

Analysis of
non-dispensing
pharmacists in
general practice
clinics

Australian Medical
Association

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Glossary

ABS	Australian Bureau of Statistics
ADE	adverse drug event
AIHW	Australian Institute of Health and Welfare
AMA	Australian Medical Association
BCR	benefit cost ratio
BEACH	Bettering the Evaluation and Care of Health
CPI	consumer price index
GP	general practitioner
MBS	Medicare Benefits Schedule
NHPA	National Health Performance Authority
NPV	net present value
PBS	Pharmaceutical Benefits Scheme
PNIP	Practice Nurse Incentive Program
PPB	Pharmaceutical Policy Branch
PSA	Pharmaceutical Society of Australia
SWPE	standardised whole patient equivalent

Executive Summary

Deloitte Access Economics was commissioned by the Australian Medical Association to analyse the financial impact of a proposed policy to integrate non-dispensing pharmacists into general practice clinics.

The policy will provide financial incentives to general practice clinics to hire a non-dispensing pharmacist, who will share current drug information with doctors and practice staff, respond to medicine queries, increase practice efficiency and free up general practitioners' time, deliver patient-directed services, and perform practice based quality assurance activities.

The aim of the policy is to improve the quality of primary healthcare by increasing compliance and persistence with medication regimens, reduce the level and severity of adverse drug events, optimise the management of long-term conditions, and reduce the burden on the Pharmaceutical Benefits Scheme that arises from overprescribing of medicines.

The analysis by Deloitte Access Economics estimated the financial costs associated with the base case (that is, the current situation), and estimated the financial costs associated with the intervention (that is, the policy as proposed by the Australian Medical Association). This allowed for a comparison to be made between the two states (base case and intervention), which provided an estimate of cost savings that may be achieved from the policy. Data for the analysis was sourced from a variety of publicly-available databases, as well as from peer-reviewed journal articles.

The costs under the base case and intervention were limited to:

- **Medications that are prescribed to patients:** there is a lower cost of medications in the intervention as the policy reduces the rate of overprescribing of medications.
- **Visits to general practitioners that arise when a patient has a moderate or severe adverse drug event:** there is a lower rate of visits in the intervention as the policy reduces the risk of adverse drug events.
- **Hospital admissions due to severe adverse drug events:** as with visits to general practitioners, these are lower in the intervention.
- **Incentive payments to general practice clinics to hire non-dispensing pharmacists** (these costs are only incurred in the intervention, and not the base case).
- **The costs of individuals' co-payments for prescribed medications and for consultations with general practitioners that are not bulkbilled:** these costs are lower in the intervention due to consultations avoided and medicines being deprescribed.

The results of the analysis demonstrated that the policy results in financial savings of \$544.87 million over the four years from 2015-16 to 2018-19 (\$440.23 million in net present value terms using a 7% discount rate). The policy delivers a benefit-cost ratio of 1.56, which means that every \$1 invested in the program generates \$1.56 of benefits.

Deloitte Access Economics

1 Background

Deloitte Access Economics was commissioned by the Australian Medical Association (AMA) to analyse the financial impact of a proposed policy to integrate non-dispensing pharmacists into general practice clinics.

1.1 Overview of policy

The aim of the policy (which has been developed by the AMA in conjunction with the Pharmaceutical Society of Australia, PSA) is to improve the quality of primary healthcare by:

- increasing compliance and persistence with medication regimens;
- reducing the level and severity of adverse drug events¹ (ADEs);
- optimising the management of long-term conditions; and
- reducing the burden on the Pharmaceutical Benefits Scheme (PBS) that arises from overprescribing of medicines.

A study by Picton and Wright (2013) estimated that rates of non-compliance by patients with their medication regimens are as high as 33%, and hospital admissions related to medications have been estimated to cost \$1.2 billion per annum² (Roughead et al, 2013). The prescribing of unnecessary medications by GPs also contributes to the total \$9.2 billion annual cost of the Pharmaceutical Benefits Scheme (Pharmaceutical Policy Branch, 2014).

In response to these concerns, several roles are proposed for pharmacists as part of the policy (PSA, 2015). These are outlined in the box below.

Roles of non-dispensing pharmacists in the policy

Sharing current drug information with doctors and practice staff

Activities conducted include education sessions, providing information on new evidence and therapeutic uses for medications, providing summaries of new guidelines, teaching medical students and registrars, and performing patient education seminars.

