



Australian Government
Department of Health and Ageing



The Pharmacy
Guild of Australia

Documenting Clinical Interventions in Community Pharmacy: PROMISe III

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FINAL REPORT

THE RESEARCH AND DEVELOPMENT PROGRAM IS FUNDED BY THE AUSTRALIAN GOVERNMENT DEPARTMENT OF
HEALTH AND AGEING AS PART OF THE FOURTH COMMUNITY PHARMACY AGREEMENT

Acknowledgements

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The team would also like to thank all the pharmacies and pharmacists that participated in this project.

This report was produced with the financial assistance of the Australian Government Department of Health and Ageing. The financial assistance provided must not be taken as an endorsement of the contents of this report.

The Pharmacy Guild of Australia manages the Fourth Community Pharmacy Agreement Research & Development which supports research and development in the area of pharmacy practice. The funded projects are undertaken by independent researchers and therefore the views, hypotheses and subsequent findings of the research are not necessarily those of the Pharmacy Guild.

Acronyms

Acronym	Explanation
#	Number
AACP	Australian Association of Consultant Pharmacy
ACE	Angiotensin Converting Enzyme
ACI	Actual Clinical Intervention(s)
ADR	Adverse Drug Reaction
AMT	Australasian Medicines Terminology
APESMA	Association of Professional Engineers, Scientists and Managers, Australia
APN	Australian Product Number
ASCEPT	Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists
ATC	Anatomic Therapeutic Chemical
Aust-L	Australian Listed
Aust-R	Australian Registered
BD	Twice a day
BNF	British National Formulary
BP	Blood Pressure
CAC	Care Activity Code
CATI	Computer Assisted Telephone Interview
CEA	Cost Effectiveness Analysis
CGA	Computer Generated Alert
CI	Clinical Intervention, or Confidence Interval
CIR	Consumer Information Record
CMI	Consumer Medicine Information
COPD	Chronic Obstructive Pulmonary Disease
CPA	Community Pharmacy Agreement
CPD	Continuing Professional Development
CUA	Cost Utility Analysis
DAA	Dose Administration Aid
DCI	Documented Clinical Intervention(s)
DMAS	Diabetes Medication Assistance Service
DOCUMENT	Drug selection, Over or underdose, Compliance, Undertreated, Monitoring, Education or information, Not classifiable, Toxicity or adverse reaction
DRP	Drug Related Problem
EQ-5D	European Quality of Life – 5 Dimensions
FTE	Full Time Equivalent

GDP	Gross Domestic Product
GI	Gastrointestinal
GORD	Gastro-Oesophageal Reflux Disease
GP	General Practitioner
EHR	Electronic Health Record
HMG CoA	HydroxyMethylGlutaryl Coenzyme A
HMR	Home Medication Review
HPIR	Health Professional Information Record
HV	High Value
ICER	Incremental Cost Effectiveness Ratio
ICT	Information and Communications Technology
ID	Identifier
IMSANZ	Internal Medicine Society of Australia and New Zealand
IQR	Inter Quartile Range
IT	Information Technology
L2	Level 2
L3	Level 3
L4	Level 4
L5	Level 5
M	Million
MATES	Medicines Advisory and Therapeutic Education Services, Veterans Program
MBS	Medicare Benefits Scheme
N	Number
NCI	Non-Clinical Intervention
NEHTA	National E-Health Transition Authority
NEI	Not Enough Information
NHHRC	National Health and Hospitals Reform Commission
NPS	National Prescribing Service
NSAID	Non-Steroidal Anti-Inflammatory Drug
OTC	Over The Counter
P	Patient(s)
PAMS	Pharmacy Asthma Management Service
PBS	Pharmaceutical Benefits Scheme
PGA	Pharmacy Guild of Australia
PhARIA	Pharmacy Access/Remoteness Index of Australia
PIF	Prescription Intervention Form
PMP	Patient Medication Profile
POM	Prescription Only Medicine

POS	Point Of Sale
PPI	Proton Pump Inhibitor
PROMISe	Pharmacy Recording Of Medication Incidents and Services electronically
PSA	Pharmaceutical Society of Australia
QALY	Quality Adjusted Life Year
QOL	Quality Of Life
QUM	Quality Use of Medicine
DCI	Documented Clinical Intervention
RV	Reasonable Value
Rx	Prescription
S1	Significance – consequences related to information
S2	Significance – prevented mild symptom or improved compliance
S3	Significance – prevented or required a GP visit
S4	Significance – prevented or required a hospital admission
SD	Standard Deviation
SNOMED CT	Systematised Nomenclature of Medicine – Clinical Terminology
SSL	Secure Socket Layer
TDS	Three times a day
TIA	Transient Ischemic Attack
UMORE	Unit for Medication Outcomes Research and Education
VALMER	Value of Medication Reviews
VNV	Virtually No Value
XML	eXtensible Mark-up Language

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1 Introduction: Identifying and Resolving Drug-Related Problems in Community Pharmacies

Drug-related problems (DRPs) are a major burden on the Australian healthcare system, with many such problems resulting in admissions to hospital each year. A large proportion of these adverse events are potentially avoidable and originate in the community. Community pharmacists are highly trained health professionals who are in an ideal situation to detect and resolve problems that are evident (and indeed detect consumers at high risk of DRPs and put strategies in place to prevent DRPs occurring).

1.1 Background

Community pharmacists detect and resolve DRPs during the course of their routine prescription-related activities within their pharmacies. A DRP can be considered an all encompassing description for situations where the desired outcome of drug therapy is actually or potentially interfered with, which can be broadly applied to medication errors, adverse events (including drug interactions) or adherence issues. For the purposes of this study, the detection, recommendation and resolution process surrounding a DRP is termed a clinical intervention. At present, the documentation of this process is not a routine procedure in community pharmacy practice.

There is a wide range of reported frequencies of DRPs in community pharmacies from previous studies both in Australia and overseas. The calculated ACI rate varies from 0.09% (approximately one intervention every 1,000 prescriptions) to over 2.5% (approximately one intervention every 40 prescriptions).¹⁻²⁸ Many of the studies reported pharmacies where little or no documentation occurred and, given the reactive nature of many interventions, it is likely that interventions did occur in these pharmacies, but they were not documented. Differences in factors including clinical knowledge, prescription workload, ongoing feedback or remuneration may influence the intervention frequency and DCI rates.

One of the obvious barriers to recording interventions within Australian pharmacies is the lack of an adequate and standardised documentation system within dispensing software packages, which was the focus of this work.

1.2 Objectives

The overall aim of this project was to establish the viability of, and requirements for, national implementation of an electronic documentation system for the recording of medication issues (clinical interventions) identified in community pharmacy.

2 Methods: A Project to Trial Documenting Clinical Interventions in Community Pharmacies

There were four phases of the PROMISE trial; these are outlined in the following sections.

2.1 Phase One: Establishing the Requirements for and Developing an Intervention Documentation System

The first phase of the project consisted of a review of the currently available software, as well as conducting focus groups with key stakeholders to determine the requirements for an intervention documentation system.

2.1.1 Focus Groups and Interviews

DeBoos Associates conducted in-depth focus groups and semi-structured interviews with key stakeholders. The focus groups consisted of representatives from the Pharmacy Guild of Australia, the Pharmaceutical Society of Australia, and Quality Use of Medication (QUM) organisations, plus pharmacy owners, employee pharmacists, PROMISE II participants and consumers. The findings from these focus groups helped determine the requirements of the intervention system and also identified potential barriers and facilitators to intervention performance and recording.

2.1.2 Modifications to DOCUMENT Classification System

The classification system (DOCUMENT) for the types of DRPs and their resolution was refined on the basis of a detailed examination of the interventions recorded in the previous PROMISe II project and from international experience (published and unpublished). The main purpose of the revision was to simplify the documentation process to make it easier and quicker to use. The classification system clearly indicated the type of DRP and the recommendation that was made to resolve it.

2.1.3 Development of Documentation Interface and Data Repository

Two software vendors (Fred Health® and Simple Retail Pharmacy Solutions®) were approached to build an integrated intervention documentation system which would transmit information to a central repository (constructed by Logica®). The documentation process had the same “look and feel” as the individual dispensing system, which was an important feature for the users and the vendors. The user interface could be accessed with one keystroke or by clicking on the PROMISe icon, with the ability to pre-fill several fields (such as the drug involved, or the patient gender and age). The DOCUMENT classifications and extra notes sections were available in a tabbed section of the screen, with help from scope notes available within the interface. The intervention could also be saved as a draft and accessed later. An intervention recorded against a patient name was accessible through the patient’s dispensing history. Two different reports could be produced for each recorded intervention: a Consumer Intervention Record (CIR) for the patient, which contained details of the intervention written in a language suitable for a consumer; and a Health Professional Intervention Record (HPIR), which was designed to be forwarded to the patient’s prescriber.

A secure messaging system was developed to facilitate the transmission of intervention and prescription data to a secure web server using protocols that could be easily adapted for use by other software vendors in the future. Feedback mechanisms were also built into the interface in the form of a real time statistic display, and participants were able to access web-based summary reports.

2.2 Phase Two: The PROMISe III Trial

The second phase was conducted over a 12-week period and involved a representative sample of pharmacies from across Tasmania, Victoria and New South Wales (Figure 1). The trial involved installing three levels of the PROMISe software to determine the optimum software requirements that facilitated the conduct and recording of interventions. A number of sub-studies and surveys were administered during the trial to collect additional information to be later compared with the intervention findings. A fourth group of 24 pharmacies did not have the

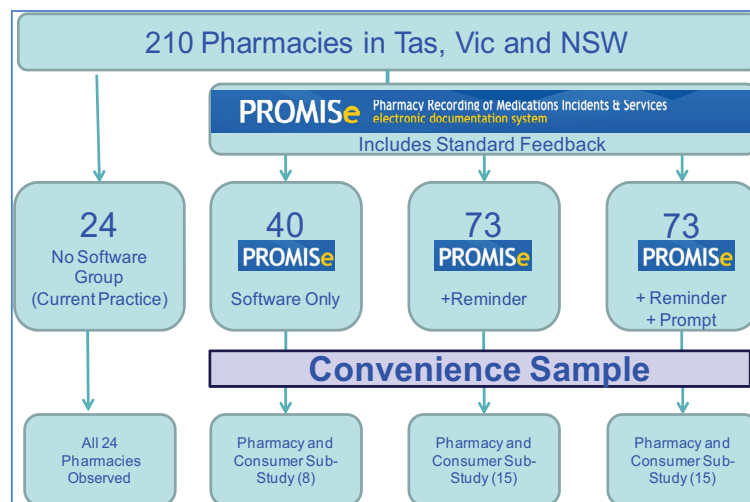


Figure 1: Software Group Allocation

pharmacies did not have the PROMISe software installed and was used as a “baseline” to examine current pharmacy practices, particularly to estimate the rate of clinical interventions without any dedicated software system to record these. The ACI rates recorded in the “no software” group were compared with the ACI rates in the PROMISe software pharmacies to determine if the presence of the interface increased the ACI rate as well as the DCI rate. These figures were then used in the economic analysis and business case modelling (see Figure 14).

2.2.1 Trial Methods

Recruitment and Enrolment of Pharmacies and Pharmacists

The majority of pharmacies were recruited through a fax-out from the Pharmacy Guild of Australia to all pharmacies within the three targeted states, asking interested parties to contact the PROMISe team. From the 186 pharmacies that participated in the project, 531 pharmacists were enrolled in the trial. A further 24

pharmacies were recruited to make up the no software group, which included some pharmacies that did not have the FRED® or Aquarius® dispensing systems. Of the total 210 recruited pharmacies, 209 completed the trial (one pharmacy withdrew due to the sale of the business).

Training for the PROMISe Project

Pharmacists participating in the PROMISe project were trained in the use of both the DOCUMENT classification system and the PROMISe intervention software, with over 80% of pharmacists completing either the online or face-to-face training, or both.

2.2.2 Study Design

The representative sample of 210 pharmacies were then stratified based on the national data for Pharmacy Access/Remoteness Index of Australia (PhARIA) and by estimated annual prescription volume categories, as outlined in the 2008 Guild Digest. The pharmacies were then randomly allocated into four groups (Figure 1) Group one had the PROMISe software installed, group two had the software installed with an additional timed reminder feature, and group three had the software installed with both the timed reminder and a specific decision support prompt. The fourth group, referred to as the “no software group”, did not have the PROMISe software installed but instead provided “baseline” data to determine differences in the frequency of conducting and recording interventions between itself and the software pharmacies (groups one, two and three). The data for the no software group was collected by impartial observers; their only participation in the trial consisted of five days of observation.

Reminder

Groups two and three had a non-specific reminder that appeared at 11am and 3pm, which consisted of a simple pop-up dialogue box designed to remind pharmacists to document their clinical interventions. This dialogue box also gave the pharmacist the option to open any incomplete draft records of interventions.

Intervention Prompt

Group three had an additional electronic prompt intended to influence a specific type of intervention on high-dose proton pump inhibitor (PPI) medication. The prompt was activated when pantoprazole 40mg or esomeprazole 40mg were selected for dispensing and was designed to encourage the pharmacist to approach suitable consumers to discuss the possibility of decreasing their PPI dose, utilising evidence-based guidelines from the National Prescribing Service (NPS).

2.2.3 Observation Sub-study

Trained pharmacist observers were placed in a sample of the pharmacies for five consecutive work days (Monday to Friday). Each observer monitored the routine activities of one pharmacist in each designated pharmacy in order to collect information concerning the pharmacist’s intervention behaviour.

The primary purpose of the observation was to document the ACI performed and whether or not the interventions were documented. Twelve observers were recruited based on their community pharmacy experience. Observers were allocated in a representative sample (according to PhARIA and annual prescription volume) of approximately 20% of the pharmacies with the software installed (38 of 186 observed) and in all pharmacies that did not have the software installed (24 of 24). Observations took place during the middle six weeks of the trial (weeks four to nine).

In addition, the observers were asked to document the barriers and facilitators that influenced both the pharmacists’ performance of interventions and their recording of interventions.

2.2.4 Consumer Sub-study

The consumer sub-study was primarily designed to determine the uptake of pharmacists’ recommendations and to establish the views of consumers who received an intervention during the trial and pharmacy consumers in general. Consumers from a selection of the participating pharmacies who had received an intervention during the trial were given or posted a consent form. Those consumers who returned the consent form indicating their assent for participation were then asked to complete a questionnaire over the phone. Consumers who had received a pharmacist intervention outside of the project were recruited by DeBoos Associates via an online survey company and asked to complete an online questionnaire. More detail regarding the consumer sub-study can be found in the full report in Section 2.2.1.

2.2.5 Data Collection

The PROMISE trial collected information related to the intervention, the patient, the pharmacy and the pharmacist.

- Intervention – DOCUMENT classifications (type, recommendations and significance), the drug involved, patient details and six-month dispensing history.
- Prescriptions – All prescriptions dispensed by participating pharmacies during the trial period.
- Pharmacy – Survey (Owner/Manager regarding pharmacy details, business style and staffing) and site visits.
- Pharmacist – Five pre-trial surveys (Background, Opinions on Interventions, Empathy, Professionalism, Clinical Knowledge) and one post-trial survey (Software Feedback).
- Observed Pharmacies – Details of each intervention (even those not documented), Hourly Logs, Daily Logs and Barriers/Facilitators present in the pharmacy.
- Consumers – Intervention recall, views on the pharmacist and the intervention, uptake of the pharmacist's recommendations, quality of life.

2.3 Phase Three: Evaluation of Trial

The third phase involved several stages of data analysis. The demographics of the participants were analysed to ensure a representative sample had been obtained. The frequency and type of interventions were analysed to determine any trends. Many different pharmacy and pharmacist factors, including the specific PPI prompt, were examined to determine their impact on the DCI rate. An expert clinical assessment panel was also used to estimate the economic value of a representative sample of 200 interventions. Potential remuneration models were also examined by the participating pharmacy owners from the study.

2.4 Phase Four: Development of an Implementation Plan

Deloitte Australia constructed a business case and implementation plan for a national rollout of an electronic documentation system for recording clinical interventions in community pharmacies. Using a three-part methodology, Deloitte developed a business case taking into consideration the information gained from the previous three phases of the project, especially regarding the value of clinical interventions in pharmacy and suggested remuneration models.

In part one, Deloitte reviewed the background and policy context to the PROMISE program and established that the PROMISE Program has the capacity to enhance the delivery of primary care services in a way that is strongly aligned with the Federal Government's healthcare reform agenda. This particularly aligns with the key reviews and policy frameworks of the health reform agenda, including the National Health and Hospitals Reform Commission (NHHRC), the National Primary Health Care Strategy and the National Medicines Policy, as shown in Appendix A.

Part two involved the development of five remuneration options. A preferred remuneration option was developed by using a multi-criteria scorecard approach which was derived by the definitions of effectiveness and efficiency as they relate to the PROMISE program and broader health reform goals. Each option was assessed considering the multiple objectives of the government; for example, balancing the improvement in the quality use of medications with its cost to the government.

The final part of the Deloitte methodology involved the development of a proposed national implementation plan and a review of potential risks and mitigation strategies. A preferred plan and a phased implementation plan were developed.

