence Propagation Neural Network (BCPNN)
Sensitivity (%)	65	49	49	51
Specificity (%)	90	92	92	89

- Where the result is positive, it is quite likely to be valid
- Interpretation requires reading the graphic and the statistic
- Only suitable for acute events
- Not suitable where medicine initiation associated with the event (eg medicines commonly initiated in hospital for the condition under study). This often results in an apparent protective association which does not indicate safety

Potential place in safety assessment



Potential place in drug utilisation research

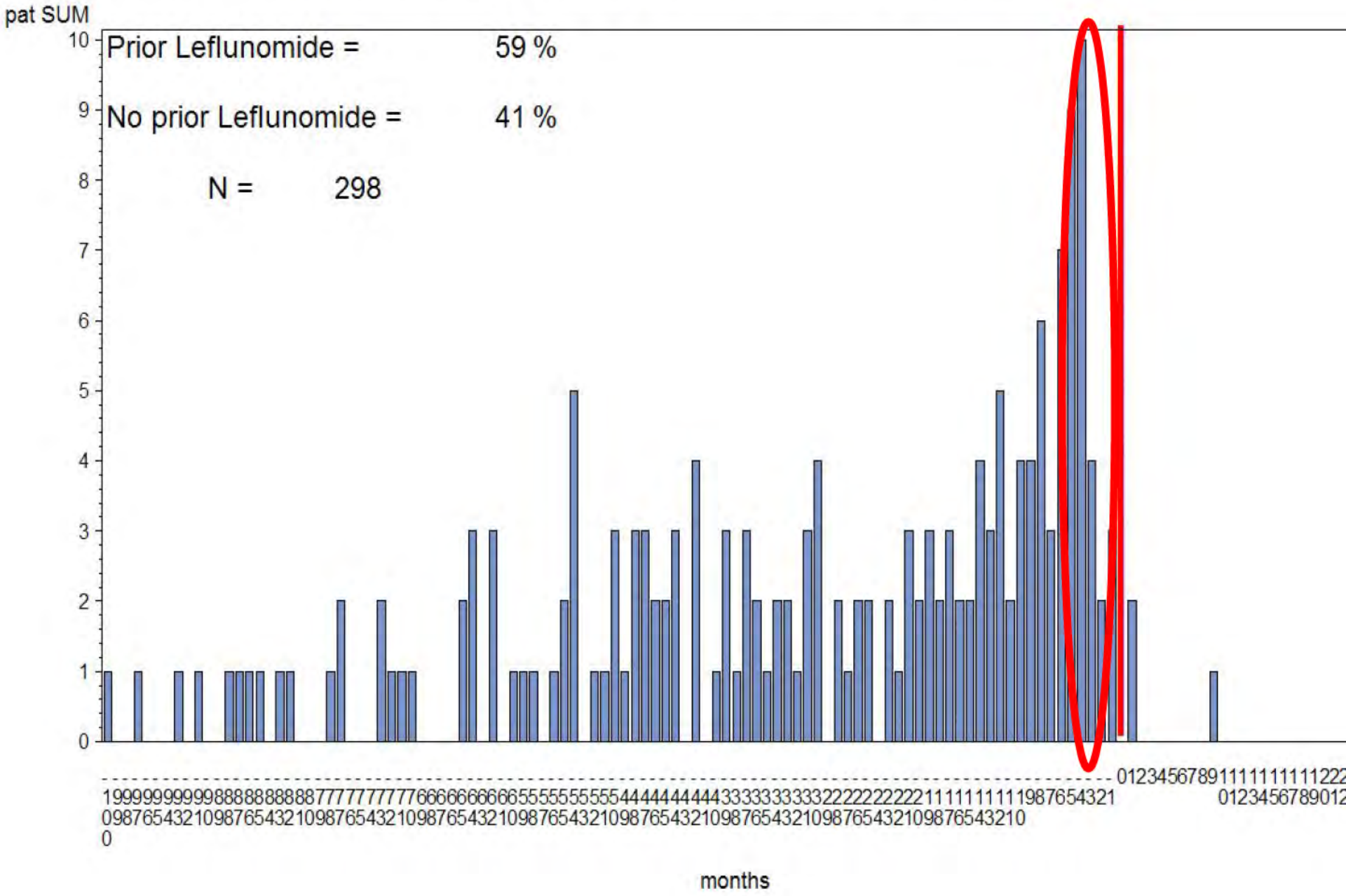
- We have used these types of analyses to underpin studies and then subsequent interventions targeting
  - Appropriate use of medicines for glaucoma in those with comorbidity
  - Medicines potentially contributing to worsening incontinence

Quality measures

Prior use listings

- Modification of the PSSA algorithm to run across the entire time frame of the data set enables assessment of utilisation of co-dependent technologies
- It was an Australian subsidy requirement that leflunomide was trialed (for at least three months) prior to initiation of TNF alphas for rheumatoid arthritis

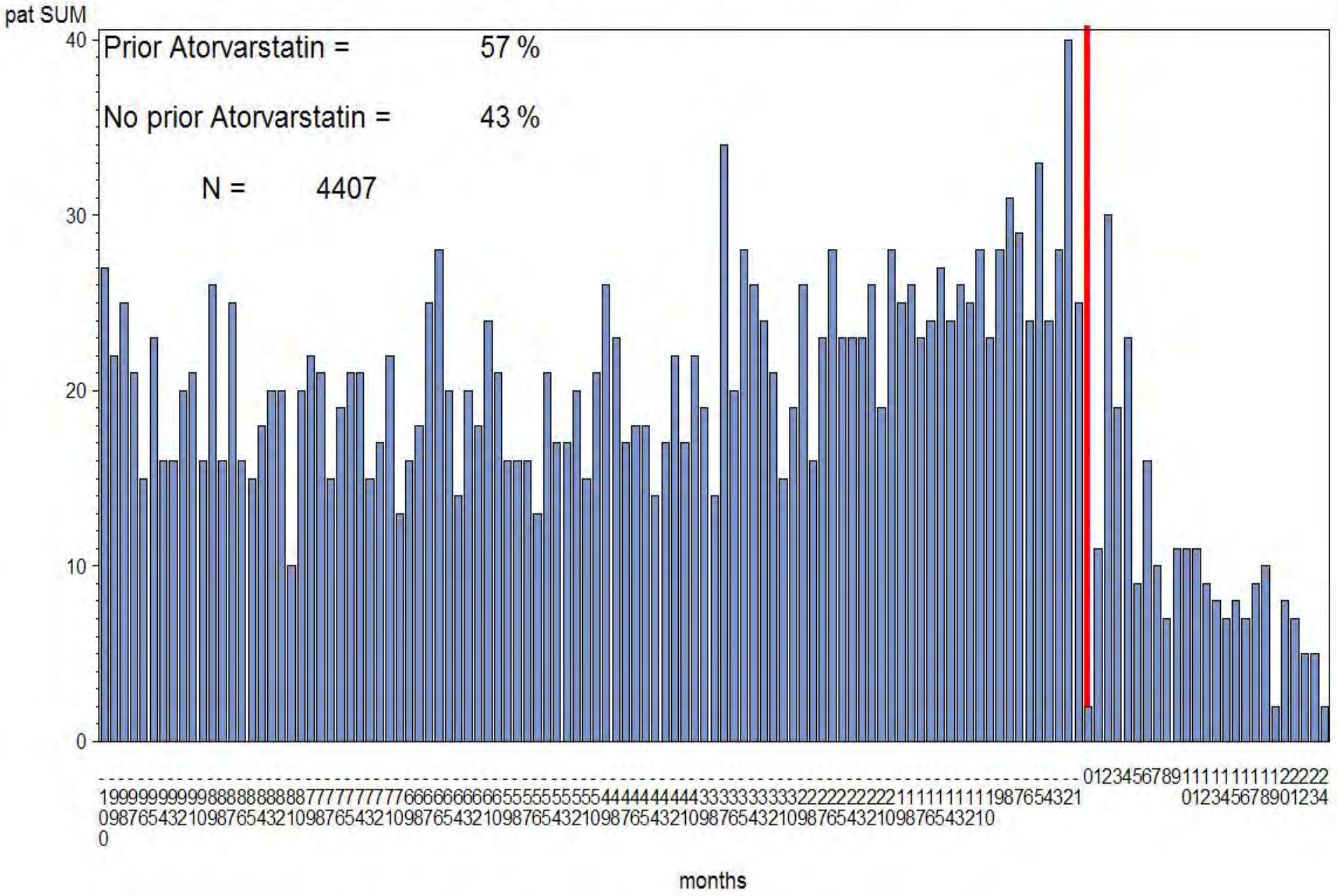
Leflunomide prior to TNFalpha



Combination product use

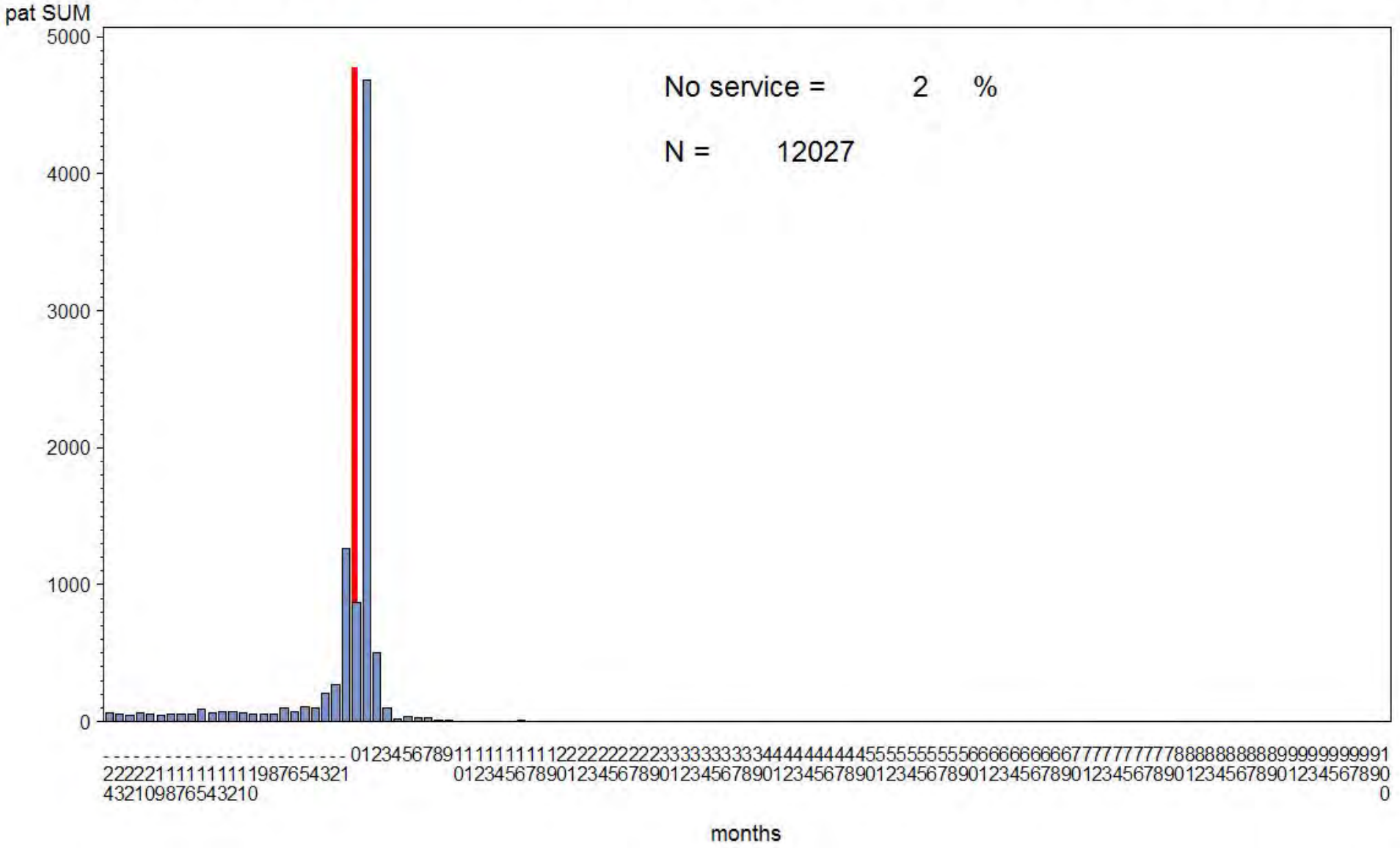
- Are single agents used prior to the initiation of combination products?

Atorvarstatin prior to Atorvastatin-Amlod

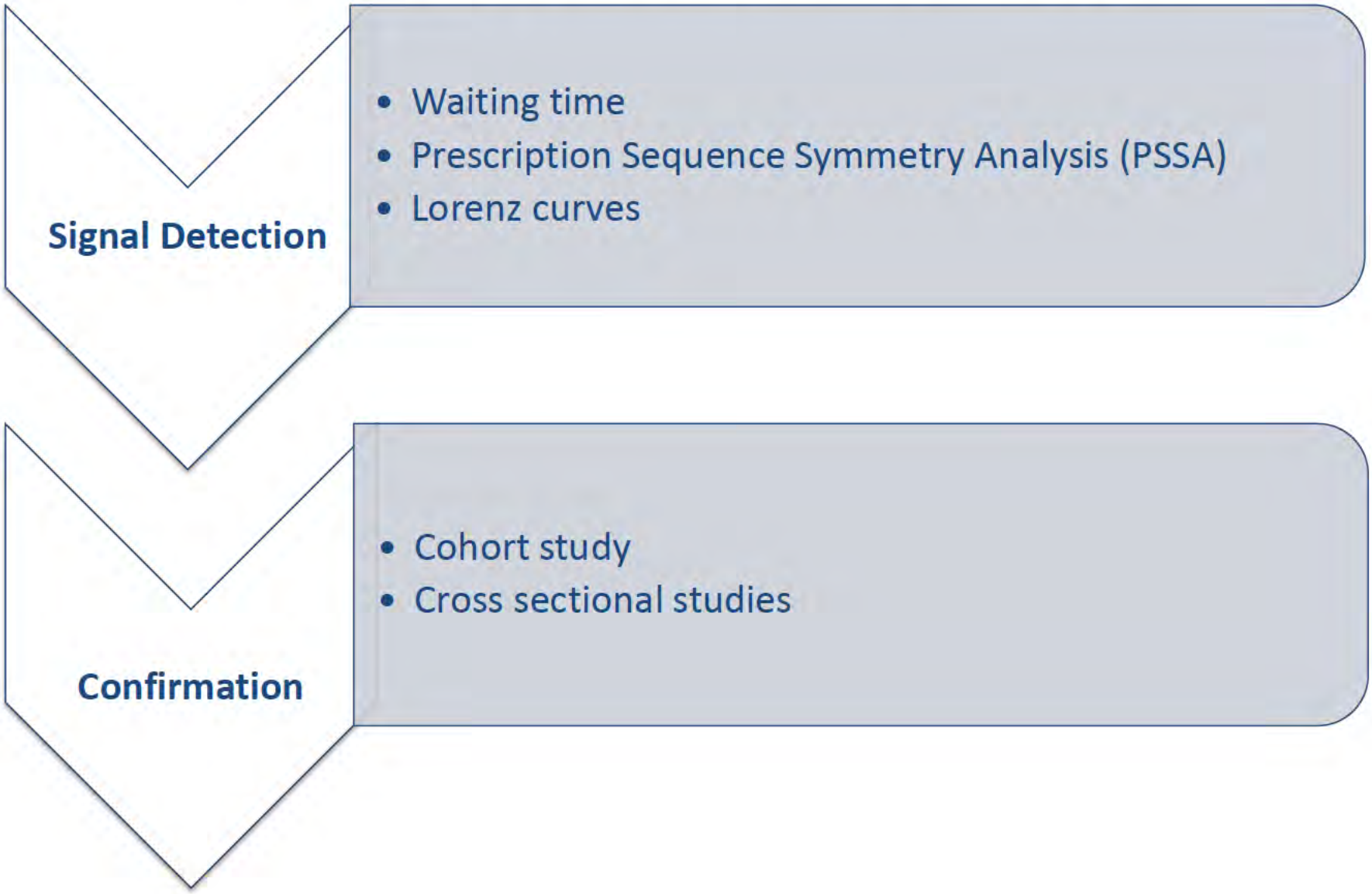


Listing dependent on service use

clopidogrel for those with drug_eluting_stent in 2004 - 2008



Potential place in medicine utilisation



Cohort studies

- Compliance studies
  - Measurement: does it differ when measuring for local practice (primary care) or national programs?