Responding to medicine queries

The pharmacist would answer queries on the PBS, source medications for GPs, provide advice on specific medication concerns from GPs (for example, switching coagulants, antidepressants, and opioid equivalence), and answer questions about medicine formulations.

¹ An adverse drug event is defined as 'an appreciably harmful or unpleasant reaction, resulting from an intervention related to the use of a medicinal product' (Edwards and Aronson, 2000).

² This figure is quoted in 2013 dollars.

Increasing practice efficiency and freeing up general practitioners' time

This would be achieved through providing seamless care with community pharmacists, and providing prompt medication reviews and advice on medications.

Delivering patient-directed services

The services include providing in-practice referral-based medicine reviews, private consultations for medication-based concerns for patients, documentation and patient follow up on ADEs, counselling on smoking cessation, lifestyle issues and medicine-based activities, and assisting patients to navigate the health system and medication changes between health settings.

Practice based quality assurance activities

The pharmacist would optimise medication regimens, perform drug utilisation reviews and drug use evaluations, and monitor and advise on prescribing practices.

The policy would require government funding to incentivise GP clinics to hire a non-dispensing pharmacist. The funding arrangements proposed for this policy have been based on the arrangements for the Practice Nurse Incentive Program (PNIP) as described by Department of Human Services (2012). Participating clinics that hire a non-dispensing pharmacist for a minimum of 12 hours and 40 minutes per week would receive \$25,000 per annum per 1,000 Standardised Whole Patient Equivalent (SWPE) at the clinic. The funding would be capped at a maximum of five incentives per clinic, and so the maximum funding available to a single clinic would be \$125,000. As per the PNIP, a loading of up to 50% for rural practices would apply. Specifically, the loadings would be:

- major cities: no loading;
- inner regional: 20% loading;
- outer regional: 30% loading;
- remote: 40% loading; and
- very remote: 50% loading.

The AMA has advised Deloitte Access Economics that the average annual salary for a pharmacist is \$67,000 plus on-costs. Thus, it is anticipated that only clinics with a SWPE of 3,000 or greater would elect to take part in the program (as this would approximately cover the costs associated with hiring one pharmacist).

1.2 Related policies

There are currently four programs that are funded through the 5th Community Pharmacy Agreement, and perform related roles to the policy. The policy proposed by the AMA is intended to fill a gap in health service delivery, rather than replicate the services provided through these programs.

Medicines Use Review and Diabetes Medication Management Service

The Medicines Use Review and Diabetes Medication Management Services (also known as MedsCheck and Diabetes MedsCheck, respectively), are in-pharmacy, patient centred services that consist of a face-to-face medication check delivered by community pharmacists to patients who fit the eligibility criteria. They help patients to learn more about their medicines, identify the problems that patients may be experiencing with their medicines, improve the effective use of medicines by patients, and encourage and educate patients about the best practice use and storage of their medicines. The Diabetes MedsCheck also assists patients with improving the use of blood glucose monitoring devices, improving blood glucose control, and reducing the risk of patients developing complications associated with type 2 diabetes (Deloitte Access Economics, 2012).

Home Medicines Review

Under the Home Medicines Review (also known as the Domiciliary Medication Management Review), a patient's GP requests a pharmacist to visit the patient at their home to conduct a review of the patient's medication regimen. The pharmacist provides a report to the GP which is used to develop and implement a medication plan for the patient (Department of Health, 2014b).

Residential Medication Management Review

This is a medication management program provided to residents of government-funded aged care facilities. A resident's GP requests an accredited pharmacist to undertake an assessment of a resident's medication regimen to identify, resolve and prevent medication-related problems. A report is provided to the resident's GP (Department of Health, 2014b).

1.3 Consultation

Deloitte Access Economics consulted with Dr Kean-Seng Lim during the development of this report. Dr Lim has undertaken a small trial of a medicines management scheme at Mt Druitt Medical Centre that is similar to the policy proposed by the AMA. The preliminary results of the trial are not publishable due to patient privacy restrictions. However, the results have been used to triangulate and validate some parameters that have been used in the modelling for this report.

2 Methodology and data

This section presents an overview of the methodology and data that was used to conduct the analysis of the proposed policy.