3 Results: Nature and Frequency of Clinical Interventions

During the course of the 12-week study, the 531 enrolled pharmacists dispensed 2,396,451 prescriptions for 546,717 patients. An additional 245 pharmacists who were not enrolled in the study dispensed 292,528 prescriptions for 63,570 patients. There were 7,000 DCI, of which 6,755 were documented by the enrolled pharmacists. Of these, 6,230 DCI were related to prescription medications recorded on 2,013,923 prescriptions. The 525 remaining DCI were related to over-the-counter (non-prescription) medications or symptom-based requests to the pharmacist (Figure 2).

3.1 Overall Number and Rate of Clinical Interventions

There were 6,230 prescription-related DCI by enrolled pharmacists over the 12 weeks of the trial. Of these, 263 were specifically related to the software prompt in group three pharmacies. The remaining 5,967 documented interventions are considered in this section (Figure 2).

The DCI rate was calculated from the number of DCI divided by the number of prescriptions dispensed. The overall rate of prescription-related DCI across the entire study period and all active study groups was 0.31 DCI per 100 prescriptions (approximately one DCI every 300 prescriptions) or 1.4 DCI per 100 unique patients (approximately one DCI every 70 patients).

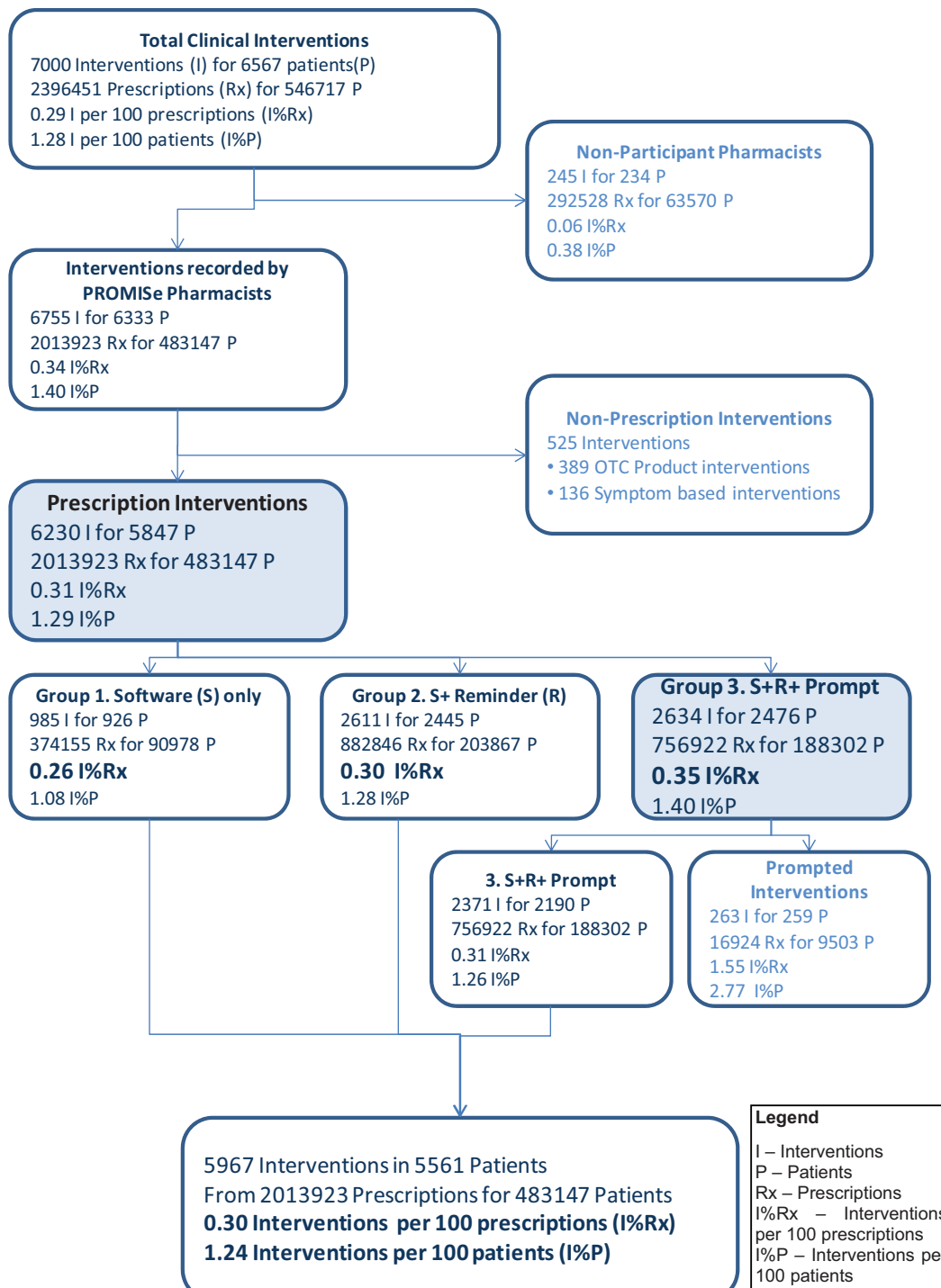


Figure 2: Overall Number and Recording Rate of Interventions

The observers found that only 49% of interventions were being documented, which means that the overall ACI performance rate may be double the current documentation rate. The observers also found that 62% of ACI with higher significance were documented, but only 43% of ACI with lower significance were documented.

There was a decline in recording of interventions with time (see Figure 3). Factors contributing to the decline in recording of interventions are discussed later.

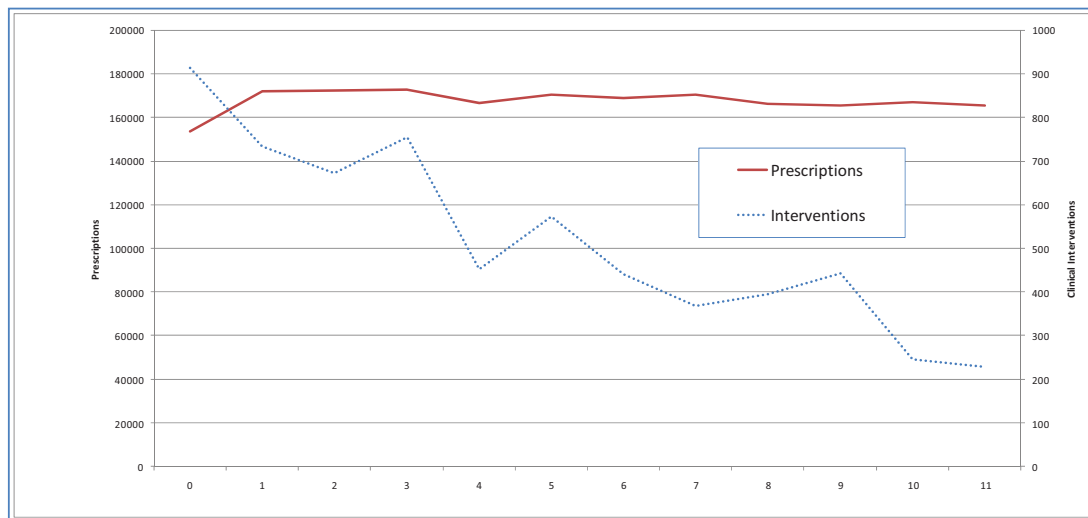


Figure 3: Prescriptions Dispensed and Number of DCI over the 12 weeks of the PROMiSe III Study

3.2 Categories and Subcategories of Interventions

The majority of interventions were related to either drug selection problems (1,837; 31%) or educational issues prompted by patient requests (1,421; 24%). Examples of the different types of interventions are included in Appendix B. The range of categories and subcategories which were documented for the interventions was in keeping with the previous PROMiSe study, and with our understanding of the types of DRPs identified in routine community pharmacy practice.

3.3 Pharmacists' Recommendations

The documenting pharmacist was able to assign up to four recommendations to each DCI, resulting in 9,580 recommendations for the 5,967 DCI (an average of 1.6 recommendations for each DCI). In over 30% of the 5,967 DCI, the pharmacist recommended referral to the prescriber to resolve the problem (1,794 or 30.1%). In 41% (2,441 occasions) of the DCI, a counselling and education session was provided to the patient to resolve the problem. These two recommendations (referral to the prescriber and an education or counselling session) accounted for over 70% of the recommendations made by pharmacists to resolve the identified DRPs. Again, this is consistent with our understanding of community pharmacy practice, where potential problems are resolved through discussions with the patient, his or her prescriber or both.

When the 9,580 recommendations were examined in terms of their major type, the most common type of recommendation related to a change in therapy, with 40% (3,841 of 9,580) of DCI receiving these types of recommendations. These changes were commonly a change of drug (847 occasions), or a dose change (642 dose increases; 656 dose decreases). Provision of information was the next most common recommendation, with 34.3% (3,325) of DCI having recommendations of this type made. Approximately 75% (or 2,441 occasions) of these presumably related to the verbal provision of information in the form of a counselling or education session. When a referral recommendation was made, this was almost always to the prescriber (91%; 1,794 occasions).

Relationships between the types of recommendations made on DCI in each of the original categories showed that a change in therapy recommendation was more likely to occur on either drug selection problems or dosage problems. Interventions where a referral was required were more likely to involve a

DRP associated with toxicity or an undertreated indication requiring addition of therapy. Recommendations associated with provision of information were more likely to be associated with education or compliance issues.

3.4 Clinical Significance

During the documentation process, pharmacists were asked to assign a clinical significance to the DCI. It was subsequently determined that the pharmacists' assignment of clinical significance correlated well with that determined by the project's clinical

expert panel and that determined by members of the research team.

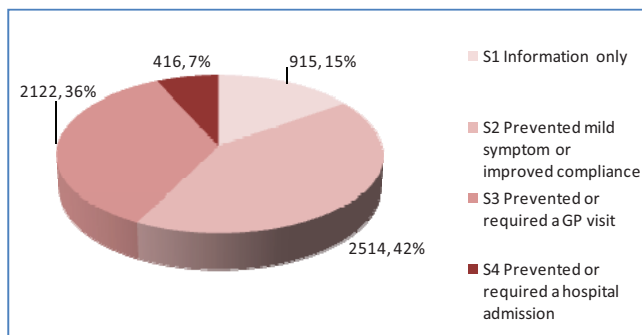


Figure 4: Clinical Significance of DCI

Almost one half of the DCI (43%; 2,538 occasions) were classified as being either of moderate (S3) or severe (S4) level of clinical significance by the recording pharmacist (see Figure 4). Moderate clinical significance DCI were those that were likely to have avoided/required medical intervention, and severe clinical significance DCI were those that were likely to have avoided/required hospitalisation.

More significant DCI tended to be associated with a drug change, contact with the prescriber or referral to a hospital, or a monitoring recommendation. Less significant DCI were more commonly associated with information or educational recommendations. DCI where a referral was recommended also tended to be associated with a higher level of clinical significance.

3.5 Drugs Involved

For 5,668 of the DCI, a specific generic drug was identified by the documenting pharmacist as the drug involved. A wide range of drugs (299 different generic entities) were involved, indicating that at least some types of DCI were being performed in relation to many different groups of drugs.

The drug groups with the largest *number* of DCI were beta lactam antibiotics (388; 6.8%), opioids (320; 5.6%), antidepressants (311; 5.5%) and drugs for peptic ulcer disease (287; 5.1%). The high number of DCI for antibiotics was probably related to the relatively high frequency of use of these agents in the winter period when the study was conducted. It is interesting to note the high number of DCI for drugs for peptic ulcer disease, despite removal of the specifically prompted interventions for this class of drug. When the number of DCI was considered in relation to the number of prescriptions for each of the drug groups, antivirals, otologicals, nervous system drugs and corticosteroids were frequently involved in the DCI (see Chapter 4 in the Full Final Report for more details).

4 Factors Influencing the Documentation of Clinical Interventions

During the trial, several software, prescription, pharmacy and pharmacist factors were examined to determine their influence on the frequency of DCI. The most important factors found to influence DCI frequency were:

- Prescription Type
- Prompts/Reminders
- Workload
- Clinical Knowledge
- Commitment to Ongoing Education
- PROMISe Training

4.1 Prescription Factors

Original prescriptions were subjected to a much higher DCI rate than repeat prescriptions, accounting for 78% of all DCI at a rate of 0.37% (3.7 interventions in 1,000 prescriptions) which was significantly higher than the DCI rate of 0.09% on repeat prescriptions (0.9 interventions in 1,000 prescriptions; $p < 0.01$).

4.2 Prompt

The PROMISE electronic documentation system was built by two software vendors, who both incorporated three different software allocation groups into their systems, one of which was the electronic PPI prompt.

Intervention Rate between Software Allocation Groups

The prompt and reminder both significantly increased the pharmacy's intervention rate.

There was a significant difference in the DCI rates between the three software groups (see Figure 5 and Figure 6) (Kruskal-Wallis $p < 0.01$), with a positive trend of the DCI rate increasing from group one to group three.

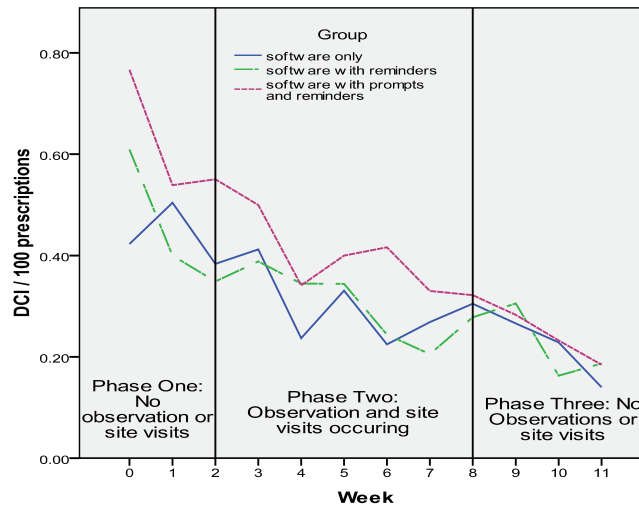


Figure 5: Overall DCI Frequency Within the Software Groups Over the Three Phases of the Trial

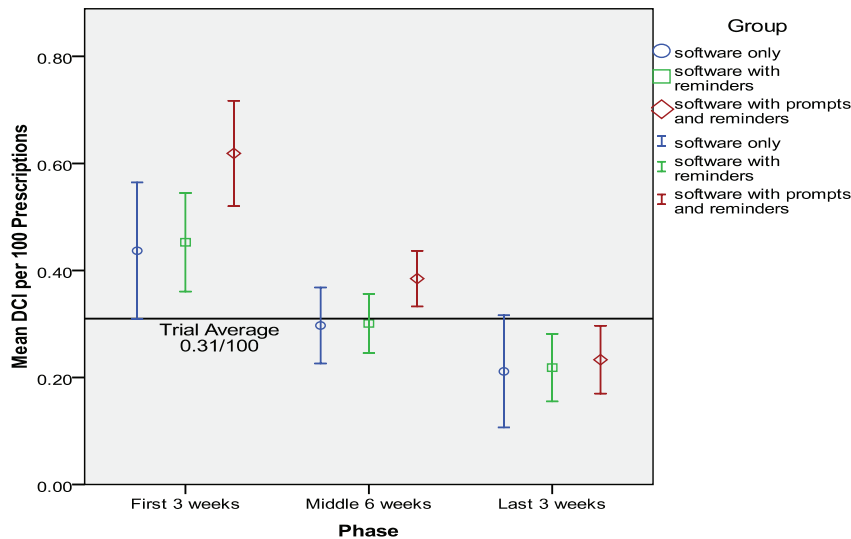


Figure 6: Mean DCI Rate Within Software Groups by Phase of Trial

Each pharmacy's DCI rate was calculated for each week of the 12-week trial, which was then broken down into three phases to separate out the middle of the trial when observation and site visits were being conducted. Significant differences still remained between the three groups in phases one and two (Chi-square test $p < 0.01$ and $p = 0.01$, respectively); however, phase three no longer showed a significant difference in the DCI rates between the groups ($p = 0.41$), indicating a possible waning effect of the prompt and trial fatigue.

Prompted Interventions

An electronic prompt could significantly increase the number of proactive interventions performed.

Pharmacies allocated to group three received a specific prompt which was activated upon dispensing esomeprazole 40mg or pantoprazole 40mg to trigger the pharmacist to discuss step-down options to a lower strength PPI, as advocated by the NPS.²⁹ It was

determined that there were 330 DCI that were related to the PPI step-down prompt. As can be seen in Table 1, the rate of PPI step-down DCI was much higher in group three than groups one and two, indicating that the prompt in group three was a very effective trigger to perform a proactive intervention.

Group	Esomeprazole 40mg			Pantoprazole 40mg		
	No. of Prescriptions	No. of Interventions	Interventions per prescription (%)	No. of Prescriptions	No. of Interventions	Interventions per prescription (%)
1	3730	8	0.21%	4600	5	0.11%
2	8854	24	0.27%	10283	11	0.11%
3	7967	158	1.98%	8957	124	1.38%
Total	20551	190		23840	140	

Table 1: Number of Step-Down DCI Within Each Software Group

Consumer uptake of PPI step-downs was estimated using both objective and subjective methods. One method was to look at patient prescription data collected in the repository during the 12 weeks of the trial. Evidence from this dispensing data indicated that in group three there was a definite uptake rate of 16%. A second method was to use consumer survey responses. Surveys were sent out to selected group three consumers (n=75) who were subject to a PPI step-down intervention. Evidence from these surveys showed that 88% of consumers acted upon, or intended to act upon, the pharmacist's advice and follow up with their GP. Of those 63% who did visit their GP, 53% either had their dose decreased or their PPI therapy was ceased.

