Annual Evaluation Report 2015

NPS MEDICINEWISE

Foreword

I am very pleased to introduce the 18th NPS MedicineWise Annual Evaluation Report which reflects on both the effectiveness of our programs and the quality of our evaluation capability.

Since our inception in 1998, stakeholders have asked us to provide evidence that our programs not only lead to safer, better quality and more efficient care but also to better health outcomes for patients. It has taken time and access to the right data sets and now we are demonstrating changes in health outcomes that are most meaningful for consumers and patients. For example we report on the number of strokes averted through more appropriate prescribing of antipsychotic medications for older Australians.

Consistent with previous years, this evaluation report underscores our ability to deliver on quality and efficiency targets, from better patient safety to reductions in PBS and MBS growth for targeted items. Much of this impact continues to rely on high levels of participation among primary health care practitioners and these are reported at record levels in this report.

There remain challenges for evaluating our impact on prescribing of newly marketed medicines where time series methodologies are less helpful and it will be interesting to see how MedicineInsight data might assist with this in the future. We have seen some improvement in knowledge, attitudes and practice for antibiotic prescribing and we are now looking to see this shift to a wider impact on prescription numbers in the coming years.

Thank you to the dedicated people at NPS MedicineWise who design, implement and evaluate our programs, using the best evidence and drawing on state of the art techniques.

I recommend the 2015 Evaluation Report to you.

Dr Lynn Weekes
Chief Executive Officer

‘medicinewise’

(med·i·cine wise) /’medəsən wīz/

1. Being well informed about medicines and medical choices to make better decisions for optimal health outcomes.

OUR MISSION
is to enable the best decisions about medicines, health technologies and other health choices for better health and economic outcomes.

OUR VISION
is to lead innovation and improvement in health care by building trust, implementing change and demonstrating impact.

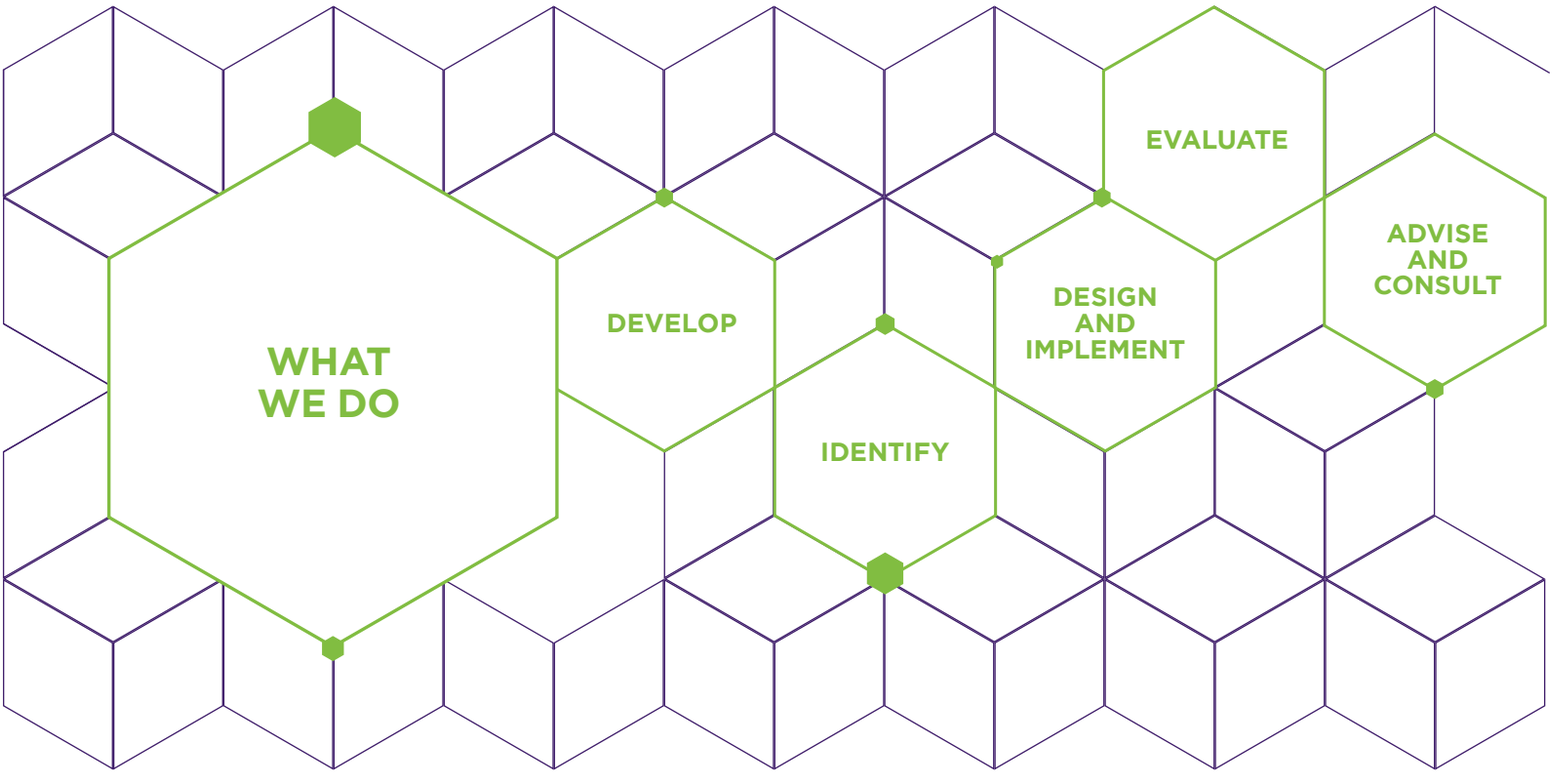
About this Report

NPS MedicineWise aims to lead innovation and improvement in health care by building trust, implementing change and demonstrating impact. The 18th Annual Evaluation Report includes the key results* of evaluation projects for the 2014-15 financial year and provides an overview of the impact of our work. Success stories and key issues are addressed so that we can continue to learn from experience to achieve the best health outcomes and to be efficient and effective at what we do.

*Some figures in this evaluation report are different to those in the 2014-15 Annual Report. More complete data was able to be accessed subsequent to publication of the 2014-15 Annual Report.

This report demonstrates that through our work in 2014-15 NPS MedicineWise has made a contribution to:

- data availability and use by GPs with the innovative MedicineInsight initiative
- the promotion of safer use of medicines in older people
- savings and improved quality of life for people living with dementia with the reduction in the prescribing of antipsychotic therapy
- an increase in doctors not initiating fixed-dose combination hypertensive therapy by following clinical guidelines
- supporting the government reforms by increasing proportions of consumers whose therapy is initiated with generic equivalents over time
- knowledge of health professionals through the well received and respected Australian Prescriber and RADAR
- educating consumers and health care professionals with our online educational modules and information.



NPS MedicineWise promotes the safe and efficient use of medicines and medical tests in a world experiencing a growth of: antibiotic resistance, inappropriate use of drugs and tests, and rising health care costs.

We educate health professionals and consumers to make better decisions, to achieve better health outcomes and a more efficient health care system.

OUR FORMULA FOR DELIVERING BETTER HEALTH OUTCOMES

DEVELOP
best practice evidence-based knowledge about quality use of medicines and medical tests through research, data collection and analysis.

IDENTIFY
the gap between actual medicine and medical test use and best practice.

DESIGN AND IMPLEMENT
behaviour change programs which encompass **communication, education** and **support** for health professionals and students, consumers and communities.

EVALUATE
health programs and services and their impact rigorously using our comprehensive evaluation framework.

ADVISE AND CONSULT
to government, clients and stakeholders on health policy and quality use of medicines and medical tests.

COLLABORATE AND CONSULT WITH STAKEHOLDERS THROUGHOUT THE PROCESS

Australian Government Department of Health · Consumers · Member organisations · Industry · Partners
International partners · Health professionals · Therapeutic Goods Administration · Community

Setting the Scene

Why being medicinewise matters?

Medicines play a major role in protecting, maintaining and restoring people's health. It is important that people are informed to make wise decisions about medicines, medical tests and other health care choices so that the benefits of medical technologies can be maximised and unnecessary costs can be avoided to create more sustainable health care solutions.

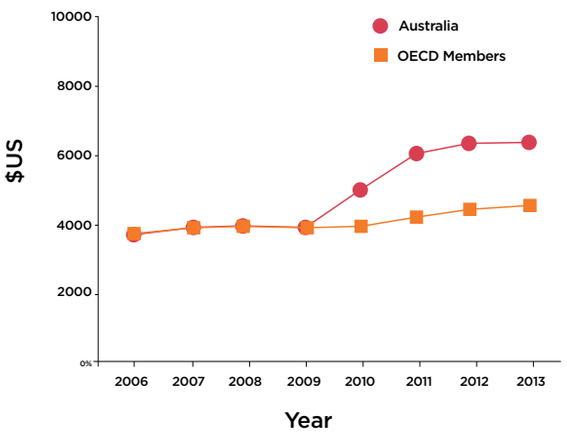
Recently, the concept of the 'value' of medicines has grown internationally. Pharmaceutical reimbursement and pricing (R&P) policies are becoming increasingly based on the 'value' the medicines and other health technologies bring to the health system and society. At NPS MedicineWise we continue to focus on promoting and advancing medicine wise behaviour through our therapeutic programs and awareness campaigns. We have facilitated the Australian launch of Choosing Wisely, an international, clinically led movement to help the medical community and consumers question and improve the quality of health care by eliminating unnecessary and sometimes harmful tests, treatments and procedures.

The Australian National Health Act 1953 requires the Pharmaceutical Benefits Advisory Committee (PBAC) to evaluate the efficacy and safety as well as cost effectiveness of medicines and to recommend which medicines should be subsidised by the Pharmaceutical Benefits Scheme (PBS).[1] In 1993 Australia was the first country to introduce a mandatory requirement for economic analysis to select pharmaceuticals for a publicly funded formulary.[2] Germany reformed their R&P system in 2011 and imposes maximum reimbursement prices for all new drugs after assessing their added therapeutic value. France has been using economic evaluation in the R&P process since 2013 and the UK planned to start using value-based pricing for medicines in 2014. Directly and indirectly, the concept of value is influencing pricing decisions internationally.[3]

Health spending in Australia

Total health expenditure is the sum of public and private health expenditures as a ratio of total population. In Australia this ratio has increased since 2009 although the ratio of OECD members has been relatively constant.[4] See Figure 1.