2.1 Methodology

The approach used in this analysis was to estimate the financial costs associated with the base case (that is, the current situation), and estimate the financial costs associated with the intervention (that is, the policy as proposed by the AMA). This allows for a comparison to be made between the two states (base case and intervention), which provides an estimate of the costs and benefits of the policy. The analysis considers the costs under each state that accrue to the Commonwealth government, jurisdictional governments, and individuals.

2.1.1 Scope of analysis

This analysis is intended to be a high-level examination of the costs and benefits associated with the policy. As such, the scope of the costs has been limited to

- the Commonwealth Government's costs of medicines under the PBS, and GP consultations under the MBS;
- jurisdictional governments' costs of hospital admissions; and
- patients' costs of co-payments for medicines and GP consultations.

The policy has been costed over the four-year forward estimates period from 2015-16 to 2018-19. Costs and benefits over the period were used to demonstrate the net financial impact of the policy, which has been expressed in both whole dollar terms, as a net present value,³ and as a benefit-cost ratio.

2.1.2 Base case

In order to cost the base case, it is necessary to identify the **target population** for the policy. The target population was used in costing both the base case and the intervention. As this is a high-level analysis of the costs of the policy, the target population was limited to GP patients who had had an ADE in the past six months. The patients in the target population are individuals who, but for the intervention, would have had an ADE, and as such will benefit from the services provided in the policy. Miller et al (2006) analysed data from the Bettering the Evaluation and Care of Health (BEACH) data set on patient responses to questions about ADEs. Through this analysis, it was identified that 10.4% of patients who visited their GP had had an ADE in the past six months. This figure was combined with data from the Australian Bureau of Statistics on the Australian population (ABS, 2015a), and the proportion of the population that attends a GP clinic each year (NHPA, 2015).

³ A discount rate of 7% has been used for net present value calculations, in line with recommendations by the Department of Prime Minister and Cabinet (Office of Best Practice Regulation, 2014).

The cost items calculated in the base case are set out under the following headings.

PBS expenditure

Expenditure under the PBS was calculated by identifying the number of people in the target population, and making an assumption as to the number of medications that they were currently taking. It was assumed that people in the target population were taking an average of five medications, as these people are most likely to benefit from the policy. The average PBS cost of medications prescribed to patients was based on data from the Pharmaceutical Policy Branch within the Department of Health (PPB, 2014).

MBS expenditure

MBS expenditure was assumed to arise from individuals in the target population that had had an ADE of at least moderate severity. Miller et al (2014) identified three categories of ADE severity:

- **Mild:** a reaction of limited duration which may or may not require further treatment, and has a minimum impact on daily activities.
- **Moderate:** a reaction of longer duration or which requires further treatment, and limits daily activities.
- **Severe:** a reaction of any duration which results in hospitalisations and/or long-term limitations of daily activities.

The analysis assumed that individuals who had a mild ADE would not seek medical treatment, a moderate ADE would result in a visit to the GP, while a severe ADE would necessitate admission to a hospital and a follow-up visit with a GP upon being discharged from hospital. The MBS cost associated with a standard GP consultation (item 23) was sourced from the Department of Health's annual Medicare statistics publication (Department of Health, 2014a).

Hospital expenditure

As noted in the previous section, patients in the target population who had a severe ADE would need to be admitted to hospital. The number of hospital separations arising from ADEs was provided in Roughead and Semple (2009). The average cost of a hospital separation was sourced from the Australian Institute of Health and Welfare (AIHW, 2015).

Individual expenditure

Individual expenditure is a combination of out-of-pocket costs (co-payments) associated with GP consultations that are not bulk-billed, and prescription medications. GP consultations arise when a patient has a moderate severity or severe ADE.

2.1.3 Intervention

Under the intervention, the policy is progressively rolled-out to suitable GP clinics across Australia, and is aimed at the target population. The take-up rates in each year, and the overall take-up across GP clinics, were determined from the results of a survey of all AMA

members. In the survey, members indicated their willingness to take part in the scheme.⁴ It was assumed that all practices who will take part in the policy will do so by the end of the four year period of analysis.

The take-up rate in each year, and the overall take-up rate over the four years, determine the number of people in the target population who are able to access services provided under the policy. Each year, a proportion of the target population (referred to as 'participants') will be able to access these services, and this proportion increases in each subsequent year as more GP clinics take part in the policy. Over the same period, the remaining proportion of the target population (referred to as 'non participants') that attend a clinic that is not part taking part in the policy, will decrease in each subsequent year.