Value of the Prompt

A conservative estimate showed that the PPI prompt could save the Australian health care system an estimated \$3.1 million annually.

Using the very conservative uptake rate of 16%, as determined by the prescription data, the estimated cost savings were calculated. After calculating the difference in cost between the higher and lower dose

strengths, these savings were extrapolated to all Australian pharmacies at a rate of 0.38 interventions per pharmacy per month to give an average yearly saving of \$3.1 million to the Australian healthcare system. In addition, cost savings are likely to accrue beyond the first year. Using an alternative method, which utilised the results from the consumer study, the expected rate of uptake in each pharmacy was 0.36 per month. In this instance, the total cost savings per pharmacy in the first year of implementation would be \$730.86, equating to a national saving of \$3.7 million per year.

These savings are achieved despite the fact that it is a financial disincentive for the pharmacies to perform this intervention, due to a loss of income revenue, since the lower dose is cheaper. It is possible that a similarly prevalent issue that does not have the same loss of income might perform substantially better, since the pharmacist will have less incentive to *not* intervene. Similarly, if a one-off compensation payment was made to the pharmacy, they may see this as offsetting the loss of income, thus providing more motivation to intervene. This will still have long-term economic benefits to the community, since the patient is likely to remain on the lower dosage medication for a substantial period of time, and the Pharmaceutical Benefits Scheme (PBS) saving related to the cheaper medication will be realised every time he or she fills his or her prescription.

4.3 General Reminder

A general reminder increased the awareness of the PROMISe software and increased the number of interventions documented at 11am and 3pm.

Pharmacies with the general reminder (group two and group three) had a higher number of DCI at the times of 11am and 3pm, whereas group one had a steadier rate of recording over the whole day.

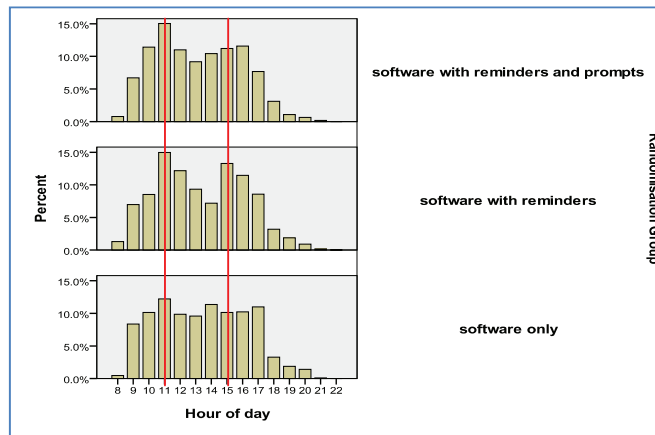


Figure 7: DCI Within Each Software Group Compared to Hour of Day

Workload

DCI frequency was affected by many factors that increased the required workload within the pharmacy. Post-trial focus groups noted that:

- “Many pharmacies do not have time to document interventions within the current staffing and workflow of pharmacies” (participant pharmacist)
- “Pharmacists with a high prescription workload have less opportunity to perform and document interventions” (participant pharmacist)
- “Busy periods in pharmacies limit the time available for documentation” (online survey with 72% participating pharmacists agreeing)
- “Pharmacies have a low staffing levels to workflow demand and an associated lack of available time for performing clinical interventions during busy periods” (observer)

Weekly Prescription Volume

As the pharmacy's prescription volume increased, the intervention rate tended to decrease.

The actual weekly prescription volume during the trial was collected throughout the trial with each pharmacy dispensing $1,079.5 \pm 600.9$ prescriptions on average per week. There was a moderately weak, but statistically significant, negative correlation between the pharmacy's average weekly prescription volume and its DCI rate (Spearman's $p = 0.02$), with busier pharmacies tending to record less interventions.

Pharmacist Workload

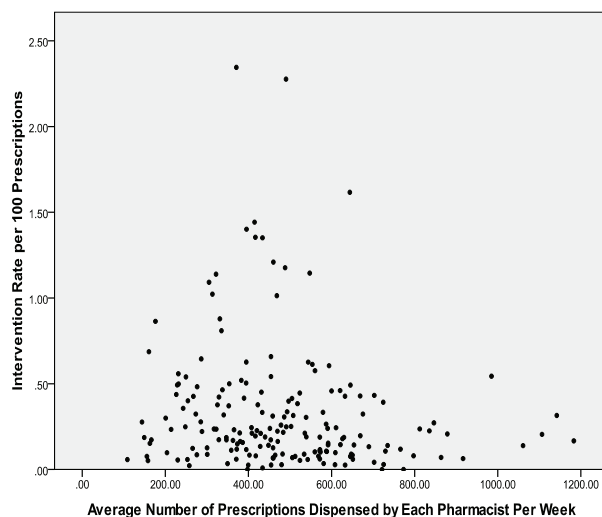


Figure 9: Effect of Pharmacist Workload on the Intervention Rate

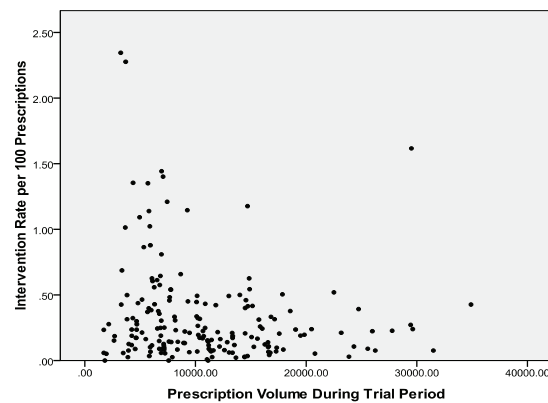


Figure 8: Effect of Prescription Volume on the Intervention Rate

As the pharmacist's workload increased, the pharmacy's intervention rate tended to decrease.

The pharmacist workload was calculated by determining the actual number of prescriptions dispensed per week by the pharmacy during the trial and dividing it by the number of full time equivalent (FTE) pharmacists per week, resulting in the average number of prescriptions dispensed by a pharmacist during a 38-hour week. The mean pharmacist weekly prescription volume was 479.5 ± 196.1 . There was a moderately weak, but statistically significant negative correlation between the pharmacy's DCI rate and the pharmacist's workload (Spearman's $p = 0.02$). Therefore, busier pharmacists tended to record less interventions.

Annual Financial Turnover

The pharmacies with the lowest annual financial turnover had the highest overall intervention rate.

The annual financial turnover of each pharmacy was compared to the intervention rate with a significant difference being found between the four categories (Kruskal-Wallis $p < 0.01$). However, a distinct positive or negative trend was not observed; rather, there was a possible J-curve where the pharmacies with the lowest turnover had a higher DCI rate, which sharply decreased with the next turnover category and then increased again, with the highest turnover category showing the second highest DCI rate. This could possibly be explained by staffing levels and workload, where the pharmacies with the lower turnover have a smaller workload and the pharmacies with the higher turnover perhaps have adequate staffing levels (critical mass) and therefore both have more time to perform and document their interventions. The pharmacies with turnovers in the two middle groups may have larger workloads relative to their staffing levels, but also do not have the turnover to warrant employing more staff, which may lead to less time to perform and document clinical interventions.

Annual Turnover	Count	%	Median
Less than 1.5M	58	31.5%	0.26
1.5 - 2.5M	60	32.6%	0.17
2.5 - 4.0M	40	21.7%	0.19
Over 4.0M	26	14.1%	0.22
Total	184	100.0%	0.21
Statistics	$\chi^2 = 13.11, df = 3, p < 0.01$		

Table 2: Median Intervention Rate Compared to Annual Financial Turnover

4.4 Pharmacist Factors

Level of PROMISe Training

Adequate training for the PROMISe system significantly increased the pharmacist's intervention rate.

Type of Training	Count	%	Median
Neither web or face-to-face training	101	19.0%	0.04
Face-to-face training only	19	3.6%	0.10
Web training only	215	40.5%	0.16
Web and face-to-face training	196	36.9%	0.26
Total	531	100.0%	0.16

Table 3: The Relationship Between the Level of PROMISe Training and Individual Pharmacist DCI Rates

Nearly 81% of participating pharmacists completed some form of PROMISe training, with 37% completing both the online and face-to-face training. There was a significant difference and positive correlation between the four different training groups and the pharmacist's DCI rate (Kruskal-Wallis $p < 0.01$). See Table 3.

Level of CPD Activity	Count	%	Median
None	3	0.7%	0.00
Less than 10 hours	45	9.8%	0.11
10 - 25 hours	175	38.2%	0.15
25 - 50 hours	158	34.5%	0.22
More than 50 hours	77	16.8%	0.27
Total	458	100.0%	0.18
Statistics	$\chi^2 = 19.58, df = 4, p < 0.01$		

Table 4: Median DCI Rate Compared to Annual Level of CPD Undertaken By Pharmacists

Level of CPD Activity

Pharmacists completing more hours of CPD annually tended to have a higher intervention rate.

The majority of pharmacists (73%) estimated that they completed 10 to 50 hours of CPD each year. There was a significant difference and a positive correlation between the level of CPD activity and the pharmacist's DCI rate (Kruskal-Wallis $p < 0.01$). See Table 4.

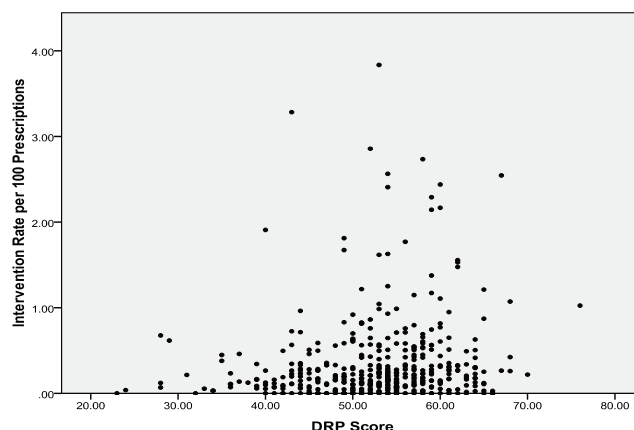


Figure 10: Effect of Clinical Knowledge on Individual Pharmacist DCI Rates

Pharmacists with a higher clinical knowledge survey score tended to have a higher intervention rate.

Clinical Knowledge Score

Participating pharmacists were asked to complete a clinical knowledge survey that was developed and validated by the PROMISE team. The mean score was 52.4 ± 8.1 out of a possible 80 points. There was a moderately weak, but statistically significant, correlation between the pharmacists' survey score and their DCI rate (Spearman's $p < 0.01$). See Figure 10.

Factors With No Apparent Influence on Intervention Rate

The pharmacy's PhARIA, type, dispensary attribution to total turnover, owner/manager operation, dispensing software, the type of counselling area and the physical accessibility of the pharmacist did not appear to significantly affect the DCI rate. Individually, a pharmacist's DCI rate did not appear to be influenced by his or her gender, age, graduation year, empathy score, professionalism score or position within the pharmacy.

4.5 Overview of Factors Influencing Intervention Frequency

There was a significant decline in DCI rates over the 12-week trial period which could be explained by several factors.

The electronic prompt was shown to significantly increase the DCI rate within the group three pharmacies. However, due to the nature of the prompt, the group of eligible consumers would have been exhausted after a two month period which could have contributed to the DCI rate decline. There is also a possibility that the pharmacies experienced some "trial fatigue" where the system reminders no longer triggered recording of interventions. Both of these factors could be improved through the use of "rotating prompts" where different electronic prompts were introduced every eight to 12 weeks to ensure the maximum benefit of each prompt was achieved and that the pharmacists did not become fatigued with the system.

In addition to these factors, the pharmacies were only remunerated twice during the trial, once upon enrolment, and once upon completion. Therefore, there was no provision of an ongoing financial incentive or motivation to maintain performance during in the trial, since the pharmacies received these payments regardless of performance. This could be overcome through the different remuneration options investigated by Deloitte (see page 27). By providing adequate remuneration, pharmacies should be able to implement change management strategies to help ensure that an optimal DCI rate was achieved.

Regardless of these factors, it is the ACI rate that is more critical in terms of both health and economic outcomes. It is known that the ACI rate is substantially higher than the DCI rate, and it was found in this study that the ACI rate is significantly improved in pharmacies with the PROMISe program implemented, over current practice. What is not known is whether this improvement is maintained in the long term, or whether it too declines alongside the DCI rate. It is considered likely that this improvement would be maintained, despite the decline in documentation, since it is felt that it is not the performance of interventions that the pharmacists become fatigued with (since the pharmacists will feel a moral obligation to perform many of these interventions), but rather the documentation (since there is no incentive to document). However, this supposition remains to be proven, since the observation periods of this trial were not sufficiently long to draw any firm conclusions on this matter.

The majority of the factors that were identified as influencing the rate of DCI during the trial were previously recognised through the pre-trial focus groups. Time pressures were identified as a major barrier to the documentation of clinical interventions, and the PROMISe results show that any factor affecting workload (such as prescription volume, pharmacist workload and financial turnover) impacted significantly on the DCI rate of the pharmacy. Strategies to improve pharmacist workloads would need to be employed to ensure optimisation of the DCI rate. Focus groups also highlighted the need for adequate pharmacist training on the software and sufficient clinical knowledge to increase the ability to recognise interventions, and the PROMISe results showed that both of these factors had significant impacts on the pharmacist's DCI rate. See Chapter 5 in the Full Final Report for more details on the factors influencing DCI rate.

4.6 Results from the Consumer Sub-study

A total of 78 PROMISe consumers completed the telephone questionnaire and 674 general pharmacy consumers completed the online survey. Pooling the data from these two groups showed that around 52% of ACI made by pharmacists are resolved at the time, commonly by contacting the prescriber or making an adjustment of dose. Most of the surveyed consumers were willing to follow the recommendations made by

pharmacists. Overall, it was shown that consumers had a high degree of satisfaction when dealing with their pharmacist, with PROMISE consumers giving a median score of 10 out of 10 for appreciation and 10 out of 10 for satisfaction with their experience at the pharmacy. A higher proportion of PROMISE consumers (68%) believed that pharmacists should be paid for performing clinical interventions compared with 38% of non-PROMISE consumers. This may have been due to the fact that the PROMISE consumers were more aware of when an intervention had occurred. Of those who thought pharmacists should be paid, both consumer groups believed \$10-\$14 to be an appropriate fee. Of those who did not think pharmacists should be paid, the main reason was because they thought pharmacists have a duty of care to provide this service. See Chapter 7 in the Full Final Report for further information.

4.7 Economics Evaluation of Clinical Interventions

The intervention process begins with the detection and recognition of a DRP by the pharmacist, followed by a recommendation for the resolution of the problem. We conducted a literature review to determine how issues relating to estimating the value of community pharmacists' clinical interventions had been previously addressed.

Literature concerning the determination of the value of community pharmacists' interventions is limited to 10 studies using, fundamentally, only three different methods.^{2 3 10 11 28 30-34} All of the methods assumed 100% compliance with the pharmacist's recommendation, and assumed 100% attribution to the pharmacist. That is, they estimated cost avoidance based on the consequences of the pharmacist's intervention, without considering the consequences of possible intervention by another person. All studies reviewed used clinical experts to estimate the possible outcomes if the intervention had not occurred.

One of the key issues in determining an appropriate value for an intervention in such hypothesised situations, is the definition of the before and after intervention states. In all of the studies reviewed, the effect of the pharmacist's intervention was inferred to be absolute and the costs associated with the intervened state were not considered. All interventions, although intended to reduce adverse events, have the possibility of an adverse outcome even with the intervention. For example, if aspirin is added to a patient's therapy to prevent heart attacks, the patient may still suffer a heart attack despite the aspirin therapy. Previous methods have failed to capture this, assuming wrongly that the intervention will completely eliminate the consequence.

Aspirin also has some risk of causing adverse effects in its own right, such as the risk of gastrointestinal (GI) bleeding. These consequences may occur at different levels of severity (for example, a severe GI bleed requiring transfusion, or a lesser bleed requiring blood tests and monitoring) and there is a difference in the probability of each consequence for each level of severity. So, for example, there may be a moderate probability of causing a mild GI bleed with the addition of aspirin and a lower probability of a major bleed associated with the aspirin addition. There is also a probability that the aspirin addition would decrease the risk of stroke, but this may be different to the probability that the addition of the aspirin will reduce the risk of heart attack.

Thus, in order to estimate an appropriate value for an intervention, estimates of the probability of different consequences at different levels of severity need to be made for both the before and after intervention situations. By appropriately adjusting these probability differences using the attribution to the pharmacist, and having some estimates of the costs associated with particular consequences, a reasonable estimate of the value of the intervention can be made.

In light of these considerations, a new and necessarily more complex economic evaluation methodology was developed for rigorously assessing the value of clinical interventions performed by pharmacists. This method is outlined below.