Figure 1: Total health expenditure per capita in Australia and OECD members, 2006 to 2013.



Government health expenditure growth in Australia has largely been explained by the increased use of complex and expensive care, resulting in the use of more expensive health services per person. Additional drivers of expenditure include health inflation, population growth and the ageing population.[5] Prior to 2011-12, there was a strong growth rate for pharmaceutical spending of over 6% per year in real terms although it was more modest in 2011-12. According to the OECD, health spending in Australia went up by over 5% in real terms in 2011-12 compared to a 1% increase across OECD countries due to substantial growth in spending on outpatient curative care, administration and public health services.[6] The PBS is forecast to cost $9.6 billion in 2015-16, although this excludes outcomes expected from the Sixth Community Pharmacy Agreement[i] and the broader PBS Access and Sustainability Package of measures.[7] The pharmaceutical safety net allows patients in Australia to get free medication when they have spent more than $1475.50 for general patients and $372 for concession card holders.[8]

From June 2005 to June 2014 the population of Australia rose by 16%.[9] The number of people over 85 years old will increase to 1.8 million in Australia by 2050.[10] Medical research is providing better drugs, devices and interventions so people can live longer and healthier lives. However, with risk factors for chronic diseases increasing, such as obesity and limited exercise, the burden of funding health care in the future is becoming a concern.

There are evolving economic and clinical models of care being developed, which will likely change the way health care is delivered over the next few years.

Decreasing rate of medication prescriptions

BEACH (Bettering the Evaluation and Care of Health) is in its 18th year and is a continuous national study of general practice activity in which ever-changing random samples of about 1,000 individual general practitioners (GPs) participate each year. Each GP records details of 100 consecutive encounters with consenting patients. The rate at which medications were prescribed decreased significantly from 2005–06 (58.7 per 100 problems managed) to 2014–15 (55.2 per 100 problems managed). In 2014–15, a large number of medications were prescribed less frequently than in 2005–06, some decreases being associated with a decrease in problems managed with that medication (for example, amoxycillin); low-cost over-the-counter availability, particularly from supermarkets (for example, paracetamol); becoming part of combination medications (for example, irbesartan); or by being superseded by newer drugs within the group (for example, atorvastatin).[9]

The Australian growing medical workforce

There was a substantial increase in the Australian medical workforce since 2000 with 3.3 practising physicians per 1000 population in 2012 compared to 2.5 in 2000, above the OECD average of 3.2. The average annual rate of increase in employed medical practitioners over the period 1996 to 2012 was 3.8%, 2.2% for employed medical practitioners per 100,000 estimated resident population (ERP) and 1.1% for full-time equivalent medical practitioners per 100,000 ERP.[11,12] The supply of overseas trained doctors, exempt from s19AB[ii], increased from 1,303 in 2002 to 7,461 in 2011. In 2011-12, there were 10,857 overseas trained GPs working in Australia. In 2012 there were 16,868 medical students studying in Australian universities, an increase of 2.3% from 2011. A total of 3,832 medical students are expected to graduate in 2017, 29.3% higher than the actual number who graduated in 2011 (2,964).[13] Although this is good news for the health care of Australians, there will be more pressure on health budgets as more graduates enter the medical workforce and the supply of overseas trained doctors' increases.

Health Care Challenges for Australia

Although Australia has a high standard of living and health care with a life expectancy of 82 years, four areas that need improvement include Indigenous health, quality of care and affordable and timely access to services.

[i] Community Pharmacy Agreements are five year agreements between the Australian Government and the Pharmacy Guild of Australia that pay pharmacists to dispense PBS medicines, fund professional programs and support the supply of PBS medicines by wholesalers.

[ii] Section 19AB of the Health Insurance Act 1973 restricts access to doctors with Medicare provider numbers and requires overseas trained doctors and foreign graduates of an accredited medical school to work in a District of Workforce shortage for a period of generally 10 years in order to access Medicare benefit arrangements.

Making a difference to Australia's health

Making a difference to the safe use of medicines in older people

In September 2013, NPS MedicineWise launched **Older and wiser: promoting safe use of medicines in older people**, and conducted field visits throughout the next year. The goal of the program was to reduce the prevalence of and harm resulting from medicine related problems in older people by raising health professional and consumer understanding of the contributing factors and increasing their use of strategies to optimise the quality use of medicines (QUM).

Process and impact evaluations were conducted in 2014-15 to see if the short term objectives of the program had been achieved. A survey was conducted to determine the program's impact on GPs knowledge, attitudes and practice. The program ran from September 2013 to September 2014 and reached 11,573 unique health professionals through one-to-one visits, small group cased based meetings, a clinical e-audit and a pharmacy practice review. This included 8609 GPs, 1333 nurses and 1262 pharmacists.

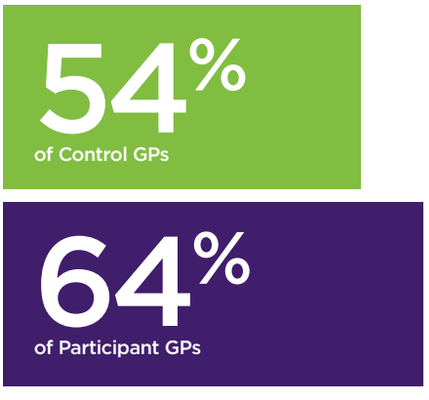
One of the program's key messages encouraged GPs to assess medicines in the light of their older patient's health and treatment goals. This evaluation showed that GPs who participated in the program activities were significantly more knowledgeable than those who did not participate regarding some of the triggers for reviewing a patient's medicine, a knowledge gap that the program sought to address with this key message:

- new or worsening confusion is likely to be a medicine-related problem and would trigger a review of medicines (96% participant vs 83% control, p<0.001)
- decline in kidney function requires reappraising the dose of metformin (98% participant vs 92% control, p<0.001).

Participant GPs demonstrated a significant increase in understanding that disease-specific guidelines cannot be readily applied to frail older patients (47% to 62%, p<0.001), as well as a 14% increase in those who believed that relying solely on disease-specific guidelines may lead to polypharmacy. A 14% increase was also seen in the proportion of GPs who believed that 'research suggests that older people generally place more emphasis on maintaining their independence compared to long term health outcomes'.

Another of the program's key messages sought to help health professionals identify and address actual and potential medication related problems. Significantly more GPs who participated in the program (64%) correctly stated they would always consider withdrawing benzodiazepines when there is a decline in a patient's cognition and psychomotor skills, compared to GPs who did not participate in the program (54%) (Figure 2).

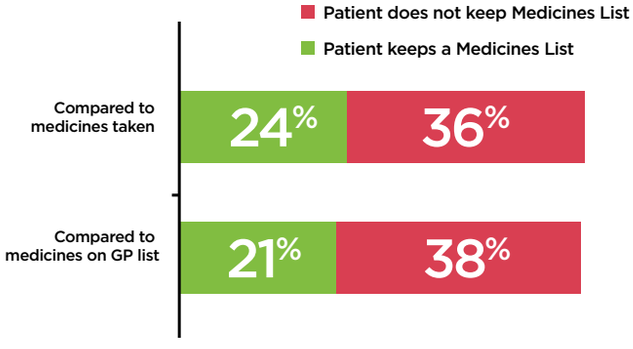
Figure 2: Proportion of General Practitioners stating they would always withdraw benzodiazepines when there is a decline in a patient's cognition and psychomotor skills



One component of the consumer program, a group based education intervention, aimed to reduce potential medicine related problems in people aged 75 years and over through improved use and accuracy of a medicines list. Health professionals delivered the educational intervention and provided medicines list resources to consumer groups in a one-off session that encouraged consumers to build, share and maintain an accurate list of their medicines.

The evaluation measured any discrepancies between the consumer's medicines list, their GP's medicines list, and the medicines they were taking, as well as measuring the overall risk of discrepancies leading to a medicines related problem. For consumers who participated in the program, those who kept a medicines list displayed a significantly lower risk of a medicines related problem than those who chose not to keep a medicines list (Figure 3). Consumers themselves saw the value of and need for medicines list, particularly as they age and are on a greater number of medicines.

Figure 3: Percentage of patients at risk of a medicines related problem



If anything happens you can't always remember off hat what the medicines are...I think it's very important and I find that that's why I've got it in my handbag, so it's with me every day - every time I go out and it's here anyway while I'm at home."

Consumer

Making a Difference to Australia's Health

Making a difference to the diagnostic approach for fatigue

The goal of the **Back to basics for fatigue: a diagnostic approach (2015)** program was to reduce unnecessary ordering of medical tests by GPs for patients presenting with non-specific fatigue where there were no red flags and an unremarkable patient history.

GPs report that managing people presenting with fatigue is challenging and GP registrars report that pathology testing is confusing. Because pathology testing is often unhelpful in establishing a cause for fatigue and can be harmful to patients, the program reinforced a number of messages to reduce the use of selected medical tests:

- the balance of benefits and harms associated with testing
- how testing should be targeted based on risk
- whether the results would influence management
- the likelihood of false positives.

The program ran from October 2014 until August 2015 and reached 9,300 unique health professionals: 7,100 GPs (30% of the GP workforce), 800 pharmacists and 1,400 nurses. An impact evaluation found that the program was effective in improving GP knowledge and behaviour when ordering medical tests for patients presenting with fatigue for the first time.

When GPs were asked to rank the most important diagnostic approaches for evaluating patients with fatigue, a significantly larger proportion of GPs who participated in an active intervention correctly selected pathology testing as the least important approach (84%) compared with GPs who had not participated in the program.