The cost items calculated in the intervention are set out under the following headings.

PBS expenditure

PBS expenditure is calculated as the sum of the PBS cost of medicines prescribed to participants, plus the sum of the PBS cost of medicines that are prescribed to the non-participants. The number of medicines prescribed to the participants will be less than the number of medicines prescribed to the non-participants, as these patients will experience an average net reduction in the number of medicines that they are prescribed. Parameters for the reduction in medications per patient were sourced from Castelino et al (2010).

Reduction in medications per patient (Castelino et al, 2010)

This study examined the impact of GP-led pharmaceutical services on use of medicines by community-dwelling older people in New South Wales. The services provided by the pharmacists in the study include a GP referral to a patient's pharmacist, an interview between the pharmacist and patient, a report from the pharmacist to the GP following the interview, and a medication management plan between the GP and patient based on the report. Similar activities would be performed as part of the AMA's proposed policy, and as such the reduction in the number of medications in the trial was considered to be a suitable proxy for the reduction in medications that would be achieved through the policy.

The study investigated whether pharmacists' recommendations would lead to an improvement in the use of medications as measured by a decrease in the Drug Burden Index score.⁵ The study estimated the baseline level of medications consumed by the study population, and the number of medications that were ceased following the pharmacist review.

The PBS cost of medicines prescribed was the same as the cost used in the base case calculations.

⁴ The results of this survey have not been made publicly available.

⁵ The Drug Burden Index is a tool that measures a person's total exposure to medications that possess anticholinergic and/or sedative properties, using the principles of dose response and maximal effect (Castelino et al, 2010).

MBS expenditure

As with the PBS expenditure, the MBS expenditure is the sum of expenditure for participants plus the sum of expenditure for non-participants. Participants in the program will have a fewer number of moderate severity and severe ADEs, due to having access to services provided through the policy. It should be noted that the policy will not reduce the number of ADEs to zero for participants, as a proportion of ADEs are not totally preventable through the services provided under the policy. The number of moderate severity and severe ADEs will be unchanged for non-participants.

Parameters for the change in the number of moderate severity ADEs for participants were sourced from Miller et al (2006).

Fewer moderate severity ADEs (Miller et al, 2006)

Miller and colleagues used BEACH data and supplementary analysis of nominated data techniques to investigate the frequency, cause and severity of ADEs among general practice patients, and the percentage of ADEs that are considered to be preventable.

The study considers ADEs to be preventable if they are avoidable by means such as better communications between health professions, better communication between patient and health professions, and better knowledge of a patient's medical history. As all these activities would be performed through the AMA's proposed policy, it was considered that the impact of these 'preventability activities' would be a suitable proxy for the impact of the AMA's proposed policy.

Estimates for the change in the number of severe ADEs were provided in Chan et al (2001). Preventability of severe ADEs was limited to severe ADEs that were considered to be definitely preventable, and did not include any ADEs that were considered to be possibly preventable (insufficient information was provided in the study as to the nature of activities that would have avoided a 'possibly preventable' severe ADE). Activities that would have prevented the ADE in the study were considered to be similar to the activities performed by a pharmacist as part of the policy.

Fewer severe ADEs (Chan et al, 2001)

A study of the cause and preventability of hospital admissions for elderly patients was undertaken on admissions to acute medical units of the Royal Hobart Hospital over an eight week period. These admissions were all caused by an ADE, and causality was graded as either definite, or probable/possible (this second category was added in cases where the study authors strongly suspected that an ADE was the cause of the admission, however, it had not been recognised by the treating doctor at the time).

The preventability of the ADE was classified as:

- Definitely preventable: the drug event was a result of a drug-treatment procedure that was inconsistent with present-day knowledge of good medical practice or was clearly unrealistic, taking the known circumstances into account.
- Possibly preventable: the prescription was not erroneous, but the drug event could have been avoided by an effort exceeding obligatory demands.
- Not preventable: the drug event could not have been avoided by any reasonable means, or it was an unpredictable event in the course of a treatment fully in accordance with good medical practice.

