Method

- Veterans, gold card, aged 65 or over
  - Dispensed a medicine between 01 Jul 2001 and 01 Jan 2002
- Study period: Jan 2002 – July 2006
- **Exposure: time on PPI**
- Those on H2RA medicines excluded
- Confounders: age, gender, number of co-morbidities, aged-care status, socioeconomic index, season, heart failure, COPD, number of doctors, pharmacies, allied health visits, prescriptions
- **Outcome: hospitalisation for pneumonia**

Risk estimates: pneumonia

		Adjusted analysis
Cohort study I new users, first event		1.92 (1.73-2.15)
Case series	Post 1-7 days	1.79 (1.33 - 2.41)
	Post 8-30 days	1.55 (1.30 - 1.85)
	Post > 30 days	1.03 (1.00 - 1.07)
Cohort study II All users, multiple exposures, multiple events		1.16 (1.11-1.22)

Risk difference and extent of harm in practice

	Risk Difference (per 100 person years)	Estimated extra pneumonia / year: Australian veteran population ~300,000
Cohort study I (new PPI users, first event)	1.58	1355 (prevalent pop'n) 271 (incident users)
Case series (days 8-30) (new pneumonia cases)	1.52	1304 (prevalent pop'n) 261 (incident users)
Cohort study II (all PPI users, multiple exposures and events)	8% of all pneumonia cases	395

What about antipsychotics?

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Harm from antipsychotics: hip fracture and pneumonia

- How much harm do they cause?
  - 3 observational studies of hip fracture – all case control
  - 7 observational studies of pneumonia – all case control
  - RCT's – most 12 weeks
  - Only long term RCT
    - examined death as the outcome
- No studies to tell us overall extent of harm at a population level

Case series

- Study period: 2002 -2006
- 8,284 veterans with a hospitalisation for hip fracture
  - 1252 initiated on antipsychotic
- 13,932 veterans with a hospitalisation for pneumonia
  - 1353 initiated on antipsychotic

Risk estimates pneumonia

		Adjusted analysis
Atypical	>8 weeks	1.47 (1.29-1.68)
Typical	>8 weeks	1.51 (1.24-1.83)

Risk estimates hip fracture

		Adjusted analysis
Atypical	>8 weeks	1.08 (0.94-1.24)
Typical	>8 weeks	1.46 (1.26-1.69)

Estimated harm

- Case series risk difference estimates
  - 14 per 100 patient years hip fracture (typical only)
  - 15 per 100 patient years pneumonia (typical and atypical)

Estimated harm in the USA

- Extrapolation to the US population
  - aged 65 years and over, assuming 2.0% taking atypical, 0.5% typical (Canada data)
    - Assuming 65% incident users (Aust data)
- 10,000 extra hospitalisations for hip fracture due to atypical antipsychotics
- 55,000 extra hospitalisations for pneumonia

Medication safety in prescribing cascades

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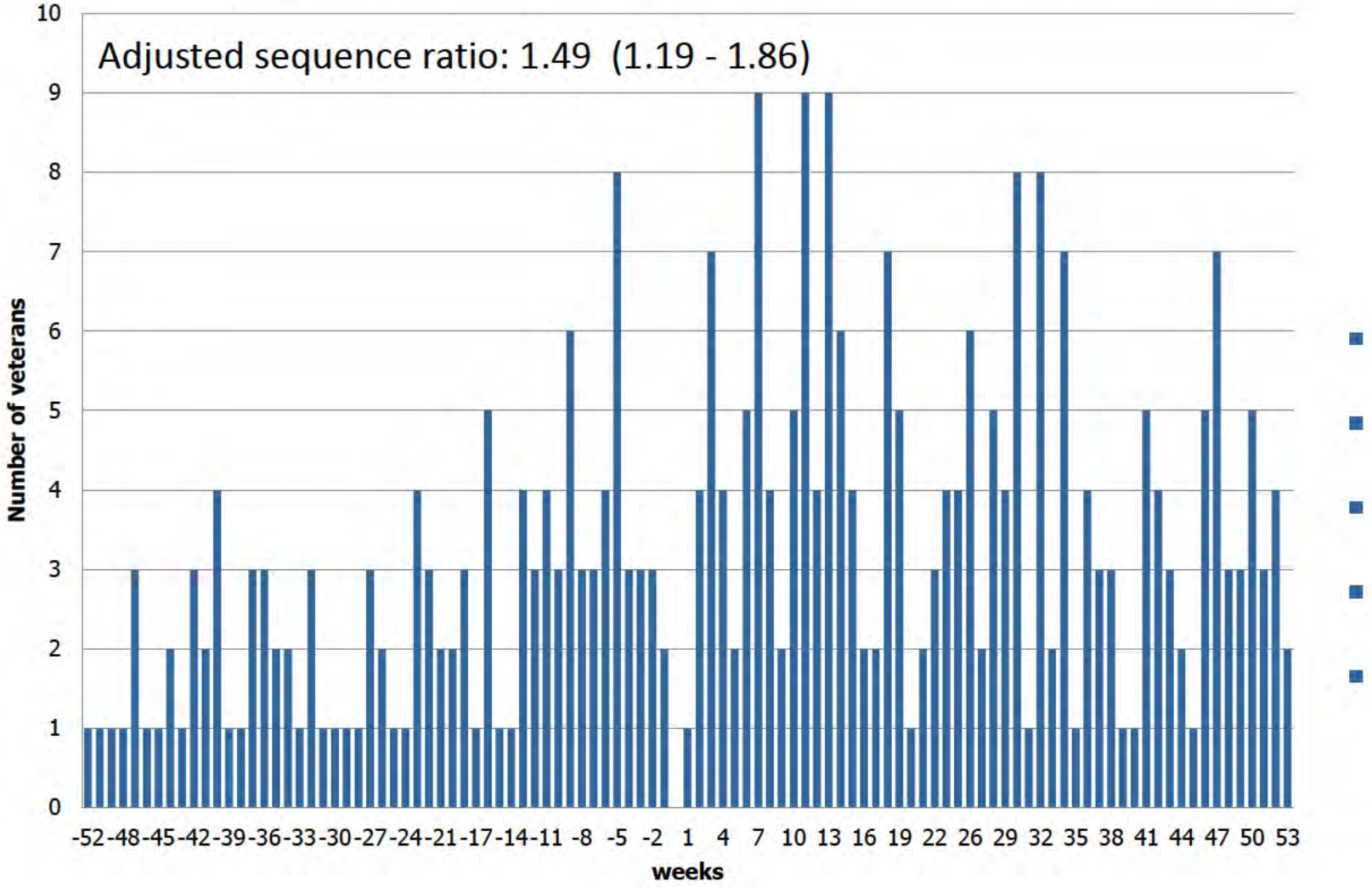
The cascade involving dizziness

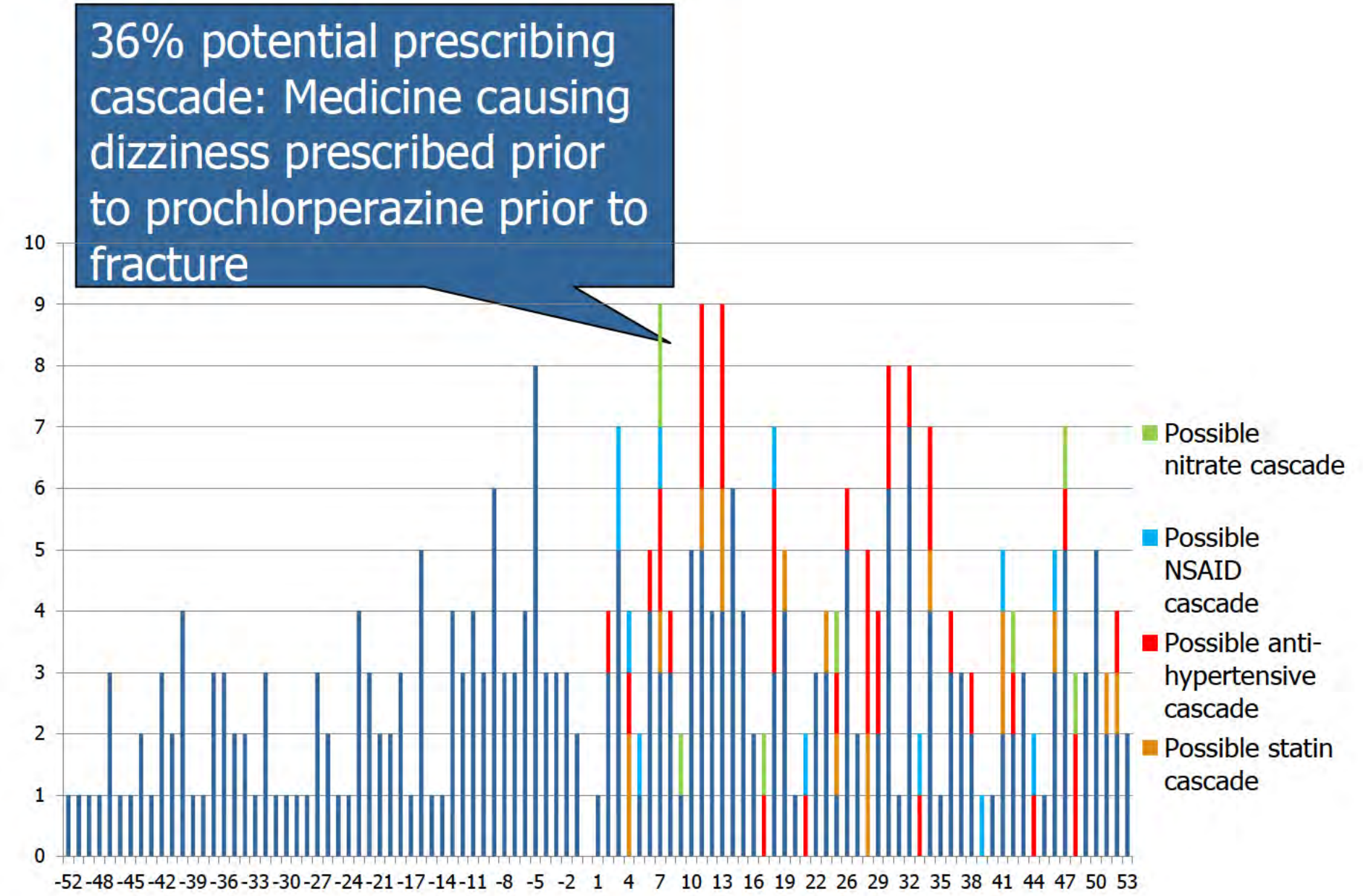
- Prescription symmetry analysis
- Prescription event analysis
  - Robustness still to be established, apparent null and protective associations are confounded by medicines prescribed during hospital stay

Prescription event analysis: Prochlorperazine- hip fracture



Prescription symmetry analysis

	Adjusted (95%CI)
Calcium channel blockers (C08)- prochlorperazine	1.26 (1.16-1.36)
Beta-blockers (C07)- prochlorperazine	1.13 (1.05-1.21)
ACE inhibitors (C09A) – prochlorperazine	1.22 (1.14-1.31)
A2RB (C09C) – prochlorperazine	1.20 (1.11-1.30)
Diuretics (C03) – prochlorperazine	1.07 (1.01-1.14)
Nitrates (C01DA) – prochlorperazine	1.12 (1.03-1.21)
Statins (C10AA) – prochlorperazine	1.50 (1.40-1.61)
NSAIDs (M01A) - prochlorperazine	1.37 (1.27-1.47)


36% potential prescribing cascade: Medicine causing dizziness prescribed prior to prochlorperazine prior to fracture
10
9
8
7
6
5
4
3
2
1
0
-52 -48 -45 -42 -39 -36 -33 -30 -27 -24 -21 -17 -14 -11 -8 -5 -2 1 4 7 10 13 16 19 22 26 29 32 35 38 41 44 47 50 53
Possible nitrate cascade
Possible NSAID cascade
Possible anti-hypertensive cascade
Possible statin cascade

Compliance studies

- 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
- Thus compliance studies need to reflect use in practice

Can we measure compliance to medicines for chronic therapy that reflects practice?

- Most duration studies published in the literature today are limited to new users of medicines and limited to analysis of their first episode of use
- Relatively easy to measure, but is this the right question?
- For chronic therapy people often stop and start, especially when illness is new
- Can we measure it differently?

How long do people stay on bisphosphonates?

- 2007 systematic review
- 14 studies (none from Australia)
- Persistent 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

Can we measure overall duration?

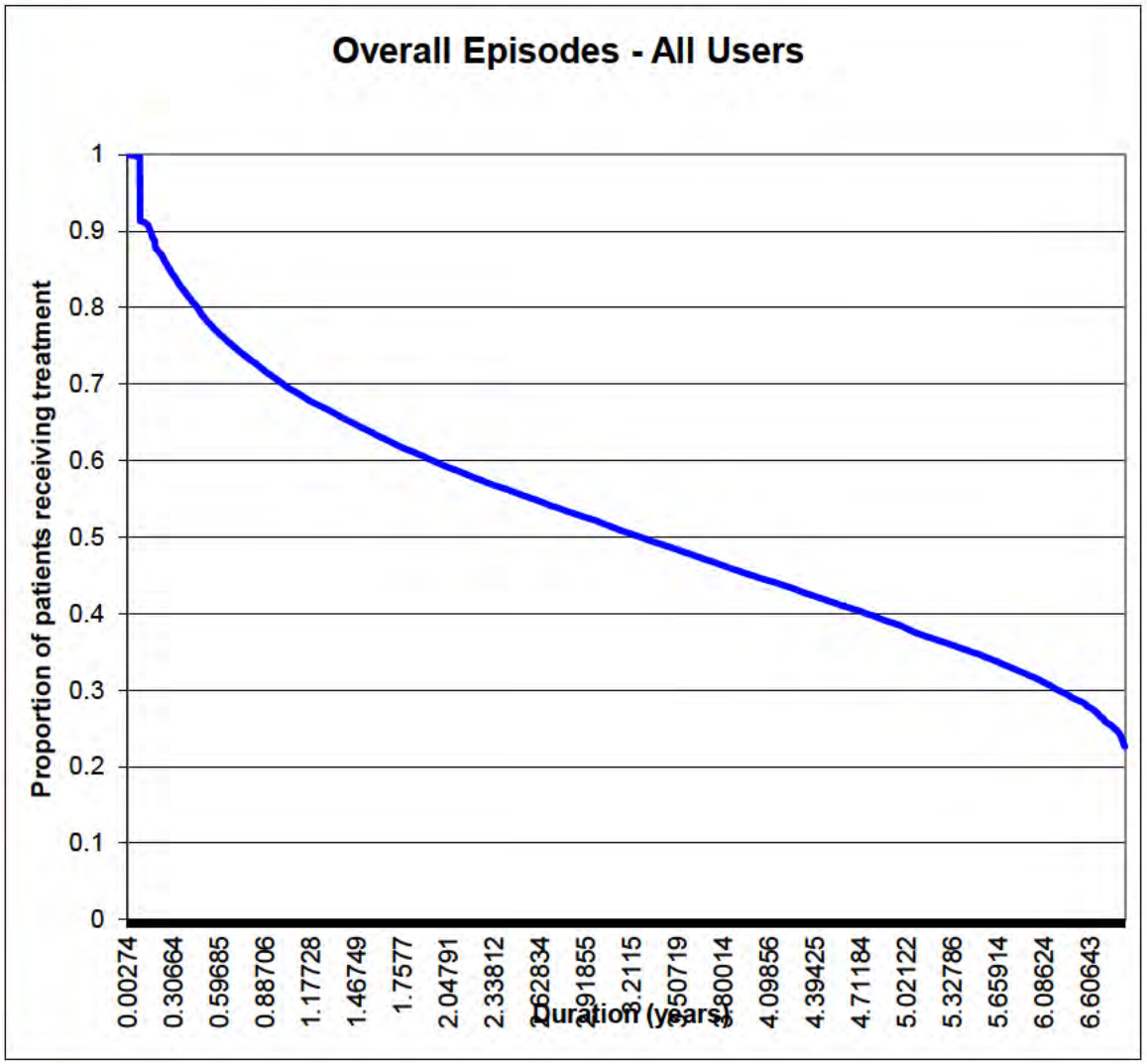
- DVA study
- Study period 7 years
- Veterans, gold card holders, with at least one dispensing of a bisphosphonate
- Followed until death or study end
  - Sub group analysis by new and existing users

Definitions

- Individual episode = time to cessation (cessation = 2 time periods equivalent to the prescription duration without a dispensing)
- Overall duration = sum of individual episodes of duration
- Overall time without therapy = sum of gaps in therapy
- If still alive at study end, then censored according to medicine taking status (i.e. no medicine – then ceased, still taking medicine, then persistent)

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
- Overall duration gives a different estimate



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

University of South Australia

Sansom Institute

Results compared

	N=42,855
How many people are still on bisphosphonates twelve months after **first** starting?	53%
How long do people take bisphosphonates for when only considering first episode of use	1.2 years (median)
How long do people take bisphosphonates for when considering all episodes of use	3.27 years (median)
How many people get sufficient quantity to be adherent over the total time for which they could take the medicine?	66%
How many people get sufficient quantity to be adherent over the entire episode of use (excludes periods of cessation)?	81%
Median time without therapy	1.7 years
How many people get the minimum recommended treatment of at least 3 years?	52% overall (66.5% of existing users)

Conclusion

- Methods development is still required to assist policy makers, particularly when considering policy related to access and quality use of medicines

Acknowledgments

- Department of Veterans' Affairs

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Validation of an Australian claims database to detect adverse events post drug therapy

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ABSTRACT

Background: Observational studies demonstrated increased risk of gastrointestinal bleeds, heart failure, acute renal failure, hypertension and myocardial infarction with non-steroidal anti-inflammatory drug (NSAID) use. The Australian Government Department of Veterans' Affairs maintains a dataset of pharmaceutical claims data. We aimed to determine if these data were suitable for observational studies by exploring a known association.
Objectives: To assess hospitalisations associated with NSAID use in two groups, those on diabetes medicines and those on angiotensin-renin system medicines and loop diuretics.
Methods: Veterans dispensed angiotensin-renin system medicines and frusemide or diabetes medicines in the six months prior to 31st July 2000 were entered into the cohort. In addition, they had no NSAID dispensings in the previous 12 months. The primary end-point was hospitalisation with a primary diagnosis of congestive heart failure (CHF), gastrointestinal ulcer (GI Ulcer), acute renal failure (ARF), acute myocardial infarction (AMI) or hypertension. Subjects not exposed to NSAIDs were followed until first NSAID dispensing then 30 days post. Relative risks were calculated using poisson regression adjusting for sex and age at entry into the cohort.
Results: There were 16,394 subjects dispensed angiotensin-renin system medicines and frusemide with 1849 hospitalisations. The relative risk of all hospitalisations of interest in the exposed compared to unexposed periods was 1.34; 95% CI (1.02, 1.75). Considering diagnoses separately the only excess risk was for GI Ulcer, RR=6.2; 95% CI (2.81, 13.88). The diabetes cohort had 15,401 subjects with 980 hospitalisations. The relative risk of all hospitalisations in the exposed compared to unexposed periods was 1.54; 95% CI (1.08, 2.19). The rate of hospitalisations for CHF and GI Ulcer were significantly increased, RR=1.62; 95% CI (1.05, 2.5) and RR=3.75; 95% CI (1.35, 10.45) respectively.

CONFLICT OF INTEREST STATEMENT

This work is funded by the Department of Veterans Affairs. The department reviews work prior to publication.

BACKGROUND

Observational studies have demonstrated an increased risk of gastrointestinal bleeds[1], heart failure[2], acute renal failure[3], hypertension[4] and acute myocardial infarction[5] with non-steroidal anti-inflammatory drug (NSAID) use.

Subgroups of patients may be at increased risk of these events

- Patients with diabetes are more vulnerable to the effects of NSAIDS[5]
- Patients taking ACE and Frusemide are vulnerable to the "triple whammy effect"[6]. The triple whammy is an adverse event resulting from the combination of medicines acting on the renin-angiotensin system, diuretics and NSAIDs which puts people at risk of renal dysfunction

The Department of Veterans Affairs (DVA) administrative claims database was used to explore the association between NSAID prescribing and hospitalisation for congestive heart failure (CHF), gastrointestinal ulcer (GI Ulcer), acute renal failure (ARF), acute myocardial infarction (AMI) or hypertension. The pharmacy claims database contains details of all prescription medicines dispensed to veterans for which the DVA pay a subsidy. The DVA also maintains a hospital dataset which contains information on admission and separation dates and primary diagnosis codes in both the public and private health systems. The veteran population has approximately 305,000 live members with a median age of 80 years.

We aimed to determine if these data are suitable for observational studies by exploring a known association.

OBJECTIVES

To assess the risk of hospitalisation associated with NSAID initiation in three groups, those on diabetes medicines, those on angiotensin-renin system medicines and loop diuretics and those on other medicines

References

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[3] Huerta, C , J Castellsague, et al Nonsteroidal anti-inflammatory drugs and risk of ARF in the general population Am J Kidney Dis, 2005 45(3): 531-9
[4] Solomon, D H , Schneeweiss S , Levin R , Avorn J Relationship between COX-2 specific inhibitors and hypertension Hypertension, 2004 44(2): 140-5
[5] Hernandez-Diaz, S , C Varas-Lorenzo and L A Garcia Rodriguez Non-steroidal antiinflammatory drugs and the risk of acute myocardial infarction Basic Clin Pharmacol Toxicol, 2006 98(3): 266-74
[6] Lobez, K K and G M Shenfield Drug combinations and impaired renal function -- the "triple whammy" Br J Clin Pharmacol, 2005 59(2): 239-43

Table 1: Demographics

	Exposure	ACE/Frusemide Cohort	Diabetes Cohort	Reference Cohort
N	Exposed	8113	8334	69309
	Not Exposed	9752	8239	59441
Age (*Median*)	Exposed	79	77	77
	Not Exposed	80	78	78
Sex (*% Male*)	Exposed	60.4	67.8	61.4
	Not Exposed	66.4	72.7	62.9

Table 2: Risk of Hospitalisation with NSAID initiation by cohort

Outcome	Exposure	ACE/Frusemide Cohort		Diabetes Cohort		Reference Cohort	
		Events / PY	RR** (95% CI)	Events / PY	RR** (95% CI)	Events* / PY	RR** (95% CI)
Hospitalisations of interest***	Exposed	137 / 660	1.48 (1.25 - 1.75)	78 / 681	1.47 (1.17 - 1.84)	67 / 2024	1.79 (1.40 - 2.28)
	Not Exposed	4696 / 33114		2808 / 35511		2024 / 296758	
CHF	Exposed	94	1.32 (1.08 – 1.62)	50	1.53 (1.16 - 2.03)	11	1.20 (0.66 - 2.17)
	Not Exposed	3610		1730		513	
GI Ulcer	Exposed	10	4.49 (2.35 – 8.56)	6	2.82 (1.24 - 6.40)	22	2.80 (1.82 - 4.30)
	Not Exposed	113		113		414	
ARF	Exposed	10	2.03 (1.08 – 3.81)	2	1.02 (0.25 - 4.13)	4	1.51 (0.56 , 4.09)
	Not Exposed	249		103		146	
AMI	Exposed	20	1.56 (1.0 – 2.43)	19	1.26 (0.80 - 1.99)	29	1.95 (1.34 , 2.82)
	Not Exposed	648		797		799	
Hypertension	Exposed	3	1.91 (0.60 – 6.06)	1	0.77 (0.11 - 5.53)	1	0.35 (0.05 , 2.50)
	Not Exposed	76		65		152	

* Private Hospital admissions only
** Rate Ratio, adjusted for sex and age at entry into the cohort
*** Hospitalisations of interest are all hospitalisations with a primary diagnosis of congestive heart failure (CHF), gastrointestinal ulcer (GI Ulcer), acute renal failure (ARF), acute myocardial infarction (AMI) or hypertension

METHODS

A longitudinal cohort study design was used to compare the risk of hospitalisation in the 30 days following NSAID initiation with the risk in the unexposed population. Subjects alive as at 1/8/2000 who had a least one medication prescribed in the 4 months (baseline period) prior to this date but were not prescribed an NSAID in the previous 12 months were eligible for entry. Three cohorts were established at study entry.

Diabetes cohort: Veterans dispensed an oral hypoglycaemic or insulin in the baseline period (World Health Organization anatomical and therapeutic chemical (ATC) classification A10)

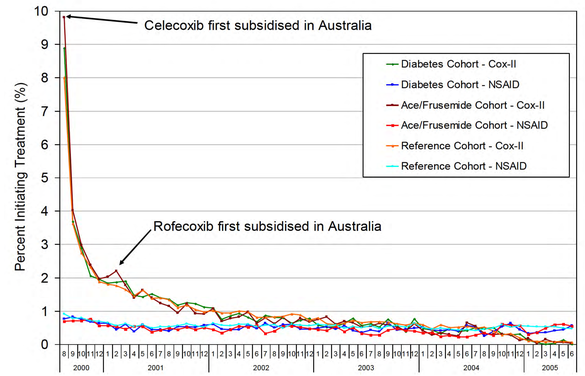
ACE/Frusemide cohort: Veterans dispensed an angiotensin converting enzyme inhibitor or angiotensin II receptor blocking agent (ATC classification C09) and frusemide in the baseline period

Reference cohort: Veterans not in the Diabetes or ACE/Frusemide cohort, dispensed at least one medicine in the baseline period

The primary end-point was hospitalisation with a primary diagnosis of congestive heart failure (CHF), gastrointestinal ulcer (GI Ulcer), acute renal failure (ARF), acute myocardial infarction (AMI) or hypertension. Public and private hospital admissions were available for the ACE/Frusemide and diabetes cohort. Private hospital admissions only were available for the reference cohort.

Follow-up time commenced at entry into the cohort. Subjects not exposed to NSAIDs were followed until death or end of study (30/6/2005). Subjects prescribed an NSAID were followed from entry into the cohort until their first NSAID script then 30 days post their first NSAID prescription. Rate Ratios were calculated using poisson regression adjusting for sex and age at entry into the cohort. All analyses were performed using SAS version 9.12 (SAS Institute, Cary, NC).

Figure 1: Distribution of NSAID initiation by Cohort



RESULTS

- Overall, first time NSAID use was reported in 45.4%, 49.7% and 53.8% of patients in the ACE/ Frusemide, Diabetes and Reference cohorts respectively
- Celecoxib was first subsidised in Australia in August 2000 followed by Rofecoxib in February 2001. A marked increase in the utilisation of these drugs was seen in all patients at this time irrespective of concomitant prescribing. Almost 10% of patients who had not been dispensed NSAIDs in the previous 12 months were initiated on celecoxib in the first month it was subsidised in Australia (Figure 1).
- The **Diabetes cohort** had 16573 subjects (70.2% male, median age 78 years) with 2886 hospitalisations. There was a significantly increased risk of all hospitalisations of interest, and individually for CHF and gastrointestinal ulcer hospitalisations (Table 1).
- There were 17865 subjects in the **ACE/Frusemide** cohort (63.7% male, median age 79) with 4833 hospitalisations. There was a significantly increased risk of all hospitalisations of interest, and individually for CHF, gastrointestinal ulcer and acute renal failure hospitalisations (Table 2).
- The **Reference cohort** had 128750 subjects (62.0% male, median age 77 years) with 2091 hospitalisations. There was a significantly increased risk of all hospitalisations, and individually for gastrointestinal ulcer and myocardial infarct hospitalisations (Table 2).

CONCLUSION

This study demonstrates that following NSAID initiation the risk of hospitalisation was significantly increased in all patients. The risk of hospitalisation due to GI Ulcer was 4 times greater than unexposed patients in the ACE/Frusemide cohort and almost 3 times greater in both the diabetes and reference cohorts, the latter of which is consistent with other published studies[1]. The risk of hospitalisation due to myocardial infarction was almost 2 times greater in patients initiated in NSAIDs in the reference cohort. This result is also consistent with other published observational studies[5].
Thus, the Australian Department of Veteran Affairs' dataset is sensitive enough to detect known associations.

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.

Prevalence and Trends of Analgesic Medication Utilisation in Patients Undergoing Total Joint Replacement Surgery

MEDICINE & DEVICE SURVEILLANCE CRE

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Conflict of Interest

- *The authors declares that the research for and communication of this independent body of work does not constitute any financial or other conflict of interest.*

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Background

- Candidates for joint arthroplasty have failed several pain management interventions
- Opioid use:
  - Globally: use increased since the 1990s
    - In part due to the relaxing of prescription restrictions, regulations, and changes in guidelines for non-cancer chronic pain
  - Australia: 15 fold increase
  - For musculoskeletal pain: increased 50% (2001-2010)
- *However, no estimates exist for the treatment of arthritis or patients undergoing joint arthroplasty, and how this changed the use of other pain medication use*

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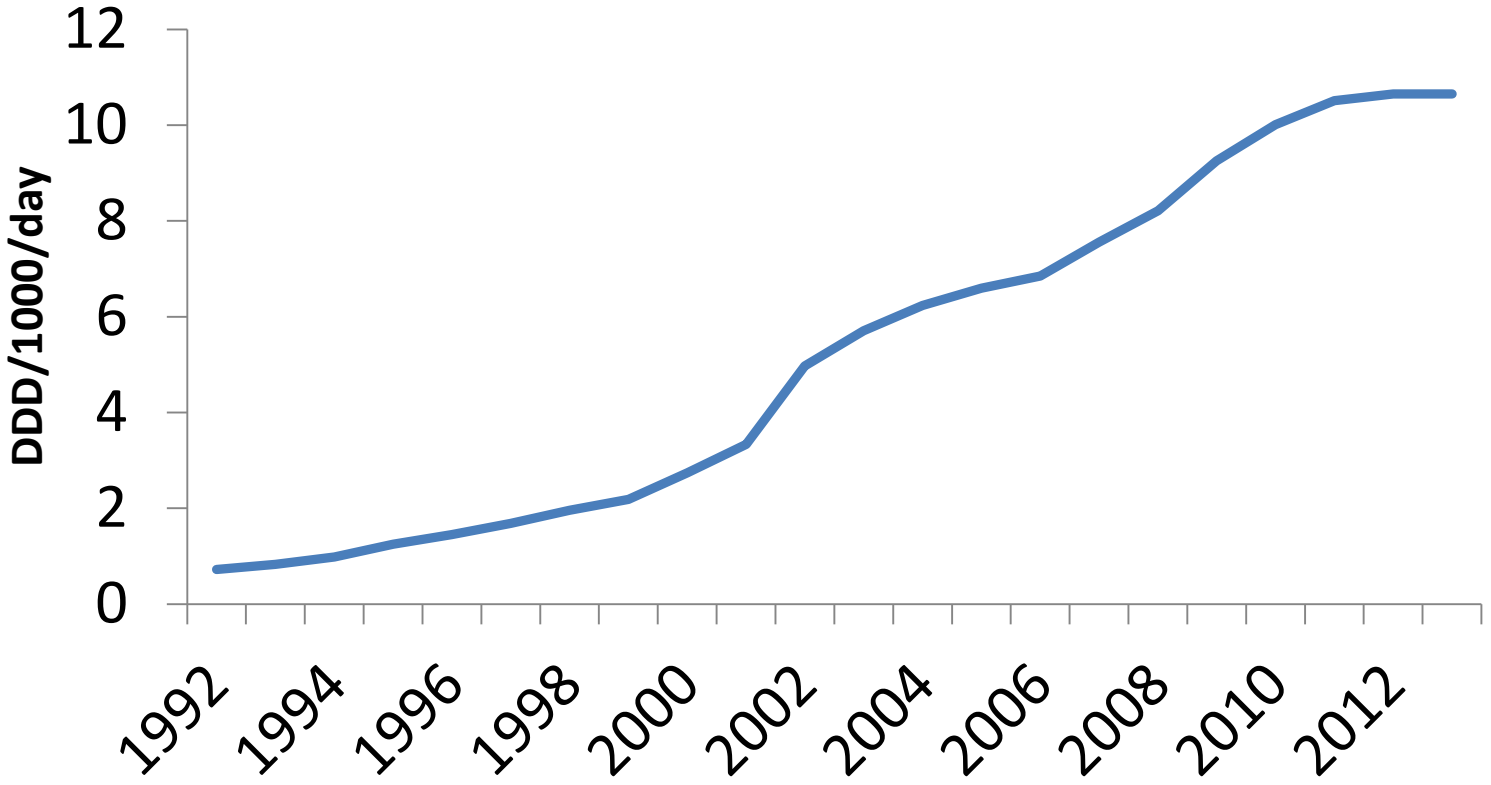
Opioid use: Australia



Source: Australian Government Drug Utilisation Subcommittee

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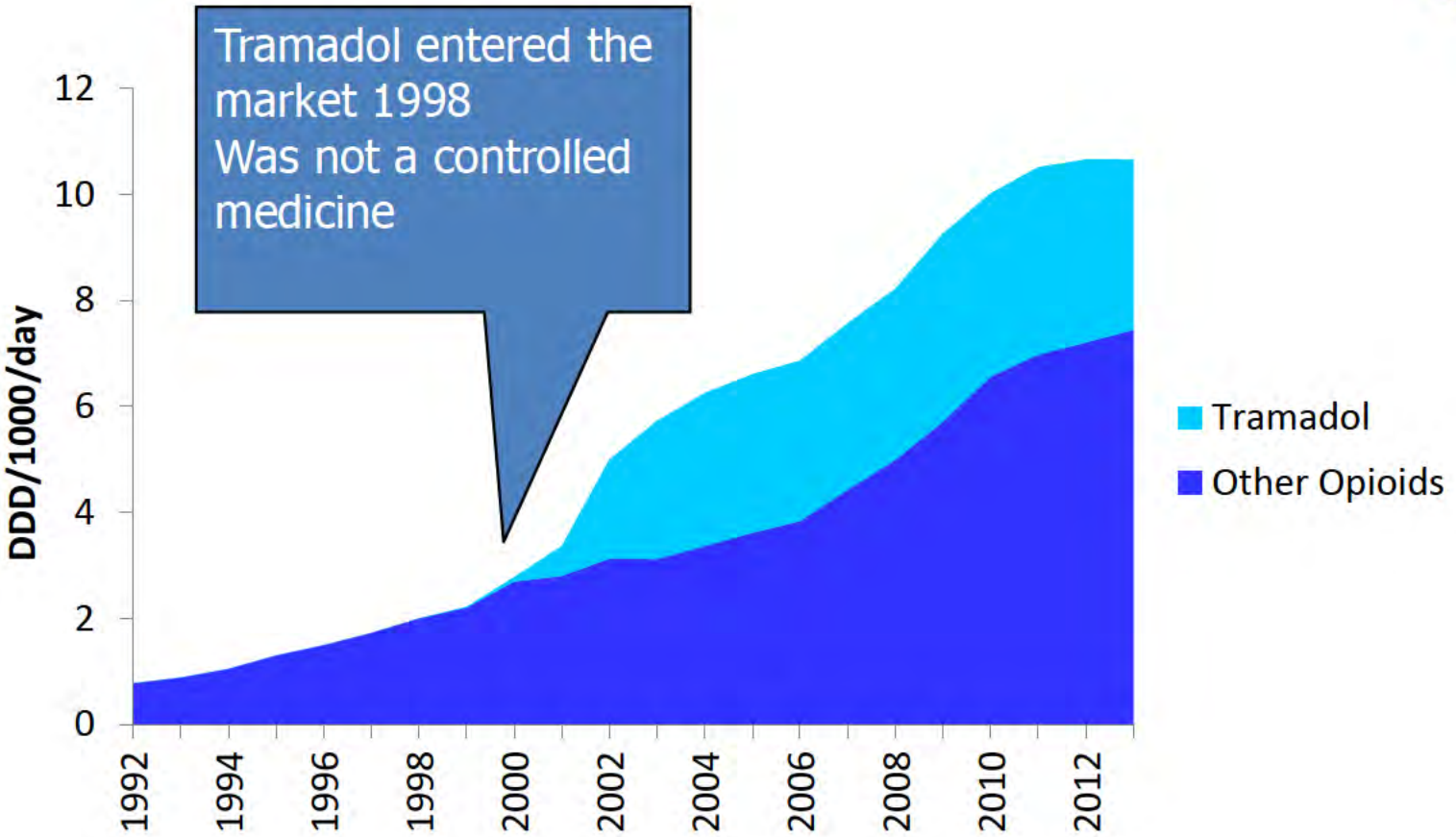
Drivers of increased use



Source: Australian Government Drug Utilisation Subcommittee

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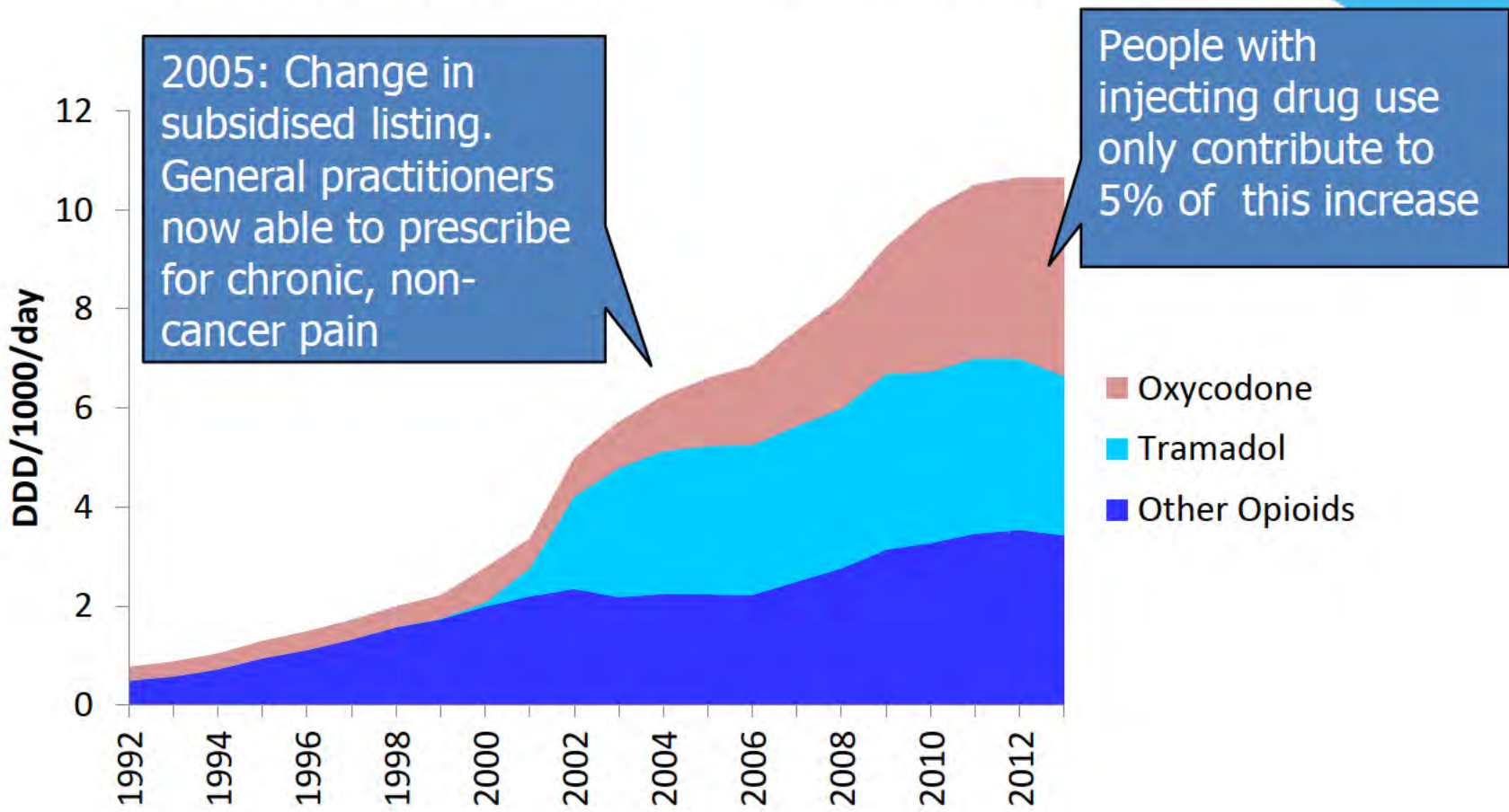
Drivers of increased use



Source: Australian Government Drug Utilisation Subcommittee

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Purpose

To evaluate trends in prevalence and rate of change in analgesic medication dispensing in patients prior to undergoing joint arthroplasty.

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Methods

- **Design**: population based epidemiological study
- **Population and Data source: Australian Government Department of Veterans' Affairs and their health claims database**
- **Cohort**: adult, primary unilateral elective total hip (THA) or primary total knee arthroplasty (TKA), no history of cancer,

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Australian Government Department of Veterans' Affairs (DVA) Health Database

- All prescription **medications**, medical, allied health services, and **hospitalizations** for veterans which DVA pays a subsidy
  - Medications:
    - ATC and PBS item coding scheme
  - Hospitalizations:
    - ICD-10-AM coding scheme

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Methods

- **Time Frame**: Procedures between 2001-2012
- **Primary outcome:** dispending of opioids in the year prior to surgery
- **Secondary outcomes:** NSAIDs, corticosteroid injections, neuropathic pain medication, hypnotics, and muscle relaxants supply in the year prior to surgery
- **Covariates**: gender, age, primary diagnosis and co-morbidities and use of the other analgesics
- **Analysis**: prevalence and adjusted prevalence rate ratios (PRR)

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Results

Primary Total Hip Replacement Surgery

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Patient Characteristics

	THAs (N=10,018)	
Year	2001	2012
Total N	848	642
Females, %*	42	51*
Age, median (IQR)*	79 (76-82)	82 (69-87)*
Primary Diagnosis: Osteoarthritis, %	94	96
N of Co-morbidities[1], median (IQR)*	5 (3 - 7)	6 (4 - 8)*
Depression,* %	14	23
Back Pain, * %	13	14
PTSD, * %	0	0.3

*Comparison over years, $p<0.05$.

1. RxRisk-V measure.

IQR=Interquartile range.

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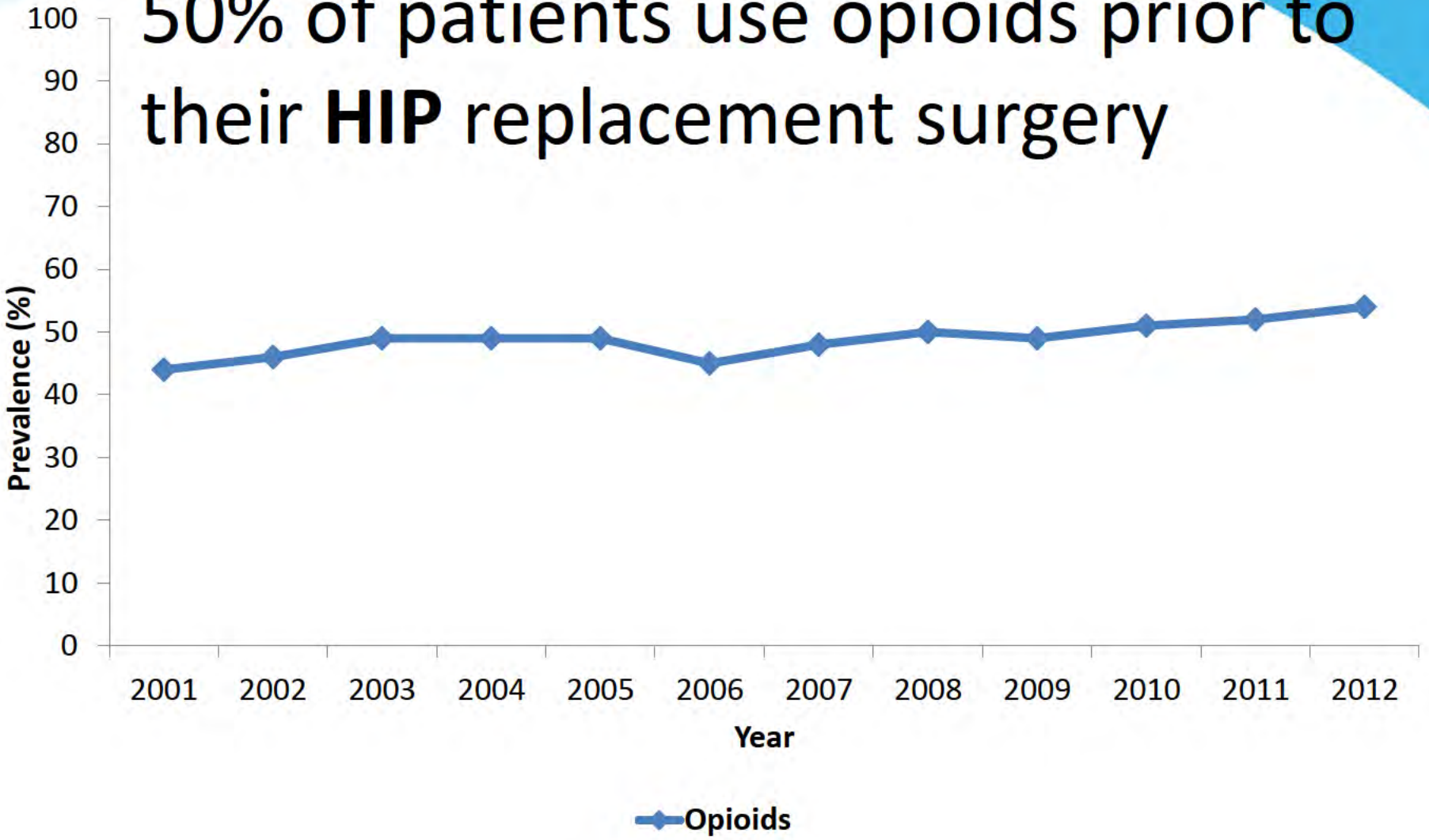
50% of patients use opioids prior to their **HIP** replacement surgery



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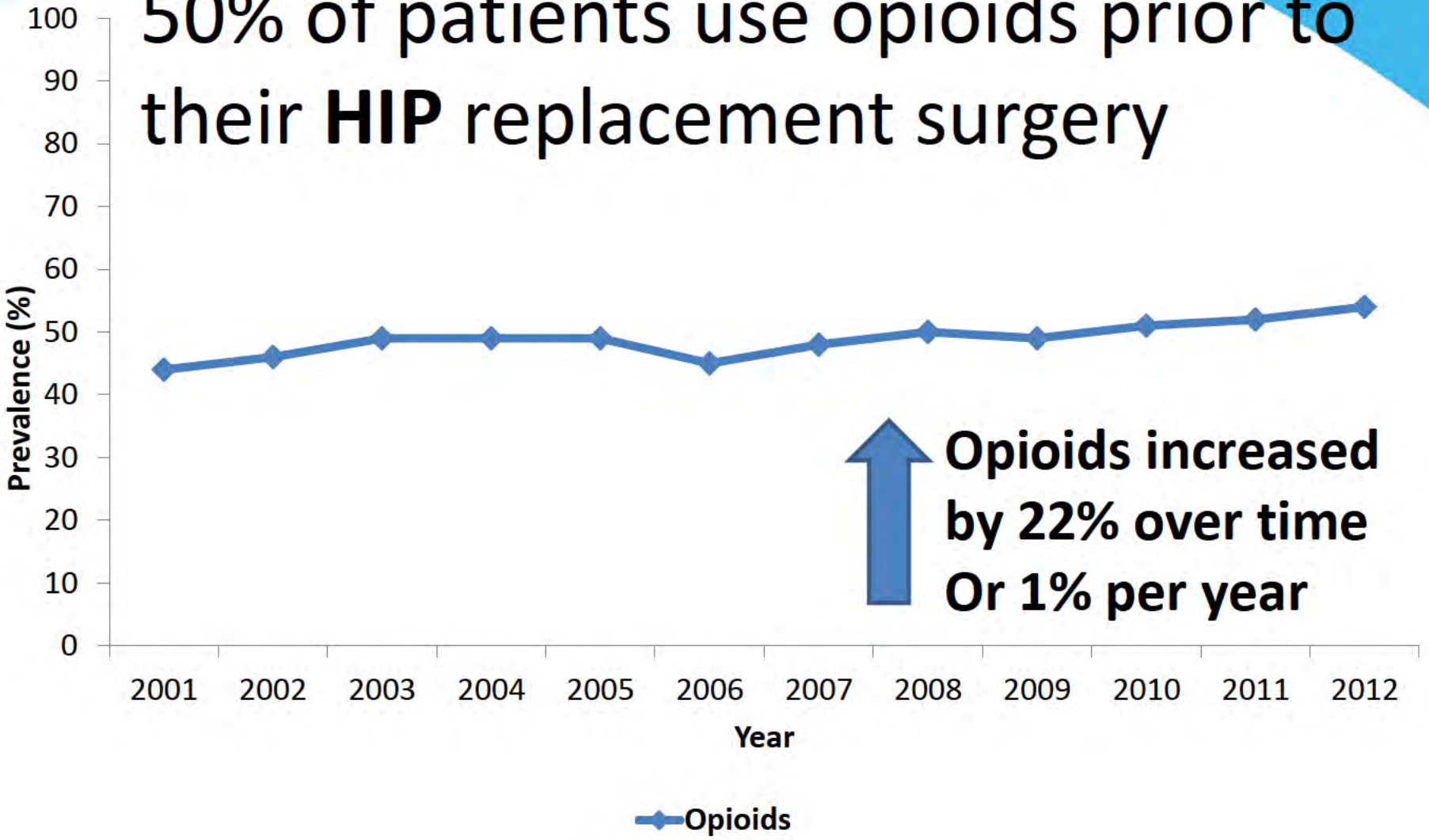

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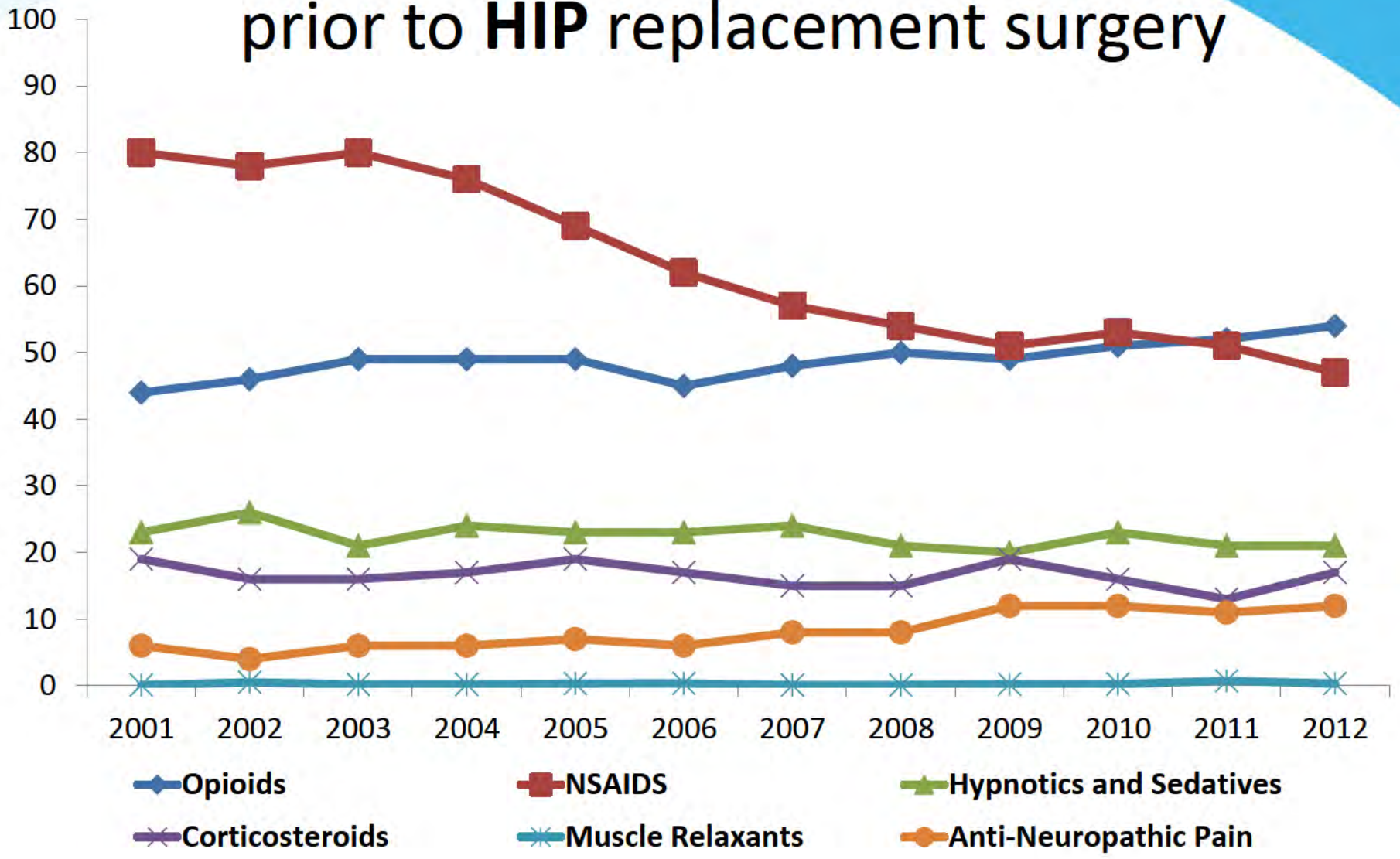
Prevalence of analgesic medicines prior to **HIP** replacement surgery



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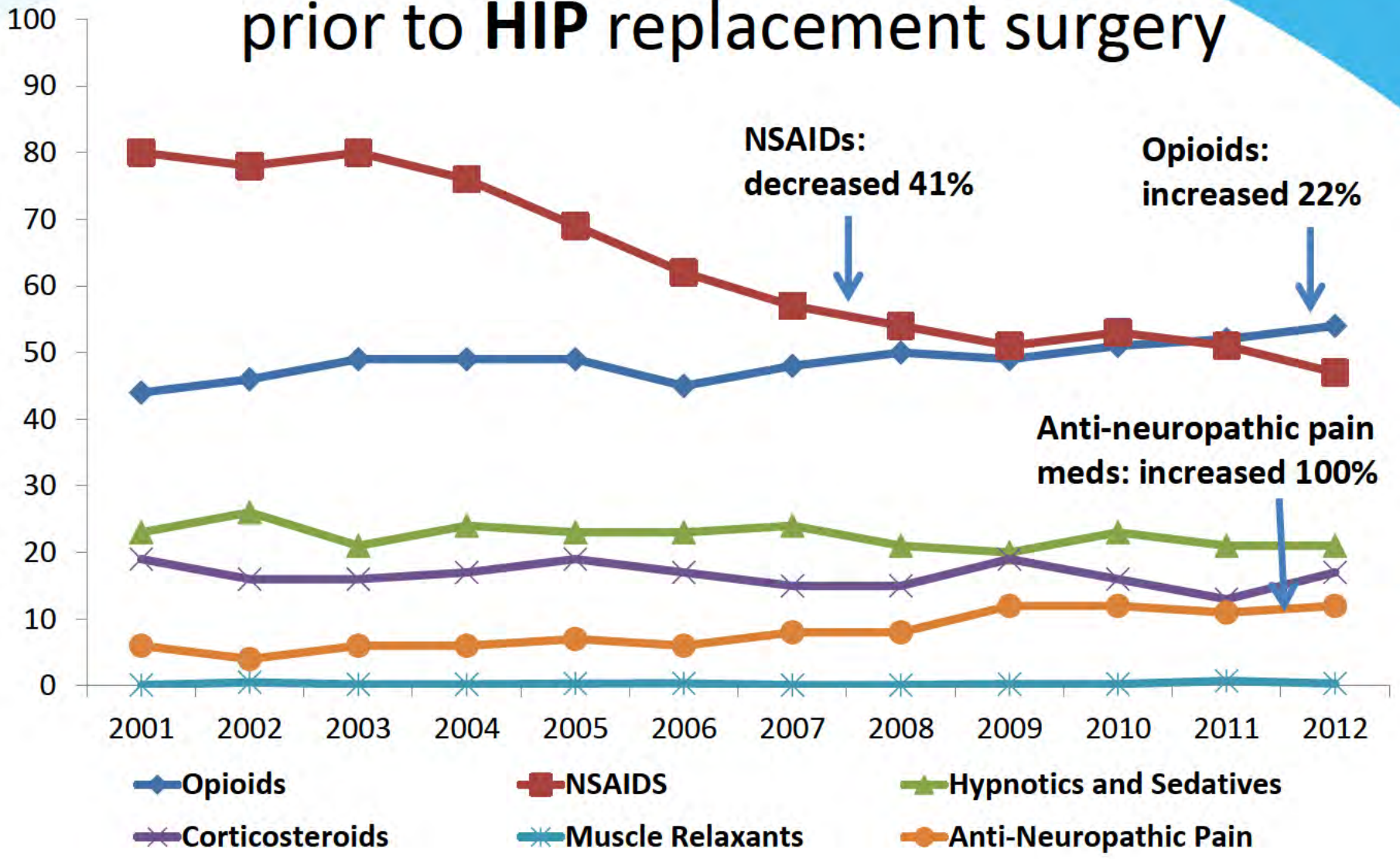
Prevalence of analgesic medicines prior to **HIP** replacement surgery



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Amount of analgesic medicines prior to **HIP** replacement surgery

Year	2001	2012
Opioids		
Days Exposed	***21 (8 - 49)***	***39 (14 - 91)***
N of scripts	3 (1 - 7)	4 (2 - 10)
NSAIDS		
Days Exposed	**181 (99 - 252)**	**154(62 - 305)**
N of scripts	6 (3 - 9)	5 (2 - 10)
Corticosteroids		
Days Exposed	**67 (31 - 233)**	**64 (36 - 180)**
N of scripts	2 (1 - 7)	1 (1 - 5)
Anti-Neuropathic Pain		
Days Exposed	***120 (58 - 261)***	***138 (58 - 335)***
N of scripts	4 (1 - 7)	5 (2 - 11)

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Results

Primary Total Knee Replacement Surgery

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Patient Characteristics

	TKAs (N=15,517)	
Year	2001	2012
Total N	1257	1113
Females, %*	42	46*
Age, median (IQR)*	78 (76-81)	79 (67-85)*
Primary Diagnosis: Osteoarthritis, %	96	98*
N of Co-morbidities[1], median (IQR)*	5 (2-7)	6 (5-8)*
Depression,* %	14	26
Back Pain, * %	9	12
PTSD, * %	0.2	1

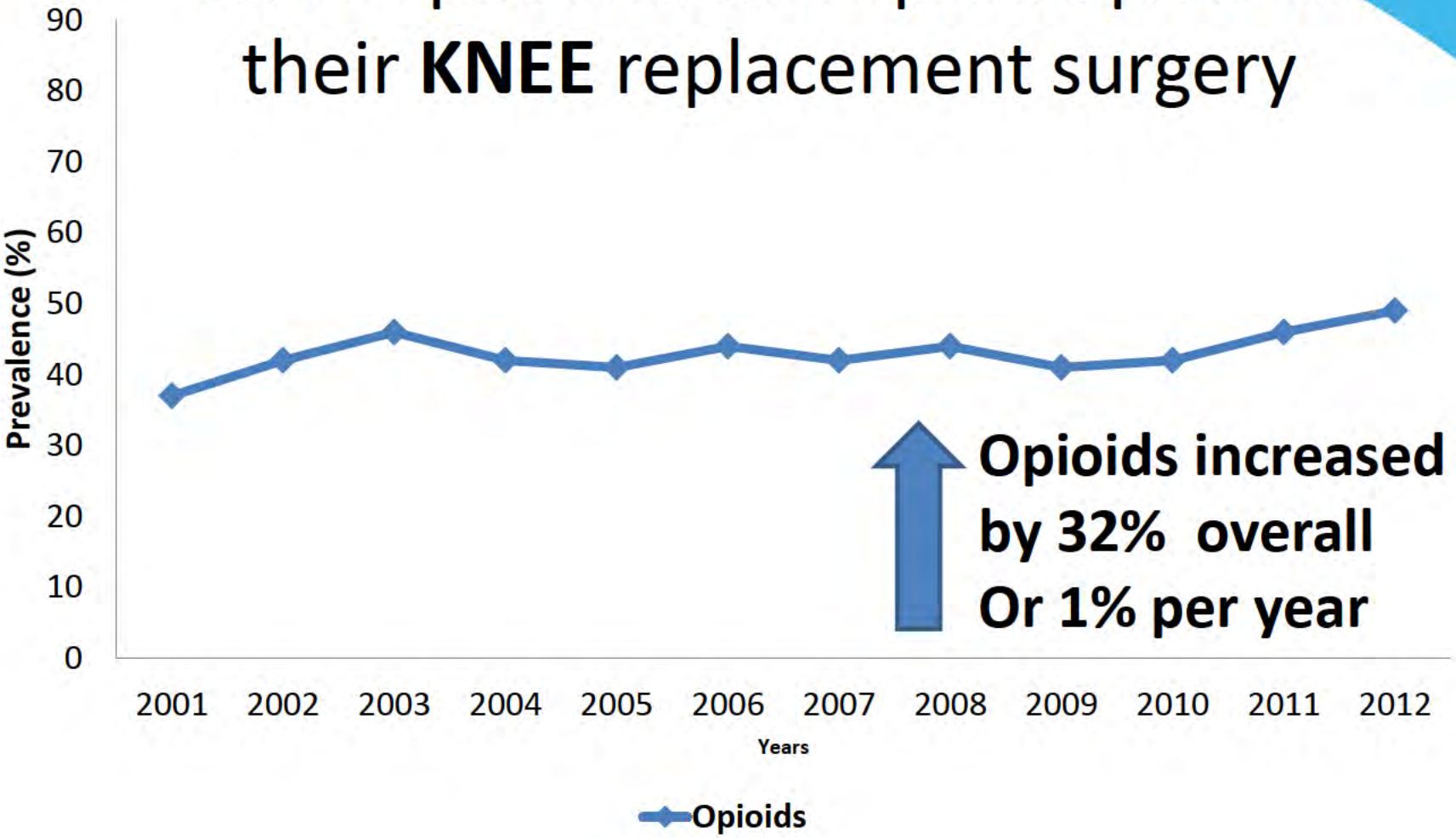
1. RxRisk-V measure.

IQR=Interquartile range.

*Comparison over years, $p<0.05$.

MEDICINE & DEVICE SURVEILLANCE CRE

45% of patients use opioids prior to their **KNEE** replacement surgery



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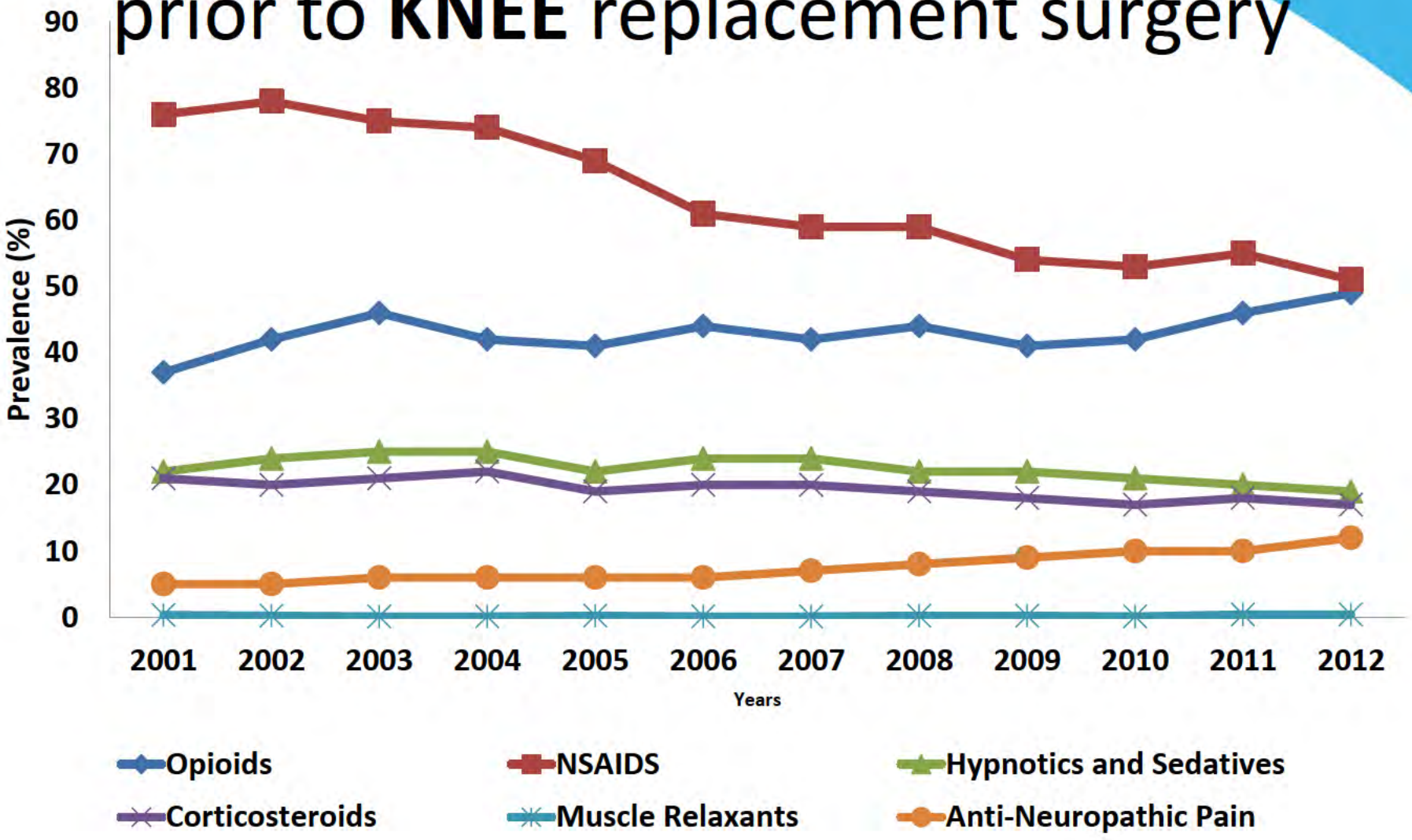
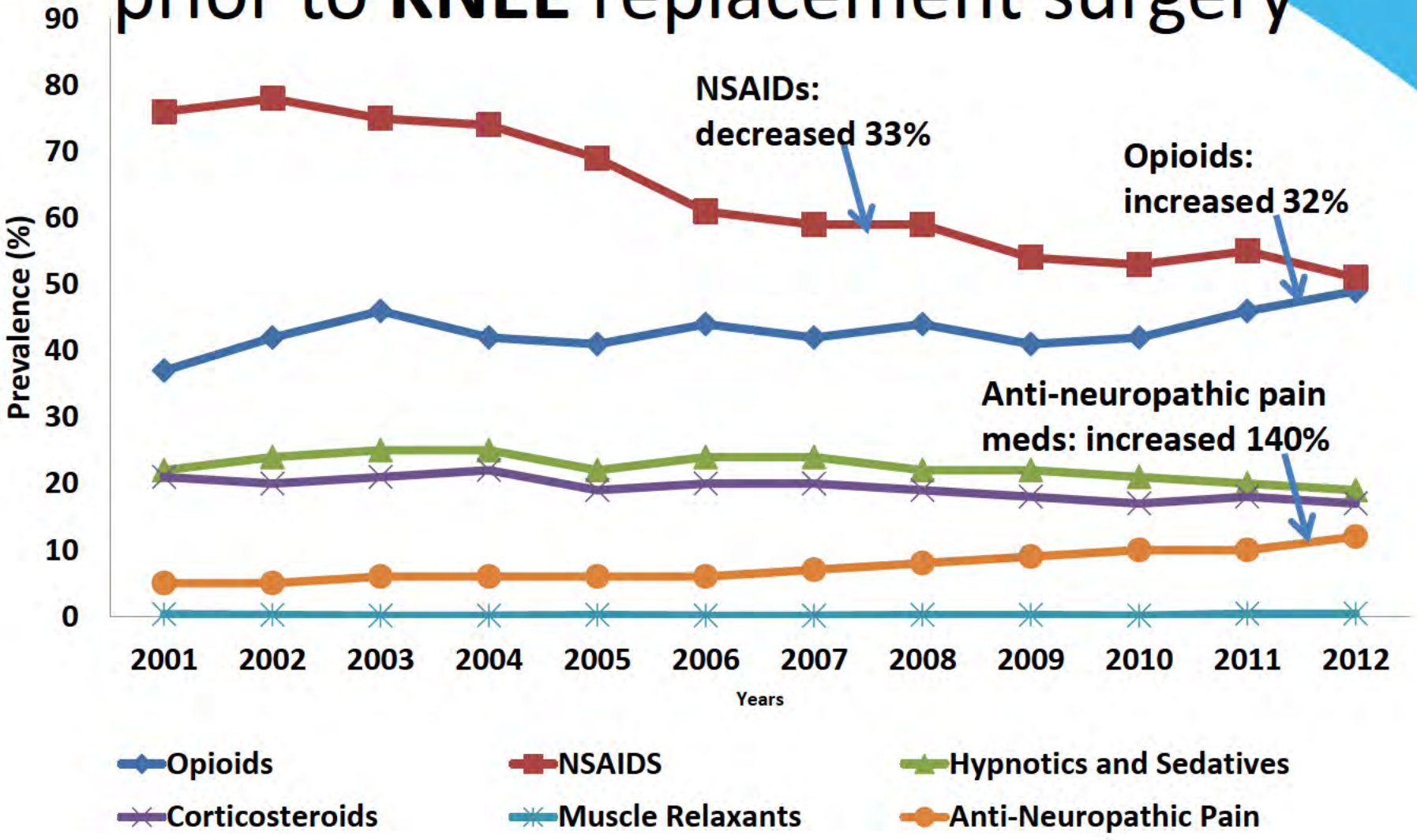
Prevalence of analgesic medicines prior to **KNEE** replacement surgery



MEDICINE & DEVICE SURVEILLANCE
CRE

Prevalence of analgesic medicines prior to **KNEE** replacement surgery



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Amount of analgesic medicines prior to **KNEE** replacement surgery

Year	2001	2012
Opioids		
Days exposed	***20 (7-43)***	***29 (9 - 87)***
N of scripts	3 (1 - 6)	4 (1- 9)
NSAIDS		
Days exposed	***158 (86 - 251)***	***176 (65 - 328)***
N of scripts	5 (3 - 8)	6 (2 - 12)
Corticosteroids		
Days exposed	**36 (31 - 108)**	**36 (31 - 95)**
N of scripts	1 (1 - 3)	1 (1 - 3)
Anti-Neuropathic Pain		
Days exposed	***157 (68- 277)***	***292 (149 - 344)***
N of scripts	4 (2 - 8)	9 (5 - 13)

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Discussion

- Approximately half of all patients receiving a total hip or total knee replacement were dispensed opioids in the year prior to their surgery
  - We identified only a small increase in opioid use over time

- Utilisation of other analgesic medications prior to a patient's joint replacement surgery changed significantly over time
  - Decreased utilisation of NSAID
  - *Relative* increase in anti-neuropathic pain medication but prevalence is still low

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Conclusion

- Use of opioids prior to JR surgery was high with half of all patients using opioids
- Unlike the general population there has been only marginal increases in utilisation in this population over time
- Future work will determine whether utilisation of opioids **after** joint replacement surgery has changed over time

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Thank you

A SELF-CONTROLLED CASE SERIES TO ASSESS THE EFFECTIVENESS OF BETA-BLOCKERS FOR HEART FAILURE IN REDUCING HOSPITALISATIONS IN THE ELDERLY

Emmae Ramsay[1], Nicole Pratt[2], Elizabeth Roughead[2], Philip Ryan[1] and Ben Ewald[3].
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[3]School of Medicine and Public Health, University of Newcastle, Australia.

Background

Beta-blockers are recommended for patients with symptomatic or advanced chronic heart failure[1] but participants clinical trial are younger than those living in the community with heart failure.[2] Few observational studies have been conducted in the elderly with heart failure and confounding by indication is possible limitation of these studies. The self-controlled case-series (SCCS) design has been used successfully to study the safety of medicines but has not been used widely to address questions of medicine effectiveness in the elderly.

Objectives

To determine the suitability of using the self-controlled case-series design to assess improvements in health outcomes using the effectiveness of beta-blockers for heart failure in reducing hospitalisations for heart failure as the example.

Methods

Patients aged 65 years or over who were hospitalised for chronic heart failure (CHF) (ICD-10; I500, I501, I509) between July 2005 - June 2006 were included. The risk of hospitalisation for CHF associated with exposure to beta-blockers for heart failure (bisoprolol, carvedilol, and metoprolol succinate) compared to non-exposure was compared. Models were adjusted for time varying confounders including age, co-morbidity using the Australian adaption of Rx-Risk-V, number of prescribers, admission to aged care and dispensing of frusemide, ACE/A2RB, digoxin and aldosterone anatagonists. Sensitivity analyses were performed by varying the study period and the length of follow-up.

Results

The one year observation period showed a non-significant decreased risk of heart failure with 4-8 months beta-blocker exposure, (RR, 0.76; 95% CI (0.57-1.02)) and a significant decreased risk with 8-12 months exposure (RR, 0.62; 95% CI (0.39, 0.99)). For the four year observation period there was an increased risk of hospitalisation less than eight months after initiation and significant but smaller decrease 8-12 months after initiation (RR, 0.90; 95% CI 0.82, 0.98)).

Table 1: Characteristics of study subjects by period of observation

Exposure Status	Number of Subjects (%)	Follow-up Years*	Duration of exposure*	Age at first hospitalisation*	Age at first exposure*
1 Year observation period					
Exposed	645 (18.7%)	0.5(0.3,0.7)	0.3(0.1,0.6)	81(79,84)	81(78,84)
Unexposed	2805 (81.3%)	0.5(0.3,0.8)	-	82(79,86)	-
4 Year observation period					
Exposed	3276 (25.8%)	2.0(1.1,3.0)	0.8(0.2,1.8)	83(80,86)	81(78,84)
Unexposed	9406 (74.2%)	1.7(1.0,3.0)	-	83(80,87)	-

* Median (q1,q3)

Discussion

The results of the SCCS analysis showed similar results to those observed in RCTs[3] (OR 0.63; 95% CI 0.56-0.71) indicating that the method can be successfully applied to assess health outcomes. The risk of hospitalisation for heart failure was increased in the first weeks following treatment initiation which is not unexpected as an RCT[4] assessing carvedilol found a worsening of heart failure in 5.9% of study participants during the two week run in period.

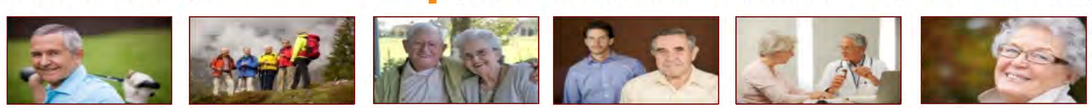
Conclusion

SCCS is a potentially useful tool for studying the effectiveness of medicines but results are sensitive to underlying assumptions of the method. Further research is necessary to develop guidelines for the appropriate use of this design in effectiveness studies. The results also illustrate the benefits of extending beta blocker utilisation to the older age group of heart failure patients in which their use is common but the evidence is sparse.

Table 2: Self controlled case-series results

Risk Period	Events/PY	IRR* (95% CI)	IRR** (95% CI)
1 Year observation period			
Unexposed	3275/2660	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)
Weeks Prior to beta-blocker initiation			
6-8 weeks	18/22	1.37 (0.93 - 2.01)	1.29 (0.88 - 1.89)
4-6 weeks	52/23	3.74 (2.90 - 4.82)	3.47 (2.70 - 4.46)
2-4 weeks	87/24	5.85 (4.72 - 7.26)	4.97 (4.02 - 6.16)
1 day-2 weeks	255/25	15.98 (13.51 - 18.91)	12.72 (10.74 - 15.07)
Weeks after to beta blocker initiation			
1 day-2 weeks	46/25	2.85 (2.18 - 3.72)	2.21 (1.70 - 2.88)
2-4 weeks	25/23	1.63 (1.16 - 2.29)	1.29 (0.92 - 1.80)
1-3 months	94/107	1.34 (1.08 - 1.67)	1.18 (0.94 - 1.47)
3-8 months	46/76	0.78 (0.58 - 1.04)	0.76 (0.57 - 1.02)
8-12 months	15/24	0.66 (0.42 - 1.05)	0.62 (0.39 - 0.99)
4 Year observation period			
Unexposed	13541/34944	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)
Weeks Prior to beta-blocker initiation			
6-8 weeks	137/147	2.22 (2.00 - 2.45)	2.24 (2.02 - 2.48)
4-6 weeks	237/148	3.79 (3.50 - 4.11)	3.82 (3.52 - 4.14)
2-4 weeks	380/149	5.93 (5.54 - 6.34)	5.92 (5.54 - 6.34)
1 day-2 weeks	872/150	13.04 (12.38 - 13.73)	12.95 (12.29 - 13.63)
Weeks after to beta blocker initiation			
1 day-2 weeks	190/149	2.75 (2.52 - 3.01)	2.74 (2.51 - 3.00)
2-4 weeks	156/145	2.27 (2.06 - 2.50)	2.27 (2.06 - 2.50)
1-3 months	488/734	1.71 (1.61 - 1.82)	1.68 (1.58 - 1.79)
3-8 months	322/685	1.21 (1.12 - 1.30)	1.18 (1.10 - 1.27)
8-12 months	212/535	0.93 (0.85 - 1.02)	0.90 (0.82 - 0.98)
>12 months	458/1358	0.65 (0.60 - 0.70)	0.61 (0.57 - 0.66)

*Adjusted for asge and month
** Adjusted for age at heart failure hospitalisation[8], study month and time-varying covariates which were assessed quarterly; co-morbidities using the Australian adaption of Rx-Risk-V[19], number of prescribers, admission into aged care and prescription of frusemide, ACE/A2RB, digoxin and aldosterone antagonists



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.

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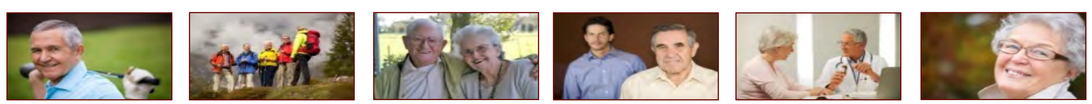
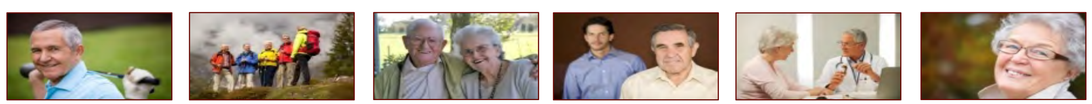
[3] Shibata MC, Flather MD, Wang D: Systematic review of the impact of beta blockers on mortality and hospital admissions in heart failure. European Journal of Heart Failure 2001, 3:351-357
[4] Packer M, Bristow M, Cohn J, *et al:* The Effect of Carvedilol on Morbidity and Mortality in Patients with Chronic Heart Failure. The New England Journal of Medicine 1996, 334(21):1349-1355.





Medicines to be used with caution in the elderly; patterns of use in Australian war veterans

M. s 47F
Austin and Repatriation
E.E. s 47F A.L. s 47F
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

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

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

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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.

- Want to learn more about your medicines?
- Unsure how long you should keep taking each medicine?
- Unsure about the best time to take each medicine?
- Recently started a new medicine or had your medicines changed?
- Do you forget to take your medicines?
- Are you confused or worried about your medicines?

A **Home Medicines Review** may help

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Therapeutic area selected

Medication-related problem analysis

Module topic selected

Patient specific feedback developed

Module implementation

Evaluation

- This paper presents both the medication related problem analysis and impact of the program for the eighth module;
  - Potentially inappropriate medication use in the elderly

Inappropriate medicine use is common

- Use of potentially inappropriate medicines in the elderly is common
  - ranging from 17% to 25%[1-3]
- Even higher in the frail elderly or nursing home residents
  - ranging from 20 to 50%[4-5]

[1-3] Stuck et al., 1994; Sloan et al., 2002; Pitkala et al., 2002
[4-5] Fick et al., 2001; Fu et al., 2004

Leads to poorer health outcomes

- These medicines have the potential for harm
- Intermittent and chronic use have both been found to be problematic[6]
- Observational studies have shown
  - increased hospitalisation (OR = 1.27, p = 0.002)[6]
  - death (OR = 1.28, p = 0.01) [6]
  - Self-reported poorer health status[7]

[6] Lau et al., 2005; [7] Fu et al., 2004

- Extent of potentially inappropriate medicine use had not been assessed in Australia
- However, studies had shown 1 in 5 unplanned hospital admissions in the elderly in Australia is due to medication related problems[8]

[8] Roughead et al., 1998

- Aim:
  - To determine the extent of potentially inappropriate medicine use in the Australian veteran population
  - Evaluate the impact of a prescriber feedback intervention to reduce use of potentially inappropriate medicines

Identifying potentially inappropriate medicine utilisation

- Medicines considered inappropriate in the elderly were those identified within the Beers[9] (USA) or McLeod[10] (Canada) criteria adapted for Australia
  - all medicines requiring diagnostic information were excluded (data unavailable), as were all medicines not available under Australia's subsidised scheme

[9] Fick et al., 2003; [10] McLeod et al., 1997

Final list of potentially inappropriate medicines

- long-acting benzodiazepines
- primidone
- dexamphetamine
- thioridazine
- amitriptyline. doxepin, imipramine, fluoxetine
- propoxyphene
- methyldopa, short acting nifedipine, clonidine
- amiodarone, disopyramide
- antihistamines
- oxybutinin, propantheline
- ergot alkaloids
- ticlopidine
- indomethacin, high dose naproxen, high dose piroxicam, high dose ketoprofen, mefenamic acid
- nitrofurantoin
- cimetidine

Method: medication related problems

- Department of Veterans' Affairs (DVA) pharmacy claims database
- 75 million pharmacy records for a treatment population of approximately 320,000 veterans, with a median age of 80 years
- Subjects included
  - aged 70 years and over at Jan 1st 2005 and eligible for all DVA services
- Outcome
  - dispensed at least one potentially inappropriate medicine between Jan 1st and June 30th 2005

Evaluating the intervention

- Method
  - Rate of potentially inappropriate medicine use in veterans who were targeted
  - Compared to historical controls
  - Data source: Department of Veterans Affairs pharmacy claims data

Results

- 192,363 veterans included
- 53% male and 47% female
- mean age 82 (SD 4.8) years
- On average, 8.5 prescriptions dispensed per month

Results

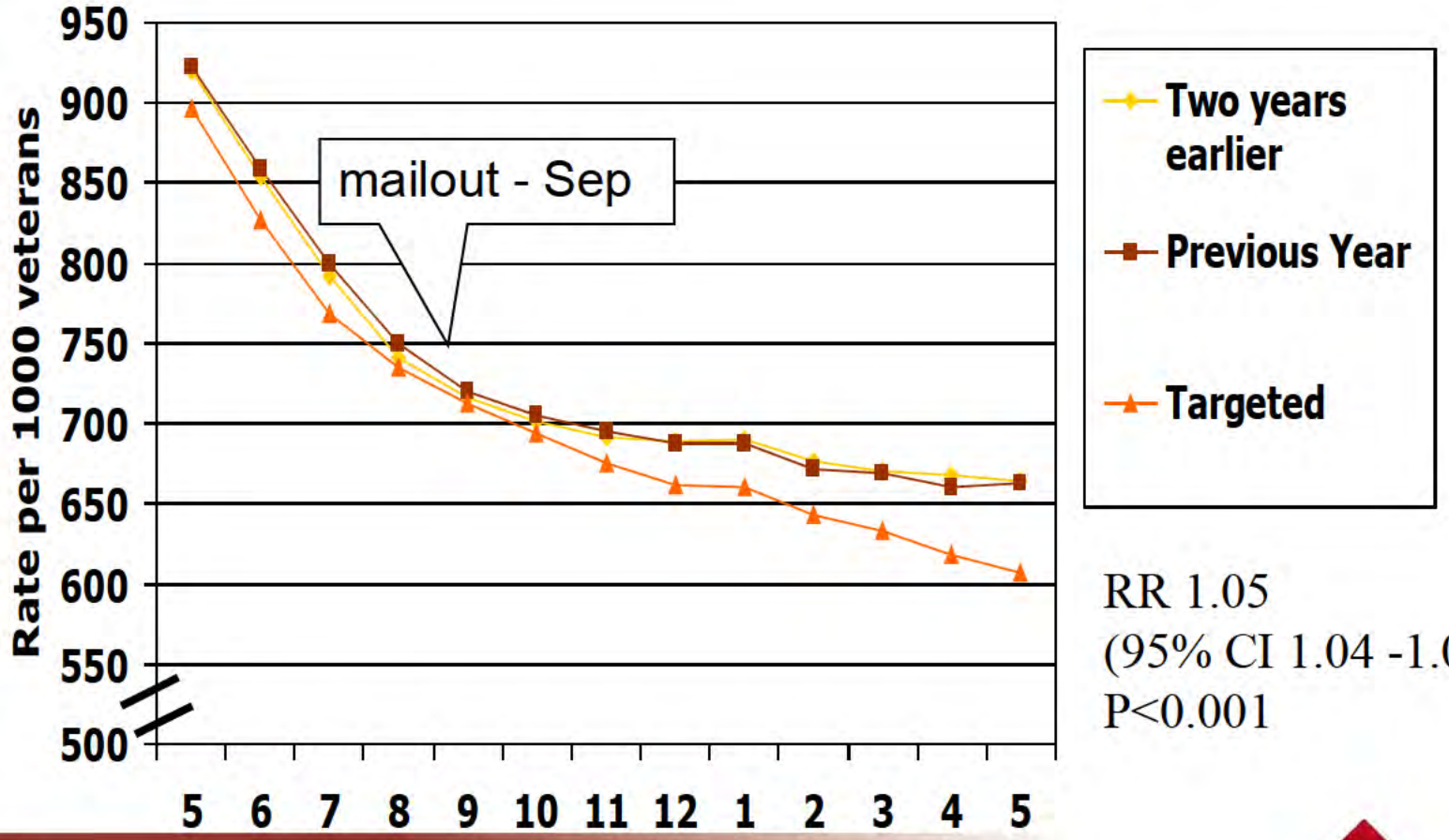
- 21% dispensed at least one potentially inappropriate medicine

Most common medicines	Percentage of veterans N=192,363
Long acting benzo-diazepines	**7.25%**
Amitriptyline	**3.15%**
Doxepin	**1.52%**
Amiodarone	**2.63%**
Oxybutinin	**1.88%**

The subsequent intervention

- As a result of the analysis
- Prescriber feedback intervention was implemented in Sep 2006
- Materials were mailed to
  - 11,050 general practitioners
  - 7,074 pharmacies
  - 32,481 veterans who had been prescribed a potentially inappropriate medicines

Small, but significant reduction in potentially inappropriate medicines



RR 1.05
(95% CI 1.04 -1.06)
P<0.001

Conclusion

- Use of potentially inappropriate medicines in elderly veterans in Australia was common (21%)
  - Similar to levels observed in other countries
- Prescriber feedback program supported by direct mail to veterans was effective in decreasing the use of these medicines compared to historical controls

Post-traumatic stress disorder, antipsychotic use and dementia

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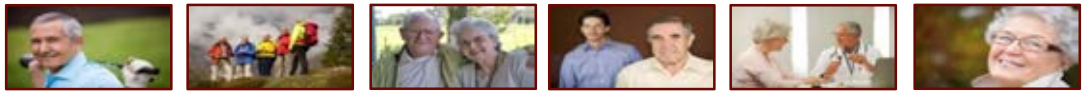
Veterans'MATES



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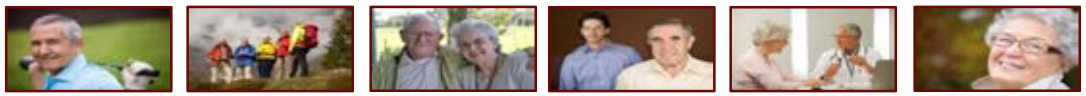
Disclosures

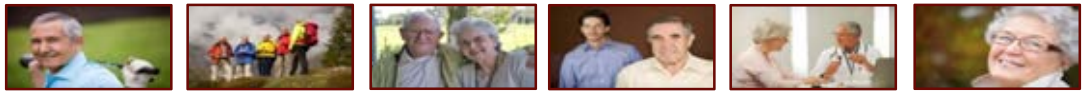
- This research was funded by the Australian Government Department of Veterans' Affairs

- P Morris has received industry funding (Servier) in the past 3 years, unrelated to the current study
- All other authors: no relationships to disclose



Background

- Observational studies suggest an increased risk of dementia for patients with PTSD
- USA study 180,000 veterans 55 years or older[1]
  - HR 1.8 (95% CI 1.70-1.85) for all veterans with a diagnosis of PTSD
- USA study 10,481 veterans 65 years or older[2]
  - OR 2.2 (95% CI 1.86-2.6) for PTSD and no combat injury
- USA study, 180,000 veterans 55 years or older[3]
  - PTSD only — HR 1.52; 95%CI, 1.41–1.64
  - Prisoner of War only — HR 1.61; 95%CI, 1.30–1.98
  - PTSD and prisoner of war — HR 2.24; 95% CI, 1.72–2.92

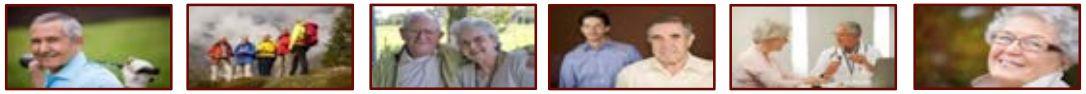


1. Yaffe et al. Arch Gen Psychiatry 2010
2. Qureshi et al. JAGS 2010
3. Meziab et al., Alzheimers Dement 2014

Limitations of the previous research

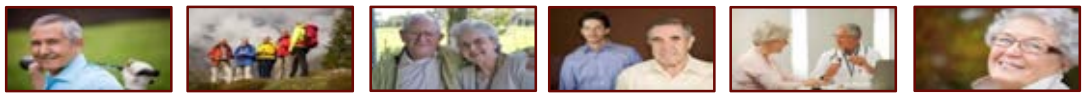
- Previous observational research included veterans 65 years and over
  - some participants may have been in prodromal phase of dementia

- None of the previous research examined the influence of medicine use
  - Antipsychotic use of particular concern



Why worry about antipsychotic use in PTSD?

- Not recommended in PTSD, but commonly used
- Contribute to development of diabetes and cardiovascular problems
  - These comorbidities also associated with increased dementia risk
- Associated with changes in brain structure in patients with schizophrenia and mood disorders
  - So have the illnesses themselves
- Associated with cell death in animal models
  - Alzheimer's disease is caused by the toxic build-up of the proteins tau and amyloid in the brain, which causes brain cells to die



Arnone D et al, Br J Psychiatry 2009
Arnone D et al., Eur Neuropsychopharmacol 2012
Dean et al., Prog Neuropsychopharmacol Biol Psychiatry 2006

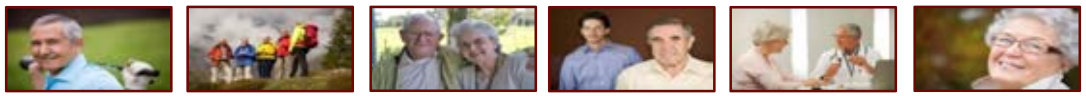
Study design

- Retrospective cohort study using Australian Government Department of Veterans' Affairs health claims data
- Cohort: Male Vietnam veterans aged 55 to 65 years at baseline with no record of dementia
- Outcome: Development of dementia during follow-up, with censoring for death or end of study

The study cohorts

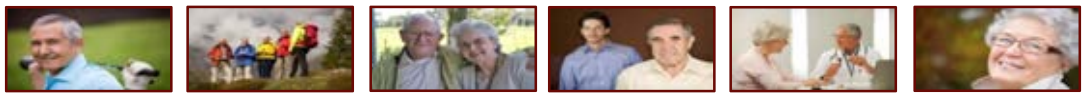
- Cohort 1
  - Had a hospitalisation for PTSD
- Cohort 2
  - PTSD as an accepted service related disability prior but no hospitalisation for PTSD
- Cohort 3
  - Were not hospitalised for PTSD and no record of PTSD as a disability

- All cohorts subsequently stratified by antipsychotic use



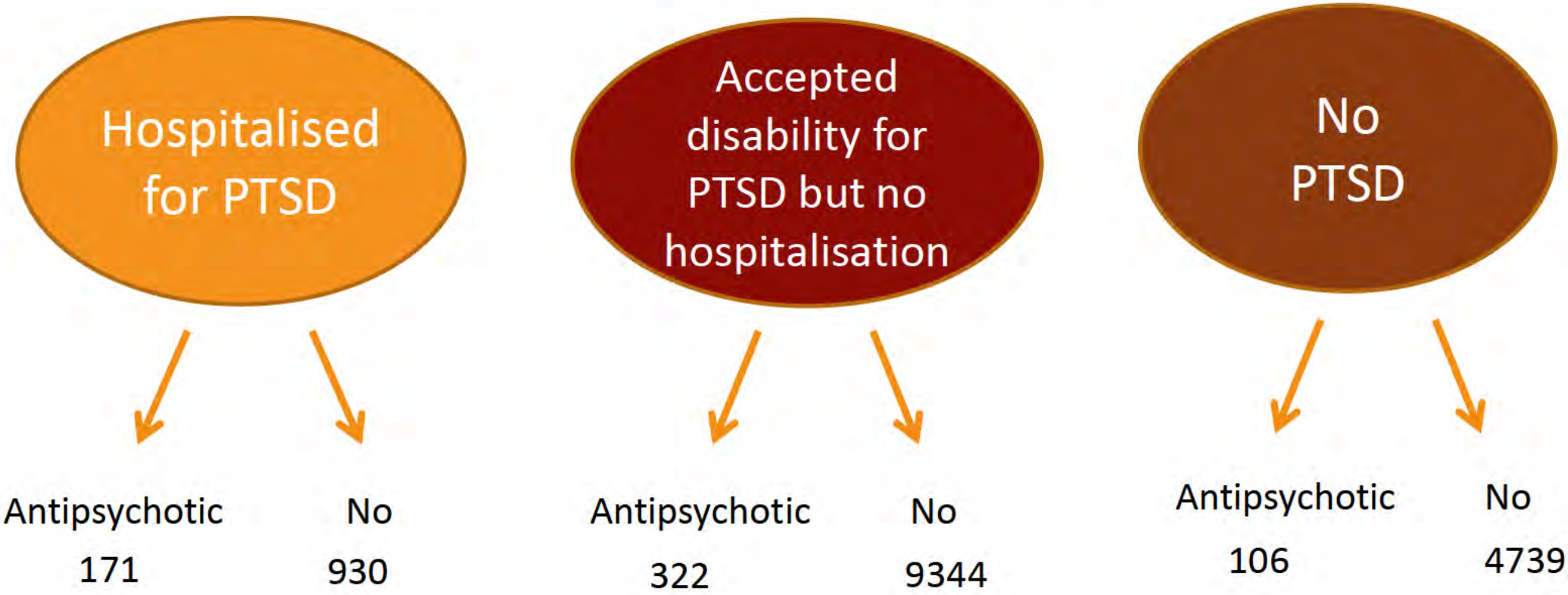
Adjustments

- Age
- Socioeconomic status
- Hypertension, Diabetes
- Benzodiazepine use
- Clinical depression
- Myocardial infarction, Cancer, Cerebrovascular disease, tobacco use, alcohol abuse, other substance abuse
- Sensitivity analysis: Excluded all veterans who developed dementia within 2 years of follow-up



Results

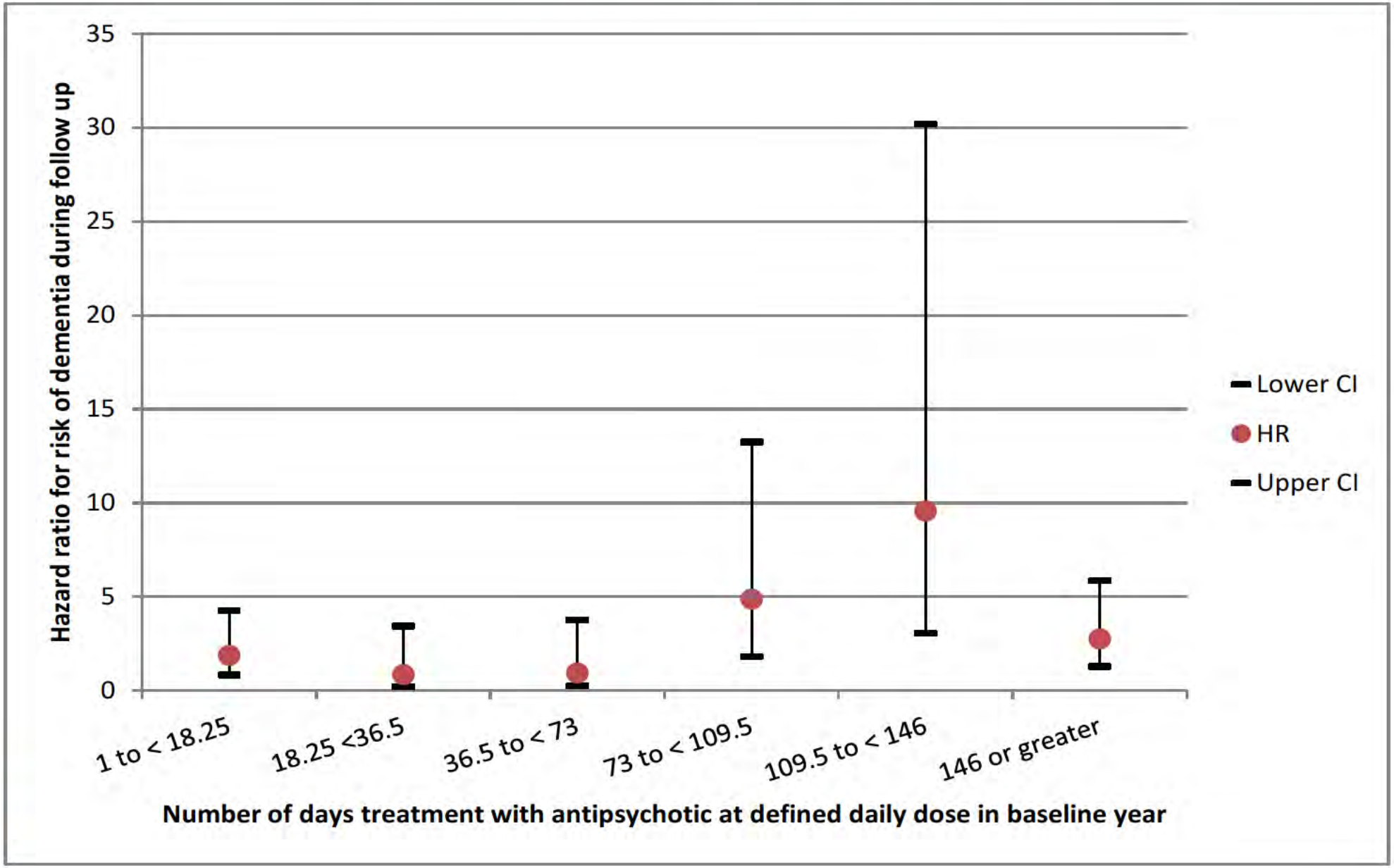
15,612 veterans in total



Risk of dementia

		Dementia %	Adjusted[a] HR (95% CI)
PTSD hospitalisation	**Antipsychotic**	5.3	2.2 (1.1-4.5)
	NO antipsychotic	2.3	1.2 (0.7 -1.9)
PTSD disability	**Antipsychotic**	1.9	1.3 (0.4-2.3)
	NO antipsychotic	1.5	0.9 (0.7-1.2)
NO PTSD	**Antipsychotic**	8.5	4.3 (2.1 -8.6)
	No antipsychotic	2.0	1.0

Risk of dementia by number of days treated with an antipsychotic

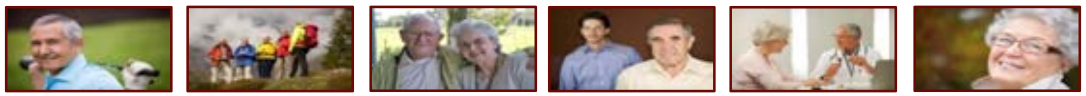


Our results compared to a US study published 2017

	Our study (s 47F et al., J Am Geriatr Soc 2017)	US Study (Mawanda et al., J Am Geriatr Soc 2017)
N	15,612	417,172
Age group	aged 55 to 65 years at baseline with no record of dementia	≥56 years with no diagnosis of dementia or mild cognitive impairment at baseline
Baseline period	2001-2002	2002 -2003 FY
Follow-up	2014	2012
Risk of dementia	HR 1.2 (0.7 -1.9)	HR 1.4 (1.3-1.4)
Risk of dementia if on antipsychotics	HR 2.2 (1.1-4.5)	HR 4.2 (3.7-4.8)

What does it mean?

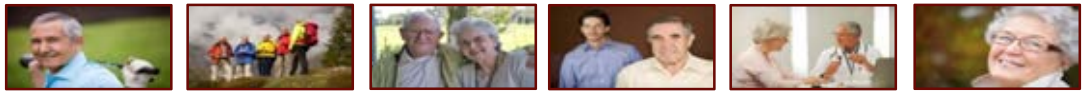
- While we found antipsychotic use was associated with risk of dementia,
  - the use of antipsychotics and use in high doses could be due to people having more severe PTSD
- Our results cannot determine whether the risk is due to the PTSD or the antipsychotics used to manage PTSD
- Our results do raise the hypothesis that use of antipsychotics could be contributing to dementia risk
  - Only use antipsychotics in patients where there is a clear, evidence based indication for use



Acknowledgements

- Australian Government Department of Veterans' Affairs

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



Measuring quality use of medicines: What are the challenges and how can we move forward?

Libby s 47F

Sansom Institute,

University of South Australia

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The challenges

- Understanding what we mean when we say "quality use of medicines"
- Asking the right questions
- Interpreting what we find

What is quality use of medicines?

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What is quality use of medicines?

- Primacy of the consumer
- Partnership
- Consultative, collaborative, multidisciplinary activity
- Support for existing activity
- Systems-based approaches

- How do you measure these?

Asking the right questions?

- Australia is one of the few countries in the world that has a national approach to quality use of medicines
- This enables us and demands of us to ask questions from this novel perspective
- It also means we can't necessarily rely on international methods to answer our questions

Interpreting the results

- We need to interpret the results keeping the objectives and principles of the national medicines policy and quality use of medicines in mind

A challenge and a way forward: Maximising use of the data we have

- Australia has a linked national pharmaceutical data set
- 6 years of data
- 20 million people
- We need to develop systems so we can work with this routinely

What can we progress now?

- At the very least
  - Age-specific trends
  - Co-prescribing
  - Switching of medicines
- We need to strengthen the data set by adding date of death
  - Duration
  - Adherence

- Analyses of co-prescribing can help us identify where we might need to intervene

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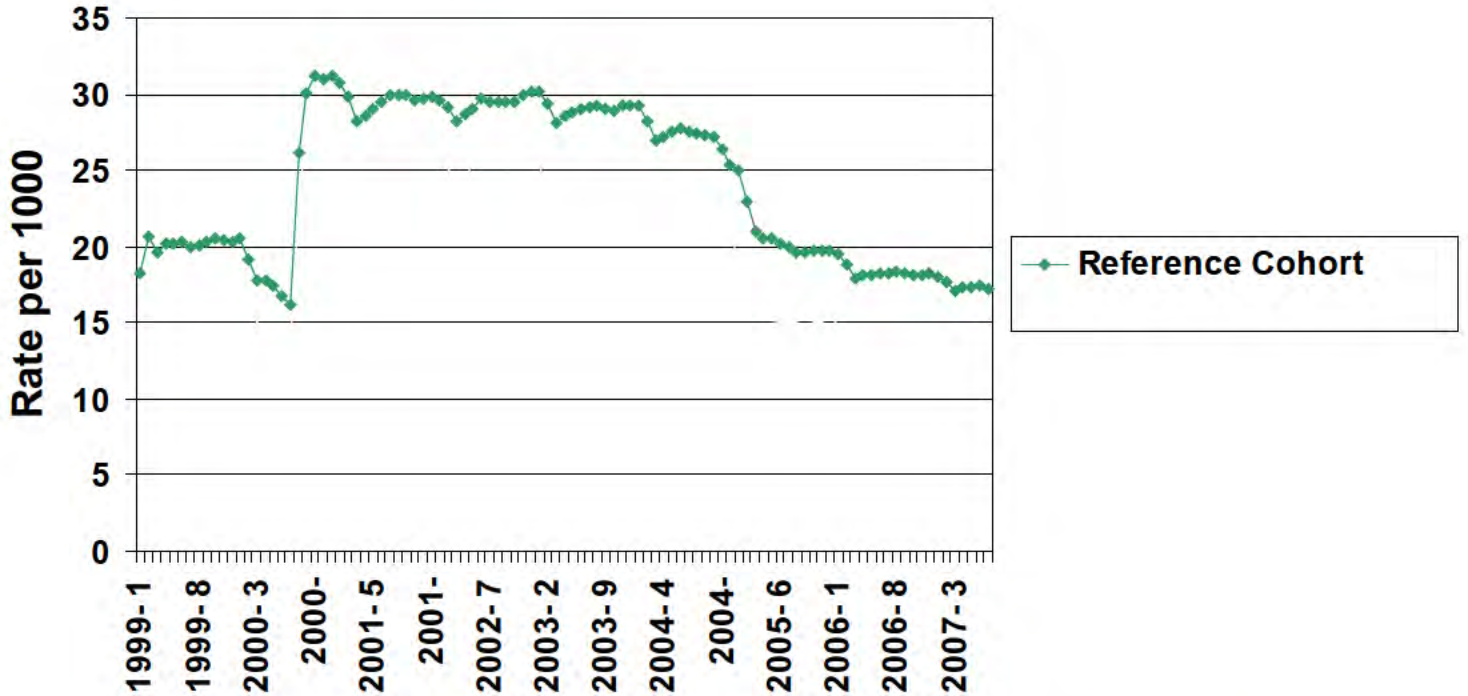
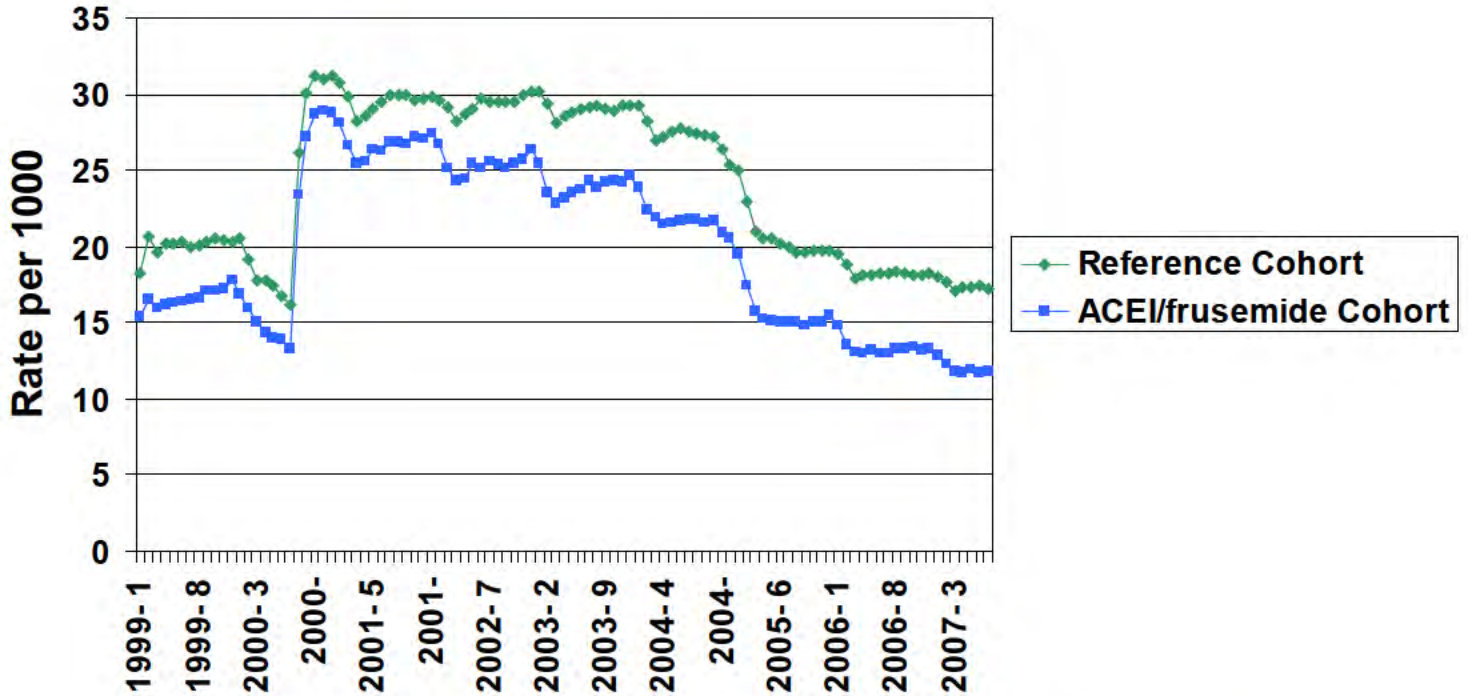
NSAID use: Australia



NSAID use in a high risk group

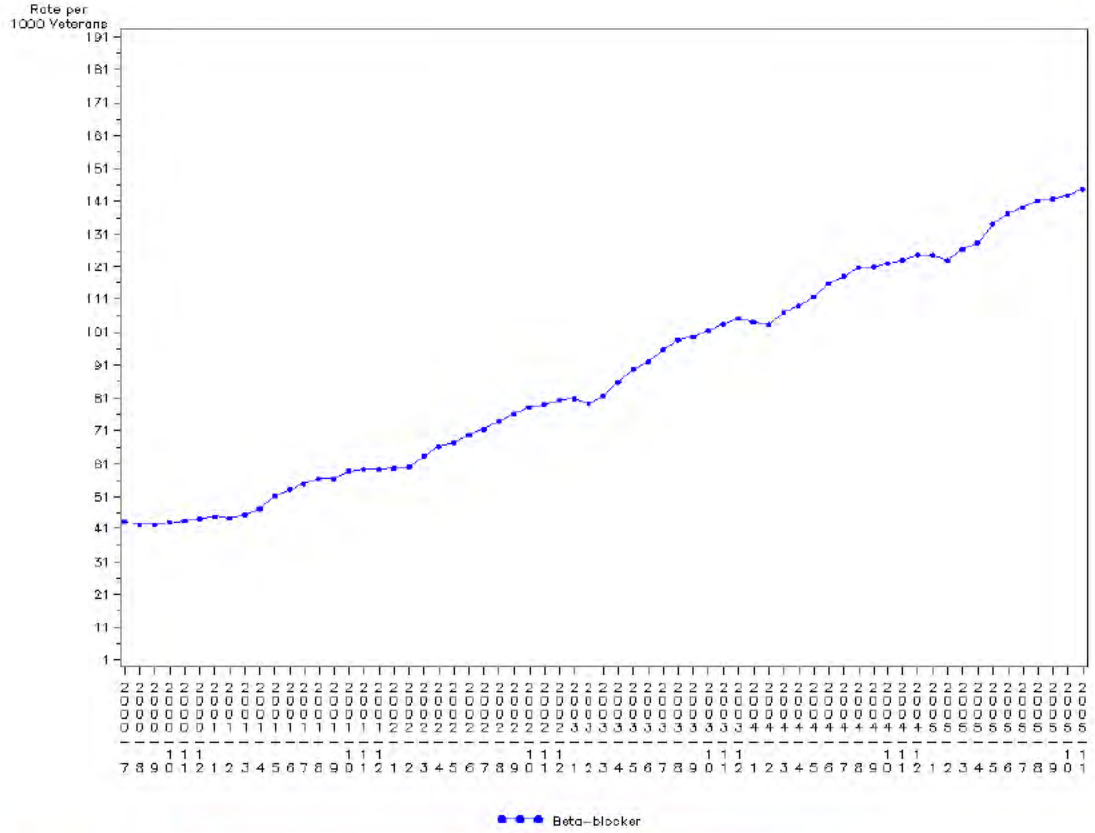


The challenge and the way forward

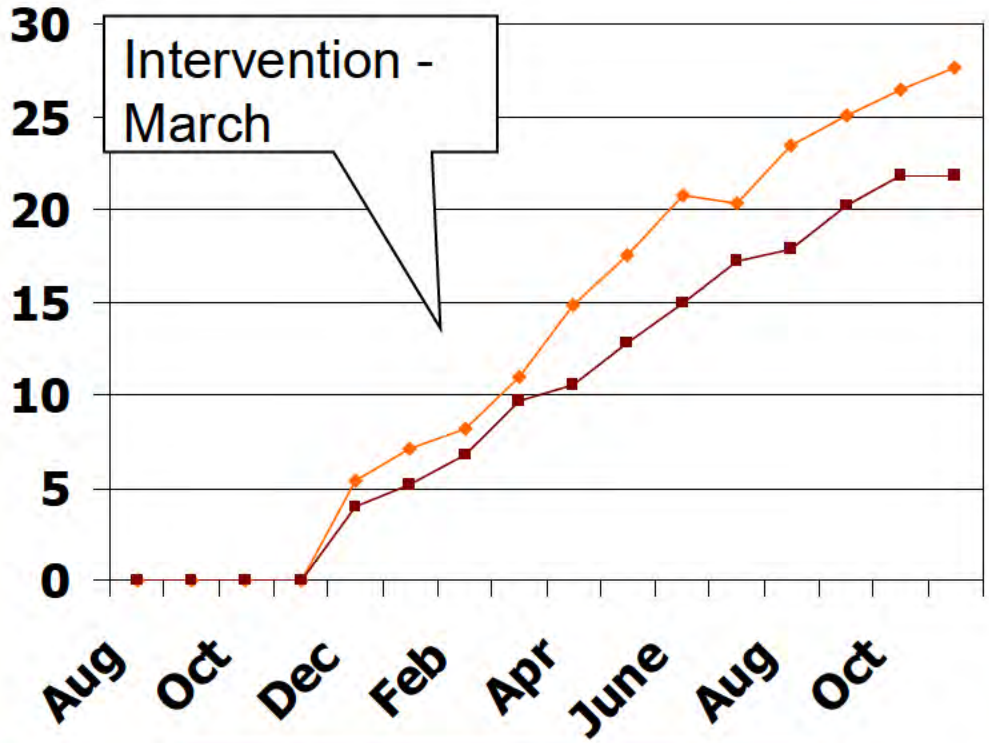
- To establish a mechanism to routinely monitor use in high risk groups
- To disseminate findings quickly in attempts to stimulate best practice

- Co-prescribing analyses can also assist with evaluating quality use of medicines interventions

Time series trends: Beta blocker utilisation in the heart failure population



Beta-blocker use has increased in those with heart failure targeted by QUM initiatives



RR 1.29,
95% CI 1.23-1.35,
p <0.0001

- Analyses of switching can help us identify whether we have more appropriate use of medicines or if regulatory policy is working

An example of switching: how common is brand substitution?

- Veterans who were gold card holders
  - Dispensed atenolol, citalopram, enalapril, metformin, omeprazole or ramipril
- 113,000 patients included
- Followed up until cessation, death or study end
- Study period 2001-2005

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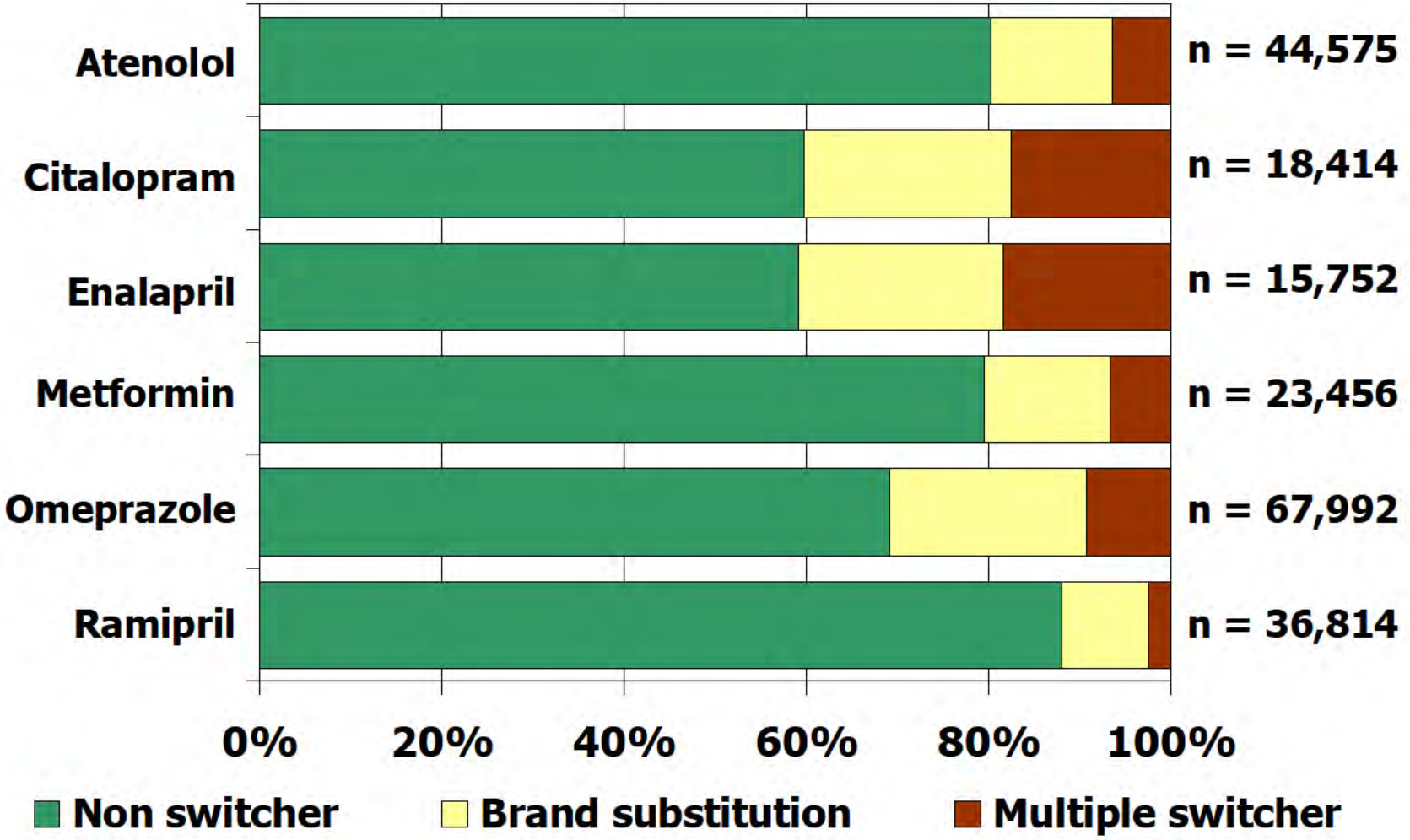
s 47F et al 2007

Multiple switching is uncommon: > 80% don't switch or only brand substitute in a five year period:



s 47F et al 2007

The challenge and the way forward

- To be able to link the pharmaceutical data set with other data sets to identify those who are most vulnerable to multiple switching

How should we measure compliance or duration?

- Most duration studies published in the literature today are limited to new users of medicines and limited to analysis of their first episode of use
- Relatively easy to measure, but is this the right question?
- For chronic therapy people often stop and start, especially when illness is new
- Can we measure it differently?

How long do people stay on bisphosphonates?

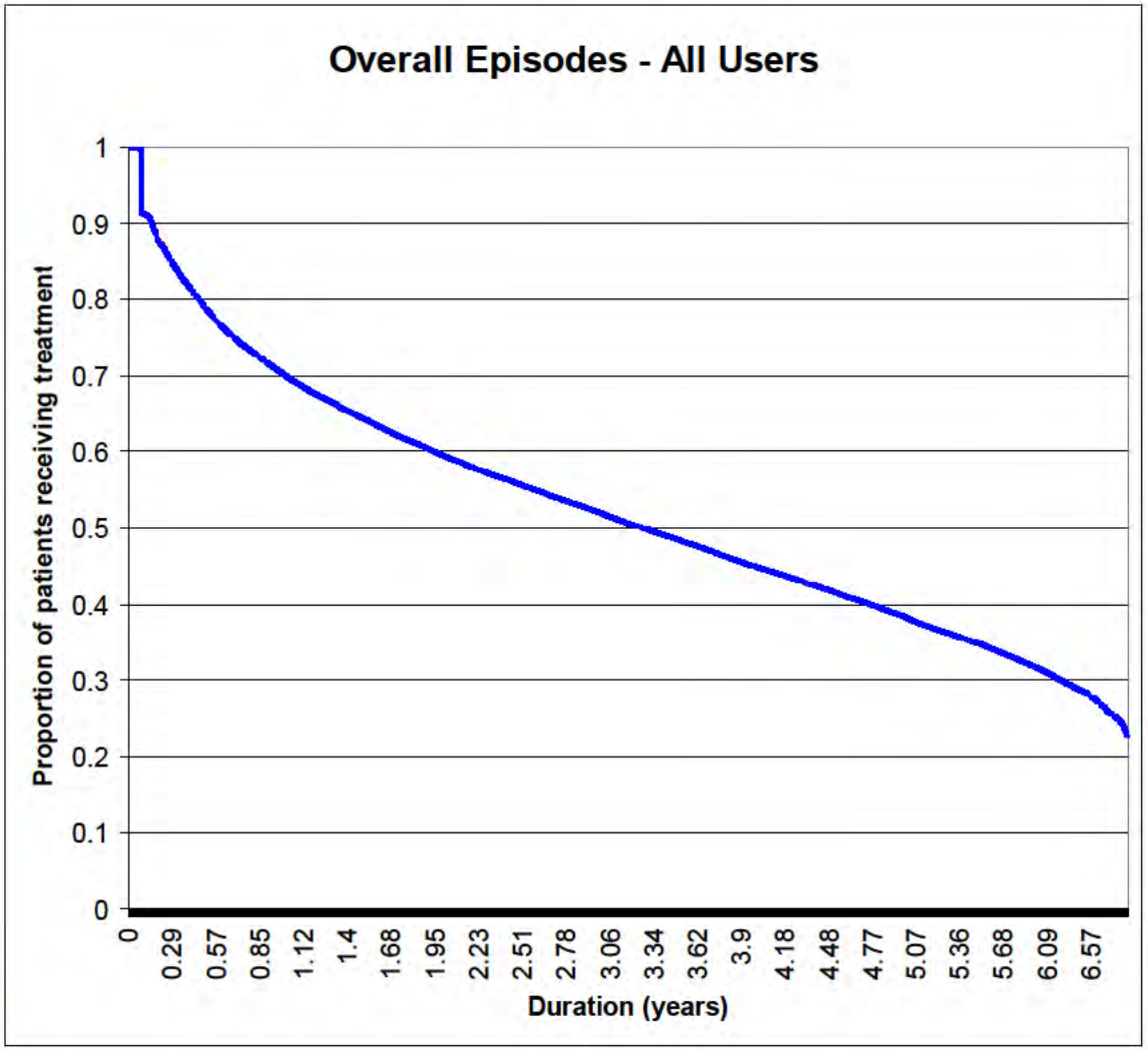
- 2007 systematic review
- 14 studies (none from Australia)
- Persistent rates at one year varied between 18% and 78%, with the majority finding 43% and 55% persistent at one year
  - All but one study only included new users
  - Most only followed patients for a year

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
- Overall duration gives a different estimate



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

University of South Australia

Sansom Institute

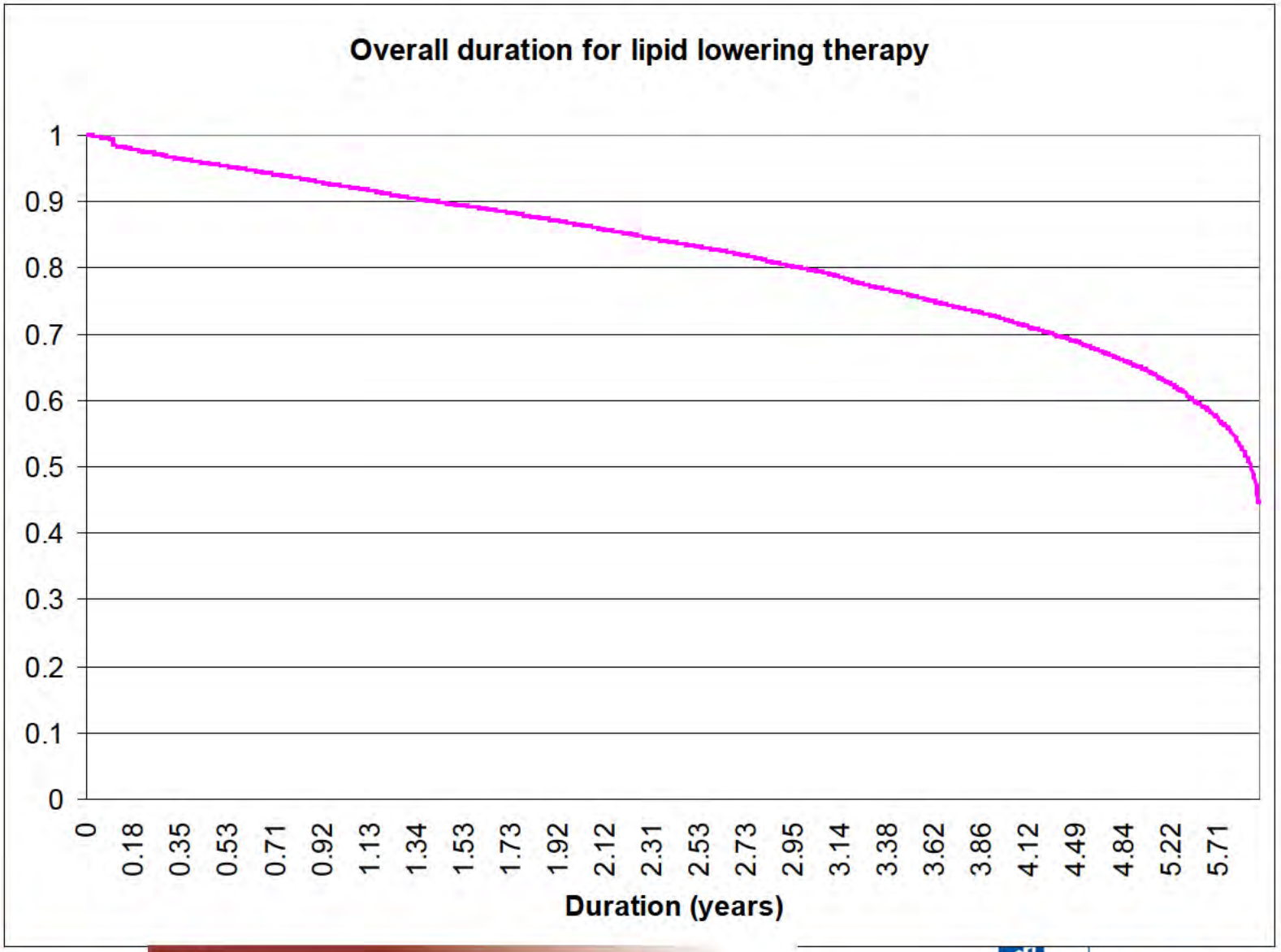
How long do people stay on cardiovascular medicines?

- Gold card holders who had been hospitalised for ischaemic heart disease
- Duration of use of
  - Lipid lowering therapy
  - ACE inhibitors/Angiotensin blockers
  - Calcium channel blockers
  - Antiplatelets
  - Beta-blockers
- If dispensed these medicines immediately after hospitalisation

How long do people stay on cardiovascular medicines?

- Study period 6.5 years
- Followed until death or study end
- Over 9,635 people included
- On average on 4 cardiovascular medicines at study start

	Number people	Median time on treatment	Median time without treatment	Proportion compliant during treatment
ACE I	6,691	5.4 years	3.5 months	75%
Lipid lowering	7,225	6.2 years	0	84%
Antiplatelets (excl aspirin)	7,073	5.0 years	4.6 months	84%
CCB	4191	2.8 years	3.4 years	72%


Overall duration for lipid lowering therapy
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.18
0.35
0.53
0.71
0.92
1.13
1.34
1.53
1.73
1.92
2.12
2.31
2.53
2.73
2.95
3.14
3.38
3.62
3.86
4.12
4.49
4.84
5.22
5.71
Duration (years)

The challenge and the way forward

- Interventions and products that improve compliance are now being considered for national funding (eg PBAC combination products, Pharmacy Guild)
- As a matter of priority we need to include date of death in the pharmaceutical data set to enable duration studies to be undertaken
- We also need to consider what methods would enable us to assess where it would be advantageous to intervene and evaluate effectiveness

What about outcomes research?

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NSAIDs and adverse events

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Method

- Veterans included gold card holders
  - Dispensed at least one medicine in previous four months, but NO NSAID in previous 12 months
  - 3 cohorts: general, ACE Inhibitor/frusemide, and diabetes populations
- Study period: Aug 2000 – Jun 2005

Method

- Primary endpoint: Hospitalisation for
  - GI ulcer, heart failure, acute renal failure, myocardial infarction or hypertension within 30 days of NSAID initiation
- Follow-up until study end, death or hospitalisation
- Confounders: age, gender, co-morbidity, aged-care status, socioeconomic index

- 128,908 subjects in general population
- 17,865 Ace/Frusemide
- 16,573 diabetes
  - ~50% dispensed NSAIDs
  - Cox-II inhibitors accounted for:
    - 70% of NSAID use in general population
    - 76% in the ACE/Fusemide cohort
    - 76% of the Diabetes cohort.

Hospitalisations for adverse events* of NSAIDs

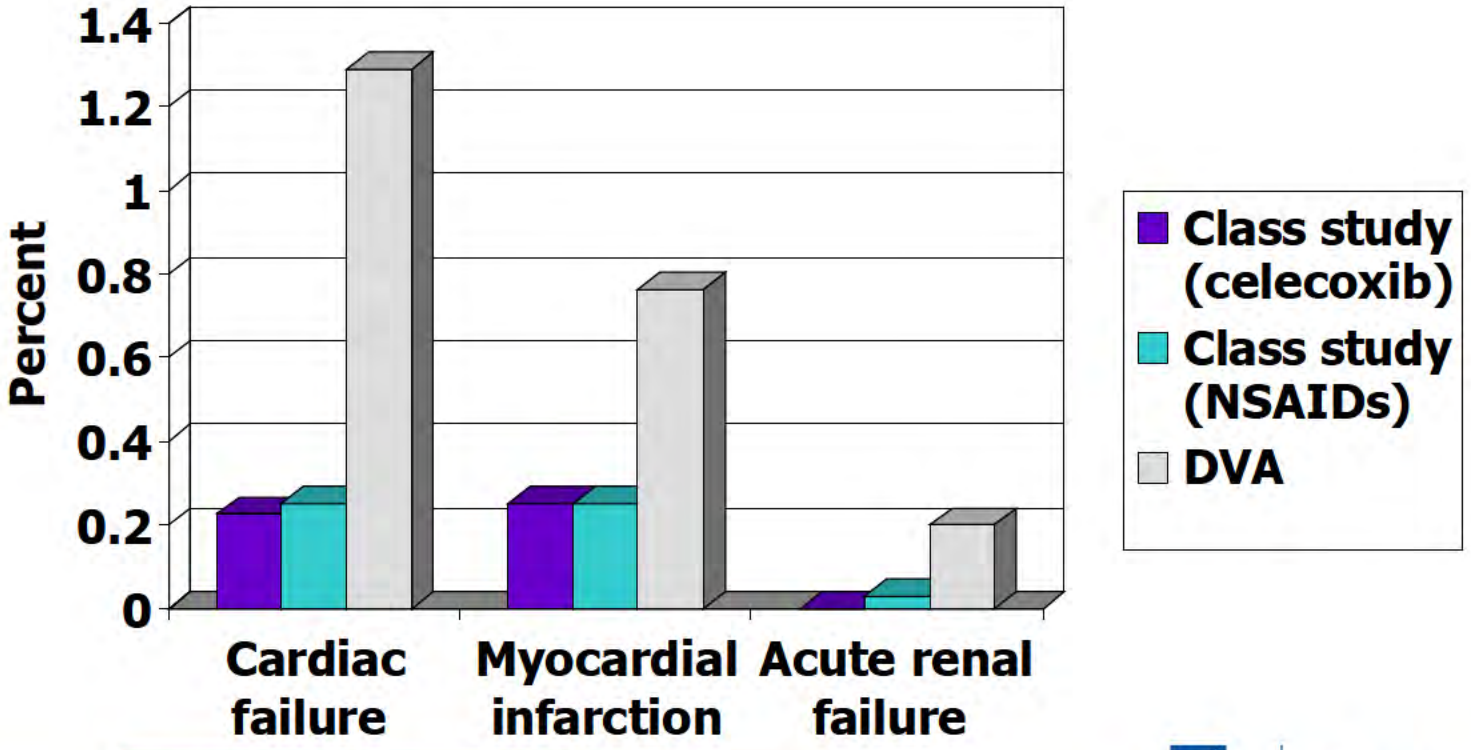
	Relative risk
General population	1.47 (1.30-1.66)
ACE I / frusemide population	1.34 (1.13-1.58)
Diabetes population	1.31 (1.08- 1.60)

*Heart failure, Renal Failure, GI ulcer, Myocardial Infarct, Hypertension

Hospitalisations for specific events

	GI ulcer	Heart Attack	Heart failure	Renal failure
General population	2.29 (1.96-2.69)	1.31 (1.12-1.53)	1.33 (1.10-1.60)	1.97 (1.63-2.38)
ACE I / frusemide	4.97 (4.01- 6.14)	1.54 (1.20-1.98)	1.16 (0.95-1.41)	1.77 (1.33-2.37)
Diabetes population	2.61 (1.97- 3.45)	1.40 (1.09-1.80)	1.25 (0.99-1.59)	0.91 (0.58-1.44)

Incidence of adverse events causing hospitalisation: trial versus practice



- 11 extra hospitalisation per year for every 1000 people treated in the reference cohort
- 62 extra hospitalisations per year for every 1000 people dispensed ACEI/A2RB and frusemide
- 29 extra hospitalisations per year for every 1000 people dispensed medicines for diabetes

Proton pump inhibitors and risk of community acquired pneumonia

- 4 international studies
- Two fold increased risk of respiratory tract infections (OR 2.34 95%CI 1.4-4.1)
- One and a half to two fold increased risk of community acquired pneumonia in adults (OR 1.89, 95%CI 1.36-2.62) (OR 1.5 95%CI 1.3-1.7)
- Six fold increased risk in children (OR 6.39; 95% CI 1.38-29.70)
- Dose related effect

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- Does Proton Pump inhibitor use increase the risk of respiratory tract infections or community acquired pneumonia
  - Cohort study comparing those exposed to proton pump inhibitors and those not-exposed

Method

- Veterans included
  - Gold card holders, aged 65 or over dispensed at least on medicine
- Study period: Jan 2002 – Dec 2005
- Those on H2RA medicines excluded
- Endpoints:
  - hospitalisation for pneumonia
  - prescription for antibiotics commonly prescribed for respiratory tract infections

Method

- Follow-up until death or study end
  - Multiple exposures and outcomes included
- Confounders: age, gender, co-morbidity, aged-care status, socioeconomic index, season, heart failure, COPD, number of doctors, pharmacies, allied health visits, prescriptions
- 185,000 veterans included

Results

	Unadjusted analysis	Adjusted analysis
Antibiotic dispensings	1.72 (1.70-1.75)	1.23 (1.21-1.24)
Hospitalisation for pneumonia	1.69 (1.62-1.76)	1.16 (1.11-1.22)

- In 2006, 6% of the Australian population took proton pump inhibitors
  - > 80% using the highest strength product
- Study results suggest this could mean
  - 4000 extra hospital admissions due to pneumonia in Australia annually
  - 300,000 extra antibiotic prescriptions

The challenge and the way forward

- There is lots of opportunity for improved post-marketing surveillance in Australia
  - This shouldn't be limited to new adverse drug reaction detection
- It should included methods for assessing outcomes in practice and over time:
  - Have we minimised adverse events of NSAIDs as practice has changed?
- Role and opportunity for many national medicines policy partners
  - TGA, ADRAC, PBAC and NPS

Improvements in health outcomes

- Outcome studies demonstrating improved health outcomes related to treatments still require methods development
- Very often treatments are given to sicker people. When we compare their outcomes with people not treated we find the opposite of what we expect, worse outcomes in those treated than those not treated.
- We need to develop methods to overcome this
  - eg propensity scores, instrumental variable analysis, case series methods

With thanks

- Department of Veterans' Affairs

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How similar is the veteran population to the Australian community?

	Men	Women	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 and service related disability usage is similar

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Source: AIHW

In conclusion

- There is much that can now be undertaken with Australian data
- There needs to be national leadership so that all stakeholder needs are addressed
- We need to improve access to data, develop capacity and share resources and learnings
- Develop mechanisms of routinely providing analyses to all stakeholders
- We are one of the few countries with a national medicines policy, Australia is well placed to develop questions and methods from this perspective

We need to remember:

Data and evaluation is only one of the building blocks of quality use of medicines

- "In the final analysis, medicinal drug policies are concerned with more than drugs. They are fundamentally about people and their relationships with one another. They are concerned with achieving a balance: between economic growth and social justice; wealth and poverty; regulation and freedom; risk and certainty; incentives and sanctions; costs and benefits; suspicion and trust; isolation and involvement".

Mary Murray, Ken Harvey

University of South Australia | Sansom Institute

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Veterans' MATES

Medication-related hospital admissions in aged care residents

Lisa Kalisch Ellett, Gizat Kassie, Gillian Caughey, Nicole Pratt, Emmae Ramsay, Elizabeth Roughead

Quality Use of Medicines and Pharmacy Research Centre

University of South Australia






Aged care residents use multiple medicines, have multiple medication-related problems

- 11 medicines per person
- 98% have medication related problem
- >50% use potentially inappropriate medicine
- 34% admitted to hospital each year

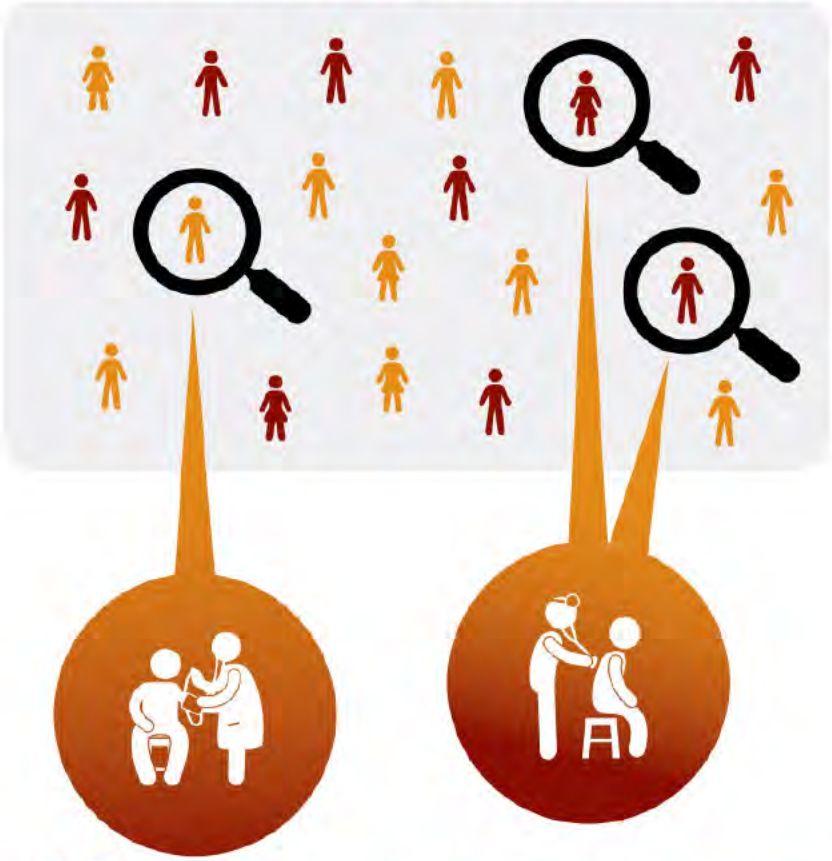
Problems due to medicines are one of the most common causes of avoidable hospitalisations

Up to 90% of medication related admissions in older people are avoidable

Prevalence of medication related hospital admissions in aged care residents unknown

- prevalence of potentially avoidable medication related admissions in aged care residents also unknown

We identified medication-related hospital admissions preceded by suboptimal medication related processes of care in aged care residents



- DVA administrative claims data
- Hospital admissions from 1-July-2014 to 30-June-2019
  - Permanent aged care residents only, respite care excluded

We used a previously defined clinical indicator set to identify medication related admissions

- defines an outcome hospitalisation that may be avoidable if a clinical guideline recommended process of care was followed prior to the hospital admission. For example:

- **Outcome**: hospitalisation for asthma
- **Process of care**: regular use of a short-acting inhaled beta agonist in a patient with a history of asthma, but no use of an inhaled corticosteroid


Research

Suboptimal medication-related quality of care preceding hospitalisation of older patients

220.e1

18,874 hospital admissions were included in the study

10,148

Aged care residents

88 years

median age

53%

of residents had at least one admission preceded by a sub-optimal process of care

70%

30%

46% of admissions were preceded by suboptimal medication management

7,655

Admissions for fracture

26%

occurred in people who had a prior fracture, and weren't using medicines to reduce fracture risk

46% of admissions were preceded by suboptimal medication management

7,655

Admissions for fracture

87%

occurred in people aged ≥65 years who were using a medicine known to increase falls risk

46% of admissions were preceded by suboptimal medication management

3,601

Admissions for heart failure

30%

occurred in people with a history of heart failure, who weren't currently using an ACEi or ARB

Admissions for some outcomes were rarely preceded by suboptimal medication management

1,575

Admissions for acute coronary syndrome

2%

occurred in people with a history of heart attack who weren't using guideline recommended medicines

Characteristics of people who had a medication related hospital admission preceded by a suboptimal process of care were generally similar to those who didn't

Except for:

73% vs. **68%**

Admission preceded by suboptimal medication management

Admission not preceded by suboptimal medication management

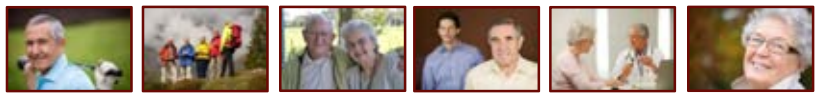
Diagnosis of dementia

56%

46%

Gaps in care prior to hospital admission were identified in nearly half of all admissions

- Important to remember that our study only included admissions where suboptimal medicine use in primary care may contribute to the risk of admission.
- Interventions to improve use of medicines for aged care residents in these areas are warranted.



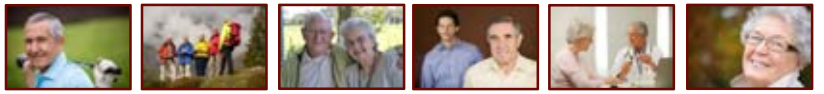
Veterans' MATES
An enterprising partnership improving medication safety






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**

1/2 BILLION

Contains over half a billion health claims records

10 YEARS

More than ten years of historical health data

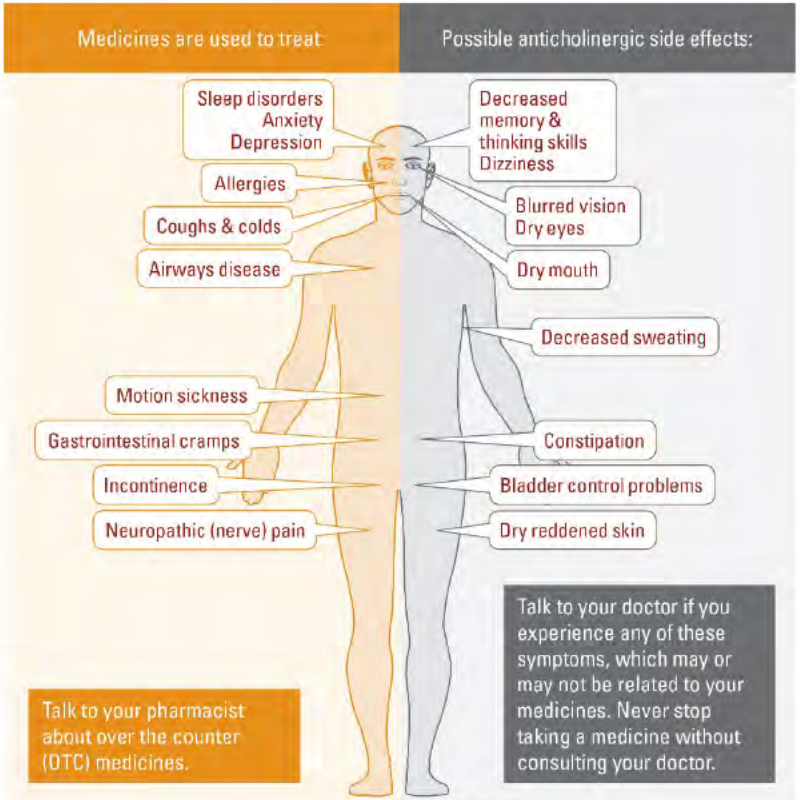
Contains hospital records including diagnosis and procedures

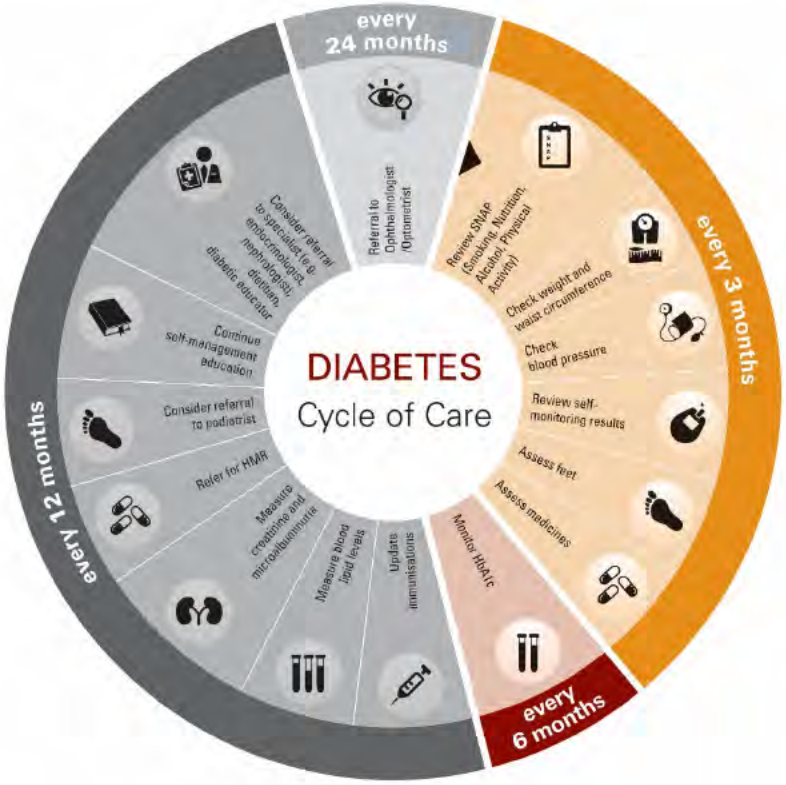
Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

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



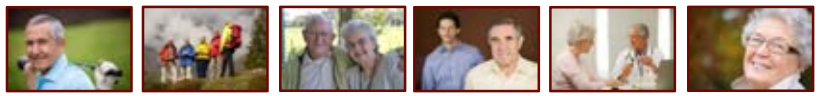


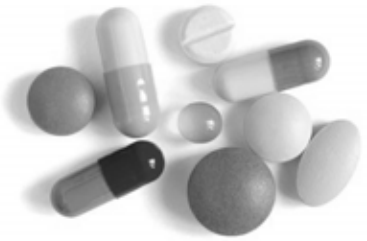
Each topic is either:

- 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





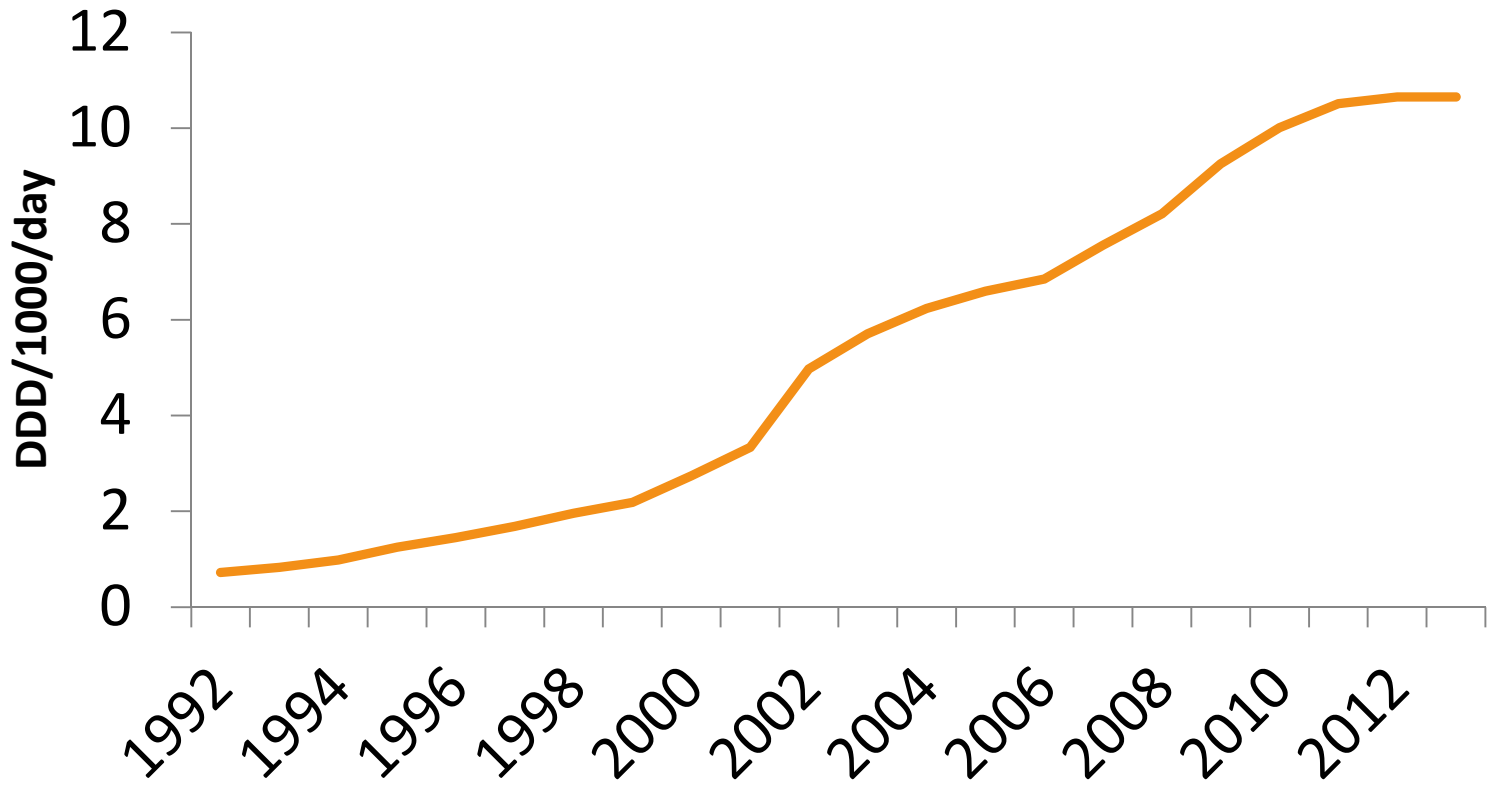
So what happens?

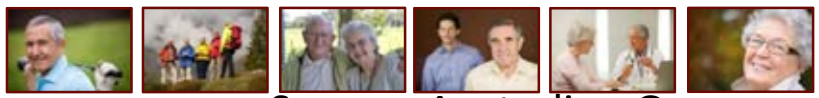
- Pain management
- Depression
- Insomnia management






Opioid use: Australia





Source: Australian Government Drug Utilisation Subcommittee

Who is the patient with chronic non-cancer pain using opioids chronically?

Women -53%

Married – 50%

Tertiary educated – 50%

Back pain 76%

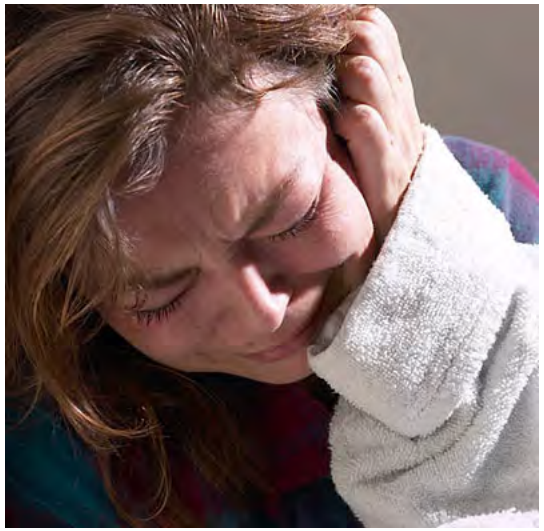
Unemployed because of pain - 51%

More than 1 lifetime pain condition -80%

History of abuse

Alcohol use disorder - 40%

Smoking – 47%



Depression - 60%

Generalised anxiety -32%

Agarophobia – 31%

PTSD – 25%

Co-prescribed

Benzodiazepines 43%

Antidepressants 57%

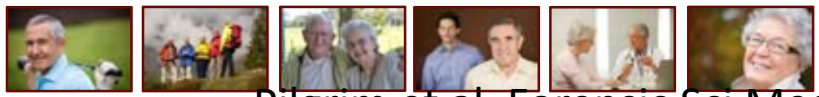
Antipsychotics 11%

Surgery for pain 25%

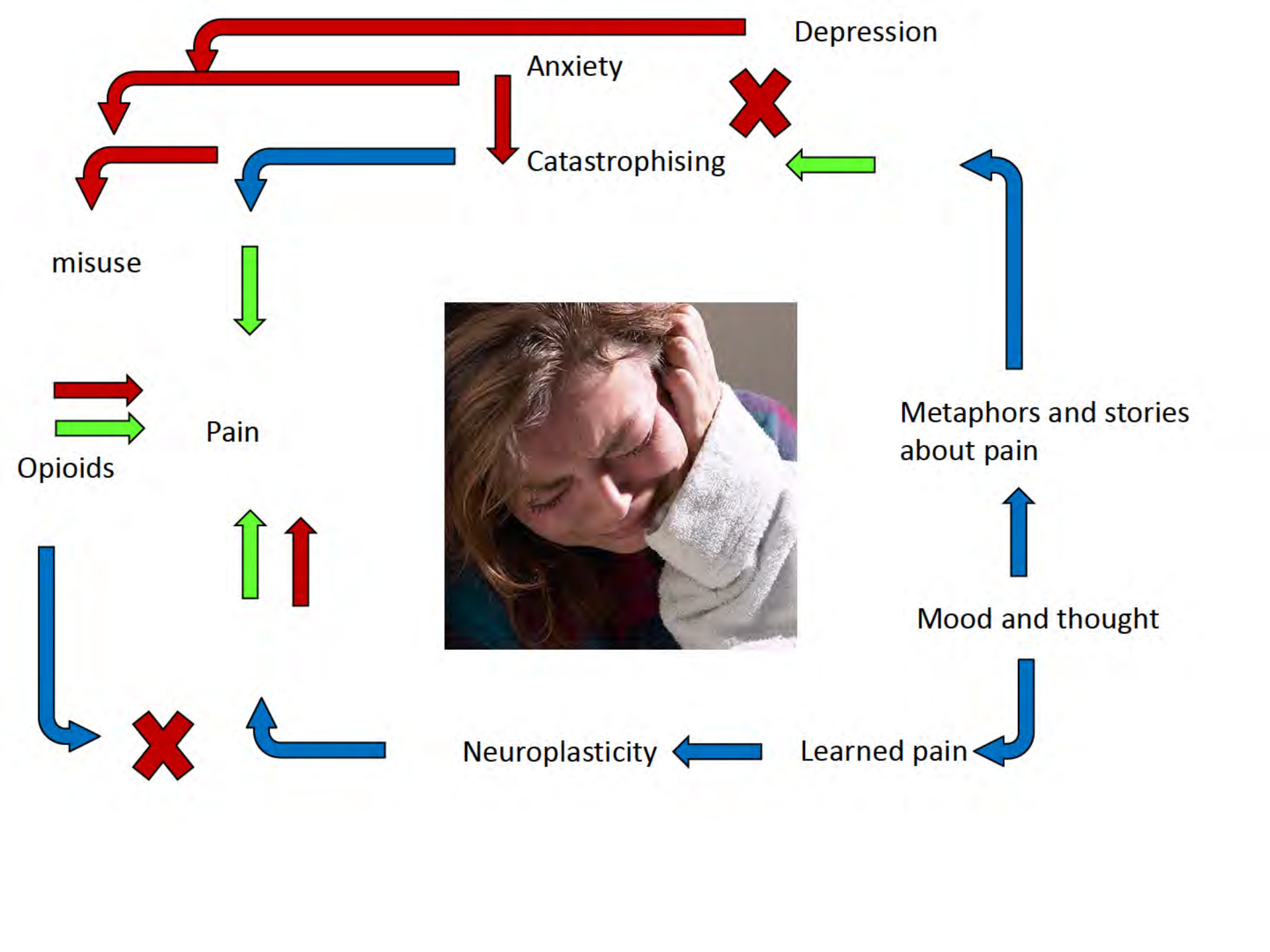
Pain. 2015 Feb;156(2):231-42.

Who is the patient who dies from opioid use?

- More than half the deaths were unintentional
- 63% were due to multiple drug toxicity
- Most deaths were
  - Male (59%)
  - Aged 35-44 years (27%)
  - Who died unintentionally (56%)
  - With mental illness (52%)
  - And a history of pain (46%)
- 75% of the indications for use were considered appropriate



Pilgrim et al, Forensic Sci Med Pathol. 2015;11:3-12


Depression
Anxiety
Catastrophising
misuse
Opioids
Pain
Metaphors and stories about pain
Mood and thought
Learned pain
Neuroplasticity


N
W
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S
SYMPTOM RECOGNITION
Stream of Uncertainty
What does this mean?
DIAGNOSIS
Island of Hope
ORGANIZING SUPPORT
LEGAL FINANCIAL
Channel of Decisions
DRIVING
ENJOYING LIFE
TREATMENT
Sense of Urgency
LONELINESS
GRIEF
GUILT
DEPRESSION
ANGER
SYMPTOMS OR SIDE EFFECTS?
COMORBIDITIES
Desperate Straits
COAST GUARD
"Everyday is a New Day."

What is happening in the veteran community?

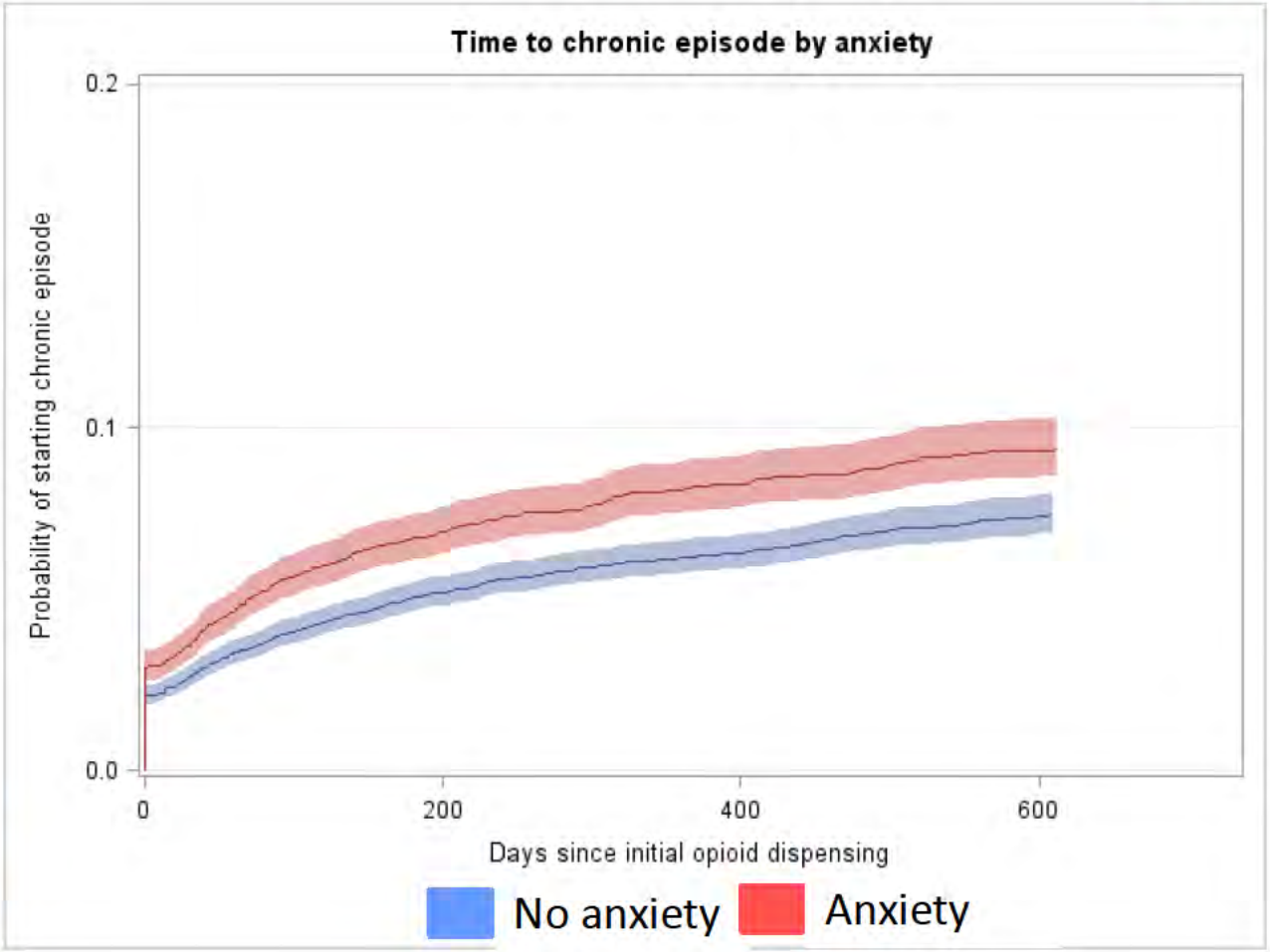
The planning stage

Identifying the problem: how many veterans are chronic opioid users?

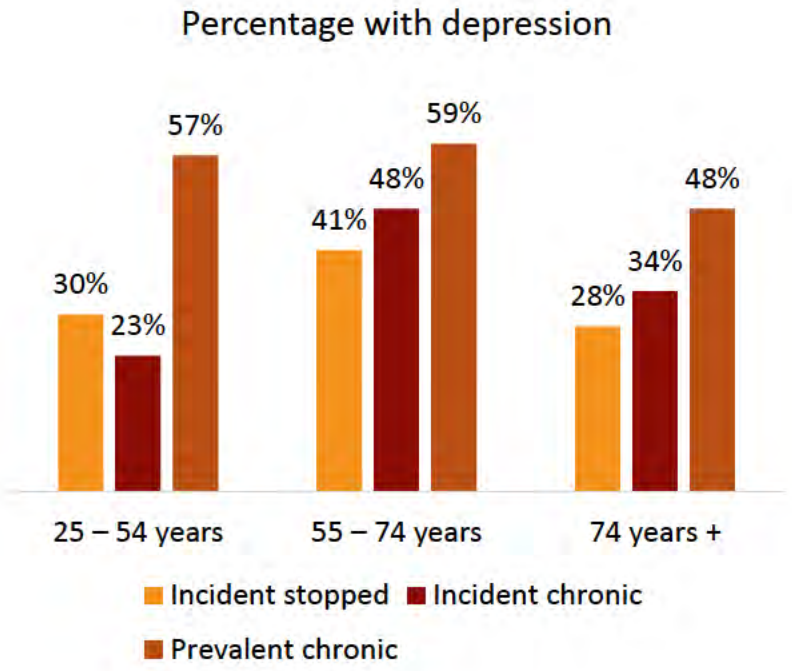
Improving pain management:

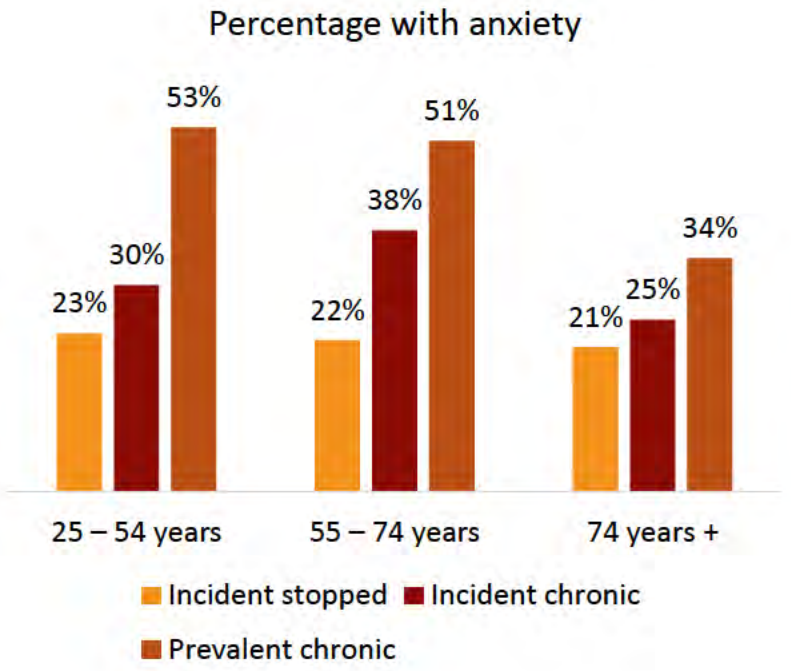
The planning stage

Identifying the problem: who is at risk of becoming a chronic user

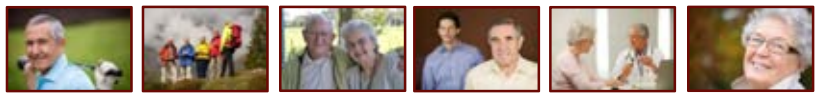


Improving pain management:
The planning stage
Identifying the problem: opioid use and comorbidity development





- So to solve the opioid problem we need to intervene early and focus on pain management
- Identify those at risk of developing chronic pain or opioid misuse
  - eg prior history anxiety or substance abuse



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.

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

Building on the 2014 program: Chronic musculoskeletal pain and the biopsychosocial approach

Movement and lifestyle

- Maintain a healthy and balanced lifestyle; this involves enjoying a balanced diet, maintaining a healthy weight, limiting alcohol intake and quitting smoking.
- Keep as fit and active as possible with regular movement and stretching. Exercise has been shown to reduce pain and increase function, as well as lifting your mood.

I had to learn to pace my exercise and activity, acknowledge pain's there, don't give it the attention, the power, the domination and you can keep on living. **Jamie, Former Navy Submariner – Back pain**

With permission from Department of Health, Government of Western Australia (2013) https://painhealth.csse.uwa.edu.au/pain-module/jamie-m/

I needed to start looking at grey areas, bringing everything into a different perspective. It has taken 12-14 months with the breathing, meditation and the different steps I have taken, it has been phenomenal. I still struggle from time to time. **Jamie, Former Navy Submariner – Back pain**

With permission from Department of Health, Government of Western Australia (2013) https://painhealth.csse.uwa.edu.au/pain-module/jamie-m/

Mind

Acknowledging your pain is the first step towards living with it. Your emotions and how you think about pain can influence the level of pain you feel. Stress, tension and worry can all increase your response to pain.

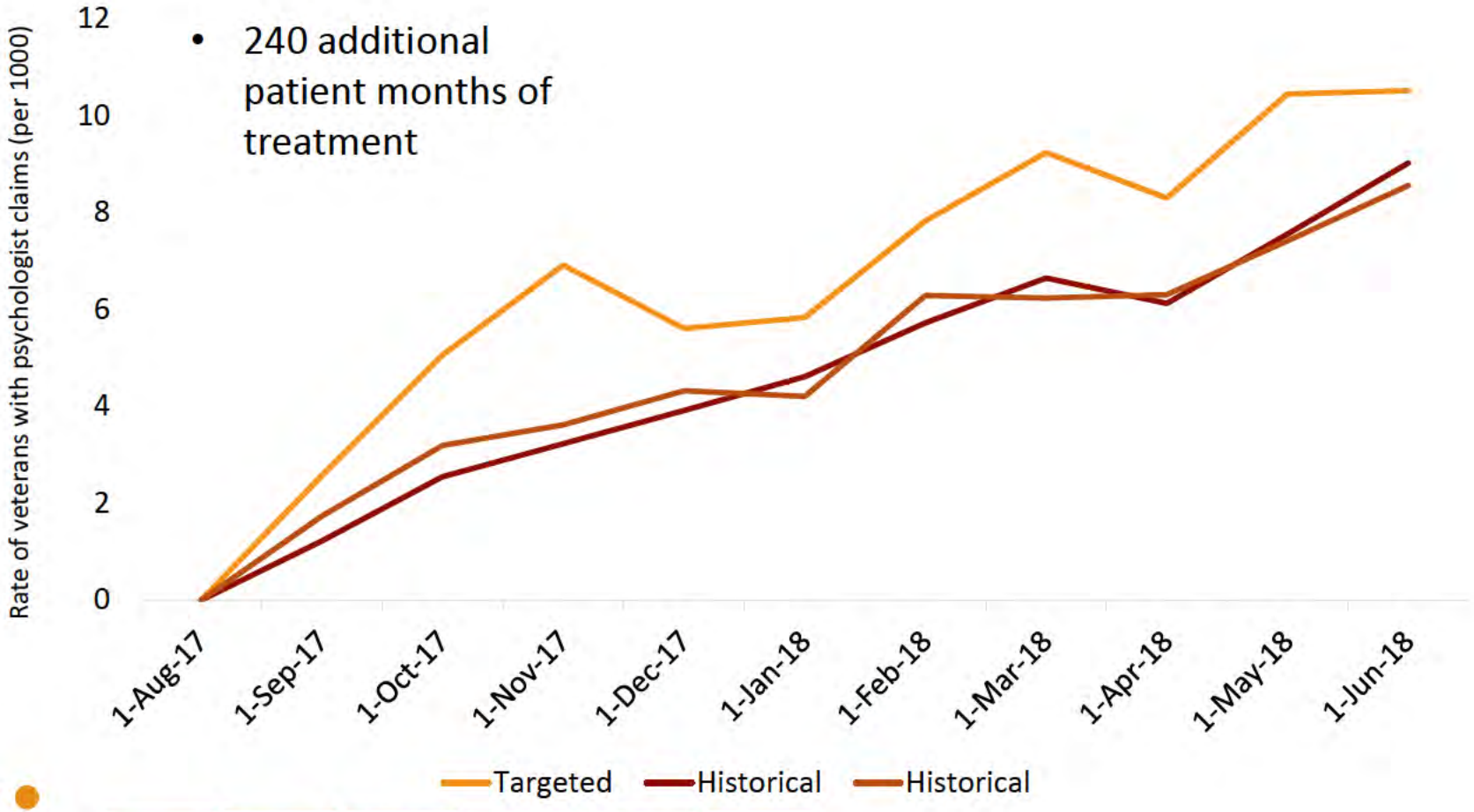
- Continue regular enjoyable activities.
- Learn relaxation techniques to reduce

Medicines

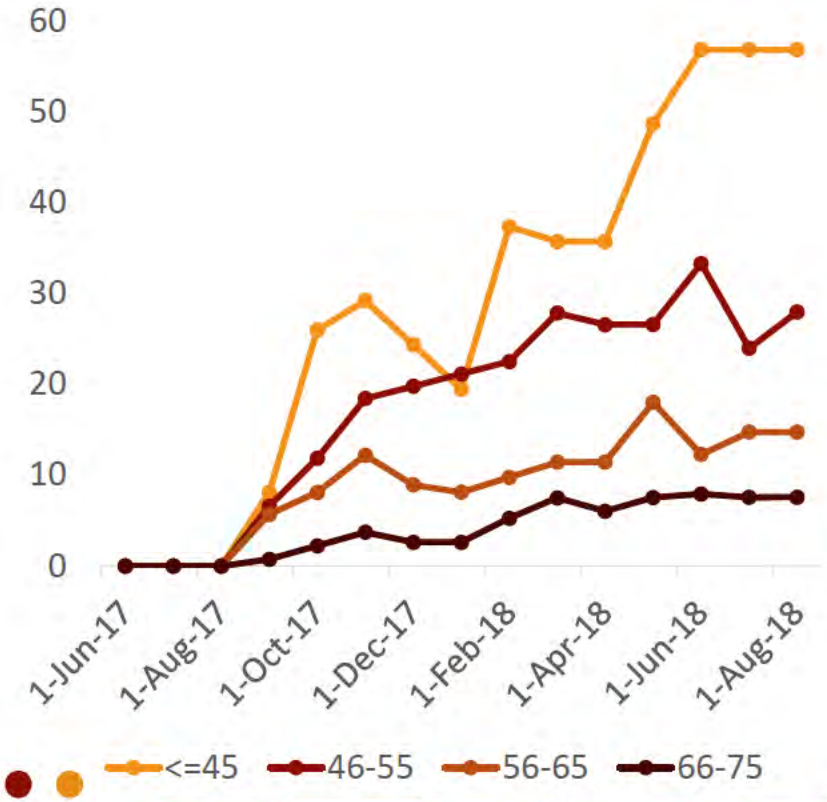
Used for a short time, medicines can help get you moving and functioning again and relieve the distress of pain. Medicines are only one part of pain management and are best used in combination with other non-medicine therapies. It may be unrealistic to expect complete pain relief; medicines often only reduce the level of pain.