In a pre and post survey, GPs were presented with a case scenario where a patient was described as having non-specific fatigue for the past 3 weeks. It was the patient's first presentation with an unremarkable history and no red flags. The most correct answer from a choice of 20 possible medical tests was for GPs to not order any pathology tests at this consultation. Prior to the intervention, only 17% of the GPs indicated that they would not order medical tests and 44% ordered between 6 and 10 medical tests. Following the intervention, significantly more active GPs correctly indicated they would not order medical tests (41%, p=0.000), with 38% selecting between 6 and 10 tests. In Figure 4, active GPs participated in a one-to-one visit or quality improvement activity and passive GPs received print materials only.

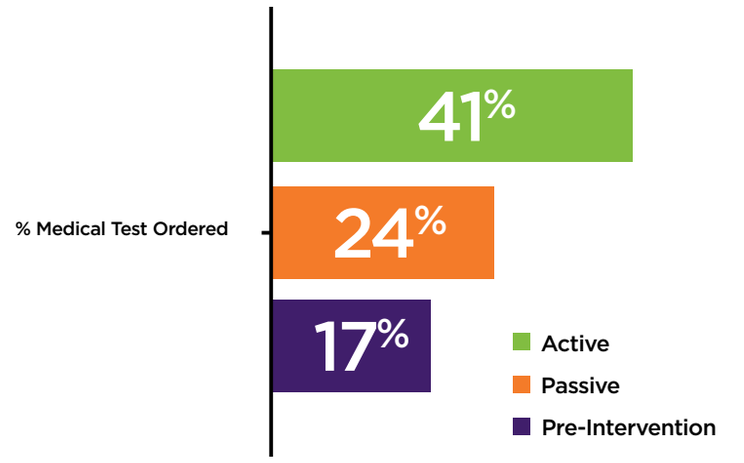


Figure 4: Proportion of GP respondents who correctly chose to order no medical tests in a case scenario pre and post intervention

Linking data sets to determine the impact of the NPS MedicineWise hypertension management program on medication use

We conducted national educational interventions on anti-hypertensive prescribing with GPs in 1999 and again in 2003, as well as conducting non-visiting interventions in 2001 and 2007.

During 2015, the NPS MedicineWise Evaluation Team conducted a retrospective cohort study, with 45 and Up Study[15] individuals from NSW classified into either an 'intervention' or 'control' group based on the GP participation rate in the geographic area of their primary GP.

The data sources linked and utilised in this study included:

- the 45 and Up Study baseline questionnaire data;
- Medicare Benefit Scheme (MBS) claims subsidised by Australian government (Jun 2004- Dec 2011)
- Pharmaceutical Benefit Scheme (PBS) subsidised claims (Sep 2005-Dec 2011)
- New South Wales (NSW) Admitted Patient Data Collection (APDC) (Dec 1999-Dec 2011)
- NSW Emergency Department Data Collection (EDDC) (2006-2011).

There were three cohorts based on 45 and Up Study participants which included:

- a hypertension cohort who self-reported hypertension in the baseline survey;
- a hypertension cohort with high CVD risk; and
- an initiation cohort who initiated antihypertensive medication after March 2006.

Logistic regression was used to assess the impact of the NPS Medicine Wise intervention on (i) guideline concordance and (ii) the association between guideline concordance and CVD events comparing the participants in the intervention and control groups. The outcome measures of medication use, including guideline concordance and eligibility for antihypertensive prescriptions, were expected to be associated with improved health outcomes (decreased hospitalisation for myocardial infarction, congestive heart failure, other cardiovascular events and stroke).

For the initiated cohort, the result showed that the intervention group was less likely to be initiated fixed dose combination hypertensive drugs than the control group (OR = 0.81, 95% CI: 0.70 - 0.94). This demonstrates that through participating in our hypertension management program doctors have been influenced positively and demonstrate better patient management by following clinical guidelines. No other significant differences were found between the intervention and control groups including concordance with the guidelines pertaining to prescribing for unfavourable indictions or for initiation of anti-hypertensive drugs for those with compelling indications. As a consequence, no demonstrable health outcomes could be linked to the program.

Findings were limited due to the long lag time between the interventions and the evaluation. However, building on this experience, the linking of data sets will be a useful strategy for evaluating NPS MedicineWise programs in the future.

Making a difference to the health system

Optimising use of our health dollars and delivering efficiency

Savings gained from the *Balancing benefits and harms of antipsychotic therapy* Program

The **Balancing benefits and harms of antipsychotic therapy** program conducted by NPS MedicineWise, began in 2011 and aimed to improve quality of life through safe and effective use of antipsychotic medication while balancing optimal disease management. Part of the program focussed on reducing antipsychotics inappropriately prescribed to elderly patients with dementia. For the behavioural and psychological symptoms of dementia (BPSD), the use of non-pharmacological approaches is recommended as first–line therapy. The program focussed on atypical or second generation antipsychotics, including the medications risperidone, quetiapine and olanzapine.

An economic evaluation attempted to identify the costs and benefits of the program in monetary terms. NPS MedicineWise expected a decrease in volume of atypical antipsychotics as well as a reduction in potential side effects from the medications (strokes, falls, gait disturbances and death) to be observed in people aged 65 years and over following the completion of the program.

The study consisted of: two meta-analyses examining the risk of falls and stroke and cerebrovascular adverse events (CVAE) following use of atypical antipsychotic medication (quetaipine, risperidone and olanzapine) among dementia patients; an assessment of the effectiveness of the program using data from the 2011 NPS clinical audit, the general practitioner survey and an interrupted time series analysis of administrative data from the Australian Pharmaceutical Benefits Scheme (PBS); and a cost-benefit analysis.

The meta-analyses found that:

- the risk of a fall event was not statistically significantly greater in those taking atypical antipsychotics
- the odds ratio of a stroke event or CVAE occurring was 1.67 higher in atypical antipsychotic users compared to non-users.

The assessment of the effectiveness of the program found that:

- 41% of GPs in Australia participated in the program
- there was a 7.3% reduction in modelled PBS prescription volume for those aged 70 years and over with an estimated savings of $4.27 million
- 177 strokes were averted due to the program
- $2,229,230 was saved for state hospitals as a result of reduced hospitalisation for stroke giving a total saving for the health system of $6.5 million.

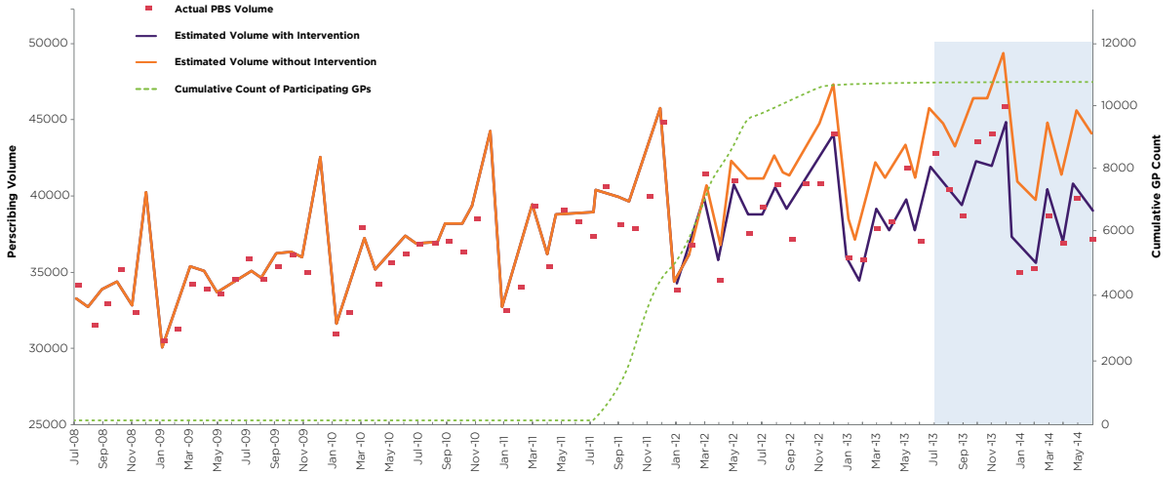
After assessing the cost of the program and the savings in terms of PBS and hospital savings and the quality of life gains:

- the cost to benefit ratio was 2.4: for every $1 invested in the NPS MedicineWise program, $2.40 in benefits was generated.

More savings to the health care system may have been found if the model took into account: our recommendations for alternatives to treatment, deaths, falls, infectious diseases, and MBS item costs.

The findings show that the NPS MedicineWise program had a positive effect on health outcomes and quality of life gains for dementia patients, as well as savings for the health care system.

Figure 5: Impact of the NPS MedicineWise program 'balancing the benefits and harms of antipsychotics (2011)' on PBS volume of olanzapine, quetiapine and risperidone used in the management of psychiatric disorders and BPSD for those aged 70 and over, after allowing for covariates and assuming no decay of the program message



*Shaded area represents reporting period based on savings observed.

Increased Impact

Working together to improve diabetic adherence to metformin

It is estimated that up to 50% of patients with a chronic condition do not adhere to their medication.[15] Diabetes is the fasting growing chronic condition in Australia and metformin is the most commonly prescribed oral anti-hyperglycaemic drug. Metformin is one of the top ten drugs prescribed annually in Australia. The standard approach for managing type 2 diabetes is to initiate metformin as a first line option, in addition to incorporating lifestyle measures. This study aimed to measure adherence to metformin and explored factors and perceptions that may contribute to its non adherence.

The evaluation used a mixed methods approach incorporating quantitative analysis of administrative data and information from focus groups and one-to-one interviews with patients regarding their prescribed medication.

Younger patients

Younger age groups were significantly associated with:

- not filling their second prescription; and
- discontinuation of metformin

We found that:

- 45% of patients were adherent with metformin treatment
- 13% were unintentionally non-adherent
- 42% were intentionally non-adherent
- 11% failed to fill a second prescription
- the discontinuation rate in patients who had two or more prescriptions filled was 9%.