Compliance studies

- Most duration studies are limited to new users of medicines and limited to their first episode of use
- Focus on the people/practice
  - For chronic therapies we need to know this over their life time of use
  - To what extent can this be improved?

Why does studying compliance matter?

- Application for funding products/programs that improve compliance
- Determining need for quality use of medicines programs (at the public health level)
- Evaluating improvements in programs

How long do people stay on bisphosphonates?

- 2007 systematic review
- 14 studies
- Persistence rates at one year varied between 18% and 78%, with the majority finding 43% and 55% persistent at one year
  - All but one study only included new users
  - Most only followed patients for a year
- But people stop and start, what is the measure of compliance overall

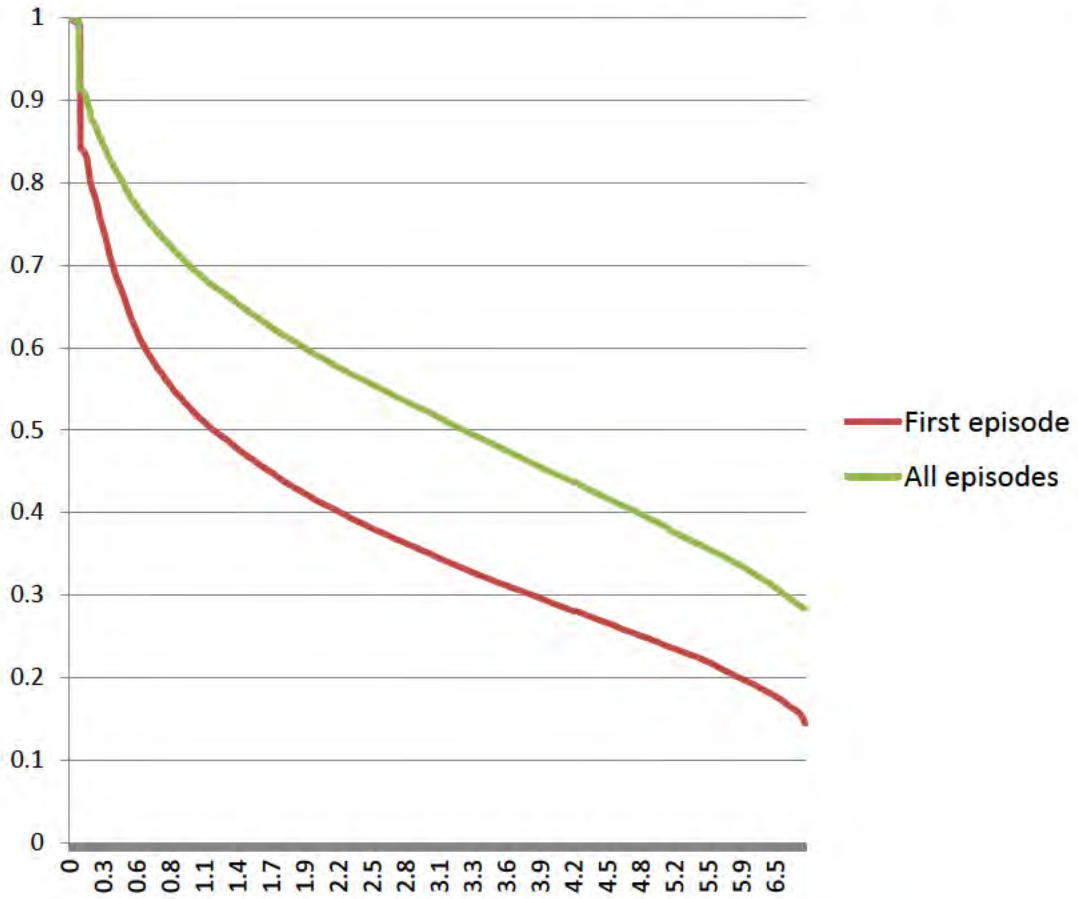
Can we measure overall duration?

- DVA study
- Study period 7 years
- Veterans, gold card holders, with at least one dispensing of a bisphosphonate
- Followed until death or study end
  - Sub group analysis by new and existing users

Results

- 42,885 veterans
- For new users,
- 47% of subjects had discontinued treatment at the end of the first year.
    - international results; 43% and 55%
- Medication possession ratio 0.66
    - international studies 0.66-0.70
- These results are consistent with the earlier studies
- However, overall duration gives a different estimate

Overall use:



Median duration of 3.3 years

Existing users median duration of 5.6 years

81% adherent for total duration of use

37% no gaps in treatment

Median gap = 1.7 years

Australian Government
Department of Veterans' Affairs

Veterans' MATES

- Need for compliance studies for chronic therapies to reflect use in practice
- Methods development still required

Conclusion

- There are challenges in targeting drug utilisation research to areas of need
- Health technology decision makers and regulatory agencies increasingly identifying issues to target for drug utilisation research
- Rapid assessment methods have the potential to help target areas of concern
- Need to be supported by more rigorous methods
- There is still a need for advanced methods development in drug utilisation research

- We wish to acknowledge the Department of Veterans' Affairs, which provided all data in these analyses

Urinary incontinence: a poorly recognised adverse effect of medicines

LM s 47F s 47F NL s 47F JD s 47F EE s 47F

Quality Use of Medicines and Pharmacy Research Centre, School of Pharmacy and Medical Sciences, Sansom Institute, University of South Australia, Adelaide, Australia

This research was funded by the Australian Government Department of Veterans' Affairs as part of the delivery of the Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) project. The authors have no conflicts of interest to declare.

Background

Urinary incontinence (UI) is common in the elderly, with prevalence of 35% in elderly community dwelling women and 26% in elderly community dwelling men.[2]

Reports of UI as an adverse effect of medicines are infrequent.[3] However, many commonly used medicines have UI listed as a potential side effect. Very few studies have estimated the risk of UI associated with medicines. We located only four studies which assessed the risk of incident UI with medicine use.[4-7]

Objectives

Our study aimed to estimate the risk of urinary incontinence in new users of medicines which have been reported to be associated with urinary incontinence.

Methods

Department of Veterans' Affairs (DVA) administrative claims data were used. These data contain details of all prescription medicines, medical and allied health services and hospitalisations provided to veterans for which DVA pay a subsidy.

Medicines associated with UI were identified from the Australian Medicines Handbook,[8] Meyler's Side Effects of Drugs,[9] and the approved Australian product information for medicines. Published papers which listed drug causes of urinary incontinence were also identified and reviewed to identify any additional medicines. We excluded any medicines not subsidised under the Australian national pharmaceutical insurance scheme. The final list of medicines with the potential to cause or worsen UI which were included in the study is shown in Table 1.

Table 1 - Medicines reported to be associated with urinary incontinence

Medicine associated with incontinence	Evidence
Prazosin	Level II
Diuretics	Level II
Calcium channel blockers	Level IV
Agents acting on the renin – angiotensin system	Level III
Hormone replacement therapy**	Level 1
Opioid analgesics	Level IV
Anticonvulsants	Level IV
Levodopa	Level III
Antipsychotic	Level III
Anxiolytic	Level IV
Hypnotic/sedative	Level IV
SSRIs	Level II
Venlafaxine	Level III
Anticholinesterase	Level II

Prescription sequence symmetry analyses (PSSA) were undertaken to examine asymmetry in the distribution of incident oxybutynin prescription before and after the initiation of medicines with the potential to cause or worsen urinary incontinence, using data for medicines dispensed between 1 January 2001 and 31 December 2011.

Asymmetry may indicate an association of medicines reportedly associated with incontinence with subsequent initiation of oxybutynin to treat urinary incontinence. We calculated the ratio of the number of people who initiated oxybutynin after initiation of a medicine associated with UI, versus the number of people who initiated oxybutynin before initiation of a medicine associated with UI (the crude sequence ratio).

The probability of medicines associated with urinary incontinence to be prescribed before oxybutynin, in the absence of any causal relationship, was estimated by a null-effect sequence ratio. The adjusted sequence ratio (ASR) was obtained by dividing the crude sequence ratio by the null-effect ratio and 95% confidence intervals were calculated.[19] The bootstrap method was used to generate 95% confidence intervals using 500 replicates.

All analyses were undertaken using SAS for windows, V9.1.3 SP4 (SAS institute, Cary, North Carolina, USA).

Results

PSSA results are shown in Table 2.

Significant associations between initiation of CCBs, ACEI, ARBs, and hypnotic/sedatives and subsequent initiation of oxybutynin were found. ASRs ranged from 1.28 (95% CI 1.18-1.39) for ACEI to 1.45 (95% CI 1.33–1.96) for CCBs. [Figure 1 and Figure 2].

Table 2 - Risk of incident oxybutynin dispensing after initiating a medicine that may be associated with UI (statistically significant results in bold)

Medicine	n	Oxybutynin initiated in the 12 months:		Crude sequence ratio	Adjusted sequence ratio (95% CI)
		Before medicine	After medicine		
Prazosin*	**135**	**88**	**47**	**1.87**	**1.84 (1.29-2.63)**
Diuretics	**3669**	**1805**	**1864**	**0.97**	**0.93 (0.87–0.99)**
CCB	**2230**	**1337**	**893**	**1.50**	**1.45 (1.33–1.57)**
ACEI	**2616**	**1496**	**1120**	**1.34**	**1.28 (1.18–1.39)**
ARB	**2040**	**1196**	**844**	**1.42**	**1.42 (1.30–1.55)**
HRT*	**2446**	**1512**	**934**	**1.62**	**1.54 (1.42–1.67)**
Opioids	4952	2557	2395	1.07	1.03 (0.98–1.09)
Anticonvulsant	1436	718	718	1	1.01 (0.92–1.12)
Levodopa	602	306	296	1.03	1.03 (0.88–1.21)
Antipsychotic	3062	1416	1646	0.86	0.83 (0.78–0.89)
Anxiolytic	2121	1076	1045	1.03	0.99 (0.91-1.08)
Hypnotic/ sedative	**3326**	**1786**	**1540**	**1.16**	**1.10 (1.03-1.18)**
SSRIs	2526	1320	1206	1.09	1.06 (0.98-1.15)
Venlafaxine	600	323	277	1.17	1.14 (0.97-1.33)
Anti-cholinesterase	700	371	329	1.13	1.08 (0.93–1.26)

*Women only; CCB = calcium channel blocker; ACEI = ACE inhibitor; ARB = angiotensin II receptor blocker; HRT = hormone replacement therapy

Figure 1- Increased risk of oxybutynin initiation following ACE inhibitor initiation

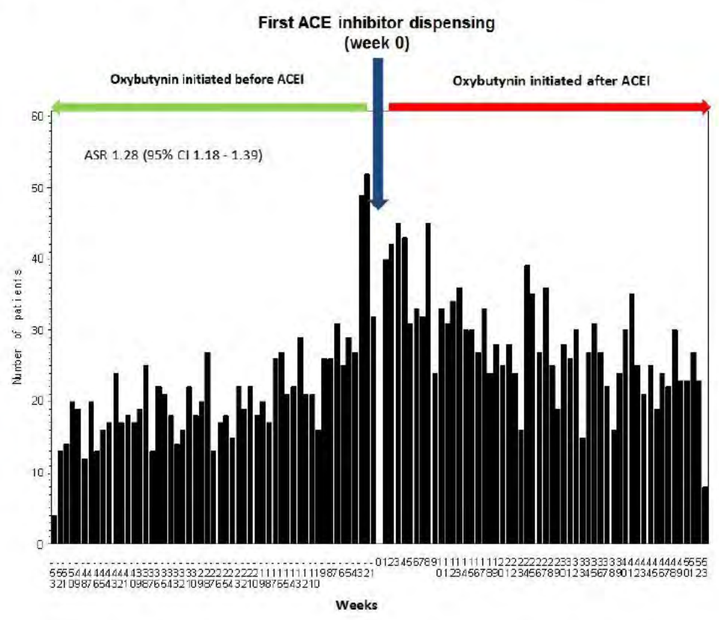
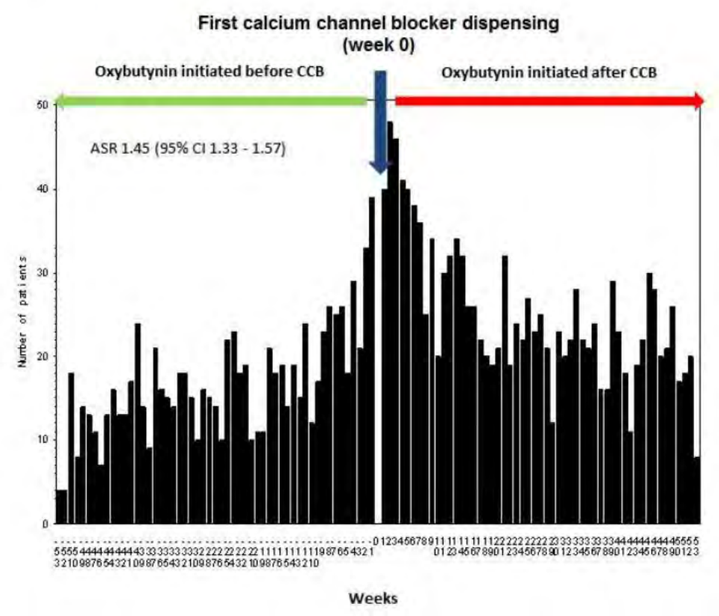


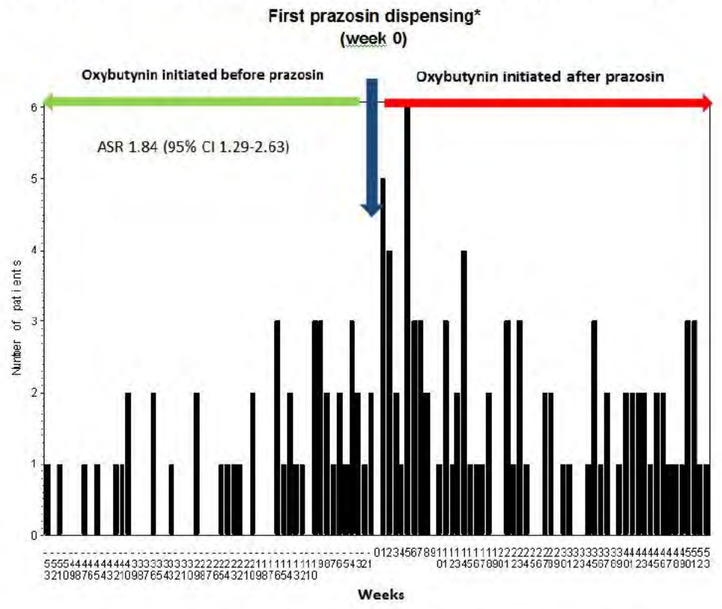
Figure 2 – Increased risk of oxybutynin initiation following calcium channel blocker initiation



Results (continued)

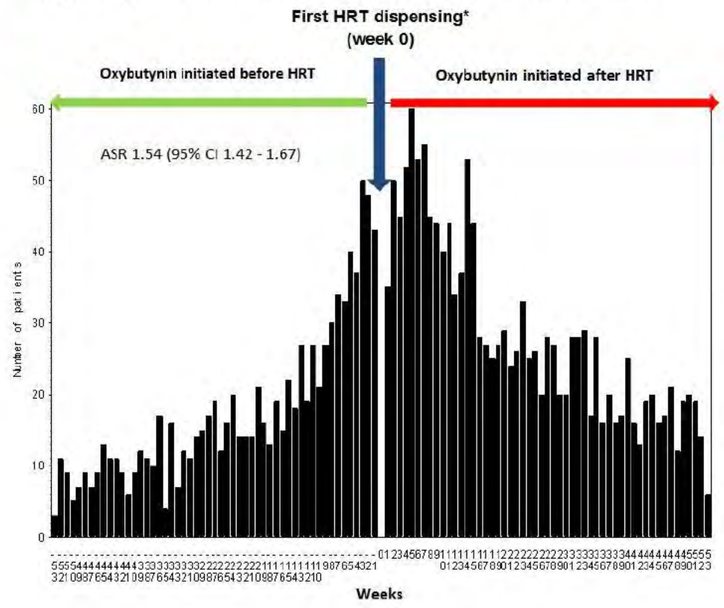
Amongst female patients, there was increased risk of initiation of oxybutynin following prazosin (ASR 1.84 (95% CI 1.29-2.63) and hormone replacement therapy initiation (ASR 1.54 (95% CI 1.42-1.67) [Figure 3 and Figure 4].