Increasing numbers of veterans seeing psychologists

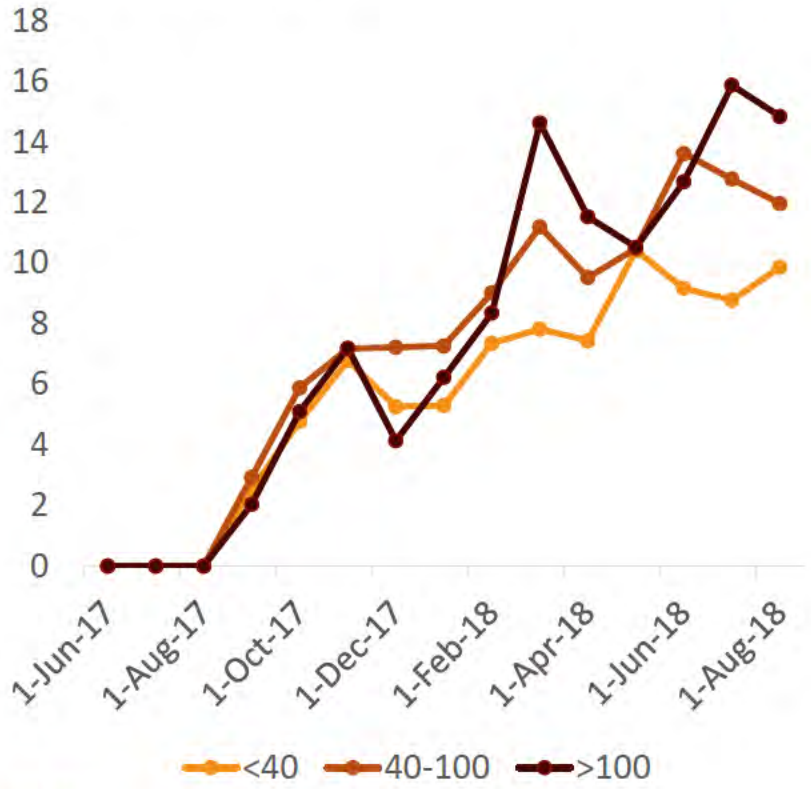
- 240 additional patient months of treatment



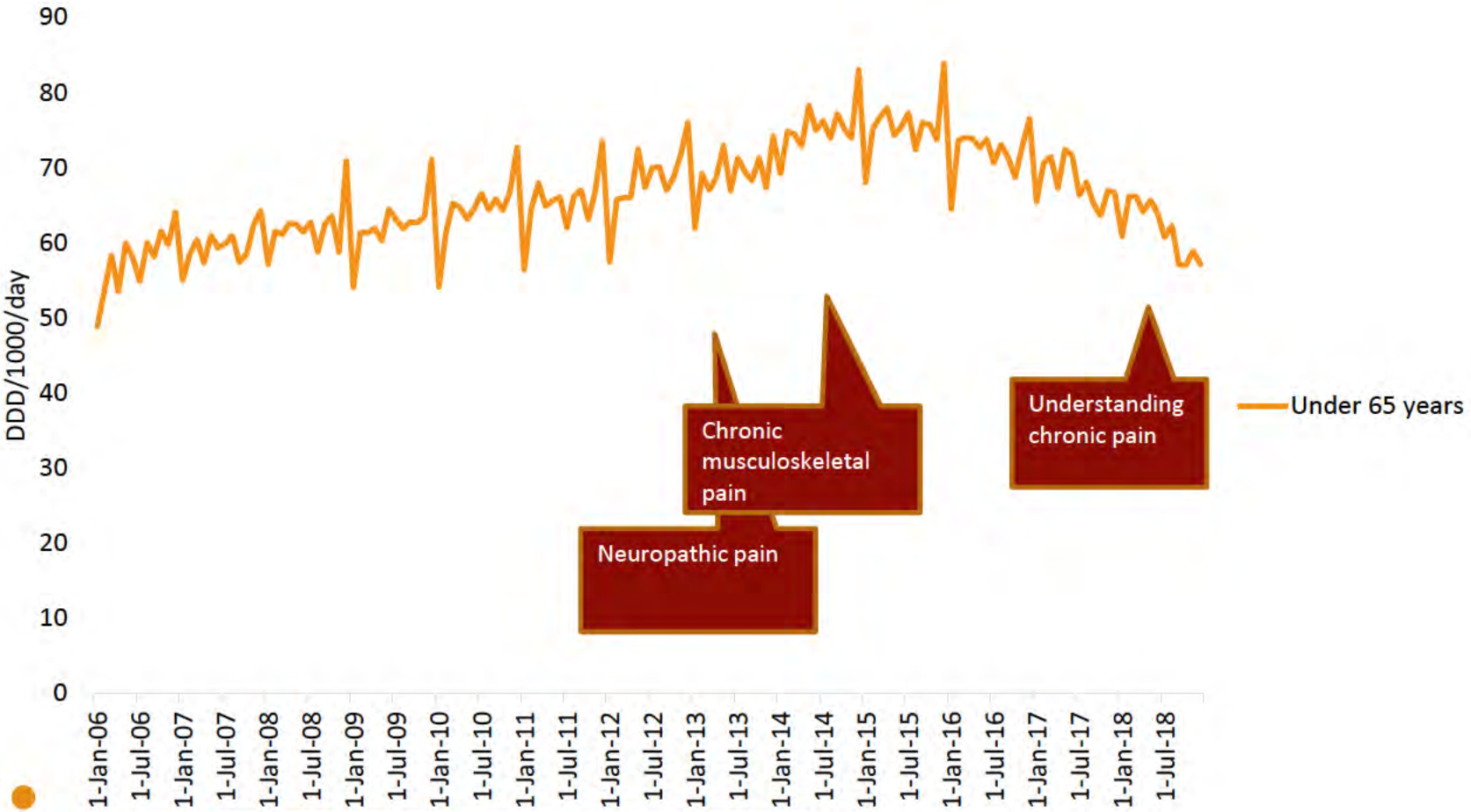
Psychologist claims by age



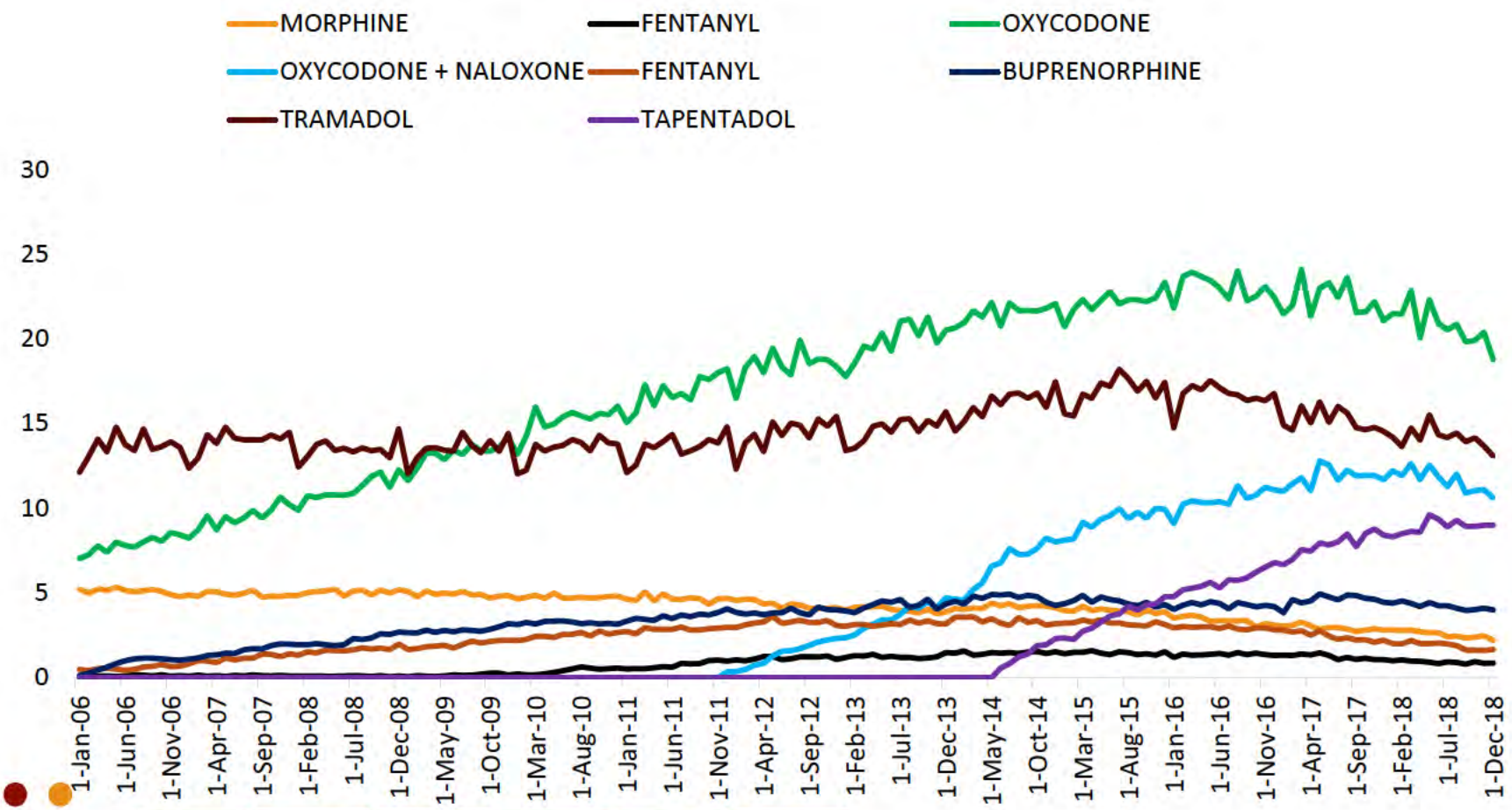
Psychologist claims by level of opioid use (oral morphine equivalents)



Opioid use is beginning to decline

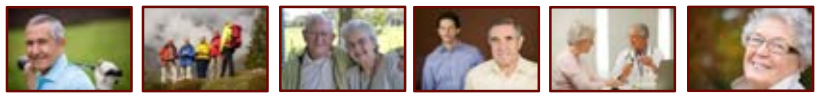


Rate of opioid use per 1000 veterans -under 65 years

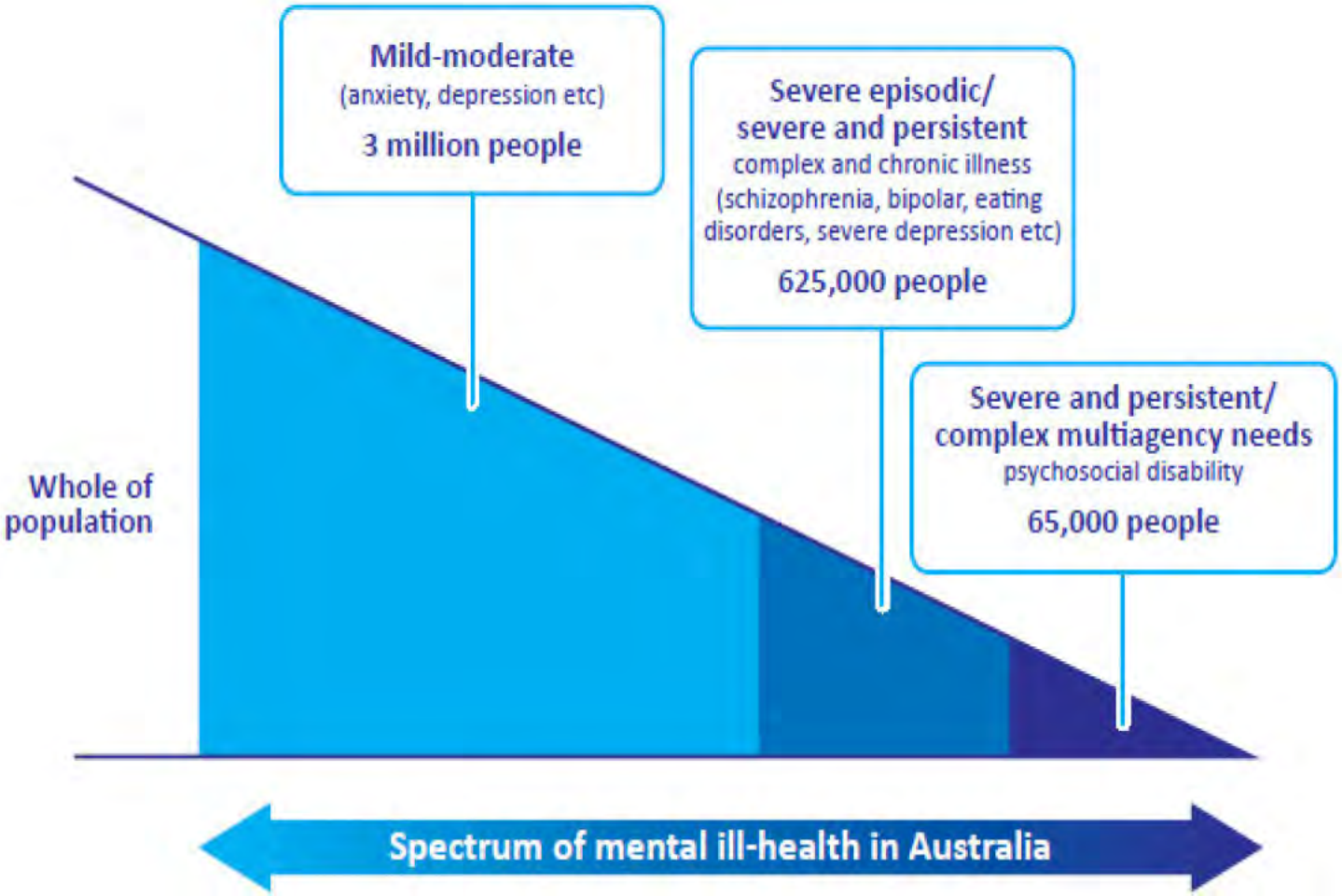


Note: codeine with paracetamol not included

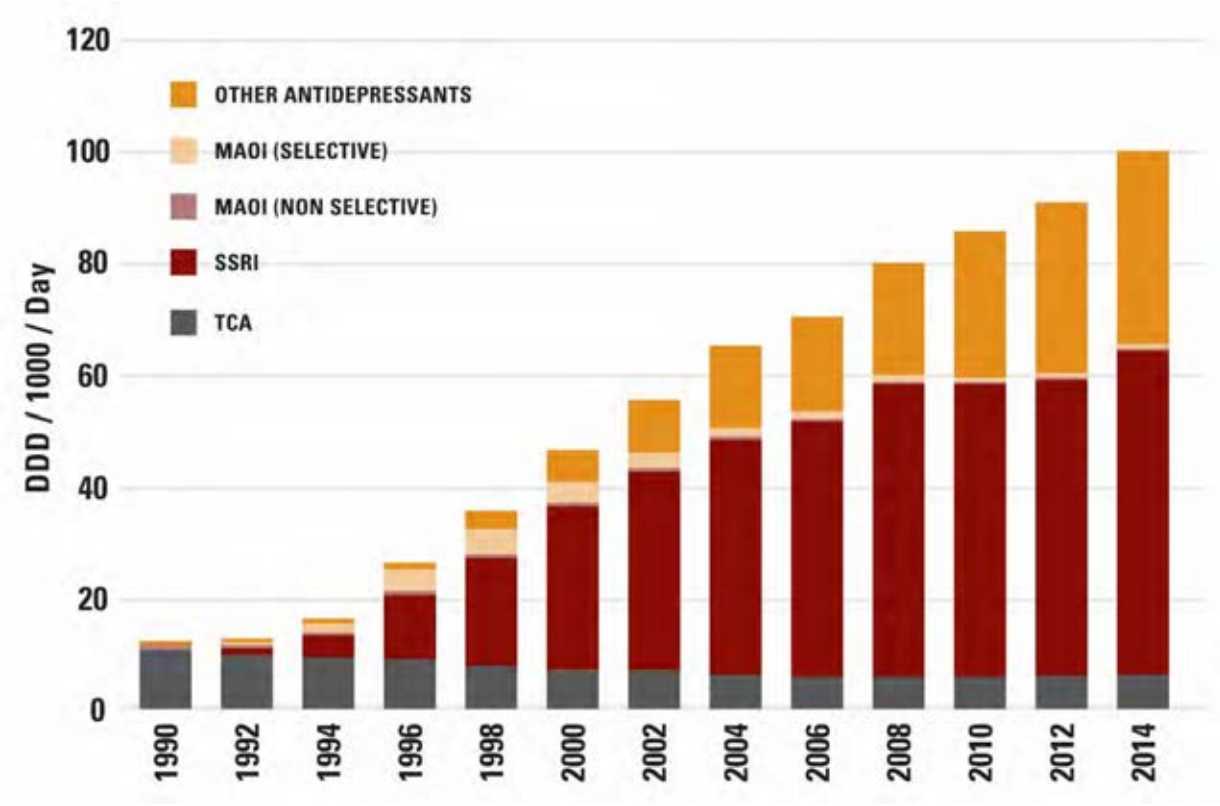
Improving depression management

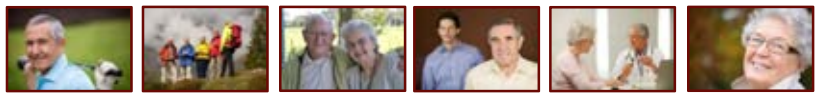


Mental ill health in Australia



Antidepressant use: Australia

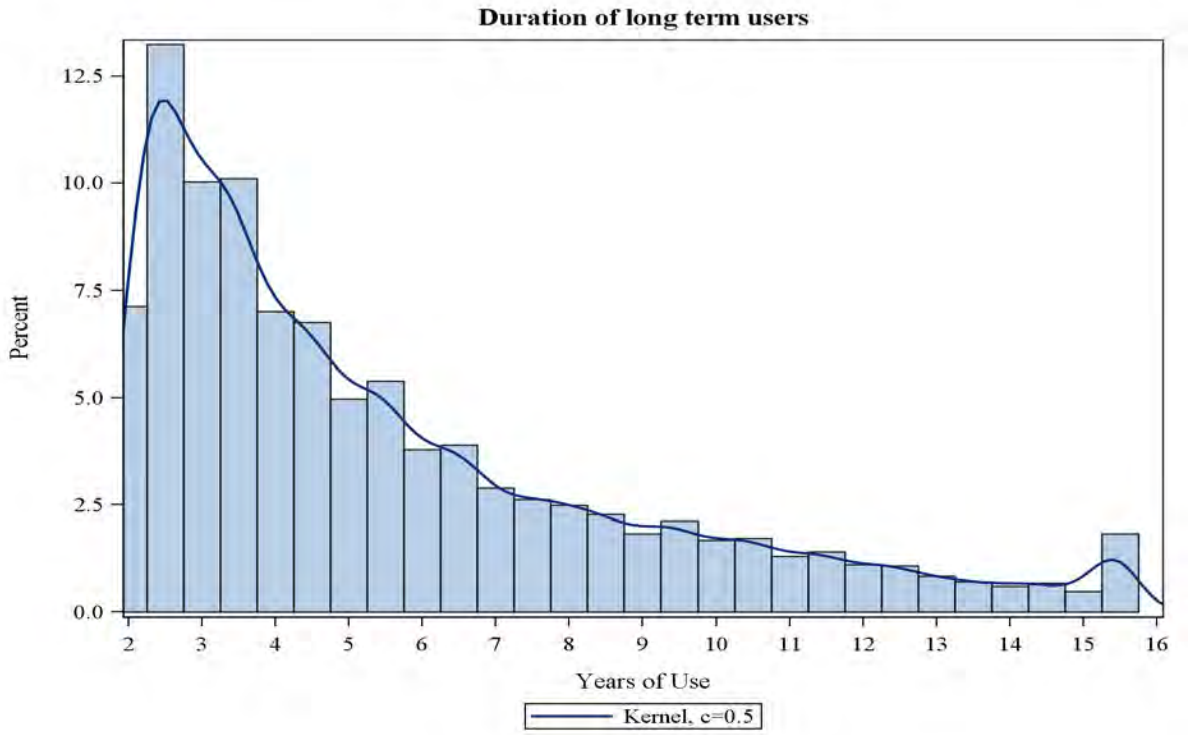




Improving depression management:

The planning stage

Identifying the problem: how many veterans are long term antidepressant users?

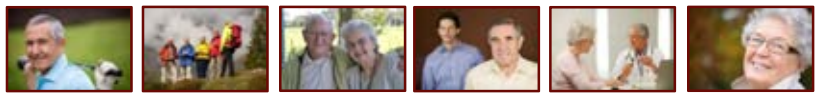


65,233 veterans who received at least one antidepressant prescription anytime in the two year period.

- 26% were on the same antidepressant continuously for 2 or more years

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



Building on 2015 program: mental fitness

Australian Government
Department of Veterans' Affairs

MVet

AT EASE
RECOGNISE > ACT > MAINTAIN

DVA mobile apps:

- The PTSD Coach Australia app can help you learn about and manage symptoms that commonly occur after trauma*

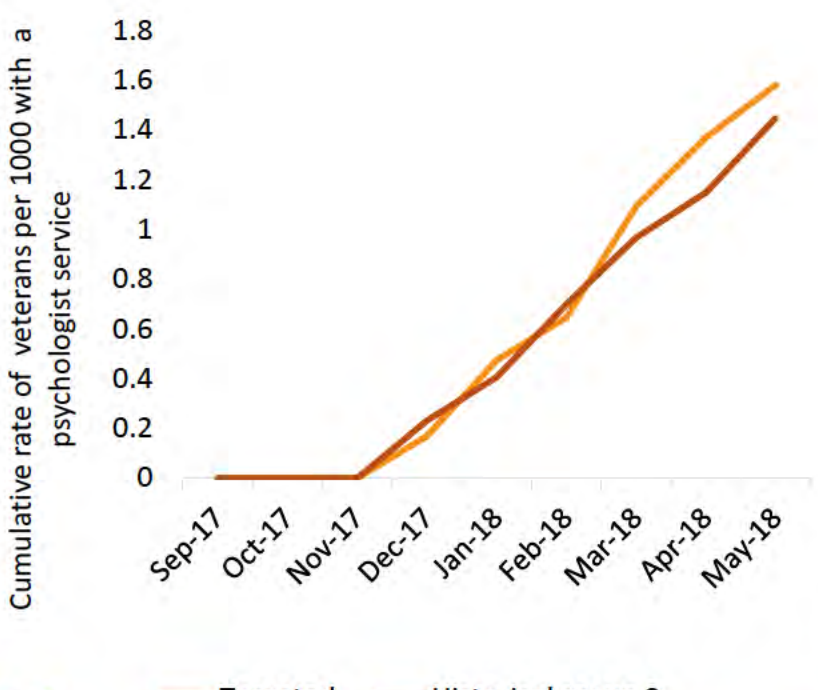
*Mobile apps available free for Android and Apple devices.

- The Right Mix – DVA's alcohol management site that provides practical information and strategies to raise awareness about alcohol-related harm and achieve the 'right balance' with alcohol, diet and exercise, www.therightmix.gov.au

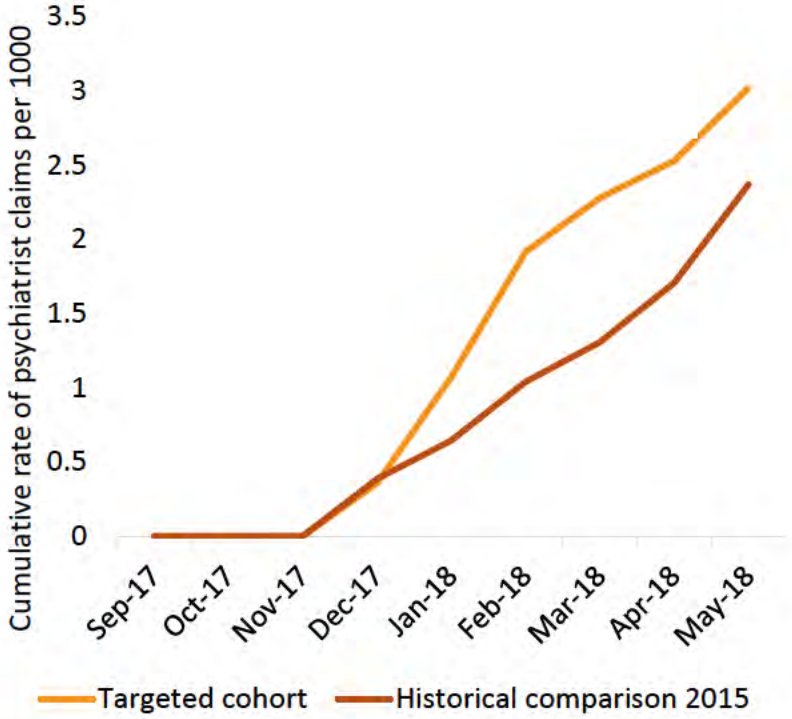
TALKING ABOUT MENTAL FITNESS – IT'S OK

We hear a lot about physical fitness and its importance for good health. Mental fitness is just as important, in fact physical and mental wellbeing are closely related. Mental fitness and emotional wellbeing allow us to recognise our strengths and abilities, to cope with the stresses of life, to build strong relationships and to contribute to our family and community. It means we can enjoy life.

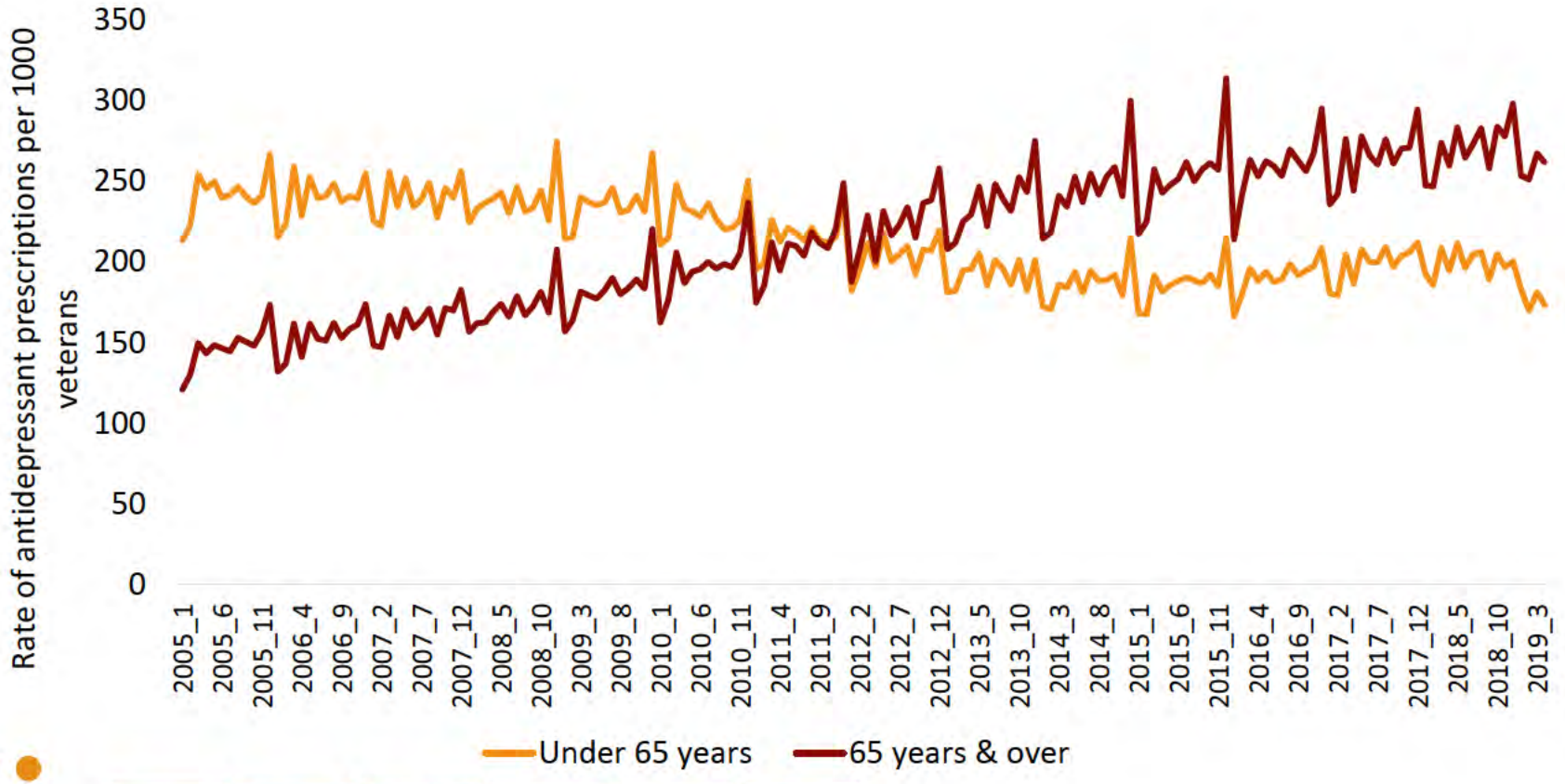
Increase in psychologist claims in new antidepressant users



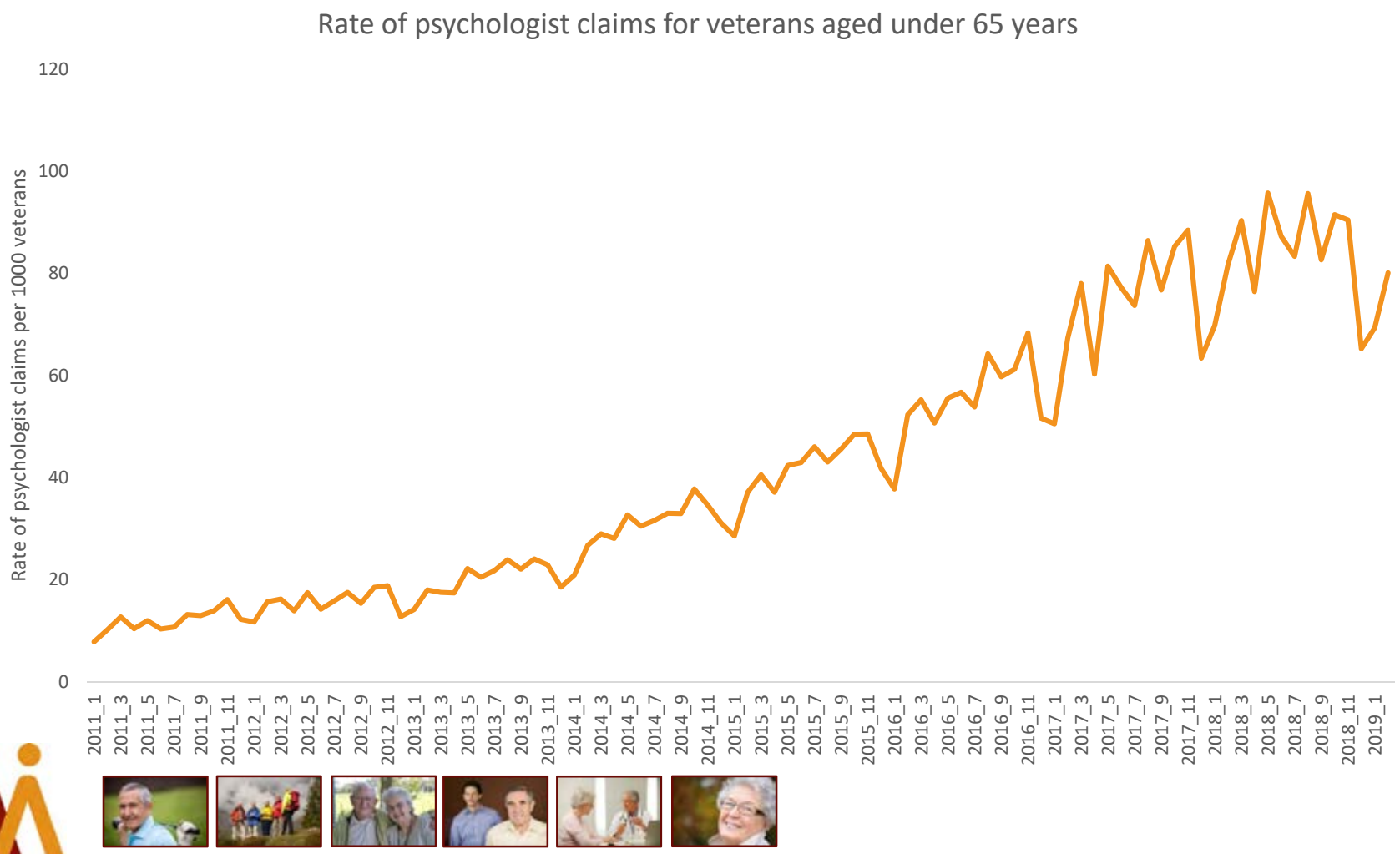
Increase in psychiatrist claims in veterans who had changed antidepressants



Rate of antidepressant prescriptions are decreasing in younger veterans



Use of psychology services is increasing in younger veterans



Insomnia management: June 2019

Australian Government
Department of Veterans' Affairs

Veterans' MATES

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

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

Collaborating with veterans to address issues of concern to them

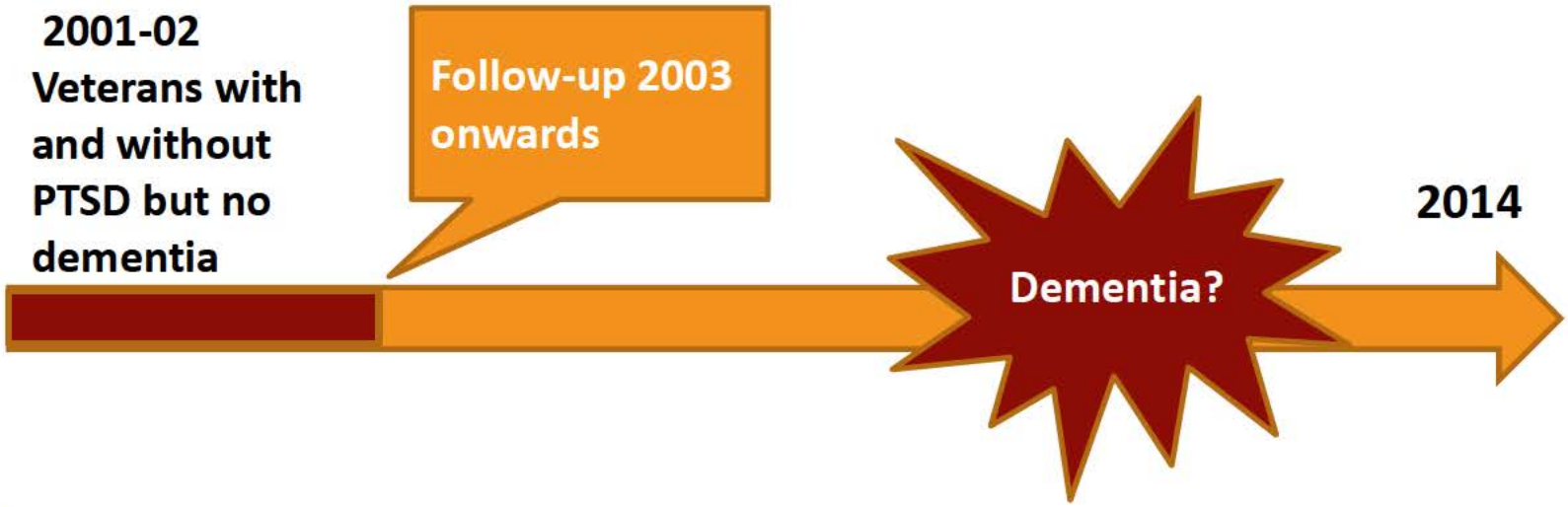
- Veterans and DVA came to us with the question is post-traumatic stress disorder a risk for dementia in Australian veterans

What was known?

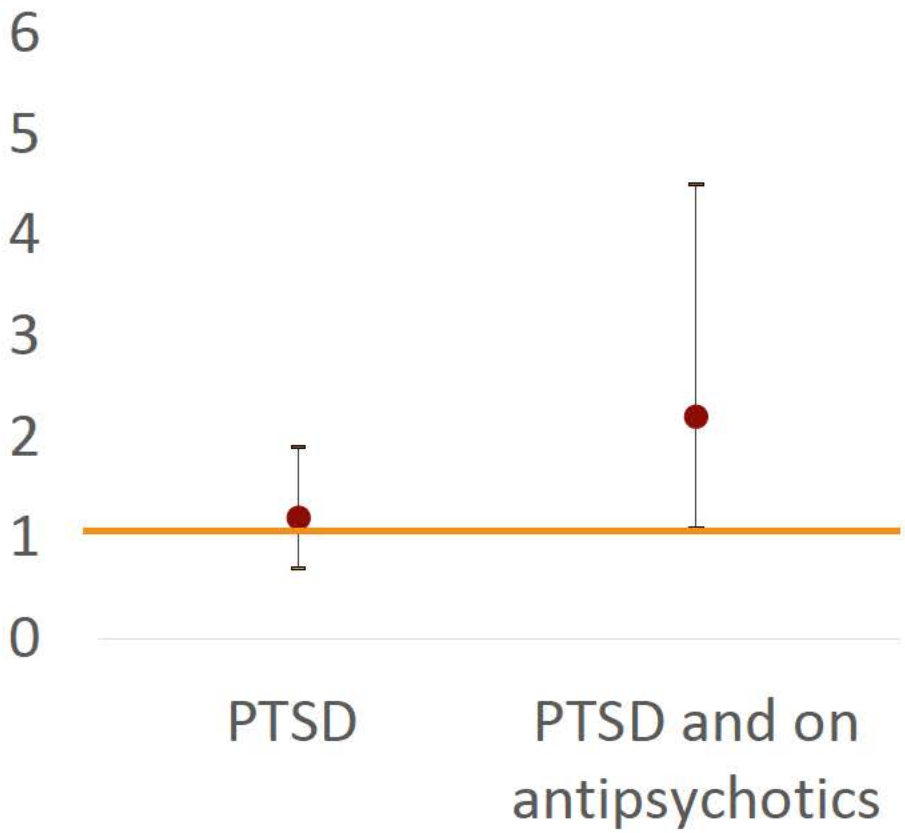
- A number of US studies have suggested patients with PTSD had almost a doubling in risk of developing dementia
- The previous research included veterans 65 years and over, some of whom may have been in the early phases of dementia.

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

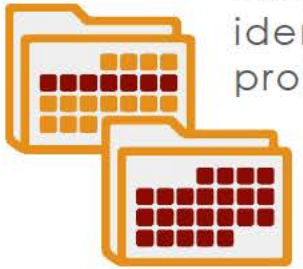
Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

Significant stakeholder engagement

Grounded in behavioural theories and models



Only target identified problems

Veterans' MATES

An innovative approach to the safer use of antipsychotics in older patients

Natalie s 47F **Tammy** s 47F **Elizabeth** s 47F **Andrew** s 47F **Emmae** s 47F

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What is Veterans' MATES?

- Provides patient specific feedback & educational material to GPs to improve medicine use for veterans
- Supported by educational brochures to veterans encouraging them to talk to their doctor & pharmacist
- Educational material to pharmacists

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)

New therapeutic topics are developed and sent every three months to approximately:

- 30,000 veterans
- 10,000 general practitioners
- 7,500 pharmacies & accredited pharmacists

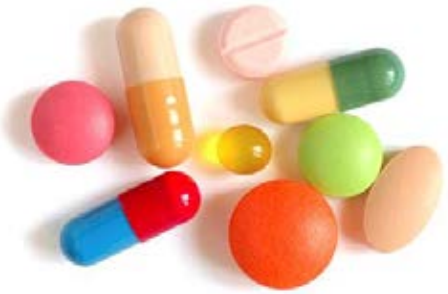
Therapeutic area selected

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

Selection of module topics

The subject needs to be:

1. problematic in the veteran community of Australia;
2. specific to medication management or related to health service delivery;
3. amendable to change by the interventions employed by this project;
4. evaluable using the available data sets;
5. suitable for repeat messages over time; and
6. relevant to the National Health Priority Areas.



- To date 26 modules delivered
  - Disease specific: Diabetes, COPD, Heart failure,
  - Drug Specific: Wafarin, Clopidogrel, NSAIDs
  - Service delivery: Medicines Review, Care Planning
- Participation
  - 250,000 veterans
  - 25,000 doctors
  - 8,500 pharmacies & accredited pharmacists

National Strategy for Quality Use of Medicines

- The primacy of consumers
- Partnership
- Consultative, collaborative, multi-disciplinary activity
- Support for existing activity
- System-based approaches

Partnerships

- The Repatriation General Hospital; Daw Park
- The National Prescribing Service
- The Drug & Therapeutics Information Service (DATIS)
- The Australian Medicines Handbook
- Disciplines of General Practice & Public Health; University of Adelaide
- The Data Management & Analysis Centre (DMAC); University of Adelaide

Antipsychotics in dementia

- Frequently used to treat the behavioural and psychological symptoms (BPSD) of dementia
- Limited efficacy for BPSD
- Serious adverse effects in the elderly
- Associated with increased risk of hip fracture, pneumonia and all cause mortality
- Not recommended as first line in patients with BPSD

Antipsychotic use in veterans

- 21,000 veterans dispensed an antipsychotic medication in the last 4 months of 2004
  - Almost 6,000 using long term (12 months)
  - Average 9 antipsychotic prescriptions (12 months)
- Residential aged-care
  - Over one third with high care needs
  - One fifth with low care need
- Care planning
  - 31% living in the community, most commonly annual health assessment
  - 14% psychiatry consultation, 2% psychology service

Aim

To improve the use of antipsychotics in the elderly veteran population

Methods

- Patient-specific prescriber feedback for veterans aged 65 years and over dispensed at least two antipsychotic prescriptions in the 6 months December 2006 to May 2007 distributed to general practitioners (GPs)
- Tailored educational materials distributed to both GPs and pharmacists

Patient specific prescriber feedback

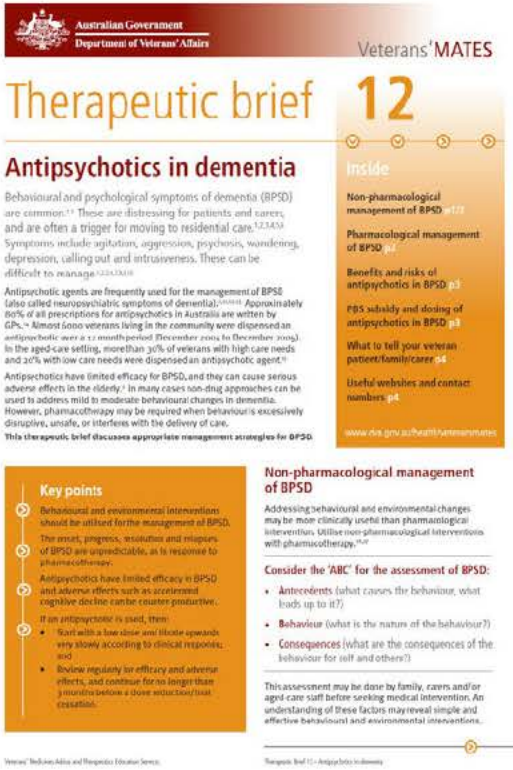
<Dr Fred Smith>

PLEASE KEEP FOR YOUR RECORDS

		Number of dispensings June 06 - May 07	Last dispensing	Other prescriber	GP ACTION
<Veteran Name 30 charactersxx>	**<Town/Suburb 17 characters> <Independent><Resident of aged-care facility>**				Date of next Review ...../...../.....
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx68 characters	xxxxxxxxxxxxxxxxxxx33 characters	#	<date>	<yes/no>	
Medicine Name & Brand 2	<Form and Strength>	#	<date>	<yes/no>	
Last medication review service claimed <None claimed> or <Date>					
<Mr Andrew Jones>	**<Adelaide> <Independent><Resident of aged-care facility>**				Date of next Review ...../...../.....
Medicine Name & Brand 2	<Form and Strength>	#	<date>	<yes/no>	
Medicine Name & Brand 3	<Form and Strength>	#	<date>	<yes/no>	
Medicine Name & Brand 4	<Form and Strength>	#	<date>	<yes/no>	
Medicine Name & Brand 5	<Form and Strength>	#	<date>	<yes/no>	
Last medication review service claimed <None claimed> or <Date>					

The supporting materials

- Therapeutic brief
  - Non pharmacological management & pharmacological management of BPSD
  - Benefits & risks of antipsychotics in BPSD
- Educational brochure
  - Managing behaviour change in dementia - A helpful guide for veterans and their carers


Australian Government
Department of Veterans' Affairs
Veterans' MATES

Therapeutic brief 12

Antipsychotics in dementia

Behavioural and psychological symptoms of dementia (BPSD) are common.[1,2] These are distressing for patients and carers, and are often a trigger for moving to residential care.[1,2,3,4,5] Symptoms include agitation, aggression, psychosis, wandering, depression, calling out and intrusiveness. These can be difficult to manage.[1,2,3,4,5,6]

Antipsychotic agents are frequently used for the management of BPSD (also called neuropsychiatric symptoms of dementia).[1,2,3,4,5,6] Approximately 80% of all prescriptions for antipsychotics in Australia are written by GPs.[1,2] Almost 5000 veterans living in the community were dispensed an antipsychotic over a 12 month period (December 2004 to December 2005). In the aged-care setting, more than 30% of veterans with high care needs and 20% with low care needs were dispensed an antipsychotic agent.[3]

Antipsychotics have limited efficacy for BPSD, and they can cause serious adverse effects in the elderly.[1] In many cases non-drug approaches can be used to address mild to moderate behavioural changes in dementia. However, pharmacotherapy may be required when behaviour is excessively disruptive, unsafe, or interferes with the delivery of care.

This therapeutic brief discusses appropriate management strategies for BPSD.

Inside

www.dva.gov.au/health/veteransmates

Key points

- Behavioural and environmental interventions should be utilised for the management of BPSD.
- The onset, progress, resolution and relapses of BPSD are unpredictable, as is response to pharmacotherapy.
- Antipsychotics have limited efficacy in BPSD and adverse effects such as accelerated cognitive decline can be counter-productive.
- If an antipsychotic is used, then:
  - Start with a low dose and titrate upwards very slowly according to clinical response; and
  - Review regularly for efficacy and adverse effects, and continue for no longer than 3 months before a dose reduction/trial cessation.

Non-pharmacological management of BPSD

Addressing behavioural and environmental changes may be more clinically useful than pharmacological intervention. Utilise non-pharmacological interventions with pharmacotherapy.[1,4,5]

Consider the 'ABC' for the assessment of BPSD:

- Antecedents (what causes the behaviour, what leads up to it?)
- Behaviour (what is the nature of the behaviour?)
- Consequences (what are the consequences of the behaviour for self and others?)

This assessment may be done by family, carers and/or aged-care staff before seeking medical intervention. An understanding of these factors may reveal simple and effective behavioural and environmental interventions.

Veterans' Medicines Advice and Therapeutics Education Services

Therapeutic Brief 12 – Antipsychotics in dementia


medicines

Australian Government
Department of Veterans' Affairs

Role of medicines

Sometimes medicines may help.

However, they:

- are not always needed
- can help some people, but not everyone
- need to be reviewed regularly
- are often needed for a short time only
- may cause unwanted side effects.

If you think the medicine is not helping or causing an unwanted side effect talk to the doctor.

NEVER stop taking medicine suddenly.

ALWAYS talk to the doctor first.

If you need additional helpful information, we suggest:

Living with Dementia - A Guide for Veterans, their Families and Carers

To order a copy contact DVA on 133 254 (metropolitan) or 1800 555 254 (non-metropolitan).

Veterans' MATES

Veterans' MATES
www.dva.gov.au/health/veteransmates

Managing behaviour change in dementia

A helpful guide for veterans and their carers

Get the best from your medicines

Australian Government
Department of Veterans' Affairs

Veterans' MATES

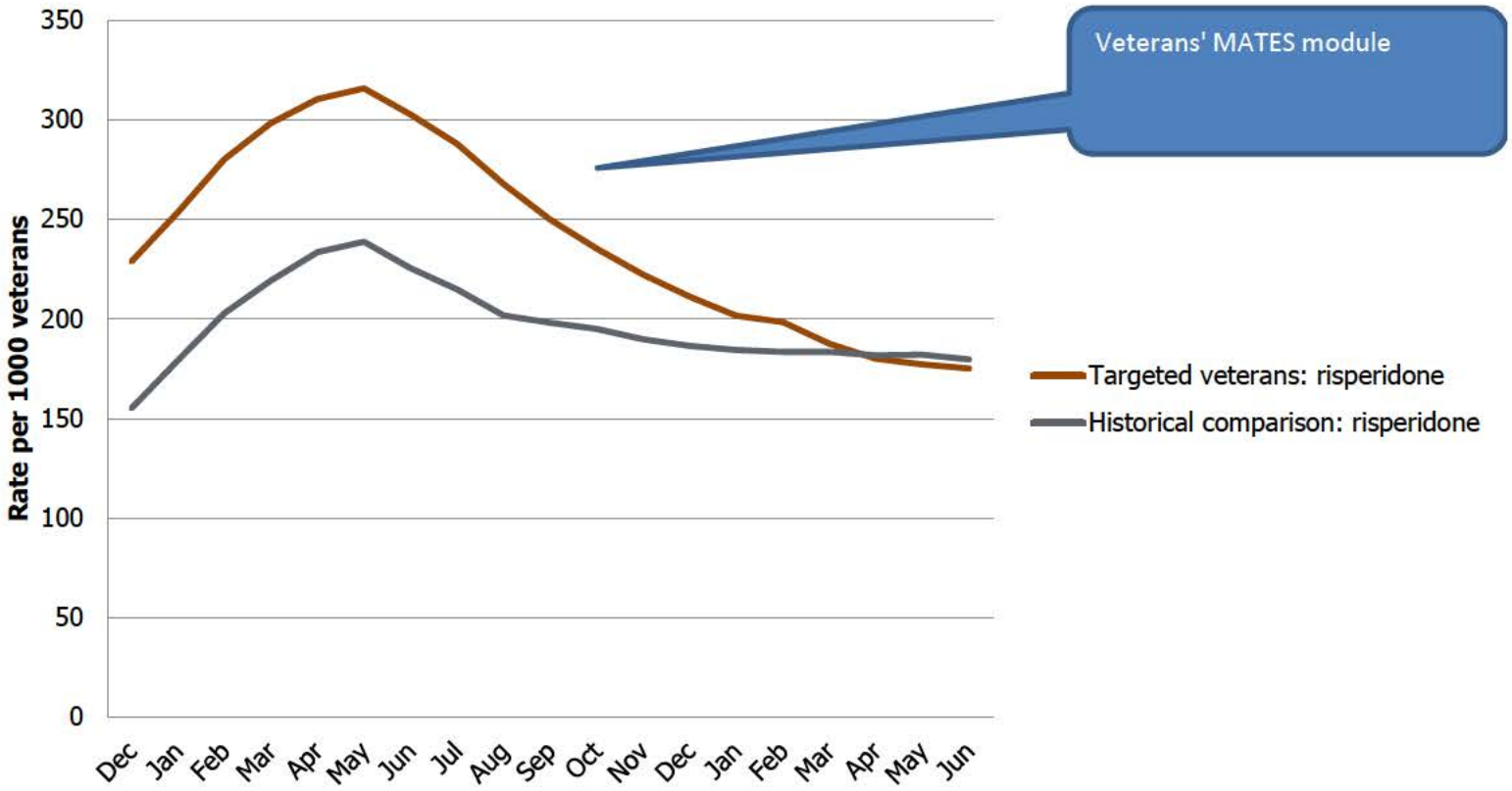
Evaluation

- Time series trends between targeted veterans and a historical cohort
- Health outcomes
  - self controlled case series analyses
  - inferred using published trial data

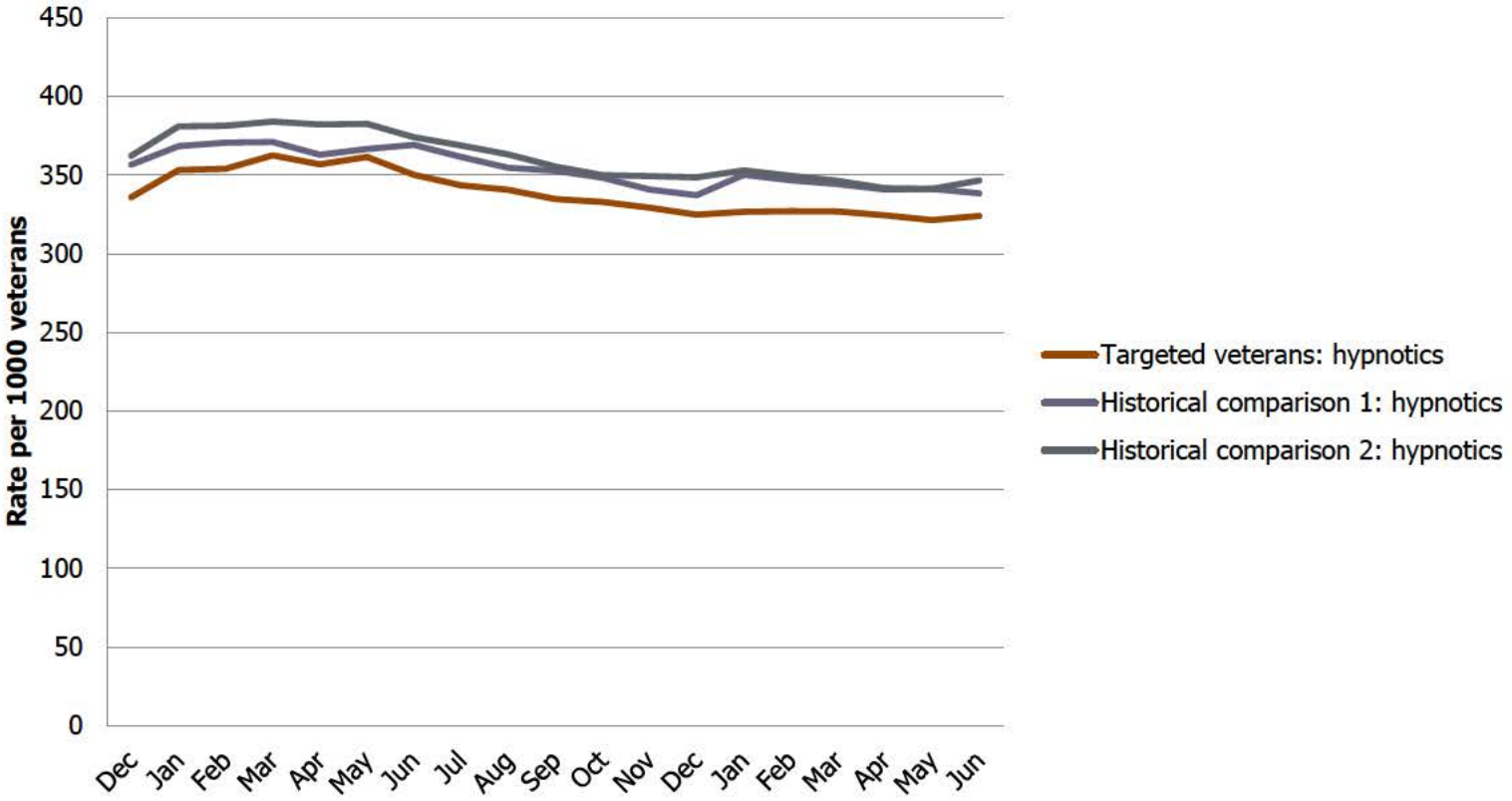
Results

- Module 12 materials were mailed 25th September 2007
  - 3,884 GPs (about 6,990 of their veteran patients)
  - 8,085 pharmacies

Rate of veterans dispensed risperidone amongst veterans dispensed antipsychotics



Rate of veterans dispensed hypnotics amongst veterans dispensed antipsychotics



	Monthly trend pre mail-out (Sep 05-Aug 07)	Change in use at the time of intervention (Sep 07 – Dec 07)	Monthly trend post mail-out compared to trend prior to the intervention (Jan 08 – Sep 09)
Risperidone use	RR 1.036 (1.034-1.039) p<0.0001 3.6% per month increase in rate of risperidone use	RR 0.857 (0.82 – 0.89) p<0.0001 14% fall in use of risperidone	RR 0.973 (0.970-0.977) p<0.0001) Compared to prior 3% decrease
Hypnotic use	RR 1.00 (0.99-1.001) p=0.16 Rate was stable	RR 0.999 (0.990-1.001) p =0.11 No change at time of intervention	RR 0.998 (0.997-0.998) p <0.0001 Rate now decreasing at a rate of 0.02% per month

Adverse effects associated with risperidone

	Risk per 1000 dementia patients treated for 12 weeks	Events prevented as a result of Veterans' MATES mail out
Hip fracture	25 per 1000 patients	27
Pneumonia	77 per 1000 patients	274
Cerebrovascular events	21 per 1000 patients	36
Death	13 per 1000 patients (63 per 1000 over 12 months)	22-108
Serious adverse events avoided	38 – 95 per 1000 patients	66-164

Conclusions

- Veterans' MATES is effective in promoting the safer use of antipsychotics in older patients through:
  - Patient-specific feedback and education to GPs
  - Educational materials to pharmacists
- Consultation, collaboration and multidisciplinary approach is critical to Veterans' MATES success


www.veteransmates.net.au

Disease Management and Medication Management: You can't have one without the other

Professor Andrew s 47F
Veterans' Medicines Advice and Therapeutics Education Services

In this presentation I will:

- Introduce the *Veterans'* MATES project
- Describe the critical place of Medicines Review in Disease Management Plans for people with poly morbidities
- Describe preliminary results from the *Veterans'* Mates project in terms of increasing Home Medication Review rates.

Veterans' Medicines Advice & Therapeutics Education Service

- Aim: To improve health outcomes for veterans through quality use of medicines
- Method: Use evidence-based change strategies to influence behaviours of doctors, pharmacists and veterans.
- Strategies include prescriber feedback, consumer engagement, academic detailing, opinion leader strategies.

Core Program

- Clinical Modules (10 across 3 years)
  - Mail-out to medical practitioners (Therapeutic brief)
  - Mail-out to veterans (Veteran brochure)
  - Mail-out to pharmacies
  - Plus

    Individual patient feedback to medical practitioners
    - Practice visits
    - Opinion Leaders

Veterans' Mates Project Update
Module 1: Home Medicines Review

- Mail out to 11,384 doctors — Dec 04
- Mail out to 38,570 veterans — Jan 05
- Academic detailing to 150 doctors — April 05
- Feedback
  - Response forms from doctors and veterans
    - At the end of March 2005, 12,235 response forms had been received from
      - 1,085 (10.6%) of doctors who received the mailing and
      - 11,150 (29%) veterans

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.

Risk flags:

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

The risk flags

Multiple medicines

Veterans often need multiple medicines for optimal management of chronic disease. Over 70% of veterans use six or more different medicines in a year and more than 40% regularly use combinations of five to ten medicines.

When multiple medicines are used there is an increased risk of interaction. When five medicines are prescribed concurrently, the potential for interaction is approximately 50%. If eight or more medicines are prescribed the potential for interactions approaches 100%.[4]

Using multiple medicines may reflect best practice but it can lead to patient confusion and poor compliance resulting in poorer health outcomes.

Recent hospitalisation

In the past 12 months 38% of veterans have had a hospital admission. Significant patient harm and sub-optimal use of medicines frequently arises after discharge from hospital.

One study found that patient confusion about their medicines was responsible for 61% of medication-related problems post discharge (Figure 2).[10]

Confusion, hearing, vision or dexterity problems

92% of Australian veterans report visual problems and 55% report hearing problems: these factors may cause difficulty understanding or following instructions for medicines.

53% of veterans report arthritis, which may result in difficulty opening containers and handling medicines.

Confusion, hearing, vision and dexterity problems also impact on the veteran's ability to use devices such as inhalers, nebulisers, dose administration aids and monitoring devices including blood glucose meters.

Patient confusion about their medicines was responsible for 61% of medication-related problems post discharge.

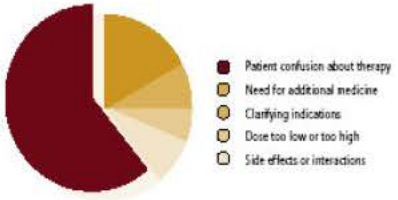


Figure 2. Medication-related problems identified six weeks after hospital discharge

High risk medicines

Some medicines present a greater risk to veterans because of:

- narrow therapeutic index
- high propensity for interactions
- frequent or severe adverse reactions
- monitoring requirements
- requirement for dosage modification with renal impairment.

Warfarin, digoxin, amiodarone and tramadol are examples of high risk medicines.

Particularly for older veterans, renal function may be compromised despite a serum creatinine within the reference range. Reduced cognitive function, medical co-morbidities and use of multiple medicines also compound risks associated with medicines.

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10. Spurling L. *An education liaison service: a community-linked approach.* Masters Thesis, University of South Australia. 2001.

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

? ???

- Want to learn more about your medicines?
- Unsure how long you should keep taking each medicine?
- Unsure about the best time to take each medicine?
- Recently started a new medicine or had your medicines changed?
- Do you forget to take your medicines?
- Are you confused or worried about your medicines?

A **Home Medicines Review** may help

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

UniSA

Veterans' Medicines Advice and Therapeutics Education Services

Australian Government
Department of Veterans' Affairs

Veterans'MATES

Home Medicines Review

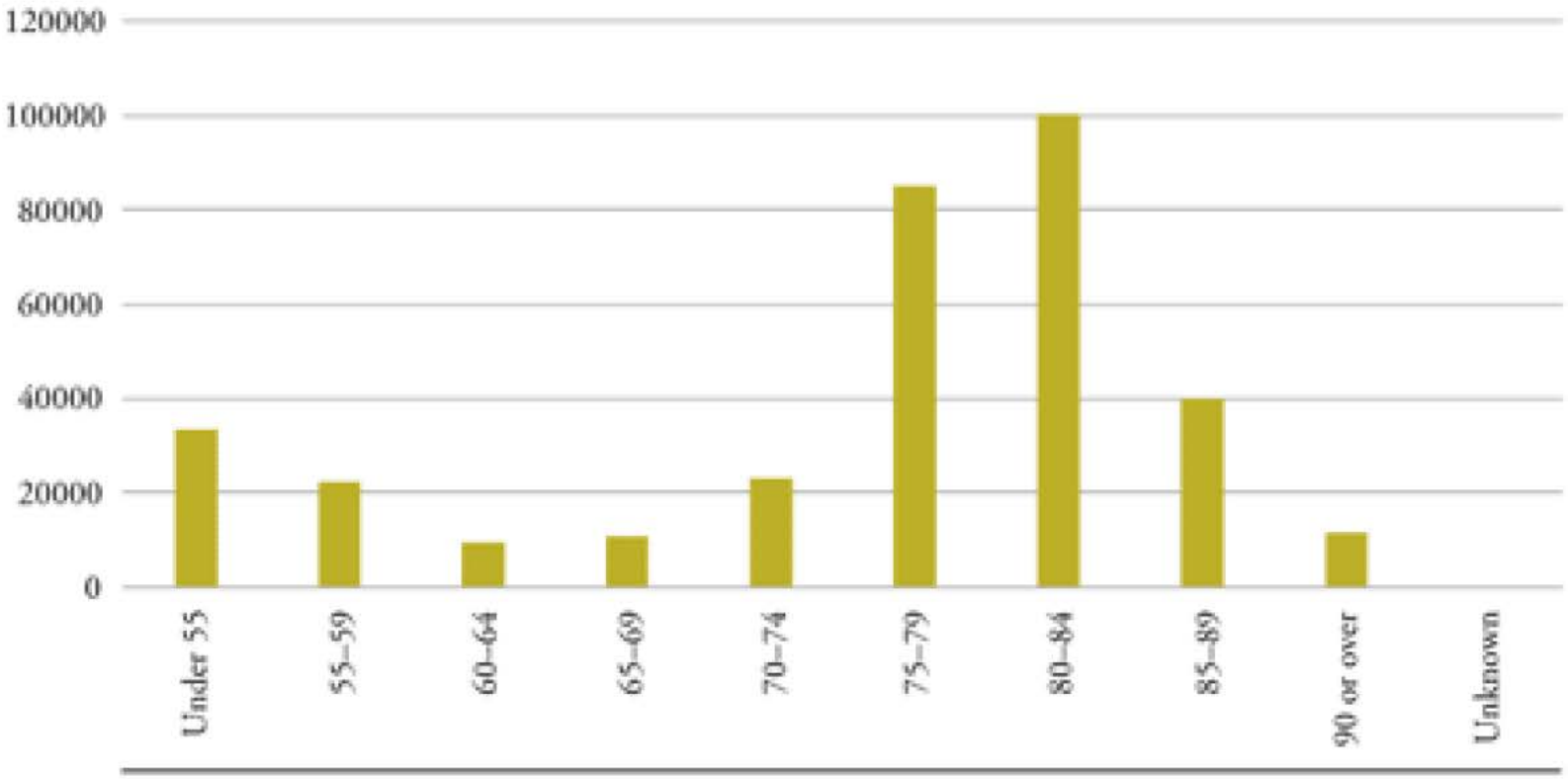
Get the best from your medicines

Veterans' Medicines Advice and Therapeutics Education Services

Why start with Home Medication Review?

- Australian evidence that home medication reviews;
  - Improve patient outcomes
  - Minimise ADRs
  - Reduce hospitalisation rates
  - Achieve cost savings to the health system
  - Highly relevant in the Australian veteran community

Veteran Treatment population by age



DVA annual report 2003-2004

Veteran Self-reported Health Problems

	1997	2003
Visual problems	86%	92%
Arthritis	-	53%
Depression	19%	22%
Hearing difficulties	49%	55%
Dementia memory loss	16%	38%
Insomnia/sleep disturbance	28%	33%
Anxiety	18%	18%
Foot/leg problems that affect mobility	19%	43%
Incontinence	8%	15%
High blood pressure	38%	44%
Post Traumatic Stress Disorder	9%	13%

Department of Veterans' Affairs 2003 Survey of Veterans, War Widows and their Carers

Unique Prescription Medicines 2004

Unique RPBS Items	Number of Veterans	Percentage of Rx Population	
1 to 5	84,967	26.34 %	
6 to 10	95,562	29.63 %	
11 to 15	70,403	21.83 %	74%
16 to 20	38,835	12.04 %	
21 to 25	18,581	5.76 %	
26 Plus	14,182	4.40 %	
Total	322,530	100.00 %	

DVA Departmental Management Information System – March 2005

Why is this relevant to Disease Management Programs?

Disease Management Programs involve:

Clinical guidelines

plus

Ongoing management

plus

Supporting arrangements

Disease Management Programs

- Nearly always single disease focused
- Often miss those at most need who have multiple chronic conditions
- Following clinical guidelines inevitably leads to polypharmacy

Dr JoAnne Epping-Jordan; WHO; 2004 National Disease Management Conference

"It is a question of whether what is good for the disease is always best for the patient."

Mary E. Tinetti et al, Potential Pitfalls of Disease-Specific Guidelines for Patients with Multiple Conditions. NEJM 2004: 351;2870-2874.

Treatment guidelines in people with poly-morbid conditions: unanswered questions

- What is the relative benefit of guideline adherence vs risk of guideline driven polypharmacy and ADRs?
- Contradictory recommendations?
- Ability of patients to manage and comply with complex management plans?
- Patient preferences?

Many veterans have multiple chronic conditions

- Heart Failure 13,500 veterans
- Diabetes 17,900 veterans
- Diabetes and Heart Failure 1,500 veterans
- Diabetes or Heart Failure and arthritis 10,000 veterans

DVA Pharmacy Datamart 2005

Best practice management

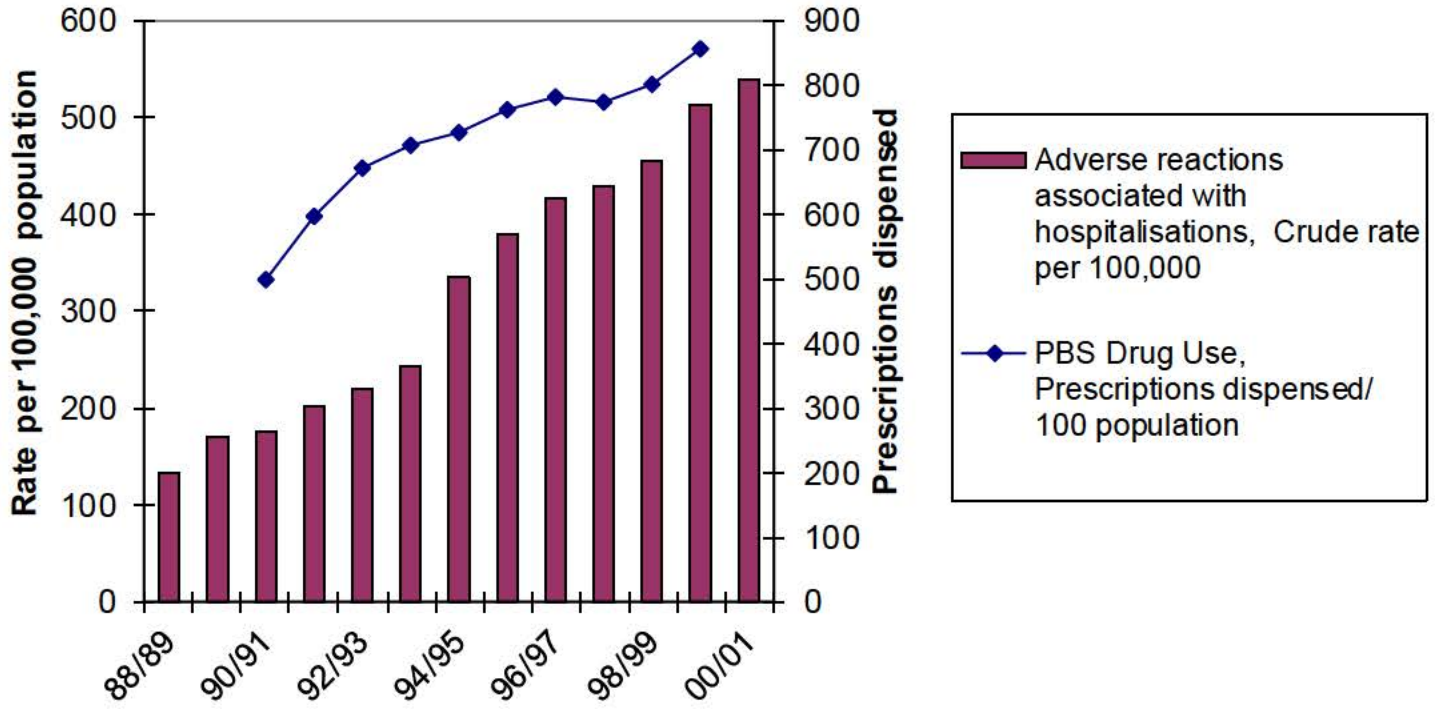
Diabetes

- Oral hypoglycemic or insulin 1
- ACE inhibitor 2
- Low Dose Aspirin 3
- Lipid Lowering agent 4

CHF

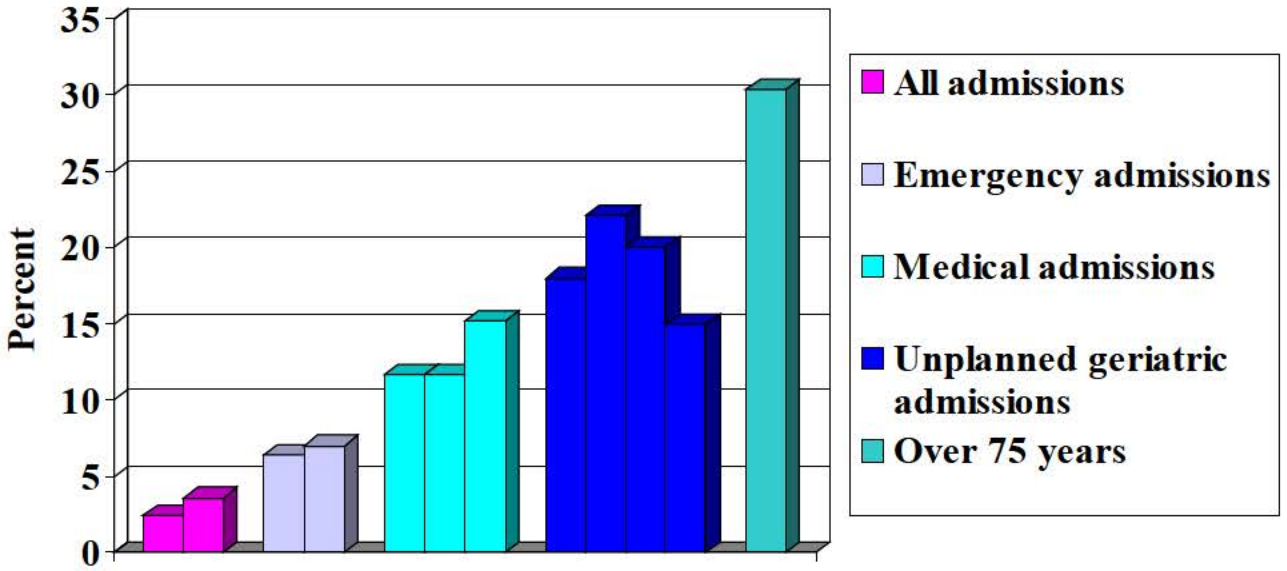
- ACE inhibitor
- Diuretic 5
- B-Blocker 6
- Spironolactone +/- digoxin 7

Trends in ADRs associated with hospitalisation: South Australia



Roughead E, Gilbert A, Primrose J, Sansom L. Hospitalisation rates as outcome indicators of National Medicinal Drug Policies: The example of gastrointestinal ulcer. *Pharmacoepidemiology and Drug Safety 1999; 8: 291-299*

Medication-related hospital admission studies



Roughead, E.E., Gilbert, A.L., Primrose, J.G., Sansom, L.N. Drug related hospital admissions: A review of recent Australian studies . *MJA 1998; 168: 405-408*

Medication-related Hospital Admissions

- Medication error is one of the most common causes of unintentional harm in Australia which results in an estimated 140,000 hospital admissions every year.
- 50% (70,000) admissions are potentially preventable

Safety and Quality Council, National Report on Patient Safety, July 2002

Understanding the context of the problem

To put these figures into perspective:

Hospital admissions for;

Influenza and Pneumonia	62,586
Asthma	60,759
Heart Failure	41,708
Medication-related	140,000

AIHW Australian Hospital Statistics 1999-00

In the community setting.

- Just for ADRs (as a sub-set of medication-related problems)
- Main drug groups involved
  - Cardiac medications (39% of ADRs)
  - CNS medications (27%)
  - Musculoskeletal (12%)
- At the level of drug class
  - ACE inhibitors accounted for 14% of all ADRs
  - antidepressants 11%
  - NSAIDs 10%

Gilbert A, Roughead E, Mott K, Barratt J. Collaborative Medication management services; improving patient care. *MJA* 2002;177:189-192

Strategies for reducing adverse drug events

- Discharge liaison services & case conferencing
  - both shown to improve medication use in controlled trials
- Medication Management Services
  - uncontrolled trials show a reduction in medication related problems

Roughead I, Semple S, Vitry A. The value of pharmacist professional services in the community: A systematic review of the literature 1990-2002. Commonwealth Department of Health and Ageing. 2003. Canberra Australia.

- Due pharmaco-vigilence must be a part of Disease Management
- Home Medication Reviews are a proven service in preventing and resolving many medication-related problems

Was the Veterans' MATES module successful in increasing Home Medication Review rates in at risk veterans?

Quality Use of Medicines and Pharmacy Research Centre
University of South Australia

GP Responses

- 57% percent of the doctors who responded indicated they would refer at least one of their veteran patients for a review.
- Estimated that at least 1785 veterans would be referred for a home medicines review.

How many veterans listed. who have not had a review in the last twelve months, will you refer?	Number (n=1085)	%
None	379	34.9
One	222	20.5
Two	152	14.0
Three	84	7.7
Four	54	5.0
Five	35	3.2
Six	19	1.8
Seven	9	0.8
Eight	4	0.4
Nine	3	0.3
Ten or more	38	3.5
missing	86	7.9

- The majority of GPs (79%) indicated they were aware of the Home Medicines Review service prior to receiving the *Veterans'* MATES information

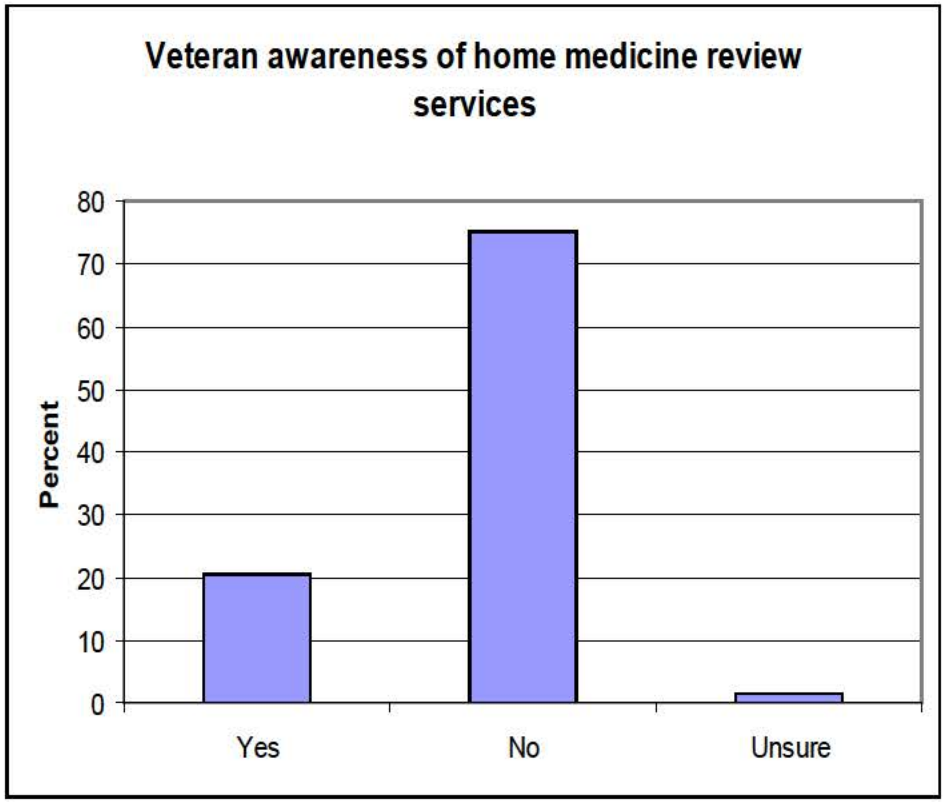
Aware of Home Medicines Review service prior to letter?	n	%
Yes	855	78.8
No	174	16.0
Unsure	31	2.9
missing	25	2.3
Total	1085	100.0

- While 79% of respondents were aware of the Home Medicines Review service, only 35% of those who reported they were aware of the service also reported they had previously used the service

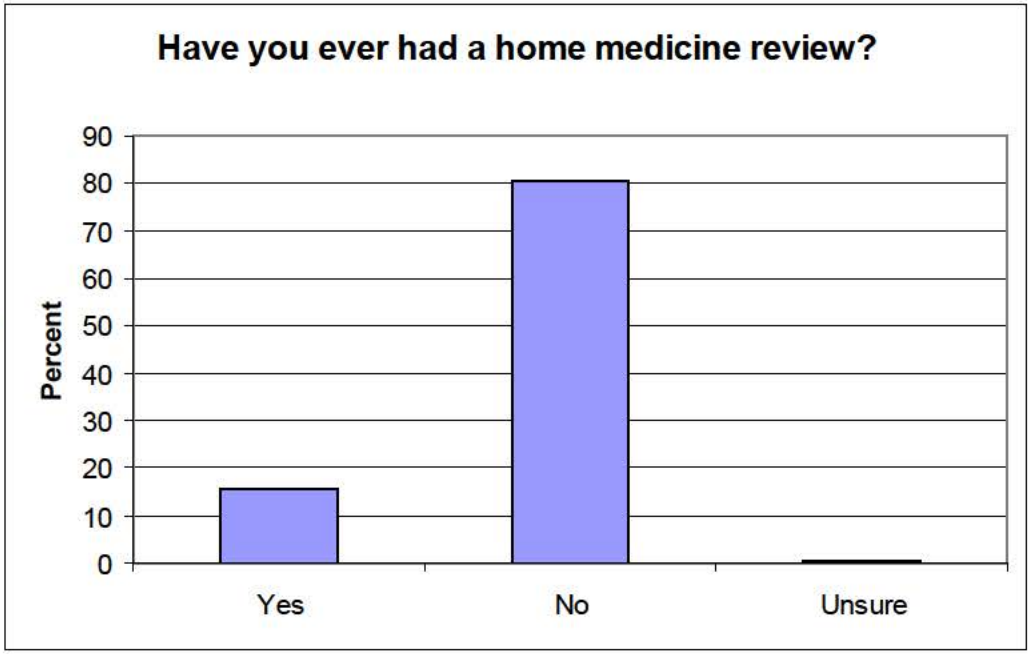
If aware of HMR service, on how many occasions previously have you referred your veteran patients for a HMR?	n=855
None	505
One	108
Two	89
Three	31
Four	15
Five	19
Six	6
Seven	2
Eight	1
Ten or more	29
missing	50

Veteran responses

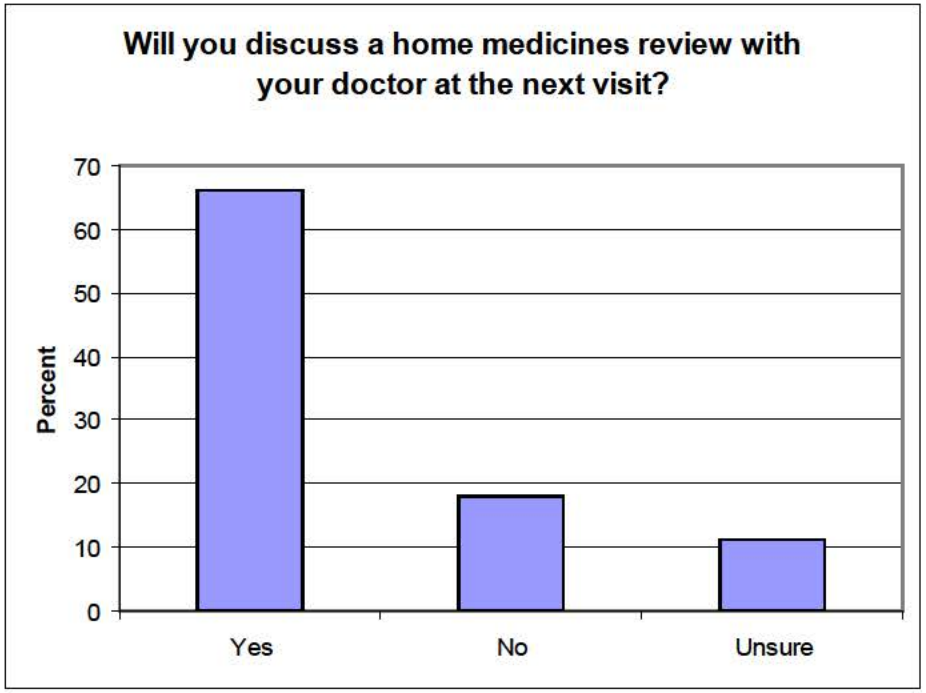
- 75% of the veterans who responded indicated they were not aware of the Home Medicines Review service prior to receiving the *Veterans'* MATES brochure



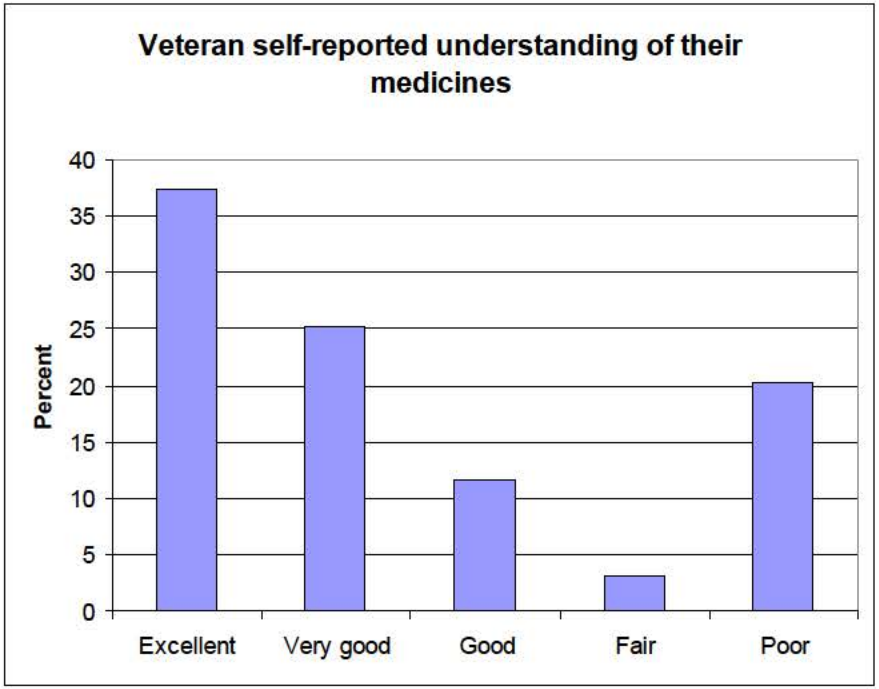
- The majority of veterans who responded (81%) had not previously had a Home Medicines Review



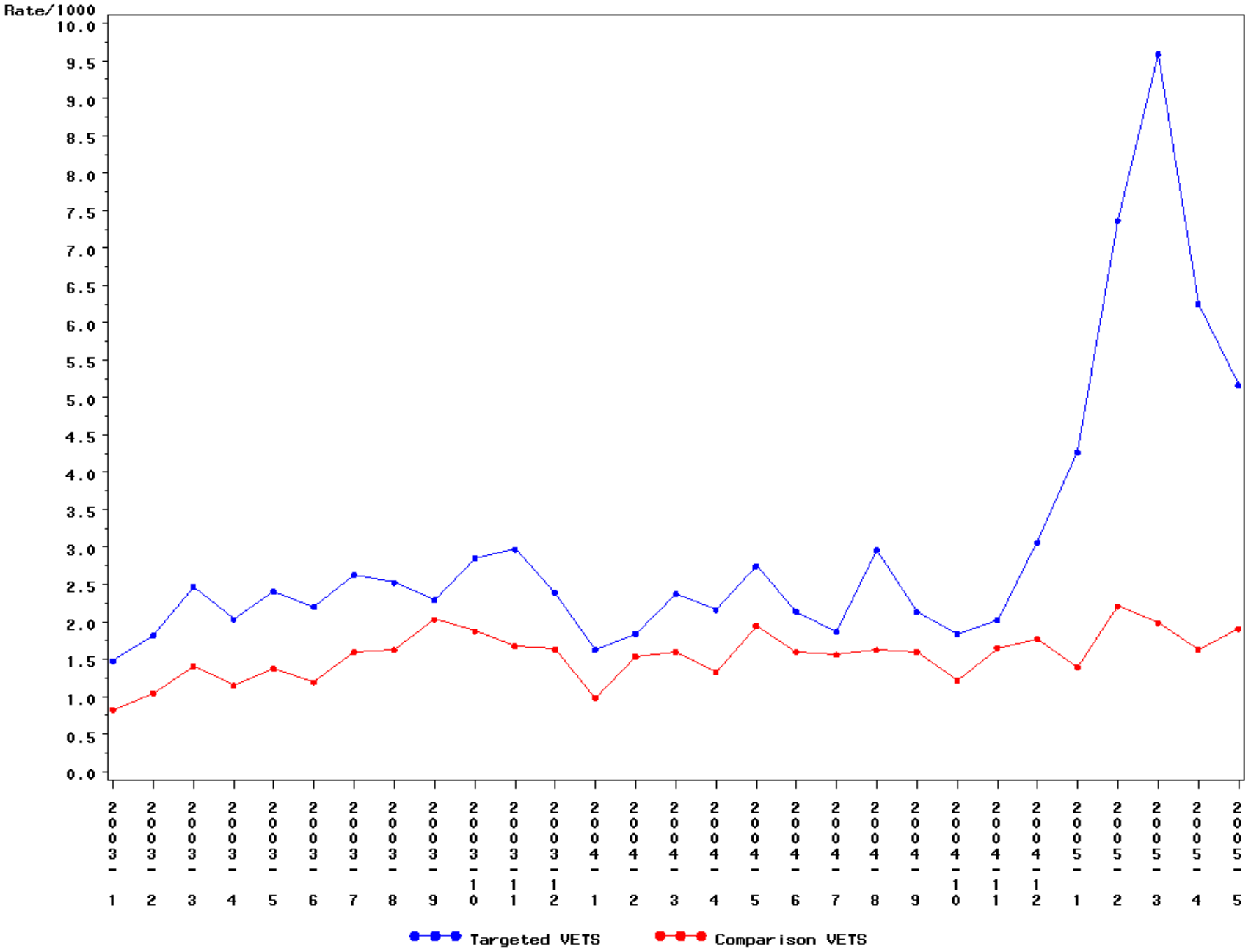
- 65% of the veterans who responded indicated they intended to discuss the service with their LMO at their next visit, with 18% indicating they would not



- 75% of the veteran respondents rated their understanding of their medicines from good to excellent. Only 20% considered they had a poor understanding of their medication



Rate of Home Medication reviews per month



In summary

- Current disease management guidelines are disease specific
- In the older population poly-morbidity is common
- Evidence is not available to help clinicians apply disease management guidelines in this situation
- One evidence-based strategy to help achieve best possible outcome for patients, in the face of polypharmacy, is home medication review
- Appropriate practice support for medical practitioners to help identify at risk patients through the ***Veterans' MATES*** project has facilitated increased rates on medication reviews.

The Wizard of Id

Disease Management and Medication Management: You can't have one without the other

Andrew s 47F

Veterans' MATES

Veterans' Medicines Advice and Therapeutics Education Services

Quality Use of Medicines and Pharmacy Research Centre
University of South Australia

In this presentation I will:

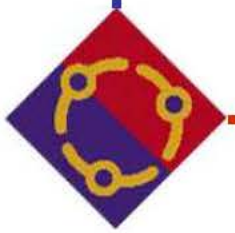
- Introduce the *Veterans'* MATES project
- Describe the critical place of Medicines Review in Disease Management Plans for people with poly morbidities
- Describe preliminary results from the *Veterans'* Mates project in terms of increasing Home Medication Review rates.

Veterans' Medicines Advice & Therapeutics Education Service

- Aim: To improve health outcomes for veterans through quality use of medicines
- Method: Use evidence-based change strategies to influence behaviours of doctors, pharmacists and veterans.
- Strategies include prescriber feedback, consumer engagement, academic detailing, opinion leader strategies.

Core Program

- Clinical Modules (3 to 4 Per Year; 10 across 3 years)
  - Mail-out to medical practitioners (Therapeutic brief)
  - Mail-out to veterans (Veteran brochure)
  - Mail-out to pharmacies
- *Plus*
  - Individual patient feedback to medical practitioners
  - Practice visits
  - Opinion Leaders



Veterans' Mates Project Update
Module 1: Home Medicines Review

- Mail out to 11,384 doctors — Dec 04
- Mail out to 38,570 veterans — Jan 05
- Academic detailing to 150 doctors — April 05
- Feedback
  - Response forms from doctors and veterans
    - At the end of March 2005, 12,235 response forms had been received
      - 1,085 (10.6%) of doctors who received the mailing and
      - 11,150 (29%) veterans

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.

The risk flags

Multiple medicines

Veterans often need multiple medicines for optimal management of chronic disease. Over 70% of veterans use six or more different medicines in a year and more than 40% regularly use combinations of five to ten medicines.

When multiple medicines are used there is an increased risk of interaction. When five medicines are prescribed concurrently, the potential for interaction is approximately 50%. If eight or more medicines are prescribed the potential for interactions approaches 100%.[4]

Using multiple medicines may reflect best practice but it can lead to patient confusion and poor compliance resulting in poorer health outcomes.

Recent hospitalisation

In the past 12 months 38% of veterans have had a hospital admission. Significant patient harm and sub-optimal use of medicines frequently arises after discharge from hospital.

One study found that patient confusion about their medicines was responsible for 61% of medication-related problems post discharge (Figure 2).[5,6]

Confusion, hearing, vision or dexterity problems

92% of Australian veterans report visual problems and 55% report hearing problems: these factors may cause difficulty understanding or following instructions for medicines.

53% of veterans report arthritis, which may result in difficulty opening containers and handling medicines.

Confusion, hearing, vision and dexterity problems also impact on the veteran's ability to use devices such as inhalers, nebulisers, dose administration aids and monitoring devices including blood glucose meters.

Risk flags:

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

Patient confusion about their medicines was responsible for 61% of medication-related problems post discharge.

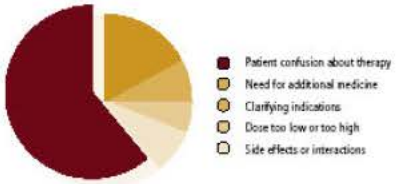


Figure 2. Medication-related problems identified six weeks after hospital discharge

High risk medicines

Some medicines present a greater risk to veterans because of:

- narrow therapeutic index
- high propensity for interactions
- frequent or severe adverse reactions
- monitoring requirements
- requirement for dosage modification with renal impairment.

Warfarin, digoxin, amiodarone and tramadol are examples of high risk medicines.

Particularly for older veterans, renal function may be compromised despite a serum creatinine within the reference range. Reduced cognitive function, medical co-morbidities and use of multiple medicines also compound risks associated with medicines.

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1. Gilbert AL, Roughead EE, Beilby J, Mott K, Barratt JD. *Collaborative medication management services: improving patient care.* MJA. 2002;177:289-292.
2. Department of Veterans' Affairs. *Implementation pilot for community medication management.* Canberra: Department of Veterans' Affairs; 1 December 1997 to 30 June 1998.
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4. Zermansky AG, Petty DR, Raynor DK, Lowe CJ, Freemantle N, Vail A. *Clinical medication review by a pharmacist of patients on repeat prescriptions in general practice: a randomised controlled trial.* Health Technol Assess. 2001;5(8):1-.
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8. Barratt A, Smith C, Chee T, Johnsen S, Hurst E. *A comparative study of two collaborative models for the provision of domiciliary based medication reviews. Final report.* Sydney, Australia: University of Sydney and St George Division of General Practice; 2000.
9. Atkin PA, Sheffield GM. *Medication-related adverse reactions and the elderly: A literature review.* Adverse Drug Reactions and Toxicological Reviews. 1995;14(3):177-191.
10. Spurling L. *An education liaison service: a community-linked approach.* Masters Thesis, University of South Australia. 2001.

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

?????

- Want to learn more about your medicines?
- Unsure how long you should keep taking each medicine?
- Unsure about the best time to take each medicine?
- Recently started a new medicine or had your medicines changed?
- Do you forget to take your medicines?
- Are you confused or worried about your medicines?

A **Home Medicines Review** may help

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

UniSA

Australian Government
Department of Veterans' Affairs

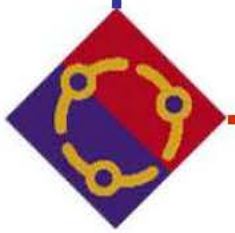
Veterans'MATES

Home Medicines Review

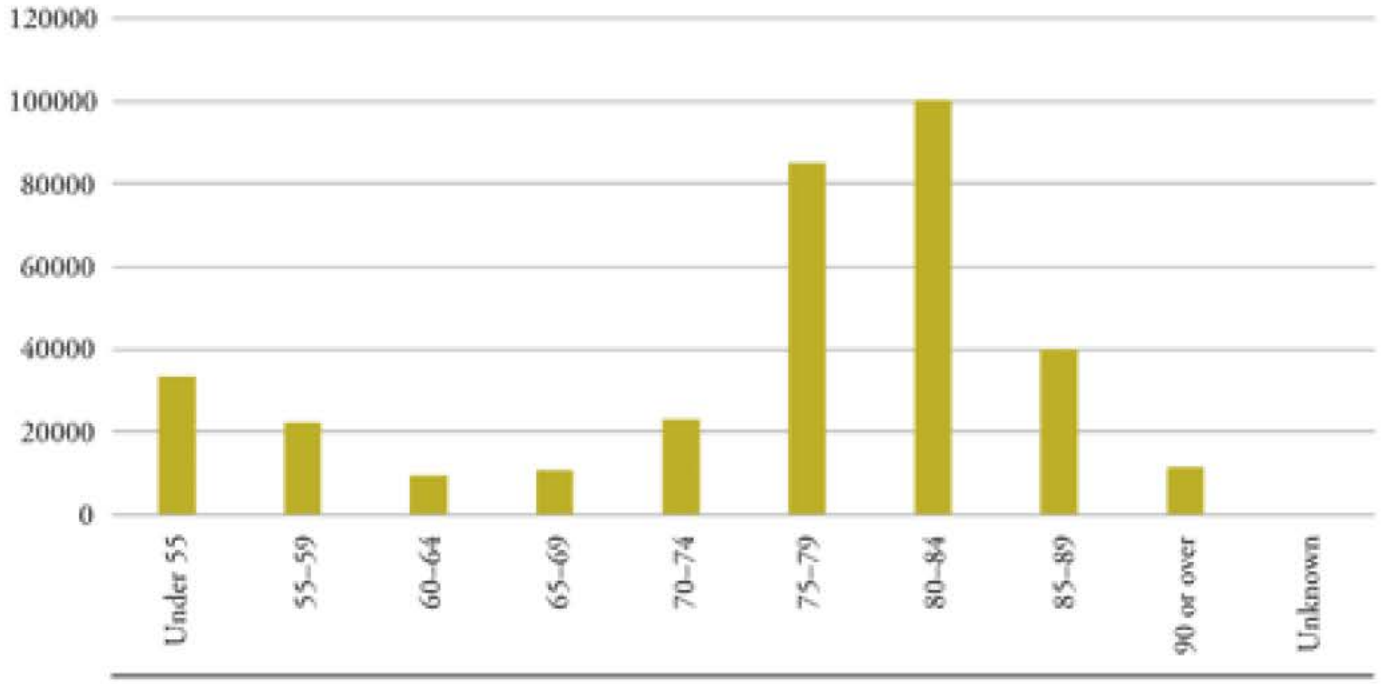
Get the best from your medicines

Why start with Home Medication Review?

- Australian evidence that home medication reviews;
  - Improve patient outcomes
  - Minimise ADRs
  - Reduce hospitalisation rates
  - Achieve cost savings to the health system
  - Highly relevant in the Australian veteran community



Veteran Treatment population by age DVA annual report 2003-4; p117



Veteran Self-reported Health Problems

Department of Veterans' Affairs 2003 Survey of Veterans, War Widows and their Cares

	1997	2003
Visual problems	86%	92%
Arthritis	-	53%
Depression	19%	22%
Hearing difficulties	49%	55%
Dementia memory loss	16%	38%
Insomnia/sleep disturbance	28%	33%
Anxiety	18%	18%
Foot/leg problems that affect mobility	19%	43%
Incontinence	8%	15%
High blood pressure	38%	44%
Post Traumatic Stress Disorder	9%	13%

Unique Prescription Medicines 2003

DVA annual report 2003-4; p117

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%*

72% (67% of treatment poptn.)

Why is this relevant to Disease Management Programs?

Disease Management Programs involve:

Clinical guidelines

plus

Ongoing management

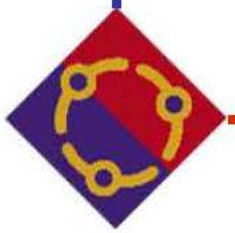
plus

Supporting arrangements

Disease Management Programs

- Nearly always single disease focused
- Often miss those at most need who have multiple chronic conditions
- Following clinical guidelines inevitably leads to polypharmacy

Dr JoAnne Epping-Jordan; WHO; 2004 National Disease Management Conference



"It is a question of whether what is good for the disease is always best for the patient."

Mary E. Tinetti et al, Potential Pitfalls of Disease-Specific Guidelines for Patients with Multiple Conditions. NEJM 2004: 351;2870-2874.

Unanswered questions of treatment guidelines in people with poly-morbid conditions

- What is the relative benefit of guideline adherence vs risk of guideline driven polypharmacy and ADRs?
- Contradictory recommendations?
- Ability of patients to manage and comply with complex management plans?
- Patient preferences?

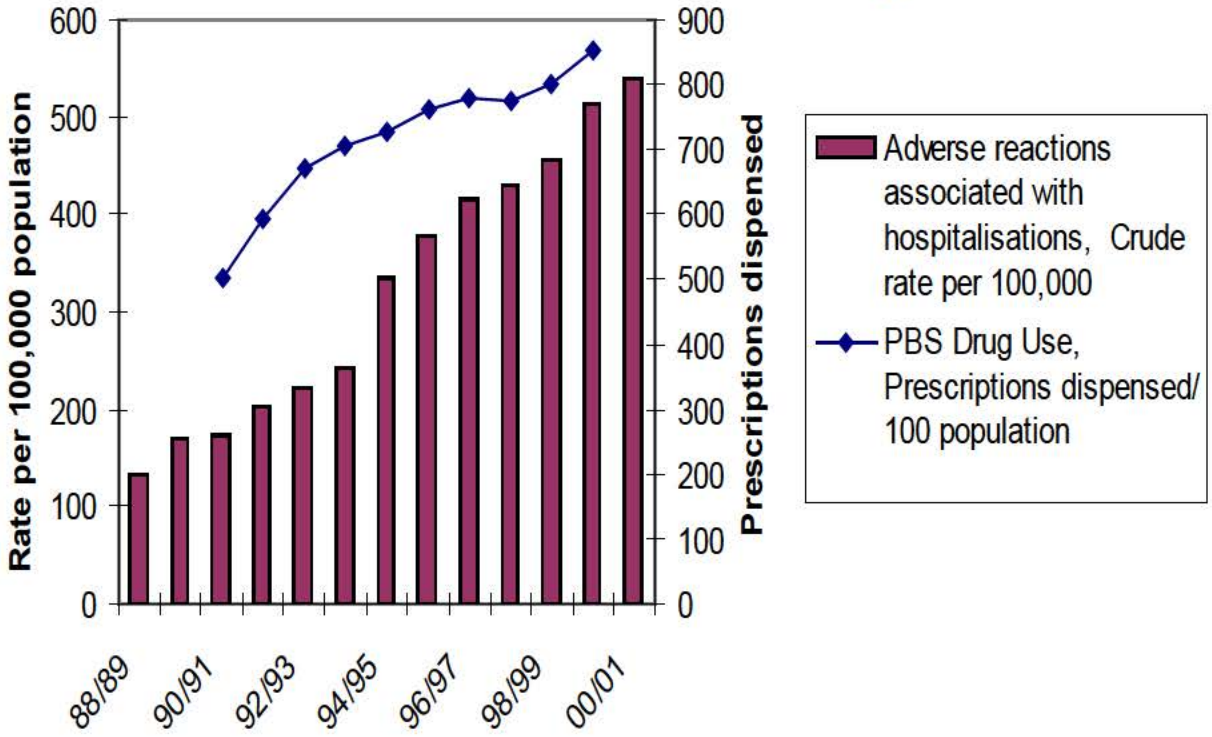
Many veterans have multiple chronic conditions

- Heart Failure 13,500 veterans
- Diabetes 17,900 veterans
- Diabetes and Heart Failure 1,500 veterans
- Diabetes or Heart Failure and arthritis 10,000 veterans

DVA Pharmacy Datamart 2005

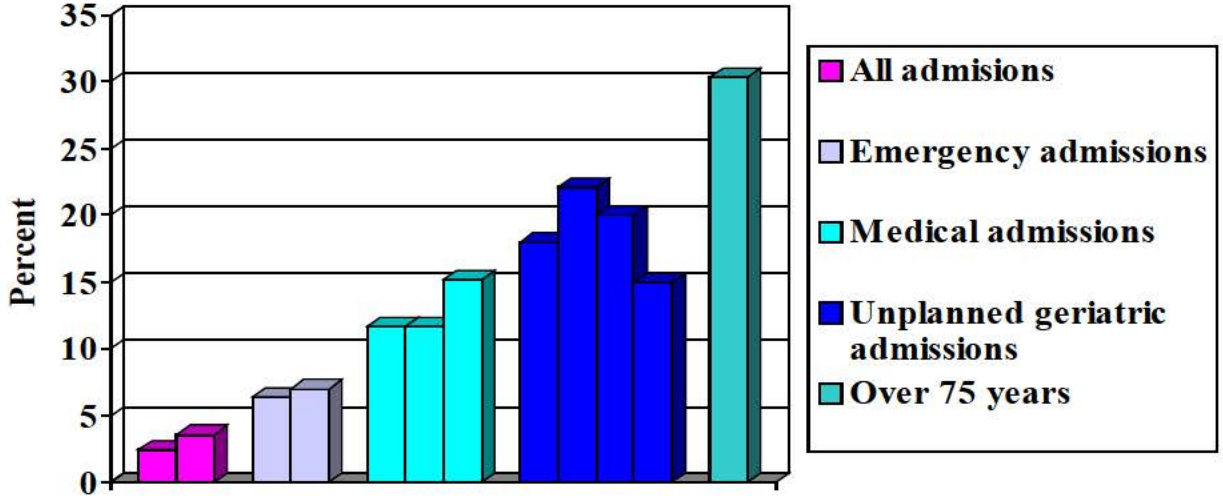
- Best practice management of;
  - Diabetes
    - Oral hypoglycemic or insulin 1
    - ACE inhibitor 2
    - Low Dose Aspirin 3
    - Lipid Lowering agent 4
  - CHF
    - ACE inhibitor
    - Diuretic 5
    - B-Blocker 6
    - Spironolactone +/- digoxin 7

Trends in ADRs associated with hospitalisation: SA



Roughead E, Gilbert A, Primrose J, Sansom L. Hospitalisation rates as outcome indicators of National Medicinal Drug Policies: The example of gastrointestinal ulcer. *Pharmacoepidemiology and Drug Safety 1999; 8: 291-299*

MEDICATION-RELATED HOSPITAL ADMISSION STUDIES



Roughead, E.E., Gilbert, A.L., Primrose, J.G., Sansom, L.N. Drug related hospital admissions: A review of recent Australian studies. *MJA 1998; 168: 405-408*

Medication-related Hospital Admissions

- Medication error is one of the most common causes of unintentional harm in Australia which results in an estimated 140,000 hospital admissions every year.
- 50% (70,000) admissions are potentially preventable

*Safety and Quality Council, National Report on Patient Safety, July 2002

Understanding the context of the problem

To put these figures into perspective:

Hospital admissions for;

Influenza and Pneumonia	62,586
Asthma	60,759
Heart Failure	41,708
Medication-related	140,000

AIHW Australian Hospital Statistics 1999-00

In the community setting.

Just for ADRs (as a sub-set of medication-related problems)

- **Main drug groups involved**
  - **Cardiac medications (39% of ADRs)**
  - **CNS medications (27%)**
  - **Musculoskeletal (12%)**
- **At the level of drug class**
  - **ACE inhibitors accounted for 14% of all ADRs**
  - **antidepressants 11%**
  - **NSAIDs 10%**

Gilbert A, Roughead E, Mott K, Barratt J. Collaborative Medication management services; improving patient care. *MJA* 2002;177:189-192

Strategies for reducing adverse drug events

- Discharge liaison services & case conferencing
  - both shown to improve medication use in controlled trials
- Medication Management Services
  - uncontrolled trials show a reduction in medication related problems

Roughead l, Semple S, Vitry A. The value of pharmacist professional services in the community: A systematic review of the literature 1990-2002. Commonwealth Department of Health and Ageing. 2003. Canberra Australia.

- Due pharmacovigilence must be a part of Disease Management
- Home Medication Reviews are a proven service in preventing and resolving many medication-related problems

Was the *Veterans'* MATES module successful in increasing Home Medicines Review rates in at tisk veterans?

GP Responses

- 57% percent of the doctors who responded indicated they would refer at least one of their veteran patients for a review.
- Estimated that at least 1785 veterans would be referred for a home medicines review.

How many veterans listed. who have not had a review in the last twelve months, will you refer?	Number (n=1085)	%
None	379	34.9
One	222	20.5
Two	152	14.0
Three	84	7.7
Four	54	5.0
Five	35	3.2
Six	19	1.8
Seven	9	0.8
Eight	4	0.4
Nine	3	0.3
Ten or more	38	3.5
missing	86	7.9

The majority of GPs (79%) indicated they were aware of the Home Medicines Review service prior to receiving the *Veterans'* MATES information

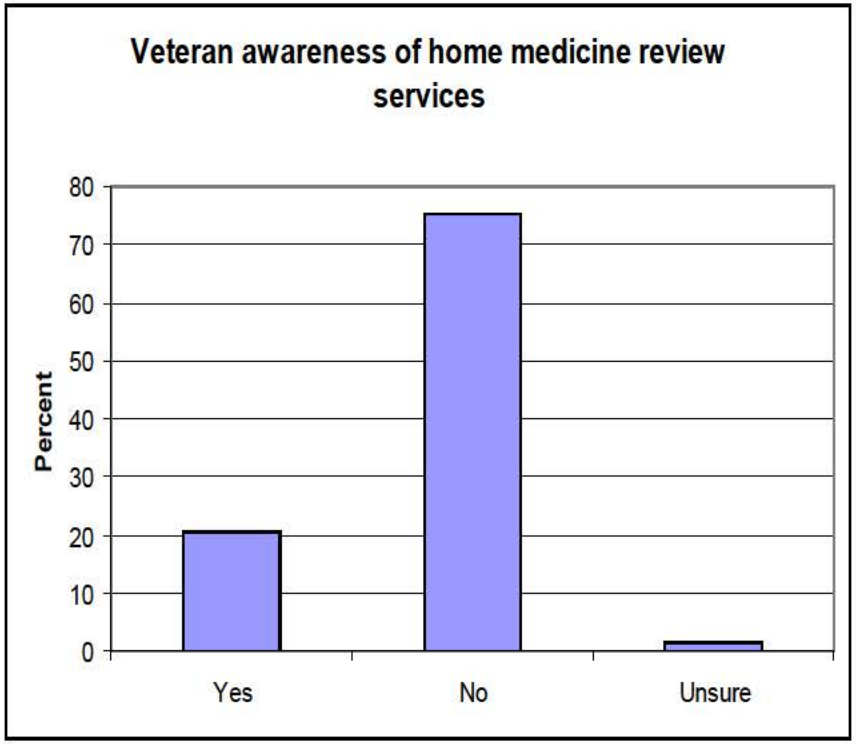
Aware of Home Medicines Review service prior to letter?	n	%
Yes	855	78.8
No	174	16.0
Unsure	31	2.9
missing	25	2.3
Total	1085	100.0

While 79% of respondents were aware of the Home Medicines Review service, only 35% of those who reported they were aware of the service also reported they had previously used the service

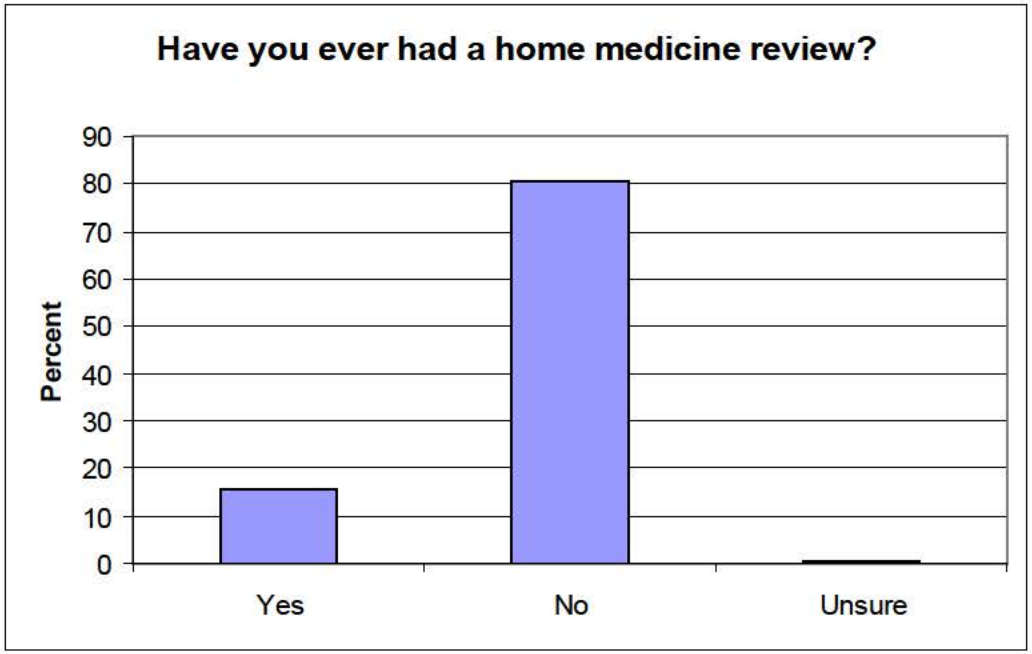
If aware of HMR service, on how many occasions previously have you referred your veteran patients for a HMR?	n=855
None	505
One	108
Two	89
Three	31
Four	15
Five	19
Six	6
Seven	2
Eight	1
Nine	
Ten or more	29
missing	50

VETERAN RESPONSES

75% of the veterans who responded indicated they were not aware of the Home Medicines Review service prior to receiving the *Veterans'* MATES brochure



The majority of veterans who responded (81%) had not previously had a Home Medicines Review



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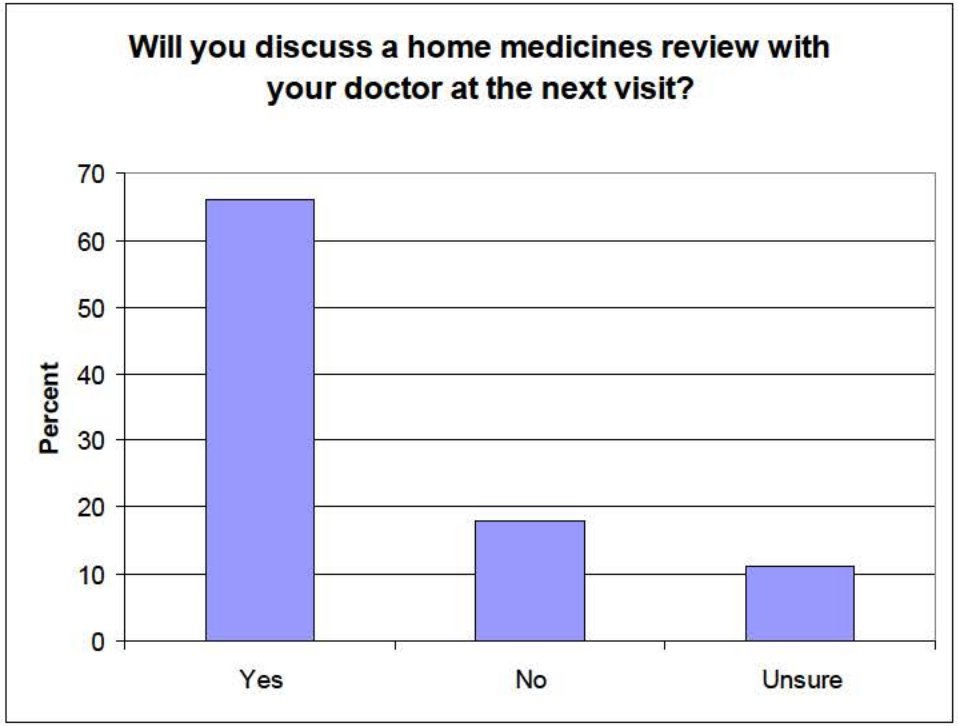

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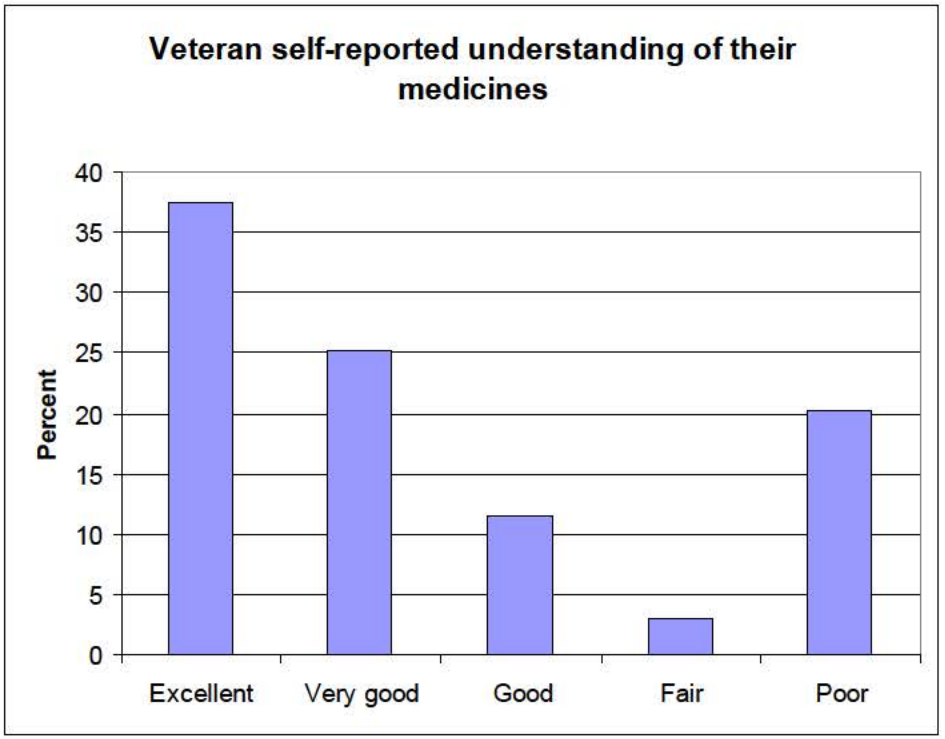
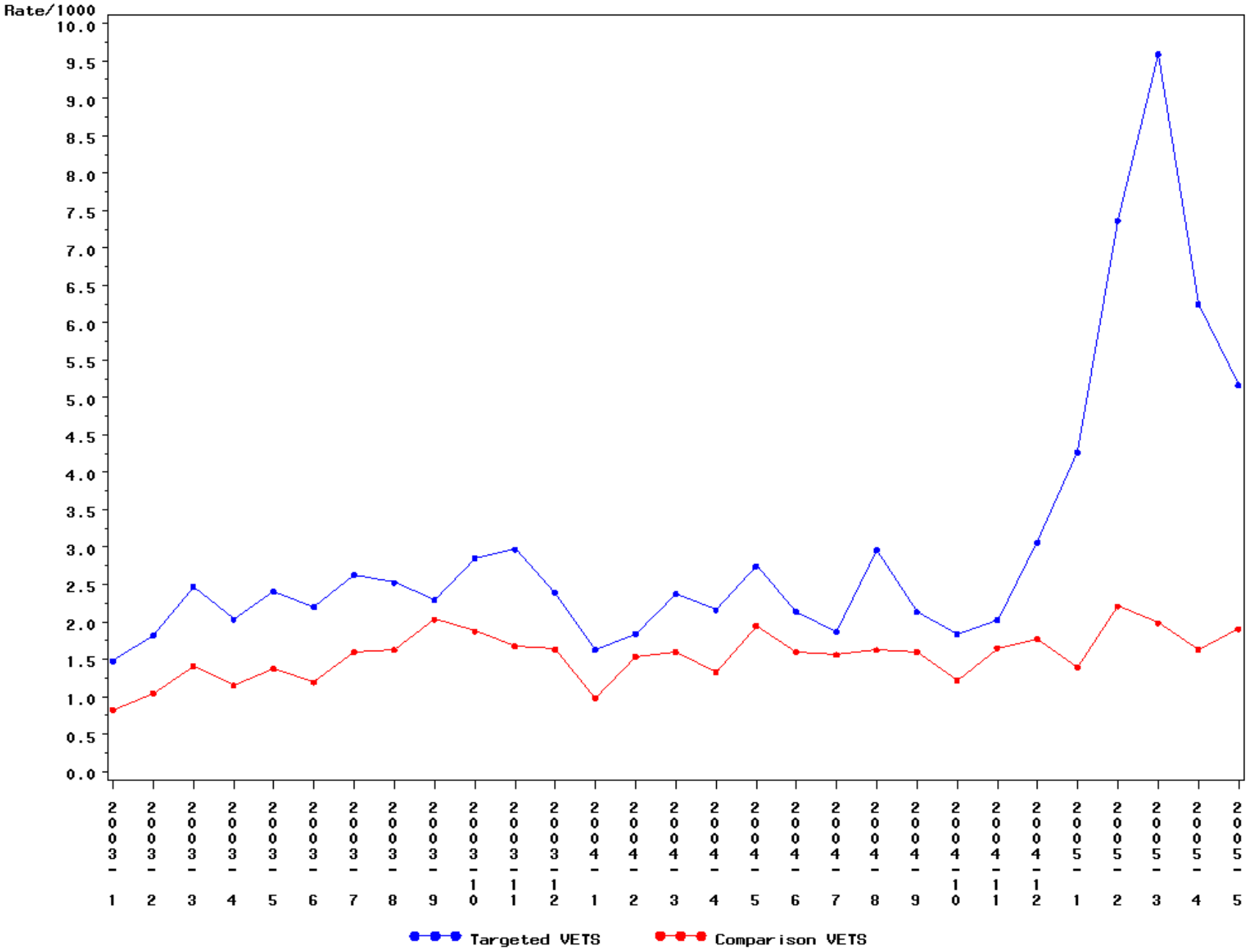


Rate of Home Medication reviews per month



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The Wizard of Id
OLD AGE USED TO BE THE NUMBER-ONE KILLER
NOW WE HAVE ALL KINDS OF DISEASE
DOES THAT MEAN WE WON THE FIGHT AGAINST OLD AGE?
7-30
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PARKER

Veterans' Medicines Advice & Therapeutic Education Services:

What have we found and where can it take us?

Andrew s 47F **Libby** s 47F **&**
John s 47F

- What are we doing and why?
- What have we achieved?
- Where to from here?

Veterans' MATES: What are we doing?

The Veterans' Medicines Advice and Therapeutics Education Service (Veterans' MATES) is a national project to improve health outcomes for veterans and war widows/widowers through quality use of medicines.

We use the DVA linked health database covering 355,000 veteran and war widows/widowers.

We provide patient-specific prescribing feedback and evidence-based therapeutics information to up to 20,000 medical practitioners.

Identified veterans and war widows/widowers receive a letter and an information brochure, which encourages them to speak to their doctor or pharmacist about the issues in the brochure.

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.

For EVERY module

- We mail out our module materials to key stakeholders groups including individuals and organisations supporting HMR
- We now have been provided with AACP's mailing list for accredited pharmacists and from Module 8 they will also receive a direct mail out of module materials

Name	State	Number sent
Chris Francis	ACT	1
Bill Kelly	ACT	1
Merelyn Boyce	SA	1
Carlene Smith	NSW	40
Mel Blachford	VIC	35
Debbie Rigby	QLD	20
Lee Sadler	SA	15
Vic Stoyanoff	WA	14
Sue Leitch	TAS	3
Helen Bowden	NT	2
Alison Clark	ACT	1

Modules implemented to date

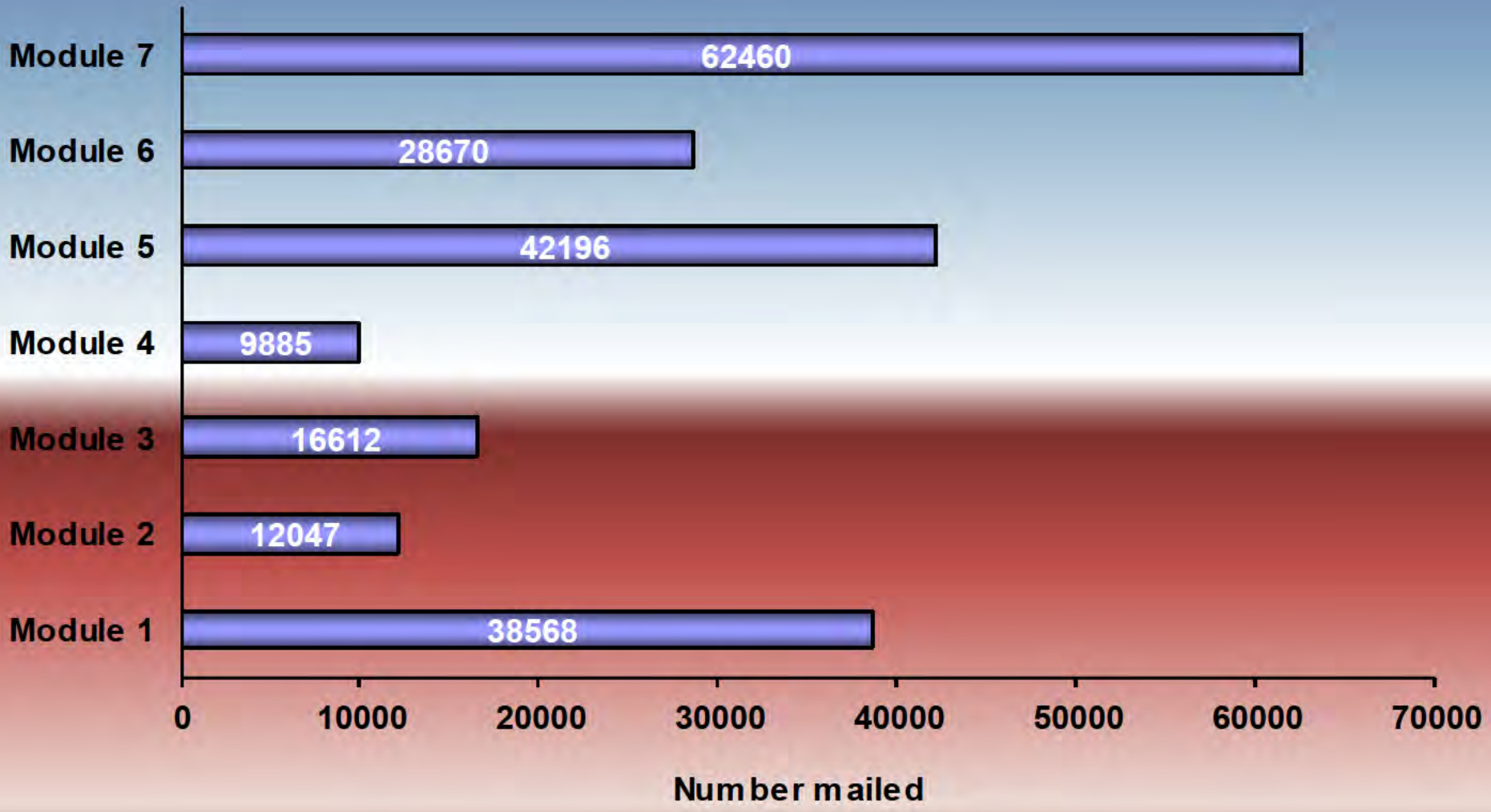
- Home Medicines Review services*
- Beta-blocker use in patients taking medicines indicative of heart failure
- Cardiovascular medicine use in patients with diabetes
- Non-steroidal anti-inflammatory drug use in patients with heart failure or diabetes
- Antidepressant drug interactions*
- Chronic Obstructive Airways Disease and inhaler use*
- Proton Pump Inhibitor use
- Reducing adverse drug events in veterans*

* HMR specifically mentioned

Participation in each module

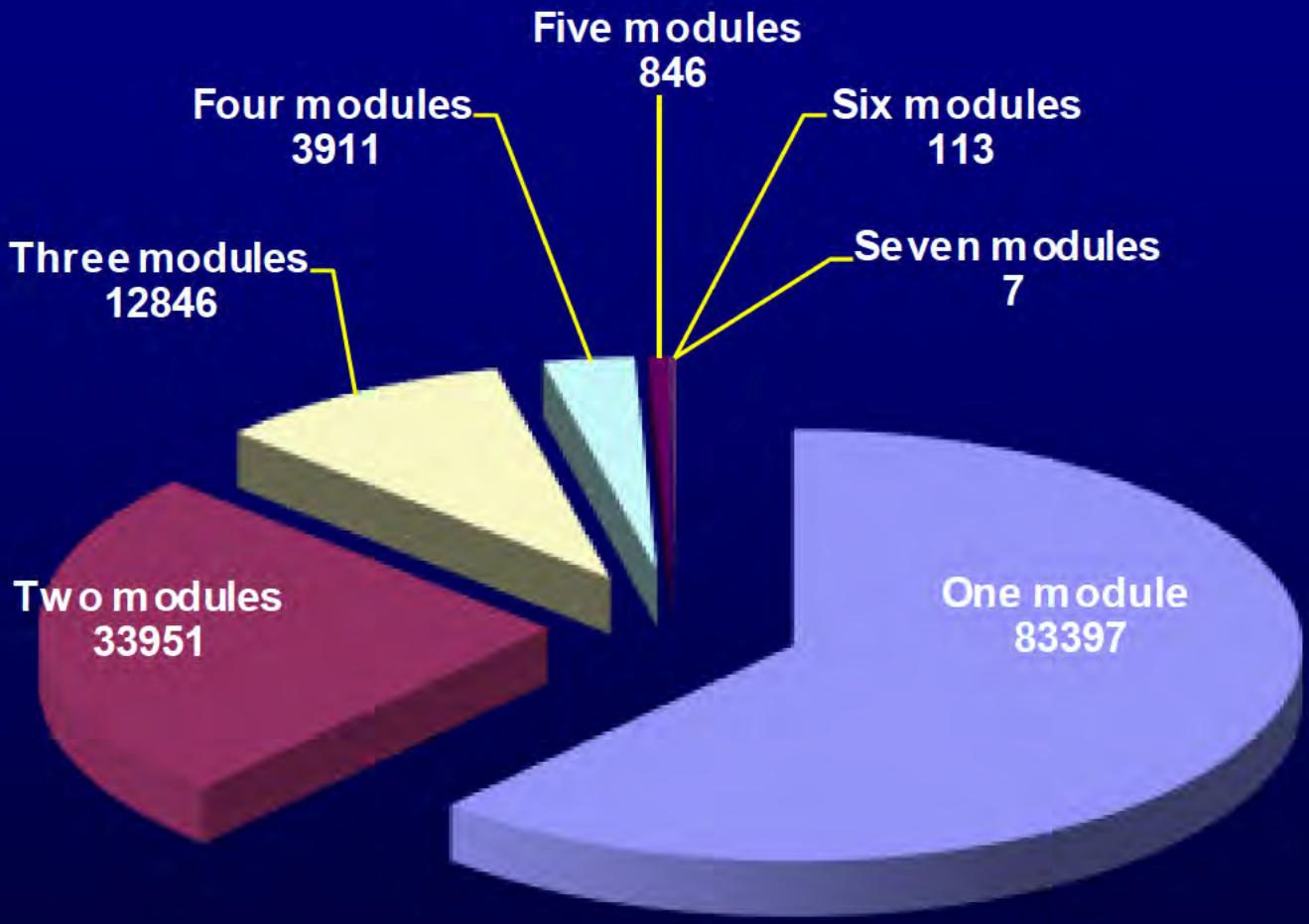
Module	Number of veterans	Number of GPs
Medicine Review	38570	11384
CHF	12047	6954
Diabetes	16612	8668
NSAIDs	9885	11419
Antidepressants	42199	12472
Respiratory	28670	10910
PPIs	62460	13773
In total we have contacted	135071 veterans at least once	18458 doctors at least once

Veterans in each module

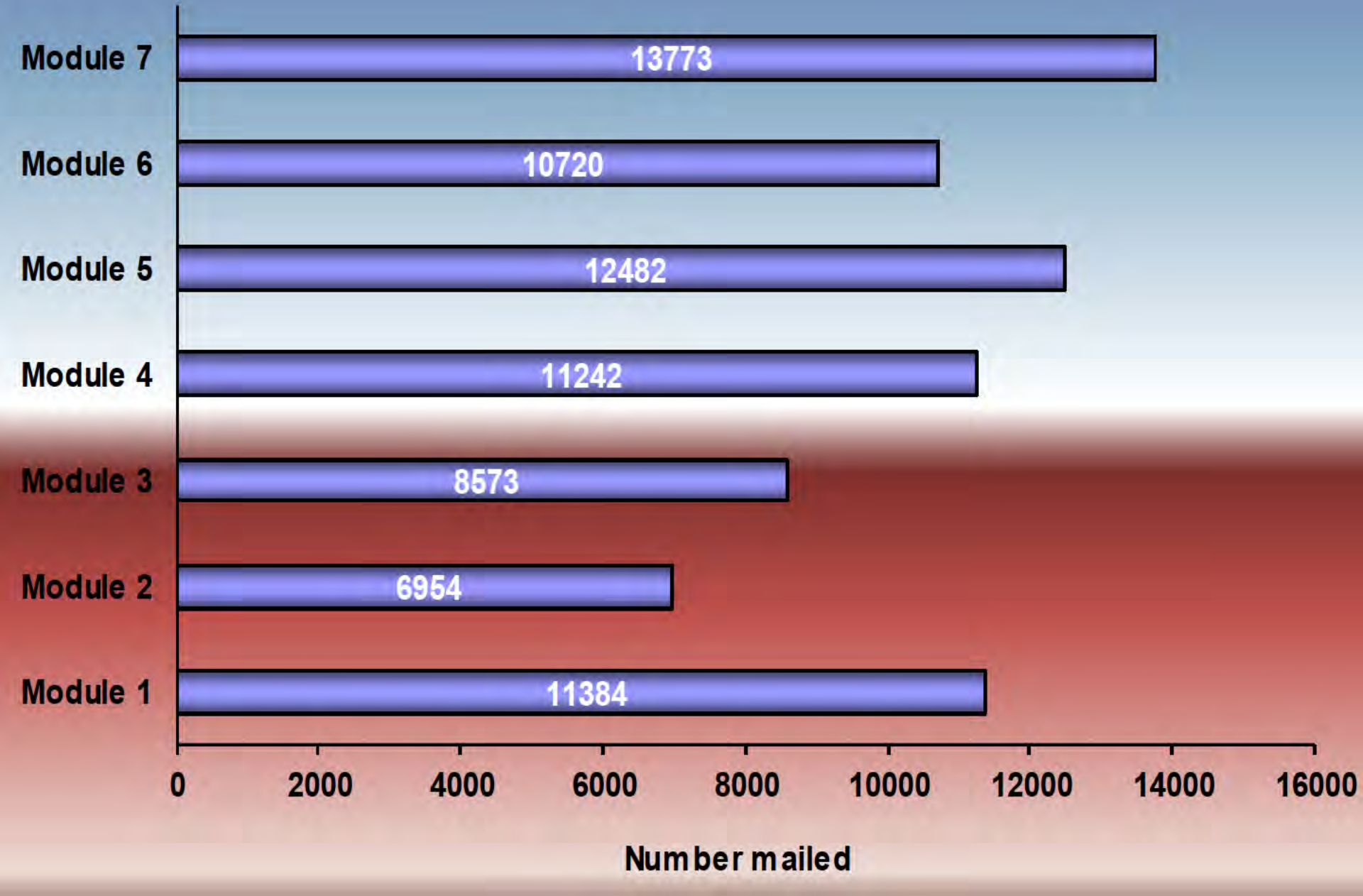


Veterans in different modules

Mailed to 135071 different veterans

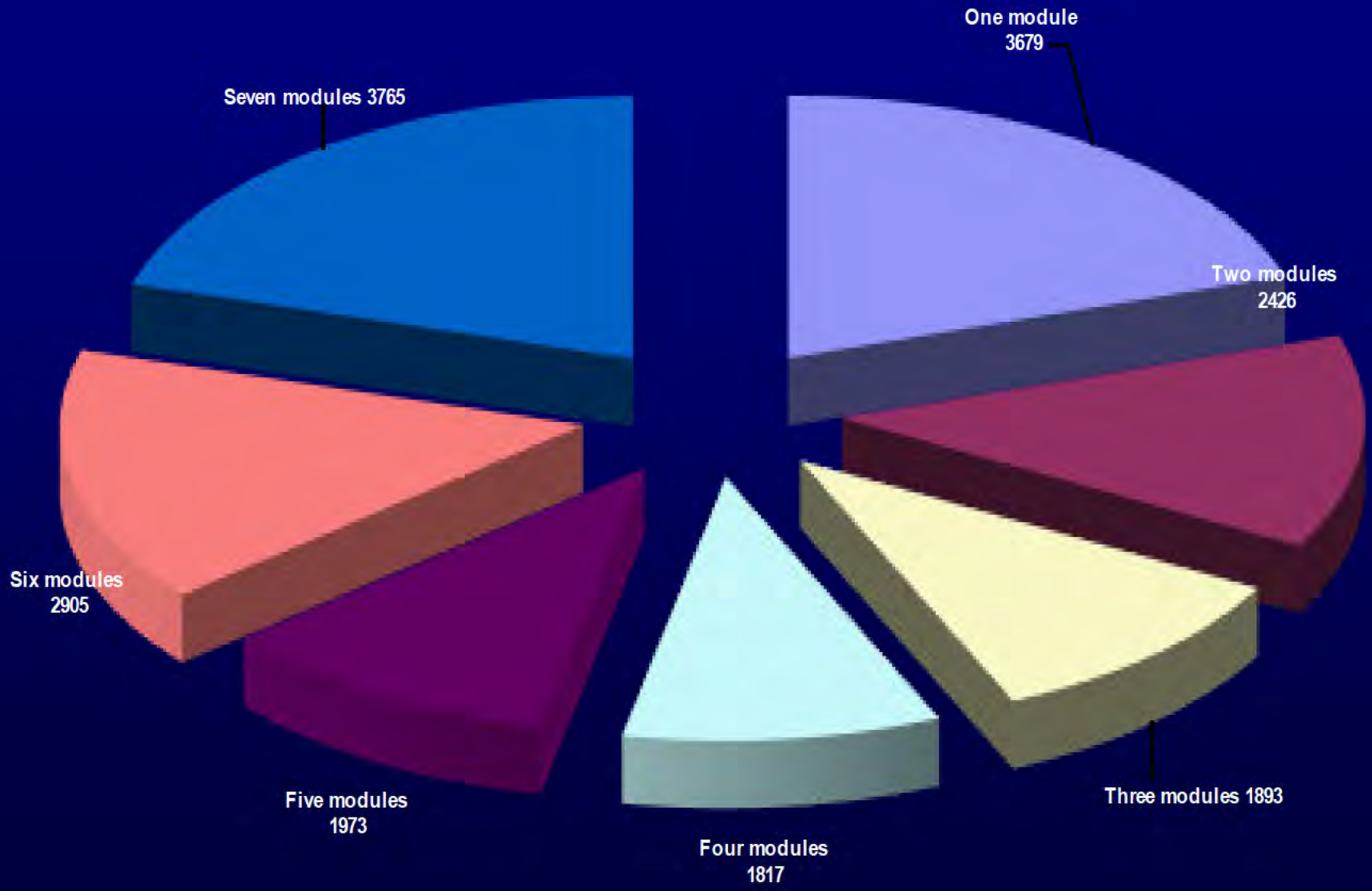


LMO in each module



LMOs in different modules

Mailed to 18458 different LMOs

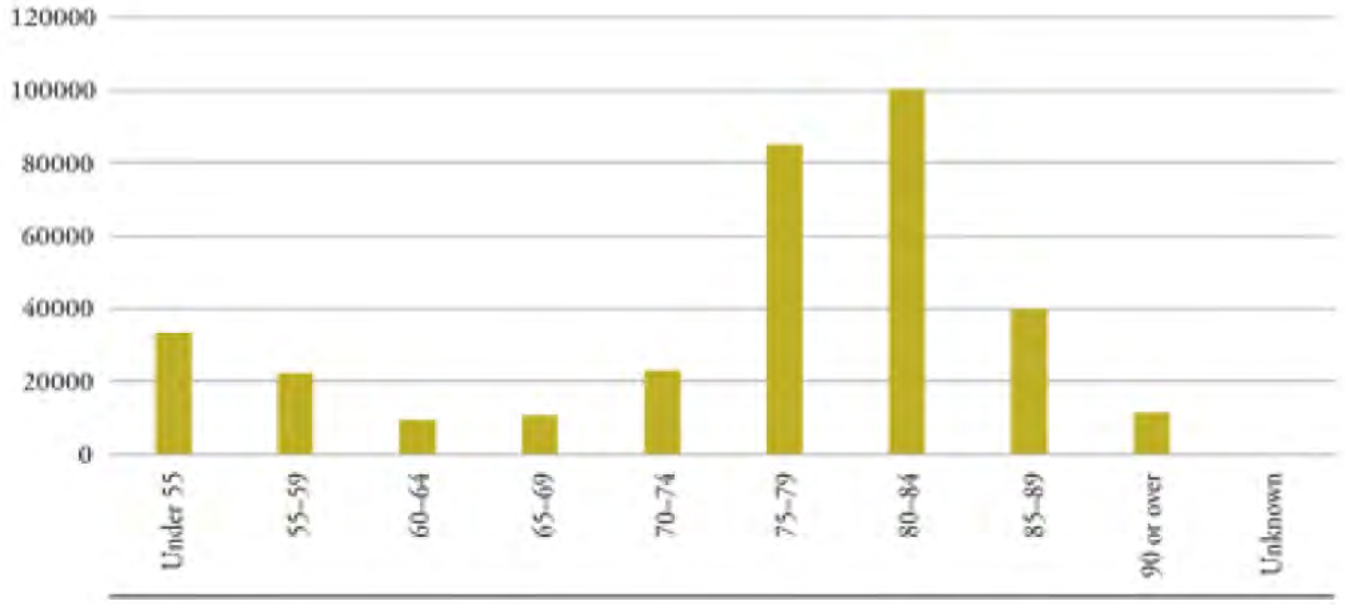


Why are we doing this?

- 72% of veterans are aged > 70years
- Many of these older veterans have 2 or more chronic medical conditions
- Older people are much more likely to experience adverse drug events than younger people

Veteran treatment population by age

DVA annual report 2003-4; p117

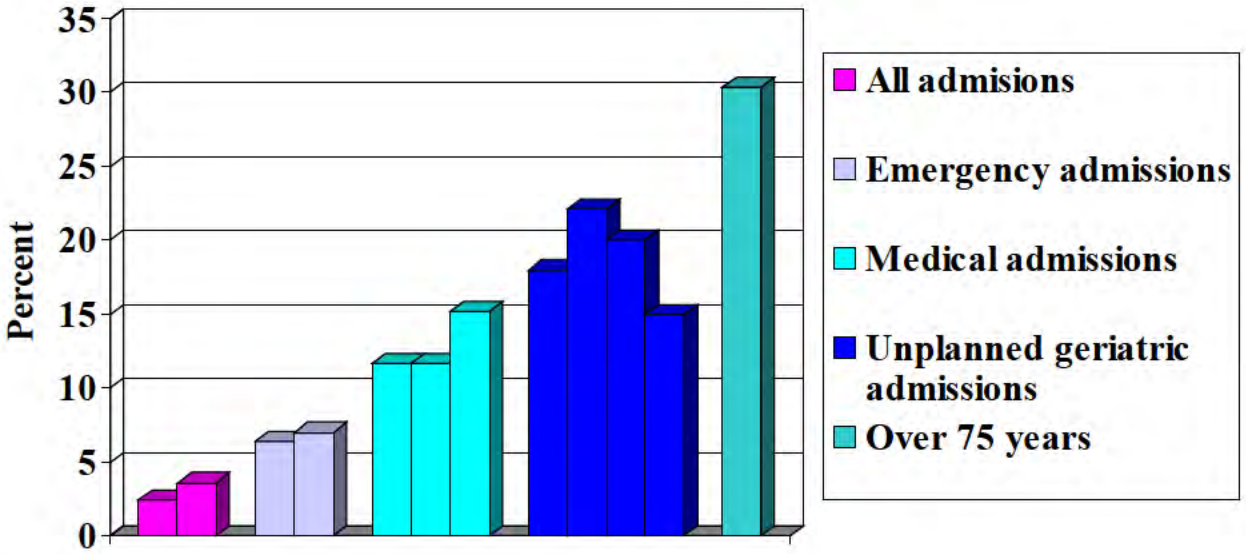


Veterans' health problems

	1997	2003
• Visual problems	86%	92%
• Arthritis	-	53%
• Depression	19%	22%
• Hearing difficulties	49%	55%
• Dementia memory loss	16%	38%
• Insomnia/sleep disturbance	28%	33%
• Anxiety	18%	18%
• Foot/leg problems that affect mobility	19%	43%
• Incontinence	8%	15%
• High blood pressure	38%	44%
• Posttraumatic Stress Disorder	9%	13%

Department of Veterans' Affairs 2003 Survey of Veterans, War Widows and their Cares

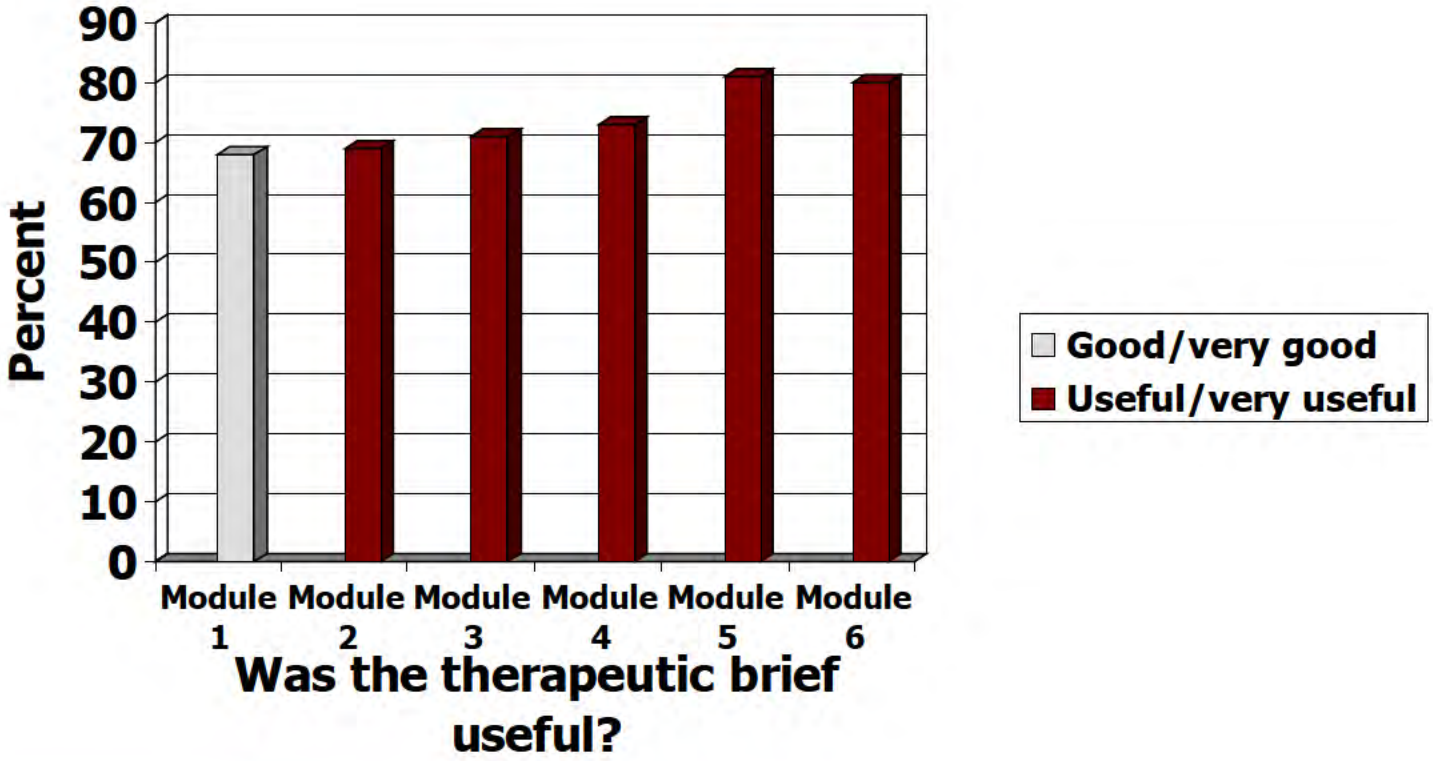
Medication related hospital admissions (12 Australian studies)



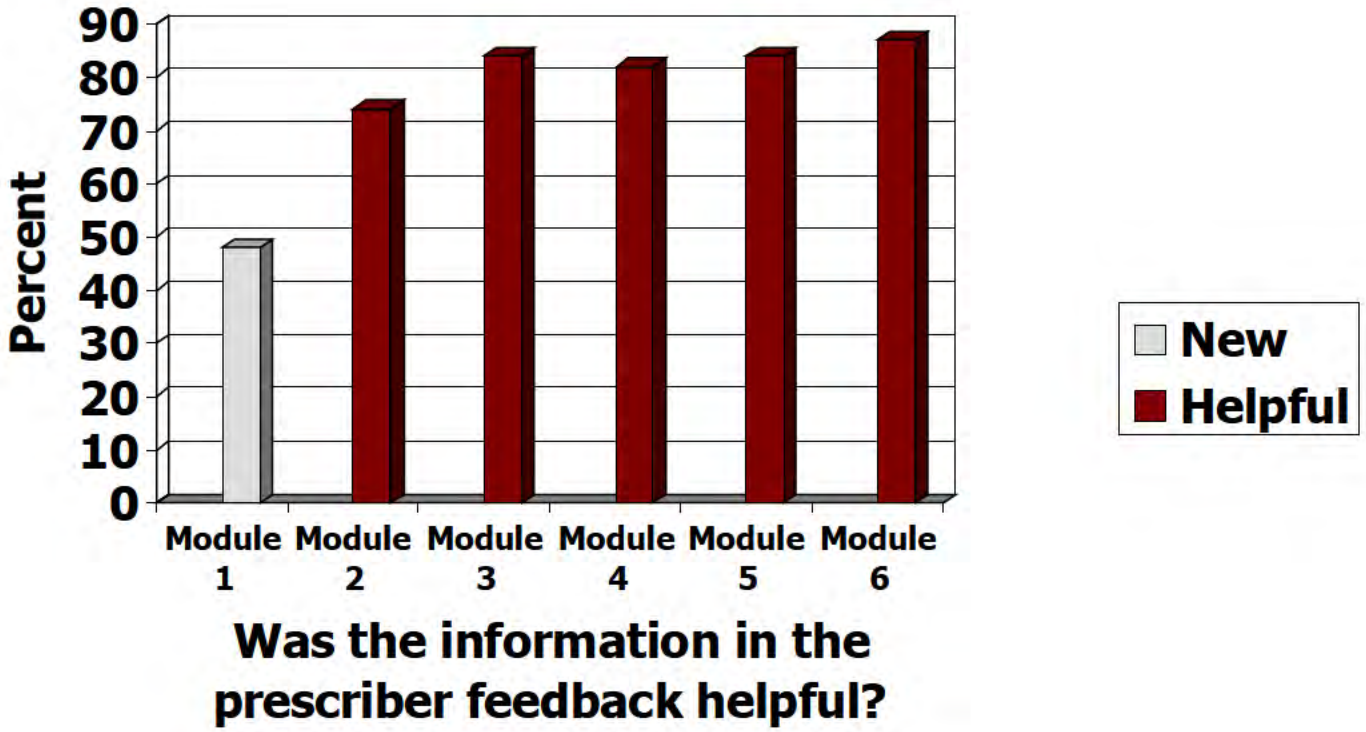
Roughead, E E, Gilbert, A L, Primrose, J G, Sansom, L N. Drug related hospital admissions: A review of recent Australian studies. *Med J Aust 1998 168;405-408.*

What have we achieved?

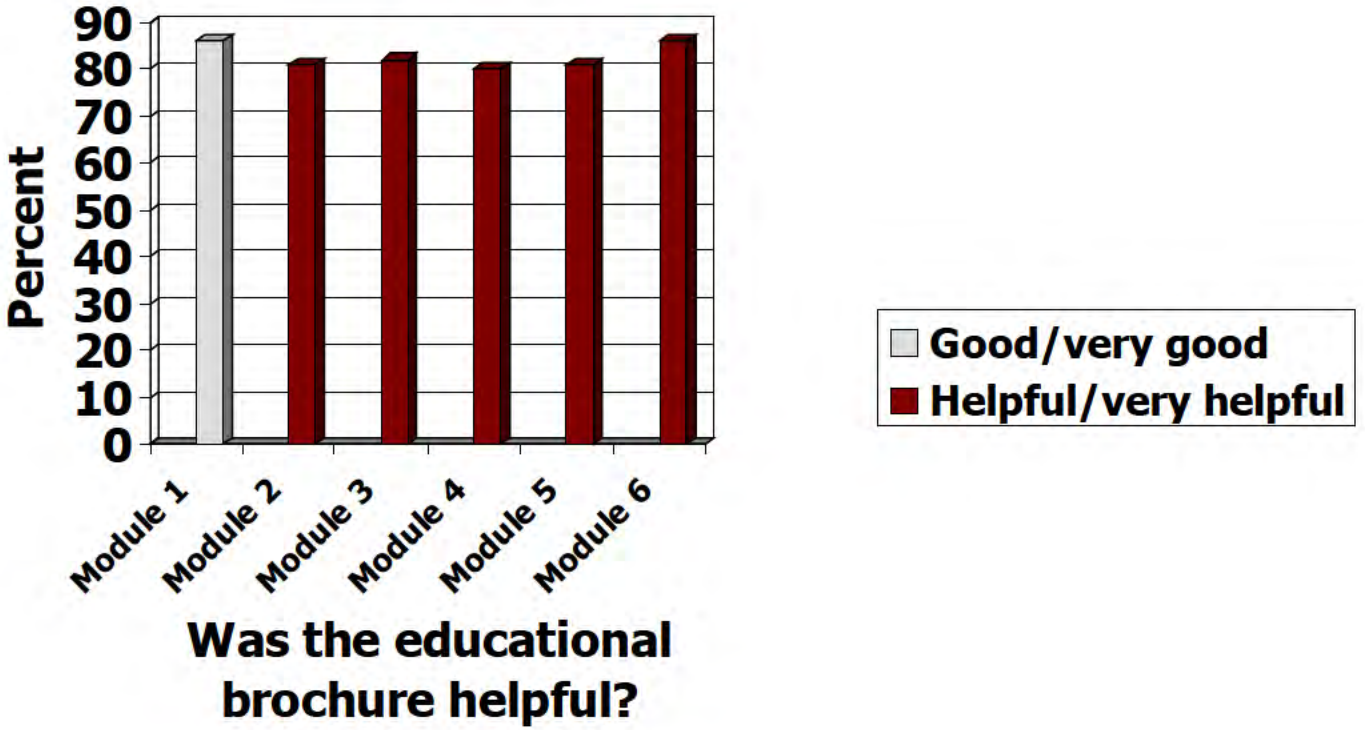
We have designed therapeutic information that doctors find useful



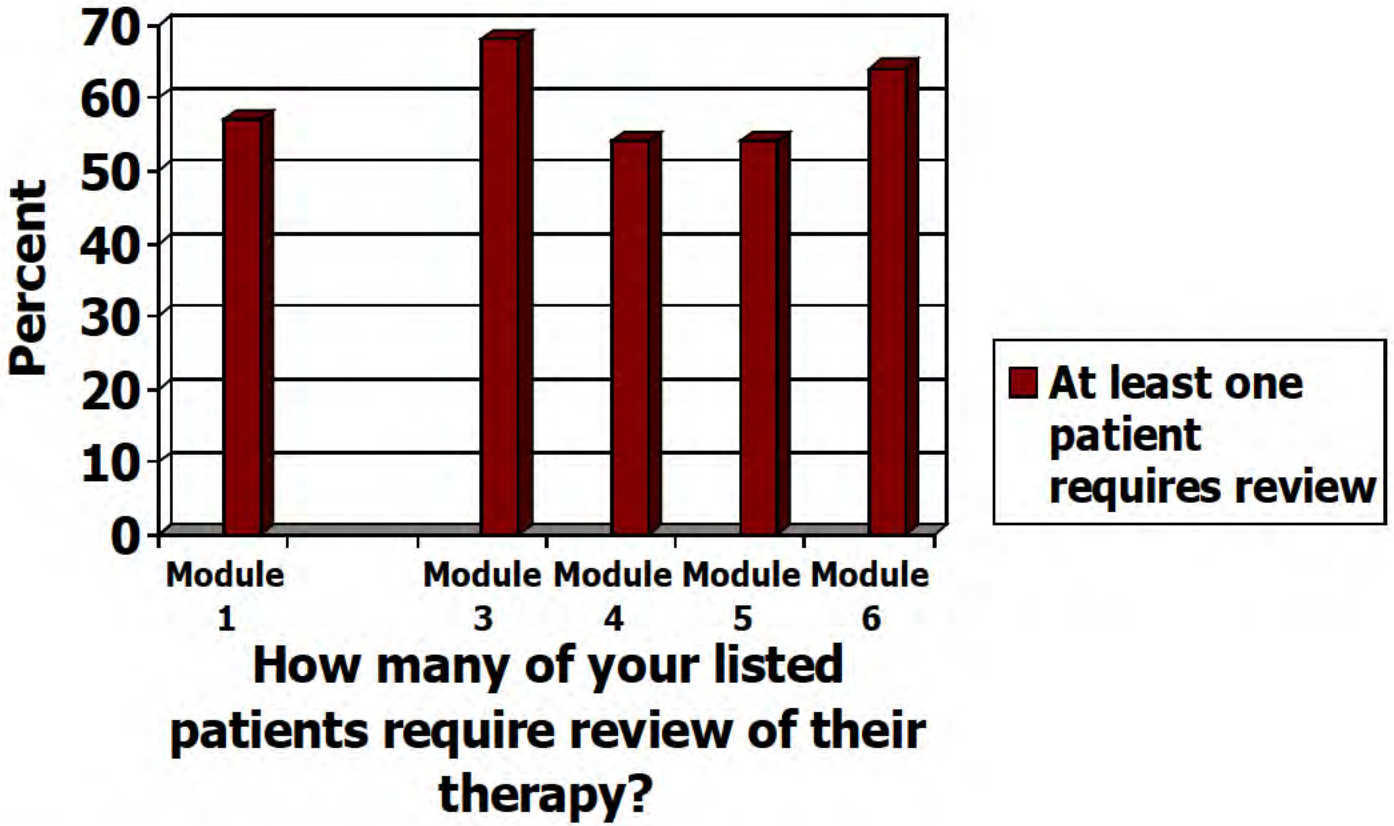
Doctors also find the prescriber feedback helpful



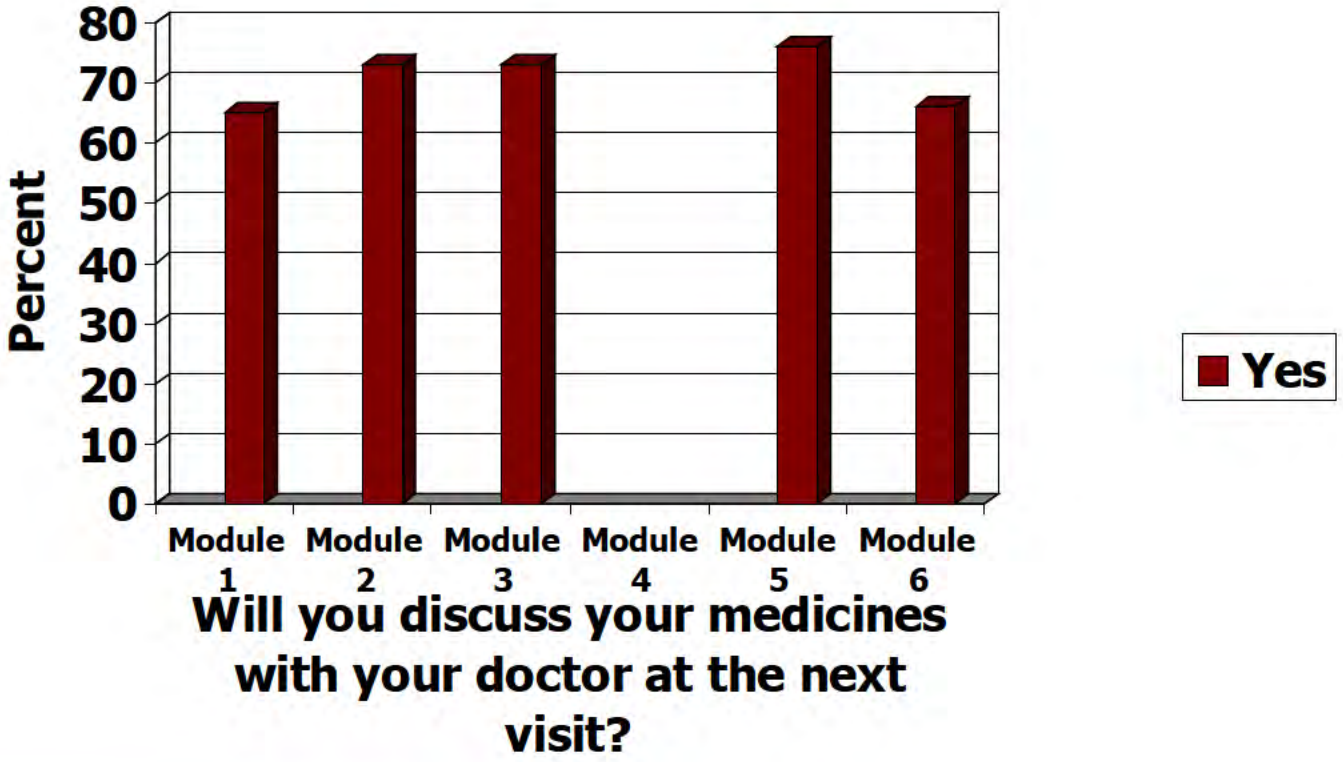
Veterans find the educational material helpful



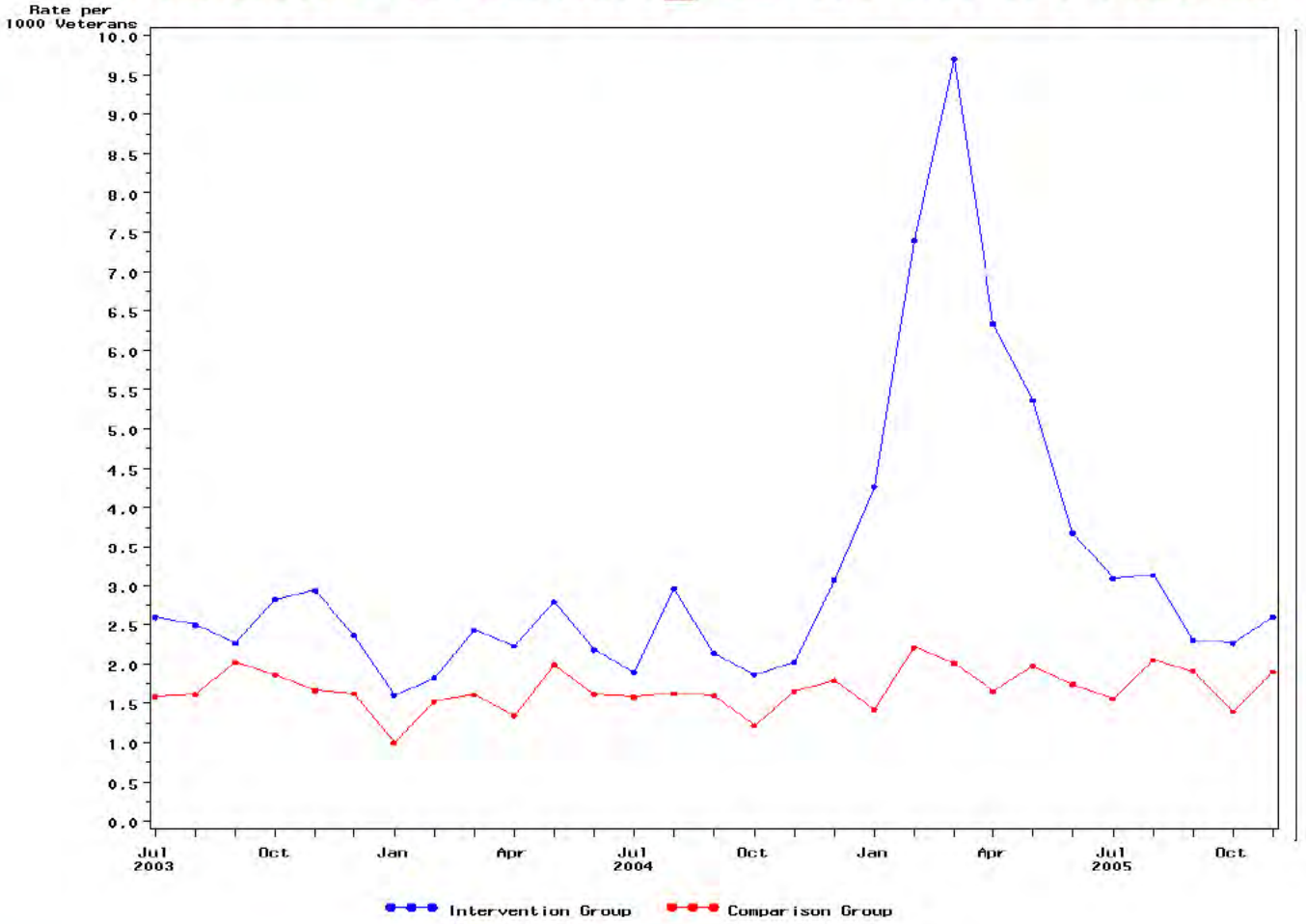
Doctors indicate they are likely to review their patients



Veterans indicate they are likely to discuss the issues with their doctor



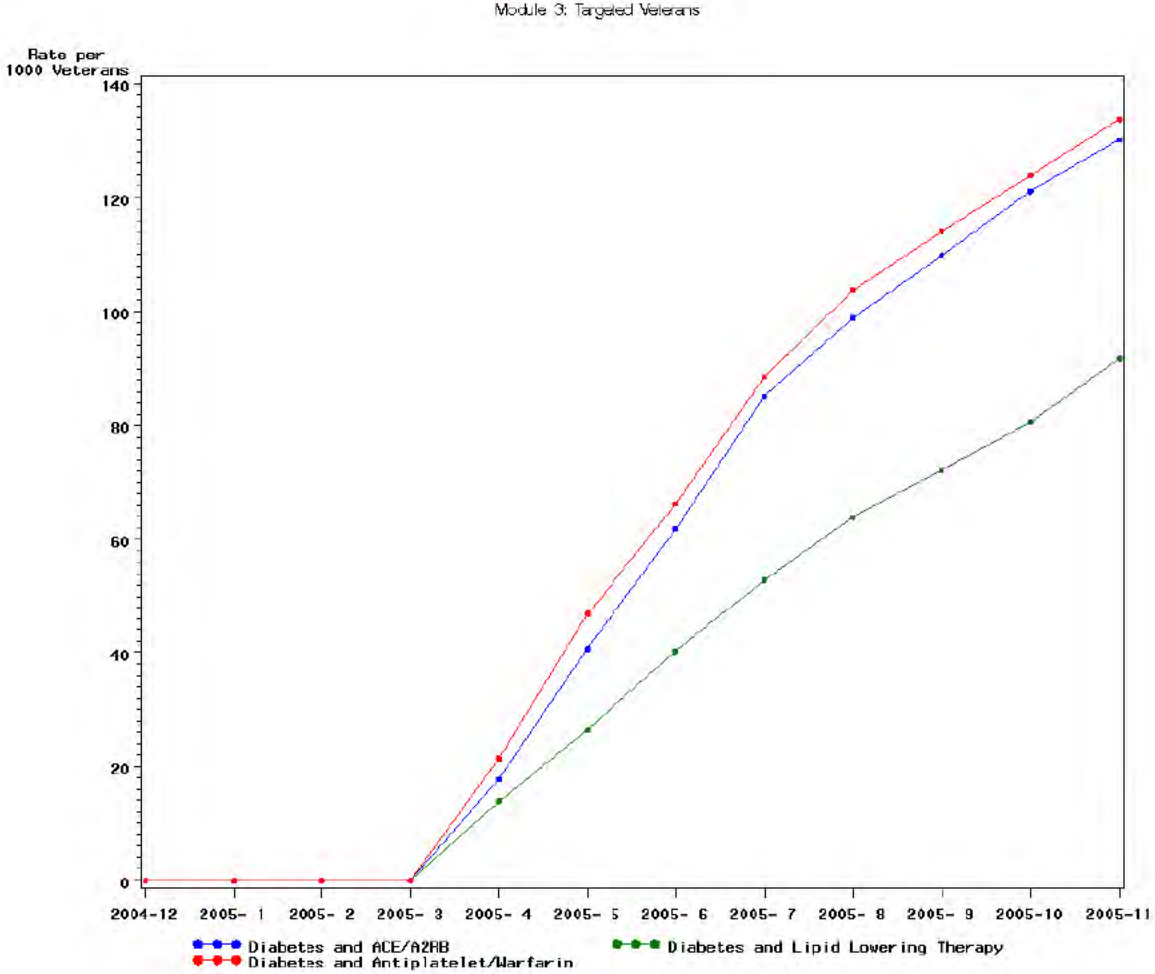
Module 1:Changes in HMR rates



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



In summary

- The Veterans' MATES project has been well received by general practitioners and veterans
- The patient specific feedback is 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?

- Contract extension to take the Project out to 2009
- Opportunity to deliver new topics and revisit important topics viz MMR

Module 9: Flag veterans for medicines review

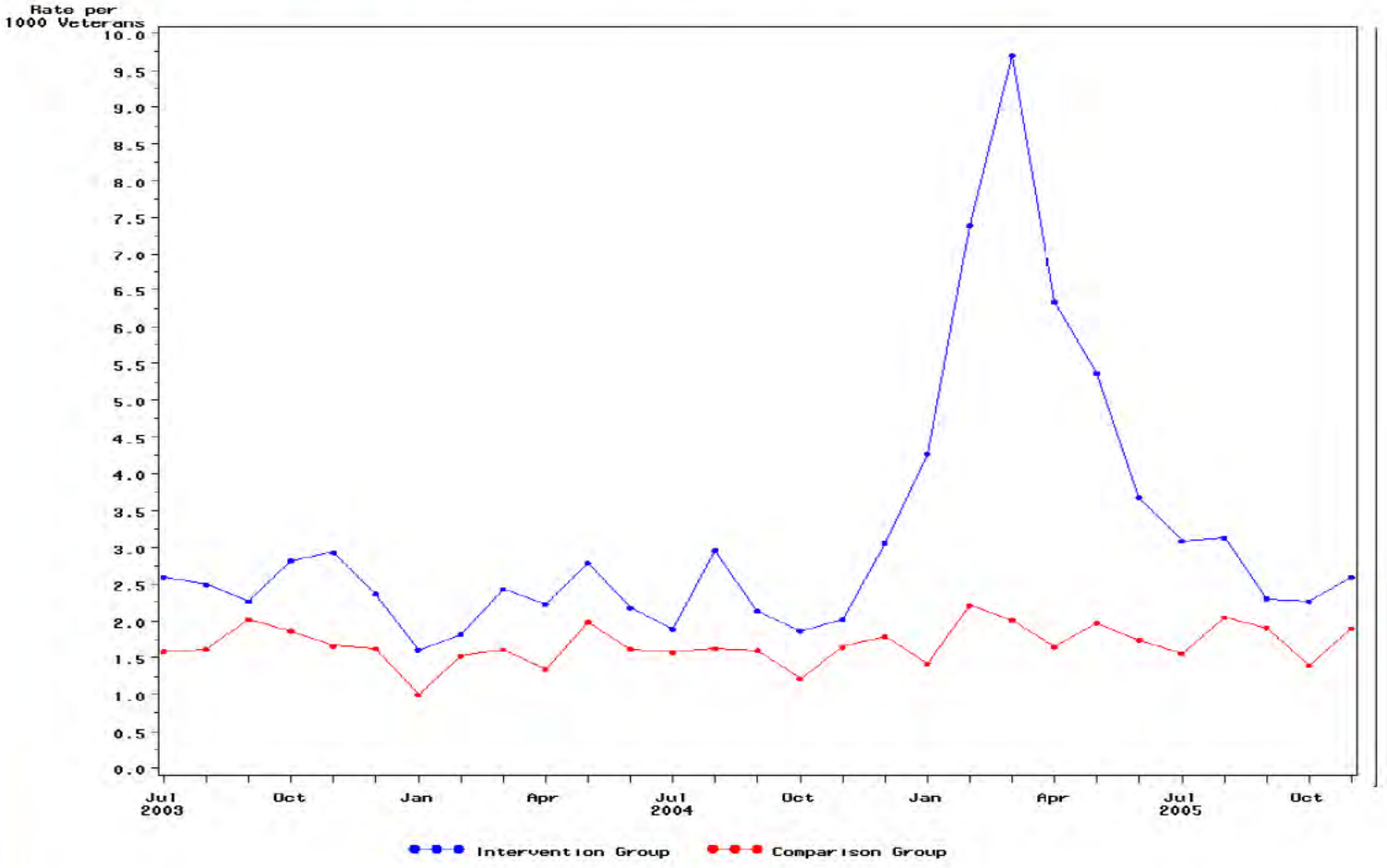
This module will:

- Repeat and expand on the successful intervention implemented in Module 1
- The target group will include all veterans aged over 65 years, dispensed four or more unique medicines concurrently every month over a four month period
- It will include veterans in aged-care and we will provide information on the new medication review funding arrangements.

Module 9: Flag veterans for medicines review

- This is the first opportunity within the Veterans' MATES project to "close the loop" in the audit and feedback cycle and provide GPs with evidence of the effect of their intervention.
- It reinforces messages about HMR from modules 1, 5, 6 and 8

It will close the feedback loop



Higher rates of HMRs occurred in the intervention group GPs than in the comparison group (Rate Ratio 1.79, 95% CI (1.58, 2.02), p <0.0001).

And increase GP participation in MMRs

- The number of new GPs per month participating in the provision of HMR services, that is those who had not billed for a HMR service in the 18 months prior to the intervention date, were compared pre and post intervention.
- On average 73 new GPs/month billed for HMRs in the twelve months prior to intervention compared to 95 new GPs per month who billed for HMR in the twelve months post intervention

A preliminary study using linked data from the Department of Veterans' Affairs' (DVA) Repatriation Pharmaceutical Benefits Scheme (RPBS) Pharmacy Claims Database and from the DVA Hospitals Database demonstrated a significant decrease in emergency department attendances post HMR in the intervention group (Paired $t = 0.0396$ $p = 0.0290$).

We hope to achieve the following objectives

- To provide useful information to GPs about medicine review services, including the need for and effectiveness of the program and the new aged-care arrangements.
- To increase GPs' 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.
- To provide pharmacies and consultant pharmacists with useful information about medicines review services
- To provide useful information to veterans about medicine review services.

With your help we hope to:

- Increase the annual medicine review rate amongst veterans who are dispensed four more medicines concurrently and;
- Increase the number of GPs who have participated in at least one medicines review in the last 12 months.

People with dementia living in the community have 96 visits to six different types of healthcare provider each year.

Use of health and support services by people with dementia living in the community

Lisa M s 47F s 47F Nicole L s 47F Tuan A s 47F Elizabeth E s 47F
Quality Use of Medicines and Pharmacy Research Centre, University of South Australia
lisa.s 47F unisa.edu.au

WHY IS THIS IMPORTANT?

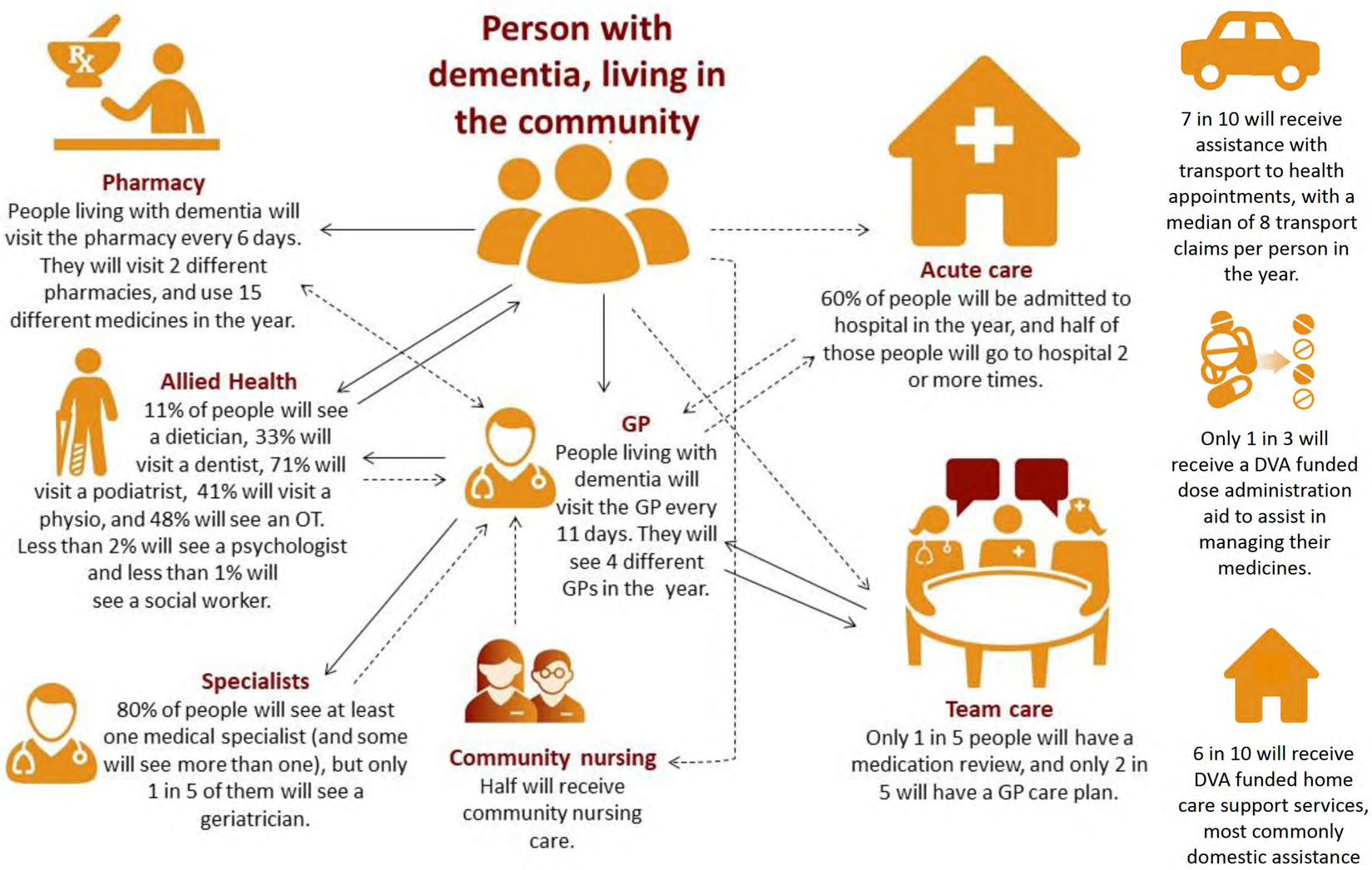
- Over 70% of people with dementia live in the community. Most (84%) of them require assistance with their healthcare, and in most cases this is provided by their carers.
- In general, people with dementia have multiple other chronic conditions in addition to dementia.
- Navigating the healthcare system is complex, and the effect of dementia on memory, thinking and communication has the potential to further complicate this.
- To adequately care for people living with dementia in the community, it is important to understand which health services they access and how frequently they access them.
- It is also important to understand the complexities people with dementia face in accessing healthcare services and communicating with multiple different healthcare providers so that strategies to mitigate this complexity can be developed.

WHAT DID WE DO?

- We conducted a cross sectional study using Australian Government Department of Veterans' Affairs (DVA) administrative claims data. We included veterans with dementia who were eligible for all health services funded by DVA, who were living in the community, and looked at their use of DVA funded health services from 1 July 2016 to 30 June 2017.
- We mapped the usual communication pathways between the person with dementia and the health practitioners involved in their care.

WHAT DID WE FIND?

- 10,171 people were included in the study. They had a median age of 89 years, 60% were women and 63% lived in a major city. In addition to dementia, they had a median of six other chronic conditions. During the one year period, they had claims for a median of 96 visits to a median of six different types of healthcare providers. Usual communication pathways (solid arrows), and potential communication pathways (dotted arrows) show the complexities in communicating and coordinating care between the person with dementia, their carer(s) and all of the different healthcare providers. In the context of the current healthcare system, there is little direct communication to the person with dementia.



WHAT DOES THIS MEAN?

- People with dementia who live in the community setting have multiple interactions with the healthcare system each year, most commonly visits to the pharmacy (every 6 days) and the GP (every 11 days).
- Communication pathways between all of these healthcare providers and the person with dementia and their carers are complex.
- Only 2 in 5 people received GP care plans in the year, only 1 in 5 had a home medicines review and 6 in 10 received home care supports, indicating that there is scope to improve the uptake of the available, subsidised care and support services to people living with dementia in the community.

Information for health professionals

Take a picture to read more about what Veterans' MATES is doing to help veterans with cognitive impairment to live well at home, for longer.

Information for consumers

If you don't have a QR code scanner, go to:
For consumers: https://www.veteransmates.net.au/topic-54-veterans-advice/
For health professionals: https://www.veteransmates.net.au/topic-54-therapeutic-brief

Veterans' MATES: What are we doing?

The Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) is a national project to improve health outcomes for veterans and war widows/widowers through quality use of medicines.

We use the DVA health database covering 355,000 veterans and war widows/widowers.

We provide patient-specific prescribing feedback and evidence-based therapeutics information to up to 20,000 medical practitioners.

Identified veterans and war widows/widowers receive a letter and an information brochure, which encourages them to speak to their doctor or pharmacist about the issues in the brochure.

Actions

- **Initial and ongoing consultation and engagement processes:**
  - medical organisations
  - pharmacy organisations
  - veterans' organisations
- **We use evidence-based change strategies:**
  - patient-specific prescriber feedback
  - academic detailing and opinion leader support
  - supporting information to targeted veterans
  - supporting information to pharmacies
- **We work in a Health Services Research framework involving:**
  - Identification of issues from an examination of the DVA health data set;
  - Discussions of issues with stakeholder reference groups;
  - Development of an intervention plan based on the behaviour changes we can influence and our ability to measure those changes in the data;
  - Provision of patient specific prescribing feedback information to individual GPs via mail together with practical change information to target groups associated with clinical guidelines;
  - Provision of complementary information to veterans. This information is mailed to GPs and pharmacists one month prior to veterans receiving their mail out;
  - Evaluation.

Making population health messages relevant to the patient in front of the doctor

What improvements could we make

- We have worked effectively at the organisational and individual level
- Refocus our work at the local level eg Divisions to become a formal part of activities such as small group learning
- Engage better with veterans/carers to understand their needs.