Hospital expenditure

The number of avoidable severe ADEs (which result in hospitalisation) was sourced from the Chan et al (2011) study outlined in the previous section. The total hospital expenditure costs are the sum of costs arising from participants and non-participants who have an ADE and are admitted to hospital. The rate of severe ADEs is lower for participants, when compared to non-participants.

Individual expenditure

Individual expenditure is the sum of co-payment costs for medical consultations and medicines for participants, plus the sum of these co-payments for non-participants. Each group is subject to the same unit costs for consultations and medicines. However, the participant group requires fewer consultations and medicines as a result of the services delivered through the policy.

Policy costs

As outlined in Section 1.1, government funding is required for the policy to be implemented. The proposed funding arrangement is based on the PNIP funding guidelines, and would provide \$25,000 per annum to a participating general practice for each 1,000 SWPE at the practice. The funding would be capped at a maximum of five incentives per clinic, and a loading of up to 50% for rural practices would apply.

2.1.4 Limitations of analysis

The scope of works for the analysis conducted by Deloitte Access Economics necessitates that the costs and benefits be limited to selected components. In addition, uncertainty around the final design of the policy makes it difficult to cost certain elements of the policy with any degree of certainty. A more complete analysis of the proposed policy could include costs and benefits in the following areas:

- GP roles under the policy: it is unclear what the roles of GPs would be under the policy, and the extent to which they would perform these roles. For example, it is not yet known how many medication reviews would be undertaken by GPs, and how many reports pharmacists would prepare for review by GPs⁶. It is likely that some roles performed by the GP under the policy would require reimbursement through the MBS. The value of reimbursable items could potentially range from \$37.05 (item 23, consultation at consulting rooms) through to \$154.80 (item 900, Domiciliary Medication Management Review).
- Improved health outcomes: the policy will likely lead to improved compliance and persistence⁷ with medication regimens, which will result in improved health outcomes for patients. This will result in significant avoided financial and economic costs for both the patient and the health system, as well as avoided broader economic costs such as lost productivity that arise when a health condition is treated and managed sub-optimally.

The financial impacts of the policy have been modelled on the assumption that the time of the non-dispensing pharmacists in GP clinics is devoted to the policy roles outline in Section 1.1. Were the staff to do activities unrelated to these policy roles, then the financial savings from the policy would necessarily be smaller. Alternatively, there may be a need for monitoring processes (for example, random audits) to help ensure that taxpayer funded personnel are performing the tasks that they have been hired to do.

2.2 Data

The data for this analysis was sourced from a variety of publicly-available databases as well as from peer-reviewed journal articles. Table 2.1 presents all data items that were used in this analysis.

⁶ No information was located to enable an estimate to be made of the rate at which GPs would conduct medication reviews for the target population. Medicare data from the Department of Human Services (2015) provides information on the number of MBS rebates paid for item 900 (Domiciliary Medication Management Review) and item 903 (Residential Management Medication Review) in 2013-14. However, no information was located that estimated the targeted population for these policies, and as such it was not possible to estimate the rate at which these medication reviews were requested by GPs.

⁷ Compliance refers to the extent that the patient conforms to their treatment protocol in terms of timing, dosage and frequency. Persistence refers to whether the patient continues the treatment for the prescribed duration (Cramer et al, 2008).