Figure 3 - Female patients: Increased risk of oxybutynin initiation following prazosin initiation



* PSSA for prazosin was undertaken for female patients only, because prazosin use in men may be for benign prostatic hypertrophy (BPH); a condition with which urinary incontinence is associated.

Figure 4 - Female patients: Increased risk of oxybutynin initiation following HRT initiation



*PSSA for HRT was undertaken for female patients only

PSSA showed no significant association with initiation of opioids, anticonvulsants, levodopa, SSRIs, venlafaxine or anticholinesterases and subsequent initiation of oxybutynin.

Conclusion

Our study has highlighted the potential for initiation of commonly used medicines to be associated with subsequent initiation of oxybutynin to treat urinary incontinence and has provided an estimate of the risk of urinary incontinence associated with these medicines. Prescribers should be alert to urinary incontinence that occurs shortly after initiation of new medicines, and the potential for an adverse event should be considered.

References

1. Chiarelli P, Brown W, McElduff P. Leaking urine: Prevalence and associated factors in Australian women. Neurol Urodyn 1999;18:567-577.
2. Kwong P, Cumming R, Chan L, et al. Urinary incontinence and quality of life among older community-dwelling Australian men: the CHAMP study. Age Ageing 2010;39:349-354.
3. Health Canada. Canada vigilance adverse reaction online database. [22 January 2013]; Available from: http://www.hc-sc.gc.ca/dhp-mps/medeff/databasdon/index-eng.php.
4. Peron E, Zheng Y, Perera S, et al. Antihypertensive drug class use and differential risk of urinary incontinence in community-dwelling older women. J Gerontol A Biol Sci Med Sci 2012;67(12):1373-1378.
5. Ruby C, Hanlon J, Boudreau R, et al. The effect of medication use on urinary incontinence in community-dwelling elderly women. J Am Geriatr Soc 2010;58:1715-1720.
6. Hendrix S, Cochrane B, Nygaard I, et al. Effects of estrogen with and without progestin on urinary incontinence. J Am Med Assoc 2005;293:935-948.
7. Movig K, Leufkens H, Belitser S, et al. Selective serotonin reuptake inhibitor-induced urinary incontinence. Pharmacoepidemiol Drug Saf 2002;11:271-279.
8. Rossi S, editor. Australian Medicines Handbook. Adelaide: AMH; 2010.
9. Aronson J, editor. Meyler's side effects of drugs. The international encyclopedia of adverse drug reactions and interactions. Oxford: Elsevier; 2006.

Module 7

Veterans' MATES - Module Plan & Results

PPIs in GORD: Reduce the dose - Keep the benefits

June 2006

Veterans' Medicines Advice & Therapeutics Education Services

Veterans' MATES
Provided by: University of South Australia | Quality Use of Medicines and Pharmacy Research Centre
In association with: Discipline of General Practice, The University of Adelaide | Discipline of Public Health, The University of Adelaide | Repatriation General Hospital, Daw Park | NPS - Better choices, Better health | Australian Medicines Handbook | Drug and Therapeutics Information Service
UniSA
Australian Government
Department of Veterans' Affairs

Veterans'MATES - Module Plan & Results

PPIs in GORD:
Reduce the dose - Keep the benefits

June 2006

Veterans'MATES
Provided by: University of South Australia | Quality Use of Medicines and Pharmacy Research Centre
In association with: Discipline of General Practice, The University of Adelaide |
Discipline of Public Health, The University of Adelaide | Repatriation General Hospital, Daw Park |
NPS - Better choices, Better health | Australian Medicines Handbook | Drug and Therapeutics Information Service

UniSA

Australian Government
Department of Veterans' Affairs

FOREWORD

The Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) program aims to improve the health care of veterans and war widows through quality use of medicines and better use of health services.

Veterans' MATES is provided through a collaboration between the Department of Veterans' Affairs and The University of South Australia's Quality Use of Medicines and Pharmacy Research Centre. Veterans' MATES provides general practitioners, pharmacists, members of the veteran community, and at times other key stakeholders, with information to support quality use of medicines and better health service utilisation. The program uses administrative claims data to develop patient-specific feedback for general practitioners (GPs) identifying potential medication-related problems. Supportive educational material is provided to assist GPs to resolve these medication-related problems. Veterans identified in the GP mailing are sent an educational brochure highlighting medication issues and encouraging them to speak with their doctor. Educational material is also provided to all pharmacies and accredited pharmacists to enable pharmacists to support this practice change. The program commenced in 2004 and has covered a range of topics involving more than 250,000 veterans, 25,000 general practitioners and 8,500 pharmacists. The program is evaluated using surveys provided at the time materials are distributed as well as observational studies using administrative claims data.

This document provides a summary of the key materials developed as part of the Veterans' MATES Module 7 initiative. The module plan discusses the scope of the intervention, expected behaviour change and evaluation methods. A sample of the patient-specific feedback to practitioners, supporting educational materials and evaluation surveys are included. The results section provides a summary of the key findings of the evaluation.

s 47F

Prof Andrew s 47F
Project Director
Veterans' Medicines Advice & Therapeutics Education Services
Quality Use of Medicines and Pharmacy Research Centre
University of South Australia

CONTENTS

Module 7: Proton pump inhibitors, step down in the elderly

a) WHAT are we aiming to do?

Aim:

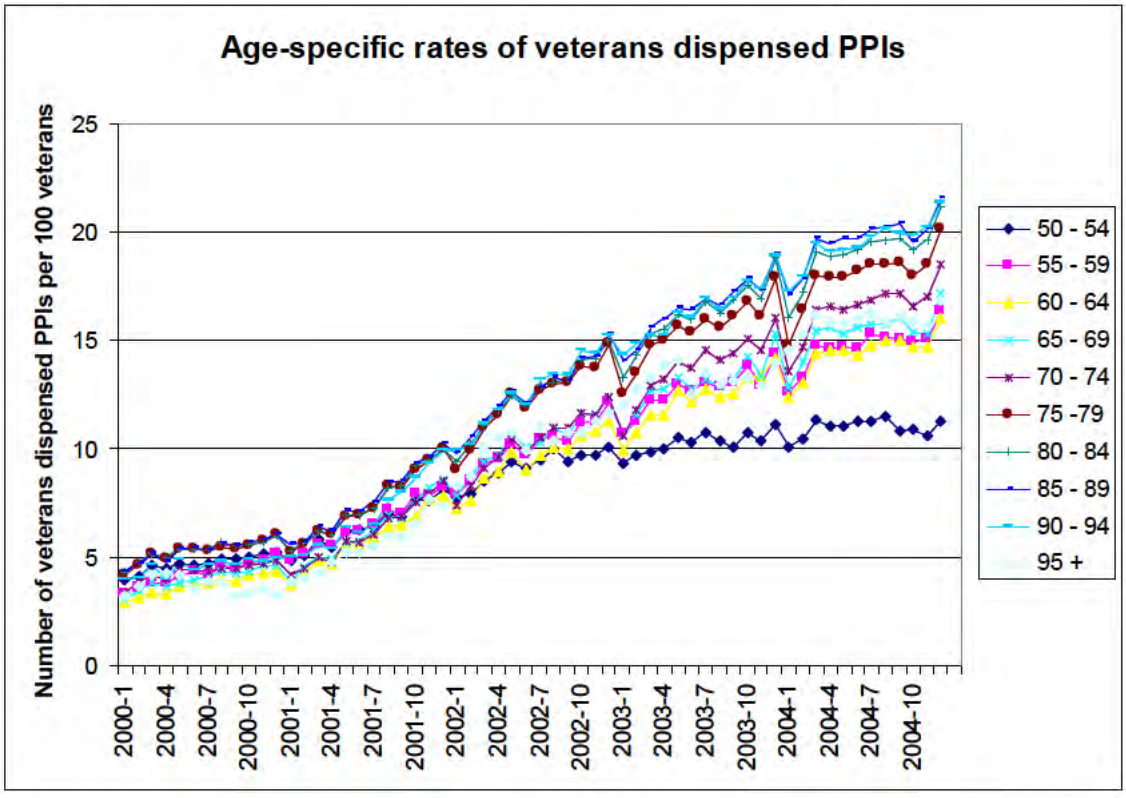
To increase the number of veterans dispensed low dose proton pump inhibitors.

b) WHY are we doing this module?

Acid-suppressive medicines are dispensed to large numbers of veterans. In the twelve months to 1st Dec 2004, 105,000 veterans received at least one dispensing for a proton pump inhibitor and 31,000 received at least one dispensing of a histamine 2 receptor antagonist. By comparison, antacid dispensings were less common, with 12,000 veterans receiving at least one dispensing for an antacid.

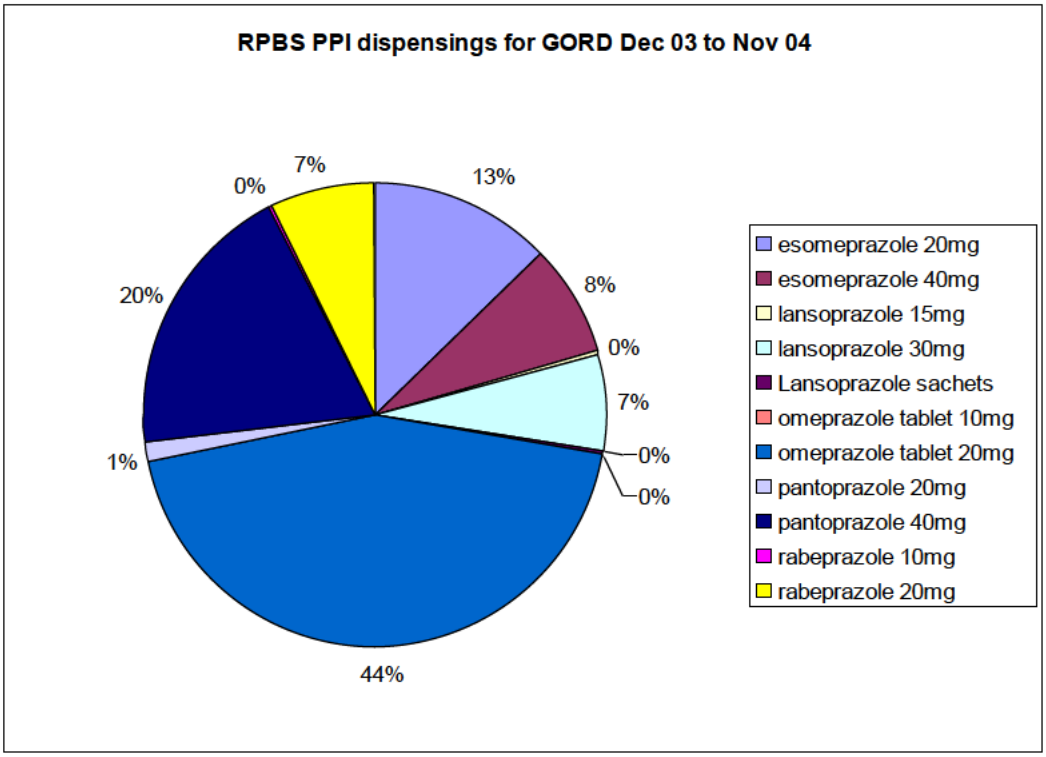
Figure 1 shows the age specific rates of veteran dispensed PPIs. It can be observed that the number of veterans receiving these medicines over the last five years has increased four fold and that the highest rates of dispensings are in the population aged 75 years and above, with approximately 1 in 5 veterans in this age group receiving a PPI.

Figure 1:



While the increased use, particularly in the older age groups, may reflect increased incidence of gastroesophageal ulcer and reflux, the doses of PPIs is an area of concern. Therapeutic Guidelines: Gastrointestinal recommend initial therapy for gastrointestinal oesophageal reflux disease(GORD) at the higher doses, however, for maintenance therapy, lower doses are recommended where possible (1). To determine the extent of dispensings of PPIs by dose, counts of prescription dispensings for PPI indicated for GORD over the twelve months to 1st Dec 04 were undertaken. This analysis (figure 2) shows that for all products except esomeprazole, the majority of dispensings is accounted for by the higher dose product.

Figure 2:



More recent concerns have also been expressed about the ongoing treatment with acid suppressive drugs and the risk of community acquitted pneumonia and community acquired respiratory infections. In a large case control study undertaken in the Netherlands it was found that there was an increased risk of community acquired pneumonia amongst those using PPIs (adjusted relative risk = 1.89; 95% CI, 1.36 – 2.62). For those on PPIs, a significant positive dose-response relationship was observed, suggesting lower dose therapy may be more appropriate (2). A much smaller study undertaken in the Netherlands also showed an association between gastric acid-suppressive therapy and community-acquired respiratory infections. Those using acid-suppressive medicines were 2.34 (95% CI, 1.4 – 4.1) times more likely to have a respiratory infection than those who did not. They were also more likely to have visited a doctor (OR = 3.72, 95% CI, 2.1-6.8), and received an antibiotic (OR = 4.19, 95% CI, 2.2-8.1) (3).

Key messages for module seven include:

- Step down to lower doses of PPIs for maintenance therapy
- Step down, particularly, in the very old, because of potential risk of respiratory infections.

c) Study objectives

1. To provide GPs with useful information about PPI dosing, particularly in the elderly.

2. To provide pharmacies with useful information about PPI dosing, particularly in the elderly.

3. To increase GPs' knowledge of the veterans they treat who are dispensed PPIs, the dose at which it is dispensed, the number of PPI prescriptions dispensed per veteran in the last twelve months and if current treatment is at the higher dose, whether a lower dose has been trialled in the previous 12 months.

4. To provide veterans with useful information GORD.

5. To increase the number of veterans who are dispensed low dose PPIs.

6. To increase the number of GPs who treat veterans with low dose PPIs.

d) HOW are we going to do it?

Target groups

Target groups for this intervention are:

- Veterans dispensed PPIs
- GPs who are the primary providers for the veterans targeted
- All pharmacies and accredited pharmacists and

Intervention

The intervention will consist of the following strategies:

1. A therapeutic brief providing information about PPI dosing, particularly in the elderly;
2. Prescriber feedback indicating to GPs the veterans they treat who are dispensed PPIs, the dose at which it is dispensed, the number of PPI prescriptions dispensed per veteran in the last twelve months and if current treatment is at the higher dose, whether a lower dose has been trialled in the previous 12 months; and
3. Subsequent to the letter and prescriber feedback to GPs and mailing to pharmacies, a letter and educational brochure will be sent to veterans providing them with useful information about GORD.

How the strategies link to the objectives

The strategies listed in the previous section are designed to address specific objectives of module seven. This section of the document details each objective of module seven and then the strategy that is primarily designed to achieve the objective.

1. To provide useful information to GPs about PPI dosing, particularly in the elderly.
   Information will be provided in the therapeutic brief and letter.

2. To increase GPs knowledge of the veterans they treat who are dispensed PPIs, the dose at which it is dispensed, the number of PPI prescriptions dispensed per veteran in the last twelve months and if current treatment is at the higher dose, whether a lower dose has been trialled in the previous 12 months.
   Information provided by veteran-specific prescriber feedback letter.

3. To provide pharmacies and accredited pharmacists with useful information about PPI dosing, particularly in the elderly.
   Information provided in the therapeutic brief and pharmacy letter.

4. To provide useful information to veterans about GORD.
   Information provided in the veteran brochure and letter.

5. To increase the number of veterans who are dispensed low dose PPIs.
   The total module will facilitate this objective.

6. To increase the number of GPs who treat veterans with low dose PPIs.
   The total module will facilitate this objective.

e) EVALUATION: What was the effect?
Development of measurement instruments and criteria

Evaluation of all objectives will be undertaken. This section of the document details each objective of module twenty-seven and the indicators which will be used to measure whether the objective has been achieved and the data source for each indicator.

1. To provide useful information to GPs about PPI dosing, particularly in the elderly.
   Indicator: the percentage of GPs reporting the information in the therapeutic brief was useful.
   Source: Response form distributed with print material.