Monitoring medicines in use:

Complementing the Veteran's MATES program of informing medication safety and reducing harm

Andrew s 47F
Nicole s 47F & Libby s 47F
University of South Australia

Veterans'MATES

DVA Data

- Administrative Claims Data
  - Pharmaceutical dispensings
  - Health Service encounters
    - Hospitalisations
    - GP visits
    - Community Pharmacy visits
    - Community nurse visits
- Other Information
  - Demographics
  - Residential Aged-Care

DVA data

- Treatment population
  - 248,841 veterans (as at March 2011)
  - median age is 83 years
- 120 million prescription records over 10 years
- 200 million medicare and allied health records
- 6 million hospital records (public and private)

Advantages

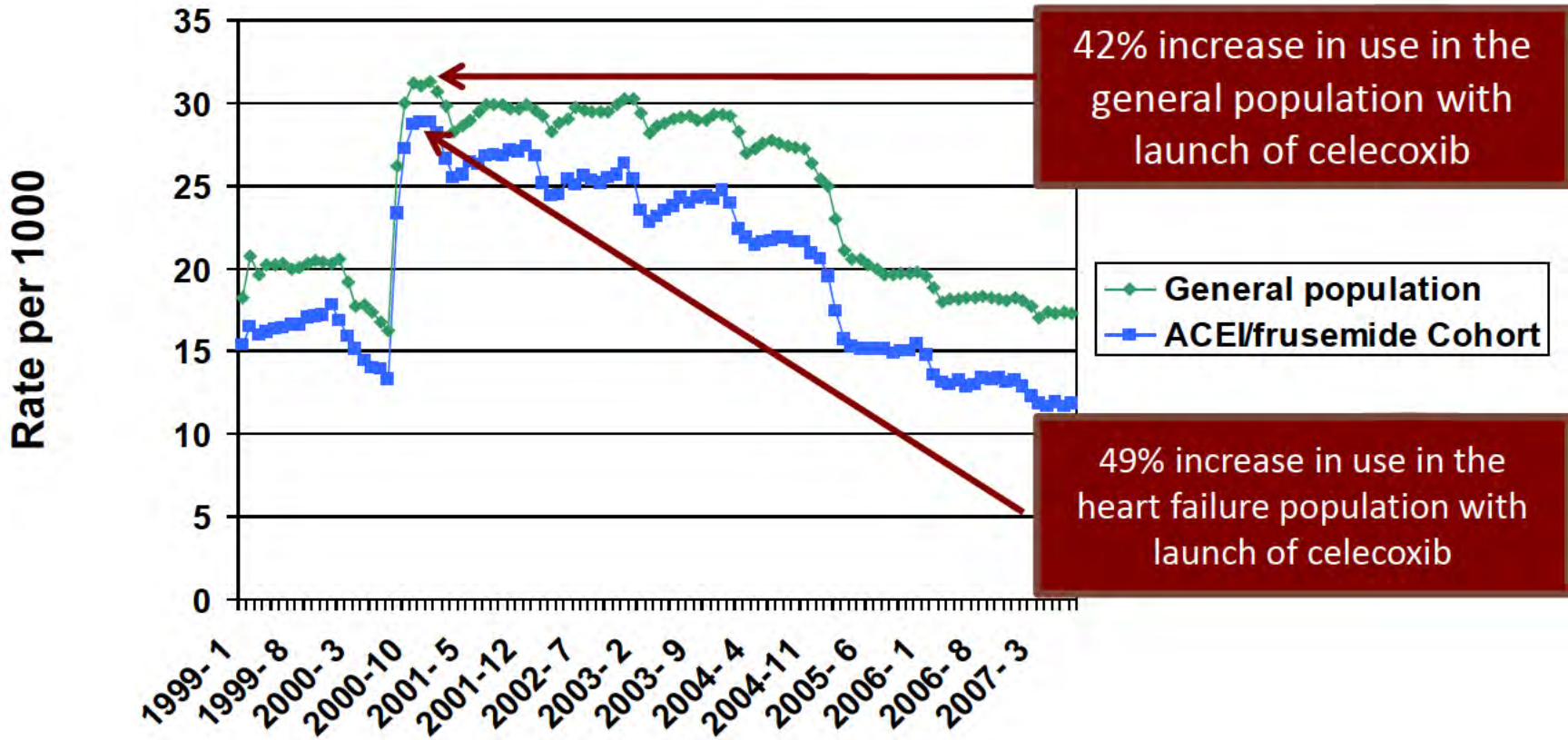
- Large population
  - Ability to detect rare events
- Extended follow-up
  - Ability to investigate long-term outcomes
- Effects of medications in populations excluded from RCTs
- Effectiveness and safety of medicines as they are used in routine clinical practice

Veterans' MATES contribution to medication safety and effectiveness

1. Monitoring, identifying inappropriate use and preventing known adverse drug reactions
2. Identifying previously unrecognised adverse drug reactions via easy to use signalling methods
3. Confirming adverse drug reactions using sophisticated, validated methods
4. Evaluating improvements in patient outcomes

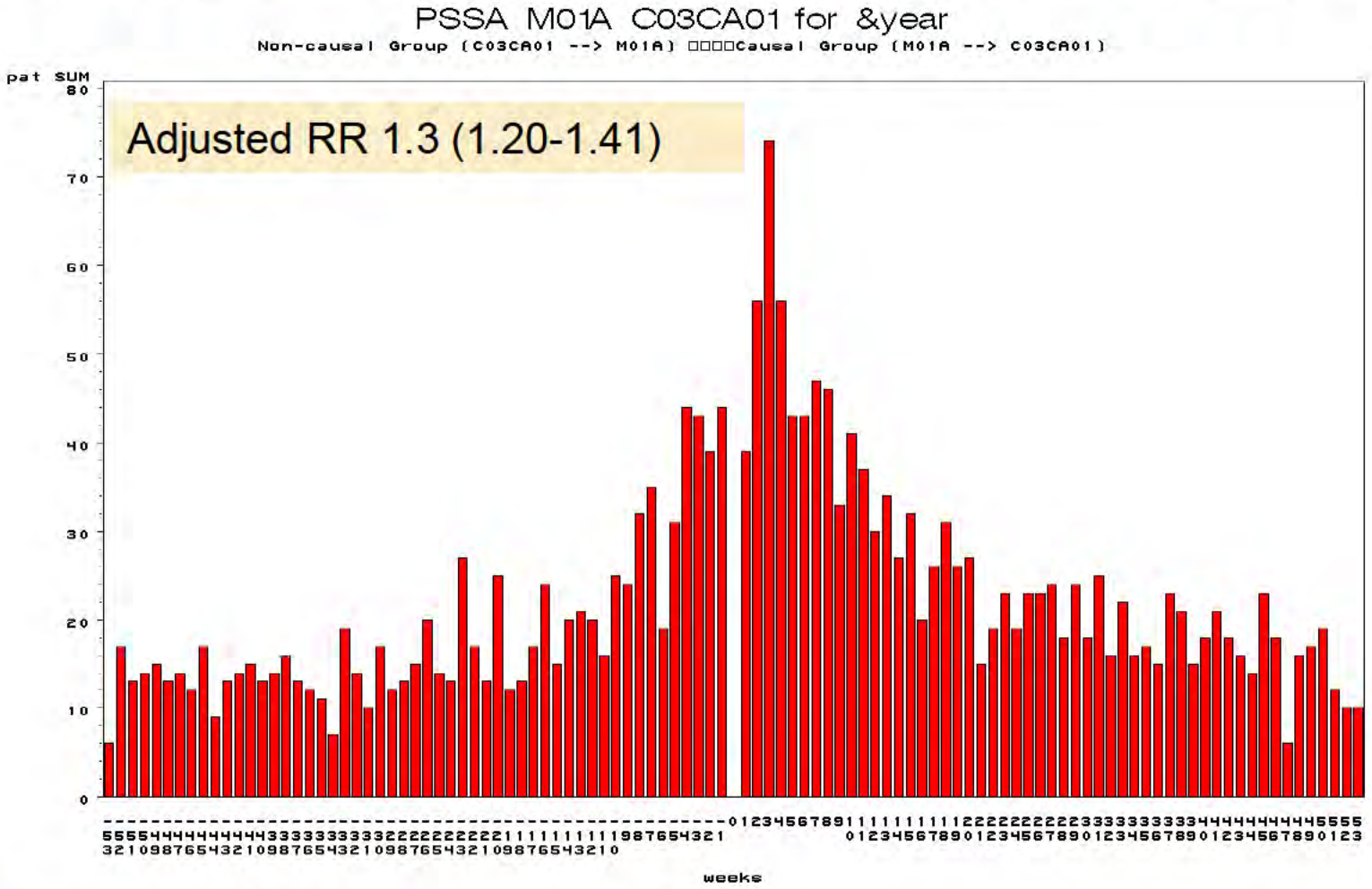
Note: sustainability is defined in whole of health terms, not simply costs to the PBS.

1. Monitoring and preventing known adverse drug reactions: NSAID use in Australia and in high risk patients



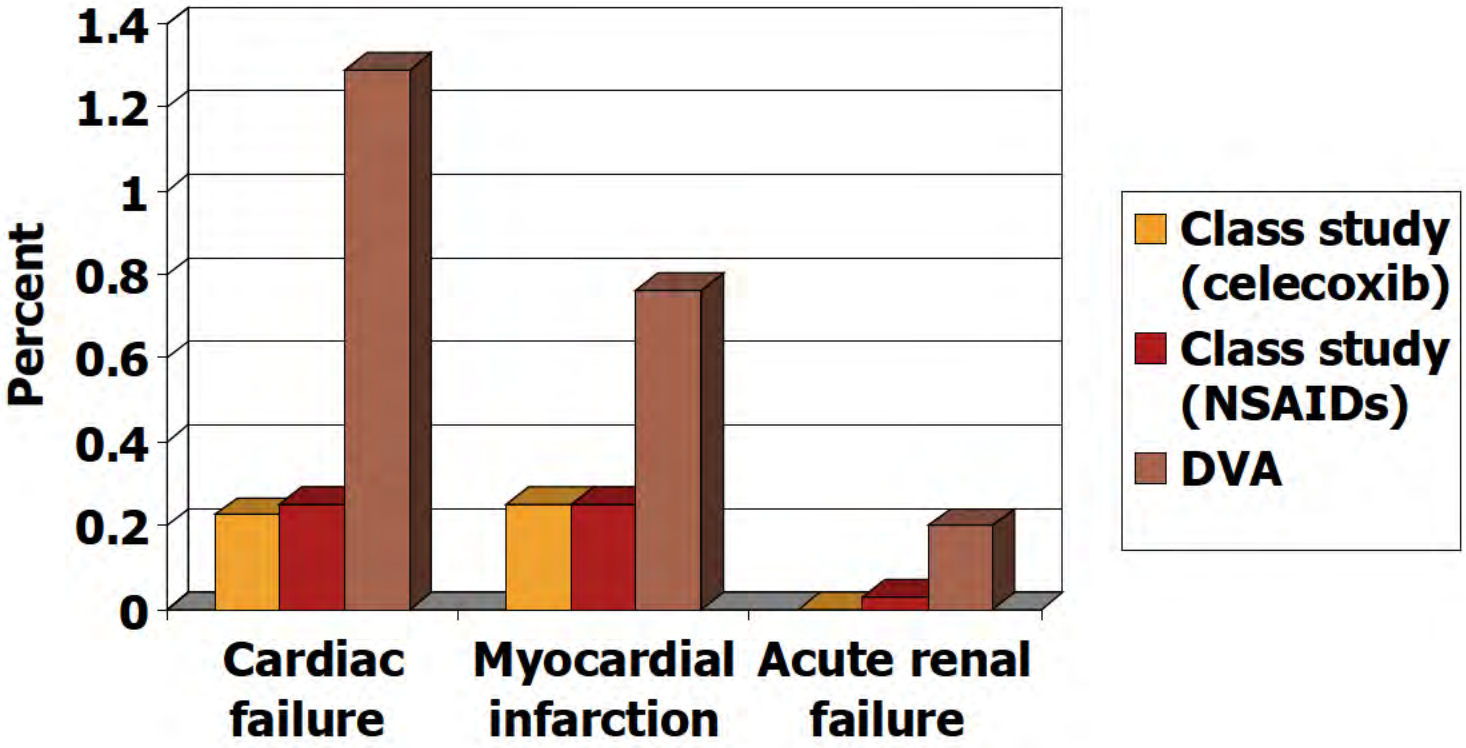
Veterans'MATES

There is a 30% increase in likelihood of starting a loop diuretic after initiation of an NSAID



Veterans'MATES

Incidence of adverse events causing hospitalisation: trial versus practice



Veterans' MATES

2. Identifying previously unrecognised adverse drug reactions using simple signalling methods

Examples

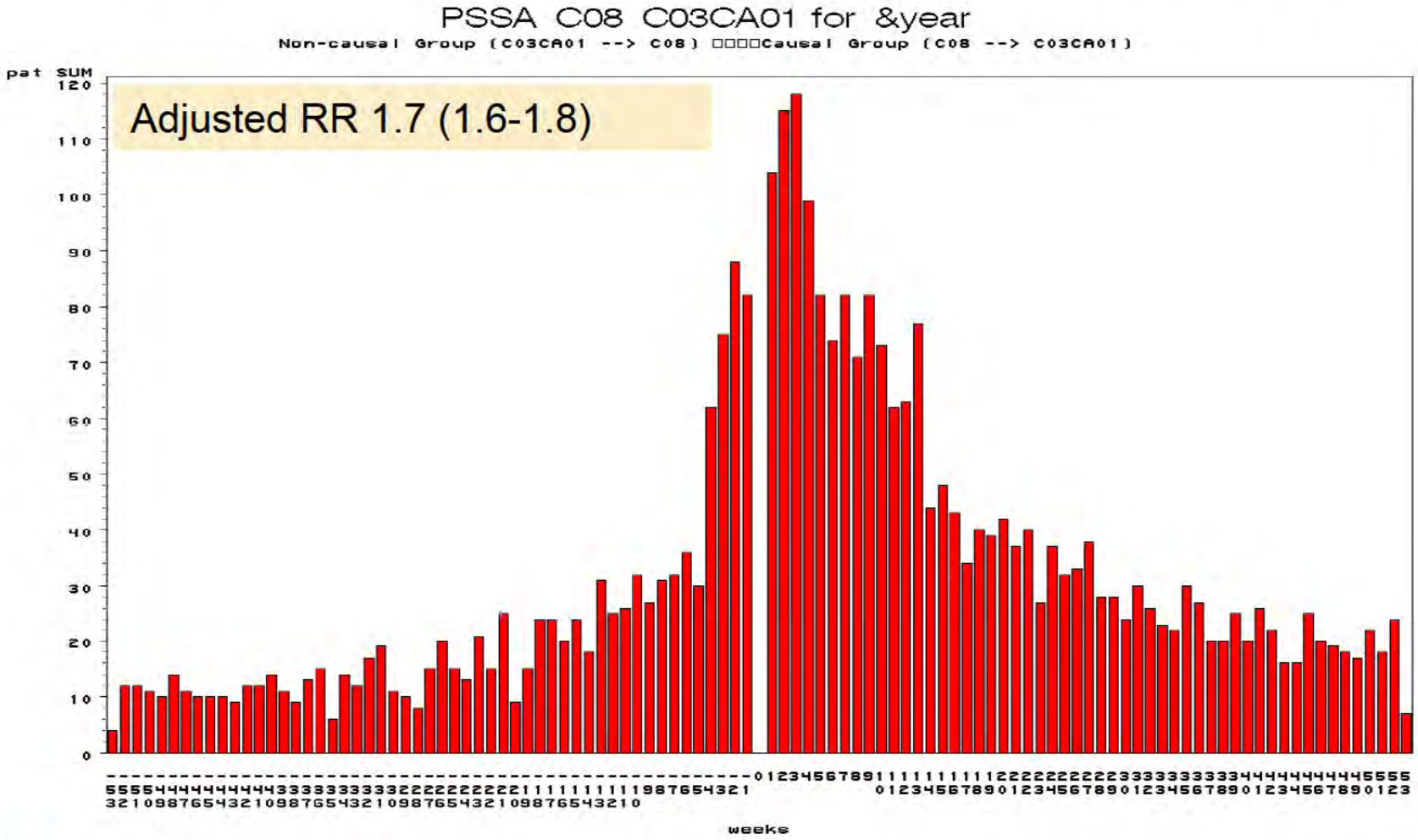
- Do calcium channel blockers precipitate heart failure?
- Do thiazolidinediones precipitate heart failure?

Prescription for loop diuretic used as a marker for HF.

- Does PPI use increase the risk of respiratory tract infections

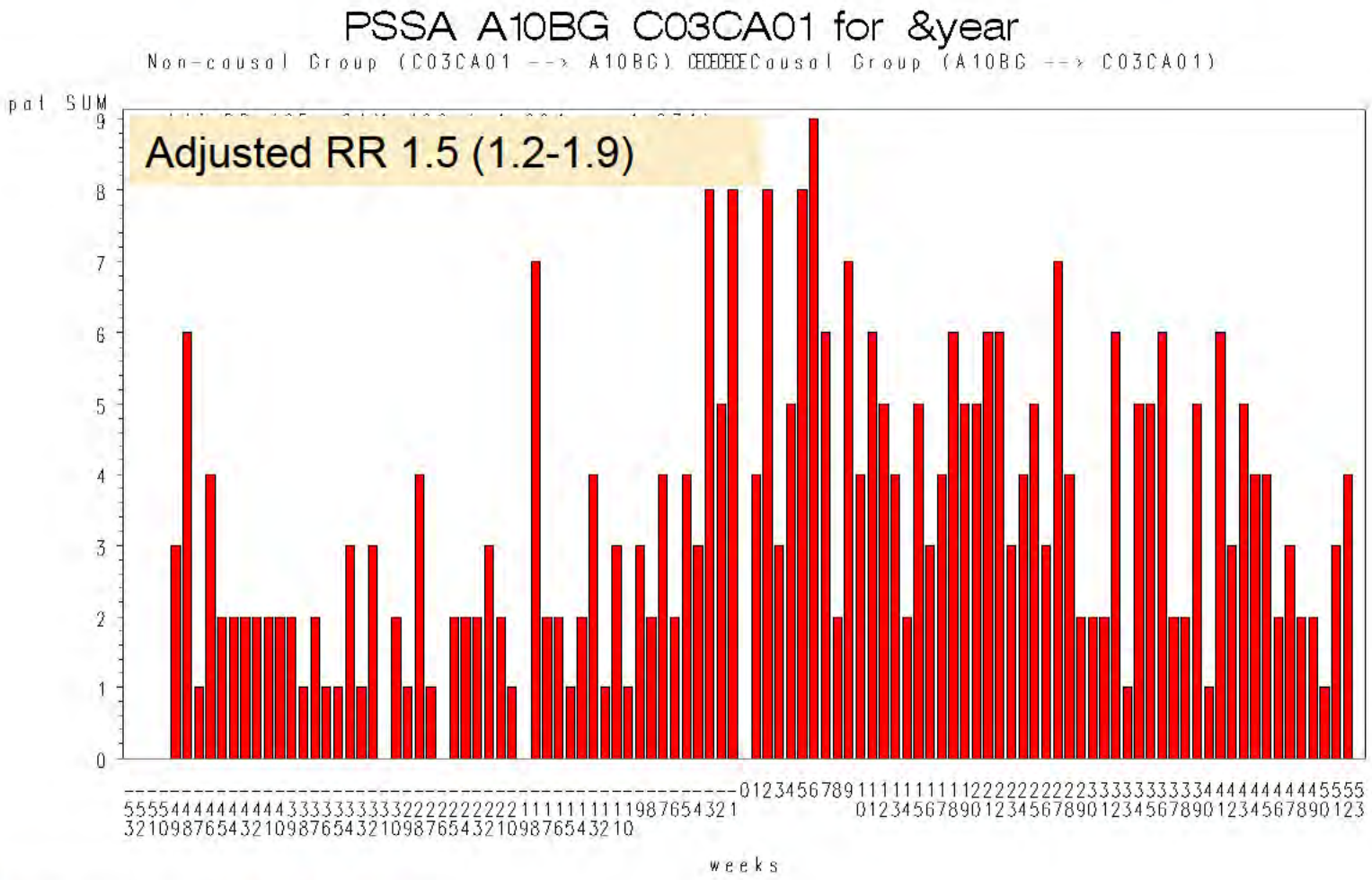
Antibiotic prescribing used as a marker for RTI.

There is a 70% increase in likelihood of starting a loop diuretic after initiation of calcium channel blocker



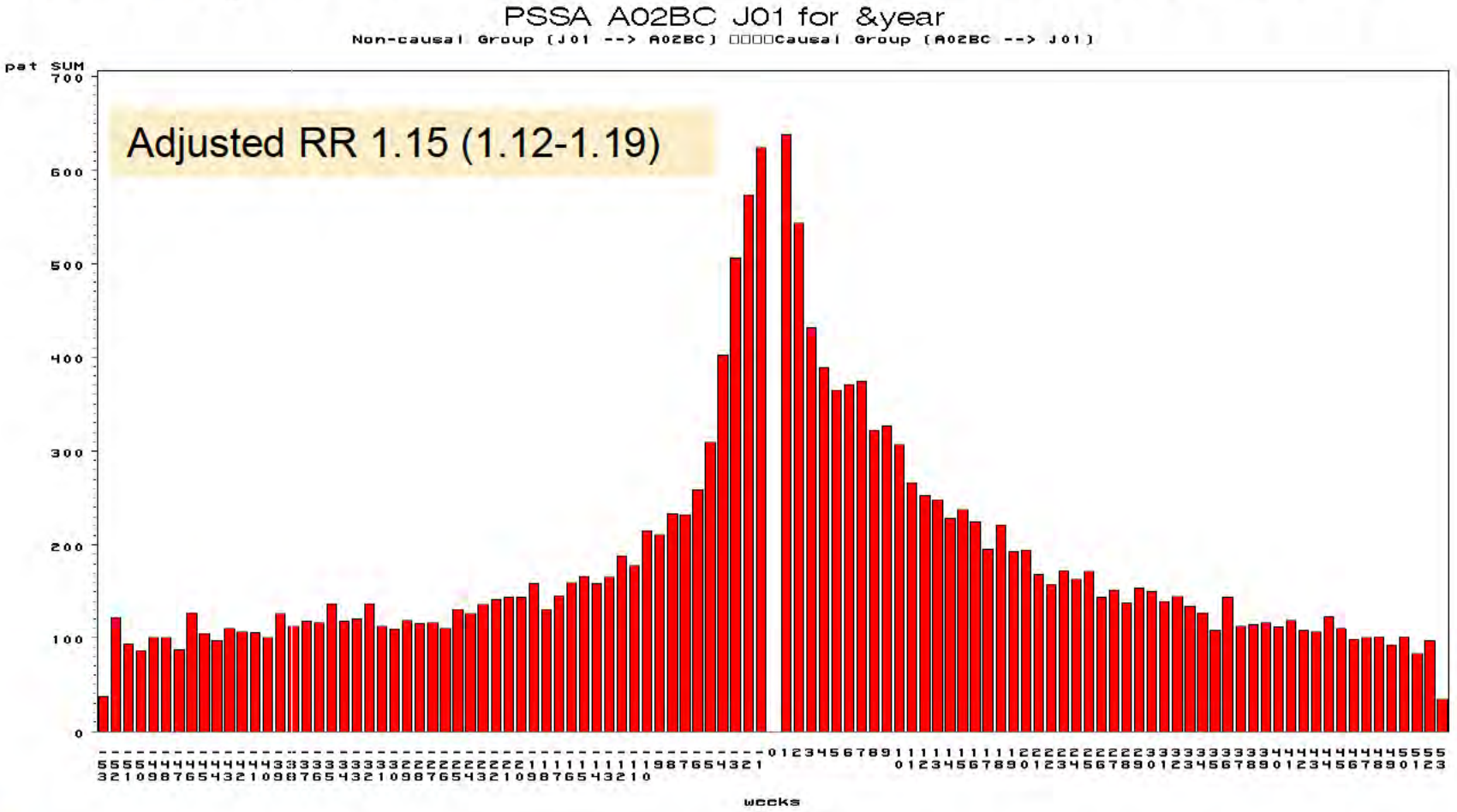
Veterans' MATES

There is a 50% increase in likelihood of starting a loop diuretic after initiation of thiazolidinedione



Veterans'MATES

There is a 15% increase in likelihood of starting an antibiotic after initiation of a PPI



Veterans' MATES

3. Confirming adverse drug reactions using sophisticated methods and providing risk and incidence data

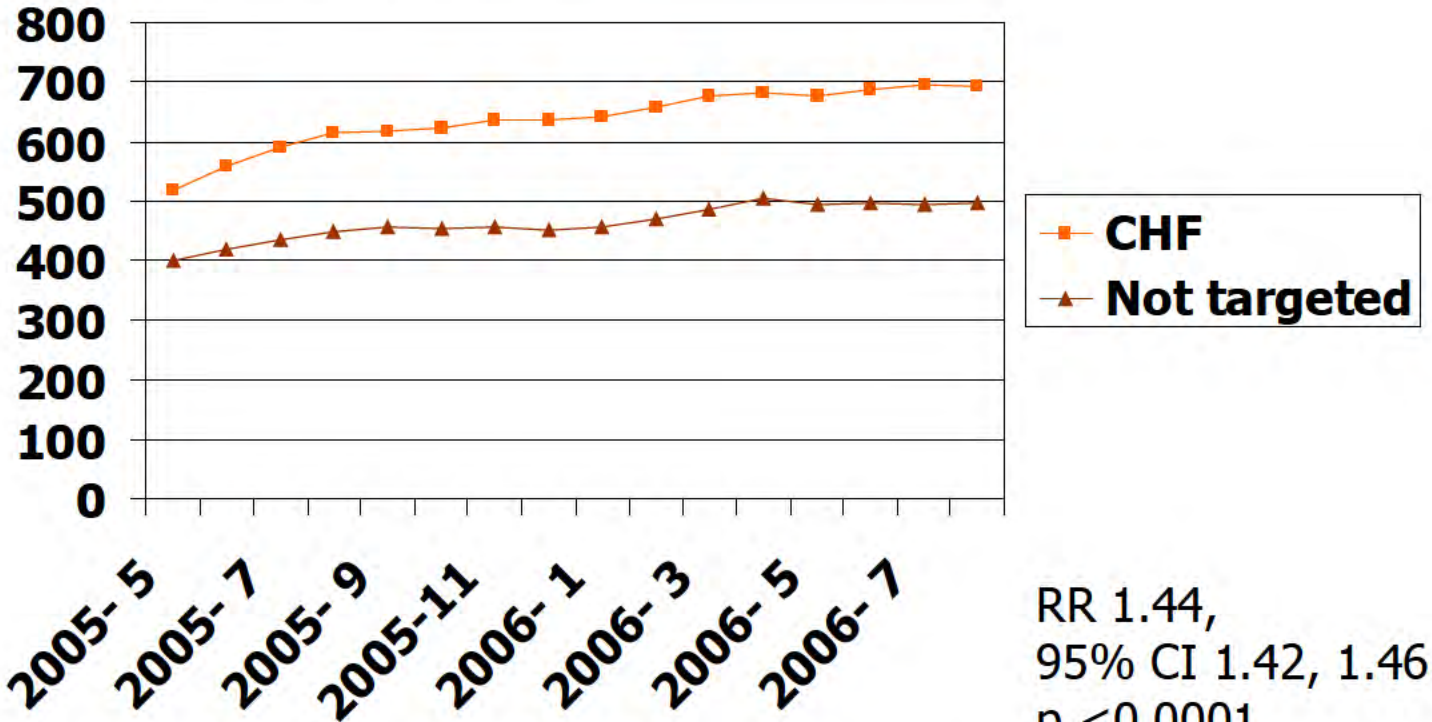
- Provision of risk and incidence data (eg via Number Needed to Harm) is currently the biggest knowledge gap.
- Does Proton Pump inhibitor use increase the risk of respiratory tract infections or community acquired pneumonia?
  - Prescription symmetry results
    - Proton pump inhibitors and antibiotics
  - Cohort study comparing those exposed to proton pump inhibitors and those not-exposed
- Outcomes:
  - hospitalisations for pneumonia
  - antibiotic prescriptions

Does Proton Pump inhibitor use increase the risk of respiratory tract infections or community acquired pneumonia?

	Unadjusted analysis	Adjusted analysis
Hospitalisation for pneumonia	1.69 (1.62-1.76)	1.16 (1.11-1.22)
Antibiotic dispensings	1.72 (1.70-1.75)	1.23 (1.21-1.24)

4. Evaluating improvements in prescribing and patient outcomes

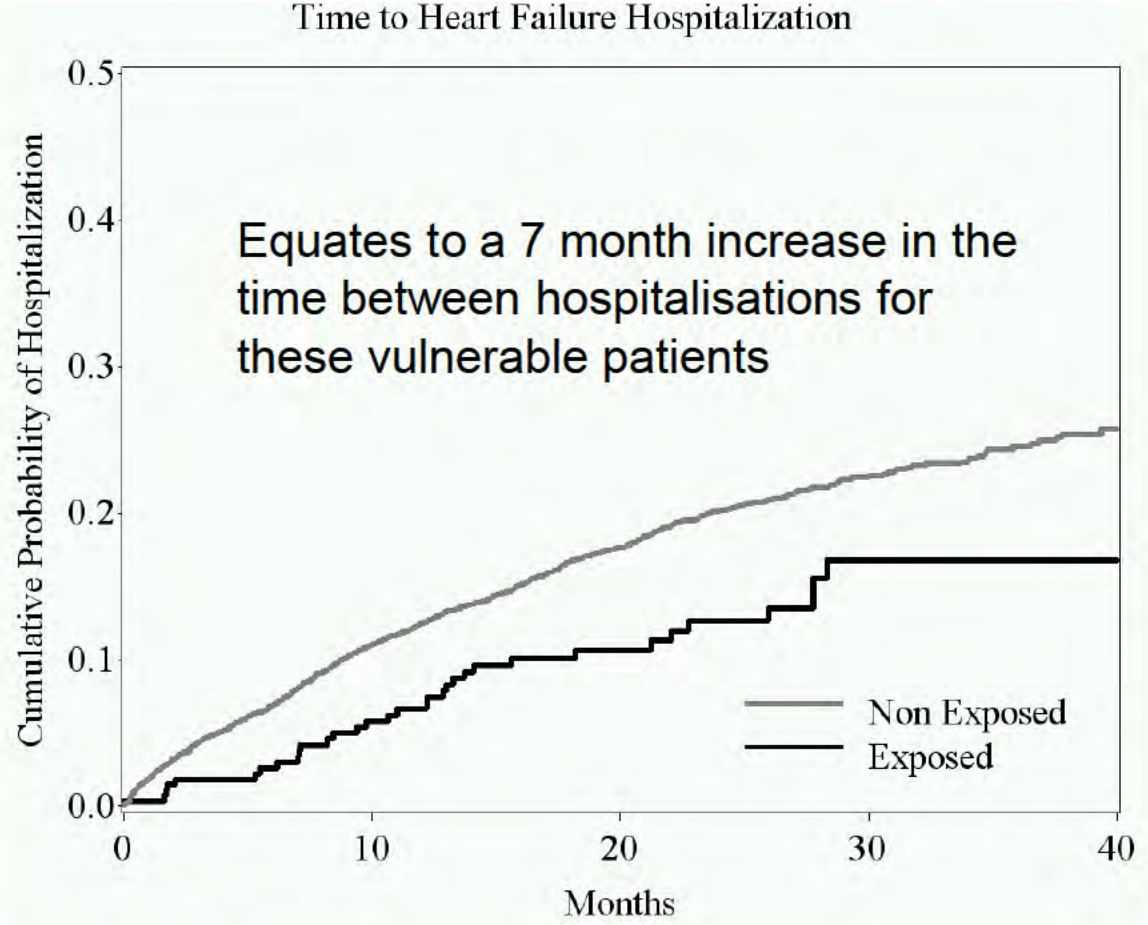
Cessation of NSAIDs occurred at a faster rate in targeted veterans



RR 1.44,
95% CI 1.42, 1.46
p <0.0001

Veterans' MATES

Home medicines review delayed time to next hospitalisation for heart failure



Veterans' MATES

The Post Marketing Monitoring intervention will complement the Veterans' MATES work by:

- Establishing a mechanism to routinely monitor medicines use in all high risk groups (not only veterans)
- Disseminating findings quickly in attempts to stimulate best practice and inform consumers through a stronger health professional and consumer support structure
- Providing a larger dispensing data-set, enabling assessment of rare but serious side-effects
- Increasing the capacity in Australia to continue the development of data analysis, reporting and intervention techniques

Veterans'MATES

UniSA | Sansom Institute for Health Research

Veterans' MATES

Does the acquisition of new knowledge prompt communication between veterans and their health professionals?

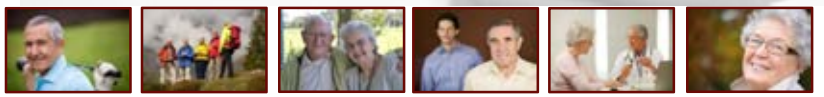
Suzanne s 47F Tammy s 47F Kerrie s 47F Natalie s 47F Chris s 47F John s 47F Elizabeth E. s 47F






Background: The Australian Government Department of Veterans' Affairs MATES program provides quarterly interventions on a variety of topics to veterans, general practitioners and pharmacists.

Objective: To determine whether veterans consider they learn new information and whether they consider this facilitates conversations with their doctor.



Veterans were sent a four page educational brochure to improve their knowledge and understanding of the topics and to encourage them to talk to their doctor.

Method: Five topics, *oesophageal reflux, dermatitis, diabetes, neuropathic pain and statin therapy* were distributed between September 2012 and September 2013. Evaluation forms were sent to veterans and health professionals.

Veterans were asked if they had learnt new information and whether they would speak to their doctor about the topic.

Responses were cross tabulated and differences between groups assessed using Chi square tests.

How helpful do you think the brochure will be in talking to your doctor about neuropathic pain?

How much new information did you gain from reading this brochure?

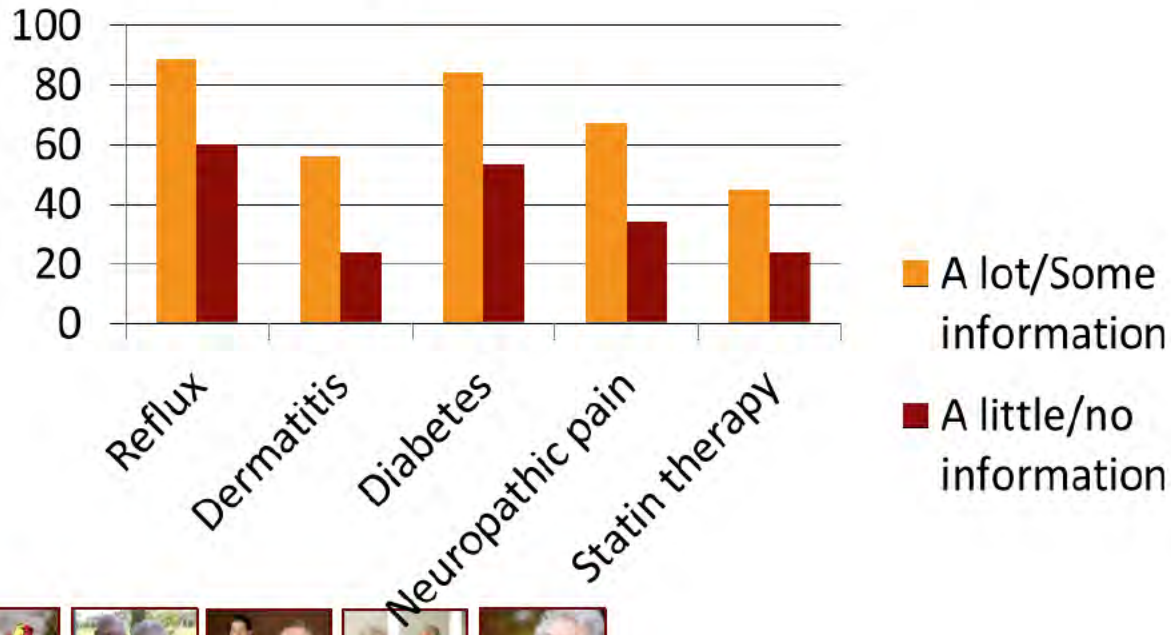
Do you intend to make a specific appointment to talk to your doctor about your statin medicines?

Results:

The majority of veterans (range 59% - 76%) reported learning *a lot or some new information*

Most veterans (range 73% – 83%) reported the information would *be helpful in talking to their doctor*

Veterans who reported learning a lot or some new information *were significantly more likely to report their intention to talk to their GP*, compared to those who reported learning no or little new information ($p<0.0001$).



Conclusion: Veterans' MATES materials provide new information for veterans and this is associated with increased likelihood of indicating veterans will speak with their doctor.

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Veterans' MATES

Repeated messages over time can lead to sustained behaviour change: the example of proton pump inhibitors

LM s 47F s 47F EN s 47F NL s 47F
S s 47F EE s 47F

Quality Use of Medicines and Pharmacy Research Centre, School of Pharmacy and Medical Sciences, University of South Australia

This research was funded by the Australian Government Department of Veterans' Affairs as part of the delivery of the Veterans' MATES project



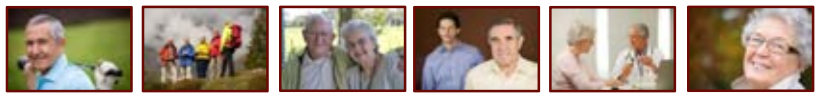



Interventions to improve the use of medicines often have immediate impact…

- …however, sustaining behaviour change can be difficult
- Behavioural theory suggests repetition and reinforcement supports sustained behaviour change
- The Australian Government Department of Veterans' Affairs (DVA) Veterans' MATES and NPS MedicineWise have run complementary programs to improve use of proton pump inhibitors (PPIs)
- In this presentation, we examine the impact of these programs on sustained practice change

Proton pump inhibitors are used in the management of gastro-oesophageal reflux disease and other stomach acid related problems

- Use of PPIs increased by 1318% from 1995 – 2006
- Enough PPIs are now dispensed to treat 7% of Australians (1.6 million people) every day
- Despite their perceived safety, PPIs are associated with rare but serious adverse effects
  - osteoporosis / fractures, hypomagnesaemia, interstitial nephritis, enteric infection, community acquired pneumonia
- Reducing the dose, adopting intermittent use or trialling cessation are advocated to maintain symptom control while reducing risk of serious adverse events



The intervention aimed to improve the use of PPIs by increasing the use of lower cost alternatives and high dose PPIs

*Click on the text or pictures to view the documents on this slide

April 2004 - NPS

June 2006 – Veterans' MATES

August 2012 – Veterans' MATES

2004 — 2006 — 2009 — 2012

June 2006 - NPS

May 2009- NPS

The trend continued to rise, with the rate more than double the rate before any of the interventions.

These results highlight how repeating messages in different interventions, at different time points, can lead to sustained practice change

- Likely to have had significant quality use of medicines benefits

Contact details:

Lisa s 47F s 47F

Post Doctoral Research Fellow, Quality Use of Medicines and Pharmacy Research Centre, School of Pharmacy and Medical Sciences, University of South Australia

lisa.s 47F unisa.edu.au

Further information on Veterans' MATES:

www.veteransmates.net.au

UniSA | Sansom Institute for Health Research

Veterans' MATES

Veterans' Medicines Advice and Therapeutics Education Services – tailoring information for veterans needs

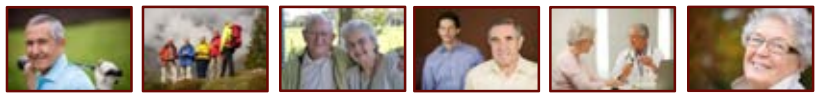
Natalie s 47F Suzanne s 47F Chris s 47F Kerrie s 47F
Tammy s 47F John s 47F Elizabeth E s 47F





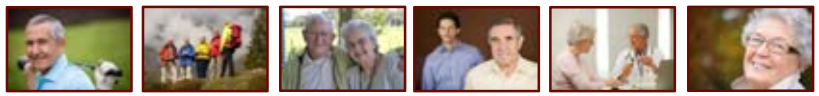

What is Veterans' MATES?

- The Veterans' MATES program 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.
- Supporting educational material is sent to GPs and pharmacists.
- Targeted veterans are provided with an educational brochure.
- The national program is evaluated using surveys provided at the time materials are distributed as well as observational studies using administrative claims data.
- To date more than 35 topics have been delivered involving more than 250,000 veterans, 25,000 doctors and 8,500 pharmacists.



Objective

To evaluate whether veterans prefer receiving more detailed information in order to aid their understanding of medicine related issues.



What do veterans prefer?

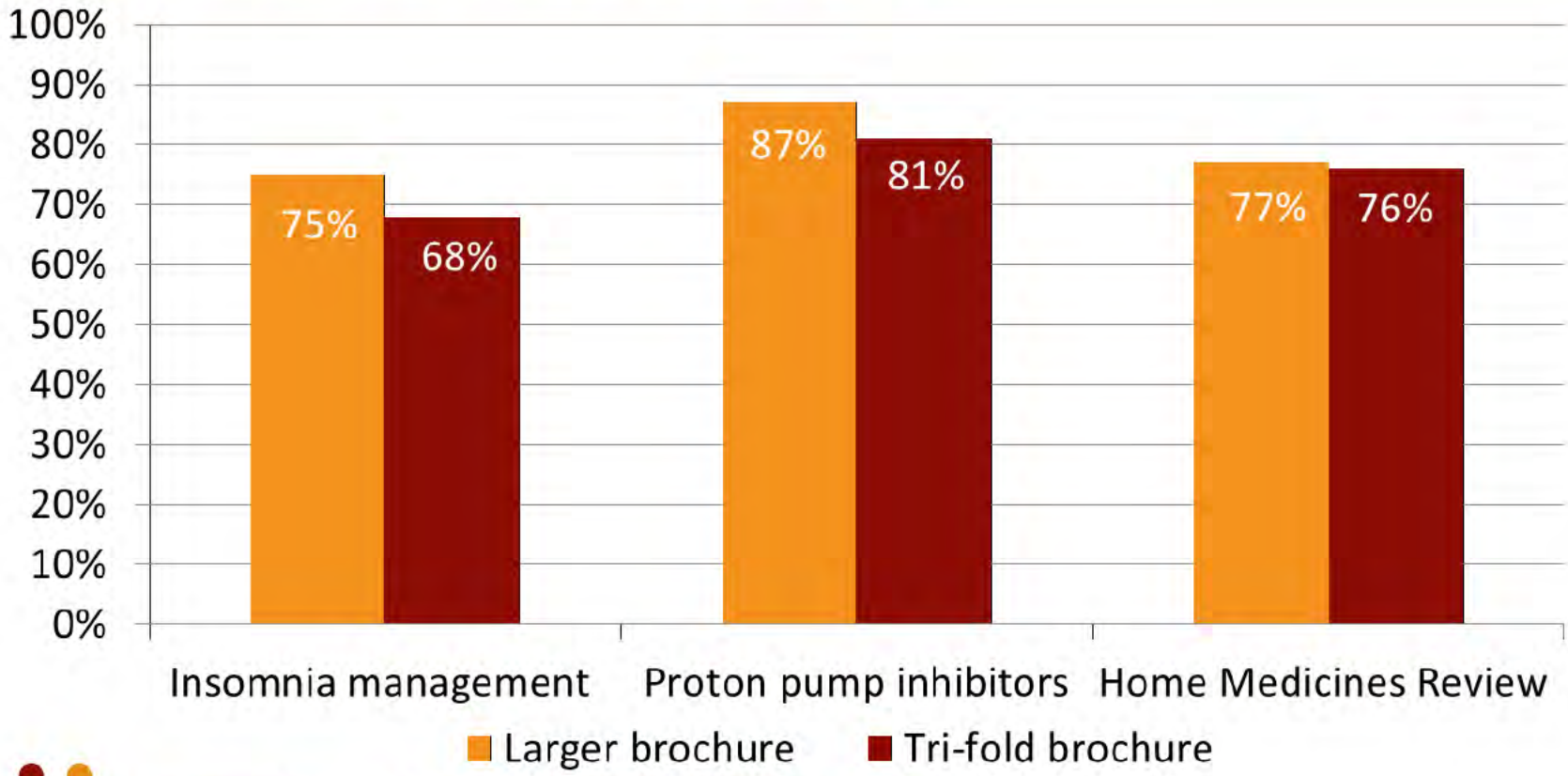
Simple tri-fold brochure (2005 – 2012)

Detailed four page brochure (since 2012)

One-page reply paid response forms evaluated how helpful veterans found the information in each format

How helpful do veterans find the different formats?

Responding veterans preferred the larger detailed brochure for topics focusing on insomnia management *(X^2=79.48, p<.001)* and proton pump inhibitors *(X^2=203.04, p<.001)* *Veterans did not indicate a preference for either format for the service related topic of Home Medicines Review (X2=2.92, p=.088)*



Conclusion

The Veterans' MATES program has successfully adapted to the information needs of veterans providing more helpful and detailed information as the program has developed.

For further information see www.veteransmates.net.au

Veterans' MATES

Using routinely collected administrative health claims data to improve the uptake of primary health care services

Libby s 47F

University of South Australia | Sansom Institute for Health Research

Australian Government
Department of Veterans' Affairs

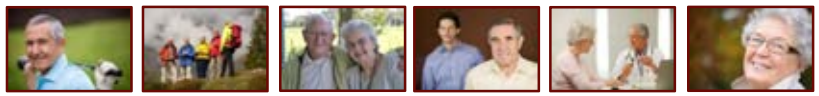





What is Veterans' MATES?

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.



Australian Government
Department of Veterans' Affairs

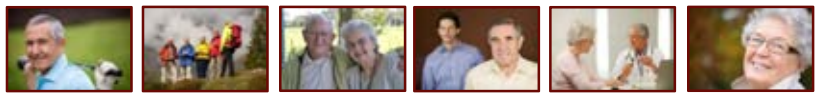
The Veterans' MATES approach

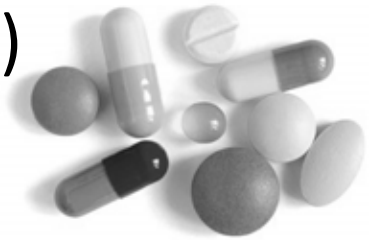
Every three months a chosen health topic is distributed:

- 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.

Health Claims Data are central to the program

- Australian Government Department of Veterans' Affairs health claims data
- Treatment population of approximately 225,000 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
- Module topic selected

Development & Implementation stages

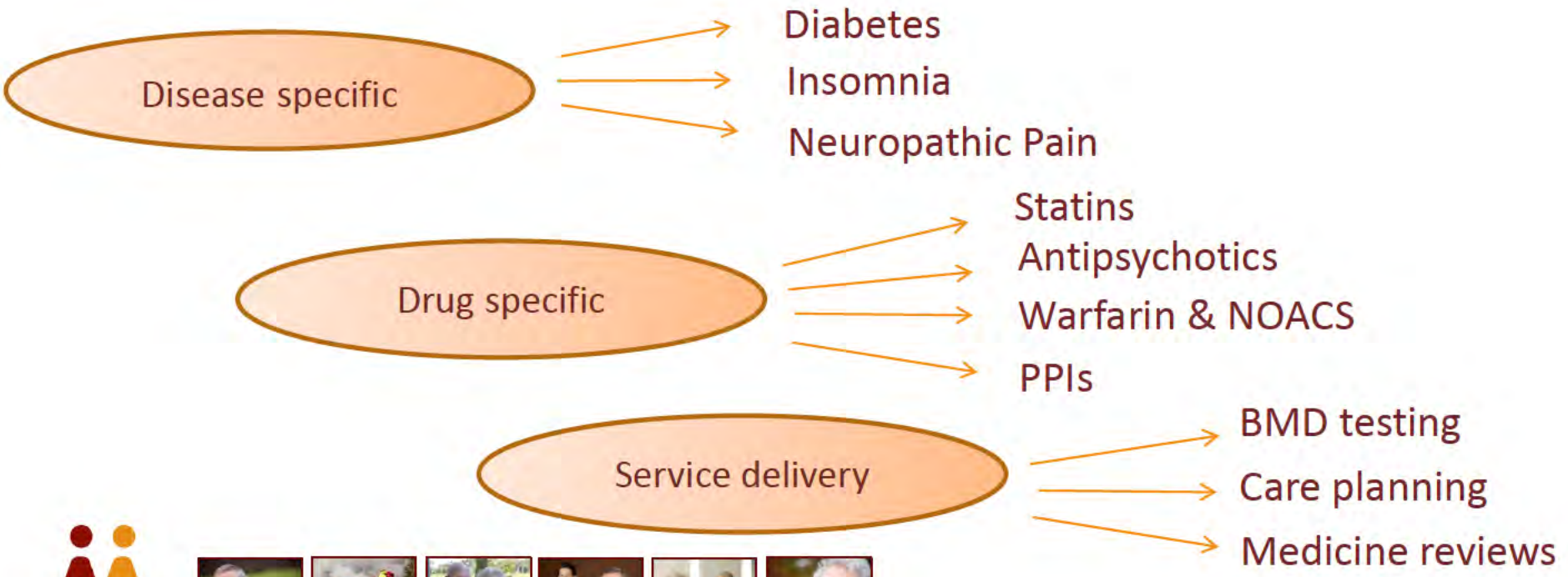
- Patient specific feedback & evidence based information developed
- Topic implementation

Evaluation stage

- Evaluation

The Veterans' MATES approach

- To date 37 topics delivered:



So what happens to our veterans?

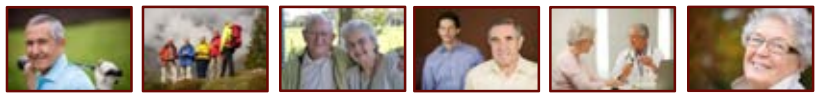




Veterans' MATES highlights

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 pharmacists and 27,000 veterans taking medicines that require renal function monitoring.



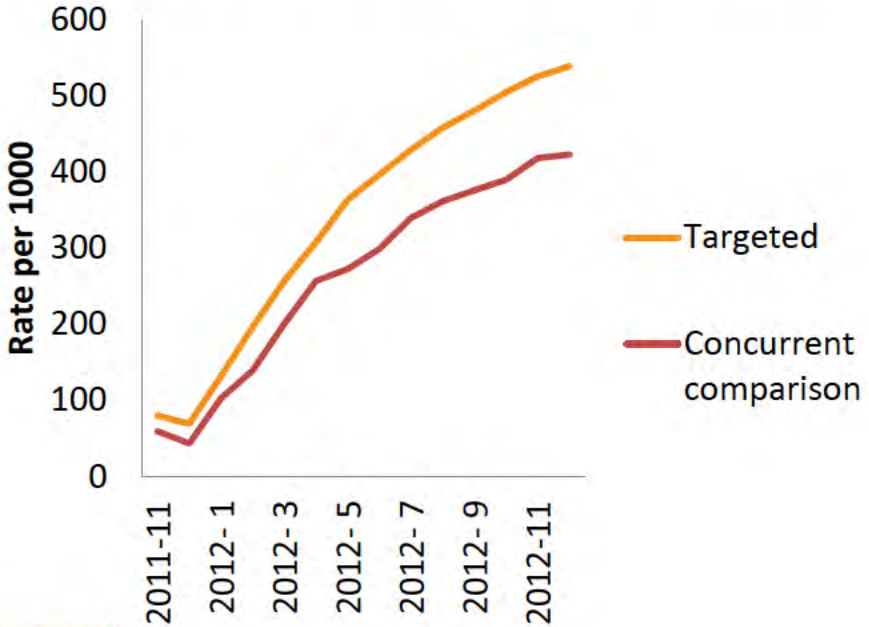
Veterans' MATES highlights

Improving the monitoring of renal function

So what happened?

- ✓ 35% relative 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 18% more likely to receive a renal function test than those who said they would not

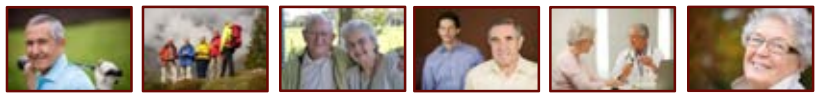
Rates of claims for blood test that include renal function tests in veterans taking medicines that require renal monitoring



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
- Our fracture and falls prevention topics were implemented in 2008 and 2012 aimed to assist appropriate medicine use and reduce risk of falls or fracture

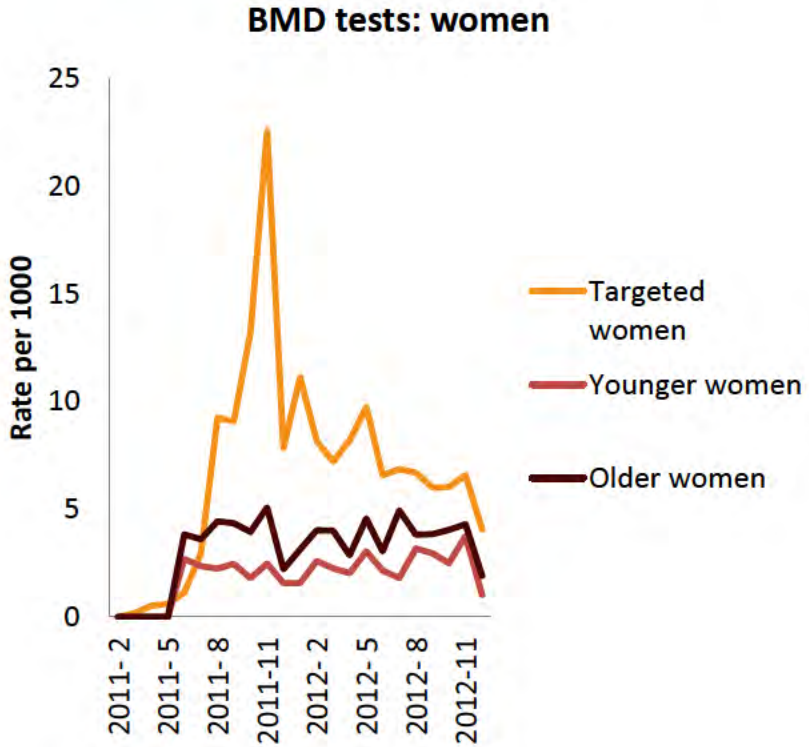


Veterans' MATES highlights

Reducing the risk of falls & hip fractures

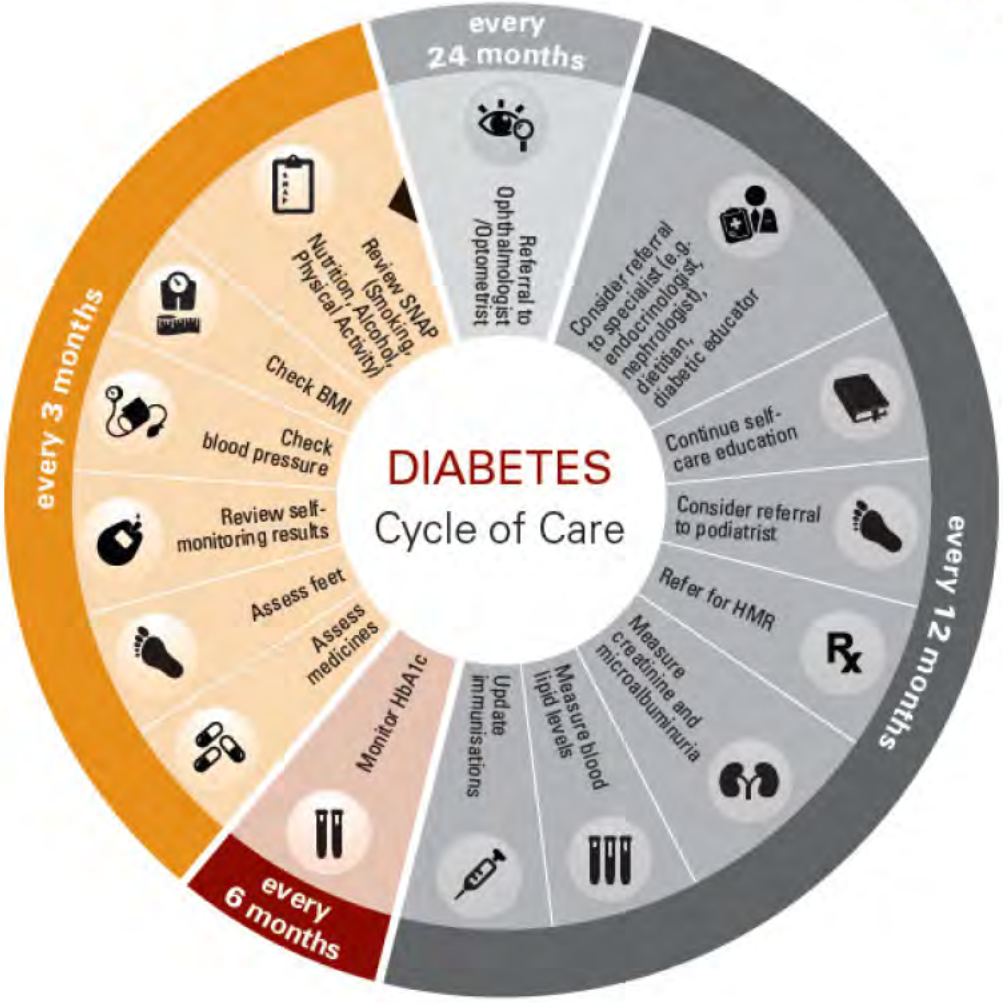
So what happened?

- ✓ 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

Improving the management of diabetes



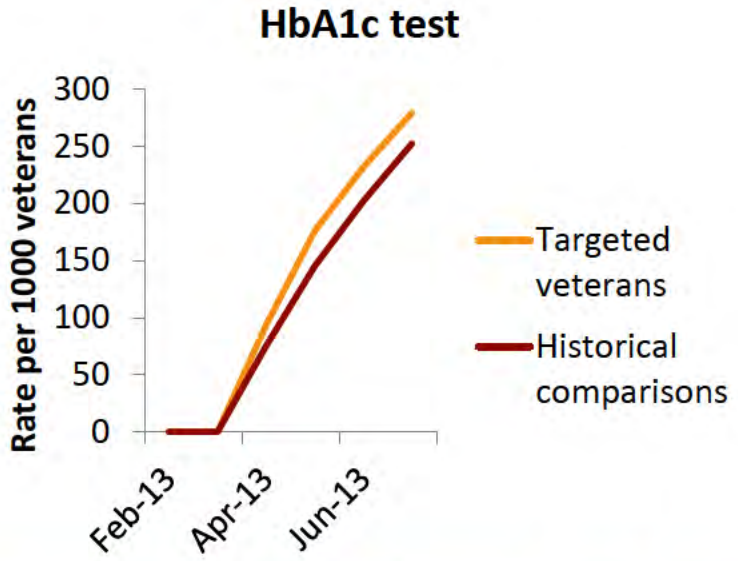
- Diabetes is Australia's fastest growing disease
- Diabetes increases the risk of cardiovascular disease including heart attack and stroke
- Our diabetes topics distributed in 2007 and 2013, aimed to improve management and monitoring in those with diabetes

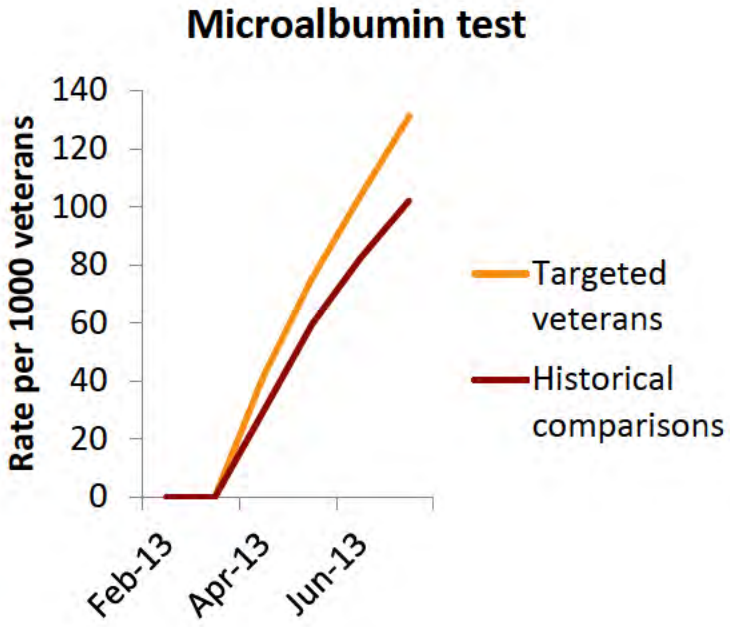
Veterans' MATES highlights

Improving the management of diabetes

So what happened?

- ✓ 17% relative increase in HbA1c tests
- ✓ 8% increase in microalbuminuria tests



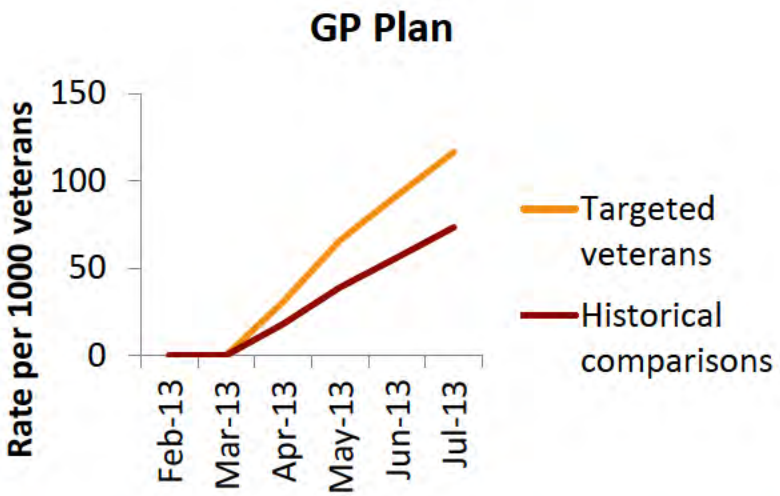


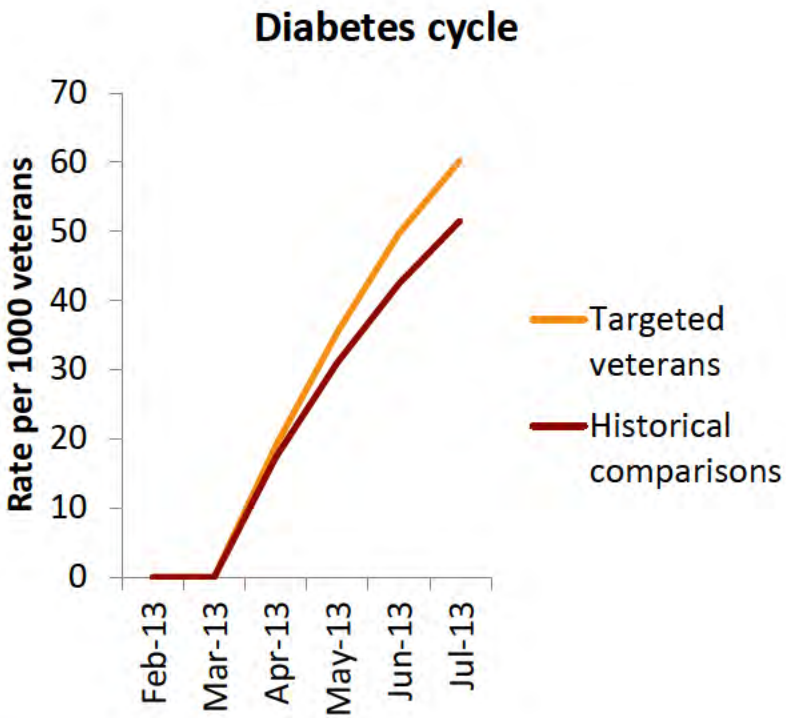
Veterans' MATES highlights

Improving the management of diabetes

So what happened?

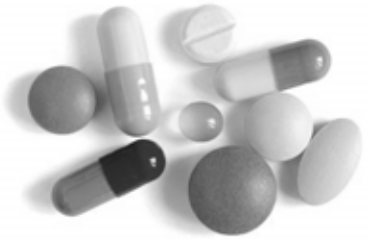
- ✓ increase in GP plans
- ✓ increase in diabetes cycle of care claims



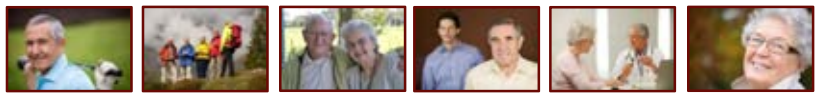


Veterans' MATES highlights

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

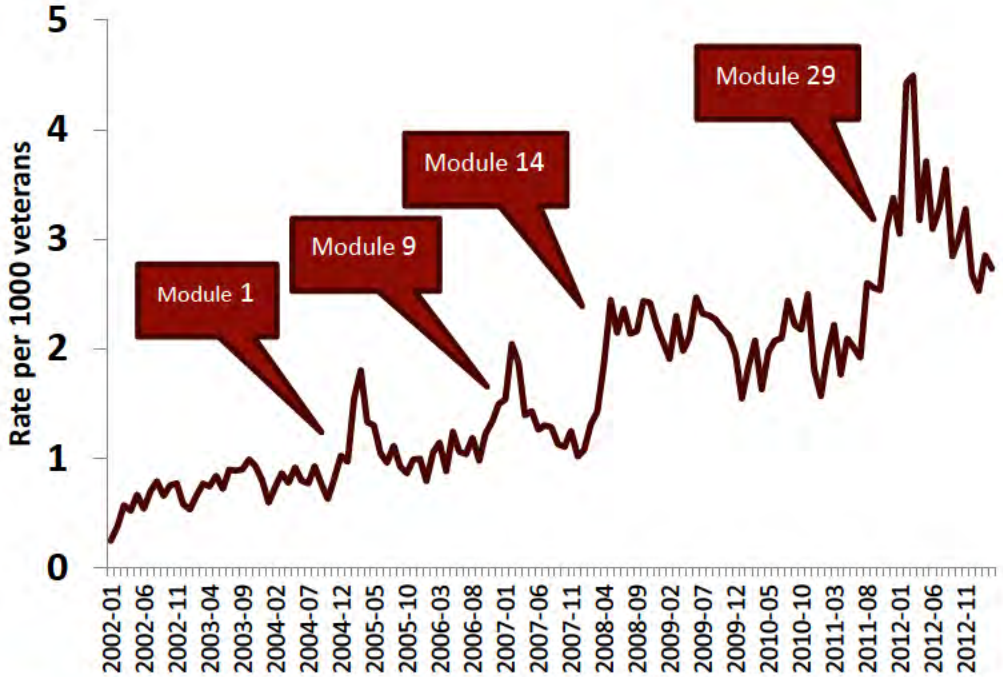


Veterans' MATES highlights

Increasing home medicine review use

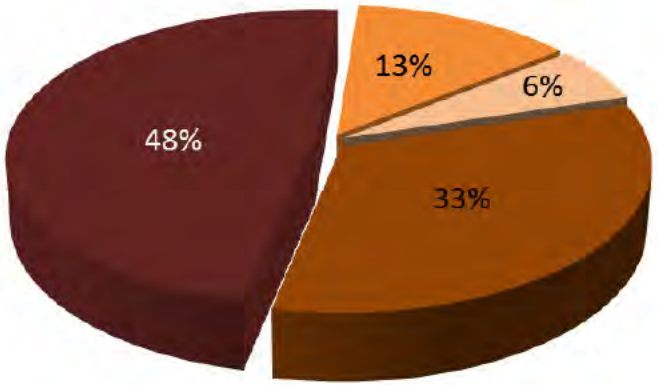
So what happened?

- ✓ Four fold increase in home medicine review rates
- ✓ Three fold increase in dose administration aid rates

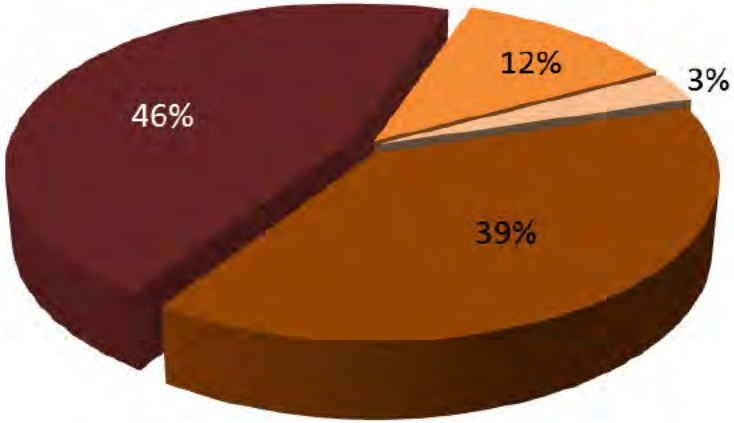


Feedback about Veterans' MATES

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

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- Topics

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- Contact Us

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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.

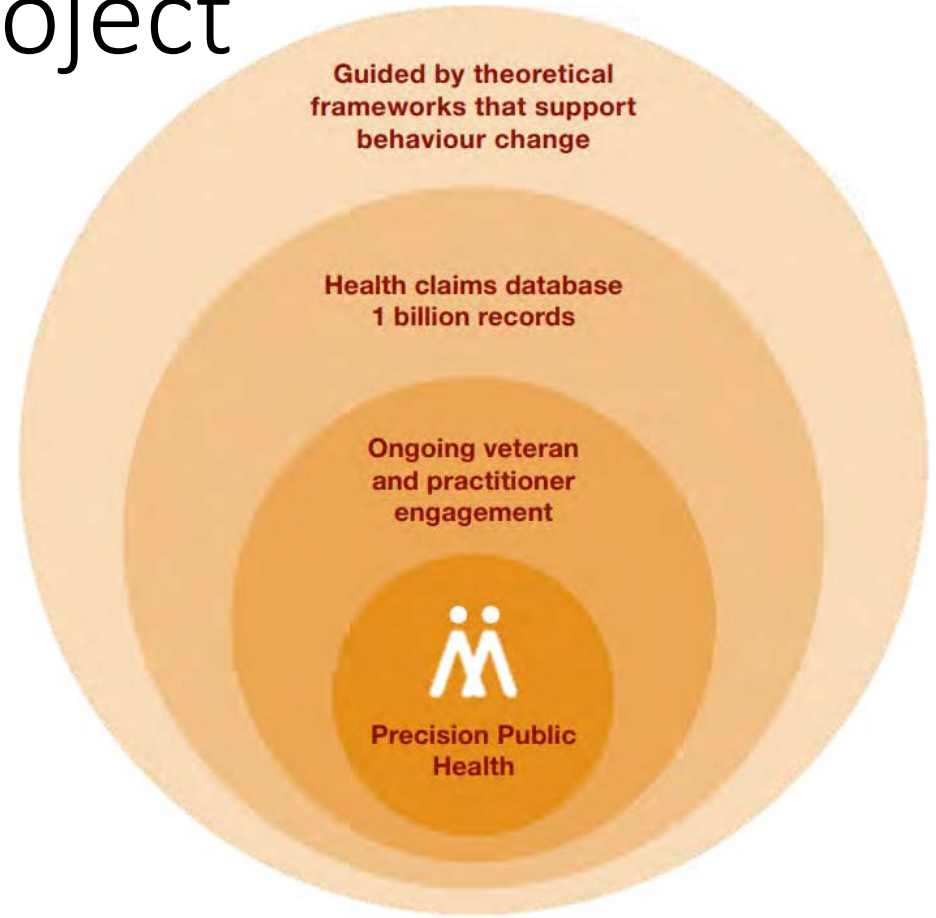
Useful Links

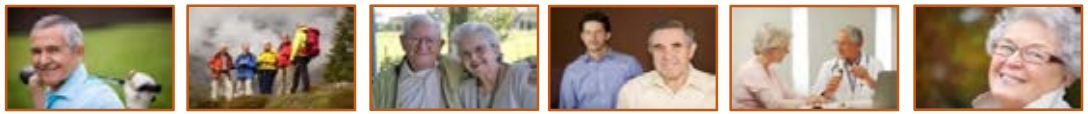
- Medicines Advice for Veterans
- Therapeutic Education for doctors and pharmacists
- Information for doctors about continuing education points
- Information for pharmacists about continuing professional development points
- A list of Veterans' MATES publications
- Veterans' MATES Report 2004 - 2010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

Digital delivery of audit and feedback – the Veterans' MATES e-delivery project

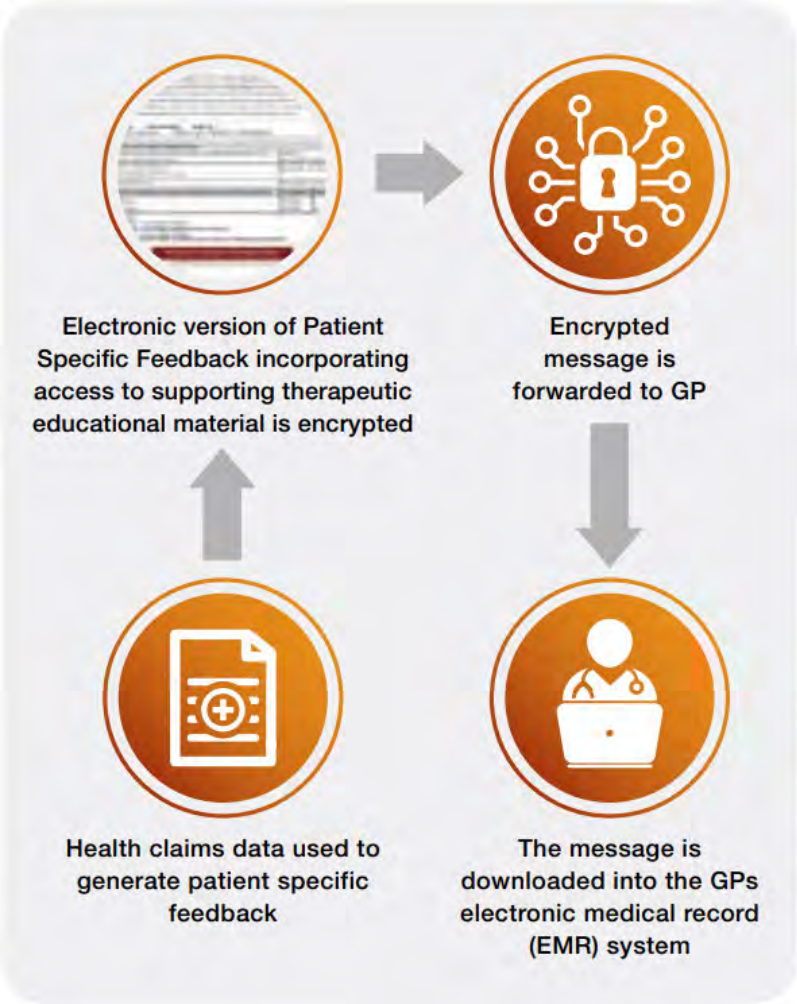
- Veterans' MATES: Department of Veterans' Affairs funded program that provides medicines advice and promotes adoption of best practices

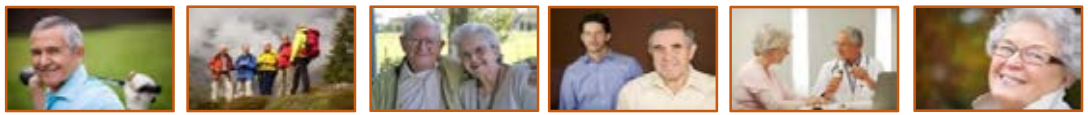
- How to use existing digital infrastructure to improve veteran care?





Our solution





Veterans' MATES

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME **Date: 15/03/2020**

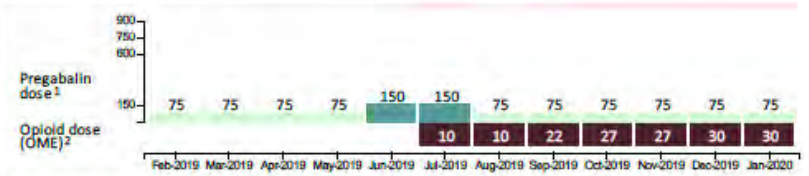
This Veterans' MATES information aims to assist you to review gabapentinoids (pregabalin or gabapentin) that may cause harmful side effects when used long term. It is advisory in nature. The information is based on DVA claims that indicate that a veteran has had multiple dispensings of pregabalin or 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.

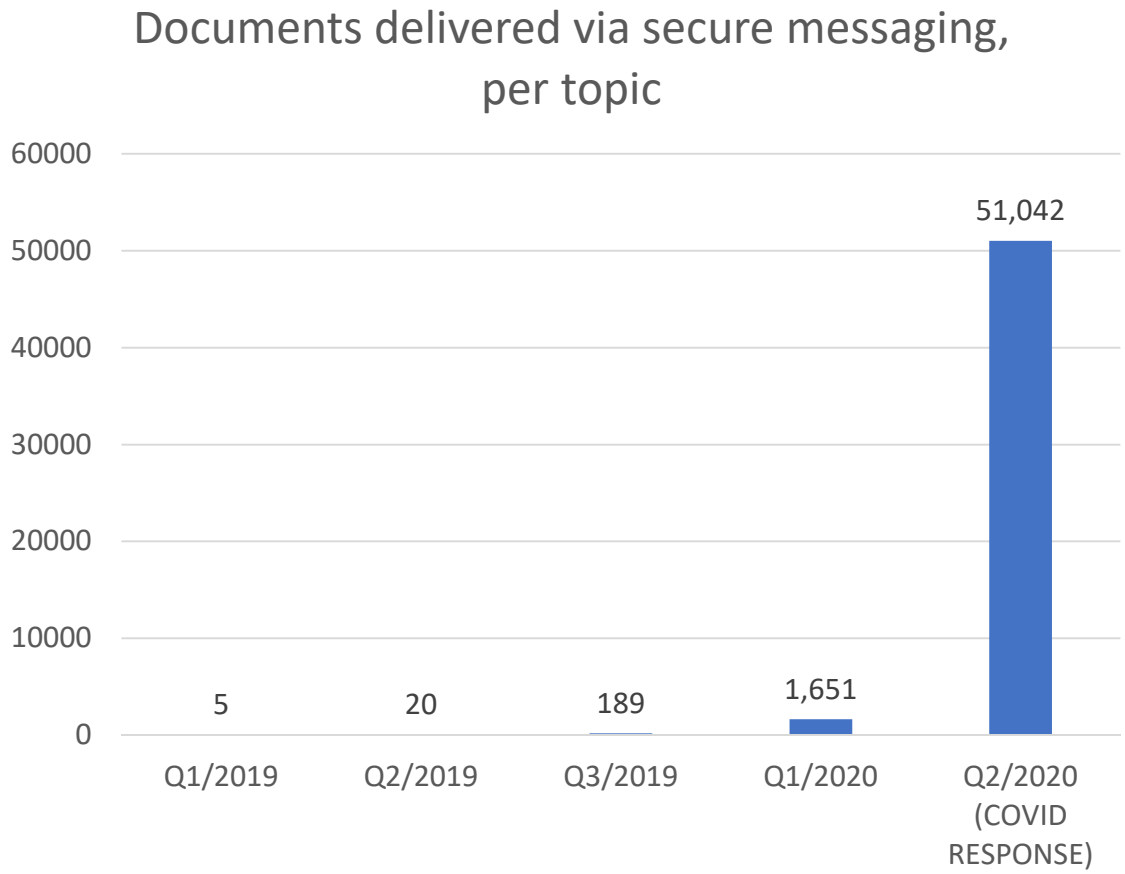
Along with this letter, you will receive information about 4 other patients eligible for this module. If you wish to be involved with RACGP CPD or ACRRM PDP for this clinical audit activity please follow this link to view the requirements. Note: This activity is only available until 25 June 2020. **Claim 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.

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
For specific questions about the program contact the Veterans' MATES Health Professional Helpline on 1800 500 869.

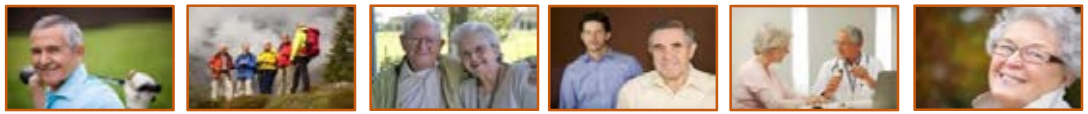
Challenges and results

Challenge	Solution
Significant effort (and cost) to adapt off-the-shelf solutions	Internal development in collaboration with secure messaging partner
Fitting the message to the digital workflow	PDF document encoded using HL7 standards
Gaining support from stakeholders	Communication, small scale pilots and seizing opportunities



Digital delivery increased capacity to respond quickly, accurately and at scale

In April/2020, we digitally delivered 51,000 letters to over 11,000 General Practitioners around Australia, identifying their patients with high risk of poor COVID-19 infection outcomes, while providing personalized and timely clinical recommendations



Veterans' MATES

Australian Government
Department of Veterans' Affairs

15 years of translating the evidence into practice:

What the Veterans' MATES program has achieved

Mafalda s 47F V Tammy s 47F Natalie s 47F Anna s 47F Jemisha s 47F Mhairi s 47F Kerrie s 47F
John s 47F Emmae s 47F Nicole s 47F Lisa s 47F s 47F and Elizabeth E s 47F
Quality Use of Medicines and Pharmacy Research Centre, University of South Australia, SA

Veterans' MATES

- A precision public health initiative to improve the use of medicines and healthcare services for the Australian veteran community;
- 57 interventions have been delivered to more than 300,000 veterans and 33,000 GPs, as well as all pharmacists and aged-care facilities

Supporting DVA clients during COVID-19

- This year's efforts focused on keeping veterans well during COVID-19
- Responding to COVID-19 required an agile response and realignment of work
- Possible because we had: established analytics, behavioral theory framework, stakeholder engagement with veterans and doctors, commitment to innovation

Helping at-risk DVA clients maintain access to health services during COVID-19

- Risk factors for people with poor outcomes from COVID-19 include: increasing age, male gender, chronic heart disease, diabetes, chronic airways disease, chronic renal failure, being immunocompromised
- **In April**, Veterans' MATES delivered a rapid response to 70,600 DVA clients at increased risk of poor outcomes if they contracted COVID-19, and to 18,500 GPs and 2,700 residential aged care facilities

Resource for DVA clients at increased risk

Keeping well during the Coronavirus (COVID-19) pandemic: Three practical things you can do.

Keep up with your usual care.

Seek treatment when needed.

Face to face, video and telephone consultations are available.

Continue taking your medicines.

Your medicines can be delivered to your home.

Get your influenza vaccination.

Secure, actionable electronic messages direct to the GP's clinical desktop software

Identifies DVA patient at increased risk of poor outcomes due to age and comorbidity profile

↓

Identifies specific vulnerability of the patient

↓

Provides recommended actions

Evidence summaries for GPs and directors of residential aged care facilities

FACT SHEET 1

Risk factors for poor outcomes with COVID-19

- Risk factors for poor outcomes with COVID-19:
  - older age, male gender, being a current smoker, living with multiple chronic conditions
- Living Guidelines: caring for people with COVID-19

FACT SHEET 2

What to tell patients about taking their routine medicines during COVID-19

- ACE inhibitors or ARBs
- Ibuprofen
- Medicines with immunosuppressive properties including disease modifying agents

Helping DVA clients manage COVID-19 related emotional distress

- COVID-19 has lead to increased anxiety and distress, with potential for exacerbation of mental ill-health
- **In July**, Veterans' MATES delivered a rapid response to 29,100 DVA clients with history of mental ill-health as well as 15,500 GPs, and 9,000 pharmacists

Resource for DVA clients at increased risk

Three actions to enhance and protect your mental well-being during and after COVID-19

Explaining the stress response

Tools to help calm distressing emotions

Technique to manage negative thoughts

Secure, actionable electronic messages direct to the GP's clinical desktop software

Identifies DVA patient at increased risk of poor outcomes due to prior or existing mental health vulnerabilities

↓

Identifies specific vulnerability of the patient

↓

Provides recommended actions

Evidence summaries for GPs and pharmacists

HEALTH PROFESSIONAL FACT SHEET

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

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]

- Helping your patients experiencing distress to:
  - Understand the stress response
  - Manage distressing emotions and physical reactions

  - Manage negative thoughts
  - Maintain healthy behaviours
  - Get the best healthcare team on board

UniSA | Sansom Institute for Health Research

Veterans' MATES

Multiple anticholinergic medicine use and risk of hospital admission for confusion or dementia

Lisa s 47F s 47F Nicole s 47F Emmae s 47F
John s 47F Elizabeth s 47F

Quality Use of Medicines and Pharmacy Research Centre
School of Pharmacy and Medical Sciences, University of South Australia

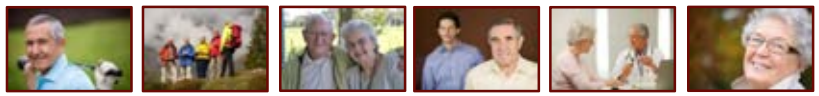





Anticholinergic medicines are frequently prescribed to older people

- Up to 90% in those aged over 75 years

- Medicines with anticholinergic properties include: oxybutynin, tricyclic antidepressants(e.g. amitriptyline, doxepin), antipsychotics (e.g. haloperidol, risperidone), loperamide, Parkinson's disease medicines (e.g. biperiden, benzhexol)



Instruments have been developed to estimate cumulative exposure to anticholinergics; e.g.

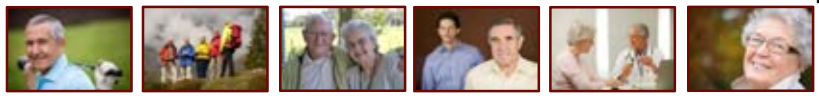
- Anticholinergic Cognitive Burden Scale
- Anticholinergic Risk Scale
- Anticholinergic Drug Scale
- assign ‘scores’ to medicines

  0-1 = none or limited anticholinergic activity

  2 = moderate anticholinergic activity

  3 = strong anticholinergic activity

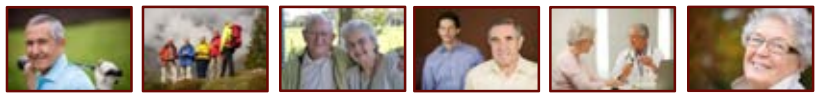
Boustani M, et al. Aging Health 2008;4:311-20.
Rudolph J, et al. Arch Intern Med 2008;168: 508-13.
Carnahan RM, et al. J Clin Pharmacol 2006; 46:1481-86.



Studies using these instruments have shown an association between higher scores and

- cognitive decline[1]
- cognitive impairment[2]
  - Strong vs. no anticholinergic – risk doubled
  - ≥3 mild anticholinergics vs. none – nearly three times increased risk

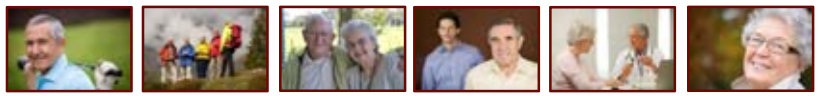
1.Fox C, et al. J Am Geriatr Soc 2011;59(8):1477-83.
2.Pasina L, et al. Drugs Aging 2013;30(2):103-112.



Prior studies compared patients using anticholinergics with those not using them

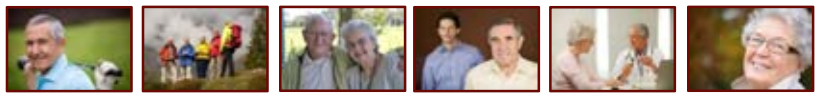
- potential for residual confounding
  - patient characteristics may effect exposure (e.g. antipsychotics for BPSD)

- no studies have assessed the contribution of anticholinergics to hospital admission for confusion or dementia in older people



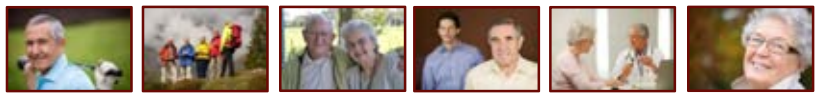
Aim

- to examine the impact of use of anticholinergic medicines on the risk of hospitalisation for acute confusion, delirium or dementia



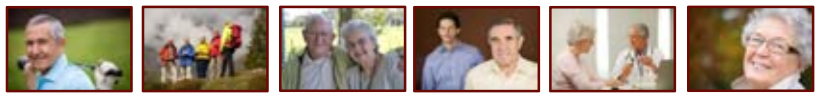
Methods

- Retrospective analysis of Department of Veterans' Affairs (DVA) administrative claims data
- Study period: 1 July 2010 – 30 June 2012
- Inclusion criteria:
  - ≥65 years
  - Dispensed ≥1 anticholinergic in year prior
  - Eligible for all DVA funded health services (Gold card)
- Exclusion criteria:
  - resident in an aged care facility
  - palliative care
  - dementia



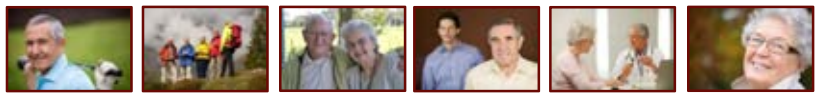
Primary outcome: Hospitalisation for confusion, delirium or dementia

- Subjects followed until primary end-point or end of the study period; whichever occurred first
- Subjects censored at:
  - Hospitalisation other than primary outcome
  - Entering residential aged care
  - Palliative care
  - Initiation of anticholinesterase (dementia medicine)
  - Death



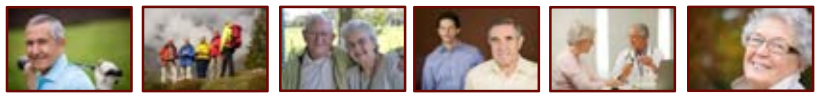
Medicines with moderate or high anticholinergic activity were included

- Identified from prior publications, drug burden index
- Limited to PBS/RPBS subsidised medicines
- Propantheline, Atropine, Loperamide, Disopyramide, Oxybutinin, Baclofen, Pizotifen, Carbamazepine, Benzhexol, Biperiden, Benztropine, Amantadine, Chlorpromazine, Prochlorperazine, Trifluoperazine , Periciazine, Haloperidol, Ziprasidone, Olanzapine, Quetiapine, Risperidone, Paliperidone, Imipramine, Clomipramine, Amitriptyline, Nortriptyline, Doxepin, Dothiepin, Paroxetine, Promethazine, Cyproheptadine



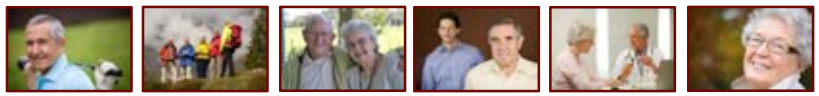
Daily exposure to anticholinergic medicines was determined

- Total number of anticholinergics per person calculated for each day in the study
  - assessed risk of hospitalisation on the subsequent day
- Reference period: time when subjects were not taking any anticholinergics



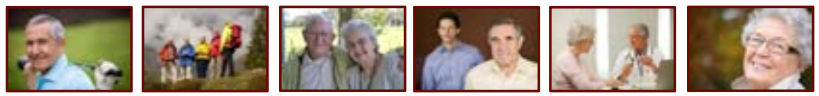
Hospitalisation rates were calculated as the cumulative number of hospitalisations in each exposure category divided by the number of days at risk

- Incidence rate ratios (IRR) were calculated using Poisson regression, adjusting for:
  - age
  - gender
  - socioeconomic status
  - number of medicines
  - GP visits
  - specialist visits
  - hospitalisations
  - co-morbidities
- Sensitivity analyses: excluded those dispensed antipsychotics and excluded dementia hospital admissions from the outcome



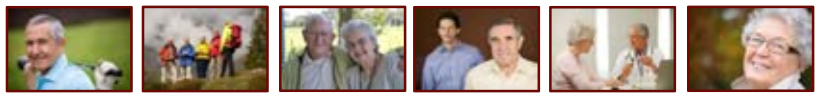
Results

Demographics	Cohort (n=36,015)
Mean age	83 years
% Male	40%
Median number of medicines used	23
% of Patients receiving antipsychotic medicines	5%



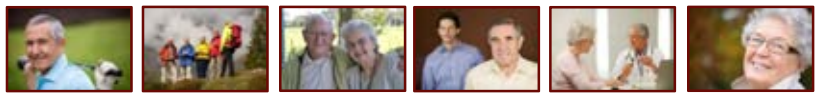
Risk of hospitalisation for confusion or dementia significantly increased with increasing number of anticholinergics

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)



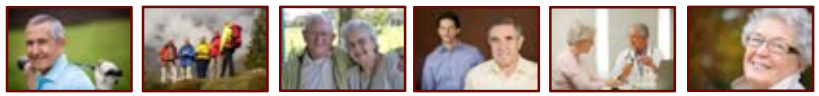
Consistent results even after excluding dementia admissions and those dispensed antipsychotics from the outcome

Number of anticholinergics	Adjusted IRR (95% CI)
0	1.0 (1.0 - 1.0)
1	1.0 (0.8 - 1.2)
2	1.8 (1.2 - 2.8)
≥3	4.0 (1.5-10.6)



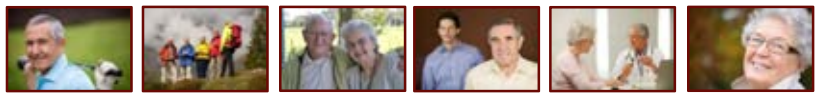
Use of anticholinergic medicines is associated with increased risk of hospitalisation for dementia or confusion

- association remains even after excluding those with indicators of early dementia
- risk increases with increasing number of anticholinergic medicines



Although hospitalisation for confusion is relatively uncommon, the implications for patients are likely to be significant …

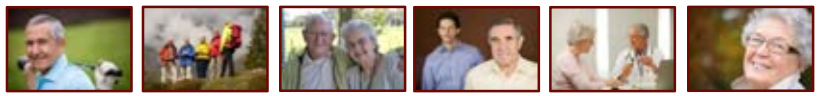
- particularly if the association between the anticholinergic and confusion is not recognised
- Our results likely to be an underestimate – many patients won't be hospitalised
- Health professionals should be aware of the potential for anticholinergics to be associated with confusion



Acknowledgements

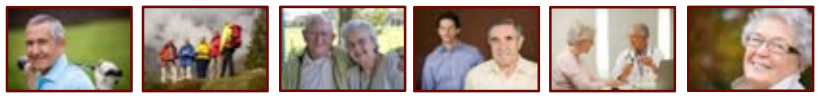
- This research was funded by the Australian Government Department of Veterans' Affairs as part of the delivery of the Veterans' MATES project

- Any further questions?
  lisa.s 47F unisa.edu.au



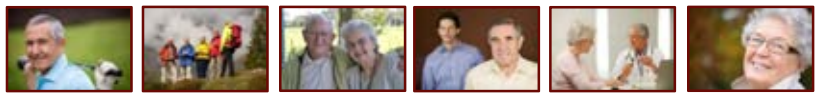
Results – excluding those dispensed antipsychotics

Number of anticholinergics	Adjusted IRR (95% CI)
0	1.0 (1.0 - 1.0)
1	1.1 (0.9 - 1.3)
2	1.9 (1.3 - 2.8)
≥3	4.2 (1.7 - 10.1)



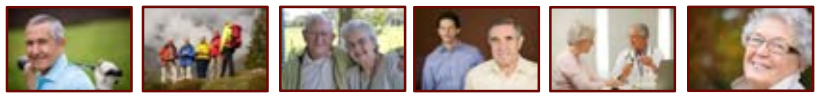
Results – excluding dementia hospitalisation from the outcome

Number of anticholinergics	Adjusted IRR (95% CI)
0	1.0 (1.0 - 1.0)
1	1.1 (0.9 - 1.3)
2	2.3 (1.6 - 3.2)
≥3	4.0 (1.8 – 9.0)



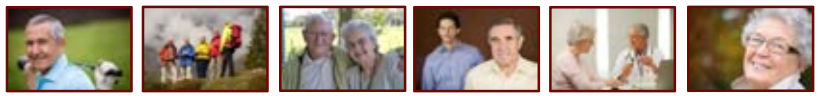
Veterans' MATES: engaging veterans and health professionals to improve health outcomes

Lisa s 47F s 47F - Senior Research Fellow: Veterans' MATES
Natalie s 47F - Development Coordinator: Veterans' MATES
Anna s 47F - Evaluation Leader: Veterans' MATES
University of South Australia



Workshop overview

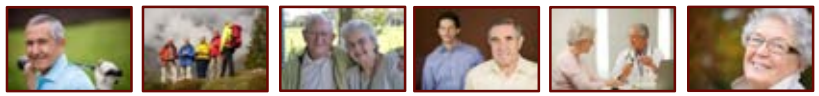
- Overview of the Veterans' MATES program
  - Lisa s 47F s 47F
- The Veterans' MATES approach and stakeholder engagement
  - Natalie s 47F
- Evaluation methods used in Veterans' MATES interventions
  - Anna s 47F



Veterans' MATES

Funded since 2004 by the Australian Government Department of Veterans' Affairs (DVA)

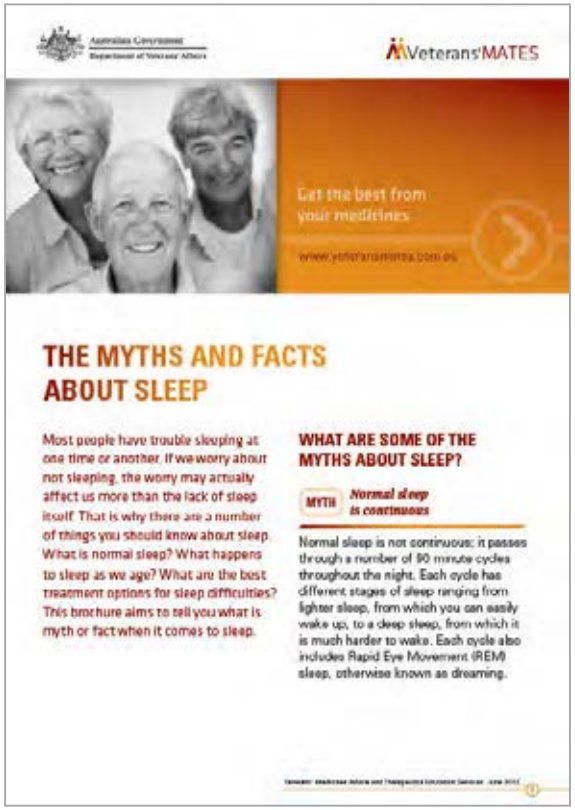
- Aims to improve medicine use and health outcomes for veterans
- Program is underpinned by behavioural theory

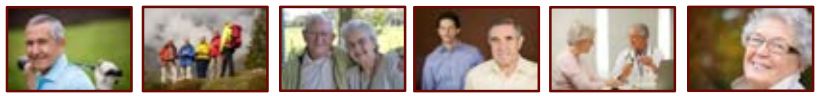


The Veterans' MATES approach

Every three months a chosen health topic is distributed:

- A letter and educational material are sent to:
  - targeted veterans
  - their main GP
  - pharmacists and other health professionals
- GPs also receive patient based feedback



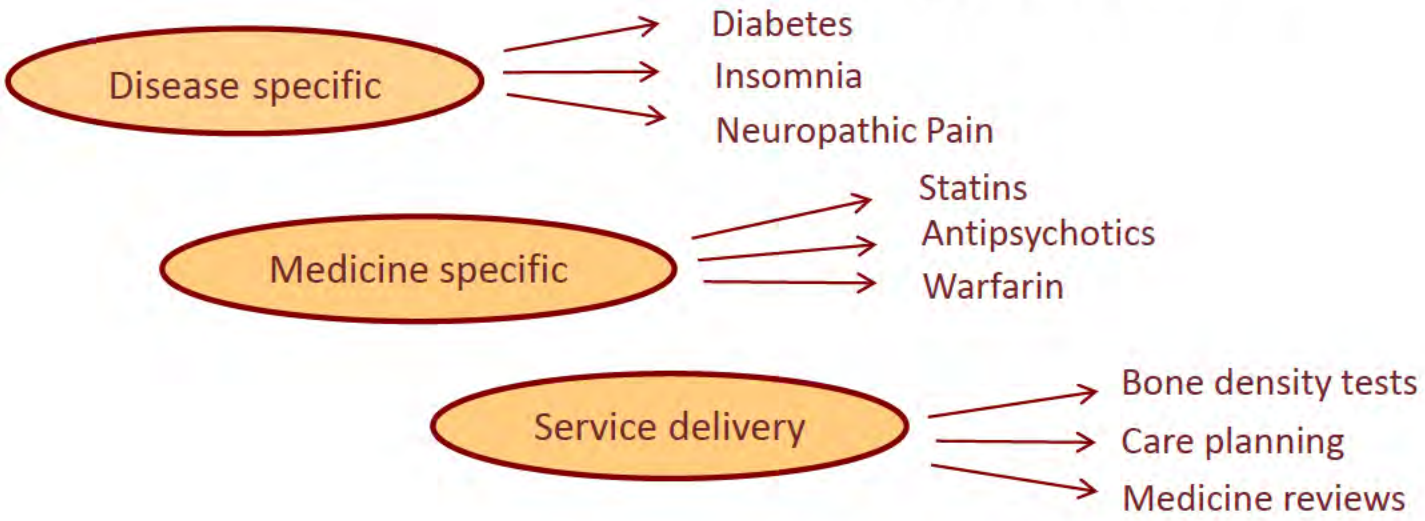


The Veterans' MATES approach

- To date 50 topics delivered:

On average:

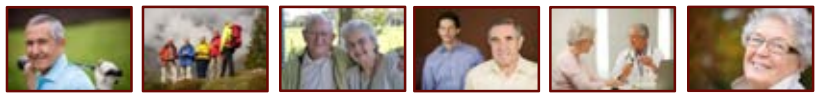
- 40,000 veterans
- 10,000 GPs
- 8,500 pharmacies and accredited pharmacists
- 2,600 Directors of Care, Residential Aged Care Facilities



The behavioural theories underpinning Veterans' MATES

- Social cognitive theory and the Transtheoretical Model
  - Individuals at different states of change
  - Cognitive engagement, repetition, reinforcement, self efficacy and motivations

- Precede-Proceed Health Promotion Model
  - Needs assessment, both social and epidemiological
  - Barriers, reinforcers, enablers
  - Process, impact and outcome measures of evaluation



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

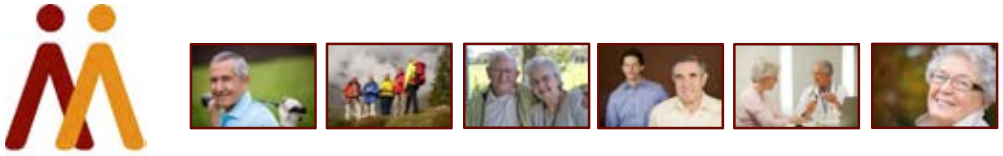
Topic implementation

Evaluation stage

Evaluation

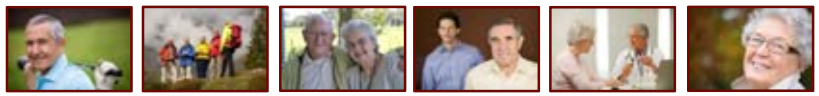
Consultation & Collaboration

- National Strategy for Quality Use of Medicines (QUM)
  - A foundation of strong partnerships and meaningful consultation.
  - Our partners and stakeholders are involved at every stage.
  - They assist in identifying emerging topics, review of our materials and advice on intervention design.



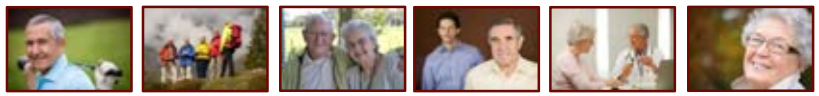
Stakeholder involvement in educational materials

- Tailored for the veteran community.
- Developed with the support of a multidisciplinary clinical reference group that meets twice per topic.
- Reviewed by a national editorial committee that includes representatives from veteran and health professional organisations.
- A veteran reference group and a practitioner reference group meet twice each year.



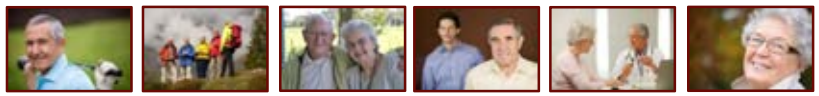
Veterans are at the core of the program

- Veterans play a central role in attaining quality use of medicines and providing the wisdom of their experience.
- Are involved at all stages – design, implementation and evaluation of the program.
- They are asked for their feedback for each topic.



Health professionals are involved at every step

- Consultative, collaborative, multidisciplinary activity.
- Involving medical practitioners, other health professionals and professional organisations.
  - endorsement by RACP, AMA, RACGP, NPS MedicineWise and veterans' organisations
- Targeted health professionals for each topic are asked for their feedback.



Key partnerships

- The program has been developed in partnership with a core consortium of organisations.
- National consultation with stakeholder organisations involving over 45 health professional, veteran and government organisations.

AMH
AUSTRALIAN MEDICINES HANDBOOK

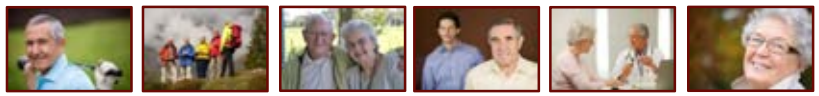
NPS MEDICINEWISE

DATIS
Drug & Therapeutics Information Service
Clinical Support Service

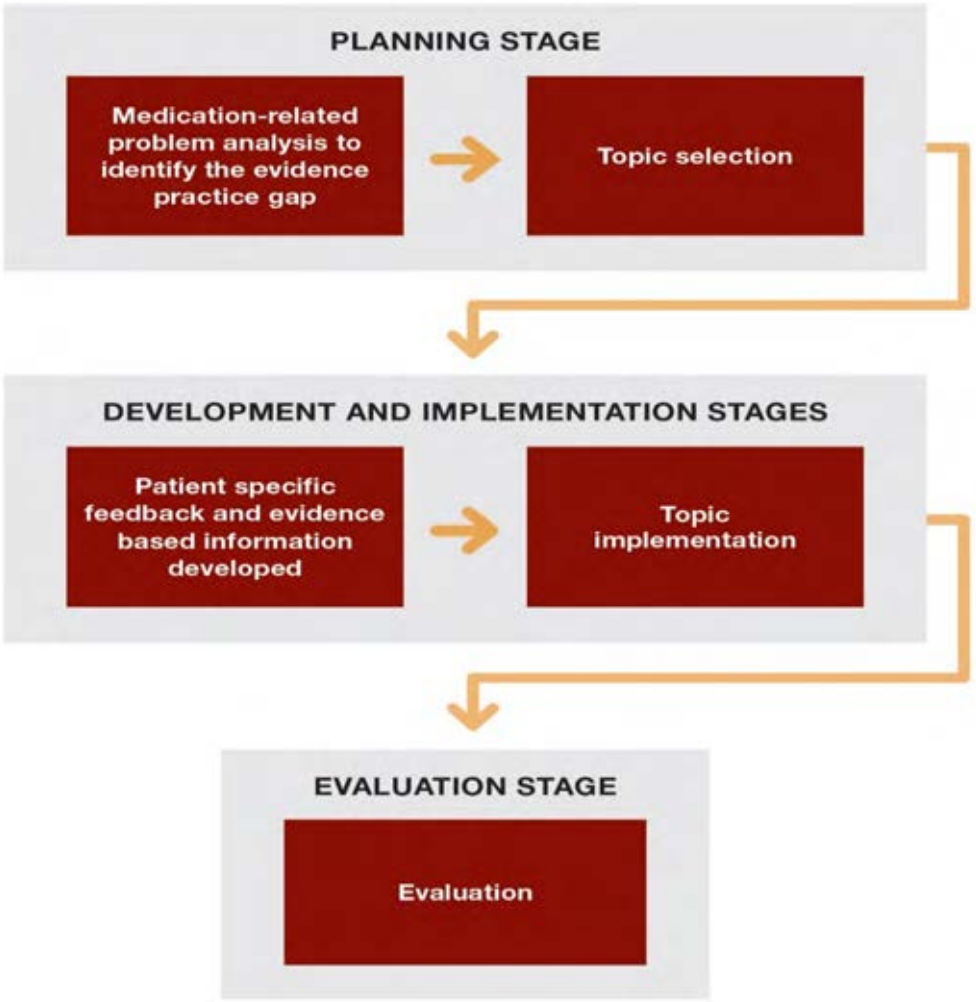
THE UNIVERSITY of ADELAIDE

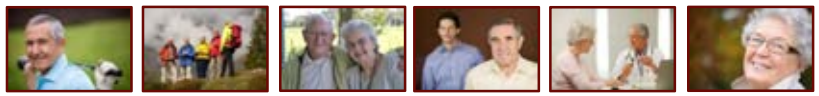
Health claims data are central to Veterans' MATES

- Australian Government Department of Veterans' Affairs health claims data
- 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 and Transport
- Generation of prescriber feedback is automated and tailored



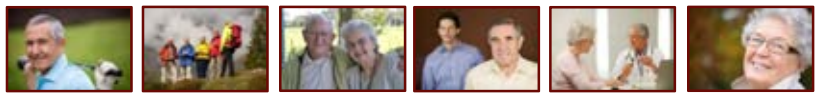
Data are used in every stage of the program





Veterans' MATES Evaluation

- Main evaluation relies on use of routinely collected data
  - Measure practice change
  - Health outcomes avoided
  - Impact of repeat messaging
  - Link with commitment and learning questions from feedback



Challenge: To reduce the use of antipsychotics in dementia

Cohort comparisons and time series analyses

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

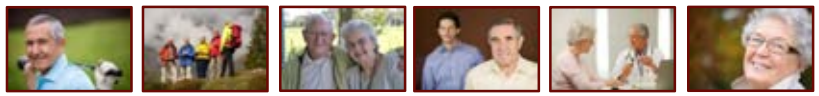
70 cerebrovascular events

70

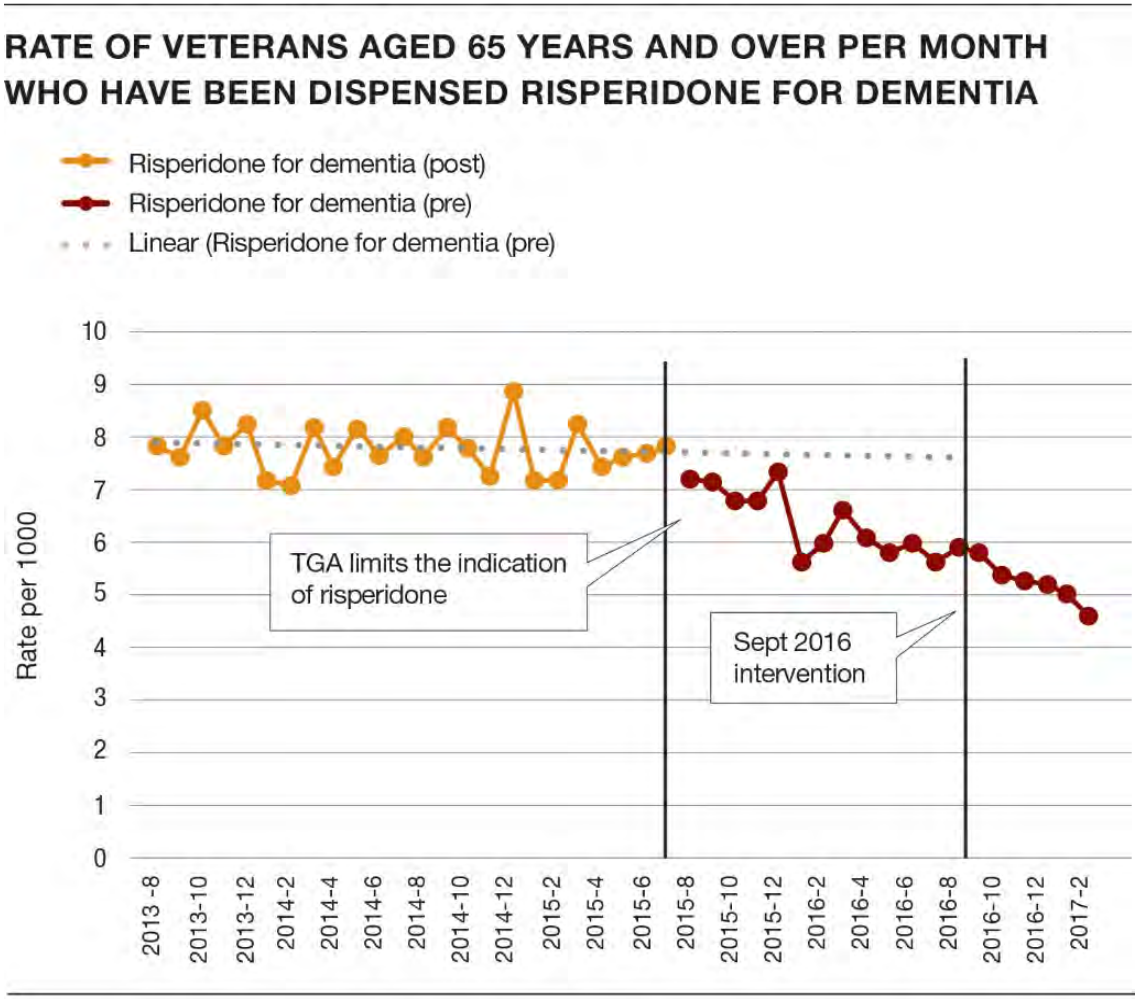
41 premature deaths

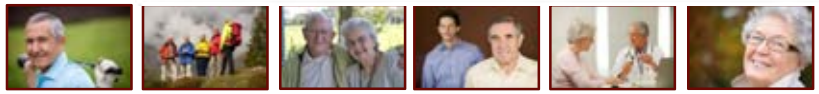
41

*Numbers based on Veterans' MATES analysis and published literature.



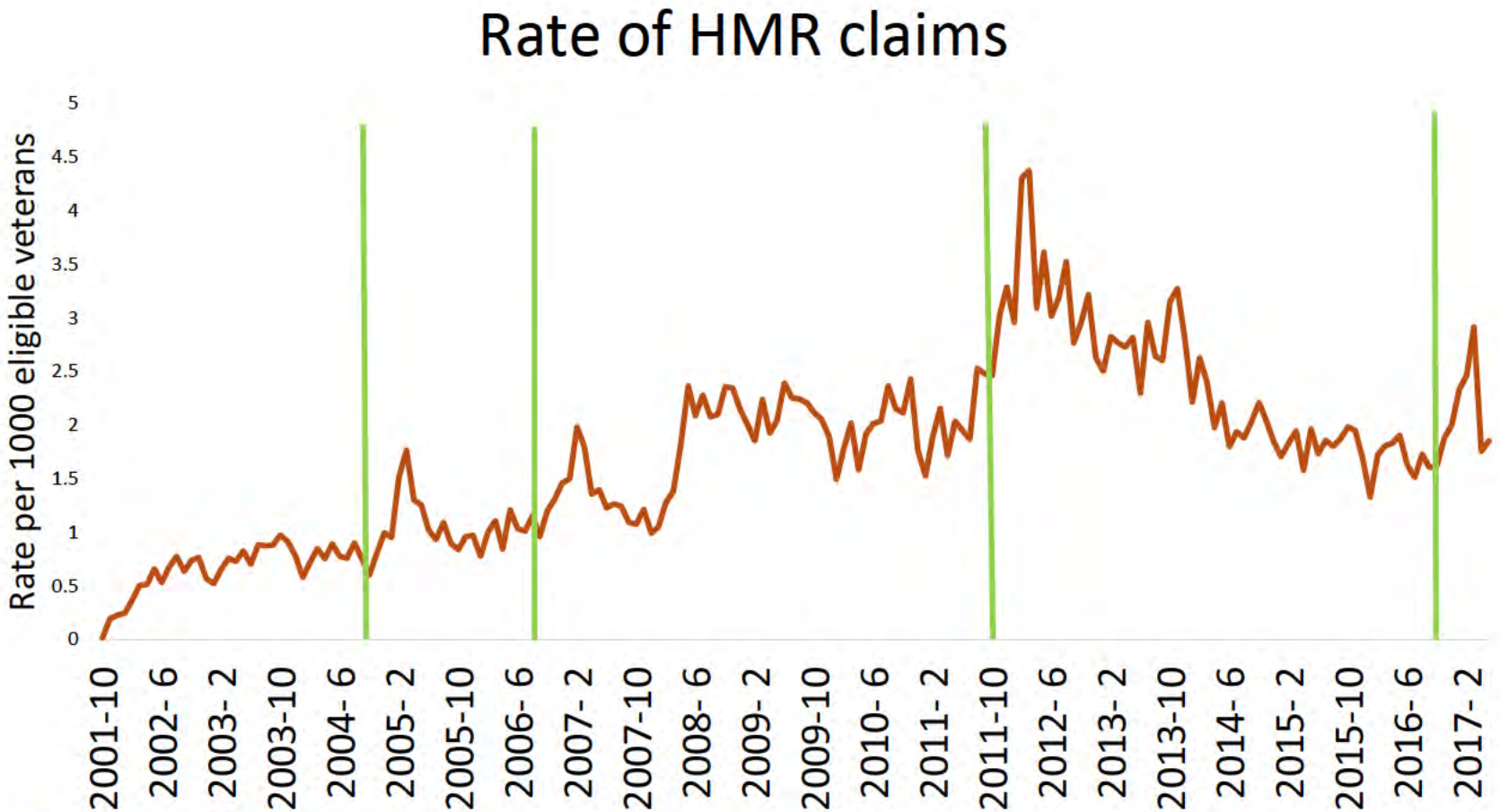
Challenge: To reduce the use of antipsychotics in dementia





Time series analyses for impact evaluation

Home Medicines Review



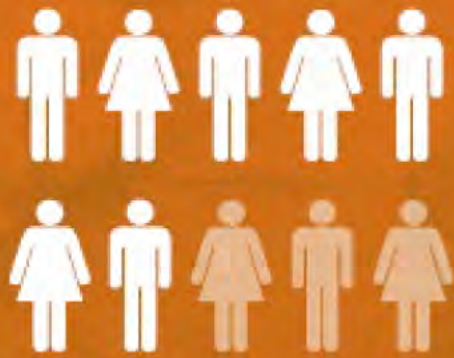
Repeat messaging

Stakeholder feedback

Antipsychotics in dementia

GENERAL PRACTITIONER RESPONSE

More than 7 out of 10 general practitioners reported increased confidence to cease antipsychotics as a result of Veterans' MATES materials.



To date, more than 50 topics have been delivered, involving more than:

310,000 VETERANS

36,000 DOCTORS

8,500 PHARMACIES AND ACCREDITED PHARMACISTS

There is a high degree of participant satisfaction:

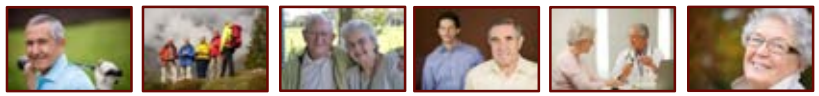
77% OF VETERANS REPORT THE EDUCATION IS HELPFUL

80% OF DOCTORS REPORT THE INFORMATION IS USEFUL

94% OF PHARMACISTS REPORT THE INFORMATION IS USEFUL

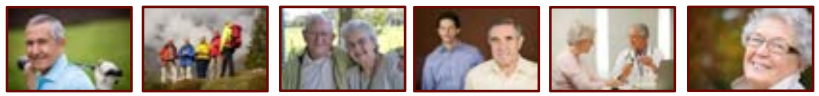
Veterans' MATES success

- The multidisciplinary, collaborative approach
  - Clinicians, practitioners, veterans, health professional organisations, government
  - Biostatisticians, behavioural scientists, Pharmacists, general practitioners, epidemiologists, computer programmers, database managers, security manager
- The analytics are methodologically rigorous
- The clinical information is evidence based



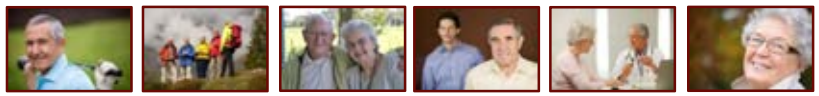
The contributing factors

- There is significant stakeholder engagement
- We only target identified problems
- The interventions are grounded in behavioural theory; target one behaviour at a time
- We repeat interventions over-time
- The program has independently audited data and security standards



The future: Veterans' MATES

- Online delivery
- Link with My Health records
- Intervention innovations
- Future topics:
  - emerging needs



Initiation of antipsychotic medicines in older Australians during hospital admission

Lisa M s 47F s 47F Nicole L s 47F Jemisha s 47F Elizabeth E s 47F

Quality Use of Medicines and Pharmacy Research Centre,
School of Pharmacy and Medical Sciences,
University of South Australia

University of South Australia

Antipsychotics are frequently initiated in hospital

- Antipsychotics initiated in 4.7% to 9% of non-psychiatric hospital admissions
- Of those who initiate antipsychotic in hospital, 26% to 48% are discharged on it
- Predictors of antipsychotic initiation and continuation: older age, delirium, dementia, being a nursing home resident

University of South Australia

Herzig S et al. Antipsychotic use in hospitalized adults: rates, indications and predictors. J Am Geriatr Soc 2016;64:299-305.

Loh K et. al. From hospital to community: use of antipsychotics in hospitalized elders. J Hosp Med 2014;9(12):802-4.

Antipsychotics cause significant harm in older people

- **Hip fracture, pneumonia, stroke, death[1,2,3]**
- **Limited evidence for antipsychotic efficacy in delirium**
    - None TGA approved; if used at all a single dose is usually enough
- **Risperidone is the only antipsychotic indicated for dementia; Maximum 12-weeks duration**
- **International studies suggest frequent and long term antipsychotic use is associated with hospital admission**

University of South Australia

1. Pratt N et al. Pharmacoepidemiol Drug Saf 2013; 22: 915-924.
2. Pratt N et. al. Drug Safety 2011; 34: 567-575.
3. Pratt N et. al. Pharmacoepidemiol Drug Saf 2010; 19: 699-707.

Antipsychotics cause significant harm in older people

- How often are antipsychotics started in non-psychiatric hospital admissions in Australia?
- What are the types of hospital admission most commonly involved?
- How many people keep taking antipsychotics after discharge, and how long do they keep taking them?

We looked at non-psychiatric hospital admissions for people aged ≥ 65

- We excluded people who had previously used antipsychotics or who had been admitted to hospital for psychotic illness
- We determined how many admissions were associated with antipsychotic initiation and the diagnosis for these admissions
- For people who started an antipsychotic in hospital, we determined how long they kept taking it after leaving hospital

Data source: Australian Government Department of Veterans' Affairs administrative claims data

142,009 admissions
66,415 people

49.9% men

50.1% women

Median age 86 years

11% lived in an aged care facility before admission

Antipsychotic initiated in 921 admissions (0.6%)

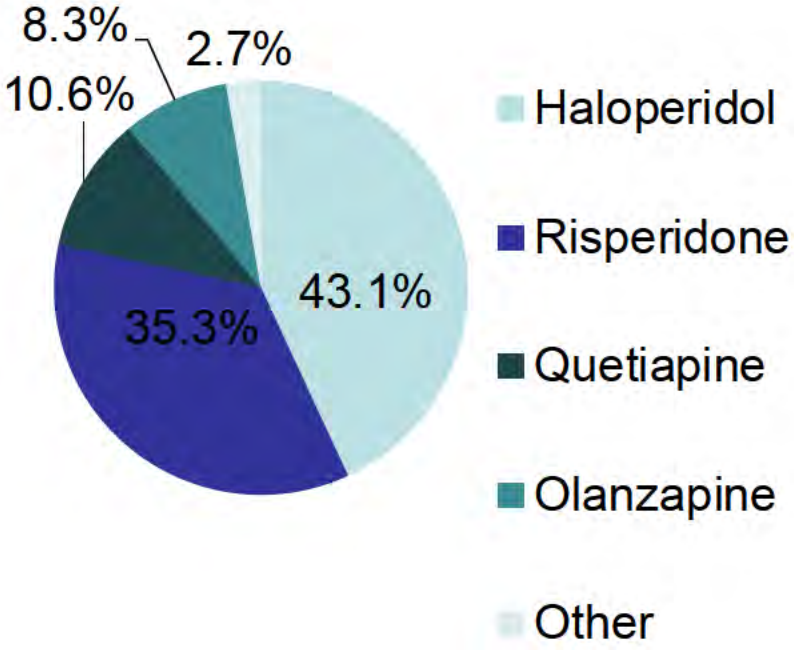
49.5% men

50.5% women

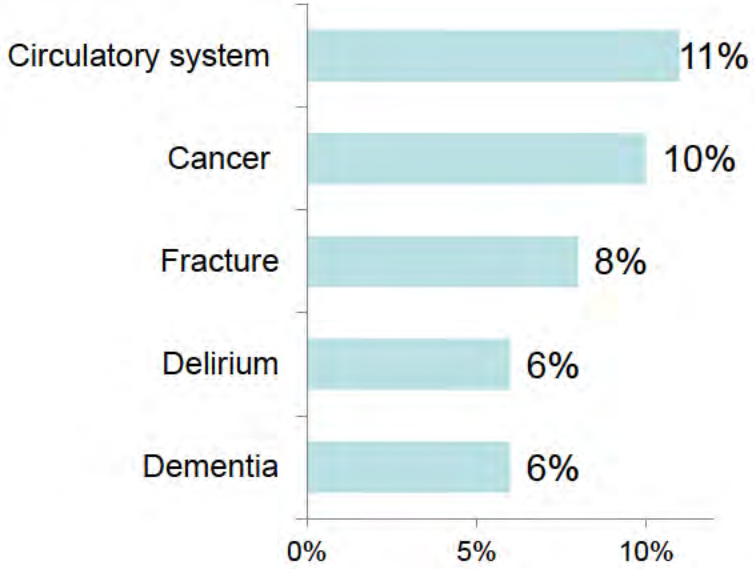
Median age 89 years

16% lived in an aged care facility before admission

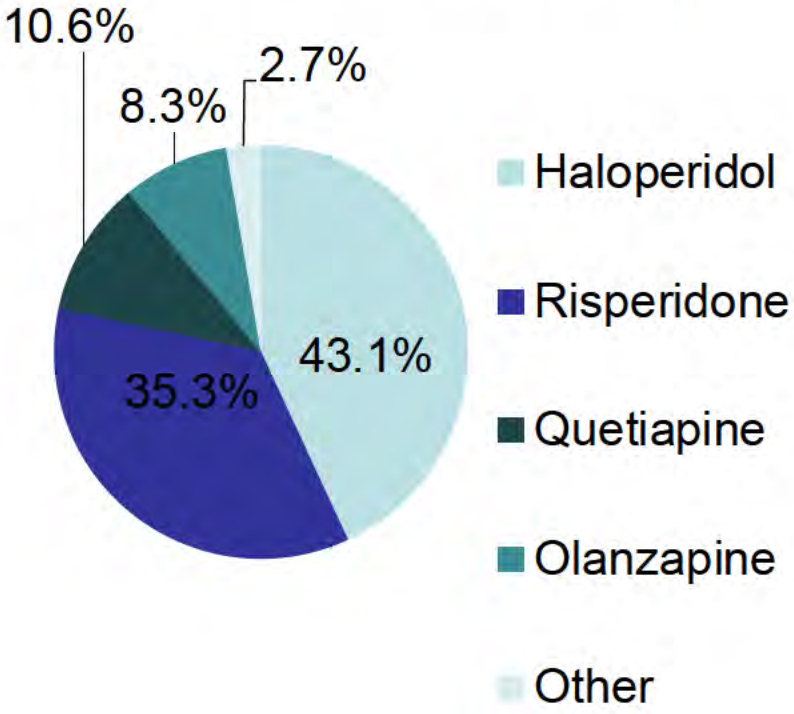
Of the 921 admissions with antipsychotic initiated, it was most commonly:



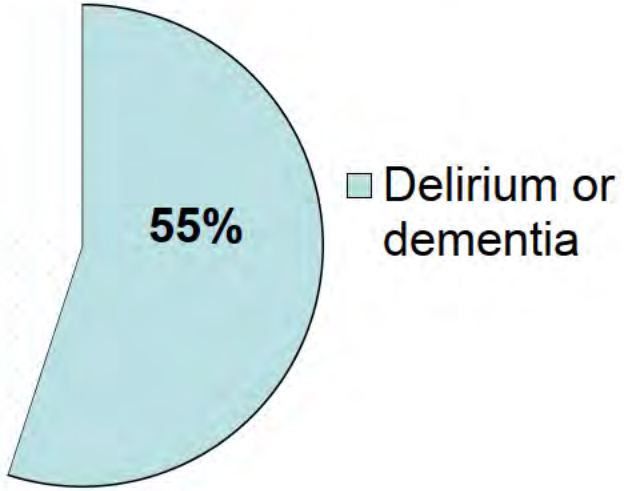
The primary diagnosis for the 921 admissions where antipsychotics were initiated was most commonly:



Of the 921 admissions with antipsychotic initiated, it was most commonly:



When secondary diagnoses for admissions were also considered, more than half involved a diagnosis of delirium or dementia



Long term use of antipsychotics was common

- At one year follow up, 53% continued to use antipsychotic
- Conclusions: Antipsychotic initiation associated with non-psychiatric hospital admissions is uncommon…
    - but amongst those who do initiate, long-term use is common
    - Need to ensure duration of antipsychotic use after hospital is appropriate

Acknowledgements

- Australian Government Department of Veterans' Affairs

- Funding source: LKE is supported by an NHMRC-ARC Dementia Research Development Fellowship

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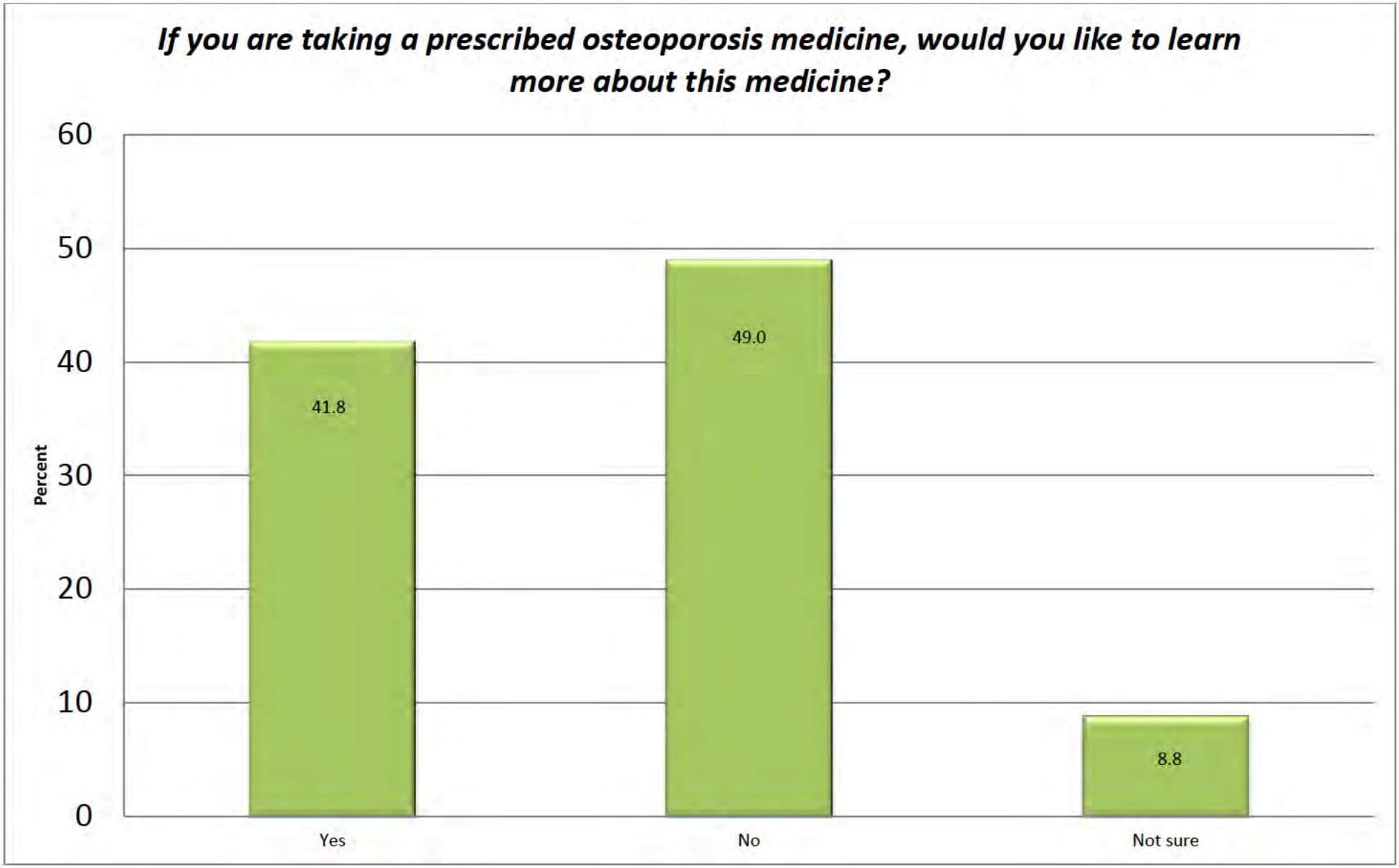
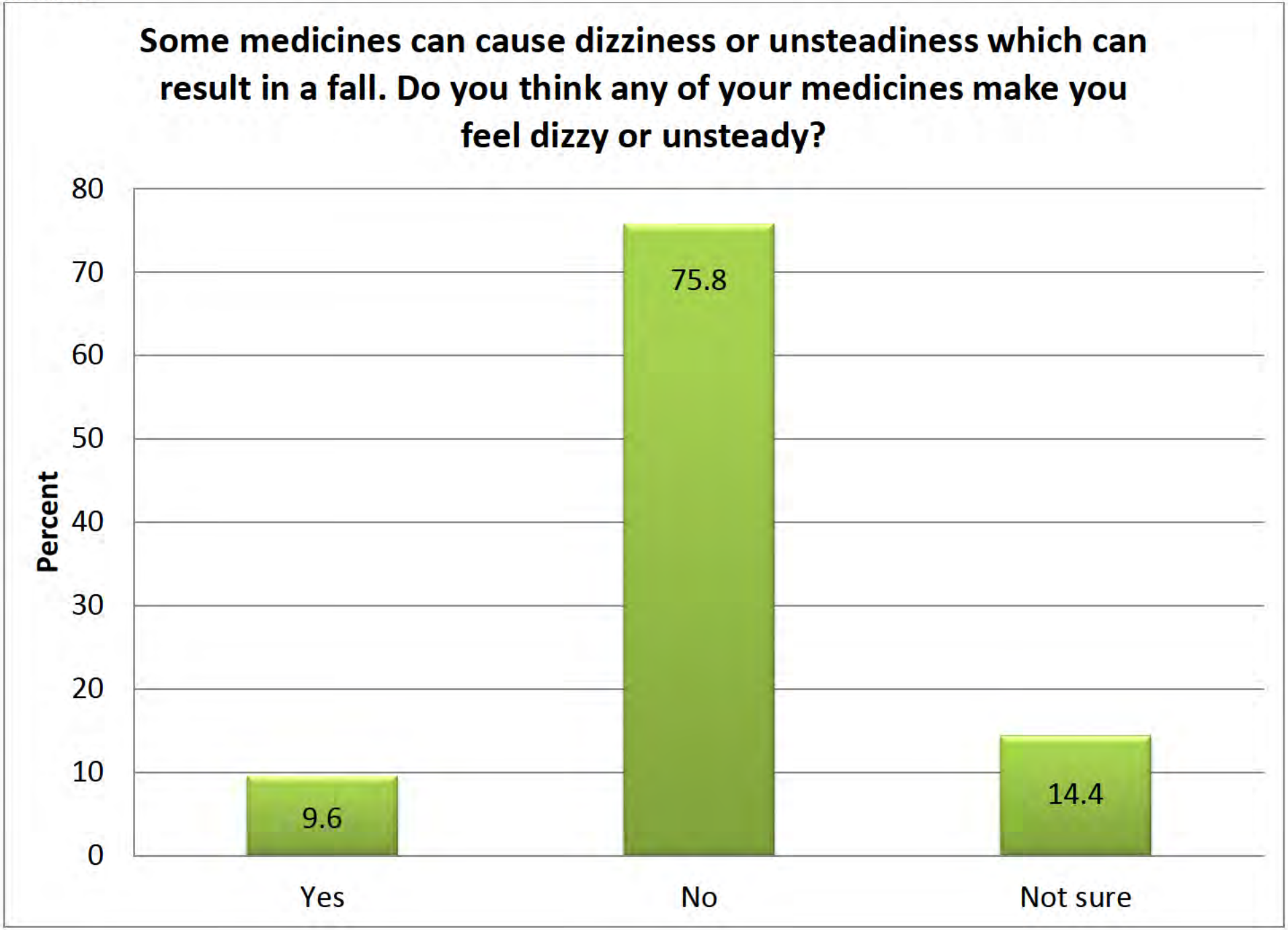
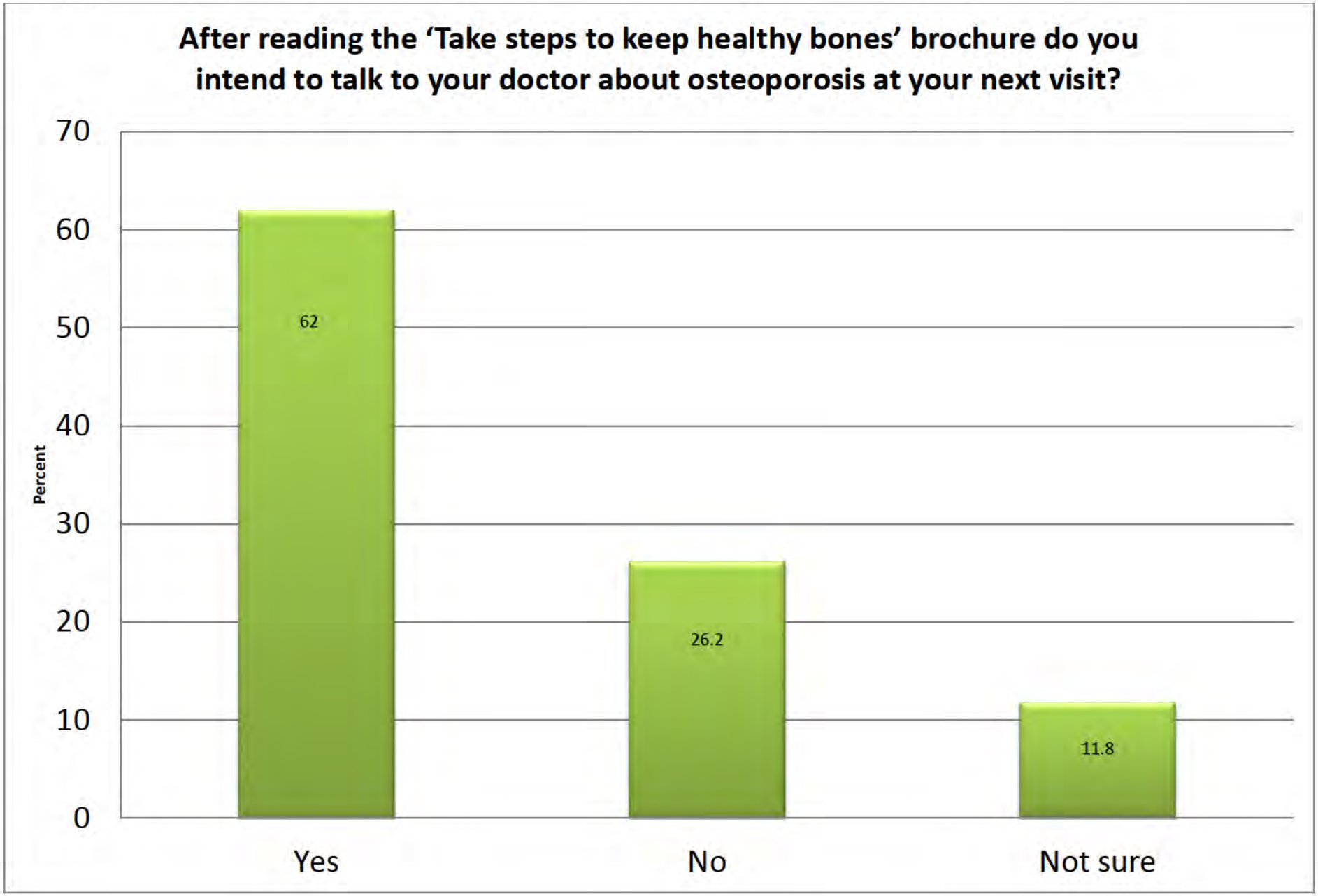
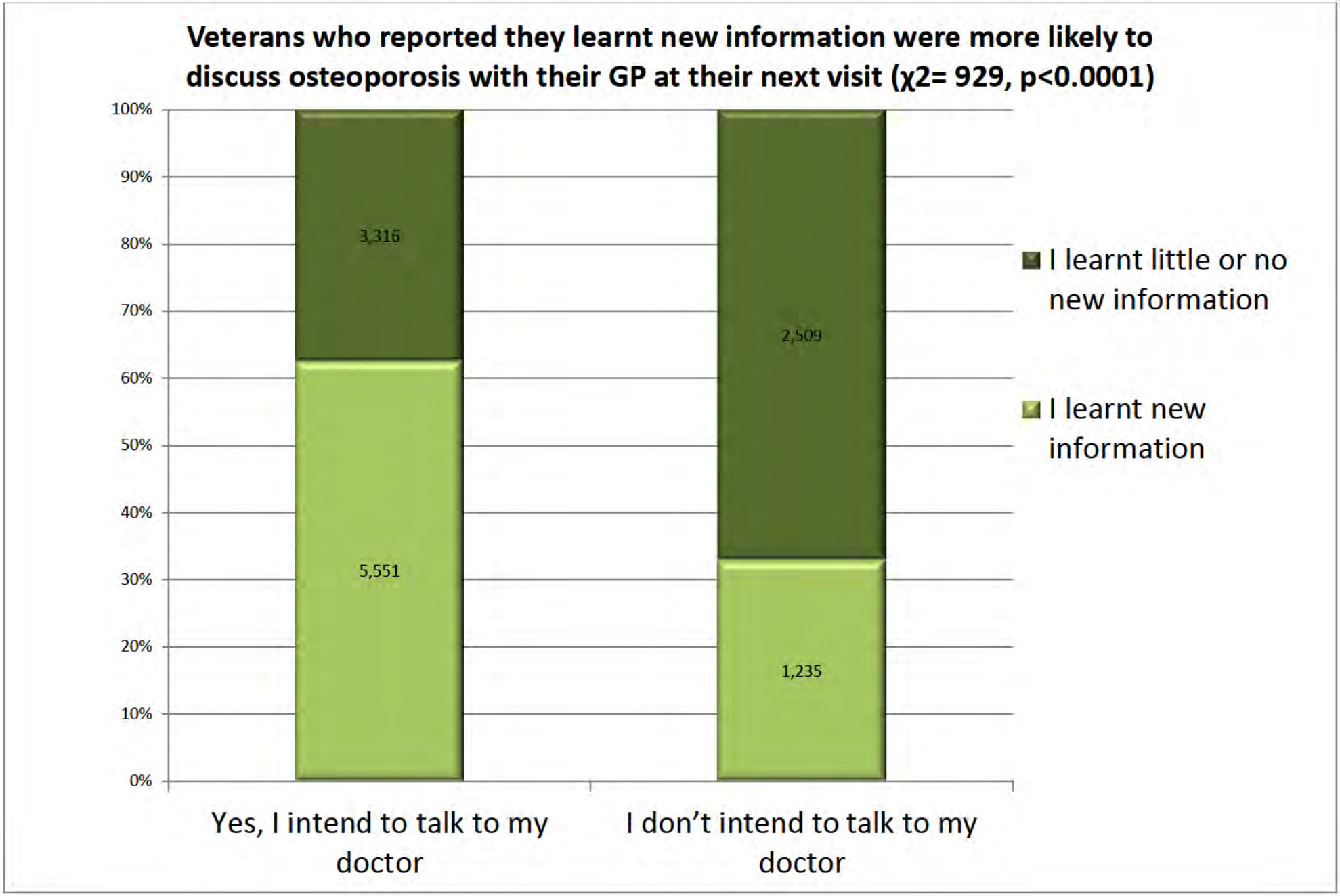
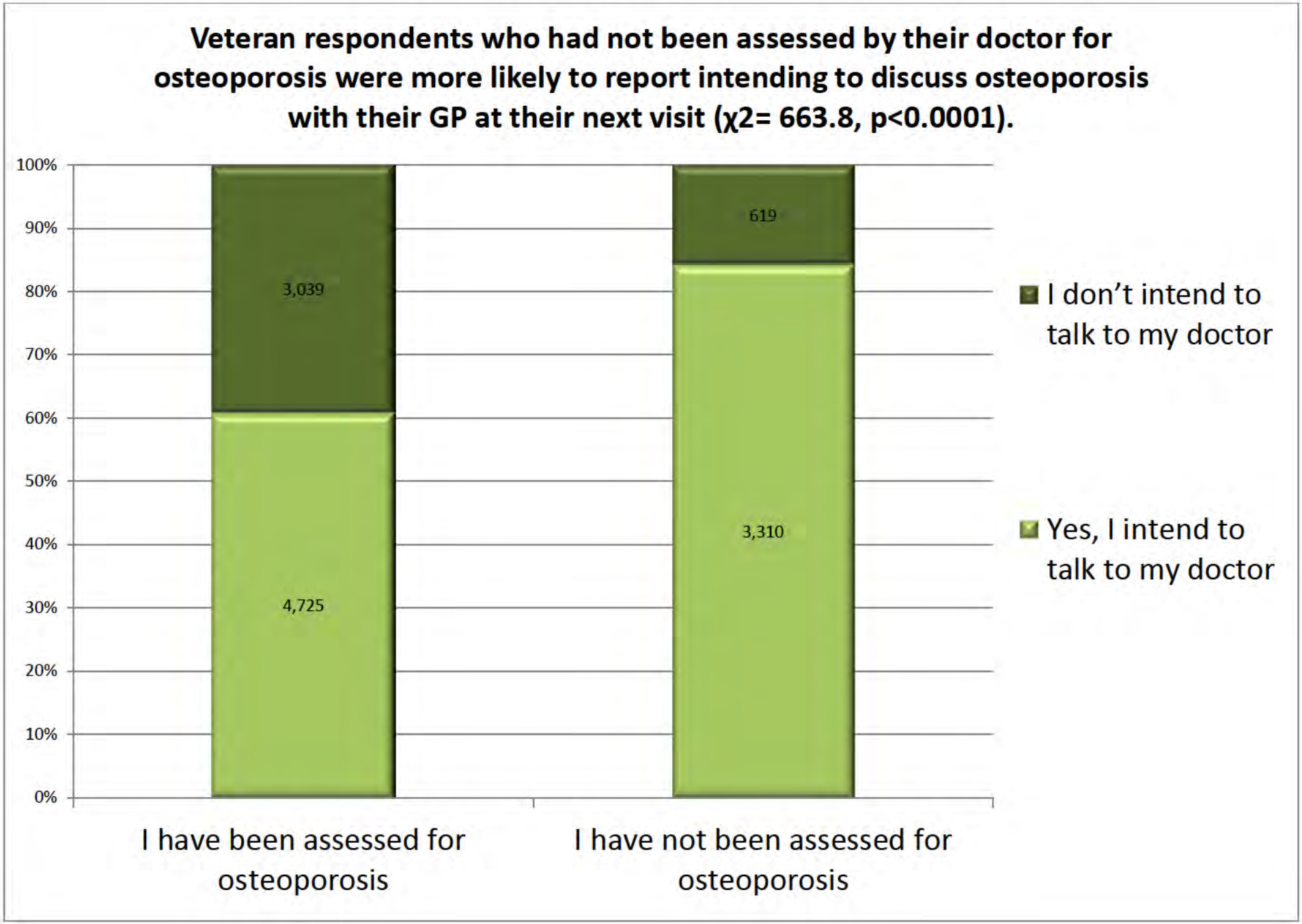
Module 28


If you are taking a prescribed osteoporosis medicine, would you like to learn more about this medicine?
60
50
40
30
20
10
0
Percent
41.8
49.0
8.8
Yes
No
Not sure

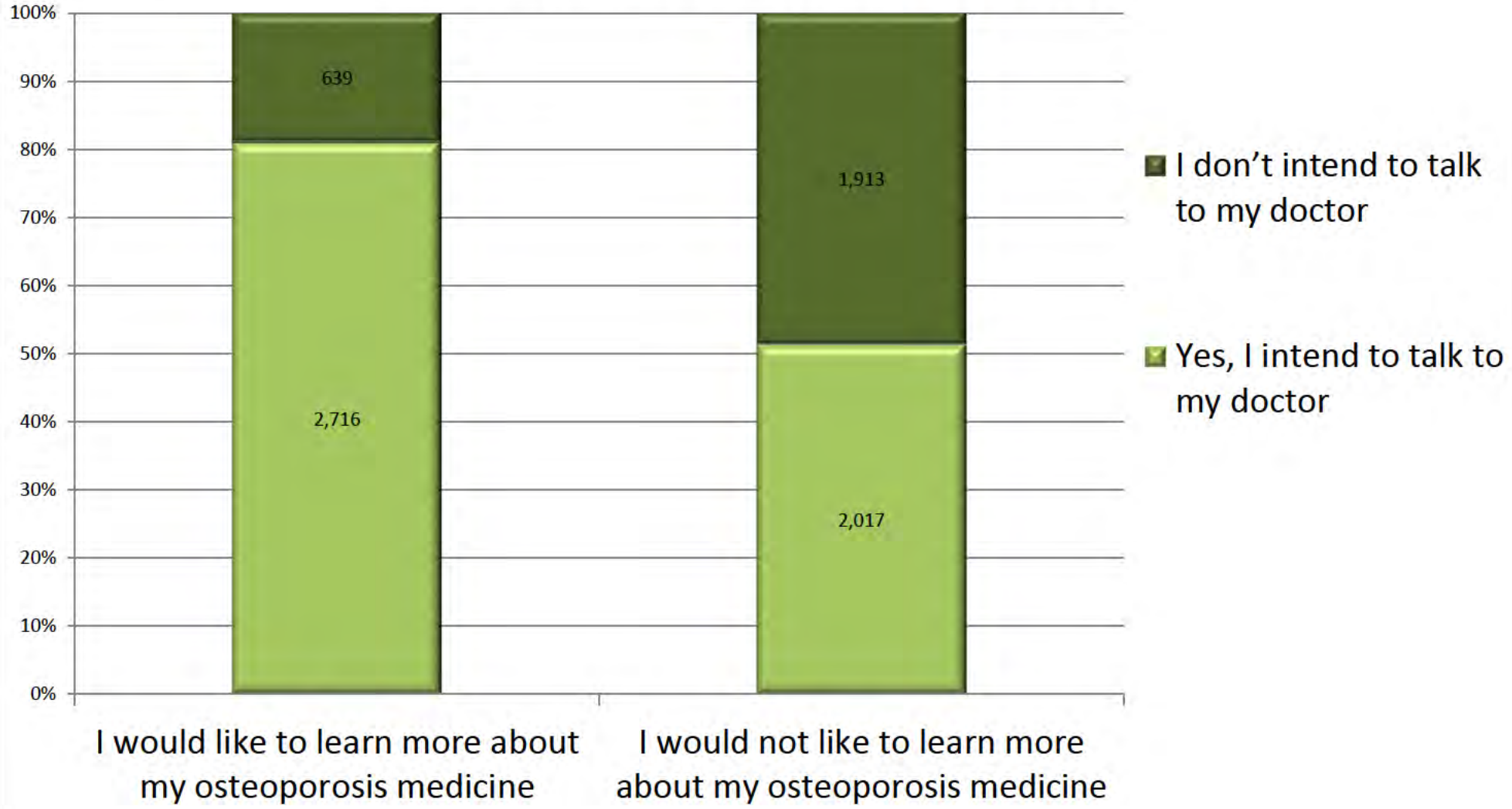

Some medicines can cause dizziness or unsteadiness which can result in a fall. Do you think any of your medicines make you feel dizzy or unsteady?
Percent
80
70
60
50
40
30
20
10
0
9.6
75.8
14.4
Yes
No
Not sure

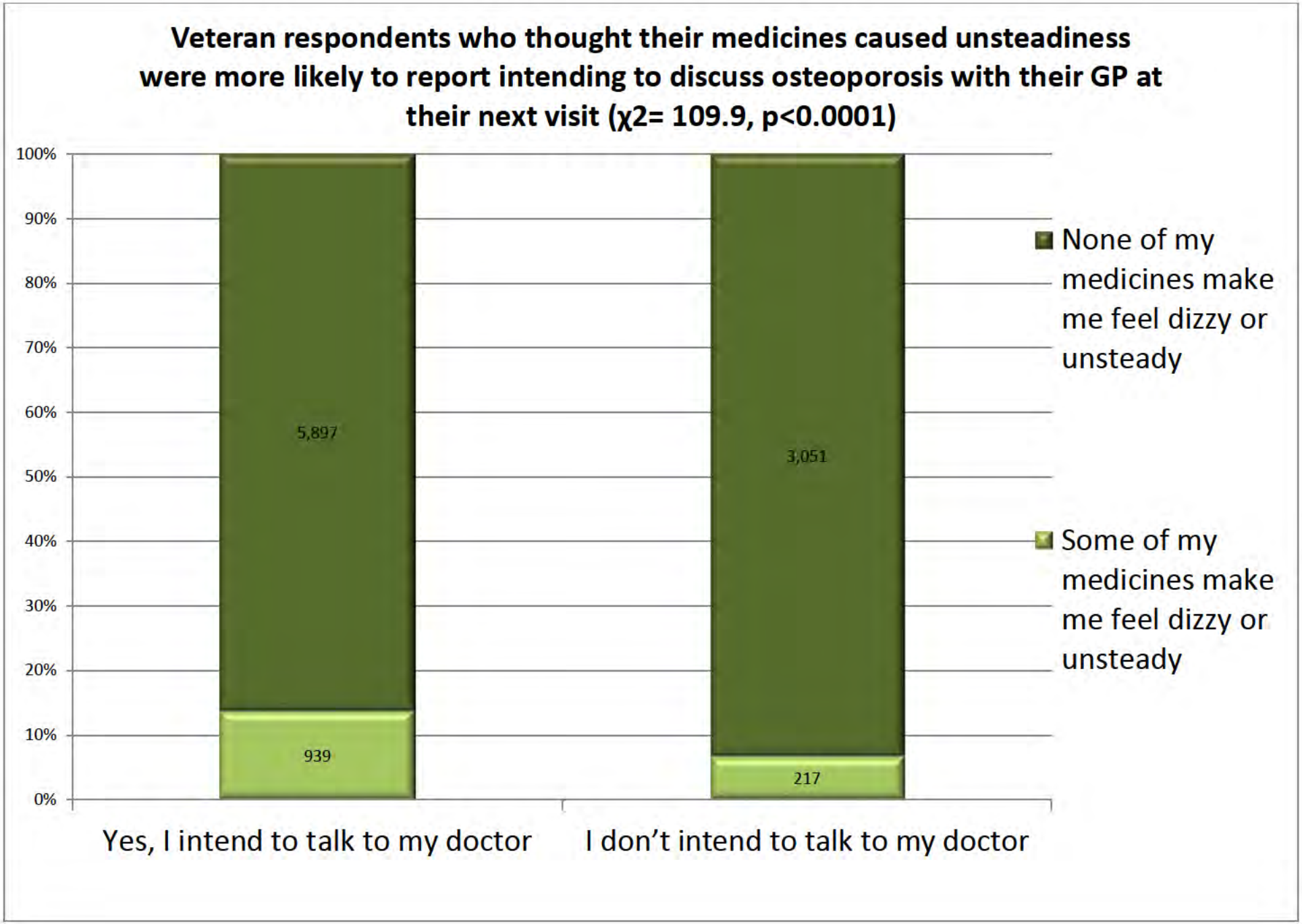

After reading the 'Take steps to keep healthy bones' brochure do you intend to talk to your doctor about osteoporosis at your next visit?
Percent
70
60
50
40
30
20
10
0
62
26.2
11.8
Yes
No
Not sure

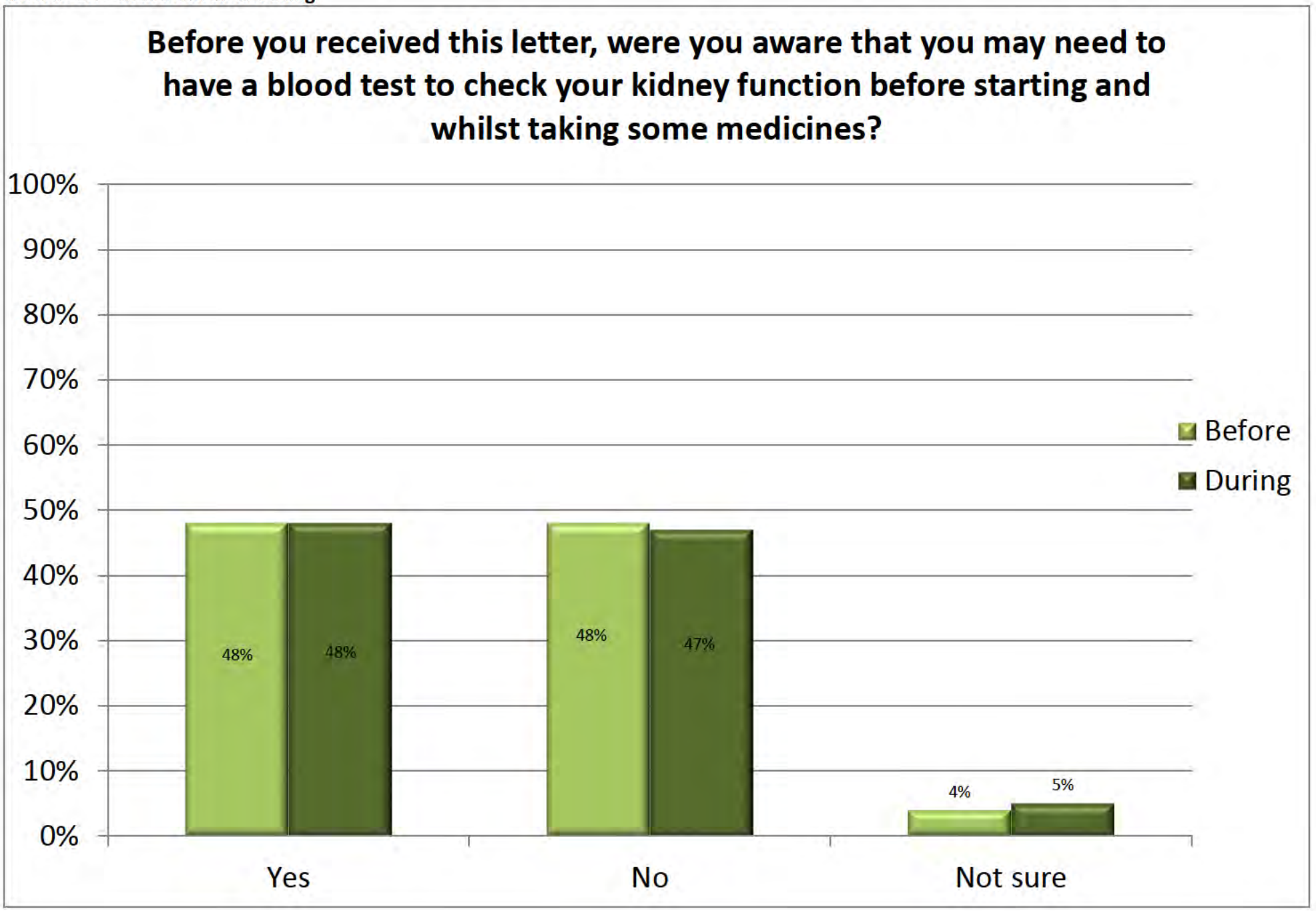

Veterans who reported they learnt new information were more likely to discuss osteoporosis with their GP at their next visit (χ2= 929, p<0.0001)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
3,316
5,551
2,509
1,235
I learnt little or no new information
I learnt new information
Yes, I intend to talk to my doctor
I don't intend to talk to my doctor

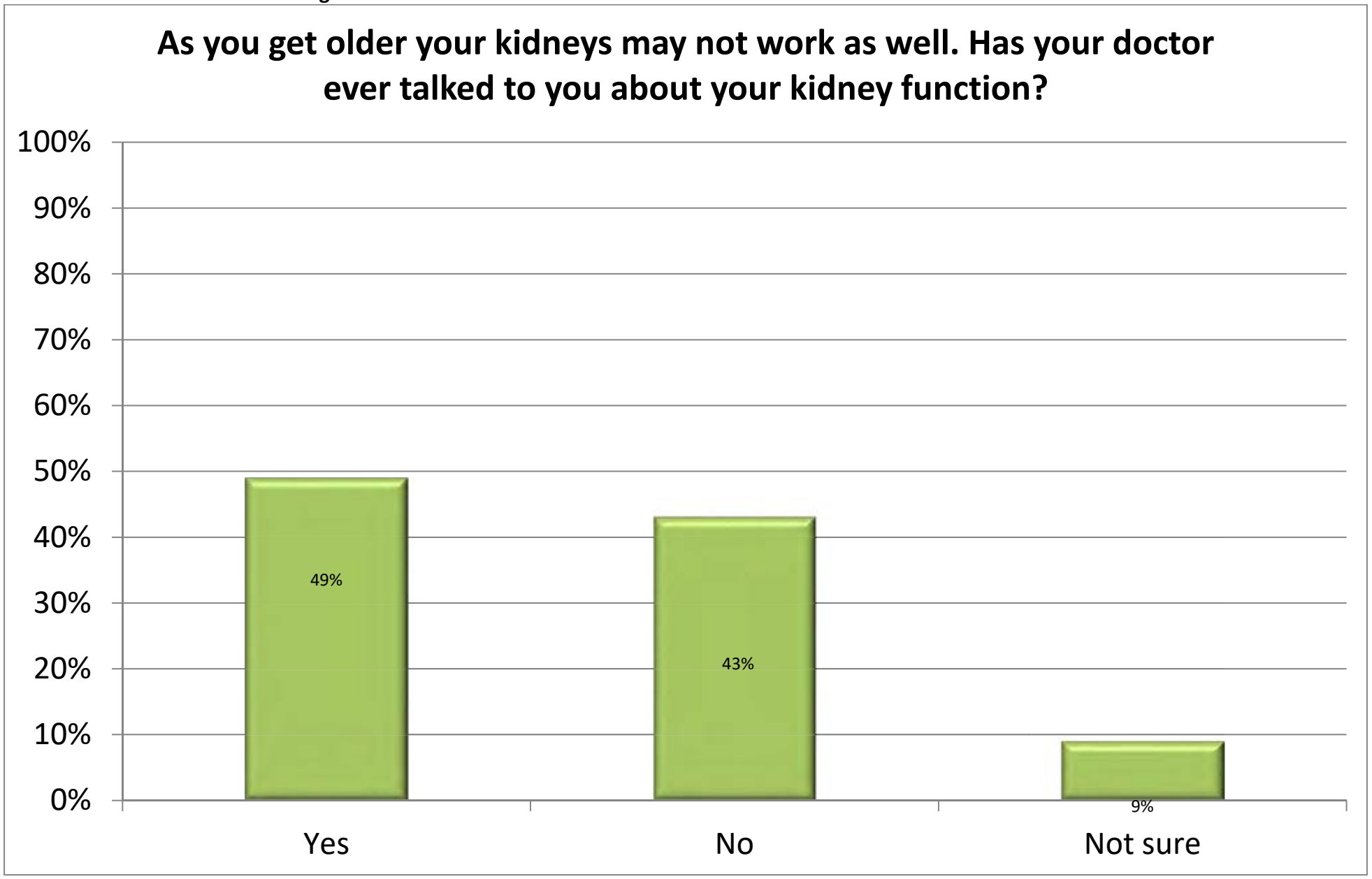

Veteran respondents who had not been assessed by their doctor for osteoporosis were more likely to report intending to discuss osteoporosis with their GP at their next visit (χ2= 663.8, p<0.0001).
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
3,039
4,725
619
3,310
I don't intend to talk to my doctor
Yes, I intend to talk to my doctor
I have been assessed for osteoporosis
I have not been assessed for osteoporosis

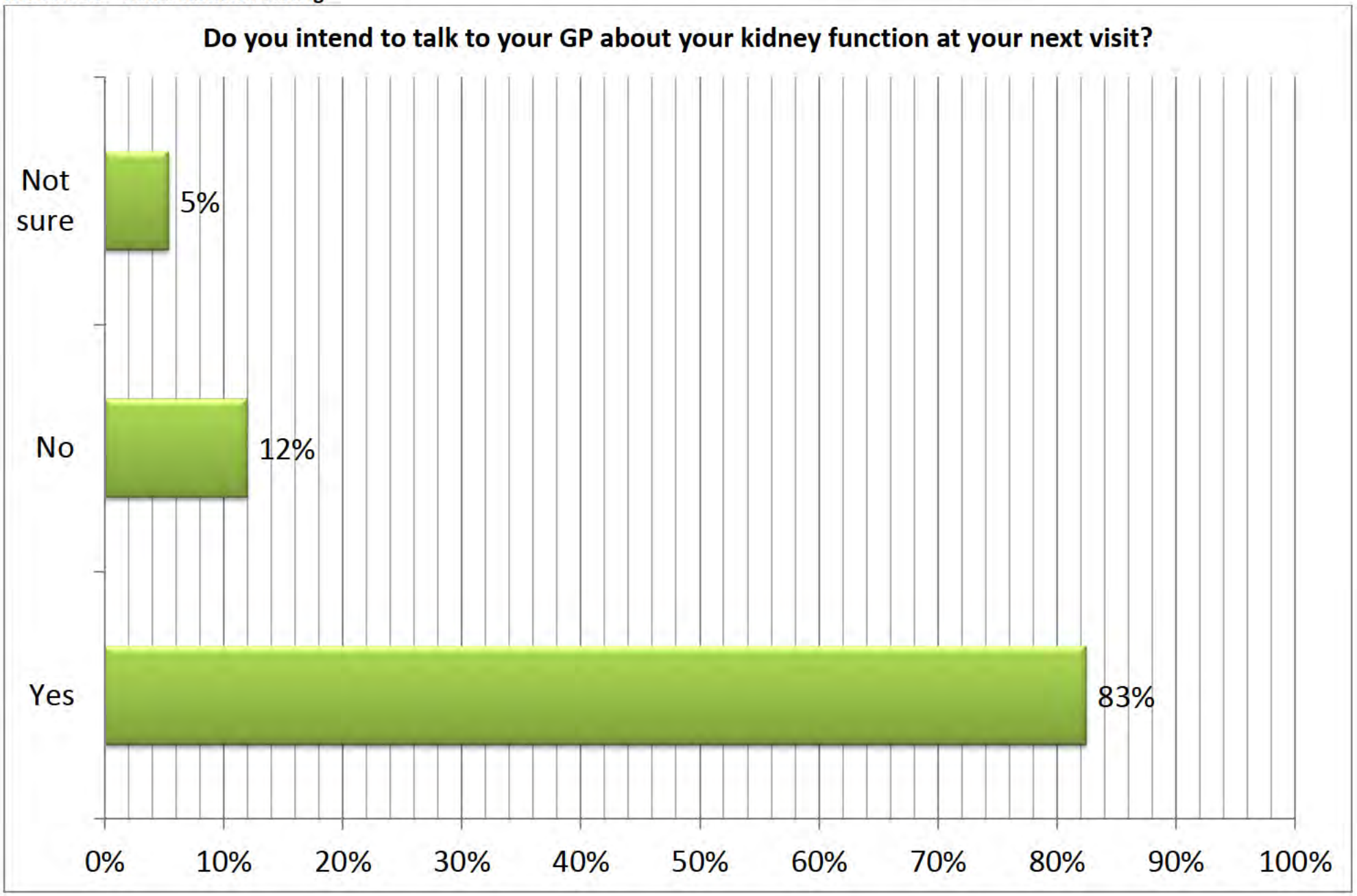
Veteran respondents who stated they would like more information about their osteoporosis were more likely to report intending to discuss osteoporosis with their GP at their next visit ($\chi 2 = 698.2$, $p<0.0001$).

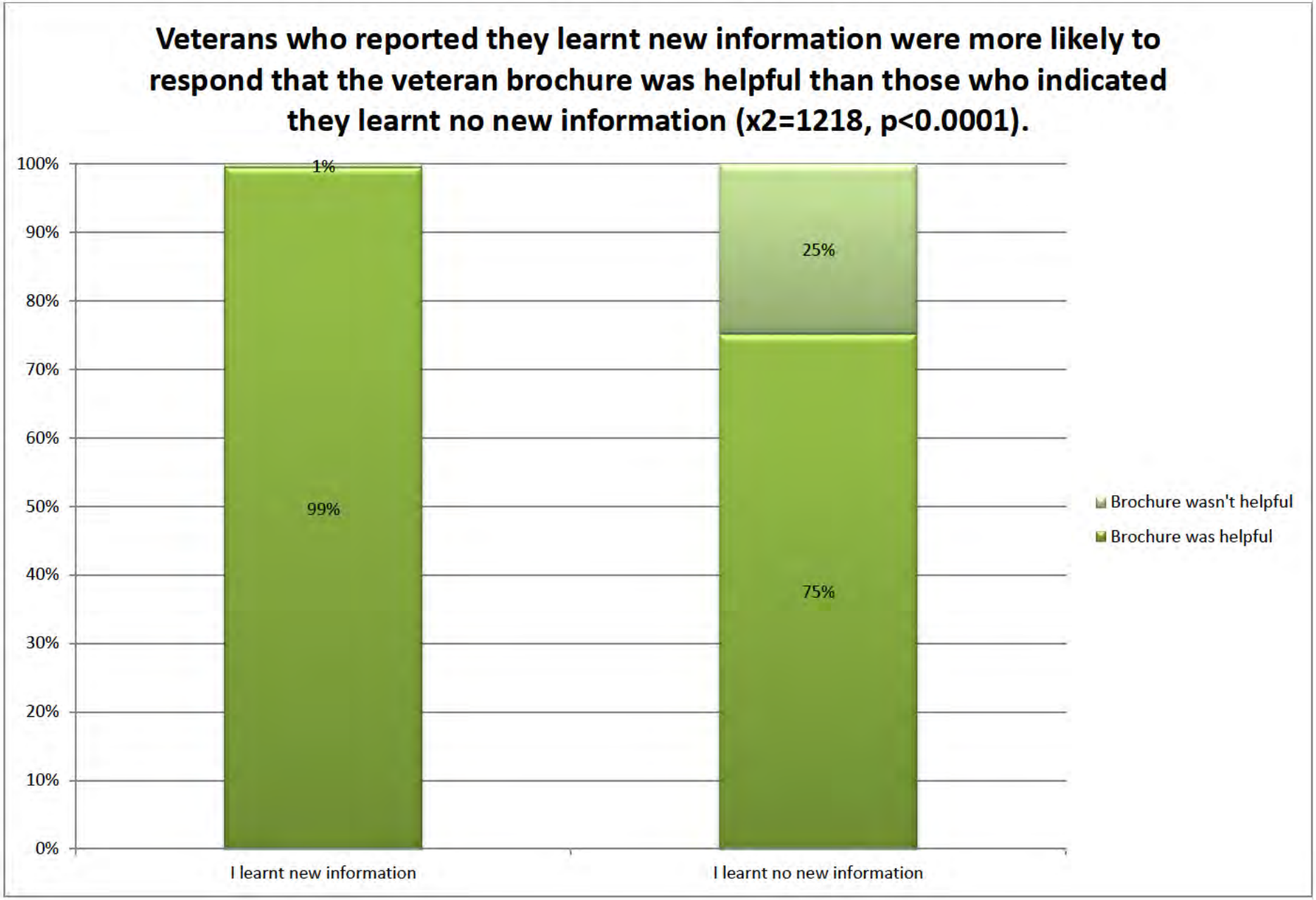



Veteran respondents who thought their medicines caused unsteadiness were more likely to report intending to discuss osteoporosis with their GP at their next visit (χ2= 109.9, p<0.0001)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
5,897
939
3,051
217
None of my medicines make me feel dizzy or unsteady
Some of my medicines make me feel dizzy or unsteady
Yes, I intend to talk to my doctor
I don't intend to talk to my doctor


Before you received this letter, were you aware that you may need to have a blood test to check your kidney function before starting and whilst taking some medicines?
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
48%
48%
48%
47%
4%
5%
Yes
No
Not sure
Before
During


As you get older your kidneys may not work as well. Has your doctor ever talked to you about your kidney function?
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
49%
43%
9%
Yes
No
Not sure


Do you intend to talk to your GP about your kidney function at your next visit?
Not sure
5%
No
12%
Yes
83%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%


Veterans who reported they learnt new information were more likely to respond that the veteran brochure was helpful than those who indicated they learnt no new information (x2=1218, p<0.0001).
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1%
99%
25%
75%
I learnt new information
I learnt no new information
Brochure wasn't helpful
Brochure was helpful

Veterans' Medicines Advice and Therapeutic Education Services Project

Libby s 47F

Sansom Institute

University of South Australia

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

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

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.

- Want to learn more about your medicines?
- Unsure how long you should keep taking each medicine?
- Unsure about the best time to take each medicine?
- Recently started a new medicine or had your medicines changed?
- Do you forget to take your medicines?
- Are you confused or worried about your medicines?

A **Home Medicines Review** may help

Veterans' Medicines Advice and Therapeutics Education Services

Australian Government
Department of Veterans' Affairs

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

UniSA

Veterans' Medicines Advice and Therapeutics Education Services

Veterans'MATES

Home Medicines Review

Get the best from your medicines

Veterans' Medicines Advice and Therapeutics Education Services

Therapeutic area selected

Medication-related problem analysis

Module topic selected

Patient specific feedback developed

Module implementation

Evaluation

The data set

Primary data set: DVA Pharmacy Datamart

- Three major tables
  - Claims table
  - Client table
  - Provider table
- Other tables
  - Look up tables
  - Authority table
  - Medication review table

Claims table

- Pharmacy Id
- Prescriber Id
- Client Id
- Prescription date
- Dispensing date
- Claim date
- PBS item number
- Quantity
- Manufacturer

- Safety net indicator & id
- Authority indicator & id
- Original or repeat indicator
- Repeat number
- Previous supply number
- Regulation 24 indicator
- Benefit paid

Client table

- Date of birth
- Date of death
- Gender
- Card type (eg white, gold, orange)
- Conflict (eg war)
- Relationship (eg spouse)
- Postcode

Provider table

- Speciality codes
- Practice locations

Enables

- Tracking patients, doctors or pharmacies

Types of analyses undertaken

Medication related problem analysis

Types of medication related problems

- Under utilisation
- Unnecessary medicine
- Wrong medicine
- Inappropriate dose (too much or too little)
- Inappropriate duration (too much or too little)
- Adverse drug event

Medication related problem analysis

- Lack of utilisation
  - Relatively easy
  - Absence of a prescription or service in specified period

  Examples:
  - no medicines review service in the last twelve months in the population taking five or more medicines
  - no beta-blockers dispensed in the veteran population dispensed medicines indicative of heart failure
  - no ACE inhibitor/A2RB, lipid lowering agent or anti-platelet agent in people dispensed medicines for diabetes

Medication related problem analysis

- Unnecessary medicine or wrong medicine
  - Usually requires an assessment of concurrent use

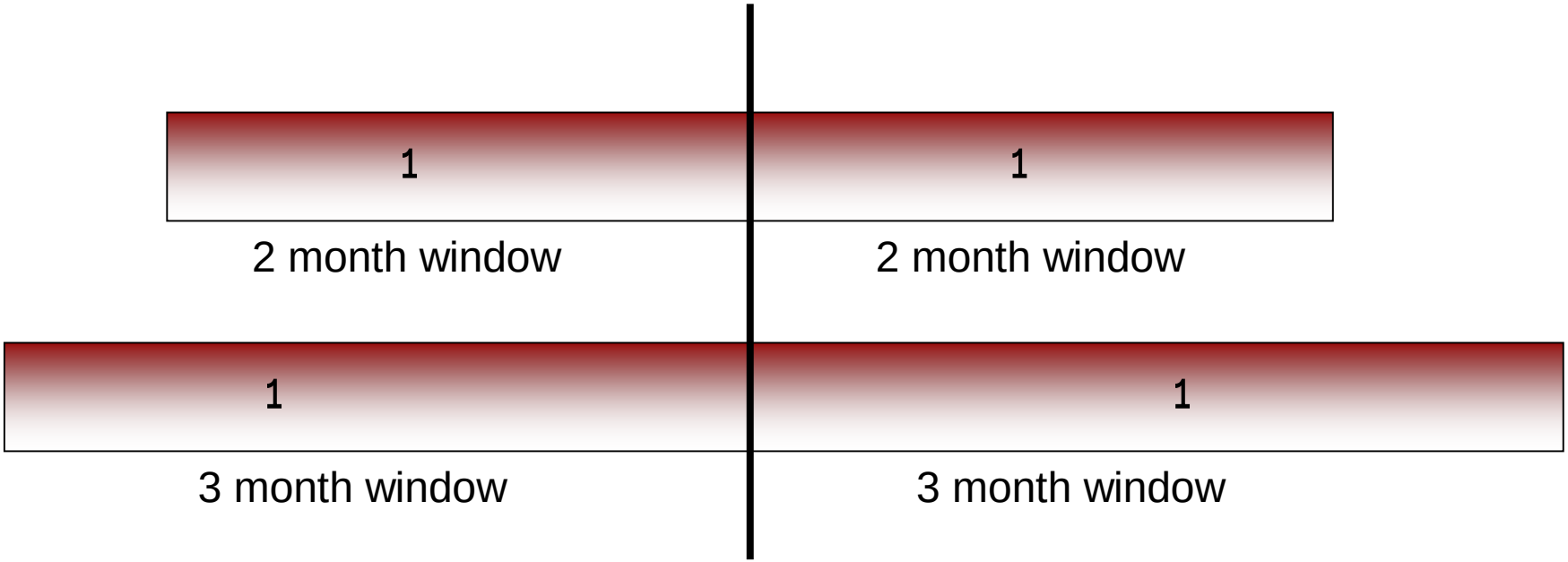
  Examples:
  - tiotropium use with long acting beta agonists
  - antidepressant use with interacting medicines

Concurrent medication use

- Two methods:
  Where pack sizes are similar
  - Identify first dispensing in the month of each product
  - Take latest date of dispensing of second product dispensed (note, they may be the same day)
  - Find one or more subsequent dispensings of both products after the latest date identified above

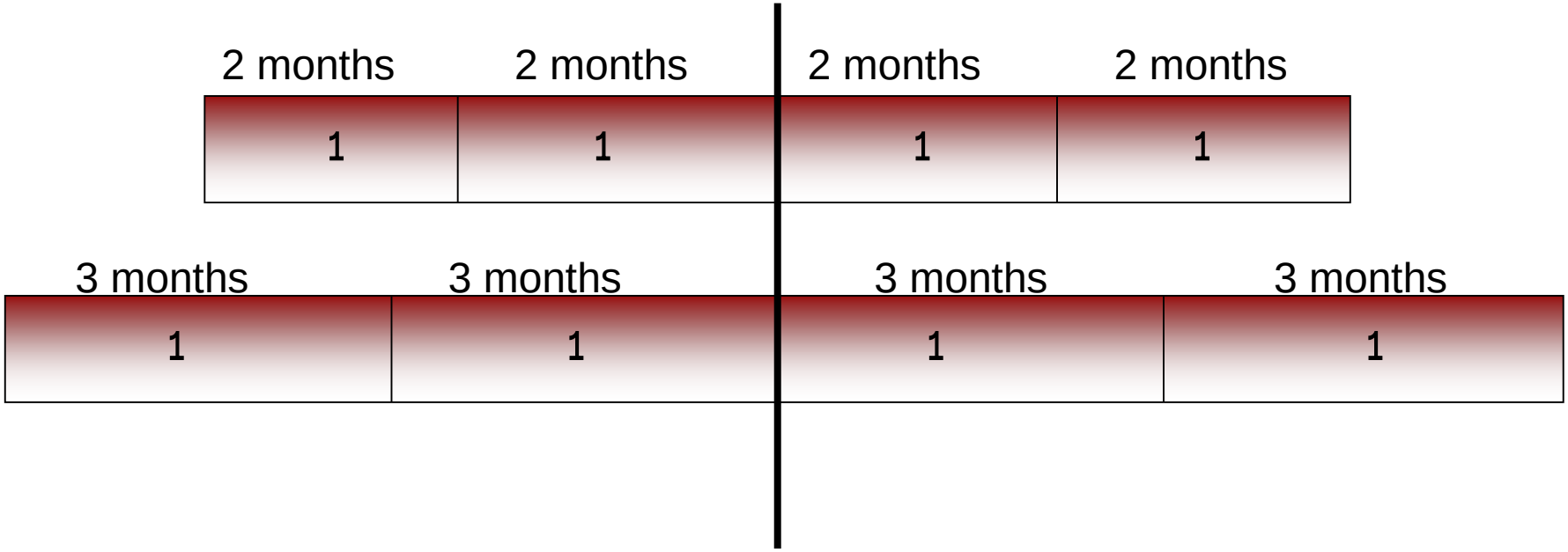
Concurrent medication use

- Where pack sizes are dissimilar



Concurrent medication use

- Where pack sizes are dissimilar



Creation of patient specific feedback

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

- What definition of “multiple medicines”
- We used patients who were dispensed at least five unique medicines every month for four months: approximately 40,000 veterans
- Difficulty: those who were dispensed 6, 6, 4, 7, would not be in our target list.
- When we examined those who had at least five unique medicines dispensed over the four months and at least 20 dispensings in the four months, we found another 50,000 veterans.