4.8 PROMISE Economic Evaluation Methods

The economic evaluation undertaken was comprehensive, involving a number of analytical steps. Fundamentally, expert opinion was used to determine the HRU and benefits (in terms of impact on clinical consequences) of a sample of interventions, and then advanced uncertainty analysis techniques were used to model the variation in opinions regarding each DCI. Once the value of DCI was estimated, the cost of undertaking the DCI was also calculated to facilitate the performance of a cost utility analysis (CUA). In addition, by determining the expected ACI frequency in pharmacies without the PROMISE software, we were able to determine the *incremental* cost effectiveness (improvements over current practice) of the PROMISE program and extrapolate this to the Australian situation. A step-wise description of these

processes follows (and they are outlined in Figure 12 and Figure 13). Numbers in the test refer to the relevant area in the figures.

1. Determine all the clinical consequences that are likely to be avoided or caused by clinical interventions in community pharmacies.

This involved a comprehensive review of the literature and analysis of results of previous community pharmacy clinical intervention studies including PROMISE II.³⁵ Fundamentally, as medication is used to treat a symptom or disease, the consequences of an intervention relating to medication could be either the improvement or worsening of one of these conditions, or development of an adverse effect relating to the medication use. The final list of consequences consisted of 60 common conditions; definitions for each of these conditions were developed at three different levels of severity. For example, severe heart failure was defined as “significant signs and symptoms of heart failure (for example, NYHA class IV) requiring hospitalisation and medical management (for example, acute pulmonary oedema)”, moderate heart failure as “resulting in significant signs and symptoms of heart failure (for example, NYHA class III) requiring medical management by modification of medication regimen” and mild heart failure as “mild signs or symptoms of heart failure (for example, NYHA class II) which resolve without intervention”.

2. Consult the available literature, and use expert panels where literature is not available, to form a “consequences table” that includes estimates of:

- a. what the likely HRU of each clinical consequence will be, in terms of:
 - The number and cost of general practitioner (GP) visits.
 - The number and cost of specialist visits.
 - Any likely investigations (such as pathology tests), and the associated costs.
 - The duration and cost of any hospital admissions.

An expert group of 14 GPs participated in an online assessment process and provided estimates of the number of GP and specialist visits and the investigations that would be required for each of the 60 consequences at each level of severity.

- b. The impact on quality of life (QOL) and the duration of the impact.

A similar online expert assessment process using five consultant physicians was used to determine the quality weights that were to be assigned to the consequences where no literature values were available. In order to achieve this, physicians were asked to (utilising an online quality of life questionnaire) give their opinions on how each of the consequences (at each level of severity) influenced five domains of health. An example of one assessor’s opinion of the consequence psychosis and the five domains is shown in Figure 11.

PSYCHOSIS
 The three levels of severity for PSYCHOSIS are as follows:
MILD: Mild signs or symptoms of psychosis which resolve without intervention
MODERATE: Worsening of psychotic illness requiring modification of treatment regimen
SEVERE: Destabilisation or unmasking of psychosis requiring specialist medical attention
 Please select from the drop down menus

	MOBILITY	SELF-CARE	USUAL ACTIVITIES	PAIN/DISCOMFORT	ANXIETY/DEPRESSION
MILD psychosis	No problems	No problems	No problems	None	Moderate
MODERATE psychosis	No problems	Some problems	Some problems	Some	Moderate
SEVERE psychosis	Some problems	Some problems	Cannot perform	Some	Extreme

 Click [here](#) to view full descriptions of each of the domains (opens in a new window)

Figure 11: Quality Weight Online Assessment Process

3. Select a sample of 200 suitable clinical interventions for assessment by an expert panel consisting of five specialists, nine pharmacists and 10 GPs.

The sample of 200 DCI was selected (100 each) from two randomly selected samples of 500 from the first and second half of the study data. Each DCI selected had a narrative description prepared and this information, along with the patients’ demographics and medication list was provided to experts in order to assess possible outcomes.

4. Have the selected sample assessed by the expert panel, to determine:

- a. which consequences are likely to occur

Assessors were provided with at least two consequences to consider for each intervention but were at liberty to delete these or add further consequences.

- b. the likelihood (% probability) of each identified clinical consequence occurring with and without the intervention (estimating a change in probability) at each of three levels of severity
 - c. the likelihood that the pharmacist would have been the only health professional to detect the DRP and intervene (attribution as a %).
5. Combine the expert estimates of probability and the attribution to the pharmacist to determine an attributed change in probability.
6. Combine the attributed change in probability for each consequence, and the associated values (6a) in the consequences table to determine the economic impact of each intervention in terms of utility and HRU (6b).
7. Add the change in medication costs (based on PBS costs) for each intervention.

Each of the DCI in the sample was assessed to determine any recommended change in medication utilisation. Where a change was recommended, the before and after intervention use of medication was used to calculate the cost of the change in terms of cost to the PBS over a period of 12 months.

The remaining steps enabled us to relate the value of specific interventions from our sample of DCI to the broader Australian perspective, and to determine an estimate of the *additional (or incremental) benefit* that the PROMISE program provides to the nation, when compared to current practice.

8. Calculate the cost of performing interventions based on the pharmacists' time in screening prescriptions for interventions and performing interventions.

Performing interventions requires that pharmacists identify that a potential DRP exists. As such, time "investigating" for possible problems in appropriate high-risk situations can increase the frequency of ACI. As a result of the PROMISE program reminders and prompts, there was an increase of up to 30 seconds in time spent screening prescriptions for interventions. The calculation of cost to perform interventions was based on the time taken to screen for interventions along with the time taken to actually undertake and document the interventions and the cost of the pharmacists' time. We estimated the cost of performing an intervention (with the PROMISE program in place) to be \$67.24 and the cost of performing an intervention in current practice was \$44.50.

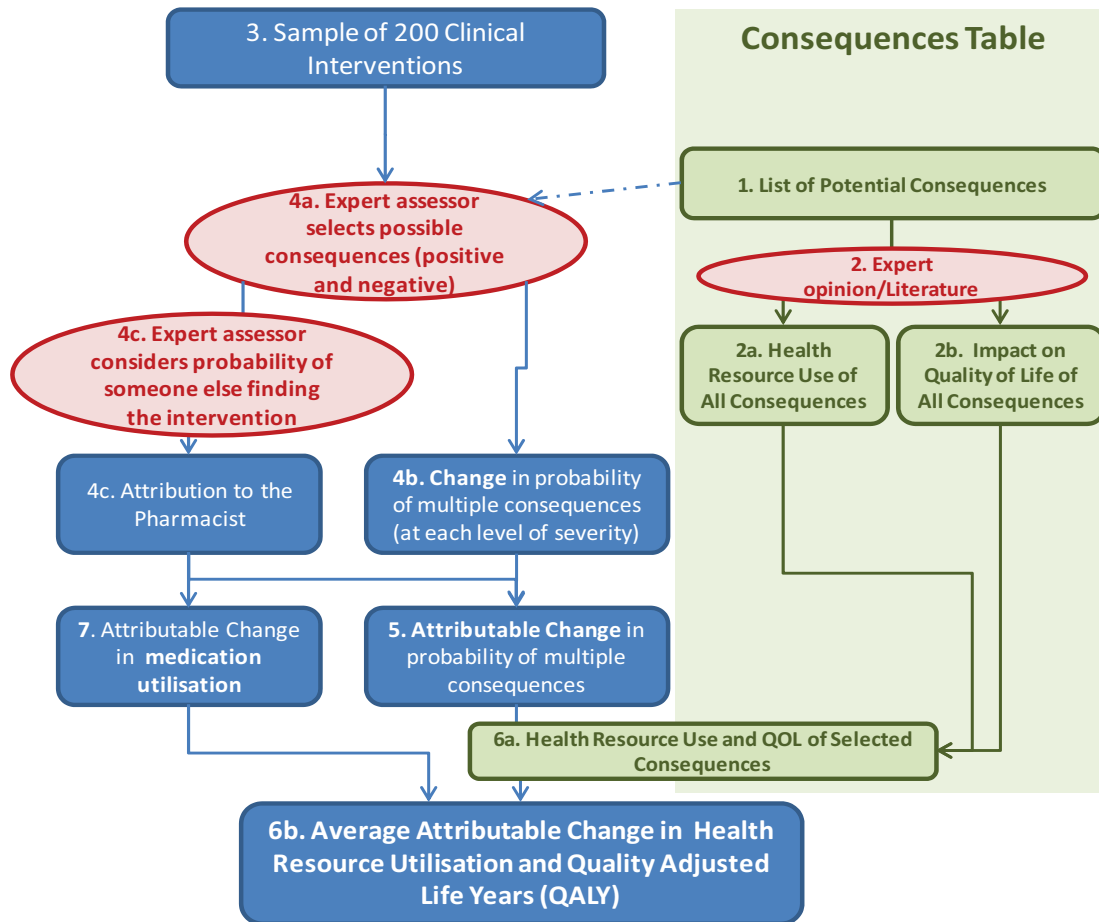


Figure 12: Determination of Health Resource Utilisation Associated with Clinical Interventions

9. Perform uncertainty analysis (that is, establish a model of uncertainty regarding the expert opinions relating to the estimated value of both the consequences and the interventions).

This was done using the Monte Carlo simulation software program @RISK 5.5 (<http://www.palisade.com/risk/>). Calculations of average values for total attributable health resource utilisation (HRU) took into consideration uncertainty in the HRU estimates for the consequences, uncertainty in the quality weight estimates, variation in the time to perform and screen for interventions and the interventions frequency. For all uncertainty analyses, 10,000 iterations were used. That is, a value for HRU was calculated from a different set of inputs on 10,000 separate occasions to provide a more robust estimate of the possible true result.

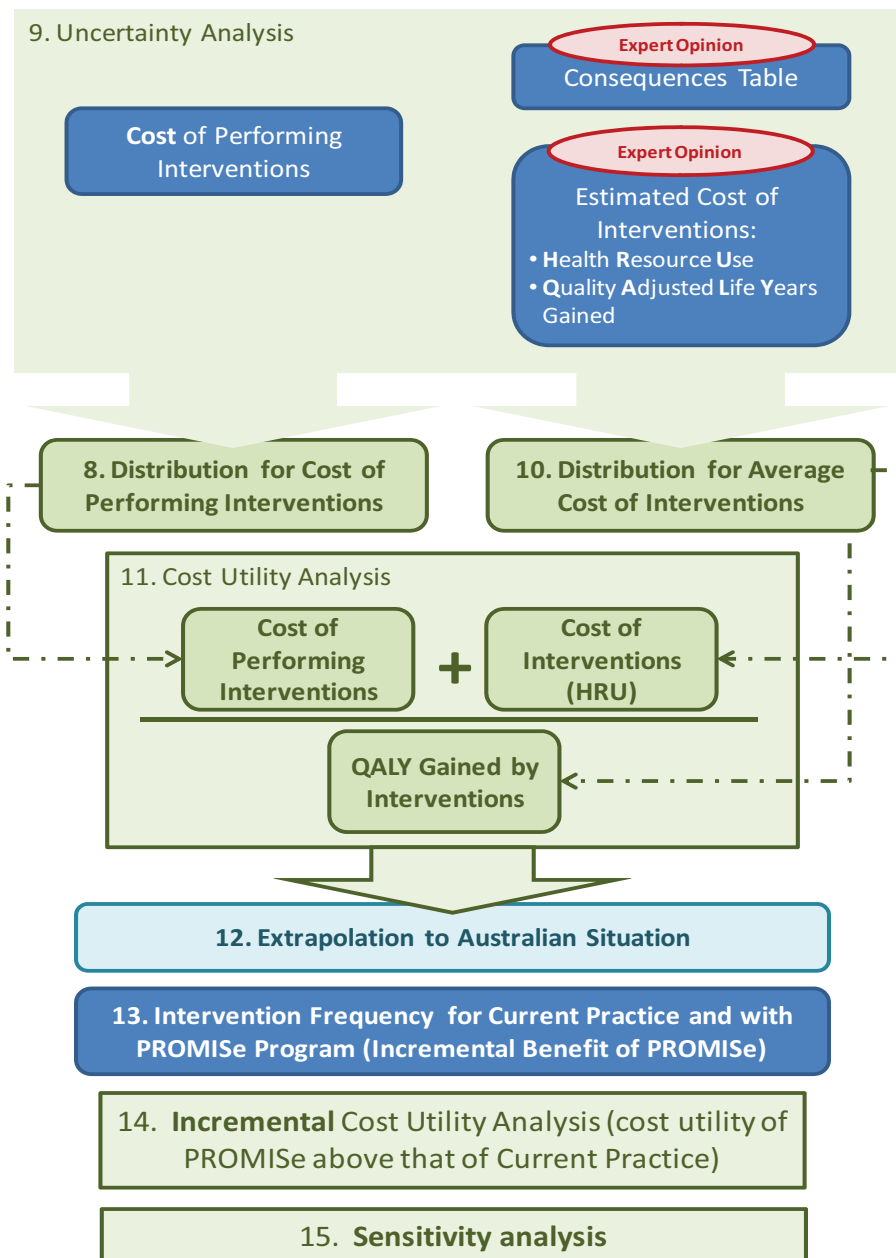


Figure 13: Determination of Cost Effectiveness of DCI and Extrapolation to Australian Situation

10. Determine the average economic value of DCI at each of four levels of clinical significance.

The average value was calculated using the @RISK software and the resultant resampled average results were used to extrapolate the value of the sample of DCI to the value of the PROMISe dataset.

11. Conduct a CUA to determine the average cost utility of interventions.

A CUA used the resultant average values for the avoided costs of interventions and the costs to perform interventions and the overall utility (benefit in terms of QOL) to determine an average cost effectiveness ratio.

12. Extrapolate these figures to the Australian perspective.

Extrapolation was based on the number of prescriptions and the number of pharmacies in Australia

13. From the broader PROMISe study, determine the relative cost-driving variables and their differences in Current Practice vs Practice with the PROMISe program in place (PROMISe Practice).

The rate of *performance* of ACI in current practice was calculated by determining the impact of observation on the PROMISe software pharmacies and applying the ratio to the ACI frequency in the non-software, current practice pharmacies.

14. Conduct a second CUA to determine the *incremental* cost utility of ACI performed in PROMISe that would otherwise not have been performed in current practice
15. Perform appropriate sensitivity analyses to determine whether with very low DCI frequencies and values (which will influence the estimated ACI frequencies), the overall program would still be cost effective.

The key results are presented here, with further results and more detail available in Chapter 8 of the Full Final Report.

4.9 Economic Results

Steps 1-7 of our analysis identified the average change in healthcare utilisation and QOL as a result of expert opinions of a sample of 200 cases. These were then extrapolated to the PROMISe dataset by adjusting for the proportion of interventions of different clinical significance, to correct for selection bias in the sample. The average values that resulted from these estimates are shown for each of the four levels of clinical significance in Table 5.

Parameter	S1	S2	S3	S4
Quality Adjusted Life Years (Days)	0.009 (3.28)	0.0077 (2.80)	0.0113 (4.12)	0.020 (7.29)
Number of GP visits	1.3103	1.1554	1.7468	2.4479
Cost of GP visits	-\$43.96	-\$38.76	-\$58.60	-\$82.13
Number of specialist visits	0.2987	0.3278	0.4590	0.9390
Cost of specialist visits	-\$16.71	-\$18.61	-\$26.26	-\$50.21
Cost of investigations	-\$23.91	-\$38.67	-\$36.99	-\$68.21
Duration of hospital admission	0.1382	0.2412	0.2683	0.6060
Cost of hospital admissions	-\$137.57	-\$224.35	-\$274.17	-\$555.00
Cost of medications	-\$9.04	\$15.93	-\$58.95	\$24.46
Total Health Resource Utilisation	-\$231.19	-\$304.47	-\$454.97	-\$731.09

Table 5: Health Resource Utilisation and QOL changes by Clinical Interventions

In order to enable cost effectiveness analysis to be undertaken, the pattern of practice in pharmacies without the PROMISe software was determined (using observers) and compared with the pattern in PROMISe software pharmacies. Intervention frequency (adjusted for observation effect) was higher in the PROMISe group and more time was thought to be spent screening for interventions in pharmacies with the PROMISe software installed. A distribution of uncertainty was applied to the estimates for intervention frequency and time to screen prescriptions, and a net cost of intervention (at each level of significance) was estimated. The figures that were reached, for both current practice and PROMISe practice, are shown in Figure 14.