The main barriers to patient adherence included:

- lack of trust in their GP and the diagnosis and treatment inherent beliefs regarding the benefit and harm of the medication
- lack of time with their GP to discuss side effects
- having no strategy for refilling their medication.

The cost of medicines was not raised as an issue.

With the increasing prevalence of diabetes in the population, medication non-adherence poses a significant public health problem to both patient health outcomes and to secondary health-care costs. Strategies are required to address both patient and provider related barriers to medication adherence.

Table 2: Characteristics associated with repeat prescription fill rates for metformin

Variable		Number (%) N=9,515	% Filled One Prescription Only	% Filled More than One Prescription	Adjusted odds ratio
Sex	Female	5,031 (52.9)	12.0%	88.0%	
	Male	4,258 (44.8)	9.4%	90.6%	0.86 (0.75-0.99)
Year of Birth	<1940	2,818 (29.6)	7.1%	92.9%	
	1940-1960	4,961 (52.1)	9.2%	90.8%	1.13 (0.94-1.35)
	≥1961	1,736 (18.2)	21.5%	78.5%	2.29 (1.85-2.83)
Initial Year	2010	4,087 (42.9)	7.8%	92.2%	0.70 (0.59-0.83)
	2011	2,692 (28.3)	13.6%	86.4%	1.11 (0.94-1.31)
	2012	2,736 (28.8)	12.6%	87.4%	
Repeat on initiation	No	1,999 (21.0)	14.7%	85.3%	
	Yes	7,516 (79.0)	9.8%	90.2%	0.66 (0.57-0.76)
Comorbidity	0	647 (6.8)	21.6%	78.4%	
	1-2	2,767 (29.1)	11.9%	88.1%	0.99 (0.72-1.38)
	≥3	6,101 (64.1)	9.2%	90.8%	0.90 (0.70-1.19)
Hyperlipid	No	3,733 (39.2)	15.0%	85.0%	1.30 (1.11-1.52)
	Yes	5,782 (60.8)	8.1%	91.9%	
CVD	No	3,234 (34.0)	15.8%	84.2%	1.55 (1.25-1.92)
	Yes	6,281 (66.0)	8.2%	91.8%	

Fighting Antibiotic Resistance

NPS MedicineWise has been involved with the fight against antibiotic resistance for over 15 years. It was exciting to see that the BEACH study observed decreases in the prescription rate for antibacterials for systemic use, from 10.0 per 100 problems managed in 2005–06 to 8.7 in 2014–15, and a decrease in prescriptions for the broad spectrum penicillin amoxycillin from 2.4 per 100 problems in 2005–06 to 2.0 per 100 problems in 2014–15.[9] Nevertheless even though there were more prescriptions for these drugs in 2014–15 than in 2005–06 due to the increase in encounter numbers nationally.

Antibiotic Awareness Week 2014

Antibiotic Awareness Week was held in Australia from 17 - 23 November 2014. As in previous years, NPS MedicineWise partnered with the Australian Commission for Safety and Quality in Health Care (Commission), Australian Veterinary Association, Department of Agriculture and state and territory governments to acknowledge the 'one health' approach to antibiotic stewardship.

Antibiotic Awareness Week was used to promote the appropriate use of antibiotics to consumers and health professionals in primary care settings. Media and public relations activities during the week included:

- four media releases, plus a joint media release with the Commission
- release of antibiotic resistance fact sheet
- distribution of a multimedia news release (162 unique views)
- release of a TV advertisement 'Imagine a world without antibiotics' as a community service announcement (84 advertising spots across the Southern Cross TV network)
- pharmacy mail-out (sent to 5,564 pharmacies around Australia) and School's mail-out (sent to 7,500 schools around Australia)
- children's event and unveiling of the superbug mascot.

NPS MedicineWise also undertook creative social media activities to engage with consumers online, which included:

- participation in the global Twitter chat (#AntibioticsDay)
- week-long Facebook quiz on antibiotic use and myths
- Pharmacist Hour for the week focused on antibiotics
- development of a social media pack to distribute to members and stakeholders.

The social media activities reached, on average, one in 40 Australians through Twitter, Facebook and YouTube.

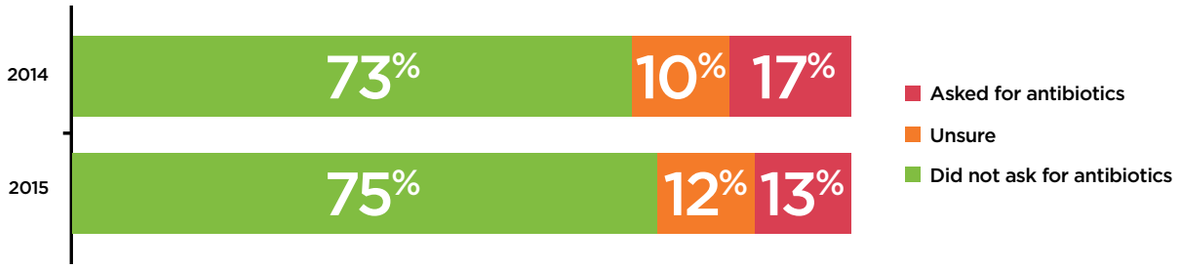
Total number of followers gained	172
Total reach through social media	760,933
Total number of people engaged	2,164
Number of new pledges to fight antibiotic resistance	250

Antibiotic Resistance – The Consumer perspective

An evaluation of the Antibiotics Winter Campaign 2015 was conducted via the NPS MedicineWise National Consumer Survey 2015. A cross-sectional nationally-represented sample form the Australian population completed a survey in August to September 2015. The survey found that among respondents residing in New South Wales, Queensland and Victoria where the two TV commercials were broadcast, 13% reported to have seen the "Antibiotics are Losing its Power" ad, 16% had seen the "Pass it On" ad and 21% had seen either of the two. Among those who had seen either of the two TVCs, understanding of antibiotic resistance was found to be higher compared to consumers who had not seen either advertisement.

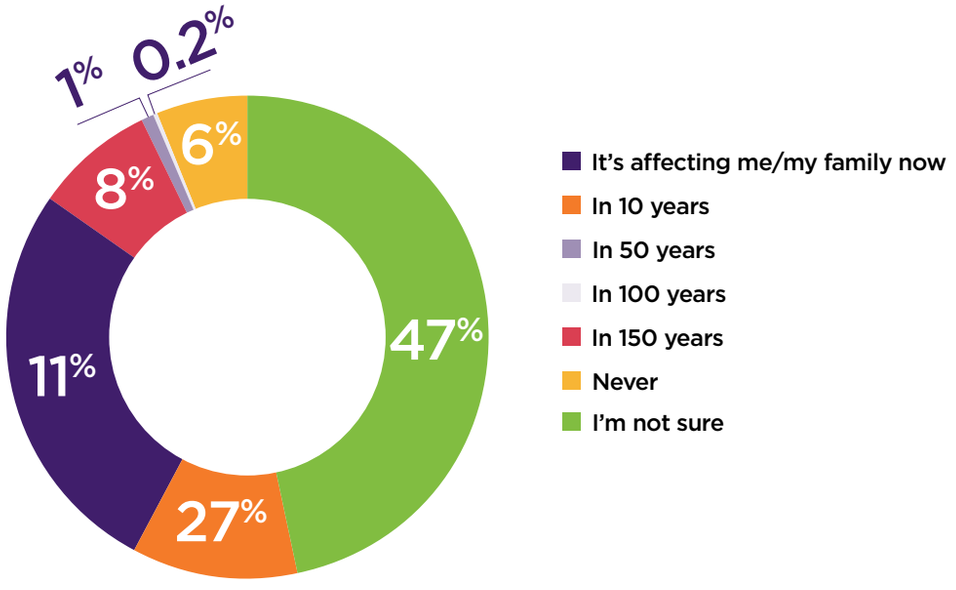
Of the respondents who have seen either advertisement, 46% understood that "when people take antibiotics for cold and flu, they risk passing on antibiotic resistant bacteria to others" compared to 33% of those have not seen either advertisement. Similarly, more respondents who saw an NPS ad agreed that "when antibiotics are taken for cold and flu, they risk developing antibiotic-resistant bacteria" (73% compared to 66% of consumers who have not seen one of our antibiotics advertisements). Our survey also found the proportion of consumers who will ask for an antibiotic from their doctor if they have a cold or flu has decreased from 17% in 2014 (National Consumer Survey 2014) to 13% in 2015.

Figure 6: Percentage of consumers who report asking a doctor for antibiotics for a cold or flu



However, while consumers have a general understanding that antibiotics are becoming less effective and are unlikely to ask their doctor for an antibiotic to treat their cold and flu, most are unclear about when the impact of antibiotic resistance will affect them. When asked when they thought the impact of antibiotics will affect them or their family, almost half of consumers were not sure, while over a quarter believed it would be in "10 years" time.

Figure 7: When do you think the impact of antibiotic resistance will affect you and your family?



Generic Medicine

Patterns of brand use

NPS MedicineWise investigated the patterns of use of PBS medicines with multiple brands over time as well as the impact the PBS reforms and NPS MedicineWise programs may have had on consumer behaviour in switching from originator to generic brands.

In 2005, we rolled out a two year program aimed at both consumers and health professionals to increase the safe use of generic medicines. In 2008, a second program was implemented that aimed to support the PBS reforms that were rolled out by the Government. These reforms involved a restructure of the PBS pricing of medicines with reductions in pricing for medicines with multiple brands available on the market.