2. To increase GPs knowledge of the veterans they treat who are dispensed PPIs, the dose at which it is dispensed, the number of PPI prescriptions dispensed per veteran in the last twelve months and if current treatment is at the higher dose, whether a lower dose has been trialled in the previous 12 months.
   Indicator: the percentage of GPs reporting the information helpful.
   Source: In-house database of the activity plus response forms distributed with print material.

3. To provide pharmacies and accredited pharmacists with useful information about PPI dosing, particularly in the elderly.
   Indicator: the percentage of pharmacies reporting the information in the therapeutic brief was useful.
   Source: Response form distributed with print material.

4. To provide useful information to veterans about GORD.
   Indicator: the percentage of veterans reporting the information was useful.
   Source: Response form distributed with print material.

5. To increase the number of veterans who are dispensed low dose PPIs.
   Indicator: the rate of veterans targeted who are dispensed low-dose PPIs.
   Source: DVA Health Claims Database

6. To increase the number of GPs who treat veterans with low dose PPIs.
   Indicator: the number of GPs with veterans targeted who are dispensed low-dose PPIs.
   Source: DVA Health Claims Database.

References

1. Therapeutic Guidelines Ltd. Therapeutic Guidelines Gastrointestinal. North Melbourne: Therapeutic Guidelines Ltd, 2005.

2. Laheij RJ, Sturkenboom MC, Hassing RJ, Dieleman J, Stricker BH, Jansen JB. Risk of community-acquired pneumonia and use of gastric acid-suppressive drugs. JAMA. 2004; 292: 1955-60.

3. Laheij RJ, Van Ijzendoorn MC, Janssen MJ, Jansen JB. Gastric acid-suppressive therapy and community-acquired respiratory infections. Aliment Pharmacol Ther. 2003; 18: 847-5.

MODULE MATERIALS

Therapeutic Brief

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Therapeutic brief 7

PPIs in GORD: Reduce the dose – Keep the benefits

Low dose proton pump inhibitors (PPIs) control dyspepsia in 70-80% of patients with healed oesophagitis.[1-3]

This therapeutic brief asks you to review the management of your veteran patients who take PPIs for gastroesophageal reflux disease (GORD) and to consider the 'step-down' approach.

In 2004, over one third of medicine-taking veterans were dispensed a medicine to treat gastric acid-related disorders, of which 78% were PPIs.[4] Analysis of PPI dispensings by strength over the same period showed that the majority were for the higher strength products (refer to Table 1 for low and high strength product listings)[4].

Inside

The 'step-down' approach
Reducing the dose
Intermittent symptom-driven PPI
Trial cessation

Since 1999, there has been a slow but steady rise in the proportion of lower strength products dispensed. In the year 2004/2005 approximately 18 % of dispensings were for the lower strength products (see figure 1)[5].

When treating GORD, prolonged therapy with high PPI doses is rarely more effective than low doses.[6]

The high prevalence of regular use of PPIs means that rare but serious adverse effects such as acute interstitial nephritis and microbiological infections are seen more often.

The 'step-down' approach is recommended for most people with mild to moderate GORD.[7,8] A 4 or 8 week course of PPI (e.g. 20mg omeprazole once daily) usually results in symptom control and healing of oesophagitis. Treatment can then be 'stepped-down' to the minimum dose for symptom control, which may include intermittent, patient-driven therapy.

The 'step-down' approach is not recommended for patients with severe oesophagitis, strictures, Zollinger-Ellison syndrome or Barrett's oesophagus who will require regular rather than intermittent PPI therapy.[7,9]

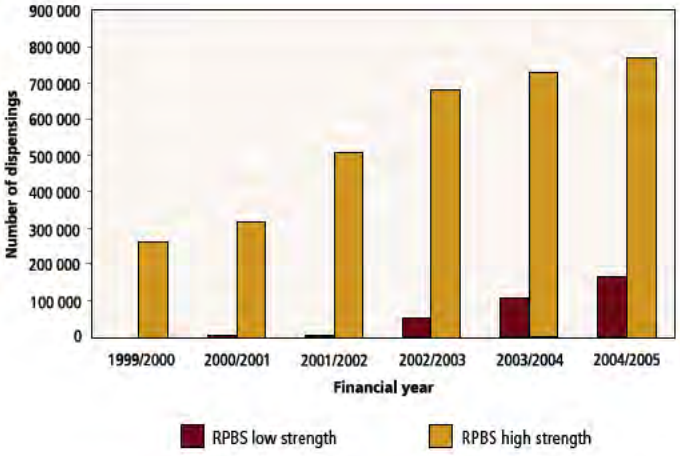


Figure 1: RPBS dispensings of low and high strength PPI products

Key Points

- Review patients on prolonged PPI therapy for GORD for both indication and dose.
- Use 'step-down' approach for maintenance therapy.
- Low dose PPI controls dyspepsia in 70-80% of patients with healed oesophagitis.
- Lifestyle interventions may improve symptom control for some patients.

2 Review PPI Therapy

PPIs are effective in controlling symptoms of dyspepsia due to GORD.[8] Use higher strength PPI products (see Table 1) for 4 or 8 weeks to control symptoms and heal oesophagitis. Then review with a view to 'step-down' treatment to the minimum dose of PPI that controls symptoms.[7]

All patients on PPI therapy should be reviewed:

- after an initial 4 weeks of therapy for GORD or oesophagitis;[7,9] and
- on completion of 8 weeks of therapy for GORD or oesophagitis.[7,9]

The need for ongoing therapy should be established when repeat prescriptions are requested.

PPI therapy may fail to give symptomatic relief due to an inadequate effect on lowering gastric acid secretion, a misdiagnosis, or major complications from oesophagitis. If higher dose PPI therapy is required, twice daily dosing may be more effective than once daily dosing.[9] Also, changing to another PPI may be effective.

Hospital-initiated PPI therapy should be reviewed after discharge to confirm an ongoing indication for the medicine and a plan developed for future review and dose reduction.

Review the need for medications that may induce/ exacerbate dyspepsia

Certain drugs may induce or worsen symptoms of dyspepsia. These drugs include aspirin, cholinesterase inhibitors, conventional NSAIDs, COX-2 selective NSAIDs, bisphosphonates, calcium channel blockers, clopidogrel, corticosteroids, iron, nitrates, tetracyclines, SSRIs, venlafaxine and theophylline.[7,8,10]

Avoid use of all NSAIDs in patients with symptoms of dyspepsia.

If continued NSAID use is required, prophylactic PPI therapy should be considered in patients with risk factors for gastrointestinal bleeding.[7,11]

Omeprazole and pantoprazole are currently approved for NSAID-induced ulcer prophylaxis in Australia, although neither is listed as a concessional benefit for this indication.

The 'step-down' approach

Following a satisfactory response to initial standard dose PPI therapy for 4 or 8 weeks 'step down' options include:

Reducing the dose

A recommended approach is to continue the same PPI and prescribe either half the daily dose or alternate daily dosing, depending on patient preference. Low dose PPIs control symptoms of dyspepsia in 70-80% of patients with healed oesophagitis.[1-3] Refer to Table 1 for dosing advice.

Intermittent symptom-driven PPI

E.g. Use omeprazole 10mg or equivalent on days when symptoms occur. On average, tablets are taken two to three days per week[7]. This dosage controls symptoms in most people with endoscopy negative GORD.[12,13]

Trial cessation

In a significant minority of patients (up to 40%) cessation of PPI therapy does not cause symptom relapse.[6,7] The decision to cease therapy should be guided by symptom control and each patient's ability to report return of symptoms.

Table 1: Safety, efficacy, strength and dose comparison for proton pump inhibitors.

	Safety and efficacy equivalence of PPIs*	Usual daily dose for healing GORD	Consider for maintenance therapy for GORD+
		High strength product	Low strength product
Omeprazole (Acimax, Losec, Meprazol, Probitor) tablet, capsule	20 mg	20 mg	10 mg
Lansoprazole (Zoton) capsule, granules (for suspension)	30 mg	30 mg	15 mg
Pantoprazole (Somac) tablet	40 mg	40 mg	20 mg
Rabeprazole (Pariet) tablet	20 mg	20 mg	10 mg
Esomeprazole (Nexium) tablet	20 mg	40 mg	20 mg

*Provided by the Pharmaceutical Benefits Pricing Authority 04/04.
+Recommended "Step-down dose" – is half the daily dose for healing GORD or half the current daily dose which gives symptom control.

Adverse effects

PPIs are generally well tolerated and all agents have a similar adverse effect profile with few contraindications for use.[8]

The exception to the above statement is lansoprazole, which has been associated with a higher reported incidence of diarrhoea. It has been suggested that the diarrhoea is due to drug-induced microscopic colitis[14,15] and may occur more frequently in the elderly.[16]

The high prevalence of use of PPIs amongst veterans may result in a higher burden of rare adverse effects than anticipated, so regular review of the need for ongoing therapy and monitoring of adverse effects is necessary. For example, in Australia, PPIs are the third most reported group of medicines associated with the rare adverse effect, interstitial nephritis.[17] Research in the United Kingdom supports this observation.[18]

There is evidence from observational trials that long-term PPI use is associated with an increased risk of community-acquired pneumonia compared to non-users in a dose-related manner.[19,20] If confirmed by larger prospective trials, this risk is roughly comparable to that of upper gastrointestinal bleeding caused by non-steroidal anti-inflammatory drugs.[21]

In addition, PPIs have been reported as a risk factor for *Clostridium difficile* diarrhoea.[22] Other risk factors for infection with *Clostridium difficile* include concomitant treatment with broad spectrum antibiotics, chemotherapeutic agents and advancing age.[23]

H. pylori infection

The preponderance of evidence suggests that neither *H. pylori* infection nor eradication cause or exacerbate GORD in the majority of patients.[7,24] However, long term PPI use in the presence of *H. pylori* infection increases the risk of gastric mucosal atrophy . Eradication of *H. pylori* reduces this risk.[7]

The Gastroenterology Society of Australia (GESA) and the Maastricht report[24] advocate that consideration be given to testing for *H. pylori* in patients with GORD who are long term PPI users, followed by eradication therapy in patients testing positive for the bacterium. However, this approach is not universally accepted because gastric mucosal atrophy associated with long-term PPI use has not unequivocally shown to lead to neoplasia.

A non-invasive test such as urea breath test (UBT) , faecal antigen test (FAT), or serology may be used to detect active infection. PPIs must be withheld for at least one week, and antibiotics for at least 4 weeks, prior to either the UBT or FAT to avoid false negatives. Confirming the eradication of *H. pylori* following eradication therapy is performed using either the UBT or FAT. Serology is not suitable for confirming eradication, because antibody titres can remain elevated for months following successful eradication.

Of the veterans dispensed medicine for gastric acid-related disorders in 2004, only 1.1% were also dispensed *H. pylori* eradication therapy.[4] As the bacterium has a prevalence of 40% in people over 40 years of age,[7] testing for *H. pylori* when prescribing long-term PPI therapy may be considered.

Patient directed use of antacids and H_2 antagonists

Symptom-driven use of antacids, antacid/alginate combination, or 'over-the-counter' H2 antagonists may be helpful for the relief of mild, occasional reflux symptoms.[7] However, patients who require frequent self-medication should be assessed for more effective treatment.

Regular antacid use in patients with endoscopically significant reflux is ineffective and has not been shown to heal oesophagitis;[7] however it can be effective in patients with endoscopically negative reflux who have intermittent symptoms.

4 Lifestyle interventions

For patients with GORD, lifestyle interventions can be used as adjuncts to appropriate pharmacologic therapy.[7]

The main lifestyle interventions are:

- Diet modification: identify and avoid foods that precipitate reflux episodes e.g. fatty and spicy foods and excess coffee, tomato and orange juice.
- Physical adjustments and accommodations: avoid large meals and refrain from lying down, bending or straining soon after meals. Avoid tight fitting clothing, particularly after meals. Raising the bed head may decrease the occurrence of night-time reflux.
- Moderation of alcohol consumption: avoid excessive alcohol intake.
- Obesity: obese patients should lose weight.
- Smoking cessation: cease smoking as it aggravates reflux and increases the risk of oesophageal and other cancers. The QUIT Line is available 24 hours a day for information and support – 131 848 or 137 848.

What to tell your patient

- Expect the same benefits from lower dose PPI therapy.
- Potentially fewer tablets/capsules to take with 'step-down' approach.
- The less medicine you take, the less risk of unwanted effects.
- Once symptoms are controlled, you may be able to take when needed.
- Report any abdominal symptoms immediately.
- Lifestyle interventions can improve symptom control.
- Bring a list of all medicines to each visit for review.

Useful websites for more information on the treatment of GORD include:

- **www.nice.org.uk and**
- **www.gesa.org.au**

Patients can be referred to **www.quit.org.au** for advice and support on how to quit smoking.

References

1 Birbara C, Breiter J, Perdomo C, et al. Rabeprazole for the prevention of recurrent erosive or ulcerative gastro-oesophageal reflux disease. Rabeprazole Study Group. Eur J Gastroenterol Hepatol 2000;12:889-97.

2 Plein K, Hotz J, Wurzer H, et al. Pantoprazole 20 mg is an effective maintenance therapy for patients with gastro-oesophageal reflux disease. Eur J Gastroenterol Hepatol 2000;12:425-32.

3 Robinson M, Lanza F, Avner D, et al. Effective maintenance treatment of reflux esophagitis with low-dose lansoprazole. A randomized, double-blind, placebo-controlled trial. Ann Intern Med 1996;124:859-67.

4 Veterans' Datamart, University of South Australia, QUMPRC. Accessed March 2005.

5 Medicare/HIC data. www.medicareaustralia.gov.au/statistics/dyn_pbs/forms/pbs_tab1.shtm. Accessed March 2006.

6 Guidance on the use of proton pump inhibitors in the treatment of dyspepsia. London: National Institute for Clinical Excellence, July 2000.

7 Gastro-oesophageal reflux disease in adults - Guidelines for Clinicians.: Gastroenterological Society of Australia (GESA) 2001 3rd Edition. Available at www.gesa.org.au.

8 Australian Medicines Handbook. Adelaide: Australian Medicines Handbook Pty Ltd, 2004.

9 Therapeutic Guidelines: Gastrointestinal, Version 3. North Melbourne: Therapeutic Guidelines Ltd 2002.

10 Aronson JK, editor. Meylers Side Effects of Drugs. 14 ed. Amsterdam: Elsevier, 2000.

11 Veterans' MATES. Therapeutic brief 4: Clinical Risk Management: NSAIDS. Available at www.dva.gov.au/health/veteransmates.

12 Talley NJ, Venables TL, Green JR, et al. Esomeprazole 40 mg and 20 mg is efficacious in the long-term management of patients with endoscopy-negative gastro-oesophageal reflux disease: a placebo-controlled trial of on-demand therapy for 6 months. Eur J Gastroenterol Hepatol 2002;14:857-63.

13 Talley NJ, Lauritsen K, Tunturi-Hihnala H, et al. Esomeprazole 20 mg maintains symptom control in endoscopy-negative gastro-oesophageal reflux disease: a controlled trial of 'on-demand' therapy for 6 months. Aliment Pharmacol Ther 2001;15:347-54.

14 Hilmer SN, Heap TR, Eckstein RP, Lauer CS and Shenfield GM. Microscopic colitis associated with exposure to lansoprazole. MJA 2006; 184 (4):185-186.

15 Thomson RD, Lestina, LS, Bensen SP et al. Lansoprazole-associated microscopic colitis: A case series. American J of Gastroenterol 2002; 97(11):2908-2913

16 Martin RM, Dunn NR, Freemantle S and Shakir S. The rates of common adverse events reported during treatment with proton pump inhibitors used in general practice in England: cohort studies. Br J Clin Pharmacol 2000; 50: 366-372

17 Personal communication, Ian W Boyd, Adverse Drug Reactions Unit, Therapeutic Goods Administration.

18 Torpey N, Barker T and Ross C. Drug-induced tubulo-interstitial nephritis secondary to proton pump inhibitors: experience from a single UK renal unit. Nephrol Dial Transplant 2004; 19:1441-1446.

19 Laheij RJ, Sturkenboom MC, Hassing RJ, et al. Risk of community-acquired pneumonia and use of gastric acid-suppressive drugs. JAMA 2004;292:1955-60.

20 Laheij RJ, Van Ijzendoorn MC, Janssen MJ, et al. Gastric acid-suppressive therapy and community-acquired respiratory infections. Aliment Pharmacol Ther 2003;18:847-51.