Row	Assumptions	Current Practice	PROMiSe Practice	Source
1	Prescriptions per week	907.17	907.17	Trial Data
2	Actual intervention frequency	0.00456	0.00898	See Appendix D
3	Interventions performed per pharmacy week	4.13318	8.14933	Row1*Row2
4	Pharmacies	5006	5006	Guild Digest 2009
5	S1 (%)	19%	20%	Observed and Documented Data
6	S2 (%)	45%	40%	
7	S3 (%)	31%	34%	
8	S4 (%)	5%	5%	
9	Scripts to screen per intervention	219.49	111.32	1/Row2
10	Time to screen 1 script (mins)	0.25	0.75	Conservative Assumption
11	Time to document intervention (mins)	1.0	1.0	Observer Data
12	Cost of pharmacist time (per hour)	\$35.00	\$35.00	Assumed
13	On costs multiplier	1.29	1.29	Conservative Assumption
14	Cost of pharmacist time (per hour) incl. On-costs	\$45.15	\$45.15	Row12*Row13
15	Time to perform S1 intervention (mins)	2.0	4.0	Observed and Documented Data
16	Time to perform S2 intervention (mins)	3.0	4.0	
17	Time to perform S3 intervention (mins)	4.0	6.0	
18	Time to perform S4 intervention (mins)	6.0	7.5	
19	Average time spent performing intervention (mins)	3.27	4.86	Time to perform weighted by incidence
20	Time to find an intervention (mins)	59.14	89.35	Row9*Row10+Row19+Row11
21	Time to find an intervention (hours)	0.99	1.49	Row20/60
22	Cost to find and do an intervention	\$ 44.50	\$ 67.24	Row21*Row14

Figure 14: Assumptions Used for Extrapolation

The PROMiSe project also demonstrated that ACI *do* currently occur in community pharmacies, although they are not routinely documented. The difference between current practice and the practice in PROMiSe software pharmacies was determined and then extrapolated to the Australian situation. These results are shown in Table 6 and Table 7.

	Per Pharmacy Week		
	Current Practice	PROMiSe Practice	Incremental Difference
	4.13 Ints/week	8.15 Ints/week	
Quality Adjusted Life Years	0.040	0.080	0.040
Number of GP visits	5.93	11.86	5.93
Cost of GP visits	-\$198.84	-\$397.96	-\$199.12
Number of specialist visits	1.63	3.25	1.62
Cost of specialist visits	-\$91.88	-\$183.18	-\$91.30
Cost of investigations	-\$152.28	-\$298.67	-\$146.39
Duration of hospital admission	1.03	2.03	1.00
Cost of hospital admissions	-\$992.31	-\$1,963.78	-\$971.47
Cost of medications	-\$47.58	-\$115.23	-\$67.65
Total healthcare utilisation cost	-\$1,482.88	-\$2,958.83	-\$1,475.95
Total cost to pharmacies	-\$183.95	-\$547.94	-\$363.99
Net Cost	-\$1,298.94	-\$2,410.89	-\$1,111.95

Table 6: Incremental Benefit of PROMiSe Software Extrapolated to a Week of Pharmacy Activity

	Current Practice	PROMiSe Practice	Incremental Difference
	Per Year (Australia)		
Quality Adjusted Life Years	10404	20814	10410
Number of GP visits	1542766	3087717	1544952
Cost of GP visits	-\$51,759,794	-\$103,592,919	-\$51,833,125
Number of specialist visits	423997	845292	421295
Cost of specialist visits	-\$23,916,420	-\$47,684,619	-\$23,768,199
Cost of investigations	-\$39,640,435	-\$77,747,909	-\$38,107,474
Duration of hospital admission	267440	527365	259925
Cost of hospital admissions	-\$258,310,961	-\$511,196,761	-\$252,885,799
Cost of medications	-\$12,384,956	-\$29,995,569	-\$17,610,613
Total healthcare utilisation cost	-\$386,012,566	-\$770,217,777	-\$384,205,211
Total cost to pharmacies	\$47,883,135	\$142,634,788	\$94,751,653
Net Cost	-\$338,129,431	-\$627,582,989	-\$289,453,557

Table 7: Incremental Benefit of PROMiSe Software Extrapolated to a Year of Activity Across Australia

These results indicate a significant incremental benefit of the PROMISE program above that of current practice in terms of cost savings from healthcare utilisation avoided. The majority of the avoided healthcare utilisation was from ~260,000 avoided days in hospital (see Figure 15), while almost two million visits to medical practitioners (GPs and specialists) were also avoided. It should be noted that these estimates are based on 100% uptake of the program in all pharmacies in Australia and do not include any costs for implementing the program. In the section regarding implementation, a more realistic uptake and appropriate implementation strategies and costings are used (see section 5).

When the cost effectiveness of the incremental difference that the PROMISE software made was examined, the re-sampling process resulted in the cost effectiveness plane shown in Figure 16.

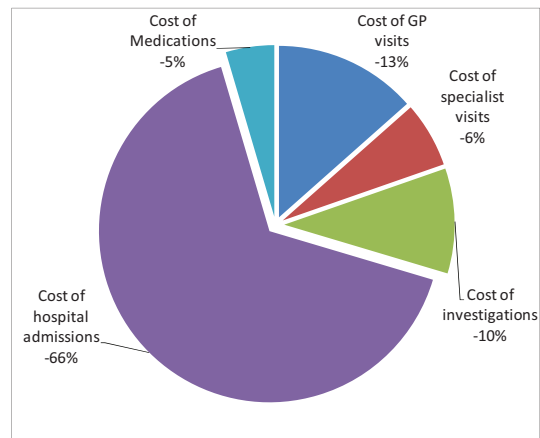


Figure 15: Estimated Health Resource Utilisation Avoided by Clinical Interventions

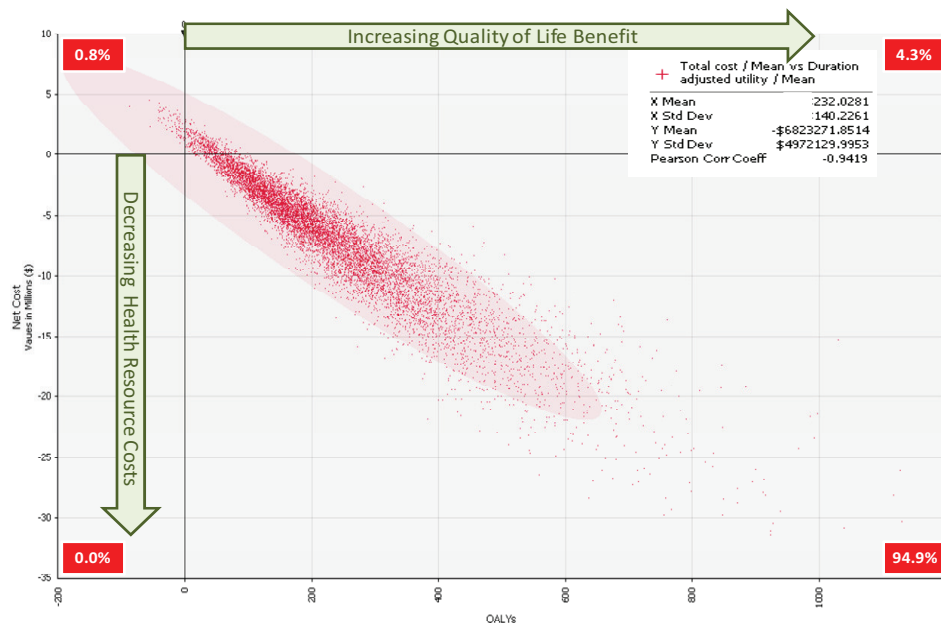


Figure 16: Cost Effectiveness Plane for Incremental Difference between PROMISE Practice and Current Practice (per week of activity across Australia)

As with the previous cost effectiveness plane, the majority of re-samplings resulted in, on average, a “dominant” finding, where the DCI had a negative cost (that is, saved health resources) and a positive benefit (increased QOL). Of the iterations, 94.9% resulted in the incremental benefit being dominant, with a further 4.3% positioned in the “improves quality of life yet costs money to implement” (north-east) quadrant, although many of these are under the generally accepted threshold of \$50,000 per QALY (98.9% of all outcomes were under the \$50,000 cost per QALY threshold). Sensitivity analyses run on the intervention frequency and time to screen a prescription variables with high/low values appear to support these findings. See Chapter 8 in the Full Final Report for more information about the economic analysis.

4.9.1 Implementation Plan

The economic evaluation described thus far fails to consider the complexities and costs of implementing the PROMISE program on a large scale. The role of performing this task was subcontracted to Deloitte Australia, and is described on page 27. To facilitate its performance of this task, Deloitte was provided with a broad range of data from the PROMISE study, including the results of the choice-modelling and consumer surveys, the raw expert assessment data, and, importantly, our findings as to the mean S1, S2, S3 and S4 DCI costs, and their relative proportions in the total DCI.

5 National Implementation of a Clinical Intervention Documentation System

Through the combination of information from consumers, the PROMISE economic evaluation, and the choice-modelling survey, an implementation plan and business case to support and facilitate the roll-out of the PROMISE program was developed. Deloitte Australia was contracted to develop this component of the project. From a multi-criteria scorecard approach, Deloitte established a Preferred Option of remuneration. It shows that, in order to optimise the net benefits to the community, clinical benefits and benefits to pharmacists from the operation of the PROMISE program, the government should remunerate participating pharmacists as follows:

- \$4,000 upfront payment per pharmacy
- \$20 per prescription intervention
 - Cap of \$15,000 per pharmacy per year
- \$1,000 quarterly payment
- Non-monetary allowance for the accrual of CPD points from participation in the program.

5.1 Preferred Remuneration Option Outcomes

5.1.1 Patient Outcomes

By driving a higher frequency of clinical interventions and documentation by pharmacists – approximately 708,000 each year – the base case option would be expected to prevent:

- 3.5 million days of illness
- one million GP visits
- 167,016 hospital days or approximately 52,521 potentially avoidable admissions.

By significantly improving the quality use of medicines, patients would be expected to have a higher QOL and to reduce demand on the healthcare system.

5.1.2 Pharmacies and Pharmacist Outcomes

Participation in the PROMISE program will impact on the “business-as-usual” operation of a pharmacy. For the typical community pharmacy, participation in the PROMISE program will result in:

- An increase in private costs to the business.
- An increase in revenues to the business from remuneration associated with participation in the program.
- Improvements in the quality of the services provided through the receipt of additional training and information through the PROMISE website and Clinical Intervention Prompt Campaigns.

5.1.3 Government and Community Outcomes

The expected healthcare utilisation savings to the community under the base case option would be \$732 million over five years. This represents an average saving to the government of \$367 per intervention performed alone. The investment would offer a direct benefit cost ratio of 4.7 to the government, with a payback period of less than two years.

5.2 Implementation Plan

Deloitte Australia suggested that to implement the Preferred Option for the PROMISE program, the Pharmacy Guild will need to implement a program of work to ensure the necessary investments are made and business change processes are implemented. The suggested business case involves two major phases, as shown in Figure 17.

Phase	Description	Key workstreams
ICT Development Phase (Year 1)	This phase will ensure the ICT infrastructure is operational to support the national rollout of the Program. It will take approximately 12 months to complete.	<p><i>Software Development and deployment</i> - The promise III study has tested the concept of the PROMISe Program. A number of modifications would be required, as recommended by post-trial analysis, before the Program is rolled out nationally. It is recommended that the software is developed as a fully integrated component of dispensing software by relevant software vendors.</p> <p><i>Repository Development</i> - A number of design modifications will be recommended as a result of the post-trial performance analysis and the scale up of the repository capacity for national expansion. These recommendations will need to be incorporated into the technical and functional specification</p>
The Operational Phase (Years 2-5)	This phase will involve the rollout of training, change management and compliance Programs to drive uptake of the Program and ensure the Program achieves its outcomes and objectives. The Operational Phase will run from Year 2 through Year 5.	<p><i>ICT Support for the PROMISe Software</i> - ICT support for the PROMISe software will be provided by vendors as a part of their normal role as providers of dispensing software services to pharmacists</p> <p><i>Education Support</i> - Education support for pharmacists for questions regarding interventions will be provided by the Pharmacy Guild through an email query built into the national website and a national hotline</p> <p><i>Training in the Use of the Software, the DOCUMENT System</i> — pharmacists will be required to undertake training in the use of the software and the types of clinical interventions in order to access payments from the Program. It was recommended that training be provided through a mix of virtual classroom courses and face-to-face seminars.</p> <p><i>Software Development and Deployment</i> - The promise III study has tested the concept of the Program. A number of modifications would be required, as</p> <ul style="list-style-type: none"> • Development of a change and adoption strategy • Implementation of change and adoption activities • Ongoing training strategy and needs analysis. <p><i>Monitoring and Compliance</i> - The key objectives for a monitoring and compliance framework for the Program are to:</p> <ul style="list-style-type: none"> • Prevent fraud within the system • Ensure documentation is compliant with the Program requirements • Evaluate the quality of the clinical interventions. <p>In turn, there are three levels of auditing which should be implemented as part of the Program:</p> <ul style="list-style-type: none"> • Identification of possible fraud through Data analytics and trending analysis • Compliance and enforcement of documentation requirements through random audits of pharmacies • Quality assurance of clinical interventions through peer audits. <p>The cost of monitoring and compliance will be a function of the level of auditing required by Government and the number of participating pharmacies.</p>

Figure 17: Details of the Proposed Implementation Plan

The Information and Communications Technology (ICT) Development phase will ensure the ICT infrastructure is operational to support the national rollout of the program. The second phase, the operational phase, involves the rollout of training, change management and compliance programs to drive uptake of the program and ensure the program achieves its outcomes and objectives.

In addition, the PROMISe program will be required to demonstrate compliance with all relevant legislation, particularly the legislative requirements of the pharmacy and pharmacist specific legislation, the *National Health Act 1953* (Cth), and the privacy legislation, *Privacy Act 1988* (Cth).

5.3 Risk Assessment

Deloitte constructed a risk assessment of the implementation of the program and, as such, a number of risks were identified including:

- investment planning risk
- completion risk
- demand risk
- implementation risk
- management risk
- operations risk
- financial risk

These risks were taken into consideration when developing the proposed business case and, consequently, three major strategies were incorporated into the ICT and operational phases to significantly control them: the provision of education support and training to pharmacists; the rollout of a comprehensive change management strategy; and the development of a monitoring and compliance framework.

5.3.1 Educational Support and Training

Inadequate knowledge of clinical interventions by pharmacists was demonstrated throughout the project to be one of the largest non-monetary barriers to performing and documenting clinical interventions. With this in mind, *training and education support* is essential to ensuring that pharmacists are able to appropriately identify, perform and document clinical interventions accurately. It is recommended that training be provided in the use of software, and in classifying interventions, in order to access payments from the PROMISE program. This training should be provided both online and through face-to-face seminars. Furthermore, it is recommended that an education support help desk, a query function built into the national website, and a national hotline be implemented.

5.3.2 Change Management Strategy

Other major barriers identified throughout the project were poorly trained staff and entrenched practices of non-recording which may have influenced the pharmacist's inability to see any tangible purpose for the documentation of interventions. To drive more frequent interventions by pharmacists which will serve to improve the quality use of medicines and prevent avoidable GP visits and hospital admissions, it is recommended that a comprehensive *change management strategy* be developed to support the successful deployment of the PROMISE program nationally. It is suggested that the change management strategy have three main key streams of work: the development of change and adoption strategy; implementation of change and adoption activities; and the ongoing training strategy and needs analysis, as shown in Appendix A.

5.3.3 Monitoring and Compliance Framework

Finally, it was recommended that a rigorous monitoring and compliance framework be established as part of the program. This framework would prevent fraud within the system; ensure documentation is compliant with the program requirements; and evaluate the quality of the clinical intervention. To achieve these aims, three levels of auditing would be required, including the prevention of fraud, compliance and enforcement of documentation requirements, and the quality assurance of clinical interventions through peer audits.

5.4 Summary of Business Model

Deloitte concluded that the objectives of the PROMISE project are strongly aligned with the recent directions of Australian healthcare policy more broadly and the objectives of the National Medicines Policy. As a result of the strong alignment between the objectives of the PROMISE program and the broader government healthcare reform objectives, outcomes which successfully meet the program goals will also contribute towards the broader government health policy objectives. The analysis and business case presented in this report recommends that in order to optimise the net benefits to the community, clinical benefits, and benefits to pharmacists from the operation of the PROMISE program, the government should remunerate participating pharmacists following the preferred option as detailed above. Finally, the national rollout of the PROMISE program should be supported by a comprehensive change management strategy and the development of a strong monitoring and compliance framework.

5.5 Alternate Business Model

The Business Case indicated that the base case remuneration model would optimise uptake and, in turn, the health and net economic returns from the program's development.

Given the short-term impact on the government's budgetary position as a result of the global financial crisis, a further "phased approach" to the PROMISE program was also considered. This sixth remuneration option does not include a documentation incentive of \$20 per intervention but would instead be comprised of only:

- an upfront payment of \$4,000
- a quarterly payment of \$1,000 available to each pharmacy, contingent on the pharmacy documenting a minimum number of interventions
- CPD points for pharmacists earned from participation.

The results of the choice-modelling survey shows that the uptake by pharmacists under the phased approach would be 31% which is 37% lower than the base case option. As the participation would be far less with the phased approach than the base case option, the net benefit for the government would also be substantially less when compared to the base case option, as shown in Table 8.

However, this approach is still expected to deliver a net economic benefit to the community of approximately \$433 million, and a net savings to the government of approximately \$348 million. As participation in the program would be expected to be much lower under this phased approach remuneration model there would need to be a very strong focus on the change management strategy as a part of the program (which is required for the base case remuneration model as well).