To examine the effect of both these programs and the reform, data from the PBS from July 2003 to December 2011 was extracted for 14 drugs. These drugs included antidepressants, cardiovascular agents, an oral hypoglycaemic, a biphosphonate, a diuretic and a proton-pump inhibitor. Each medicine was examined individually for switching patterns between originator medicines and generic equivalents and modelled against various patient and script characteristics to investigate patterns associated with generic use at initiation and becoming a multi-switcher. The main findings were as follows:

- for users of antidepressants, the majority of users of fluoxetine used the generic brand only
- the use of originator brands of sertraline and escitalopram decreased by about 90% by the end of the study period due to patent expiry
- for citalopram the exclusive use of the originator brand fell by 20%
- for antidepressant users, multi-switching was positively associated with attending pharmacies from different states and less likely if users were on two or more concomitant medicines or initiated their drug after our program
- concession card users of escitalopram and sertraline were more likely to be multi-switchers than non-concession card users
- the majority of users of each cardiovascular drug did not switch brand types and most non-switchers used the generic equivalent of the drug
- multi-switching was associated with attending pharmacies in more than one state
- atenolol, ramipril and simvastatin users were less likely to be multi-switchers if two or more medicines were used concomitantly
- mixed results were seen with initiating a drug before our programs; with users of atenolol and simvastatin more likely to multi-switch if they commenced pre-2005 and users of amlodipine, clopidogral and ramipril less likely
- concession card users of amlodipine and ramipril were more likely to be multi-switchers than non-concession card users
- the vast majority of people using metformin and frusemide used the generic equivalent exclusively (99% and 83% respectively)
- since our programs, decreases in users of originator alendronate and omeprazole were matched by increases in users of generic brands and multi-switchers
- multi-switching for omeprazole use was associated with visiting pharmacies in different states and initiating medication after our program but was less likely if users were on two or more concomitant medicines
- for alendronate, visiting different states and not being on a concession card were associated with multi-switching although, if initiating after our programs, multi-switching was less likely.

Table 3: No. (%) Non- Switching Patients, mean number of switches and mean number of months to first switch (*of those who switched in the study period)

Target Medication	No (%) non- switchers	Mean number of switches/ patient*
Alendronate	180,803 (54.7)	2.2
Amlodipine	305,436 (56.2)	2.0
Atenolol	536,659 (86.4)	2.6
Citalopram	247,604 (63.7)	2.7
Clopidogral	287,435 (54.5)	2.5
Diclofenac	166,677 (55.6)	2.6
Escitalopram	193,136 (57.7)	2.6
Fluxetine	218,073 (88.3)	2.7
Frusemide	556,851 (83.8)	2.1
Metformin	653,604 (98.6)	3.1
Omeprazole	475,968 (61.4)	3.0
Ramipril	478,778 (85.1)	3.1
Sertraline	325,310 (51.0)	2.6
Simvastatin	511,751 (56.7)	2.6

Overall, the results of this study have identified that the generics program supported the government reforms by increasing the proportion of consumers initiating with generic equivalents over time. If the drug patent expired prior to the commencement of the study period, a higher proportion of exclusive generic users were seen. For some drugs, a large proportion of users were multi-switchers and a variety of factors contributed to patients being multi-switchers and these factors were conditional upon each drug.

Trusted Source

We are seen as a trusted source of information about both medicines and medical tests by health professionals

Print copy subscriptions for Australian Presciber

Australian Prescriber was first published in 1975 by the Department of Health. In 2002 Australian Prescriber joined the National Prescribing Service which is now NPS MedicineWise.

The journal aims to provide an independent review of therapeutics with expert, balanced, impartial, reliable and up-to-date information for its readers. PubMed Central (PMC) accepted Australian Prescriber on 14 November 2015 and PMC will be publishing AP articles from February 2016.

Figure 8: Total print copy subscriptions for Australian Prescriber, 2010 to 2015

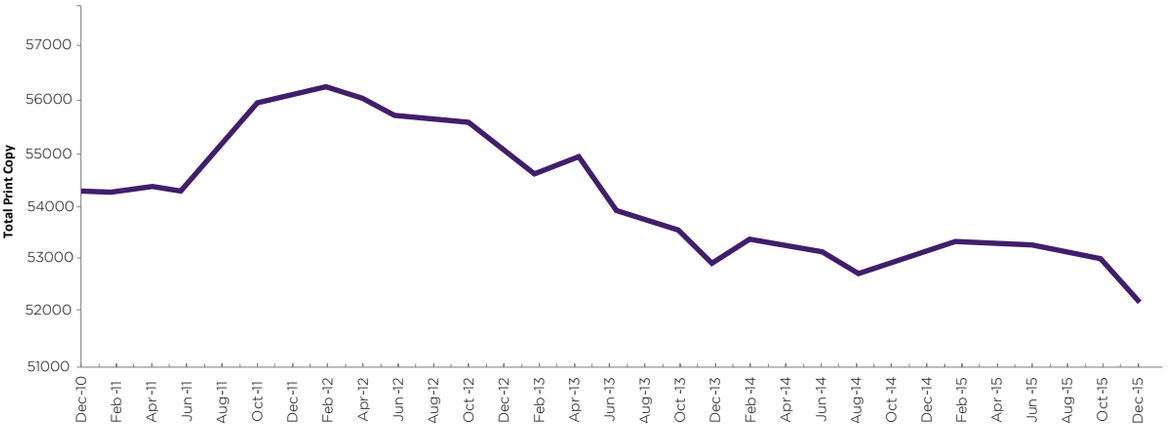
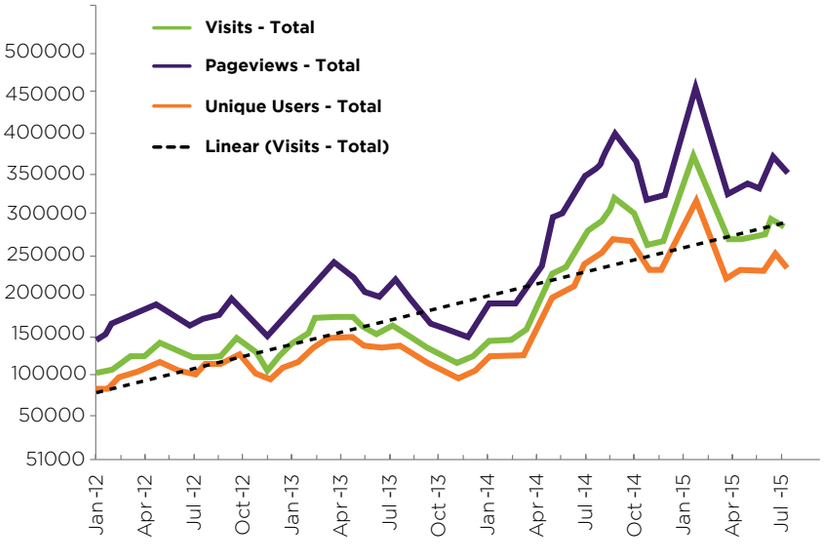


Figure 9: Total mobile and desktop pageviews, unique users and visits



Australian Prescriber is published six times a year in a printed journal format and web-friendly searchable electronic format with email alerts with a link to each issue. Over 52,000 health professionals are on the printed journal format distribution list, 800 living internationally. The proportion of health professional categories has remained the same over the last 5 years, with pharmacists and GPs at around 25% each. Over 20,000 subscribe to the email alerts, including 17,000 health professionals. Use of the Australian Prescriber website continues to grow. The average monthly unique user count in 2012 was 105,108 and in 2014 it had risen to 190,637. The monthly unique user average for 2015 is 250,896, an increase of around 32% from 2014.

The 2014 Australian Prescriber Readership Survey included a random selection of health professionals and indicates that over three quarters of specialists, GPs and pharmacists read Australian Prescriber.

Australian Prescriber has offered CPD activities fort pharmacists since April 2014. A total of 10 activities are now offered, and have so far been completed 4,908 times.

Table 4: Percentage of Australian Prescriber readers by demographic information

Demographic Information	% of group who accessed Australian Prescriber
Occupation	
General practitioner	90%
Hospital pharmacist	95%
Community pharmacist	86%
Other pharmacist	92%
Specialist	81%
Medical resident/Intern/Registrar	70%
GP registrar	83%
Dentist	62%
State	
NSW	88%
VIC	91%
QLD	83%
SA	90%
WA	84%
TAS	83%
NT	83%
ACT	79%
Age	
< 35 years	85%
35 – 44 years	86%
45 – 54 years	87%
55+ years	89%
Years worked in profession	
0 – 2 years	84%
3 – 5 years	92%
6 – 10 years	80%
11 – 15 years	90%
16 – 20 years	86%
21+ years	88%
Medical training locations	
Australia	89%
Overseas	81%
Both in Australia and overseas	87%

Trusted Source

The Doctor's Bag

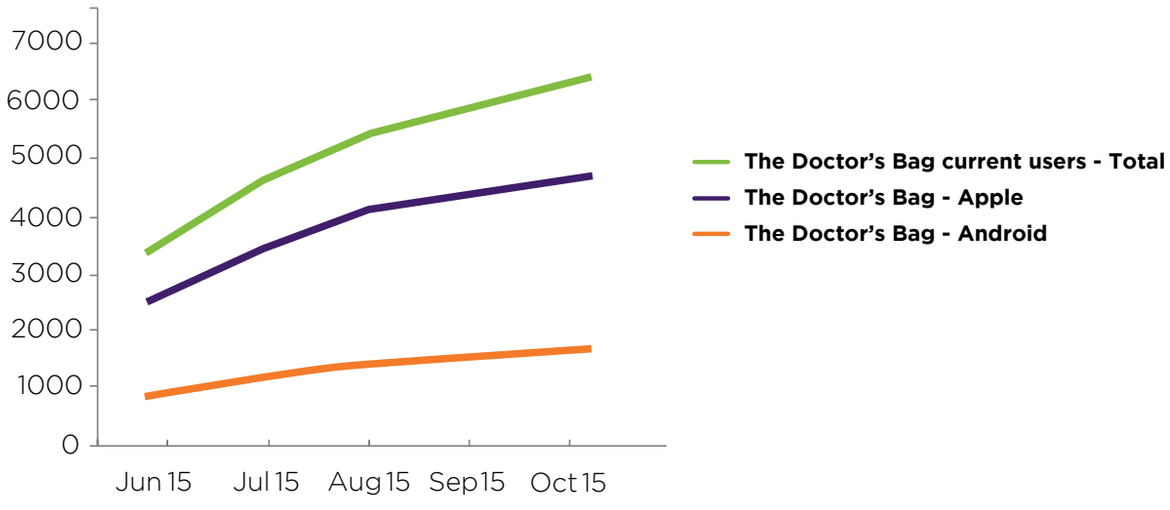
Australian Prescriber launched The Doctor's Bag on the Apple App Store and the Google Play Store on 1 June 2015. Since the launch, the app has been downloaded over 6,000 times.