21 Gregor J (Ed). Acid Suppression and Pneumonia. JAMA 2004; 292:2012-2013.

22 Dial S, Delaney JA, Barkun AN, et al. Use of gastric acid-suppressive agents and the risk of community-acquired Clostridium difficile-associated disease. JAMA 2005;294:2989-95.

23 Cunningham R, Dale B, Undy B and Gaunt N. Proton pump inhibitors as a risk factor for Clostridium difficile diarrhoea. J Hosp Infect 2003; 54;243-245.

24 Malfertheiner P, Megraud F, O'Morain C, Hungins APS, Jones R, Axon A, Graham DY, Tytgat G & The European Helicobacter Pylori Study Group (EHPSG). Current concepts in the management of Helicobacter pylori infection – The Maastricht 2-2000 Consensus Report. Aliment Pharmacol Ther 2002; 16: 167-180.

UniSA

Veterans'MATES

Provided by: University of South Australia | Quality Use of Medicines and Pharmacy Research Centre

In association with: Department of General Practice, University of Adelaide | Department of Public Health, University of Adelaide | Repatriation General Hospital, Daw Park National Prescribing Service | Australian Medicines Handbook | Drug and Therapeutics Information Service

MODULE MATERIALS

GP Prescriber Feedback

The patients[1] listed below were dispensed a PPI at least three times during the period of analysis (Nov 2005 to March 2006). They were identified from an analysis of the pharmacy claims data for the Repatriation Pharmaceutical Benefits Scheme (RPBS). We have indicated the latest PPI they were dispensed in those five months as well as the total number of PPI dispensings in the last 12 months. We have also indicated if the patient was dispensed a low strength PPI in the last 12 months. Where patients have not trialled low-dose therapy, we ask you to consider whether a review of their PPI therapy is appropriate.

Some of the prescriptions listed below may have been written by other doctors. As the prescriber who has written most of the prescriptions for these patients you have been identified as the doctor most likely to be responsible for their care.

DR. JOHN s 47F

Please keep for your records

		Last dispensing	Other doctor
Anne T Sample	**SUBURB: Kensington Park**		
ESOMEPRAZOLE Nexium Tab 40 mg		25/03/2006	No
Number of PPI scripts in last 12 months: **10**			
Dispensing of lower strength in last 12 months (n/a for those currently on lower strength): **No**			
John E Citizen	**SUBURB: Burnside**		
OMEPRAZOLE Losec Tab 10 mg		15/03/2006	No
Number of PPI scripts in last 12 months: **6**			
Dispensing of lower strength in last 12 months (n/a for those currently on lower strength): **n/a**			

If you are unfamiliar with any of the patients listed above, it may be because:

- Patients may have moved and are no longer under your care but they may still be receiving repeats from the original prescription written by you;
- Your prescription pad may have been used by a locum or other doctor in your group practice and the pharmacy claims data has attributed the prescription to you; or
- Errors can occur during the RPBS claiming process.

[1] Patients are selected from all sites at which you practice

MODULE MATERIALS

Veteran Brochure

What you should do

Use your heartburn medicines safely by:

- Knowing when to take your medicines.
- Contacting your doctor if you notice any unwanted effects.
- Telling your doctor and pharmacist about ALL the medicines you are taking including medicines purchased from pharmacies, health food shops or supermarkets.
- Asking your pharmacist or doctor for a Consumer Medicine Information (CMI) leaflet for each of your medicines.
- Asking your doctor and pharmacist to assist you to maintain an accurate list of ALL your medicines.

For more help with your medicines ask your doctor for a Home Medicines Review.

Veterans'MATES

www.dva.gov.au/health/veteransmates

Provided by:
University of South Australia
Quality Use of Medicines and Pharmacy Research Centre
In association with:
Department of General Practice, University of Adelaide
Department of Public Health, University of Adelaide
Repatriation General Hospital, Daw Park
National Prescribing Service
Australian Medicines Handbook
Drug and Therapeutics Information Service

UniSA

Veterans' Medicines Advice and Therapeutics Education Services

Australian Government
Department of Veterans' Affairs

Veterans'MATES

What you need to know about Medicines for Heartburn

Get the best from your medicines

Veterans' Medicines Advice and Therapeutics Education Services

heartburn

What is **heartburn?**

Heartburn is also called indigestion. It is a burning sensation or pain in your chest, behind your breastbone.

Symptoms may include:

- a sour taste in your mouth,
- excessive saliva, and
- bloating (often relieved by burping).

Heartburn is caused by stomach contents, including acid, rising up into your oesophagus (food pipe). This is also called reflux.

Heartburn can be worse when you bend forward or lie down.

Speak to your **doctor and pharmacist** about how to get the best from your medicines. Take this brochure with you.

medicines

Medicines to treat heartburn

Speak to your doctor and pharmacist about the best way for you to take these medicines. There are several types of medicines to treat heartburn which include antacids and acid-reducing medicines. You may need to take a medicine regularly or just when you feel the heartburn.

Ask your **doctor**

How long do I need to take the medicine?

What should I do if my heartburn returns or gets worse?

What should I do if I notice

- black sticky stools
- unexplained weight loss
- difficulty or pain on swallowing
- if I vomit blood?

tips

How you can **reduce heartburn**

- Stop smoking.
- Lose weight, if you need to.
- Ask your doctor and pharmacist to review your medicines to make sure they are not causing or making it worse.
- Avoid eating large meals.
- Avoid the foods that make your heartburn worse such as fatty and spicy foods.
- Avoid excessive alcohol, caffeine and chocolate.
- Avoid lying down, bending or straining immediately after meals.
- Raising the head of your bed may lessen night-time heartburn.

MODULE MATERIALS

GP Response Form

Pharmacist Response Form

Veteran Response Form

Response Form - Module 7

"PPIs in GORD: Reduce the dose - Keep the benefits"

Dear Doctor,

Thank you for participating in the *Veterans' MATES* program. Completion of **two** modules using the eight step process outlined in the accompanying flyer now qualifies for **30 Category 1 RACGP QA & CPD points**. You must submit this response form to be recorded as eligible for points. We are also grateful for your feedback to further improve our service.

☒ Please cross the appropriate selection with a black or blue pen.
Mark one box only.

1. Please rate the usefulness of the ***"PPIs in GORD: Reduce the dose - Keep the benefits"*** therapeutic brief.

   ☐ Very Useful.

   ☐ Useful.

   ☐ Fairly Useful.

   ☐ Not Useful.

2. Please indicate which one of the following statements applies to the information provided about your patients and their medicines.

   ☐ The information was helpful. It made it easier to determine which of my patients may benefit from a review of their medication.

   ☐ Some of the information was helpful. It made it easier to determine for some of my patients, who might benefit from a review of their medication.

   ☐ The information was not helpful. It did not assist me to review my veteran patients.

3. Prior to receiving the therapeutic brief, when initiating PPI therapy for your veteran patients with GORD, on average, what duration of therapy do you prescribe?

   ☐ Initial prescription with no repeats.

   ☐ Initial prescription with one repeat.

   ☐ Initial prescription with five repeats.

4. Prior to receiving the therapeutic brief, how often did you review your veteran patients with GORD to see whether it was possible to 'step-down' PPI therapy?

   ☐ After an initial four weeks of standard dose therapy.

   ☐ After eight weeks of standard dose therapy.

   ☐ Once they have achieved symptomatic control.

   ☐ Annually.

   ☐ I was not aware of the need to consider 'stepping-down' therapy.

5. Thinking of the veteran patients listed in the covering letter, how many do you estimate require either a Home Medicines Review (HMR) or your review of their medicines?

   ☐ Nil ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 or more

6. RACGP QA&CPD points are available for completion of two *Veterans' MATES* modules. Do you want your participation in this module to be recorded for QA&CPD points?

   ☐ Yes ▶ Please provide your RACGP QA&CPD reference number

   ☐ No

If you would like to make further comments on this material or the *Veterans' MATES* program, e-mail us at MATES.comments@unisa.edu.au or to make an enquiry or comment phone our *Veterans' MATES* Prescriber Helpline on 1800 500 869.

Please post in the reply paid envelope provided. No stamp is required.
Thank you for participating in the *Veterans' MATES* program.

Response Form - Module 7

"PPIs in GORD: Reduce the dose - Keep the benefits"

Dear Pharmacist

Thank you for participating in the *Veterans' MATES* program. **Each time you participate in a *Veterans' MATES* module you will be awarded ONE CPD&PI point.** You must submit this response form to be recorded as eligible for points. We are also grateful for your feedback to further improve our service.

X Please cross the appropriate selection with a black or blue pen.
Mark one box only.

1. Please rate the usefulness of the ***"PPIs in GORD: Reduce the dose - Keep the benefits"*** therapeutic brief.
   - ☐ Very Useful.
   - ☐ Useful.
   - ☐ Fairly Useful.
   - ☐ Not Useful.
2. Prior to receiving the therapeutic brief, when counselling patients who are initiating PPI therapy did you provide information on the possibility of "step-down" therapy at four or eight weeks?
   - ☐ Yes, for the majority of patients.
   - ☐ Yes, for some patients.
   - ☐ No, not at all.
3. Prior to receiving the therapeutic brief, when dispensing PPIs, how often did you counsel patients regarding medicines that can induce or exacerbate heartburn symptoms?
   - ☐ Every time.
   - ☐ Most of the time.
   - ☐ Some times.
   - ☐ Hardly ever.
   - ☐ Never.
4. Prior to receiving the therapeutic brief, when dispensing PPIs, how often did you counsel patients about relevant lifestyle interventions to manage heartburn symptoms?
   - ☐ Every time.
   - ☐ Most of the time.
   - ☐ Some times.
   - ☐ Hardly ever.
   - ☐ Never.
5. One PSA CPD&PI point is available for reading each Therapeutic brief. Do you want your participation in this module to be recorded for this point?
   - ☐ Yes. ▶ Please provide your PSA membership number. ☐☐☐☐☐☐
   - ☐ No.

If you would like to make further comments on this material or the *Veterans' MATES* program, e-mail us at MATES.comments@unisa.edu.au or to make an enquiry or comment phone our *Veterans' MATES* Prescriber Helpline on 1800 500 869.

Please post in the reply paid envelope provided. No stamp is required. Thank you.

Your Opinion:

"What you need to know about Medicines for Heartburn"

Thank you for participating in the *Veterans' MATES* program. We would be grateful if you could complete this form to assist us to improve our service, even if you have completed a response form from a previous mail out.

☒ Please cross the appropriate selection with a black or blue pen. **Mark one box only.**

1. Which words best match how helpful the ***"What you need to know about your Medicines for Heartburn"*** brochure was to you?

   ☐ Very Helpful.

   ☐ Helpful.

   ☐ Slightly Helpful.

   ☐ Not Helpful.

2. After reading the brochure

a) Do you think you will discuss your medicines with your doctor at your next visit?

   ☐ Yes.

   ☐ No.

   ☐ Unsure.

b) Do you think you will discuss your medicines with your pharmacist at your next visit?

   ☐ Yes.

   ☐ No.

   ☐ Unsure.

3. Do you buy medicines for heartburn without a prescription?

   ☐ Yes.

   ☐ No.

   ☐ Unsure.

4. If yes, where do you MOST COMMONLY buy them from?

   ☐ Pharmacy.

   ☐ Supermarket or health food store.

   ☐ Other.

5. Do you tell your doctor if you buy heartburn medicines without a prescription?

   ☐ Yes.

   ☐ No.

   ☐ Unsure.

   ☐ I don't buy my heartburn medicines without prescription.

6. Before reading the brochure, which one of the following statements best described how well you understood your medicines for heartburn?

   ☐ Very well. I understood a lot about them including how they work and the side effects.

   ☐ Well. I understood why I needed them and how to use them.

   ☐ Not well. I didn't understand much about them.

   ☐ I don't take medicines for heartburn.

Your answers are confidential and will not be submitted to your doctor or pharmacist. If you would like further information, phone our *Veterans' MATES* Helpline on 1300 556 906 for the cost of a local call.

Please post in the reply paid envelope provided. No stamp is required. Thank you.

MODULE RESULTS

Module 7: Proton pump inhibitors, step down in the elderly

Module 7 was distributed in June 2006 and aimed to encourage use of lower-strength proton pump inhibitors (PPIs) where they were being used for maintenance therapy. The therapeutic brief, "PPIs in GORD: reduce the dose – keep the benefits", was distributed to 13,684 GPs and 5,477 pharmacies. The GPs also received patient-specific prescriber feedback indicating those veterans currently treated by the GP, who received at least three dispensings of the same PPI over the five months, Nov 1 2005 to Mar 31 2006 inclusive. The veteran brochure, "What you need to know about medicines for heartburn", was mailed to 62,460 veterans.

Evaluation method

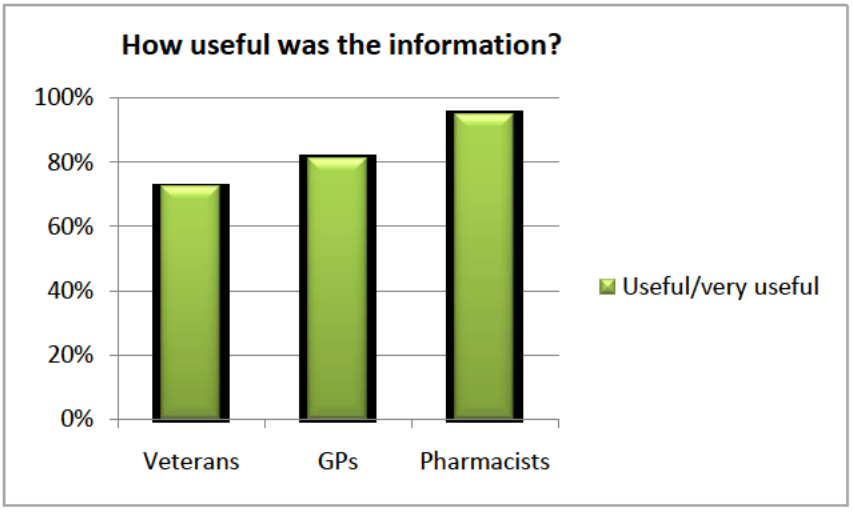
The evaluation comprised two methods; surveys of GPs, pharmacists/pharmacies and veterans who were targeted in the module and a time series analysis of rates of use of low dose proton pump inhibitors.

Stakeholder survey

Survey responses were received from 1030 (7.5%) GPs, 381 (7%) pharmacists and 15,522 (24.9%) veterans.

Positive feedback was received for module 7, with 81% of GPs and 95% of pharmacists who responded rating the information they received as useful or very useful. Seventy-two percent of veterans who responded rated the "*What you need to know about Medicines for Heartburn*" brochure as helpful or very helpful. (Figure 1)

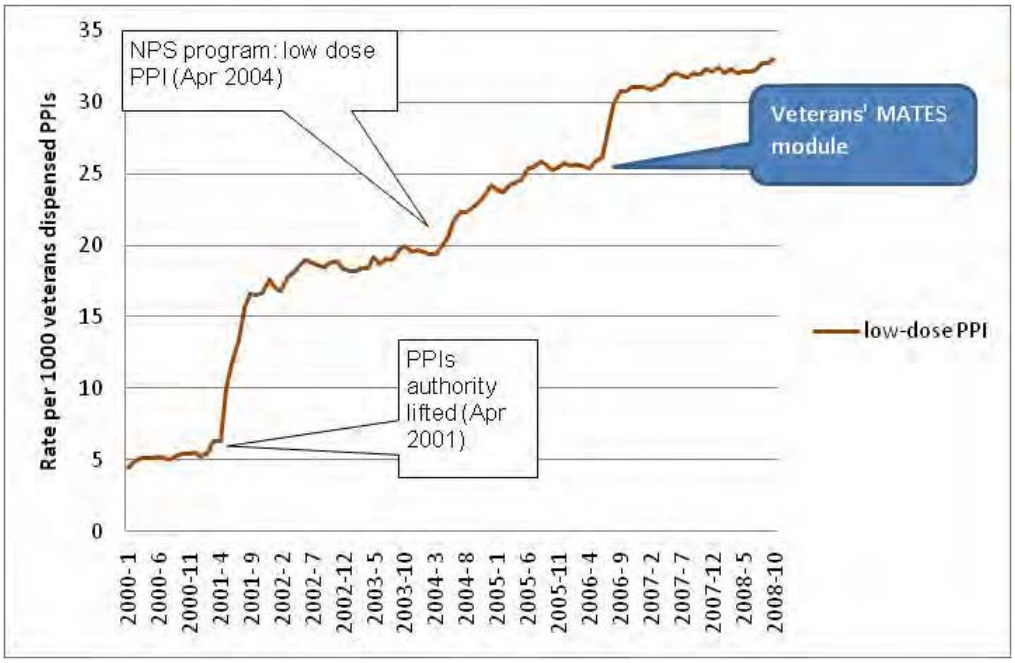
Figure 1: Respondents' rating of the usefulness/helpfulness of module 7



Trends in proton pump inhibitor dispensings

The module was effective in achieving its aim, increasing the number of veterans using low-dose proton pump inhibitors by 15% amongst all veterans using proton pump inhibitors (p<0.0001) (Figure 2).