Module 2: aimed to increase the use of beta-blockers in patients with heart failure

- Identifying patients with possible heart failure
- Proxy indicators were patients dispensed an ACE inhibitor or A2RB AND frusemide
- ACE inhibitors, A2RBs: pack size 30, ~ 1 month
- Frusemide: pack size 100, ~ 90 days
- To determine time period for pack sizes that are likely to be more than one months supply, we look at median number of dispensings per year for people who have had more than 2 dispensings in the year

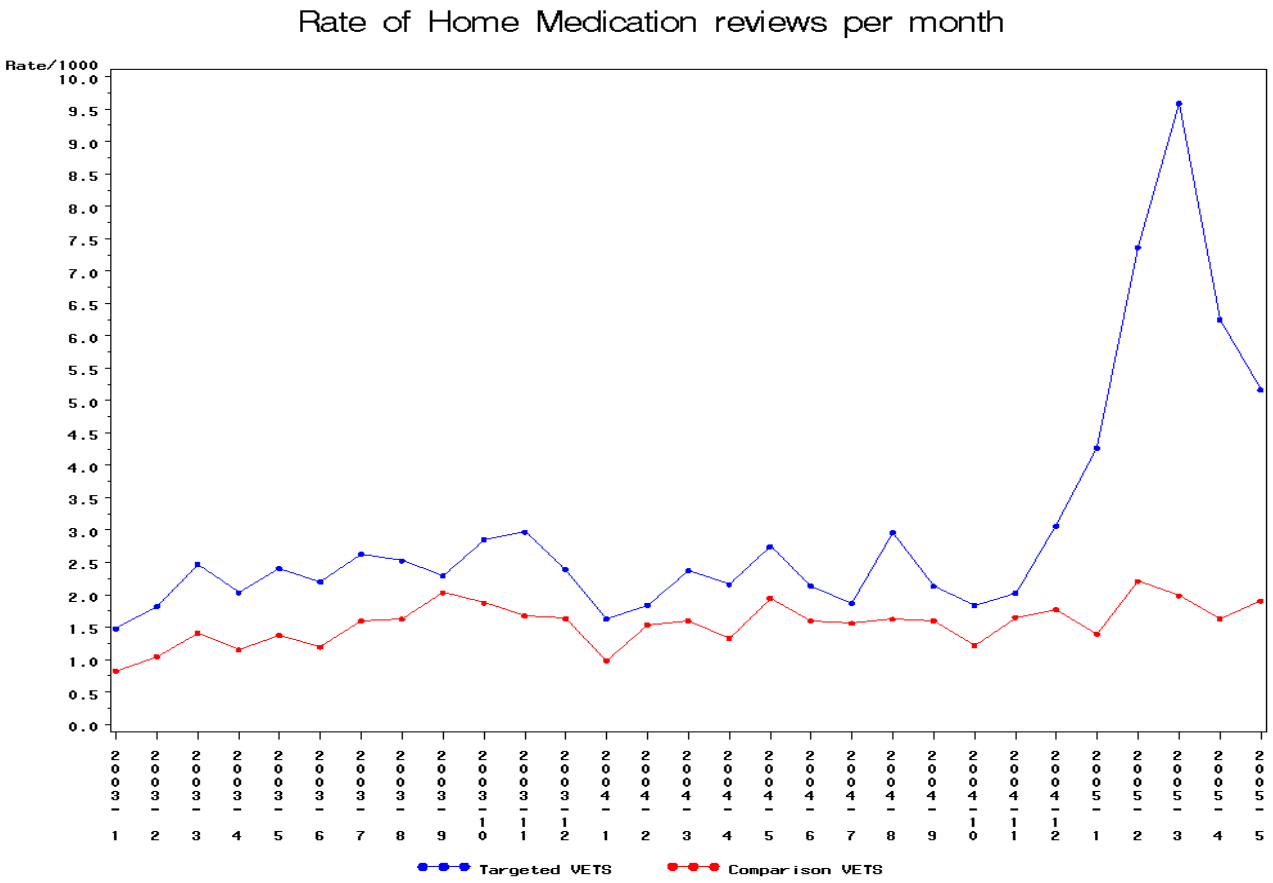
Evaluation: Module 1

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

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)

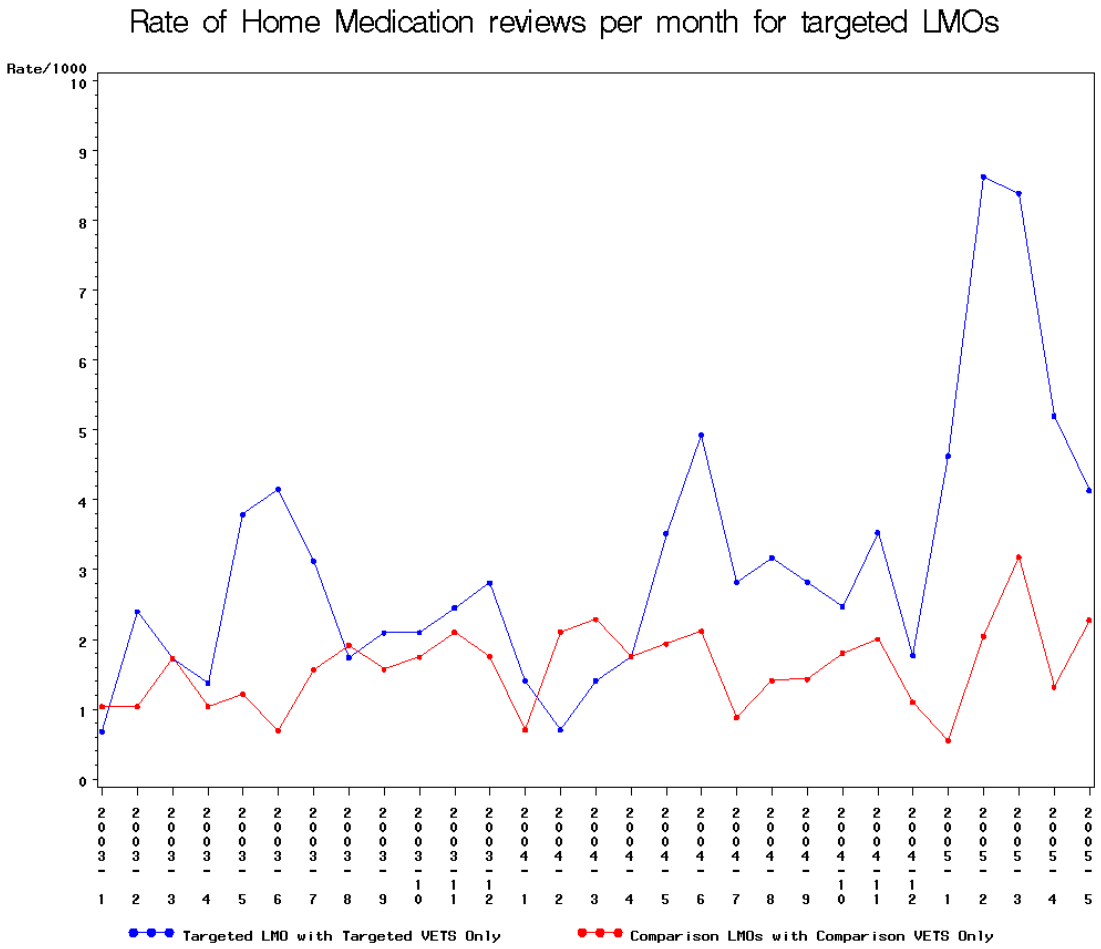
Changes in HMR rates



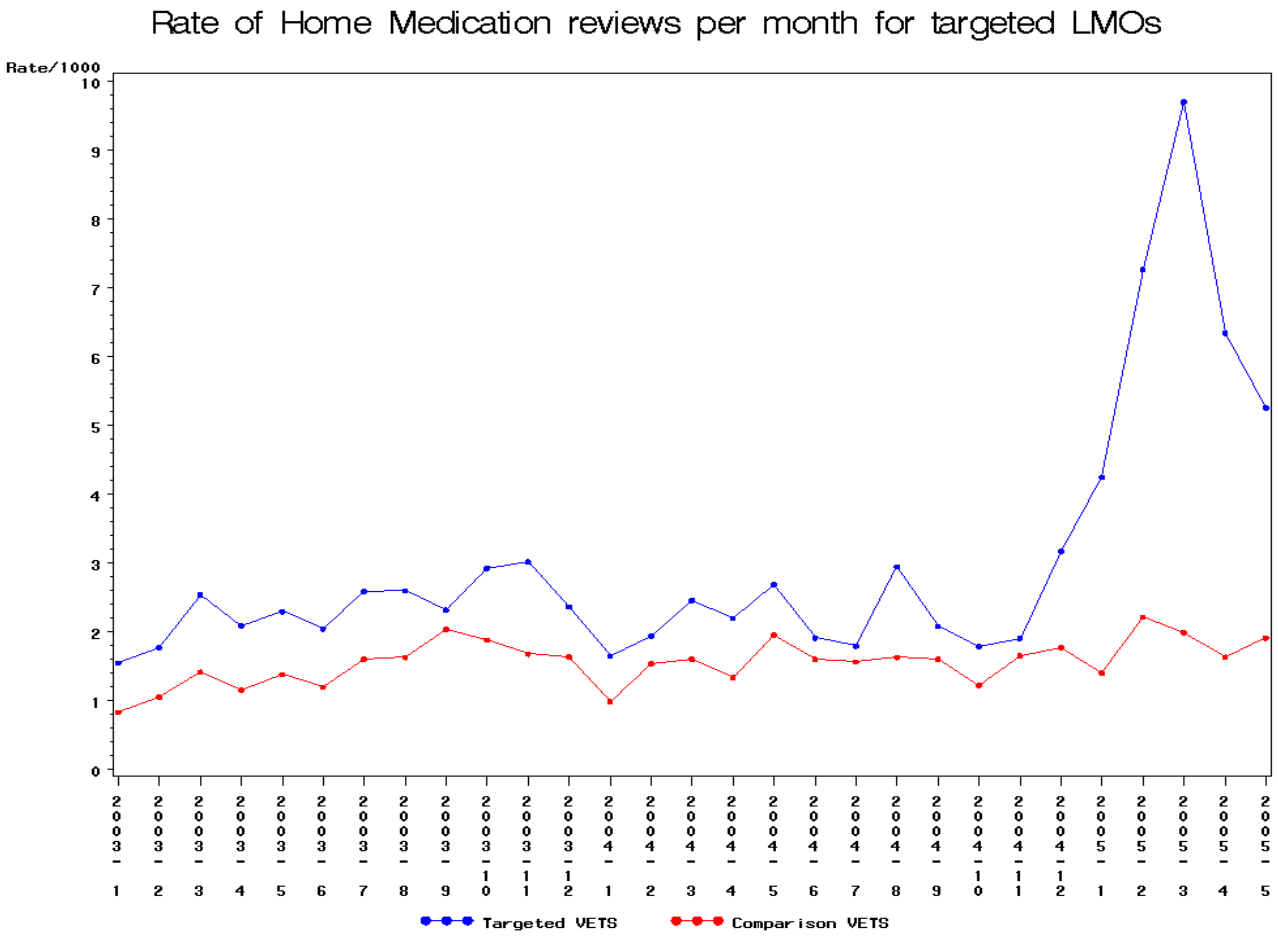
LMO cohort study

- 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 medicines
- Number of hospitalisations (any diagnosis)
- Number of general practitioner and specialist attendances

Other planned evaluations

- For some of our modules, comparison groups will not be possible (eg heart failure and diabetes)
- We are considering using case series as a method for assessing outcomes for this module

Engaging pharmacists to promote the quality use of medicines among members of the Australian veteran community: The Veterans' MATES program

Andrew s 47F

Quality Use of Medicines and Pharmacy Research Centre

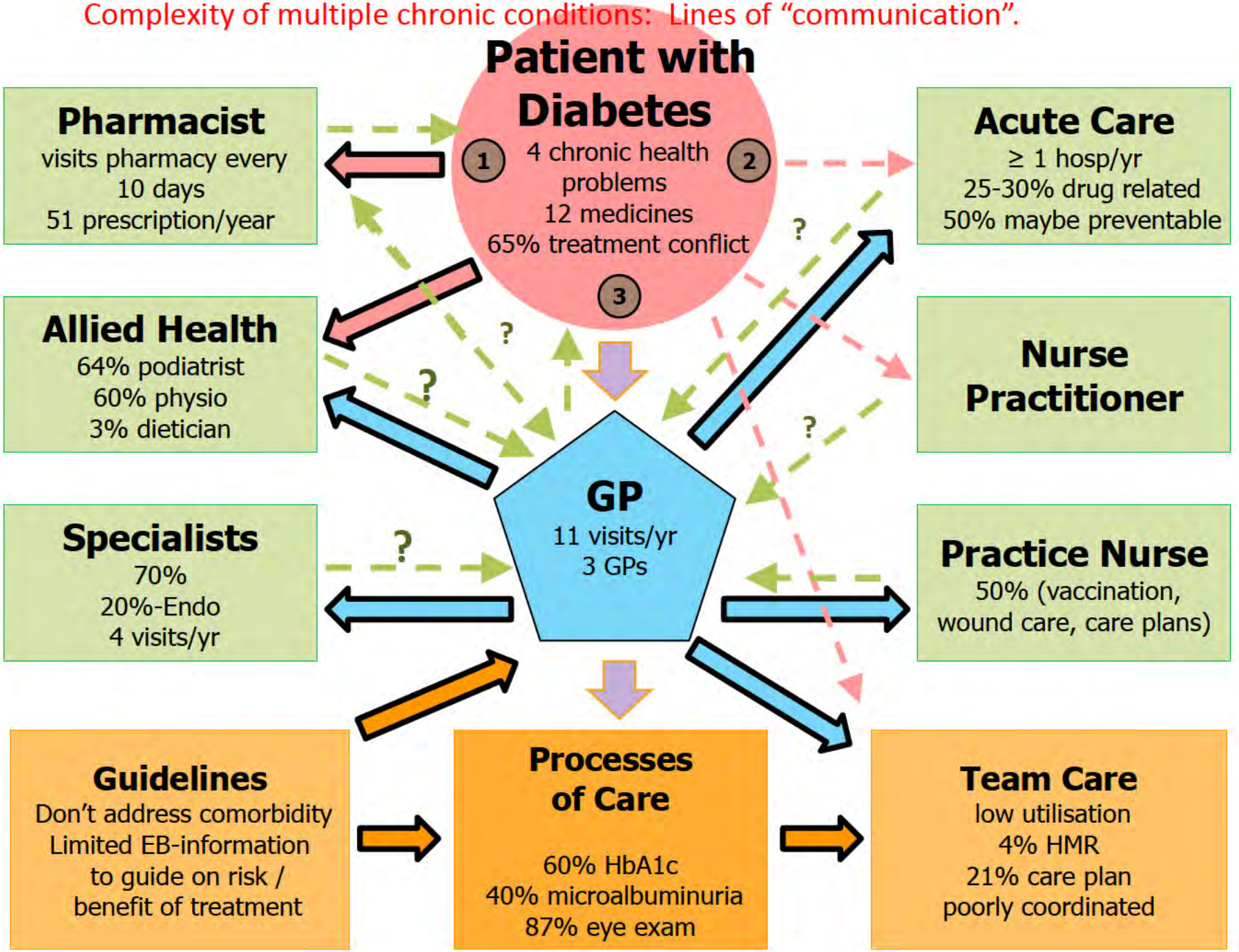
University of South Australia

Veterans' MATES

- Over 200 community pharmacies in Australia have over 100 veterans as regular patients in their practice.
- Veterans typically have 4 chronic conditions and visit their pharmacy every 10 days
    - They have at least 1 hospitalisation a year
    - They see 3 specialists
    - Less than 10% receive collaborative medication reviews
- How can we best support pharmacists in their care of veterans?

Veterans'MATES

Complexity of multiple chronic conditions: Lines of "communication".



The risk of harm from their health care is high

- 90% of veterans 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 veterans over 75.
  - of which 25% - 75% are potentially preventable

Veterans'MATES

Roughead et al., 2004, Miller et al., 2006, Roughead and Semple, 2009

Medication-related problems

- Patients with diabetes are at high risk of cardiovascular disease; but low use of cardio-protective medication:
  - 69% of diabetics were taking ACE/ACEI
  - 59% of diabetics were taking lipid-lowering therapy
  - 43% of diabetics were taking anti-platelet therapy
- Patients with diabetes, and those aged over 65 years, are at particular risk of cardiovascular and renal adverse effects; but high use of medications which could impair renal function:
  - 5648 (34%) of veterans with diabetes were dispensed at least one NSAID prescription/year

Diabetes, NSAID use & hospitalisation

	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

Put simply

For every 1000 patients with diabetes who were treated with an NSAID, an extra 20 hospitalisations per year occured compared to those not treated with a NSAID.

Patterns of care

- For example: Diabetes Cycle of Care
  - Only 40% had claims for an annual diabetes 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
    - <10% had a medicines review

Intervention to improve health medicines use and service delivery are effective

- Increased use of cardio-protective medicines
- 62% of those patients with diabetes who were taking NSAIDS at the time of the intervention stopped NSAID use and were not taking NSAIDs one year later.
- As a result of the Diabetes Cycle of care intervention
  - more than 300 extra patients now have the benefit of diabetes care plans,
  - over 600 extra have HbA1c tests and
  - over 800 extra have microalbuminuria tests.
- ***HMRs are effective and prevent hospitalisations***

Veterans'MATES

Improvements in outcomes for veterans with heart failure or those taking warfarin who received an HMR

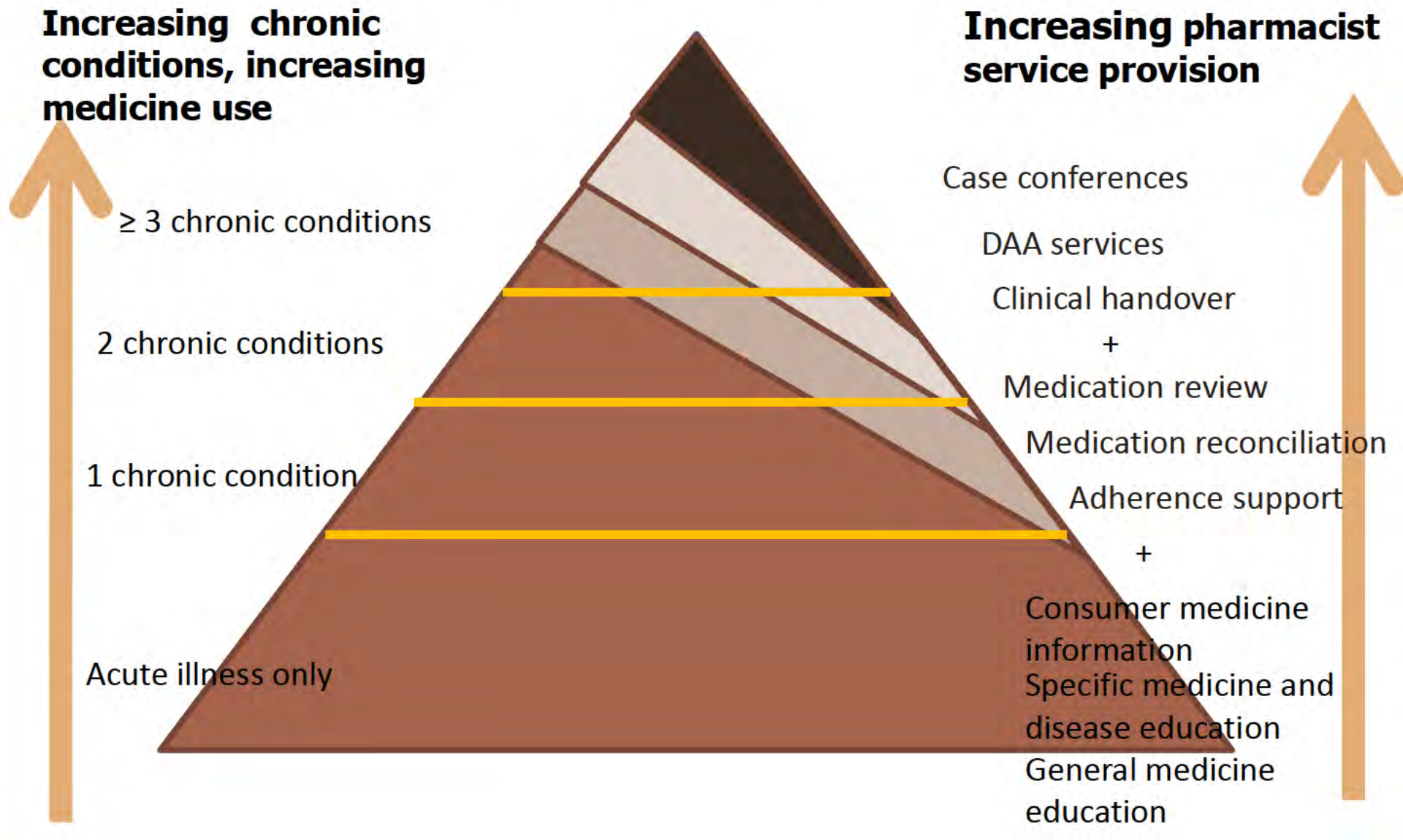
- Those who received a HMR had a 46% reduction in the likelihood of hospitalisation for heart failure of for bleeding related event.
- This delay equated to a delay of 7 months between re-hospitalisations.
- Note: less than 10% of veterans being treated for heart failure or using warfarin received a HMR!

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.
Roughead E, Barratt J, Ramsay E, Pratt N, Ryan P, Peck R, Killer G, Gilbert A.
Circulation: Heart Failure 2009 Sep;2(5):424-8.

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

Veterans' MATES

A model of pharmacy practice supporting complex patients



What else is needed for greater engagement of pharmacists in the care of elderly veterans?

- Closer professional relationship with GPs
- Better organisation of care in pharmacy
- Better collaboration with hospital and accredited pharmacists.

Home Medicines Reviews reduce hospitalisations for patients taking warfarin.

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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 of this paper.

- Elizabeth s 47F John s 47F Emmae s 47F Nicole s 47F Phil s 47F and Andrew s 47F all declare that they no have competing interest.

- Robert s 47F and Graeme s 47F 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 17000 veterans are being treated with warfarin

Introduction

- Warfarin is effective in preventing thrombo-embolic events[1].
- Use is associated with a high risk of hospitalisations due to bleeds[2].
- Rates of major bleeds range from 4.75/100 person years in those < 80 years to 13/100 person-years over those > 80 years of age[3].
- In Australia, it was the second most commonly reported medicine implicated in ADE-related hospital admissions[4].

1.Hart RG, Pearce LA, Aguilar MI. (2007) Meta-analysis: antithrombotic therapy to prevent stroke in patients who have nonvalvular atrial fibrillation. Ann Intern Med, 146, 857-67.

2.Bereznicki LR, Peterson GM, Jackson SL, Jeffrey EC. (2006) The risks of warfarin use in the elderly. Expert Opin Drug Saf, 5, 417-31.

3.Hylek EM, Evans-Molina C, Shea C, Henault LE, Regan S. (2007) Major hemorrhage and tolerability of warfarin in the first year of therapy among elderly patients with atrial fibrillation. Circulation, 115, 2689-96.

4.Runciman WB, Roughead EE, Semple SJ, Adams RJ. (2003) Adverse drug events and medication errors in Australia. Int J Qual Health Care, 15 Suppl 1, i49-59.

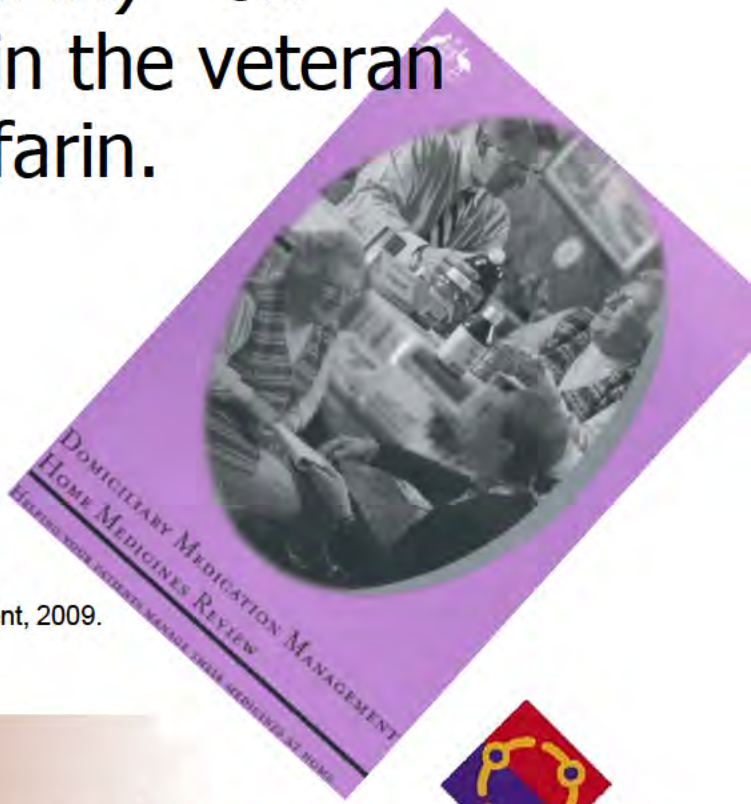
- Home Medicines Reviews are effective in preventing and resolving medication-related problems[5].
- Some systematic reviews indicate limited effects of pharmacist-led medicines reviews on patient outcomes, such as reduction in hospitalisations[6].
- RCTs however demonstrate that the effectiveness of medicines reviews depends on the type of review and disease characteristics[7,8].
- An Australian RCT showed that after warfarin initiation in a hospital; home visits (every second day) by a pharmacist for 8 days post hospitalisation led to a reduction in major and minor bleeding events[9].

5. 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.
6. 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.
7. 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.
8. 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.
9. Jackson SL, Peterson GM, Vial JH, Jupe DM. (2004) Improving the outcomes of anticoagulation: an evaluation of home follow-up of warfarin initiation. J Intern Med, 256, 137-44.

Objective

To determine the impact of general medical practitioner & pharmacist collaborative Home Medicines Review (HMR)[10] on hospitalisations for bleeds in the veteran population with taking warfarin.

HMR
Home Medicines Review



10. 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 determine hazard ratios in the following time periods; 0-2 months post HMR, >2 months – 6 months, >6 months – 1 year and > 1 year. .
- Setting: The ambulatory veteran and war widow population, Australia
- Time period 1 Jan 2004 until 1 July 2006
- Participants: Veterans ≥65 years receiving at least two prescriptions for warfarin in the study period.
- Exposure: HMR

Method; continued

- Exposed group: Veterans who;
  - had received a home medicines review,
  - had all health services fully subsidized by DVA,
  - had been dispensed at least two prescriptions for warfarin in the 6 months prior to the HMR,
  - were aged 65 years or over at the time of the review.
- Unexposed group: Veterans who;
  - had all health services fully subsidized by DVA,
  - had been dispensed at least two prescriptions for warfarin,
  - were aged 65 years and over, but
  - had not had a home medicines review.
- Exclusions: Veterans resident in aged-care facilities
- Main outcome measure: Time to next hospitalisation for bleeding.

Method; continued

- Eligibility for the unexposed group was determined each month.
- These veterans were randomly allocated to an index month to match the time of a HMR in the exposed group. (20 to 1)
- Subjects were followed up until time to first hospitalization for bleeding post the index month for the unexposed group or post the home medicines review in the exposed group.

Results

There were 816 persons included in the group exposed to a HMR and 16,320 in the unexposed group.

	Exposed N=816	Unexposed N=16320	P value
Male gender	64% male	65% male	0.37
Age	81.6 years (SD 4.2)	81.4 years (SD 4.6)	0.37
Number of co-morbidities*	7.1 (SD 2.4)	6.0 (SD 2.4)	<.0001
Number of prescriptions in year prior	88 (65-114)	68 (47-95)	<.0001
Number of prescribers: ≤2	21%	28%	<.0001
3-4	34%	37%	
≥ 5	45%	36%	
Number of pharmacies	2 (1-3)	2 (1-3)	0.28
Number of occupational therapy visits			
0	79%	84%	0.01
1	20%	16%	
At least one visit speech therapy visits	0.7%	0.4%	0.13
Dispensed palliative care medicines	0.3%	0.1%	0.11
Socio-economic index of disadvantage			
Lowest disadvantage	25%	25%	0.78
Med/low disadvantage	27%	25%	
Med/high disadvantage	23%	25%	
Highest disadvantage	25%	25%	
Prior hospitalisations: 0	38%	42%	0.02
1	25%	24%	
>2	37%	34%	
At least one prior hospitalisation for bleed	3%	3%	0.70
Region: Outer regional	8%	9%	0.02
Inner regional	23%	26%	
Major city	69%	65%	

Parameter	Parameter Estimate	Standard Error	Chi-Square	P value	Hazard Ratio	95% Hazard Ratio Confidence Limits	
0 – 2 months post home medicines review	0.12	0.30	0.17	0.68	1.13	0.63	2.02
>2 to 6 months post home medicines review	-1.54	0.71	4.68	0.03	0.21	0.05	0.87
>6 to 12 months post home medicines review	0.07	0.27	0.07	0.79	1.07	0.64	1.81
> 12 months post home medicines review	0.48	0.16	8.90	0.003	1.61	1.18	2.20

Results

- In the 2-6 months after HMR there was 79% reduction in likelihood of hospitalisation for bleeding (HR, 0.21 95% CI, 0.05-0.87).
- This effect was not seen in the 0-2 months post HMR, nor after six months post HMR.
- After 12 months, the exposed group were at increased risk of being hospitalised for bleed.

Summary

- Home Medicines Review in the population dispensed warfarin was associated with a 79% reduction in the likelihood of hospitalisation due to a bleeding event in the time period two to six months after the home medicines review.
- The effect observed was time-limited, which is consistent with the likely impact of educational interventions.
- Note: less than 5% of veterans taking warfarin received a HMR

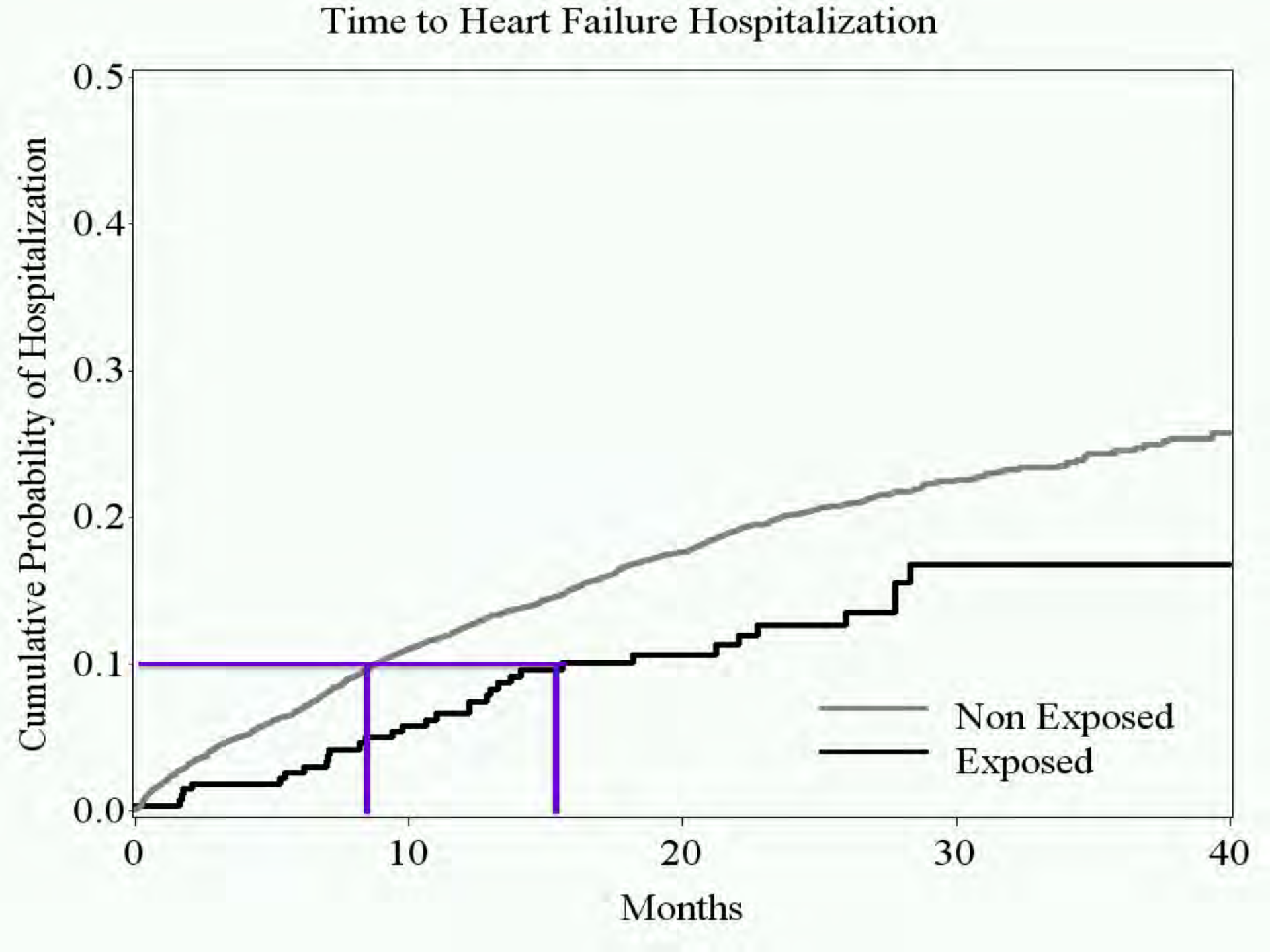
We see the same effect in heart failure patients

- Over 12000 veterans are being treated for heart failure.
- 44% of patients with heart failure will be re-hospitalised within six months of discharge[11].
- To determine the impact of general medical practitioner & pharmacist collaborative Home Medicines Review (HMR) on time to hospitalisation for heart failure in the population with heart failure

11. 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.

Results

- The HMR group had a 46% reduction in the likelihood of hospitalisation for heart failure at any time (HR, 0.54 95% CI, 0.38-0.77).


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

Increased time to next hospitalisation for HF patients who received an HMR

- The effect is clinically significant
- For some patients this delay in time to hospitalisation equated to over 200 days (~7 months).
- 5.5% of the exposed group compared to 12% of the unexposed group were hospitalised for HF within 365 days.
- Note: Less than 5% of veterans with heart failure received a HMR.

Authors and affiliations

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  3. Department of Veterans' Affairs, Australian Government, Canberra, Australian Capital Territory, Australia, 2600.

Veterans' MATES: Using routinely collected administrative health claims data to improve primary care practice

Elizabeth E s 47F Andrew s 47F V Tammy s 47F Lisa M s 47F Nicole s 47F John s 47F Emmae N s 47F Robert s 47F Graeme s 47F

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[3]Department of Veterans' Affairs, Canberra

BACKGROUND

The Veterans' Medicines Advice and Therapeutics Education Services (Veterans' MATES) program, is a health promotion based, quality improvement program that utilises administrative health claims data to bridge the evidence-practice gap to improve use of medicines and health outcomes.

Since 2004, the program has been improving 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 activities of the Veterans' MATES program are underpinned by the guiding principles of Australia's National Strategy for the Quality Use of Medicines.

METHODS

Veterans' MATES, funded by the Australian Government Department of Veterans' Affairs (DVA), joins health professionals and veterans in its interventions, which are delivered quarterly. The program utilises routinely collected health claims data to identify medicine-related problems in the elderly population. The data are then used to provide direct patient-based feedback to medical practitioners about the dispensed medicines. The feedback is supported with educational material developed by a clinical panel, peer reviewed and overseen by a national editorial committee. Veterans who meet target criteria are mailed educational brochures. The program is supported by a national call centre, ongoing consultation with stakeholder organisations and, veteran and practitioner reference groups. Evaluation includes surveys and observational studies.

Data utilised in each stage of program development

Planning Stage
- Medication-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

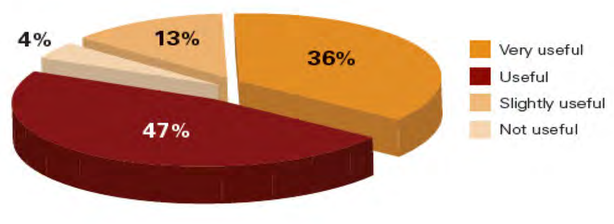
To date, thirty-one educational topics targeting more than 250,000 veterans, 34,000 doctors and 7,500 pharmacies and accredited pharmacists have been implemented.

Evaluation has demonstrated:
- Stakeholder satisfaction
- Changes in targeted medicines and services
- Improved health outcomes

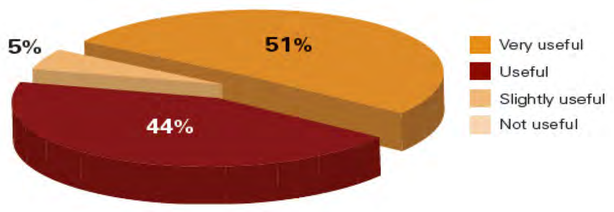
Stakeholder satisfaction

Medical practitioners, pharmacists and veterans consistently reported the material was helpful.

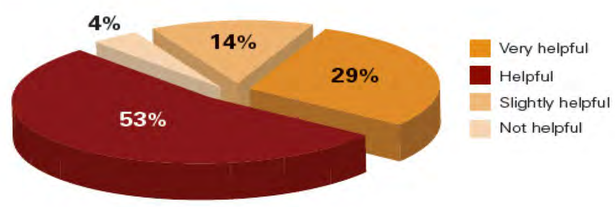
83% of general practitioners considered the educational material useful



95% of pharmacists considered the educational material useful



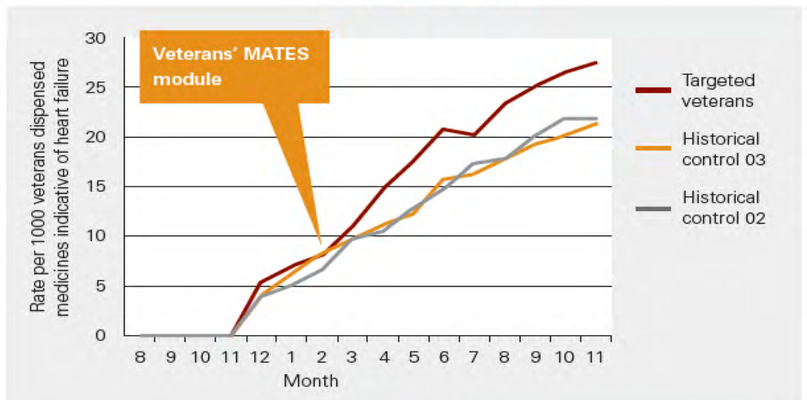
82% of veterans reported the educational material to be helpful



Health outcome highlights

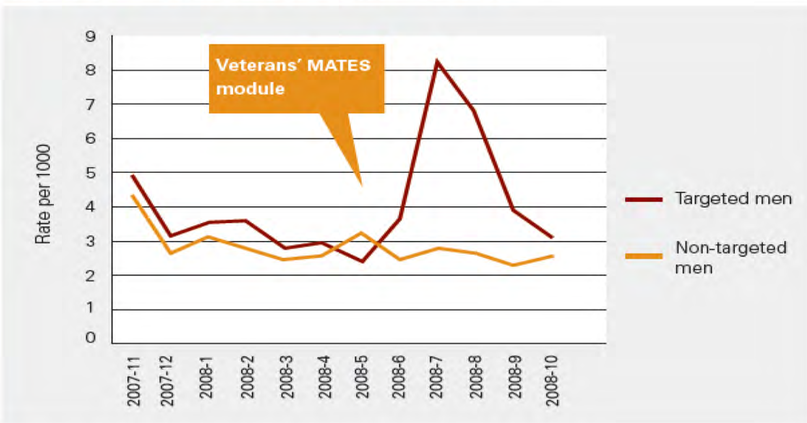
☑**Improved management of heart failure**
- 46% reduction in likelihood of hospitalisation for heart failure in those who received a Home Medicines Review
- Increase in the use of beta blocker medicines
- Decrease in the use of NSAIDS

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



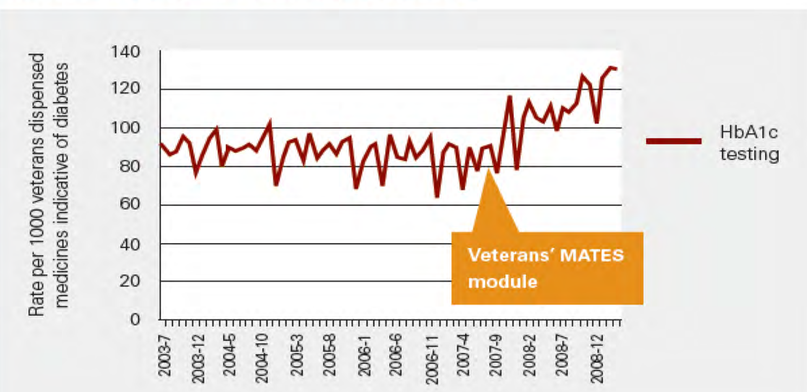
☑**Reduced risk of falls & hip fractures**
- Reduction in use of medicines that increase the risk of falls and hip fractures:
  - Risperidone (antipsychotic)
  - Benzodiazepines (sleeping pills)
  - "Z drugs" (sleeping pills)
- Increase in Bone Mineral Density Tests to detect osteoporosis
- 24% increase 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

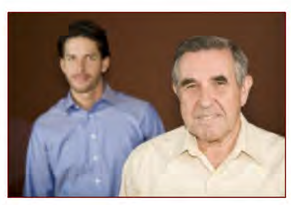
Key factors contributing to the success of the program include its grounding in behavioural theory, strong stakeholder engagement and the utilisation of routinely collected data.

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

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.



Australian Government
Department of Veterans' Affairs

Veterans' MATES

Libby s 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;
  - Phoenix Australia; and
  - HealthLink.

The approach

Every three months a chosen health topic is distributed:

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

Veterans'MATES

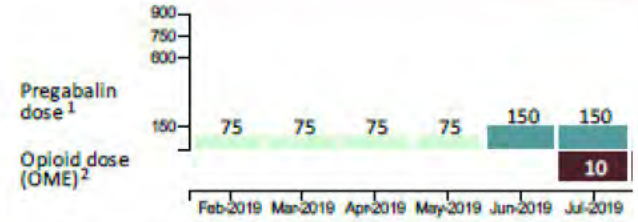
Dear DR P SURNAME

This Veterans' MATES information aims to assist you to review gaba
side effects when used long term. It is advisory in nature. The inforn
had multiple dispensings of pregabalin or gabapentin in a 12 month p
Consider whether your patient will benefit from non-pharmacological
ceasing gabapentinoids is appropriate. Please consider within the cor

Educational material explaining the rationale for these recommendati

FIRST & SURNAME* DOB: <DD/MM/YYYY> Gender: <Male o
<Residential address>

Relevant claims history for pain



1Daily average dose per month (mg), estimated from dispensing data
2Oral mo

Notes
Latest Hc
Latest Ps

Medicin
Pregabali
Tramadol
Oxycodor

Suggest

- Re Ra he es
- Re Ra
- Ch Ra
- Re

Australian Government
Department of Veterans' Affairs

PART 2: UNDERSTANDING YOUR PAIN CAN HELP TO EASE YOUR PAIN

Understanding how your pain works is the first step in working out a treatment plan tailored for you. A number of health professionals can help you understand and treat persistent or chronic pain.

If you are living with persistent pain, you might have already tried quite a few things. Understanding your pain and having a treatment plan are likely to be the most useful ways to reduce your pain and improve day-to-day life. Finding a supportive healthcare team, and being involved in choosing your own plan of action, will help.

This is Part 2 of the series. Part 1 introduced how pain works, and the health professionals that can help. Part 2 helps you identify the things that impact on your pain on a day-to-day basis and how you might be able to change them.

For additional copies of these brochures visit www.veteransmates.net.au

Your pain is personal and unique to you

We now know that pain is not as simple as it might seem. Pain is a complex protective mechanism that is always decided upon by the brain. As highlighted in Part 1, pain can exist with or without damage to the body. Because of this, many things can contribute to your experience of pain, including your general mood, your beliefs about what is causing your pain, social interactions with others and past experiences.

Veterans' Medicines Advice and Therapeutics Education Services, September 2017

Therapeutic Brief

www.veteransmates.net.au

September 2017

Chronic pain rehabilitation: It's about improving function and day-to-day life

Inside

Chronic pain is a common problem in Australia

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

1 BILLION

Contains over half a billion health claims records

15 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

Veterans' MATES 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

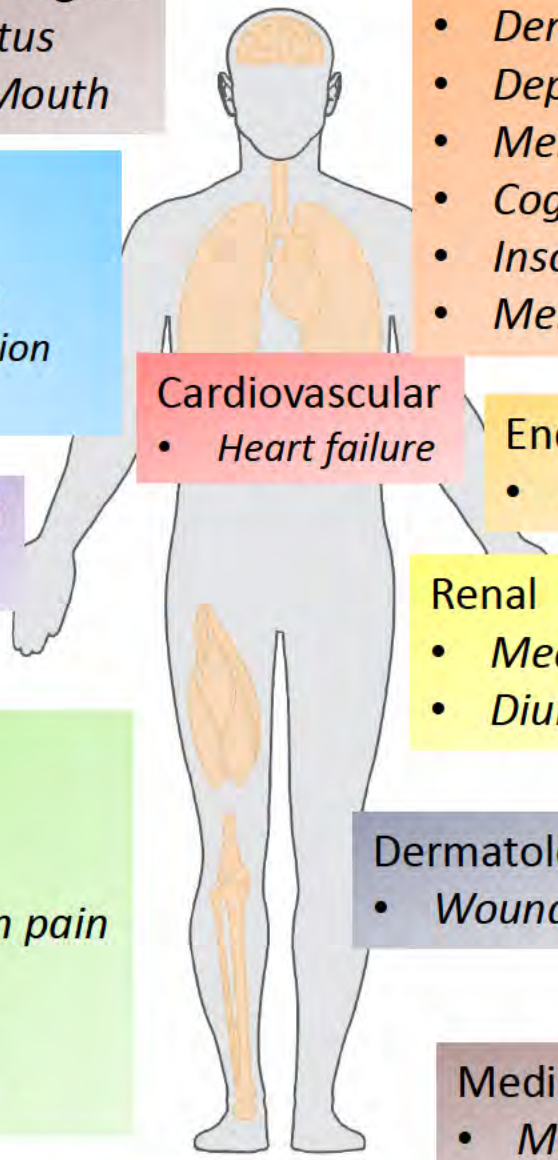
Our Topics

28 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*

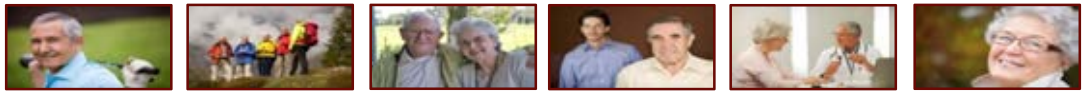
Musculoskeletal
- *Osteoporosis*
- *Chronic pain*
- *Recovering from pain*
- *Falls*
- *Staying active*
- *Persistent pain*

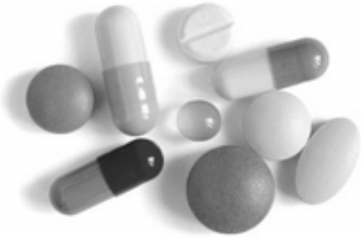
Dermatology
- *Wound Care*

Medicines Services
- *Medicine Complexity*

Our materials are written and endorsed by a clinical team that includes general practitioners

- 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 (including RACGP, AMA)



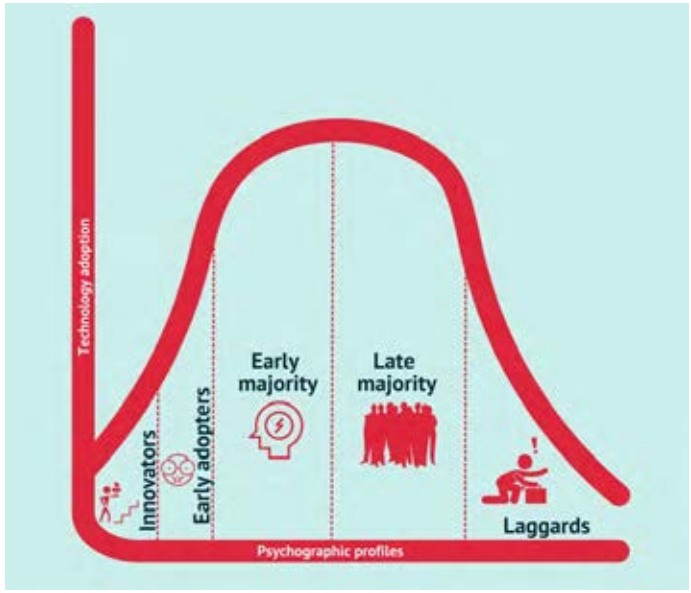


The materials are underpinned by behavioural theory

How do individuals learn?

How do individuals learn over time?

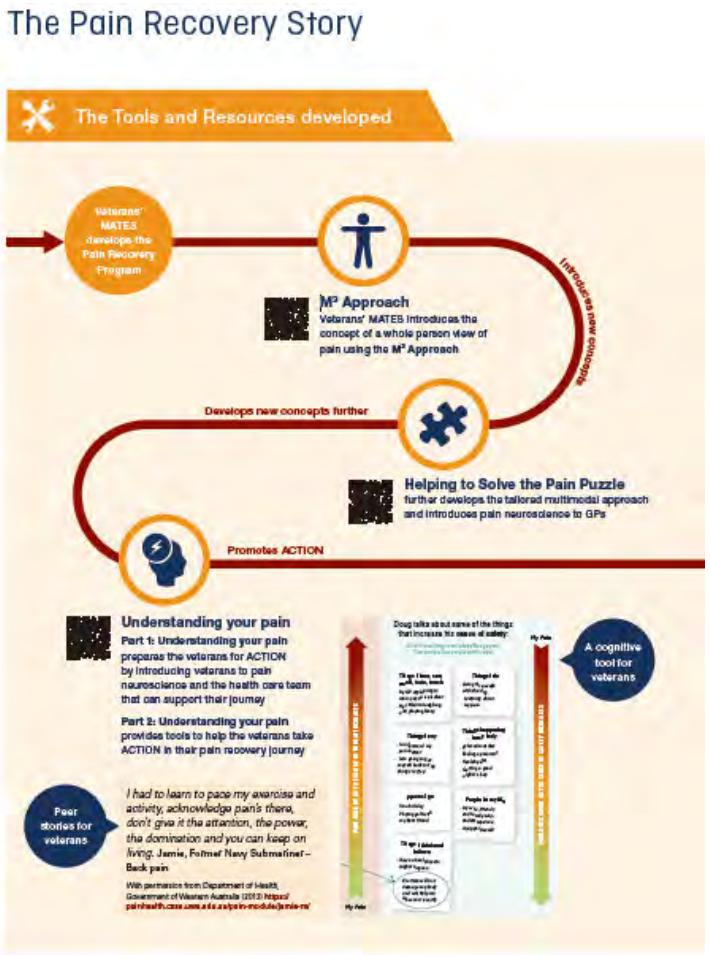
How do communities learn or change over time?



How do communities learn or change?

Communication and persuasion theory

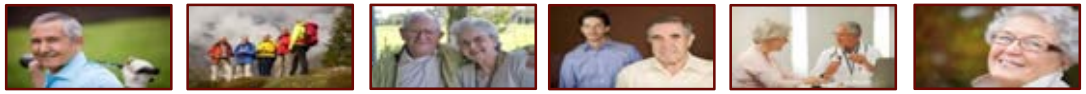
Our topics build on each other over time



1. Introducing the multidisciplinary approach M3: mind, movement medicines

2. Introducing pain neuroscience

3. Providing cognitive tools to implement pain neuroscience and focus on reducing analgesic use



Our reach

Since 2016,
We have sent 600,000 tailored, patient specific care messages to doctors
We have sent 570,000 educational brochures to DVA clients

170,000 unique DVA clients

3500 Psychologists

8700 Dentists

2300 Exercise Physiologists

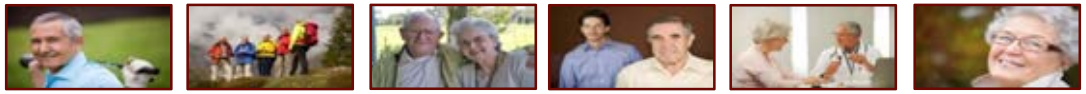
Materials have reached

30,100 unique Doctors

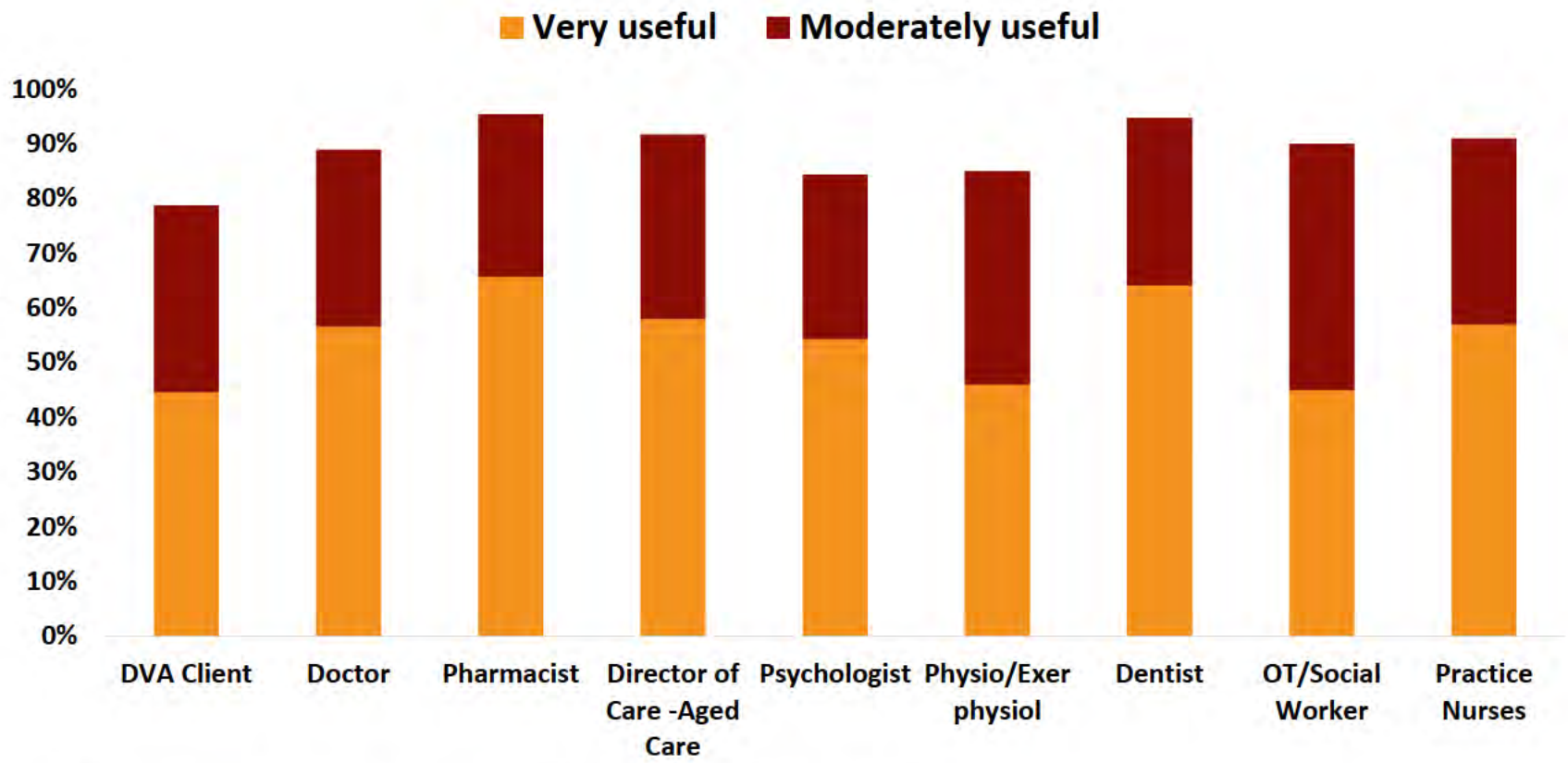
9300 Pharmacists

9600 Physiotherapists

2700 Directors of Care of Aged-Care



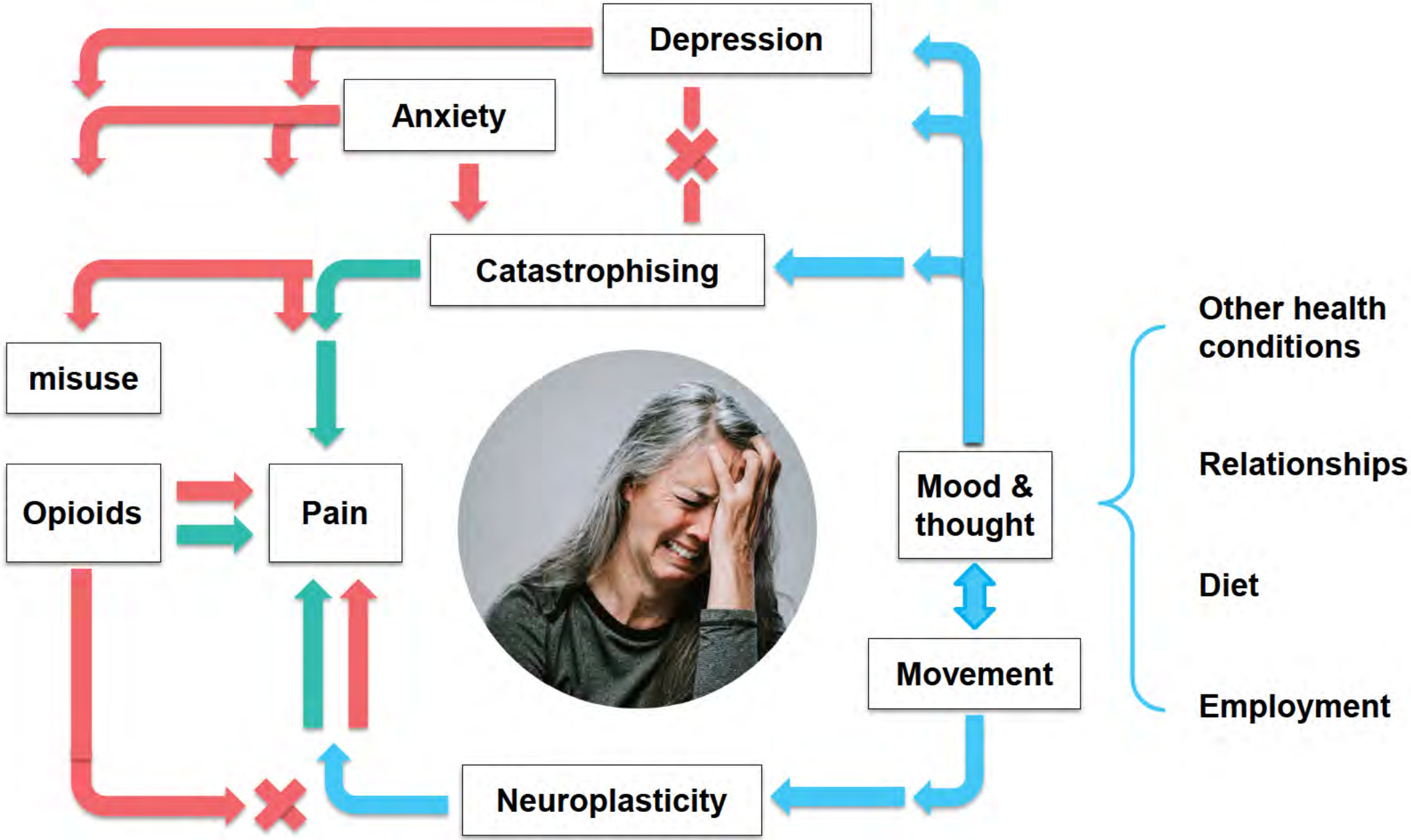
Our satisfaction



33% of veterans targeted have responded at least once.
14% of doctors targeted have responded at least one
85% of doctors tell us that on average, at least one of the identified patients requires review

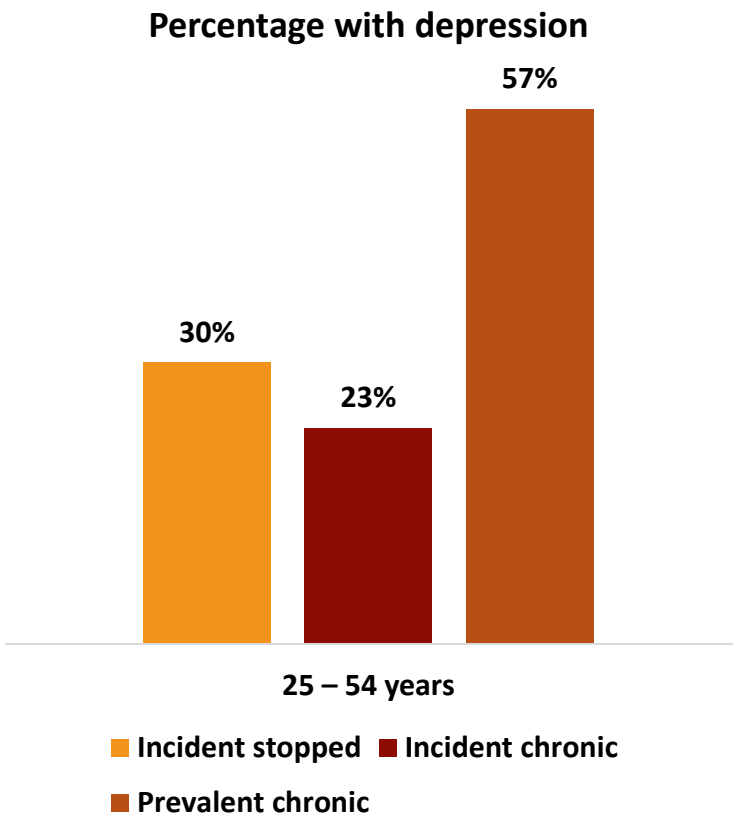
Translating the evidence into practice: The Veterans' MATES process

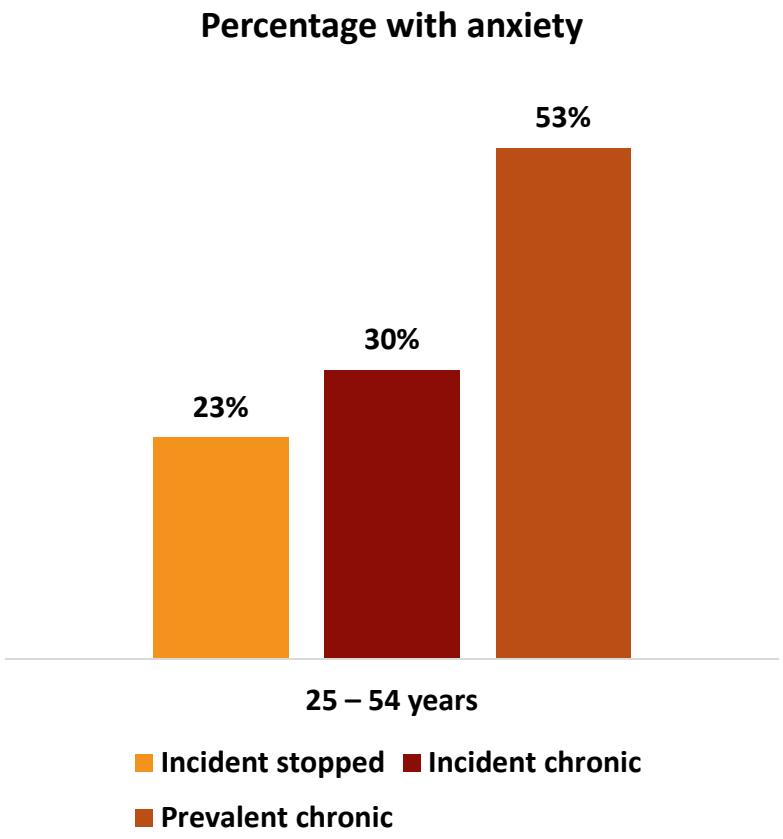
Chronic Pain

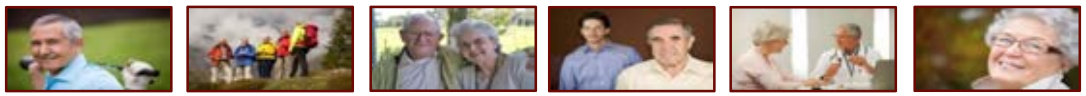

Depression
Anxiety
Catastrophising
misuse
Opioids
Pain
Mood & thought
Movement
Neuroplasticity
Other health conditions
Relationships
Diet
Employment

How common is pain and opioid use in veterans?

How common is pain and mental health problems?







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.

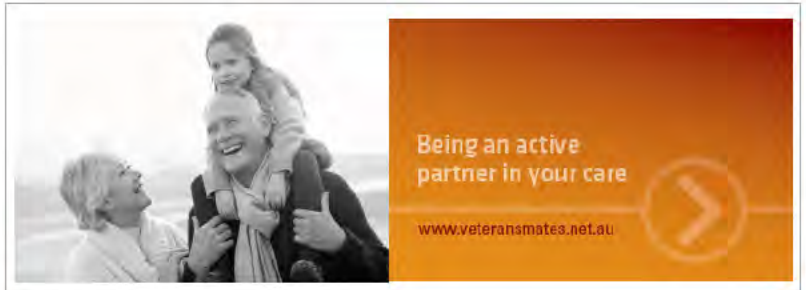
Patient co-prescribed a benzodiazepine

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

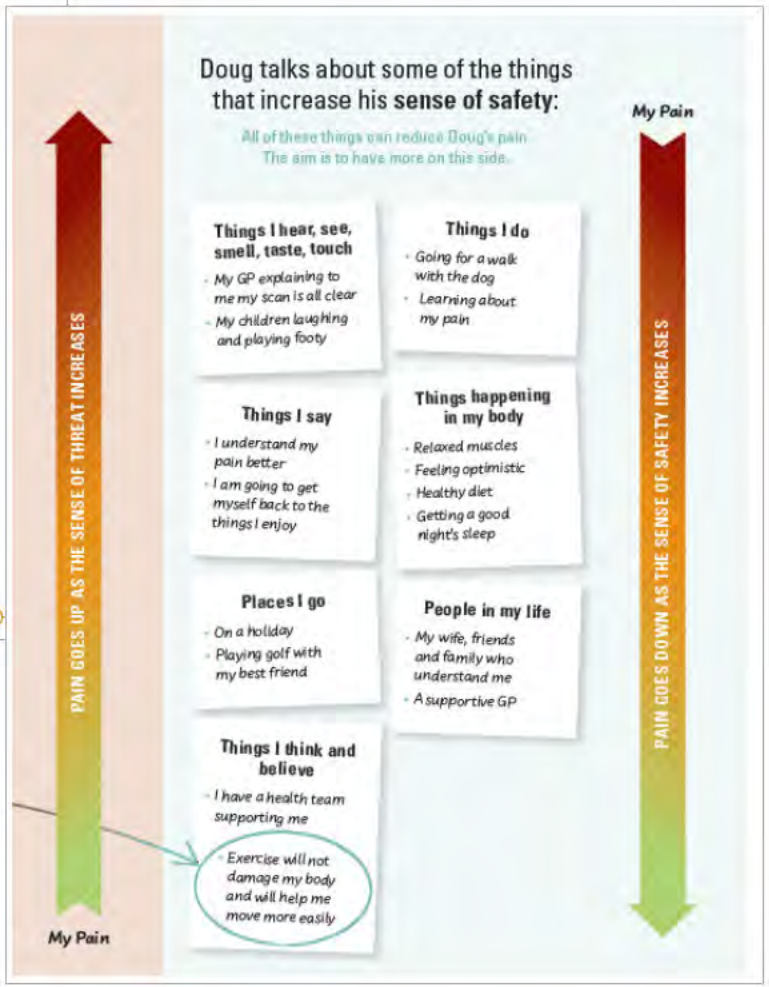
Research has shown that by learning about how pain works, you can reduce it and improve daily life.[1] Here are five key facts to help you understand your pain better:

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 2017



What happened to veterans with chronic pain?

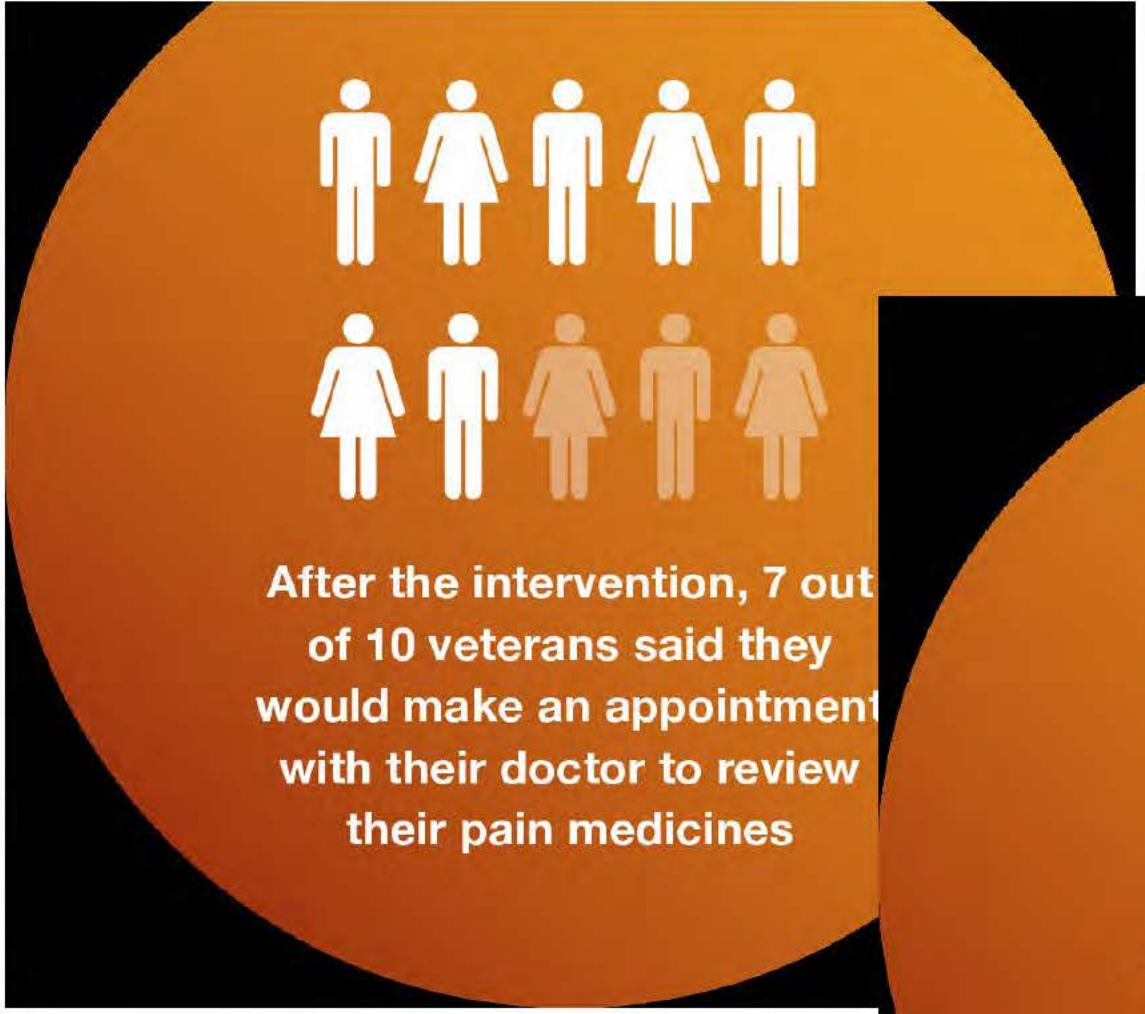
Pain

8,500
general
practitioners

8,300
pharmacists

690
psychologists

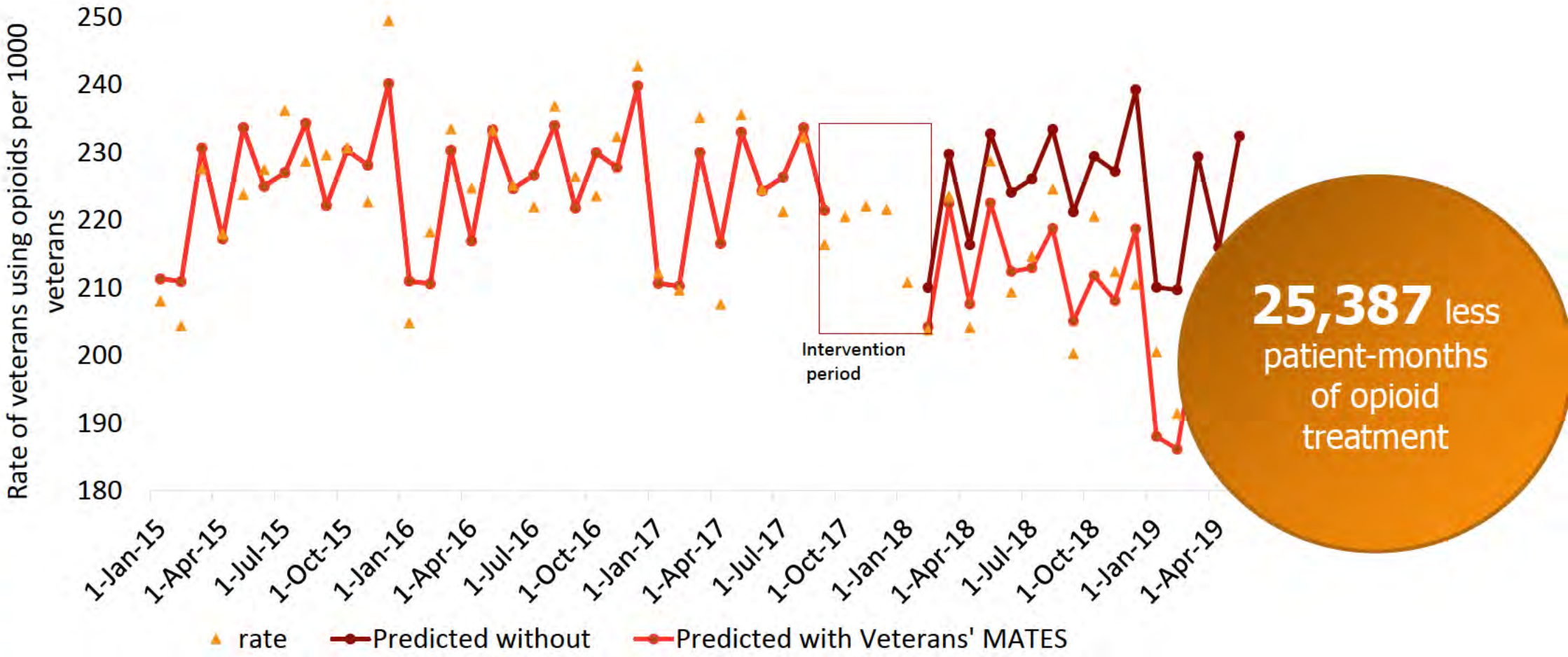
13,900
veterans



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

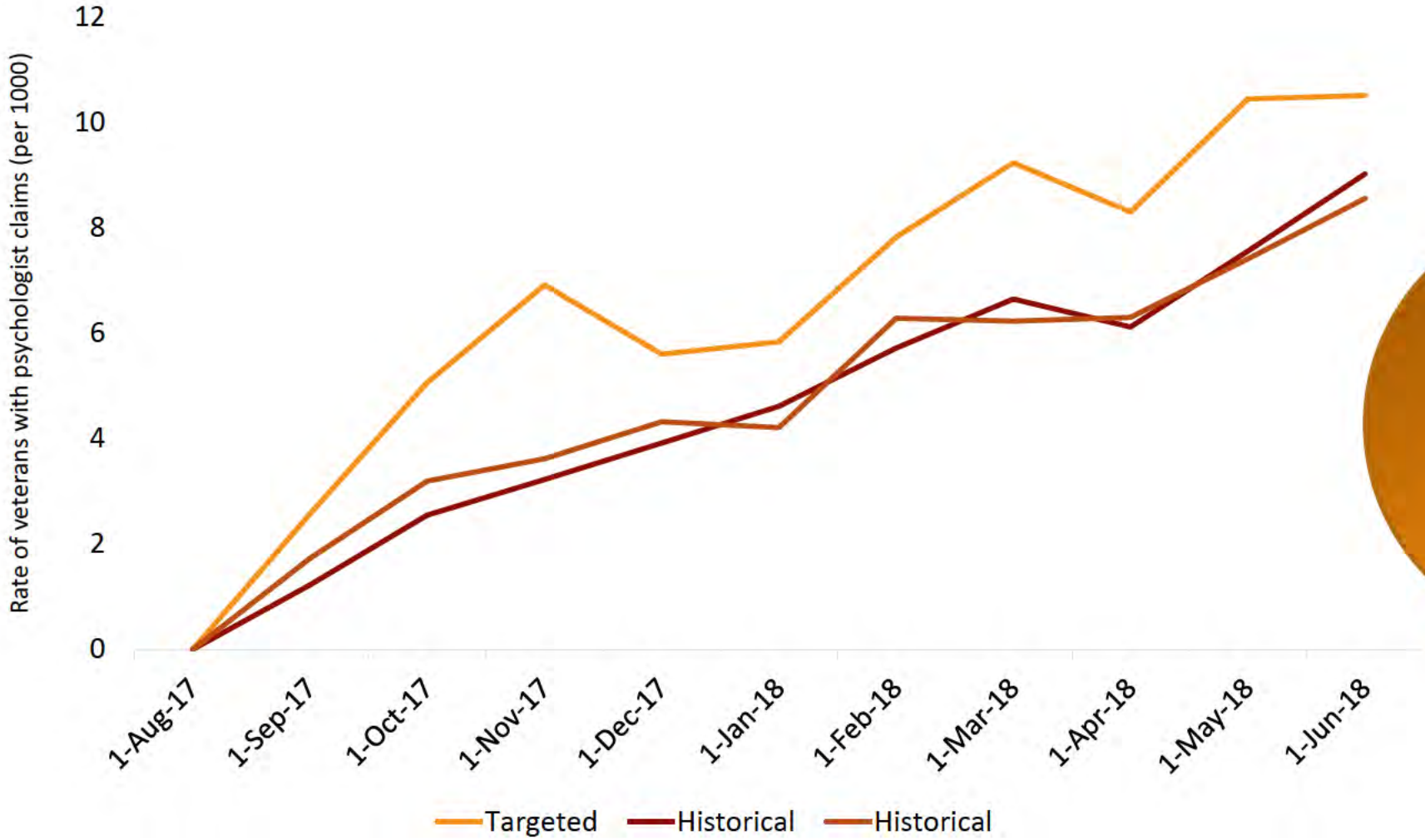
The intervention reduced opioid use



25,387 less patient-months of opioid treatment

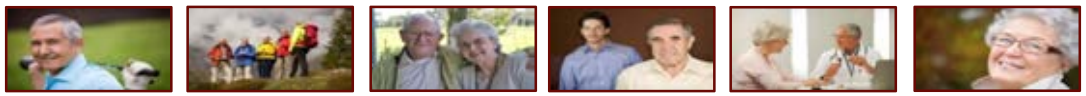
Pain

Increasing numbers of veterans seeing psychologists



690
additional patient-months of psychologist treatment

Increasingly we are wanting to engage allied health



Involving allied health in pain

	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sept 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022
Opioid dose (OME)[1]						10	10	22	27	27	30	30

1 - Oral morphine equivalent daily average dose per month (mg) estimated from dispensing data

Allied health services claimed	Date of last service claimed	Number of services claimed in last year
Psychologist	None claimed in the last year	
Physiotherapist	28/02/2022	
Exercise physiologist	None claimed in the last year	
Occupational therapist	None claimed in the last year	
Medicine review	None claime	

A multidisciplinary approach for improving functio

The allied health treatment cycle, which aims to improve the quality of care for Vet practitioners to refer eligible DVA clients to allied health providers. To select the ap algorithm:

- Does the patient have persistent pain (lasting for more than 3 months)? Is it n
- If yes for both questions, **consider referral to allied health providers:**
  - Does the patient have an emotional component to the pain (eg catastro
    - If yes, **consider referral to a psychologist**
  - Does the patient have functional limitations due to pain?
    - Do they need assistance with functional limitations at home or wo **therapist**
  - Does the patient use multiple medicines for pain and have a complex m
    - **Consider referral to a Home Medicines Review**
- Note, the need for services may not be applicable for patients scheduled for s persistent pain

Learn more about the treatment

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Teaming up against chronic pain

A rehabilitation plan that addresses the physical, psychological, social and environmental factors that contribute to a patient's chronic pain, is current best practice.[1,2] A variety of health professionals can be beneficial in getting the patient to play an active role in their recovery; the most important health practitioner is an engaged and supportive general practitioner.

Helping your patient to understand their pain

A biopsychosocial strategy that incorporates teaching the patient about how chronic pain can persist even after the initial injury has healed, helps them to overcome their pain, catastrophic thinking and activity-related fears.[3,4] It helps them to understand that their beliefs, thoughts, behaviours and social interactions are all linked to their individual pain experience.[4,5]

Key elements include a thorough history, examination and interview, paced and targeted educational sessions, exercise programs, confidence building and goal setting.[4] Stories, metaphors, pictures and examples are used to convey the message that chronic pain might not necessarily be because of continuing tissue damage but because of various complex biological and psychological processes happening in the body.[5]

Educating patients about their chronic pain helps them to understand that:

- pain occurs when there is more credible evidence of danger to the body, than credible evidence of safety
- pain is linked to attitudes and beliefs, thoughts and feelings, and

All patients with chronic pain can benefit

Therapists can devise individual strategies to calm down a patient's over-protective alarm system, improve their knowledge of pain, alter attitudes and behaviours towards pain, improve their day-to-day functioning, and ultimately reduce pain itself.[2,6] Patients often feel more in control and able to play an active role in their recovery and to safely 'get moving' again in a considered and planned manner.[7] The best results are obtained when pain education is used in combination with other biopsychosocial interventions.[2]

Getting the best team together

Current best practice is to include a combination of medical and educational approaches and psychological and physiotherapy interventions, based on the principles of Cognitive Behavioural Therapy (CBT).[8] CBT can address unhelpful beliefs, such as catastrophising and activity avoidance due to fear of injury or re-injury, expectations of treatment and lack of motivation. A rehabilitation plan that involves the patient's partner and family members can have a positive impact on their emotional and physical recovery.[9] Patients who practise active self-management strategies experience improvement in their day-to-day functioning and general wellbeing, and are less reliant on medicines to 'fix' their pain.[10]

A clinical psychologist can address feelings of despair, anger or hopelessness associated with chronic pain, and psychosocial issues including stress, post-traumatic stress disorder or anxiety and depression. All of which can impact on a patient's experience of pain. Interventions might include educating the patient about how and why pain can persist, CBT or relaxation techniques.

Find a psychologist trained in pain management through the Australian Psychological Society at: http://www.psychology.org.au/findapsychologist/

A physiotherapist or exercise physiologist can help people get moving again with graded exercises and activities designed to improve function. They can provide education about how pain works and what influences it, and help to modify

Medicine(s)	Last dispensed	Other prescriber
SALBUTAMOL (Ventolin) 100 mcg/dose MDI	15/01/2021	Yes
TIOTROPIUM + OLODATEROL (Spiolto Respimat) 2.5 mcg + 2.5 mcg/dose inhal	05/02/2021	No

Indication of COPD exacerbations in the last year	
Number of hospital admissions for COPD	2
Number of hospital admissions for pneumonia	1
Number of systemic corticosteroid dispensings+	2

+It was not possible to determine the diagnosis for which the corticosteroid(s) were prescribed (i.e.: COPD or other con

Services	
Coordinated Veterans' Care (CVC) program claim*	None claimed in the last year
GP Management Plan (GPMP) or review of GPMP claim*	None claimed in the last year
Physiotherapist or exercise physiologist visit claim*	04/03/2020
Home Medicines Review (HMR) or Residential Medication Management Review (RMMR) claim*	None claimed in the last 2 years

*Claims are according to the DVA Health Claims Database at the time of development, therefore some claims might not be i

Actions to consider

☐ **Consider whether your patient would benefit from participating in DVA's Coordinated Ve program if they meet the eligibility criteria**

DVA Gold Card holders with COPD may be eligible for the CVC program if they are livin at risk of unplanned hospital admissions. If your patient does not meet the eligibility crit program, consider a General Practitioner Management Plan (GPMP); GPMPs have beer COPD-related hospital admissions.

☐ **Refer your patient for a pulmonary rehabilitation program if they are not already enrolle**

Pulmonary rehabilitation programs, often provided by physiotherapists or exercise physio hospitals, help reduce COPD symptoms, improve quality of life and reduce COPD-related

☐ **Refer your patient for an HMR or RMMR**

A HMR or RMMR is recommended for reviewing medicines and checking inhaler techniq

Involving allied health in COPD

Emphasise to patients that pulmonary rehabilitation is highly effective in:

Reducing hospitalisation
For every four people attending a pulmonary rehabilitation program, one person will avoid hospitalisation.[7]

Improving functional capacity
For every two people who participate in exercise training, one person will walk at least 54 metres further in the six-minute walk test.[8]

Reducing dyspnoea and fatigue[9,10]

Improving quality of life and psychological wellbeing[9,10]

Allowing patients a sense of control over their condition[9,10]

More than 300 pulmonary rehabilitation programs and 70 Lungs in Action Programs are registered with Lung Foundation Australia.[11]

- Offer to refer all symptomatic patients with COPD to a pulmonary rehabilitation program.[9,12]

Lung Foundation Australia

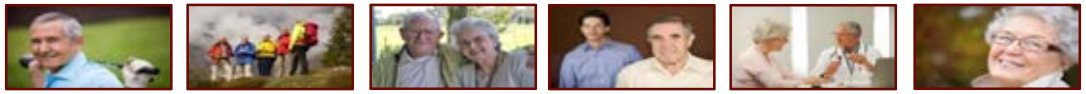
To find a program near your patient, contact Lung Foundation Australia on 1800 654 301 or go to: https://pulmonaryrehab.com.au/national-program-map/

- If there is no pulmonary rehabilitation program near your patient, find an exercise physiologist (Exercise & Sports Science Australia) at: www.essa.org.au/find or a physiotherapist (Australian Physiotherapy Association) at: https://choose.physio/find-a-physio

See insert 'Providing pulmonary rehabilitation for veterans: useful resources for physiotherapists and exercise physiologists' if you are interested in setting up your own program to treat veterans and their families.

- An appropriate follow-on program such as the Lungs in Action Program helps patients to maintain benefits gained through pulmonary rehabilitation and to find like people for emotional support and social interaction.[13] To find a class near your patient, go to: https://lungfoundation.com.au/patients-carers/support-services/lung-disease-and-exercise/exercise-classes/
- **Due to COVID-19, some programs may not be conducting face-to-face sessions; contact the facility directly to see if they deliver telerehabilitation or have resumed as COVID-19 restrictions change.**
- Promote ongoing physical activity that includes 30 minutes a day for at least five days a week to maintain fitness.[14]

- As the program continues we are keen to have your suggestions for topics or issues to be addressed



Australian Government

Department of Veterans' Affairs

Veterans' MATES Relaunched 2016-2018

Libby s 47F

University of South Australia

Veterans' MATES

- Funded by the Australian Government Department of Veterans' Affairs (DVA)
- Aims to improve medicine use and health outcomes for veterans
- A new funding agreement in place from 2016

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 are sent to members of the veteran community for whom the health topic is relevant.

2016 releases

Antipsychotics in dementia: August 2016

Aim: to reduce antipsychotic use in patients with dementia

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

- 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)
- The TGA also recommended risperidone should only be used to treat persistent agitation or aggression if these symptoms do not respond to non-pharmacological strategies.[13]

These behaviours respond poorly, if at all, to antipsychotics

- Disruptive vocalisations
- Disinhibited behaviours
- Voiding inappropriately
- Emotional withdrawal
- Incontinence
- Wandering
- Pacing
- Repetitive behaviours
- Insomnia

Short-term antipsychotic use might help SOME PATIENTS with these behaviours

- Psychotic symptoms
- Persistent aggression
- Persistent agitation

The benefit versus the harm

The benefit

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

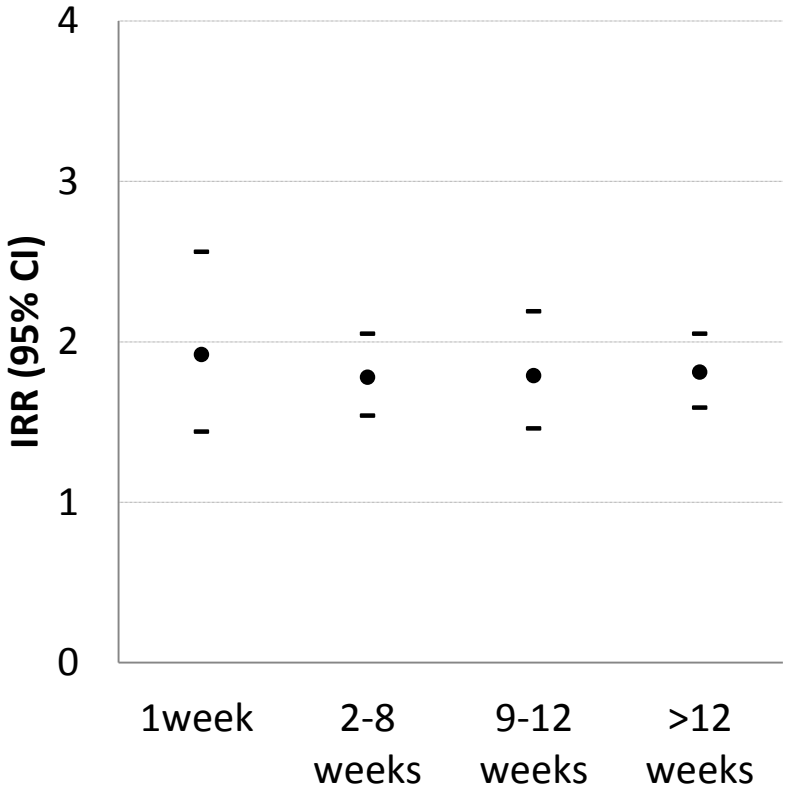
The risk-benefit ratio for antipsychotics

- 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

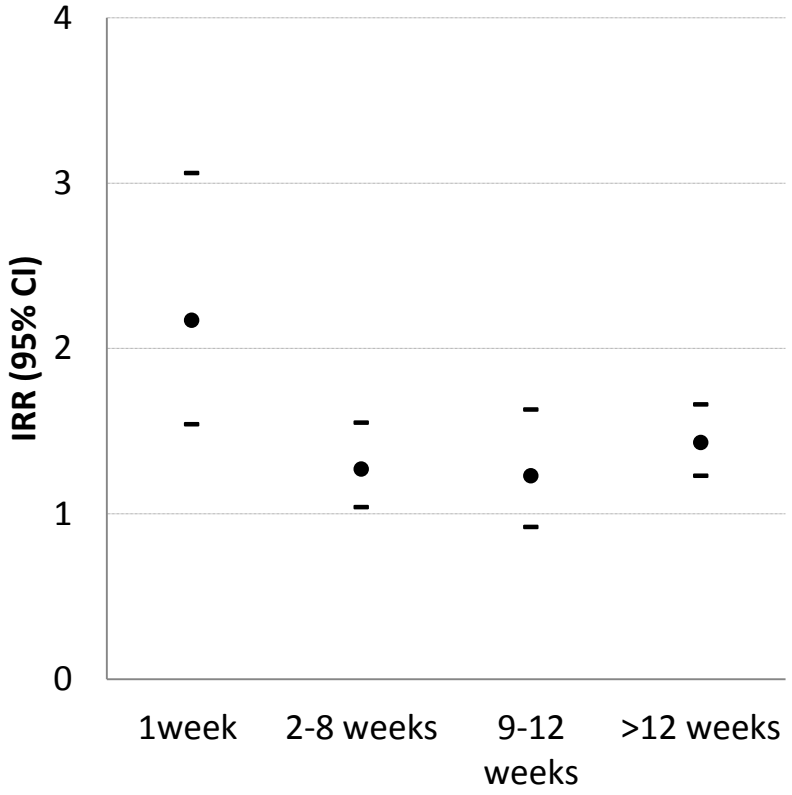
Pratt et al., Drug Saf. 2011

Quantifying the harm

Risk of pneumonia



Risk of hip fracture



Pratt et al., Drug Saf. 2011

Ceasing antipsychotics

Steps	
1	Discuss ceasing the antipsychotic with the patient, far home staff
2	Cease the antipsychotic without tapering if the recom starting dose (eg risperidone 0.25 mg daily)
3	Otherwise reduce the dose over several weeks
4	Monitor at least weekly for worsening or re-emergence of ted problems
5	If targeted problems return or worsen do not continue t wer the dose
6	Withdrawal symptoms that might occur usually appear within one to four days and abide by seven to 14 days
7	If targeted problems or withdrawal symptoms occur consider reinstating previous dose. If symptoms settle, maintain the dose for 2 to 4 weeks before gradually reducing again
8	Continue to monitor until starting dose reached, then cease
9	Consider prn orders as an interim measure

- Nausea or vomiting
- Anorexia
- Diarrhoea
- Sweating
- Muscle pain
- Numbness or tingling
- Restlessness
- Insomnia
- Anxiety
- Agitation

What else helps?

- The TOP 5 program
- Carers provide the five most important tips and strategies to personalise care and support communication, which is recorded on a standardised form and placed at the bedside.
- Implemented in 20 public hospitals and five private hospitals in New South Wales
- Two hospitals measured changes in antipsychotic use,
  1. found an average reduction in cost of 68% per month
  2. decrease of 67mg per month, $p<0.1$, which corresponded with clinicians perceptions of less need for physical or chemical restraint.

Carer's brochure includes 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 Ludord 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: / /

Carers name:

Carers 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/tops5/Pages/Carer-family.aspx

How you can help

- Assist your patients and their carers to complete the tips
- Assist the aged-care facilities in tapering doses and monitoring withdrawal symptoms

Reducing medicine complexity: Nov 2016

- Aim: to assist with reducing medicine complexity in veterans'
  - Reducing use of unnecessary medicines
  - Reducing complexity of medication regiment

Why are we doing the module?

- Significant evidence that consumers have trouble organising their medicine times across the day
- In one study of 464 adults (age range, 55-74 years)
  - only 15% of patients developed the correct regimen of four administration times,
  - the majority developed a regimen that included six different administration times
  - One third developed a regimen that included seven different administration times

Arch Intern Med. 2011 Feb 28;171(4):300-5
doi: 10.1001/archinternmed.2011.39.

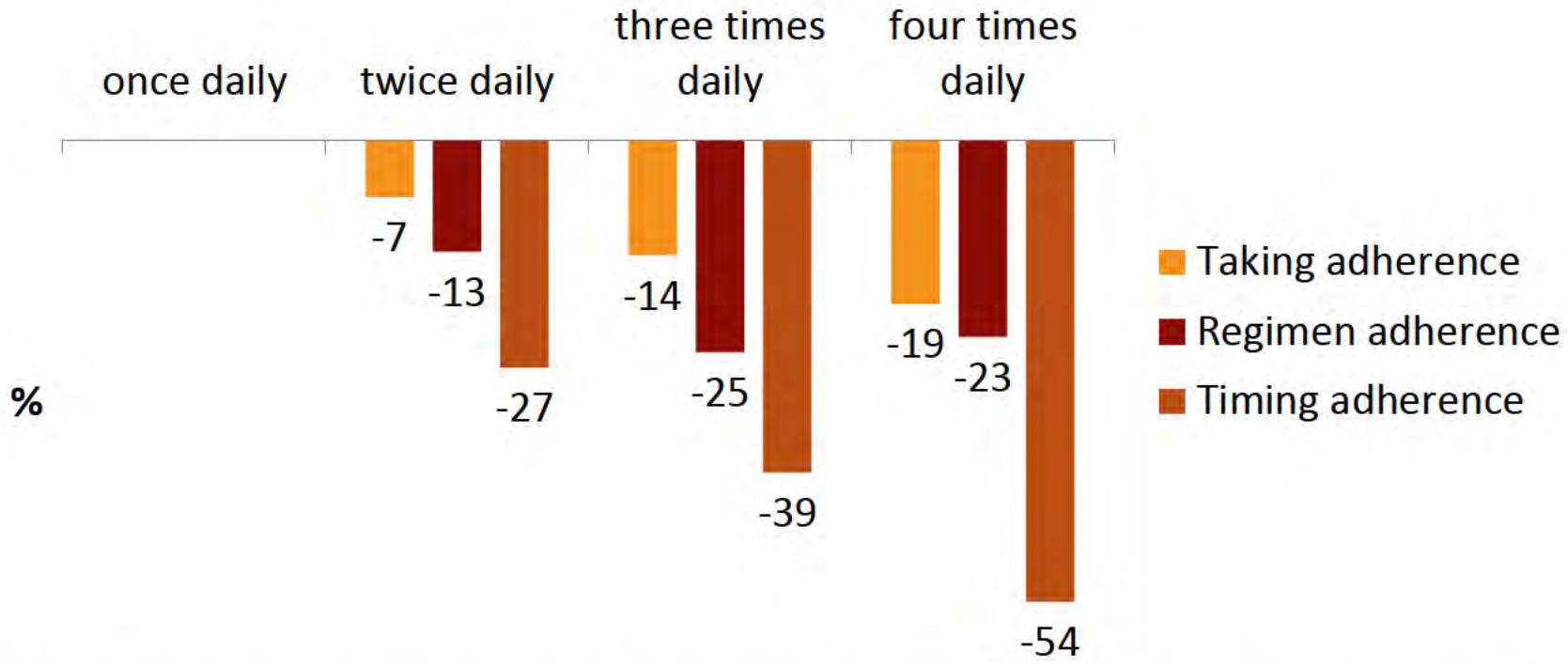
- Another study of 200 community dwelling persons aged 70 years and over showed
  - almost half of the patients could have their medication regimen simplified,
  - 26% able to eliminate one additional administration time a day
  - 16% being able to eliminate two additional administration times a day.

Patient Educ Couns. 2014 Jul; 96(1): 93–97

- A systematic review involving 51 studies showed that in elderly patients with polypharmacy,
  - the medication regimen had on average 4 characteristics that were likely to increase risk of non-adherence, including tablet splitting and multi-dose administrations.
  - Half of the tablet splitting and one fifth of the multi-dose administrations could be avoided.

Drug Safety 36(1):31-41 ·

Percent change in adherence with increasing regimen complexity



Data from a systematic review of 51 prospective studies where adherence was monitored electronically

J Manag Care Pharm. 2012 Sep;18(7):527-39.

How you can help

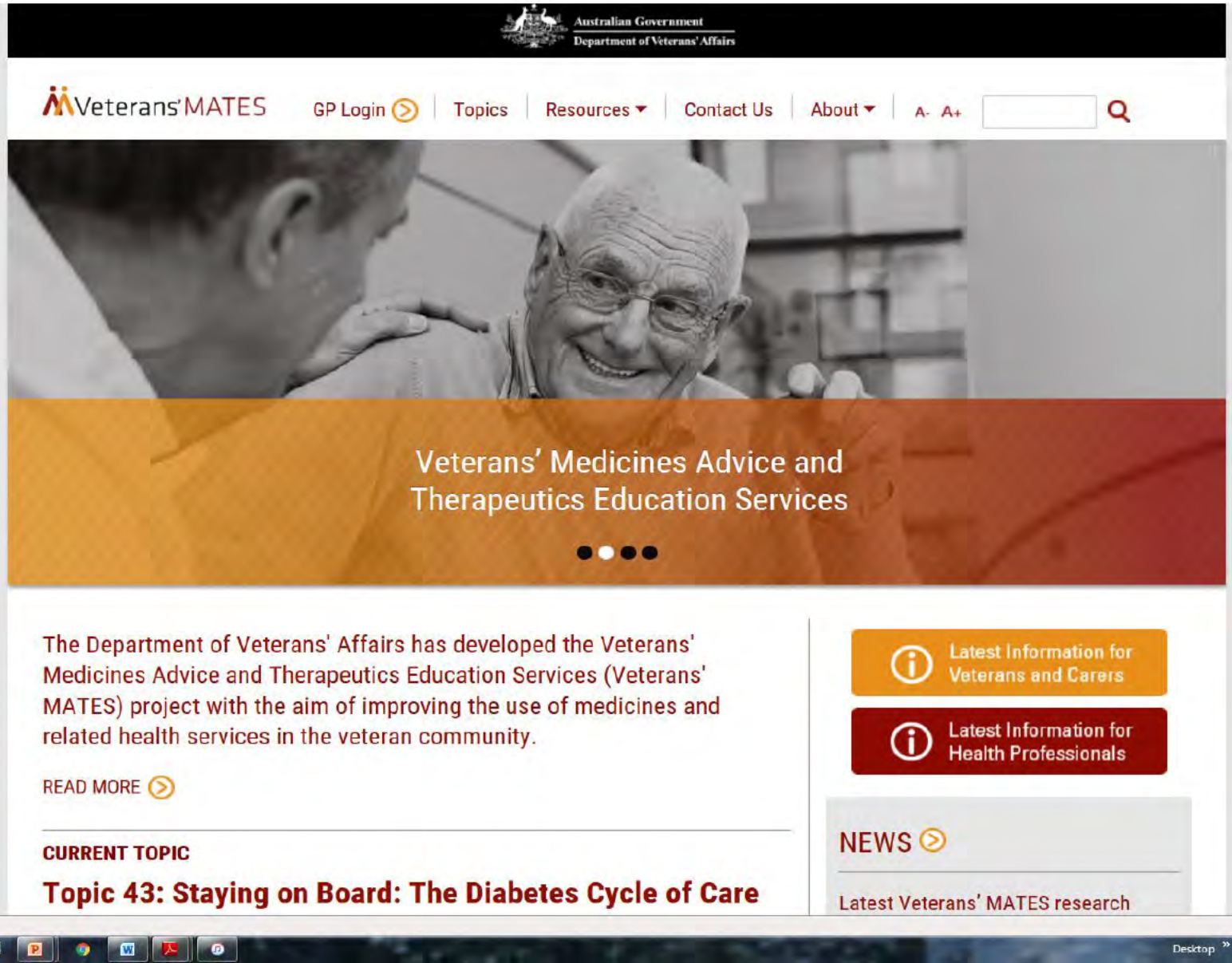
- As part of home medicines review, look at ways you can help veterans to simplify their regimen

• Are there any medicines where dose frequency can be reduced?
• Can the number of dosage units taken at one time for a specific medicine be reduced?
• Can dose times be varied?
• Can the formulation be modified to one that is simpler to use?

Future topics

- Chronic obstructive pulmonary disease
- Chronic pain
- Wound care

www.veteransmates.net.au



Quality Use of Medicines and Pharmacy Research Centre

Value of Pathology

University of South Australia | Sansom Institute

Quality Use of Medicines and Pharmacy Research Centre

- Research focus:
  - improving use of medicines in Australia
- Research enterprise:
  - extends from applied research to understand the problem, introduce practice change within the existing health care setting to address the problem, and support national policy development, implementation and evaluation

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Our centre

- Currently employ 20 FTE academic staff with expertise in
  - Pharmacy including clinical and community practice
  - Medicine
  - Behavioural psychology
  - Health program planning and evaluation
  - Biological science
  - Mathematics, biostatistics and epidemiology
  - Computer programming, software engineering
  - Business management

Our current work

- Medication safety and Antimicrobial surveillance:
  - Australian Commission on Safety and Quality in Health Care
- Practice change supporting quality use of medicines:
  - Veterans Medicines Advice and Therapeutics Education Services (MATES) Australian Government Department of Veterans' Affairs
- Post market surveillance in medicines and medical devices
  - Centre of Research Excellence: NHMRC with support TGA
  - Post-market reviews for the Pharmaceutical Evaluation Section, Australian Government Department of Health
  - NHMRC project grant
- Medicine utilisation methods: World Health Organisation

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Translation into practice is a priority

- All projects are supported by reference groups
  - Clinical reference groups
  - Consumer reference groups
  - Practitioner reference groups
  - Multi-representative stakeholder advisory groups

Where we started

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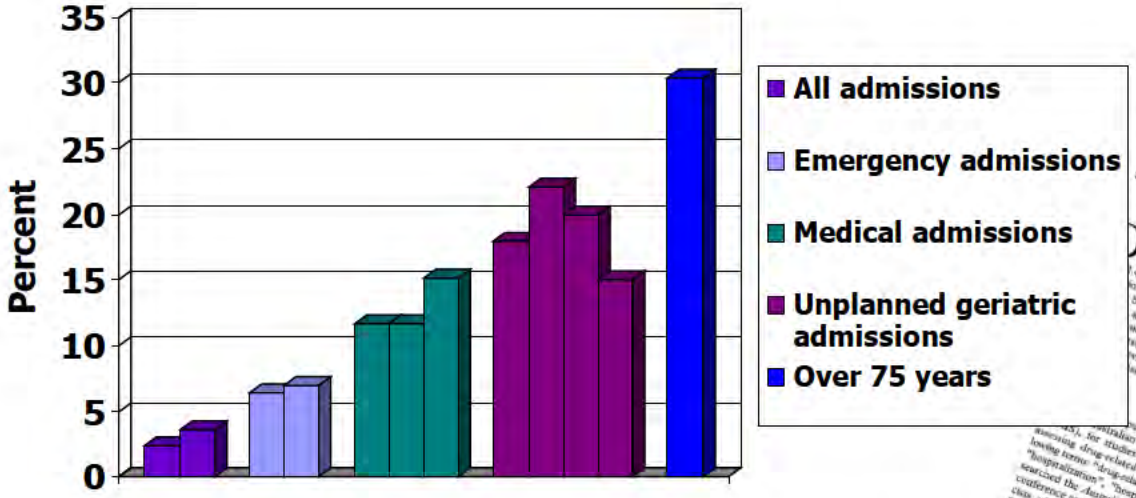
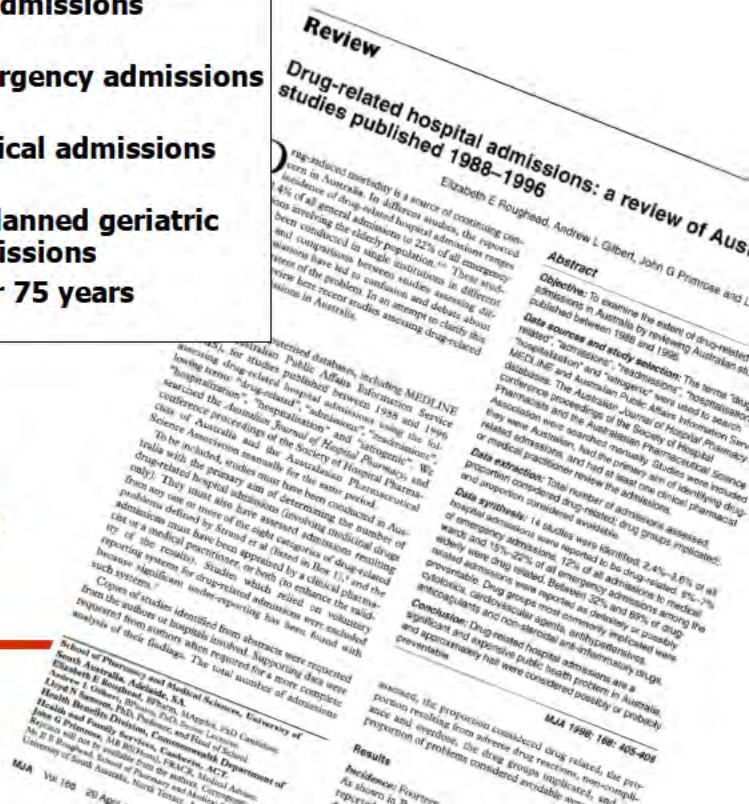
Our work

Understanding the problems

- How common are medication-related problems?

How often do people go to hospital because of medication-related problems?




Review

Drug-related hospital admissions: a review of Aus studies published 1988–1996

Elizabeth E Roughead, Andrew L Gilbert, John G Primrose and

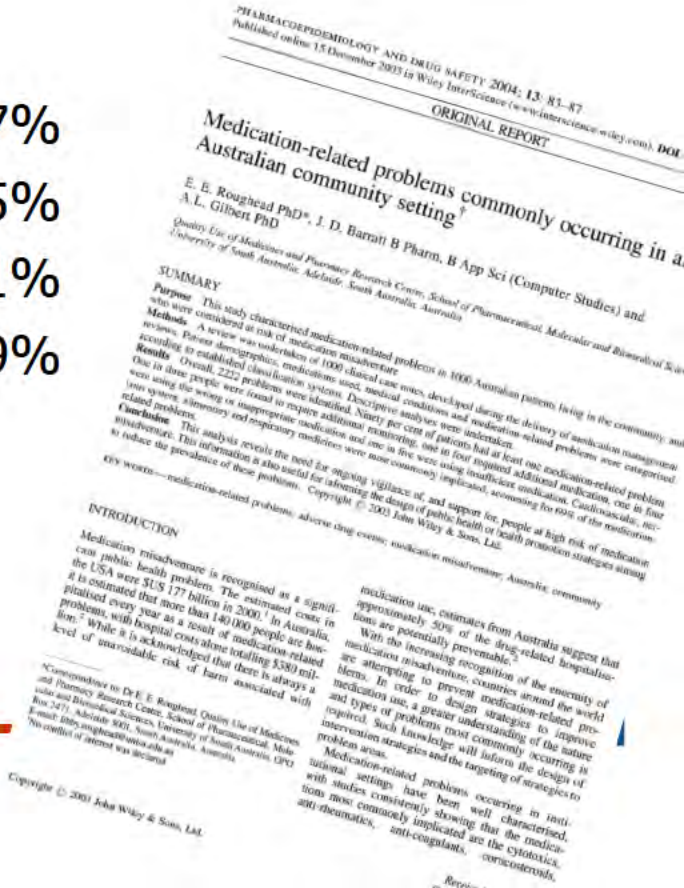
Abstract

230,000 hospitalisations per annum

Cost $1.2 billion per annum

How common are medication-related problems in the community?

- Sample of 1000 persons considered at risk of medication misadventure
  - Use of wrong medicine: 27%
  - Need for additional medication: 25%
  - Use of too little medicine: 21%
  - Adverse drug reaction: 19%



PHARMACOEPIDEMIOLOGY AND DRUG SAFETY 2004; 13: 83–87
Published online 15 December 2003 in Wiley InterScience (www.interscience.wiley.com). DOI:

ORIGINAL REPORT

Medication-related problems commonly occurring in a Australian community setting†

E. E. Roughead PhD*, J. D. Barratt B Pharm, B App Sci (Computer Studies) and A. L. Gilbert PhD

Quality Use of Medicines and Pharmacy Research Centre, School of Pharmaceutical, Molecular and Biomedical Sci University of South Australia, Adelaide, South Australia, Australia

SUMMARY

Purpose This study characterised medication-related problems in 1000 Australian patients living in the community, and who were considered at risk of medication misadventure

Methods A review was undertaken of 1000 clinical case notes, developed during the delivery of medication management reviews. Patient demographics, medications used, medical conditions and medication-related problems were categorised according to established classification systems. Descriptive analyses were undertaken.

Results Overall, 2252 problems were identified. Ninety per cent of patients had at least one medication-related problem. One in three people were found to require additional monitoring, one in four required additional medication, one in four were using the wrong or inappropriate medication and one in five were using insufficient medication. Cardiovascular, nervous system, alimentary and respiratory medicines were most commonly implicated, accounting for 69% of the medication related problems.

Conclusions This analysis reveals the need for ongoing vigilance of, and support for, people at high risk of medication misadventure. This information is also useful for informing the design of public health or health promotion strategies aiming to reduce the prevalence of these problems. Copyright © 2003 John Wiley & Sons, Ltd.

KEY WORDS—medication-related problems; adverse drug events; medication misadventure; Australia; community

INTRODUCTION

Medication misadventure is recognised as a significant public health problem. The estimated costs in the USA were $US 177 billion in 2000.[1] In Australia, it is estimated that more than 140 000 people are hospitalised every year as a result of medication-related problems, with hospital costs alone totalling $330 million.[2] While it is acknowledged that there is always a level of unavoidable risk of harm associated with medication use, estimates from Australia suggest that approximately 50% of the drug-related hospitalisations are potentially preventable.[3]

With the increasing recognition of the enormity of medication misadventure, countries around the world are attempting to prevent medication-related problems. In order to design strategies to improve medication use, a greater understanding of the nature and types of problems most commonly occurring is required. Such knowledge will inform the design of intervention strategies and the targeting of strategies to problem areas.

Medication-related problems occurring in institutional settings have been well characterised, with studies consistently showing that the medications most commonly implicated are the cytotoxics, anti-rheumatics, anti-coagulants, corticosteroids,

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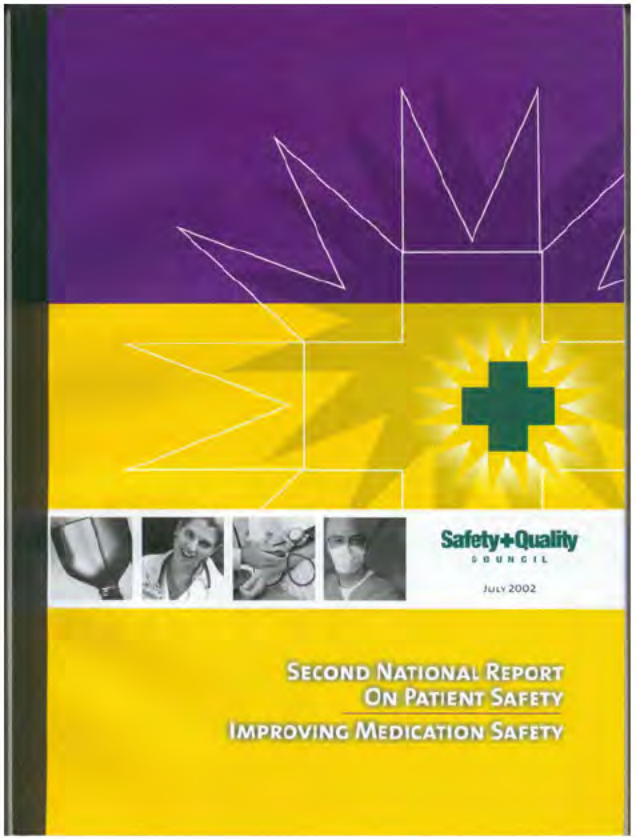
E-mail: Elizabeth.roughead@unisa.edu.au
†No conflict of interest was declared

Outcomes



- National reports on patient safety (2002, 2009, 2013)
- National targets for medication safety
- Medication safety is one of three goals of the Australian Commission on Safety and Quality in Healthcare
- Medication safety is a nominated program of the Australian Digital Health Agency

Quality Use of Medicines Research:

Implementing solutions

- How can we develop local practice to support improvements in medication use?

Implementing solutions: in Pharmacy

- **Developing new models of practice** (March et al.)
  - Implementing pharmaceutical care
  - 12 community pharmacies, 205 patients
  - 87% had at least 1 medication-related problem
  - Service resulted in 75% of problems well managed
  - 85% of consumers believed the service had made a significant contribution to their health
  - Net annual cost savings of $40 to $311

Developing and evaluating a model for pharmaceutical care in Australian community pharmacies

GEOFF MARCH, ANDREW GILBERT, ELIZABETH ROUGHEAD and NEIL QUINTRELL

Implementing solutions: in Pharmacy

- **Quality Use of Medicines in the Community Implementation Program** (s 47F et al.)
  - Area wide implementation trial of collaborative medication review
  - 129 medical practitioners and 63 pharmacists, 1000 patients
  - On average 2.5 problems per person
  - At the projects completion 61% of problems resolved, with a further 20% improving

Collaborative medication management services: improving patient care

Andrew L Gilbert, Elizabeth E Roughead, Justin Beilby, ...

ABSTRACT

Objective: To implement and evaluate a collaborative ... service model.

Design: Participatory action research.

Setting and participants: The study was conducted from ... 2008. 1000 patients, 63 pharmacists and 129 general practi... Divisions of General Practice in South Australia participated.

Interventions: A collaborative service delivery model, involv... conferences, a home visit and a second case conference, was ... discussions with medical and pharmacy representatives and then ... implemented.

Outcome measures: Medication-related problems; actions/ reco...

Results: Overall, 2764 problems were identified. The most common ... related problem (17.6% of all problems) was the need for additional ... and 17% for the medications related to medicine selection. 20% to patie... medication-related problems, 42% were implemented. Of the 878 probl... which action was taken and follow-up data were available, 81% were re... be "resolved", "well managed" or "improving".

Conclusion: This implementation model was successful in engaging GPs ... pharmacists and in assisting in the resolution of medication-related problem...

METHODS

Developing the service

We used a participatory action research design,[12] in which researchers worked with participants to design, implement and evaluate the service, allowing researchers and participants to refine it. The participatory action research process involved general practitioners, pharmacists and consumers in a series of workshops, focus groups and feedback sessions.

A call for expressions of interest in participating in the project was sent to all Divisions of General Practice in South Australia. Eight of the 15 Divisions responded and six participated (three rural and three urban Divisions). A Divisional Liaison Officer (DLO) was employed in each Division to facilitate the interaction between GPs and pharmacists and to assist in the local implementation of the HMR service.

A collaborative service delivery model (Box 1) was agreed on, and standard forms for documenting relevant patient information, reports and actions plans were developed in consultation with participating GPs and pharmacists.

Implementing the service

The study was carried out between March 1999 and March 2000.

GP and pharmacist recruitment

DLOs used divisional newsletters and meetings with GPs to encourage participation. Pharmacists were invited to participate through a mailout. The DLO visited interested GPs and community pharmacists to discuss the proposed service and provided support to GPs and pharmacists throughout the project. Local relationships established to...

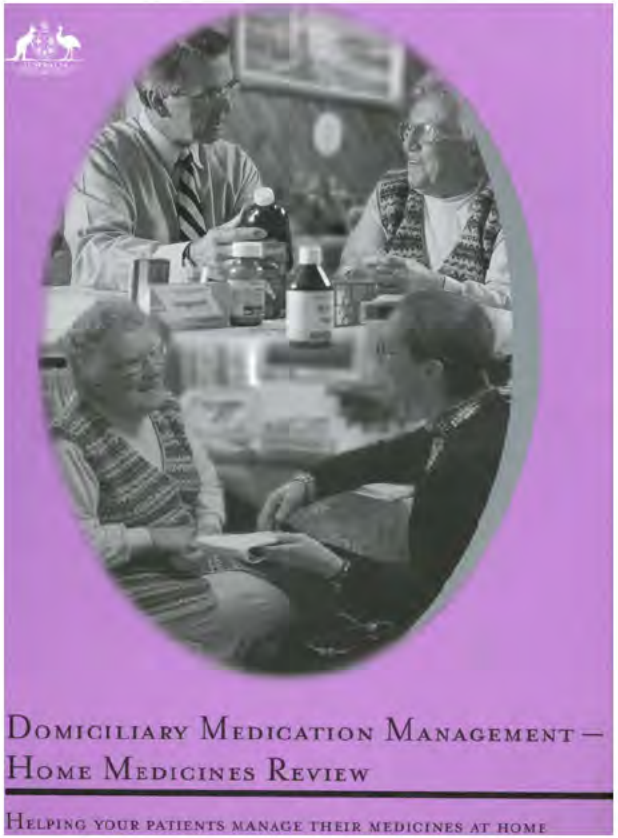
Quality Use of Medicines and Pharmacy Research Centre, School of Pharmaceutical, Molecular and Biomedical Sciences, University of South Australia, Adelaide, SA.

Department of General Practice, University of Adelaide, Adelaide, SA.

Quality Use of Medicines Research:

Outcomes

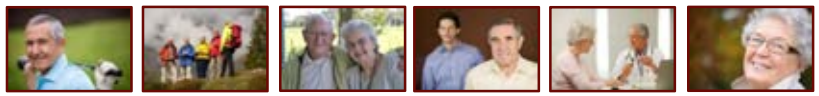
- Collaborative medication review services are now funded by the Federal Government in Australia
- Over 50,000 home visits per annum



University of South Australia | Sansom Institute

Our current work using linked Australian health claims data

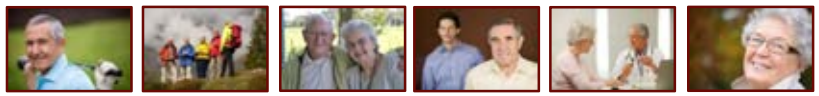
- Using health data to improve practice
  - Veterans' Medicines Advice and Therapeutics Education Services (MATES)



Veterans' MATES

Funded since 2004 by the Australian Government Department of Veterans' Affairs (DVA),

- Aims to improve medicine use and health outcomes for veterans



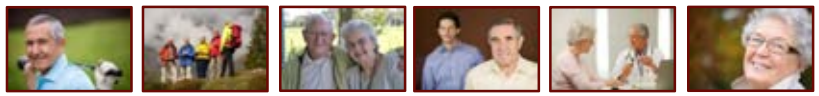
The Veterans' MATES approach

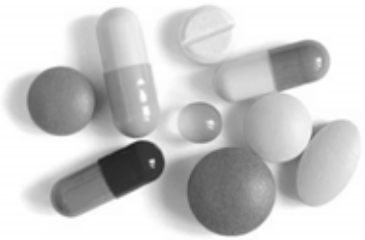
Every three months a chosen health topic is distributed:

- 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.

Health claims data are central to the program

- Australian Government Department of Veterans' Affairs health claims data
- Data over fifteen years – pharmacy, medical and allied health records (no diagnosis, includes GP visits, radiology, pathology claims, but not results)
- Hospital records (diagnosis and procedures)
- Client data-updated weekly, health claims data up-dated monthly





Using the health claims data

Planning stage

- Medication-related problem analysis to identify the evidence practice gap
  - Module topic selected

Development & Implementation stages

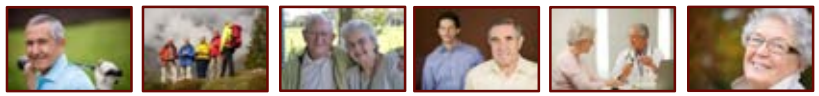
- Patient specific feedback & evidence based information developed
  - Topic implementation

Evaluation stage

- Evaluation

Veterans' MATES highlights

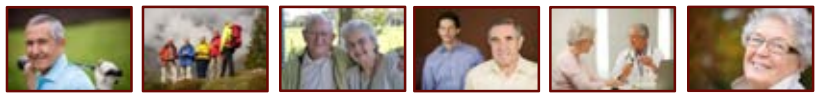
Improving the management of diabetes



The planning stage

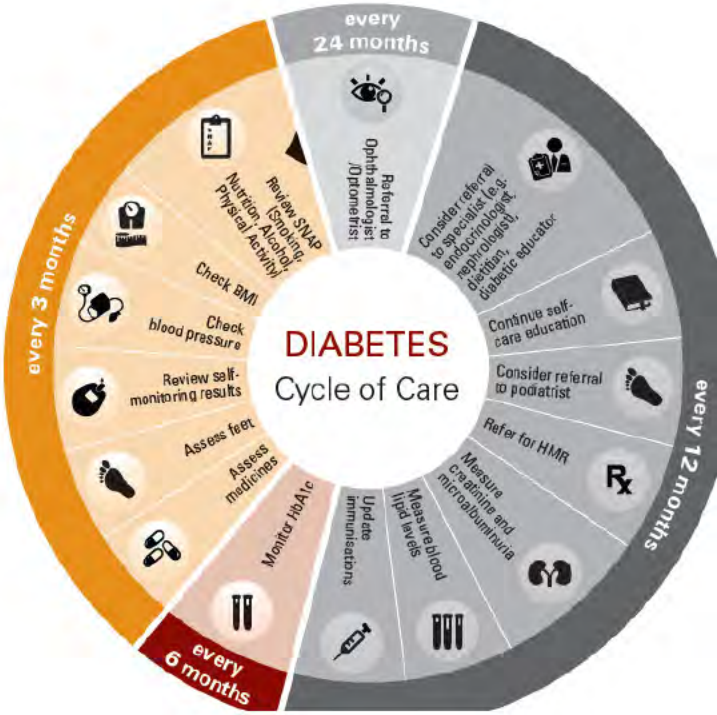
Identifying the problem:

	Started medicines in the last two years (N=5388)	On medicines for at least 2 years (N=16509)
HbA1c test	59	69
Microalbuminuria test	33	39
HDL test	49	52
Podiatrist visit	50	62
Dietician service	5	6
Endocrinologist visit	5	10
HMR/RMMR	7	9
Diabetes educator	2	2
Ophthalmology/ optometry visit	56	61



Veterans' MATES highlights

Improving the management of diabetes



DR S BROWN

PLEASE KEEP FOR YOUR RECORDS

LEIGH A REID	**SUBURB: Linden Park**		**ACCOMMODATION: Community**		
Services claimed	**Date of last service claimed**	**Claim within recommended period**	**Actions**		
			Your Action	**Practice Nurse to organise**	**Service organised**
Microalbuminuria test	25/06/2012	yes			
HbA1c test	25/06/2012	yes			
Lipids/cholesterol profile	25/06/2012	yes			
Home Medicines Review	None claimed	no			
Ophthalmology / optometry service	11/02/2009	no			
Podiatry service	None claimed	no			
GP Management Plan (GPMP) service	None claimed	no			
Annual Diabetes Cycle of Care service	None claimed	no			

Services to support patient education claimed:

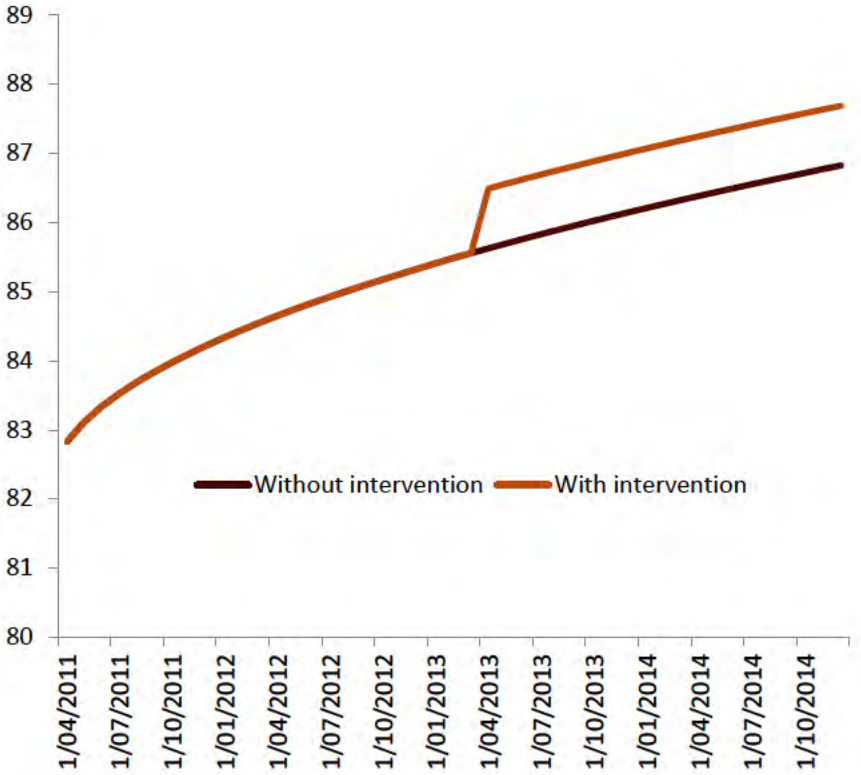
- ☑ *Diabetes educator*
- ☐ *Dietitian*
- ☐ *Exercise physiologist*

Veterans' MATES highlights

Improving the management of diabetes

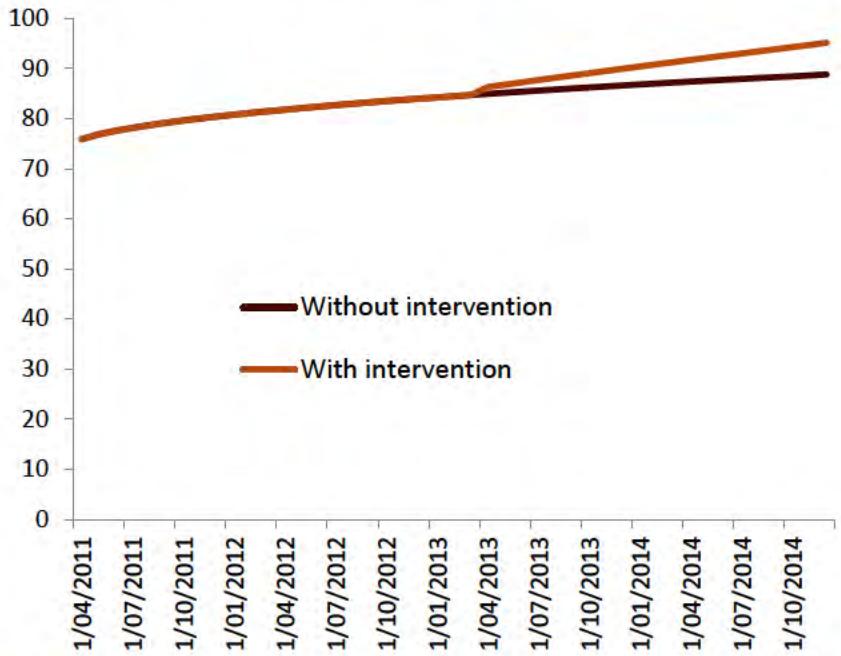
So what happened?

- ✓ 17% relative increase in HbA1c tests
- ✓ Further 2% monthly increase
- ✓ 7% relative increase in microalbuminurea testing at time of intervention
- ✓ Further 1% monthly increase

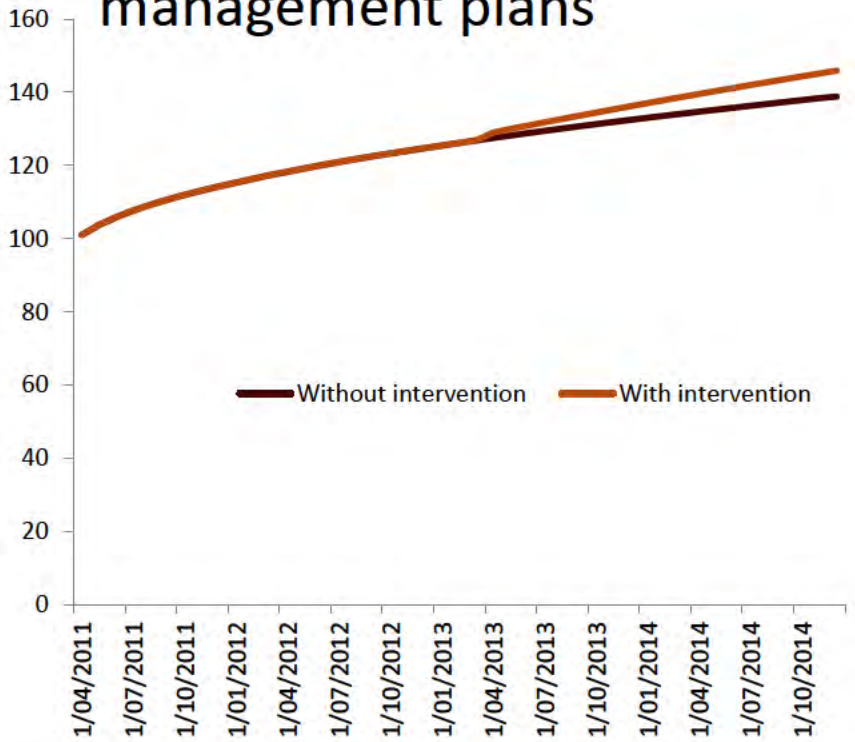


Improving the management of diabetes

748 additional microalbuminuria tests



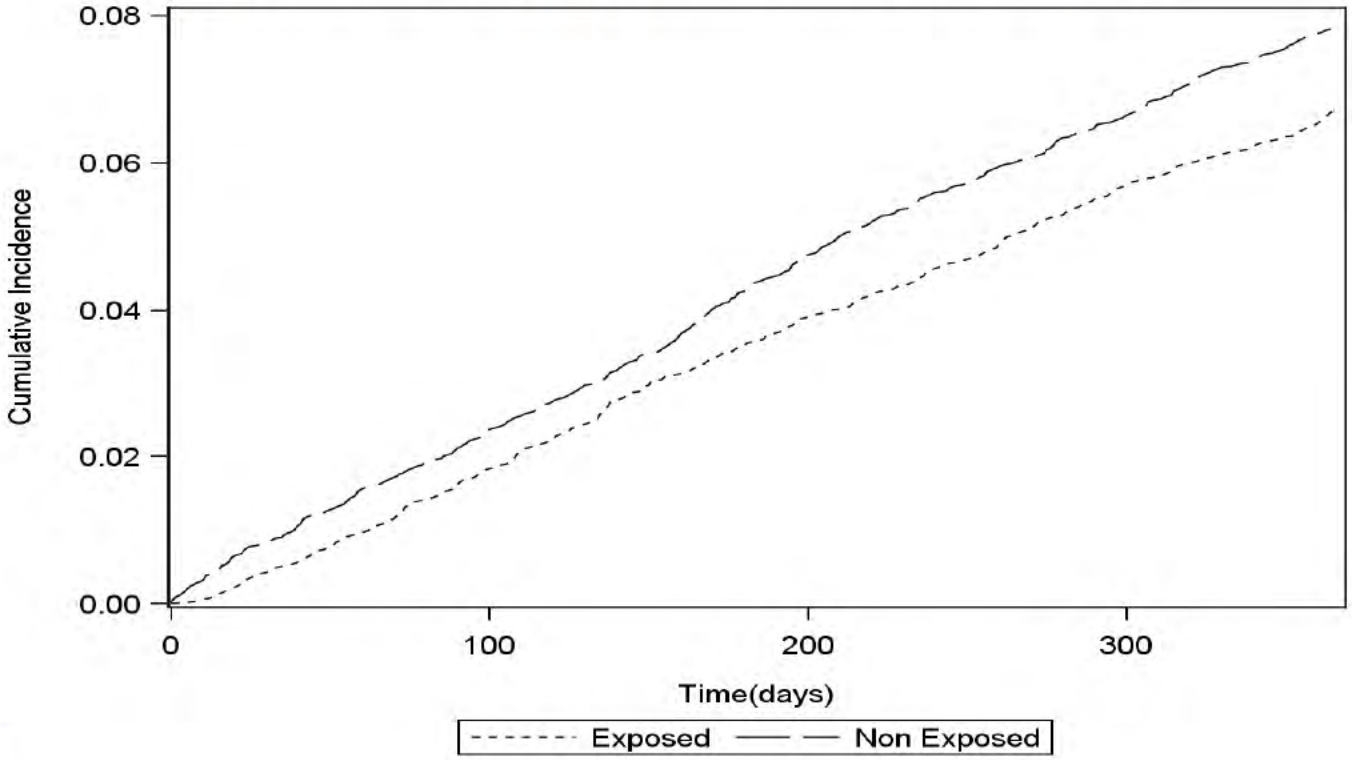
830 additional GP management plans



Veterans' MATES highlights

Improving the management of diabetes

Time to next hospitalisation for diabetes in people with and without a GP management plan

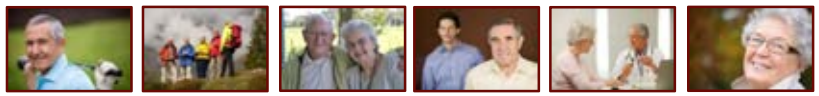


Factors contributing to success

- 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

Factors contributing to success

- Significant stakeholder engagement
- Only target identified problems
- Interventions are grounded in behavioural theory; target one behaviour at a time
- Repeated interventions over-time
- Independently audited data and security standards

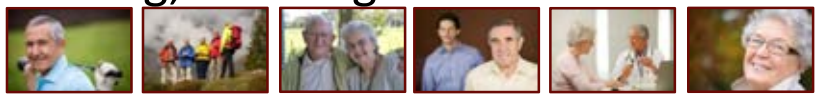


Potential opportunities for pathology

- Federal Government is increasing access to data
  - Should be possible to get a 10% patient linked sample of MBS data now
    - PBS 10% sample currently provided to Universities and commercial companies
      - Costs ~ $1250 per annum, plus $700 per data project.
  - There are plans to provide a 10% MBS-PBS linked data set. Commonwealth agencies already have access

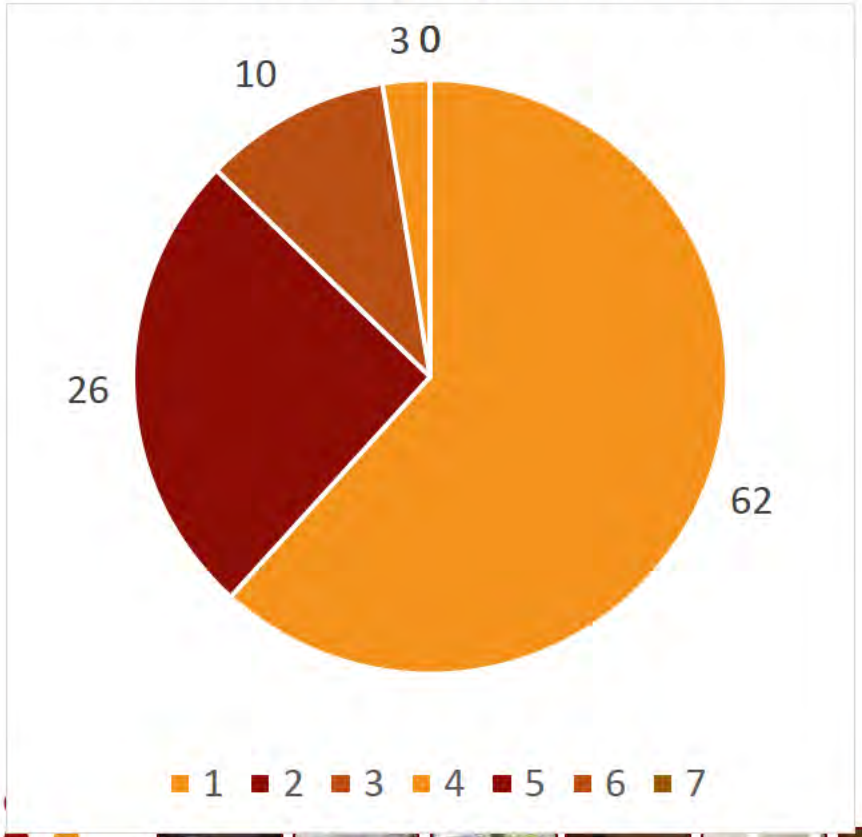
Potential opportunities for pathology using routinely MBS data collected data

- Appropriateness of use
  - Frequency, (over-use, under use and omission, duplication)
  - Inappropriate selection (wrong test)
  - Setting (private sector)
  - Co-dependent use
    - Can stratify any of these by age, gender, comorbidity (dependent on proxy measures in MBS data set or if linked, PBS or hospital
- Effects on practice
  - Time to use, Time to subsequent outcome
  - Comparative studies of exposure
- Policy and regulatory changes
  - Listing, delisting decisions

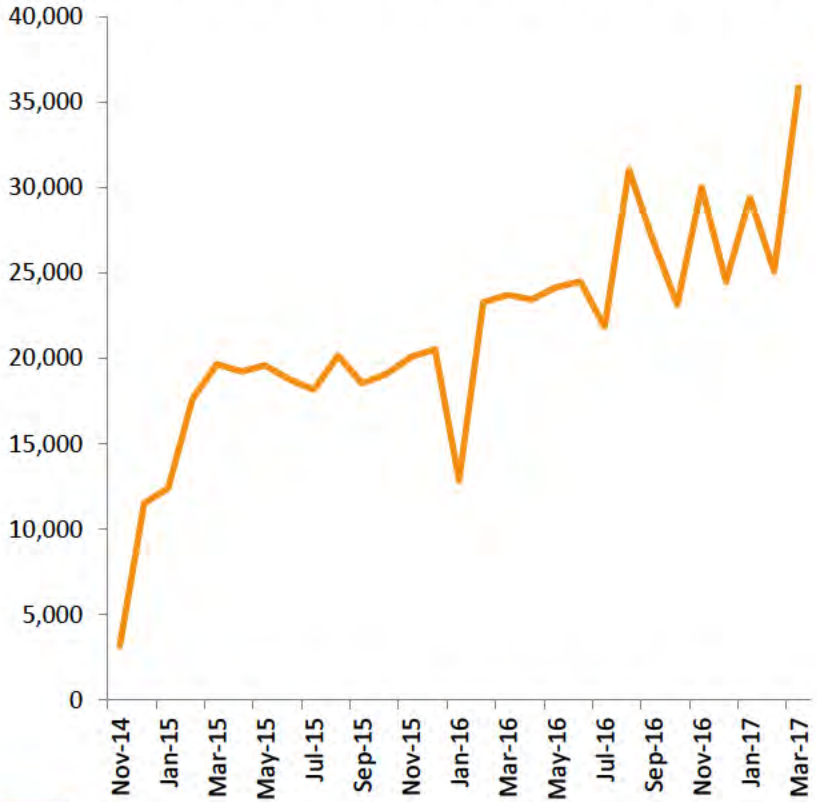


HbA1c tests per person per year

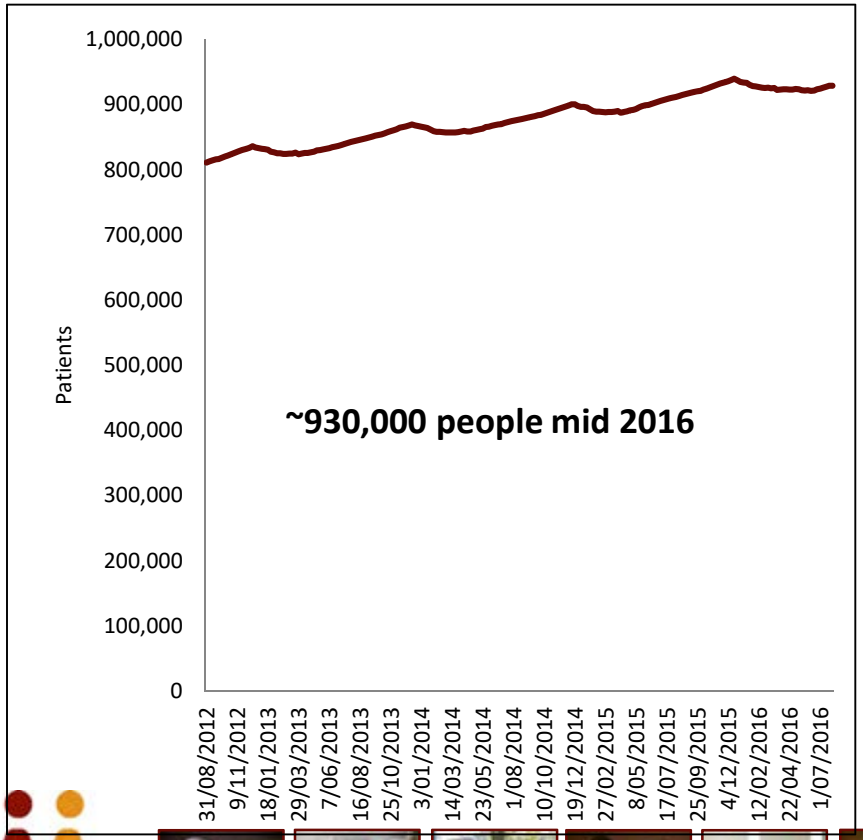
HbA1c claims per person: 2014



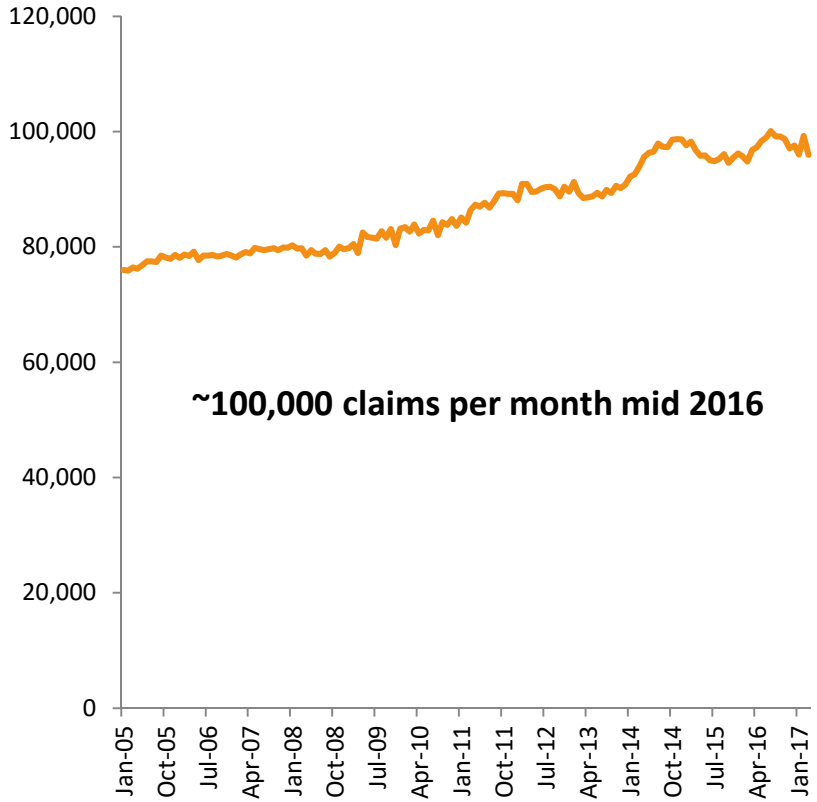
Uptake of HbA1c as a diagnostic test



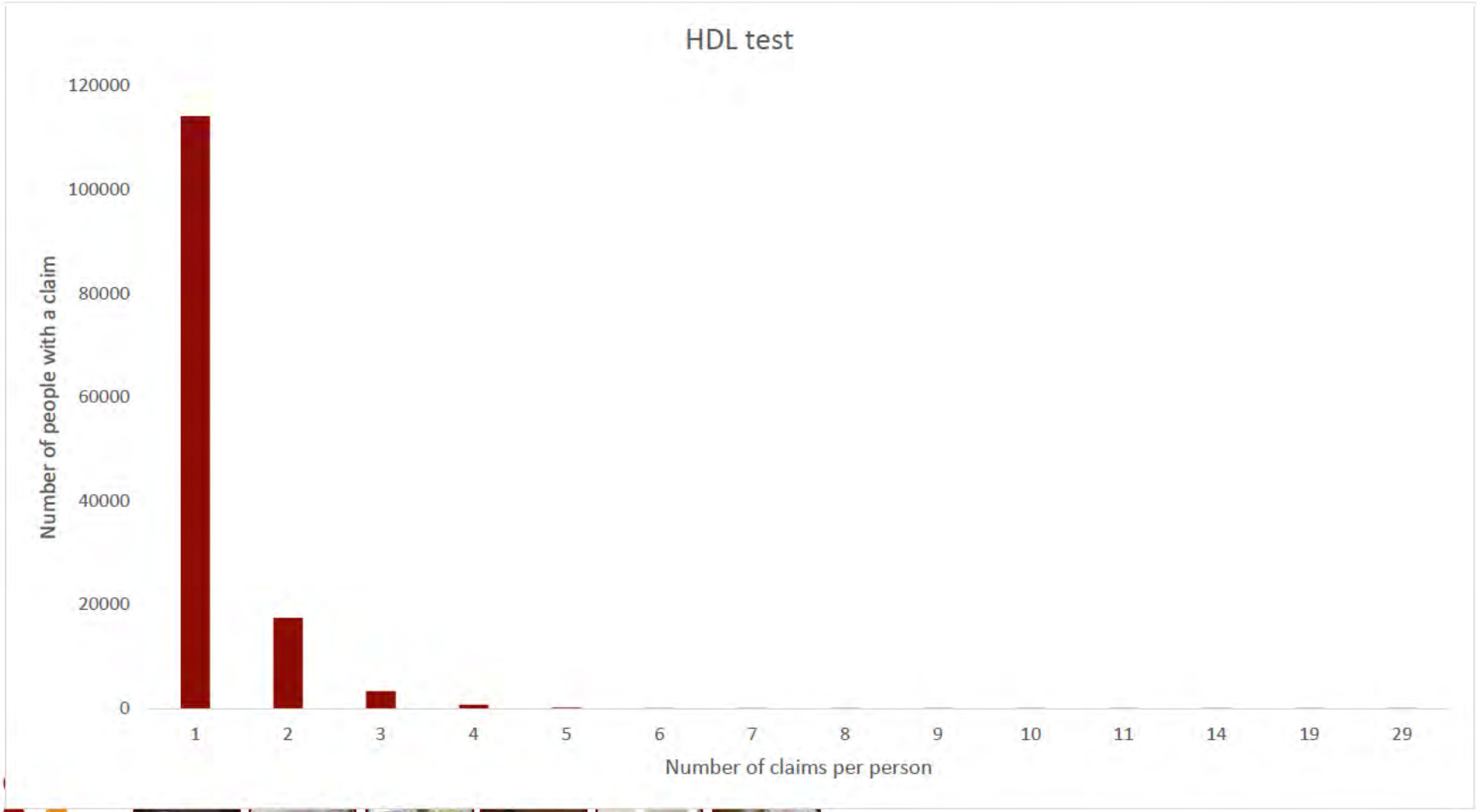
Number of people on medicines for diabetes



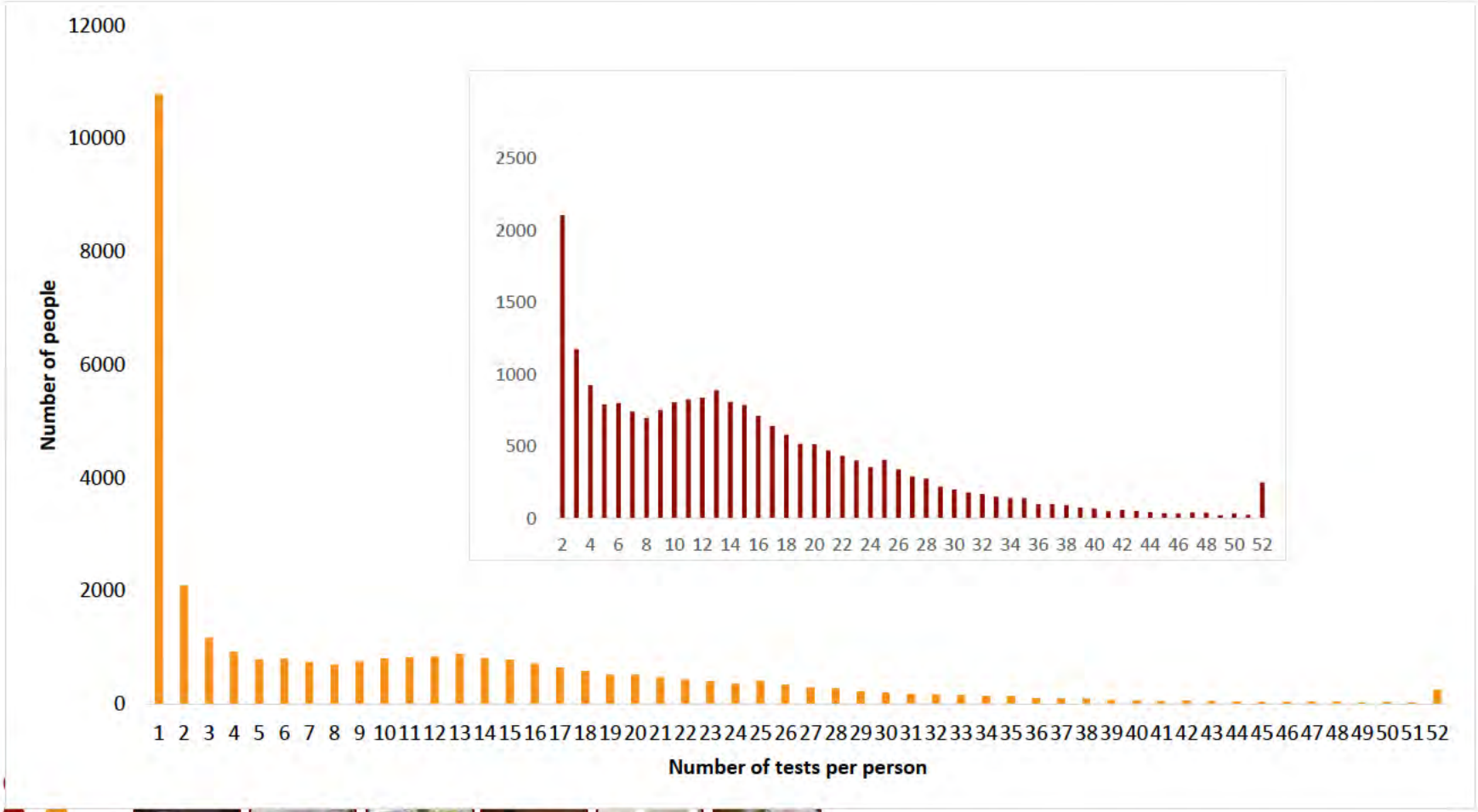
Total claims for HbA1c over time (rolling average)



HDL tests per person per year: 2014

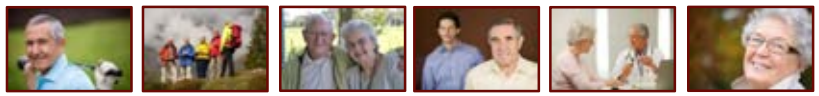


INR tests per person per year: 2014



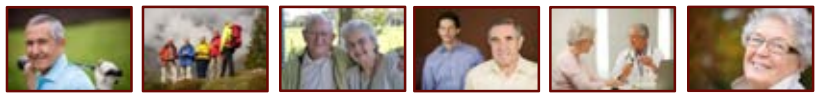
Potential opportunities for pathology: Medicine Insight

- MedicineInsight is an NPS MedicineWise program
  - collects regular de-identified data from general practices across Australia
  - 500 participating practices, with over 3000 GPs involved
  - representing more than 4.8 million patients
  - Clinical results of pathology tests are available.
    - In a study we did, 25% of SGLT2 initiators had documented renal function monitoring at the time of initiation or during the 6 months follow-up period.
    - Quality of data still to be verified



Potential opportunities for pathology: My Health Record

- Pathology reports now able to be viewed on my health record by consumers
  - 4 million people now have a My Health Record
  - Federal government has announced we will be moving to an opt-out system and budget has been provided for full implementation.



First, do no harm- research to improve the safety of medicines

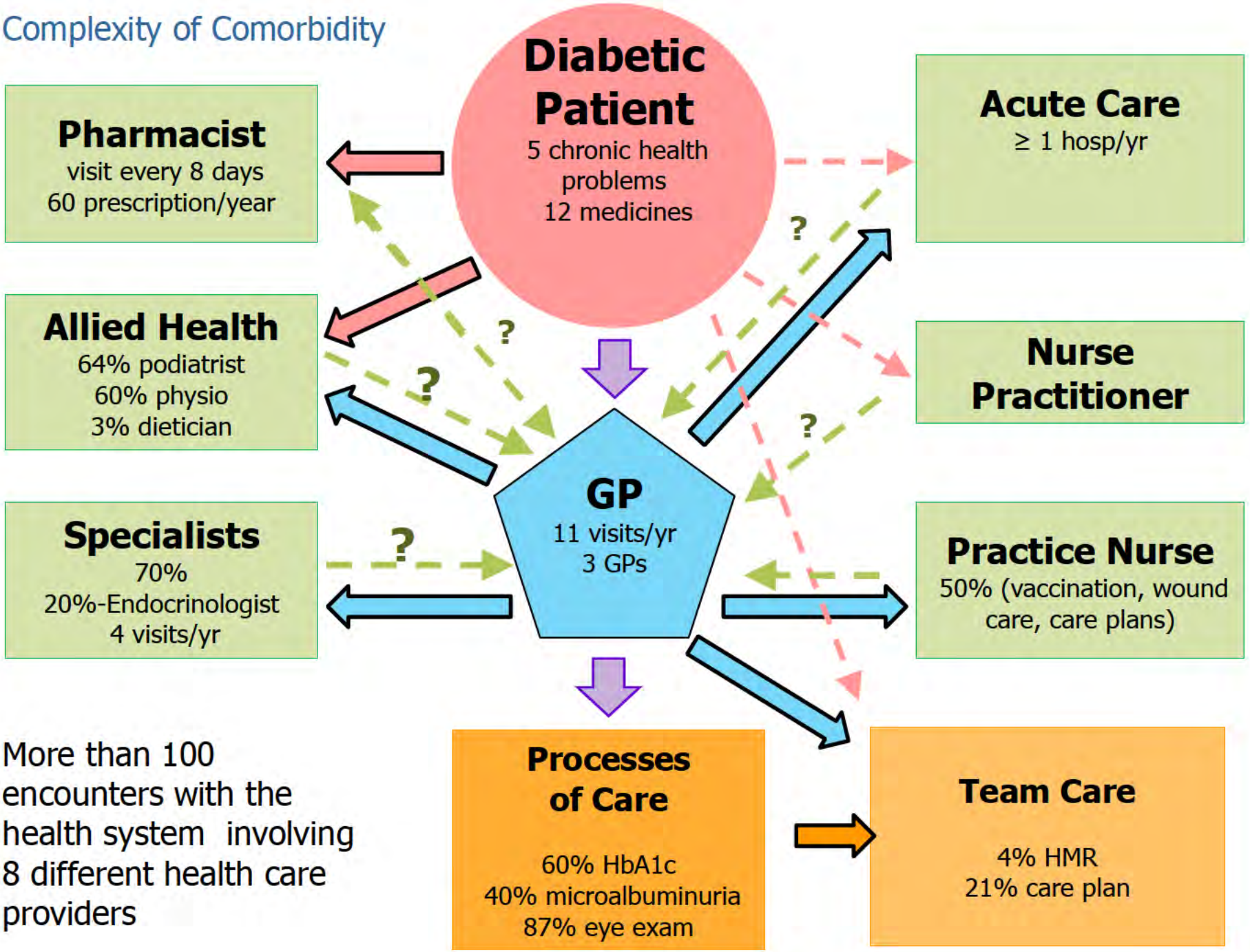
Libby s 47F
School of Pharmacy and Medical Sciences,
University of South Australia

University of South Australia

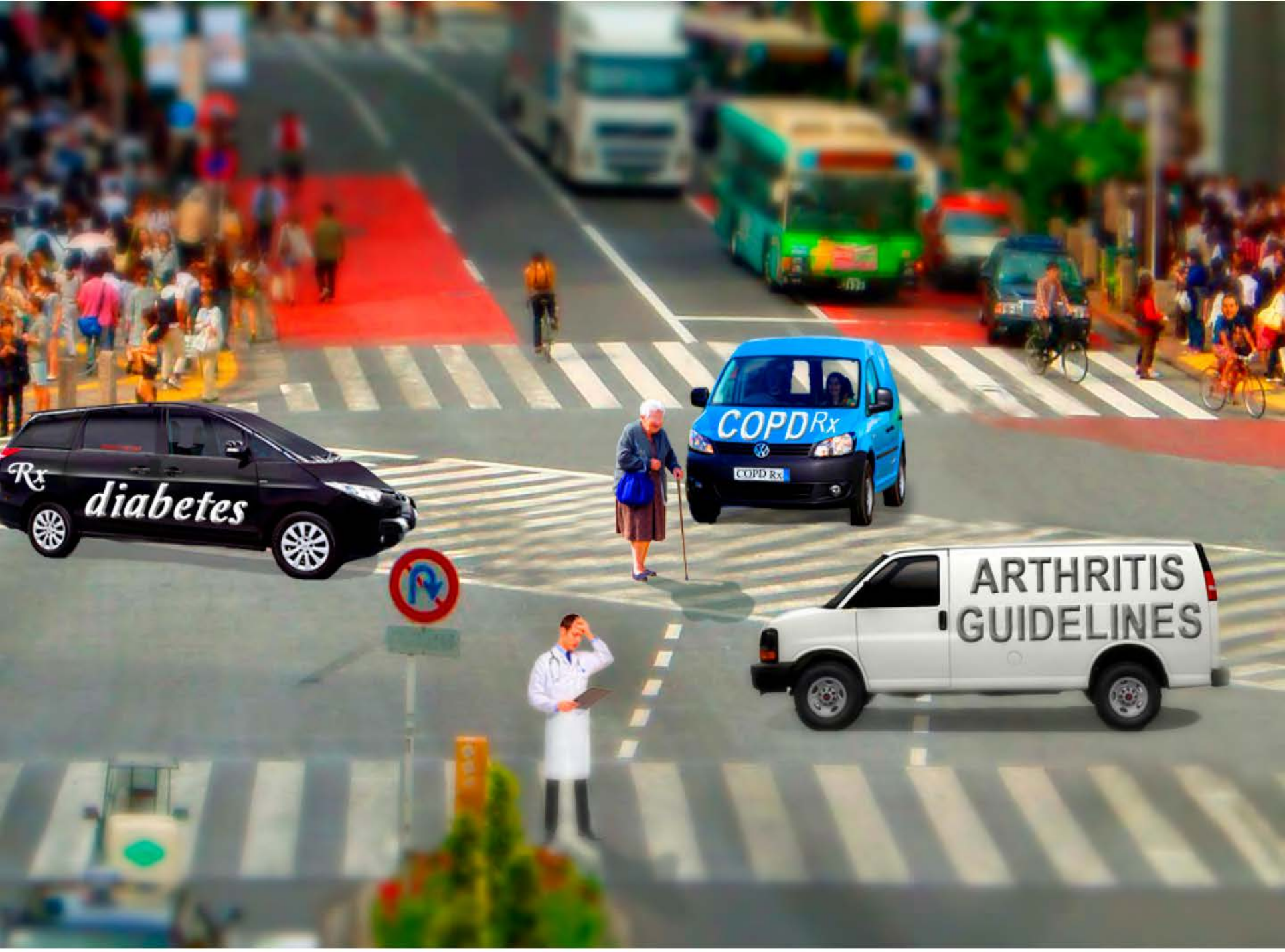
Medicine use in the 21st century is very complex

University of South Australia

Complexity of Comorbidity

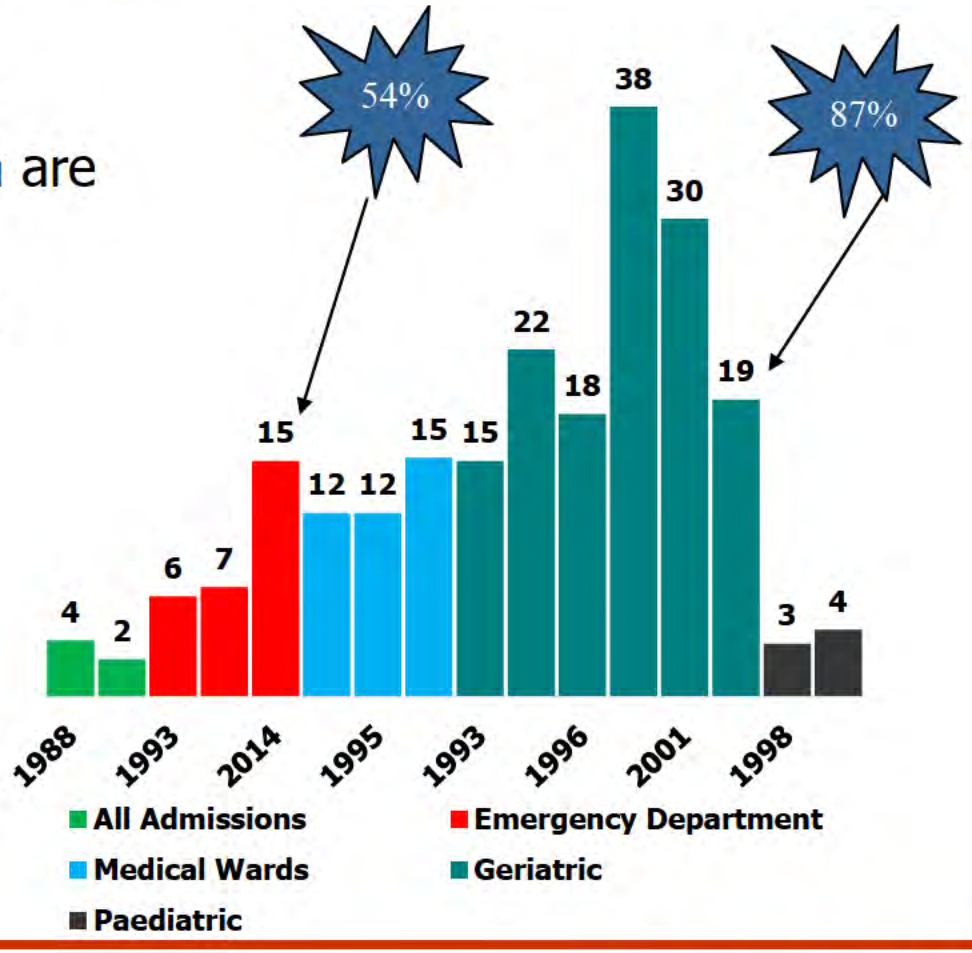


More than 100 encounters with the health system involving 8 different health care providers


Rx
diabetes
COPD Rx
COPD Rx
ARTHRITIS
GUIDELINES

The size of the problem: medication related hospital admissions

- 2%-3% of all hospital admissions in Australia are medication-related
- ~ 250,000 per annum
- ~$1.4 billion



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Quality Use of Medicines and Pharmacy Research Centre

- Research focus:
  - improving use of medicines
- Research enterprise:
  - extends from applied research to understand the problems, and introduce practice change within the existing health care setting through to national policy development, implementation and evaluation

University of South Australia

Our centre

- Multidisciplinary research centre with expertise in
  - Pharmacy, medicine, nursing
  - Biological sciences, pharmacokinetics, systems pharmacology, ethnopharmacology
  - Behavioural psychology, health program planning and evaluation,
  - Machine learning biostatistics and epidemiology
  - Digital health, computer programming, software engineering
  - Business management

University of South Australia

Today's talk

- I'm going to be talking about

1. the research and service delivery we do with veterans
2. The trial we are running in aged-care facilities to see if we can reduce side effects from medicines
3. Our research with international partners to identify safety issues with medicines

University of South Australia

Veterans' MATES
An enterprising partnership improving medication safety

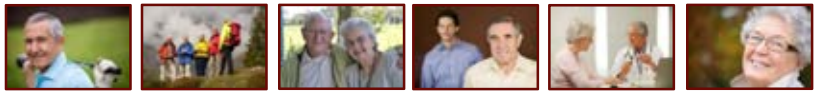
MATES: Medicines Advice and Therapeutics Education Services






Veterans' MATES

- First funded in 2004 by the Australian Government Department of Veterans' Affairs.
- 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.

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

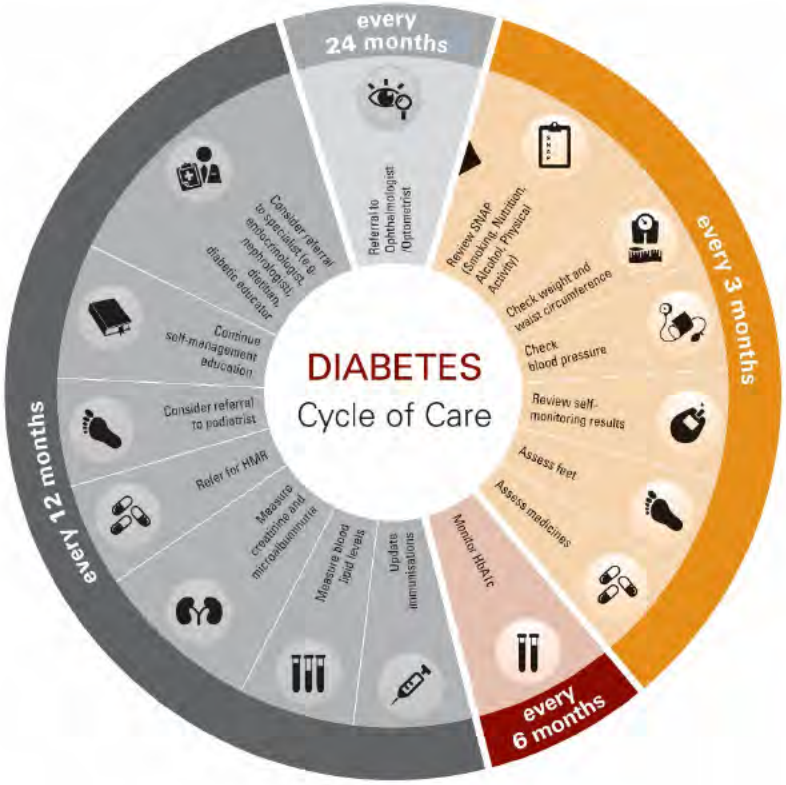
Contains hospital records including diagnosis and procedures

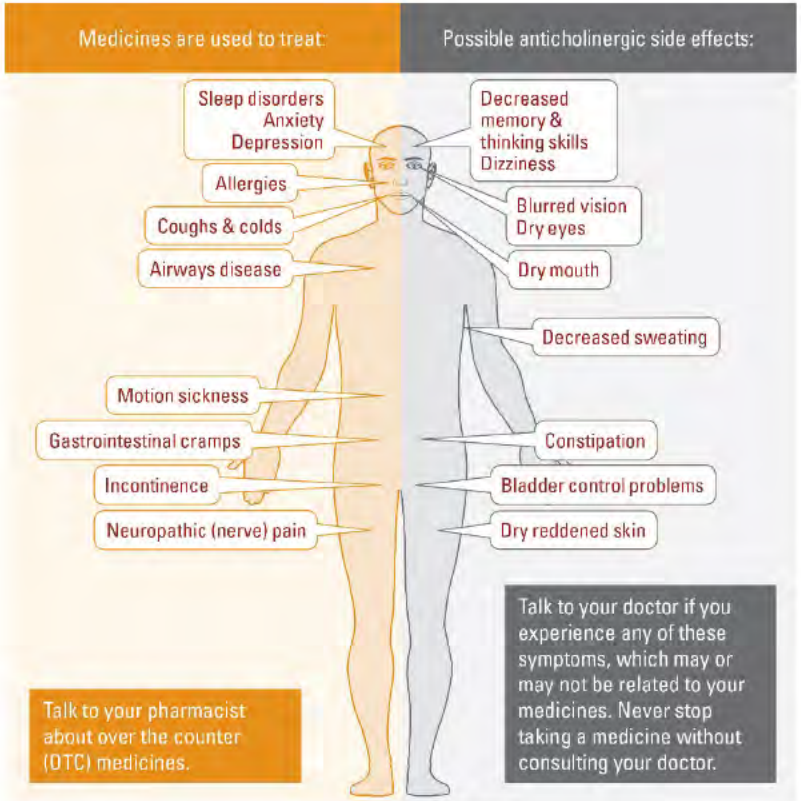
Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

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



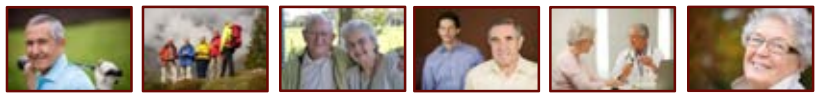


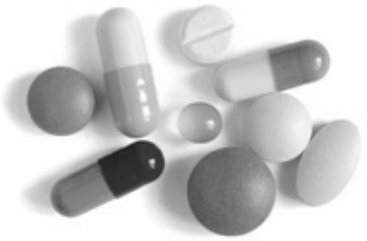
Each topic is either:

- 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 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?



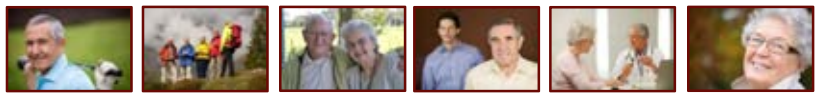


Improving osteoporosis management:

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

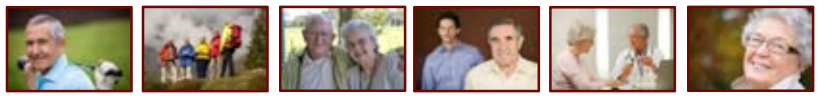


Improving osteoporosis management:

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

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

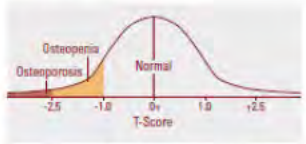
66% of people with osteopenia do not receive appropriate treatment

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.



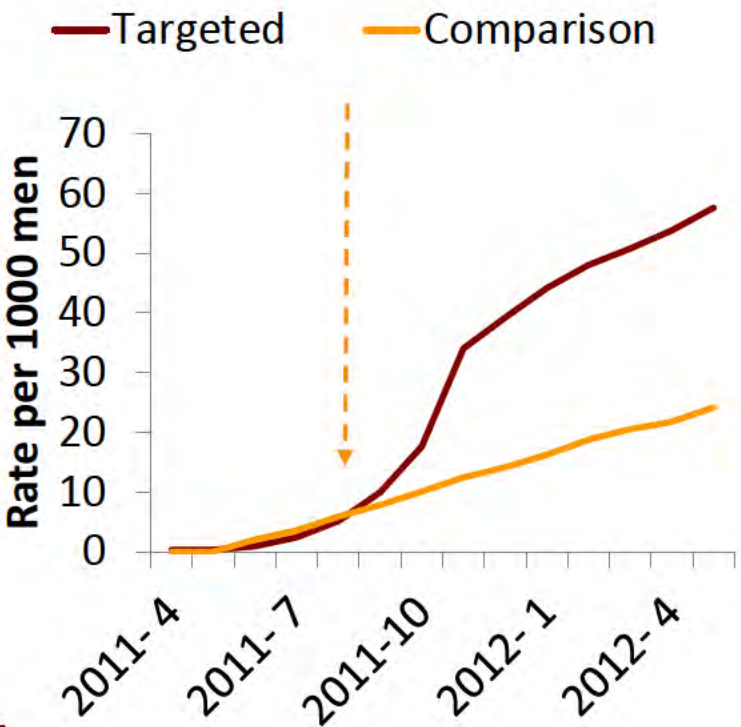
World Health Organisation **diagnostic criteria for osteoporosis, osteopenia and normal bone mineral density. Adapted with permission from *Osteoporosis Australia***

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

Rate of BMD testing (men)



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

Reducing the risk of falls & hip fractures

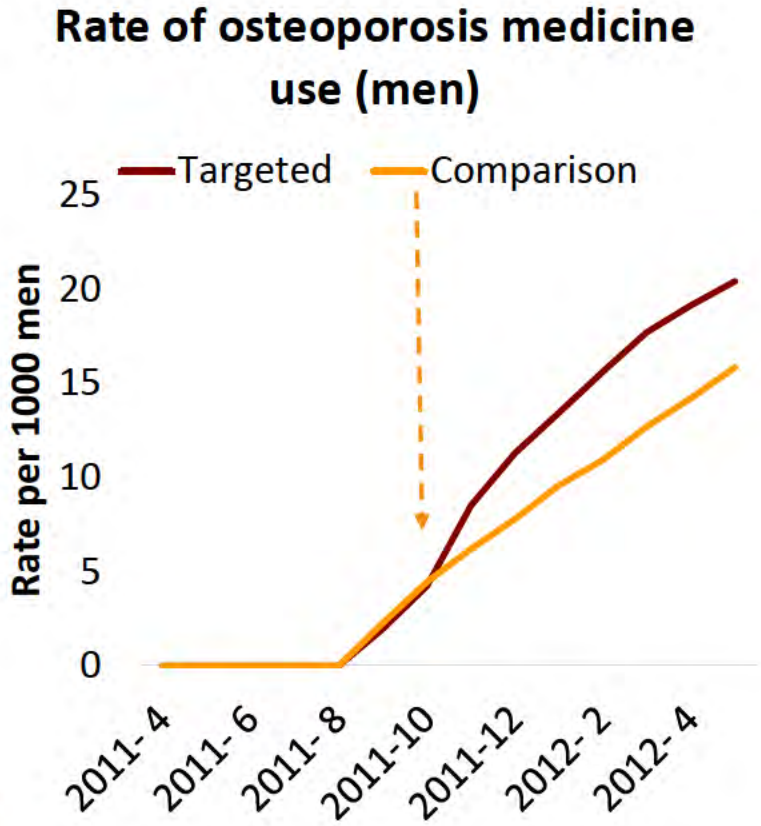
What happened?

✓ 40% relative increase in osteoporosis medicine use in men

- 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 pa
You might feel that there is nothing that can be done to help and that it's just one of
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 reduc
chance of having a fall.

Dr J Howell

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

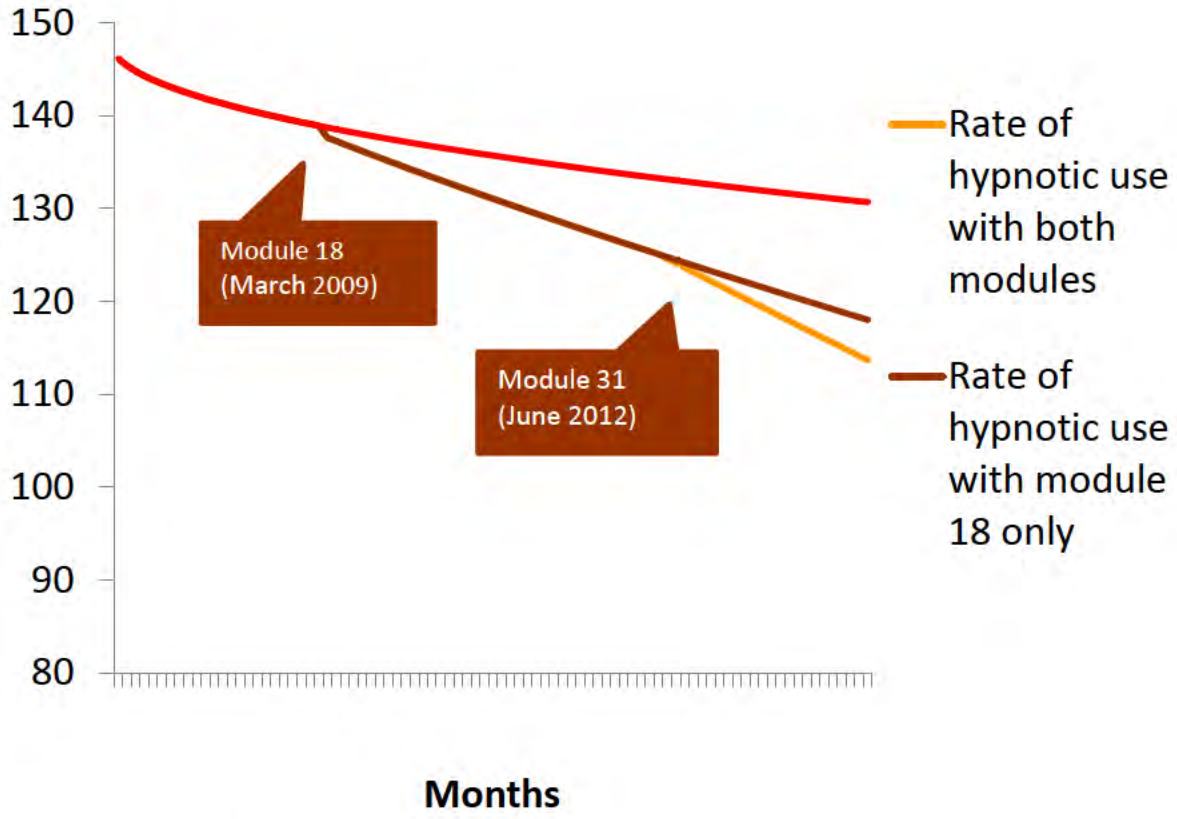
- Ask the patient how steady they feel on their feet or if they have previously fallen Yes ☐
- Review medicines to see if any are suitable for tapering or ceasing Yes ☐
- Ask the patient if they would consider reducing the medicine Yes ☐
- Plan a reduction strategy and address other risk factors for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

Reducing the use of sedative medicine use

What happened?