There has been positive feedback as well as some helpful comments about technical problems which has allowed some minor issues to be resolved soon after launch.

The doctor's bag is designed well in the sense of being well thought out (tutorial to familiarise the user with the app, and advice to frequently revise), easy to learn its navigation, and contains succinct drug information. … On the whole, I am delighted that there is an app like this, and I hope there is more app from NPS in the future.

Dr Roland Chee

Figure 10: Current Users of the Doctors Bag, Apple, Android and Total



RADAR

RADAR is a print publication produced by NPS MedicineWise as part of its commitment to promoting the quality use of medicines. This publication provides health professionals with independent evidence-based information on new drugs, medical tests and changes to listings on the PBS.

RADAR is currently published three times a year, in line with major updates to the Schedule of Pharmaceutical Benefits. In 2014-15, RADAR was distributed to a total of **79,289** health professionals, including specialists, general practitioners and pharmacists. The distribution of NPS RADAR has increased by 6% since last financial year.

Health professionals can also subscribe to RADAR Direct, a free e-newsletter to keep up to date between issues of RADAR. This e-newsletter was distributed to over 17,000 health professionals during 2014-15.

NPS Direct

NPS Direct is a free monthly e-newsletter which aims to keep health professionals and health professional students up to date with evidence-based information about medicines, medical tests and current health topics. In 2014-15, NPS Direct was distributed to **30,053** health professionals and students across Australia.

MedicineWise News

Medicinewise News is a free publication available in print and online, which provides health professionals with independent information on therapeutic topics and related issues. It also offers evidence-based advice on quality prescribing and use of medical tests. The number of issues published each financial year varies. In 2014-15, five issues were published and distributed to approximately **71,000** health professionals.

National Prescribing Curriculum

From July 2009 to June 2015 there were a total of 29,739 enrolments in our National Prescribing Curriculum (NPC) learning modules, with the table 5 showing enrolments by year.

In 2014-15, 100% of medical schools and 83% pharmacy schools were using the NPC.

Table 5: Number of NPC enrolments*

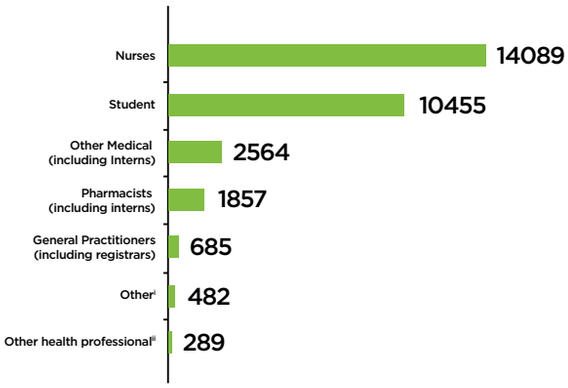
2008 - 2009	3,211
2009 - 2010	4,714
2010 - 2011	3,845
2011 - 2012	4,414
2012 - 2013	4,696
2013 - 2014	4,335
2014 - 2015	4,524
Total	29,739

* Variances in enrolments depend on individual university factors.

Online learning modules

In addition to the National Prescribing Curriculum, NPS MedicineWise provides a range of online learning courses for both students and health professionals. In 2009-10 we offered one course and had 676 registered learners. Since that time, we have expanded our reach, improved our technology and increased our offerings, so that in 2014-15 we offered 26 courses and have over **81,000** registered learners on our system.

Figure 11: Number of unique learners who completed one or more online course (excluding NPC and case studies) in 2014-15 by professional group.



[i]Academic/Educator, Other, Volunteer, Pharmacy Assistant, NPS Employee and NPS CSS
[ii]Aboriginal Health Worker, Community Health Worker, Dentist, Other Health Professionals

In 2014-15 NPS MedicineWise reach multiple channels

Website

Overall traffic

Total website sessions (visits)

5,531,434

68% on 2013-14

Total website users (unique visits)

4,216,558

68% on 2013-14

Engaged traffic*

Engaged Visits

2,091,988

45% on 2013-14

Percentage engaged visits

37.82%

Average visit duration

1:53

**A visit to the website is considered 'engaged' if the visitor spends more than 180 seconds on the site, spends more than 60 seconds on one page, scrolls to the bottom of a page or downloads content such as a pdf, ppt or doc file, shares via social media, plays a video or interacts with tool, quiz or poll.*

ached millions of people through

Social Media

Total Views
2,933,578
26% on 2013-14
Total Engagement
6,103
43% on 2013-14

Total Views
4,635,806
201% on 2013-14
Total Engagement
108,398
10% on 2013-14

Total Views
176,911
39% on 2013-14
Total Engagement
1,043
88% on 2013-14

Total Views
163,010
Total Engagement
2,309

Total Views
15,101
Total Engagement
105

MedicineList+

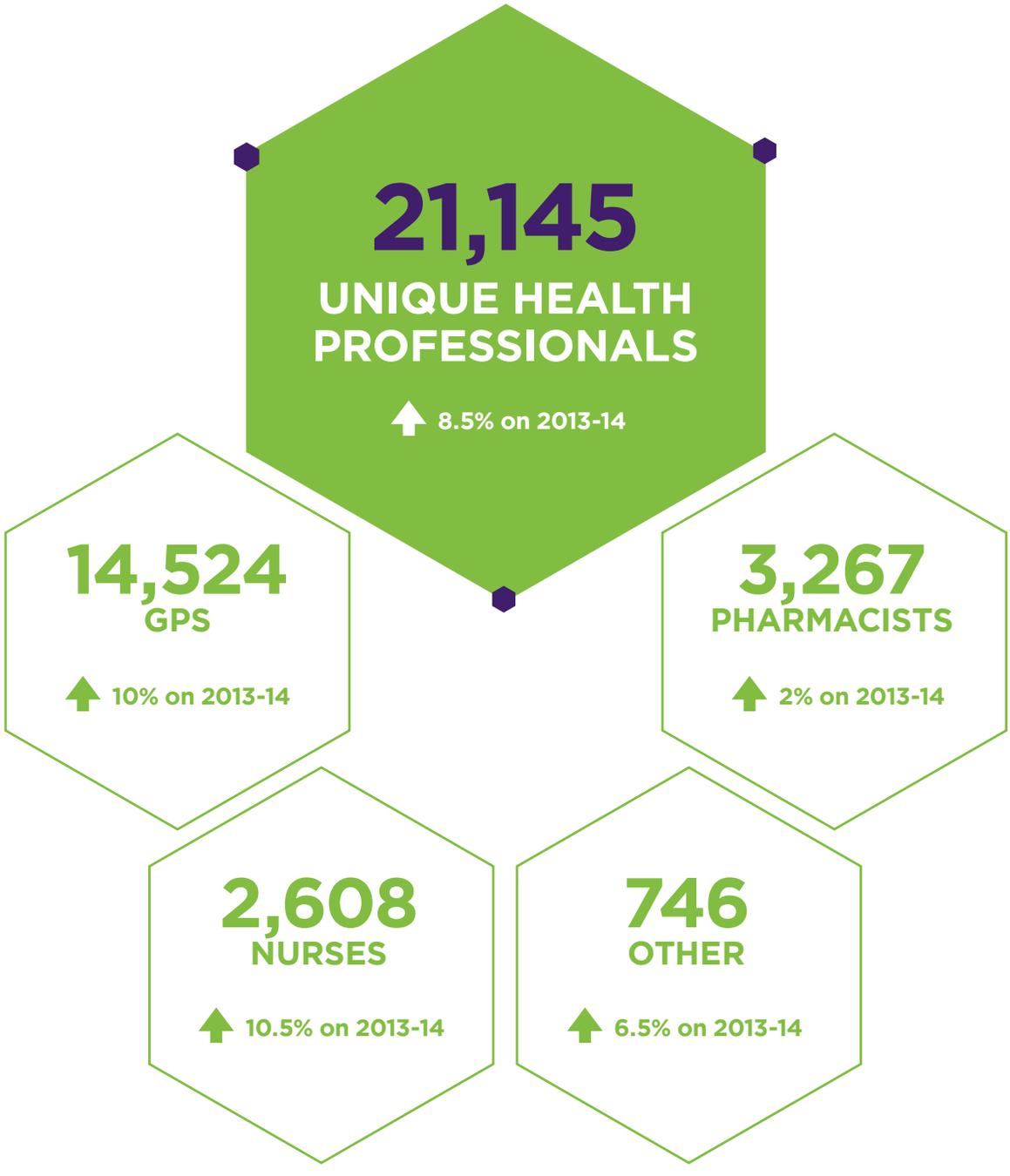
13,349
Downloads of the App

Medicines Line

8,356
Completed medicines enquiries

REACH: NPS MedicineWise continu
health professionals through its ed

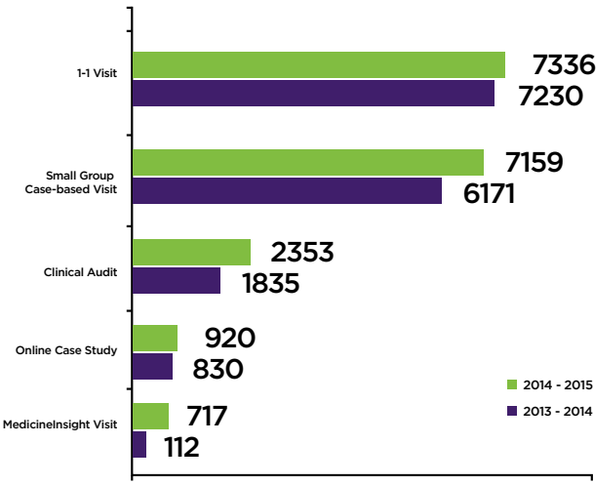
Unique number of health professionals by type