Figure 2: Rate of utilisation of lower strength PPI (excluding lower strength esomeprazole) products amongst veterans dispensed any PPI



There was a 2.7 fold increase in dispensings of the low dose products at the time the authority restriction was lifted in April 2001 (rate ratio 2.70, 95%CI 2.272, -3.223 p<0.0001). In April 2004, when the National Prescribing Service (NPS) intervention was undertaken there was a 16% increase in the proportion of veterans dispensed low dose proton pump inhibitors (RR 1.155, 95% CI 1.108 - 1.203 p<0.0001). In June 2006, after module 7 was implemented, 15% additional veterans were dispensed low dose proton pump inhibitors (RR 1.145, 95% CI 1.103 - 1.189 p<0.0001) (Table 1). It can be observed that this effect was sustained and increasing throughout 2007/2008 (Figure 2). Historical comparisons were not undertaken to evaluate this module as the NPS intervention and restriction changes confounded the trend.

Table 1: Segmented regression of rate of low-dose proton pump inhibitor use in the veteran population dispensed proton pump inhibitors

Monthly trend pre mail-out (Apr 2004- May2006)	**Change in use at time of intervention (Jun 2006- Sep 2006)**	**Monthly trend post mail-out compared to pre-mail out (Oct 2006 – May2008)***
1.006 (1.004,1.009) p < 0.0001 The trend prior was increasing at a rate of 0.6%	1.145 (1.103, 1.189) p < 0.0001 There was a 14.5% increase in use at the time of the intervention	1.003 (1.0009,1.006) p = p=0.0065 The trend continued to rise by 0.3% per month. Overall trend now rising at 0.9% per month

UniSA

Veterans'MATES

Provided by: University of South Australia | Quality Use of Medicines and Pharmacy Research Centre
In association with: Discipline of General Practice, The University of Adelaide |
Discipline of Public Health, The University of Adelaide | Repatriation General Hospital, Daw Park |
NPS - Better choices, Better health | Australian Medicines Handbook | Drug and Therapeutics Information Service

Australian Government
Department of Veterans' Affairs

References that highlight the Veterans' MATES approach or research

- **World Health Organization (WHO) Technical Series on Safer Primary Care: Patient engagement 2016** p7
- **Organization for Economic Cooperation and Development (OECD) The economics of medication safety 2022:** p 39
- **UK: National Institute for Health Care and Excellence (NICE)** Multimorbidity: clinical assessment and management guidelines
  - Predictive performance of frailty measures
- **Wales: Healthcare Quality Improvement Partnership 2020**
  Royal College of Physicians National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP)
  - Corticosteroid use and complications in diabetes
- **RACGP Red Book 9th edition 2016 and updates: preventive activities in old age 2016** p 45
  - Anticholinergic use and harms
- **Heart Foundation 2010 Multidisciplinary care for people with chronic heart failure** p7, p12
  - Medicine review and hospitalisations for heart failure
- **US preventative services taskforce glaucoma guidelines**
  - Treatment conflicts with glaucoma
- **The American Psychiatric Association practice guideline on the use of antipsychotics to treat agitation or psychosis in patients with dementia** p143,150,165
  - Harms from antipsychotics
- **US CDC coordinated care plan to prevent older adult falls. 2021** p43
  - Multiple sedative use and falls
- **US Agency for Healthcare Research And Quality: Prevention, Diagnosis, and Management of Opioids, Opioid Misuse, and Opioid Use Disorder in Older Adults 2020** p23,27,28,30
  - Opioid use and joint replacement

Veterans' MATES publications

Reducing opioid use for chronic non-cancer pain in primary care using an evidence based, theory informed, multi-strategic, multi-stakeholder approach.
BMJ Quality & Safety. Published: April 2023.
Anna K Moffat, Jemisha Apajee, Vanessa T Le Blanc, Kerrie Westaway, Andre Q Andrade, Emmae N Ramsay, Natalie Blacker, Nicole L Pratt and Elizabeth Ellen Roughead.
https://qualitysafety.bmj.com/content/qhc/early/2023/04/26/bmjqs-2022-015716.full.pdf

Precision public-health intervention for care coordination: a real-world study.
British Journal of General Practice. Published: March 2023.
Andre Q Andrade, Jean-Pierre Calabretto, Nicole L Pratt, Lisa M Kalisch-Ellett, Vanessa T Le Blanc and Elizabeth E Roughead.
https://bjgp.org/content/73/728/e220

Changing the Way We Treat Tinnitus.
JMVH. Published: January 2023.
Dr Russell Shute, Ms Natalie Blacker, Dr Mafalda Dias, Dr Oliver Frank and Professor Elizabeth Roughead.
https://jmvh.org/article/https-doi-ds-org-doilink-03-2023-61369896-jmvh-vol-31-no-1/

Medicine-Induced Acute Kidney Injury Findings from Spontaneous Reporting Systems, Sequence Symmetry Analysis and a Case–Control Study with a Focus on Medicines Used in Primary Care.
Drug Safety. Published: September 2022.
Elizabeth E. Roughead, Mhairi Kerr, Anna Moffat, Gizat M. Kassie, Nicole Pratt.
https://link.springer.com/article/10.1007/s40264-022-01238-4

The Risk of Preoperative Central Nervous System-Acting Medications on Delirium Following Hip or Knee Surgery: A Matched Case-Control Study.
Gizat M. Kassie, Elizabeth E. Roughead, Tuan A. Nguyen, Nicole L. Pratt, Lisa M. Kalisch Ellett.
Drug Safety. Published: November 2021.
https://doi.org/10.1007/s40264-021-01136-1

Evaluation of renal function testing in older Australian veterans dispensed medicines that require renal function monitoring.
Lisa M. Kalisch Ellett, Gizat M. Kassie, Emmae N. Ramsay, Nicole L. Pratt, Elizabeth E. Roughead.
Drugs & Aging. Published: September 2021.
https://doi.org/10.1007/s40266-021-00892-0

A data visualisation method for assessing exposure misclassification in case-crossover studies: the example of tricyclic antidepressants and the risk of hip fracture in older people.
Michael J. Leach, Elizabeth E. Roughed, Nicole L. Pratt.
BMC Medical Research Methodology. Published: February 2021.
https://doi.org/10.1186/s12874-021-01230-z

Medication-related hospital admissions in aged care residents.
Lisa M. Kalisch Ellett, Gizat M. Kassie, Gillian E. Caughey, Nicole L. Pratt, Emmae N. Ramsay, Elizabeth E. Roughead
Australasian Journal on Ageing. Published: 27 June 2021.
https://onlinelibrary.wiley.com/doi/10.1111/ajag.12975

Variation in health service use by veterans with an accepted disability of post-traumatic stress disorder who had a service record post 1975: a cluster analysis.
Elizabeth E. Roughead, Emmae N. Ramsay, Lisa M. Kalisch Ellett, A. Khoo, A. K. Moffat, Nicole L. Pratt.
BMJ Military Health. Published: 5 February 2021.
https://militaryhealth.bmj.com/content/early/2021/02/05/bmjmilitary-2020-001456.info

Responding to the under-utilisation of necessary health care in the time of COVID-19: a precision public health intervention.
Nicole L. Pratt, Andre Andrade, Lisa M. Kalisch, Vanessa T. Le Blanc, John Barratt, Elizabeth E. Roughead.
The Senior Care Pharmacist. Published: January 2021.
https://pubmed.ncbi.nlm.nih.gov/33384029/

Prevalence of multiple risk factors for poor outcomes associated with COVID-19 among an Australian population.
Pratt NL, Kalisch Ellett LM, Andrade AQ, LeBlanc VT, Barratt J, Roughead EE.
Australian Journal of General Practice. Published: January 2021.
https://www1.racgp.org.au/ajgp/2021/january-february/multiple-risk-factors-for-poor-outcomes-associated

Impact of a patient-specific national programme aimed at increasing the use of emollient moisturisers to reduce the risk of skin tears: a longitudinal cohort study.
Moffat AK, Westaway KP, Apajee J, Frank O, Shute R, Weston C, Blacker N, LeBlanc VT, Kalisch Ellett LM, Pratt NL, Roughead EE.
BMJ Open. Published: 29 October 2020.
https://bmjopen.bmj.com/content/10/10/e039579

Determinants of usefulness in professional behaviour change interventions: observational study of a 15-year national program.
Andrade A, LeBlanc VT, Kalisch-Ellett LM, Pratt NL, Moffat A, Blacker N, Westaway K, Barratt JD, Roughead EE.
BMJ Open. Published: 14 October 2020.
https://bmjopen.bmj.com/content/10/10/e038016

Use of health and support services by people living with dementia in the community setting.
Kalisch Ellett LM, Pratt NL, Nguyen TA, Roughead EE.
Australasian Journal on Ageing. Published: 20 May 2020.
https://doi.org/10.1111/ajag.12801

Use of medicines associated with dry mouth and dental visits in an Australian cohort.
Moffat, AK, Apajee, J, Pratt, NL, Blacker, N, Le Blanc, VT, Roughead, EE.
Australian Dental Journal. Published: 12 February 2020.
https://pubmed.ncbi.nlm.nih.gov/32052464/

Use of analgesics following rescheduling of codeine in Australia: An interrupted time series analysis in the veteran population.
Kalisch Ellett LM, Kemp-Casey A, Kassie GM, Pratt NL, Roughead EE.
International Journal of Drug Policy 2020; 81: 102767.
https://doi.org/10.1016/j.drugpo.2020.102767

Comorbidities in an Australian sample of chronic and new opioid users.
Moffat AK, Pratt NL, Kalisch Ellett LM, Ramsay EN, Roughead EE.
Journal of Opioid Management 2020; 16(2): 103-110.
https://pubmed.ncbi.nlm.nih.gov/32329885/

Risk of chronic opioid use in older persons with pre-existing anxiety.
Moffat AK, Pratt NL, Kerr M, Kalisch Ellett LM, Roughead EE.
Journal of Opioid Management 2019; 16(1): 59-66.
https://doi.org/10.5055/jom.2020.0551

Reduction in use of risperidone for dementia in Australia following changed guidelines.
Kalisch Ellett LM, Moffat AK, Gadzhanova S, Pratt NL, Apajee J, Woodward M, Roughead EE.
Pharmacy 2019; 7(3), 100; Published: 22 July 2019.
https://doi.org/10.3390/pharmacy7030100

Combination psychotropic medicine use in older adults and risk of hip fracture.
Westaway K, Blacker N, Shute R, Allin R, Elgebaly Z, Frank O, Pratt NL, Roughead EE.
Australian Prescriber 2019;42:93-6, 3 June 2019.
https://www.ncbi.nlm.nih.gov/pubmed/31363307

Prevalence and Duration of Use of Medicines Recommended for Short-Term Use in Aged Care Facility Residents.
Kalisch Ellett LM, Kassie GM, Pratt NL, Kerr M, Roughead EE.
Pharmacy. Published: June 2019.
https://doi.org/10.3390/pharmacy7020055

Persistence with opioids post discharge from hospitalisation for surgery in Australian adults: a retrospective cohort study.
Roughead EE, Lim R, Ramsay EN, Moffat AK, Pratt NL.
BMJ Open. Published: 2019: 9: e023990
https://bmjopen.bmj.com/content/9/4/e023990

Use of medicines and health services for chronic obstructive pulmonary disease among a cohort of Australians over 50 years.
Lim R, Kerr M, Roughead EE.
International Journal of COPD. Published: 4 October 2018: 13 3085-3093.
https://www.dovepress.com/use-of-medicines-and-health-services-for-chronic-obstructive-pulmonary-peer-reviewed-article-COPD

The extent of antipsychotic use in Australian residential aged care facilities and interventions shown to be effective in reducing antipsychotic use: A literature review.
Westaway K, Sluggett J, Alderman C, Moffat A, Proctor N, Roughead E.
Dementia. Published: 28 August 2018.
https://journals.sagepub.com/doi/10.1177/1471301218795792

Reducing hypnotic use in insomnia management among Australian veterans: results from repeated national interventions.
Kalisch Ellett LM, Lim R, Pratt NL, Kerr M, Ramsay EN, Le Blanc TV, Barratt JD, Roughead EE.
BMC Health Services Research. Published: August 9, 2018 – Open Access.
https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-018-3443-9

Analgesic use in Vietnam veterans with musculoskeletal pain.
Kalisch Ellett LM, Pratt NL, Roughead EE.
Journal of Military and Veterans' Health. Published: Vol. 26, No. 3, Jul 2018: 28-35
https://jmvh.org/article/analgesic-use-in-vietnam-veterans-with-musculoskeletal-pain/

Sustaining practice change in health care: the impact of a national quality improvement program on the uptake of collaborative medicines reviews.
Kalisch Ellett L, Pratt N, Sluggett J, Ramsay E, Kerr M, Le Blanc V, Barratt J, Gilbert A, Roughead E.
Journal of Pharmacy Practice and Research. Published online 15 June 2018
https://onlinelibrary.wiley.com/doi/abs/10.1002/jppr.1379

The validity of the Rx-Risk comorbidity index using medicines mapped to the Anatomical Therapeutic Chemical (ATC) classification system.
Pratt N, Kerr M, Barratt J, Kemp-Casey A, Kalisch Ellett L, Ramsay E, Roughead E.
BMJ Open. Accepted 22 March 2018
https://www.ncbi.nlm.nih.gov/pubmed/?term=The+validity+of+the+Rx-Risk+comorbidity+index+using+medicines+mapped+to+the+Anatomical+Therapeutic+Chemical+(ATC)+classification+system.