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



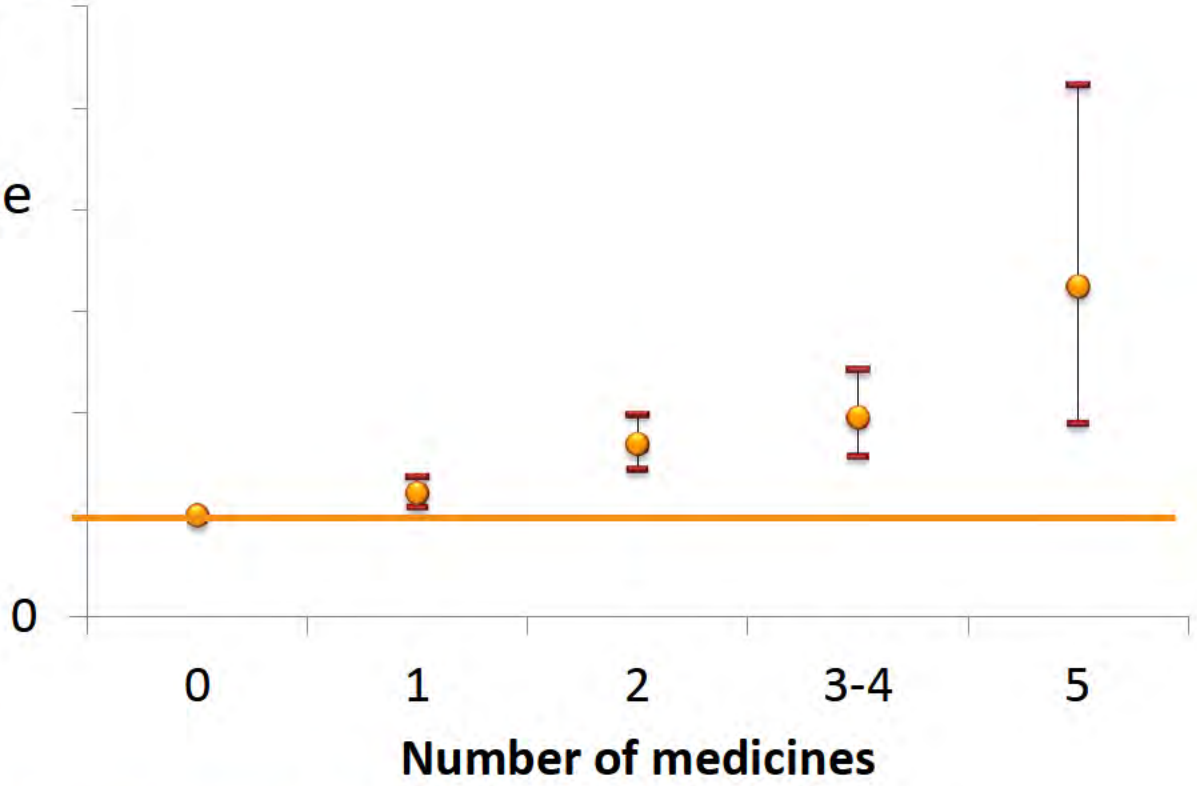
Kalisch Ellett, BMC Health Serv Res. 2018 Aug 9;18(1):626.

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

Health Outcomes:

Avoided,

- 80 hospital admissions due to falls



s 47F et al., Drug Saf. 2014

The factors contributing to our success

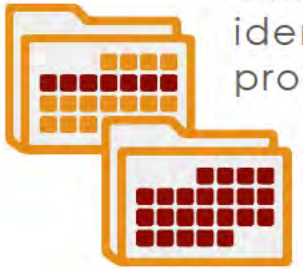
A multidisciplinary, collaborative approach

Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

Significant stakeholder engagement



Only target identified problems

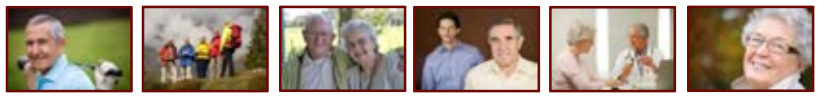
Grounded in behavioural theories and models

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

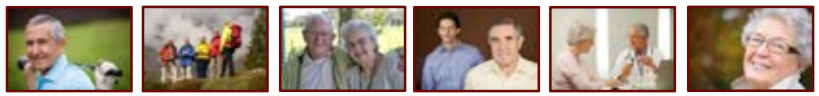
- Pharmacy Guild of Australia (National & State)
- Pharmaceutical Society of Australia (National & State)
- Australian Association of Consultant Pharmacy
- Society of Hospital Pharmacists of Australia

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

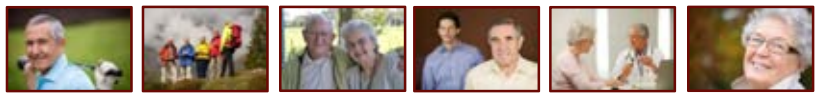
The unexpected bonuses

- 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



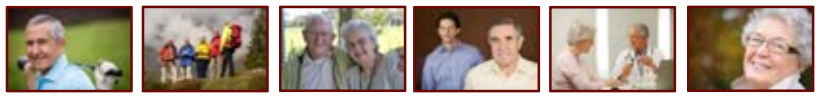
Collaborating with veterans to address issues of concern to them

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



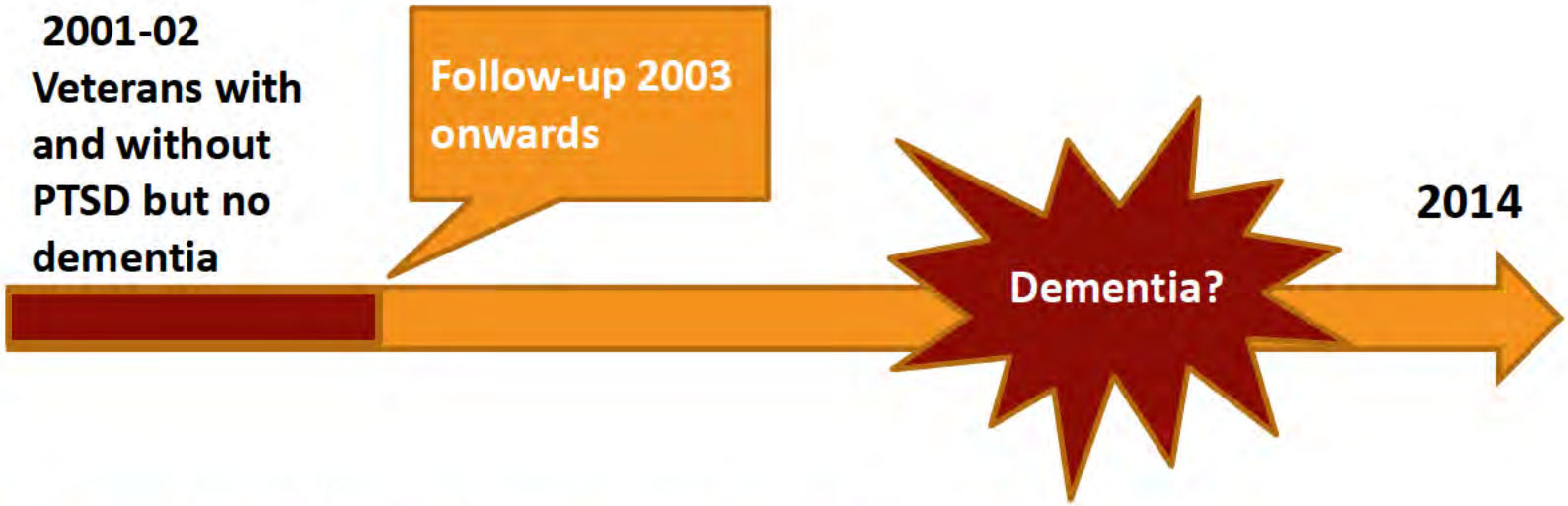
What was known?

- A number of 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.

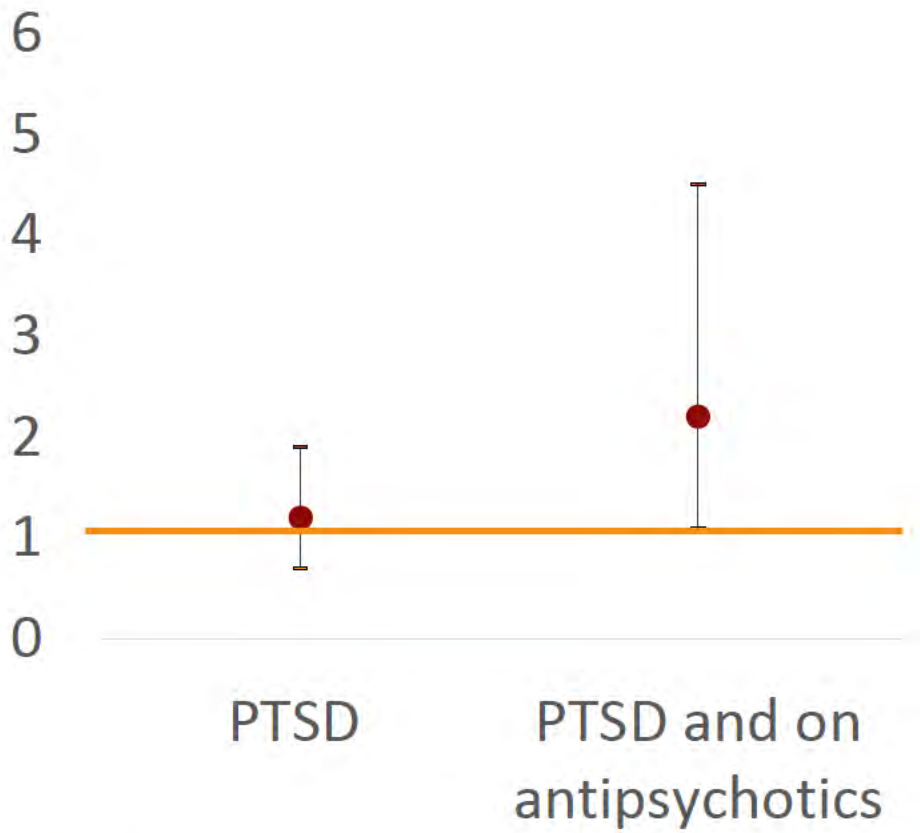


Clauston et al, Alzheimers Dement. 2016
Wang et al., J Affect Disord. 2016
Meziab et al., Alzheimers Dement 2014
Qureshi et al. JAGS 2010
Yaffe et al. Arch Gen Psychiatry 2010

What did we do?



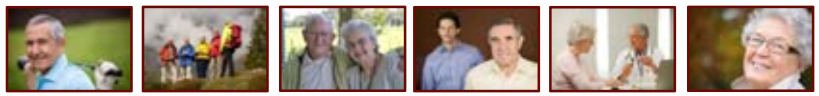
What did we find?



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

What does it mean?

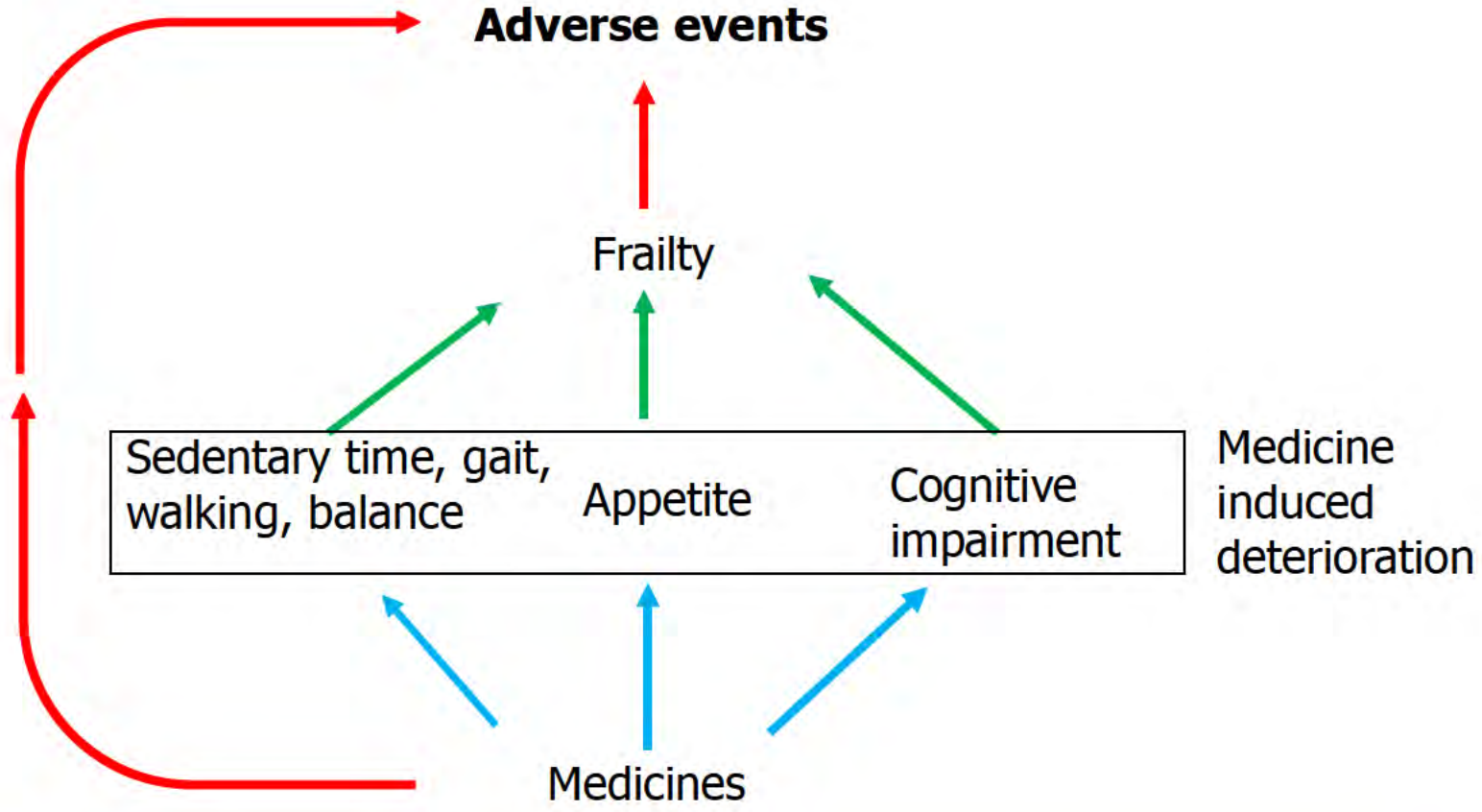
- For the majority of veterans who suffer or have had post-traumatic stress there is no evidence of elevated risk of dementia

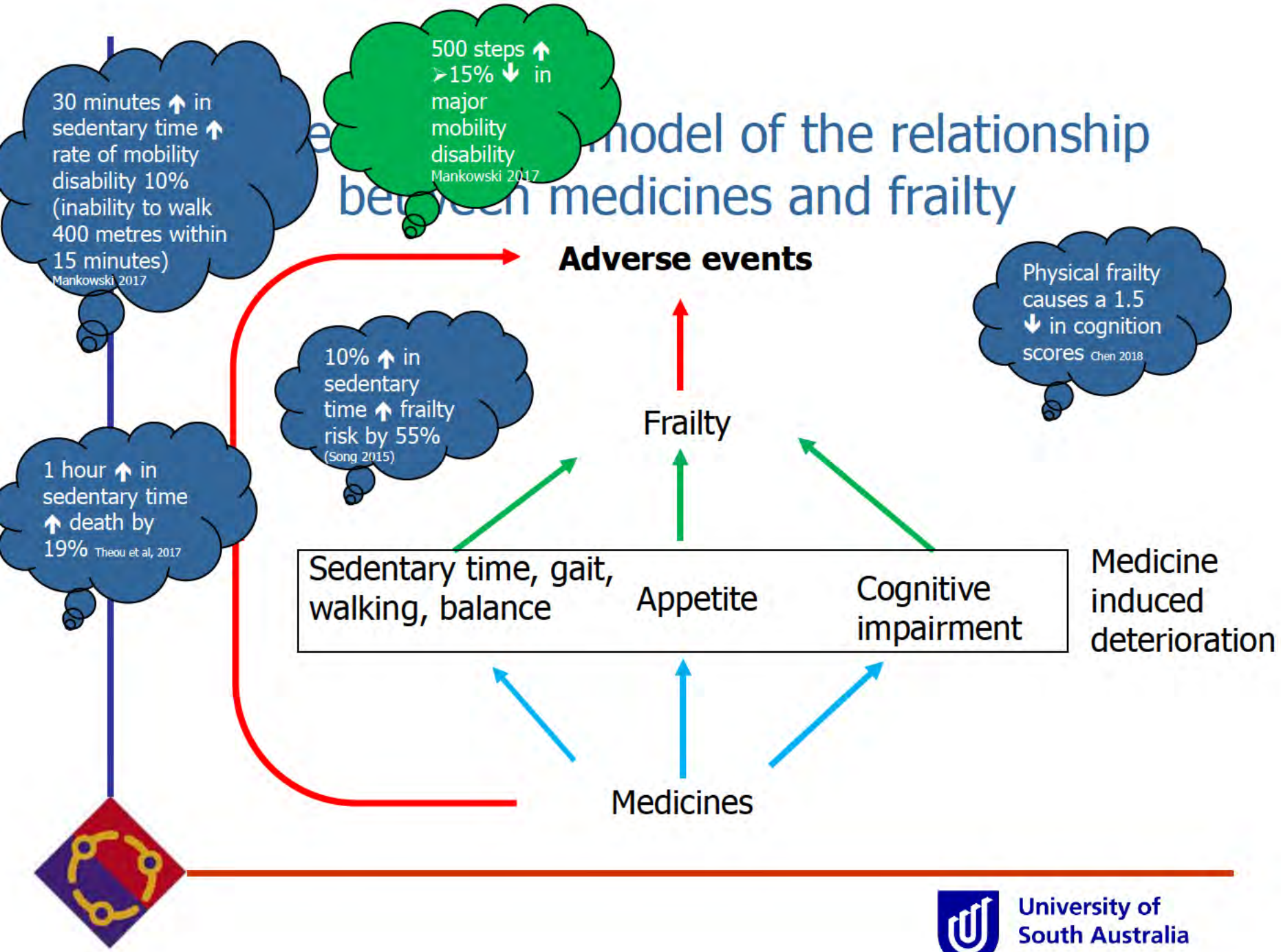


Reducing Medicine Induced Deterioration and Adverse Events (ReMInDAR) trial

University of South Australia

The explanatory model of the relationship between medicines and frailty




500 steps ↑ ➢15% ↓ in major mobility disability Mankowski 2017
30 minutes ↑ in sedentary time ↑ rate of mobility disability 10% (inability to walk 400 metres within 15 minutes) Mankowski 2017
model of the relationship
between medicines and frailty
Adverse events
Physical frailty causes a 1.5 ↓ in cognition scores Chen 2018
10% ↑ in sedentary time ↑ frailty risk by 55% (Song 2015)
1 hour ↑ in sedentary time ↑ death by 19% Theou et al, 2017
Frailty
Sedentary time, gait, walking, balance
Appetite
Cognitive impairment
Medicine induced deterioration
Medicines
University of South Australia

The ReMInDAR trial

- Provide a pharmacy service that uses a suite of validated tools to enable early identification of signs and symptoms of medicine-induced deterioration so that worsening frailty and subsequent adverse events, such as injurious falls, fractures and delirium are prevented.

The pharmacist service

- To identify signs of deterioration, the pharmacist will monitor changes in
  - Activity (sleep, sedentary behaviour, light and moderate activity)
  - Cognition
  - Weight
  - Grip strength
- Review the medical record for changes in medicines, including frequency of medicines used a required, and review record for any potential adverse events as well as self-reported events by residents or carers

The measures

Activity

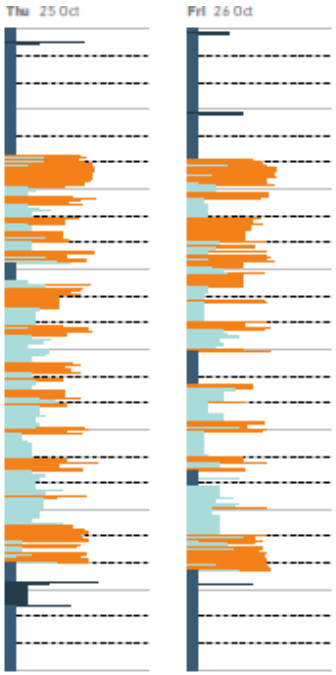
- ActivInsights band
- Health professional grade accelerometer
- Can identify time spent in sleep, sedentary time, light, moderate and vigorous activity

Activinsights

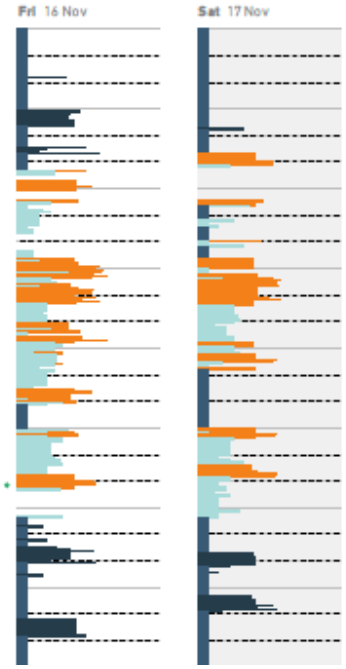
Name	BMI	Patient ID	Reported period	Report number	Page
305170, 305170	28.9	305170	13th November 2018 - 19th November 2018	8	
			Previous session: 23rd October 2018 - 29th October 2018	Date: 21st November 2018	

SLEEP	46.3%	SEDENTARY	33.1%	ACTIVE	20.6%	EXERCISE	0%	EVENTS MARKED	2
Asleep	41.7%	Inactive	10.6%	On the go	1.7%	Working out	0%	Button press	2
Active period	4.6%	Sitting/Lying	22.4%	Standing	18.7%	Running	0%		
				Walking	0.1%	Swimming	0%		
						Cycling	0%		

Good sleep/good daily activity



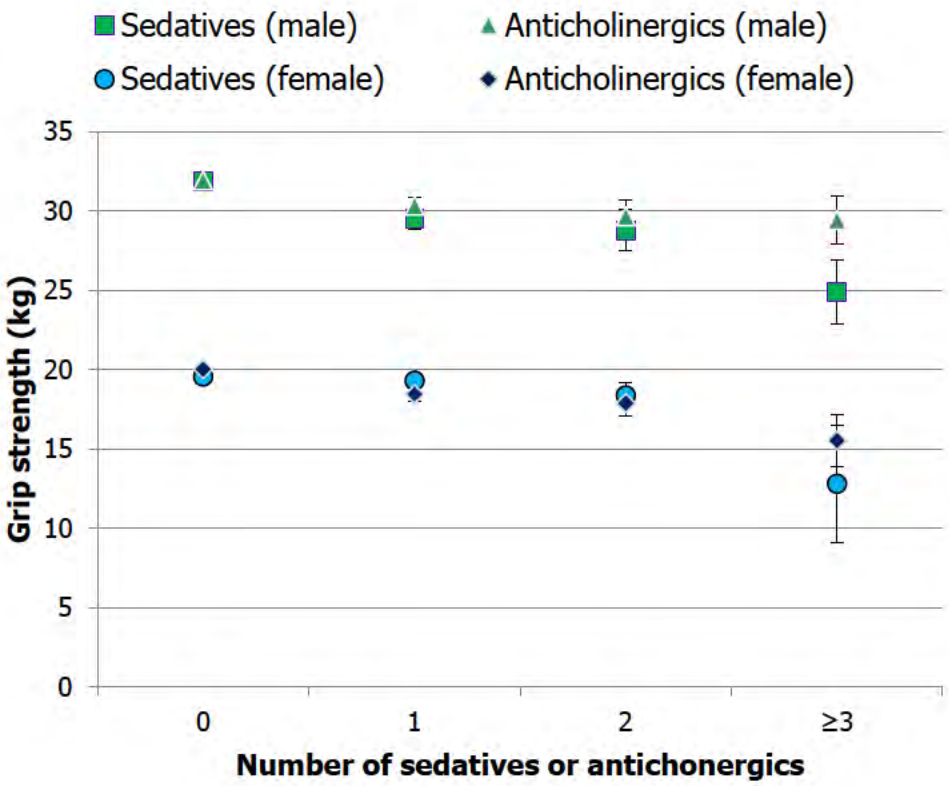
Average sleep/good daily activity



Interrupted sleep/some daily activity

Grip strength

- Dynamometer
  - Best of three attempts
- Cut off points for grip strength for sarcopaenia
  - 32 kg for men;
  - 22 kg for women
- Minimum clinically important difference (MCID) 0.84 kg



The measures

Cognition

- Montreal Cognitive Assessment test
  - Validated to detect mild cognitive impairment
  - 30 point item
  - 2 point change is considered clinically significant difference

Adverse events

- Review of medical record for episodes of delirium, falls, incontinence
- Plus discussion with patients

The outcome

- The pharmacists will create a report for the patient's general practitioner
  - Highlighting any deterioration evident (deterioration from baseline and deterioration from last review)
  - Indicating if any deterioration is considered clinically significant (change is greater than the minimum clinical significance)
  - Provide recommendations of medicines which could be contributing to the deterioration and which could be altered (eg ceased, dose reduced, switched)
- For complex cases opportunity will exist for case conferencing if required

Pharmacist service

Enrolment

Medicine change
OR health change

No

No

Baseline measures

Δ Cognition
Δ Activity
Δ Falls
Δ Strength
Δ Self report

- Frailty
- Activity
- Cognition
- Weight
- Strength
- Quality of life

Clinical report or consultation

Implementation progress to date

- Completion of recruitment activities at 18 facilities
  - 6 aged care partners and 2 states (SA and Tas)
  - 3 more facilities currently underway
  - New partners being sought.
- Recruitment of 160 active trial participants
  - a further 5 deceased and 5 withdrawn
  - on average 10% of residents/facility.

Implementation progress to date

- 14 pharmacists recruited
- 13 pharmacists have completed training
- 27 intervention sessions have been provided at 13 facilities
  - 94 resident reviews.
  - Some residents now have received their 4th visit (first sites).
  - 4 new facilities will have first sessions in late May.
- Pharmacist recommendations to GP are being sent and some have already been actioned.

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

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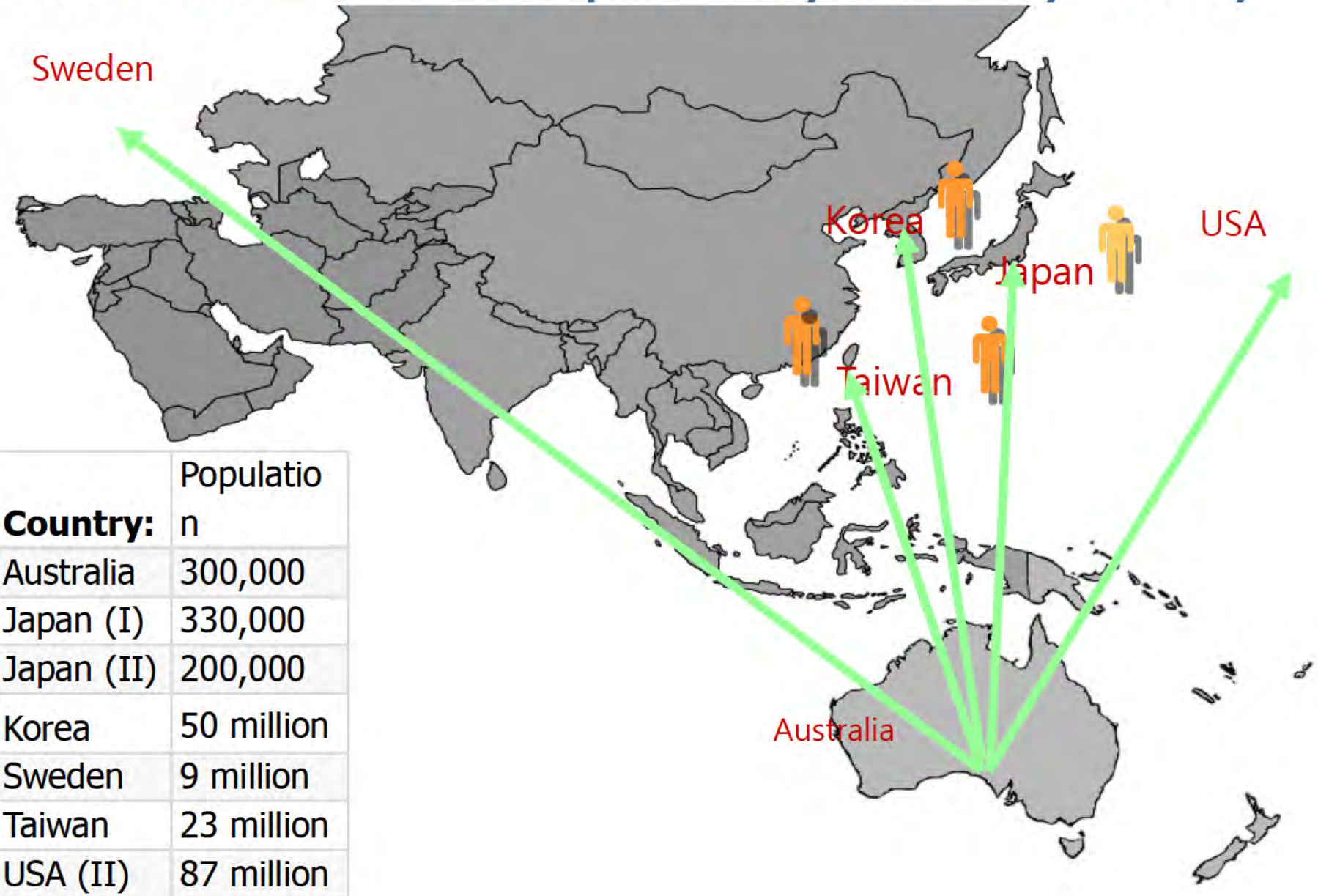
Ujeyl et al. Dtsch Arztebl Int. 2012

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

Thiazolidinediones and heart failure

- Studies predominantly in Caucasian populations suggested these medicines double the risk of heart failure
- Is the risk the same in Asian populations?

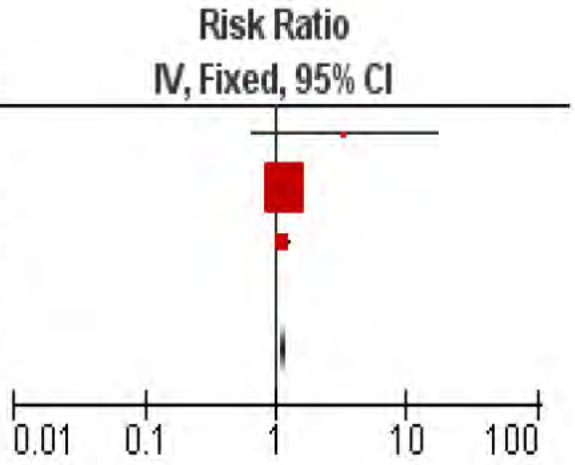
Differences in the genes that metabolise the medicine may mean the side effect may be different.
Also some differences in the genes that give the medicines its effect

1. Singh S., et al JAMA 2007; Lincoff A.M., et al JAMA 2007; Loke Y.K., et al BMJ 2011

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]**

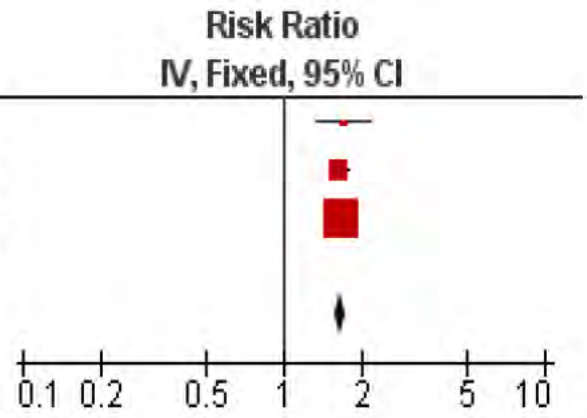
$I^2 = 0\%$



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]**

$I^2 = 0\%$



Australia and Canada

Roughead et al., Drug Saf. 2015

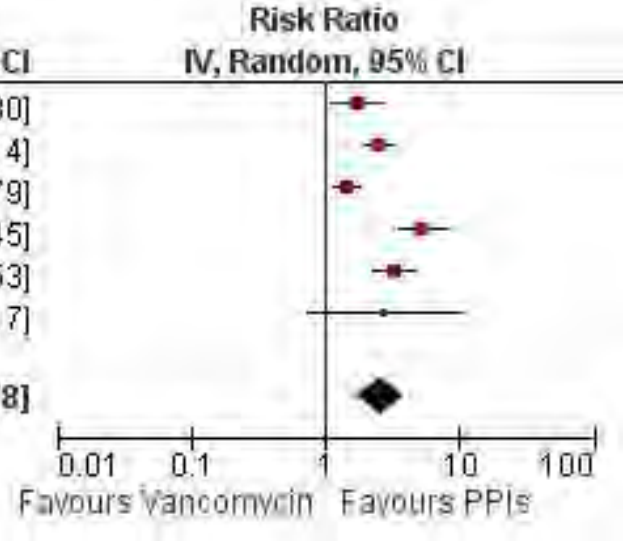
Could the regulators use it?

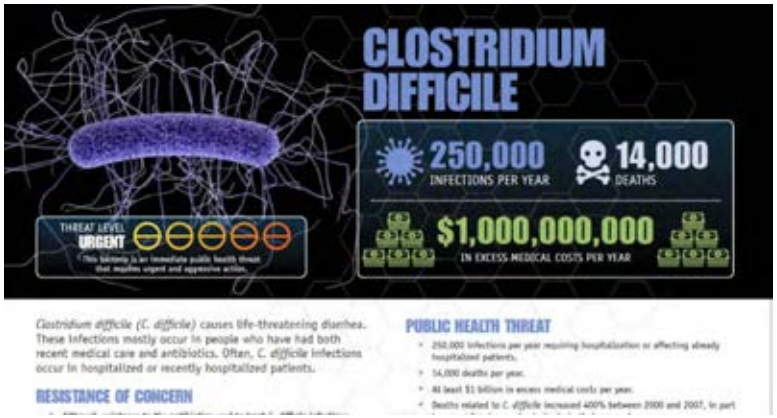
Health Canada initiated risk of clostridium difficile infections with proton pump inhibitors

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)





Roughead et al. Expert Opin Drug Saf. 2016

What was the outcome?

- Australian Therapeutic Goods Administration are now trialling implementation of the method to support post-market surveillance of medicines in Australia

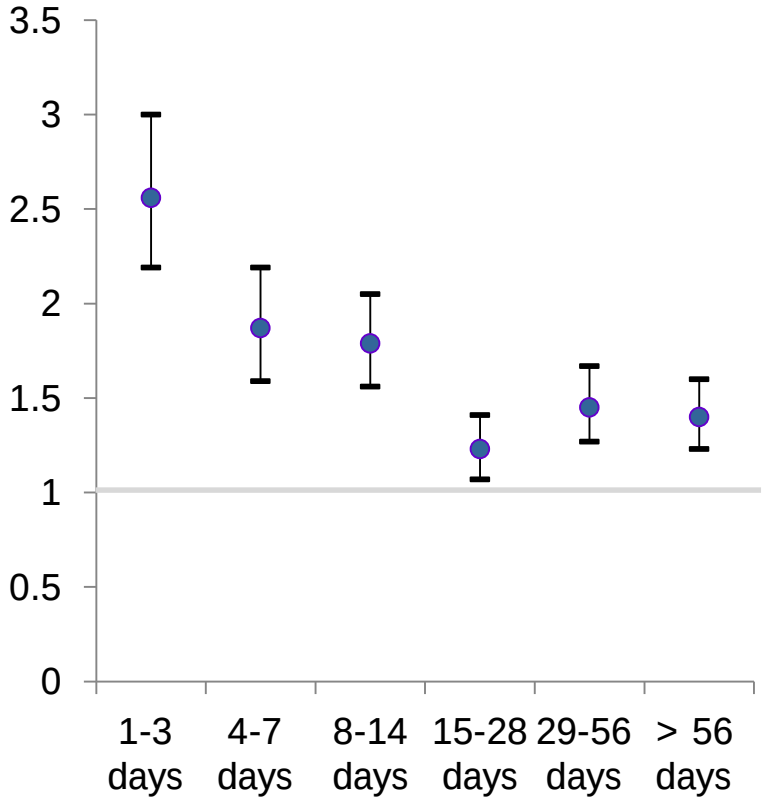
Now extended to more complex outcome studies and country exchanges

- Methylphenidate for attention deficit disorder in children and adverse cardiac outcomes
- Code written and tested here, sent to Korea for implementation

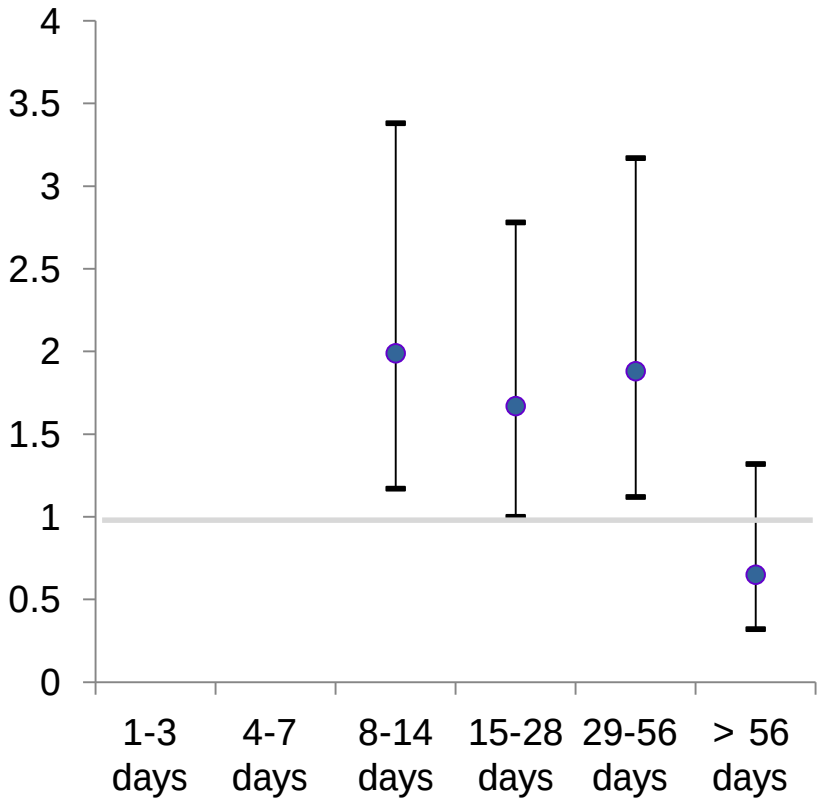
Australia Korea Foundation

Risk of adverse cardiovascular outcomes in children taking medicines for attention deficit disorder

Risk of arrhythmia



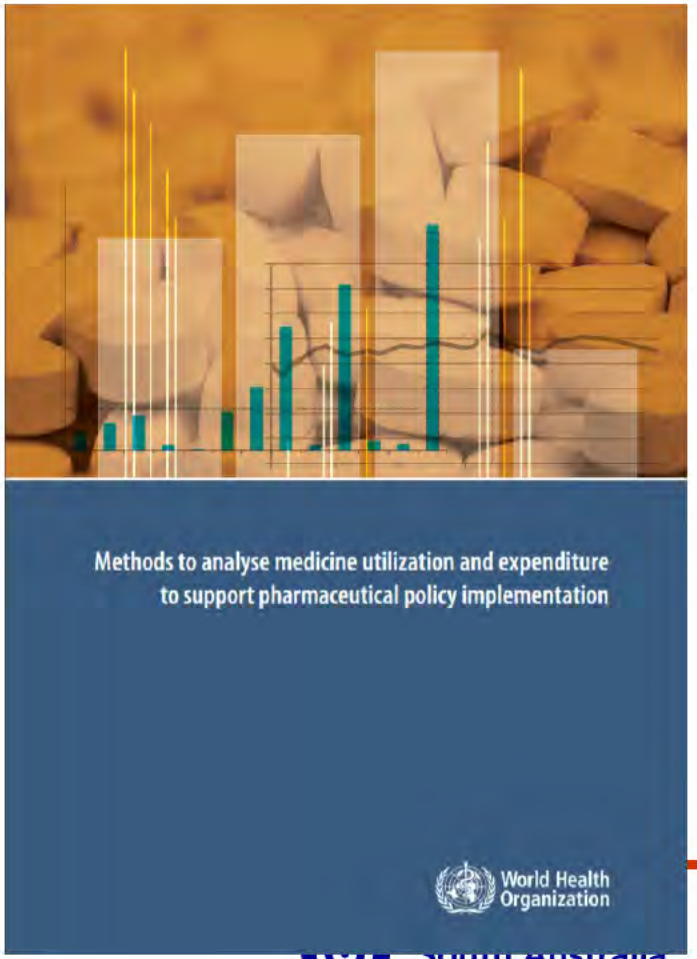
Risk of stroke



Shin et al. BMJ. 2016

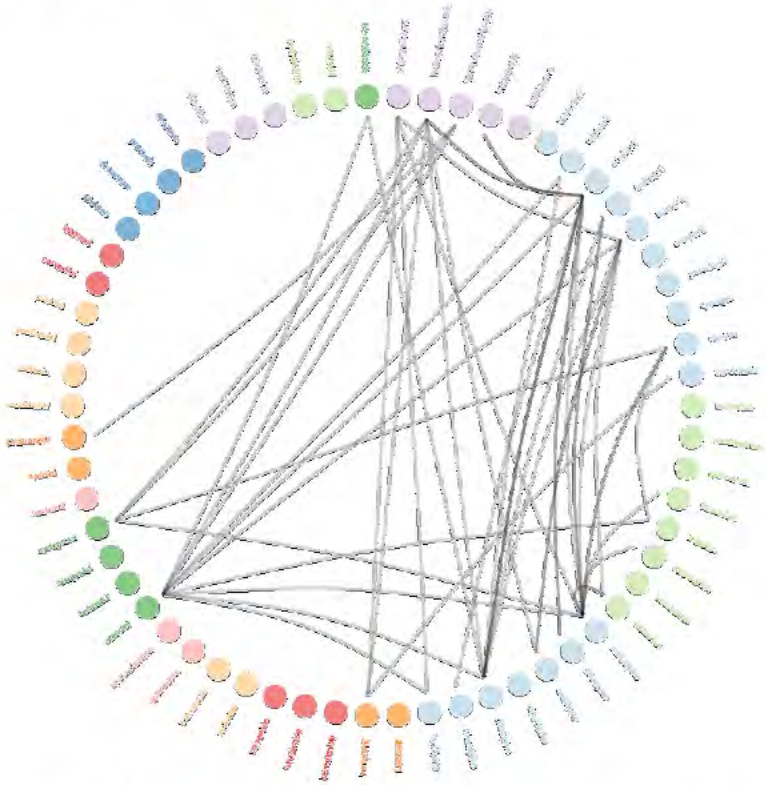
Collaborating with the World Health Organization to develop medicine utilisation capacity

- 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



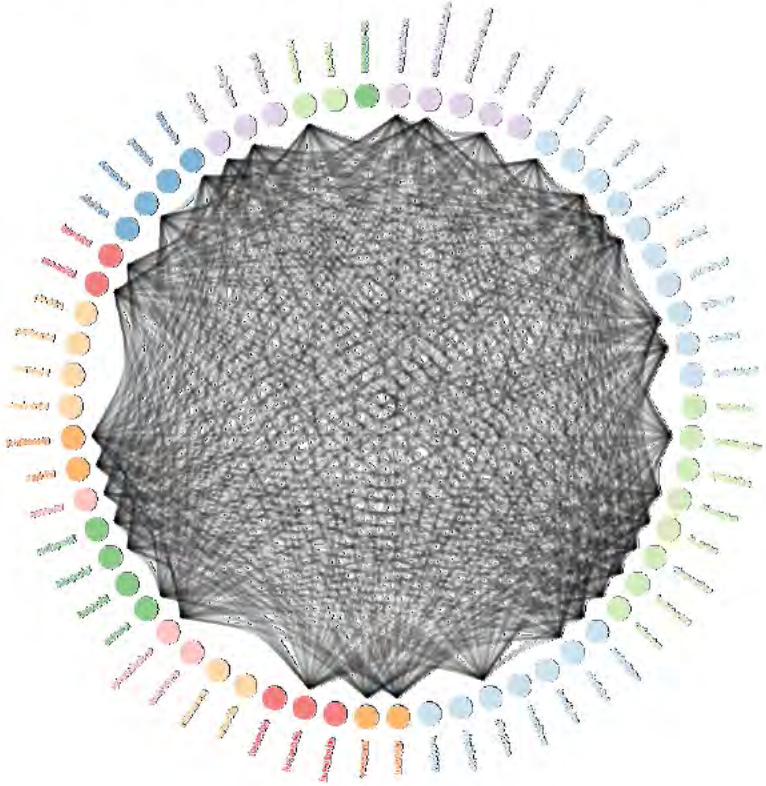
The potential for improving our understanding of health care using health data sets

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

University of
South Australia

Australian Government
Department of Veterans' Affairs

Veterans' MATES

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

QUM forum

UniSA

Quality Use of Medicines and Pharmacy Research Centre
University of South Australia

The Veterans' MATES project

1. Project overview
2. The first module

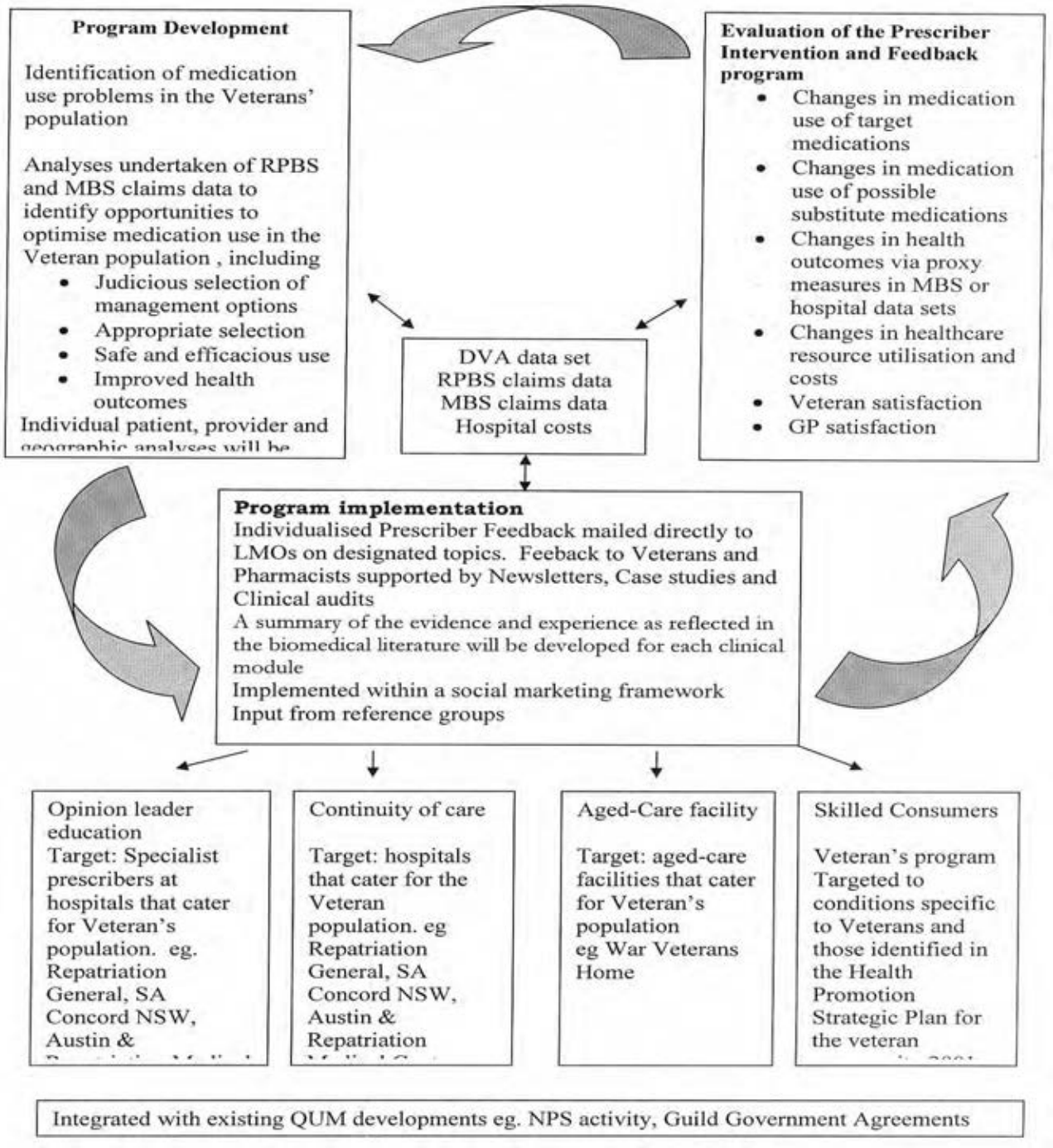
Veterans' MATES approach

- Strong consultative framework
- Veteran focused
- Based in behavioural change theory
- Evidence-based medicine and clinical focus
- Pharmaco-epidemiological analyses
- Health program and health economic evaluation
- Clear focus on achievable outcomes
- Presentation and publication of results

Who is involved?

Quality Use of Medicines and Pharmacy Research Centre and the Division of Health Sciences in association with the;

- National Prescribing Service;
- Departments of General Practice and Public Health, University of Adelaide;
- DATIS;
- Australian Medicines Handbook; and the
- Repatriation General Hospital, Daw Park


Program Development
Identification of medication use problems in the Veterans' population
Analyses undertaken of RPBS and MBS claims data to identify opportunities to optimise medication use in the Veteran population , including
Judicious selection of management options
Appropriate selection
Safe and efficacious use
Improved health outcomes
Individual patient, provider and
DVA data set
RPBS claims data
MBS claims data
Hospital costs
Evaluation of the Prescriber Intervention and Feedback program
Changes in medication use of target medications
Changes in medication use of possible substitute medications
Changes in health outcomes via proxy measures in MBS or hospital data sets
Changes in healthcare resource utilisation and costs
Veteran satisfaction
GP satisfaction
Program implementation
Individualised Prescriber Feedback mailed directly to LMOs on designated topics. Feeback to Veterans and Pharmacists supported by Newsletters, Case studies and Clinical audits
A summary of the evidence and experience as reflected in the biomedical literature will be developed for each clinical module
Implemented within a social marketing framework
Input from reference groups
Opinion leader education
Target: Specialist prescribers at hospitals that cater for Veteran's population. eg. Repatriation General, SA Concord NSW, Austin &
Continuity of care
Target: hospitals that cater for the Veteran population. eg Repatriation General, SA Concord NSW, Austin & Repatriation
Aged-Care facility
Target: aged-care facilities that cater for Veteran's population eg War Veterans Home
Skilled Consumers
Veteran's program Targeted to conditions specific to Veterans and those identified in the Health Promotion Strategic Plan for the veteran
Integrated with existing QUM developments eg. NPS activity, Guild Government Agreements

Core program

- Clinical Modules (three to four each year; total of 10 across three years);
  - -Mail-out to LMOs
  - -Mail-out to veterans
  - -Individual veteran and LMO feedback

  Plus

  - -Practice visits
  - -Opinion leaders

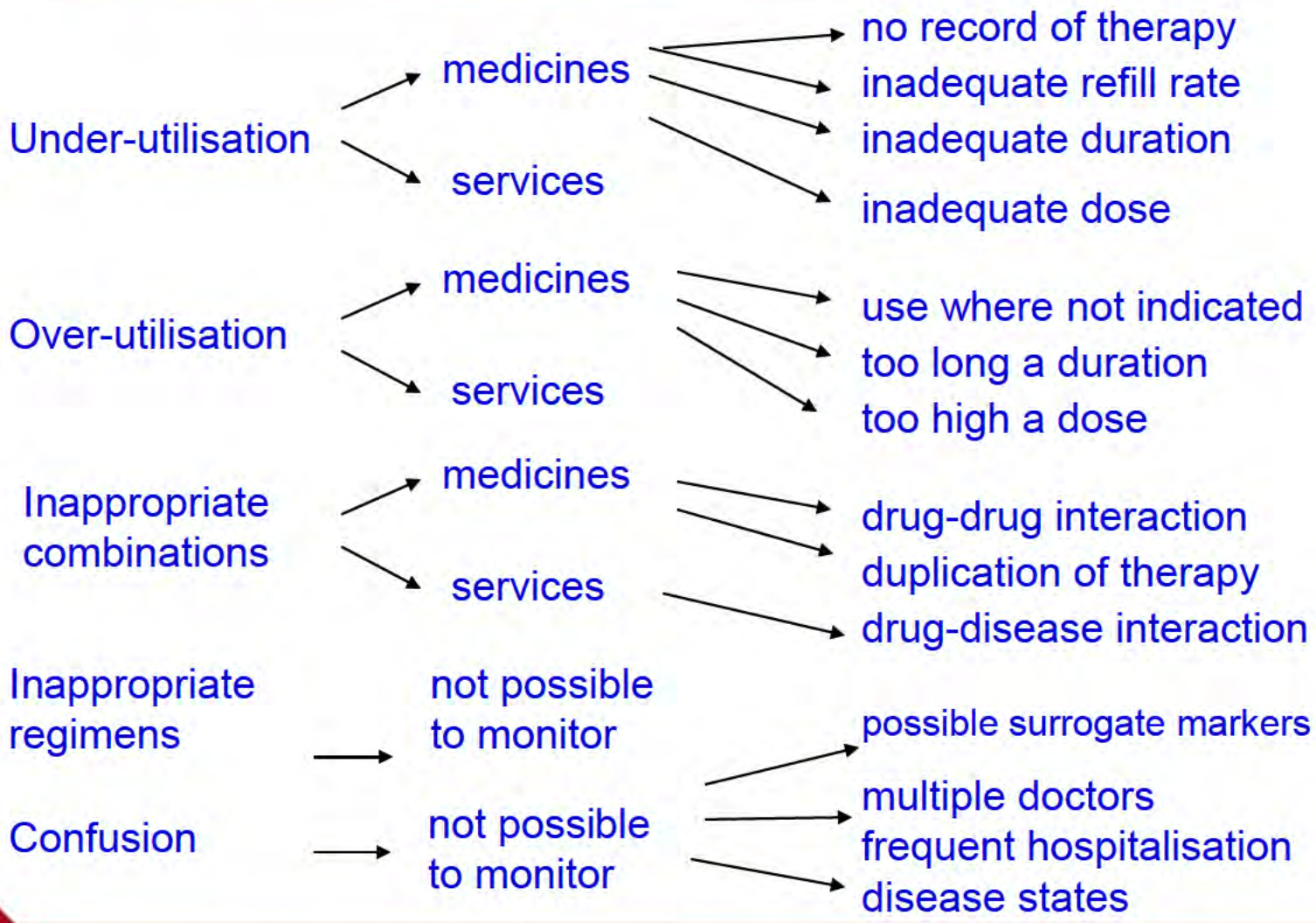
- Evaluation;
  - Process, impact and outcome measures
  - Pharmaco-epidemiology studies

- Health economic evaluation

Veterans' MATES module planning

The unique feature about the advice and education that is available to doctors from Veterans' MATES is the individualised patient data which we can provide.

Q: What are the medication-related issues that we can identify in these data?


Under-utilisation
medicines
services
no record of therapy
inadequate refill rate
inadequate duration
inadequate dose
Over-utilisation
medicines
services
use where not indicated
too long a duration
too high a dose
Inappropriate combinations
medicines
services
drug-drug interaction
duplication of therapy
drug-disease interaction
Inappropriate regimens
not possible to monitor
possible surrogate markers
Confusion
not possible to monitor
multiple doctors
frequent hospitalisation
disease states

Summarised as;

Themes across

- Adverse drug events
- Therapy optimisation
- Medicines review
- Monitoring
- Continuity of care

National Health Priority areas

- Cardiovascular
- Respiratory
- Diabetes
- Pain
- Mental Health
- Injury

Module 1- Home Medicines Review: Rationale and module plan

Q: What are we aiming to do?

- **Aims:**
  - To introduce Veterans' MATES to LMOsand veterans; and
  - To increase the use of home medicines review services amongst veterans over 65 years of age who take five or more medicines concurrently.

Why are we doing this module?

- Veterans are at high risk of medication problems.
  - they use significant numbers of medicines
  - on average, male veterans over 70 years have 45 prescriptions dispensed per year

    (derived from DVA annual report 2003-4)
- Over 90% of a sample of 1000 elderly people who were:
  - at high-risk
  - community-dwelling
  - on multiple medicines
- had a least one problem with their medicines
- most had three problems

(s 47F **A,** s 47F **E, Mott K,** s 47F **J. Collaborative Medication management services; improving patient care.** ***MJA*** **2002;177:189-192.)**

Why are we doing this module?

Continued….

- One quarter to one third of unplanned hospital admissions in the elderly are medicines related.

  (s 47F E.E., s 47F A.L., Primrose, J.G., Sansom, L.N. Drug related hospital admissions: A review of recent Australian studies. *MJA 1998; 168: 405-408)*

- Trials of home medicines review services have been shown to resolve over 60% of all medicines-related problems.

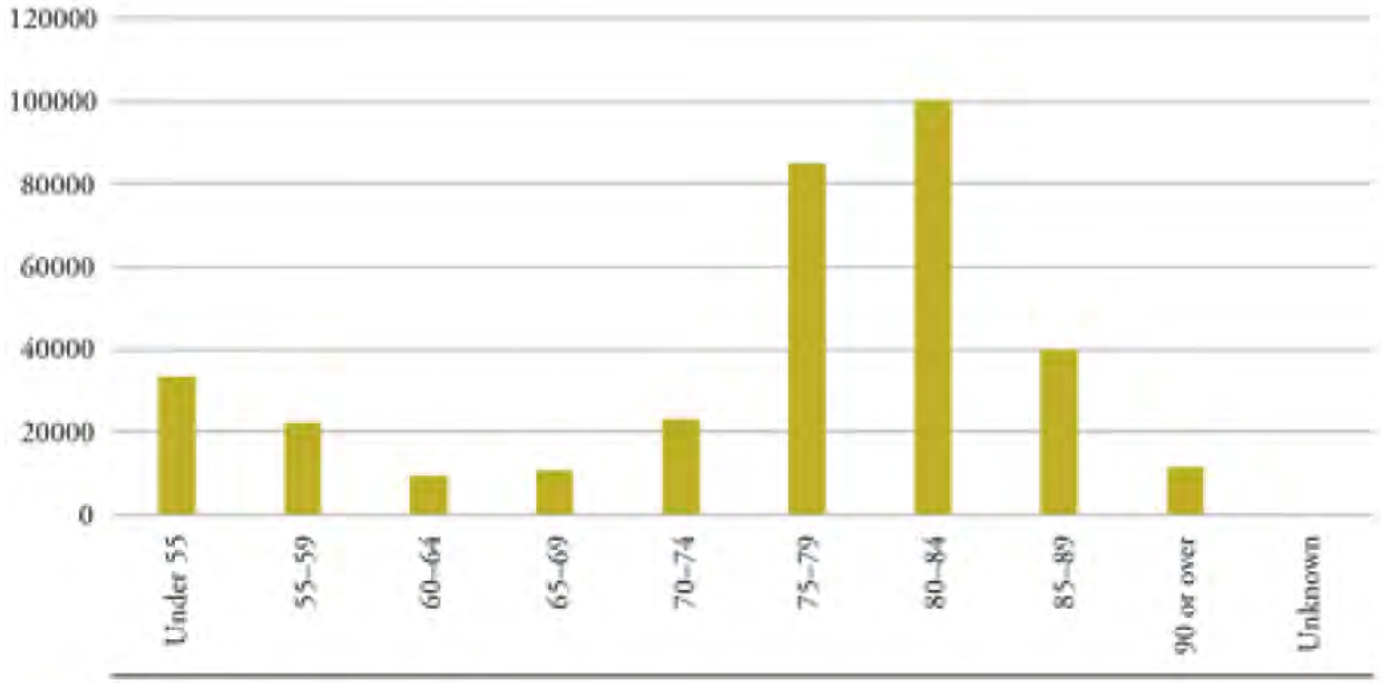
  (s 47F A, s 47F E, Mott K, s 47F J. Collaborative Medication management services; improving patient care. *MJA* 2002;177:189-192.)

- Despite funding, use of home medicines review services is low, particularly among the veteran population:
  - only 5,161 medicines review services were reimbursed for veterans in 2002 and 4,975 in 2003

  (E. Moss, DVA , personal communication September 2004)

Veteran treatment population by age

DVA annual report 2003-4; p117



Veteran self-reported health problems

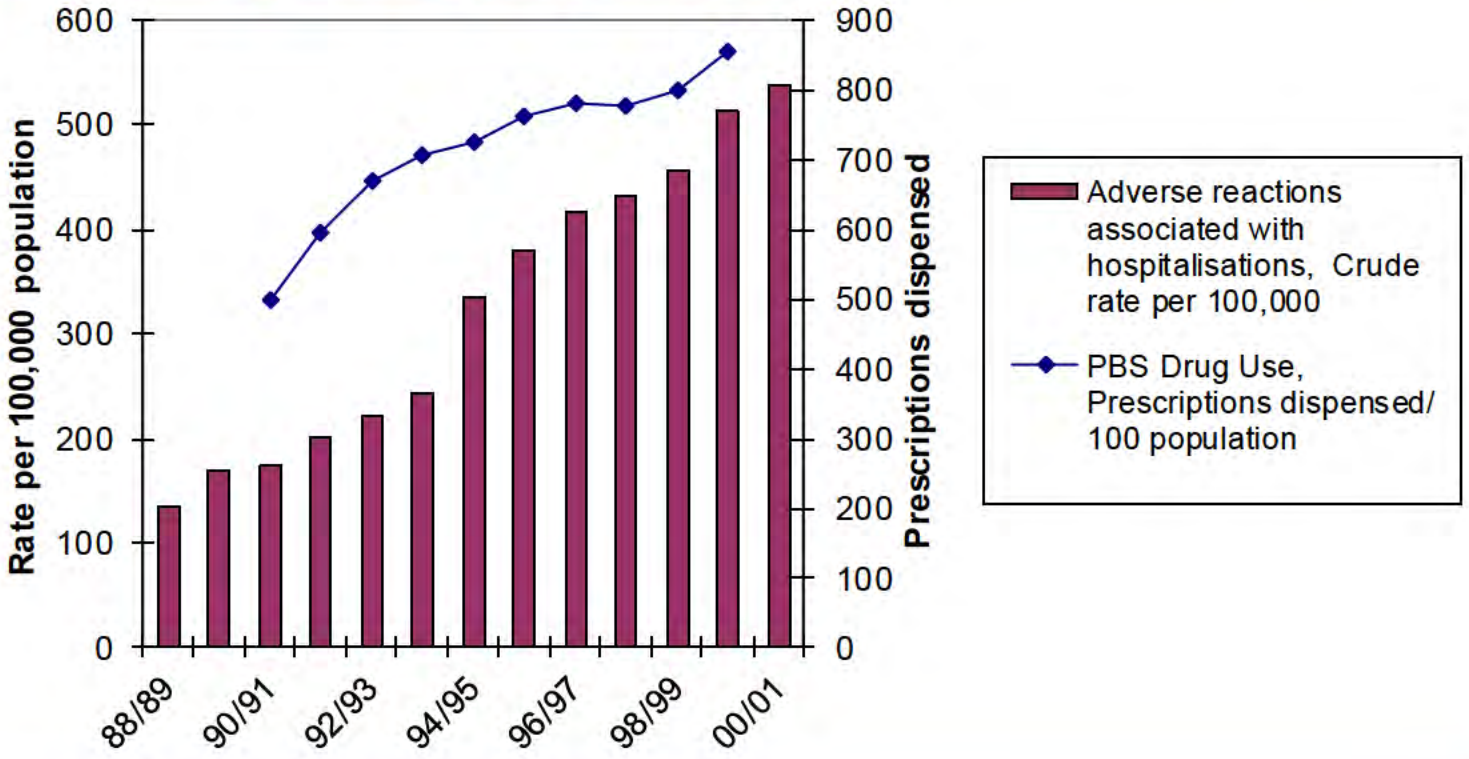
Department of Veterans' Affairs 2003 Survey of Veterans, War Widows and their Carers

	1997	2003
Visual problems	86%	92%
Arthritis	-	53%
Depression	19%	22%
Hearing difficulties	49%	55%
Dementia memory loss	16%	38%
Insomnia/sleep disturbance	28%	33%
Anxiety	18%	18%
Foot/leg problems that affect mobility	19%	43%
Incontinence	8%	15%
High blood pressure	38%	44%
Posttraumatic Stress Disorder	9%	13%

Trends in ADRs associated with hospitalisation: S.A.

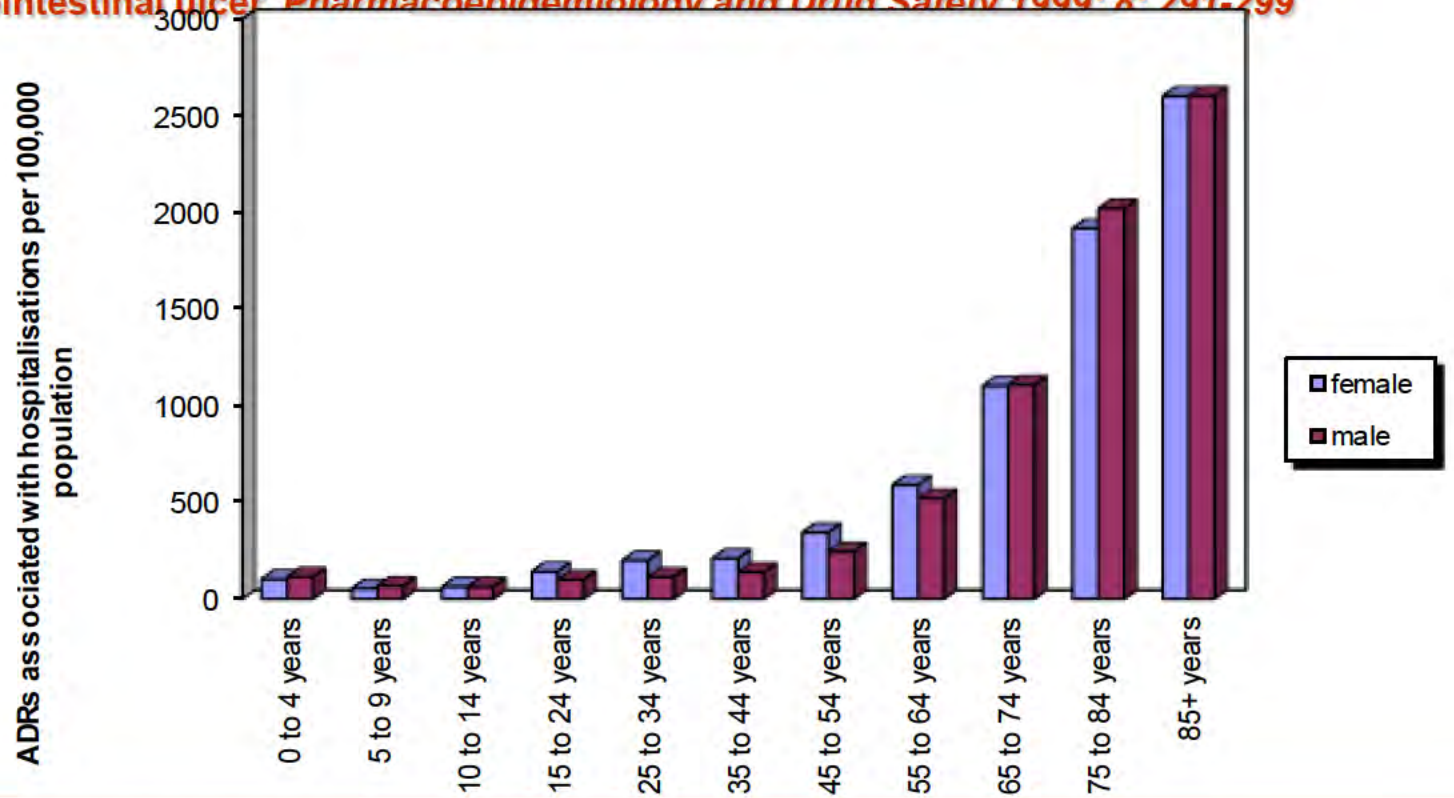
s 47F E, s 47F A, Primrose J, Sansom L. Hospitalisation rates as outcome indicators of National Medicinal Drug Policies: The example of gastrointestinal ulcer.

Pharmacoepidemiology and Drug Safety 1999; 8: 291-299



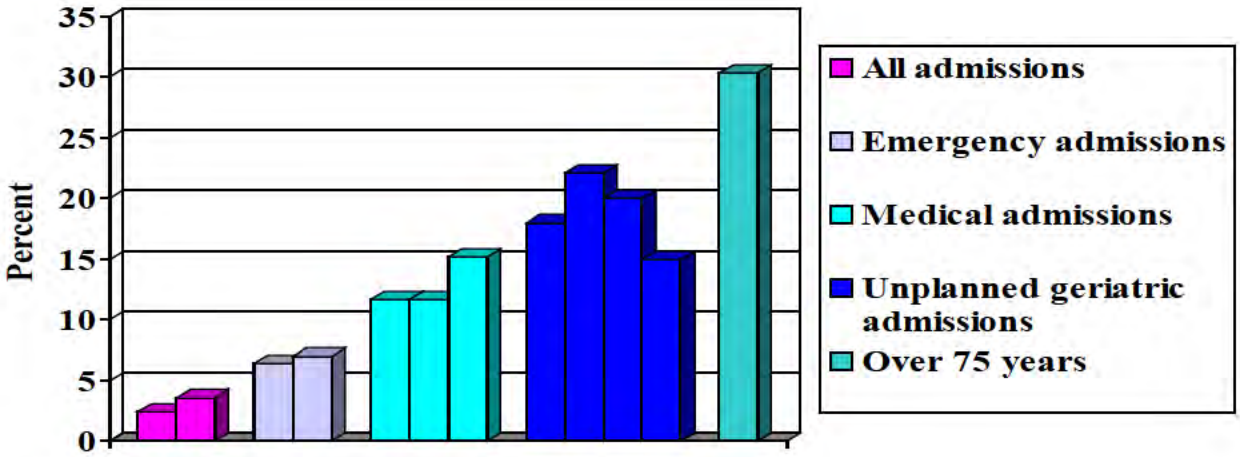
Incidence of ADRs associated with hospitalisation by age and gender s 47F

E, s 47F A, Primrose J, Sansom L. Hospitalisation rates as outcome indicators of National Medicinal Drug Policies: The example of gastrointestinal ulcer. *Pharmacoepidemiology and Drug Safety 1999; 8: 291-299*



ADEs in Australian hospitals

s 47F E.E., s 47F A.L., Primrose, J.G., Sansom, L.N. Drug related hospital admissions: A review of recent Australian studies. *MJA 1998; 168: 405-408*



Overall extent of the problem

- Extrapolation from the drug-related hospital admission studies
  - over 140,000 hospital admissions annually

- To put into perspective (1999-2000):
  - Influenza and Pneumonia 62,586
  - Asthma 60,759
  - Heart Failure 41,708

AIHW Australian Hospital Statistics 1999-00

ADEs in the community

s 47F A, s 47F E, Mott K, s 47F J. Collaborative Medication management services; improving patient care. *MJA* 2002;177:189-192.

- **Sample of 1000 persons considered at risk of medication misadventure**
- On average, 2.8 problems per person
  - Use of wrong or inappropriate medicine: 27%
  - Need for additional medication: 25%
  - Use of too little medicine: 21%
  - Adverse Drug Reaction: 19%
  - Need for more information: 18%

In the community setting

Just for ADRs (as a sub-set of medication-related problems)

- Main drug groups involved
  - Cardiac medications (39% of ADRs)
  - CNS medications (27%)
  - Musculoskeletal (12%)

- At the level of drug class
  - ACE inhibitors accounted for 14% of all ADRs
  - antidepressants 11%
  - NSAIDs 10%

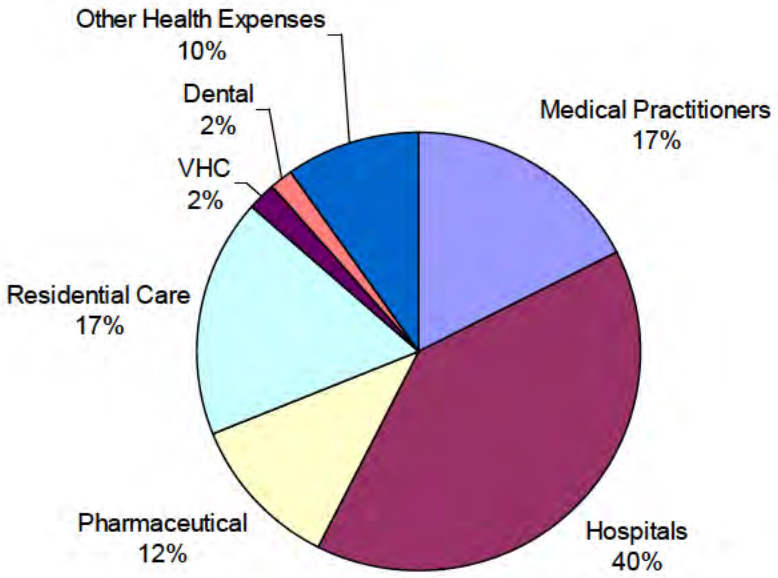
Strategies for reducing adverse drug events

s 47F I, Semple S, s 47F A. The value of pharmacist professional services in the community: A systematic review of the literature 1990-2002. Commonwealth Department of Health and Ageing. 2003. Canberra Australia.

- **Discharge liaison services and case conferencing**
  - both shown to improve medication use in controlled trials
- **Medication Management Services**
  - uncontrolled trials show a reduction in medication related problems

DVA health expenditure 2002-03

Derived from DVA annual report 2003-4; p99



Total funding: $3,601 million

"Flag veterans for medicines review"

- Due vigilance in the frail elderly patient
- Identify eligible patients for doctors
- Ask doctors and patients to think about the value of a Home Medicines Review

Key strategies

- To increase awareness of LMOs and veterans of Veterans' MATES.
- To raise awareness that four 'flags': polypharmacy; high-risk / narrow therapeutic index medicines; confusion, literacy, language or dexterity problems; and recent hospitalisation; put veterans at risk of medication-related problems.
- To increase awareness of both LMOs and veterans of how to access the home medicines review service.

Key strategies continued.....

- To increase LMOs' knowledge of the veterans they treat who are on five or more medicines concurrently, the medicines the veteran is taking and whether or not the veteran has had a home medicines review in the last twelve months.

- To have 80% of LMOs who treat more than 10 veterans targeted for HMR in this module, visited by a HMR facilitator within 12 weeks of module one being delivered and provided with training on use of referral forms in prescribing software.

Key strategies continued.....

- To increase the annual home medicines review rate amongst veterans who are on five more medicines concurrently.

- To increase the number of LMOs who have participated in at least one HMR in the last 12 months.

Evaluation

1. To increase awareness of LMOs and veterans of the Veterans' MATES Project.

   Indicator: the percentage of LMOs and veterans providing feedback on the Veterans' MATES project.

   Source: Feedback forms distributed with print information and feedback forms received from Academic Detailers.

Evaluation continued

2. To raise awareness that the four 'flags': polypharmacy; high-risk / narrow therapeutic index medicines; confusion, literacy, language or dexterity problems; and recent hospitalisation; put veterans at risk of medication related problems.

   Indicator: number of GPs who receive a therapeutic brief, receive academic detailing visits.

   Source: In-house database of the activity, plus evaluation forms from academic detailers.

Discussion

Open forum for discussion

Veterans' MATES: Use of recommended medicines after Acute Coronary Syndromes

LISA s 47F ,CARMEL s 47F , LIBBY s 47F

SANSOM INSTITUTE, SCHOOL OF PHARMACY, UNIVERSITY OF SOUTH AUSTRALIA

Veterans' MATES aims to:

Improve medication use for veterans by delivering approximately 4 educational modules per year since June 2004

Method

► patient-specific feedback and educational material to LMOs
►educational brochures to veterans
►educational brochures to pharmacists


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 incl brand substitution. Only 27% of Australian veter rated their understanding of their medical cond medicines as very good prior to a HMR. This r after the HMR visit.*
Improved ability to keep taking their medi appropriately.
Reduced risk of medication-related prob
Reassurance and peace of mind.
61% of people are very concerned ab medicine and 58% are very concerned au a drug interaction.)
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.
Therapeutic brief 1 Flag Veterans for Medicines Review
Veterans' Medicines Advice and Therapeutics Education Services
???
Want to learn more about your medicines?
Unsure how long you should keep taking each medicine?
Unsure about the best time to take each medicine?
Recently started a new medicine or had your medicines changed?
Do you forget to take your medicines?
Are you confused or worried about your medicines?
A Home Medicines Review may help
Australian Government
Department of Veterans' Affairs
Veterans' MATES
Veterans' MATES
Home Medicines Review
Get the best from your medicines

DVA Claims Data

- Treatment population of approx. 300,000 veterans (median age 80yrs)
- 120 million prescription records
- 200 million Medicare and allied health records (GP visits, radiology, pathology etc)
- 6 million hospital records (public and private)

How is each module developed?

- Therapeutic area selected
- Analysis of medication-related problems
- Module topic selected
- Patient-specific feedback developed
- Module implemented
- Evaluation 12 months later

Patterns of myocardial ischaemia

Myocardial ischaemia

↙ ↘

Stable angina Acute Coronary Syndromes (ACS)

↙ ↘

STEMI Non ST elevation ACS

↙ ↘

NSTEMI Unstable angina

National Heart Foundation of Australia/Cardiac Society of Australia and NZ Guidelines for the management of ACS 2006

Recommended discharge medications:

Aspirin 75-150mg daily

Clopidogrel *

Beta blocker

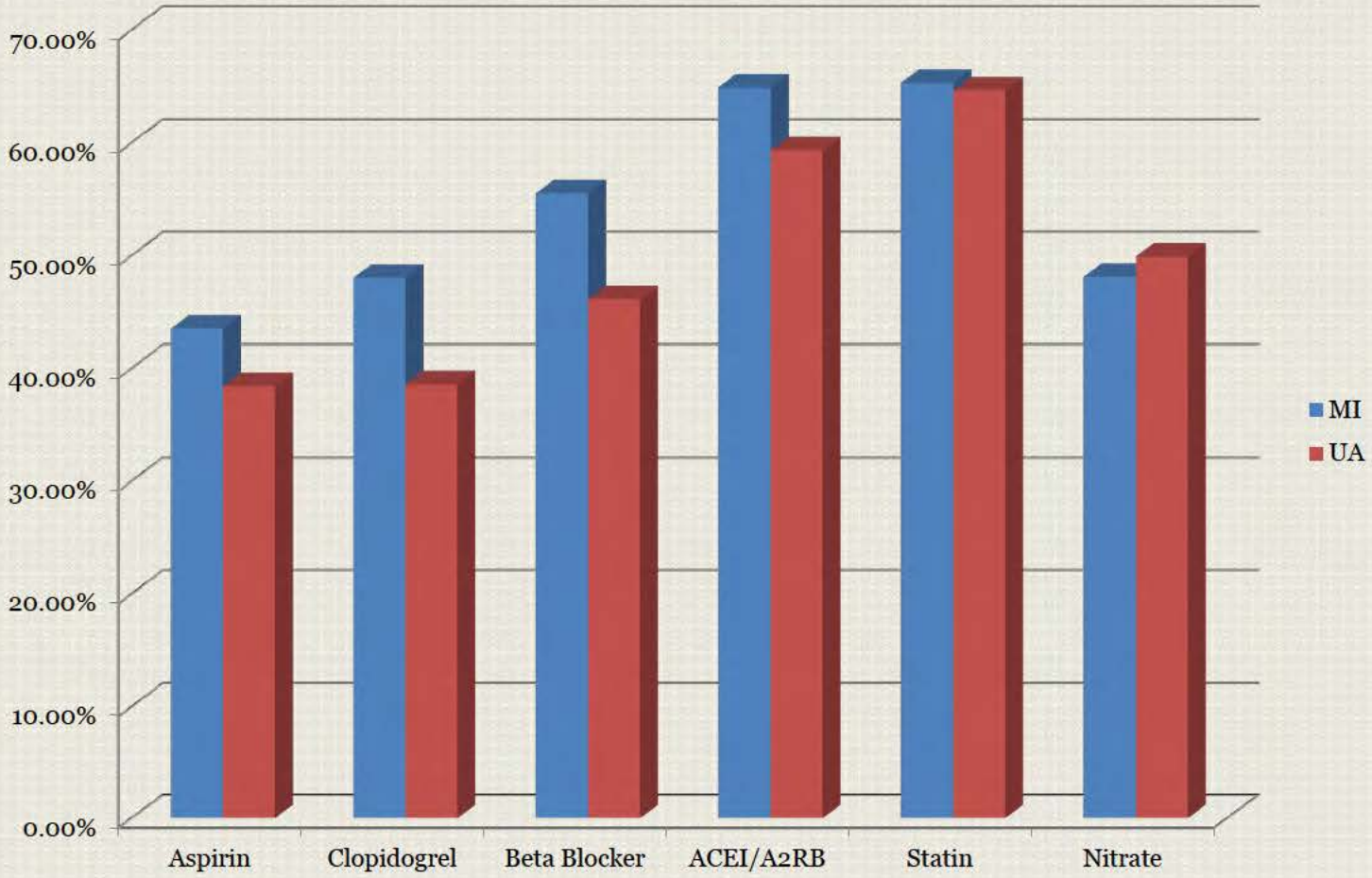
ACE inhibitor/ARB

Statin

Short-acting nitrate

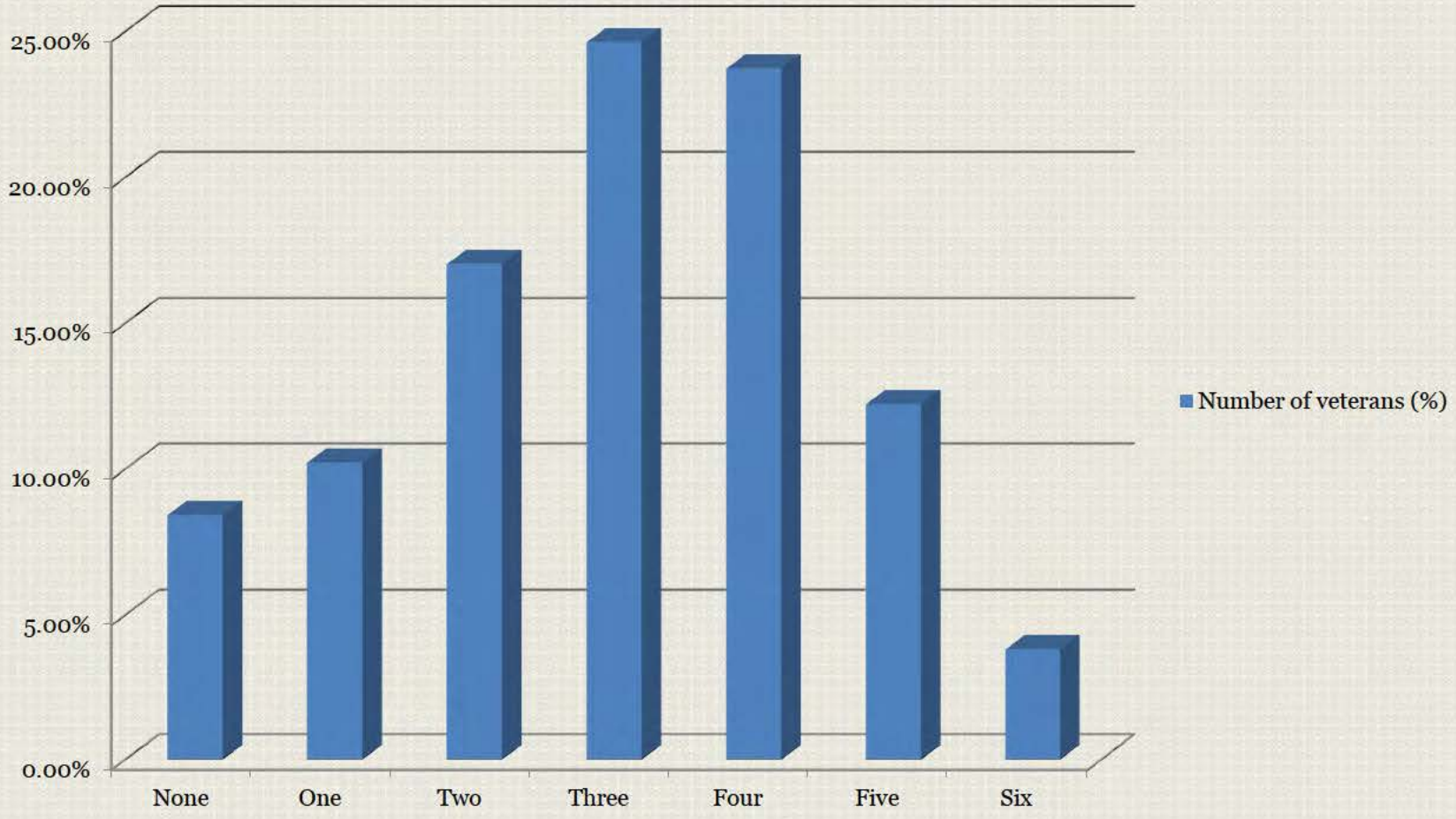
*Conditions apply!

% of veterans dispensed recommended medicines within 3 months post hospitalisation for unstable angina (UA) or STEMI/NSTEMI (MI)



Number of veterans receiving recommended medicines post MI

Number of veterans receiving recommended medicines post UA



More Statistics:

M:F ratio approx. 2:1

Most ACS veterans aged between 75-94 (nearly 90% for MI and 82% for UA)

Following first admission for MI, 29% of veterans (who were not on warfarin) were dispensed no antiplatelet agent

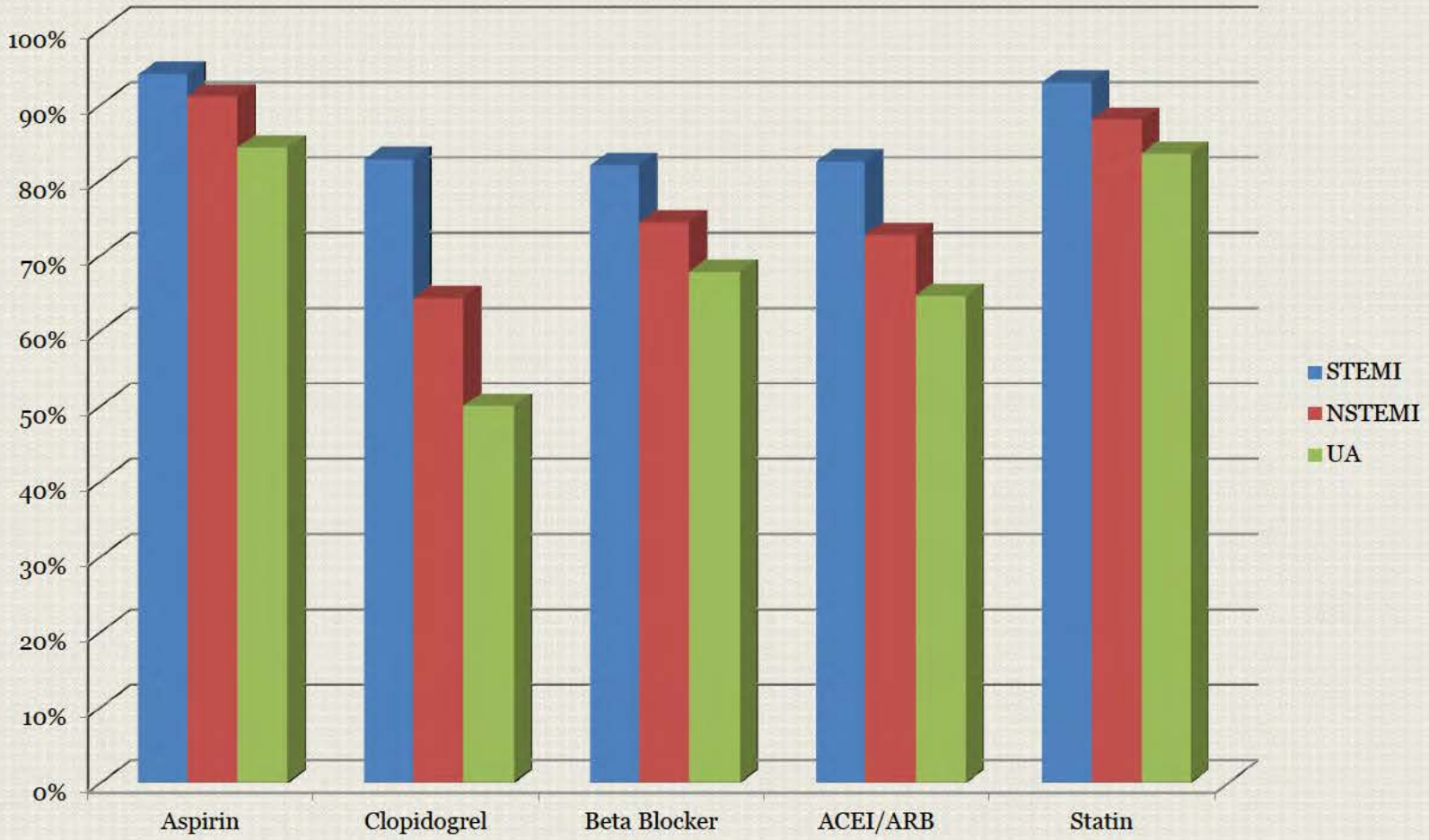
Following first admission for unstable angina, 35.5% of veterans (who were not on warfarin) were dispensed no antiplatelet agent

Use of recommended medicines in ACS deemed a suitable topic for a DVA MATES' module

Module developed and mailed out 17th September 2010

The assistance of the Department of Veterans' Affairs
is gratefully acknowledged

% of ACS patients prescribed recommended medications post discharge (Chew et al 2007)



GP initiation of pharmacological management of cardiovascular risk and processes of care in Australian war veterans* with Diabetes

Elizabeth s 47F Andrew s 47F
Robert s 47F Graeme s 47F

1.Quality Use of Medicines and Pharmacy Research Centre; Sansom Institute, University of South Australia
2. Department of Veterans' Affairs, Canberra

*The term 'Veterans' includes veterans and war widows/widowers

Veterans' MATES:

- An Australia wide 5 year program, funded and actively supported by DVA to help ensure best possible health outcomes for veterans.
- Providing practical medicines advice and therapeutic education for health professionals and veterans.
- Based on an analysis of the administrative health databases established and maintained by DVA.

Focus on Diabetes care

This paper reports on two analyses of the DVA data bases undertaken by the Veterans' MATES team to examine;

1. current pharmacological management of cardiovascular risk and
2. processes of care

in Australian war veterans who are taking medicines indicative of diabetes

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].

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

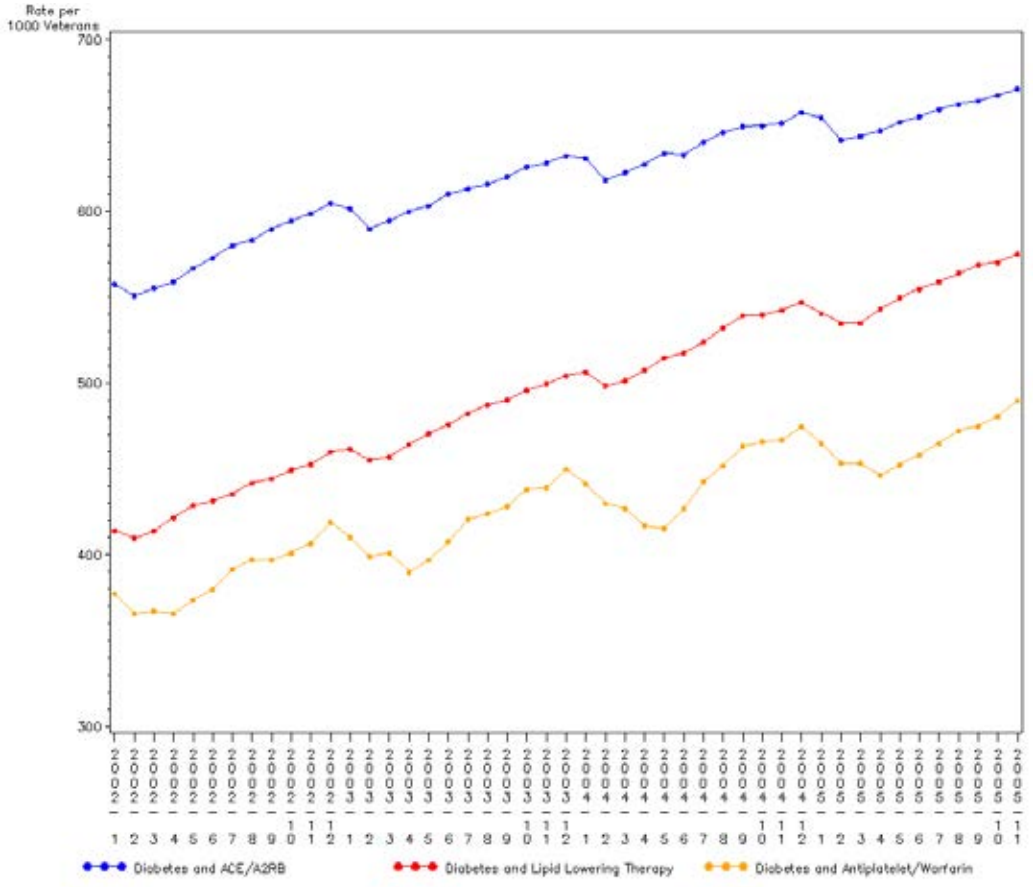
Methods: Study 1 CV meds

- The diabetes population defined as those people receiving medication for diabetes during 2002-2005.
- The proportion using an ACE inhibitor or A2RB, lipid lowering therapy, antiplatelet agents or warfarin was defined each month from the diabetes prevalent population, as those with a dispensing of:
  - ACE or A2RB in the previous 39 days
  - lipid lowering therapy in the previous 44 days
  - antiplatelet agents in the previous 100 days
  - Warfarin in the previous 42 days
    - the time period represents the time in which 75% of people are dispensed a repeat prescription

Results

- Approximately, 20,900 veterans (6.3%) were dispensed medicines indicated for diabetes in Jan 2002.
- This had risen to just over 23,000 (7.9%) by Nov 2005.
- At the 1st Nov 2005, the mean age of those on medicines for diabetes was 77.7 ± 9.5 years.
- Sixty-four percent were men

Rate of cardiovascular medicine use in the veteran population from 2002 to 2005 inclusive



Methods: Study 2 Processes of care

- The cohort of veterans had received at least two dispensings for oral hypoglycaemics or at least one dispensing of insulin in the six months 1 July 2004 to 31 Dec 2004 and were still alive at the 31st Dec 2005.
  - Processes of care in the following year, 1 Jan 2005 – 31 Dec 2005 were assessed

The following processes of care were measured for the 12 months 1 Jan 2005 – 31 Dec 2005:

- An annual diabetes care plan, health care plan, medication review or case conference;
- HDL claim;
- HbA1c claim
- Microalbuminuria claim.
- Podiatry claims
- Dietician claims
- In addition, the proportion of veterans with claims for a endocrinologist service was determined.
- Optometry or ophthalmology claims in the two years; 1 Jan 2005 to 31 Dec 2006 were also assessed

Results: 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,
- 53% were dispensed lipid lowering therapy and
- 52% antiplatelet agents respectively

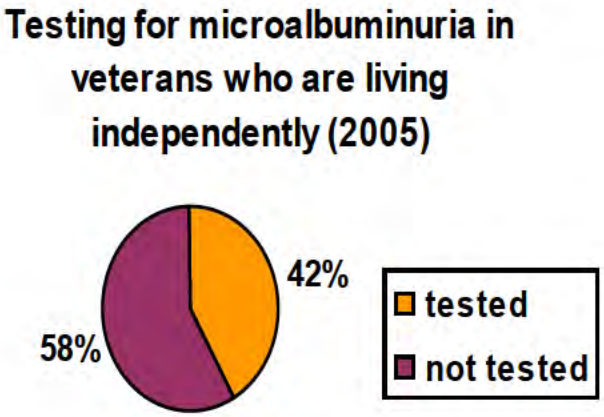
Results: Diabetes Cycle of Care

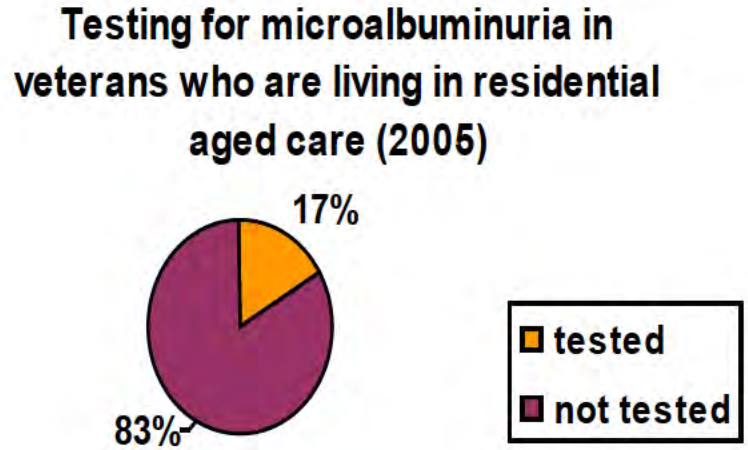
- 20% had claims for an annual diabetes care plan,
- 50% had a claim for any type of care plan, including a medication review, discharge plan, case conference, GP management plan or health care plan.

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.





Discussion

- Do these studies suggest under-utilisation of lipid-lowering and antiplatlet therapy and of some processes of care for Australian war veteran patients with diabetes?
- Practice implications: How to design strategies which will best support GPs in their care of patients with diabetes?

Using observational evidence to support decision making

What decisions?

- Multiple points in the health care system at which decisions are made. Each decision may rely on different sources of evidence and strength of evidence to support the decision making process
  - Regulator
    - Should we register this medicine?
    - Should we withdraw this medicine?
    - Is the product information adequate?
  - Payer
    - Should we subsidise this medicine?
  - Health Service Provider
    - Do I prescribe this medicine?
    - Which medicine should I prescribe?
  - Public Health Promotion
    - Should we intervene?

How are decisions made?

- Decisions to approve for market (regulator) and listing on the pharmaceutical benefits scheme (payer) are made based on gold standard evidence, Randomised Controlled Trials
- When medicines first reach market most of the medicines adverse reactions are unknown
- Why do safety issues go undetected in RCTs?
  - small sample sizes, underpowered to detect rare but serious adverse events
  - short-term follow-up, may not detect longer-term adverse events
  - performed in patient populations different than those who eventually receive treatment once the medicine is on the market
- Uncertainty around the benefit-risk balance

How can observational studies help?

- Large populations
  - Ability to detect rare events
- Data Collected longitudinally
  - Extended follow-up
- Effects of medications in populations excluded from RCTs
  - Who is treated in practice and how do they differ from those in the trials
- Effectiveness and safety of medicines as used in routine clinical practice
  - Variation in patients, clinicians, health care systems etc. Are the drivers of medicine utilisation contributing to harm?

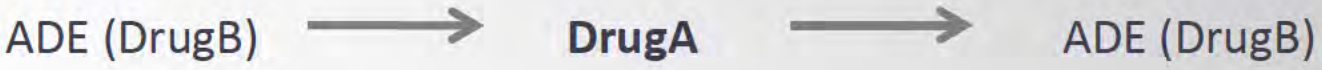
Examples of how observational evidence can support decision making

1. Rapid signalling of safety issues
   - Early detection of safety issues
   - Examples:
     1. Anti-inflammatory medicines and heart attack
     2. Proton-pump inhibitors and pneumonia
2. Inform policy makers and clinicians about the 'real world' safety and effectiveness of medicines widely available on the market
   - Identification of safety issues in high-risk populations, or those excluded from RCTs
   - Examples:
     1. Anti-inflammatory medicines in patients with heart failure
     2. Beta-blockers for heart failure in the elderly

Rapid signalling of safety issues

Prescription symmetry analysis

- Simple signaling tool
- Algorithm that detects events that occur more frequently after a medicine is prescribed than before it is prescribed
- Use prescription data only
- If Drug A causes Adverse Drug Event (DrugB), expect an excess of persons having the adverse event after starting Drug A



- Non-symmetrical distribution of prescription orders

Hallas J. Evidence of depression provoked by cardiovascular medication: A prescription sequence symmetry analysis. Epidemiology 1996; 7: 478-84

UniSA | Sansom Institute for Health Research

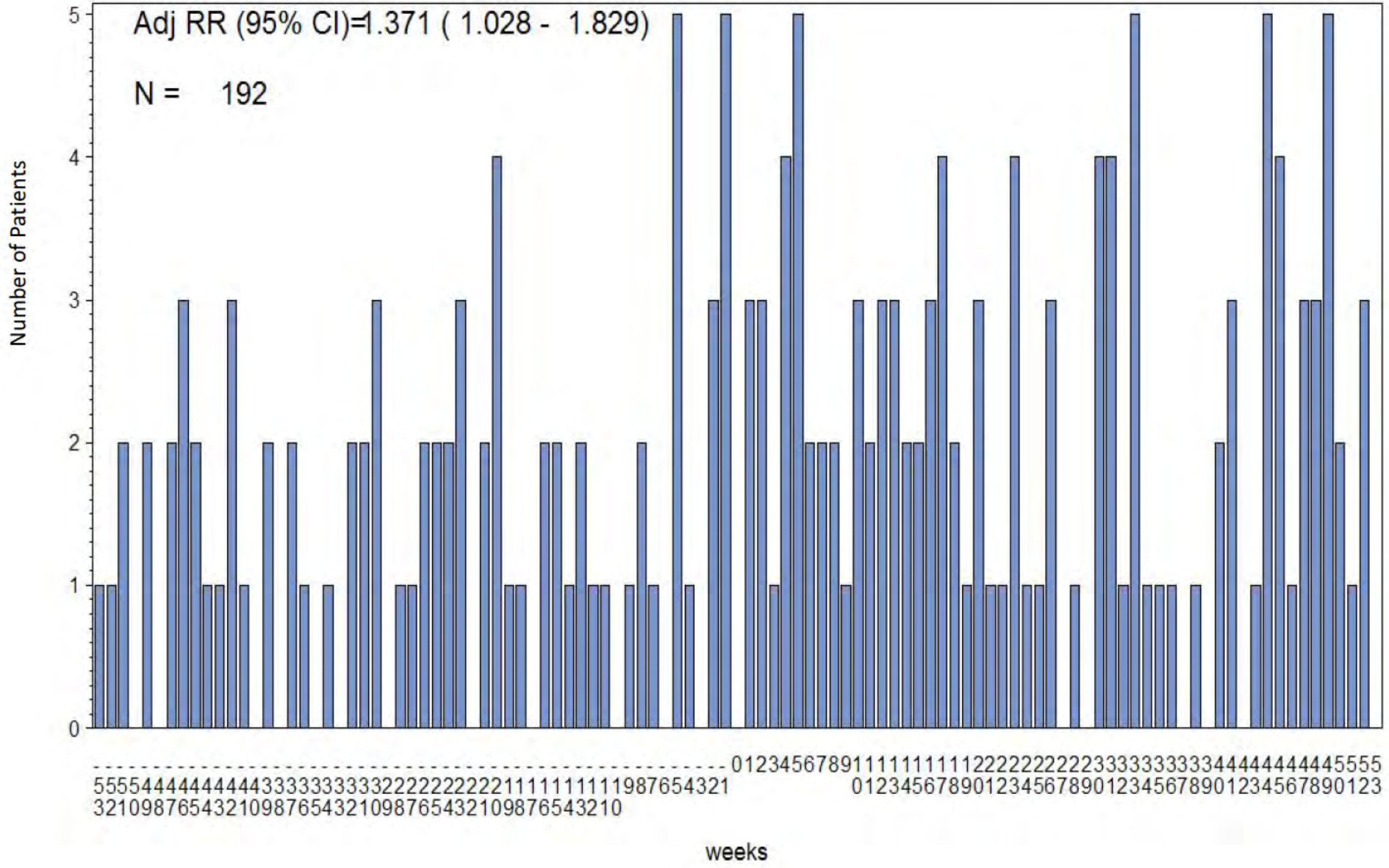
Rofecoxib and myocardial infarction

What was known at the time rofecoxib was listed?

- 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

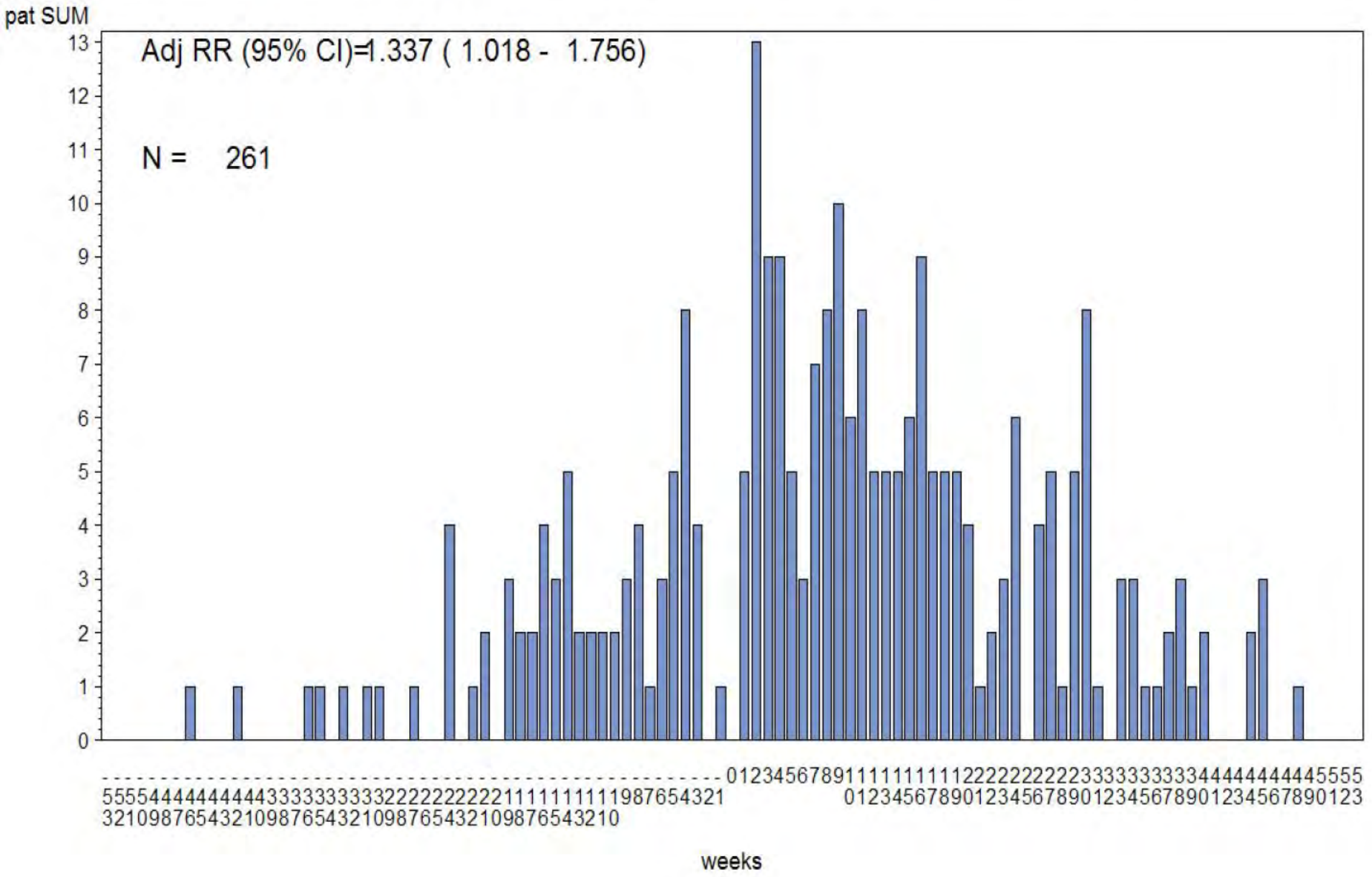
Non-causal Group (MI --> Naproxen) **Causal Group (Naproxen --> MI)**



One year after marketing was rofecoxib associated with excess heart attacks?

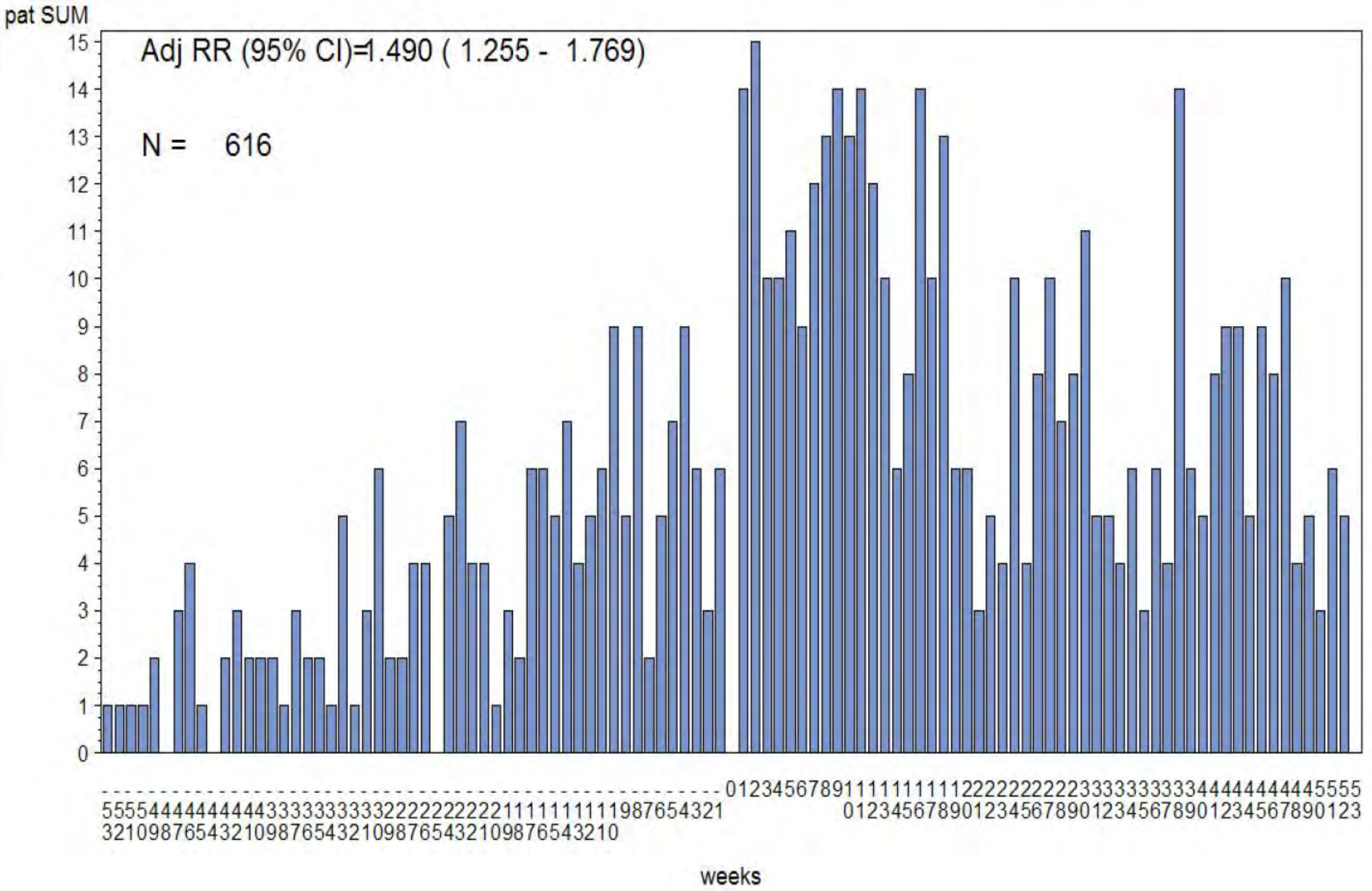
PSSA Rofecoxib MI 2001 - 2001

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



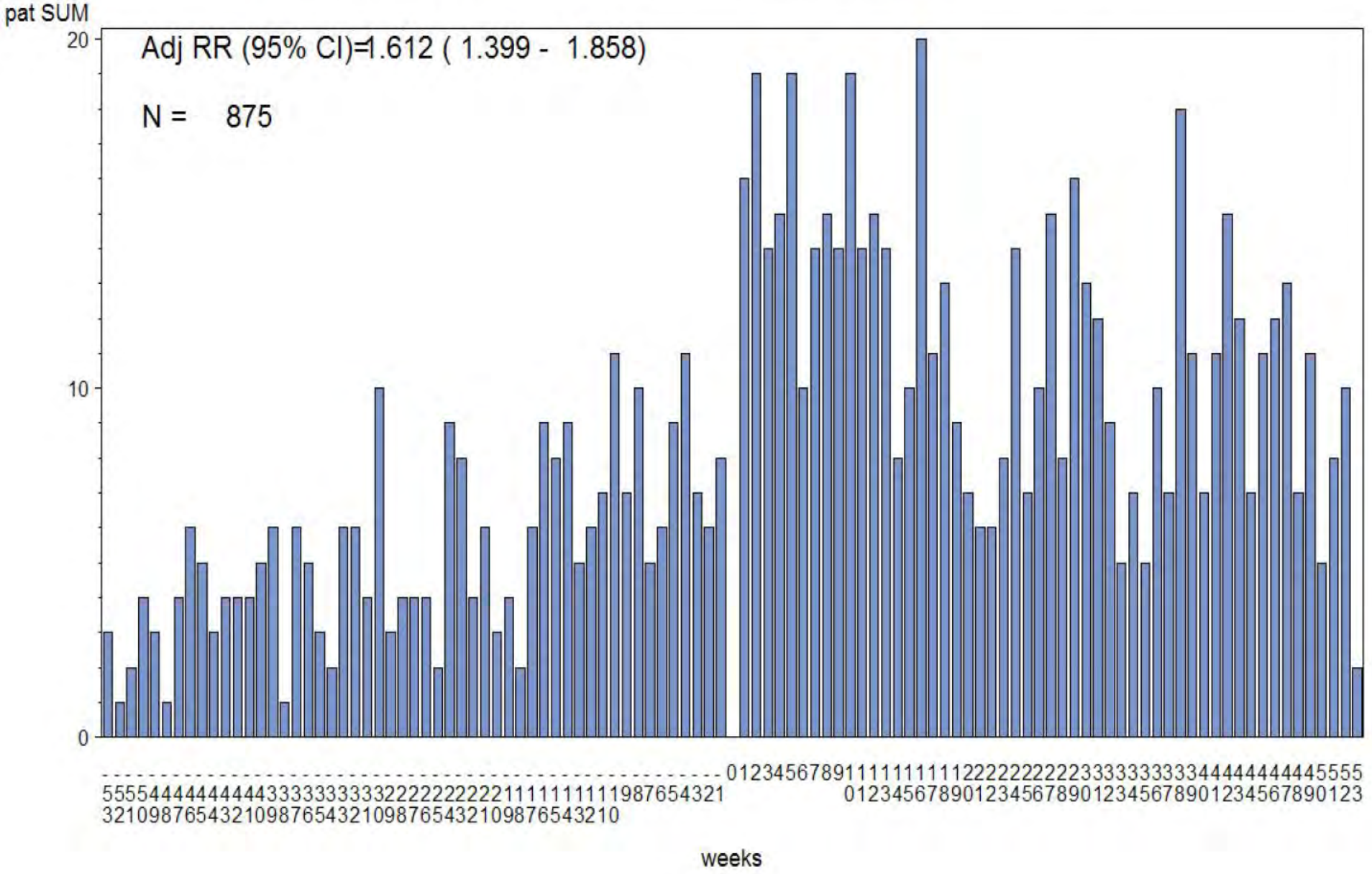
PSSA Rofecoxib MI 2001 - 2002

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



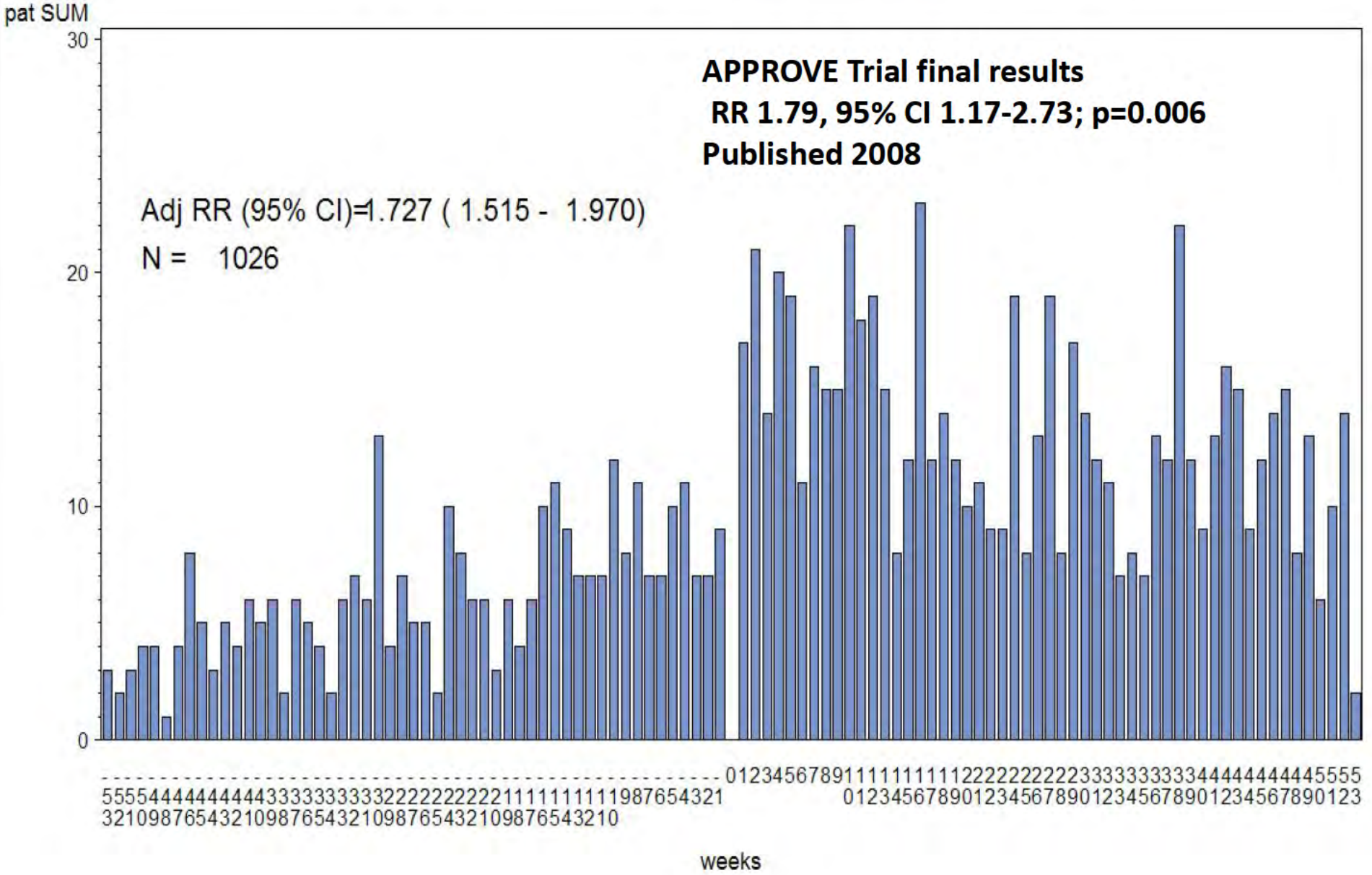
PSSA Rofecoxib MI 2001 - 2003

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



PSSA Rofecoxib MI 2001 - 2004

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



Proton-pump inhibitors and pneumonia

Risk of pneumonia with proton pump inhibitors

- Several studies suggest proton pump inhibitors (acid-suppressive medicines) may increase susceptibility to respiratory infections*
- Given the widespread use of proton pump inhibitors, identifying and clarifying the risk of pneumonia with these medicines is important

*Eom C-S, Jeon C, et al. Use of acid-suppressive drugs and riks of pneumonia: systematic review and meta-analysis. CMAJ 2010

Methods

Signal Detection

- Prescription Sequence Symmetry Analysis (PSSA)

Confirmation

- Cohort study: Adjusting for measured confounding
- Self Controlled Case Series (SCCS): Adjusting for unmeasured confounding

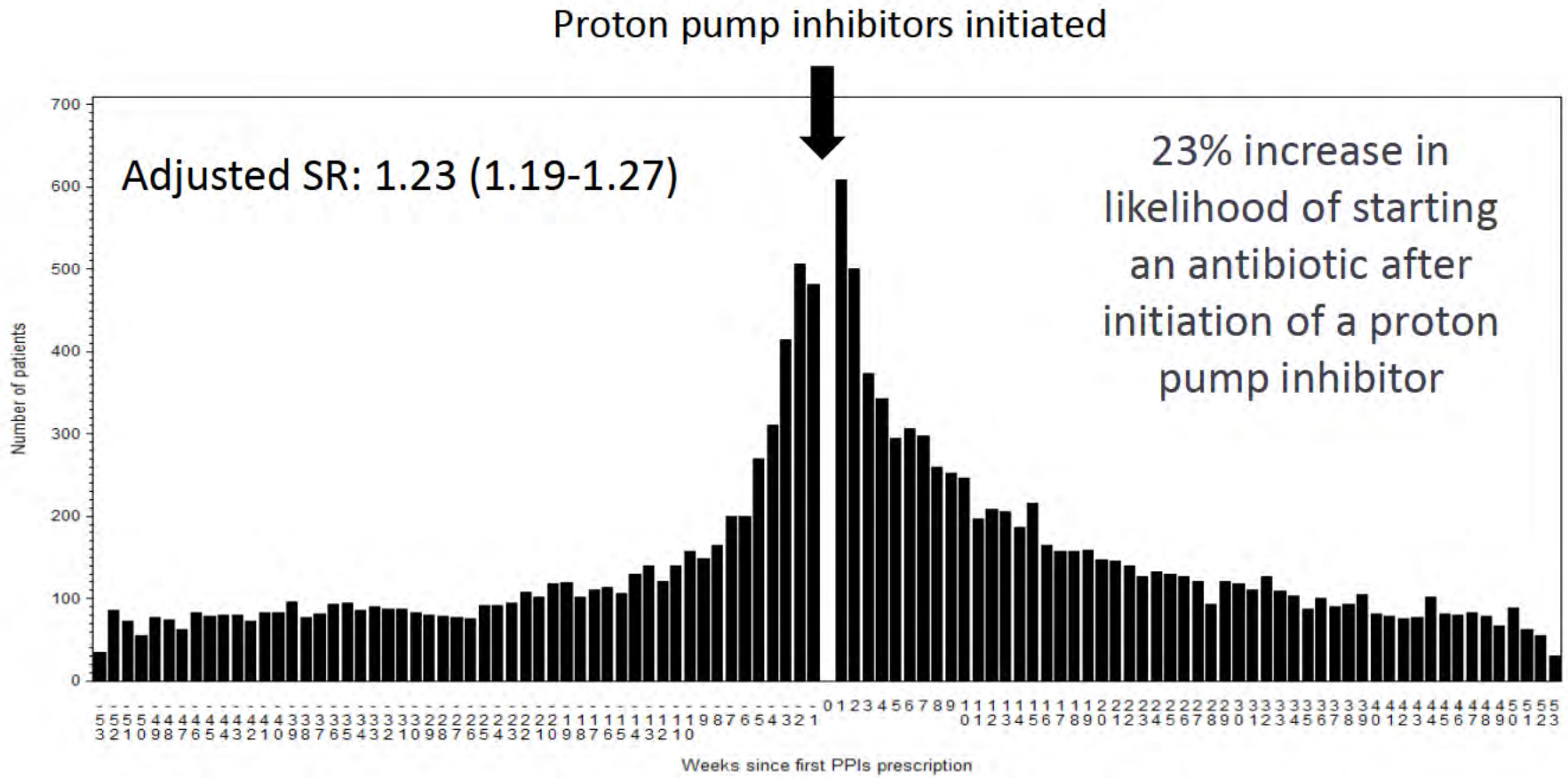
Validation

- Comparison to results of RCTs and/or Meta-analysis of observational studies

Signal detection

- If PPIs are associated with pneumonia we would expect more cases of pneumonia after patients start PPIs than before they start PPIs
- Estimates the incidence rate ratio of initiation of **antibiotics** in the 12 months after initiation of PPIs compared to before initiation of PPIs

Prescription Sequence Symmetry Analysis



Confirmation: Cohort Study

- Study period: January 2002 – 30 June 2006
- Exposed: New users of proton-pump inhibitors (excluding H2RA medicines) compared to patients not on PPIs
- Outcome: Hospitalisation for pneumonia (ICD-10 codes: J12 - J18)
- Adjusted for Confounders:
    - Confounders: age, gender, number of co-morbidities, aged-care status, socioeconomic index, season, heart failure, chronic obstructive pulmonary disease, number of doctors, pharmacies, allied health visits, and number of prescriptions
- Poisson regression

Results

Days after starting PPIs	Cohort Study Adjusted Rate Ratio (95% CI)
Unexposed	1.00
1-7	1.55 (1.26, 1.91)
8-30	1.50 (1.33, 1.69)
>30	1.26 (1.16, 1.36)

Confirmation: Self-controlled case-series design

- Similar to a cohort study but only includes patients with a hospitalisation for pneumonia
- Compare the risk of hospitalisation in periods of exposure compared with non-exposure within the same person.
- Likely to exclude the effects of major unmeasured confounders as the within-person study design **controls implicitly for confounders** that do not vary over time.
- Adjust for time varying confounders: age and calendar time
- Conditional poisson regression

Results

Days after starting PPIs	SCCS Incidence Rate Ratio (95% CI)
Unexposed	1.00
1-7	2.15 (1.87, 2.47)
8-30	1.79 (1.63, 1.95)
>30	1.34 (1.27, 1.41)

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Results

Days after starting PPIs	SCCS Incidence Rate Ratio (95% CI)	Cohort Adjusted Rate Ratio (95% CI)
Unexposed	1.00	1.00
1-7	2.15 (1.87, 2.47)	1.55 (1.26, 1.91)
8-30	1.79 (1.63, 1.95)	1.50 (1.33, 1.69)
>30	1.34 (1.27, 1.41)	1.26 (1.16, 1.36)

Validation

Days after starting PPIs	SCCS Incidence Rate Ratio (95% CI)	Cohort Adjusted Rate Ratio (95% CI)	Meta-Analysis[1] Odds Ratio (95% CI)
Unexposed	1.00	1.00	1.00
1-7	2.15 (1.87, 2.47)	1.55 (1.26, 1.91)	3.95 (2.86, 5.45)
8-30	1.79 (1.63, 1.95)	1.50 (1.33, 1.69)	1.61 (1.46, 1.78)
>30	1.34 (1.27, 1.41)	1.26 (1.16, 1.36)	1.36 (1.05, 1.78)

1 Eom C-S, et al. Use of acid-suppressive drugs and risk of pneumonia: systematic review and meta-analysis. CMAJ 2010

Summary

Signal Detection

- **Symmetry Analysis:** Increased use of antibiotics after starting PPIs using prescription data only

23%

26%

Confirmation

- **Cohort study:** Increased risk of pneumonia after starting PPIs, after adjusting for multiple confounders
- **SCCS:** Increased risk of pneumonia after starting PPIs. SCCS relies solely on design to control for confounding

34%

Validation

- **Meta-analysis** of observational studies: Increased risk of pneumonia after starting PPIs

36%

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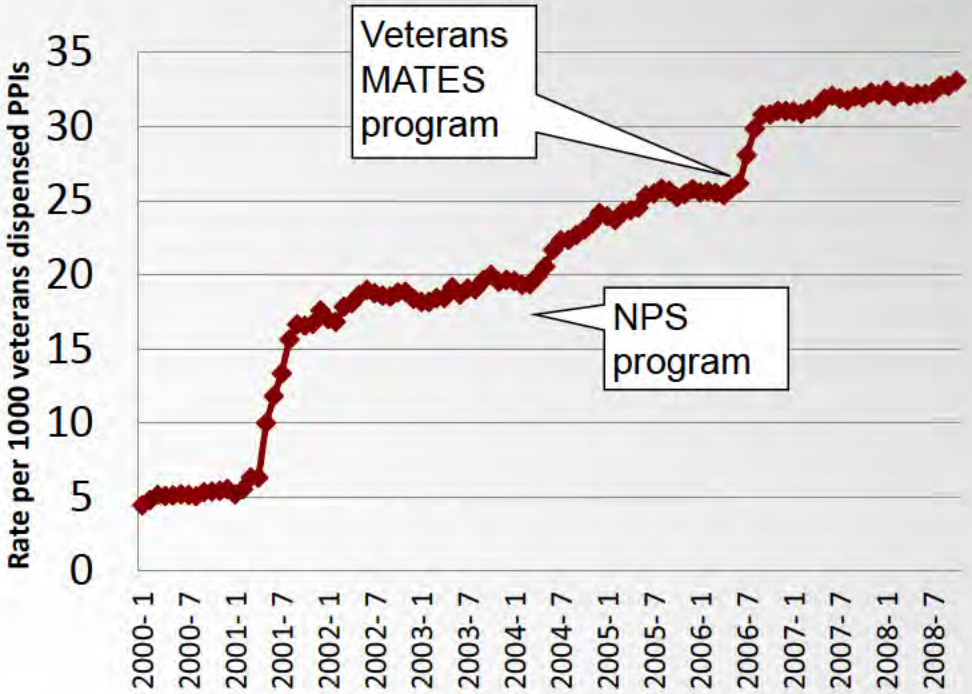
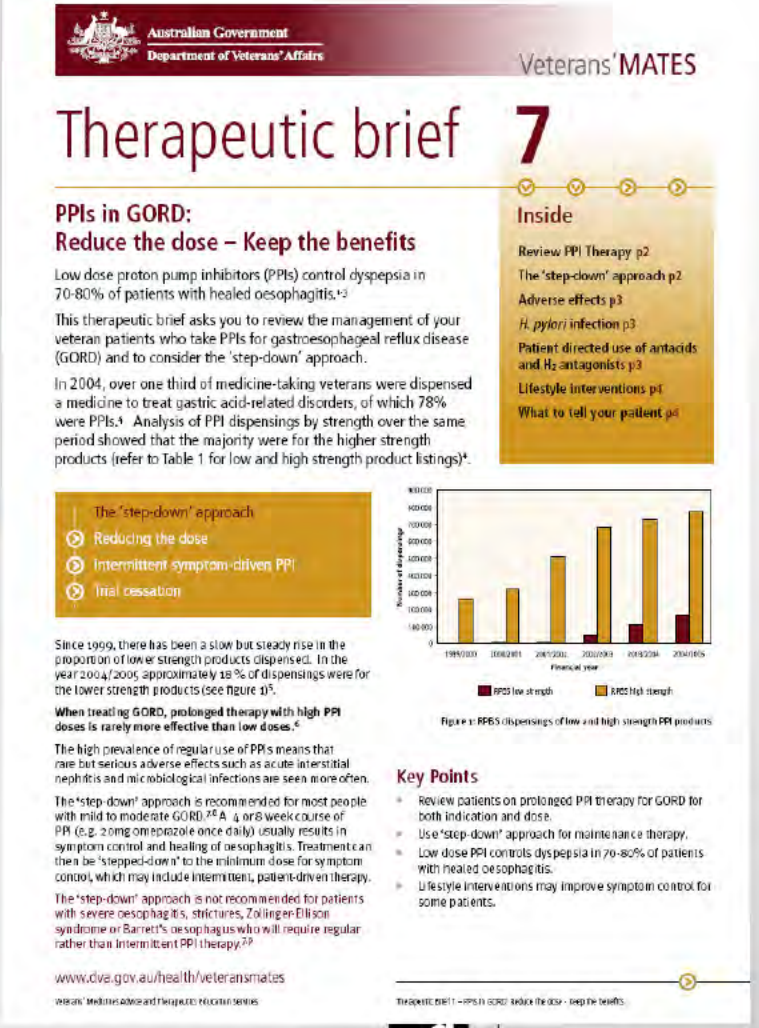
How does this support decision making?

- As new medicines enter the market we need rapid an robust information regarding new risks that may not have been identified in trials
  - Standardized statistical algorithms that are robust to the common problem of confounding will enable more timely detection of adverse effects of medicines and will help to prioritise safety signals for more detailed investigation
- Support regulators to
  - Alteration of product information
  - Changes to conditions of registration
  - Communication of changes to risk-benefit balance
  - Product suspension, cancellation or recall
- Public health interventions
  - Quality use of medicines programs to reduce high-dose PPIs

Can we reduce high-dose Proton Pump Inhibitor use?

- Module 7: 15% increase in low dose proton pump inhibitors





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: PBS 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.

www.dva.gov.au/health/veteransmates

Veterans' Medicines Advice and Therapeutics Education Services

Therapeutic Brief 7 – PPIs in GORD: Reduce the dose - Keep the benefits

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Inform policy makers and clinicians about the 'real world' safety and effectiveness of medicines widely available on the market

- Use of medicines in high risk populations

  Example 1: NSAIDS in patients with heart failure

- Use in patients under-represented in RCTS

  Example 2: Beta-blockers for heart failure in the elderly

Anti-inflammatory medicines in patients with heart failure

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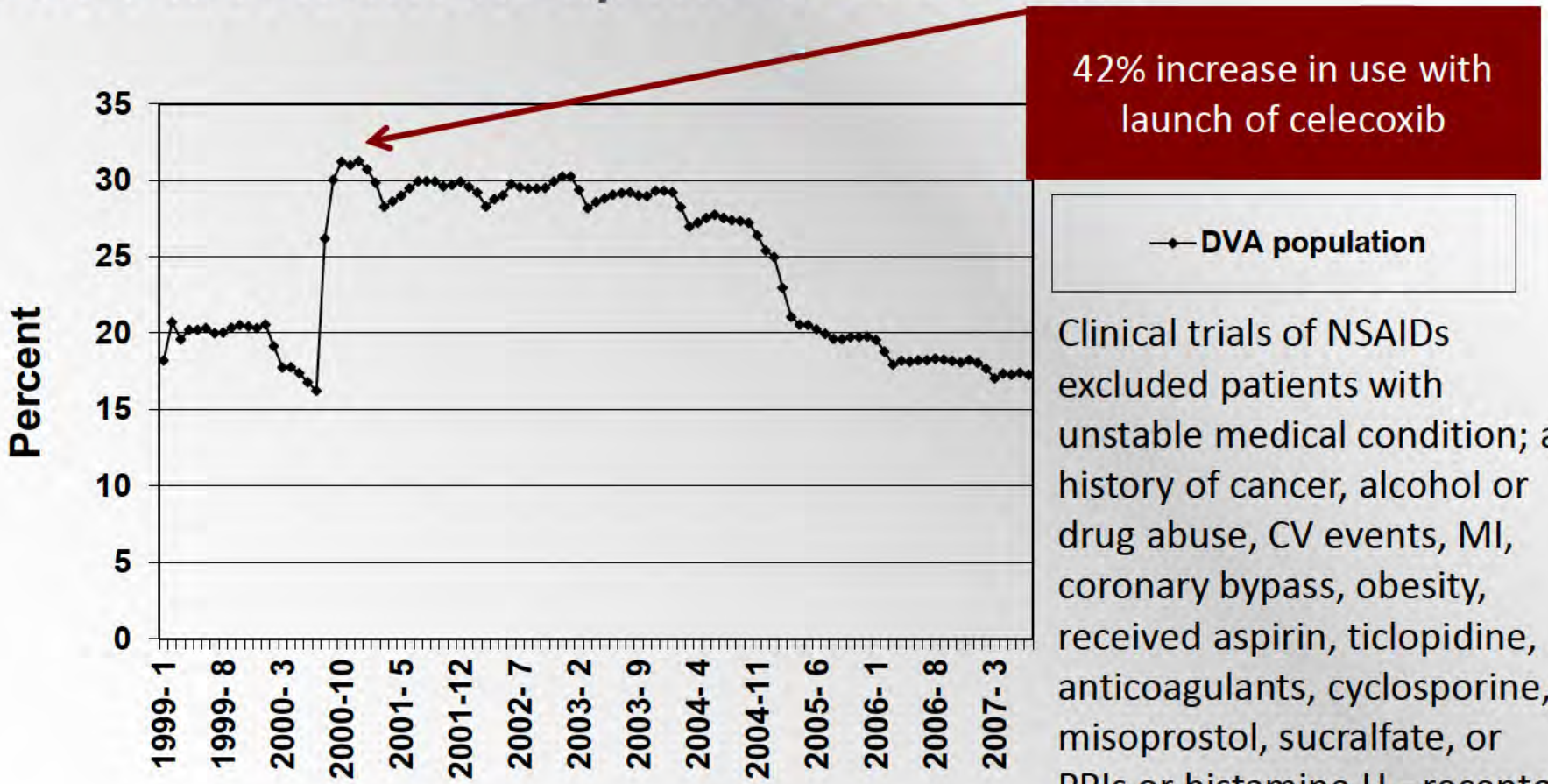
Anti-inflammatory medication use



Clinical trials of NSAIDs excluded patients with unstable medical condition; a history of cancer, alcohol or drug abuse, CV events, MI, coronary bypass, obesity, received aspirin, ticlopidine, anticoagulants, cyclosporine, misoprostol, sucralfate, or PPIs or histamine H_2–receptor antagonists (VIGOR study)

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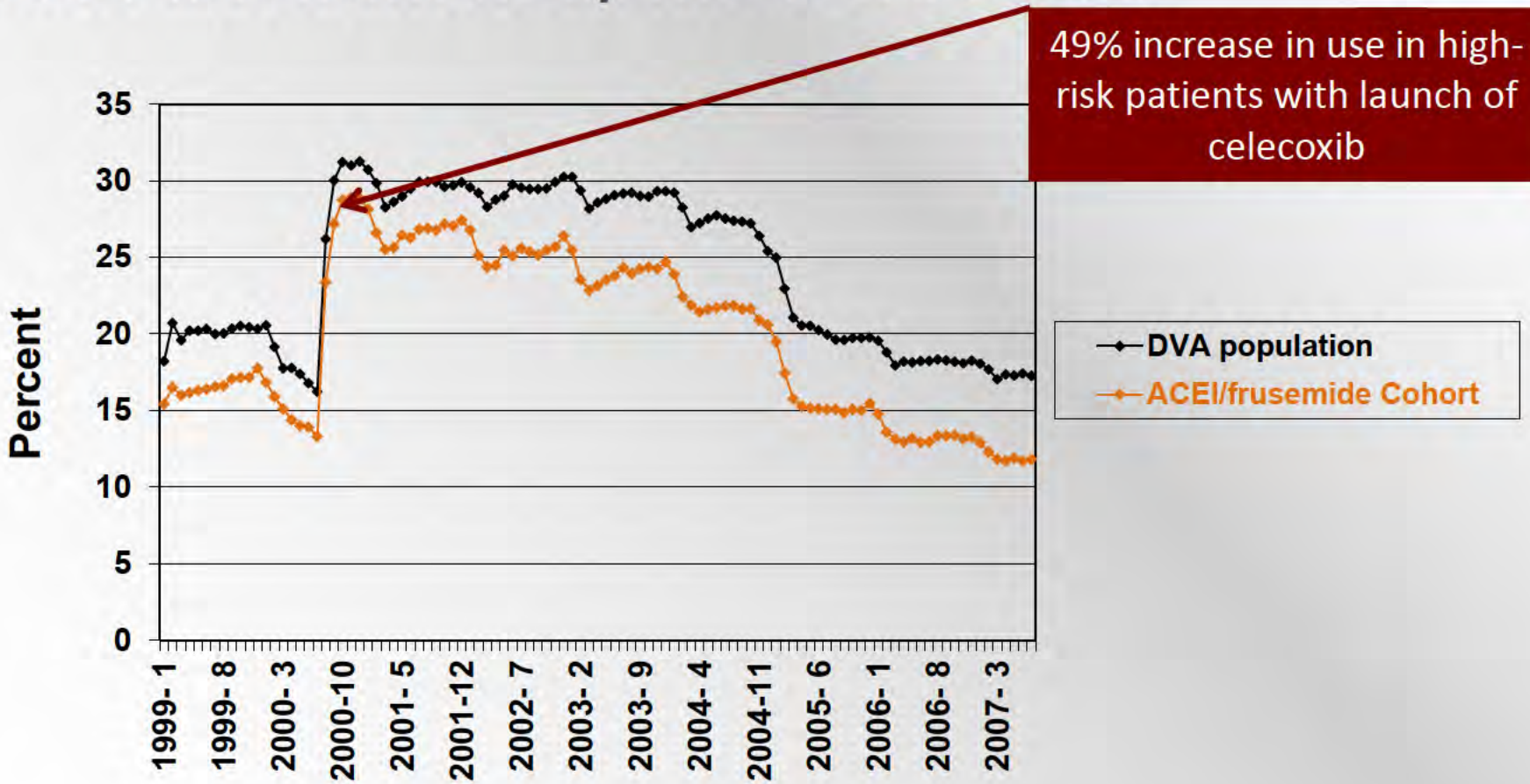
Anti-inflammatory medication use



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Did the increased use of anti-inflammatory medicines in the heart failure population cause harm?

- Observational evidence to understand how patients treated in practice differ from those in trials
- explore the consequences of such prescribing and determine whether the risk-benefit ratio in these groups is altered

Method

- Cohort study to compare the risk of adverse events in patients prescribed anti-inflammatory medicines compared to non-users
- Two groups:
  - Patients with heart failure medications
  - Patients with no heart failure medications

- Study period August 2000 – June 2005
- Gold card holders
- Dispensed at least one medicine in the last previous four months

Method

- Primary outcome: Hospitalisation for
  - heart failure, renal failure, gastrointestinal ulcer, heart attack or high blood pressure within 30 days of anti-inflammatory medicine initiation
- Follow-up until study end, death
- Adjusted for confounders including:
  - age, gender, co-morbidity, aged-care status, socioeconomic index

Results

- 17,865 patients **dispensed** heart failure medicines
  - 8,113 (45.4%) dispensed anti-inflammatory medicines
- 128,750 patients **not** dispensed heart failure medicines
  - 69,309 (53.8%) dispensed anti-inflammatory medicines

Hospitalisations* associated with anti-inflammatory medicines

- 34% increased risk of hospitalisation with anti-inflammatory medicines in patients **dispensed** heart failure medicines (Relative risk=1.34; 95% CI 1.13-1.58)
- 47% increased risk of hospitalisation with anti-inflammatory medicines in patients **not** dispensed heart failure medicines (Relative risk=1.47; 95% CI 1.30-1.66)

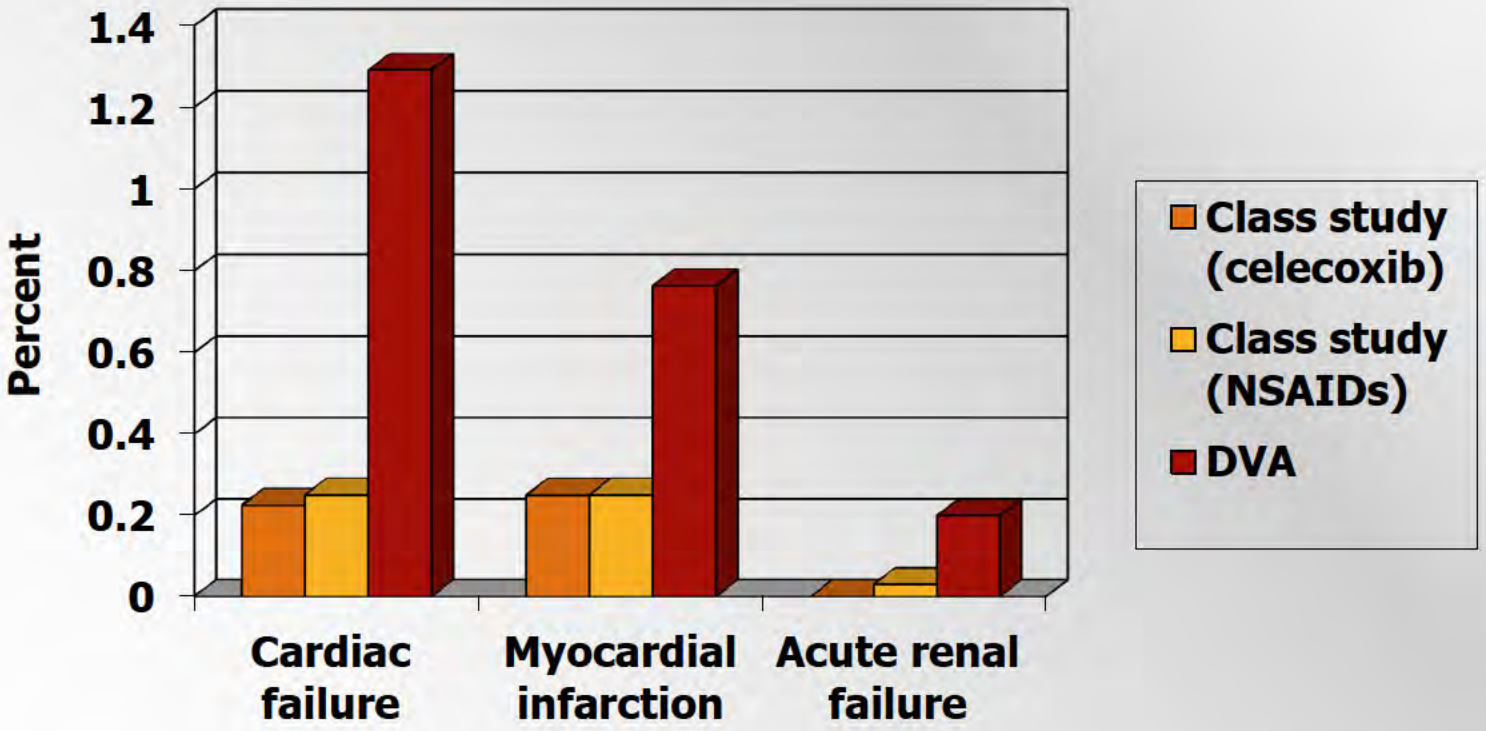
*Heart failure, renal Failure, gastrointestinal ulcer, heart attack, high blood pressure

What does it mean in practice?

- 30 extra hospitalisations for every 10,000 people treated for 30 days in the heart failure population

- 6 extra hospitalisations for every 10,000 people treated for 30 days in the non-heart failure population

Incidence of adverse events causing hospitalisation: trial versus practice



How does this support decision making?

- Public health interventions
  - Quality use of medicines programs to decrease use of NSAIDs in patients with heart failure
- Clinicians
  - More appropriate estimates of risk for individual patients
  - Identification of high risk sub-groups, when should NSAIDs be avoided?

Beta-blockers for heart failure in the elderly

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Do beta blockers for heart failure reduce the rate of hospitalisations for heart failure in the elderly?

- Clinical Trial Meta Analysis[1]
  - OR = 0.63; 95% CI: 0.56 to 0.71
  - The average age was 61 years and 4% were female, most studies excluded patients with severe heart failure
- In practice[2]
  - Patients with heart failure medicines are on average 82 years of age and have 7 to 8 concurrent medical conditions
- Observational cohort study[3]
  - HR = 0.82; 95% CI: 0.74 to 0.92
  - Confounding was identified as a possible limitation of this study[3] eg risk is attributable to the underlying disease being treated rather than to the use of beta-blockers

[1] Shibata MC, et al. EurJHeart Failure 2001;3:351-357.
[2] s 47F EE, et al. *Circ Heart Fail*. 2009;2:424-428
[3] Sin DD, et al AmJ Med 2002;113:650-656.

Method: Self-controlled Case-series

- All patients with a hospitalisation for a primary diagnosis of heart failure
  - ICD-10 I500, I501, I509
- July 2005 – June 2006
- Aged over 65
- Gold card holders
- Determine first Beta-blocker for heart failure dispensed during the study period
  - Exposure stratified into risk periods; 1 to 2 weeks, 2-4 weeks, 1-4 months, 4-8 months, 8-12 months
- Risk of hospitalisation for heart failure in exposure risk periods compared to periods of no-exposure
- Conditional poisson regression

Results

- 3,450 patients with at least one hospitalisation for heart failure
  - 645 (19%) initiated on a beta blocker for heart failure

Results

Days Since Beta blocker initiation	Self-controlled case-series Incidence Rate Ratio (95% CI)
1 day-2 weeks	2.21 (1.70 - 2.88)
2-4 weeks	1.29 (0.92 - 1.80)
1-3 months	1.18 (0.94 - 1.47)
3-8 months	0.76 (0.57 - 1.02)
8-12 months	0.62 (0.39 - 0.99)

38% reduction in hospitalisation for heart failure after 8 months treatment with beta-blockers for heart failure

Results

Days Since Beta blocker initiation	Self-controlled case-series Incidence Rate Ratio (95% CI)	Meta Analysis* Odds Ratio (95% CI)
1 day-2 weeks	2.21 (1.70 - 2.88)	0.63 (0.56, 0.71) (Average follow-up 11 months)
2-4 weeks	1.29 (0.92 - 1.80)	
1-3 months	1.18 (0.94 - 1.47)	
3-8 months	0.76 (0.57 - 1.02)	
8-12 months	0.62 (0.39 - 0.99)	

*Shibata MC, Flather MD, Wang D. Systematic review of the impact of beta blockers on mortatilty and hospital admissions in heart failure. European Journal of Heart Failure 2001;3:351-357.

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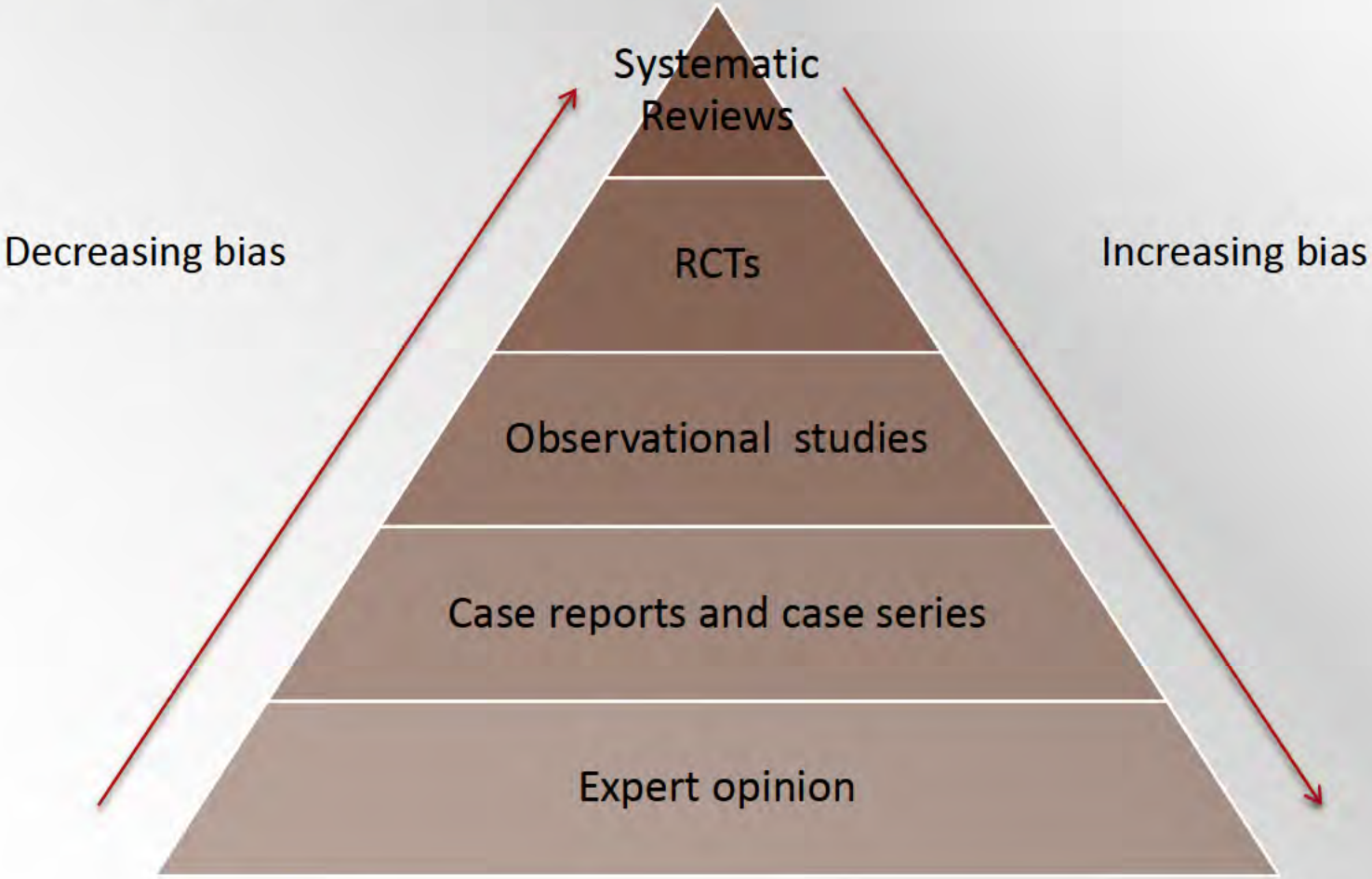
How does this support decision making?

- Public health interventions
  - Quality use of medicines programs to increase use of beta-blockers
- Clinicians
  - Assurance that treatment is effective in the elderly

Hierarchy of evidence



"For many of the decisions we face, trials generate questions and highlight gaps in evidence that must be examined and bridged with other study designs. Instead of being a narrow pillar where each study rests on the preceding one, robust evidence is better likened to a web. Trials often provide the strong strands that create the central structure, but the strength of the completed web relies on a variety of supporting cross strands made up of evidence from a more diverse array of studies."

David Atkins, Medical Care 2007

Web of Evidence

This work was funded by

Department of Veterans' Affairs as part of the Veterans' MATES program

Veterans' MATES

www.veteransmates.net.au

Australian Government

Department of Veterans' Affairs

Veterans' MATES Program

Veterans' Medicines Advice and Therapeutics Education Services

Returned & Services League of Australia
(Victorian Branch)
12 May 2005

Bob s 47F

Quality Use of Medicines and Pharmacy Research Centre
University of South Australia

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Topics

- Characteristics of the Veteran Community
- Medicines Usage by veterans
- DVA Quality Use of Medicines (QUM) initiatives
  - Past
  - Future – Veterans' MATES Program

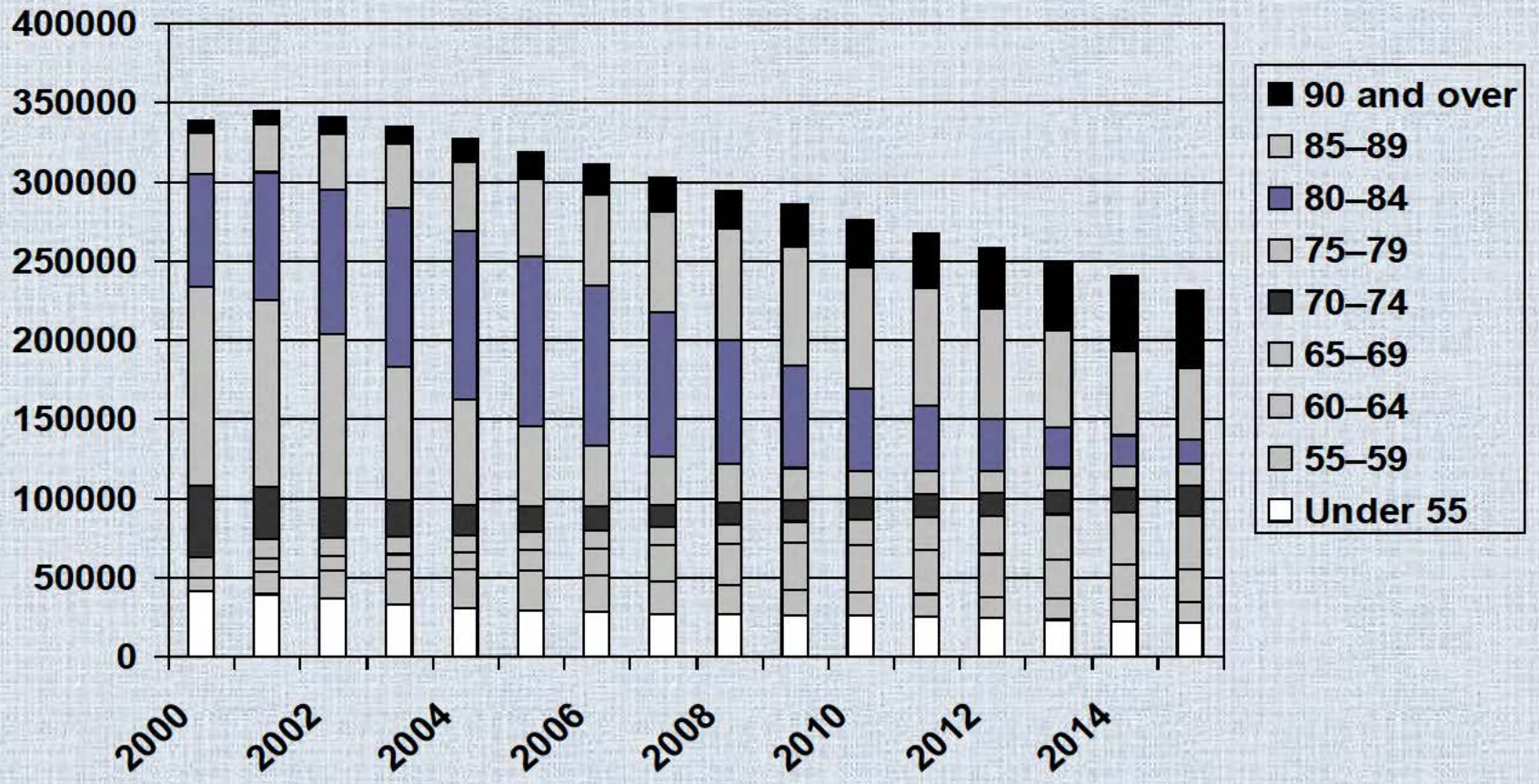
Many veterans are now old

Total Treatment Population June 2003

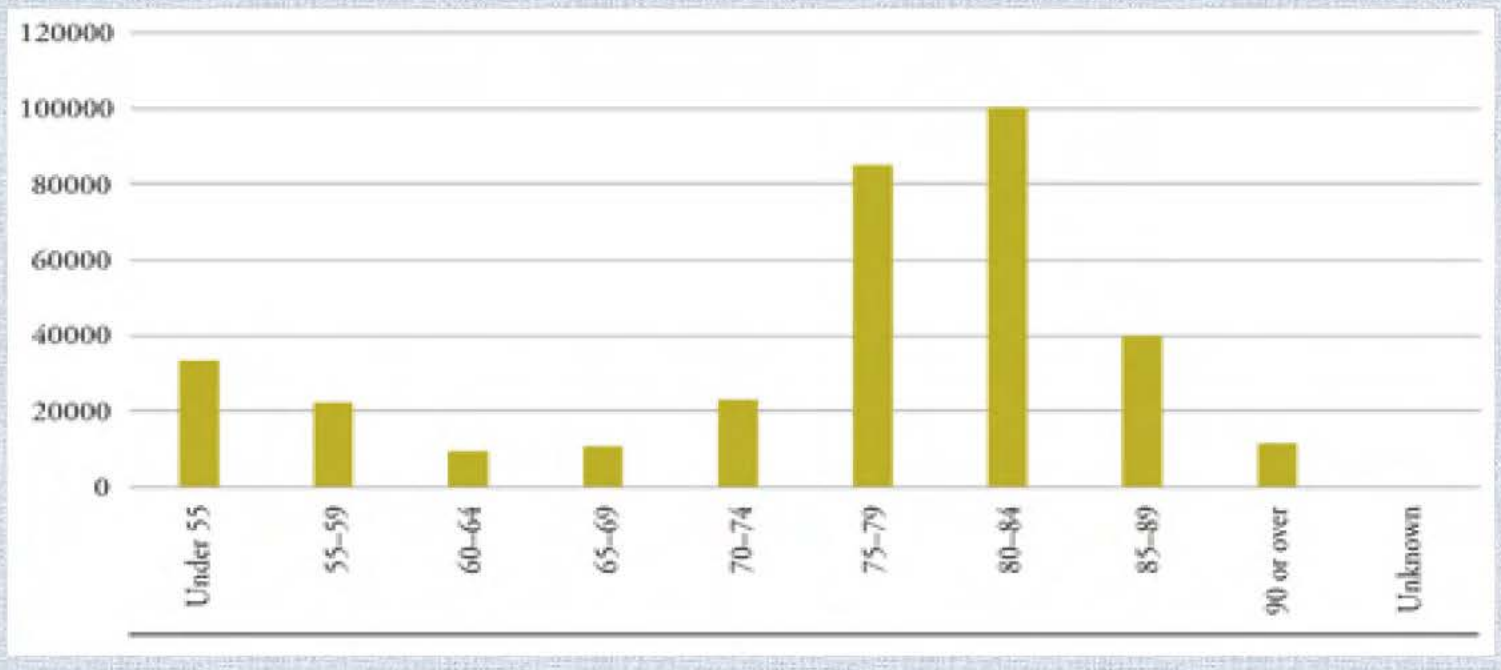
AGE GROUP	Male	Female	Total	% of Total
<55	29,172	3,967	33,139	9.3%
55-59	20,845	1,425	22,269	6.3%
60-64	7,613	2,015	9,628	2.7%
65-69	6,637	4,001	10,638	3.0%
70-74	9,075	14,109	23,184	6.5%
75-79	56,357	36,802	93,160	26.2%
80-84	72,888	36,990	109,877	30.9%
85-89	24,697	17,352	42,049	11.8%
90+	5,475	6,414	11,888	3.3%
Unknown	0	0	0	0.0%
Total	232,759	123,073	355,832	
% of Total	65.4%	34.6%		

Health Service Delivery Model Review

Projection of the eligible treatment population 2000-2014



Veteran Treatment population by age



Many are frail

Veteran Self-reported Health Problems

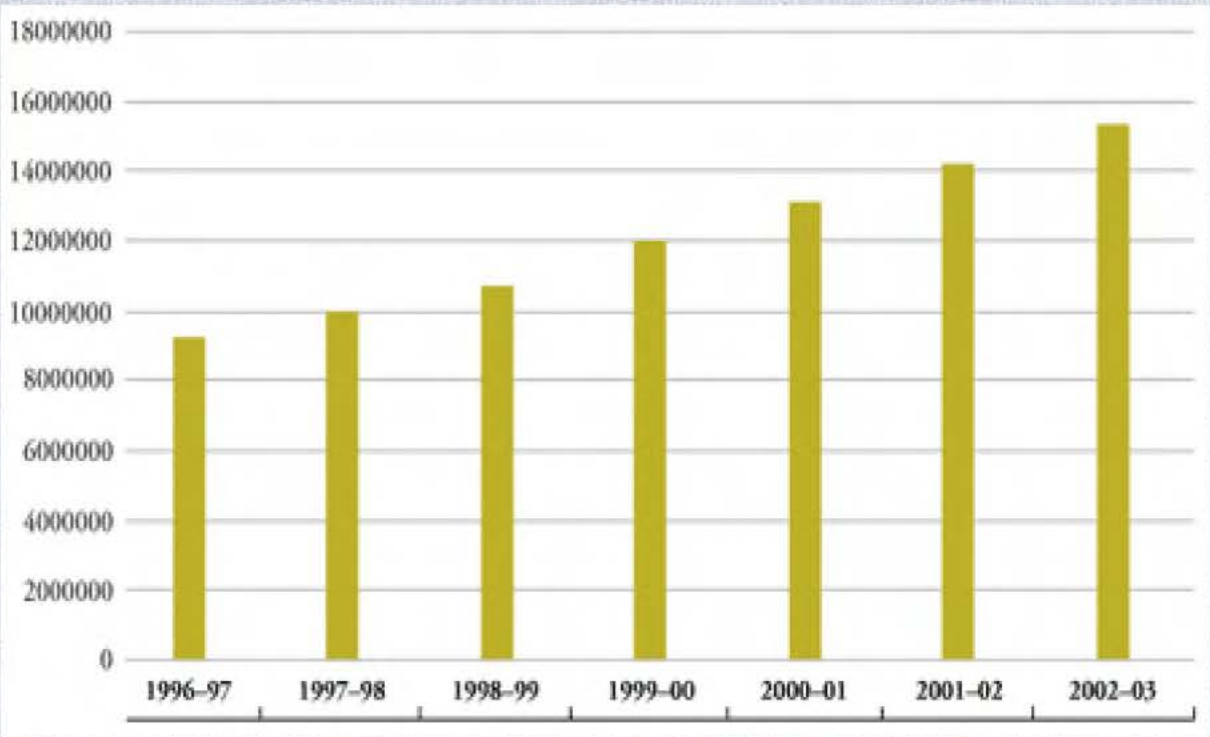
	1997	2003
Visual problems	86%	92%
Arthritis	-	53%
Depression	19%	22%
Hearing difficulties	49%	55%
Dementia memory loss	16%	38%
Insomnia/sleep disturbance	28%	33%
Anxiety	18%	18%
Foot/leg problems that affect mobility	19%	43%
Incontinence	8%	15%
High blood pressure	38%	44%
Post Traumatic Stress Disorder	9%	13%

Medicine use is high

Unique Prescription Medicines 2003

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%	**72%** (67% of treatment poptn.)
21 to 25	17,325	5.2%	
26+	12,951	3.9%	
TOTAL	*331,411*	*100.0%*	

Number of pharmaceutical items dispensed 1996–03



Medicines usage

	Prescription Medicines	OTC Medicines
Veterans*	94%	36%
Australian Population@	59%	35%

*DVA, 2003 Survey of Veterans, War Widows and their Carers, 21 October 2003
@Australian Institute of Health and Welfare 2002. Australia's health 2002. Canberra: AIHW.

Why is Veterans' Health Different?

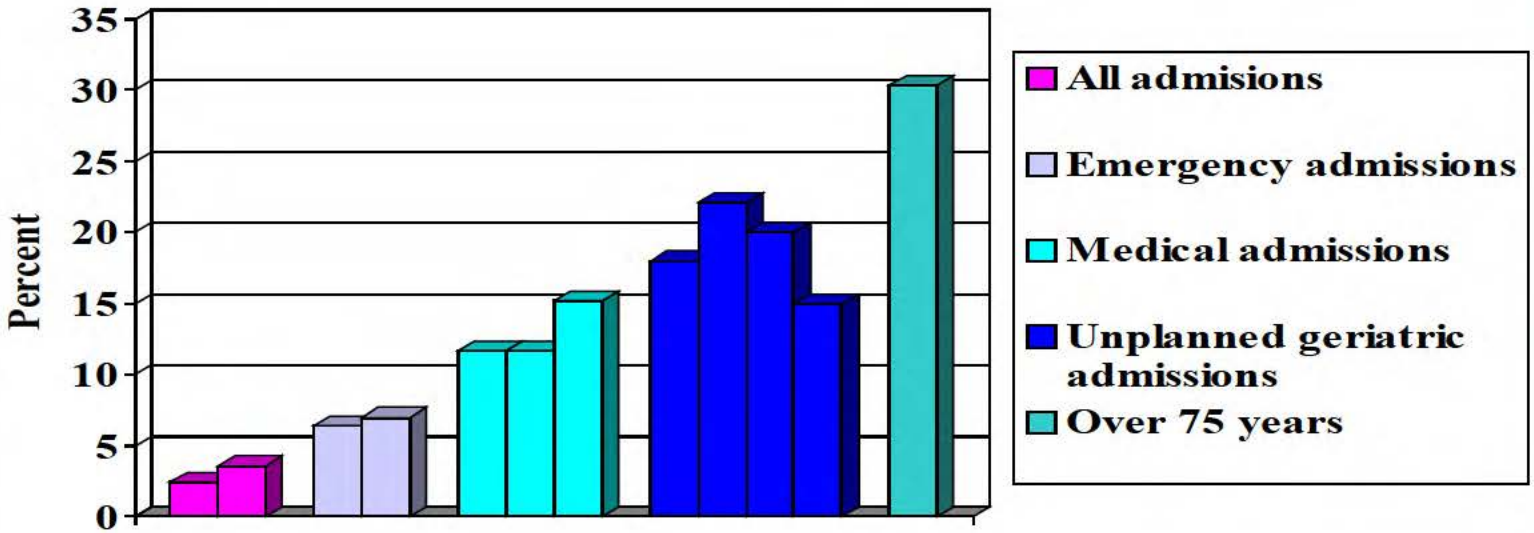
Australian Population

- 12.5% are 65+ years
- 59% use prescriptions
- 4.6% use 6+ prescription medicines
- Pharmaceutical insurance program
- Systematic care
- Service provider approach

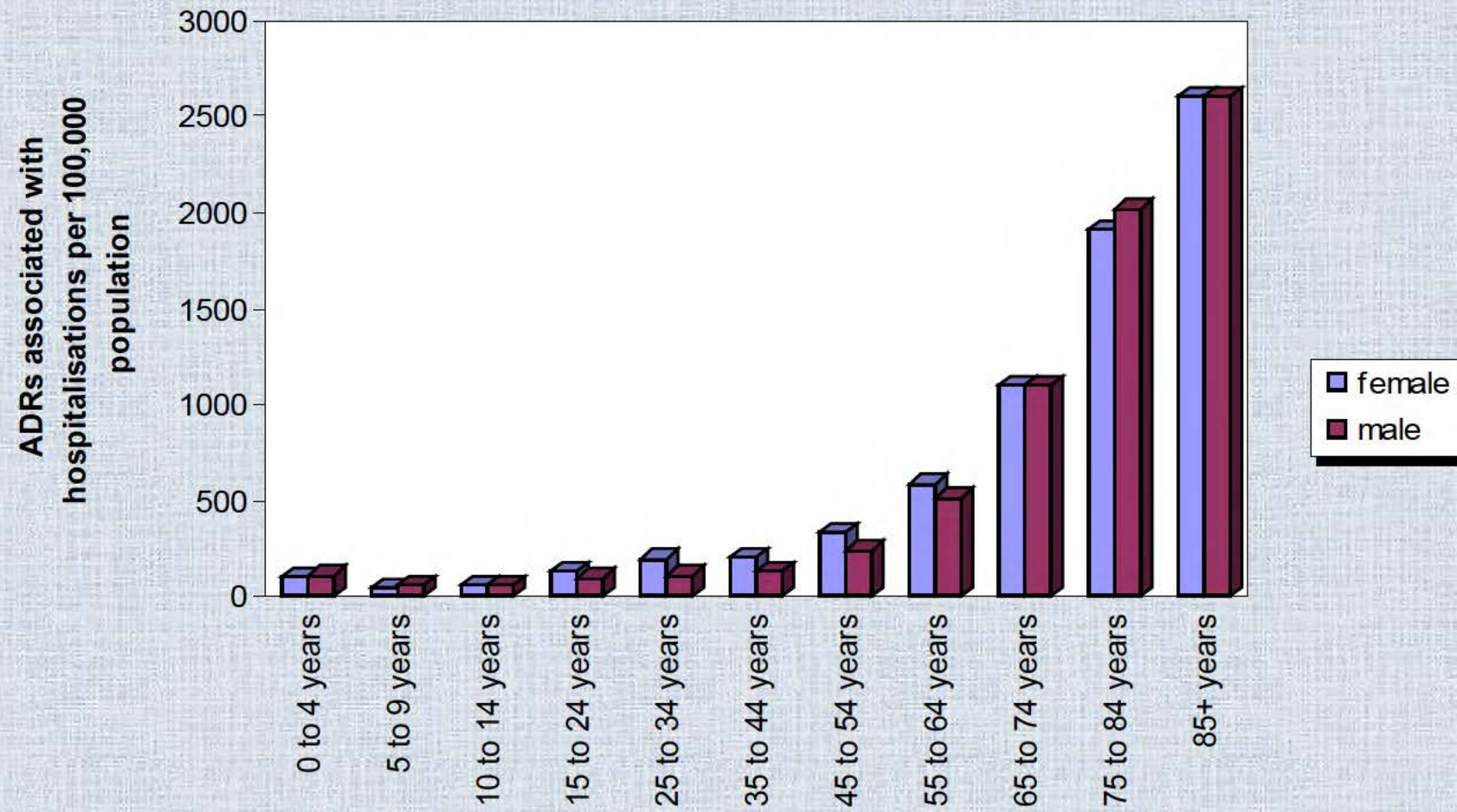
Veteran Population

- 82% are 65+ years
- 94% use prescriptions
- >67% use 6+ prescription medicines
- Integrated QUM program
- Case-by-case care
- Holistic approach

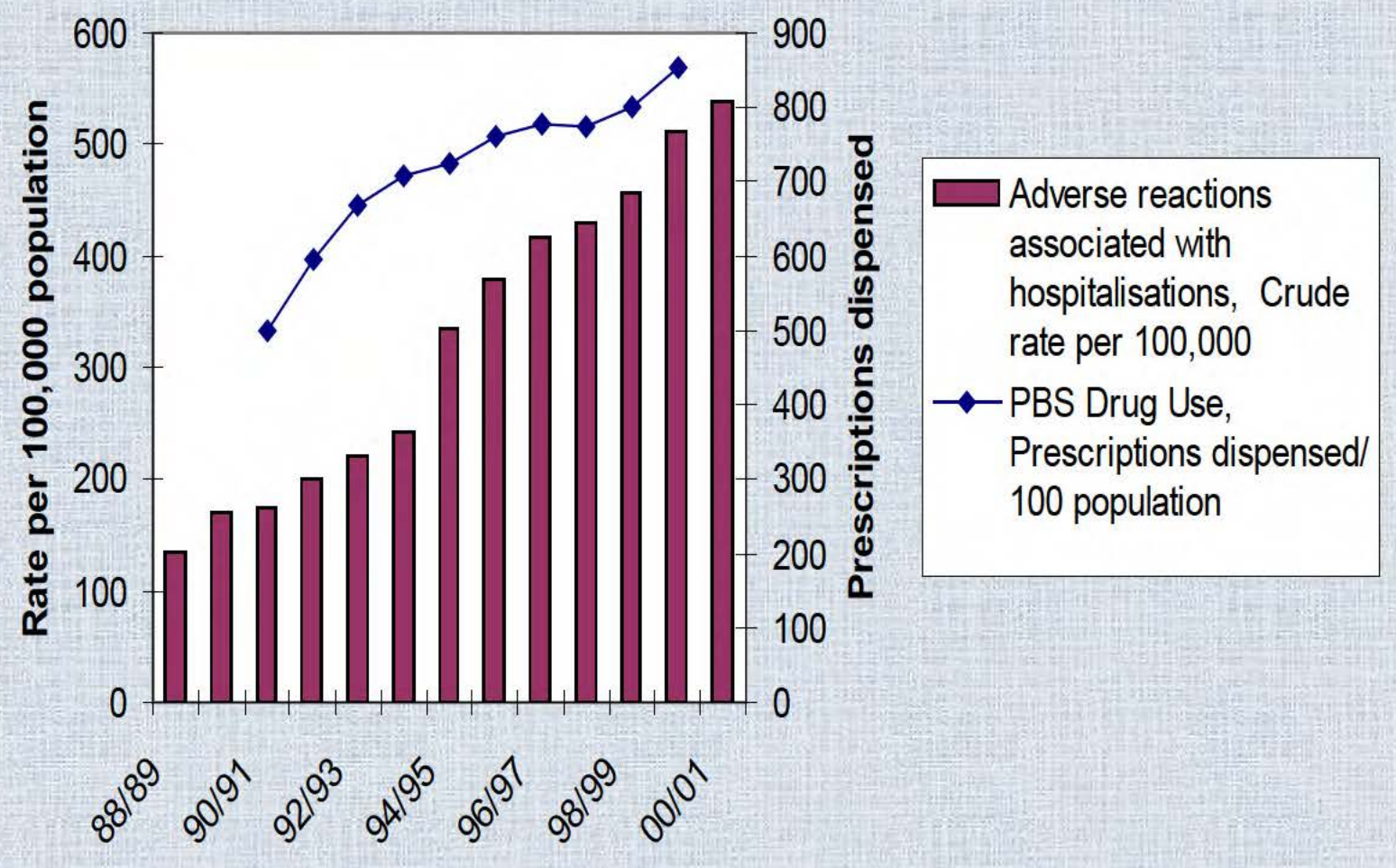
ADEs in Australian hospitals



Incidence of ADRs associated with hospitalisation by age & gender



Trends in ADRs associated with hospitalisation: SA



Drug-related Hospital Admissions

- Medication error is one of the most common causes of unintentional harm in Australia which results in an estimated 140,000 hospital admissions every year.