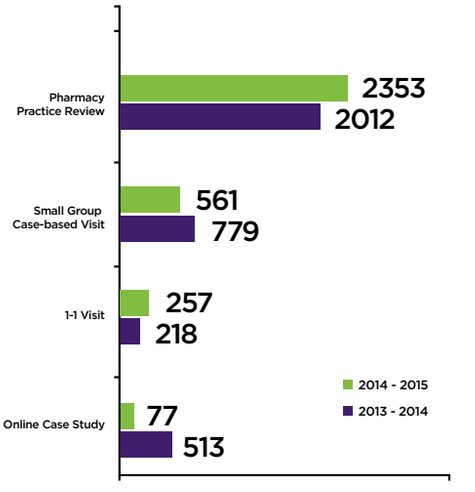
inues to build interactions with educational activities

Unique participation in Therapeutic Programs and MedicineInsight activities by health professional type

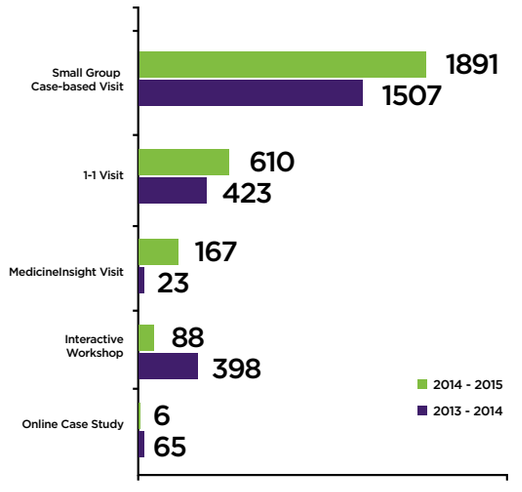
GP participation



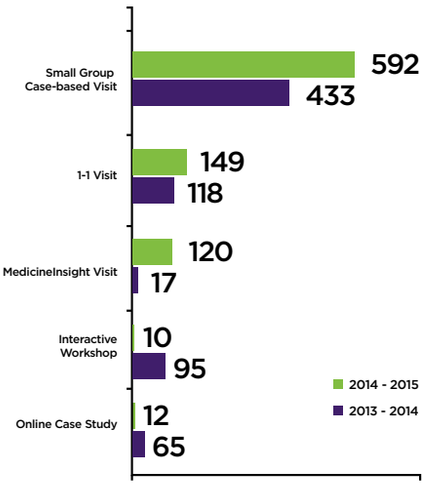
Pharmacist participation



Nurse participation



Other HP participation



Safety Monitoring and Adverse Event Reporting

NPS MedicineWise collaborated with the Therapeutic Goods Adminstration (TGA) in December 2014, producing two online learning modules. Module 1 is on reporting adverse events with medicines and vaccines and Module 2 is on reporting adverse events with medical devices. Both modules complied with requirements for accreditation as a Category 2 QI&CPD activity through the appropriate colleges.

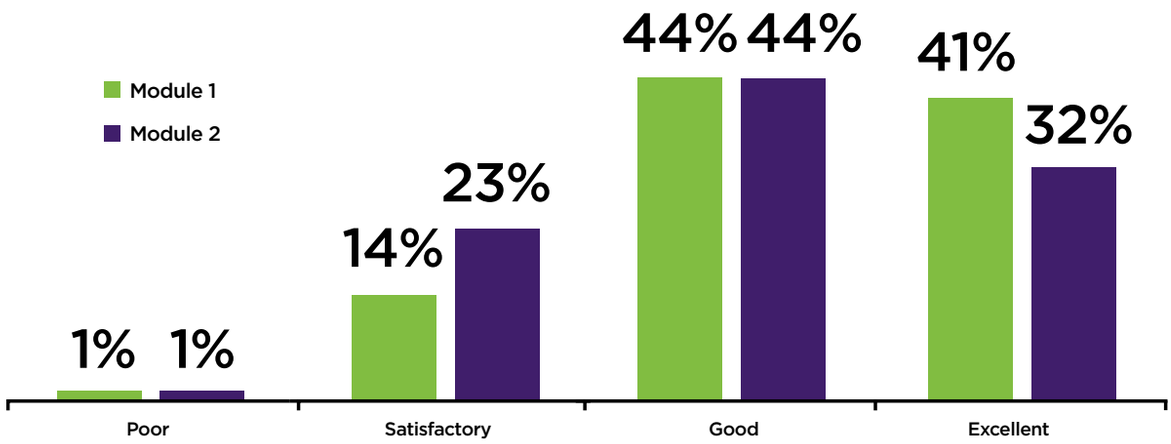
A total of 837 unique participants had started the modules by June 2015 with 410 completing Module 1 and 91 completing Module 2. NPS MedicineWise set a target of 500 completions in the 12 months following the launch. This target was achieved in the first six months. A total of 363 participants received accreditation.

The evaluation survey was completed by 89% of Module 1 participants and 92% of Module 2 participants. The majority of participants reported that their learning needs were entirely met for both modules (76% for Module 1 and 64% for Module 2). For both modules, over 67% reported that all the learning objectives were met.

The majority of participants felt Module 1 was entirely relevant to their practice (66%) compared to only 50% for Module 2 as medical devices seems to be less relevant to the practice of some health professional groups.

Over three quarters of participants were satisfied with the modules, rating them as 'good' or 'excellent' (Figure 12).

Figure 12: Participant satisfaction: adverse event reporting modules



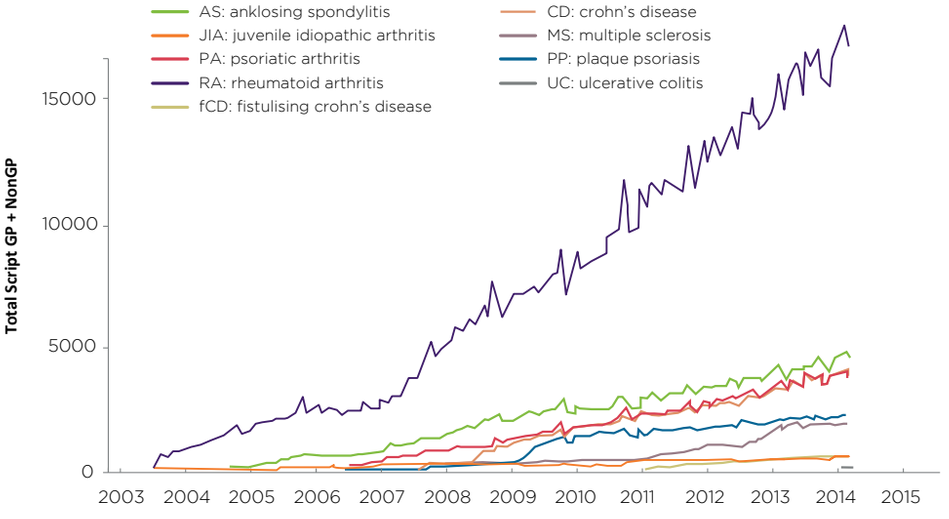
Exploring Biologic Agents

We explored the impact on expenditure of high cost drugs and excluded those with limited scope to influence change apart from biologic agents. All s100 and s85 biologic agents for various rheumatological conditions were explored from 2003 to 2014 for trends in prescribing.

Initial exploration of PBS data has found that the total scripts by GPs and specialists for biologic agents has increased over the years, especially for rheumatoid arthritis (Figure 13).

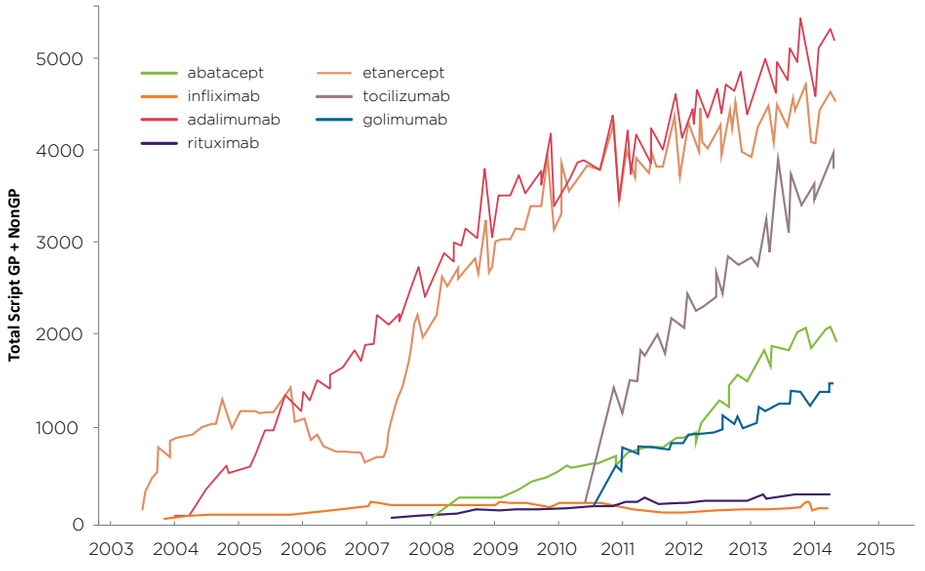
The drugs that have been increasingly prescribed for rheumatoid arthritis over this time include adalimumab, etanercept and tocilizumab as well as others (see Figure 14).

Figure 13: Total scripts by GP and non-GP for biologic agents for specific conditions by year



Data sources: Prescription data obtained from the Department of Human Services (DHS).

Figure 14: Biologic agents prescribed for rheumatoid arthritis by year



Riding the wave of big data
– MedicineInsight

The MedicineInsight program contributes to our understanding of how medicines are used in Australia, and informs policy makers and prescribers about areas for improvement that can lead to better health outcomes and cost savings. MedicineInsight was funded by Commonwealth Department of Health in 2011 with the aim of building a comprehensive dataset of routine prescribing data linked to key demographic information and clinical conditions, collecting anonymised clinical data from general practices and millions of patients who are representative of the Australian population. The program stores and analyses the data to create routine and ad hoc reports to respond to relevant research questions. Accurate and contemporaneous MedicineInsight data showing trends in clinical practice and prescribing of medicines has been used to develop effective educational interventions to assist GPs in delivering the best care to their patients. This information (in aggregated formats) has also been produced for policy makers to ensure Australia's health and medicines policy is driven by accurate and timely information from general practice.