Impact	Outcomes under Base Case	Outcomes under Phased Approach
Benefit to government		
Saving from reduced healthcare utilisation costs	\$865 million	\$394 million
Savings from reduced healthcare utilisation from Prompt Campaigns	\$66 million	\$30 million
<i>Total benefits to government</i>	<i>\$931 million</i>	<i>\$424 million</i>
Benefits to community (government plus households)		
Savings from reduced healthcare utilisation costs	\$1.0 billion	\$474 million
Savings from reduced healthcare utilisation from Prompt Campaigns	\$92 million	\$42 million
<i>Total benefits to community</i>	<i>\$1.1 billion</i>	<i>\$516 million</i>
Costs to government		
Implementation costs	\$14 million	\$14 million
Cost of PROMISE program	\$175 million	\$59 million
Additional costs from Clinical Intervention Prompt Campaigns	\$9 million	\$3 million
<i>Total costs to government</i>	<i>\$198 million</i>	<i>\$76 million</i>
Costs to community (government plus households)		
Implementation costs	\$14 million	\$14 million
Cost of PROMISE program	\$189 million	\$66 million
Additional costs from Clinical Intervention Prompt Campaigns	\$10 million	\$3 million
<i>Total costs to community</i>	<i>\$214 million</i>	<i>\$83 million</i>
Net benefit to government (Years 1-5)	\$732 million	\$348 million
Net benefit to community (Years 1-5)	\$918 million	\$433 million

Table 8: Direct Costs and Benefits to Government and the Community of the Base Case and Phased Approach Remuneration Models (Sum over Yrs 1-5)

See Chapter 11 in the Full Final Report for more information about the business case.

6 Conclusion

The overall aim of this project was to establish the viability of, and requirements for, the national implementation of an electronic documentation system for the recording of medication issues (clinical interventions) identified in community pharmacies. The project also aimed to estimate the savings to the Australian health system made by community pharmacy interventions and to propose adequate remuneration models to facilitate a national rollout.

The project was successful across a range of parameters. Within a relatively short timeframe, particularly for an e-health initiative, PROMiSe III developed, implemented and trialled an electronic documentation system for the recording of clinical interventions in community pharmacies and a central repository for the secure storage and subsequent clinical and economic analyses of these interventions. Stakeholder feedback, particularly from both owner and non-owner community pharmacists, was uniformly positive. No significant issues were identified during the trial, indicating that there should be no major barriers to a national rollout of the system.

The project is the largest study of clinical pharmacy interventions in Australia and one of the largest in the world. It has shown that Australian community pharmacists routinely undertake clinical interventions that have the potential to substantially reduce healthcare utilisation and medication costs, as well as improve QOL. Each clinical intervention in community pharmacy was, on average, estimated to reduce healthcare utilisation by \$360 and increased the number of quality adjusted life years by 0.01.

If all pharmacies in Australia used the PROMiSe program and achieved the intervention frequencies noted during the trial, approximately \$630 million of healthcare costs would be avoided and 20,000 QALYs would be gained, each year. Taking into account the fact that interventions are already being performed in community pharmacies, the incremental benefit of the PROMiSe program would still be in the order of \$290 million in healthcare costs avoided and 10,000 QALYs gained per year.

If the PROMiSe program was implemented, the preferred base case implementation model (after allowing for costs for IT development, remuneration of pharmacies and costs to government to implement and monitor the program) would still result in a net benefit to government of \$900 million over a five-year program (or approximately \$180 million per year). An alternative, phased implementation approach with lower government costs, lower pharmacy uptake and lower pharmacy remuneration would result in a net benefit to government of \$430 million over five years (or approximately \$80 million per year).

7 Recommendations

Following the PROMiSe III trial, there are several recommendations to move forward with this innovative professional program.

7.1.1 Widespread Implementation

PROMiSe III trialled the software in 186 pharmacies and implementation in all community pharmacies is now recommended. This would include developing the PROMiSe software for all dispensing systems used in Australia to allow all pharmacies to participate. *There were no significant issues in the trial to indicate that there would be any major barriers to a national rollout.* A key component of the rollout is the use of data and case scenarios from the central database for the ongoing continuing professional education of pharmacists.

7.1.2 Prompt Software

It would be crucial that the prompt function be implemented within the software, as the prompt appeared to significantly increase the number of interventions performed by the pharmacists. It would also be recommended that the prompt be rotated, as the effect of the prompt appeared to diminish after eight weeks, resulting in all groups having similar intervention rates during the last four weeks. A changing prompt every eight to 12 weeks, depending on the frequency with which a patient would be expected to present his or her prescription for the targeted drug, would help to ensure that an optimal intervention rate was maintained.

An inbuilt prompt mechanism provides a method of delivering targeted education to pharmacists regarding selected healthcare issues. It would also allow specific prompts to be hand-picked to increase the benefits to the consumers and the healthcare system. This may include high value interventions, but also those

interventions of moderate value that occur more frequently, thus resulting in large health savings (including under the PBS). One option is to develop a program of decision support prompts with the NPS.

7.1.3 Prospective Trial

Ideally, a prospective trial conducted on data collected by the implemented program would also allow confirmation of the HRU benefits that could only be predicted within the constraints of the PROMISe trial. It is envisaged that all consumers subjected to a prompted intervention could be identified and contacted to determine their actual HRU. This would allow more accurate economic values to be assigned to the intervention and therefore more precise extrapolations to be applied nationwide. This prospective study would in turn allow policy makers to better measure the efficacy of the program, and to better target high value areas throughout the health system.

Appendices

- A PROMISe III Deloitte Executive Summary
- B Examples of Recorded Interventions
- C Expert Assessment Tables
- D Actual Clinical Intervention Rate Calculation Steps

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Business Case for the national implementation of the PROMISe Program

Final Report
23 April 2010



Executive Summary

Key findings and recommendations

The PROMISe Program is a proposed five year Program that will encourage more systematic prompting and documentation of clinical interventions by community pharmacists which will be aggregated into a national data repository. Under the Program, pharmacists will be remunerated to document clinical interventions where drug related problems are identified.

The PROMISe Program will engage pharmacists to reduce costs, healthcare utilisation and ill-health related to drug related problems. Utilising Trial Data from PROMISe III trials, it was estimated that an intervention would result in an average of \$442 in avoided costs of care to households and government elsewhere in the healthcare system. **The net saving to the Government is \$367 per intervention on average.**

The total benefits and costs to the Government of the Program would be expected to depend upon the number of interventions performed by pharmacists, which in turn would be influenced by the remuneration package offered to pharmacists for their participation. Five remuneration models were analysed as part of the Business Case, and a further, 'Phased Approach' remuneration model was considered as part of the implementation plan.

The Business Case analysis found that in order to optimise the health and net economic benefits to Community, the Government should incentivise participation in the Program using the 'Base Case' remuneration model, which was comprised of a \$4,000 upfront payment per pharmacy, a \$20 payment per documented intervention, a \$1,000 quarterly payment contingent on meeting a prescribed rate of intervention and documentation, and the provision of Continuing Professional Development points for participation in the Program. **Under the 'Base Case' remuneration model, participation by pharmacy would be expected to be 68 per cent and the net economic benefits to Government would be in the order of \$732 million over five years.**

Table ES 1. Expected benefits and costs to the Australian Government (Years 1-5)

	Base Case remuneration model	Phased Approach remuneration model
Benefit to Government	\$930,962,163	\$424,409,221
Cost to Government	\$198,804,221	\$76,038,629
Net public benefit	\$732,157,942	\$348,370,592

The investment would offer a direct benefit cost ratio of 4.7 to Government, with a payback period of less than two years.

Given the positive health and economic outcomes expected of the project, the PROMISe Program presents an ideal mechanism for the Government to improve health outcomes for Australians, promote the quality use of medications, reduce unnecessary healthcare expenditure and free up scarce healthcare resources.

It is recommended that if the 'Base Case' remuneration model is introduced that a cap of \$15,000 per pharmacy be implemented to limit the total cost and risk to Government, which may be reviewed over time. In addition, it is also recommended that the national rollout of the PROMISe Program be supported by a comprehensive change management strategy and the development of a strong monitoring and compliance framework.

As an alternative, the Government may also consider a 'Phased Approach' remuneration model, which would limit the overall outlays to Government while ensuring that the Program could still be introduced. Under the Phased Approach remuneration model, pharmacists would still receive a \$4,000 upfront payment and \$1,000 per quarter (contingent on a prescribed number of interventions being achieved per quarter) but would not receive a documentation incentive.

It was expected that this package would deliver a net benefit to Government of \$348 million over five years. Participation under this model would be expected to be lower than the Base Case model (31 per cent). To ensure maximum program participation and returns on the infrastructure investment, it is similarly recommended that the Government develop a strong change management strategy to support uptake across Australia.

The following sections summarise the major analysis and key findings of the report.

The role of community pharmacy in healthcare and its reform

Pharmaceuticals are used widely in modern medicine. When used properly, they are both effective and efficient, delivering often significant improvements in health outcomes, and often reducing demand for scarce, labour and capital intensive resources such as physicians and hospital beds.

Non-compliance with pharmaceutical therapies and errors in prescribing pharmaceuticals, however, places significant strain on healthcare resources, resulting in wasteful healthcare utilisation and expenditure. Currently, it is estimated that 1.5 million Australians experience health problems related to drug related problems every year. Errors in prescribing pharmaceuticals result in over 400,000 potentially avoidable GP visits and 140,000 potentially avoidable hospital admissions. The prevention of even a subset of these drug related problems and non-compliant behaviours will lead to the more efficient allocation of healthcare resources and an overall improvement in health.

The potential benefit to communities for such savings is particularly salient now as Australians face significant challenges to the sustainability of their healthcare system. Healthcare spending has outpaced economic growth for several decades, with healthcare spending as a proportion of GDP increasing at an exponential rate. In light of this rapidly changing fiscal environment, the Australian Government is currently undertaking an extensive review of reforms to Australia's health policy.

A wide range of potential reforms to improve the effectiveness and efficiency of Australia's healthcare system has been identified by a number of recent reviews, including the findings of the final report of the National Health and Hospitals Reform Commission (NHHRC), the report of the Preventative Health Taskforce and the National Primary Health Care Strategy. Across all three reports, however, two consistent themes have emerged as critical areas for reform to improve the quality, safety and sustainability of the Australian healthcare system:

- The need to *strengthen primary care*
- The need to adopt a *prevention focus*.

In parallel, Australia also has a standing policy to improve the Quality Use of Medicines as part of its National Medicines Policy. With drug related problems occurring frequently, the development of strategies to improve the quality use of medicines is strongly aligned with the objectives of the healthcare reform agenda summarised above. The quality use of medicines relies on the continuing education of the patient's primary healthcare team to both prevent errors and promote adherence to therapies. In doing so, the quality use of medicines reduces demand on the broader healthcare system, making Australian healthcare more effective and sustainable.

Pharmacists, as the most regularly visited primary healthcare providers, have been identified as integral to ensuring the quality use of medicines in meeting broader healthcare reform agenda goals. The Minister for Health and Ageing, Nicola Roxon recently stated:

... We should be reducing medication-related errors, and reducing avoidable hospital admissions. And pharmacists, with [their] particular skills in medicines, should be playing a big part in this.¹

Minister Roxon went further to make clear that while the Government was looking to pharmacists to provide timely, accurate and understandable information about their pharmaceutical therapies, only a small number of consumers were accessing these services.

¹ Hon Nicola Roxon MP (2009)

The value of clinical interventions by community pharmacists

The PROMISE III study, led by the University of Tasmania from August 2008 to January 2010, revealed that an adopted clinical intervention using the PROMISE Program software could have a combination of the following effects on healthcare utilisation:

- Change in number of visits to the General Practitioner
- Change in the number of visits to a Specialist
- Change in the number of investigative tests performed
- Change in the number of hospital admission days
- Change in the cost of pharmaceuticals purchased.

In particular, the PROMISE III study provided an estimate of expected improvement in patients' quality of life and reduced healthcare expenditure, both by patients and by the Government, as a result of the clinical interventions performed by community pharmacists. The expected significance of the intervention was measured according to the following scale:

- *S1 — consequence related to information.* Pharmacists participating in the PROMISE III study were instructed to use the rating when the consequences to the patient were related to costs or information only.
- *S2 — prevented mild symptom or improved compliance.* Pharmacists were instructed to use this rating when the consequences to the patient were an improvement in a minor symptom, or, if a minor symptom would have developed if the intervention had not occurred. A 'minor symptom' was defined as one which did not require a doctor's visit to investigate or treat.
- *S3 — prevented or required a GP visit.* Pharmacists were instructed to use this rating when it was likely that the patient would have had to go the GP if the intervention had not occurred. This was also used when the recommendation was to refer the patient to a GP for further medical attention.
- *S4 — prevented or required a hospital admission.* Pharmacists were instructed to use this rating when it was likely that the patient would have had to go the hospital if the intervention had not occurred. This was also used when the recommendation was to refer the patient to a hospital for further medical attention.

Twenty per cent of clinical interventions were classified as S1 interventions, 40 per cent were classified as S2 interventions, 34 per cent were classified as S3 interventions and 5 per cent were classified as S4 interventions.

Based on the observed frequency of interventions of the above levels of significance, the weighted average value of an intervention to the Government was estimated to be \$367. The weighted average value of an intervention to the Community (Government and households) was estimated to be \$442 per intervention.

Barriers to clinical interventions by pharmacists

Although clinical interventions by community pharmacists have a high value to the Community, less are often performed than would be preferred.

Pharmacists are currently paid per prescription, as specified under the Fourth Community Pharmacy Agreement. This payment is intended to compensate pharmacists for the costs and services associated with dispensing medication. The payment, however, is only directly linked to the *number of*

prescriptions filled by the pharmacist, not the professional services they provide. This means that when a pharmacist spends time performing a clinical intervention this comes at the cost being paid by the Government to process prescriptions or manage other aspects of the pharmacy. The benefits of improved clinical and economic outcomes are captured by the community (through better health outcomes and lower costs of unnecessary care), while pharmacies and pharmacists bear all of the costs of performing clinical interventions. This represents market failure known as a positive externality. The presence of positive externalities result in suboptimal levels of clinical interventions by pharmacists relative to what the Community would prefer and creates inefficiencies in healthcare service delivery. In order to correct for this market failure, there is a strong argument for Government intervention to *directly compensate pharmacists for the time taken to screen for, complete and document clinical interventions* such that the private benefits at least equal the private costs of performing this additional activity.

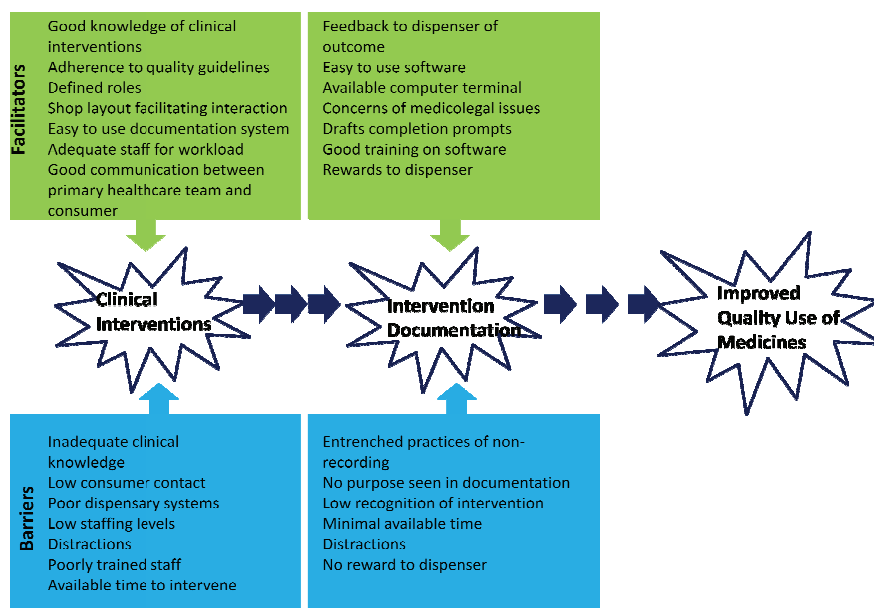
Moreover, research by DeBoos Associates ² completed as part of this study revealed a number of barriers to clinical interventions and intervention documentation beyond the lack of time (and associated market failures associated with pharmacies incurring all of the cost and receiving none of the gain).

Non-monetary barriers to performing clinical interventions and documentation included:

- inadequate knowledge of clinical interventions
- poorly trained staff and entrenched practices of non-recording, which have been developed as a result of pharmacists' inability to see any tangible purpose for the documentation of interventions.

These are shown in Figure ES 1. The research also found there were a number of facilitators of interventions and documentation, including good training in clinical interventions and documentation software.

Figure ES 1: Barriers and facilitators of clinical interventions and documentation of interventions



Source: DeBoos Associates, 2009, op. cit.

² DeBoos Associates, 2009, op .cit.

Improving rates of clinical intervention and documentation: the PROMISe Program

The quality use of medicines means that the right medicine be given to the patient, at the right time, at the right dose — encouraging providers to be mindful of drug related problems and to encourage compliance among their patients.

The PROMISe Program will encourage pharmacists to systematically and consistently identify medication related problems and make recommendations to resolve them by providing active reminders, training and appropriately aligned incentives. The PROMISe Program uses the pharmacist-consumer relationship to reduce drug related problems, improve compliance and the quality use of medication and ultimately contribute to wider healthcare reform goals. This agenda is reflected in the key objectives of the PROMISe Program:

- To improve and promote the *safe* use of pharmaceutical products
- To *prevent* the inappropriate use of pharmaceutical products
- To promote the *fiscal sustainability* of the Australian healthcare system
- To promote the continuing *professional development* of pharmacists to strengthen the delivery of primary healthcare services.