Table 2.1: Data items

Item (A – Z)	Source	Detail
Bulkbilling rate	DoH (2014a)	82.2%
Deprescribing	Castelino et al (2010)	For 372 patients, the total number of medications fell from 576 medications to 401 patients following the intervention.
GP consultations	NHPA (2015)	84.7% of the population see a GP each year
Health CPI	ABS (2015b)	Average rate of the health component of CPI for the last five years is 5.0%.
Hospital separations	AIHW (2014)	There were 9,702,304 hospital separations in 2013-14, at an average cost (in 2011 dollars) of \$4,918 per separation.
Incentive per 1,000 SWPE	AMA	\$25,000 per year
Location of GP clinics	Carne (2013)	Major cities: 72%; inner regional: 7%, outer regional: 15%; remote: 4%; very remote: 1%.
Location of GP clinics by SWPE	AMWAC (2005)	See Appendix A.
Medications costs	PPB (2014)	In 2013-14, there were 209,816,009 medications prescribed at a total cost to government of \$7,308,560,369 and total cost to individuals of \$1,545,054,740.
Medicines per participant	DAE assumption	It was assumed that individuals in the target population were consuming five medicines per person, on average, as people consuming five or more medicines are likely to be a target for the policy ⁸ .
Number of GP clinics	PC (2015)	5,210 clinics. This is a proxy for the number of accredited clinics in Australia, as per the PNIP policy ⁹ .
Population growth and size	ABS (2015a)	23,490,736 as at end June 2014. Average growth rate past five years: 1.6%.
Preventable Moderate ADEs	Miller et al (2006)	25% of ADEs seen by GPs are avoidable by undertaking tasks that would be performed by pharmacists in the policy
Preventable severe ADEs	Chan et al (2001)	53% of ADEs that lead to hospital admission are avoidable by undertaking tasks that would be performed by pharmacists in the policy
Primary care costs	DoH (2014a)	MBS schedule fee for GP consultation (item 23): \$37.05 Average co-payment for GP consultation: \$30.26
Rate of ADEs	Miller et al (2006)	10.40% of GP patients had an ADE in the past six months
Take up rate in each year	DAE assumption	2015-16: 20%; 2016-17: 30%; 2017-18: 40%; 2018-19: 10% (assumed to be independent of the locations of GP clinics).
Take up rates	AMA member survey	Proportion of all clinics that would adopt policy: 48%; proportion of all clinics that might adopt policy: 23%
Types of ADEs	Miller et al (2006)	Mild ADEs: 53.9%; Moderate ADEs: 35.8%; Severe ADEs: 10%; Unknown ADEs: 0.3%.

Source: Deloitte Access Economics research. Notes: ABS = Australian Bureau of Statistics; AMWAC = Australian Medical Workforce Advisory Committee; CPI = consumer price index; DoH = Department of Health; NHPA = National Health Performance Authority; PC = Productivity Commission; PPB = Pharmaceutical Policy Branch.

⁸ The most recent estimate of the number of medicines used per person in Australia is provided in the Australian Bureau of Statistic's 1995 National Health Survey. According to the survey 9.9% of people consumed four or five medicines, and 4.6% of people consumed six or more medicines (ABS, 1999). Smaller surveys of specific populations have been undertaken since then (for example Morgan et al, 2012).

⁹ Data on the total number of practices has not been available since 2010-11, when data collected by the Primary Health Care Research and Information Service's Annual Survey of Divisions ceased.

Where necessary, historical cost data was adjusted to 2015-16 dollars using the health component of the consumer price index (CPI) from the Australian Bureau of Statistics (ABS, 2015b). Costs of medicines under the PBS, and GP consultations under the MBS, were considered fixed over the four year period of analysis. Individuals' co-payments for medicines and consultations, and hospital separation costs, were indexed using the health component of the CPI.

3 Results

This section presents the information on the number of GP clinics taking part in the policy each year, outlines the costs under the base case and the intervention, and compares the costs under each state to demonstrate the financial savings that can be realised through implementation of the policy.

3.1 Take up of policy

Based on the results of the AMA survey and assumed take up rates in each year presented in Table 2.1, the total number of GP clinics that will take up the policy over four years is estimated to be 3,100. This result is considered to be a reasonable estimation of the number of practices taking part in the policy, as there are an estimated 3,267 GP clinics with a SWPE of 3,000 or greater, and it is assumed that only clinics with a SWPE of 3,000 or greater would be incentivised to take part in the policy. The cumulative number of clinics in each year is shown in Table 3.1. A full breakdown of clinics by SWPE and location is provided in Appendix A.

Table 3.1: Clinics taking part in policy

Clinic size	2015-16	2016-17	2017-18	2018-19
5,000 SWPE	390	976	1,756	1,951
4,000 SWPE	115	287	517	574
3,000 SWPE	115	287	517	574
Total	620	1,550	2,790	3,100

Source: Deloitte Access Economics calculations using data from Productivity Commission (2015) and Australian Medical Workforce Advisory Committee (2005), combined with survey results from the Australian Medical Association and assumptions on the take up rate in each year. See Table 2.1 for further details.

3.2 Base case results

The analysis estimates that costs under the base case are \$8.01 billion over the four year period. This is shown in Table 3.2.