MedicineInsight has recruited over 500 general practices to the program, which represents over 2,000 GPs and 2.5 million active patients, in all states and territories across Australia. A successful information technology infrastructure has been built, scaled up and maintained to securely collect and analyse quality assured and de-identified data. Robust processes have been developed and refined that allow efficient and effective analysis and reporting of data from general practices. Meaningful reports and quality improvement activities have been delivered to participating general practices and the Department of Health which are designed to provide value and impact for both policy development and clinical practice.

A total of 1,336 health professionals participated in one or more MedicineInsight activities. Activities include receiving a practice report and a facilitated meeting. In 2014/15, there were 332 MedicineInsight quality improvement activities on type 2 diabetes and stroke prevention delivered to 244 practices.

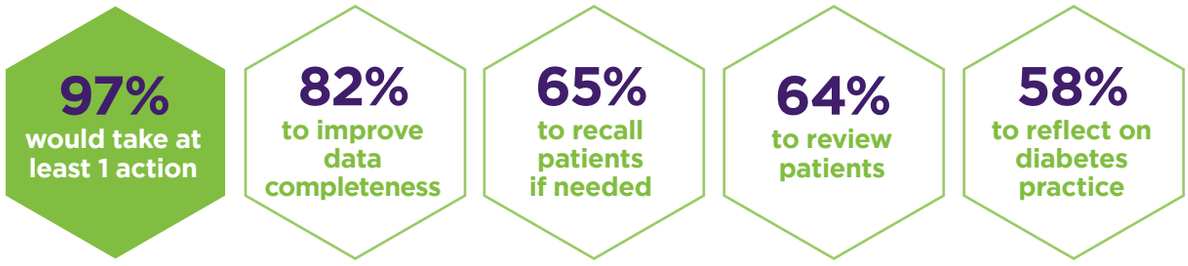
The MedicineInsight activity has been valued by the majority of participants to date. Participants commented on the clarity and presentation of the data, including "having everything in the one place", to help them reflect on and review their practice. Many also valued the comparative data detailed in the report to allow them to "benchmark". The positive atmosphere of the meeting itself was appreciated by participants, giving them a chance to take time out as a practice team and discuss their clinical practice in a non-threatening and non-judgemental atmosphere, while identifying opportunities and areas that they may be able to improve on.

The majority of participants surveyed (N=891 from 176 practices) in the Type 2 diabetes activity found it acceptable and useful for their practice (Table 6). Most participants providing feedback for the stroke prevention activity also found the report relevant and useful for their practice.

Table 6: Acceptability and usefulness of the Type 2 diabetes activity

	Strongly agree / agree % (n)	Neutral % (n)	Strongly disagree / disagree % (n)
Relevant report	97.1 (856)	2.2 (19)	0.8 (7)
Useful report	96.6 (844)	2.5 (22)	0.9 (8)
Report easy to understand	93.6 (815)	5.7 (50)	0.7 (6)
Appropriate meeting	97.6 (863)	1.9 (17)	0.5 (4)

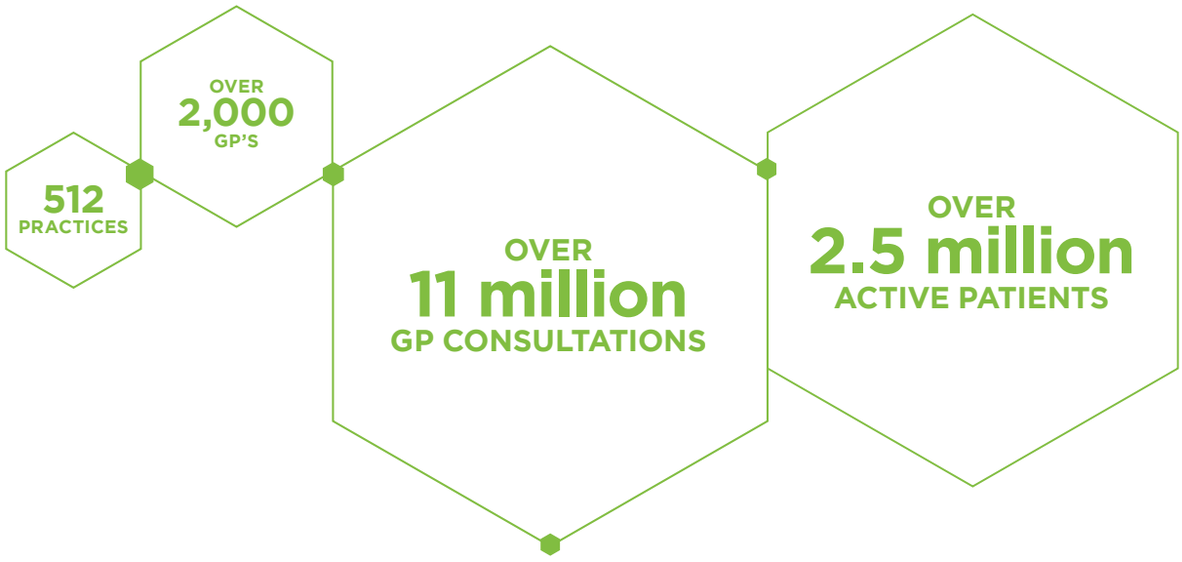
Practices believe that participating in MedicineInsight has positively impacted clinical practice, co-ordination and management of care and how they think about their patient care. It has facilitated thinking about establishing new systems and provided an opportunity to refocus and see where improvements can be made. The majority of participants in the type 2 diabetes activities stated they would take action as a result of participating.



Practices demonstrated improvements to patients reaching HbA1c and blood pressure targets after participating in a MedicineInsight quality improvement activity, with 23% of practices showing a ≥3% improvement in blood pressure and HbA1c targets being achieved.

Regular reports (n=5) and data have been provided to key government stakeholders to inform decisions on medicines policy in the areas of medicines prescribed, management of type 2 diabetes, asthma prescribing in children, opioid prescribing, utilisation and uptake of exenatide, prescription and use of seven antibiotics common to general practice.

MedicineInsight now has data from:



Financial Impact

Medicare Benefits Scheme

The assessment of the financial impact of the NPS MedicineWise Quality Use of Diagnostics (QUD) program (2013-2015) on the Medicare Benefits Scheme (MBS) included two national multifaceted programs addressing: inappropriate use of computed tomography (CT) scans and X-rays for acute low back pain (ALBP); and vitamin D blood tests for vitamin D deficiency by general practitioners (GPs) in primary care. Personalised MBS data feedback information packages were sent to almost all practicing GPs Australia wide as part of these two programs. The ALBP feedback intervention occurred in June 2013 and the Vitamin D testing feedback intervention occurred in October 2013.

Provider level reimbursement data for May 2010 to February 2015 was obtained from the Commonwealth Department of Human Services (DHS) to assess the impact of the 2013 NPS MedicineWise imaging use for low back pain intervention on the MBS.

Provider level reimbursement data for May 2010 to October 2014 was obtained from DHS to assess the impact of the 2013 NPS MedicineWise Vitamin D testing intervention on the MBS. Analysis period concluded in October 2014 because of the changes in rules regarding rebates for vitamin D testing which came into effect in November 2014.

Time series analysis was used to assess the financial impact of the NPS MedicineWise programs. The obtained data allowed classification of the health provider as either a general practitioner (GP) or not a general practitioner (non-GP). Where a constant relationship between the GP referral series and the non-GP referral series was observed prior to the NPS intervention, it was assumed that this relationship would have continued if the NPS MedicineWise intervention had not occurred. Based on this assumption, a Bayesian Hierarchial Time Series Model was used to predict the trajectory of the GP referral series had the NPS MedicineWise intervention not occurred. This predicted trajectory was compared to the observed data during the period following the intervention to estimate its impact.

NPS MedicineWise quality use of diagnostic programs delivered **$11.60 million savings** from reduced expenditure on CT scans (MBS item number: 56223) for the period July 2013 to February 2015, and **$21.45 million savings** for reduced expenditure on vitamin D test (MBS item number 6608) for the period November 2013 to October 2014.

Pharmaceutical Benefits Scheme

NPS MedicineWise has been contracted by the Department of Health (DoH) to deliver savings to the Pharmaceutical Benefits Scheme (PBS). The savings requirement for the total contract period, 2010-2015, is $381.89 million, including $69.28 million in 2015.

NPS MedicineWise systematically targets therapeutic areas where evidence suggests an opportunity for more appropriate prescribing of these related medicines. In addition, areas are targeted where education and information can have a positive impact on prescribing, consistent with quality use of medicines (QUM) principles. For cost savings to be detected, sufficient data (at least 12 months) is required to quantify the impact of the intervention.

Financial savings for this reporting period have been calculated from five programs addressing different therapeutic areas. Most of these programs took between 12-18 months to implement and complete.

The effect of the NPS MedicineWise program was determined by using interrupted time series regression models to predict the expected volume of prescriptions for particular drugs/drug classes over time. PBS volume models were modelled either directly, with a PBS expenditure model which tracks expenditure over time, or indirectly by calculating average monthly pricing from the reduction in volume.

NPS MedicineWise programs across seven therapeutic areas returned significant cost savings to the PBS expenditure. The savings reported in 2015, representing data for the financial year 2013-14, totalled **$69.24 million.**

To calculate the financial impact of our programs we evaluated these prescribing intervention programs:

- Antiplatelet and Anticoagulant Therapy in Stroke Prevention (2009)
- Proton Pump Inhibitors (2009)
- Management Options to Maximise Sleep (2009)
- Opioid use in Chronic Pain: Use a Planned Approach (2010)
- Use of Antipsychotics (2011)
- Cardiovascular (CVD) risk: Guiding Lipid Management (2011)
- Depression: Challenges in Primary Care (2012)

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