Key features of the proposed PROMISe Program are outlined in Table ES 2.

Table ES 2. Key features of the proposed PROMISe Program

Feature	Description
PROMISe Software	<p>The PROMISe software will be fully integrated into the pharmacist's current dispensing software. It will provide:</p> <ul style="list-style-type: none"> • Product specific prompts to pharmacists to encourage intervention and documentation of 'high value' clinical interventions • Mechanisms for intervention data to be sent to a National Data Repository • Links to a website that will host training modules and promote interventions. <p>Currently pharmacist dispensing software does not provide functionality to systematically record interventions across all pharmacies. Dispensing software is largely limited to the use of "notes", which tend to be used only for legal reasons.</p>
DOCUMENT system	<p>The PROMISe Program will enable clinical interventions to be classified using the DOCUMENT classification system which was developed by the University of Tasmania. Currently no systematic classification system is used by pharmacists to consistently identify drug related problems and pharmacist recommendations.</p>
National Data Repository	<p>De-identified intervention records will be sent in real time to a National Data Repository of Clinical Interventions. The repository will facilitate the delivery of more effective continuing education to pharmacists, providing the basis for feedback and identification of areas for further training. If sufficiently complete, such a repository could also serve as a unique source for pharmacovigilance data to be used by the Government, pharmacy and other researchers.</p>
Clinical Intervention Prompt Campaigns	<p>The National Data Repository will provide a rich source of information to identify pharmaceuticals or groups of pharmaceuticals, which, if highlighted to pharmacists as potential clinical interventions, would represent large reductions in healthcare expenditure. These products will either be used erroneously frequently, have significant health impacts if used incorrectly, or both. By identifying these products or product groups in the National Data Repository, targeted prompts can be developed and introduced into the PROMISe Software. Alongside general training about the correct use of the pharmaceutical product or group of products and how to identify their misuse, the prompts will run for a discrete period of time, appearing every time the product (or products) is dispensed.</p>
Training and professional development	<p>To participate in the Program and receive related funding, pharmacists will be required to complete a training course in the DOCUMENT system of clinical interventions and how to use the software. Training will be offered through a mix of face-to-face training courses and an online module.</p> <p>In addition, pharmacists will be able to earn continuing professional development (CPD) points for participation in PROMISe training modules.</p>

Alignment with the Australian Government health reform

The objectives of the PROMISE Program are strongly aligned with the key objectives of Australia's health reform agenda. Table ES 3 lists the key objectives for the Australian healthcare system as identified by the NHHRC, the National Primary Health Care Strategy, Australia's National Medicines Policy and the Fourth Community Pharmacy Agreement. The table also provides a discussion of how the PROMISE Program objectives relate to them.

Table ES 3. Alignment of the PROMISE Program objectives with Australian Government Health Reform Agenda

Government objectives	PROMISE Program alignment	Explanation of alignment
Key NHHRC goals		
Improving health outcomes of Aboriginal and Torres Strait Islander people	✓	The Program will drive better use of medicines, which have been shown to strongly improve life expectancy for all Australians, including ATSI groups. Moreover, a reduction in adverse drug events can elevate pressure on health services, which is particularly acute in rural and regional areas.
Improved care for people with serious mental illness	✓	The Program will drive better use of medicines, including the use of medicines to treat patients with mental illness.
Support for people living in remote and rural areas	✓	The Program incentivises pharmacists to engage, as primary healthcare providers, with consumers. This improves access for consumers living in remote and rural areas to primary healthcare services. Further, a reduction in adverse drug events can elevate pressure on rural medical facilities, improving access once more for local residents
Improved access to dental healthcare		Not focus of PROMISE Program
Timely access to quality care in public hospitals	✓	A reduction in adverse drug events can elevate pressure on public hospitals, improving access for other patients in the community
National Access Targets		Not focus of PROMISE Program
Embed prevention and early intervention	✓	Pharmacists are incentivised to routinely engage in behaviour which prevents adverse drug events through timely intervention
Connect and integrate health and aged care services	✓	The Program will necessitate a greater degree of communication between primary healthcare providers, particularly between pharmacists and GPs. This will enhance the continuity of care across settings for patients
'Next generation' of Medicare		Not focus of PROMISE Program
Strengthened consumer engagement and voice	✓	Consumers will benefit from increased exposure to primary healthcare providers who actively engage with their pharmaceutical therapies
Modern, learning and supported workforce	✓	Pharmacists have access to training through participation in the PROMISE Program. Data collected as part of the operation of PROMISE will be used to inform and update training courses
Smart use of data, information and communication	✓	As part of the Program, a National Data Repository will be created and used to identify healthcare savings
Well-designed funding and strategic purchasing		Not focus of PROMISE Program
Knowledge-led continuous improvement, innovation and research	✓	Training for pharmacists will be informed by the National Data Repository. Further, policy makers will be able to identify areas for potential healthcare savings using the same repository

Government objectives	PROMISE Program alignment	Explanation of alignment
National Primary Health Care Strategy		
Improving access and reducing inequality	✓	The Program incentivises pharmacists to engage with consumers as primary healthcare providers. This improves access for the community to primary healthcare services. Further, the Program has the potential to alleviate stress on other medical services, improving access to the community
Better management of chronic conditions	✓	The Program aims to improve compliance with medicinal therapies as part of improving the quality use of medication. This has the potential, in certain cases, to prevent or retard the progression of disease due to non-compliance with therapies in early stages
Increase the focus on prevention	✓	Pharmacists are incentivised to seek out opportunities to prevent adverse drug events
Improving quality, safety, performance and accountability	✓	The Program seeks to ensure quality and safe use of medication
Quality Use of Medicines Policy		
Judicious use of medicines	✓	Pharmacists are encouraged to prevent both under and over use of medication by consumers
Appropriate use of medicines	✓	Pharmacists are encouraged to engage with the consumer to ensure they are utilising appropriate treatments for their condition
Safe use of medicines	✓	The Program seeks to ensure quality and safe use of medication
Efficacious use of medicines	✓	The Program encourages pharmacists to ensure consumers are using medication effectively and appropriately
Fourth Community Pharmacy Agreement		
Enhanced Quality Use of Medicines	✓	The Program seeks to ensure quality and safe use of medication
Collaboration between care settings	✓	The Program incentivises pharmacists to engage with consumers as primary healthcare providers. This allows for the continuity of primary healthcare across a number of settings — from physician to pharmacist
Patient-focused services	✓	Consumers will benefit from increased exposure to primary healthcare providers who actively engage with their pharmaceutical therapies

Integration with other Pharmacy Professional services

The Australian Government has funded a number of Professional Programs and Services under the Better Community Health Initiatives of the Fourth Community Pharmacy Agreement. These Programs are managed by the Pharmacy Guild of Australia with the aim of achieving the most efficient and effective health outcomes for the Community. The Fourth Agreement Professional Pharmacy Programs include:

- *Dose Administration Aids Program* — Community pharmacies participate in providing medical adherence devices or dose administration aids to eligible community based patients to assist them with their medication management
- *Patient Medication Profile Program* — Participating pharmacies provide community based patients with medication profiles to assist them with their medication management
- *Home Medication Review Program* — The consumer's preferred community pharmacy provides a home visitation service, whereby, a pharmacist visits the consumer at home, reviews their medication regimen and provides the consumer's general practitioner a report.

Intervention in a patient's treatment regime is the first step in each of these Programs. The PROMISE Program has the potential to serve as an early detection mechanism to identify consumers that may benefit from other pharmacy-based professional services. Patients who are subject to particular types

of interventions may also benefit from a Medication Profile, a Dose Administration Aid, or a Home Medication Review.

Determining the Preferred Remuneration Option for the PROMISe Program

For pharmacists to perform clinical interventions at a level aligned with the Community's preferences, pharmacists must be appropriately remunerated by the Government. The PROMISe Program provides an ideal mechanism through which the Government can accurately and adequately compensate pharmacists for performing this service.

Identifying potential remuneration models

To fully compensate pharmacists for their participation in the PROMISe Program and drive optimal levels of clinical intervention and documentation, it was determined that the remuneration option could include some combination of:

- *An upfront payment to cover the private costs to pharmacists associated with training on the model* — this component of the remuneration model is required to correct for the market failure of positive externalities where all of the private costs would be borne by the pharmacists but the benefits realised by the public
- *A per-intervention payment* — either a general per-intervention payment or a targeted payment for select pharmaceutical products that have a high healthcare cost if misused (high-value products), and a lower payment for pharmaceutical products which have a low healthcare cost if misused (low-value products) low-value interventions. This ongoing payment will serve as an ongoing incentive for participation by the pharmacists
- *A minimum-intervention threshold payment* — a quarterly payment if the pharmacy meets a threshold of at least 3 interventions per 1,000 prescriptions
- *Continuing Professional Development (CPD) points* — a 'non-payment' incentive of allowing or disallowing for the collection of CPD points from participation in the Program.

Critically, depending on the different combination of potential payments to pharmacists, different levels of participation by pharmacists in the Program and rates of intervention would be expected. This in turn will determine the *net benefit* which the Community will gain from the presence of the PROMISe Program, depending on the total costs to Government as compared with the potential health and economic benefits of the clinical interventions. Five options were identified (Table ES 4) and analysed to identify the remuneration model that would optimise the net benefits to the Community.³

³ The five options were chosen by first defining a 'Base Case' option then systematically varying each element of the remuneration package (a lower upfront payment, tiered payment for high and low value interventions, payment for only high and value interventions, no quarterly payment). The Base Case Option was selected for being the option which maximised the expected net benefit to the community, even if it was assumed that only 'low value' interventions will be performed during the course of the Program (in order to minimise the risk borne by Government). CPD points were included in all options.

Table ES 4. Potential remuneration options evaluated as part of the Business Case

Option No.	Option name	Upfront Payment per pharmacy	Per intervention payment	Per 'high value' intervention payment ⁴	Payment for other general interventions ⁵	Quarterly Payment	CPD Credits?
1	Base Case	\$4,000	\$20	-	-	\$1,000	Yes
2	Lower Upfront Payment	\$2,000	\$20	-	-	\$1,000	Yes
3	Tiered Per Intervention Payment	\$4,000	-	\$20	\$2	\$1,000	Yes
4	High Value Intervention Only Payment	\$4,000		\$20	\$0	\$1,000	Yes
5	No Quarterly Payment	\$4,000	\$20	-	-	-	Yes

Pharmacists were surveyed by DeBoos Associates as part of the PROMISE study to estimate the likely rate of uptake by pharmacies. Among the five potential options, the Base Case (Option 1) was expected to drive the highest level of uptake by pharmacies (Table ES 5) and in turn, the number of interventions in community pharmacy. This was supported by the PROMISE trial and Observational Sub-Study indicating that the introduction of the PROMISE software with a prompt would drive an increase in both the frequency of interventions *performed* (an increase of 1.61 interventions per 100 prescriptions compared with a no software environment) and an increase in the number of interventions documented (an increase of 1.47 interventions per 100 prescriptions compared with a no software environment).

Table ES 5. Uptake rate and interventions performed under different options

Option	Uptake Rate	Number of Interventions Performed (and adopted) ⁶	Proportion of interventions which were low-value	Proportion of interventions which were high-value
Base Case	68%	672,430	408,717	263,713
Lower Upfront Payment	62%	613,098	372,654	240,444
Tiered per Intervention Payment	60%	593,321	360,633	232,688
High Value Intervention Only Payment	52%	514,211	312,548	201,663
No Quarterly Payment	46%	454,879	276,485	178,394

Source: Source: Deloitte analysis of DeBoos Associates (2009); PROMISE III Trial Data (2009)

Assessment framework: multi-criteria scorecard analysis

To determine the Preferred Remuneration Option for the PROMISE Program, a multi-criteria scorecard approach was adopted. This method was selected in order to balance the multiple objectives of Government: for example, while one option may result in a high level of interventions increasing the quality use of medicines, this may come at an extreme cost to Government, reducing scope for

⁴ Where 'high value' is defined as S3 and S4 interventions.

⁵ Where 'low value' is defined as S1 and S2 interventions.

⁶ It was assumed that 90% of recommendations were adopted by consumers

expenditure on other goods and services. The multi-criteria scorecard seeks to take into consideration the multiple objectives of Government, and by extension the Community, to identify the remuneration option that maximises outcomes for the Community. This method also enjoys credibility with the Australian Government.⁷ Using a multi-criteria scorecard, different remuneration models can be assessed against both budgetary impacts and the full range of Australian health policy goals.

The criteria used to select the Preferred Remuneration Option were derived from definitions of ‘effectiveness’ and ‘efficiency’ as they relate to the PROMISe Program and broader Health Reform Goals (Table ES 3). After substantial evidence-based analysis (presented in the body of the report) the expected performance under each option was reflected in a score against performance measures defined under each criterion. Performance measures, as they related to each criterion, are also listed in Table ES 6.

Table ES 6. Assessment criteria and accompanying performance measures

Criteria	Performance measure
Effectiveness	
Criterion 1: The safe use of pharmaceuticals	The expected reduction in GP visits
	The expected reduction in number of hospital admission days
Criterion 2: Prevention of the inappropriate use of pharmaceuticals	The expected reduction in non-compliant behaviour
	The expected reduction in moderate and severe events
	The expected reduction in health utilisation costs
Criterion 3: Promotion of the fiscal sustainability of the Australian healthcare system	Expected reduction in total healthcare expenditure
	Expected reduction in expenditure on pharmaceuticals
	Expected number of interventions performed (contribution to a higher value database)
Criterion 4: Promotes the continuing professional development of pharmacists	Expected number of interventions performed
	Expected number of low value and high value interventions performed
	Expected uptake rate of the PROMISe Program by pharmacies
Efficiency	
Criterion 1: Allocative efficiency	The expected total net benefit realised under each remuneration option
Criterion 2: Administrative efficiency	The expected administrative costs of auditing each option
	The expected administrative costs of complying with each option by pharmacy
Criterion 3: Dynamic efficiency	Expected number of low value and high value interventions performed

Each option was scored against the above criteria for effectiveness and efficiency as per the scoring methodology provided in Box ES 1.

⁷ See for example, The Victorian Competition and Efficiency Commission, 2005, *Victorian Guide to Regulation*, February, pp 5-12 and 5-13.

Box ES 1. Balanced scorecard methodology

For each remuneration option, assessment against each criterion resulted in the assignment of 'ticks' (✓) or a 'crosses' (✗). The expected outcomes of the PROMISE Program under each remuneration option informed the assignment of scores.

Points for each option against each criterion were allocated as follows:

- Three ticks if the option performed at least 10 per cent better than average in all performance measures
- Two ticks if the option performed better than average in all performance measure
- One tick if the option performed better than average in at least one performance measure
- A cross if the option performed worse than average on all performance measures.

Performance of each option against the effectiveness and efficiency criteria

Under each of the five remuneration options, interventions by pharmacists were expected to reduce the incidence of illness and potentially avoidable use of scarce healthcare resources. For example, under each of the five different options, the interventions were expected to reduce the frequency of presentation to hospital. Based on the expected number of interventions under each option, the PROMISE Program would be expected to reduce between 112,981 days in hospital (Option 5) and 167,016 days in hospital (Option 1) (Table ES 7). Similarly, Option 1 was expected to result in the most significant prevention of avoidable GP visits, with 1,014,724 GP visits avoided. This is driven by the expected different levels of uptake by pharmacies, with 68 per cent expected to participate in the Base Case Option compared with 46 per cent in the No Quarterly Payment Option.

Overall, as shown in Table ES 7, the Base Case Option (Option 1) was shown to perform the best against the criteria. Due to the higher levels of uptake expected by pharmacies (68 per cent), the Base Case Option was expected to drive:

- ***The greatest reduction in avoidable GP visits and hospital admissions***
- ***The greatest improvements in medication compliance***
- ***The greatest savings to government and households (total net benefit to the Community of \$918 million over five years).***

In addition, by driving the greatest level of uptake by pharmacists, the Base Case Option was expected to develop the most comprehensive dataset in the National Data Repository of Clinical Interventions; limiting remuneration to only a subset of potential clinical interventions (such as in Options 3 and 4) was expected to reduce the dynamic efficiency potential of the Program. Moreover, by funding all clinical interventions, the Base Case Option was expected to be administratively more simple than alternative remuneration models.

Sensitivity analysis testing conducted on the Base Case Option indicated that:

- The Program would deliver a net benefit to the Community even if only 'S1 valued' interventions were implemented (average value of \$235 per intervention to the Government, or \$281 per intervention to the Community)
- The Program would deliver a net benefit to the Community if a cap of \$15,000 per pharmacy were introduced, as participation was expected to remain high, at approximately 66 per cent (compared to 68 per cent without the cap).