***Safety and Quality Council, National Report on Patient Safety, July 2002**

Drug-related Hospital Admissions

- 50% (70,000) admissions are preventable

Understanding the context of the problem

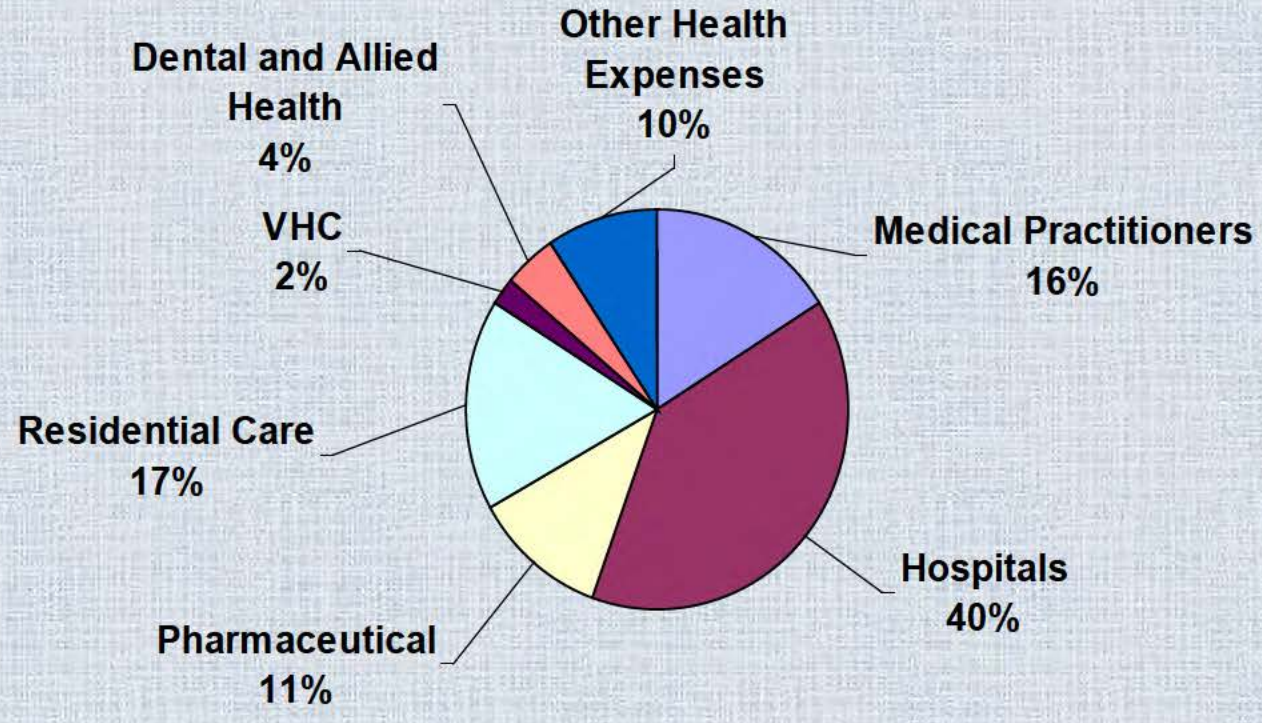
To put into perspective (1999-2000):

Hospital admissions:

Influenza and Pneumonia	62,586
Asthma	60,759
Heart Failure	41,708
Medication-related	approx 140,000

AIHW Australian Hospital Statistics 1999-00

DVA Health Expenditure 2003-04



Total funding: $4,013 million

DVA Pharmacy Program

Definitions:

- Pharmacy includes:
  - RPBS which includes: PBS items, Repatriation Schedule, Items on Prior Approval arrangements
  - Medication Management includes Quality Use of Medicines programs

Past Strategy –Participants and Programs

- Veterans and Carers
- Prescribers
  - Prescriber Feedback
- Community Pharmacists
- Hospital Pharmacists
- Nurses
- Practice Managers
- Nursing Home Staff
- Pharmacy Assistants

Previous Program Overview - Modules Delivered

- Polypharmacy 1999
- Drug-drug interactions
- Drugs in the elderly
- Anti-ulcer
- Polypharmacy 2000
- Benzodiazepines
- Warfarin
- Therapeutic duplication
- Polypharmacy 2001
- Congestive heart failure
- Cox-2 inhibitors
- Tricyclic antidepressants
- Pneumococcal vaccine
- Polypharmacy 2002
- Drug combinations
- Diabetes
- Bowel hygiene
- Osteoporosis and steroids

Previous Program Overview

- 18 clinical modules delivered over 5 years
  - 6 included direct to veteran mailing
  - 111,937 LMOs received feedback material
  - 390,692 veterans identified for intervention
- LMO survey response rate – averaged 19%
- LMO satisfaction with program – averaged 60%
- Program savings – approx $40m
  - Drug savings calculated
  - Hospital savings estimated
- Program costs - $12.3m over 5 years

Time for a new approach

Time for a Change

- PFP looked tired
- Survey responses were falling
- We thought we were excluding some important groups:
  - Medical Specialists;
  - Pharmacists;
  - Hospital health professionals- pharmacists, nurses;
  - Nurses

Future strategy

- A wider program
  - LMOs, Specialists, Veterans/carers, pharmacists (community and hospital) nurses are the new targets
- Learn from deficiencies from the past
- Add innovative ideas
  - Peer group leaders - specialists
- Add rigor
  - Control groups;
  - Publish

University of South Australia

Veterans' MATES Program

Veterans' Medicines Advice and Therapeutics Education Services

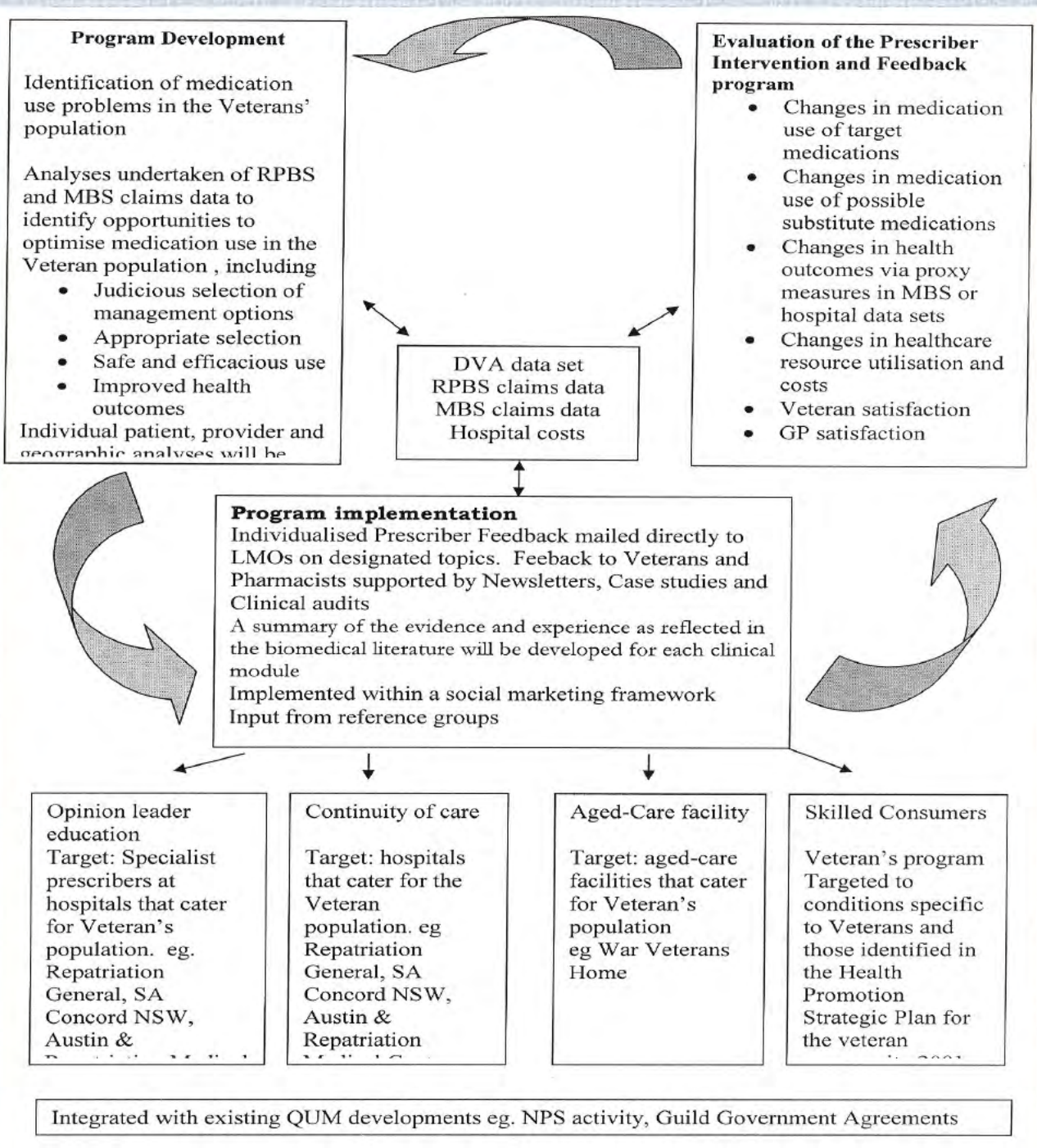
Who is involved?

Quality Use of Medicines and Pharmacy Research Centre and the Division of Health Sciences *in association with*:

- National Prescribing Service
- Departments of General Practice & Public Health, University of Adelaide
- DATIS
- Australian Medicines Handbook
- Repatriation General Hospital, Daw Park

Veterans' MATES approach

- Strong consultative framework
- Veteran focused
- Based in behavioural change theory
- Evidence-based medicine and clinical focus
- Pharmaco-epidemiological analyses
- Health Program and Health Economic evaluation
- A clear focus on achievable outcomes
- Presentation and publication of results


Program Development
Identification of medication use problems in the Veterans' population
Analyses undertaken of RPBS and MBS claims data to identify opportunities to optimise medication use in the Veteran population , including
Judicious selection of management options
Appropriate selection
Safe and efficacious use
Improved health outcomes
Individual patient, provider and
Evaluation of the Prescriber Intervention and Feedback program
Changes in medication use of target medications
Changes in medication use of possible substitute medications
Changes in health outcomes via proxy measures in MBS or hospital data sets
Changes in healthcare resource utilisation and costs
Veteran satisfaction
GP satisfaction
DVA data set
RPBS claims data
MBS claims data
Hospital costs
Program implementation
Individualised Prescriber Feedback mailed directly to LMOs on designated topics. Feeback to Veterans and Pharmacists supported by Newsletters, Case studies and Clinical audits
A summary of the evidence and experience as reflected in the biomedical literature will be developed for each clinical module
Implemented within a social marketing framework
Input from reference groups
Opinion leader education
Target: Specialist prescribers at hospitals that cater for Veteran's population. eg. Repatriation General, SA Concord NSW, Austin &
Continuity of care
Target: hospitals that cater for the Veteran population. eg Repatriation General, SA Concord NSW, Austin & Repatriation
Aged-Care facility
Target: aged-care facilities that cater for Veteran's population eg War Veterans Home
Skilled Consumers
Veteran's program Targeted to conditions specific to Veterans and those identified in the Health Promotion Strategic Plan for the veteran
Integrated with existing QUM developments eg. NPS activity, Guild Government Agreements

Core Program

- Clinical Modules (3 to 4 Per Year; 10 across 3 years)
  -Mail-out to LMOs
  -Mail-out to Veterans
  -Individual Veteran and LMO feedback
  Plus
  -**Practice visits**
  -Opinion Leader seminars

- Evaluation
  - Process, impact and outcome measures
  - Pharmaco-epidemiology studies

- Health Economic evaluation

Innovations

- Continuity of care
- Residential Aged-Care Facilities
- Skilled consumers
- PhD Student Scholarships
- Information Technology

Overall extent of the problem

- Extrapolation from the drug-related hospital admission studies
  - over 140,000 hospital admissions annually

- To put into perspective (1999-2000):
  - Influenza and Pneumonia 62,586
  - Asthma 60,759
  - Heart Failure 41,708

AIHW Australian Hospital Statistics 1999-00

ADEs in the Community

- Poorly studied; No overall incidence figures
- Four data sources
  - Medication Management trials
  - Incident monitoring in general practice
  - BEACH survey
  - Pharmaceutical Defence Records

ADEs in the Community

- Sample of 1000 persons considered at risk of medication misadventure
- On average, 2.8 problems per person
  - Use of wrong or inappropriate medicine: 27%
  - Need for additional medication: 25%
  - Use of too little medicine: 21%
  - Adverse Drug Reaction: 19%
  - Need for more information: 18%

ADEs in the Community

- Incident monitoring figures from general practice
- Analysis of 2582 reports revealed adverse medication events accounted for 51% of incidents reported.
  - Inappropriate drug: 30 of every 100 incidents
  - Prescribing error: 22 of every 100 incidents
  - Administration error: 18 of every 100 incidents

In the community setting

Just for ADRs (as a sub-set of medication-related problems)

- **Main drug groups involved**
  - **Cardiac medications (39% of ADRs)**
  - **CNS medications (27%)**
  - **Musculoskeletal (12%)**

- **At the level of drug class**
  - **ACE inhibitors accounted for 14% of all ADRs**
  - **antidepressants 11%**
  - **NSAIDs 10%**

Strategies for reducing adverse drug events

- Discharge liaison services & Case conferencing
  - both shown to improve medication use in controlled trials
- Medication Management Services
  - uncontrolled trials show a reduction in medication related problems

Help from the APAC committee?

- Link Veterans' MATES into QUM networks
  - Opportunity to consider veterans NMP issues as a priority
  - Champions for MATES
- Consider MATES program information for presentations at conferences, workshops or for publications
- Consider possible evaluation or project work

Questions

Veterans' Medicines Advice and Therapeutic Education Services Project

Medicines Information: What veterans say they need and what is provided by doctors and pharmacist

The Survey

- Postal survey conducted and analysed by Harrison Research
- Sample was 10,000 veterans who had received 2 or more Veterans' MATES mailings, at least one in the last year
- Average age 82 years, 62% male
- 4,126 responses (41%)

Questions on medicines information

- information needed
- information provision by doctor, pharmacist
- amount of information provided in relation to needs

When you are prescribed a medicine by a doctor for the first time, that is, a medicine you have not used before, what information do you like to know about that medicine?

1. Name of the medicine
2. What the medicine is for
3. When and how to use the medicine
4. What should happen after I have been taking the medicines e.g. reduction of blood pressure, less pain, out of breath less often
5. What side effects could occur
6. Action to take if side effects occur
7. How long to keep taking the medicine
8. What to do if I forget or miss a dose of the medicines
9. Interactions with other medicines
10. How to store the medicine
11. Other information (please specify) ……
12. Not sure
13. Nothing in particular

Thinking of the last new medicine you were prescribed, what information, if any, did the DOCTOR (general practitioner or specialist) tell you when it was prescribed?

YOU MAY CIRCLE MORE THAN ONE NUMBER

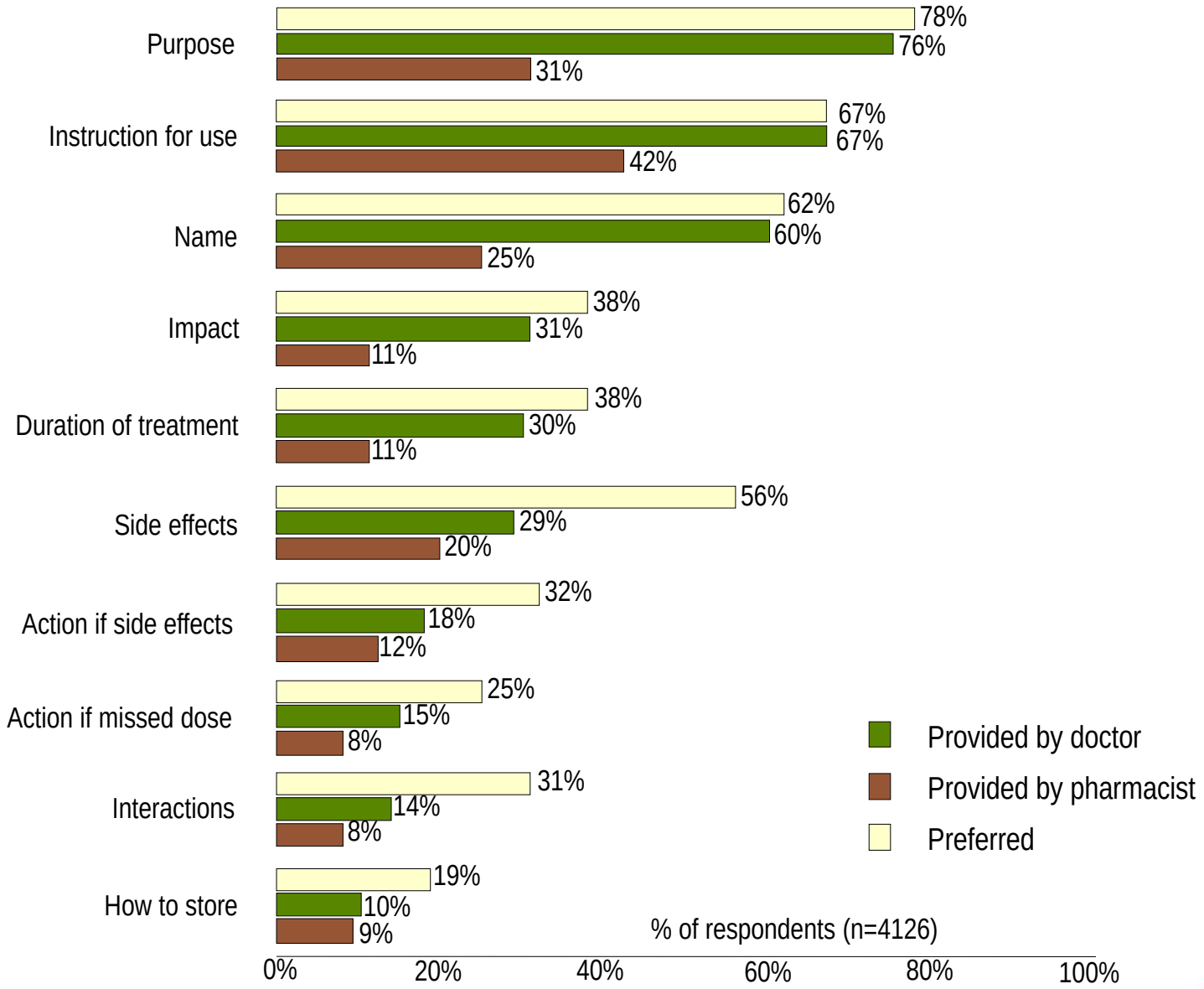
1. Name of the medicine
2. What the medicine is for
3. When and how to use the medicine
4. What should happen after I have been taking the medicines e.g. reduction of blood pressure, less pain, out of breath less often
5. What side effects could occur
6. Action to take if side effects occur
7. How long to keep taking the medicine
8. What to do if I forget or miss a dose of the medicines
9. Ways to assist managing the condition other than with medicines
10. Interactions with other medicines
11. How to store the medicine
12. Other (please specify) ……
13. Nothing that I recall

Thinking of the last new prescription medicine you received, would you have liked more or less information than you received about the following topics:

PLEASE CIRCLE ONE RESPONSE ON EACH ROW

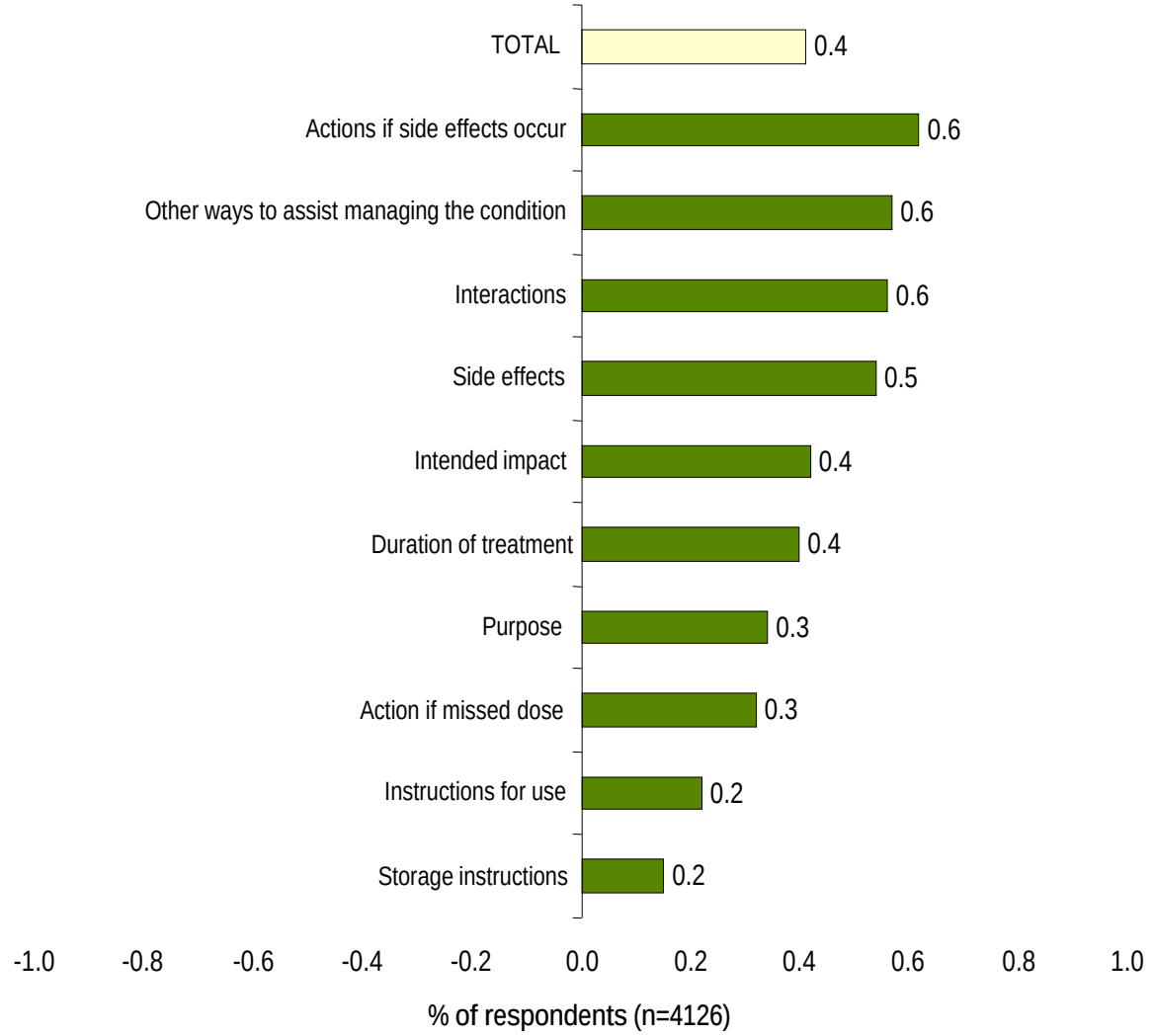
	A lot less	A little less	A little more	A lot more	Neither more nor less	Don't know
1. What the medicine is for	1	2	3	4	5	6
2. When and how to use the medicine	1	2	3	4	5	6
3. What should happen after I have been taking the medicine e.g. reduction of blood pressure, less pain, out of breath less often	1	2	3	4	5	6
4. What side effects could occur	1	2	3	4	5	6
5. Actions to take if side effects occur	1	2	3	4	5	6
6. How long to keep taking the medicine	1	2	3	4	5	6
7. What to do if I forget or miss a dose of the medicine	1	2	3	4	5	6
8. Ways to assist managing the condition other than with medicines	1	2	3	4	5	6
9. Interactions with other medicines	1	2	3	4	5	6
10. How to store the medicine	1	2	3	4	5	6

MEDICINAL INFORMATION - INFO PREFERRED VS. INFO PROVIDED



INFORMATION PROVISION - RELATIVE TO IDEAL

Base: Total sample



Summary of the findings

- information provided by doctors fairly consistent with those needed by veterans
- pharmacists provided similar information as doctors but significantly less often
- veterans wanted, but often did not receive, information on
  - side effects
  - what to do about side effects
  - drug interactions
- veterans wanted more information than they were getting on all topics
- health professionals more inclined to provide information that does not require ‘decision making’ by veterans

Veterans' MATES: addressing the information gaps

- *Therapeutic Brief*

  What to discuss with your patient

- *Veteran Brochure*

  Ask your doctor about possible side effects and what to do if they can occur

  Know what to do if you miss a dose

  Tell your doctor immediately if you notice any of the following

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.

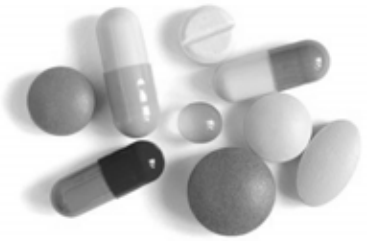
The Veterans' MATES approach

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.

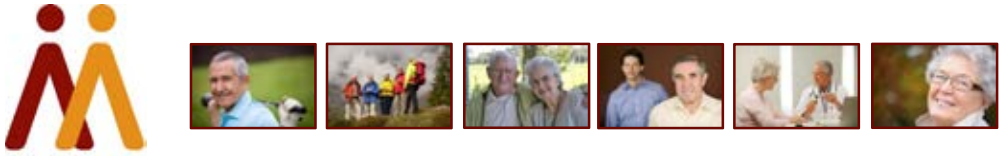
Evidence is tailored to the practice change gap and process includes significant stakeholder engagement

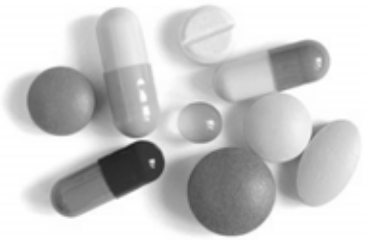
- Program is underpinned by behavioural theory
- Practitioner reference group and Veteran reference group meet twice yearly to provide advice
- Materials written by a medical writer supported by clinical reference group
- Peer-reviewed prior to publication
- Endorsed by a national, representative editorial committee
- National call centre available for follow-up with health practitioners and veterans



Health claims data are central to the program

- Australian Government Department of Veterans' Affairs health claims data
- Data over ten years – pharmacy, medical and allied health records (no diagnosis, includes GP visits, radiology, pathology etc)
- Hospital records (diagnosis and procedures)
- Client data-updated weekly, health claims data up-dated monthly





Using the health claims data

Planning stage

- Medication-related problem analysis to identify the evidence practice gap
- Module topic selected

Development & Implementation stages

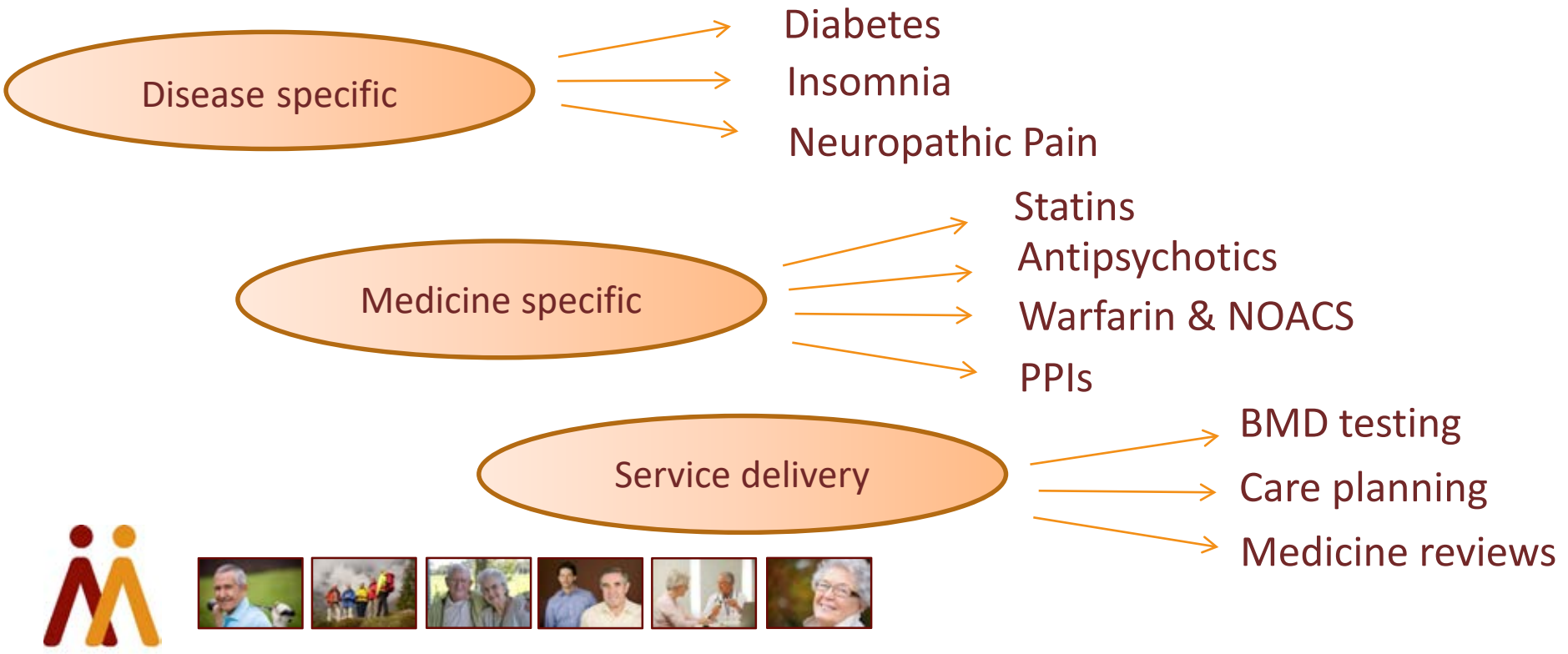
- Patient specific feedback & evidence based information developed
- Topic implementation

Evaluation stage

- Evaluation

The Veterans' MATES approach

- To date 40 topics delivered:



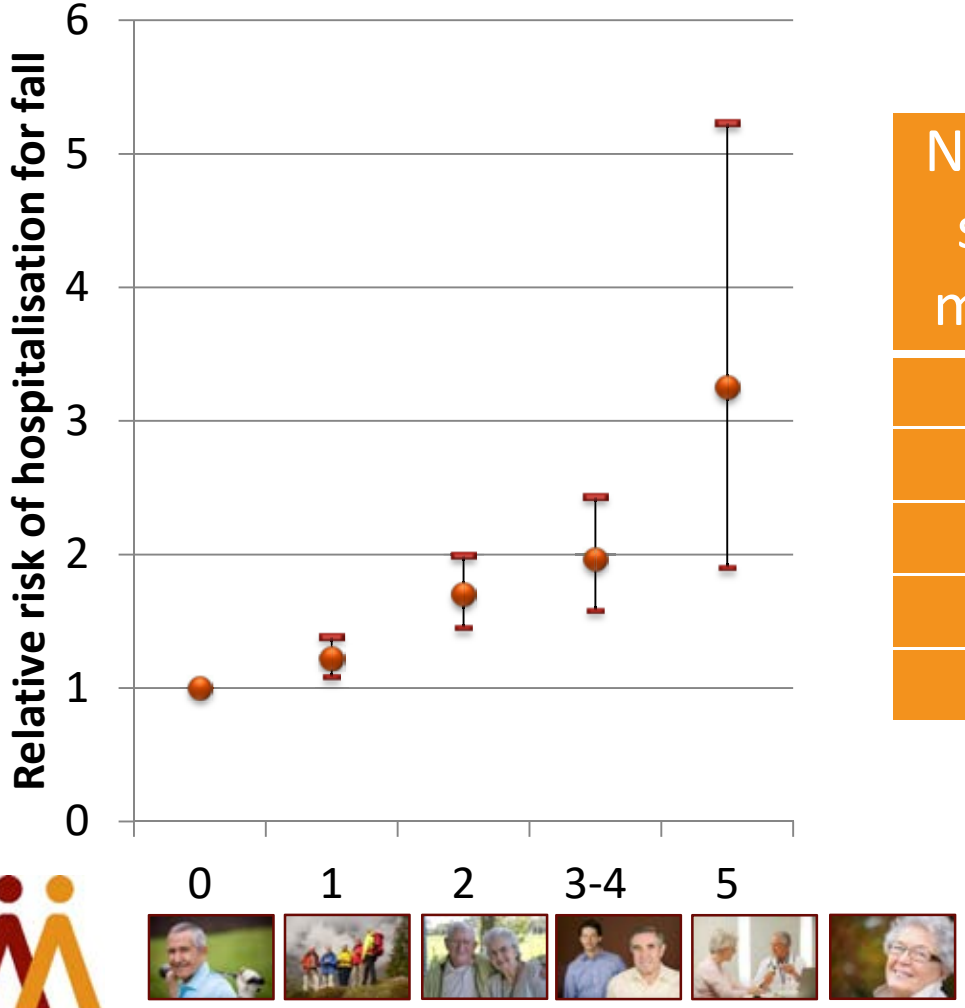
The planning stage

Identifying the problem: falls and fracture

- We assessed patients admitted to hospital for hip fracture
  - 15% of women and 18% of men had had prior fracture and were not on medicines for osteoporosis
  - 84% on at least one medicine that increases risk of fall
  - 50% on two or more
    - 1 in three were dispensed an antidepressant
    - 1 in four a benzodiazepine
    - 1 in ten an antipsychotic
    - 1 in 15 on corticosteroids and no medicines for osteoporosis

Kalisch et al., 2012
Leach et al., JPPR; 2013

Quantifying 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)

Pratt et al., Drug Saf. 2014

Implementing the interventions

Reducing the risk of falls & hip fractures

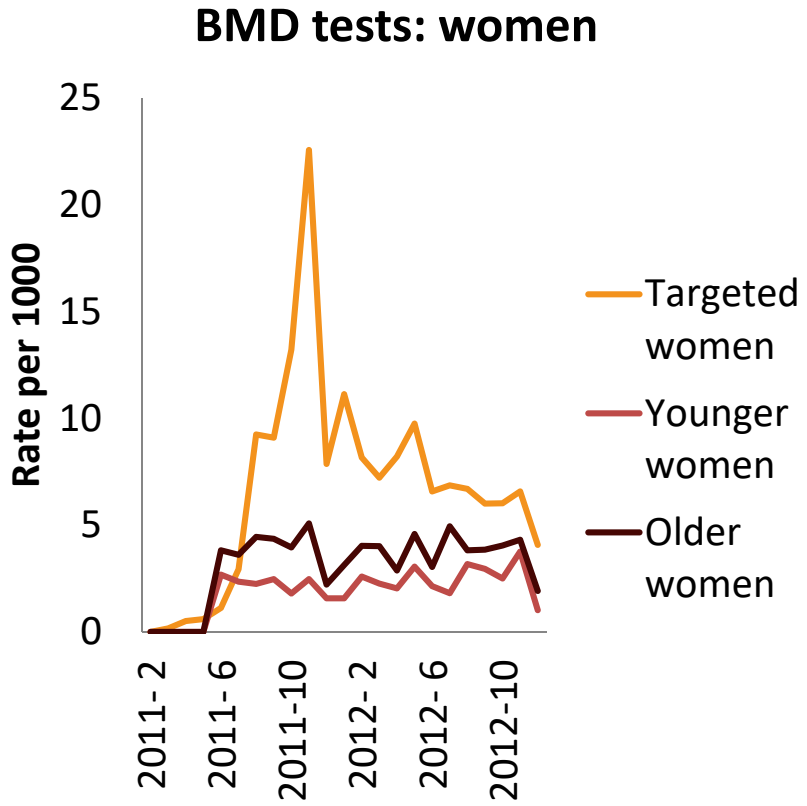
- Our medication-related problem analyses had highlighted a number of issues
  - Potential under-treatment of osteoporosis
  - Potential overuse of sedative medicines and antipsychotics
- Our fracture and falls prevention topics were implemented to assist appropriate medicine use and reduce risk of falls or fracture

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



Roughead et al., BMC health services research 2013

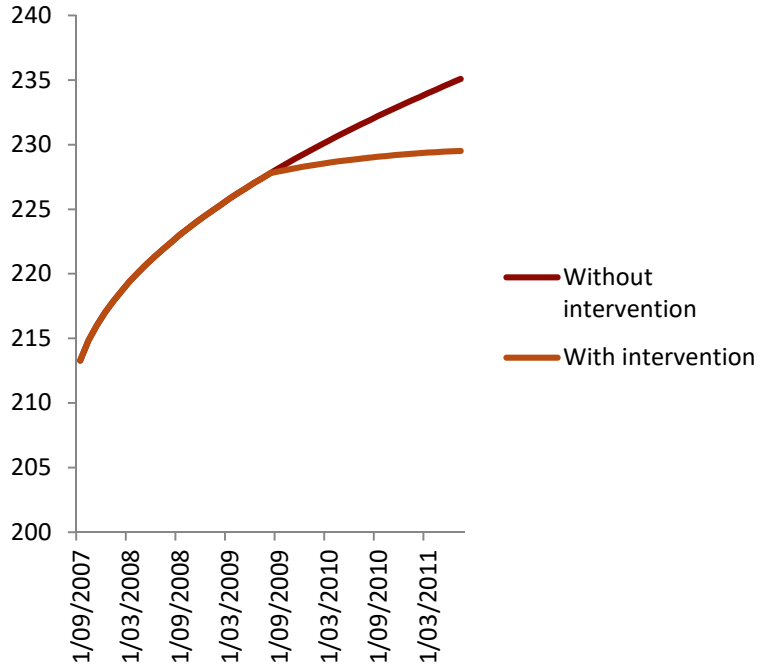
Veterans' MATES highlights

Reducing the use of multiple sedative medicine use

So what happened?

No change at time of intervention

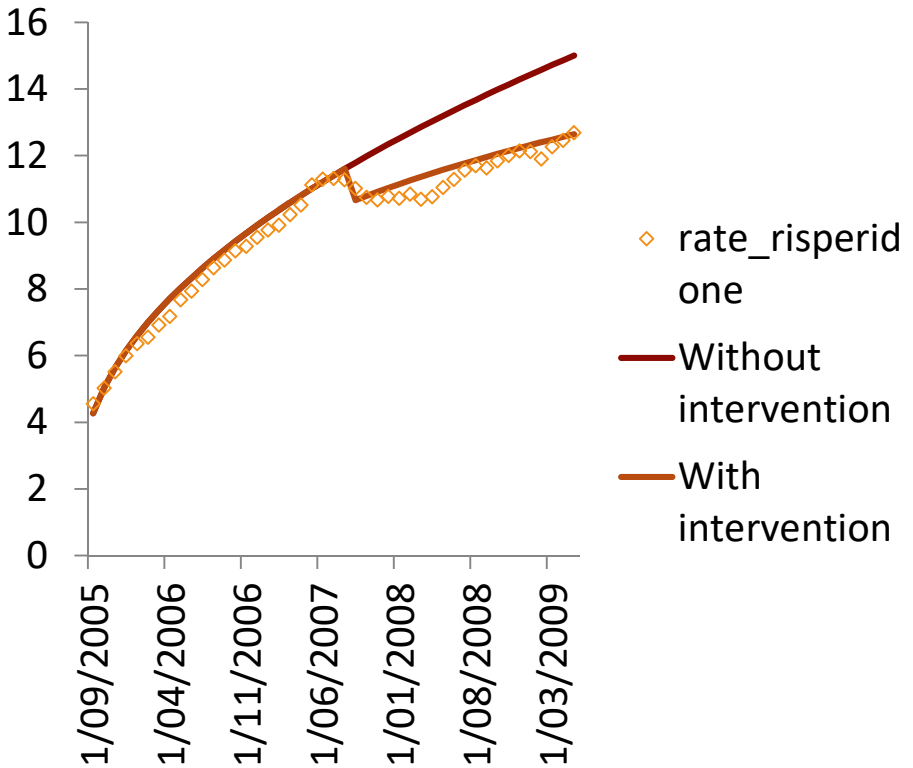
✓ 3% monthly decrease compared with trend prior to intervention



Reducing the use of antipsychotics

So what happened?

- ✓ 14.5% decrease at time of intervention
- ✓ Further 3% monthly decrease compared with trend prior to intervention

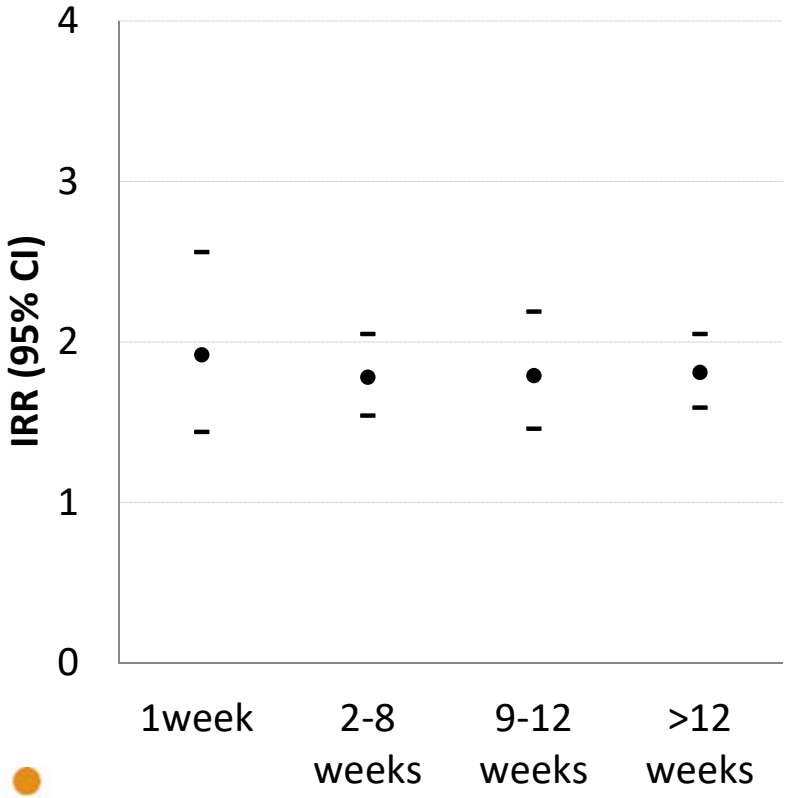


Roughead et al., BMC health services research 2013

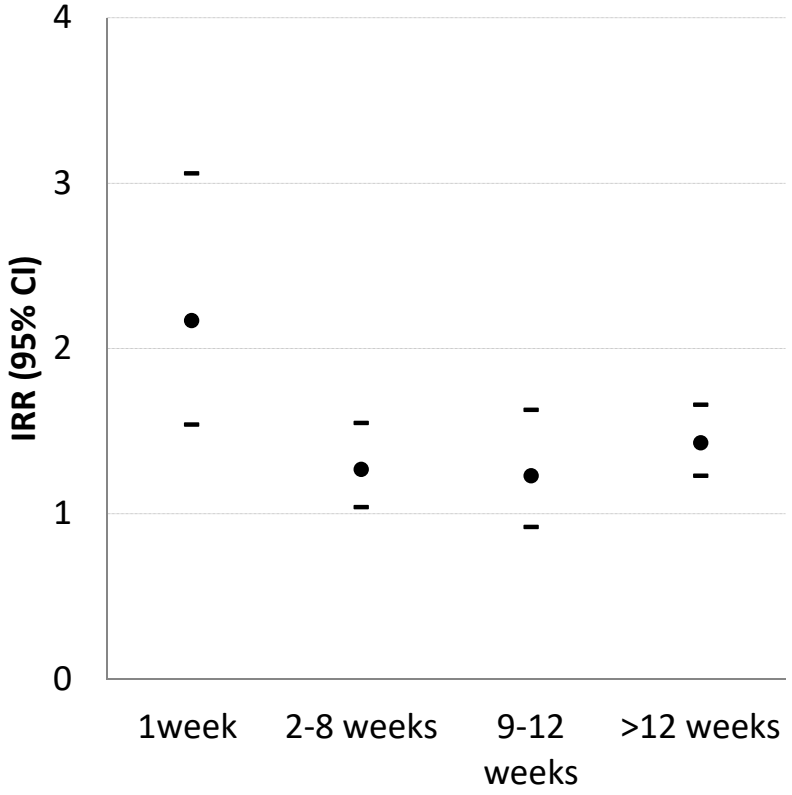
Evaluating the results

Quantifying the harm avoided

Risk of pneumonia



Risk of hip fracture



Pratt et al., Drug Saf. 2011

Quantifying the harm avoided

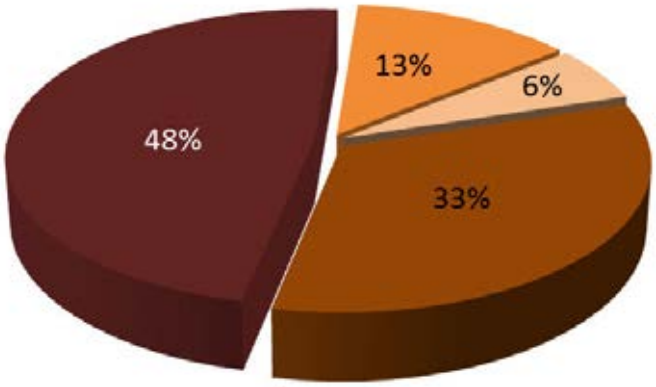
The risk-benefit ratio for antipsychotics suggests that there will be

- 1 excess hospitalization for hip fracture for every 4 to 12 patients helped with behavioural symptoms of dementia , and
- 1 excess hospitalization 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

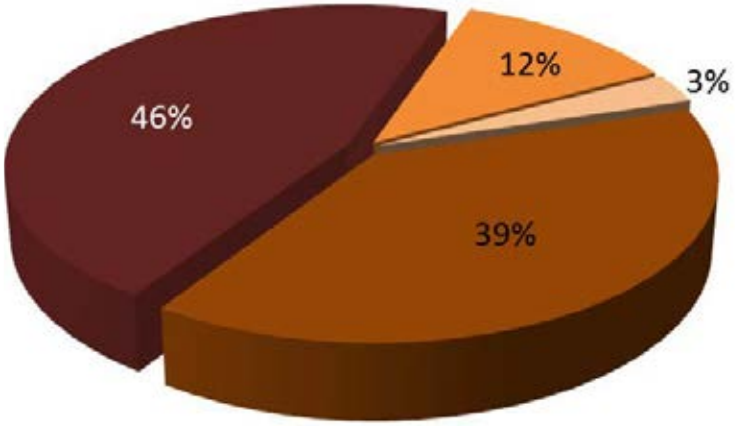
Pratt et al., Drug Saf. 2011

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

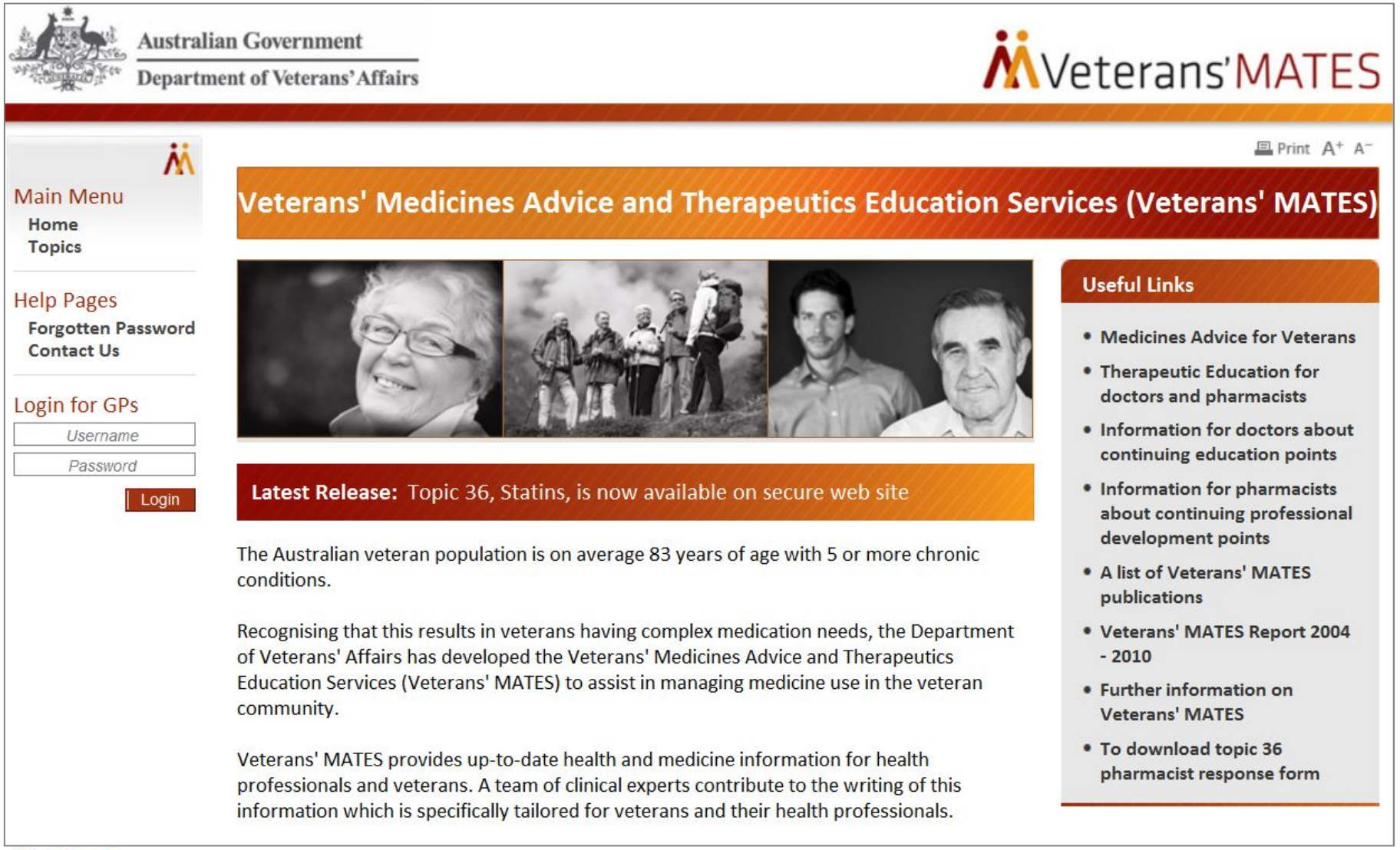
Factors contributing to success

- 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

Factors contributing to success

- Significant stakeholder engagement
- Only target identified problems
- Interventions are grounded in behavioural theory; target one behaviour at a time
- Repeated interventions over-time
- Independently audited data and security standards

www.veteransmates.net.au



Australian Government
Department of Veterans' Affairs

Veterans' MATES

Libby s 47F
University of South Australia
on behalf of the Veterans' MATES team

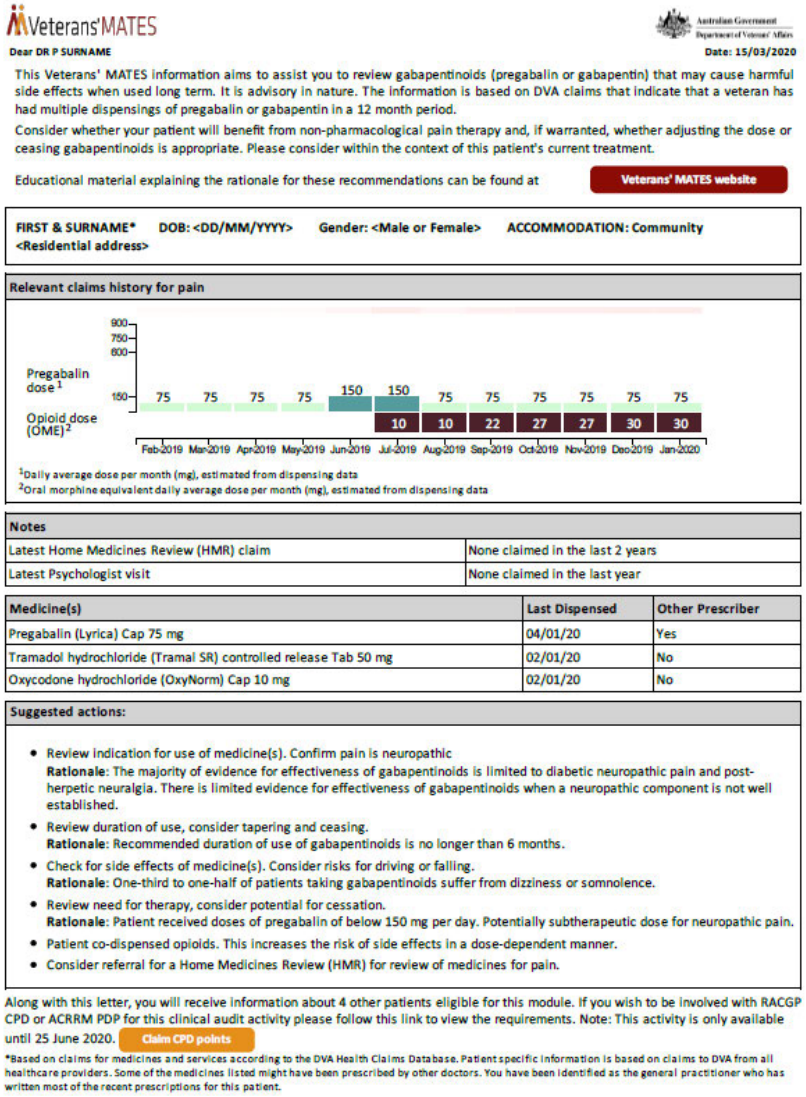
Veterans' MATES

- It is a Australian Government Department of Veterans' Affairs data driven, tailored and targeted health promotion program providing up-to-date health and medicines information specifically tailored for members of the veteran community and their healthcare team, with the specific goal of improving health outcomes for the veteran community
- Began in 2004
- Collaboration between UniSA,
  - Discipline of General Practice, Adelaide University
  - Discipline of Public Health, Adelaide University
  - Drug and Therapeutics Information Service
  - NPS MedicineWise
  - Australian Medicines Handbook
  - Health Link

The approach

Every three months a chosen health topic is distributed:

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



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.

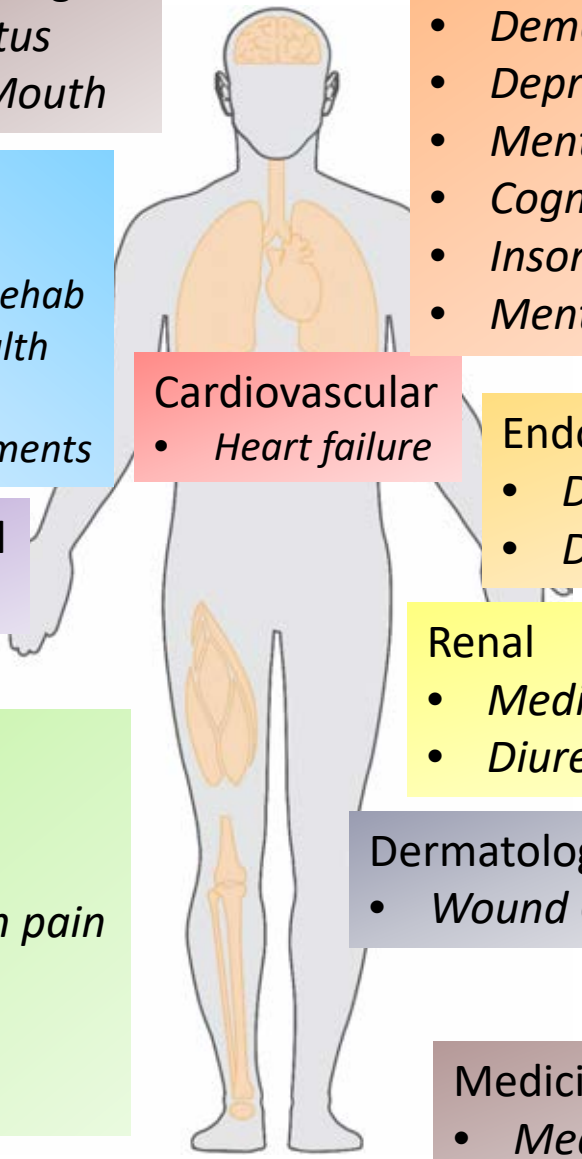
Our Topics

28 topics since 2016

Sensory Organs
- *Tinnitus*
- *Dry Mouth*

Mental Health
- *Dementia*
- *Depression*
- *Mental Wellbeing & COVID*
- *Cognitive impairment*
- *Insomnia*
- *Mental Well Being*

Respiratory
- *COPD*
- *Pulmonary Rehab*
- *COVID & health care*
- *COVID treatments*



Cardiovascular
- *Heart failure*

Endocrine
- *Diabetes tests*
- *Diabetes medicines*

Gastrointestinal
- *GORD*

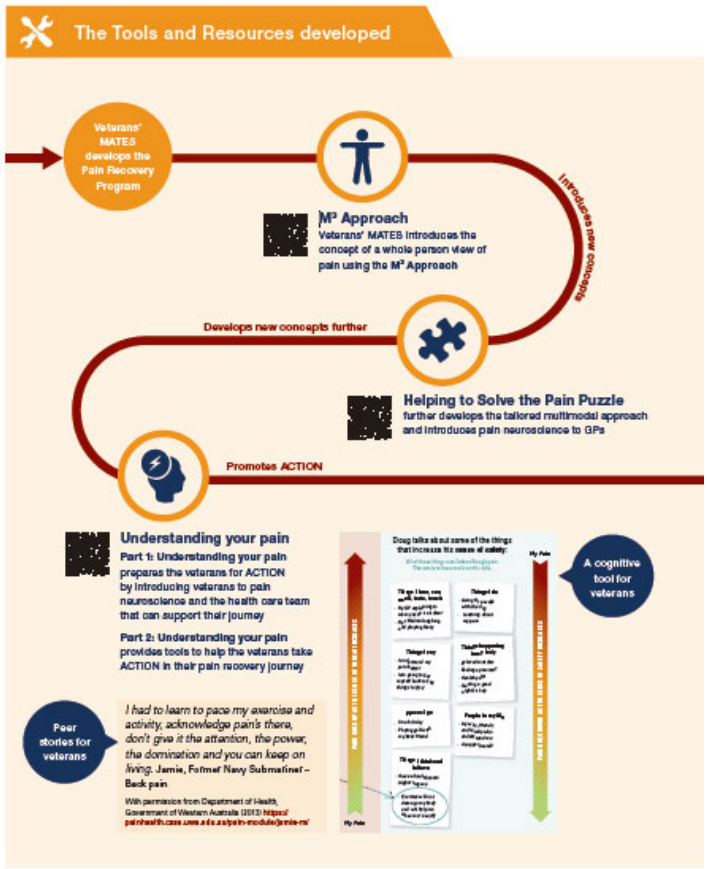
Renal
- *Medicines & your kidneys*
- *Diuretics*

Musculoskeletal
- *Osteoporosis*
- *Chronic pain*
- *Recovering from pain*
- *Falls*
- *Staying active*
- *Persistent pain*

Dermatology
- *Wound Care*

Medicines Services
- *Medicine Complexity*
- *Cumulative risk*

Our topics build on each other over time



1. Introducing the multidisciplinary approach M3: mind, movement medicines

2. Introducing pain neuroscience

3. Providing cognitive tools to implement pain neuroscience and focus on reducing analgesic use

Our reach

Since 2016,
We have sent 780,000 tailored, patient specific care messages to doctors
We have sent 780,000 educational brochures to DVA clients

202,000 unique DVA clients

3500 Psychologists

8700 Dentists

2300 Exercise Physiologists

Materials have reached

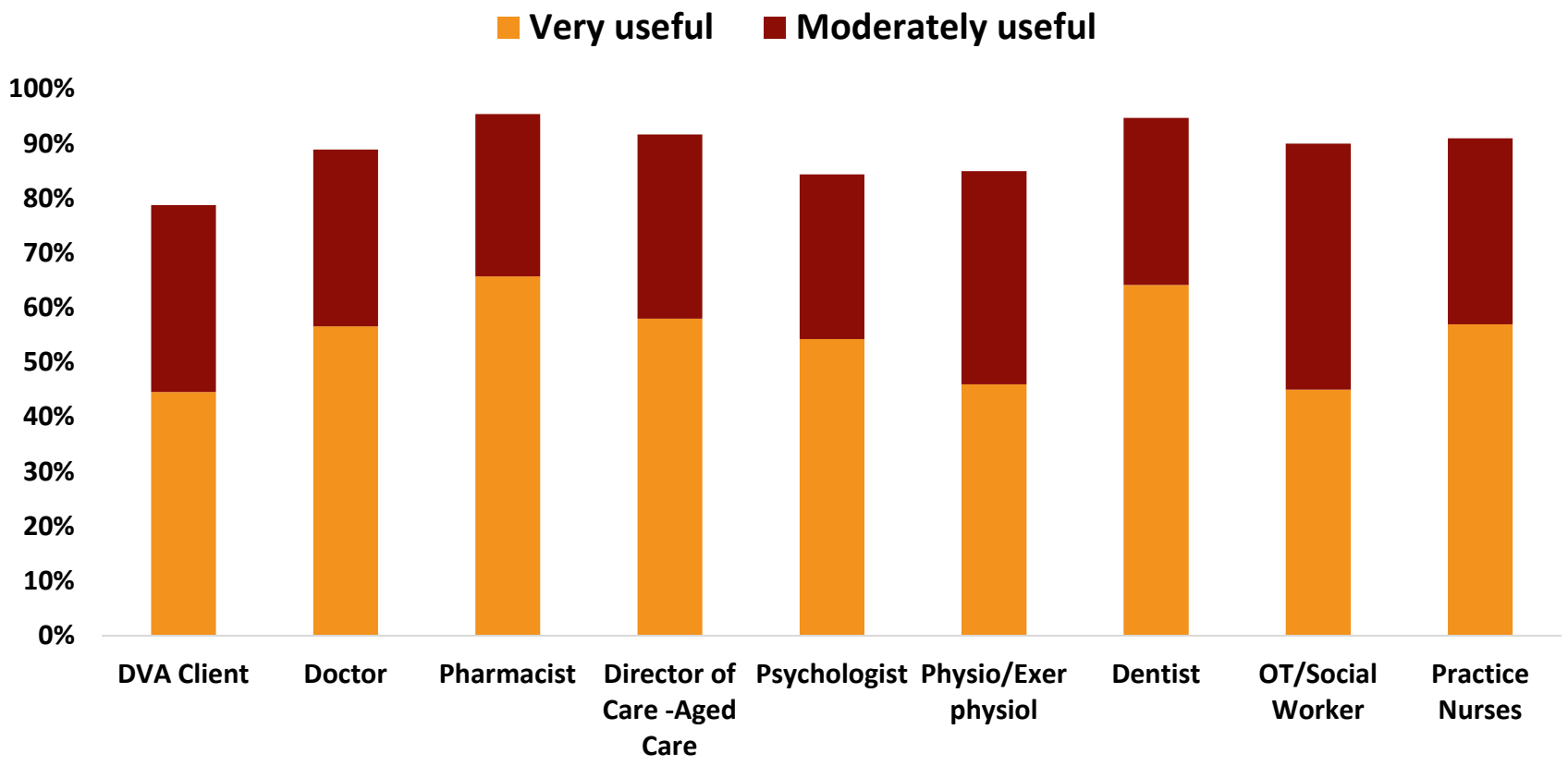
34,000 unique Doctors

9300 Pharmacists

9600 Physiotherapists

2700 Directors of Care of Aged-Care

Our satisfaction



33% of veterans targeted have responded at least once.

14% of doctors targeted have responded at least one

85% of doctors tell us that on average, at least one of the identified patients requires review

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

Our model

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

PLANNING PHASE

Using the data, we determine the prevalence of a medication or health related problem

IMPLEMENTATION PHASE

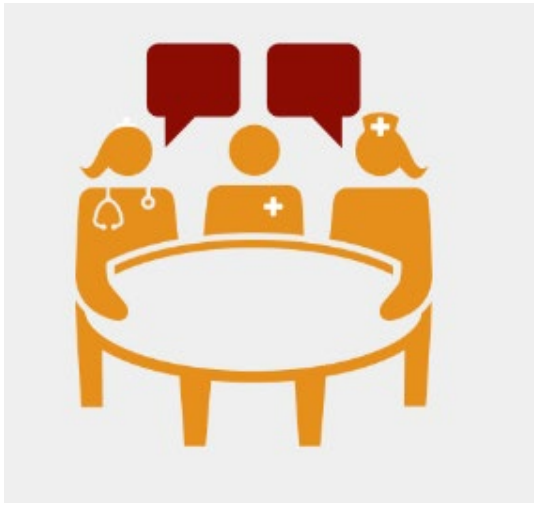
The data are used to develop the patient-based feedback provided to doctors

EVALUATION PHASE

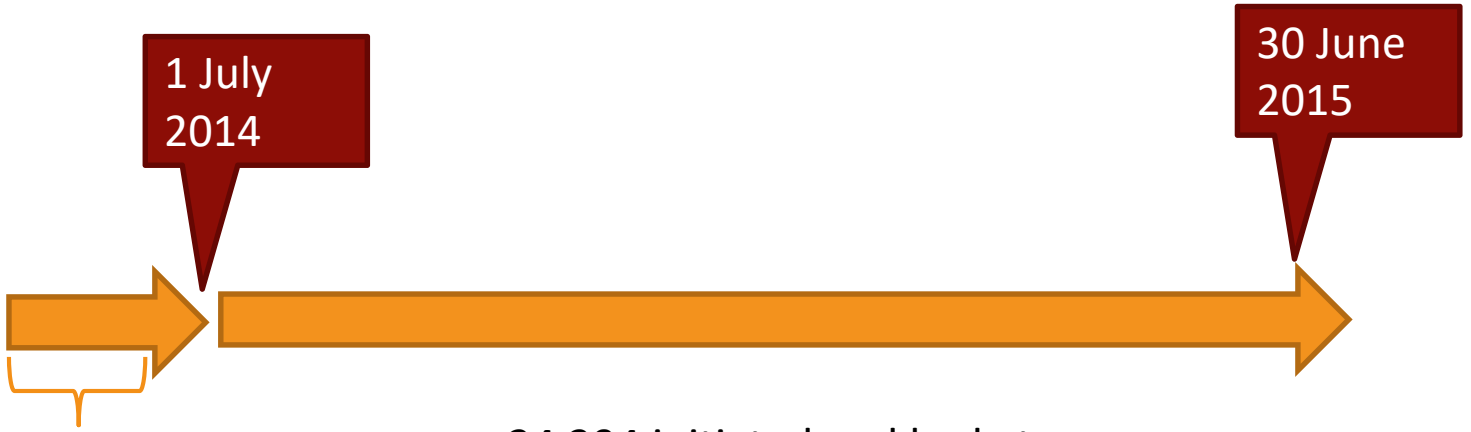
The data enable the impact and outcomes of the intervention to be measured

Veteran reference group

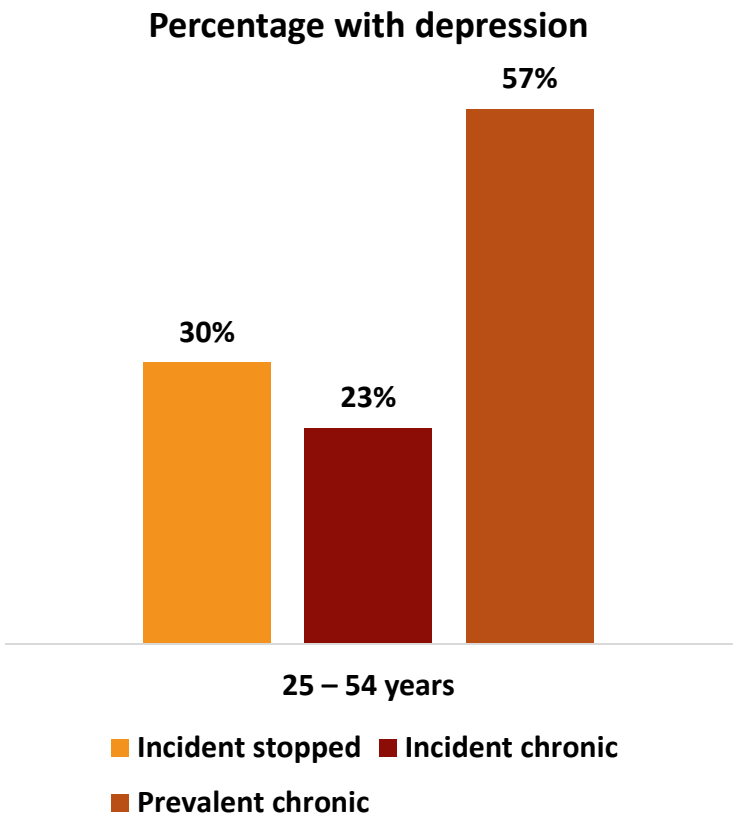
Practitioner reference group

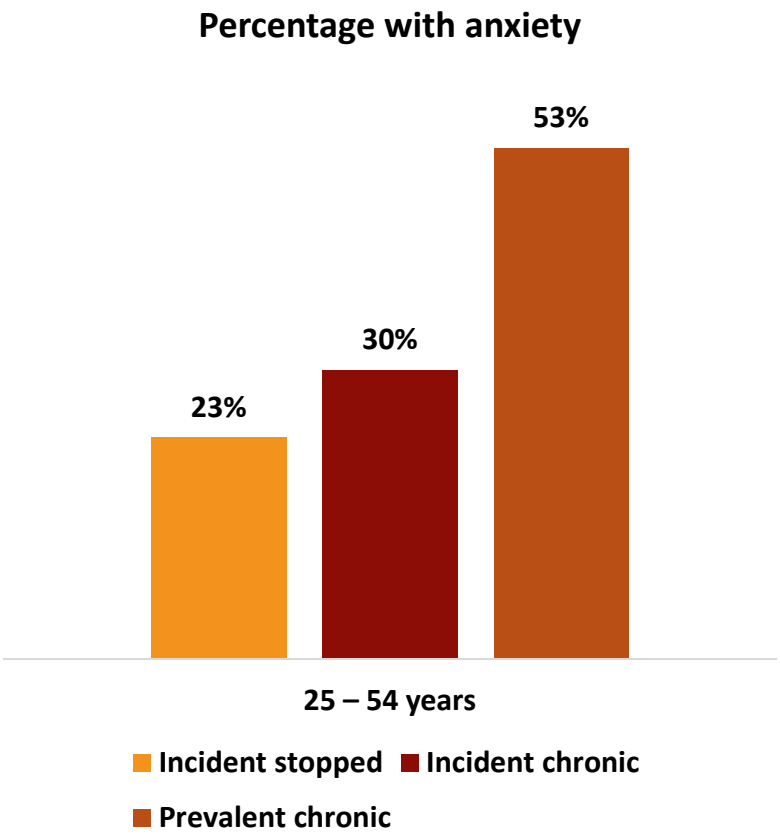


Prior to topic development we identify the problem: how many veterans are chronic opioid users?



Identifying the problem: opioid use and comorbidity development





Providing individually tailored recommendations and supportive evidence based educational material for health professionals

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.

Steps to tapering and ceasing opioid therapy[20, 25, 28, 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]

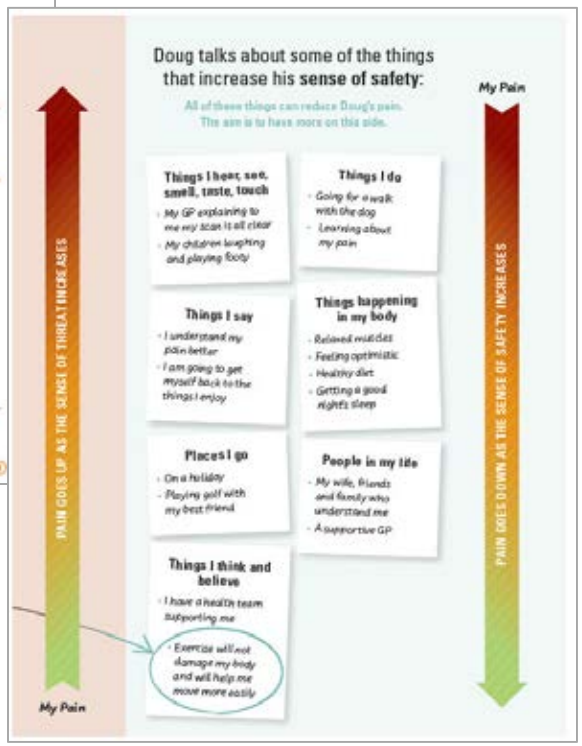
The PCS, a 13 item questionnaire that you can work thr can be completed in less than five minutes, and provid patient thinks about when they are in pain.[14]

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

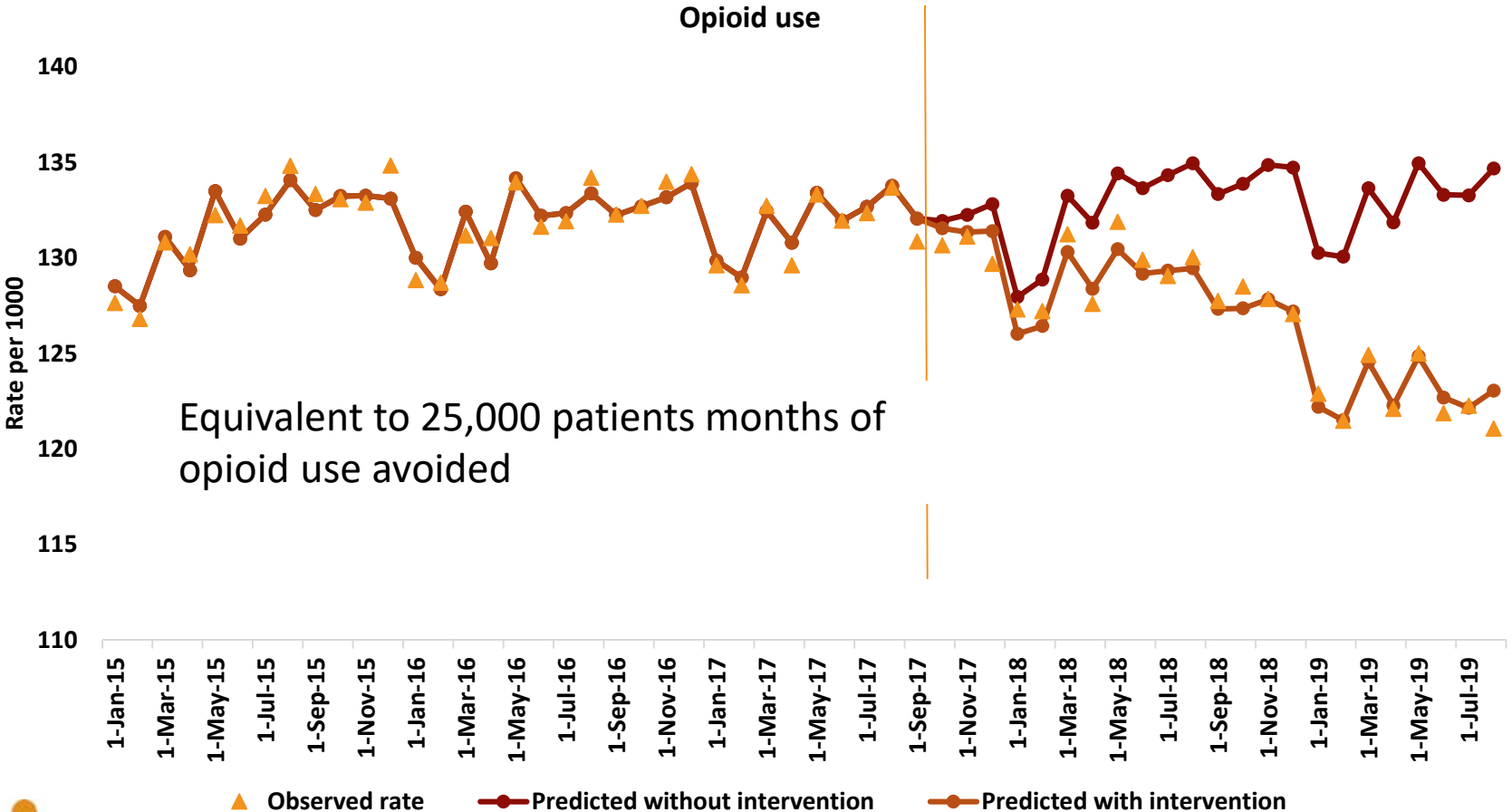
Research shows that catastrophic thinking associated w using multimodal interventions, including education, inst management strategies and physical activity.[14]

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

Providing supportive evidence based educational material for veterans



Following implementation we measure impact using segmented regression and trends over time



We measure changes in health outcomes: Opioids and SSRIs more than double the risk of hip fracture

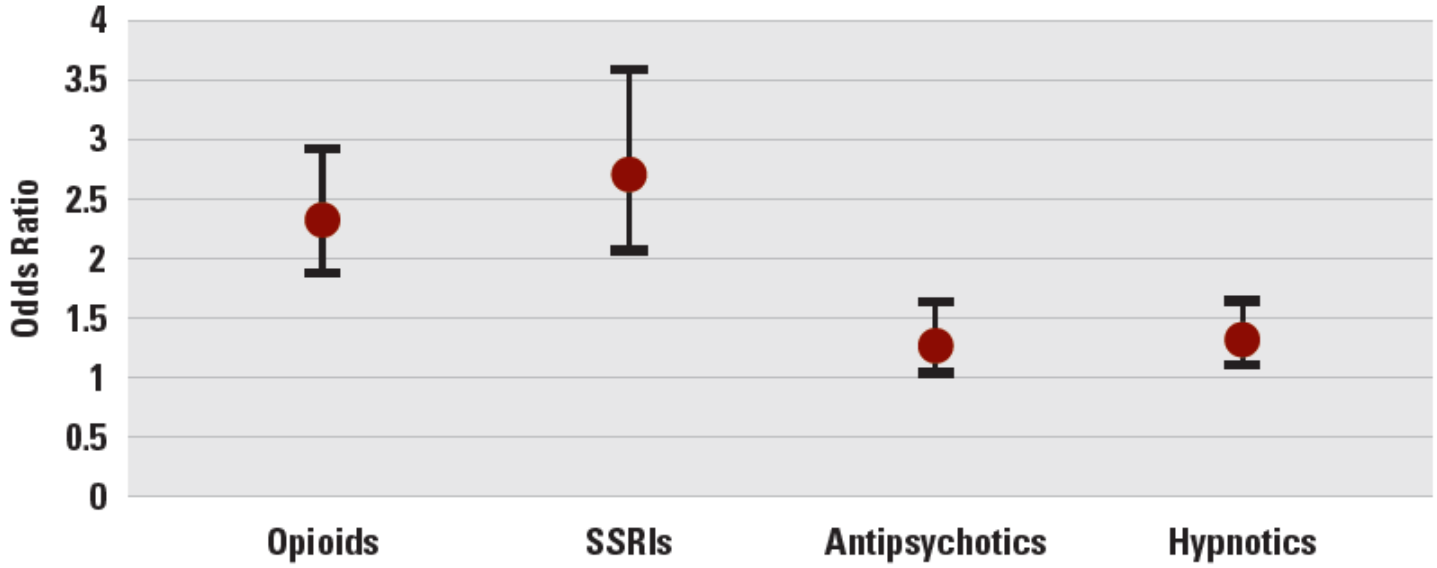
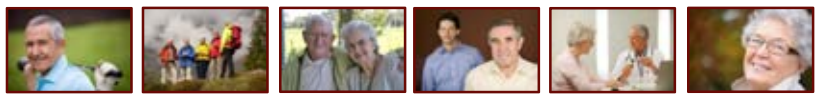


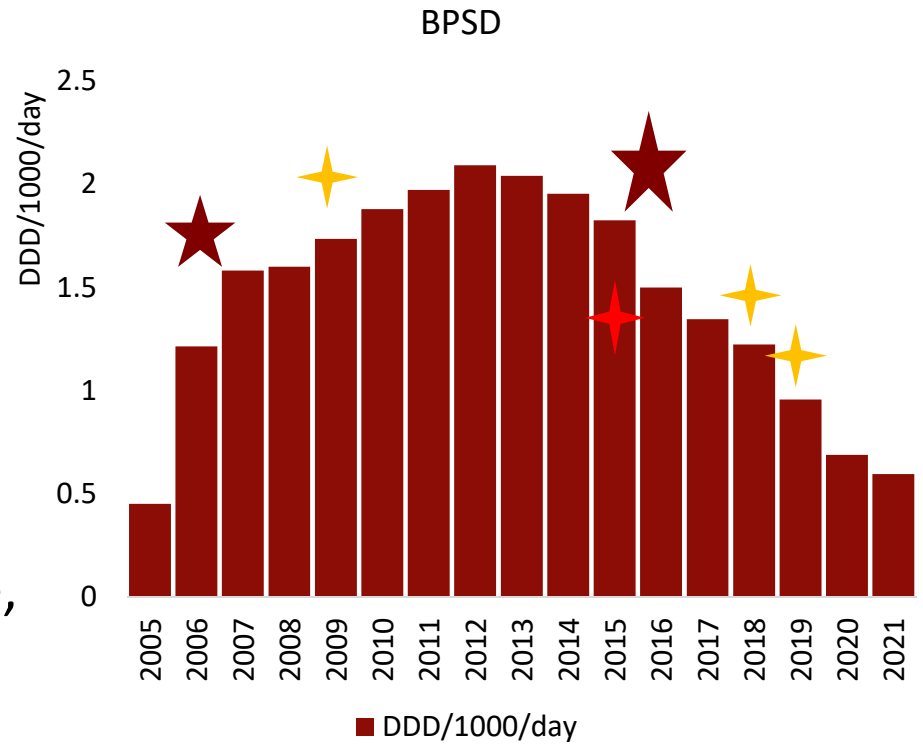
Figure 1: Initiation of commonly used medicines and increased risk of hip fracture[6]



Our impacts

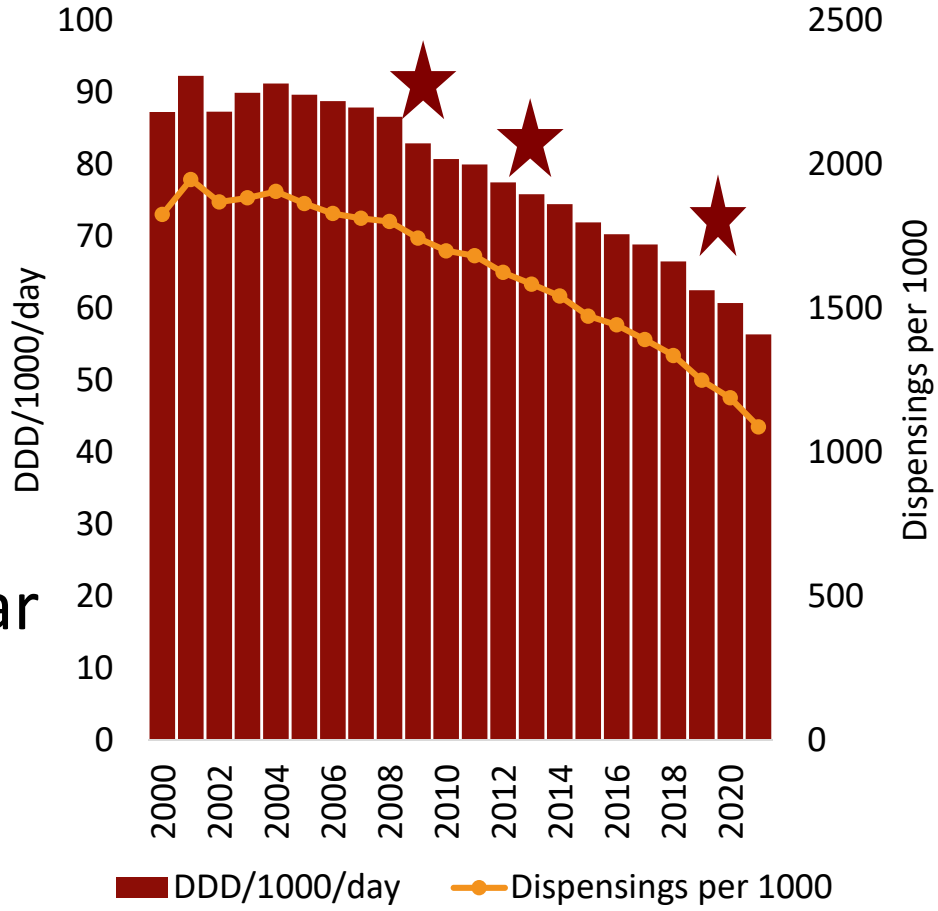
Use of risperidone for behavioural symptoms of dementia has declined

- Primary intervention:
  - 2007 – BPSD
  - 2016 –BPSD
- Supporting interventions:
  - 2009 - dementia
  - 2018 –dry mouth; falls
  - 2019 –cognitive impairment
  - 2015 TGA change to listing
- Overuse of these medicines associated with death, stroke, pneumonia and hip fracture



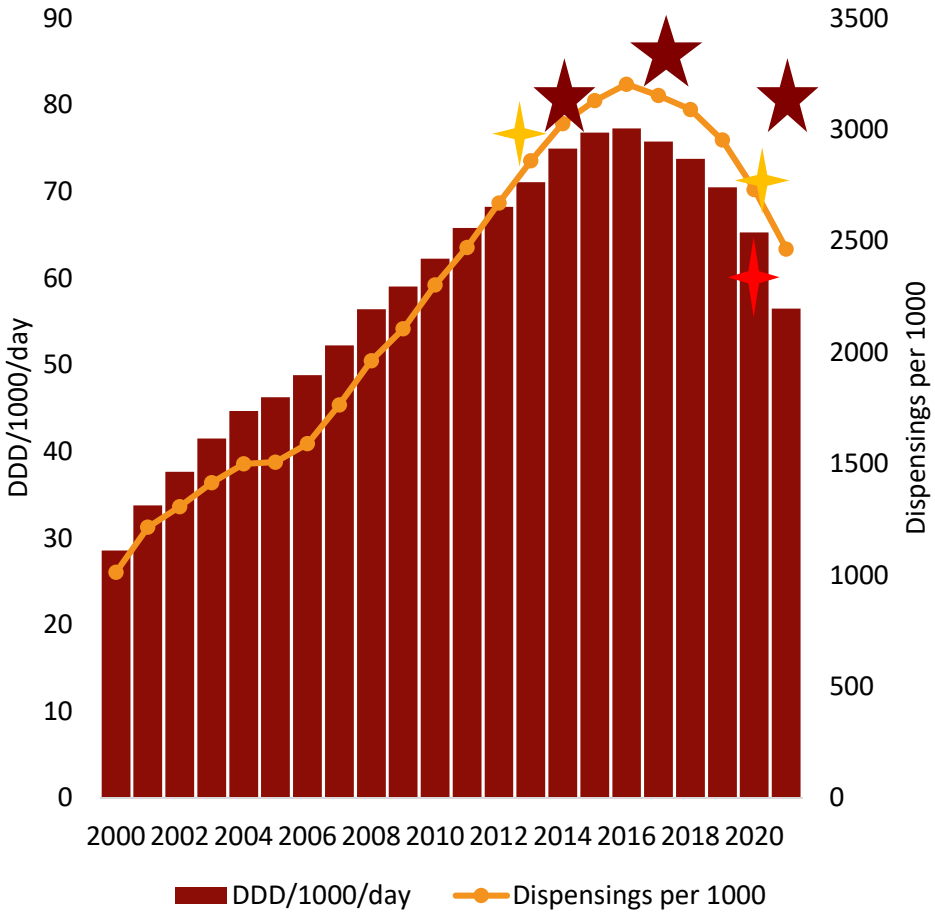
Declining use of medicines for insomnia

- Primary intervention:
  - 2019
  - 2012
  - 2009
- Over-use associated with falls, fractures, car accidents



Use of opioids for chronic pain has declined

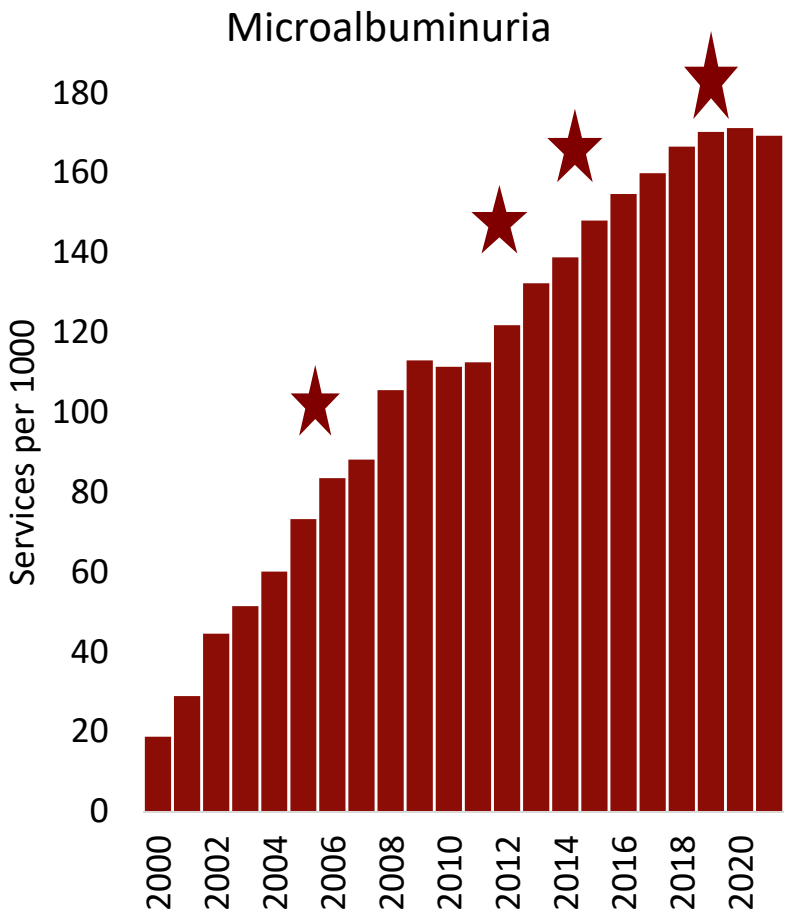
- Primary intervention:
  - 2022
  - 2017
  - 2014
- Supportive interventions
  - 2013 – Neuropathic pain
  - 2020 – Gabapentinoids
  - 2019 TGA pack size change



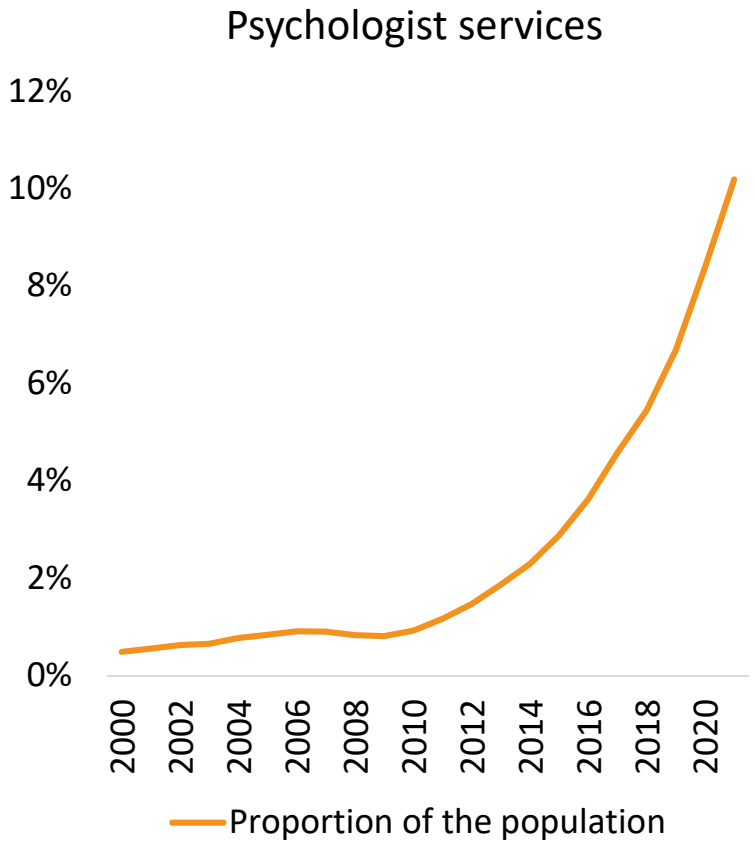
Our impact: Improving care

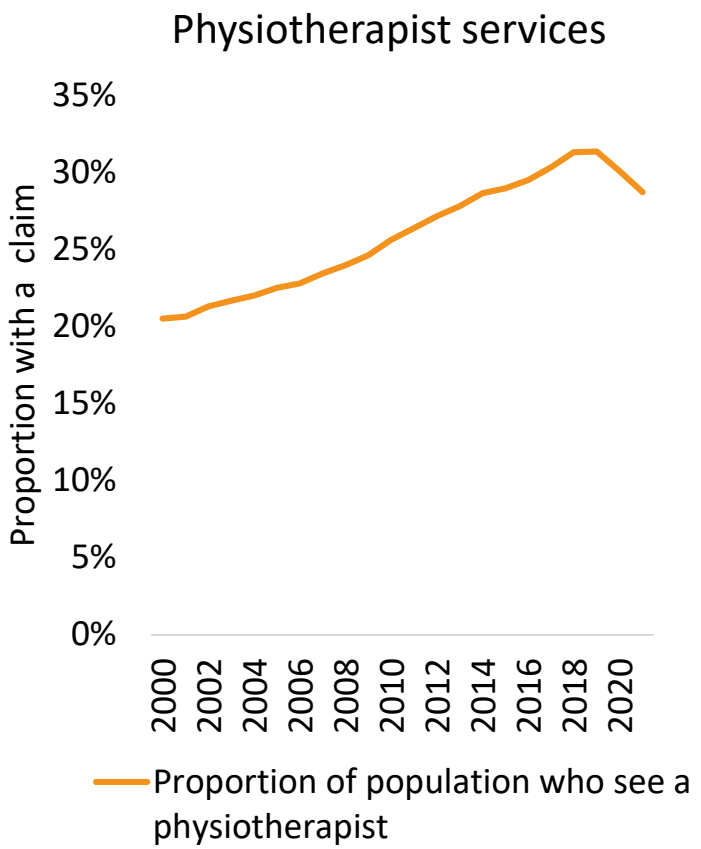
Improving management of diabetes

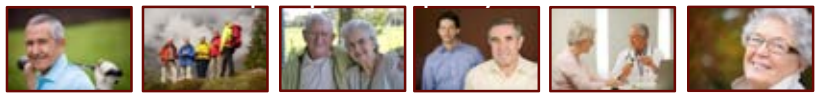
- Primary intervention
  2007
  2013
  2015
  2019



More people are seeing psychologists and physiotherapists

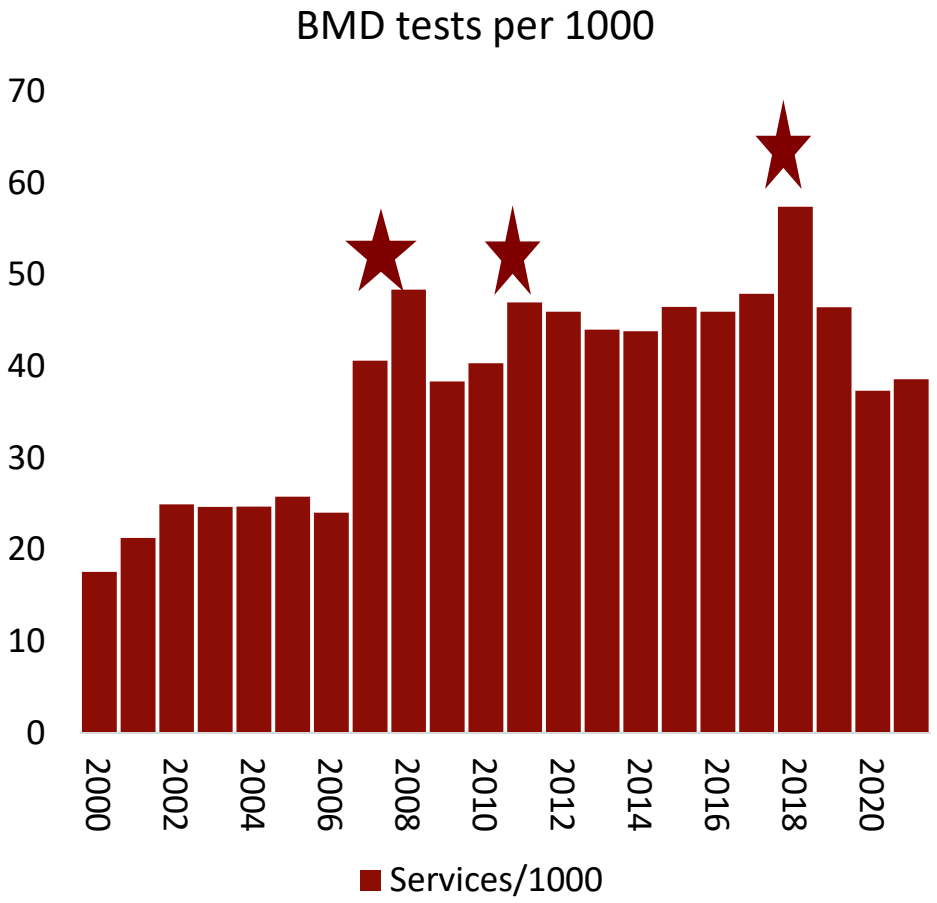






Preventing falls and fractures: osteoporosis

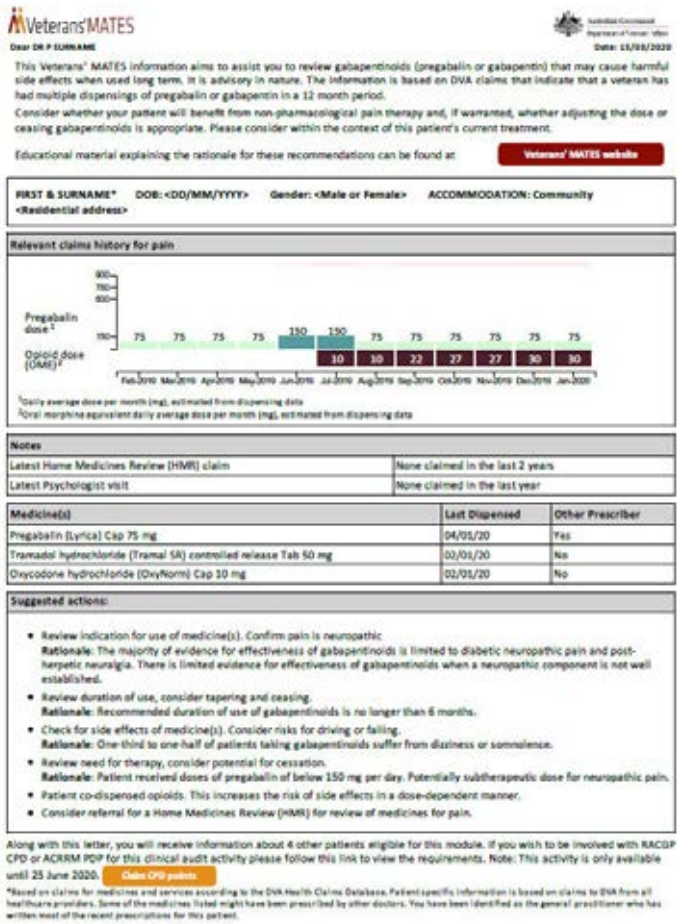
- Primary intervention: 2008, 2011, 2018 – osteoporosis



Innovations: e-delivery for doctors

- Secure e-delivery to the clinical desktop for doctors ~65% of GPs
- ~150,000 messages delivered by this means

	POSTAL	DIGITAL	
AVERAGE DDD CHANGE	-0.030	-0.023	p = 0.61
% OF INITIATION OF PSYCHOLOGIST VISITS	2.0%	3.8%	p = 0.02*
HAZARD RATIO FOR GP VISIT WITHIN 90 DAYS (CI)	0.92 (0.85 – 0.99)		p=0.04*



Veterans' MATES

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

Pregabalin dose[1]

Opioid dose (OME)[2]

75 75 75 75 150 150 75 75 75 75 75 75

10 10 22 27 27 30 30

Feb 2019 Mar 2019 Apr 2019 May 2019 Jun 2019 Jul 2019 Aug 2019 Sep 2019 Oct 2019 Nov 2019 Dec 2019 Jan 2020

[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.

Enabled capacity for rapid responses: COVID

April 2020

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 afterhours 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

July 2020

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 99 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.

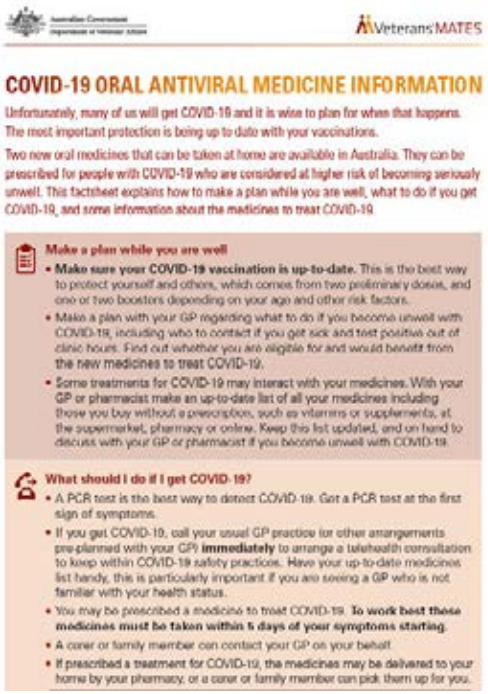
Most people take fast, shallow breaths when they are feeling worried or anxious. A good way to help calm distressing emotions is to practise controlled breathing where you take slow, deep breaths. This can help calm your mind and body, so you feel in control and are able to think more clearly.

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

June 2022



Veterans MATES

COVID-19 ORAL ANTIVIRAL MEDICINE INFORMATION

Unfortunately, many of us will get COVID-19 and it is wise to plan for when that happens. The most important protection is being up to date with your vaccinations.

Two new oral medicines that can be taken at home are available in Australia. They can be prescribed for people with COVID-19 who are considered at higher risk of becoming seriously unwell. This factsheet explains how to make a plan while you are well, what to do if you get COVID-19, and some information about the medicines to treat COVID-19.

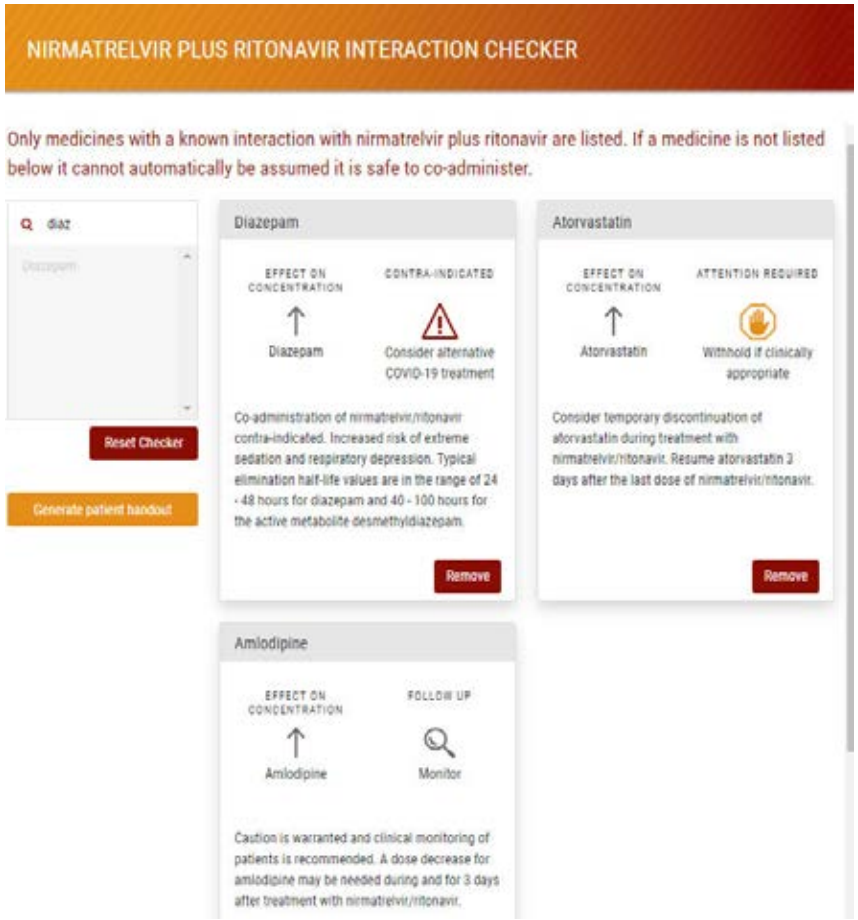
Make a plan while you are well

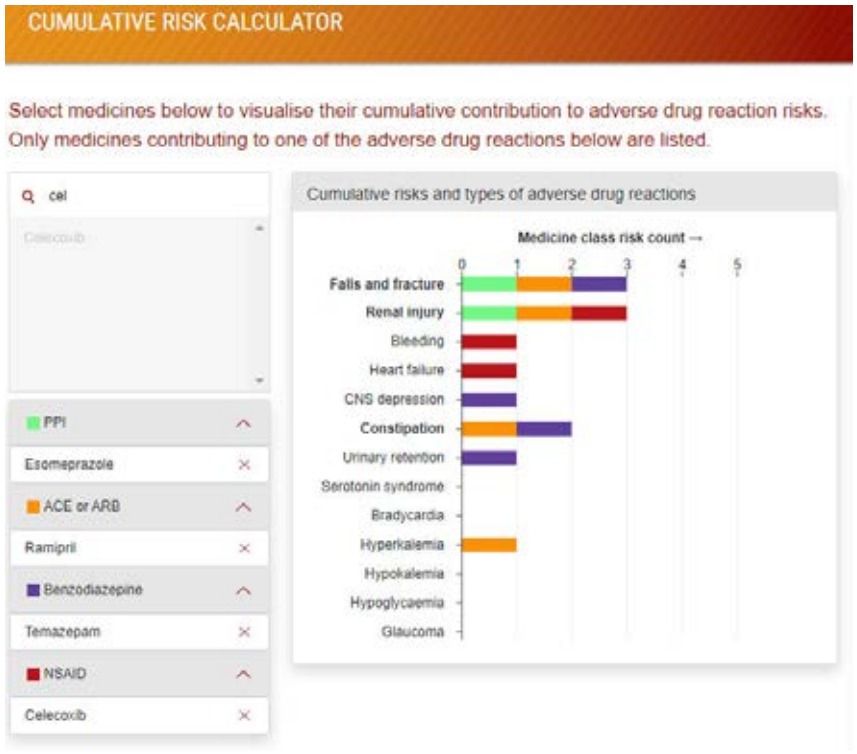
- **Make sure your COVID-19 vaccination is up-to-date.** This is the best way to protect yourself and others, which comes from two preliminary doses, and one or two boosters depending on your age and other risk factors.
- Make a plan with your GP regarding what to do if you become unwell with COVID-19, including who to contact if you get sick and test positive out of clinic hours. Find out whether you are eligible for and would benefit from the new medicines to treat COVID-19.
- Some treatments for COVID-19 may interact with your medicines. With your GP or pharmacist make an up-to-date list of all your medicines including those you buy without a prescription, such as vitamins or supplements, at the supermarket, pharmacy or online. Keep this list updated, and on hand to discuss with your GP or pharmacist if you become unwell with COVID-19.

What should I do if I get COVID-19?

- A PCR test is the best way to detect COVID-19. Get a PCR test at the first sign of symptoms.
- If you get COVID-19, call your usual GP practice (or other arrangements pre-planned with your GP) **immediately** to arrange a telehealth consultation to keep within COVID-19 safety practices. Have your up-to-date medicines list handy, this is particularly important if you are seeing a GP who is not familiar with your health status.
- You may be prescribed a medicine to treat COVID-19. **To work best these medicines must be taken within 5 days of your symptoms starting.**
- A carer or family member can contact your GP on your behalf.
- If prescribed a treatment for COVID-19, the medicines may be delivered to your home by your pharmacy, or a carer or family member can pick them up for you.

Digital tools





Innovations: feedback for DVA clients

Veterans' MATES

Australian Government
Department of Veterans' Affairs

<Dist_date>

<title> <fname> <surname>
<addr1>
<addr2>
<addr3>
<town> <state> <postcode>

Dear <title> <fname> <surname>

The latest release of the Veterans' Medicines Advice and Therapeutics Education Services program (*Veterans' MATES*) is about managing your diabetes together with your GP and other members of your healthcare team.

For most people with diabetes, having diabetes tests and health checks may help to identify any health concerns early in the management of diabetes.

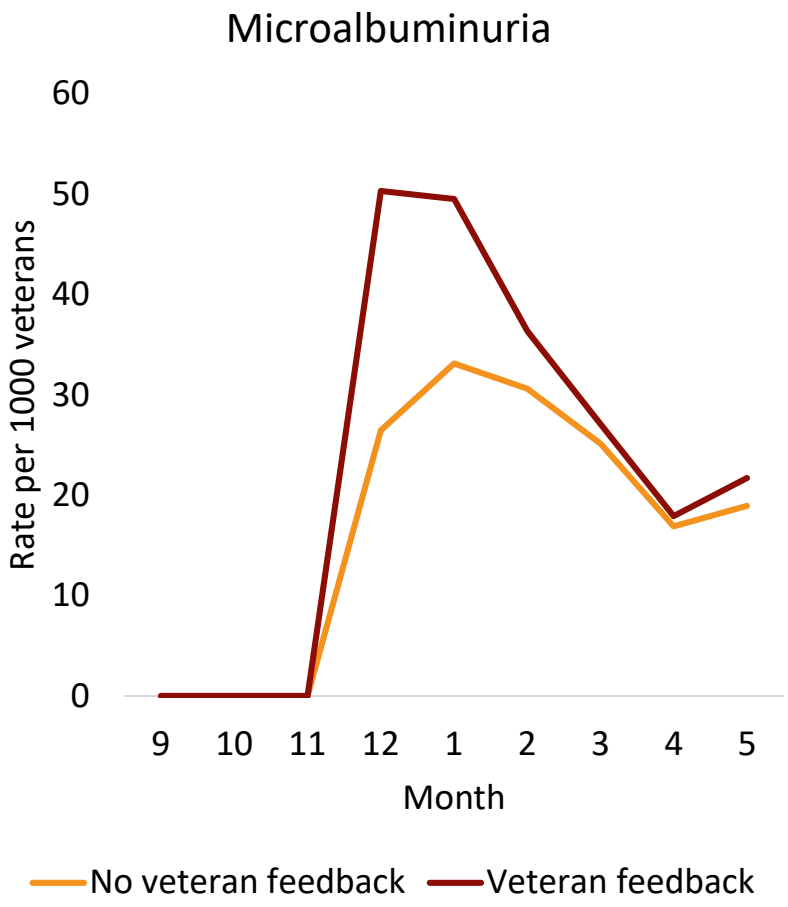
The following table shows when you last had a test for HbA1c, HDL cholesterol, and protein in the urine, according to Department of Veterans' Affairs funded services:

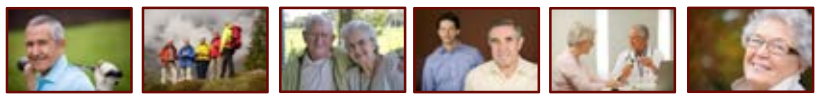
Test	Type of test	Last time you had this test*	Action to take
HbA1c to check your past blood glucose (sugar) levels	Blood test	20/10/2016	**Check with your GP if you are due for this test**
HDL cholesterol to check your blood HDL (good) cholesterol level	Blood test	None recorded	**Check with your GP if you are due for this test**
Protein in the urine to check your kidney health	Laboratory urine test	10/08/2019	Test has been undertaken in the last year

*We understand that you may have completed these test(s) since these date(s).

More information about these tests and health checks is in the included brochure, *Diabetes: self care really matters.*

PLEASE TURN OVER





Innovations: e-delivery for DVA clients

Veterans' MATES

Australian Government
Department of Veterans' Affairs

<Dist_data>

<title> <fname> <surname> <hon>
<addr1>
<addr2>
<addr3>
<town> <state> <postcode>

Dear <title> <fname> <surname>

As part of the latest release of the Veterans' Medicines Advice and Therapeutics Education Services program (*Veterans' MATES*), you have received the brochure *High Res tools for mental wellbeing. In light of the current climate (such as recent events in Afghanistan, the establishment of the Royal Commission, and the implications of COVID lock-downs and restrictions), the health and wellbeing of veterans and their families is at the forefront of our minds. See the veteran brochure for support services.*

Looking after your mental health is just as important as looking after your physical fitness. The enclosed brochure focuses on:

- **how building resilience can help you to deal with life's challenges**
- **how DVA's High Res SMART (Self-Management and Resilience Training) tools can help to improve your mental wellbeing, and how to use these tools**
- **an insert 'My plan for using the DVA High Res SMART tools' to help you decide which tools to use.**

We encourage you to take this brochure and talk with your GP and other members of your healthcare team about using the High Res tools.

The Department of Veterans' Affairs offers this service to give you and your healthcare team the most up-to-date health and medicines information. You can help us improve our services to you by completing and returning the enclosed response form. This letter and enclosed response form are confidential and will not in any way affect your entitlements from DVA. If you would prefer to receive your Veterans' MATES materials electronically in the future please scan the QR code below and enter your details.

If you have any questions about this letter or the information contained in the brochure please contact *1800 VETERAN (1800 838 372). When prompted say "Veterans' MATES".*

Yours sincerely

Professor Jenny Firman
Chief Health Officer
Department of Veterans' Affairs

Scan to receive
Veterans' MATES electronically

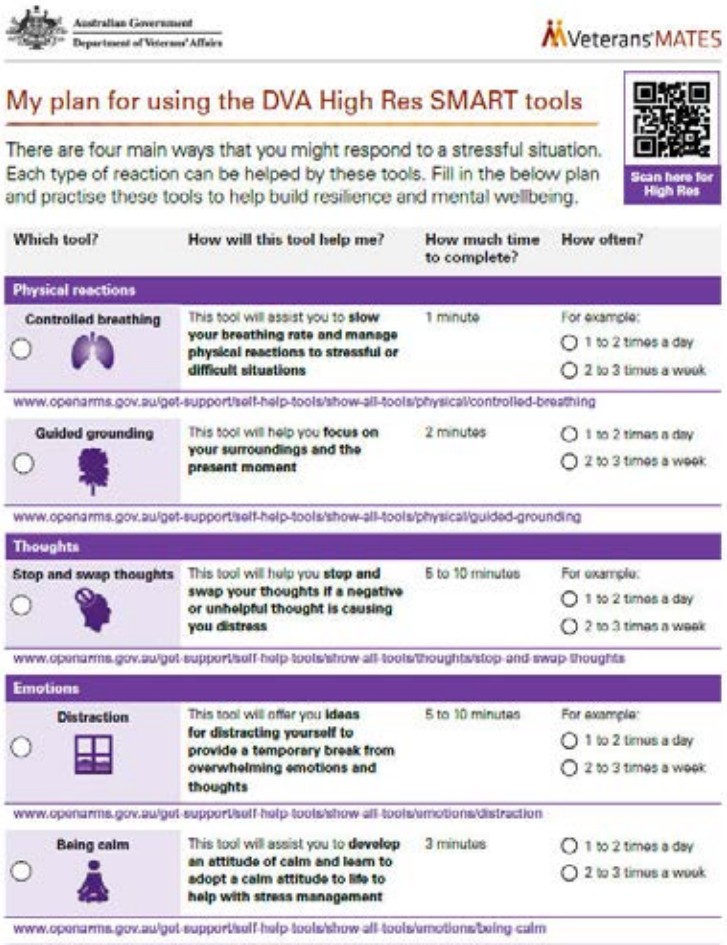
University of South Australia

Veterans' MATES

- Implemented Dec 2021
- Recruited via mailed target group
  - 280 DVA clients have registered from first mailing

Scan to receive
Veterans' MATES electronically

Innovations: social prescriptions and animations



Australian Government
Department of Veterans' Affairs

Veterans' MATES

My plan for using the DVA High Res SMART tools

Scan here for High Res

There are four main ways that you might respond to a stressful situation. Each type of reaction can be helped by these tools. Fill in the below plan and practise these tools to help build resilience and mental wellbeing.

Which tool?	How will this tool help me?	How much time to complete?	How often?
Physical reactions			
○ Controlled breathing	This tool will assist you to **slow your breathing rate and manage physical reactions to stressful or difficult situations**	1 minute	For example: ○ 1 to 2 times a day ○ 2 to 3 times a week
www.openarms.gov.au/get-support/self-help-tools/show-all-tools/physical/controlled-breathing			
○ Guided grounding	This tool will help you **focus on your surroundings and the present moment**	2 minutes	○ 1 to 2 times a day ○ 2 to 3 times a week
www.openarms.gov.au/get-support/self-help-tools/show-all-tools/physical/guided-grounding			
Thoughts			
○ Stop and swap thoughts	This tool will help you **stop and swap your thoughts if a negative or unhelpful thought is causing you distress**	5 to 10 minutes	For example: ○ 1 to 2 times a day ○ 2 to 3 times a week
www.openarms.gov.au/get-support/self-help-tools/show-all-tools/thoughts/stop-and-swap-thoughts			
Emotions			
○ Distraction	This tool will offer you **ideas for distracting yourself to provide a temporary break from overwhelming emotions and thoughts**	5 to 10 minutes	For example: ○ 1 to 2 times a day ○ 2 to 3 times a week
www.openarms.gov.au/get-support/self-help-tools/show-all-tools/emotions/distraction			
○ Being calm	This tool will assist you to **develop an attitude of calm and learn to adopt a calm attitude to life to help with stress management**	3 minutes	○ 1 to 2 times a day ○ 2 to 3 times a week
www.openarms.gov.au/get-support/self-help-tools/show-all-tools/emotions/being-calm			

Choose High Res SMART tools appropriate to your patient's reactions to stress and distress

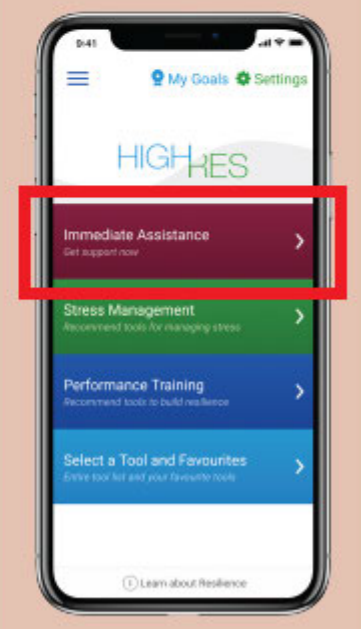
Reactions	High Res SMART tools*
Physical Rapid breathing Fast or pounding heart Dizziness or light-headedness Trembling or shaking Muscle tension or pains Nausea or 'butterflies' in the stomach Tiredness	Progressive muscle relaxation Controlled breathing Guided grounding Distraction
Thoughts Negative thoughts or self-talk Difficulty thinking through problems Frequently worrying Concentration and memory problems	Stop and swap thoughts Challenge your thoughts Problem solving
Emotions Fearful or apprehensive Stressed or 'on edge' Angry or frustrated Feeling down or depressed, guilty or ashamed Lacking motivation Feeling confused or overwhelmed with problems	Diffusing anger Managing emotions
Behaviours Changes in sleep patterns Changes in appetite Drinking or smoking too much Misuse of other substances (including prescription medicines) Being verbally or physically aggressive Not spending enough time with	Social connections Healthy sleeping Physical activities Enjoyable and rewarding activities

Encourage the patient's family to take part, where possible; their involvement and support can aid recovery, provide a sense of connection and belonging for the patient, and lessen the risk of suicidal behaviour.[5]

If your patient is feeling suicidal, at risk of self-harm or at risk of harming others, having a psychotic episode or feeling 'out of control', call 000 or contact your local acute assessment and treatment team to obtain immediate help.

For further information about acute assessment and treatment teams and how to contact them, go to: www.healthdirect.gov.au/crisis-management

Suggest developing a suicide safety plan e.g. beyondblue.org.au/get-support/beyondnow-suicide-safety-planning, and show your patient where to go for immediate assistance in the High Res app.



The High Res SMART approach focuses on identifying and adjusting reactions to stress, to improve functioning and wellbeing

Identify
Is my reaction physical, emotional, behavioural, or affecting thoughts?

Test
Is this a reasonable response to the situation?
Is it helping me?

Adjust
Use the online tools to learn adjustment strategies

Figure 2. The High Res SMART approach

Collaborating with veterans to address issues of concern to them

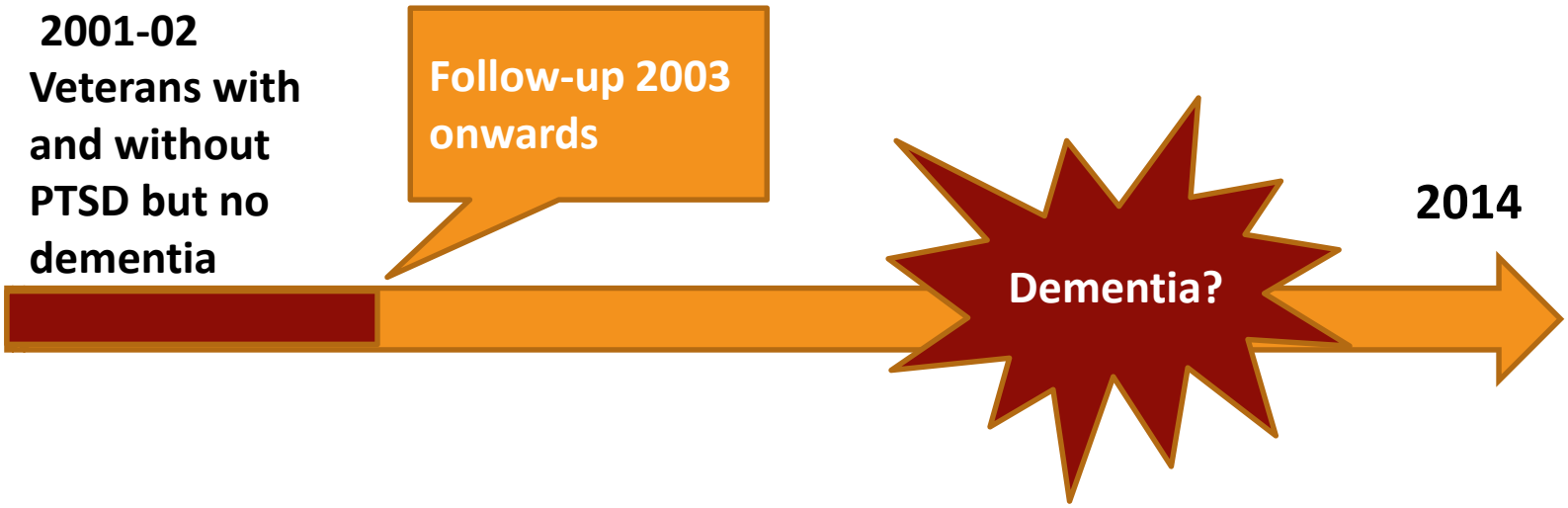
- Veterans and DVA came to us with the question is post-traumatic stress disorder a risk for dementia in Australian veterans

What was known?

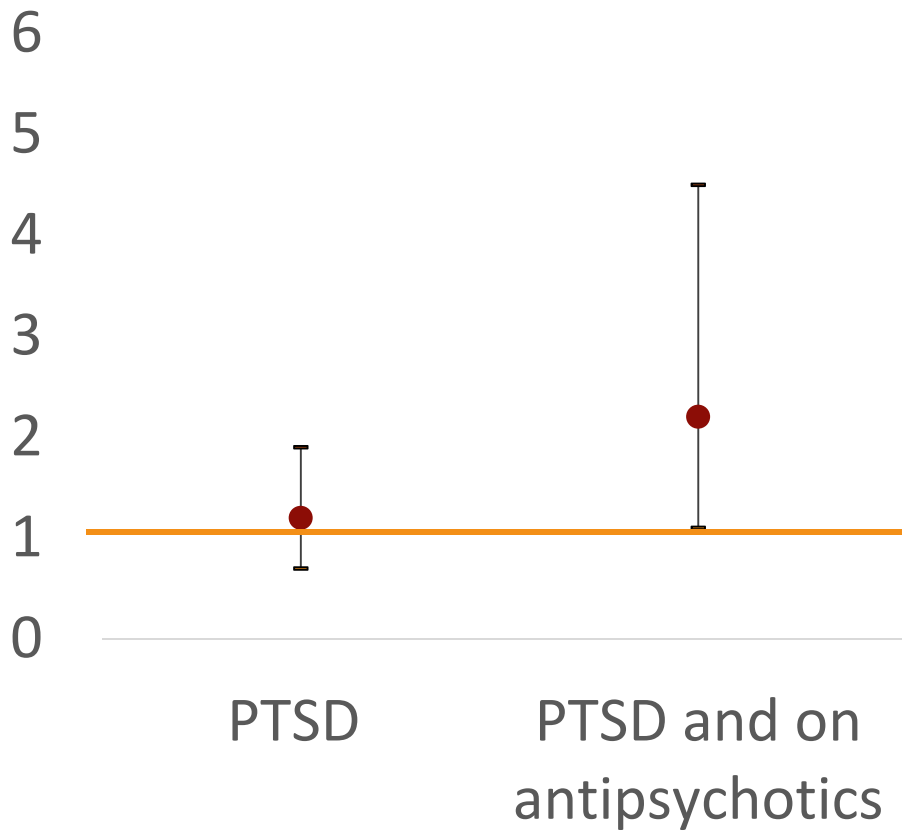
- A number of US studies have suggested patients with PTSD had almost a doubling in risk of developing dementia
- The previous research included veterans 65 years and over, some of whom may have been in the early phases of dementia.

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?



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

Our reach beyond Veterans' MATES

Box 2.1. ***The overuse of sedatives in the treatment of insomnia: the case of the Australian Veterans' MATES Program***

The treatment of insomnia is commonly associated with the overuse of sedatives, and insomnia is a common problem among the elderly. The Australian Veterans' MATES (Medicines Advice and Therapeutics Education Services) is a program that aims to optimise the use of medicines and health services through targeted education and prescriber feedback to veterans and their health professionals. The program found that one third of veterans living in residential aged care were using benzodiazepines at least eight months per year, despite guidance that these medications should be stopped after one month of use. The risks associated with the overuse of sedatives are well-known, and include increased risk of hospitalization from falls, confusion, delirium and dementia. Furthermore, prolonged use of hypnotics can lead to tolerance and dependence. Meanwhile, effective non-pharmacological alternatives for the treatment of insomnia exist (e.g. cognitive behavioural therapy, CBT).

The Australian Veterans MATES program developed an Insomnia Treatment Program to address this issue. General practitioners guided patients to use a sleep diary and therapy selection guide, and prescribed the use of CBT as an alternative to hypnotics. The program identified at risk patients for GPs and educated and supported GPs to review the risks associated with hypnotics and provided guidance on how to reduce and discontinue these medicines. Similarly, educational materials were provided to patients. The impact of this program, implemented in two phases (2009 and 2012) was significant; the program resulted in a reduction in the use of hypnotic medicines (116,000 fewer patient months of treatment) and a reduction in the number of hospitalisations for hip fracture (43 avoided) after 12 months follow-up (Kalisch Ellett et al., 2018[178]).

Source: (Australian Government Department of Veterans' Affairs, 2021[126])

OECD Report released for World Patient Safety Day 2022

The appropriate use of inhaler devices in veterans – perceptions and practice

Natalie s 47F **Tammy** s 47F **Elizabeth** s 47F **Andrew** s 47F

Sansom Institute, School of Pharmacy and Medical Sciences,
University of South Australia, Australia

What is Veterans' MATES?

- Provides patient specific feedback & educational material to GPs to improve medicine use for veterans
- Supported by educational brochures to veterans encouraging them to talk to their doctor & pharmacist
- Educational material to pharmacists
- Sent every three months to approximately
  - 10,000 general practitioners
  - 8,500 pharmacies & accredited pharmacists
  - 35,000 veterans

- To date 24 modules delivered
  - Disease specific: Heart failure, Diabetes, COPD
  - Drug Specific: Antidepressants, Contraindicated medicines, NSAIDS, Glaucoma medicines
  - Service delivery: Medicines Review, Care Planning
- Participation
  - 229,000 veterans
  - 25,000 doctors
  - 8,500 pharmacies & accredited pharmacists

- > 50% of doctors have received 6 mailings or more

Use of inhaler devices

- Correct inhaler technique maximises benefit of medicine, improves quality of life & decreases exacerbations
- Device use is difficult & requires repeated assessment & demonstration
- Important to minimise no. of types of devices used because different techniques required for activation of each device lead to confusion & error
- Inhaler technique education particularly important for elderly population who may have poor eyesight, poor hand strength & coordination difficulties

Table 1: Inhaled medicines and delivery devices for use in Chronic Obstructive Pulmonary Disease (COPD)[1]

Class	Generic name	Metered Dose Inhalers (MDI)	Autohaler® (breath-activated)	Dry powder inhalers (DPI)				Nebuliser solutions and nebules (reserve home nebuliser use for certain patients)*
				Accuhaler®	Turbuhaler®	HandiHaler®	Aerolizer®	
								
SABA	salbutamol**	Ventolin, Airomir, Asmol, Epaq (100 mcg/dose)	Airomir Autohaler® (100 mcg/dose)					Ventolin Solution (5mg/mL) Single dose: Asmol uni-dose, Butamol, Salbutamol sterinebs, Ventolin Nebules, (1mg/mL (2.5 mL) or 2 mg/mL (2.5 mL)
	terbutaline							Bricanyl Respules Single dose: 2.5 mg/mL (2 mL)
LABA	eformoterol						Foradile Aerolizer® (12 mcg/ dose)	
	salmeterol	Serevent (25 mcg/dose)						
SAAC	ipratropium	Atrovent (20 mcg/dose)						Ipravent solution (250 mcg/mL) Single dose: Aeron, Apoven, Atrovent Unit Dose Ipratrin, Ipravent (250 mcg/mL (1mL) or Single dose: Aeron, Apoven, Atrovent Adult Unit Dose Ipratrin Adult, Ipravent (500 mcg/mL (1 mL)
LAAC	tiotropium					Spiriva HandiHaler® (18 mcg/dose)		

One quarter of veterans are dispensed three or more different respiratory medicines. Of these, 50% use three or more types of devices.

Veterans' Medicines Advice and Therapeutics Education Services

Therapeutic Brief 14 – Simplifying inhaler devices for Chronic Obstructive Pulmonary Disease. March 2008.

Aim

To investigate veteran, GP and pharmacist perceptions and practice using respiratory devices



Methods

- One page reply-paid response form to GPs, pharmacists and veterans seeking feedback on Veterans' MATES materials
- In March/April 2006 and March/April 2008 Veterans' MATES program
- Descriptive analyses were undertaken for all questions

Results

- 2006 Survey responses
  - 1078 (10%) GPs
  - 320 (6%) pharmacists
  - 10,904 (38%) veterans
- 2008 Survey responses
  - 530 (6%) GPs
  - 717 (9%) pharmacists
  - 3,663 (20%) veterans

Are devices used well?

	GP	Pharmacist	Veteran
Veterans' do not use respiratory devices well	46%	54%	11% (4% 2006)
Veterans' require several lessons to learn	87%	83%	
Missed a dose because inhaler too hard to use			(10% 2006)

Is technique regularly checked?

	GP	Pharmacist	Veteran
Technique reviewed at least every 3 months	29%	17% (17% 2006)	20%
Technique reviewed annually	28%	22%	
Technique only reviewed on initiation		54% (47% 2006)	
Technique never reviewed			23%

Confidence in teaching inhaler technique

	GP	Pharmacist
Confident in instructing veterans	96%	(93% 2006)

Will veterans seek help?

	Yes
Discuss with doctor at next visit	56% (66% 2006)
Discuss with pharmacist at next visit	29% (26% 2006)

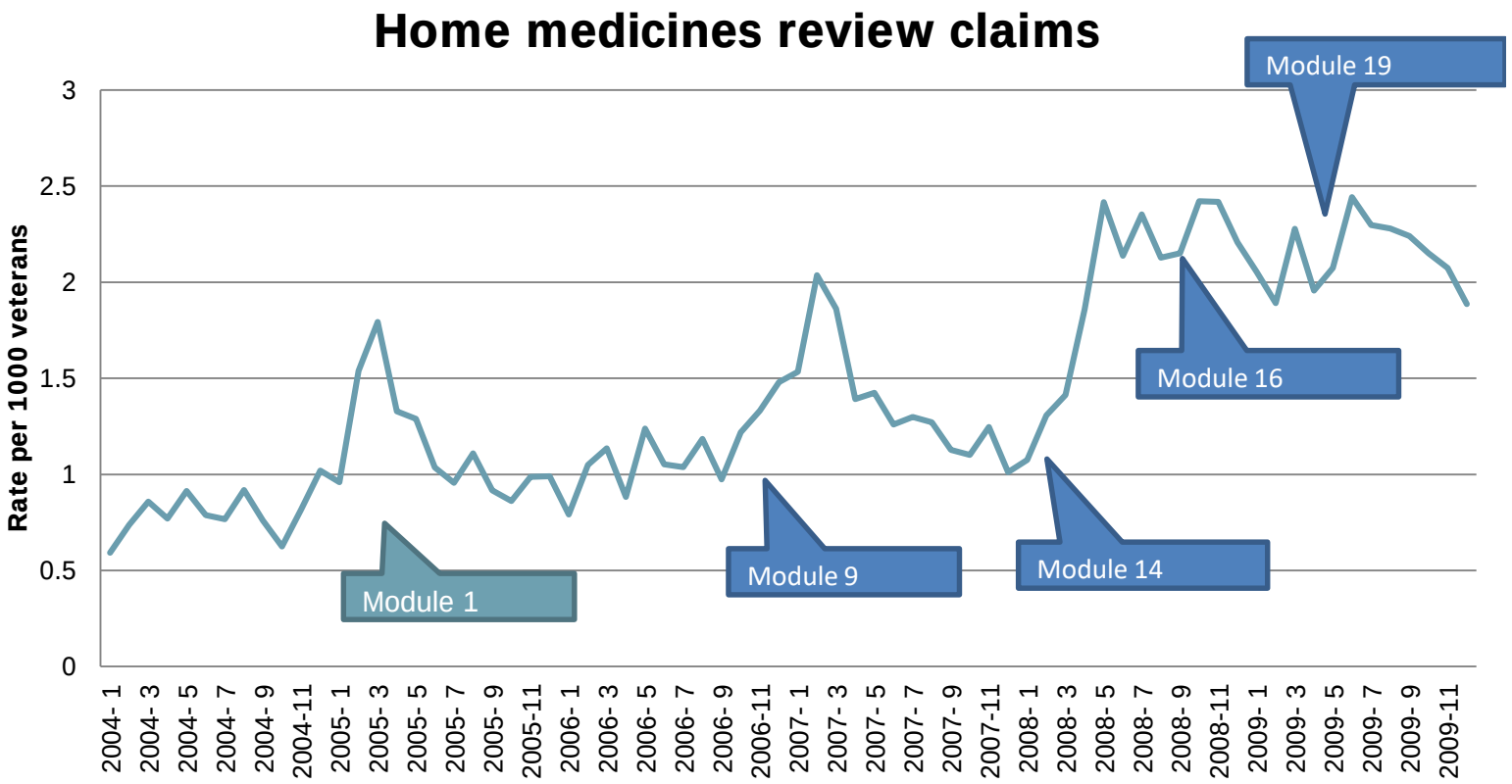
Greatest barrier to changing respiratory medicine and/or devices

	GP	Pharmacist
Patient reluctance to change	54%	59%
Fear of acute exacerbation	13%	
No time for review	4%	22%

Implications

- Health professionals need to be more proactive in checking technique
- Veterans unlikely to ask for help & may be unaware that technique declines over time
- GPs can assist by minimising the number of medicines & devices veterans use
- Education to veterans i.e. Veterans' MATES program, Home Medicines Review

Use of Home Medicine Review




www.veteransmates.net.au

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Professor Libby s 47F

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





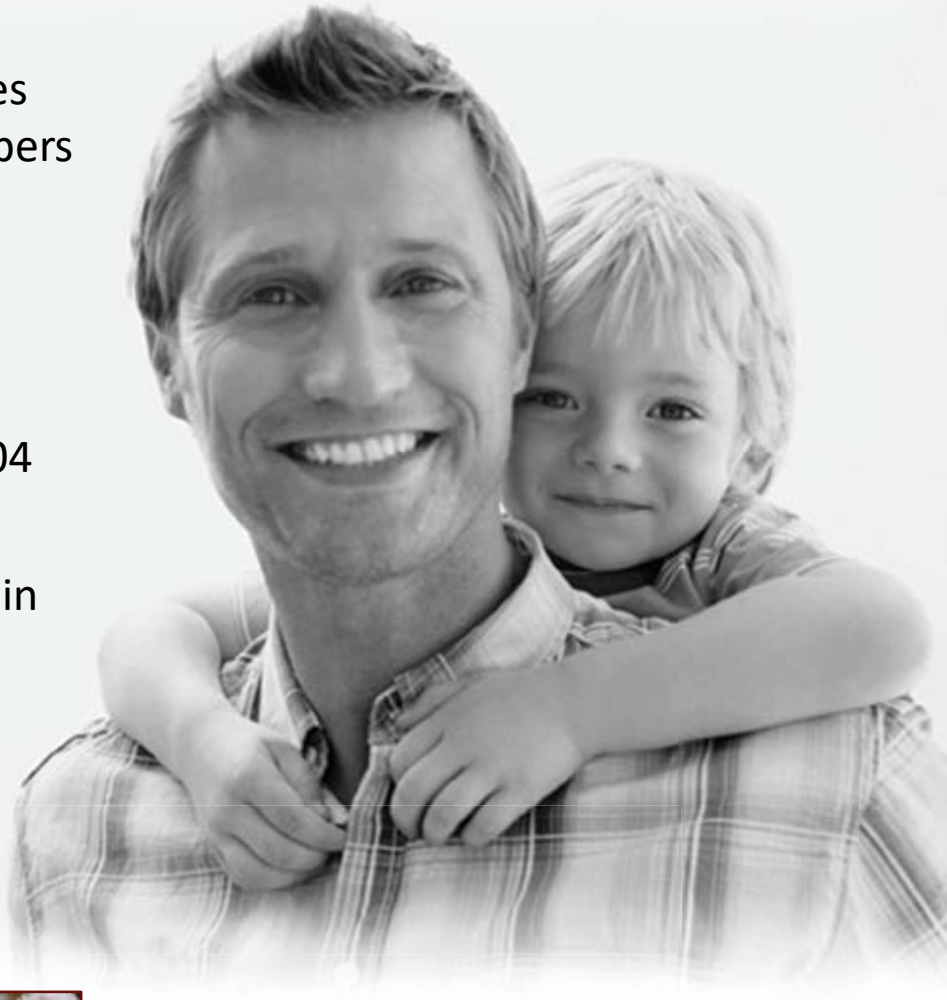


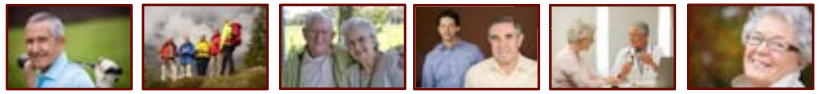
What is Veterans' MATES?

- 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

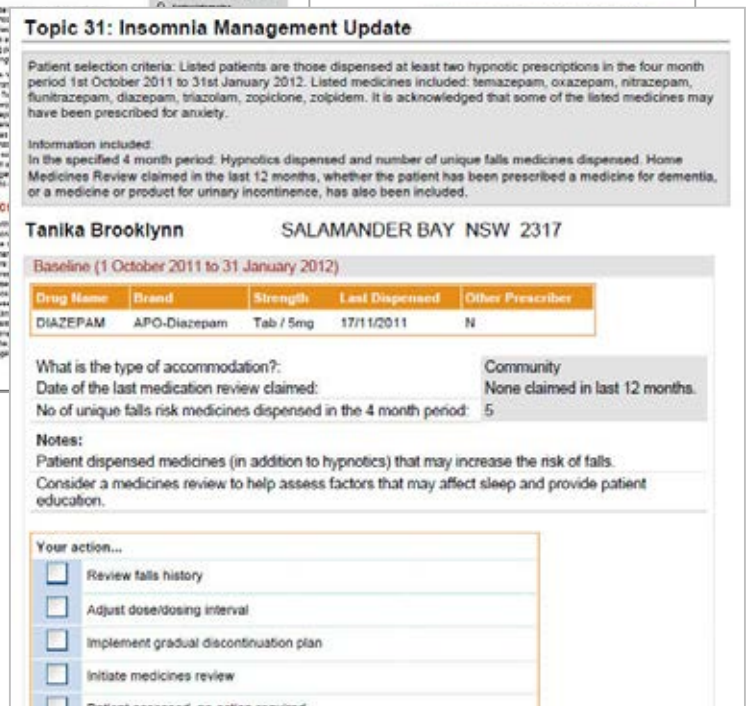




The approach

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

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

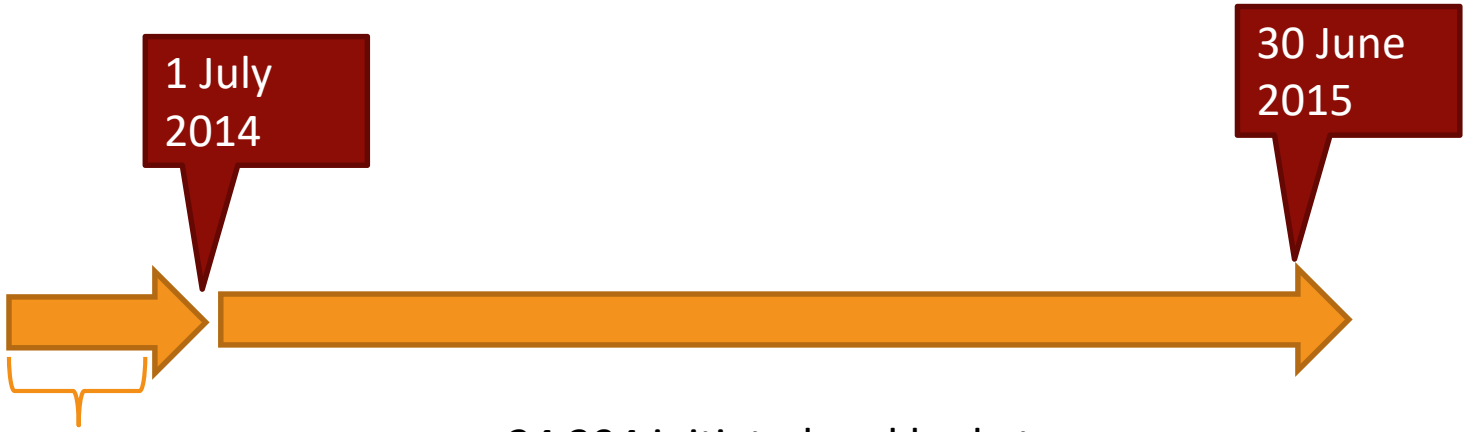
The data enable the impact and outcomes of the intervention to be measured

Veteran reference group

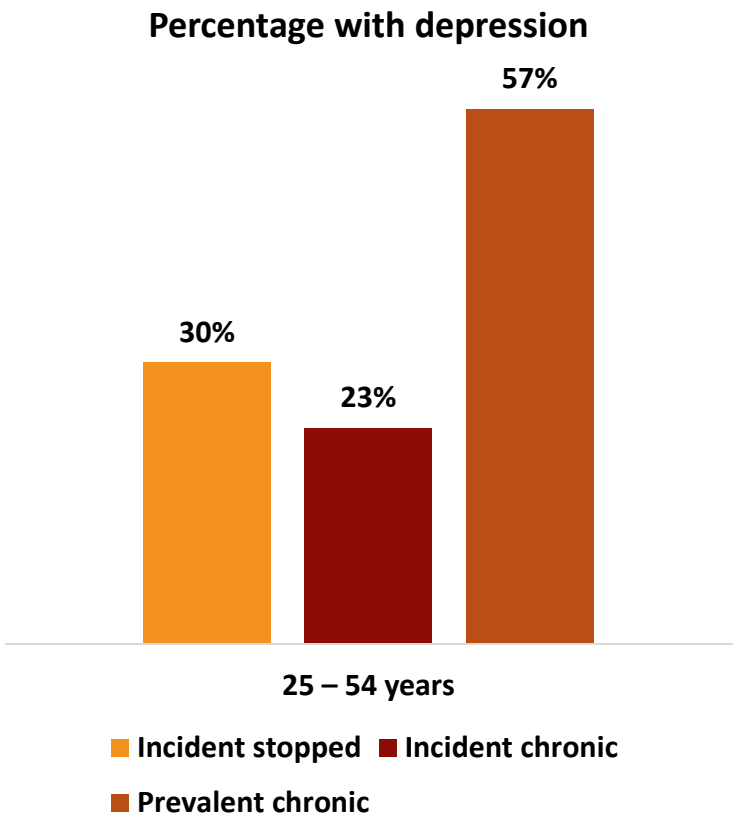
Practitioner reference group

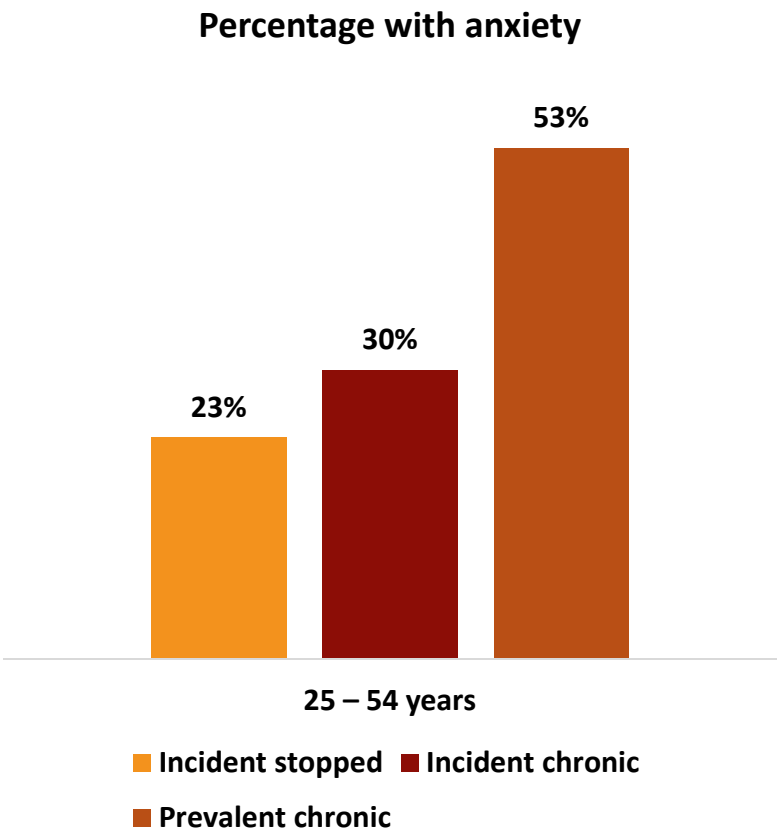
Translating the evidence into practice: Chronic Pain

Identifying the problem: how many veterans are chronic opioid users?

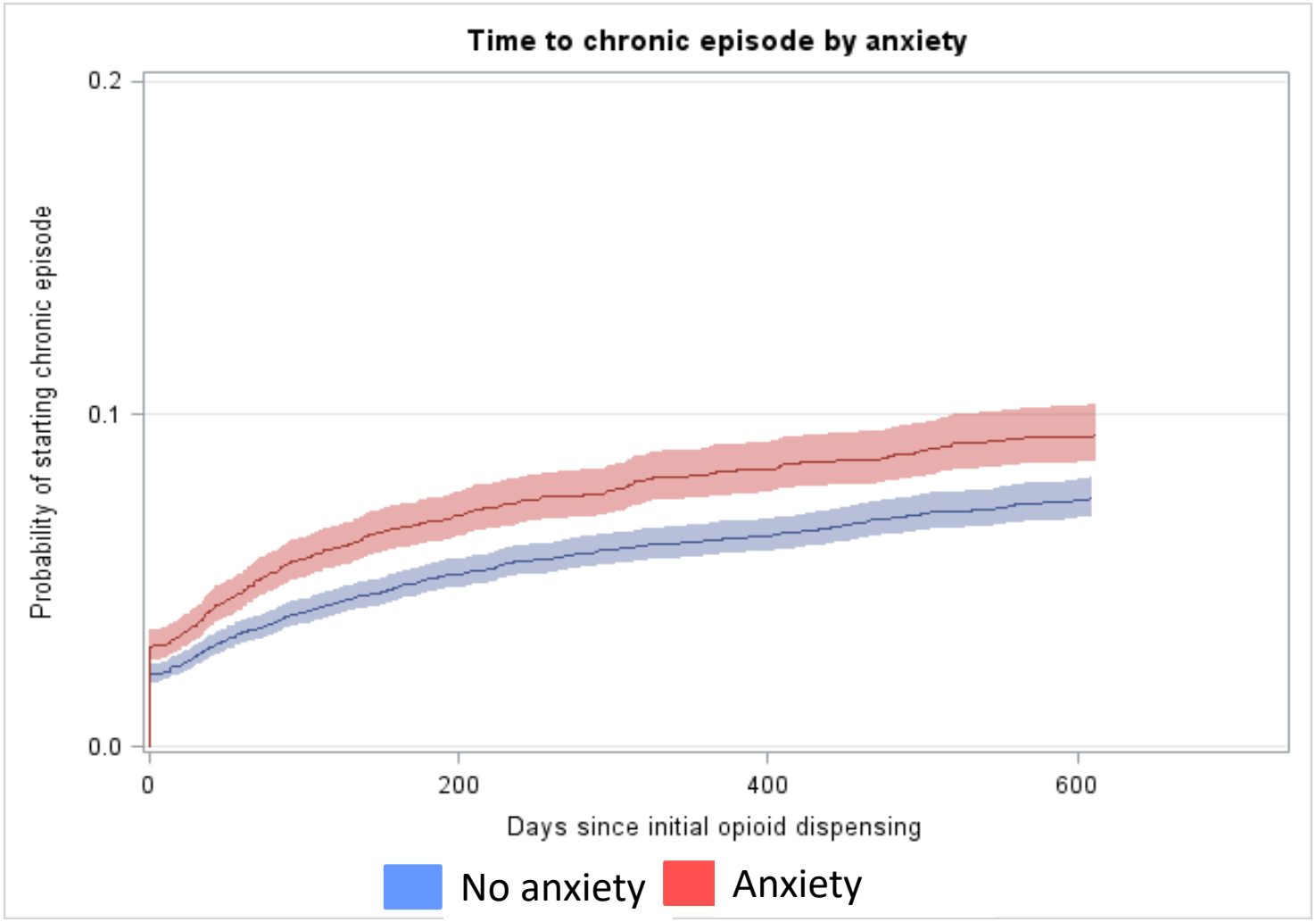


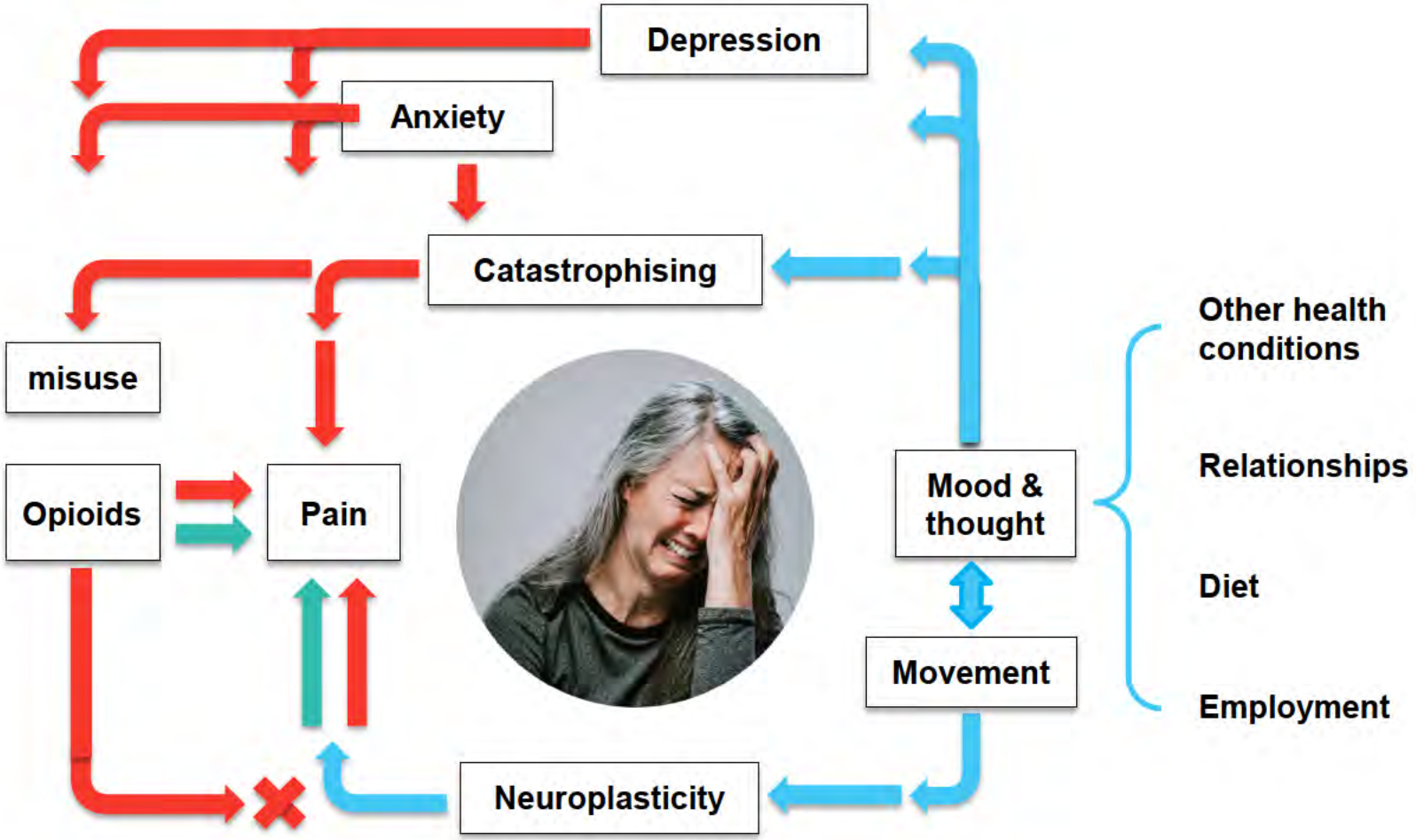
Identifying the problem: opioid use and comorbidity development



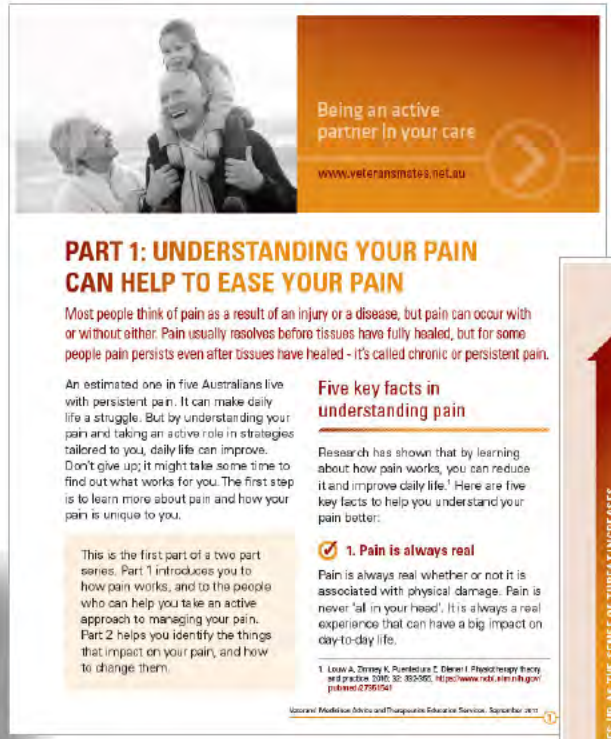


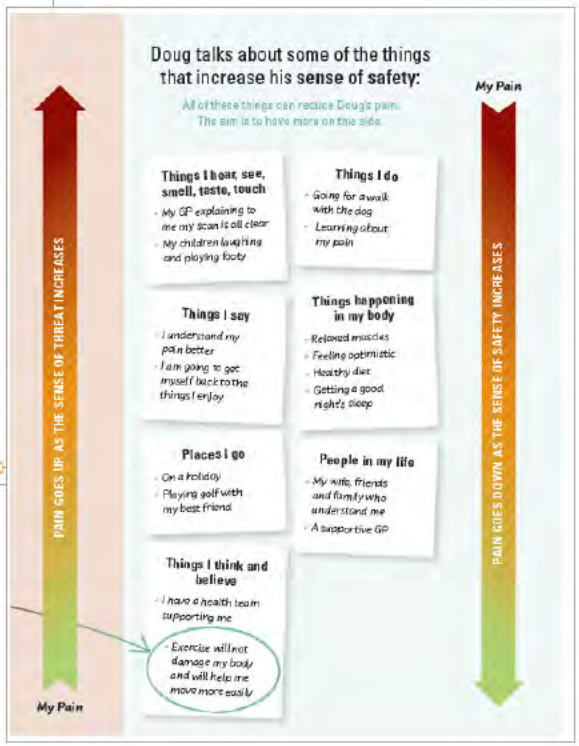
Identifying the problem: who is at risk of becoming a chronic user




Depression
Anxiety
Catastrophising
misuse
Opioids
Pain
Mood &
thought
Movement
Neuroplasticity
Other health
conditions
Relationships
Diet
Employment

Providing supportive evidence based educational material for veterans





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 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 int their history and psychological comor as the opioid dose is reduced and the
5. For patients taking opioids long-term percent per week or ten to 25% of th to their tolerance; this generally achie Generally, the longer the patient has tapering should be.
6. Consider advice from a pain medicin or refer to an addiction specialist or a if there is a dependency/addiction pr
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 can be completed in less than five minutes, and provides an insight int patient thinks about when they are in pain.[14]

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

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

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

Veterans' MATES

Australian Government Department of Veterans' Affairs

Dear DR P SURNAME **Date: 15/03/2020**

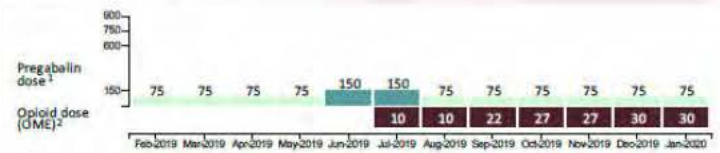
This Veterans' MATES information aims to assist you to review gabapentinoids (pregabalin or gabapentin) that may cause harmful side effects when used long term. It is advisory in nature. The information is based on DVA claims that indicate that a veteran has had multiple dispensings of pregabalin or 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.

What happened to veterans with chronic pain?

Pain

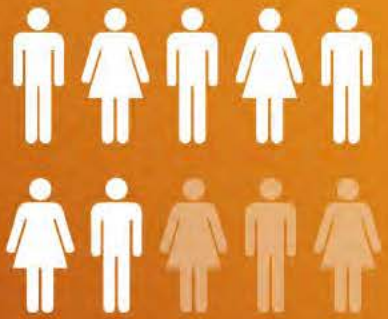
8,500
general
practitioners

8,300
pharmacists

690
psychologists

13,900
veterans

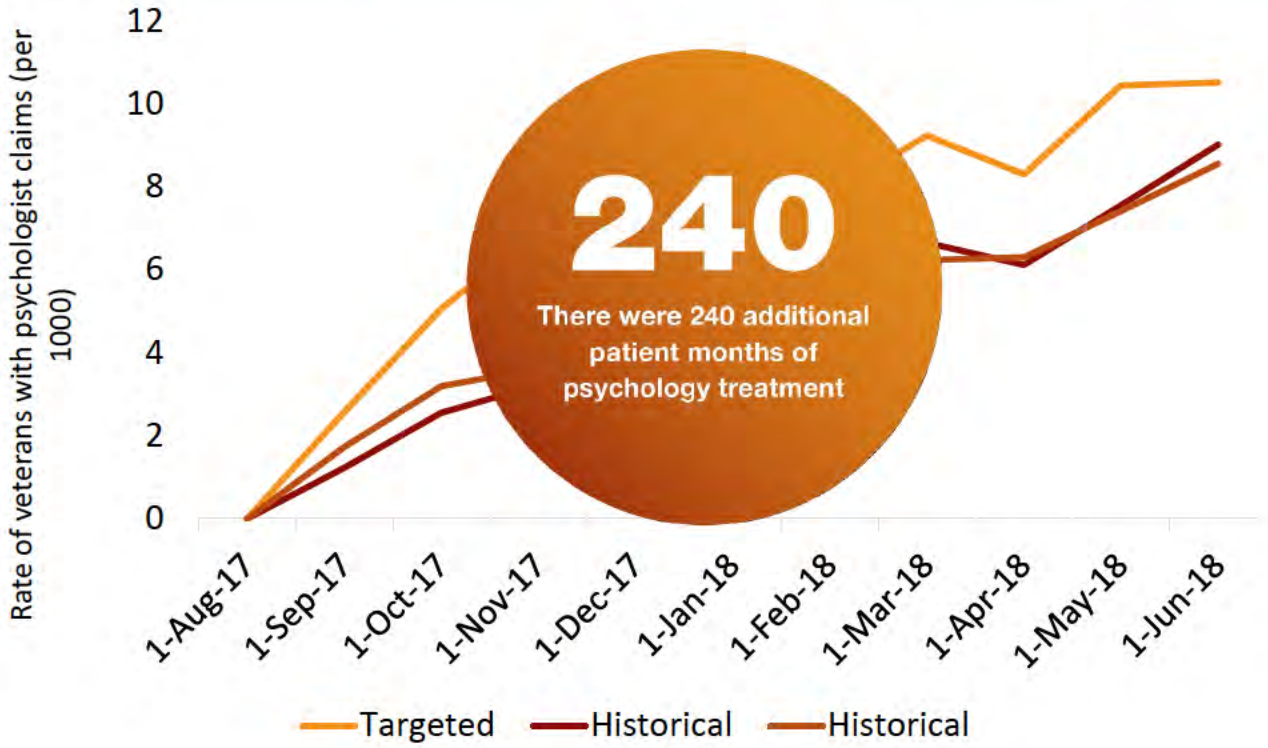
After the intervention, 7 out of 10 veterans said they would make an appointment with their doctor to review their pain medicines



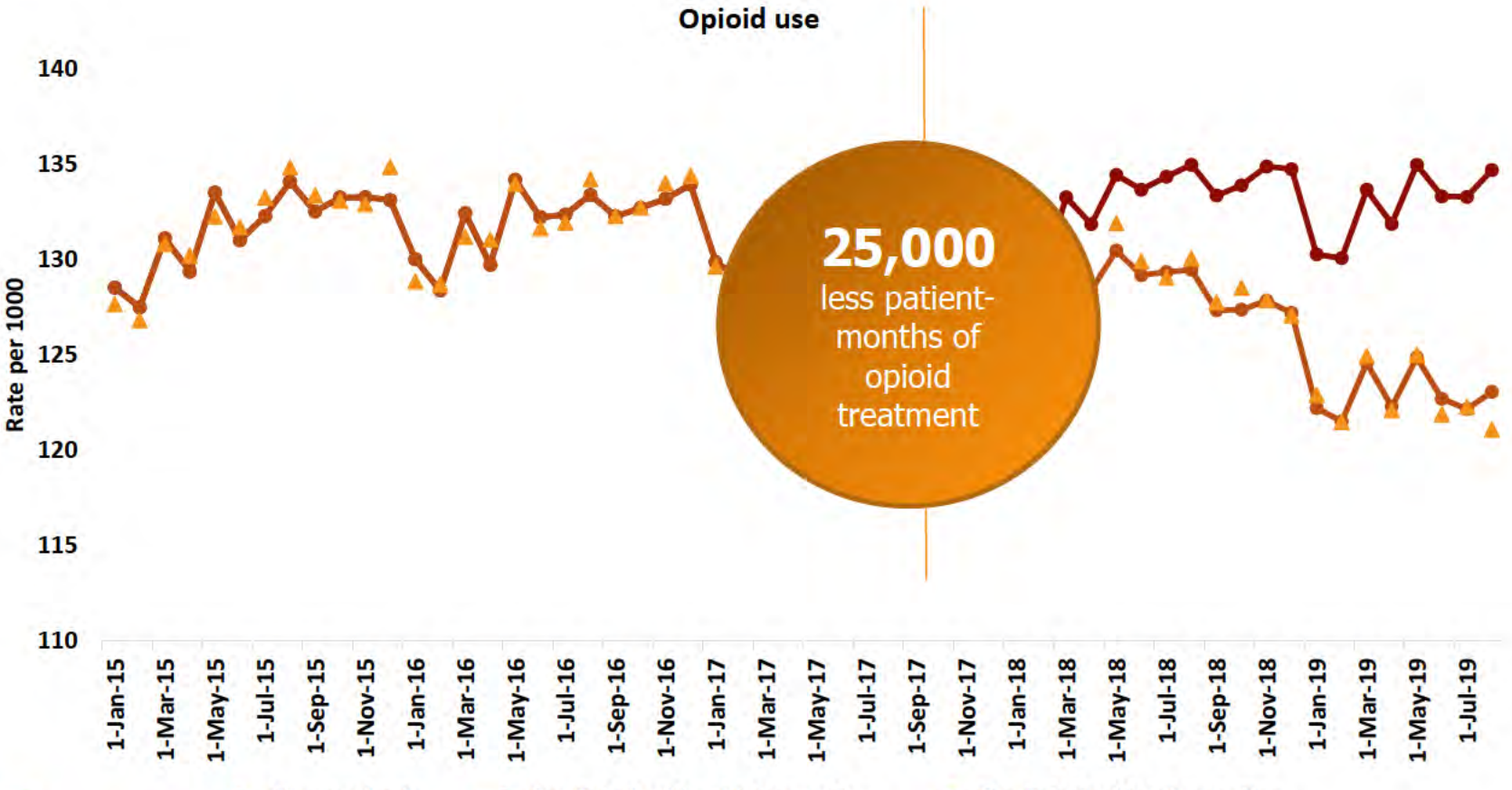
After the intervention, 7 out of 10 general practitioners said they were very likely to incorporate pain neuroscience education in a plan for their patient

Pain

Increasing numbers of veterans seeing psychologists



Use of opioids decreased



Insomnia management

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Being an active partner in your care

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

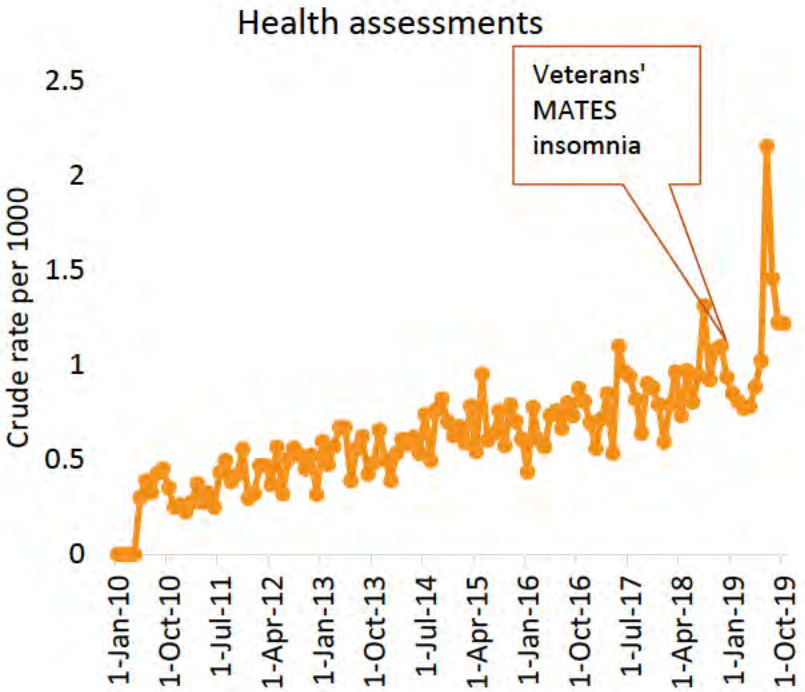
Cognitive behavioural therapy for insomnia (CBTi)

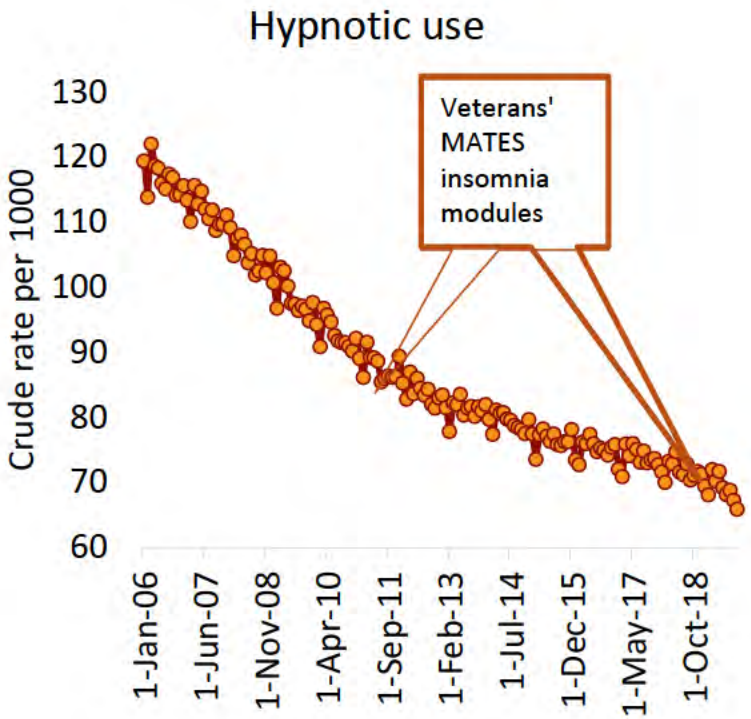
- 'The Healthy Sleeping tool' provides advice and tips for improving sleep, and is available on the DVA *High Res* website https://at-ease.dva.gov.au/highres/#!/tools/healthy-sleeping
- *Open Arms – Veterans and Families Counselling*
  - veterans and their immediate family members may access free confidential mental health support services. Phone 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=AKISyfXTkxM&
  - The 'Sleeping Better program' aims to assist DVA patients understand the sleep process and how to effectively mana 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 disturbances at: 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 used in conjunction with face-to-face therapy. It is available from iTunes on the App Store for iOS devices and from Google Play
- The *High Res* App helps veterans and families manage daily stresses and transition to civilian life, available on the DVA *At* website at: http://at-ease.dva.gov.au/veterans/resources/mobile-apps/high-res-app/

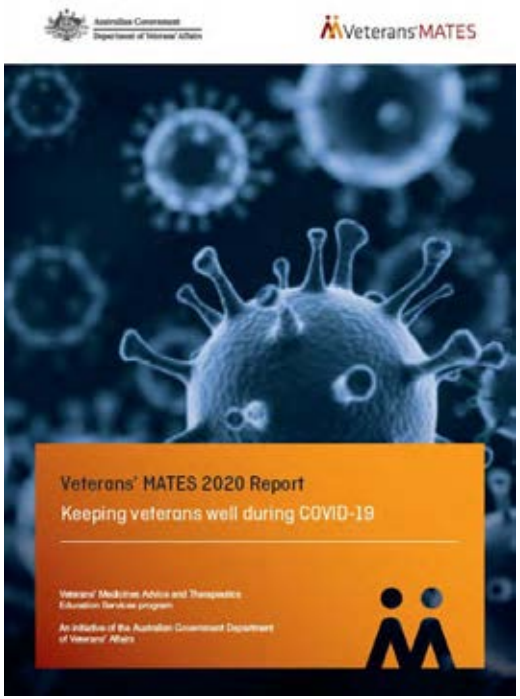
https://www.veteransmates.net.au/cbti-health

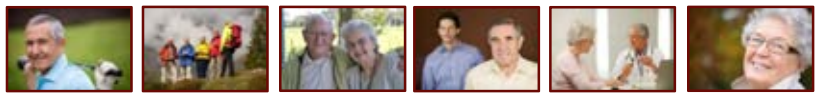

Health assessments
Veterans' MATES insomnia
Crude rate per 1000
2.5
2
1.5
1
0.5
0
1-Jan-10
1-Oct-10
1-Jul-11
1-Apr-12
1-Jan-13
1-Oct-13
1-Jul-14
1-Apr-15
1-Jan-16
1-Oct-16
1-Jul-17
1-Apr-18
1-Jan-19
1-Oct-19


Hypnotic use
Veterans' MATES insomnia modules
Crude rate per 1000
130
120
110
100
90
80
70
60
1-Jan-06
1-Jun-07
1-Nov-08
1-Apr-10
1-Sep-11
1-Feb-13
1-Jul-14
1-Dec-15
1-May-17
1-Oct-18

Veterans' MATES & COVID

- During 2020 we focused on keeping people well during COVID-19





KEEPING WELL DURING COVID-19

MENTAL WELL-BEING DURING COVID-19

HELPING YOU STAY ACTIVE

Apr	Jul	Sep
80,138	43,298	18,546

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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

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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.

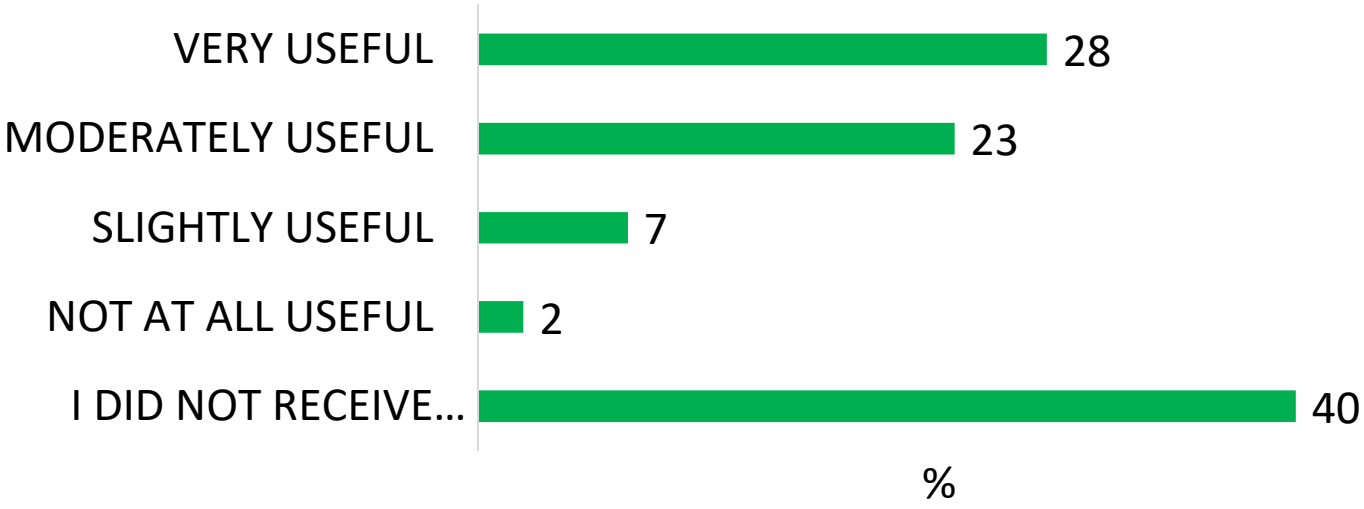
Watch this 2-minute video and try the controlled breathing tool by High Res, Australian Government Department of Veterans' Affairs (DVA): https://highres.dva.gov.au/highres/#!/tools/controlled-breathing

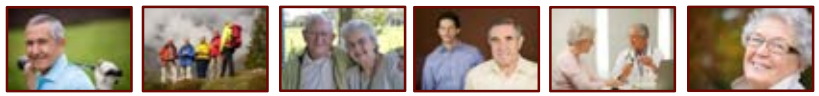
Another way to help manage distressing emotions is to practise grounding or mindfulness. This allows you to connect to what is happening right now, and be more aware of what you can see, hear and feel. This can help you develop a calmer mind and build resilience to stress.

Watch this 90-second video including a guided grounding tool by High Res, DVA: https://highres.dva.gov.au/highres/#!/tools/guided-grounding

Veterans found the information useful

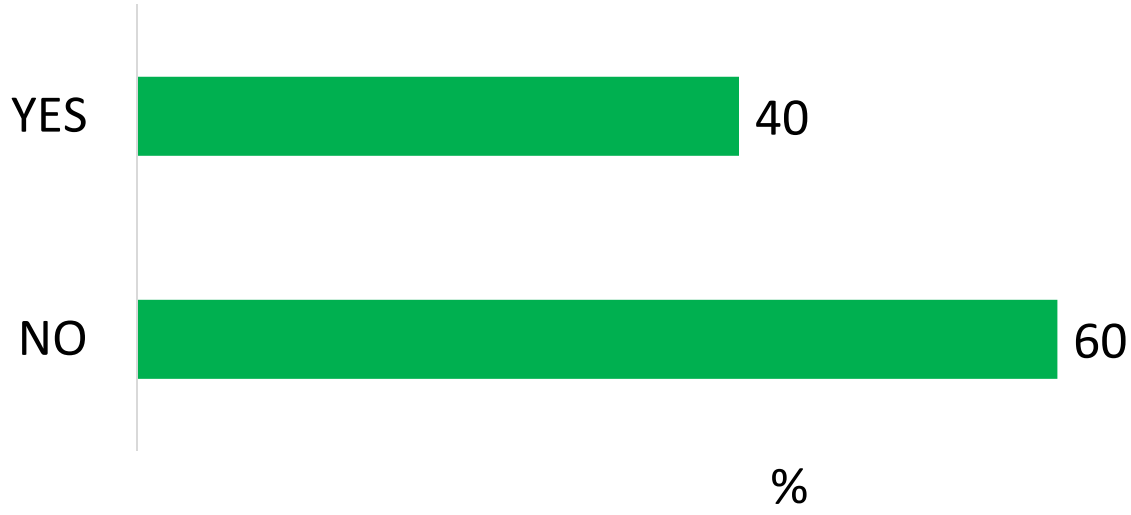
We recently provided some fact sheets to help support veterans through the COVID-19 pandemic. If you received these fact sheets, please indicate how useful you found them

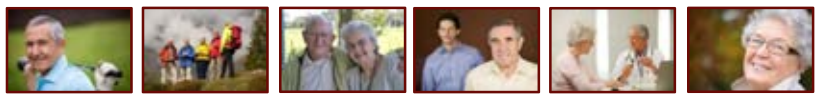




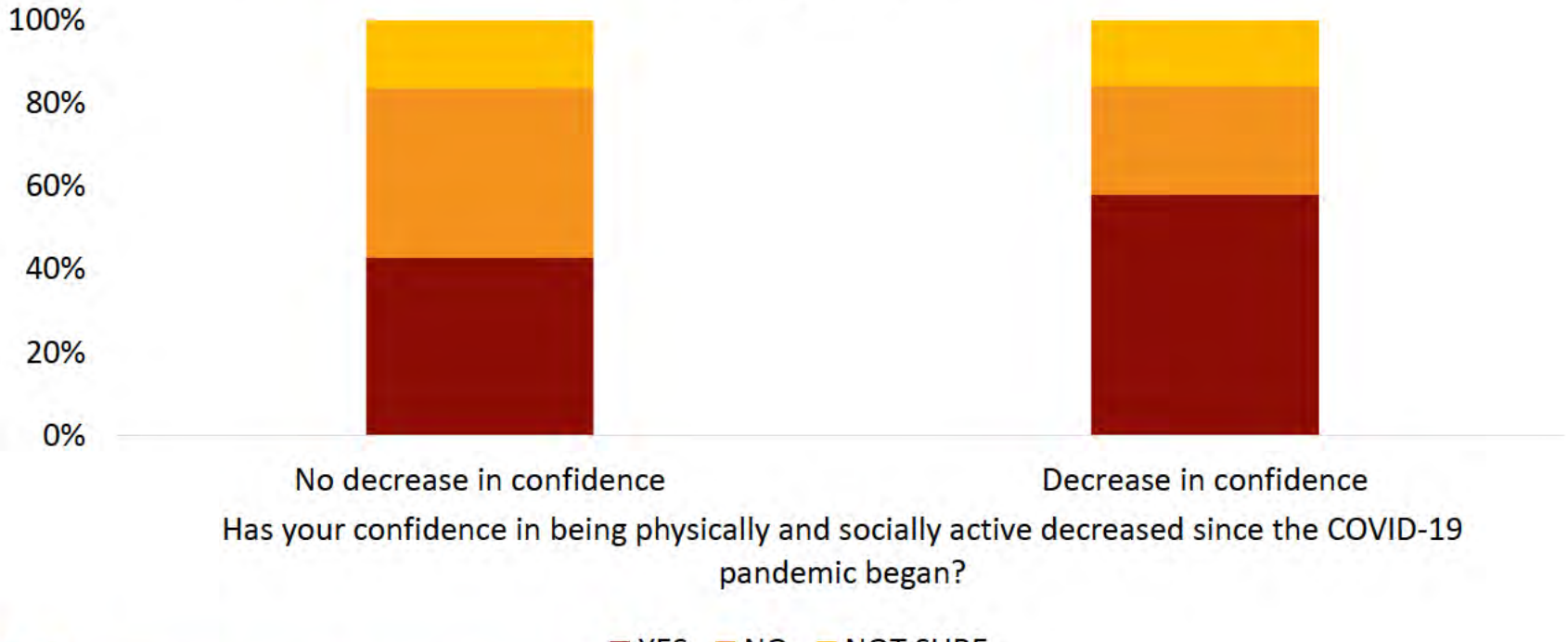
COVID – staying active

Veterans: Has your confidence in being physically and socially active decreased since the COVID-19 pandemic began?