Table 3.2: Base case results

Cost item	2015-16 (\$)	2016-17 (\$)	2018-18 (\$)	2018-19 (\$)	4 year total (\$)
PBS	372,018,049	377,970,338	384,017,863	390,162,149	1,524,168,398
MBS	36,245,532	36,825,461	37,414,668	38,013,303	148,498,963
Hospitals	1,340,712,966	1,430,272,592	1,525,814,801	1,627,739,230	5,924,539,588
Individuals	92,516,530	98,696,634	105,289,569	112,322,912	408,825,644
Incentives	-	-	-	-	-
Total	1,841,493,076	1,943,765,024	2,052,536,901	2,168,237,593	8,006,032,594

Source: Deloitte Access Economics calculations.

The most significant costs in the base case analysis are hospital costs, which comprise 74% of total costs over the four years. This is followed by PBS costs (19%), individual costs (5%), and MBS costs (2%). The net present value of the base case costs over the four years is \$6.75 billion.

3.3 Intervention

The analysis estimates that costs under the intervention are \$7.46 billion. This is shown in Table 3.3.

Table 3.3: Intervention results

Cost item	2015-16 (\$)	2016-17 (\$)	2018-18 (\$)	2018-19 (\$)	4 year total (\$)
PBS	358,567,917	343,807,003	321,539,957	319,631,535	1,343,546,412
MBS	34,899,770	33,407,226	31,163,400	30,956,316	130,426,712
Hospitals	1,255,516,020	1,203,052,337	1,089,497,378	1,110,557,644	4,658,623,378
Individuals	89,165,978	89,760,713	88,130,456	91,983,643	359,040,790
Incentives	74,579,142	186,447,855	335,606,139	372,895,710	969,528,845
Total	1,812,728,827	1,856,475,133	1,865,937,329	1,926,024,848	7,461,166,136

Source: Deloitte Access Economics calculations.

As per the base case, hospital costs (62%) are the largest component, followed by PBS costs (18%). However, the next largest cost component in the intervention case is the incentive payments to GP clinics taking part in the policy (13%), followed by individual costs (5%) and MBS costs (2%). The net present value of the intervention costs over the four years is \$6.31 billion.

3.4 Comparison

A comparison of costs under the base case and the intervention is shown in Table 3.4.

Table 3.4: Comparison

Cost item	2015-16 (\$)	2016-17 (\$)	2018-18 (\$)	2018-19 (\$)	4 year total (\$)
PBS	13,450,132	34,163,335	62,477,906	70,530,614	180,621,987
MBS	1,345,762	3,418,235	6,251,268	7,056,987	18,072,252
Hospitals	85,196,946	227,220,255	436,317,423	517,181,585	1,265,916,210
Individuals	3,350,552	8,935,921	17,159,113	20,339,269	49,784,855
Incentives	-74,579,142	-186,447,855	-335,606,139	-372,895,710	-969,528,845
Total	28,764,249	87,289,891	186,599,572	242,212,746	544,866,458
<i>BCR</i>	<i>1.39</i>	<i>1.47</i>	<i>1.56</i>	<i>1.65</i>	<i>1.56</i>

Source: Deloitte Access Economics calculations.

BCR = benefit cost ratio

As can be seen, over a four year period the policy generates savings of \$544.87 million. The policy requires \$969.53 million of funding for the incentive payments; however, this is more than offset by the \$1.51 billion in savings.

The benefit cost ratio of the project in each year is positive, and over the four year period the benefit cost ratio is 1.56. This means that for every \$1 invested in the program, \$1.56 of benefits are generated. The cumulative roll-out of the policy over the four years means that the benefit cost ratio improves over each subsequent year. The net present value of savings generated by the policy (expressed in 2014-15 dollars) is \$440.23 million.

The share of costs and benefits between the Commonwealth government, jurisdictional governments and individuals is shown in Table 3.5. A negative sign indicates a net financial cost.

Table 3.5: Share of costs and benefits

Group	2015-16 (\$)	2016-17 (\$)	2018-18 (\$)	2018-19 (\$)	4 year total (\$)
CW	-59,783,248	-148,866,285	-266,876,964	-295,308,108	-770,834,607
S/T	85,196,946	227,220,255	436,317,423	517,181,585	1,265,916,210
Individuals	3,350,552	8,935,921	17,159,113	20,339,269	49,784,855
Total	28,764,249	87,289,891	186,599,572	242,212,746	544,866,458

Source: Deloitte Access Economics calculations.