Gathering tips from carers to support people with dementia; an adaptation of the TOP 5 program for community use.
Westaway K, Frank O, Shute R, Rowett D, Blacker N, Le Blanc V, Moffat A, Roughead E.
Int J Evid Based Healthc. 2018 Feb 9. doi: 10.1097/XEB.0000000000000136. [Epub ahead of print]
https://www.ncbi.nlm.nih.gov/pubmed/?term=Gathering+tips+from+carers+to+support+people+with+dementia%3B+an+adaptation+of+the+TOP+5+program+for+community+use

Antipsychotic polypharmacy in older Australians.
Lisa M. Kalisch Ellett, Nicole L. Pratt, Mhairi Kerr and Elizabeth E. Roughead.
Int Psychogeriatr 2017 Nov 10:1-8. doi: 10.1017/S1041610217001934. [Epub ahead of print]
https://www.ncbi.nlm.nih.gov/pubmed/?term=Antipsychotic+polypharmacy+in+older+Australians

The Risk of Hip Fracture Due to Mirtazapine Exposure When Switching Antidepressants or Using Other Antidepressants as Add-On Therapy.
Leach MJ, Pratt NL, Roughead EE.
Drugs Real World Outcomes 2017 Dec;4(4):247-255. doi: 10.1007/s40801-017-0120-y
https://www.ncbi.nlm.nih.gov/pubmed/28940138

Minimising fracture risk in older people taking long-term oral corticosteroids.
Kerrie Westaway, Oliver Frank, Alan Husband, Anna McClure, Russell Shute, Jane Curtis.
Journal of Pharmacy Practice and Research (2017) 47, 158–162
https://onlinelibrary.wiley.com/doi/pdf/10.1002/jppr.1321

Posttraumatic Stress Disorder, Antipsychotic Use and Risk of Dementia in Veterans.
Roughead EE, Pratt NL, Kalisch Ellett LM, Ramsay EN, Barratt JD, Morris P, Killer G.
J Am Geriatr Soc. 2017 Mar 17. doi: 10.1111/jgs.14837. [Epub ahead of print]
https://www.ncbi.nlm.nih.gov/pubmed/28306156

Patient-specific prescriber feedback can increase the rate of osteoporosis screening and treatment: results from two national interventions.
Kalisch Ellett LM, Pratt NL, Sluggett JK, Ramsay EN, Kerr M, LeBlanc VT, Barratt JD, Roughead EE.
Arch Osteoporos. 2017 Dec;12(1):17. doi: 10.1007/s11657-017-0309-4. Epub 2017 Feb 10
https://www.ncbi.nlm.nih.gov/pubmed/?term=Patient-specific+prescriber+feedback+can+increase+the+rate+of+osteoporosis+screening+and+treatment%3A+results+from+two+national+interventions

Use of proton pump inhibitors among older Australians: national quality improvement programmes have led to sustained practice change.
Pratt NL, Kalisch Ellett LM, Sluggett JK, Gadzhanova SV, Ramsay EN, Kerr M, LeBlanc VT, Barratt JD, Roughead EE.
Int J Qual Health Care. 2016 Dec 4. [Epub ahead of print]
https://www.ncbi.nlm.nih.gov/pubmed/27920248

Increased risk of hospital admission for dehydration or heat-related illness after initiation of medicines: a sequence symmetry analysis.
Kalisch Ellett LM, Pratt NL, Le Blanc VT, Westaway K, Roughead EE.
J Clin Pharm Ther. 2016 Oct; 41(5):503-7. doi: 10.1111/jcpt.12418. Epub 2016 Jul 4
https://www.ncbi.nlm.nih.gov/pubmed/27378245

Central Nervous System-Acting Medicines and Risk of Hospital Admission for Confusion, Delirium, or Dementia.
Kalisch Ellett LM, Pratt NL, Ramsay EN, Sluggett JK, Barratt JD, Roughead EE.
J Am Med Dir Assoc. 2016 Mar 24. pii: S1525-8610(16)00108-0. doi: 10.1016/j.jamda.2016.02.008. [Epub ahead of print]
http://www.ncbi.nlm.nih.gov/pubmed/27052560

Survival after initiation of androgen deprivation therapy for prostate cancer of elderly Australian men.
Gadzhanova S, Roughead EE.
Cancer Epidemiology; 39 (6): 854859
http://www.ncbi.nlm.nih.gov/pubmed/?term=Survival+after+initiation+of+hormone+therapy+for+prostate+cancer+of+elderly+Australian+men

Commitment questions targeting patients promotes uptake of under-used health services: Findings from a national quality improvement program in Australia.
Nicole L. Pratt, Lisa M. Kalisch Ellett, Janet K. Sluggett, Emmae N. Ramsay, Mhairi Kerr, Vanessa T. LeBlanc, John D. Barratt, Elizabeth E. Roughead.
Soc Sci Med. 2015 Nov;145:1-6. doi: 10.1016/j.socscimed.2015.09.019. Epub 2015 Sep 14
http://www.ncbi.nlm.nih.gov/pubmed/?term=Commitment+questions+targeting+patients+promotes+uptake+of+under-used+health+services%3A+Findings+from+a+national+quality+improvement+program+in+Australia

Medicines can affect thermoregulation and accentuate the risk of dehydration and heat-related illness during hot weather.
Westaway K, Frank O, Husband A, McClure A, Shute R, Edwards S, Curtis J, Rowett D.
Journal of Clinical Pharmacy and Therapeutics, 2015 Jun 13. doi: 10.1111/jcpt.12294
http://www.ncbi.nlm.nih.gov/pubmed/?term=medicines+can+affect+thermoregulation+and+accentuate+the+risk+of+dehydration

Association between Ophthalmic Timolol and Hospitalisation for Bradycardia.
Nicole L. Pratt, Emmae N. Ramsay, Lisa M. Kalisch Ellett, Tuan A. Nguyen, Elizabeth E. Roughead.
Journal of Ophthalmology, Article ID 567387
http://www.hindawi.com/journals/joph/aa/567387/

Multiple Anticholinergic Medication Use and Risk of Hospital Admission for Confusion or Dementia.
Kalisch Ellett LM, Pratt NL, Ramsay EN, Barratt JD, Roughead EE.
J Am Geriatr Soc. 2014 Oct 3. doi: 10.1111/jgs.13054
http://www.ncbi.nlm.nih.gov/pubmed/25284144

Safe use of statins in elderly people.
Kerrie P Westaway, Oliver R Frank, Alan J Husband, Debra Rowett, Simone Rossi, Tammy Le Blanc, Russell Shute.
Journal of Pharmacy Practice and Research, Volume 44, Issue 3, pages 138–142, September 2014
http://jppr.shpa.org.au/lib/pdf/2014_09/Westaway_GT.pdf

Association between use of multiple psychoactive medicines and hospitalization for falls: retrospective analysis of a large healthcare claim database.
Pratt NL, Ramsay EN, Kalisch Ellett LM, Nguyen TA, Barratt JD, Roughead EE.
Drug Safety July 2014, Volume 37, Issue 7, pp 529-535
http://www.ncbi.nlm.nih.gov/pubmed/24872015

Optimising therapy for patients with neuropathic pain.
Kerrie P Westaway, Christopher P Alderman, Oliver R Frank, Alan J Husband, Debra Rowett, Tammy Le Blanc.
Journal of Pharmacy Practice and Research Volume 44, No 1, 2014
http://search.informit.com.au/documentSummary;dn=286044558390494;res=IELHEA

Risk of medication-associated initiation of oxybutynin in elderly men and women.
Lisa M Kalisch Ellett, Nicole L Pratt, John D Barratt, Debra Rowett, Elizabeth E Roughead.
J Am Geriatr Soc. 2014 Mar 17. doi: 10.1111/jgs.12741
http://www.ncbi.nlm.nih.gov/pubmed/?term=Risk+of+Medication-Associated+Initiation+of+Oxybutynin+in+elderly+men+and+women

Proton pump inhibitors and the risk of pneumonia: a comparison of cohort and self-controlled case series designs.
Ramsay EN, Pratt NL, Ryan P, Roughead EE.
BMC Med Res Methodol. 2013 Jun 24;13:82. doi: 10.1186/1471-2288-13-82
http://www.ncbi.nlm.nih.gov/pubmed/23800078

Home Medicines Reviews: Extent of Uptake by High-Risk Veterans.
Lisa M Kalisch Ellett, Emmae N Ramsay, John D Barratt, Andrew L Gilbert, Elizabeth E Roughead.
Journal of Pharmacy Practice and Research Vol 43, No 3, 2013, 182-186
http://search.informit.com.au/documentSummary;dn=656032208073581;res=IELHEA

Bridging evidence-practice gaps: improving use of medicines in elderly Australian veterans.
Elizabeth E Roughead, Lisa M Kalisch Ellett, Emmae N Ramsay, Nicole L Pratt, John D Barratt, Vanessa T LeBlanc, Philip Ryan, Robert Peck, Graeme Killer, Andrew L Gilbert.
BMC Health Service Research 2013, 13:514 doi:10.1186/1472-6963-13-514
http://www.ncbi.nlm.nih.gov/pubmed/?term=bridging+evidence-practice+gaps%3A+improving+use+of+medicines+in+elderly+Australian+veterans

What Analgesics Do Older People Use Prior to Initiating Oxycodone for Non-Cancer Pain? A Retrospective Database Study.
Gadzhanova S, Bell JS, Roughead EE.
Drugs & Aging 2013 Sep 4, 10.1007/s40266-013-0115-7
http://www.ncbi.nlm.nih.gov/pubmed/24002742

Prescribing for older people with chronic renal impairment.
Bell JS, Blacker N, Le Blanc T, Alderman CP, Phillips A, Rowett D, Rossi S, Frank O, Husband A.
Australian Family Physician. 2013 Jan/Feb; Vol 42, No 1/2
http://www.racgp.org.au/afp/2013/januaryfebruary/prescribing-for-older-people-with-cri/

Managing glaucoma in those with co-morbidity: not as easy as it seems.
Roughead, EE, Kalisch, LM, Pratt, NL, Killer, G, Barnard A, Gilbert, AL.
Ophthalmic Epidemiol. 2012 Apr;19(2):74-82. doi: 10.3109/09286586.2011.638743. Epub 2012 Feb 24
http://www.ncbi.nlm.nih.gov/pubmed/22364388

Osteoporosis Pharmacological prevention and management in older people.
Bell JS, Blacker N, Edwards S, Frank O, Alderman CP, Karan L, Husband A, Rowett D.
Australian Family Physician. 2012 Mar; Vol 41, No 3
http://www.ncbi.nlm.nih.gov/pubmed/22396923

Anticholinergic and sedative medicines - Prescribing considerations for people with dementia.
Bell JS, Mezrani C, Blacker N, Le Blanc T, Frank O, Alderman CP, Rossi S, Rowett D, Shute R.
Australian Family Physician. 2012 Jan-Feb;41(1-2):45-9
http://www.ncbi.nlm.nih.gov/pubmed/22276284

Prescriber Feedback to Improve Quality Use of Medicines among Older People: the Veterans' MATES Program.
Bell JS, Kalisch LM, Ramsay EN, Pratt NL, Barratt JD, LeBlanc T, Roughead EE, Gilbert AL.
Journal of Pharmacy Practice and Research, Volume 41, No. 4, 2011, 316-319
http://jppr.shpa.org.au/lib/pdf/2011_12/Simon_Bell_GT.pdf

A self-controlled case series to assess the effectiveness of beta blockers for heart failure in reducing hospitalisations in the elderly.
Ramsay EN, Roughead EE, Ewald B, Pratt NL, Ryan P.
BMC Medical Research Methodology. 2011 Jul 18;11:106
http://www.ncbi.nlm.nih.gov/pubmed/21762536?dopt=Citation

Risk of hospitalization for hip fracture and pneumonia associated with antipsychotic prescribing in the elderly: a self controlled case-series analysis in an Australian health care claims database.
Pratt N, Roughead EE, Ramsay E, Salter A, Ryan P.
Drug Safety 2011 Jul 1;34(7):567-75
http://www.ncbi.nlm.nih.gov/pubmed/21663332

Collaborative home medicines review delays time to next hospitalization for warfarin associated bleeding in Australian war veterans.
Roughead EE, Barratt JD, Ramsay E, Pratt N, Ryan P, Peck R, Killer G, Gilbert AL.
Journal of Clinical Pharmacy and Therapeutics 2011 Feb;36(1):27-32
http://www.ncbi.nlm.nih.gov/pubmed/21108651

Prevalence of preventable medication-related hospitalisations in Australia: an opportunity to reduce harm.
Kalisch LM, Caughey GE, Barratt J, Ramsay EN, Killer G, Gilbert AL, Roughead EE.
International Journal for Quality in Healthcare Jan 2011
http://www.ncbi.nlm.nih.gov/pubmed/22495574?dopt=Citation

Use of health services and medicines amongst Australian war veterans: a comparison of young and elderly, near centenarians and centenarians.
Roughead EE, Kalisch LM, Ramsay EN, Ryan P, Gilbert AL.
BMC Geriatrics 2010 Nov 4;10:83
http://www.ncbi.nlm.nih.gov/pubmed/21050484

Prevalence of potentially hazardous drug interactions amongst Australian veterans.
Roughead EE, Kalisch LM, Barratt JD, Gilbert AL.
British Journal of Clinical Pharmacology 2010 Aug;70(2):252-7
http://www.ncbi.nlm.nih.gov/pubmed/20653678

Improving heart failure outcomes with pharmacist-physician collaboration: how close are we?
Kalisch LM, Roughead EE, Gilbert AL.
Future Cardiology 2010 Mar;6(2):255-68
http://www.ncbi.nlm.nih.gov/pubmed/20230266

Differential impact of NSAIDs on rate of adverse events that require hospitalization in high-risk and general veteran populations: a retrospective cohort study.
Pratt N, Roughead EE, Ryan P, Gilbert AL.
Drugs & Aging. 2010;27(1):63-71
http://www.ncbi.nlm.nih.gov/pubmed/20030433?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=1

Continuity of care: when do patients visit community health care providers after leaving hospital?
Roughead EE, Kalisch LM, Ramsay EN, Ryan P, Gilbert AL.
Internal medicine journal 2009 Oct 22
http://www.ncbi.nlm.nih.gov/pubmed/19849749?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=4

The effectiveness of collaborative medicine reviews in delaying time to next hospitalisation for heart failure patients in the practice setting: results of a cohort study.
Elizabeth E. Roughead, John D. Barratt, Emmae Ramsay, Nicole Pratt, Philip Ryan, Robert Peck, Graeme Killer, Andrew L. Gilbert.
Circulation: Heart Failure 2009 Sep;2(5):424-8
http://www.ncbi.nlm.nih.gov/pubmed/19808372?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=5

Proton-pump inhibitors and the risk of antibiotic use and hospitalisation for pneumonia.
Roughead EE, Ramsay EN, Pratt NL, Ryan P, Gilbert AL.
Medical Journal of Australia 2009 Feb 2;190(3):114-6
http://www.ncbi.nlm.nih.gov/pubmed/19203305?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=13

Medication adherence, first episode duration, overall duration and time without therapy: the example of bisphosphonates.
Roughead EE, Ramsay E, Priess K, Barratt J, Ryan P, Gilbert AL.
Pharmacoepidemiology and Drug Safety 2009 Jan;18(1):69-75
http://www.ncbi.nlm.nih.gov/pubmed/19111013?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=14

NSAID use in individuals at risk of renal adverse events: an observational study to investigate trends in Australian veterans.
Roughead EE, Ramsay E, Pratt N, Gilbert AL.
Drug Safety 2008;31(11):997-1003
http://www.ncbi.nlm.nih.gov/pubmed/18840019?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=16

Reducing the risk of adverse thrombotic events - The role of aspirin and clopidogrel.
Leslie Jackowski, Nigel Stocks, Debra Rowett.
Australian Family Physician Sept 2008 Vol 37,(9)689-784
http://www.racgp.org.au/afp/200809/28827

Medication Use by Australian War Veterans in Residential Aged-Care Facilities.
Elizabeth E Roughead, Andrew L Gilbert, Michael C Woodward.
Journal of Pharmacy Practice and Research Vol 38, No. 1, March 2008
http://jppr.shpa.org.au/scripts/cgiip.exe/WService=SHPAJP/ccms.r?PageId=10006

Beta blockers in systolic heart failure.
Leslie Jackowski, Roshmeen Azam.
Australian Family Physician March 2008 Vol 37, (3) 137-139
http://www.racgp.org.au/afp/200803/29059

Diabetes processes of care in the Australian veteran population.
Roughead EE, Barratt J, Gilbert AL, Peck R, Killer G.
Diabetes Research and Clinical Practice 2008 Feb;79(2):299-304
http://www.ncbi.nlm.nih.gov/pubmed/17931732?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=22

Lipid lowering therapy for adults with diabetes.
Leslie Jackowski, Josephine Crockett, Debra Rowett.
Australian Family Physician Jan/Feb 2008 Vol 37, (1/2) 39–41
http://www.ncbi.nlm.nih.gov/pubmed/18239751

Improving medication safety: influence of a patient-specific prescriber feedback program on rate of medication reviews performed by Australian general medical practitioners.
Roughead E, Pratt N, Peck R, Gilbert A.
Pharmacoepidemiology and Drug Safety 2007 Jul;16(7):797-803
http://www.ncbi.nlm.nih.gov/pubmed/17476702?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=25

Trends over 5 years in cardiovascular medicine use in Australian veterans with diabetes.
Roughead EE, Pratt N, Gilbert AL.
British Journal of Clinical Pharmacology 2007 Jul;64(1):100-4
http://www.ncbi.nlm.nih.gov/pubmed/17298476?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=27

Potentially inappropriate prescribing among Australian veterans and war widows/widowers.
Roughead EE, Anderson B, Gilbert AL.
Internal medicine journal 2007 Jun;37(6):402-5.
http://www.ncbi.nlm.nih.gov/pubmed/17535384?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=24

Antidepressants: prevalence of duplicate therapy and avoidable drug interactions in Australian veterans.
Roughead EE, McDermott B, Gilbert AL.
Australian and New Zealand Journal of Psychiatry 2007 Apr;41(4):366-70
http://www.ncbi.nlm.nih.gov/pubmed/17464724?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&ordinalpos=2