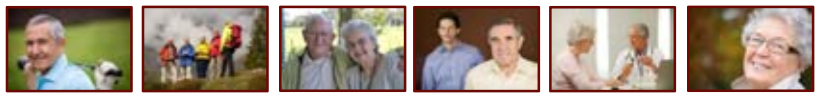




If you have recently found it difficult to be physically active, has reading the brochure encouraged you to ask your GP for advice to help you get moving again?



- *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*








2021

Mar	Jul	Sep	Nov
A NEW FOCUS FOR COPD PATIENTS	TINNITUS	DIURETICS	Well Being
8700	45,000	~ 15,000	~ 45,000

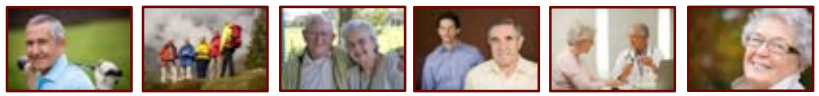
Most common accepted disability of younger veterans

Very frequent use in the elderly often with interacting medicines

Well being

Conclusion

- Since inception the program has provided more than 1.5 million educational mailings to targeted veterans
- More than 100,000 veterans have received recommended health services
- More than 25,000 patient years of improved medicine use has resulted
- Hospital admissions and premature deaths have been reduced
- Over 140,000 veterans have responded to our evaluations with, on average, 79% telling us the materials are very or moderately useful



Implementing strategies to reduce sedative and anticholinergic load among older people with dementia: the Veterans' MATES program

J Simon Bell, Tammy LeBlanc, Natalie Blacker, Christopher Eaton, Elizabeth E Roughead

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

UniSA | Sansom Institute for Health Research

Background

- People with dementia are susceptible to cognitive impairment associated with sedative and anticholinergic medicines[1,2]
- The Veterans' Medicines Advice and Therapeutics Education Services (MATES) program implemented a targeted Australia-wide intervention related to sedative and anticholinergic medicines in December 2010

1. Wright RM et al. J Am Geriatr Soc 2009
2. Roe CM et al. J Am Geriatr Soc 2002

Objective

- Conducted as part of the intervention, the objective of this study was to explore prescriber experiences in relation to sedative and anticholinergic medicines

Method

- 5,084 GPs invited to complete a 1-page survey instrument in relation to prescribing for a veteran patient with dementia
- Survey items addressed
  - ✓ consideration of cognitive impact
  - ✓ whether addition of a sedative or anticholinergic medicine to a medicine regimen causes cognitive decline
  - ✓ ease of being able to avoid sedative or anticholinergic medicines
- The face-validity of the survey instrument was assessed by the Veterans' MATES Editorial Committee

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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

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
UniSA

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.

04220304163650803500

LMO Response Form M25

Results – GP experiences prescribing a new medicine for a patient with dementia

- 310 GP respondents
- 250 (80.7%) always consider cognitive impact
- 165 (53.2%) believe addition of a sedative to the medicine regimen results in mild or no cognitive decline

Results – GP experiences prescribing a new medicine for a patient with dementia

- 202 (65.2%) believe addition of an anticholinergic results in mild or no cognitive decline
- GPs who reported that it is easy or slightly easy to avoid prescribing sedative or anticholinergic medicines were more likely to report that sedatives ($\chi 2=10.85$, $p=0.001$) or anticholinergics ($\chi 2=9.84$, $p=0.002$) caused only mild or no cognitive decline

Conclusions

- Many GPs do not perceive a high likelihood of cognitive decline associated with sedative and anticholinergic medicines
- In keeping with behavioural theories, education to raise awareness of these adverse events may be required prior to or as part of interventions to improve practice

Veterans' MATES available online at: www.veteransmates.net.au

Medicines and dementia: identifying harms and improving outcomes

Libby s 47F

University of South Australia | Sansom Institute

Our current work

Veterans' MATES

Australian Government
Department of Veterans' Affairs

Using health data to improve practice

Medicine and Device Surveillance
CRE

Using health data to support medication safety

- How we have used health claims data to identify safety concerns of medicines
  - Harms that can happen with medicines used to treat dementia or symptoms associated with dementia
  - Medicines worsening dementia
  - Medicines associated with developing dementia

Why we need to do safety studies after marketing medicines

When medicines first reach the market, we know less than half of the medicines' side effects

- Trials are designed to show a medicine works
- They may identify common side effects
- They don't usually identify rarer side effects
- They don't provide information on people who've been excluded form the trials

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What kinds of harms are associated with medicines commonly used in dementia?

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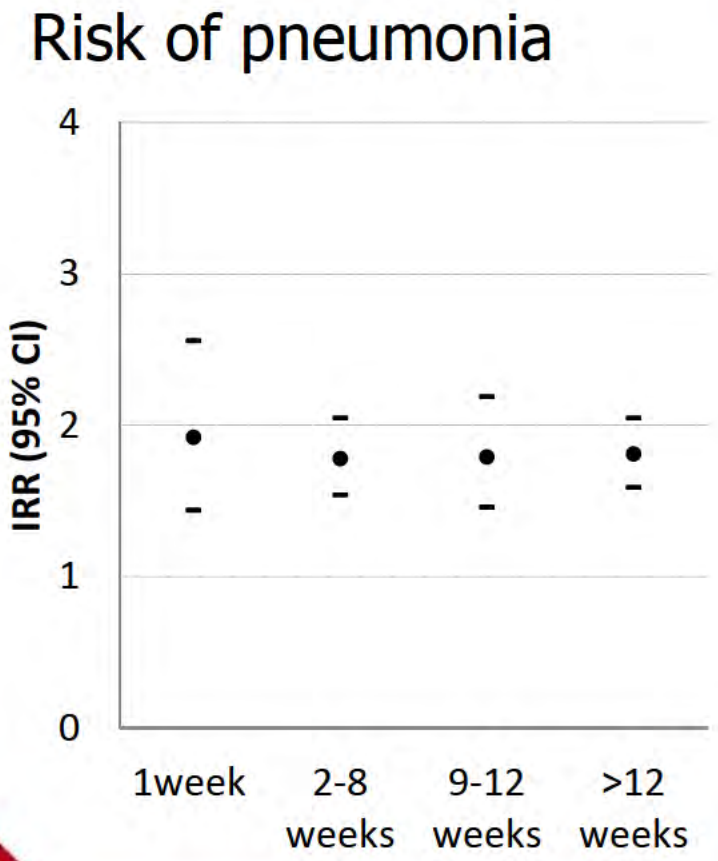
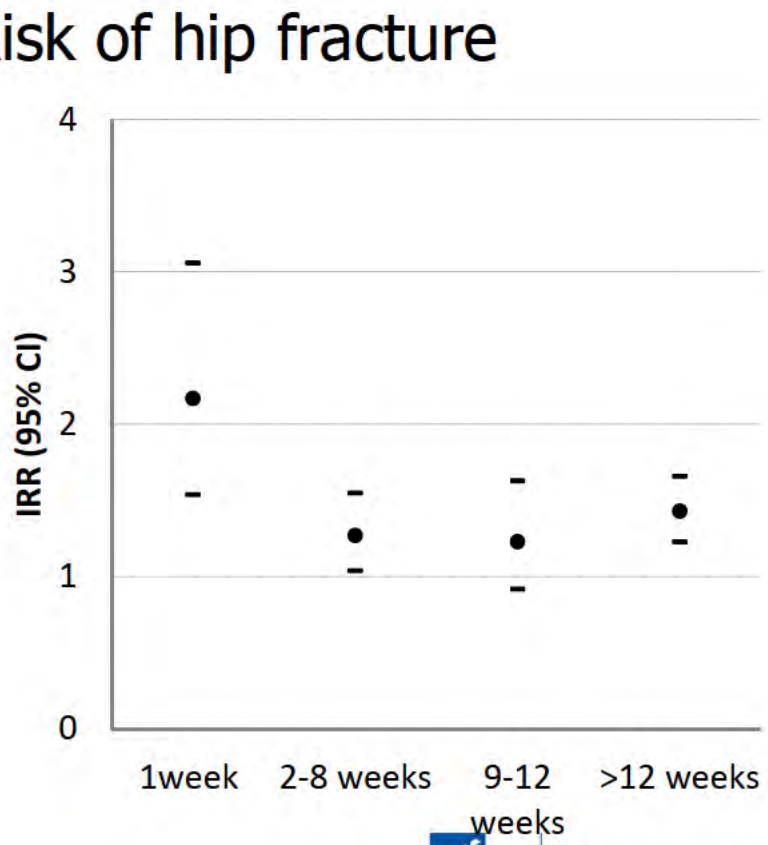
Antipsychotics and harm

- Antipsychotics are sometimes used to manage behavioural and psychological symptoms of Alzheimers' disease where non-pharmacological strategies have failed
- 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

- Randomised controlled trial data had shown that antipsychotics were associated with increased risk of death and stroke
- 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





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s 47F 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

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s 47F et al., Drug Saf. 2011

Can current medicine use contribute to dementia?

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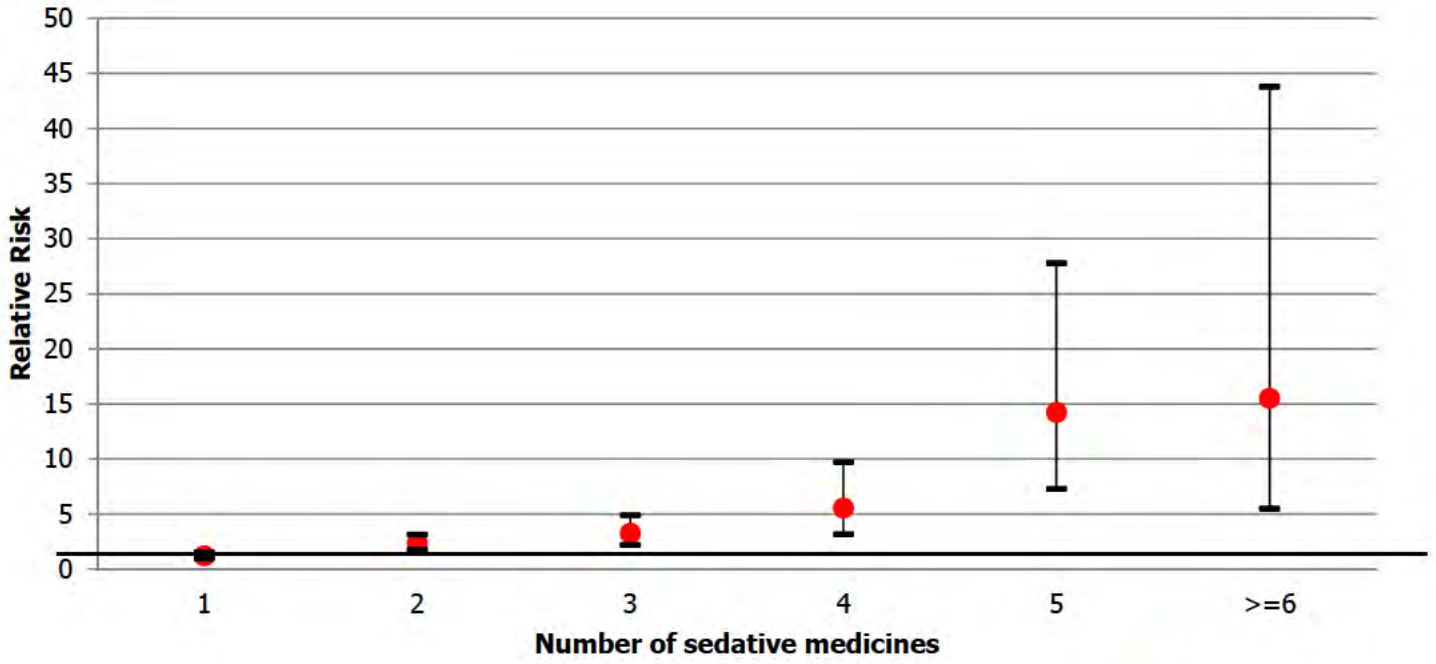
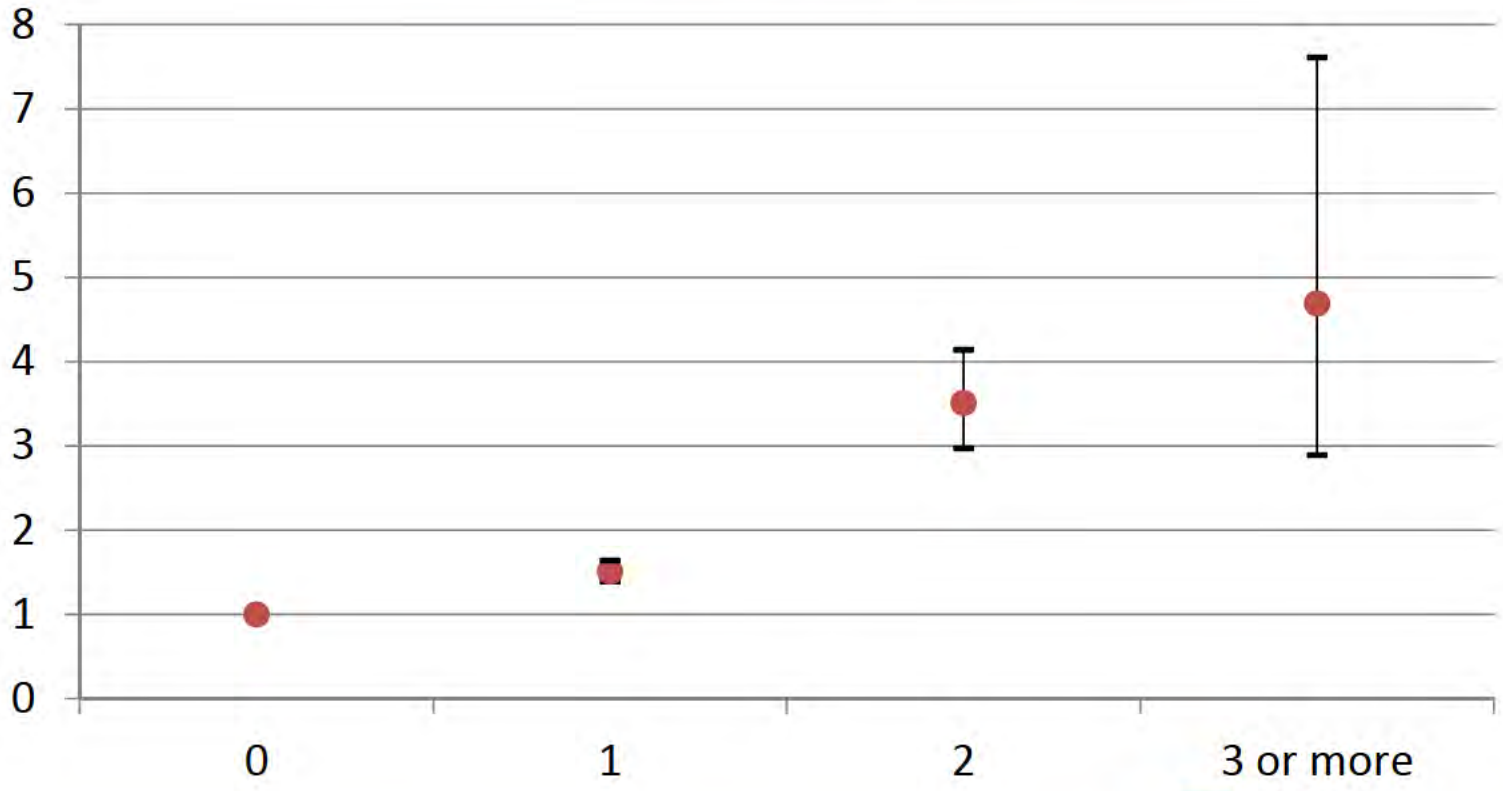
Multiple sedative medicine use increases risk of hospital admissions for confusion and delirium



Multiple anticholinergic medicines increase risk of hospital admissions for confusion and delirium



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J Am Geriatr Soc. 2014 Oct;62(10):1916-22

Can earlier medicine use contribute to dementia?

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Background

- Observational studies have suggested an increased risk of dementia for patients with PTSD
- USA study 180,000 veterans 55 years or older (Yaffe et al. Arch Gen Psychiatry 2010)
  - HR 1.8 (95% CI 1.70-1.85) for all veterans with a diagnosis of PTSD
- USA study 10,481 veterans 65 years or older (Qureshi et al. JAGS 2010)
  - OR 2.2 (95% CI 1.86-2.6) for PTSD and no combat injury
    - Combat injury seemed to be a modifying influence, with no statistically significant effect observed in those with combat injury
    - Unknown if due to differences in underlying resilience or differences in health treatments provided as a result of combat injury
- USA study, 180,000 veterans 55 years or older (Meziab et al., Alzheimers Dement 2014)
  - PTSD only — HR 1.52; 95%CI, 1.41–1.64
  - Prisoner of War only — HR, 1.61; 95%CI, 1.30–1.98
  - PTSD and prisoner of war — HR, 2.24; 95% CI, 1.72–2.92

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- Limitations of the previous observational research that they included veterans 65 years and over, some of whom may have been in prodromal phase of dementia.
- None of the previous research examined the influence of medicine use.
- Antipsychotics have been found to be associated with changes in brain structure in patients with schizophrenia and mood disorders.
- Antipsychotics have also been shown to be associated with cell death in animal models.

Arnone D et al, Br J Psychiatry 2009
Arnone D et al., Eur Neuropsychopharmacol 2012
Dean et al., Prog Neuropsychopharmacol Biol Psychiatry 2006

Post-traumatic stress disorder, antipsychotic use and dementia

- Aim: to determine the association between PTSD, antipsychotic use and development of dementia

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Study design

- Retrospective cohort study using Australian Government Department of Veterans' Affairs health claims data
- Cohort: Male Vietnam veterans aged 55 to 65 years at baseline with no record of dementia
- Outcome: Development of dementia during follow-up, with censoring for death or end of study

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The study cohorts

- Cohort 1
  - Had a hospitalisation for PTSD (F431) in the baseline period (01Jan2001 - 31Dec2002)
- Cohort 2
  - Those who had post traumatic stress disorder, as an accepted disability prior or during the baseline period and no hospitalisation for PTSD (F431) in the baseline period
- Cohort 3
  - Did not have PTSD identified by either the disability data or via a hospitalisation for PTSD
- All cohorts subsequently stratified by antipsychotic use

Adjustments made for

- Age at baseline
- Socioeconomic index of disadvantage (based on postcode)
- Hypertension, Diabetes (identified by medicine use)
- Benzodiazepine use
- Clinical depression (identified by hospital codes, disability file, or medicines)
- Myocardial infarction, Cancer, Cerebrovascular disease, History of tobacco use, Alcohol abuse , Other substance abuse, (identified by hospital codes or disability file)
- Sensitivity analysis: Excluded all veterans who developed dementia within 2 years of follow-up

Results (total sample n= 15,612)

PTSD hospitalisation	**Antipsychotic (n=171)**
	No antipsychotic (n=930)
PTSD disability	**Antipsychotic (n=322)**
	No antipsychotic (n=9344)
No PTSD	**Antipsychotic (n=106)**
	No antipsychotic (n=4739)

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Risk of dementia

	Unadjusted	Adjusted model
PTSD Hospitalisation v No PTSD Hospitalisation	2.0 (95%CI 1.3-3.0)	1.98 (95%CI 0.7-5.5)
PTSD Disability v No PTSD Disability	1.0 (95%CI 0.8-1.3)	0.6 (95%CI 0.2-1.95)
Antipsychotic v No Antipsychotic	2.9 (95%CI 1.9-4.5)	3.9 (95%CI 2.2-6.8)

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Risk of dementia

		Dementia N (%)	Unadjusted HR (95% CI)	Adjusted[a] HR (95% CI)
PTSD hospitalisation	**Antipsychotic**	8 (4.3)	4.1 (2.0 -8.5)	2.5 (1.2-5.4)
	NO antipsychotic	20 (2.2)	1.8 (1.1 – 3.0)	1.4 (0.8 -2.4)
PTSD disability	**Antipsychotic**	6 (1.7)	1.3 (0.5 -3.2)	1.1 (0.4-2.7)
	NO antipsychotic	124 (1.3)	1.1 (0.8 -1.4)	0.97 (0.7-1.3)
NO PTSD	**Antipsychotic**	10 (8.3)	6.9 (3.5 -13.1)	5.3 (2.6 -1078)
	No antipsychotic	78 (1.7)	1.0	1.0

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Risk of dementia

		Adjusted[a] HR (95% CI)	Antipsychotic dose DDD/person/day
PTSD hospitalisation	**Antipsychotic**	2.5 (1.2-5.4)	0.26
PTSD disability	**Antipsychotic**	1.1 (0.4-2.7)	0.20
NO PTSD	**Antipsychotic**	5.3 (2.6 -10.8)	0.50

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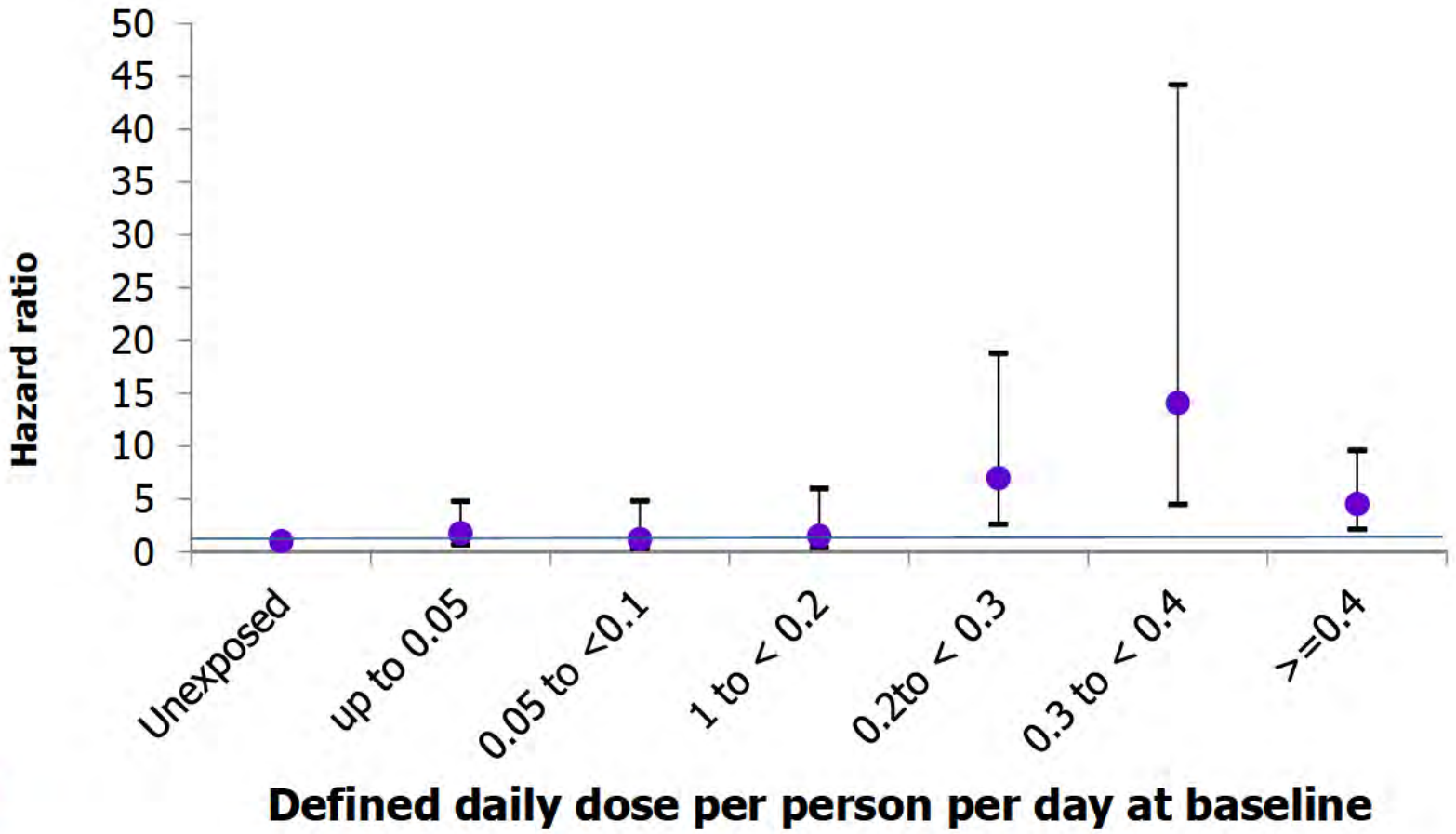
Risk of dementia by antipsychotic dose



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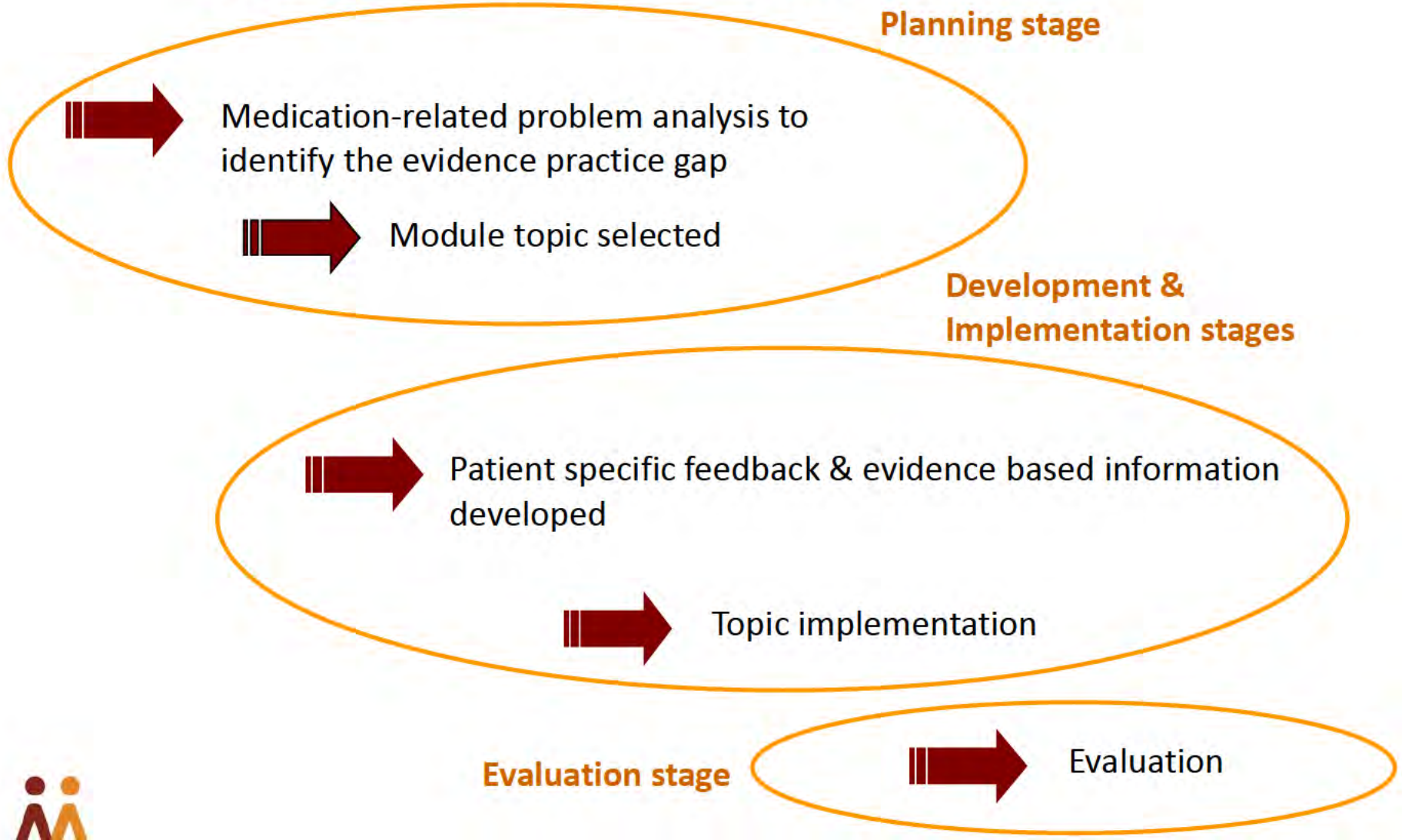
Veterans' MATES

- Funded by the Australian Government Department of Veterans' Affairs (DVA) since 2004
- Aims to improve medicine use and health outcomes for veterans
- A new funding agreement in place from 2016
- Utilises the DVA health claims data to plan, implement and evaluate interventions
- All interventions grounded in behavioural theories and supported by significant stakeholder engagement

Using the health claims data



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 are sent to members of the veteran community for whom the health topic is relevant.

Therapeutic Brief

www.veteransmates.net.au August 2016

Antipsychotic use in BPSD: limited benefits, high risks

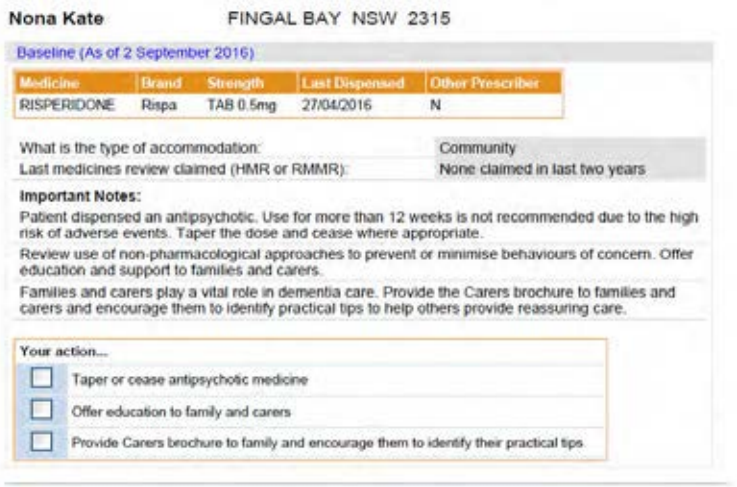
Behavioural and psychological symptoms of dementia (BPSD), often referred to as 'behaviours of concern', are common in people with dementia.[1-3] They can be distressing and difficult to manage.

Common behaviours of concern that respond poorly to treatment with an antipsychotic include verbal disruptions, disinhibited behaviours,

Debilitating effects of antipsychotic use can include increased sedation and confusion, cognitive decline, constipation, urinary retention,

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 prescribing an antipsychotic
- Ceasing the antipsychotic
- Family and carers need support too



Nona Kate FINGAL BAY NSW 2315

Baseline (As of 2 September 2016)

Medicine	Brand	Strength	Last Dispensed	Other Prescriber
RISPERIDONE	Rispa	TAB 0.5mg	27/04/2016	N

What is the type of accommodation:	Community
Last medicines review claimed (HMR or RMMR):	None claimed in last two years

Important Notes:

Patient dispensed an antipsychotic. Use for more than 12 weeks is not recommended due to the high risk of adverse events. Taper the dose and cease where appropriate.

Review use of non-pharmacological approaches to prevent or minimise behaviours of concern. Offer education and support to families and carers.

Families and carers play a vital role in dementia care. Provide the Carers brochure to families and carers and encourage them to identify practical tips to help others provide reassuring care.

Your action...

- ☐ Taper or cease antipsychotic medicine
- ☐ Offer education to family and carers
- ☐ Provide Carers brochure to family and encourage them to identify their practical tips

Modules targeting antipsychotic use in dementia implemented

- June 2007
- July 2016

Carers Brochure

Get the best from your medicines

www.veteransmates.net.au

DEMENTIA AND CHANGES IN BEHAVIOUR

Family members, friends and carers play an important role in supporting those living with dementia. This brochure is designed to help support you in caring for a person with dementia.

Many people living with dementia have changes in their behaviour at one time or another. Changes in the brain, changes in the person's environment, or the person feeling unwell can trigger these behaviours. People with dementia may wander, feel anxious, angry or frustrated, and behave in ways that others find embarrassing and socially unacceptable. For some people, certain behaviours increase in the afternoon or early evening. These behaviours are often not deliberate and might be the person trying to communicate their needs.

Whether you care for a loved one at home or support them living in an aged-care facility, there are certain strategies that might help. Many behaviours can be helped with the use of non-medicine options combined with good support from family, carers and the healthcare team.

In some cases, when the behaviour is very distressing or harmful, and nothing else seems to help, medicines may form part of the treatment plan.

Family members and those who care for someone living with dementia understand their loved ones, and their needs and preferences, best. You are often the first to notice changes in their behaviour and can help identify triggers as well as possible solutions.

If you are concerned about the behaviour of the person you are caring for contact the Dementia Behaviour Management Advisory Services (DBMAS)
Phone: 1800 699 799

Veterans' Medicines Advice and Therapeutics Education Services August 2016 1

Share your practical tips

Research from the TOPS 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).

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. Luckett K et al. Improving clinician-carer communication for safer hospital care: a study of the 'TOP 5' strategy in pe International Journal for Quality in Health Care 2015; 1-8.

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.

Date: / /

Carer's name:

Carer's Phone No: ( )

Getting to know:

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

NAME OF PERSON

Background/why:

Practical tip:

What will happen when followed:

Background/why:

Practical tip:

What will happen when followed:

Background/why:

Practical tip:

What

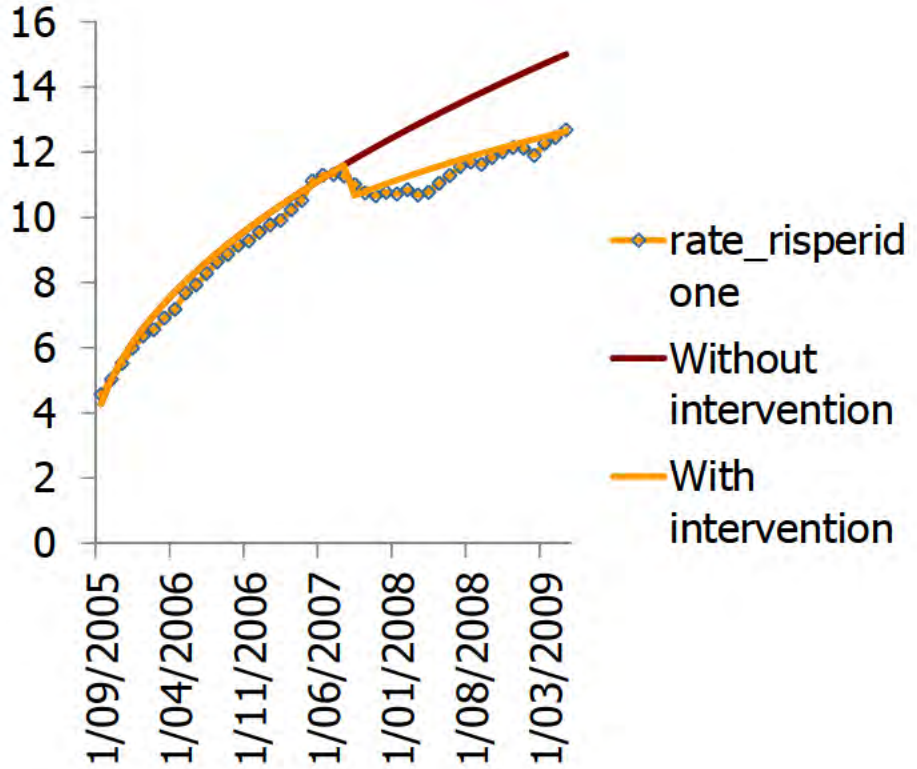
Background/why:

Veterans' MATES highlights

Reducing the use of antipsychotics in dementia: 2007 intervention

So what happened?

- ✓ 14.5% decrease at time of intervention
- ✓ Further 3% monthly decrease compared with trend prior to intervention



Veterans' MATES highlights

Reducing the use of antipsychotics in dementia: 2007 intervention

So what happened?

2007 intervention

- ✓ No inappropriate therapeutic shift to hypnotics

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

Factors contributing to success

- Significant stakeholder engagement
- Data driven and evidence based interventions
- Interventions are grounded in behavioural theory; only target identified problems, target one behaviour at a time
- Repeated interventions over-time
- Independently audited data and security standards

The S.A.F.E approach to warfarin therapy

Lisa s 47F Andrew s 47F Libby s 47F

The S.A.F.E. approach to warfarin therapy

- **S**election of patients for warfarin therapy by assessing individual risk/benefit
- **A**wareness of factors influencing warfarin effect
- **F**requent monitoring of international normalised ratio (INR)
- **E**ducation for patients

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

...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' MATES

8 steps to taking warfarin

Get the best from your medicines

7

Veterans' Medicines Advice and Therapeutics Education Services, Nov 2008

www.veteransmates.net.au

Warfarin use in Australia 2009

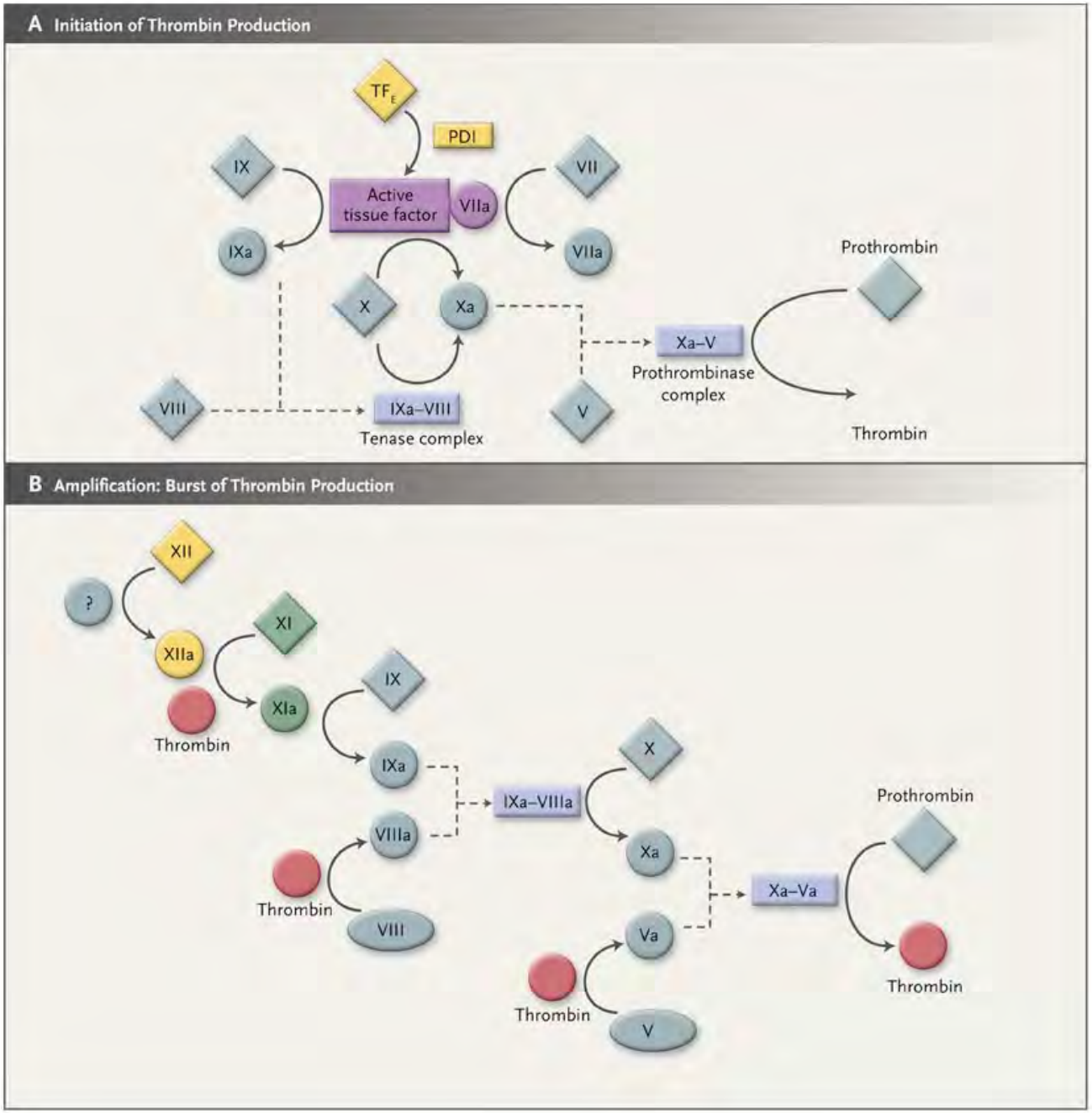
- Estimate: 145,000 Australians used warfarin
- 2,610,786 warfarin prescriptions dispensed
  - 2,356,787 PBS
  - 253,999 RPBS
  - Total PBS/RPBS cost $23,004,043
- 4,515,743 INR tests
  - 816 tests per 100,000 population
  - Total Medicare cost $59,534,562

Warfarin indications

- Prevention of venous thromboembolism
- Prevention of thromboembolism in those with prosthetic heart valves
- Prevention of stroke in patients with previous MI and increased embolic risk
- Patients with atrial fibrillation at high risk of:
  - stroke (primary or secondary prevention)
  - thromboembolism

Mechanism of action

- Inhibits synthesis of vitamin K-dependent clotting factors (II, VII, IX, X) and the antithrombotic factors protein C and protein S.


A Initiation of Thrombin Production
TF
PDI
IX
Active tissue factor
VIIa
VII
IXa
VIIa
X
Xa
Prothrombin
Xa–V
Prothrombinase complex
VIII
IXa–VIII
Tenase complex
V
Thrombin
B Amplification: Burst of Thrombin Production
XII
?
XIIa
XI
XIa
Thrombin
IX
IXa
IXa–VIIIa
X
VIIIa
Xa
Prothrombin
Xa–Va
Thrombin
VIII
Va
Thrombin
V
Thrombin

Selection of patients

- Assess risks of a thromboembolic event
  - Stroke
- Assess risks of major bleeding
- Take into account
  - contraindications
  - patient preference
  - ability to comply with treatment and monitoring

Risk of stroke

Risk factor	Estimated stroke risk per year
Valvular atrial fibrillation	15% - 20%
Non-valvular AF	2% - 18%
Transient ischaemic attack	5% - 7%
Previous stroke	4% - 5%
Hypertension	2% - 3%
Smoking, diabetes, cardiovascular disease	1% - 2%

Assessing stroke risk in AF

- Increased stroke risk amongst patients with AF and
  - Prior stroke or TIA
  - Hypertension
  - Advanced age
  - Diabetes
- Other risk factors: (INTERSTROKE study)
  - Current smoker, abdominal obesity, unhealthy cardiovascular diet, high alcohol intake, stress, depression, low physical activity

Assessing stroke risk in AF

- Numerous risk stratification schemes
  - Based on risk factors for stroke
- Generally classify patients as low, moderate or high risk
  - Low risk: treat with aspirin
  - Moderate risk: aspirin or warfarin
  - High risk: treat with warfarin
    - Benefits of warfarin use outweigh bleeding risk

Stroke risk reduction with warfarin use

- Relative risk reduction 62%
- Absolute risk reduction
  - Primary prevention: 2.7%
  - Secondary prevention: 8.4%
- ...but 0.3% absolute risk increase bleeding
- Another way of putting it:
  - If you treat 1000 AF patients with warfarin rather than aspirin for one year = 23 strokes prevented, 9 major bleeds

Assessing bleeding risk on warfarin

- Predictors of major bleeding
  - High INR levels
    - INR ≥4 compared to lower INR: 19.34 times more likely to have a bleed
  - Increasing age
    - Patients aged ≥80 years compared to <80 years: 2.75 times more likely to have a bleed
  - Recent initiation
    - Less than 90 days since initiation compared to later: 3.31 times more likely to have a bleed

Assessing bleeding risk on warfarin

- Poorly controlled hypertension
- Other serious co-morbidities
- Polypharmacy
- Co-prescription of NSAIDs or aspirin
- Social factors – dementia, falls

Assessing bleeding risk: The Outpatient Bleeding Risk index

Bleeding risk factors	Points
Age ≥ 65 years	1
History of stroke	1
History of GI bleed	1
Recent myocardial infarction	1 point maximum if any of these risk factors present
Haematocrit < 30%	
Serum creatinine > 133µmol/L	
Diabetes	

Low bleeding risk: 0 points
Intermediate risk: 1 – 2 points
High bleeding risk: 3 – 4 points

Contraindications to warfarin use

- Any condition/circumstance where risk of bleeding > benefits of anticoagulation
  - Haemorrhagic tendencies/blood dyscrasias
    - Severe, uncontrolled hypertension
    - Severe liver disease
      - Chronic alcohol abuse
    - Severe thrombocytopenia
  - Surgery – recent or planned
  - Pregnancy

Patient preferences

- “informed dissent” – patients may be aware of the benefits, but decline treatment due to
  - Inconvenience of dosing adjustments
  - Inconvenience of regular INR tests
  - Dietary restrictions
  - Bleeding risk
  - Under-appreciation of risk of stroke

Ability to comply with treatment and monitoring

- Patients may be unwilling or unable to comply with warfarin monitoring
  - Cognitive impairment
  - Psychosis
  - Inability to access services

Awareness of factors influencing warfarin effect

- Age
  - Elderly at risk of unstable response to warfarin
  - May require lower initial doses

Awareness of factors influencing warfarin effect

- Drug interactions
  - Can be unpredictable
  - Inhibition or induction of warfarin metabolism
  - Potentiation of antiplatelet effects
    - Aspirin, NSAIDs
- Avoid concurrent use if possible
- If not possible, monitor INR frequently

Common drug interactions: increased bleeding risk

- Antibiotics
  - In particular co-trimoxazole, macrolides, metronidazole, quinolones
- SSRIs
  - Even if INR within normal range
- Azole antifungals – including gels
- Amiodarone
  - Long half life, interaction may persist even with amiodarone cessation

Risk of major bleeding with interacting medicines

	Interaction frequency	Adjusted rate ratio	Number needed to harm
Amiodarone	18.2%	3.33 (1.38 – 8.00)	11
Low-dose aspirin	9.9%	1.44 (1.00 – 2.07)	55
Clopidogrel	7.1%	2.23 (1.48 – 3.36)	18
Aspirin + clopidogrel	1.1%	3.44 (1.28 – 9.23)	10
Antibiotics	67.0%	2.34 (1.38 – 8.00)	17
Macrolides	19.5%	3.07 (1.37 – 6.90)	12
Trimethoprim/ sulfamethoxazole	11.5%	5.08 (2.00-2.88)	6

Common drug interactions: decreased warfarin effect

- Antiepileptic medicines
  - carbamazepine, phenobarbitone, phenytoin
  - Increased warfarin metabolism
- Raloxifene
- St Johns Wort

GP may be unaware potentially interacting medicines are being used

- e.g. interacting medicines initiated in hospital
  - A quarter of patients come to the pharmacy within 2 days of leaving hospital, before they visit their GP
  - 69% of doctors medication history records differ to the medicines the patient says they use
- Patient may not be aware of potential for drug interactions
  - 93% of patients with INR>6 unaware that warfarin can interact with other medicines

Other interactions with warfarin

- Diet
  - Avoid drastic changes in consumption of Vitamin K rich foods:
  - Beetroot, broccoli, lettuce, cabbage, liver, spinach; soybean, canola and olive oils.
- Illness
  - especially conditions affecting liver function
    - e.g. acute exacerbations of CHF or COPD
  - Vomiting, diarrhoea, decreased appetite
    - Decreased vitamin K absorption

Frequent INR monitoring

- Essential to ensure INR within range
- Guides warfarin dosing
- Most warfarin patients: INR between 2-3
- If INR ≥ 4 – bleeding risk ⇈
- If INR <2 – ischaemic stroke risk ⇈

Management of raised INR

- Many different recommendations
  - Local guidelines should be followed if they exist

Table: Guidelines for the management of an elevated INR

Clinical setting	Action
INR < 5.0 Bleeding absent	▪ Lower the dose or omit the next dose of warfarin. ▪ Resume therapy at a lower dose when the INR approaches therapeutic range. ▪ If the INR is only minimally above therapeutic range (up to 10%), dose reduction may not be necessary.
INR ~ 5.0–9.0* Bleeding absent	▪ Cease warfarin; consider reasons for ↑ INR and patient-specific factors. ▪ If bleeding risk is high, give vitamin K1 (1.0–2.0mg orally or 0.5–1.0mg IV) †. ▪ Measure INR within 24 hrs, resume warfarin at a reduced dose once INR is in therapeutic range.
INR > 9.0 Bleeding absent	▪ Where there is a ***low risk*** of bleeding ▪ Cease warfarin, give 2.5–5.0mg vitamin K1 orally or 1.0mg IV ▪ Measure INR in 6-12 hrs & resume warfarin at a reduced dose once INR < 5.0. ▪ Where there is ***high risk*** of bleeding‡ ▪ Cease warfarin, give 1.0mg vitamin K1 IV. ▪ Consider Prothrombinex-HT (25–50 IU/kg) and FFP (150–300mL) ▪ Measure INR in 6-12 hrs, resume warfarin at a reduced dose once INR < 5.0.
Any clinically significant bleeding where warfarin induced coagulopathy is considered a contributing factor	▪ Cease warfarin therapy, give 5.0–10.0mg vitamin K1 intravenously, as well as Prothrombinex-HT (25–50 IU/kg) and fresh frozen plasma (150–300mL), assess patient continuously until INR < 5.0, and bleeding stops.§ *or* ▪ If fresh frozen plasma is unavailable, cease warfarin therapy, give 5.0–10.0mg vitamin K1 intravenously, and Prothrombinex-HT (25–50 IU/kg), assess patient continuously until INR < 5.0, and bleeding stops.§ *or* ▪ If Prothrombinex-HT is unavailable, cease warfarin therapy, give 5.0–10.0mg vitamin K1 intravenously, and 10–15mL/kg of fresh frozen plasma, assess patient continuously until INR < 5.0, and bleeding stops.§

* Bleeding risk increases exponentially from INR 5 to 9, ∴ INR ≥ 6 should be monitored closely.
† Vitamin K effect on INR can be expected within 6-12 hours.
‡ Examples of patients with a high bleeding risk:
- active gastrointestinal disorders (such as peptic ulcer or inflammatory bowel disease)
- those receiving concomitant antiplatelet therapy
- those who underwent a major surgical procedure within the preceding two weeks, and
- those with a low platelet count.

§ In all situations carefully reassess the need for ongoing warfarin therapy.

From consensus guidelines Australian Society of Thrombosis and Haemostasis 2004

Tips for INR monitoring

- Initiation of warfarin: monitor daily or second daily until INR stable and in range
  - 4 weekly testing when stabilised
- Monitor INR more frequently if changes in
  - health – e.g. worsening heart failure or liver disease, infection, GI upset
  - medicines – e.g. initiation or cessation, dose change
  - diet, in particular vitamin K rich foods
  - alcohol consumption

INR self monitoring

- Measure INR values from capillary finger stick sample
  - Results within minutes
  - May facilitate better clinical decision making, better patient adherence and satisfaction
    - Improved clinical outcomes
- Patient/carer performs the tests
  - Results provided to GP
    - Warfarin dose selected by doctor

INR self monitoring

- Project to develop a pharmacy-centred pathway for INR self monitoring
  - Hobart and Wagga Wagga
    - 13 pharmacies, 28 consumers
  - Pharmacists training consumers
    - Home medicines review

Key findings of the project:

- Patients were willing to self monitor
- INR was within therapeutic range for more of the time while patients self monitored
  - 55% of INR tests in range prior to self monitoring
  - 72% of INR tests in range while self monitoring
    - Likely associated with improved outcomes
- Self monitoring associated with more frequent INR testing
- Improved warfarin knowledge

Barriers to INR self monitoring

- Monitors are expensive
- No funding pathways to support training
  - Pharmacist training
  - Consumer training

- ?Funding may enable INR self monitoring to become more widespread

Educating patients

- Education should be systematic and ongoing
- Whose responsibility is it?
  - 39% of GPs think its their responsibility
  - 61% of GPs think its the responsibility of other health professionals
- How many patients get education?
  - 43% - at time of initiation
  - 15% - got education at some other point in time
  - 43% - didn't recall getting any warfarin education

What kind of information should be provided?

- How warfarin works
  - How it prevents clot formation and strokes
- How INR works and why frequent monitoring is important
- Why the dose of warfarin may change
- Common signs of bleeding
- Importance of letting all health care providers know they are taking warfarin
  - All doctors, pharmacist, dentist

What kind of information should be provided?

- Importance of talking to pharmacist/doctor before commencing any new medicines
  - Rx, OTC (incl. medicines from the supermarket, e.g. ibuprofen), herbal / complementary medicines
- Importance of always using the same brand of warfarin
- When to take it, what to do if a dose is missed
- Alcohol consumption, diet
- Potential duration of therapy

How can we maximise benefit, minimise harm with warfarin use?

- INR monitoring
- Awareness of factors influencing warfarin effect
  - Age, dose, drug-drug interactions, diet changes, illness
- Patient education
- **Home medicines review**

Benefits of home medicines review for warfarin patients

- Veterans aged ≥ 65 dispensed warfarin
- Retrospective cohort study, comparing
  - Exposed = veterans dispensed warfarin, had a HMR
  - Unexposed = 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

	Exposed n = 816	Unexposed n = 16,320	P-value
Male gender (%)	64	65	0.37
Age in years(SD)	81.6 (4.2)	81.4 (4.6)	0.37
Number of:			
Co-morbidities (SD)	7.1 (2.4)	6.0 (2.4)	< 0.0001
Prescriptions	88 (65-114)	68 (47-95)	< 0.0001
Prescribers:			
≤2 (%)	21	28	< 0.0001
3-4 (%)	34	37	
≥5 (%)	45	36	
Pharmacies	2 (1 – 3)	2 (1 – 3)	0.28
Prior hospitalisations:			
0 (%)	38	42	0.02
1 (%)	25	24	
≥2 (%)	37	34	

Improvements in 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

Home medicines reviews delay time to hospital admission for bleeding amongst those dispensed warfarin

- ...but the benefit is only present in the 2-6 months post HMR
- This suggests that HMR should occur 6 monthly for high risk patients dispensed warfarin

Conclusions

- Age alone is not a contraindication to warfarin
  - But, older patients often require lower doses and more frequent INR monitoring
- Older people are at increased risk of bleeding
  - Important to assess bleeding risk, monitor INR
- Patients need education about the risks, benefits, adverse effects, monitoring
- Home medicines review can improve outcomes

More information

- www.veteransmates.net.au
  - Topic 17: Warfarin
- http://www.anticoagulation.com.au
  - University of Tasmania: Unit for Medication Outcomes Research and Education

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Department of Veterans' Affairs

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Veterans' Medicines Advice and Therapeutics Education Services

The Australian veteran population is on average 80 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.

Topic 23: Glaucoma and co-morbidites now available

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.

Veterans' MATES uses data from prescription claims to identify members of the veteran community who may be at risk of medication misadventure and provides information which may assist in improving the management of their medicines. This information is tailored to an individual doctor's practice. The log-on facility allows registered practitioners to obtain their practice specific information. This information is available for doctors only.

Veterans' MATES topics cover a range of conditions and medicines and have included: warfarin, diabetes, insomnia, heart failure, falls, gout and medicines review.

Click on the following links for:

- 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
- Further information on Veterans' MATES
- Download current Pharmacy response form

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Topic 23 - Glaucom

VETERAN BROCHURE -

Take a look at glaucoma t glaucoma eye drop medicines, potential side effects and tips to get the best from th talk to their doctor or pharmacist about any concerns they may have regarding their gl

Download Veteran Broch

THERAPEUTIC BRIEF - D

Impact of glaucoma man erent drugs used in the management of primary open angle glaucoma, highlight how dr ar and respiratory disease and suggest how to minimise systemic absorption by opt

Download Therapeutic E

Topic Key Words:

Glaucoma, Eye drops, Tim amil, Cardiovascular, Respiratory, Bronchoconstriction, Prostaglandin analogues, S

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TOPICS

Select a Topic: Topic 17 - Warfarin

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Topic 17 - Warfarin - distributed: November 2008

VETERAN BROCHURE - DISTRIBUTED: JANUARY 2009

8 Steps To Taking Warfarin is a brochure providing information on how veterans can play a key role in the management of their Warfarin therapy by understanding how Warfarin works and affects their lifestyle. The brochure encourages veterans to discuss Warfarin therapy with their doctor and to record the results of their blood tests. An INR Record Sheet is also available for download.

Download Veteran Brochure *(PDF 245Kb)*

RECORD SHEET - DISTRIBUTED: JANUARY 2009

Download Record Sheet *(PDF 135Kb)*

THERAPEUTIC BRIEF - DISTRIBUTED: NOVEMBER 2008

The S.A.F.E. Approach To Warfarin Therapy contains information for doctors and pharmacists on Warfarin as a highly effective medicine and outlines how careful patient selection, regular therapeutic monitoring and systematic on-going patient education will improve the day to day management of veterans using Warfarin therapy and reduce the risk of bleeding.

Download Therapeutic Brief *(PDF 300Kb)*

Topic Key Words:

Warfarin, atrial fibrillation, INR, Coumadin, Marevan, stroke, AF, anticoagulation, aspirin, bleeding risk, vitamin K, safety alert bracelet, blood, HMR

Web Site

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UMORE Medication Outcomes Research and Education

Home ▸ Welcome

Welcome

Welcome to www.anticoagulation.com.au This website has been designed as a useful source of information for consumers and health professionals. We aim to provide complete, easy to understand information on all aspects of warfarin therapy and INR self-monitoring. Our goal is to improve access to warfarin resources for everybody.

About Warfarin

There's a lot you need to know to get the most out of your warfarin therapy. This section contains information on how warfarin works, and tips for managing warfarin safely and effectively. Click here to learn more.

Self Monitoring

Self Monitoring is a different way of keeping a check on your warfarin therapy. This section explains the basics of INR self-monitoring, and may help you decide whether this could be an option for you.

Fact Sheets

Sometimes information on warfarin can be hard to find, so we've done our best to find it for you. This section contains a range of useful warfarin related downloads. View Fact Sheets

Last Updated: 25 Feb 2010

www.anticoagulation.com.au

About Warfarin

- Warfarin ID card
- Warfarin and you information leaflet
- One page guide to warfarin treatment
- INR record form
- INR record book

Self-Monitoring

- INR record book for self-monitoring
- Self-monitoring diagram

Last Updated: 24 Feb 2010

Case study: Sprouting a warfarin interaction

BMJ 2010;341:c2621

- A 70 year old woman admitted to hospital with increasing shortness of breath and feeling generally unwell.
  - symptom onset coincided with a mild worsening of angina
- Past medical history:
  - recurrent pulmonary emboli
    - Lifelong warfarin 15 mg/day
      - INR stable and therapeutic
  - episode of severe pneumonia (ICU)
  - exertional angina (GTN spray)

- She was on no additional medication, and described herself as being "very healthy"
  - took great pride in maintaining a nourishing diet rich in fruit and vegetables, in particular sprouts and cabbage
- On examination the patient was alert and orientated.
  - Respiratory rate was mildly increased, but blood pressure and oxygen saturations were normal.
  - She had right sided bronchial breathing, and plain film radiographs showed right perihilar consolidation.

- She was treated for community acquired pneumonia with intravenous cefuroxime and oral doxycycline, as per local hospital trust guidelines.
  - Two days after admission the patient showed clinical and subjective improvement.
- The haematology laboratory then phoned the doctor on call to say that the patient's INR was greater than 15.
  - There was no evidence of active bleeding.

- Following advice from a haematologist, the patient was treated with vitamin K.
- Over the next few days the INR decreased until the patient was deemed fit for discharge.

Questions

What are the possible causes of this patient's raised INR?

- Incorrect dosing?
- Antibiotics?
- Diet?
  - Diet changes during hospital admission most likely cause in this patient

How should a raised INR be managed in the acute setting?

- Major bleeding:
  - Withhold warfarin
  - Intravenous vitamin K
- Raised INR, no bleeding:
  - Withhold warfarin
  - Oral vitamin K

How should warfarin be re-commenced in this patient?

- Follow local guidelines

Warfarin Loading Protocol

	INR	Dose for age (mg) <65 years*	Dose for age (mg) ≥65 years OR significant medical conditions*	Monitoring
Day 1**	<1.2	5	3	**Baseline INR & LFTs** (If on heparin therapy and APTT > 80 seconds, INR may be falsely elevated)
	≥1.2	**If baseline INR ≥1.2 – seek specialist physician or haematologist advice prior to warfarinisation.**		
Day 2**	<1.6	5	3	INR (in AM)
	≥1.6	1	1	
Day 3	<1.8	5	3	**Daily INRs** (in AM) until INR is within the target range for 2 consecutive days. If patient is discharged prior to stabilisation, daily monitoring should be continued by the GP.
	1.8 – 2.0	4	3	
	2.1 – 2.5	3	3	
	2.6 – 3.0	2	2	
	3.1 – 3.5	1	1	
	>3.5	0	0	
Day 4	<1.6	6	4	GP & patient need to be informed of requirement for monitoring. GPs can contact RHH Haematologists for advice on warfarin stabilisation.
	1.6 – 1.9	5	3	
	2.0 – 2.6	3	3	
	2.7 – 3.5	1	1	
	3.6 – 4.0	0	0	
	>4.0	0	0	
Day 5 +	**Use Day 4 protocol as a guide** – If INR remains low (<2.0) then increased doses may be needed (Consult Haematology for advice).			

* **Significant medical conditions**: heart failure, liver disease, severe infection, reduced oral intake, broad-spectrum antibiotics.

** **NOTE: Reduce dose by at least 30% for the first 2 days if on amiodarone or sulphonamide antibiotics (including cotrimoxazole).**

Table: Age Adjusted Warfarin Loading Protocol*

Day	INR	Dose (mg) according to age (yrs)			
		≤ 50 yrs	51–65 yrs	66–80 yrs	> 80 yrs
1	< 1.4	10	9	7.5	6
2 (16hrs after 1st dose)	≤ 1.5	10	9	7.5	6
	≥ 1.6	0.5	0.5	0.5	0.5
3 (16hrs after 2nd dose)	≤ 1.7	10	9	7.5	6
	1.8–2.3	5	4.5	4	3
	2.4–2.7	4	3.5	3	2
	2.8–3.1	3	2.5	2	1
	3.2–3.3	2	2	1.5	1
	3.4	1.5	1.5	1	1
	3.5	1	1	1	0.5
	3.6–4.0	0.5	0.5	0.5	0.5
	> 4	0	0	0	0
4 (16hrs after 3rd dose)	≤ 1.5	10–15	9–14	7.5–11	6–9
	1.6	8	7	6	5
	1.7–1.8	7	6	5	4
	1.9	6	5	4.5	3.5
	2.0–2.6	5	4.5	4	3
	2.7–3.0	4	3.5	3	2.5
	3.1–3.5	3.5	3	2.5	2
	3.6–4.0	3	2.5	2	1.5
	4.1–4.5	Omit next dose, then			
		1–2	0.5–1.5	0.5–1.5	0.5–1
	> 4.5	**Nil. Hold dose.**			

**Roberts GW, Gallus AS, Druskeit T et al. Comparison of an age adjusted warfarin loading protocol with empirical dosing and Fennerty's protocol. Aust NZ J Med. 1999; 29: 731-6.*

NB. This table is meant only as a guide, and was developed for ***non-critically ill*** patients, whose pharmacodynamics may differ significantly from the intensive care population. INR must be checked daily.

How should warfarin be re-commenced in this patient?

- Follow local guidelines
- High risk patient – use low molecular weight heparin until INR in therapeutic range
- Monitor INR frequently

Patient outcome

- Following normalisation of INR, the patient was restarted on warfarin with two initial doses of 5 mg.
- While INR was subtherapeutic, low molecular weight heparin was used to reduce the risk of further thromboemboli.
- She was educated on the implications of diet on anticoagulation, in particular the effect of foods containing high levels of vitamin K.

Using observational evidence to support decision making

What decisions?

- Regulator
  - Should we register this medicine?
  - Should we withdraw this medicine?
  - Is the product information adequate?
- Payer
  - Should we subsidise this medicine?
- Health Service Provider
  - Do I prescribe this medicine?
  - Which medicine should I prescribe?
- Public Health Promotion
  - Should we intervene?

How are decisions made?

- Decisions to approve for market (regulator) and listing on the pharmaceutical benefits scheme (payer) are made based on gold standard evidence, Randomised Controlled Trial
- When medicines first reach market most of the medicines adverse reactions are unknown
- Why do safety issues go undetected in RCTs?
  - small sample sizes, underpowered to detect rare but serious adverse events
  - short-term follow-up, may not detect longer-term adverse events
  - performed in patient populations different than those who eventually receive treatment once the medicine is on the market

How can observational studies help?

- Large populations
  - Ability to detect rare events
- Data Collected longitudinally
  - Extended follow-up
- Effects of medications in populations excluded from RCTs
  - Who is treated in practice and how do they differ from those in the trials
- Effectiveness and safety of medicines as used in routine clinical practice
  - Variation in patients, clinicians, health care systems etc

Examples of how can observational evidence can support decision making?

1. Rapid signalling of safety issues
   - Early detection of safety issues
   - Examples:
     1. Anti-inflammatory medicines and heart attack
     2. Proton-pump inhibitors and pneumonia
2. Inform policy makers and clinicians about the 'real world' effectiveness of medicines widely available on the market
   - Identification of safety issues in high-risk populations, or those excluded from RCTs
   - Examples:
     1. NSAIDs in patients with heart failure
     2. Beta-blockers for heart failure in the elderly

Rapid signalling of safety issues

Prescription symmetry analysis

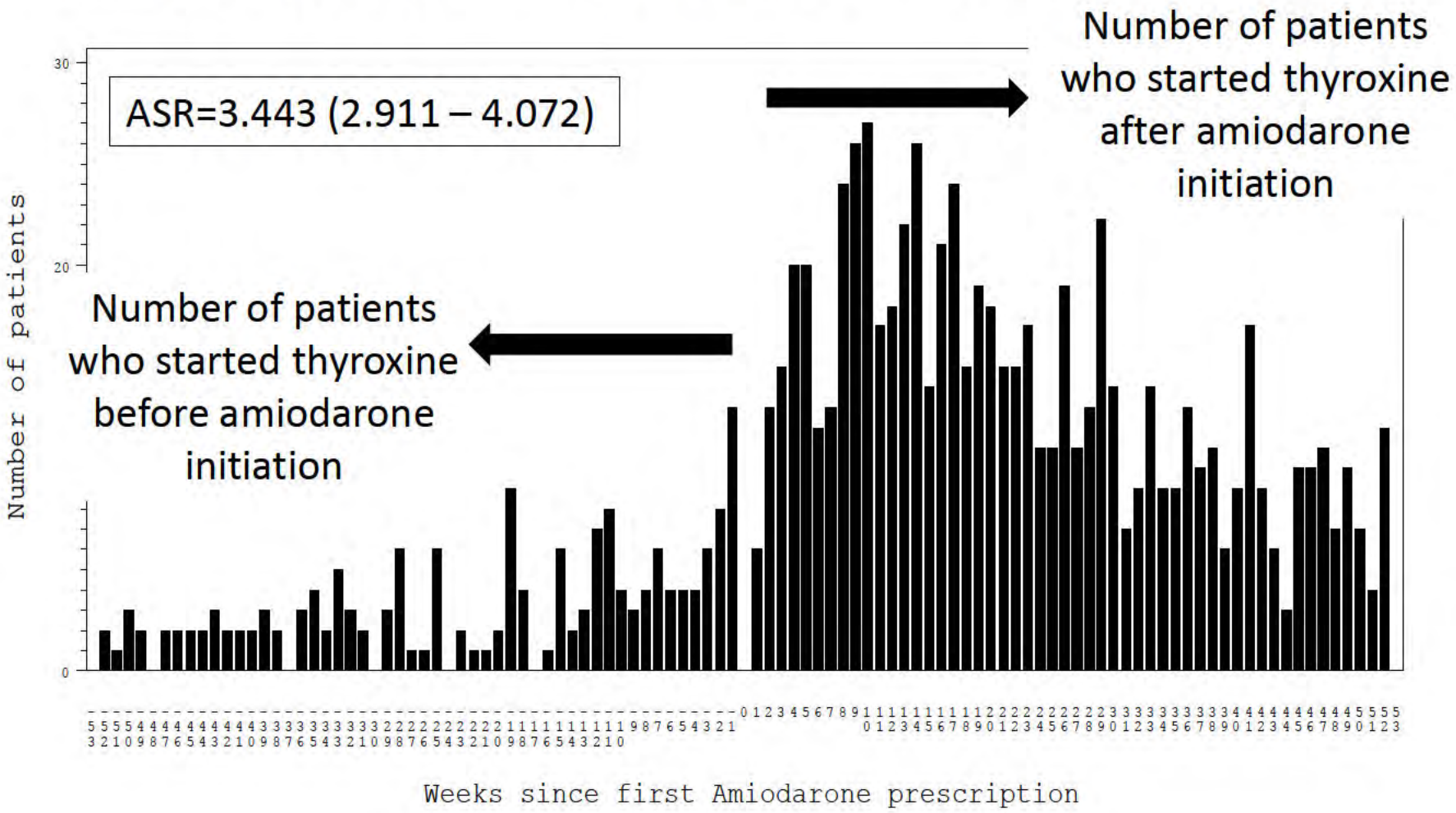
- Simple signaling tool
- Algorithm that detects events that occur more frequently after a medicine is prescribed than before it is prescribed
- Use prescription data only
- Examines the likelihood of one prescription being dispensed prior to another for the same person

ADE → **Medicine** → ADE

- If Drug A causes Adverse Drug Event, expect an excess of persons having the adverse event after starting the medicine

Hallas J. Evidence of depression provoked by cardiovascular medication: A prescription sequence symmetry analysis. Epidemiology 1996; 7: 478-84

Example: hypothyroidism as a result of amiodarone treatment



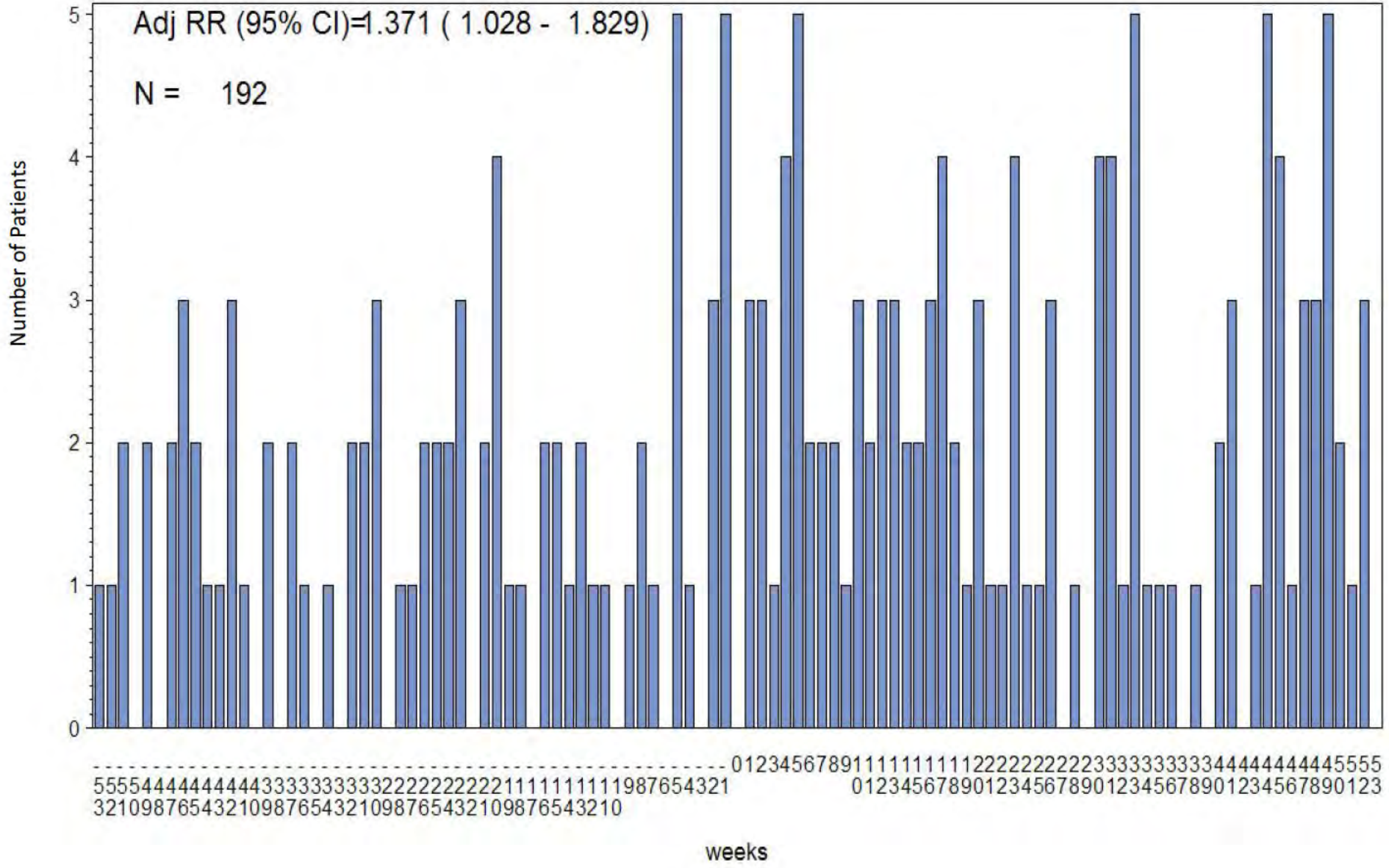
Rofecoxib and myocardial infarction

How might this help decision making at the time of the decision?

- 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

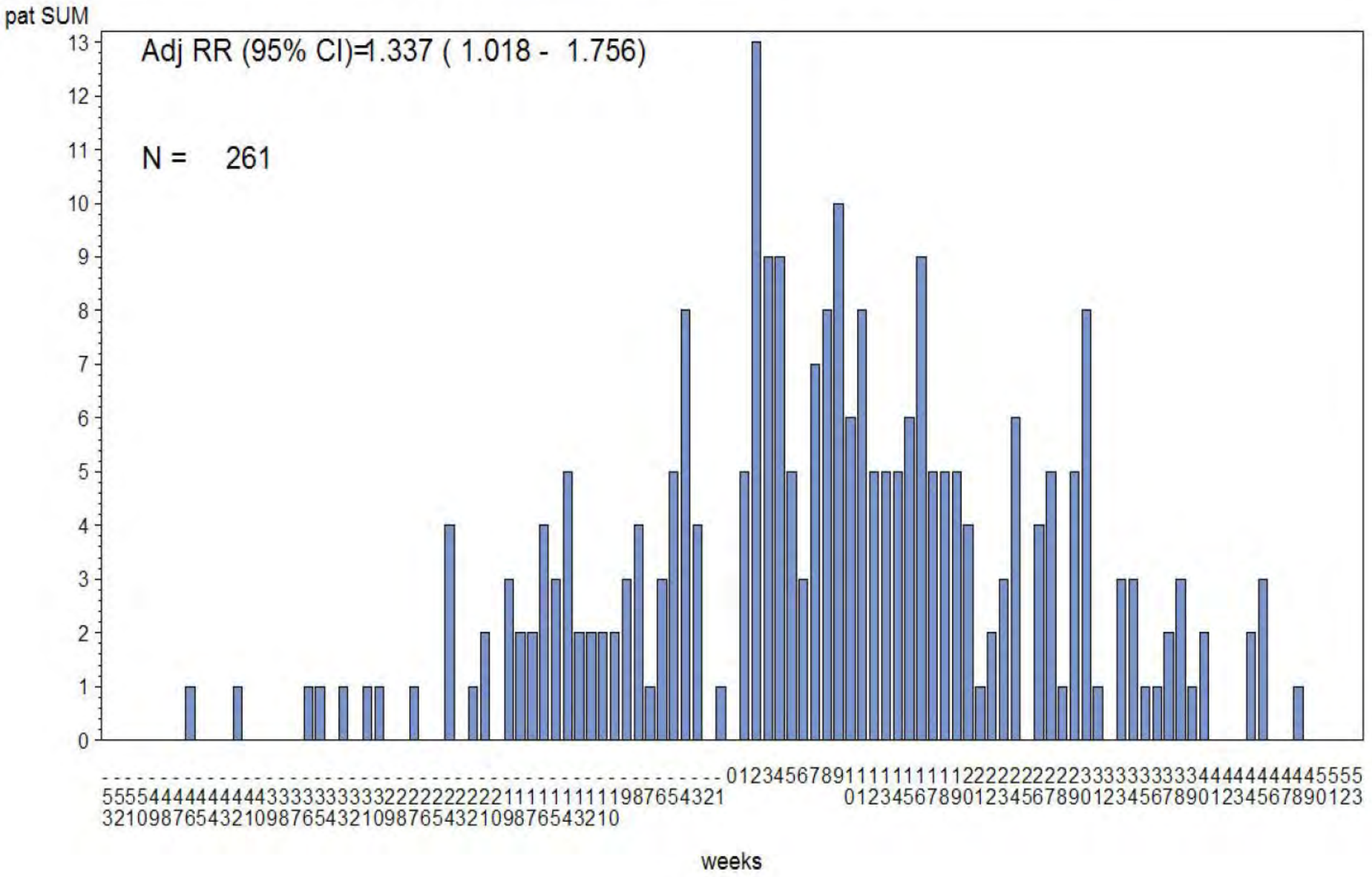
Non-causal Group (MI --> Naproxen) **Causal Group (Naproxen --> MI)**



One year after marketing was rofecoxib associated with excess heart attacks?

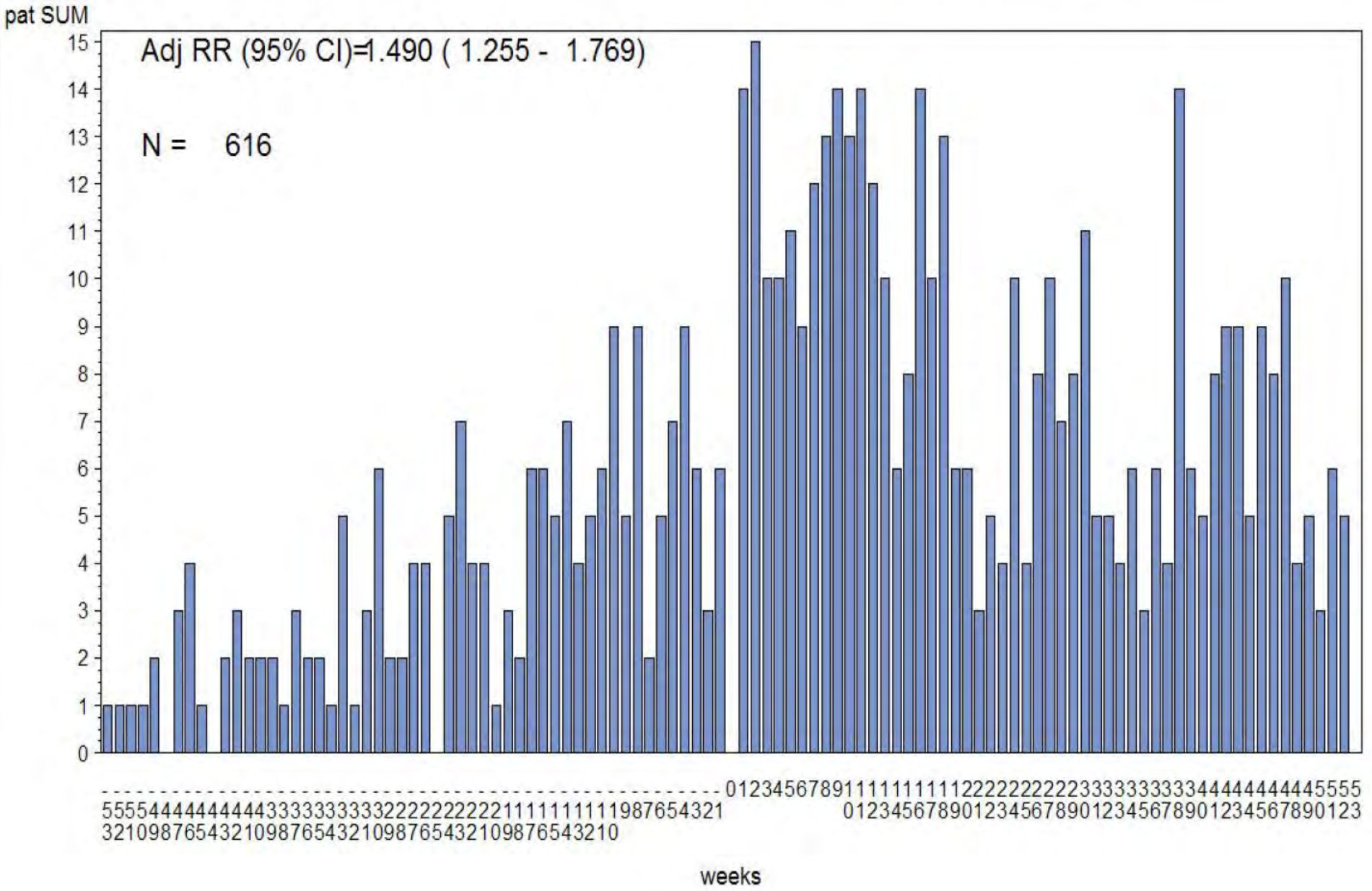
PSSA Rofecoxib MI 2001 - 2001

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



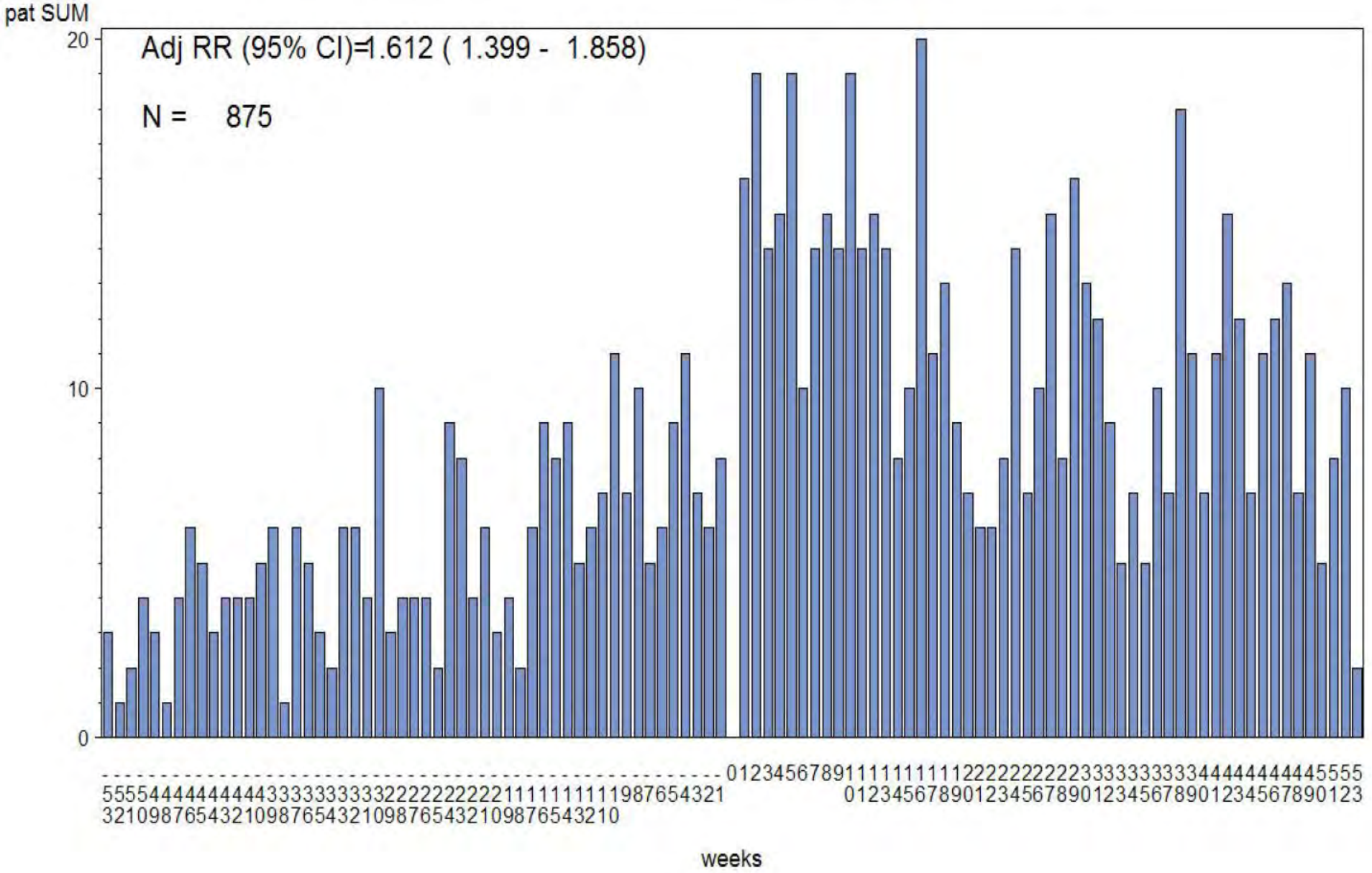
PSSA Rofecoxib MI 2001 - 2002

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



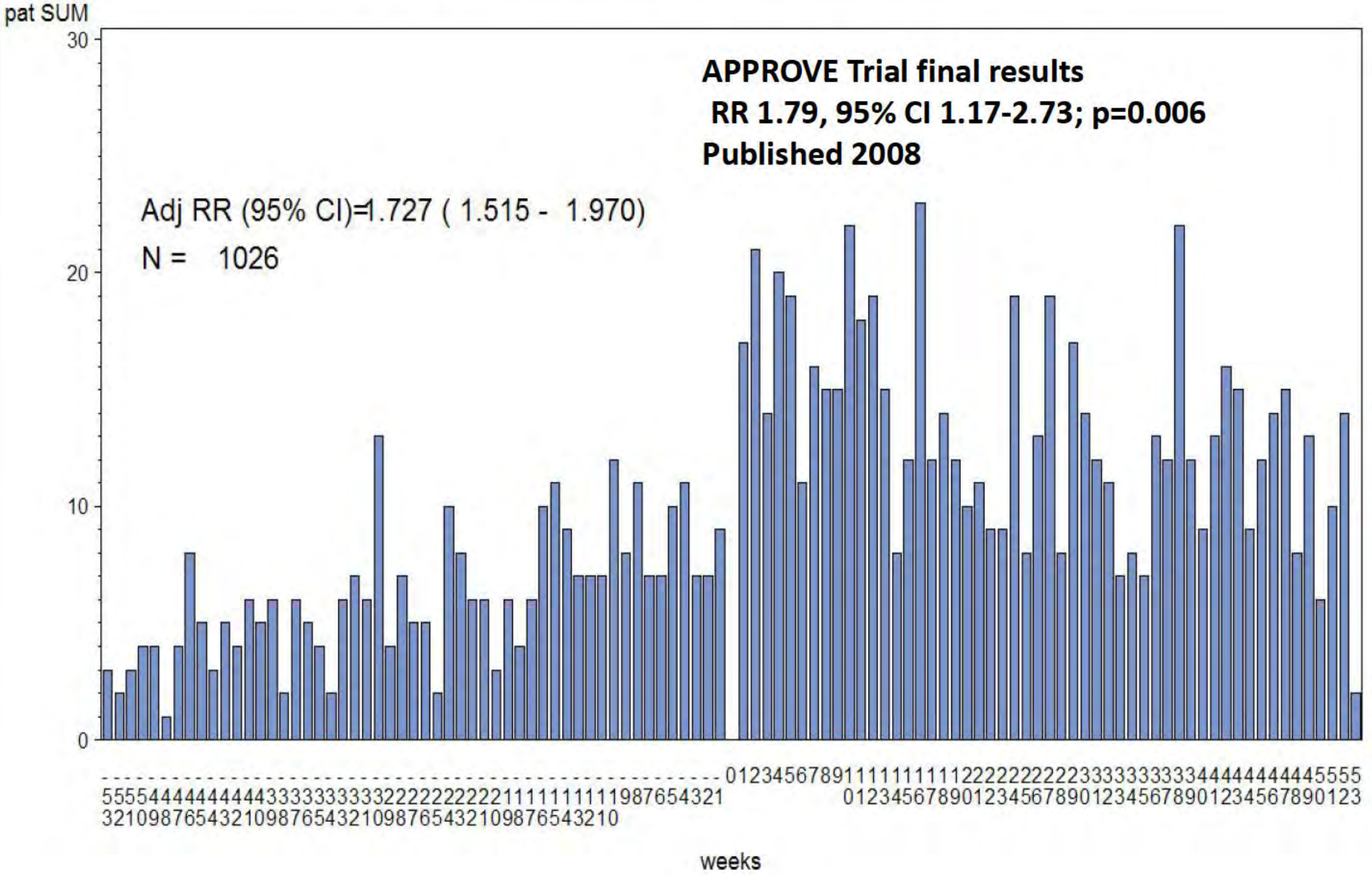
PSSA Rofecoxib MI 2001 - 2003

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



PSSA Rofecoxib MI 2001 - 2004

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



How does this support decision making?

- Regulators & payers
  - Standardized statistical algorithms that are robust to the common problem of confounding will enable more timely detection of adverse effects of medicines and will help to prioritise safety signals for more detailed investigation

Proton-pump inhibitors and pneumonia

Risk of pneumonia with proton pump inhibitors

- Several studies suggest proton pump inhibitors (acid-suppressive medicines) may increase susceptibility to respiratory infections*
- Given the widespread use of proton pump inhibitors, identifying and clarifying the risk of pneumonia with these medicines is important

*Eom C-S, Jeon C, et al. Use of acid-suppressive drugs and riks of pneumonia: systematic review and meta-analysis. CMAJ 2010

Methods

Signal Detection

- Prescription Sequence Symmetry Analysis (PSSA)

Confirmation

- Cohort study: Adjusting for measured confounding
- Self Controlled Case Series (SCCS): Adjusting for unmeasured confounding

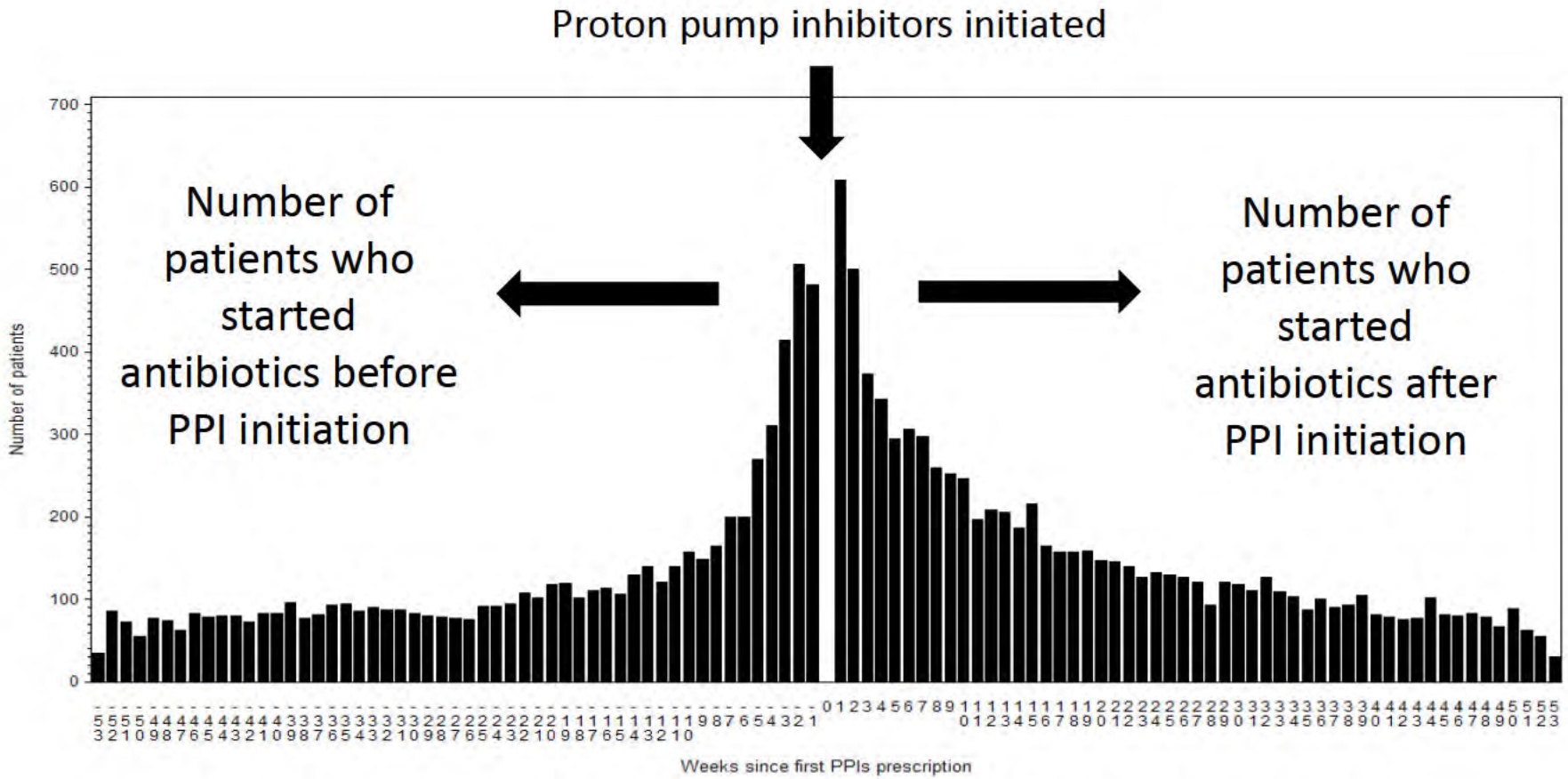
Validation

- Comparison to results of RCTs and/or Meta-analysis of observational studies

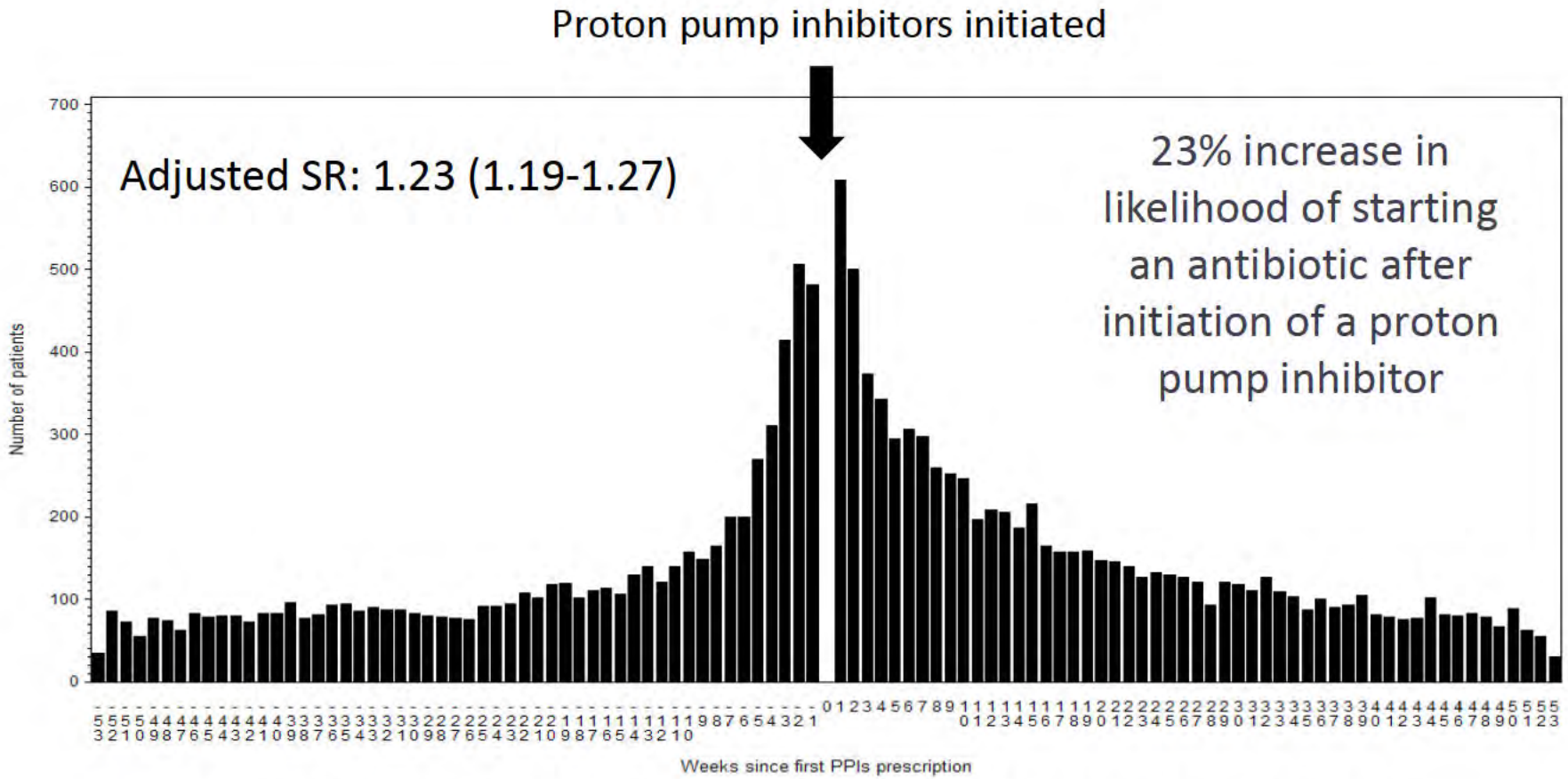
Risk of pneumonia with proton pump inhibitors

- If PPIs are associated with pneumonia we would expect more cases of pneumonia after patients start PPIs than before they start PPIs
- Estimates the incidence rate ratio of initiation of **antibiotics** in the 12 months after initiation of PPIs compared to before initiation of PPIs

Prescription Sequence Symmetry Analysis



Prescription Sequence Symmetry Analysis



Confirmation: Cohort Study

- Study period: January 2002 – 30 June 2006
- Exposed: New users of proton-pump inhibitors (excluding H2RA medicines) compared to patients not on PPIs
- Outcome: Hospitalisation for pneumonia (ICD-10 codes: J12 - J18)
- Adjusted for Confounders:
    - Confounders: age, gender, number of co-morbidities, aged-care status, socioeconomic index, season, heart failure, chronic obstructive pulmonary disease, number of doctors, pharmacies, allied health visits, and number of prescriptions
- Poisson regression

Results

Days after starting PPIs	Cohort Study Adjusted Rate Ratio (95% CI)
Unexposed	1.00
1-7	1.55 (1.26, 1.91)
8-30	1.50 (1.33, 1.69)
>30	1.26 (1.16, 1.36)

Confirmation: Self-controlled case-series design

- Similar to a cohort study but only includes patients with a hospitalisation for pneumonia
- Compare the risk of hospitalisation in periods of exposure compared with non-exposure within the same person.
- Likely to exclude the effects of major unmeasured confounders as the within-person study design **controls implicitly for confounders** that do not vary over time.
- Adjust for time varying confounders: age and calendar time
- Conditional poisson regression

Results

Days after starting PPIs	SCCS Incidence Rate Ratio (95% CI)
Unexposed	1.00
1-7	2.15 (1.87, 2.47)
8-30	1.79 (1.63, 1.95)
>30	1.34 (1.27, 1.41)

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Results

Days after starting PPIs	SCCS Incidence Rate Ratio (95% CI)	Cohort Adjusted Rate Ratio (95% CI)
Unexposed	1.00	1.00
1-7	2.15 (1.87, 2.47)	1.55 (1.26, 1.91)
8-30	1.79 (1.63, 1.95)	1.50 (1.33, 1.69)
>30	1.34 (1.27, 1.41)	1.26 (1.16, 1.36)

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Validation

Days after starting PPIs	SCCS Incidence Rate Ratio (95% CI)	Cohort Adjusted Rate Ratio (95% CI)	Meta-Analysis[1] Odds Ratio (95% CI)
Unexposed	1.00	1.00	1.00
1-7	2.15 (1.87, 2.47)	1.55 (1.26, 1.91)	3.95 (2.86, 5.45)
8-30	1.79 (1.63, 1.95)	1.50 (1.33, 1.69)	1.61 (1.46, 1.78)
>30	1.34 (1.27, 1.41)	1.26 (1.16, 1.36)	1.36 (1.05, 1.78)

1 Eom C-S, et al. Use of acid-suppressive drugs and risk of pneumonia: systematic review and meta-analysis. CMAJ 2010

Summary

Signal Detection

- **Symmetry Analysis:** Increased use of antibiotics after starting PPIs using prescription data only

23%

26%

Confirmation

- **Cohort study:** Increased risk of pneumonia after starting PPIs, after adjusting for multiple confounders
- **SCCS:** Increased risk of pneumonia after starting PPIs. SCCS relies solely on design to control for confounding

34%

Validation

- **Meta-analysis** of observational studies: Increased risk of pneumonia after starting PPIs

36%

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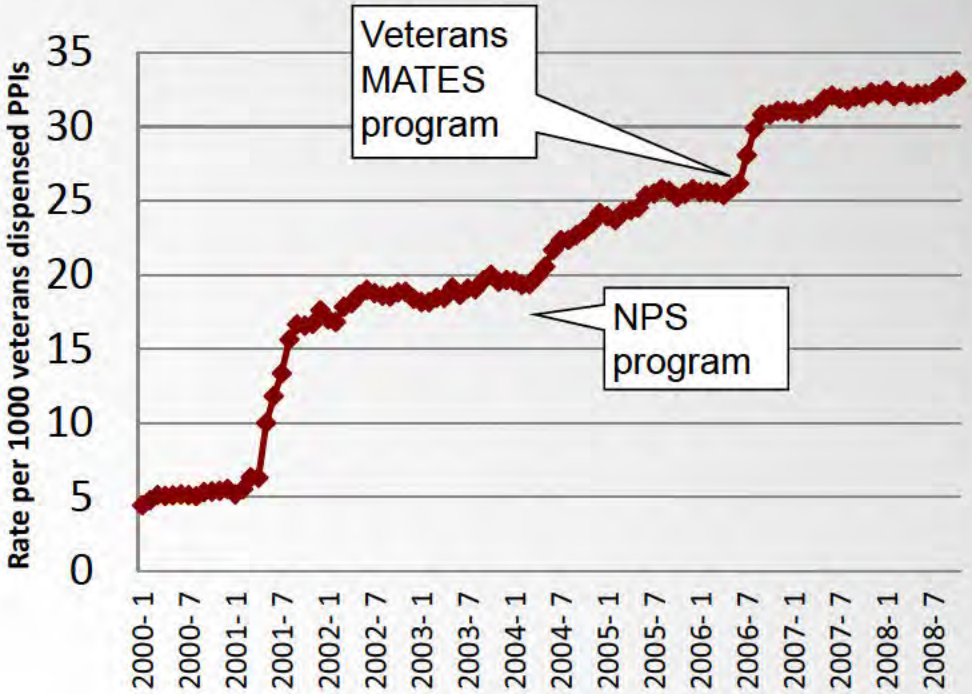
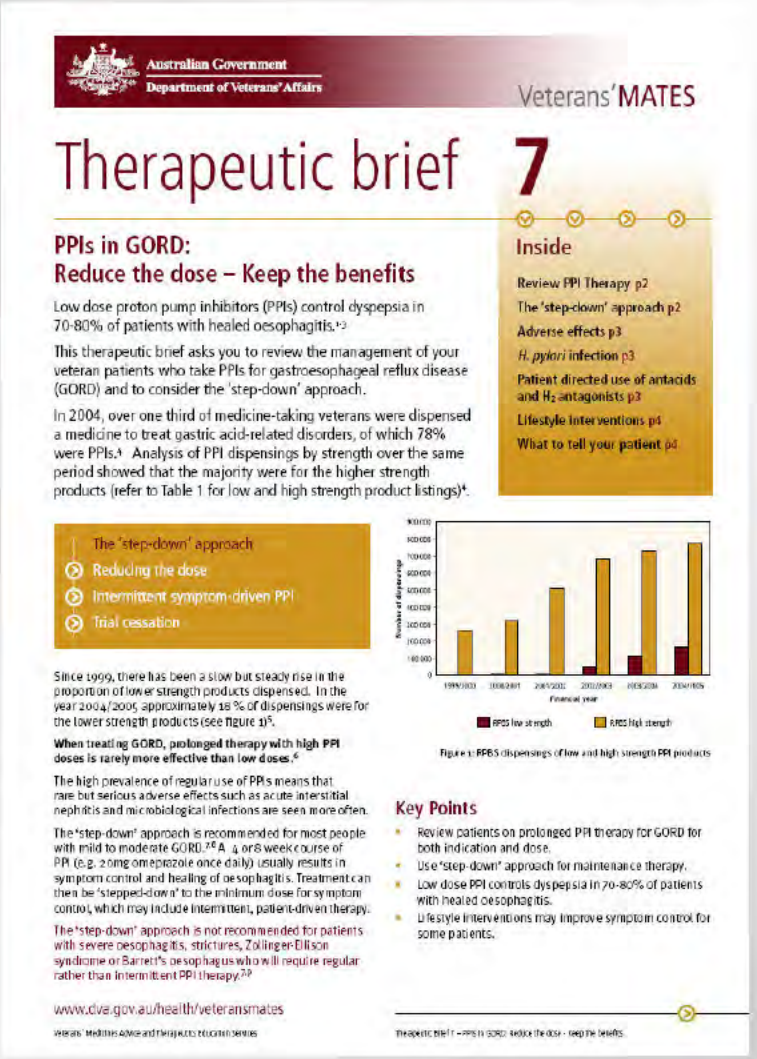
How does this support decision making?

- Public health interventions
  - Quality use of medicines programs to reduce high-dose PPIs
- Regulators
  - Change to product information

Can we reduce high-dose Proton Pump Inhibitor use?

- Module 7: 15% increase in low dose proton pump inhibitors





Australian Government
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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: PBS 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.

www.dva.gov.au/health/veteransmates

Veterans' Medicines Advice and Therapeutics Education Services

Therapeutic brief 7 – PPIs in GORD: Reduce the dose - Keep the benefits

2. Inform policy makers and clinicians about the 'real world' safety and effectiveness of medicines widely available on the market

- Use of medicines in high risk populations

  Example 1: NSAIDS in patients with heart failure

- Use in patients under-represented in RCTS

  Example 2: Beta-blockers for heart failure in the elderly

Anti-inflammatory medicines in patients with heart failure

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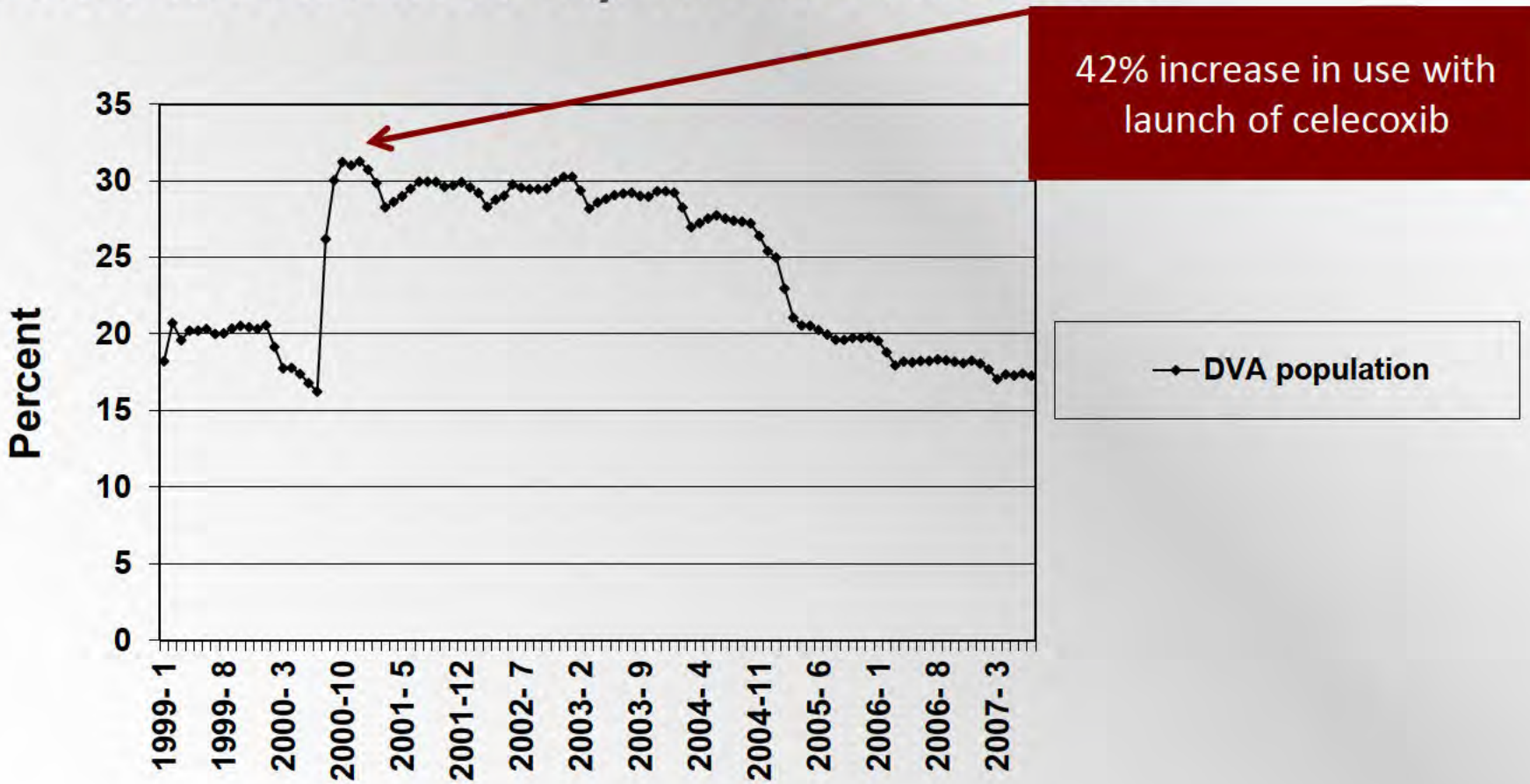
Anti-inflammatory medication use



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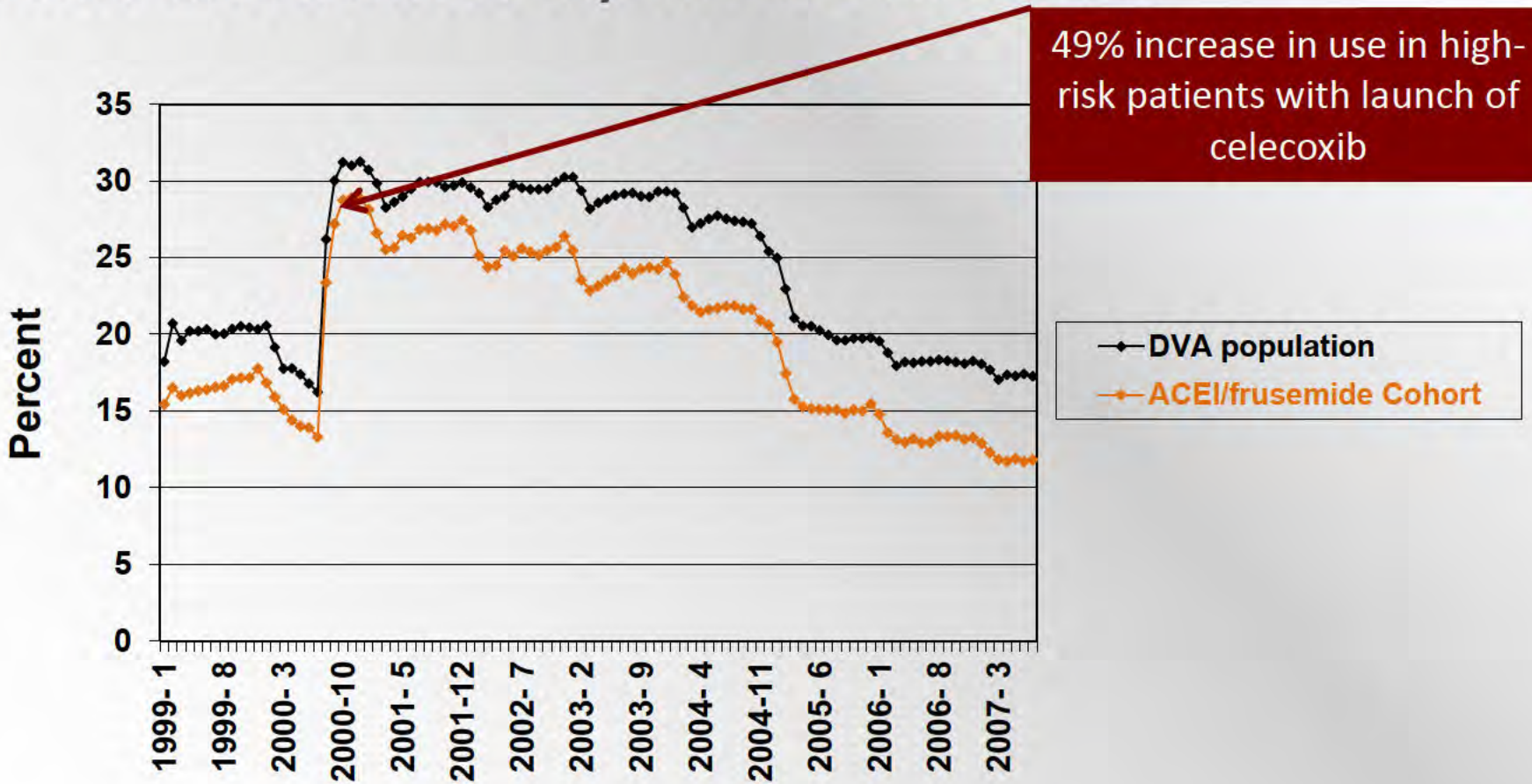
Anti-inflammatory medication use



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Did the increased use of anti-inflammatory medicines in the heart failure population cause harm?

Method

- Cohort study to compare the risk of adverse events in patients prescribed anti-inflammatory medicines compared to non-users
- Two groups:
  - Patients with heart failure medications
  - Patients with no heart failure medications

- Study period August 2000 – June 2005
- Gold card holders
- Dispensed at least one medicine in the last previous four months

Method

- Primary outcome: Hospitalisation for
  - heart failure, renal failure, gastrointestinal ulcer, heart attack or high blood pressure within 30 days of anti-inflammatory medicine initiation
- Follow-up until study end, death
- Adjusted for confounders including:
  - age, gender, co-morbidity, aged-care status, socioeconomic index

Results

- 17,865 patients **dispensed** heart failure medicines
  - 8,113 (45.4%) dispensed anti-inflammatory medicines

- 128,750 patients **not** dispensed heart failure medicines
  - 69,309 (53.8%) dispensed anti-inflammatory medicines

Hospitalisations* associated with anti-inflammatory medicines

- 34% increased risk of hospitalisation with anti-inflammatory medicines in patients **dispensed** heart failure medicines (Relative risk=1.34; 95% CI 1.13-1.58)

- 47% increased risk of hospitalisation with anti-inflammatory medicines in patients **not** dispensed heart failure medicines (Relative risk=1.47; 95% CI 1.30-1.66)

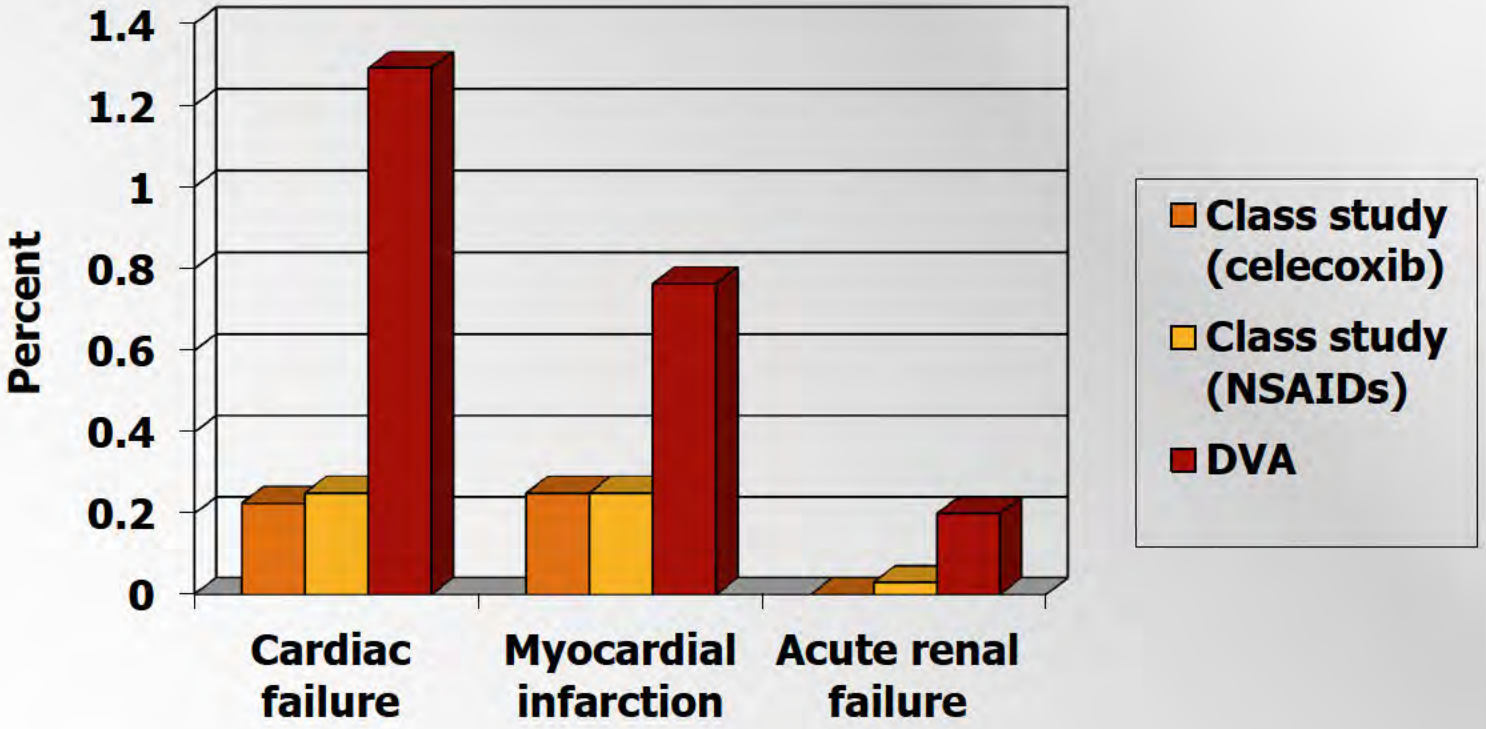
*Heart failure, renal Failure, gastrointestinal ulcer, heart attack, high blood pressure

What does it mean in practice?

- 30 extra hospitalisations for every 10,000 people treated for 30 days in the heart failure population

- 6 extra hospitalisations for every 10,000 people treated for 30 days in the non-heart failure population

Incidence of adverse events causing hospitalisation: trial versus practice



How does this support decision making?

- Public health interventions
  - Quality use of medicines programs to decrease use of NSAIDs in patients with heart failure
- Clinicians
  - More appropriate estimates of risk for individual patients
  - Identification of high risk sub-groups, when should NSAIDs be avoided?

Beta-blockers for heart failure in the elderly

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Do beta blockers for heart failure reduce the rate of hospitalisations for heart failure in the elderly?

- Clinical Trial Meta Analysis[1]
  - OR = 0.63; 95% CI: 0.56 to 0.71
  - The average age was 61 years and 4% were female, most studies excluded patients with severe heart failure
- In practice[2]
  - Patients with heart failure medicines are on average 82 years of age and have 7 to 8 concurrent medical conditions
- Observational cohort study[3]
  - HR = 0.82; 95% CI: 0.74 to 0.92
  - Confounding was identified as a possible limitation of this study[3] eg risk is attributable to the underlying disease being treated rather than to the use of beta-blockers

[1] Shibata MC, et al. EurJHeart Failure 2001;3:351-357.
[2] s 47F EE, et al. *Circ Heart Fail*. 2009;2:424-428
[3] Sin DD, et al AmJ Med 2002;113:650-656.

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Method: Self-controlled Case-series

- All patients with a hospitalisation for a primary diagnosis of heart failure
  - ICD-10 I500, I501, I509
- July 2005 – June 2006
- Aged over 65
- Gold card holders
- Determine first Beta-blocker for heart failure dispensed during the study period
  - Exposure stratified into risk periods; 1 to 2 weeks, 2-4 weeks, 1-4 months, 4-8 months, 8-12 months
- Risk of hospitalisation for heart failure in exposure risk periods compared to periods of no-exposure
- Conditional poisson regression

Results

- 3,450 patients with at least one hospitalisation for heart failure
  - 645 (19%) initiated on a beta blocker for heart failure

Results

Days Since Beta blocker initiation	Self-controlled case-series Incidence Rate Ratio (95% CI)
1 day-2 weeks	2.21 (1.70 - 2.88)
2-4 weeks	1.29 (0.92 - 1.80)
1-3 months	1.18 (0.94 - 1.47)
3-8 months	0.76 (0.57 - 1.02)
8-12 months	0.62 (0.39 - 0.99)

38% reduction in hospitalisation for heart failure after 8 months treatment with beta-blockers for heart failure

Results

Days Since Beta blocker initiation	Self-controlled case-series Incidence Rate Ratio (95% CI)	Meta Analysis* Odds Ratio (95% CI)
1 day-2 weeks	2.21 (1.70 - 2.88)	0.63 (0.56, 0.71) (Average follow-up 11 months)
2-4 weeks	1.29 (0.92 - 1.80)	
1-3 months	1.18 (0.94 - 1.47)	
3-8 months	0.76 (0.57 - 1.02)	
8-12 months	0.62 (0.39 - 0.99)	

*Shibata MC, Flather MD, Wang D. Systematic review of the impact of beta blockers on mortatilty and hospital admissions in heart failure. European Journal of Heart Failure 2001;3:351-357.

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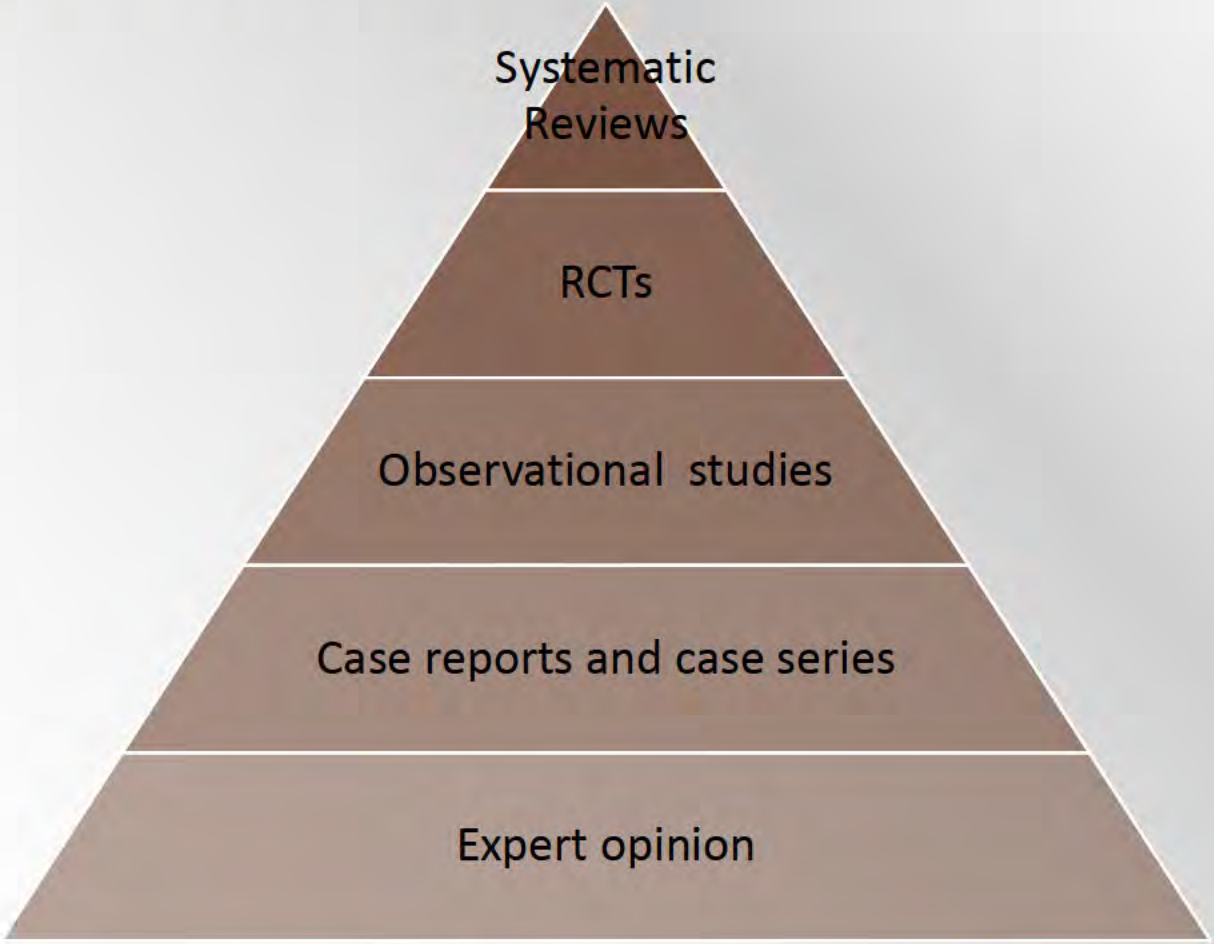
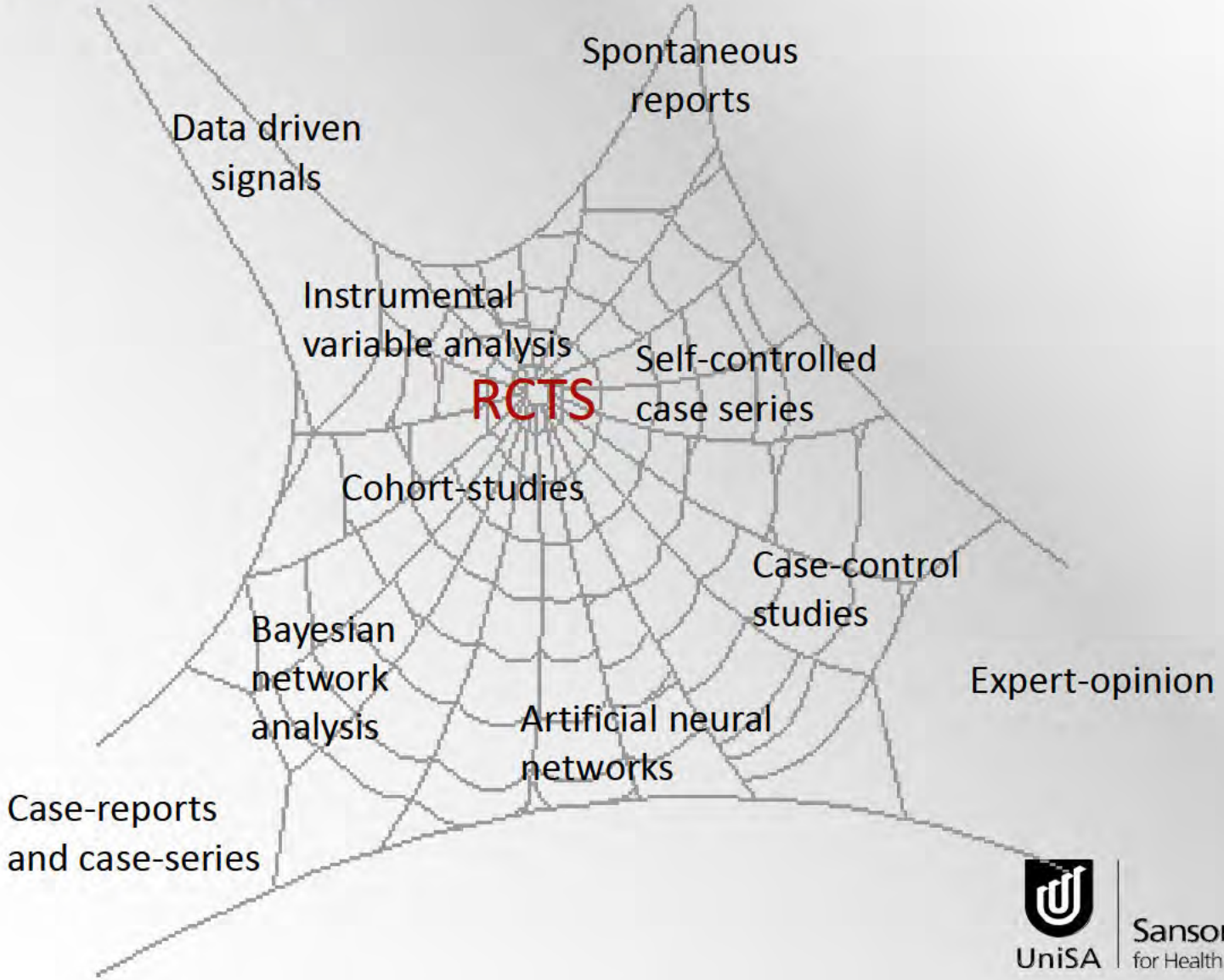
How does this support decision making?

- Public health interventions
  - Quality use of medicines programs to increase use of beta-blockers
- Clinicians
  - Assurance treatment is effective in the elderly

Hierarchy of evidence



Web of Evidence



Using Australian administrative data sets for post-marketing surveillance

Libby s 47F University of South Australia

Nicole s 47F University of Adelaide

Computerised claims databases

- Administration/billings
  - Pharmaceutical dispensings
  - Health Service encounters
    - Hospitalisations
    - GP visits
- Data available at the patient level
  - Demographics
  - Residential Aged Care

Computerised Claims Databases

- Advantages
  - Large populations
    - Ability to detect rare events
  - Extended follow-up
  - Effects of medications in populations excluded from RCTs
  - Effectiveness and safety of medicines measured as used in routine clinical practice
  - Uptake and effectiveness of health service initiatives
  - Population Health planning

Opportunities

- Evaluation of clinical interventions
- Assessment of adverse drug events
- Health services evaluation
- Health outcomes research
- Health and Pharmaceutical policy development, implementation and evaluation

Today's presentation

- Monitoring and preventing known adverse drug reactions
- Identifying previously unrecognised adverse drug reactions using simple signalling methods
- Confirming adverse drug reactions using sophisticated methods

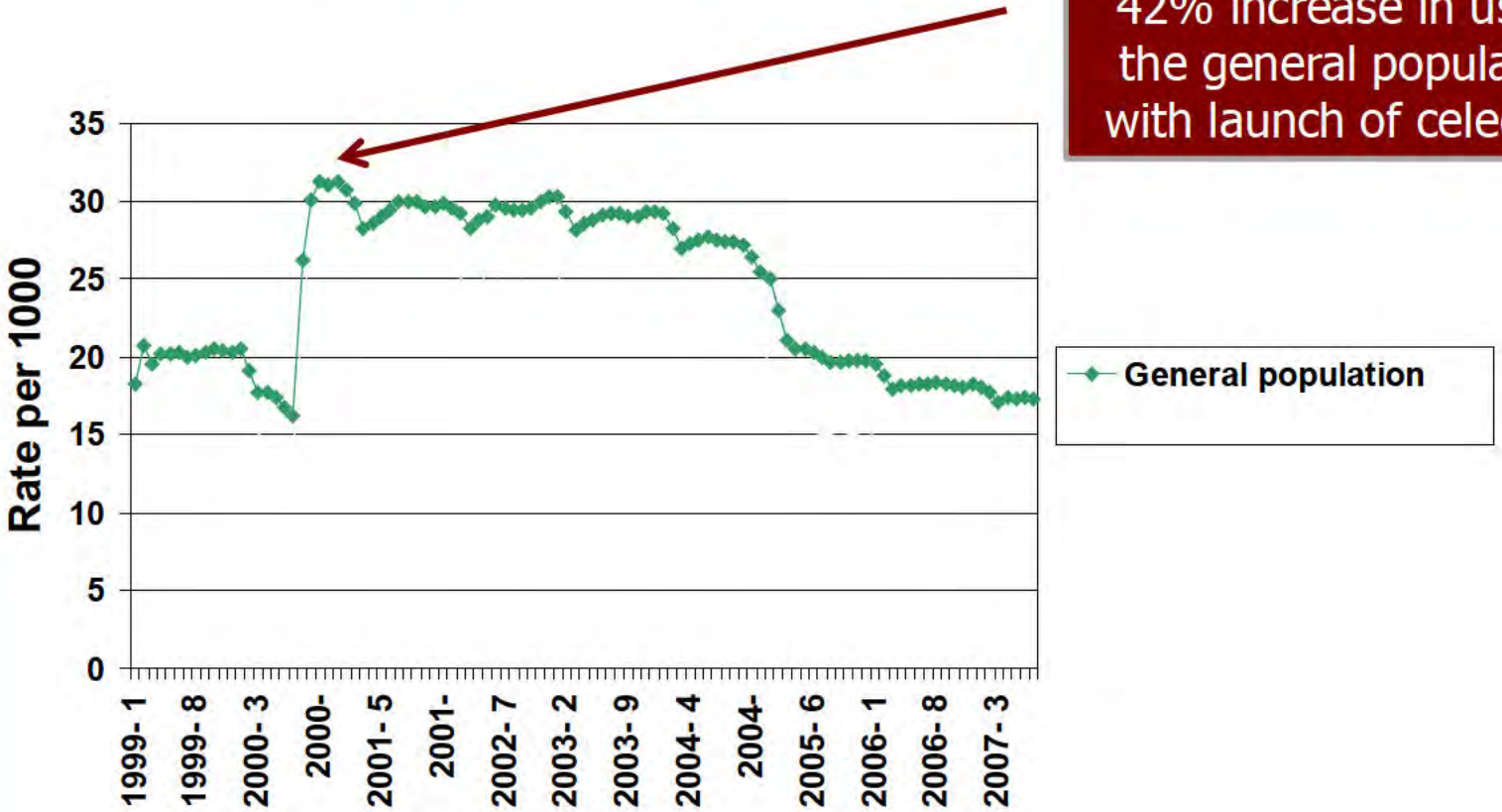
Department of Veterans' Affairs claims data

- 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
- 6 million hospital records (public and private)

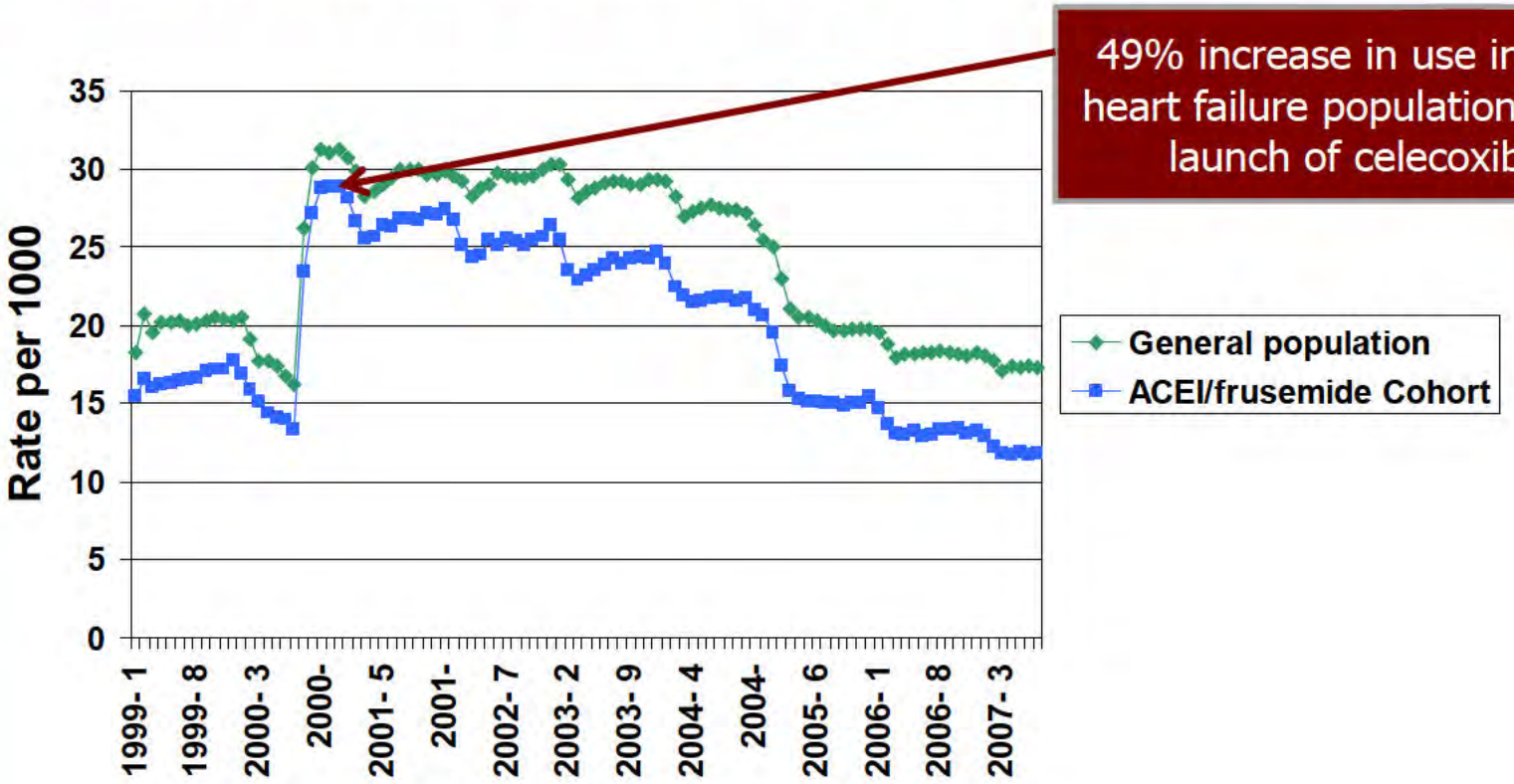
Monitoring and preventing known adverse drug reactions

NSAID use: Australia

42% increase in use in the general population with launch of celecoxib



NSAID use in ACE /frusemide population (high risk of adverse renal events)



Did the increased use of NSAIDs in the heart failure population cause harm?

Method

- Cohort study
- Veterans included gold card holders
  - Dispensed at least one medicine in previous four months, but NO NSAID in previous 12 months
  - 2 cohorts: general, ACE/frusemide populations
- Study period: Aug 2000 – Jun 2005

Pratt et al

Method

- Primary endpoint: Hospitalisation for
  - GI ulcer, heart failure, acute renal failure, myocardial infarction or hypertension within 30 days of NSAID initiation
- Follow-up until study end, death or hospitalisation
- Confounders: age, gender, co-morbidity, aged-care status, socioeconomic index

- 128,908 subjects in general population
- 17,865 Ace/frusemide
- ~50% dispensed NSAIDs
  - Cox-II inhibitors accounted for:
    - 70% of NSAID use in general population
    - 76% in the ACE/frusemide cohort

Pratt et al

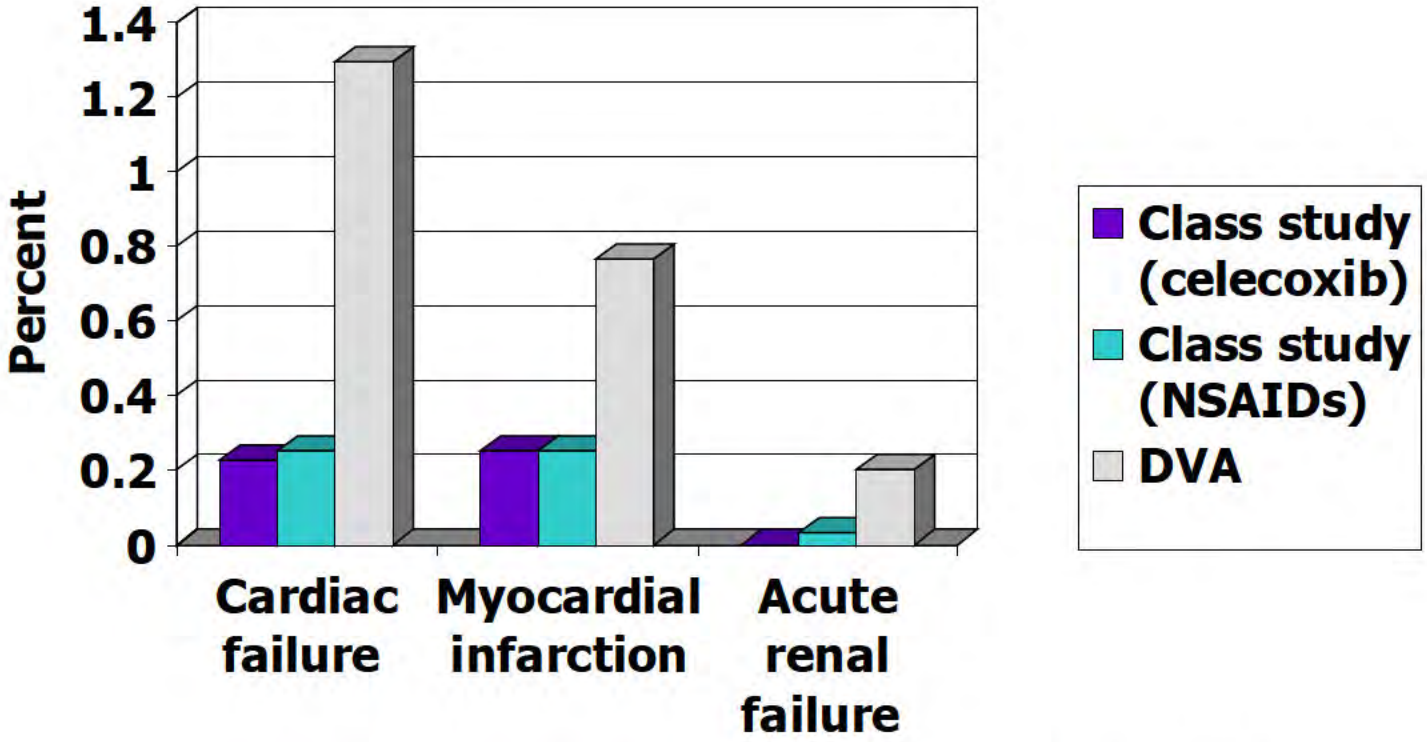
Hospitalisations for adverse events* of NSAIDs

	Relative risk
General population	1.47 (1.30-1.66)
ACE / frusemide population	1.34 (1.13-1.58)

*Heart failure, Renal Failure, GI ulcer, Myocardial Infarct, Hypertension

Pratt et al

Incidence of adverse events causing hospitalisation: trial versus practice



Pratt et al

What does it mean in practice?

- 6 extra hospitalisation for every 10,000 people treated for 30 days in the general population
- 30 extra hospitalisations for every 10,000 people treated for 30 days in the ACE / frusemide population

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.

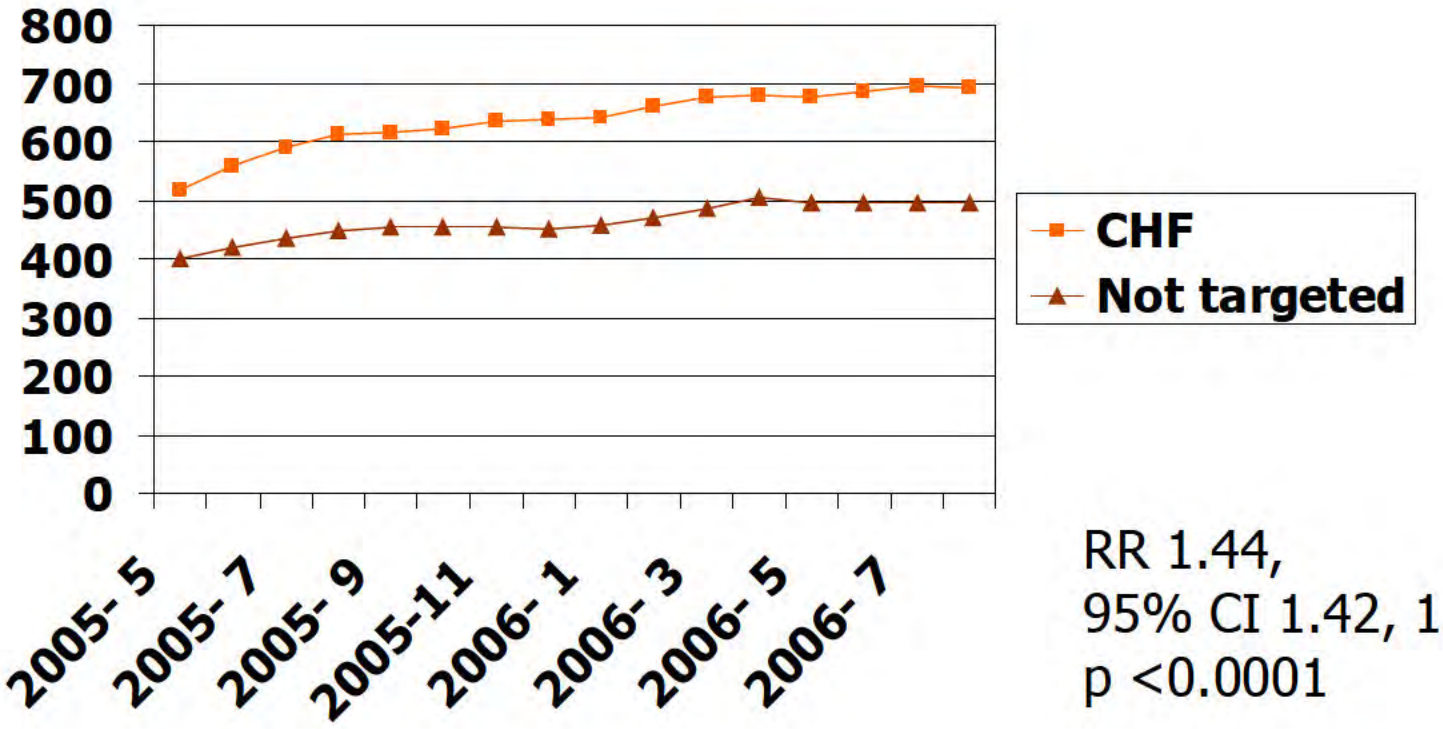
In the year April 2004 to March 2005, 105,476 of the 357,908 veterans who were dispensed at least one medicine also received a NSAID (37%).[3] 34% of veterans dispensed medicines for diabetes and 33% of veterans dispensed medicines for heart failure were also dispensed at least one NSAID.[3]

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

The challenge

- To establish a mechanism to routinely monitor use in high risk groups
- To disseminate findings quickly in attempts to stimulate best practice

Identifying previously unrecognised adverse drug reactions using simple signalling methods

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

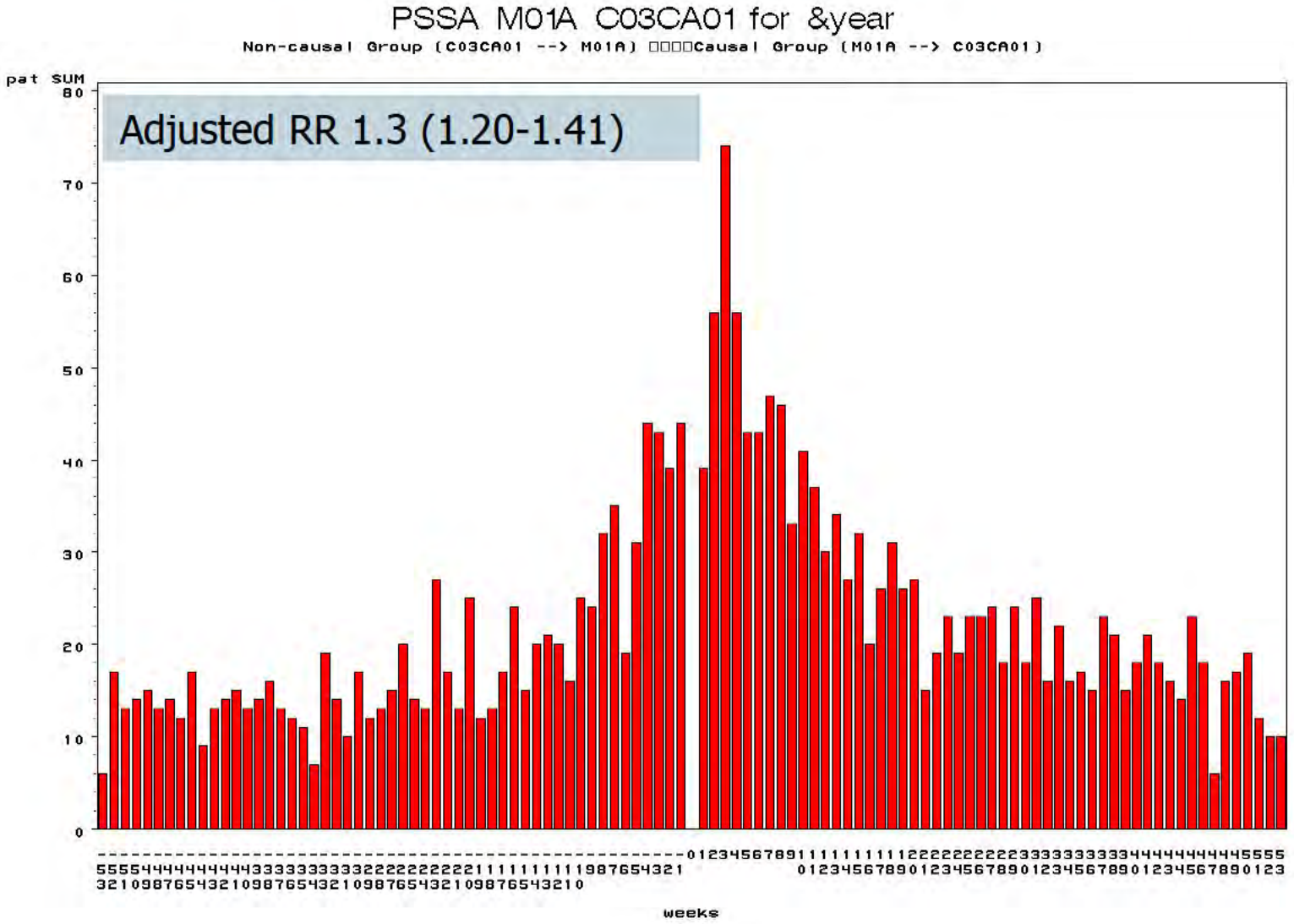
Drug A ⟷ Drug B

- If Drug A causes Drug B, expect an excess of persons starting Drug B second

→ An asymmetrical distribution of prescription order

- Examples
  - Do NSAIDs precipitate heart failure?
  - Do calcium channel blockers precipitate heart failure?
  - Do thiazolidinediones precipitate heart failure?
  - Do inhaled corticosteroids precipitate heart failure?
    - Loop diuretics are the indicator medicines for heart failure

There is a 30% increase in likelihood of starting a loop diuretic after initiation of an NSAID

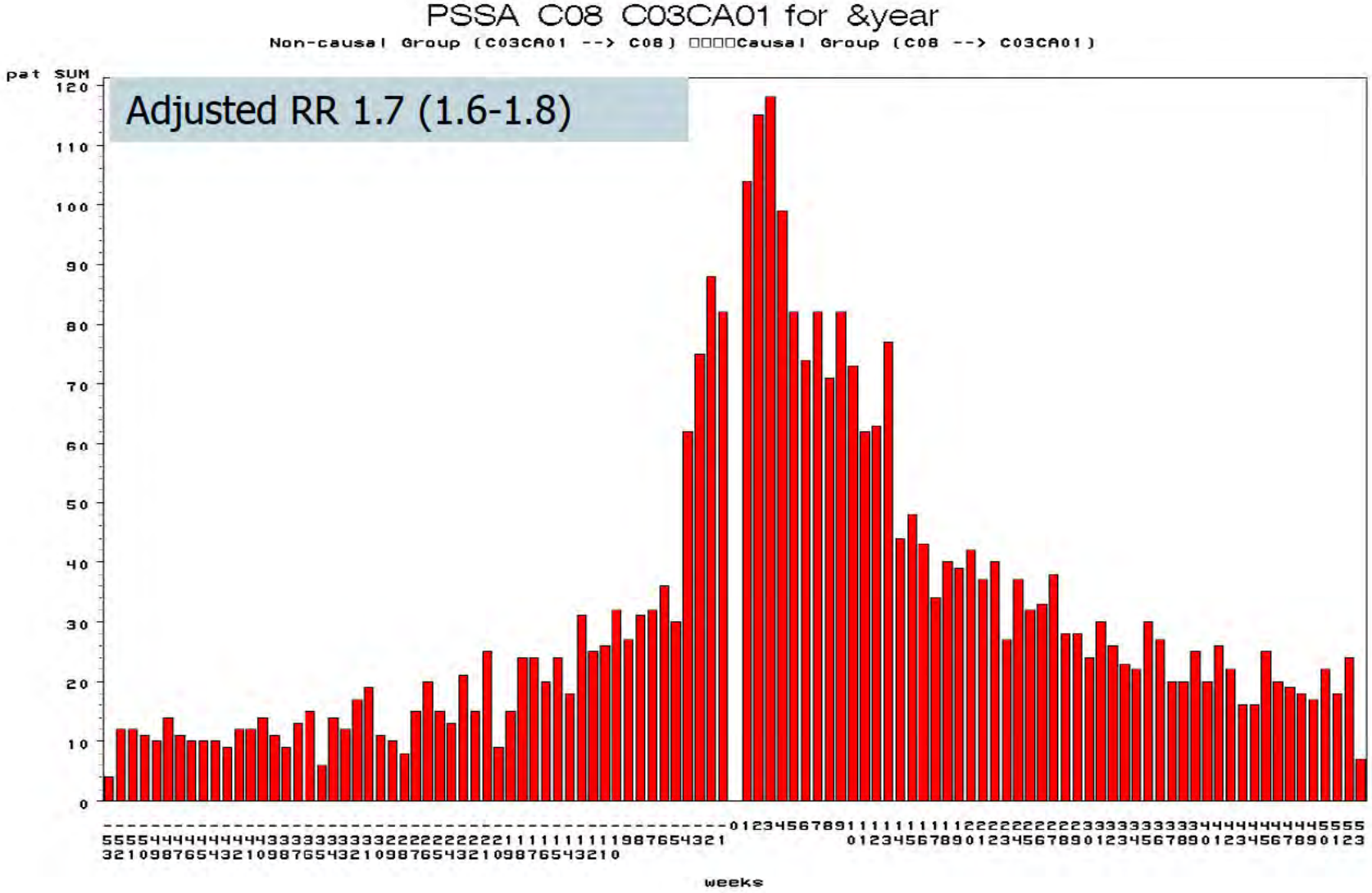


Hospitalisations for heart failure associated with NSAIDs

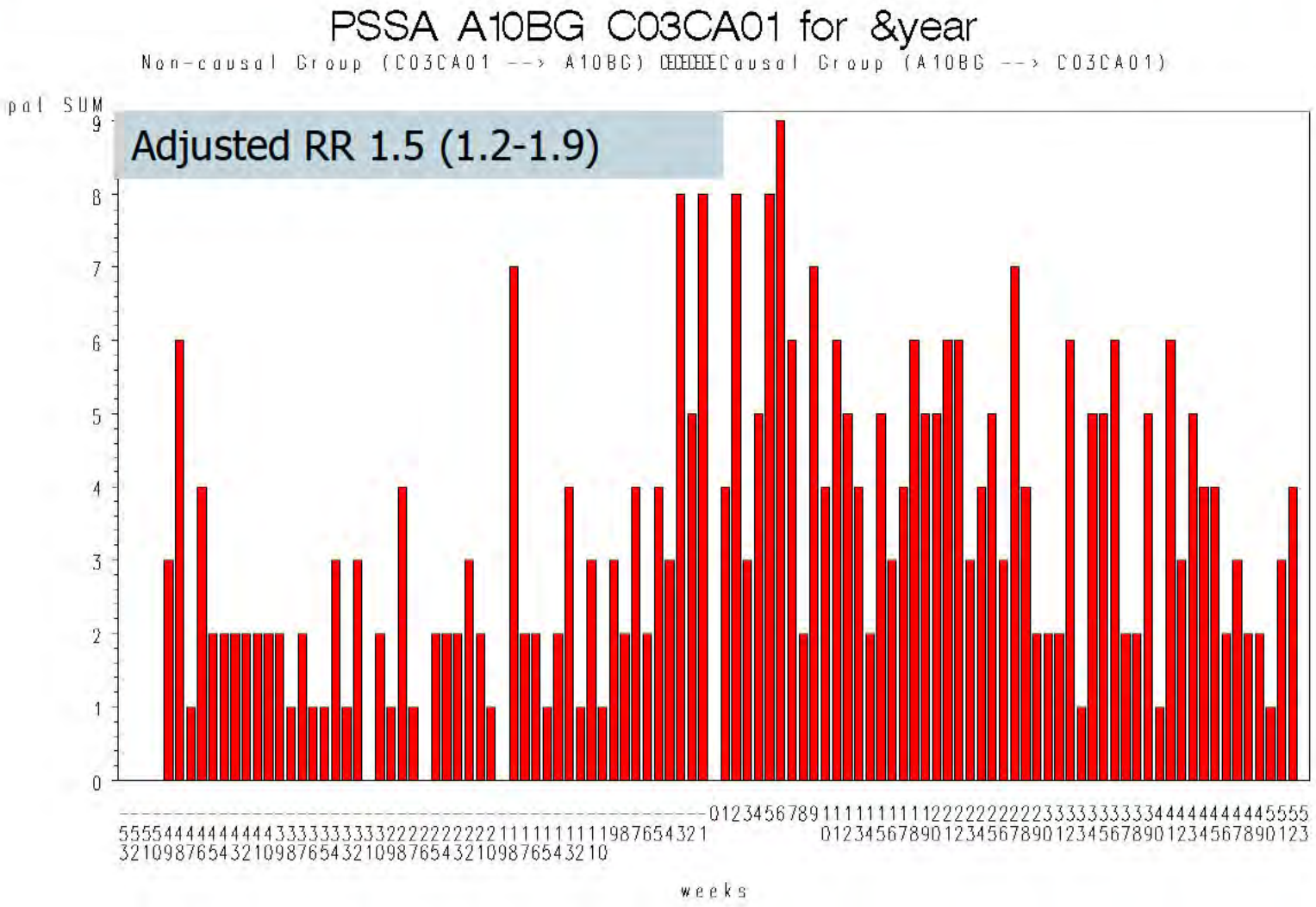
	Relative risk
General population	1.33 (1.10-1.60)

s 47F et al

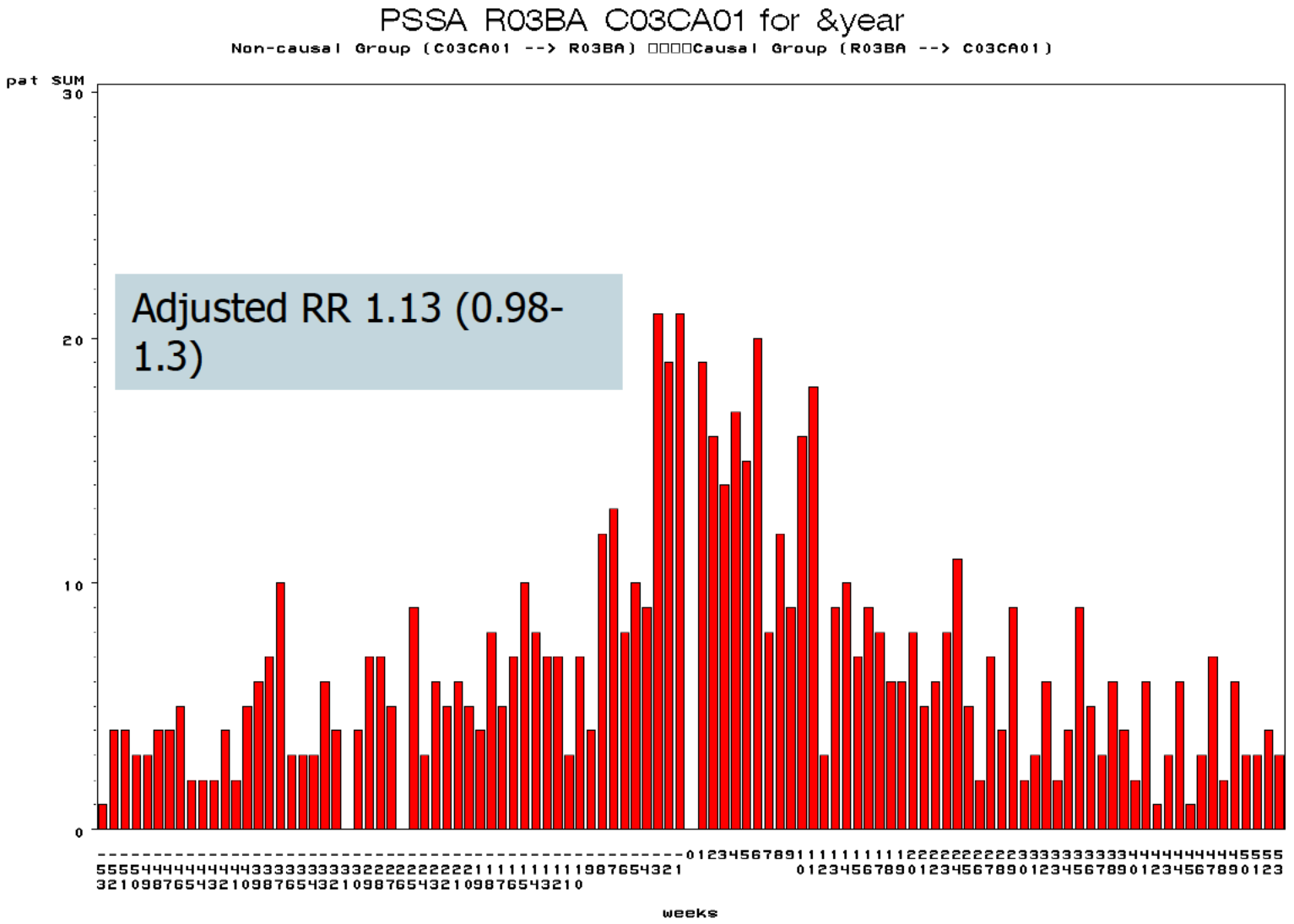
There is a 70% increase in likelihood of starting a loop diuretic after initiation of calcium channel blocker



There is a 50% increase in likelihood of starting a loop diuretic after initiation of thiazolidinedione



There is no increased risk in starting a loop diuretic after initiation of inhaled glucocorticoid



Proton pump inhibitors and respiratory tract infections

- Does Proton Pump inhibitor use increase the risk of respiratory tract infections or community acquired pneumonia
  - Cohort study comparing those exposed to proton pump inhibitors and those not-exposed
  - Outcomes:
    - hospitalisations for pneumonia
    - antibiotic prescriptions

Method

- Veterans, gold card, aged 65 or over
  - Dispensed a medicine between 01 Jul 2001 and 01 Jan 2002
- Study period: Jan 2002 – Dec 2005
- Those on H2RA medicines excluded
- Confounders: age, gender, number of co-morbidities, aged-care status, socioeconomic index, season, heart failure, COPD, number of doctors, pharmacies, allied health visits, prescriptions
- 185,000 veterans included

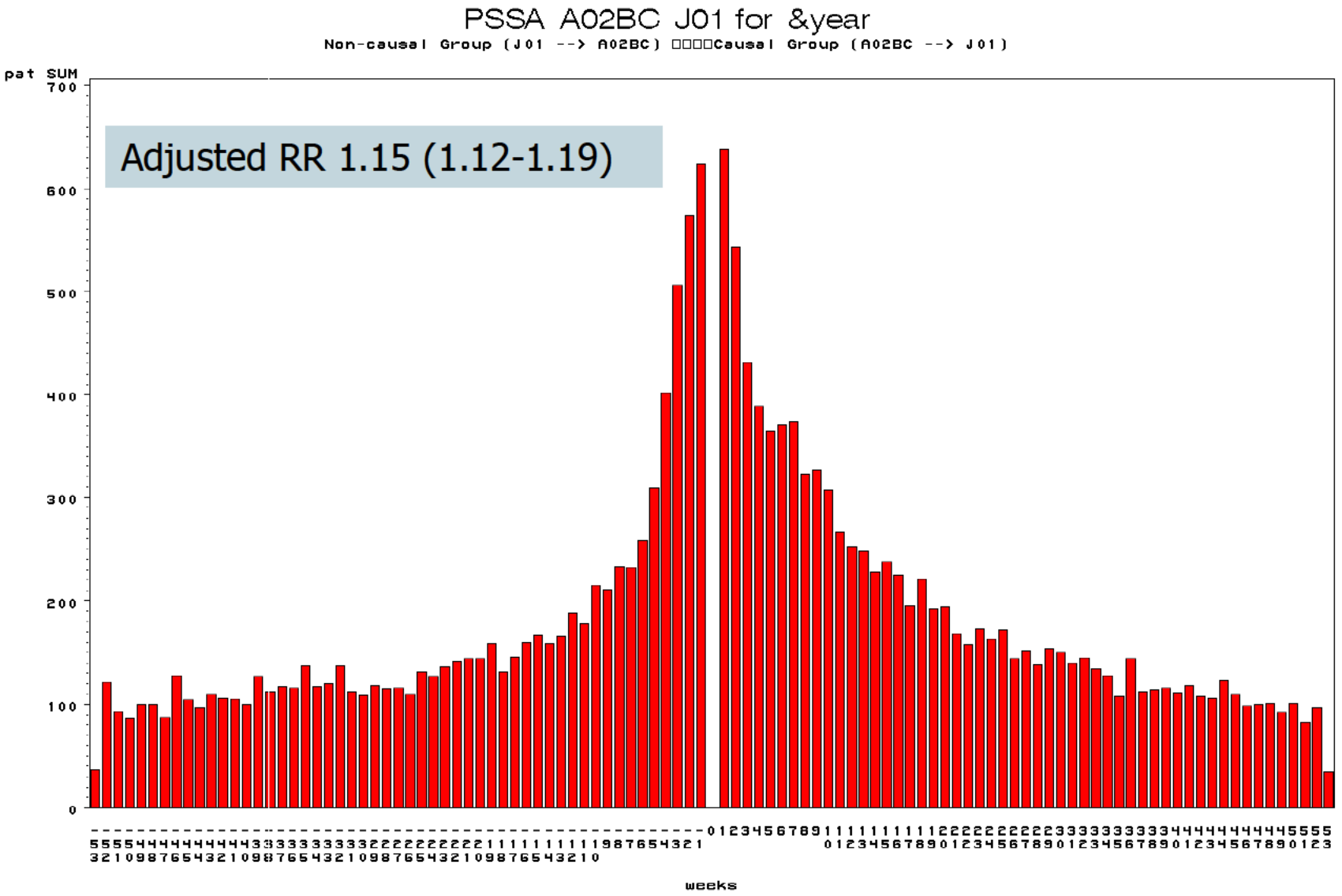
Results

	Unadjusted analysis	Adjusted analysis
Hospitalisation for pneumonia	1.69 (1.62-1.76)	1.16 (1.11-1.22)
Antibiotic dispensings	1.72 (1.70-1.75)	1.23 (1.21-1.24)

Prescription symmetry results

- Proton pump inhibitors and antibiotics

There is a 15% increase in likelihood of starting an antibiotic after initiation of a PPI



Confirming adverse drug reactions using sophisticated methods

- Cohort / case-control studies
  - Problems with confounding
  - Missing data on confounders

→ Designs that help to overcome this problem

Outcome Studies: Exposed v Unexposed

- Use patient as their own control
  - Prescription Event Sequence Analysis
    - extension of PSSA to hospitalistation outcomes
  - Self-controlled Case-series
    - uses only those subjects with events (cases)
    - compares the incidence of events occurring during pre-defined periods after an exposure with the incidence of events at other periods of time within the same individual

Outcome Studies: Exposed Drug A v Drug B

- Mimic randomised controlled trial
  - Instrumental Variable Analysis
    - Identify an instrument as proxy for actual treatment that is not associated with patient characteristics
    - Controls for unmeasured confounding

Antipsychotics

- Antipsychotic use has increased in the elderly
- RCT evidence for atypical antipsychotics only
  - risperidone subsided on PBS for the treatment of the behavioural symptoms of dementia
  - Warning of risk of death and cerebrovascular events (including stroke)
- Lack of evidence regarding safety/efficacy of typical antipsychotics

Aim

- Compare the characteristics of patients and prescribers between typical and atypical antipsychotics

Results

- 9,239 new users of atypical, 10,966 new users of typical antipsychotics

Results

Patients prescribed atypical antipsychotics

- more likely to be
  - resident in an aged care facility
  - female
  - previously dispensed lipid lowering therapy, anticholinesterases, antidepressants, antiparkinson medications
  - prescribed by the patient's usual doctor
- less likely to be
  - on more than 5 unique medicines
  - Previously dispensed morphine, oral corticosteroids
  - hospitalised for myocardial infarction or pneumonia in the previous 12 months

Conclusions

- Differences likely to be associated with the reported adverse events of these medicines

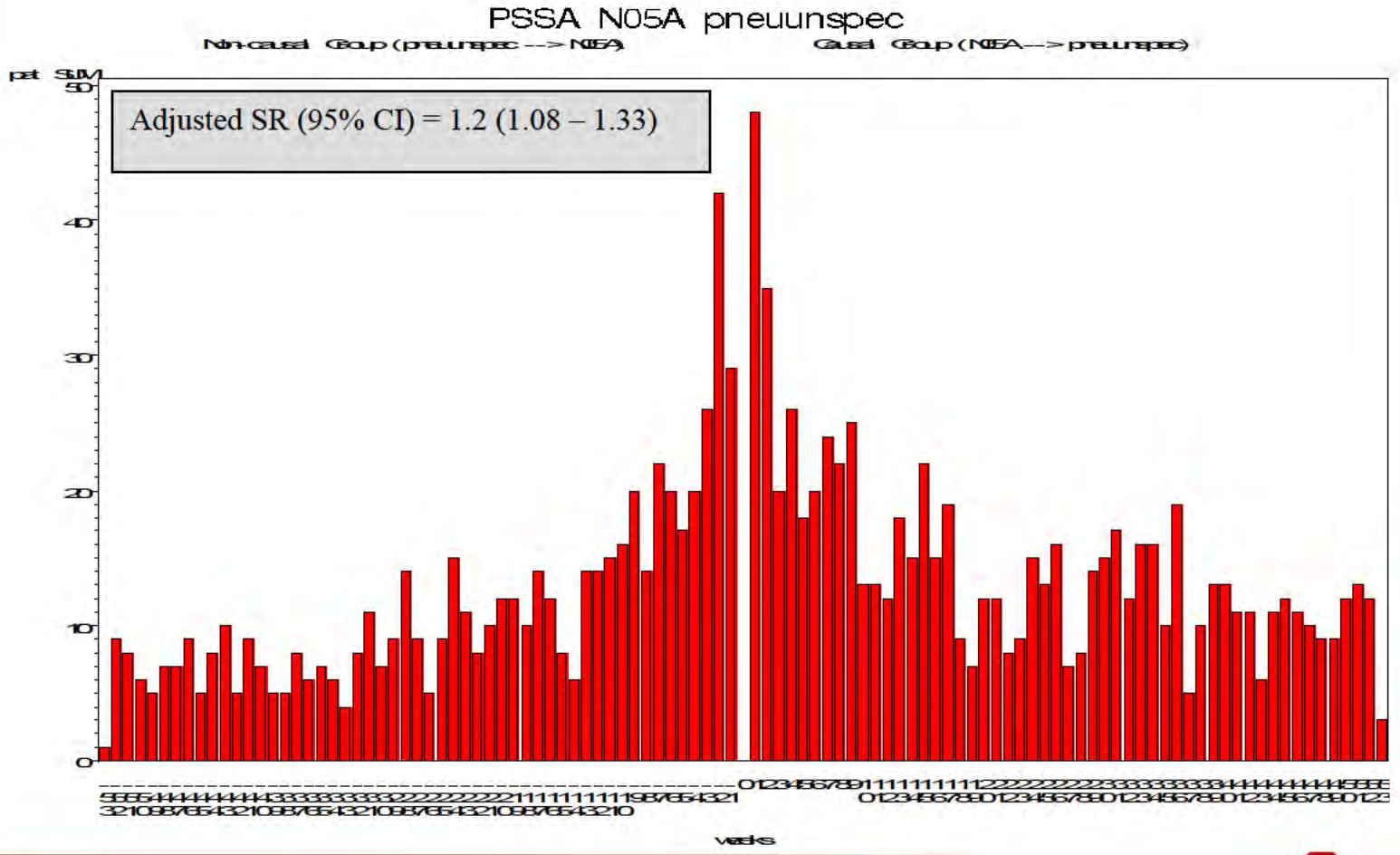
- Potential for confounding

  → Appropriate observational study designs required

Aim

- To determine whether antipsychotics are associated with an increased risk of hospitalisation for hip fracture or pneumonia compared to periods of non-exposure using the self-controlled case-series analysis

PESA - Pneumonia



Self-controlled Case-series

- Method
  - All patients with a hospitalisation for a primary diagnosis of pneumonia (ICD10 codes: J12-J18)
  - 1/1/2003 – 31/12/2006
  - Age > 65 years
  - Full entitlement (>12 months)
  - First antipsychotic dispensed during the study period (no antipsychotic in previous 12 months)

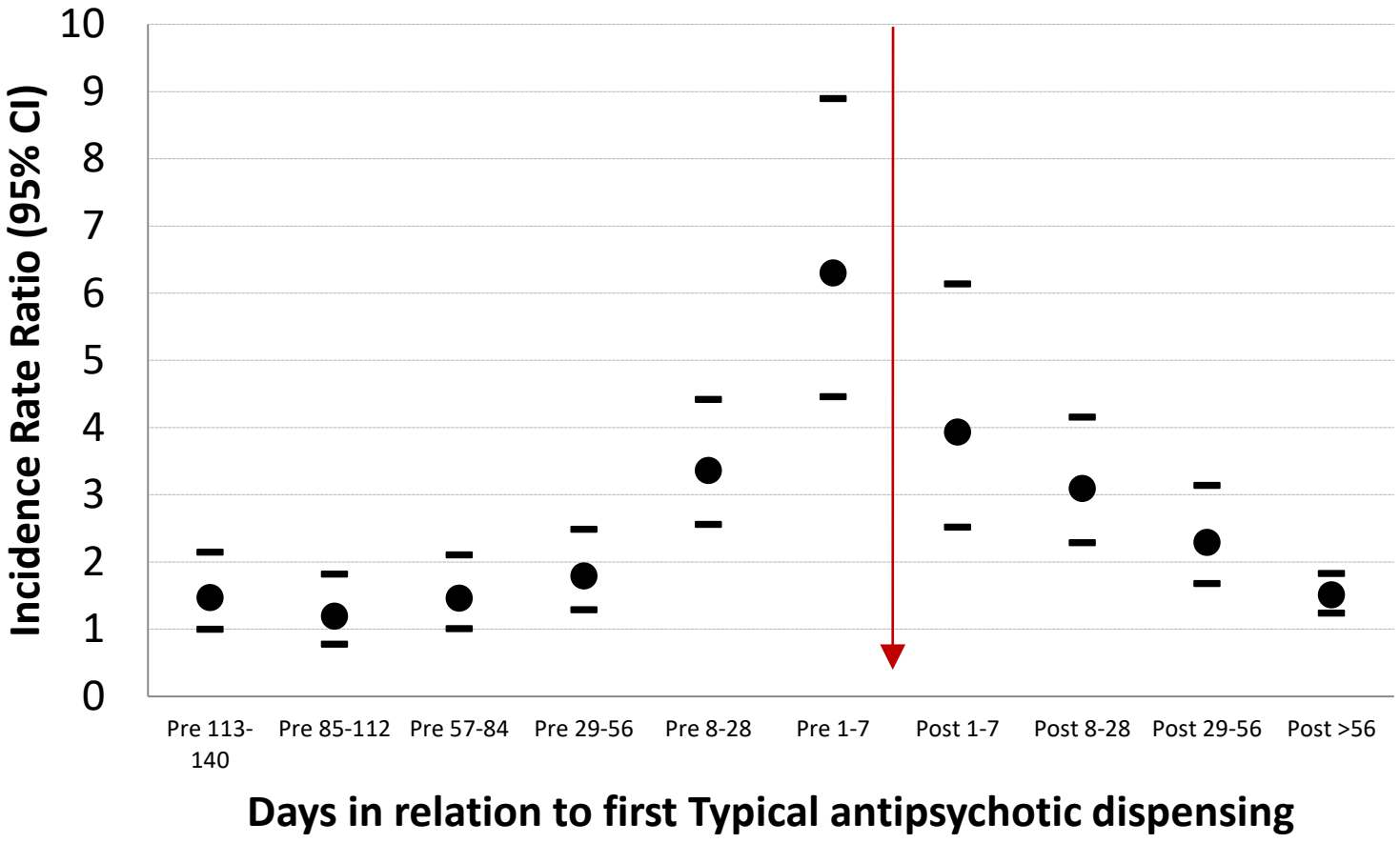
Self-controlled Case-series

- Method
  - person-time was divided into risk periods
    - 1-7, 8-28, 29-58, and >58 days post exposure
    - 1-7, 8-28, 29-56, 57-84, 85-112, and 113-140 days prior to exposure
    - No exposure
  - Risk of pneumonia in pre and post exposure risk periods compared to ‘No Exposure’ period
  - Incidence Rate Ratios for were calculated using Poisson regression adjusting for age and calendar year