Notes: CW = Commonwealth government. S/T = jurisdictional governments.

The policy represents a net cost to the Commonwealth government (assuming that the Commonwealth government funds the policy incentive payments), although it generates net savings for the jurisdictional governments through reduced hospital costs, and net savings for individuals through lower co-payments for GP consultations and medicines.

3.5 Sensitivity analysis

Sensitivity analysis was conducted on the model to illustrate the impacts of the assumed take up rates on the model output. As shown in Table 2.1, the model assumes that 48% of

all GP clinics would take part in the policy, and 23% of clinics are undecided as to whether they would take part. The sensitivity analysis varies these assumptions to generate two new scenarios:

- Scenario 1 (low take up): 40% of clinics take part in the policy, and 20% of clinics are undecided.
- Scenario 2 (high take up): 60% of clinics take part in the policy, and 25% of clinics are undecided.

The results of these scenarios (and the original model results) are shown in Table 3.6. For each scenario, the table shows the cost of the intervention, the comparison between the base case and intervention costs, the NPV of the comparison costs at 7%, and the BCR, over the four year period. For each scenario, the costs under the base case (\$8,006,032,594) remain constant.

Table 3.6: Sensitivity analysis

Scenario	Intervention (\$)	Comparison (\$)	NPV (\$)	BCR
Scenario 1	7,548,161,621	457,870,973	369,940,022	1.56
Original scenario	7,461,166,136	544,866,458	440,228,626	1.56
Scenario 2	7,342,119,684	663,912,911	536,413,031	1.56

Source: Deloitte Access Economics calculations.

The results of the sensitivity analysis show that the BCR remains constant at 1.56 under each scenario. In Scenario 1, a smaller proportion of GP clinics take up the policy, and so the benefits of the policy are restricted to a smaller proportion of the population. This means that fewer costs associated with PBS, MBS, hospital and individual expenditure are avoided. However, as fewer clinics are taking part in the policy there is a reduction in the level of funding required for the policy incentives. The reverse occurs in Scenario 2, where a larger amount of GP clinics means that there are a higher amount of avoided costs, and a higher amount of payments for policy incentives.

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Appendix A: GP clinic data and results

Table A.1: Clinics taking part in policy (cumulative)

Category	2015-16	2016-17	1017-18	2018-19
5,000 SWPE, major city	288	720	1,296	1,440
5,000 SWPE, inner regional	34	85	152	169
5,000 SWPE, outer regional	54	136	245	272
5,000 SWPE, very remote	12	30	54	60
5,000 SWPE, very remote	2	5	9	10
<i>5,000 SWPE subtotal</i>	<i>390</i>	<i>976</i>	<i>1,756</i>	<i>1,951</i>
4,000 SWPE, major city	80	199	358	398
4,000 SWPE, inner regional	8	21	38	42
4,000 SWPE, outer regional	18	46	83	92
4,000 SWPE, very remote	8	19	34	38
4,000 SWPE, very remote	1	2	4	4
<i>4,000 SWPE subtotal</i>	<i>115</i>	<i>287</i>	<i>517</i>	<i>574</i>
3,000 SWPE, major city	80	201	362	402
3,000 SWPE, inner regional	8	20	36	40
3,000 SWPE, outer regional	21	52	94	104
3,000 SWPE, very remote	4	9	17	19
3,000 SWPE, very remote	2	5	9	10
<i>3,000 SWPE subtotal</i>	<i>115</i>	<i>287</i>	<i>517</i>	<i>574</i>
Total	620	1,550	2,790	3,100

Source: Deloitte Access Economics calculations.

Table A.2: Number of practitioners (proportions) by location of GP clinics

No. of practitioners	Major city	Inner regional	Outer regional	Remote	Very remote	Not stated	Australia
1	0.164	0.133	0.171	0.219	0.294	0.116	0.159
2	0.124	0.122	0.131	0.185	0.254	0.046	0.123
3	0.113	0.108	0.136	0.086	0.159	0.053	0.112
4	0.112	0.114	0.12	0.172	0.067	0.057	0.112
5+	0.405	0.456	0.356	0.271	0.16	0.295	0.403
Not stated	0.082	0.067	0.086	0.067	0.066	0.433	0.091
Total	1	1	1	1	1	1	1

Source: Australian Medical Workforce Advisory Committee (2005).

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