Veterans' MATES publications – *PhD Students*

The risk of hip fracture in older people using selective serotonin reuptake inhibitors and other psychoactive medicines concurrently: a matched case-control study in Australia.
Michael J Leach, Nicole L Pratt, Elizabeth E Roughead.
Drugs – Real World Outcomes. 2017; 4(2), 87-96 DOI: 10.1007/s40801-017-0107-8
https://www.ncbi.nlm.nih.gov/pubmed/28516333

Construct validity of four frailty measures in an older Australian population: a Rasch analysis.
Widagdo I, Pratt N, Russell M, Roughead EE.
The Journal of Frailty & Aging (2016) [EPub ahead of print]
http://www.jfrailtyaging.com/current-issue.html

Predictive performance of four frailty measures in an older Australian population.
Imaina S. Widagdo, Nicole Pratt, Mary Russell, Elizabeth E. Roughead.
Age and ageing (2015) 44 (6): 967-972. doi: 10.1093/ageing/afv144
http://www.ncbi.nlm.nih.gov/pubmed/?term=Predictive+performance+of+four+frailty+measures+in+an+older+Australian+population

How common is frailty in older Australians?
Widagdo I, Pratt N, Russell M, Roughead EE.
Australasian Journal on Ageing, 2015 Jun 2. doi: 10.1111/ajag.12184
http://www.ncbi.nlm.nih.gov/pubmed/?term=How+common+is+frailty+in+older+Australians%3F

Psychoactive medicine use and the risk of hip fracture in older people: a case-crossover study.
Michael J. Leach, Nicole L. Pratt, Elizabeth E. Roughead.
Pharmacoepidemiology and drug safety (2015). Published online in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/pds.3785
http://www.ncbi.nlm.nih.gov/pubmed/?term=Psychoactive+medicine+use+and+the+risk+of+hip+fracture+in+older+people%3A+a+case-crossover+study

Medicine use among the elderly before and after hip fracture. Australian Journal of Pharmacy.
Leach MJ, Pratt NL, Roughead EE.
Australian Journal of Pharmacy. 2014; 95(1125): 74-76 [Republished by the Society of Hospital Pharmacists of Australia]
http://jppr.shpa.org.au/Current-issue/JPPR-2013/JPPR-December-2013

Medicine use among older Australians before and after hip fracture.
Leach MJ, Pratt NL, Roughead EE.
Journal of Pharmacy Practice and Research. 2013; 43(4):265-268
http://publishing.realviewtechnologies.com/?iid=86502&startpage=page0000074&xml=ajp.xml

Choice of observational study design impacts on measurement of antipsychotic risks in the elderly: a systematic review.
Pratt N, Roughead EE, Salter A, Ryan P.
BMC Med Res Methodol. 2012 Jun 8;12:72.
http://www.ncbi.nlm.nih.gov/pubmed/22682666

Factors associated with choice of antipsychotic treatment in elderly veterans: potential confounders for observational studies.
Pratt N, Roughead EE, Salter A, Ryan P.
Aust N Z J Public Health. 2010 Dec;34(6):589-93. doi: 10.1111/j.1753-6405.2010.00613.x. Epub 2010 Oct 7
http://www.ncbi.nlm.nih.gov/pubmed/21134060

Risk of hospitalization for stroke associated with antipsychotic use in the elderly: a self-controlled case series.
Pratt N, Roughead EE, Ramsay E, Salter A, Ryan P.
Drugs & Ageing 2010 Nov 1;27(11):885-93
http://www.ncbi.nlm.nih.gov/pubmed/20964462

Antipsychotics and the risk of death in the elderly: an instrumental variable analysis using two preference based instruments.
Pratt N, Roughead EE, Ryan P, Salter A.
Pharmacoepidemiology and Drug Safety 2010 Jul;19(7):699-707
http://www.ncbi.nlm.nih.gov/pubmed/20583208

Brand substitution or multiple switches per patient? An analysis of pharmaceutical brand substitution in Australia.
Kalisch LM, Roughead EE, Gilbert AL.
Pharmacoepidemiol Drug Saf. 2008 Jun;17(6):620-5. doi: 10.1002/pds.1580
http://www.ncbi.nlm.nih.gov/pubmed/18324613

Pharmaceutical brand substitution in Australia--are there multiple switches per prescription?
Kalisch LM, Roughead EE, Gilbert AL.
Aust N Z J Public Health. 2007 Aug;31(4):348-52
http://www.ncbi.nlm.nih.gov/pubmed/17725015

Pharmacoepidemiology supporting national pharmaceutical policy

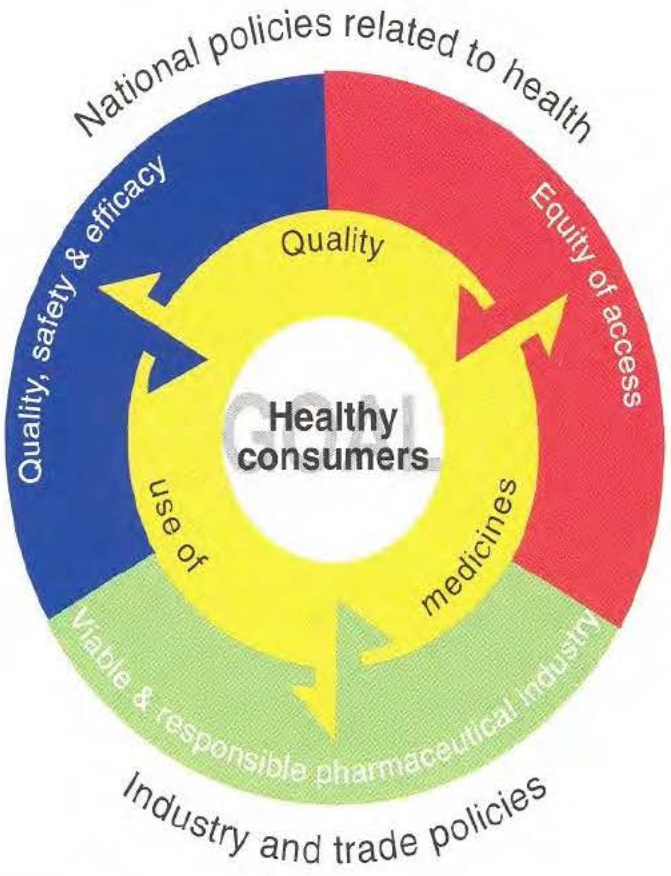
Libby s 47F
Nicole s 47F Emmae s 47F Gillian s 47F
Phil s 47F Andrew s 47F
University of South Australia / University of Adelaide

University of South Australia | Sansom Institute

The National Medicines Policy

Goal:

- To meet medication and related service needs, so that both optimal health outcomes and economic objectives are achieved



Pharmacoepidemiology

- Supporting
  - The medicine
  - The people/practice
  - The policy

Today's talk

- Medicine safety:
  - Measuring harm: does it differ when considering the medicine, the practice or the policy?
- Prescribing Cascades
  - What is their contribution to medicine safety?
- Compliance
  - Measurement: does it differ when measuring for local practice (primary care) or national programs?

University of South Australia | Sansom Institute

Data source:
Department of Veterans' Affairs

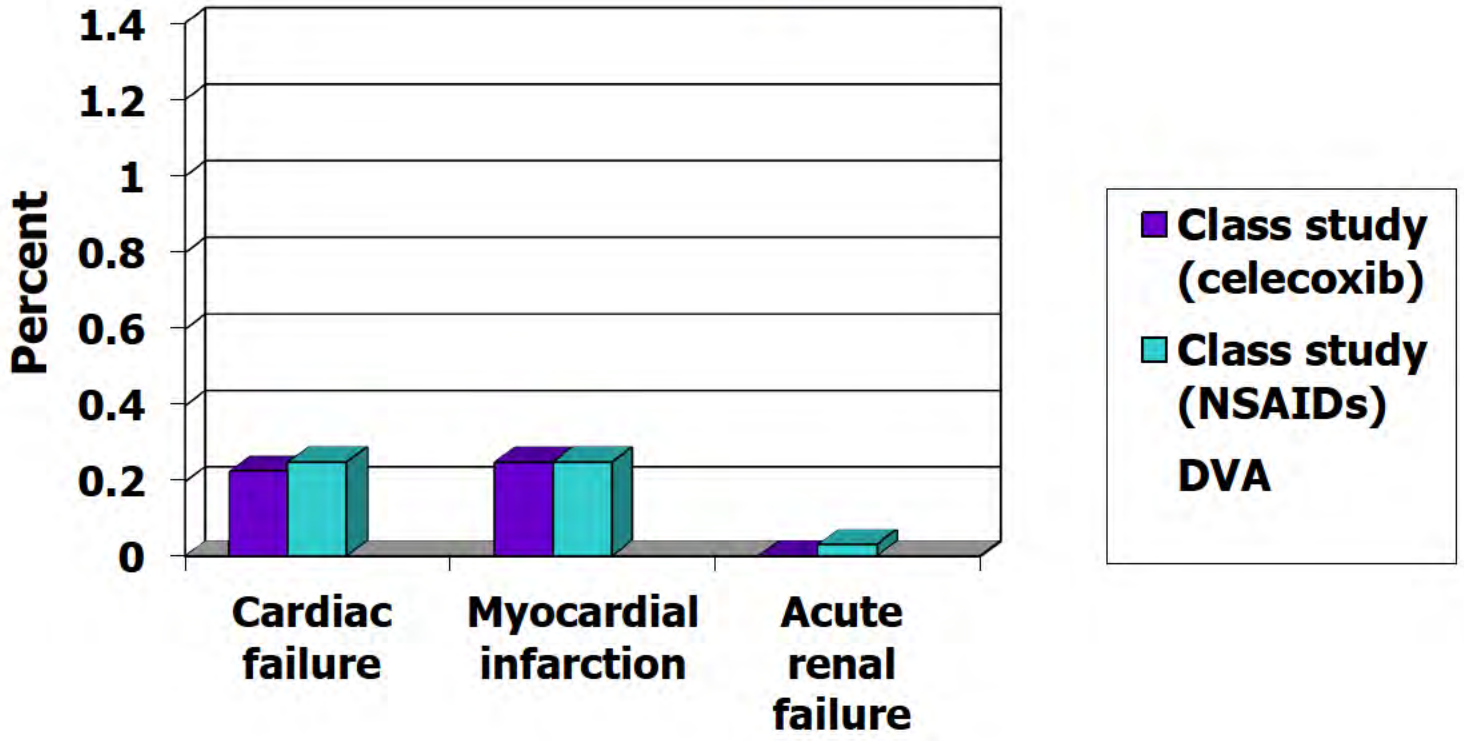
- Treatment population of approximately 300,000 veterans; median age is 80 years
- 120 million prescription records over 9 years
- 200 million medicare and allied health records (GP visits, radiology, pathology etc)
- 6 million hospital records (public and private)

University of South Australia | Sansom Institute

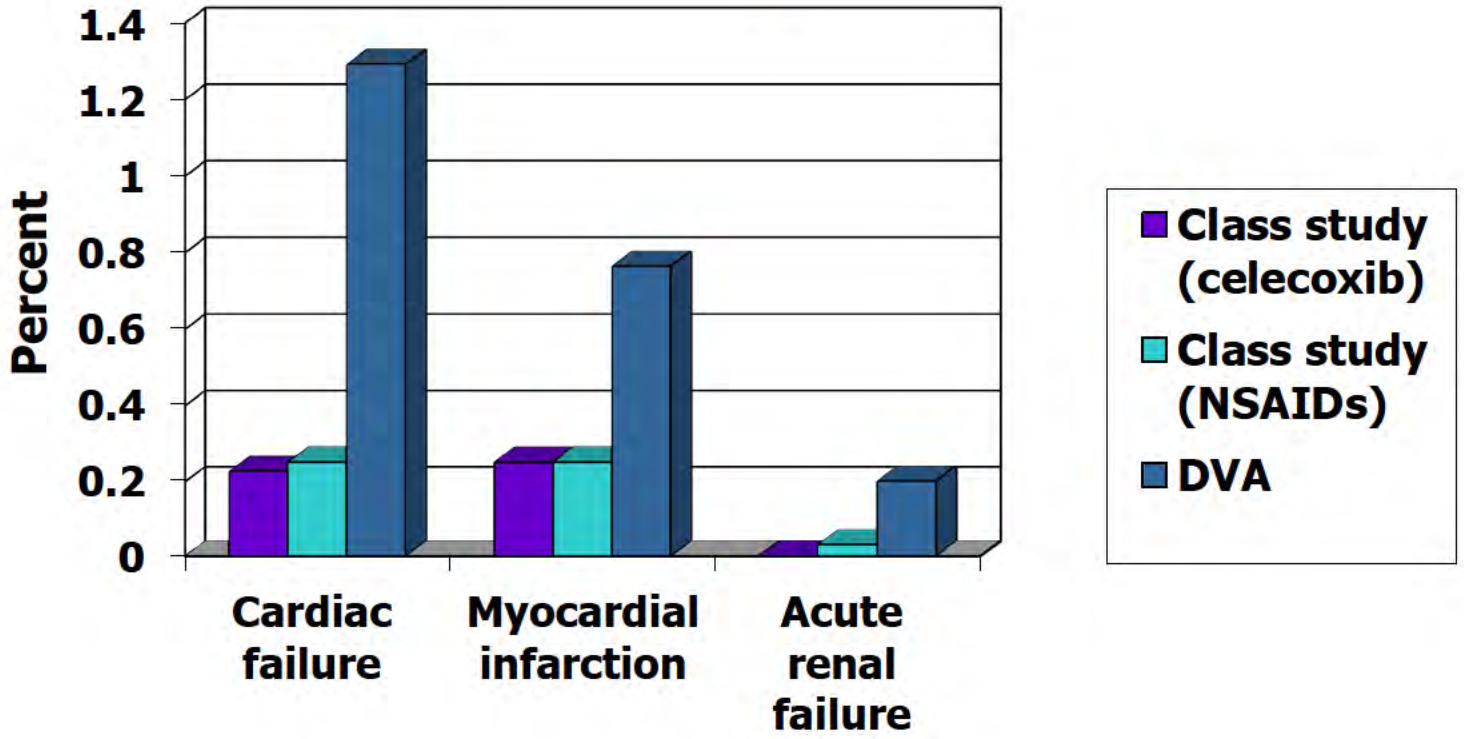
How much harm do medicines cause?

- Focus on the medicine
  - What is the level of pharmacological harm?
  - i.e what level of harm can be attributed to the medicine?
- Focus on the people/practice?
  - What level of harm does this medicine cause when used in practice?
    - i.e. what level of harm occurs as an interaction of the medicine in particular populations
  - To what extent can this be reduced?

Incidence of NSAID adverse events: trial versus practice



Incidence of NSAID adverse events: trial versus practice



Why does measuring the extent of harm in practice matter?

- Application for cost-effectiveness assessments
- Application for budget assessments
- Determining need for quality use of medicines programs (at the public health level)
- Evaluating improvements in programs

Proton pump inhibitors and risk of pneumonia

- 3 prior studies
  - 2 case control studies
  - 1 cohort study, with nested case control design

All found increased risk of pneumonia

Risk estimates

- OR, 1.9; 95% CI, 1.4–2.6: Dutch population
- OR, 1.5; 95% CI1.3–1.7: Danish population
- OR 6.39; 95% CI 1.38-29.70: Paediatric population
- Cohort reported unadjusted incidence rates of 2.45 per 100 person years in those exposed 0.6 per 100 person year in those unexposed
- Studies did not include multiple exposures nor multiple events
- No study reported adjusted incidence rates
- Overall extent of the problem unknown

- Since then additional studies, with similar results
- OR 1.55, 95% CI 1.38-1.77 UK population
- OR 1.3 (95% CI, 1.1-1.4) US study, Hospital acquired pneumonia
- OR 1.02 [95% CI, 0.97 to 1.08] (UK study)
  - However, significant when limited to use within last 30 days OR 1.74 (1.49–2.03)
- Overall extent of the problem unknown

Our studies

Measures pharmacological harm

- Cohort study 1,
  - New users and first event, follow up 12 months
    - 149,252 veterans included
- Case series
  - New users and first event
    - 10,212 cases of pneumonia
- Cohort study 2,
  - New and existing users, multiple events, multiple exposures
    - 185,000 veterans

Reflects use in practice, thus harm in practice

Australian Government
Department of Veterans' Affairs

Veterans' MATES

University of South Australia | Sansom Institute