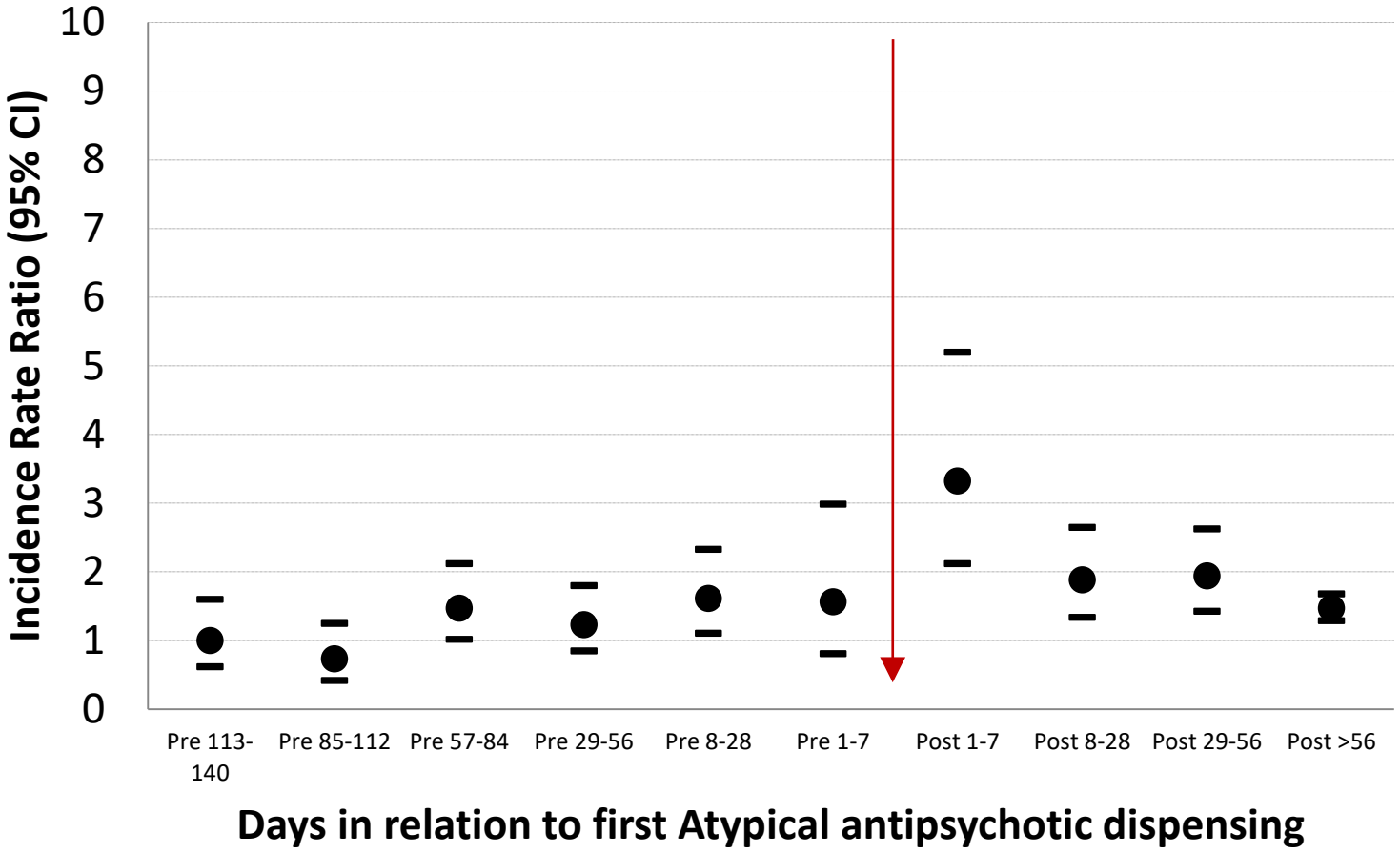
Self-controlled Case-series

- Results
  - 13932 patients with at least one hospitalisation for pneumonia
    - 690 patients were initiated on typical antipsychotics
    - 663 patients initiated on atypical antipsychotics

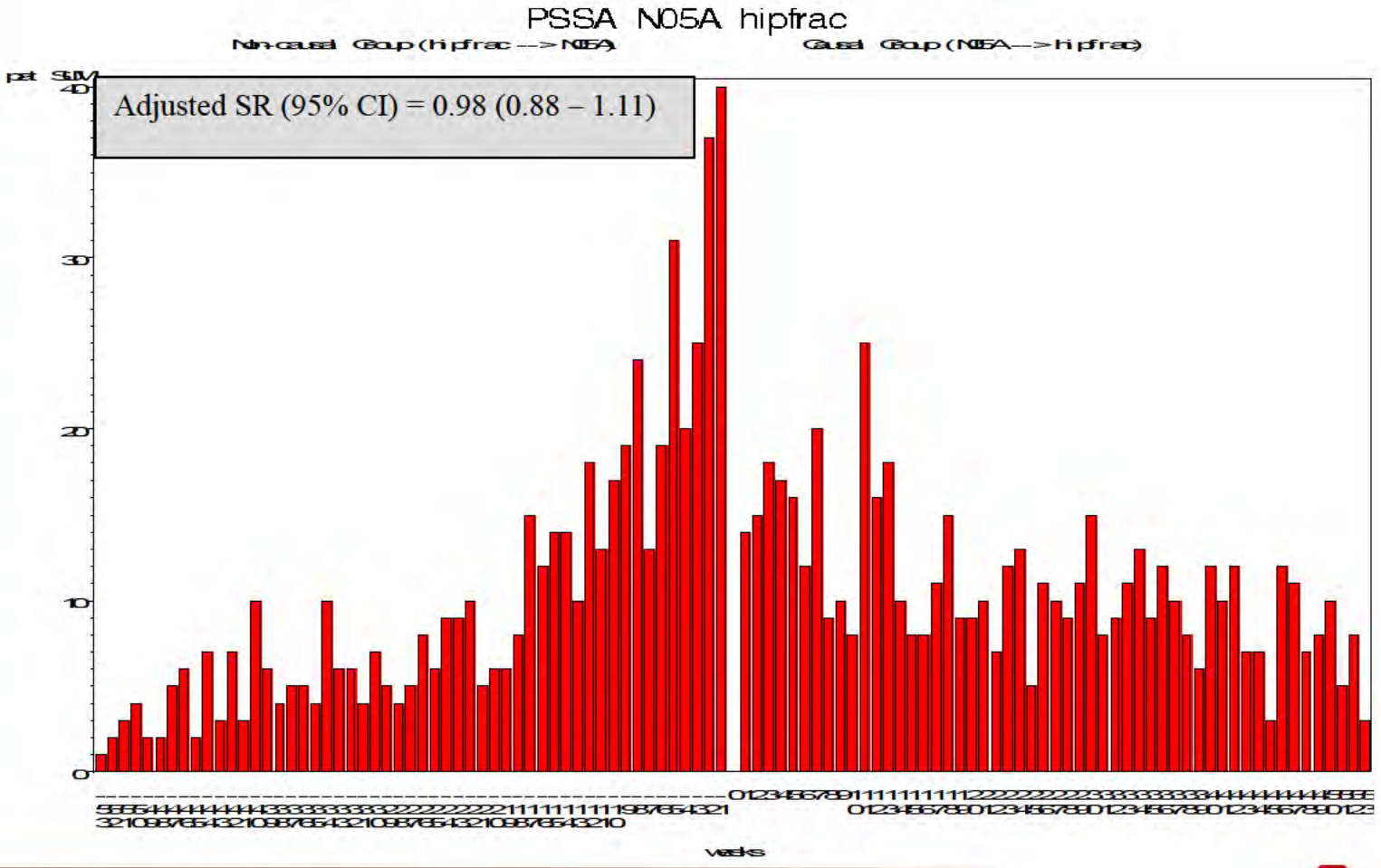
Self-controlled Case-series - Pneumonia



Self-controlled Case-series - Pneumonia



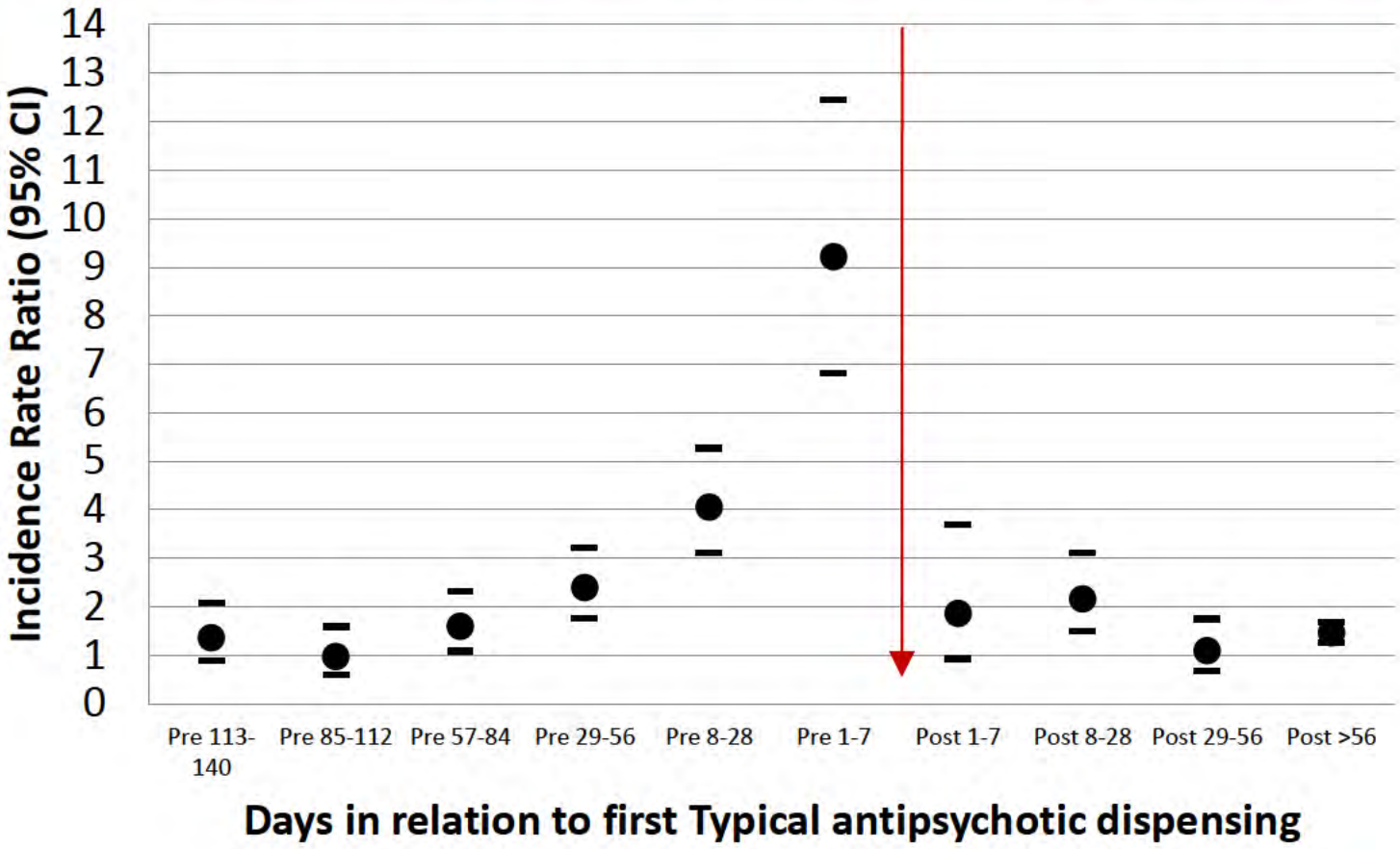
PESA – Hip Fracture



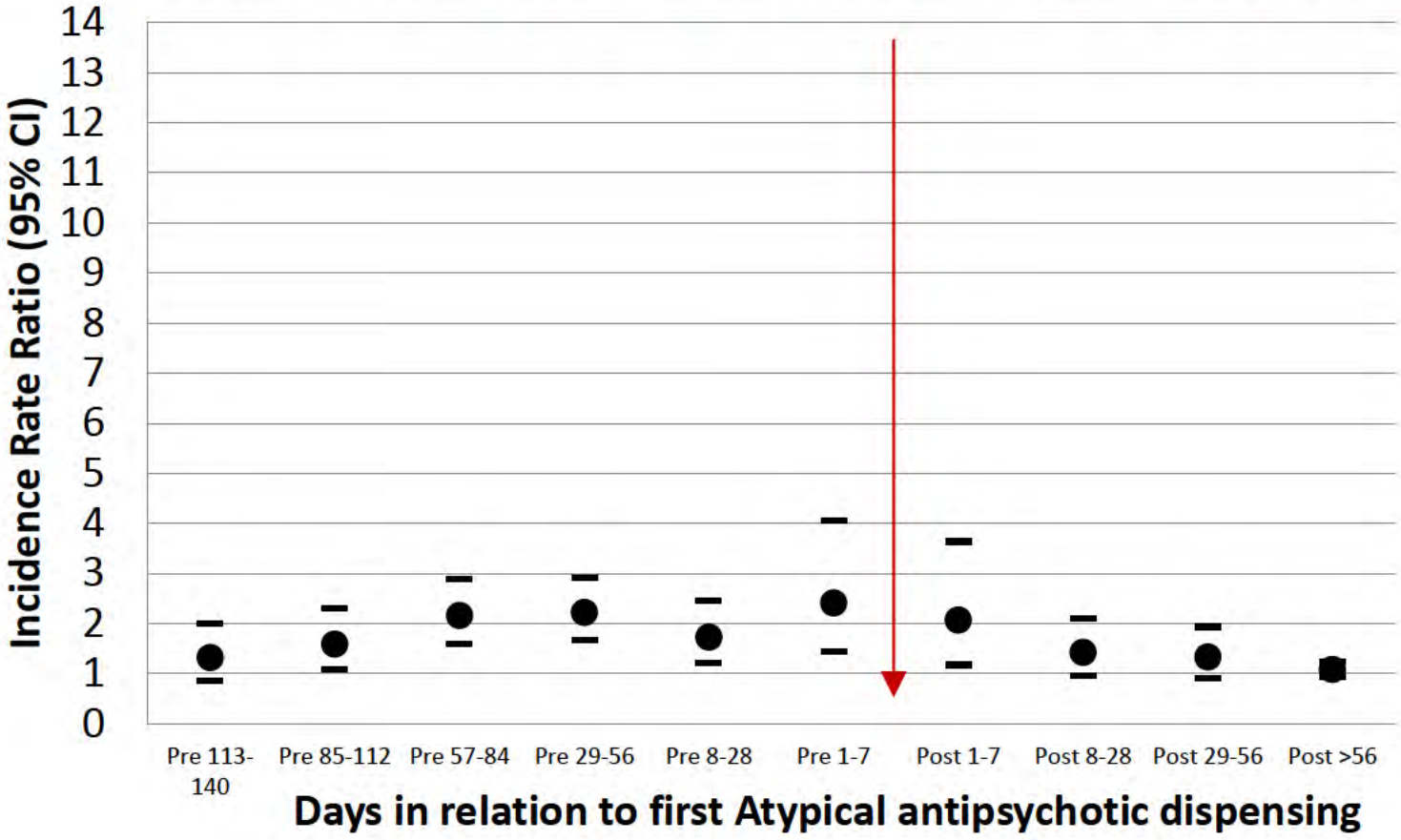
Self-controlled Case-series

- Results
  - 8284 patients with at least one hospitalisation for hip fracture
    - 618 patients were initiated on typical antipsychotics
    - 634 patients initiated on atypical antipsychotics

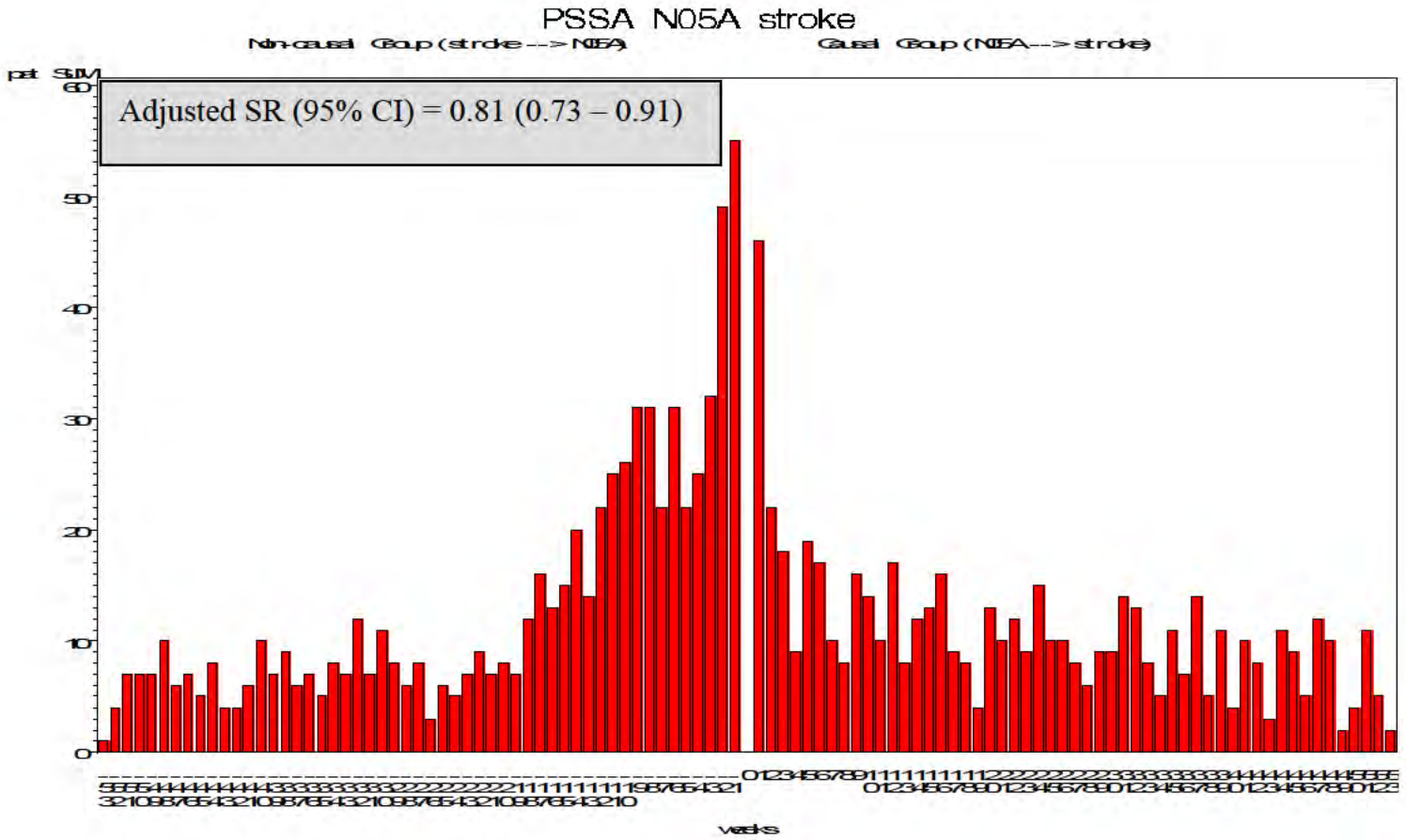
Self-controlled Case-series – Hip Fracture



Self-controlled Case-series – Hip Fracture



PESA - Stroke


PSSA N05A stroke
Non-causal Group (stroke --> N05A)
Causal Group (N05A --> stroke)
pat SUM
Adjusted SR (95% CI) = 0.81 (0.73 – 0.91)
weeks

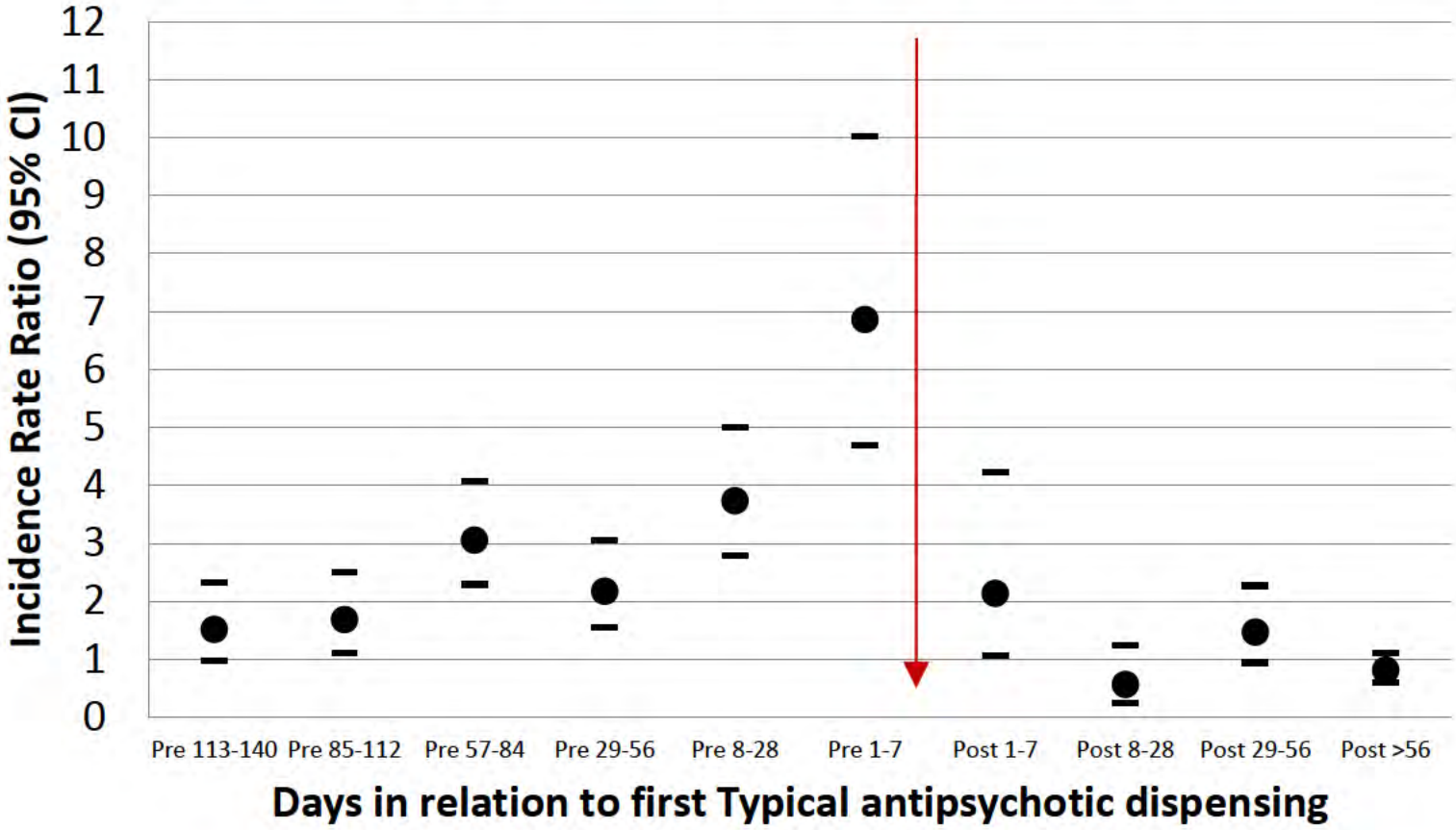
Aim

- To determine whether antipsychotics are associated with an increased risk of hospitalisation for stroke compared to periods of non-exposure using the self-controlled case-series analysis

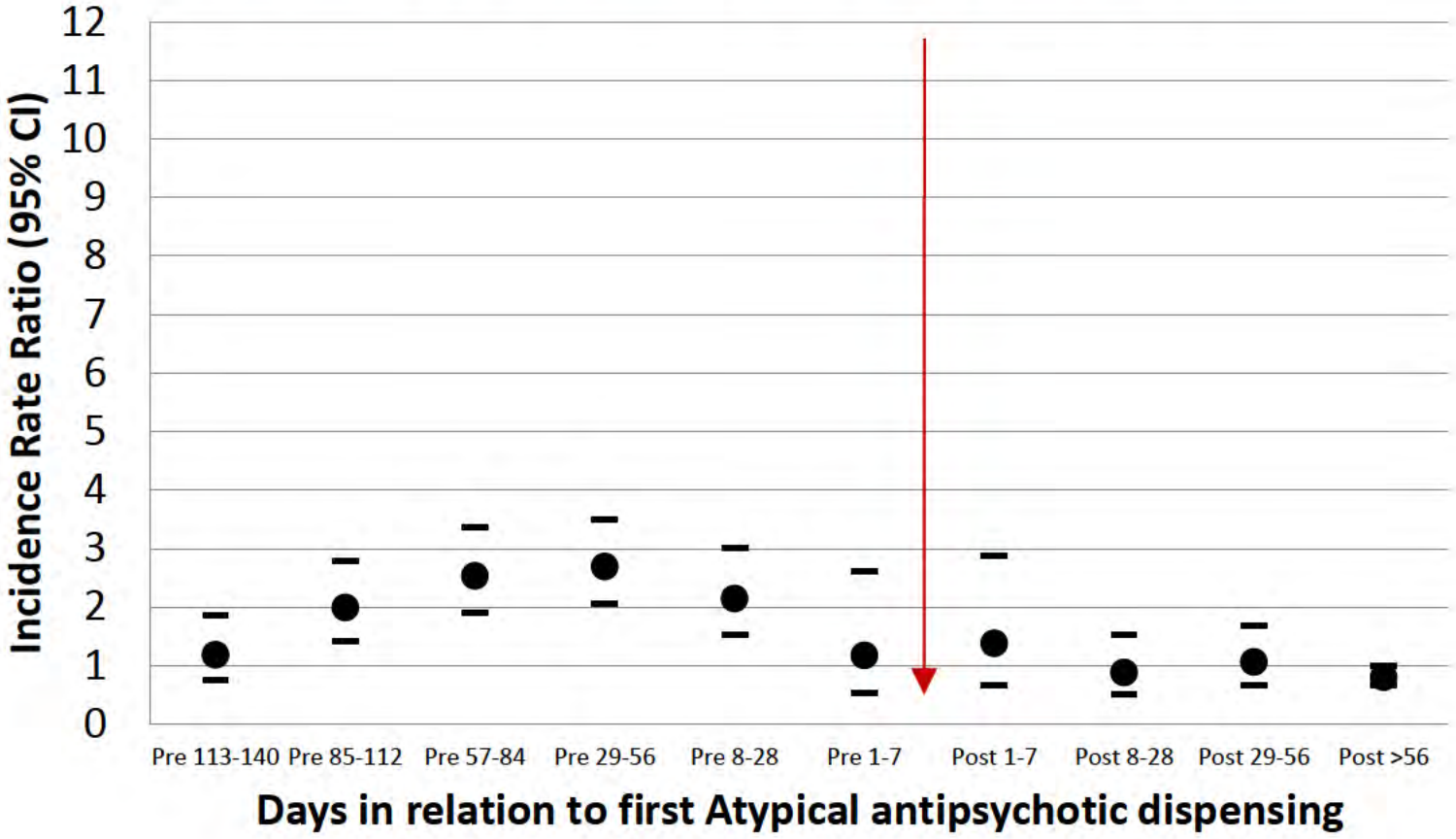
Self-controlled Case-series

- Results
  - 10638 patients with at least one hospitalisation for hip fracture
    - 514 patients were initiated on typical antipsychotics
    - 564 patients were initiated on atypical antipsychotics

Self-controlled case-series - Stroke



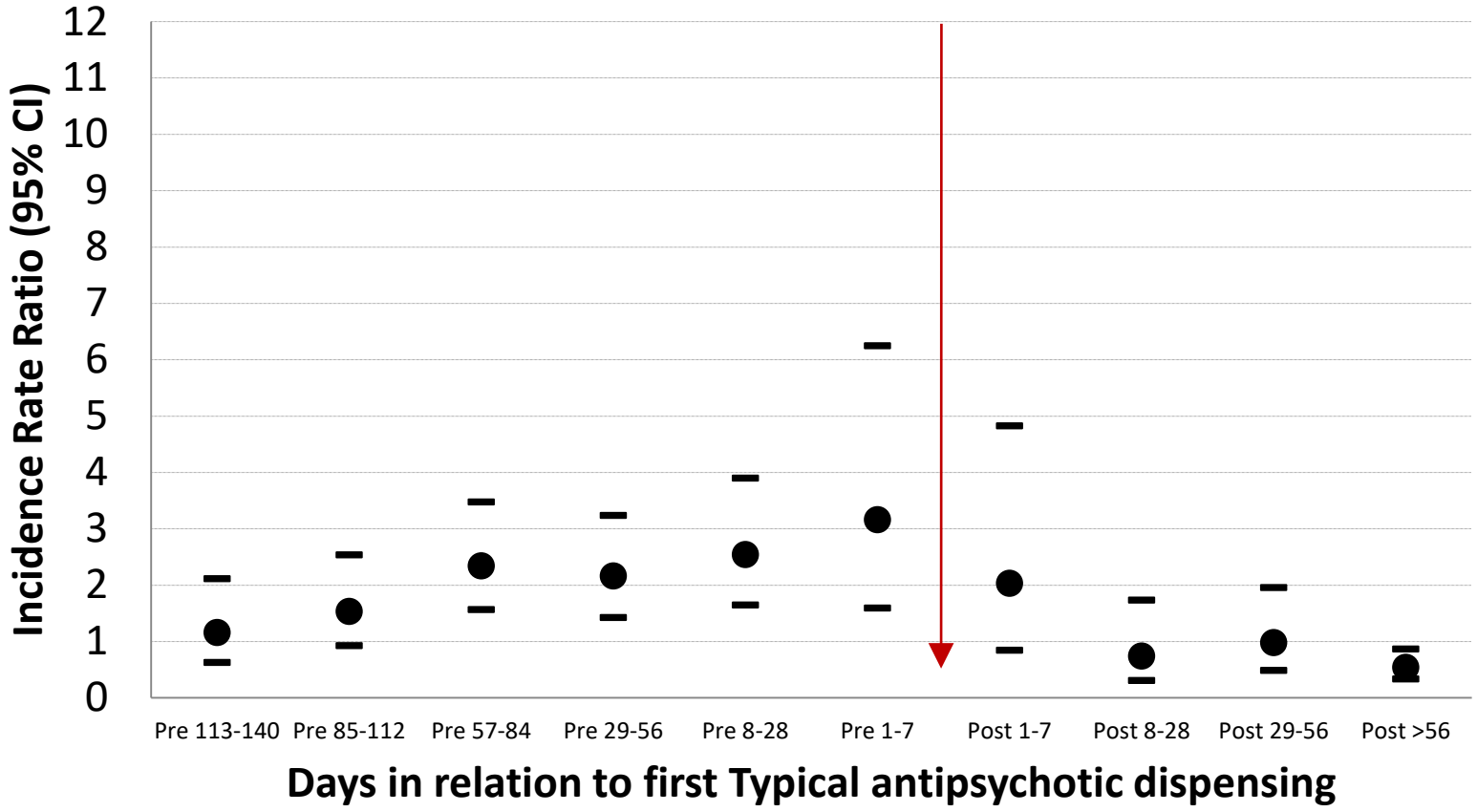
Self-controlled case-series - Stroke



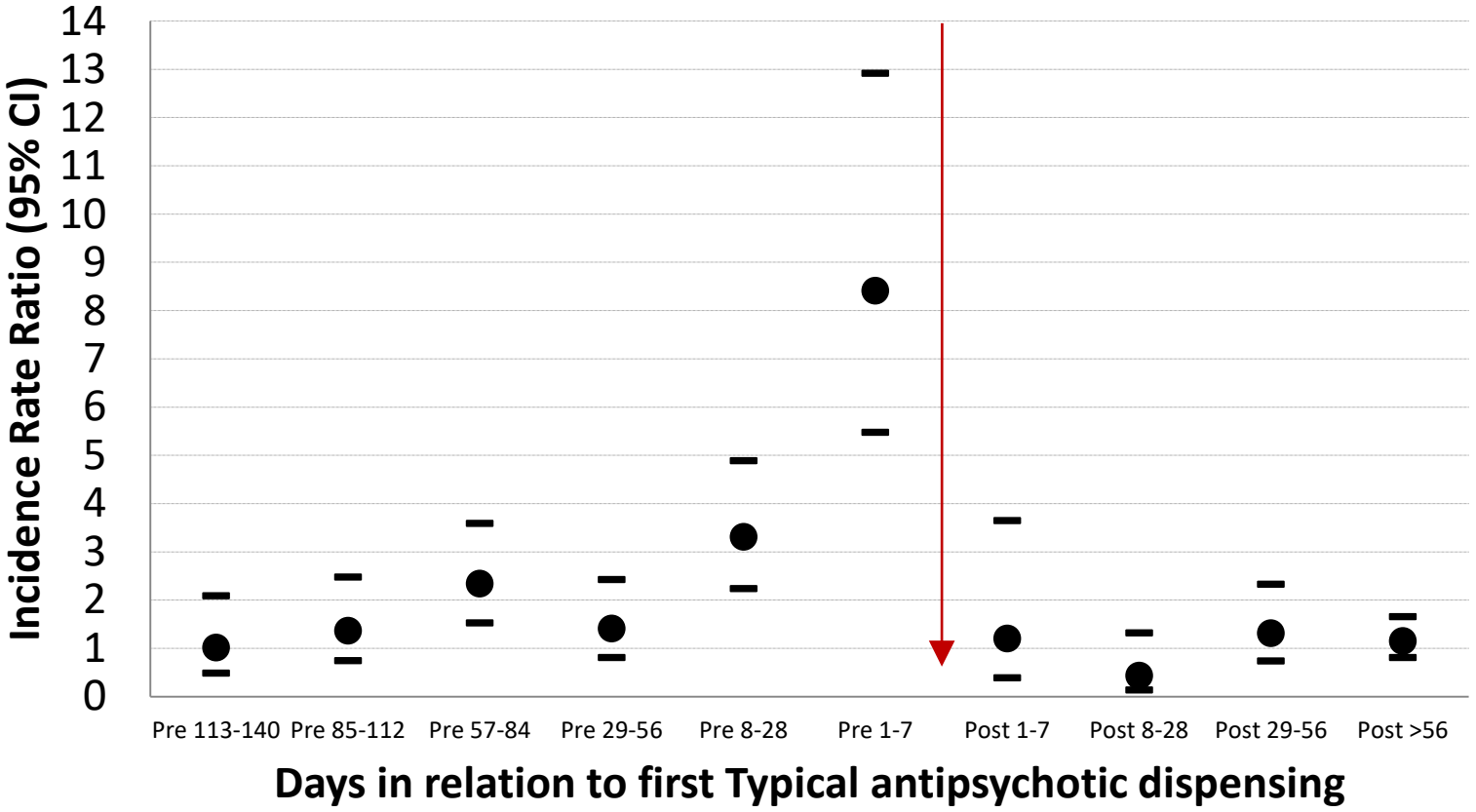
Aim

- To determine whether the risk of stroke associated with antipsychotic exposure is modified by the period of exposure

Self-controlled Case-series
Stroke – 2003-2004



Self-controlled Case-series
Stroke – 2005-2006



Aim

- To estimate the risk of death between new users of atypical and typical antipsychotics in patients resident in aged care facilities using an instrumental variable analysis

Instrumental Variable Analysis

- Patient prescribed typical or atypical antipsychotics
  - 1/1/2003 – 31/12/2006
  - First antipsychotic dispensed during the study period (no antipsychotic in previous 12 months)
  - Age > 65 years
  - Full entitlement (>12 months)
  - Resident in Aged care facility
- Instrument – nursing home preference

Instrumental Variable Analysis

- IV mimics random assignment of patients into groups of different likelihood for treatment
- Like intention-to-treat analysis in an RCT
- IV estimate = ITT estimate / Strength of IV

	Actual Treatment Received					RAC Facility Preference				
	Typical (N=3914)		Atypical (N=3705)		Diff	Typical (N=3729)		Atypical (N=3890)		Diff
Male	2036	52.0%	1863	50.3%	**1.7%**	1928	51.7%	1971	50.7%	**1.0%**
Anticholinesterase	525	13.4%	590	15.9%	**-2.5%**	504	13.5%	611	15.7%	**-2.2%**
Antidepressants	1703	43.5%	1748	47.2%	**-3.7%**	1642	44.0%	1809	46.5%	**-2.5%**
Antiparkinsons	219	5.6%	317	8.6%	**-3.0%**	248	6.7%	288	7.4%	**-0.8%**
Usual Doctor	2209	56.4%	2193	59.2%	**-2.8%**	2112	56.6%	2290	58.9%	**-2.2%**
Morphine	539	13.8%	246	6.6%	**7.1%**	477	12.8%	308	7.9%	**4.9%**
Pneumonia	193	4.9%	138	3.7%	**1.2%**	181	4.9%	150	3.9%	**1.0%**

Results

- Conventional Cohort Analysis
  - Unadjusted RD = -13 (-15,-11) deaths per 100
  - Adjusted RD = -9 (-12,-7) deaths per 100
- Instrumental Variable Analysis
  - Adjusted RD = -14 (-19,-10) deaths per 100

Conclusions

- Antipsychotics associated with an increased risk of death of in the elderly
- Risk is higher for typical antipsychotics compared to atypical antipsychotics
- This excess cannot be attributed to confounding

Conclusions

" *Observational studies suggest that, similar to atypical drugs, treatment with conventional antipsychotic drugs may increase mortality. The extent to which the finding of increased mortality in observational studies may be attributed to the antipsychotic drug as opposed to some other characteristic(s) of the patient is not clear* "

Product Information: Haldol Injection http://www.pbs.gov.au/pi/jcphaldi11208.pdf

Opportunities for TGA

- Using PBS data only
  - Monitoring extent of prescribing in high risk groups where co-prescribing is indicative of risk
  - Identifying possible new adverse drug events: Prescription Symmetry Analysis
    - Compare outcomes in trial populations versus treated populations
- Using DVA data or other linked data
  - Confirming suspected adverse drug reactions

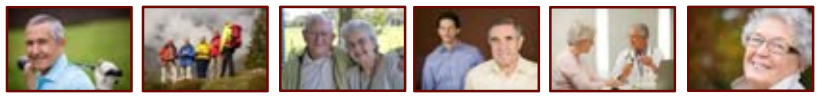
Using data analytic systems for improving medication safety in practice





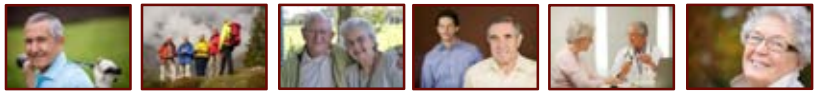

Today's talk

- Using population data sets to improve health care at the population level
- Using population data sets to generate evidence of medication safety
- Using patient collected data to reduce adverse events



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.

Therapeutic Brief

www.veteransmates.net.au September 2017

Chronic pain rehabilitation: It's about improving function and day-to-day life

Understanding pain is the first step to recovery for patients with pain that has persisted for more than 12 weeks.[1,2] A biopsychosocial strategy, that incorporates pain neuroscience education, helps patients to understand why

Inside

- Chronic pain is a common problem in Australia
- Many patients feel pain even when there is no tissue damage
- Catastrophising contributes to chronic pain
- Talk with your patient before

Patient name, Date of birth, Address

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.

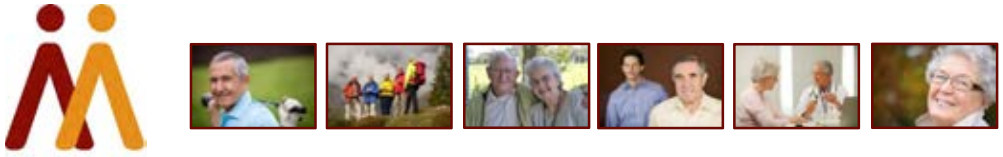
Dose of opioid has exceeded 100mg OME per day

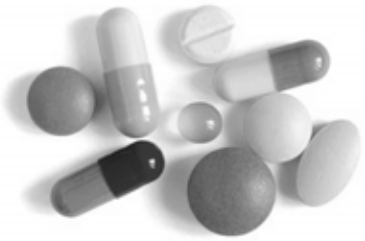
Suggested action: Referral for a specialist pain evaluation ☐ Yes

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.

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





We use the data to

- **Identify potential problems for veterans**
- **Develop the medication and problem 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

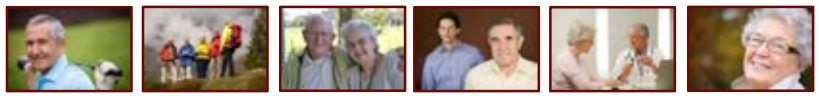
Contains hospital records including diagnosis and procedures

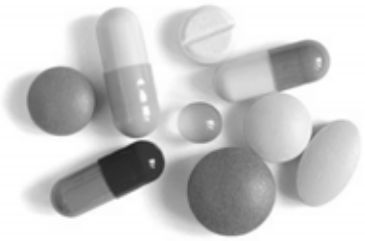
Includes pharmacy, medical and allied health records including doctor visits, radiology and pathology claims

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

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

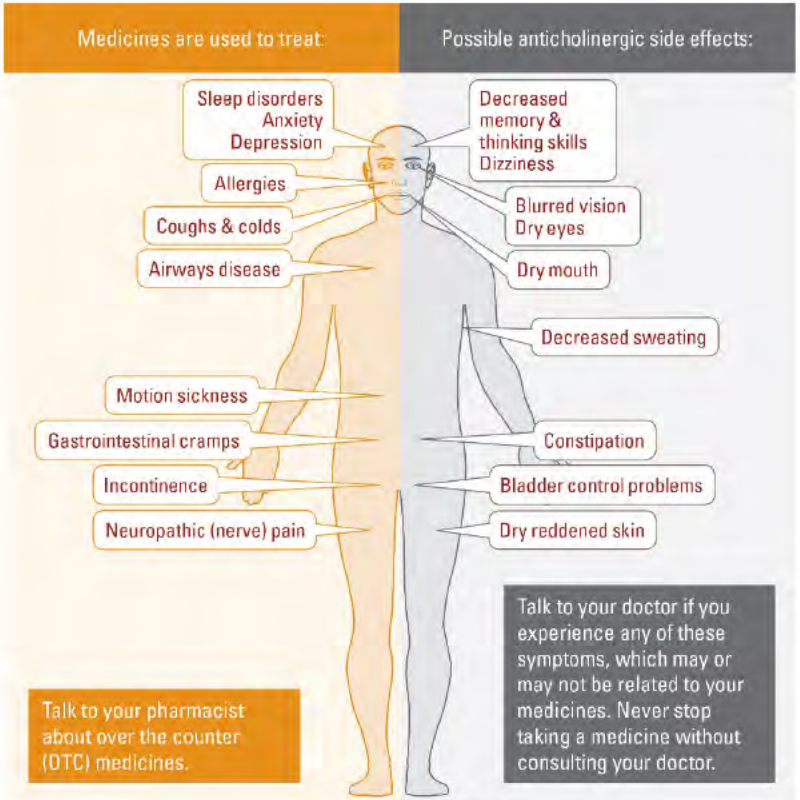
- The program is underpinned by behavioural theory
- A practitioner reference group and a veteran reference group meet twice yearly to provide advice
- Materials written by a medical writer supported by clinical reference group
- Peer-reviewed prior to publication
- Endorsed by a national, representative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

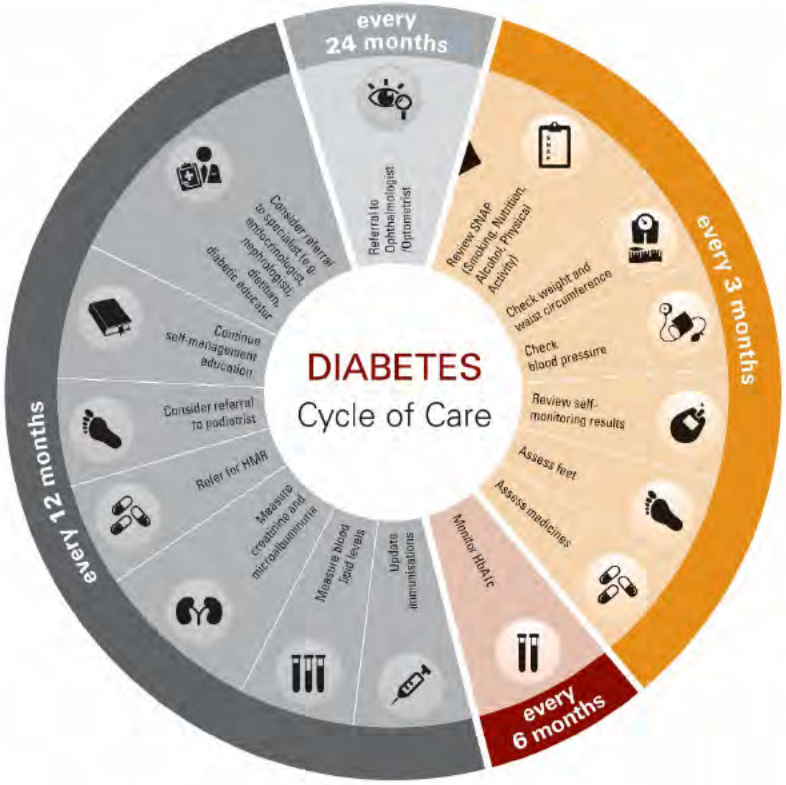




To date 57 topics delivered reaching on average:

- 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?



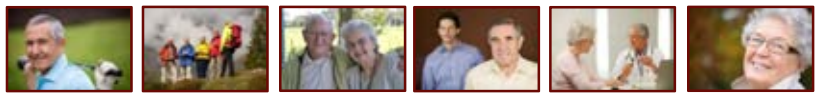


Improving osteoporosis management:

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

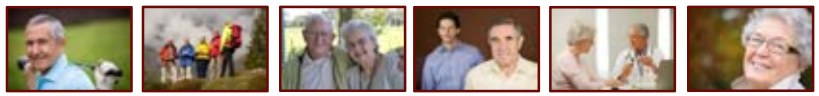


Improving osteoporosis management:

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

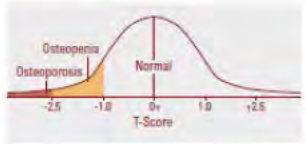
66% of people with osteopenia do not receive appropriate treatment

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.



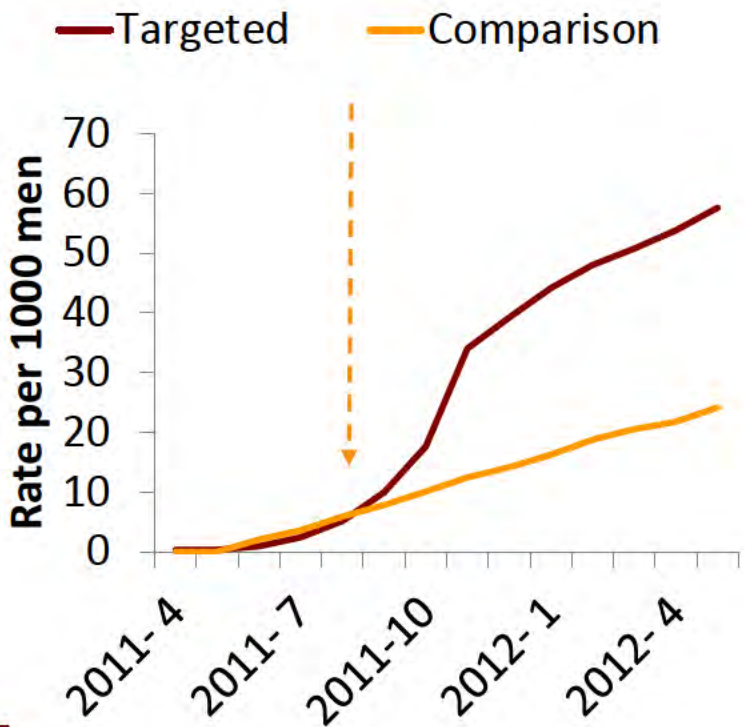
World Health Organisation **diagnostic criteria for osteoporosis, osteopenia and normal bone mineral density. Adapted with permission from *Osteoporosis Australia***

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)

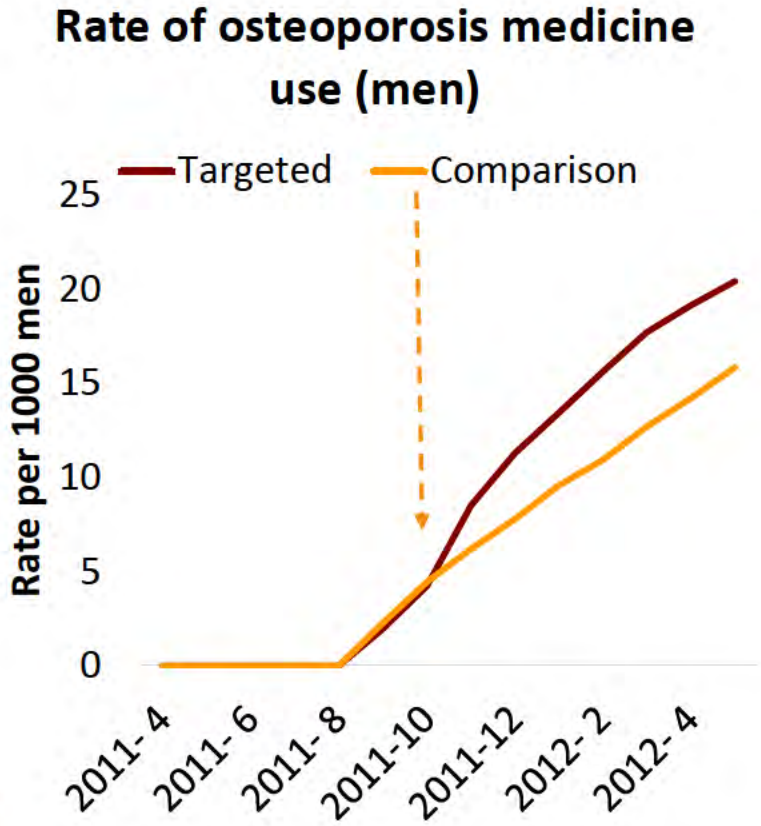
Reducing the risk of falls & hip fractures

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.

Doctor name

Patient name, date of birth, address	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:

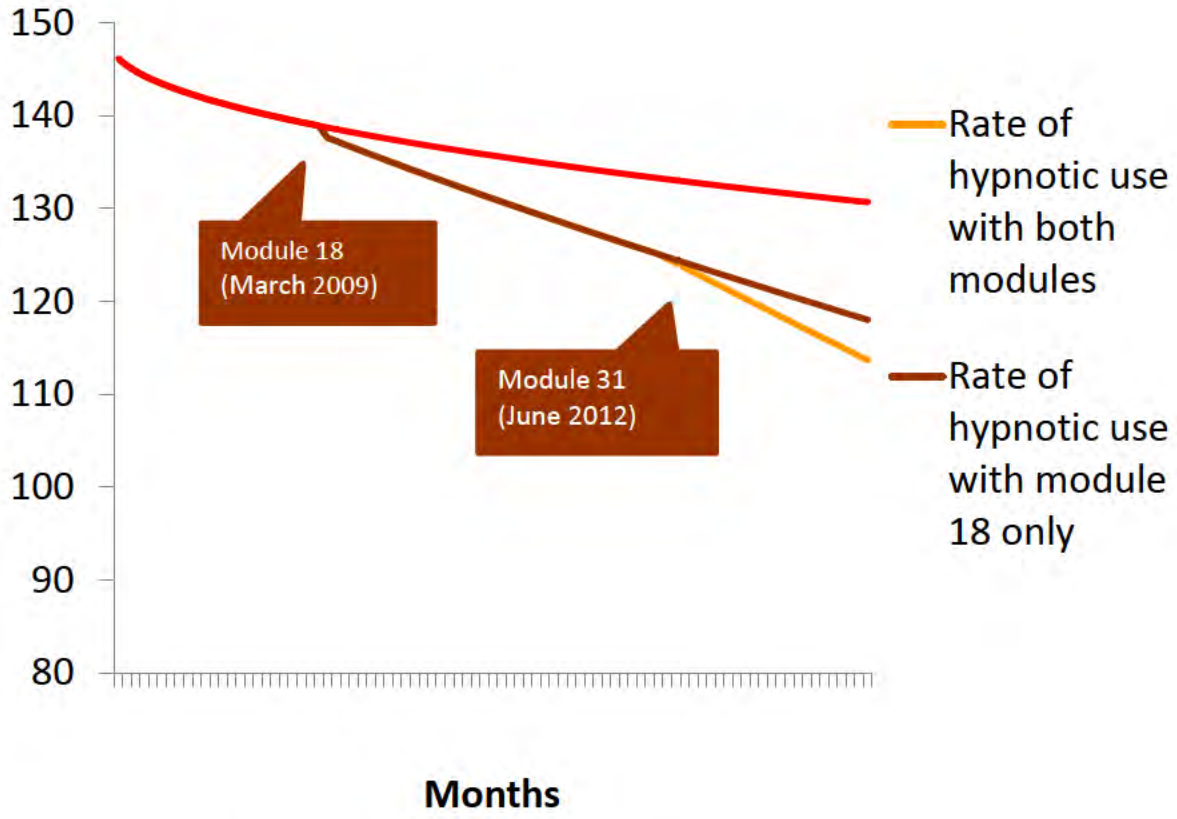
- Ask the patient how steady they feel on their feet or if they have previously fallen Yes ☐
- Review medicines to see if any are suitable for tapering or ceasing Yes ☐
- Ask the patient if they would consider reducing the medicine Yes ☐
- Plan a reduction strategy and address other risk factors for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



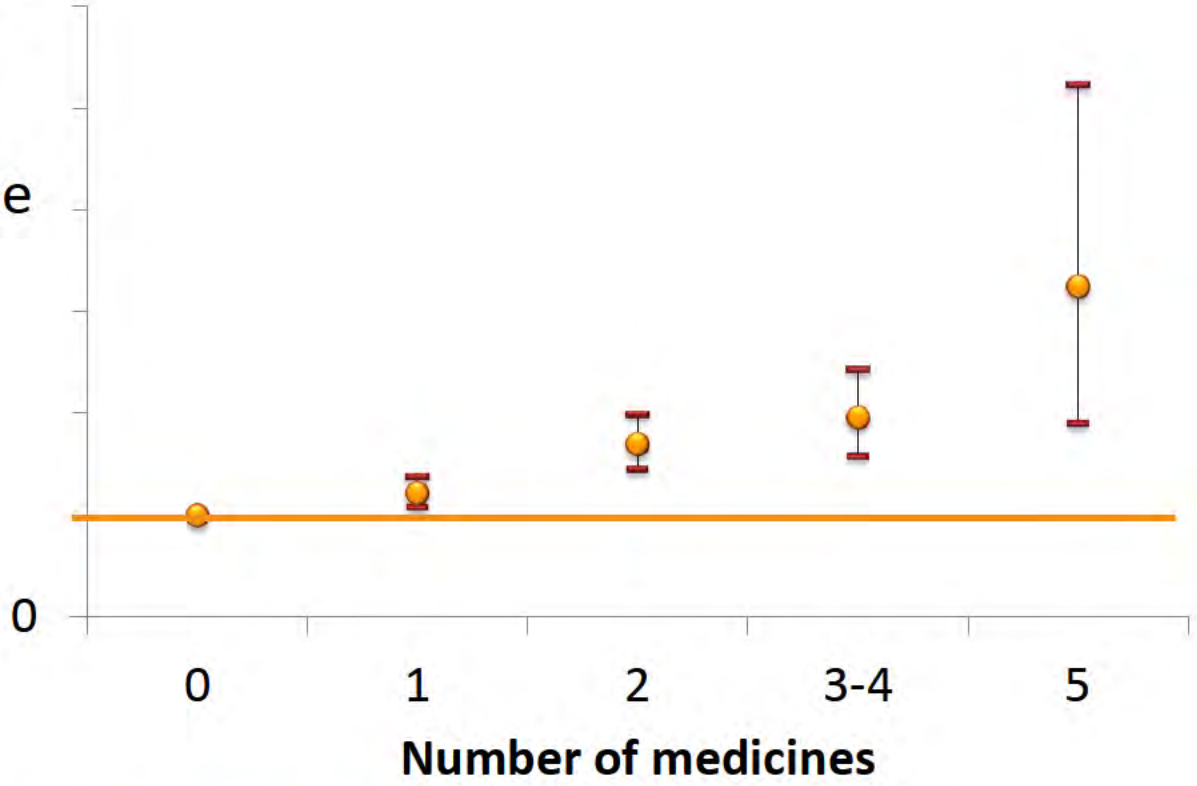
s 47F s 47F BMC Health Serv Res. 2018 Aug 9;18(1):626.

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

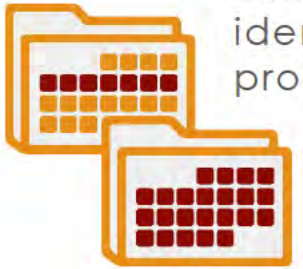
A multidisciplinary, collaborative approach

Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

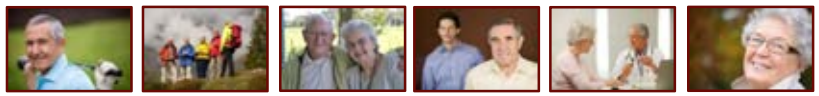
Significant stakeholder engagement



Only target identified problems

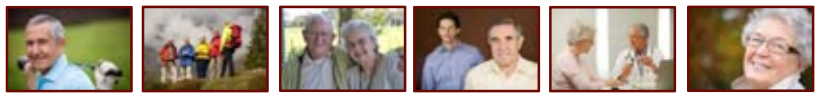
Grounded in behavioural theories and models

Using population data sets to generate evidence of medication safety



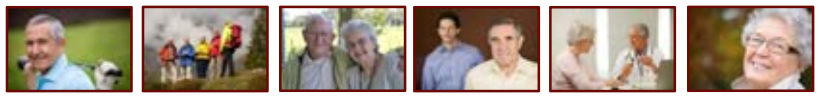
Collaborating with veterans to address issues of concern to them

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



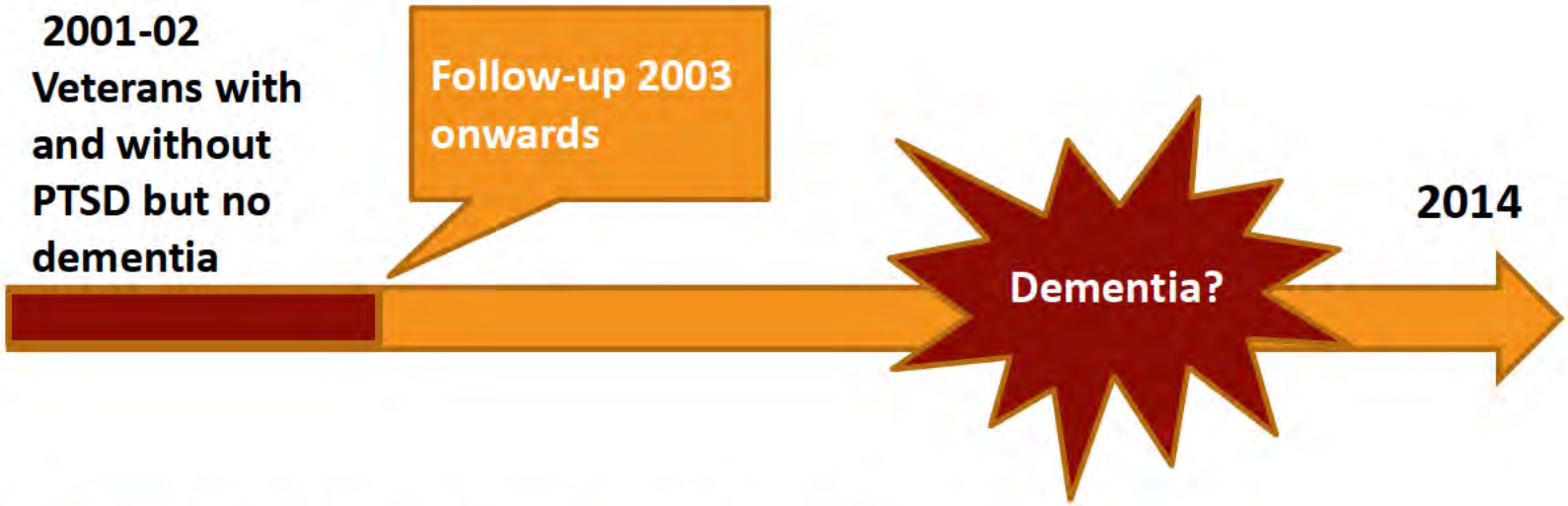
What was known?

- 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.

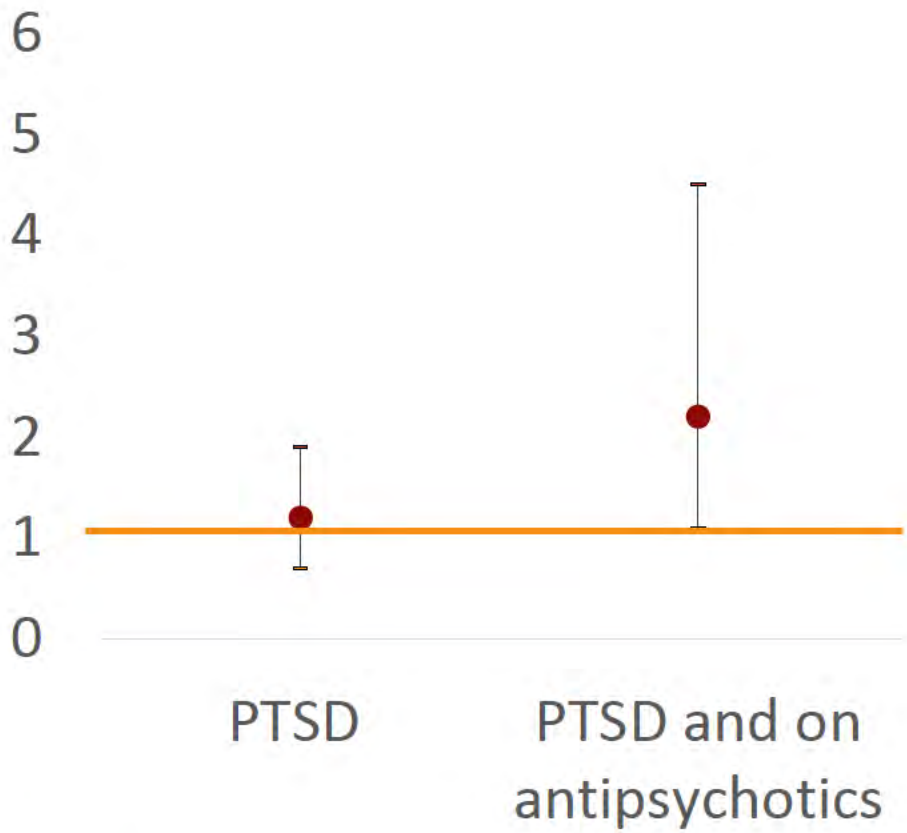


Clauston et al, Alzheimers Dement. 2016
Wang et al., J Affect Disord. 2016
Meziab et al., Alzheimers Dement 2014
Qureshi et al. JAGS 2010
Yaffe et al. Arch Gen Psychiatry 2010

What did we do?

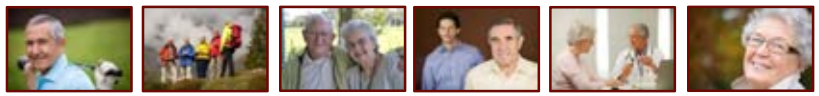


What did we find?

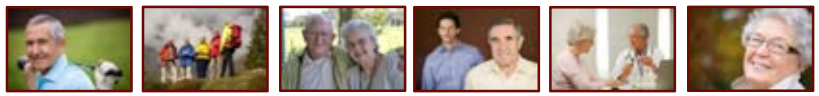


What does it mean?

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

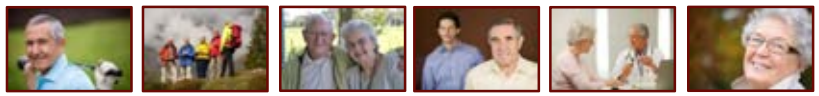


Collaborating with the Australian Government Department of Health

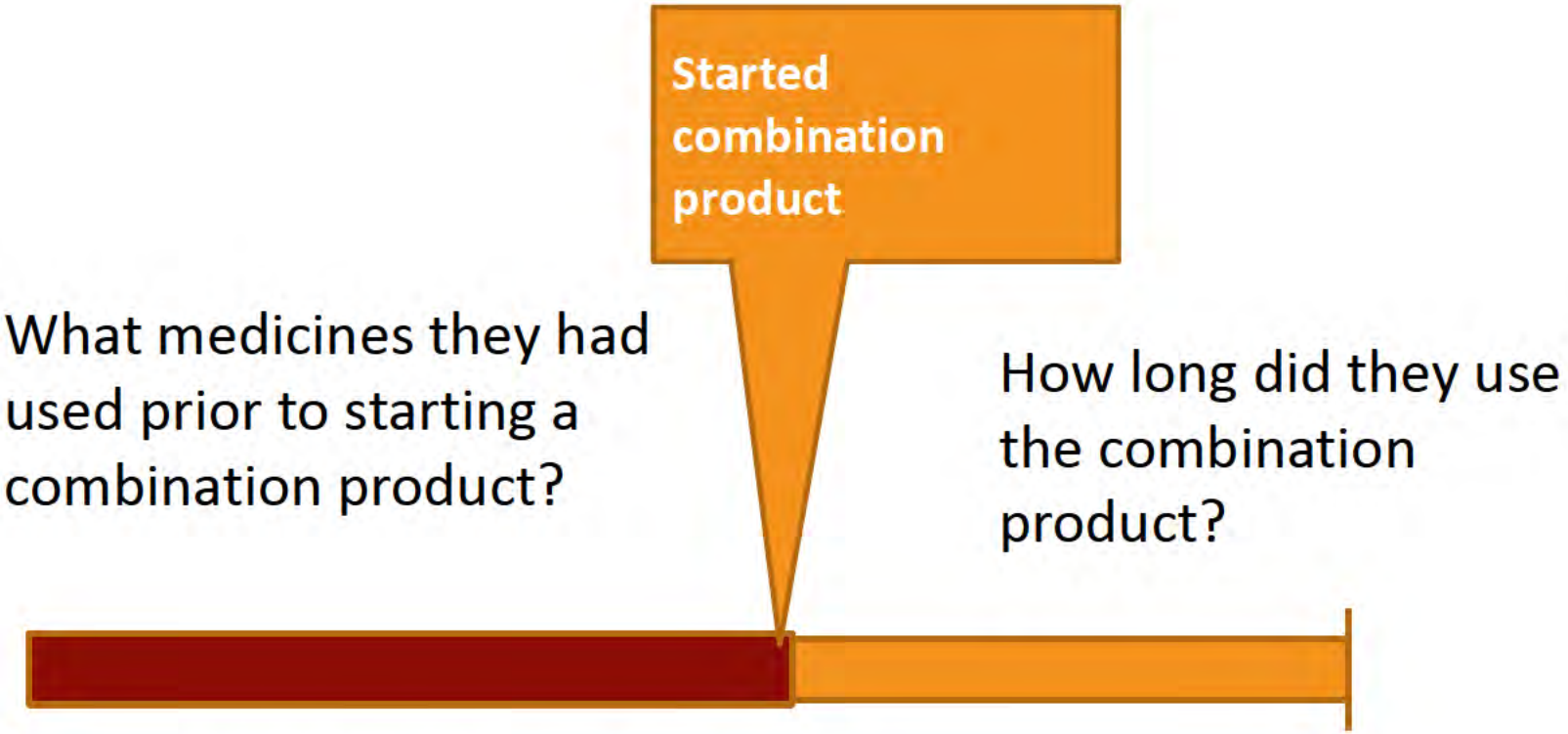


The asthma post-market review
What was known?

- 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

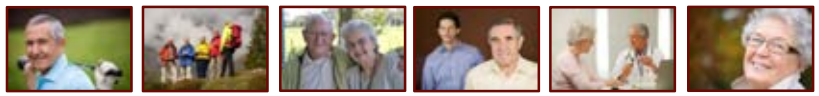
Started combination product

>60%

Only got one prescription of the combination product, which suggests inappropriate use

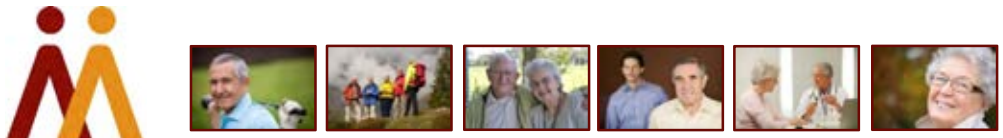
What was the outcome?

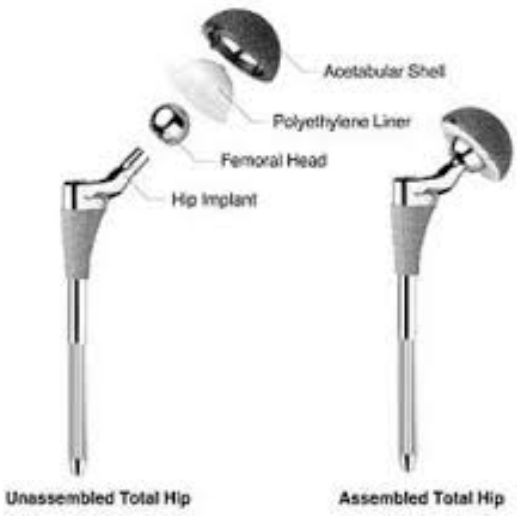
- Government advisory committee endorsed further NPS MedicineWise educational programs targeting quality use of medicines in children with asthma.



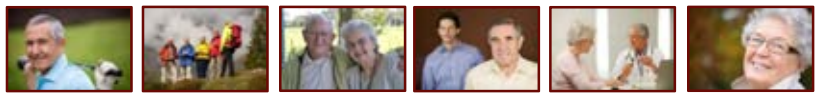
Collaborating with the Australian Therapeutic Goods Administration (TGA) to improve medical device safety

- The safety of medical devices is often assessed after they come to market
- One particular hip prosthesis (metal on metal) had been withdrawn from the market because it needed to be revised more often than other types of hip prostheses were the parts were metal on polyethelene
- The problem was thought to be because of metal ions being released from the wear of the metal parts
- TGA were interested to know if there was any evidence of heart problems in patients with metal on metal hips

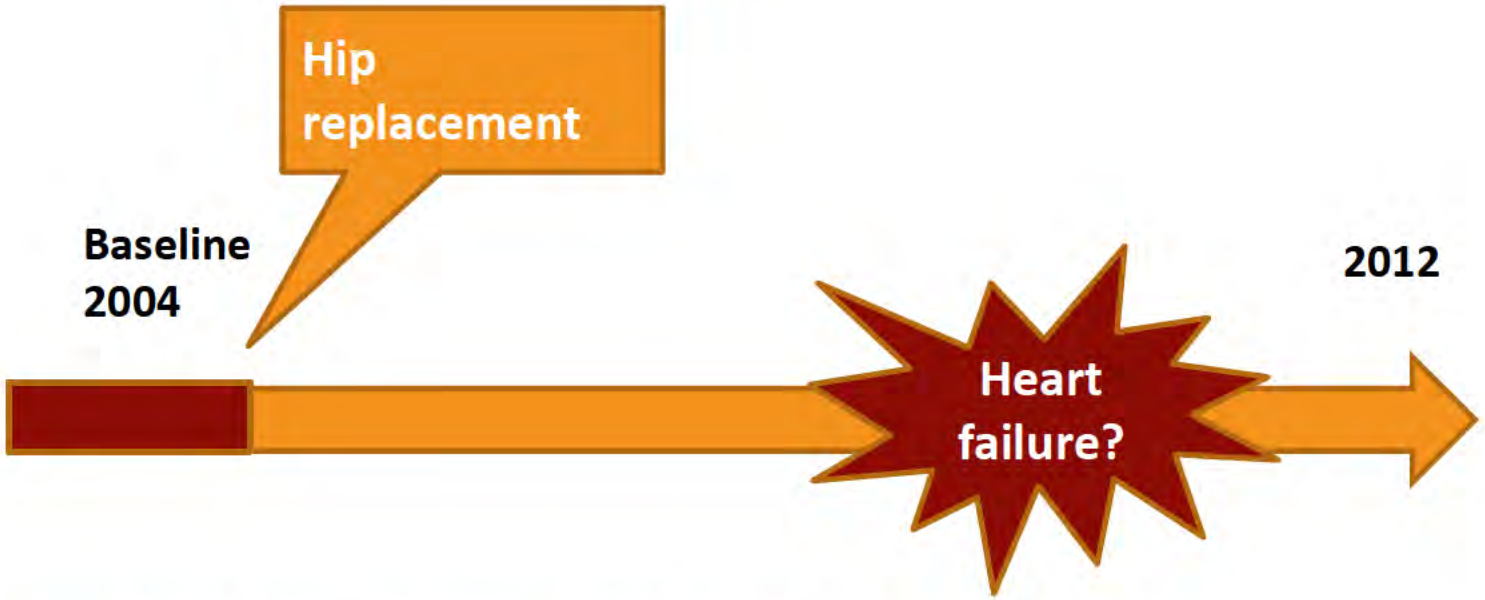




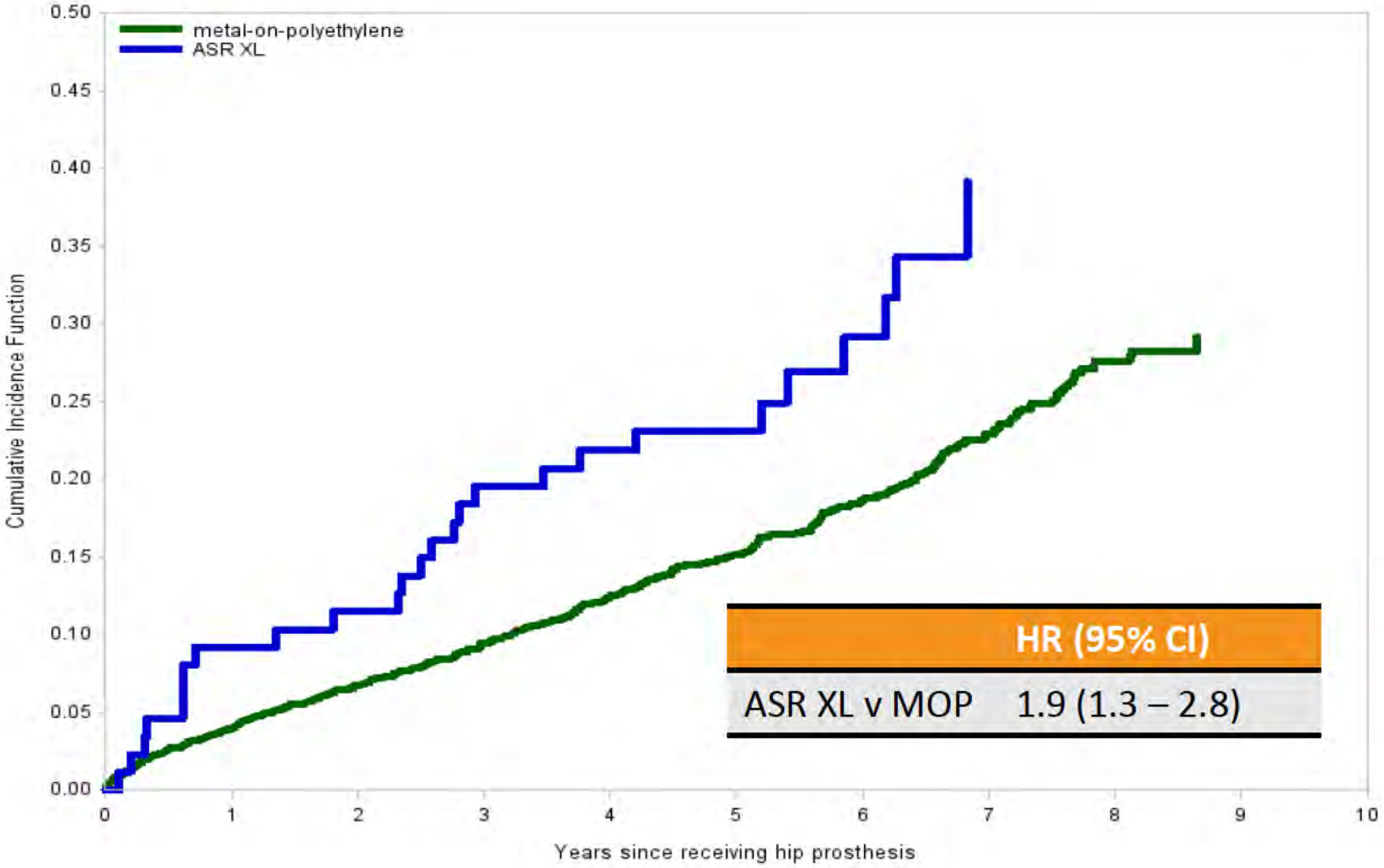
What was known?



What did we do?

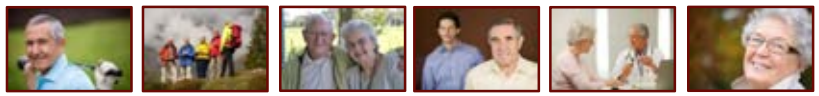


What did we find?



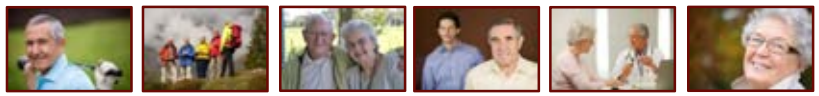
What was the outcome?

- 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



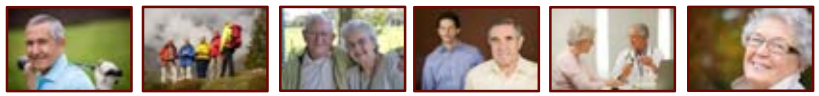
Collaborating with international partners to improve medication safety

- 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



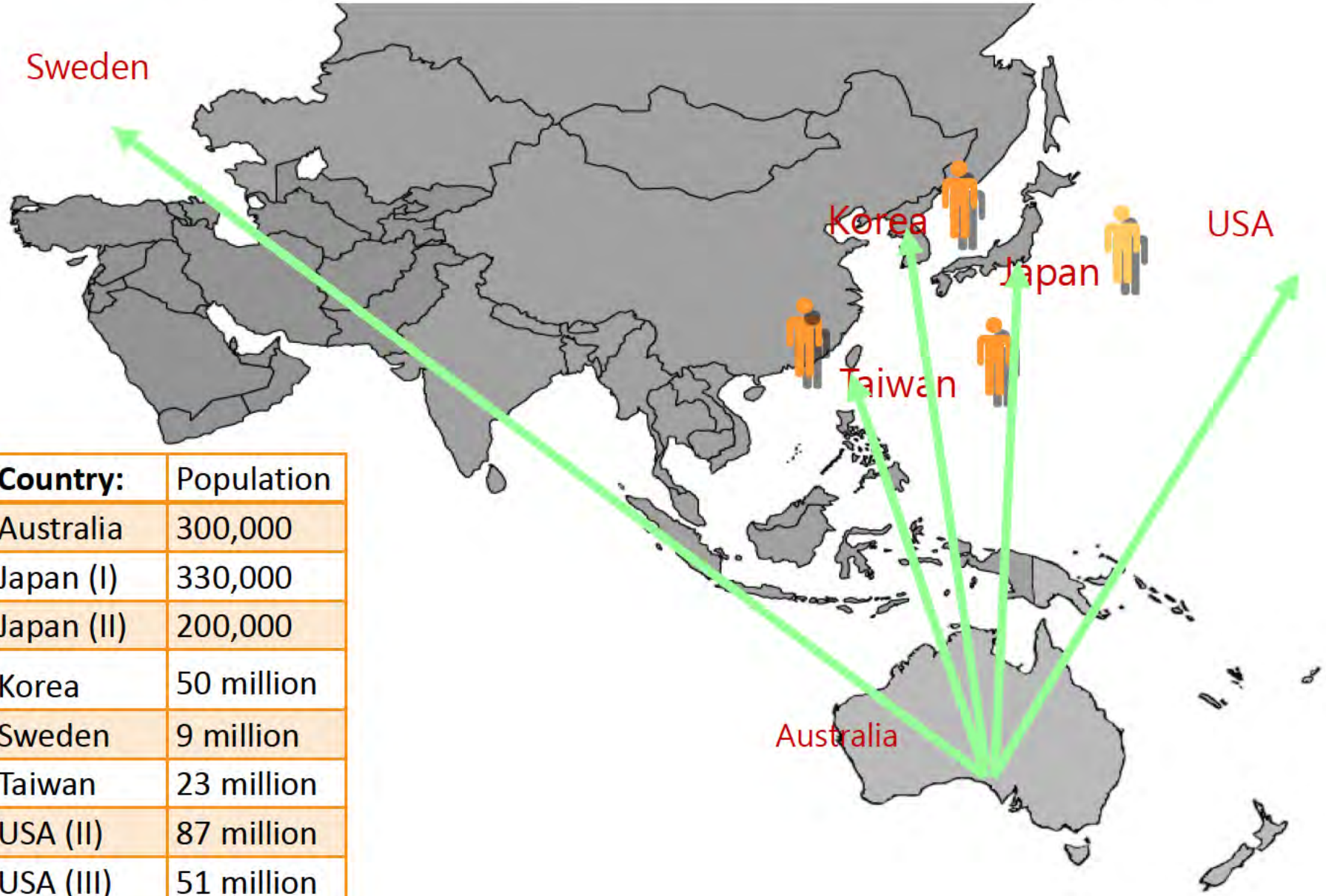
Why worry about medicines safety?

- 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

The AsPEN Prescription Symmetry study

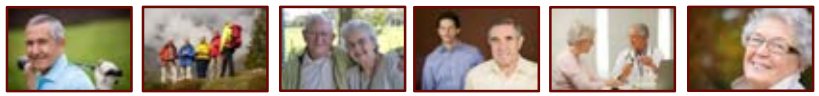


Country:	Population
Australia	300,000
Japan (I)	330,000
Japan (II)	200,000
Korea	50 million
Sweden	9 million
Taiwan	23 million
USA (II)	87 million
USA (III)	51 million

Thiazolidinediones and heart failure

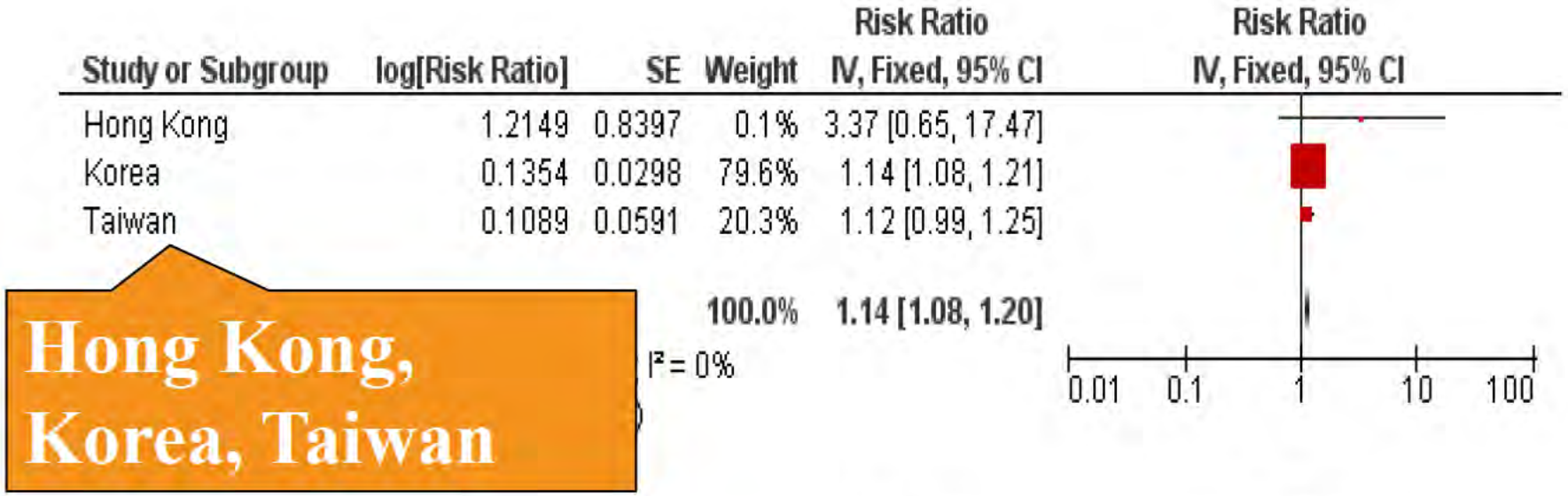
- Studies predominantly in Caucasian populations suggested these medicines double the risk of heart failure
- Is the risk the same in Asian populations?

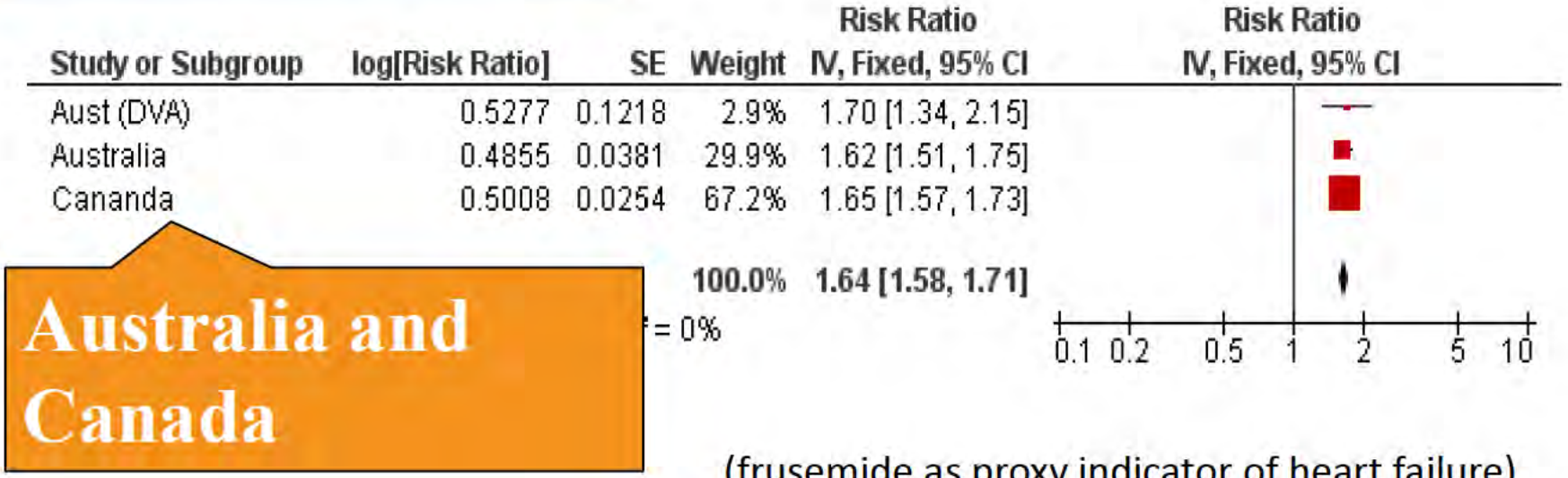
Differences in the genes that metabolise the medicine may mean the side effect may be different.



1. Singh S., et al JAMA 2007
2. Lincoff A.M., et al JAMA 2007
3. Loke Y.K., et al BMJ 2011

Rosiglitazone and heart failure risk

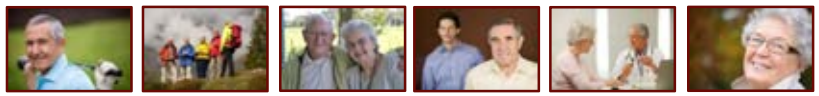




(frusemide as proxy indicator of heart failure)

What was the outcome?

- Australian Therapeutic Goods Administration are now trialling implementation of the method to support post-market surveillance of medicines in Australia



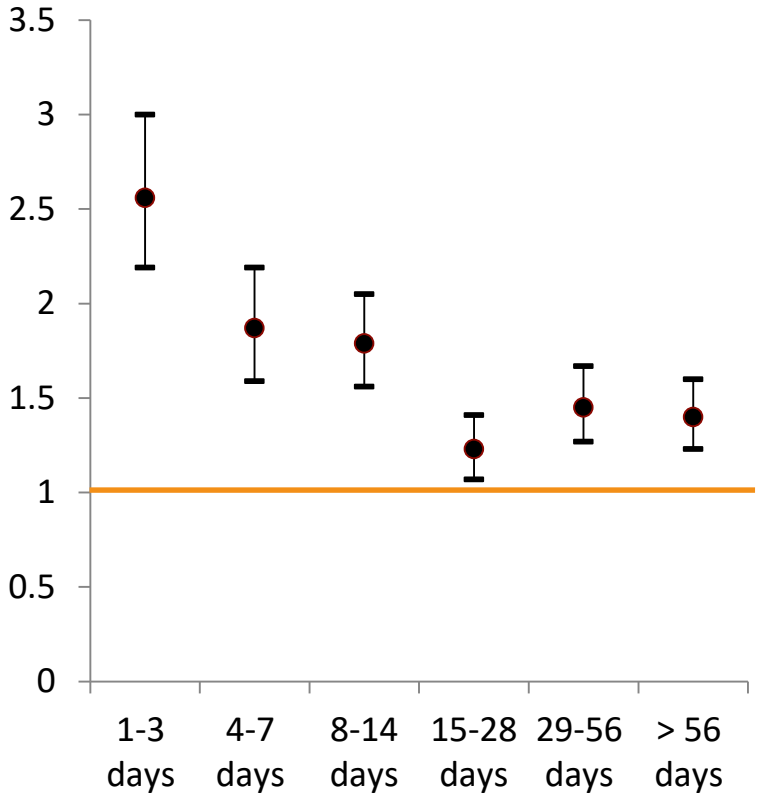
Now extended to more complex outcome studies and country exchanges

- Methylphenidate for attention deficit disorder in children and adverse cardiac outcomes
- Code written and tested here, sent to Korea for implementation

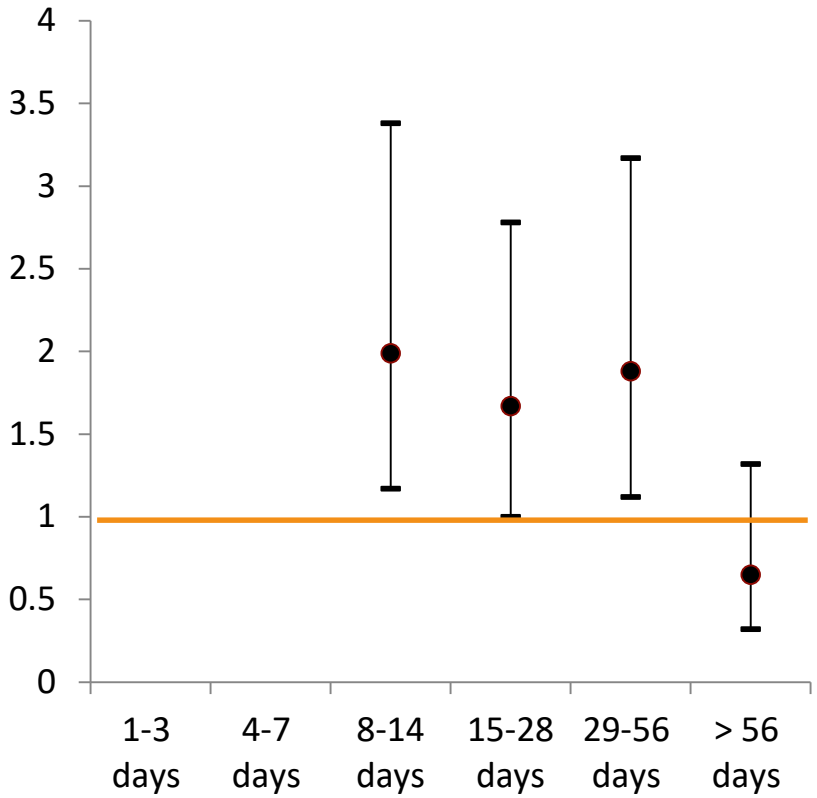
Australia Korea Foundation

Risk of adverse cardiovascular outcomes in children taking medicines for attention deficit disorder

Risk of arrhythmia



Risk of stroke

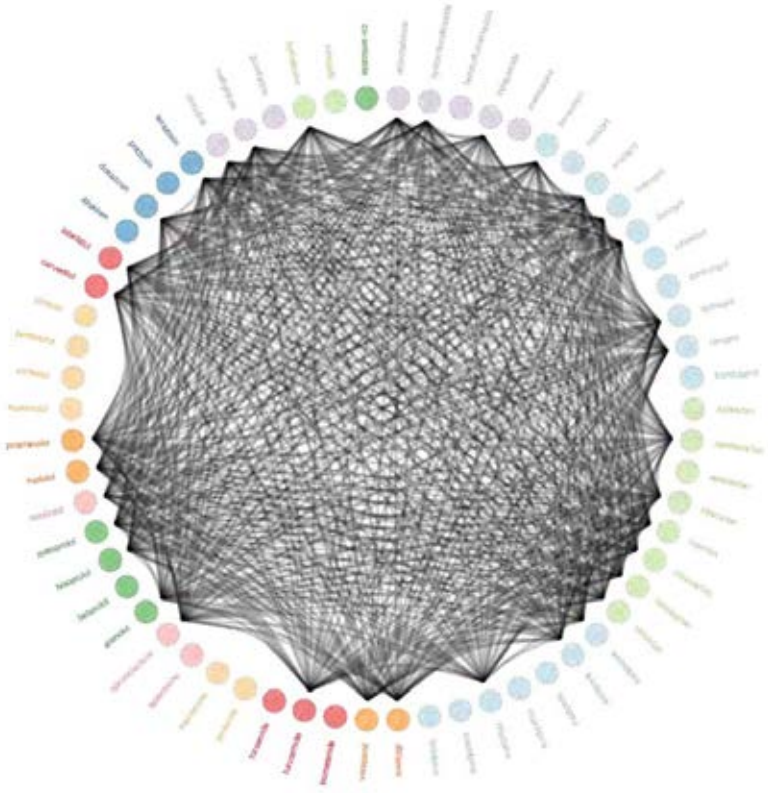


The potential for improving our understanding of health care using health data sets

Current evidence of the effectiveness of antihypertensives

The lines show the studies comparing antihypertensive medicines

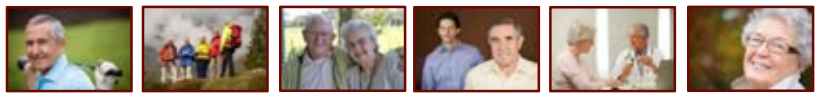
9 linked data sets from 4 different countries have now been used to compare them all



https://github.com/OHDSI/LEGEND

Conclusion

- Working with data custodians and government agencies and health care providers has enabled significant improvements in health care,
  - 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



Glaucoma eye drops in patients with co-morbidities: evidence for harm and implications for GPs: results from the Australian Veterans' MATES program

Elizabeth s 47F **Amanda** s 47F **Lisa** s 47F **Andrew** s 47F **Tammy** s 47F

1. Sansom Institute, School of Pharmacy and Medical Sciences, University of South Australia, Australia;
2. Medical School, Australian National University, 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 thirty-four educational modules over the nine years, June 2004 to June 2013

Department of Veterans' Affairs claims data

- Treatment population of approximately 290,000 veterans; median age is 80 years, with 5 co-morbidities
- 130 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 25 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, depression and airways disease

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 2007-April 2008 examined
- Current co-morbidities were identified using the medication-based co-morbidity profile Rx-Risk-V
- 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
- 3% dispensed pilocarpine – contraindicated
- 6 in 10 dispensed latanoprost, potentially a problem in asthma
- Overall, 88% 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 hospitalisation 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	95	60	35	1.71	1.57 (1.04-2.38)	2002-2006	Yes
Pilocarpine – respiratory hosp'n	57	39	18	2.17	1.67(0.96-2.92)	2002-2006	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

Contraindicated medications and cardiovascular co-morbidity

- 43% of veterans with co-morbid heart failure and treated for glaucoma were dispensed a topical beta blocker
- 4 in 10 dispensed verapamil were dispensed a topical beta blocker – contraindicated: may cause serious bradycardia
- Brimonidine dispensed to 8% with congestive heart failure and 8% with ischaemic heart disease - may aggravate heart disease

So what happens to these veterans?

- Analysis shows positive association of specific eye drop use and hospitalisation for bradycardia

Eye drop use and association with hospitalisation for ischaemic heart disease or bradycardia

	n	Causal	Non-causal	Crude ratio	Adjusted (95%CI)	Year of analysis	Association found
Timolol – IHD hospitalisation	275	145	130	1.12	1.09 (.86-1.38)	2002-2006	No
Latanoprost – IHD hospitalisation	413	219	194	1.13	1.12 (0.92-1.36)	2003-2006	No
Brimonidine – IHD hospitalisation	224	123	101	1.22	1.17 (0.91-1.54)	2002-2006	No
Timolol – bradycardia hosp'n	62	45	17	2.65	2.3 (1.30-3.96)	2002-2006	Yes
Latanoprost – bradycardia hosp'n	90	47	43	1.09	1.07 (0.71-1.62)	2003-2006	No
Brimonidine – bradycardia hosp'n	57	33	24	1.38	1.36 (0.81-2.30)	2002-2006	No

Contraindicated medications and depression co-morbidity

- 4 in 10 veterans treated for depression and glaucoma were dispensed topical beta blockers for glaucoma – possible aggravation of depression
- 7% dispensed alpha-agonists – probable aggravation of depression
- Overall, 49% of those on medicines for depression were co-dispensed a glaucoma medication with the potential to aggravate depression

So what happens to these veterans?

- Analysis shows increase in antidepressant initiation after glaucoma therapy

Eye drop use and association with initiation of antidepressants

	n	causal	Non-causal	Crude ratio	Adjusted (95%CI)	Year of analysis	Association found
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
Latanoprost – antidepressant	1871	1017	854	1.19	1.16 (1.06-1.27)	2003-2008	Yes
Latanoprost – SSRI	1155	639	516	1.24	1.20 (1.06-1.34)	2003-2008	Yes
Bimatoprost – antidepressant	582	285	297	0.96	0.98 (0.83-1.15)	2003-2008	No
Bimatoprost – SSRI	392	200	192	1.04	1.02 (0.84-1.24)	2003-2008	No
Brimonidine – antidepressant	741	401	340	1.18	1.16 (1.00-1.34)	2002-2008	Yes
Brimonidine – SSRI	497	278	219	1.27	1.24 (1.04-1.48)	2002-2008	Yes

Aims of Module –

- Provide useful information to GPs , ophthalmologists and pharmacists about optimal use of glaucoma medications in patients with respiratory and cardiovascular co morbidities
- 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
- On verapamil? beta-blockers are contraindicated
- 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

Australian Government
Department of Veterans' Affairs

Veterans' MATES

Achieving change in prescribing behaviour, medicine use and health outcomes in an elderly population: Successes and lessons from 10 Years of the Veterans' MATES program.

Professor Amanda s 47F

V T s 47F L M s 47F N L s 47F N s 47F M s 47F K P
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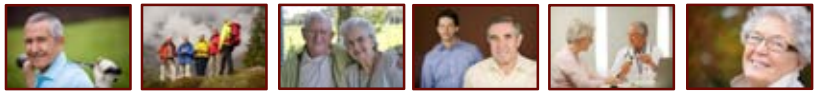
So what is the Veterans' Medicines Advice and Therapeutics Education Services program?

Veterans' MATES

- It is a data driven health promotion program providing up-to-date health and medicines information specifically tailored or 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 295 000 veterans and 33 000 general practitioners to date.



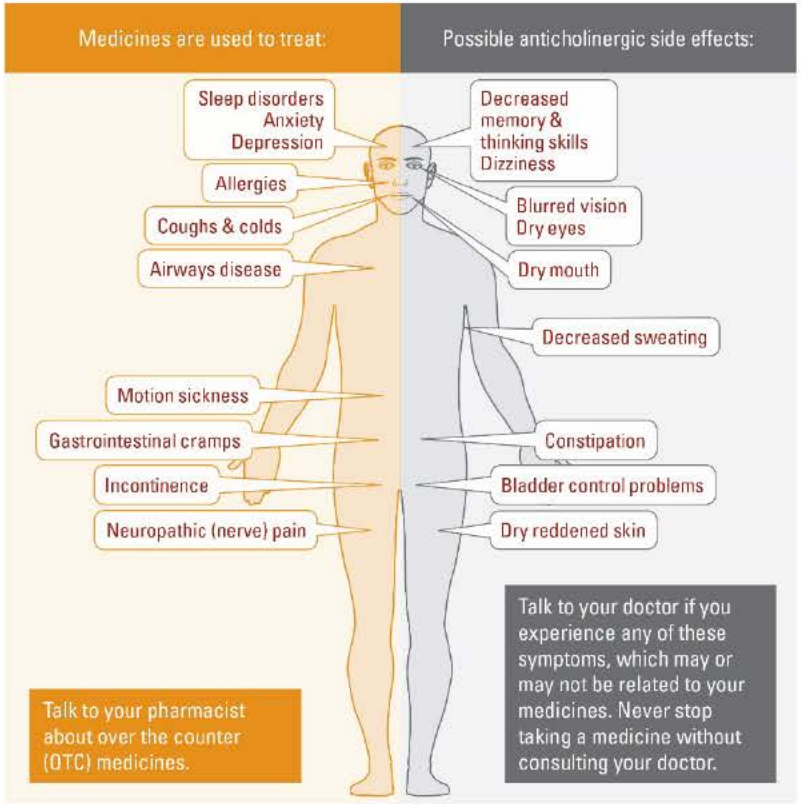
The approach

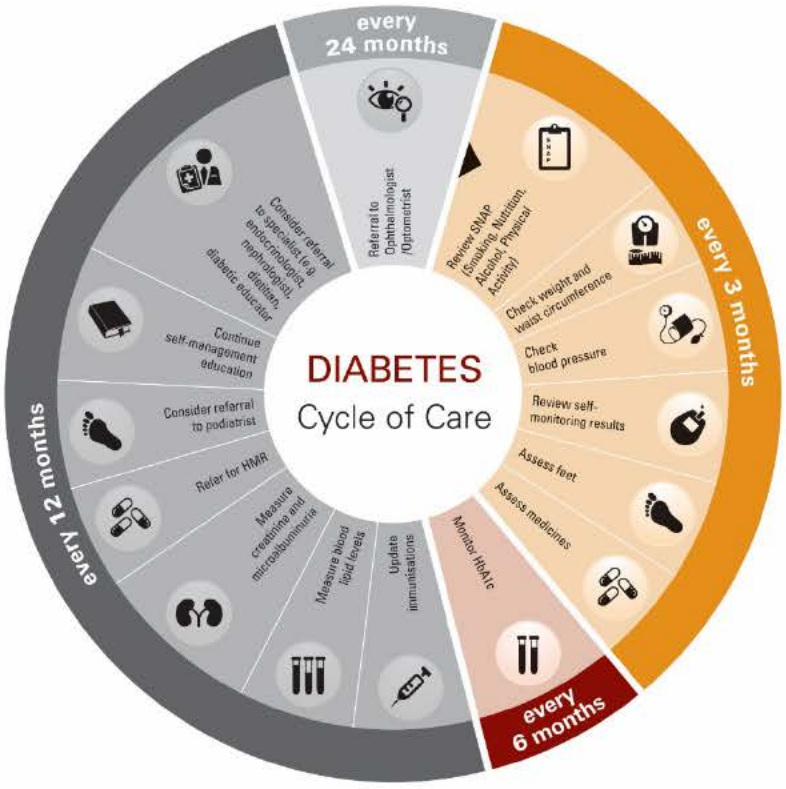
Every three months a chosen health topic is distributed:

- 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.

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



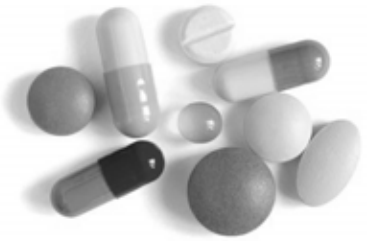


Each topic is either:

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

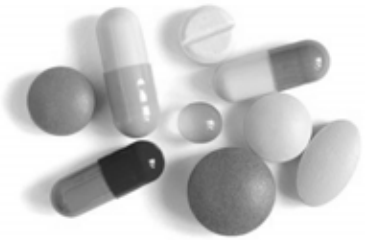
It includes significant stakeholder engagement

- 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



Is underpinned by behavioural theory

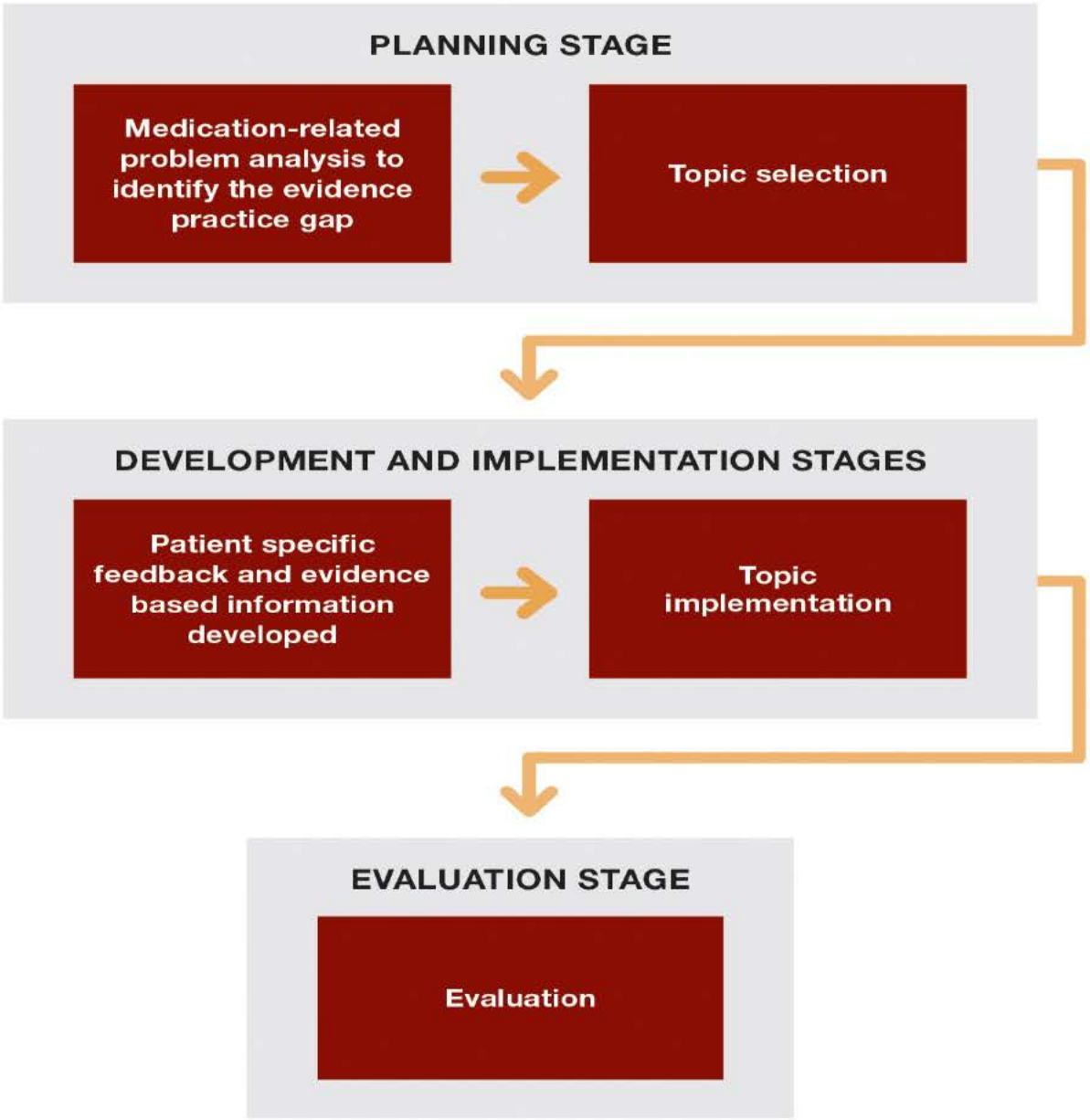
- Social cognitive theory and the Transtheoretical Model of change both inform the intervention with regards to individual behaviour change
  - Individuals at different states of change
  - Cognitive engagement, repetition, reinforcement, self efficacy and motivations
- Precede-Proceed Health Promotion Model informs the systems approach of the intervention
  - Requires a needs assessment, both social and epidemiological
  - Need to identify barriers, reinforcers, enables
  - Need Process, impact and outcome measures of evaluation



The health claims data are central to the program

- Australian Government Department of Veterans' Affairs health claims data
- Data over ten years – pharmacy, medical and allied health records (no diagnosis, includes GP visits, radiology, pathology etc)
- Hospital records (diagnosis and procedures)
- Client data-updated weekly, health claims data up-dated monthly

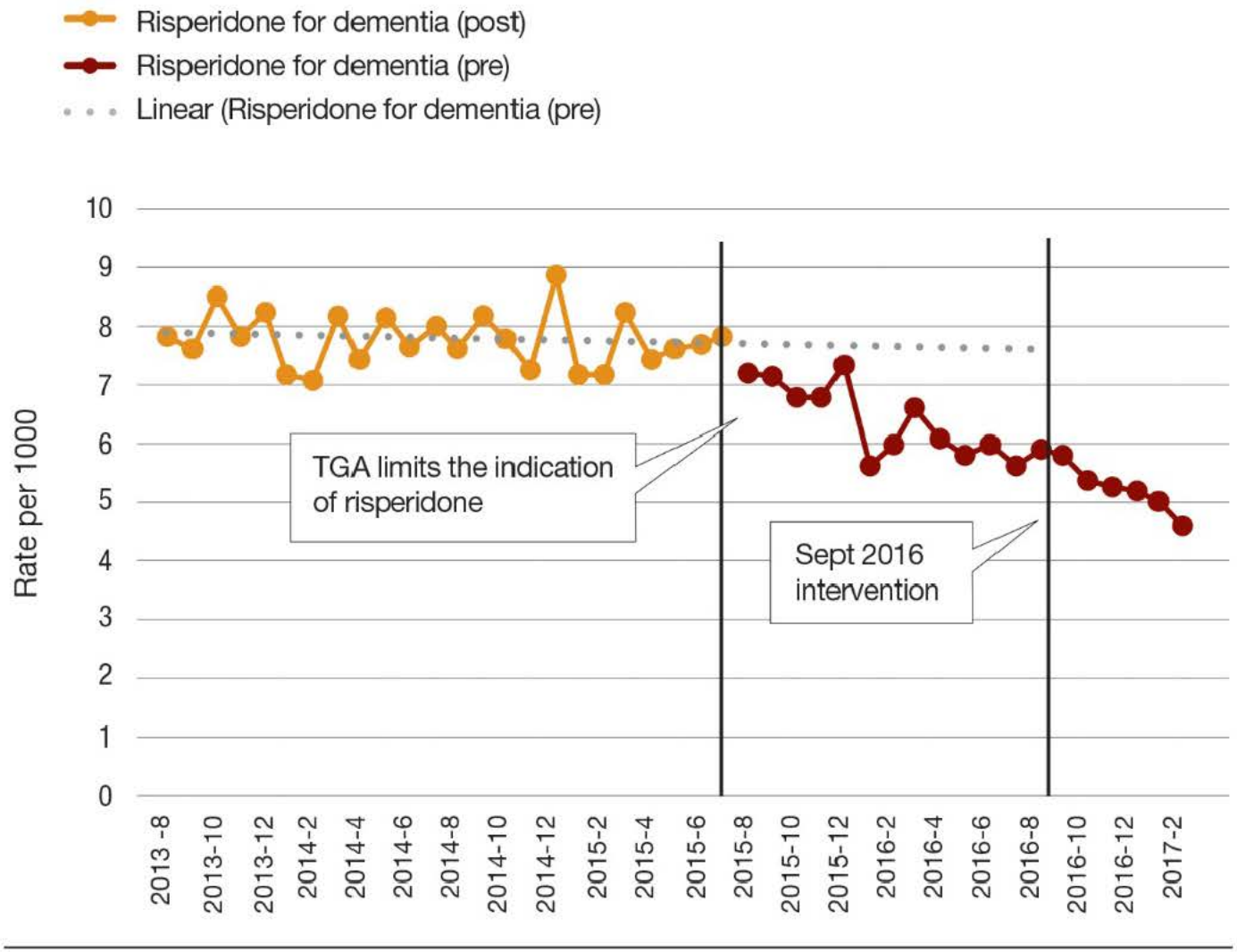
And the data are used in every stage of the program



So does Veterans' MATES make a difference?

Challenge: To reduce the use of antipsychotics in dementia

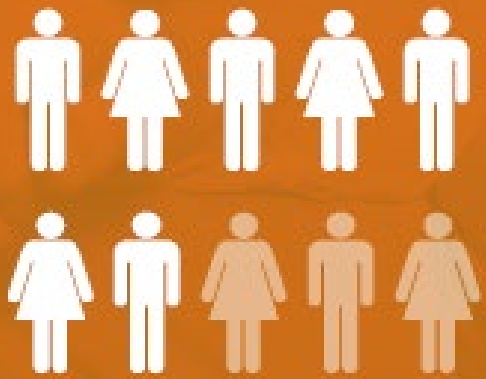
RATE OF VETERANS AGED 65 YEARS AND OVER PER MONTH WHO HAVE BEEN DISPENSED RISPERIDONE FOR DEMENTIA



Challenge: To reduce the use of antipsychotics in dementia

GENERAL PRACTITIONER RESPONSE

More than 7 out of 10 general practitioners reported increased confidence to cease antipsychotics as a result of Veterans' MATES materials.



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

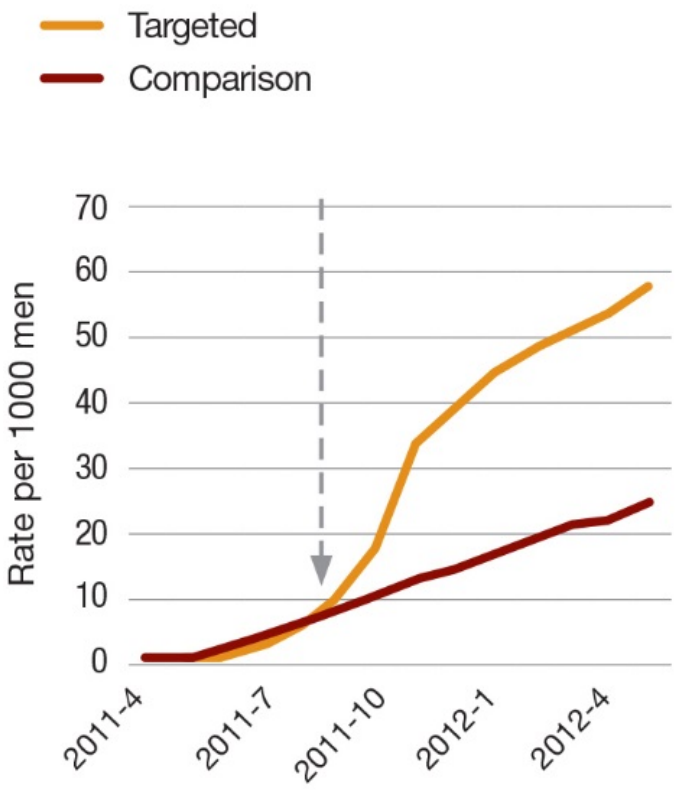
41 premature deaths

41

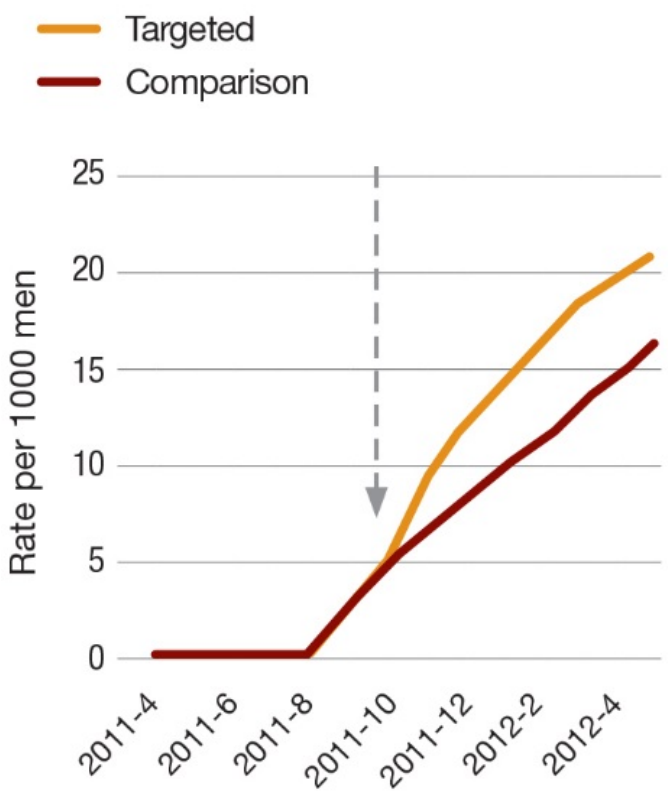
*Numbers based on Veterans' MATES analysis and published literature.

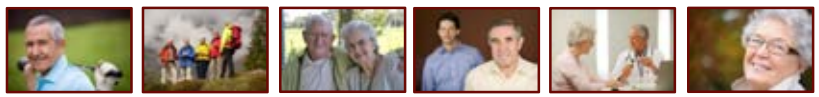
Challenge: To improve the management of osteoporosis

RATE OF BONE MINERAL DENSITY TESTING (MEN)



RATE OF OSTEOPOROSIS MEDICINE USE (MEN)

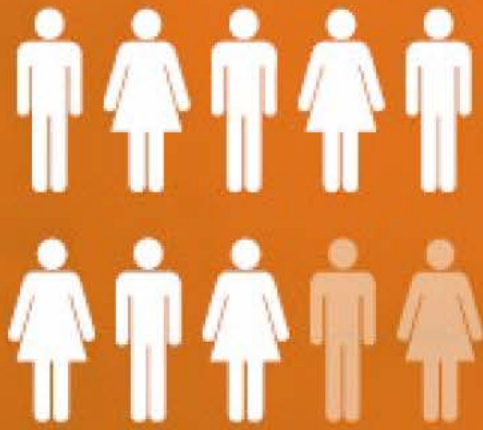




Challenge: To improve the management of osteoporosis

GENERAL PRACTITIONER RESPONSE

Almost 8 out of 10 general practitioners reported the Veterans' MATES prescriber feedback helped them to review their patients.



HEALTH OUTCOMES AVOIDED*

80-150 fractures avoided

80-150

*Numbers based on randomised controlled trial evidence.

PRACTICE CHANGE

3,871 additional veterans received tests for bone mineral density

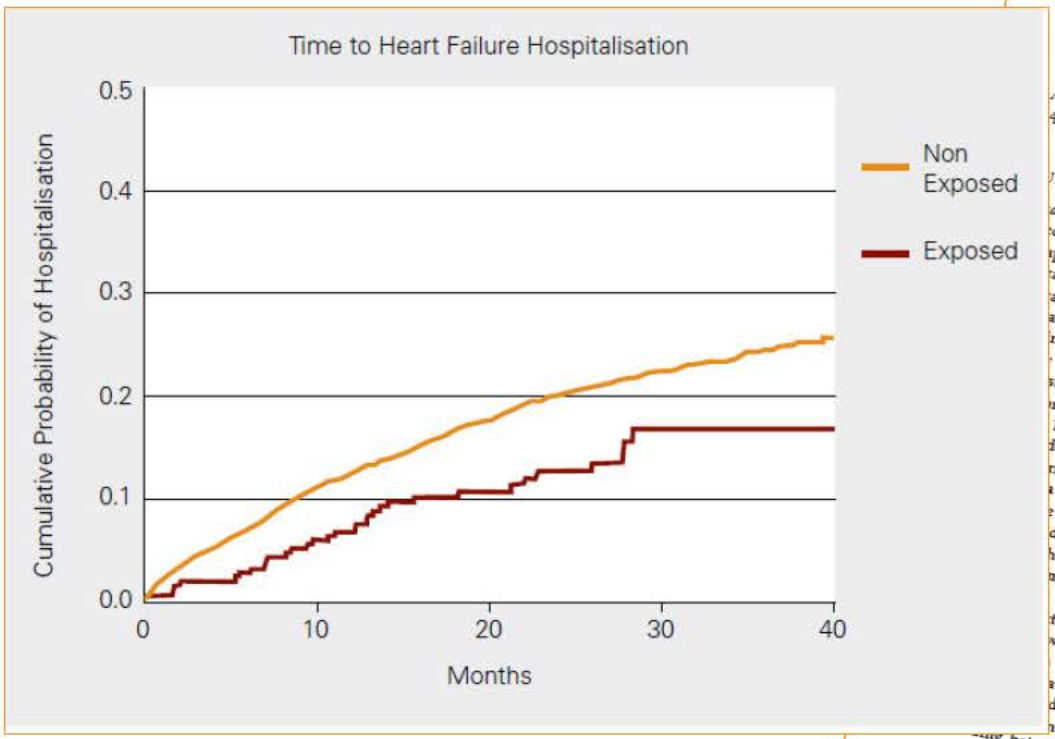
3,871

25,832 additional patient months of treatment with medicines for osteoporosis

25,832

Challenge: Demonstrating the impact of Home Medicines Reviews

Home Medicines Reviews were demonstrated to be effective in those with heart failure in reducing time to next hospitalisation for heart failure



Journal of Clinical Pharmacy and Therapeutics

Journal of Clinical Pharmacy and Therapeutics (2011) 36, 27–32

doi:10.1111/j.1365-2710.2009.01149.x

ORIGINAL ARTICLE

Collaborative home medicines review delays time to next hospitalization for warfarin associated bleeding in Australian war veterans

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*Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, University of South Australia, Adelaide, 5000, †Data Management and Analysis Centre, Discipline of Public Health, University of Adelaide, Adelaide, 5000 and ‡Department of Veterans' Affairs, Canberra, 2600, Australia

MMARY

at is known and background: Unintended ds are a common complication of warfarin py. We aimed to determine the impact of al practitioner–pharmacist collaborative ation reviews in the practice setting on alization-associated bleeds in patients on n.

We undertook a retrospective cohort sing administrative claims data for the ry veteran and war widow population, Participants were veterans, war widows dependents aged 65 years and over dis- rfarin. The exposed groups were those general practitioner (GP)–pharmacist home medication review. The des GP referral, a home visit by an harmacist to identify medication- ms, a pharmacist report with follow- by the GP. The outcome measure t hospitalization for bleeding. were 816 veterans exposed to a review and 16 320 unexposed average age of 81·5 years, and six dities. Adjusted results showed n likelihood of hospitalization g between 2 and 6 months (HR, 0·21 95% CI, 0·05–0·87) amongst those who had received a home medicines reviewed compared to the unexposed patients. No effect was seen in the time period from review to 2 months, nor in the time period 6 to 12 months post a review.

What is new and conclusion: Medicines review in the practice setting delays time to next hospitalization for bleeding in those treated with warfarin in the period 2 to 6 months after the review, but is not sustained over time. Six monthly medication reviews may be required for patients on warfarin who are considered at high risk of bleeding.

Keywords: home-based team-care, medication review, warfarin-related bleeding

WHAT IS KNOWN, BACKGROUND AND OBJECTIVE

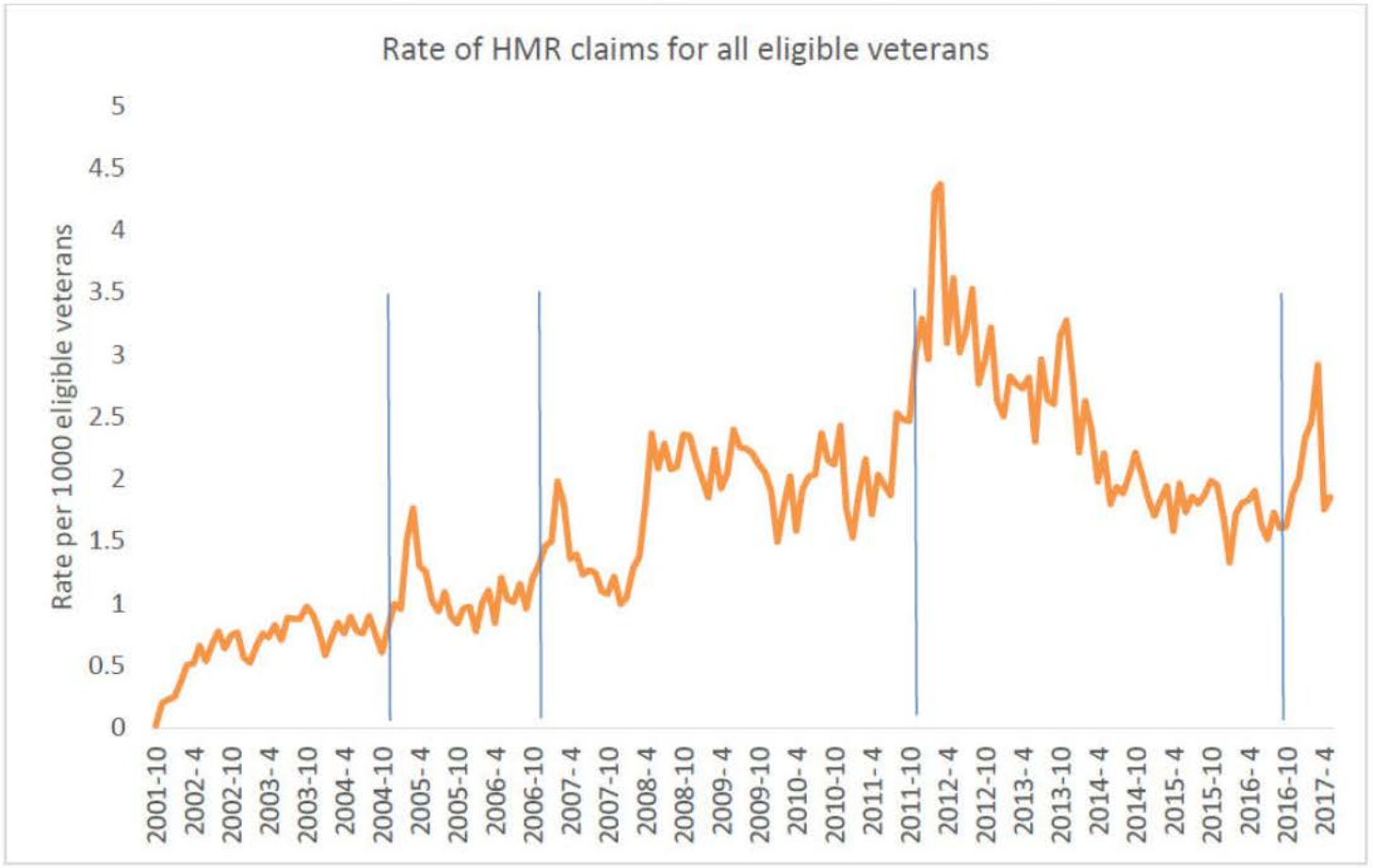
Warfarin is effective in preventing thrombo- embolic events in a range of conditions including stroke associated with atrial fibrillation (1). While effective, warfarin use is associated with a high risk of hospitalizations due to bleeds (2). Rates of major bleeds range from 4·75 per 100 person years in those aged less than 80 years to 13 per 100 person-years in patients over 80 years of age (3). In Aus- tralia, warfarin was the second most commonly reported medicine implicated in adverse drug reactions associated with hospital admissions in the year 2000 (4). Further, when treatment with patients using warfarin was measured against

Received 24 April 2009, Accepted 05 November 2009

Correspondence: E. E. Roughead, Associate Professor, Quality Use of Medicines and Pharmacy Research Centre, Sansom Institute, School of Pharmacy and Medical Sciences, University

Challenge: Demonstrating the impact of Home Medicines Reviews

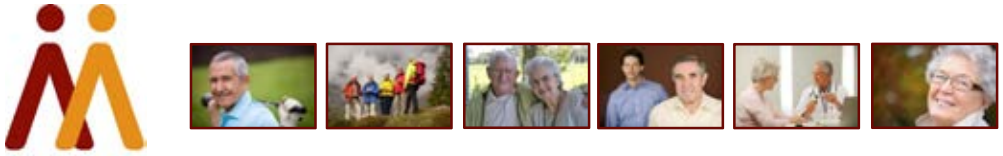
Rate of HMR claims per month for all eligible veterans aged over 18 years



So what has contributed to Veterans' MATES success?

The contributing factors

- The Multidisciplinary, collaborative approach
  - Clinicians, practitioners, veterans, health professional organisations, government
  - Biostatisticians, Behavioural Scientists, Pharmacists, General Practitioners, Epidemiologists, Computer programmers, Database managers, Security Manager
- The analytics are methodologically rigorous
- The clinical information is evidence based



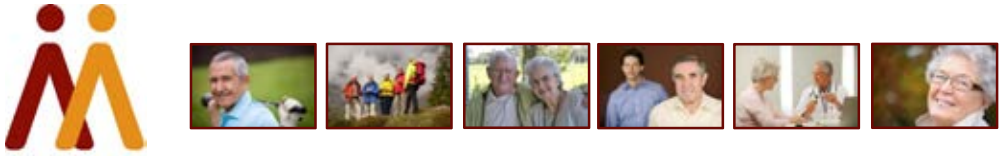
The contributing factors

- There is significant stakeholder engagement
- We only target identified problems
- The interventions are grounded in behavioural theory; target one behaviour at a time
- We repeat interventions over-time
- The program has independently audited data and security standards

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

University of South Australia | Sansom Institute for Health Research

www.veteransmates.net.au



Australian Government
Department of Veterans' Affairs

Veterans' MATES

Utilising a health promotion based quality improvement program to **put the pressure on venous leg ulcers and prevent skin tears**

A/Prof Michael s 47F AM[1]

A.s 47F J.s 47F N.s 47F K.s 47F V s 47F E.s 47F

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

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

So what is the Evidence - Practice Gap?

Venous leg ulcers and skin tears are among the most common wounds treated in General Practice.

Up to 50% of venous leg ulcers are not healed at 9 months and most people with recurrent ulcers experience the condition for an average of 15 years

Between 40% and 60% of patients with venous leg ulcers do not receive recommended treatment

43% of residents in aged care facilities experience a skin tear

Source:
Walker N, et al. New Zeal Med J. 2002.
Callam MJ, et al. Br Med J (Clin Res Ed). 1987.
Kruger A, Raptis S, Fitridge R. Aust NZ J Surg. 2003.
s 47F M. Primary Intention. 2002.
Hahnel E, et al. Journal of Tissue Viability. 2016.

And in the veteran population.....

5,000+

In a 1 year period 5000+ veterans were hospitalised with an ulcerous wound

Almost 1 in 5 of those hospitalised were hospitalised more than once in the same year

87%

Up to 87% of veterans at high risk of a skin tear due to regular use of a potent topical corticosteroid, did not receive an emollient dispensing

Source:
DVA Health Claims Database, University of South Australia, QUMPRC. [Accessed July 2016]

Best practice results in the prevention of skin tears and faster healing times for venous leg ulcers.

73% of venous leg ulcers will be healed at 12 weeks with compression therapy, compared to 31% without

In patients who regularly wear a compression stocking recurrent venous leg ulcers can be reduced to 32% at 5 years compared to 69% in those who do not

The application of an appropriate skin moisturiser twice daily reduces skin tears by between 34% to 46%

Source:
So W, et al. Hong Kong Med J. 2014.
Nelson EA, et al. J Vasc Surg 2006.
Dinn E, Henry M. Phlebology. 1992.
Carville K, et al. International Wound Journal. 2014.
Finch K, et al. Wound Practice and Research. 2016.

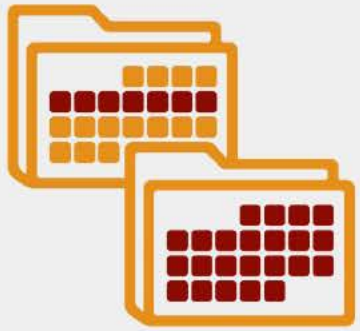
Translating the evidence into practice: The Veterans' MATES approach

Veterans' MATES Since 2004

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

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:

Veterans receive information specifically tailored for the veteran community

And pharmacists and other members of the health care team receive supportive evidence based information

And then the intervention is evaluated

Stakeholder surveys assess participant satisfaction, changes in awareness, knowledge and self-reported behaviour change

Cohort studies and time series analyses assess changes in use of medicines and health services

Cohort studies assess changes in health outcomes, such as changes in rates of hospital admissions

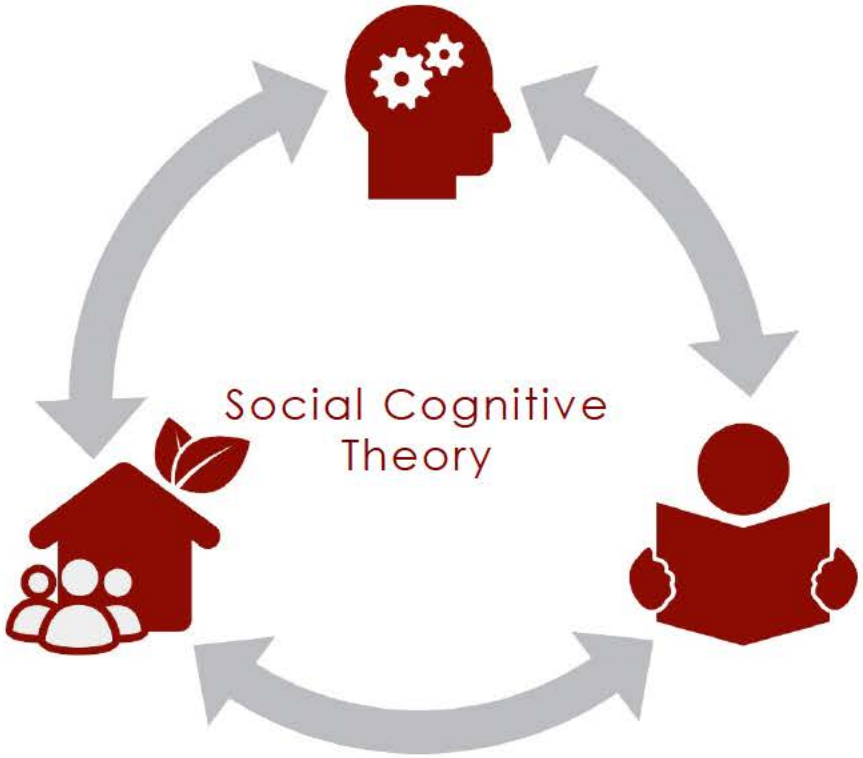
The approach includes significant stakeholder engagement

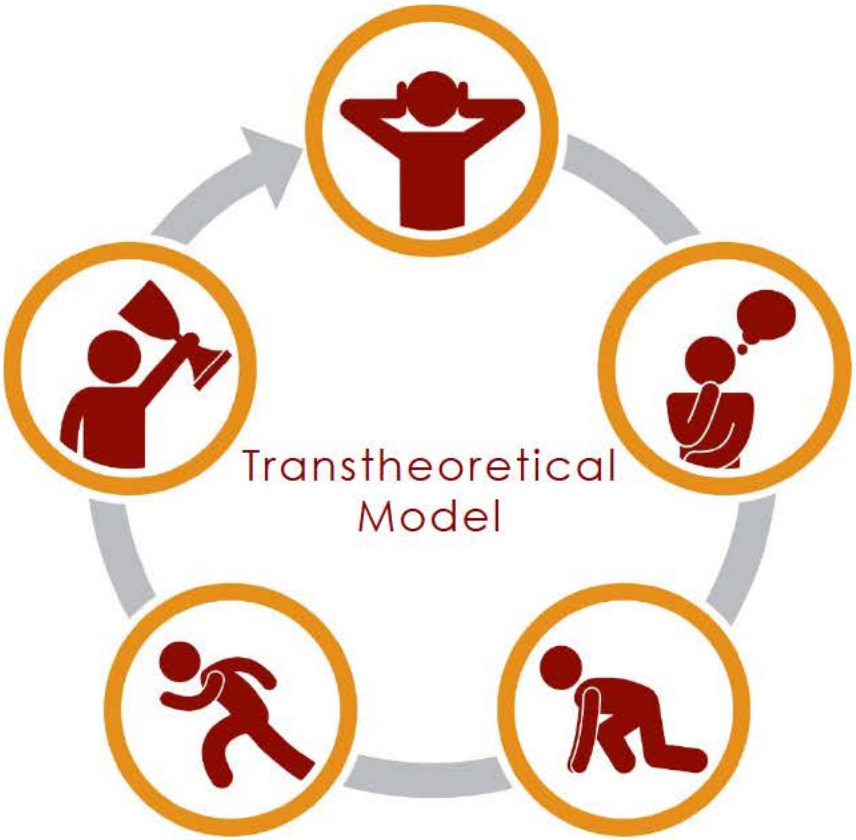
A veteran and practitioner reference group provide advice guidance and feedback

Educational materials are developed with the support of a multidisciplinary clinical reference group and peer reviewed

Topics and materials are endorsed by a national representative editorial committee

Is underpinned by behavioural theories and models





And the data are used to inform every phase of the program

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

So can Veterans' MATES make a difference to the management of venous leg ulcers & skin tears?

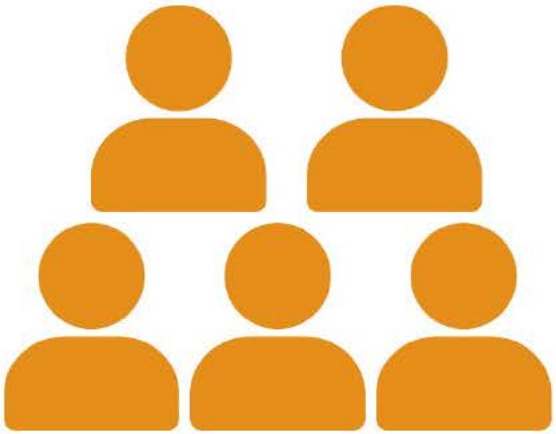
The intervention commenced in June 2017 and targeted....

14,000+
GPs

8,000+
Pharmacists

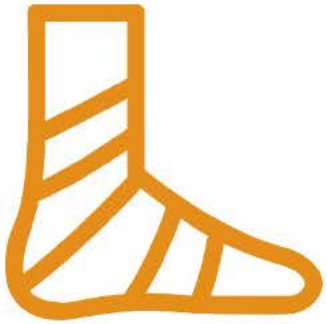
2,500+
RACFs

+



52,000+
Veterans

Advice to health professionals included:



The benefits of compression therapy

Strategies to encourage patients to persist with treatment

Where to refer patients

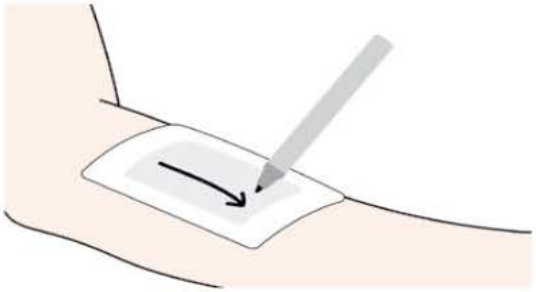


Diagram 1: Dressing your skin tear

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.**

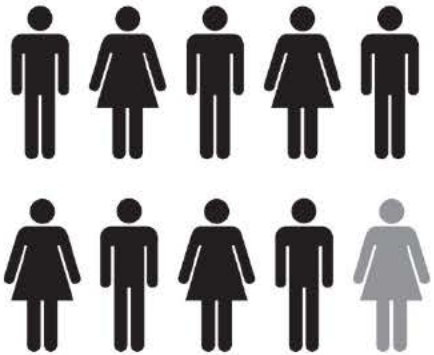
Information for veterans included a guide to looking after skin tears

What did we achieve?

Filling the evidence- practice gap

Responding health professionals were not previously aware that the majority of venous leg ulcers heal within 12 weeks with compression therapy

What did we achieve?

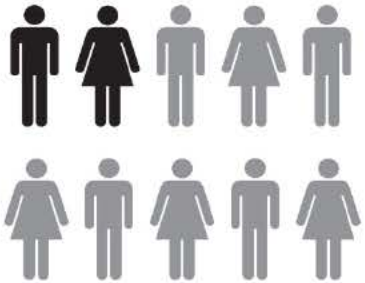


9 out of 10 veterans found the skin tear tips helpful

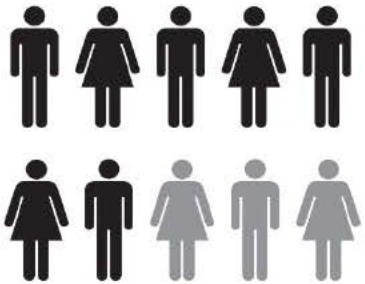
99%

99% GPs said they were likely to use compression therapy

BEFORE



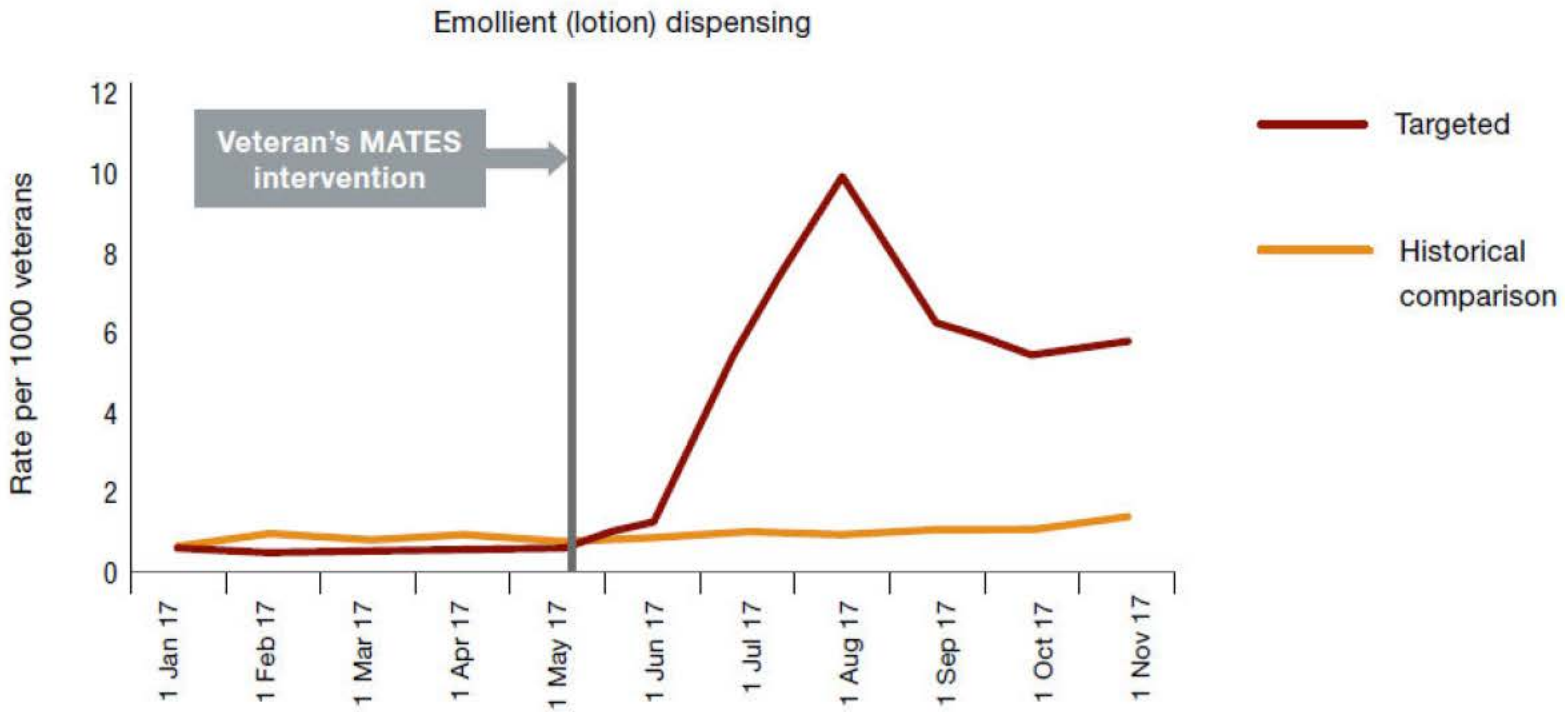
AFTER



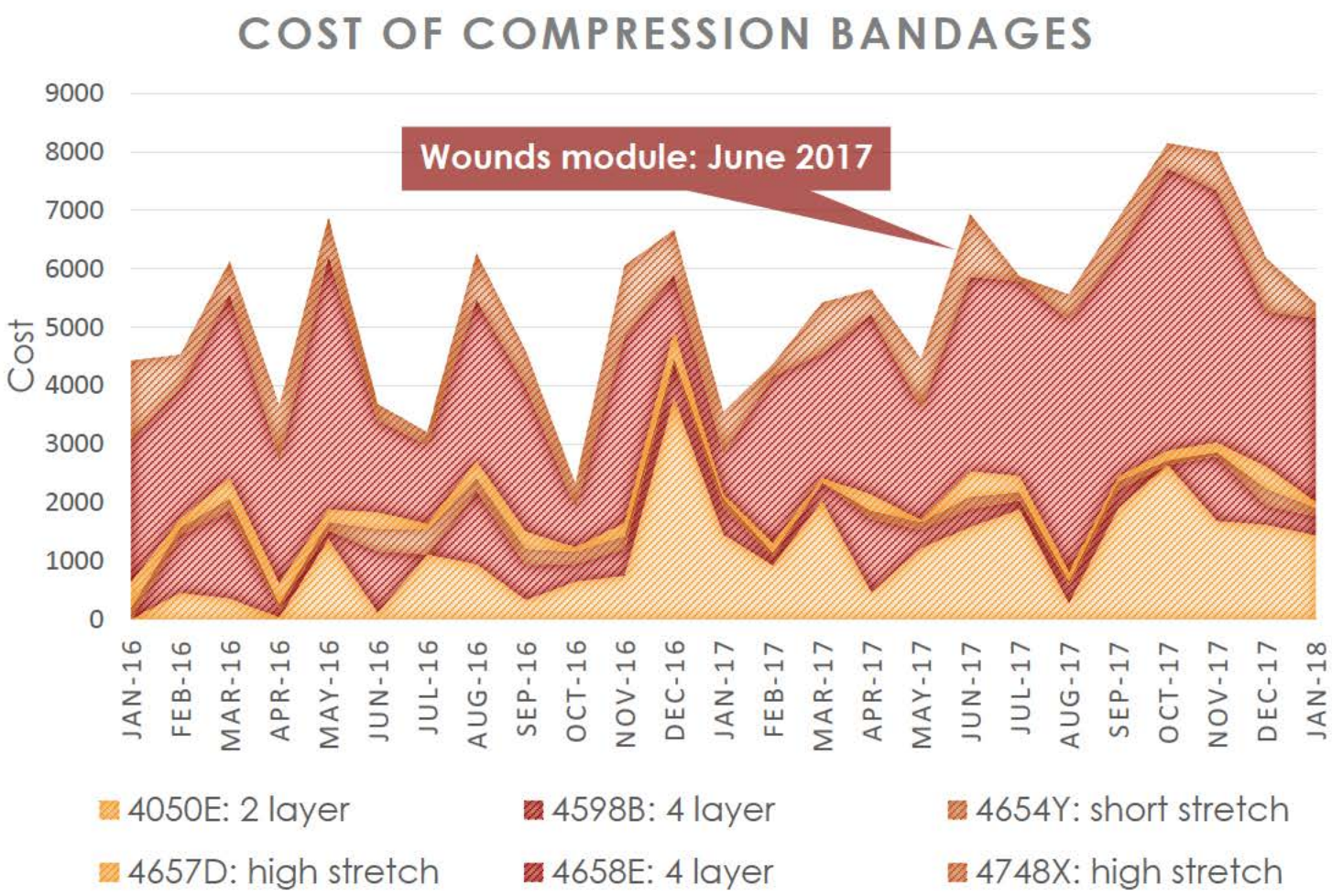
GPs became more confident in coordinating care for venous leg ulcer

What did we achieve?

INCREASE IN THE DISPENSING OF APPROPRIATE MOISTURISER



What did we achieve?



This represents a 10% increase in people receiving compression bandages

So what has contributed to Veterans' MATES success?

The contributing factors

A multidisciplinary, collaborative approach

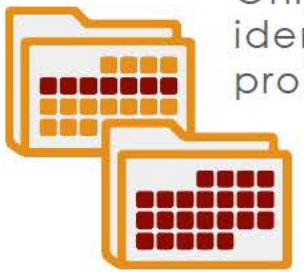
Clinical information is evidence based

Methodologically rigorous analytics

Independently audited data and security standards

Significant stakeholder engagement

Grounded in behavioural theories and models



Only target identified problems

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
using data to move from evidence to solutions

Libby 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

<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

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.

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.

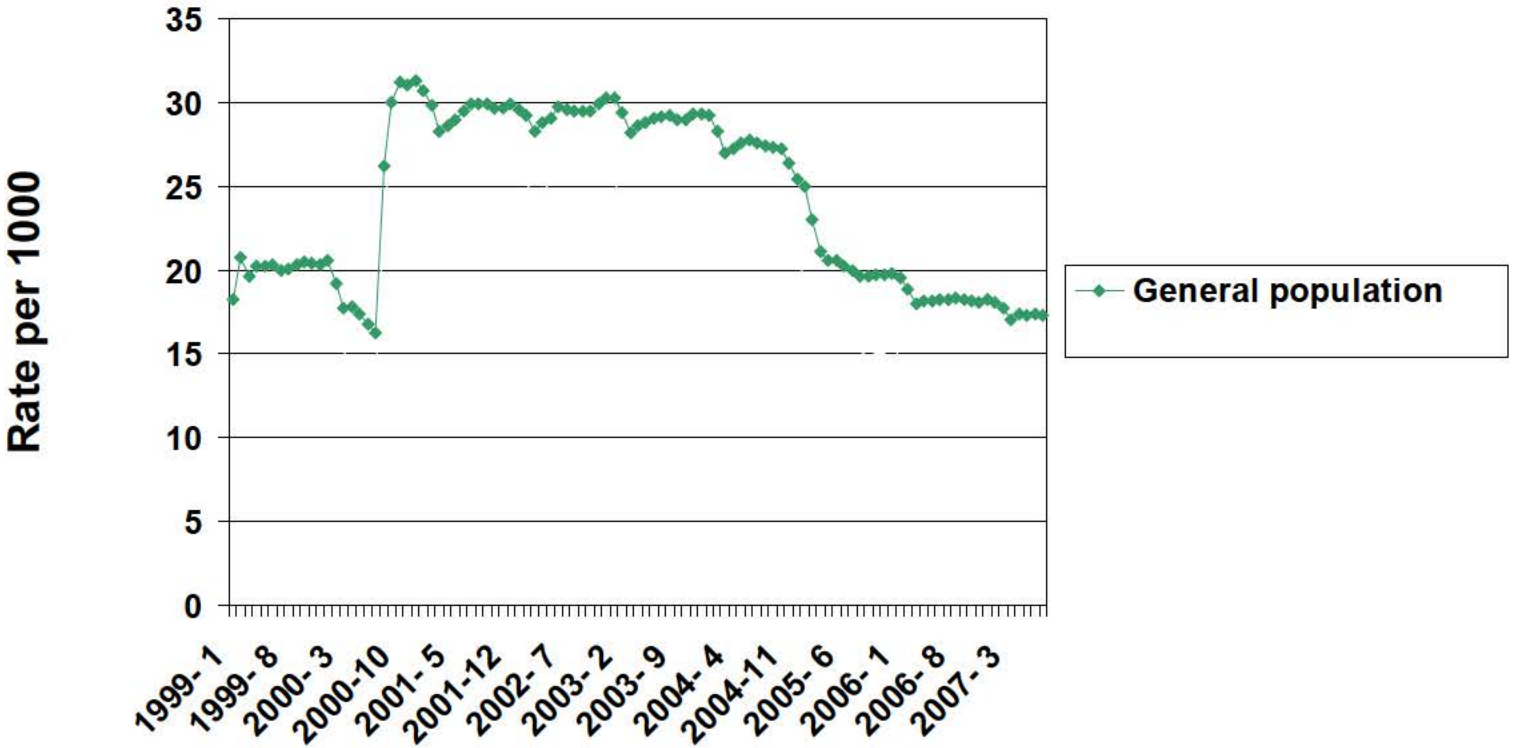
- To date 15 modules delivered
- Disease specific: Heart failure, Diabetes, COPD
- Drug Specific: Antidepressants, Contraindicated medicines, NSAIDS
- Service delivery: Medicines Review, Care Planning
- Overall
  - 175000 veterans
  - 21,000 doctors
  - 8,500 pharmacies and accredited pharmacists
- > 50% of doctors have received 6 mailings or more

Using data to move from evidence to solutions for veterans with heart failure

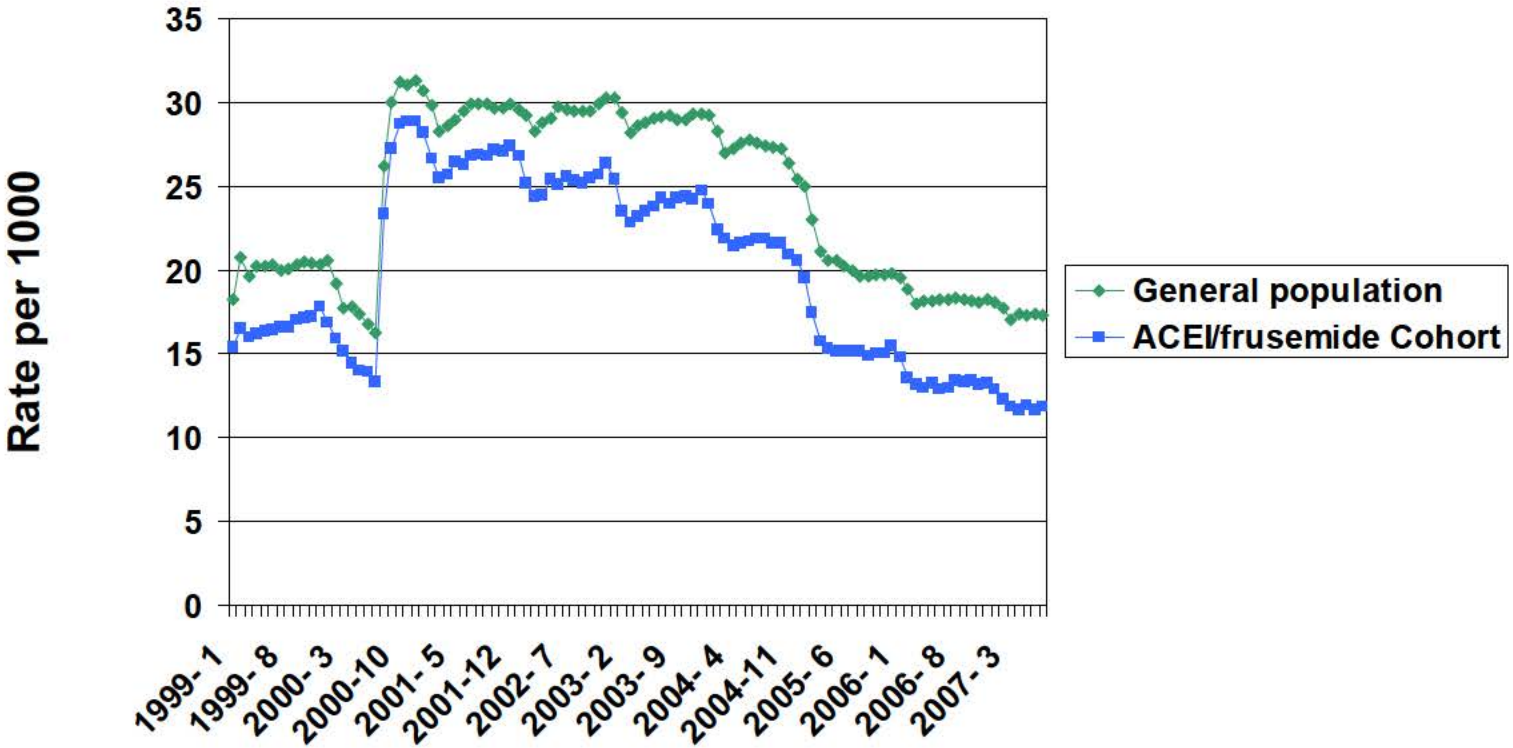
Use of potentially inappropriate therapies

- Problem: NSAID use not recommended in patients with heart failure
- How much use of NSAIDs is there in the heart failure population and what level of harm does it cause?

NSAID use in the general population



NSAID use in ACE /frusemide population (high risk of adverse renal events)



Did the increased use of NSAIDs in the heart failure population cause harm?

Method

- Cohort study
- Veterans included gold card holders
  - Dispensed at least one medicine in previous four months, but NO NSAID in previous 12 months
  - 2 cohorts: general, ACE/frusemide populations
- Study period: Aug 2000 – Jun 2005

Pratt et al

Method

- Primary endpoint: Hospitalisation for
  - GI ulcer, heart failure, acute renal failure, myocardial infarction or hypertension within 30 days of NSAID initiation
- Follow-up until study end, death or hospitalisation
- Confounders: age, gender, co-morbidity, aged-care status, socioeconomic index

- 128,908 subjects in general population
- 17,865 Ace/frusemide
- ~50% dispensed NSAIDs
  - Cox-II inhibitors accounted for:
    - 70% of NSAID use in general population
    - 76% in the ACE/frusemide cohort

Pratt et al

Hospitalisations for adverse events* of NSAIDs

	Relative risk
General population	1.47 (1.30-1.66)
ACE / frusemide population	1.34 (1.13-1.58)

*Heart failure, Renal Failure, GI ulcer, Myocardial Infarct, Hypertension

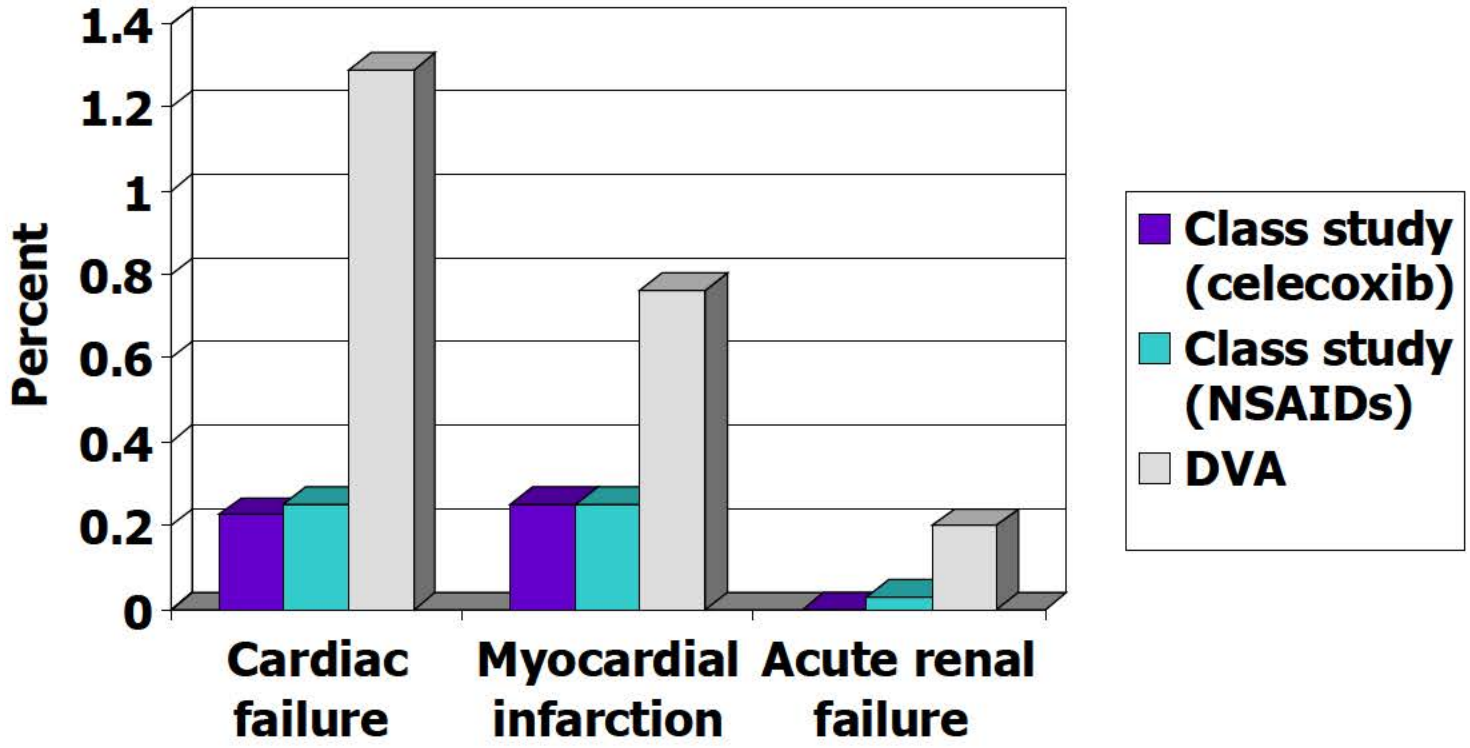
Pratt et al

Hospitalisations for specific events

	GI ulcer	Heart Attack	Heart failure	Renal failure
General population	2.29 (1.96-2.69)	1.31 (1.12-1.53)	1.33 (1.10-1.60)	1.97 (1.63-2.38)
ACE / frusemide	4.97 (4.01- 6.14)	1.54 (1.20-1.98)	1.16 (0.95-1.41)	1.77 (1.33-2.37)

Pratt et al

Incidence of adverse events causing hospitalisation: trial versus practice



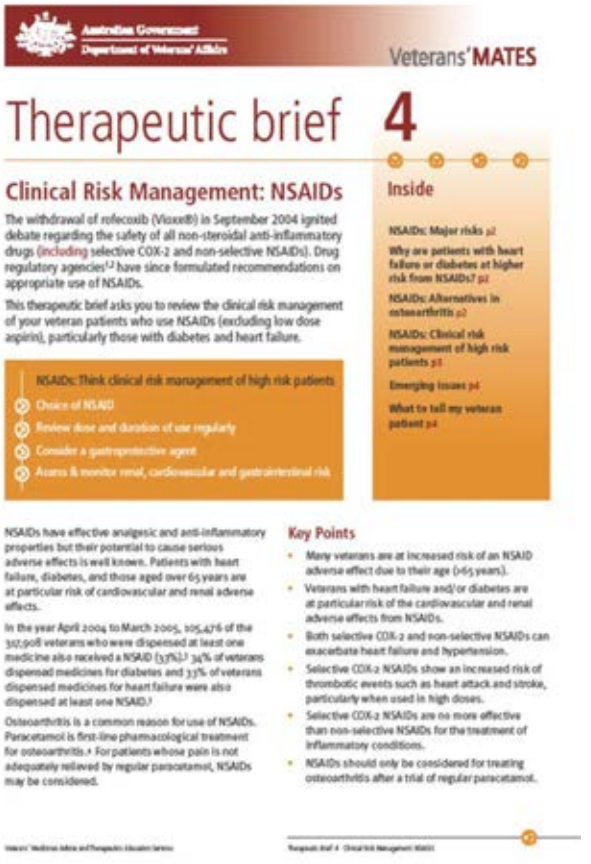
Pratt et al

What does it mean in practice?

- 9 extra hospitalisation per year for every 1000 people treated in the general population
- 62 extra hospitalisations per year for every 1000 people dispensed ACE / frusemide

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



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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.

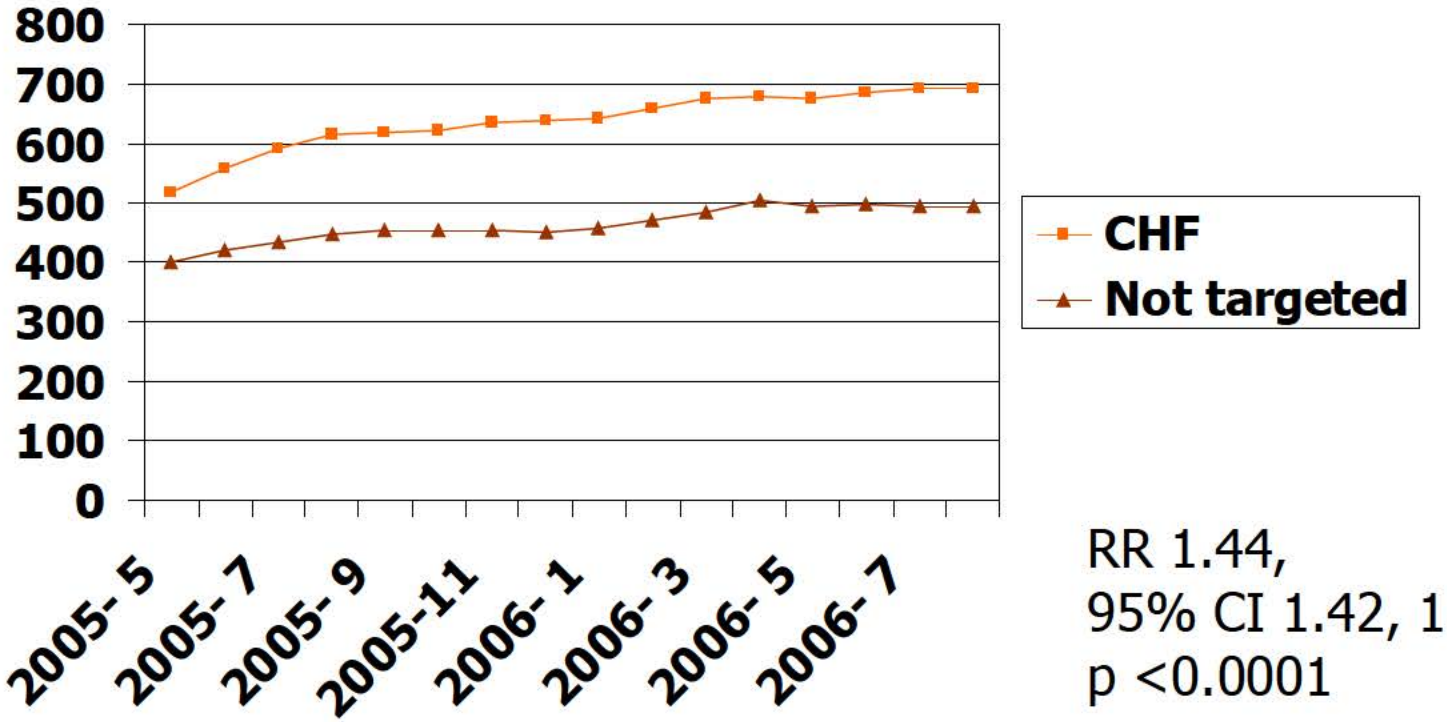
In the year April 2004 to March 2005, 105,476 of the 357,908 veterans who were dispensed at least one medicine also received a NSAID (37%).[3] 34% of veterans dispensed medicines for diabetes and 33% of veterans dispensed medicines for heart failure were also dispensed at least one NSAID.[3]

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

Under-use of recommended therapies

- What proportion of veterans with heart failure are on recommended therapies?

Medicine use amongst those hospitalised for heart failure

- Veterans hospitalised for congestive heart failure
- 1st July 2002 and 30th June 2006
- Gold card holders
- Only first hospitalisation recorded in this time included
- Medication use assessed in the four months before and four months after admission date and in the final year of the study
- Use of care plans also assessed in the final year of follow-up

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%

Persistence and adherence with recommended therapies

	Percent persistent with therapy at follow-up	Proportion compliant in last year of follow-up
ACE or A2RB	78%	79%
Lipid lowering	83%	79%
Beta blockers	73%	n/a
Beta blockers for CHF	77%	76%
Aspirin or other antiplatelets	63%	82%

Average length of follow up = 3 years post hospitalisation

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

Can we increase beta-blocker use in heart failure?

- Method: targeted cohort compared to historical comparison groups

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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[1].

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.

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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.

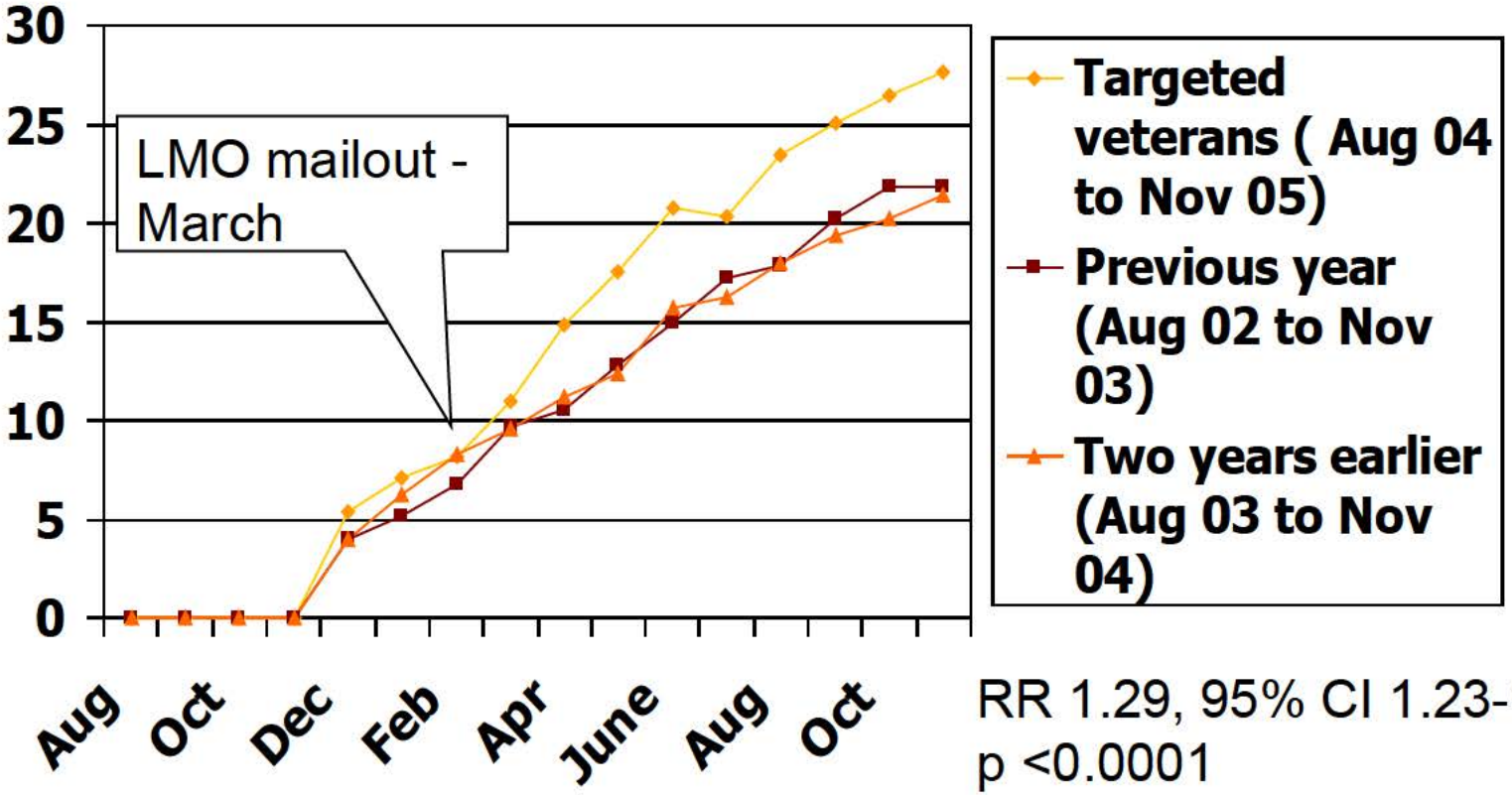
Evidence for beta-blockers in heart failure

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[2] 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[3].

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[4-6,7]. 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

Can we increase 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

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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.[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 50% are very concerned about suffering from a drug interaction.[3]

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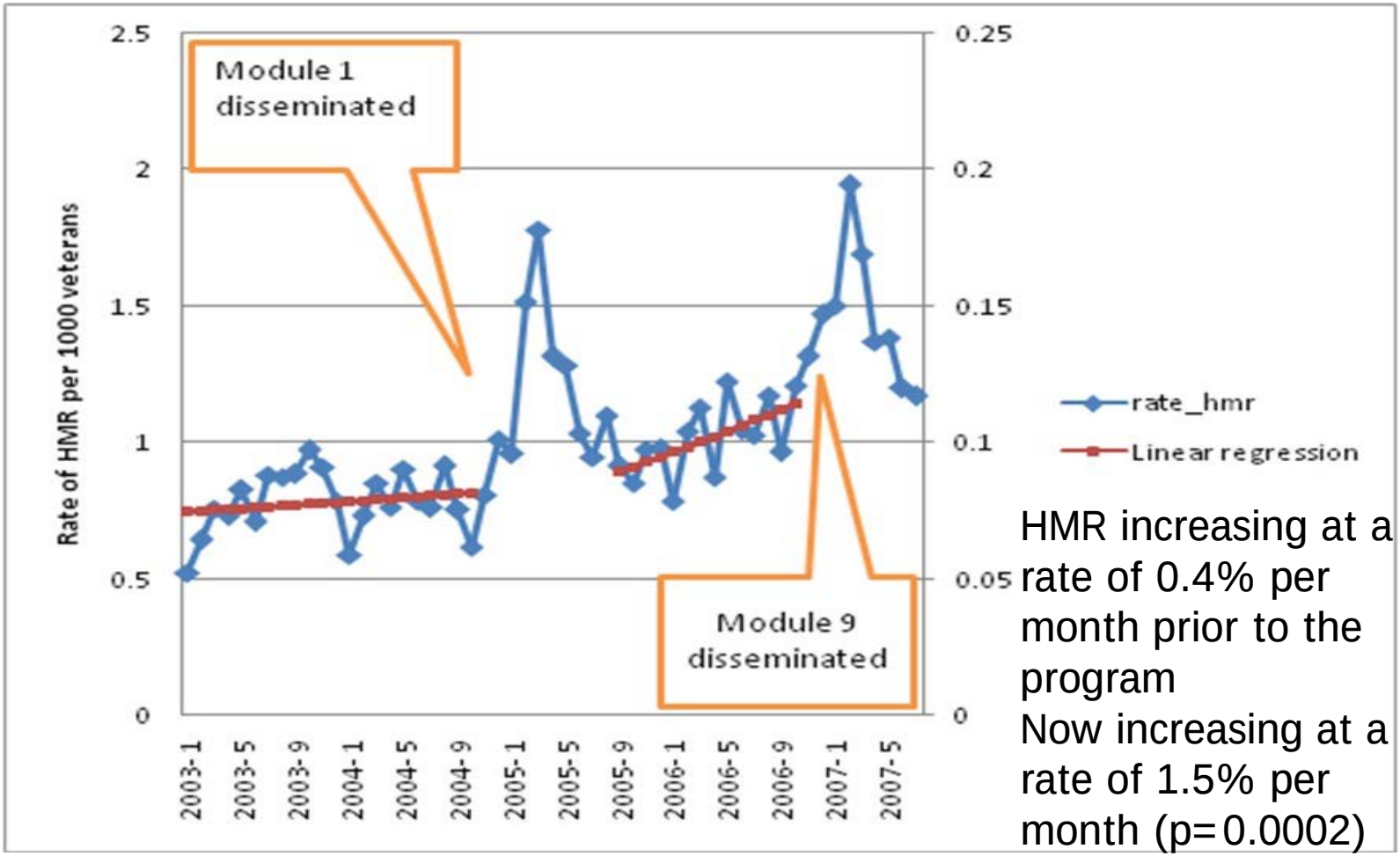
Time series medicine review rates



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)

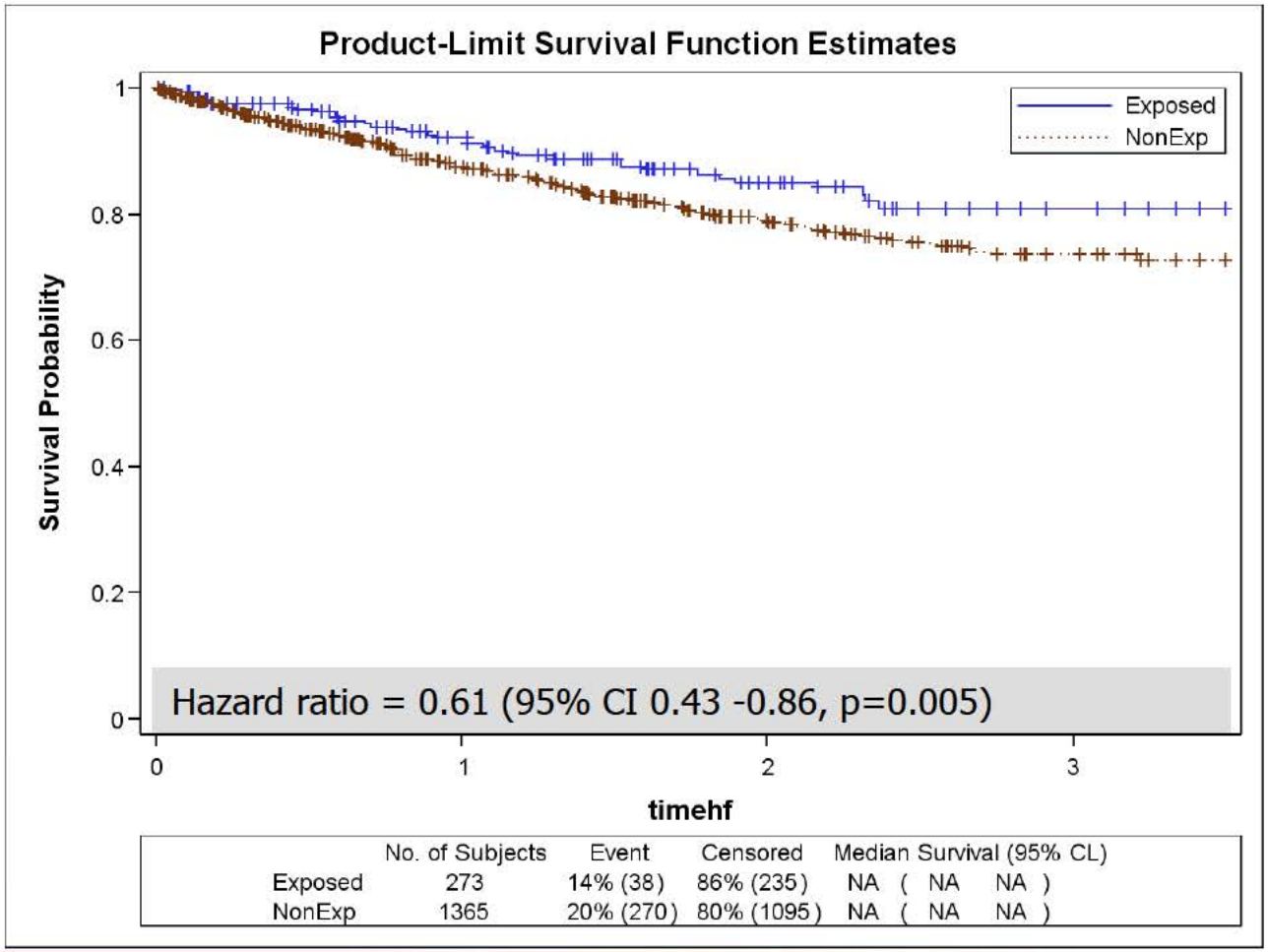
Did home medicines review have an impact?

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



Conclusion

- Improvements in management of heart failure being observed,
  - increased rates of beta-blocker use
  - reduction in NSAID use
  - Increased rates of home medicine review
- Evidence of improved health outcomes with delays in time to next hospitalisation and reduced hospitalisation from NSAID use