Table ES 7. Summary of assessment against criteria — the Multi-criteria Scorecard (per annum, except by exception)

Criteria and related performance measures	Base Case	Lower Upfront Payment	Tiered Per Intervention Payment	High Value Only Payment	No Quarterly Payment
Effectiveness					
Effectiveness Criterion 1 — The safe use of pharmaceuticals	✓✓✓	✓✓	✓✓	✗	✗
Reduction in GP visits	1,014,724	925,189	895,344	775,965	686,431
Reduction in hospital days	167,016	152,279	147,367	127,718	112,981
Effectiveness Criterion 2 — Prevention of the inappropriate use of pharmaceuticals	✓✓✓	✓✓	✓✓	✗	✗
Reduction in non-compliance	20,283	18,493	17,897	15,511	13,721
Reduction in moderate events	228,483	208,323	201,603	174,723	154,562
Reduction in severe events	35,230	32,121	31,085	26,940	23,831
Reduction in health utilisation costs	\$297 million	\$271 million	\$262 million	\$227 million	\$201 million
Effectiveness Criterion 3 — Promotes the fiscal sustainability	✓✓✓	✓✓	✓✓	✗	✗
Reduction in total healthcare expenditure	\$247 million	\$335 million	\$218 million	\$189 million	\$167 million
Reduction in expenditure on pharmaceuticals	\$10 million	\$9.2 million	\$8.9 million	\$7.7million	\$6.8 million
Number of interventions performed and adopted	672,430	613,098	593,321	514,211	454,879
Effectiveness Criterion 4 — Promotes the continuing professional development of pharmacists	✓✓✓	✓✓	✓✓	✗	✗
Number of interventions performed and adopted	672,430	613,098	593,321	514,211	454,879
Number of low value interventions performed and adopted	408,717	372,654	360,633	312,548	276,485
High-value intervention performed and adopted	263,713	240,444	232,688	201,663	178,394
Uptake rate of the PROMISe Program by pharmacies	68%	62%	60%	52%	46%
Efficiency					
Efficiency Criterion 1 — Allocative efficiency	✓✓✓	✓✓	✓✓	✗	✗
Total net benefit of the Program to the Community (Y1-Y5)	\$918 million	\$842 million	\$831 million	\$8721 million	\$648 million
Efficiency Criterion 2 — Administrative efficiency	✓	✓	✗	✗	✗
Efficiency Criterion 3 — Dynamic efficiency	✓✓✓	✓✓	✓✓	✗	✗
Number of low value interventions performed and adopted	408,717	372,654	360,633	312,548	276,485
High-value intervention performed and adopted	263,713	240,444	232,688	201,663	178,394
Ranking	1	2	3	4	5

Source: Deloitte analysis of DeBoos Associates (2009); UMORE (2010)

Outcomes for patients under the Base Case Option

Table ES 8 summarises the major expected clinical and health utilisation outcomes if the Base Case Option (the Preferred Remuneration Option) is adopted.⁸ By driving a higher frequency of clinical interventions and documentation by pharmacists — approximately 708,000 each year — the Base Case Option would be expected to prevent:

- 3.5 million days of illness
- 1 million GP visits
- 167,016 hospital days or approximately 52,521 potentially avoidable admissions.

By significantly improving the Quality Use of Medicines patients would be expected to have both a higher quality of life and reduce demand on the healthcare system.

Table ES 8. Expected health outcomes if the Base Case Option is adopted (per annum)

Health outcome measure	Expected benefits
Expected reduction in number of days of illness in the Community	An expected reduction of 3.5 million days of sickness within the Community
Reduction in the number of visits to GPs	Expected to reduce by 1 million visits
Reduction in the number of days in hospital	Expected to reduce approximately 167,016 hospital days

Source: UMORE (2010)

Outcomes for pharmacies and pharmacists under the Base Case Option

Participation in the PROMISe Program will impact on the ‘business-as-usual’ operation of a pharmacy. For the typical community pharmacy, participation in the PROMISe Program will result in:

- An increase in private costs to the business
- An increase in revenues to the business from remuneration associated with participation in the Program
- Improvements in the quality of the services provided through the receipt of additional training and information through the PROMISe website and Clinical Intervention Prompt Campaigns.

Costs of participation

It was not assumed that pharmacies would need to purchase the software to participate in the PROMISe Program. They would, however, be required to divert time from other activities in order to complete tasks required as a result of participation in the PROMISe Program:

- *Time taken to participate in the PROMISe training Program* — with the exception of small pharmacies, at least two pharmacists from each pharmacist will be required to participate in the PROMISe Program training

⁸ Assumptions employed to calculate these expected outcomes are detailed in Chapter 5

- *Time taken to screen patients more consistently to identify candidates for intervention* — The PROMISE Program will encourage pharmacists to more systematically review patients' medication history to identify potential areas of medication misuse. This has been estimated to take approximately one minute for the pharmacist to complete on average
- *Time taken to perform and document the clinical intervention* — Trial Data estimates that on average it takes pharmacists between 5 (for an S1 intervention) and 8.5 (for an S4 intervention) minutes to conduct and document the intervention

The opportunity cost of this time was estimated by reviewing the costs the pharmacy would face if it needed to hire additional labour to meet this additional time impost. A review of the hourly wages of pharmacists in April 2010 found that the hourly wages of a pharmacist were between \$29.32 and \$38.55 nationally, depending on the level of experience of the pharmacist and location of the pharmacy. After taking into account on-costs of approximately 25 per cent, the hourly opportunity cost to a pharmacist was estimated to be between \$36.65 and \$48.19 per hour.⁹

Analysis showed that the opportunity costs faced by pharmacies were sensitive to the value of time and the time required to screen patients' prescriptions for potential medical errors, with the vast majority of the private costs to pharmacies arising from the *additional* time required to more consistently and systematically screen patients for medication misuse. The potential opportunity cost to pharmacies ranged from approximately \$8,500 per annum to more than \$21,100 per annum.

Table ES 9. Opportunity costs to pharmacies

	Low estimate time to screen, Low estimate of the opportunity cost of time	Low estimate time to screen, High estimate of the opportunity cost of time	High estimate time to screen, Low estimate of the opportunity cost of time	High estimate time to screen, High estimate of the opportunity cost of time
Number of scripts screened per year on average	49,738 scripts	49,738 scripts	49,738 scripts	49,738 scripts
Number of documented interventions per year	191 documented interventions	191 documented interventions	191 documented interventions	191 documented interventions
Number of seconds per script	15 seconds	15 seconds	30 seconds	30 seconds
Value of the pharmacists' time	\$36.65 per hour	\$48.19 per hour	\$36.65 per hour	\$36.65 per hour
Number of hours screening per year	207 hours	207 hours	414 hours	414 hours
Number of hours documenting interventions per year	19 hours	19 hours	19 hours	19 hours
Number of hours training	6 hours	6 hours	6 hours	6 hours
Total number of hours	232 hours	232 hours	439 hours	439 hours
Opportunity cost to pharmacies	\$8,501 per year	\$11,178 per year	\$16,096 per year	\$21,165 per year

On balance, although there was not data available to support a final conclusion, interviews with software providers and UMORE pharmacists indicated the likely average increase in the time to screen interventions was likely to be in the range of 15 seconds per script, which would translate into approximately 11 per cent of pharmacists' time each year that would have otherwise been spent on other things being spent on screening scripts and performing interventions. *This would suggest the likely opportunity costs to pharmacies to more systematically screen, intervene and document those interventions is in the order of \$8,500 to \$11,200 each year.*

⁹ Payscale Australia (2010), *Hourly Rate Snapshot for Pharmacist Jobs*, accessed online at: http://www.payscale.com/research/AU/Job=Pharmacist/Hourly_Rate

Revenues from participation

Offsetting these private costs would be revenues to pharmacies for participation in the PROMISE Program, including the documentation of clinical interventions.

The analysis shows that pharmacies will have a strong incentive to document more clinical interventions than less, as this is the only way to recoup the costs of screening incurred and because the time to document is a reasonably low impost on pharmacy. Based on the intervention rates observed on average during the trial, pharmacies would be expected to earn additional revenues of approximately \$7,800 per annum on average. If the number of documented interventions were to rise to the intervention rate observed in the Observer Sub-Study (approximately 32.7 documented interventions per in 1,000 prescriptions compared with 3.85 documented interventions per 1,000 in the trial), the remuneration to pharmacies would rise to more than \$36,500 per annum on average (Table ES 10).

Table ES 10. Revenues to pharmacies based on Trial and Observer Sub-Study documented intervention rates

	Trial documented intervention rates (3.85 per 1000 scripts)	Observer Sub-Study documented intervention rates (32.7 per 1000 scripts)
Number of scripts screened per year on average	49,738 scripts	49,738 scripts
Expected number of documented interventions based on trial rates of intervention	191 documented interventions	1,626 documented interventions
Remuneration to pharmacies	\$7,829 per year	\$36,529 per year

This represents a strong incentive for pharmacies to document interventions, but also a risk to the Government if the Program were uncapped.

One way to balance these issues would be to agree a cap on the remuneration paid per pharmacy per annum. DeBoos Associates research tested two potential revenue caps for community pharmacies: \$11,000 per pharmacy and \$15,000 per pharmacy. Under the \$11,000 cap participation by pharmacies was expected to significantly reduce (by 13.5 per cent) which reflects that many pharmacies may not feel they would be adequately compensated for the additional private costs incurred in training, screening all prescriptions and performing/documenting clinical interventions. Under the \$15,000 cap there was only a three per cent reduction in participation predicted.

Table ES 11. Opportunity costs to pharmacies

	Low estimate time to screen, Low estimate of the opportunity cost of time	Low estimate time to screen, High estimate of the opportunity cost of time	High estimate time to screen, Low estimate of the opportunity cost of time	High estimate time to screen, High estimate of the opportunity cost of time
Number of seconds per script	15 seconds	15 seconds	30 seconds	30 seconds
Value of the pharmacists' time	\$36.65 per hour	\$48.19 per hour	\$36.65 per hour	\$36.65 per hour
Opportunity cost to pharmacies	\$8,501 per year	\$11,178 per year	\$16,096 per year	\$21,165 per year
Pareto efficiency criterion satisfied under \$15,000 cap?	✓	✓	✗	✗

The survey results confirm interviews with software vendors and pharmacists that suggest the overall additional time to screen, intervene and document each intervention is likely to be in the order of an additional 15 seconds per script as the *pareto* efficiency criterion would be satisfied under a \$15,000

cap for if on average the additional time to intervene was approximately 15 seconds per script (Table ES 11).

Impacts from skills development

The PROMISe Program would be expected to positively impact on pharmacists by:

- Reinforcing their awareness of the role they play as primary healthcare providers
- Making pharmacists more aware of the opportunities and benefits of performing clinical interventions through the intervention reporting and Clinical Intervention Prompt Campaigns.

The Program would provide a framework to encourage pharmacy graduates to fully apply their clinical knowledge. In addition, the development of a National Data Repository of Clinical Interventions would give a clear purpose for the documentation of the intervention as pharmacists would be able to positively contribute to research to improve the quality of care in Australia.

Outcomes for the Government and the Community under the Base Case Option

Table ES 12 summarises the quantifiable expected direct economic benefits and costs to the Government and Community, which is comprised of both Government and Households, under the Base Case Option.

The expected healthcare utilisation savings to the Community under the Base Case Option would be \$732 million over five years. This represents an average saving of \$367 per intervention performed to Government alone.¹⁰ The savings over five years represent approximately one per cent of total healthcare spending by Australians in a year.¹¹ The investment would offer a direct benefit cost ratio of 4.7 to Government, with a payback period of less than two years.

Table ES 12. Expected total direct economic net benefits under the Base Case Option (Years 1-5)

Impact	Value (Years 1-5)
Benefit to Government	
Saving from reduced healthcare utilisation costs	\$865 million
Savings from reduced healthcare utilisation costs resulting from Prompt Campaigns*	\$66 million
<i>Total Benefits to Government</i>	<i>\$931 million</i>
Benefits to Community (Government plus Households)	
Savings from reduced healthcare utilisation costs	\$1.0 billion
Savings from reduced healthcare utilisation costs resulting from Prompt Campaigns	\$92 million
<i>Total Benefits to Community</i>	<i>\$1.1 billion</i>
Costs to Government	
Implementation costs	\$14 million
Cost of PROMISe Program	\$175 million
Additional costs from Clinical Intervention Prompt Campaigns	\$9 million
<i>Total Costs to Government</i>	<i>\$198 million</i>

¹⁰ The average represents the average healthcare utilisation savings weighted by significance of intervention.

¹¹ A healthier future for all Australians (2009), 2006/7 Figures, accessed online: [http://www.nhhrc.org.au/internet/nhhrc/publishing.nsf/Content/1AFDEAF1FB76A1D8CA25760000B5BE2/\\$File/Financial_Report_of_the%20nhhrc_June_2009.pdf](http://www.nhhrc.org.au/internet/nhhrc/publishing.nsf/Content/1AFDEAF1FB76A1D8CA25760000B5BE2/$File/Financial_Report_of_the%20nhhrc_June_2009.pdf), last accessed 20.01.10

Impact	Value (Years 1-5)
Costs to Community (Government plus Households)	
Implementation costs	\$14 million
Cost of PROMISe Program	\$189 million
Additional costs from Clinical Intervention Prompt Campaigns	\$10 million
<i>Total Costs to Community</i>	<i>\$214 million</i>
Net Benefit to Government (Years 1-5)	\$732 million
Net Benefit to Community (Years 1-5)	\$918 million

Source: Deloitte analysis of DeBoos Associates (2009); UMORE (2010) *Note: Clinical Intervention Prompt Campaigns refer to targeted prompts for high value interventions, assumed to be introduced on quarter-year rotations. These figures are calculated on the basis of products selected using Trial Data. Therefore, these figures are intended to be illustrative of the benefits which may arise if Prompt Campaigns are run.

Implementation of the PROMISe Program

It is expected the PROMISe Program will be administered by the Pharmacy Guild (the Guild), with funding for remuneration and implementation costs being provided by the Department of Health and Ageing (The Department) through the Fifth Community Pharmacy Agreement. The National Data Repository of Clinical Interventions, however, was expected to be owned and operated by the Department.

To implement the PROMISe Program, the Guild will need to implement a Program of work to ensure the necessary investments are made and business change processes are implemented. The Program of work is comprised of two phases: the ICT Development Phase (Year 1) and an Operational Phase (Years 2-5). Details of both phases are summarised in Table ES 13.

Table ES 13. Details of the Proposed Implementation Plan

Phase	Description	Key workstreams
ICT Development Phase (Year 1)	This phase will ensure the ICT infrastructure is operational to support the national rollout of the Program. It will take approximately 12 months to complete.	<p><i>Software Development and deployment</i> - The promise III study has tested the concept of the PROMISe Program. A number of modifications would be required, as recommended by post-trial analysis, before the Program is rolled out nationally. It is recommended that the software is developed as a fully integrated component of dispensing software by relevant software vendors.</p> <p><i>Repository Development</i> — A number of design modifications will be recommended as a result of the post-trial performance analysis and the scale up of the repository capacity for national expansion. These recommendations will need to be incorporated into the technical and functional specification</p>
The Operational Phase (Years 2-5)	This phase will involve the rollout of training, change management and compliance Programs to drive uptake of the Program and ensure the Program achieves its outcomes and objectives. The Operational Phase will run from Year 2 through Year 5.	<p><i>ICT Support for the PROMISe Software</i> — ICT support for the PROMISe software will be provided by vendors as a part of their normal role as providers of dispensing software services to pharmacists</p> <p><i>Education Support</i> - Education support for pharmacists for questions regarding interventions will be provided by the Pharmacy Guild through an email query built-into the national website and a national hotline</p> <p><i>Training in the use of the software, the DOCUMENT system</i> — pharmacists will be required to undertake training in the use of the software and the types of clinical interventions in order to access payments from the PROMISe Program. It was recommended that training be provided through a mix of virtual classroom courses and face-to-face seminars.</p> <p><i>Change management</i> - The change management program will support the successful deployment of the PROMISe Program nationally. This will require the following steps:</p> <ul style="list-style-type: none"> • Development of a change and adoption strategy • Implementation of change and adoption activities • Ongoing training strategy and needs analysis.

Phase	Description	Key workstreams
		<p><i>Monitoring and compliance</i> — The key objectives for a monitoring and compliance framework for the PROMISE Program are to:</p> <ul style="list-style-type: none"> • Prevent fraud within the system • Ensure documentation is compliant with the Program requirements • Evaluate the quality of the clinical interventions. <p>In turn, there are three levels of auditing which should be implemented as part of the Program:</p> <ul style="list-style-type: none"> • Identification of possible fraud through Data analytics and trending analysis • Compliance and enforcement of documentation requirements through random audits of pharmacies • Quality assurance of clinical interventions through peer audits. <p>The cost of monitoring and compliance will be a function of the level of auditing required by Government and the number of participating pharmacies.</p>

The PROMISE Program will also be required to demonstrate compliance with all relevant legislation. Particular consideration must be given to the legislative requirements of:

- *Pharmacy and pharmacist specific legislation* — This is the legislation with which pharmacists must comply. Commonwealth legislation in this category includes the *National Health Act 1953* which sets out statutory requirements for the administration of the Pharmaceutical Benefits Scheme. Each State and Territory has a “Pharmacy Act” which regulates the dispensing and recording of prescriptions
- *Privacy legislation* — Pharmacists must comply with the requirements of the Commonwealth *Privacy Act 1988* and, in addition, some jurisdictions have State-based privacy legislation and legislation specifically covering the privacy of health-related information.

It is not anticipated, given Deloitte’s understanding of the PROMISE Program and the regulatory framework that applies to pharmacists and health information, that any regulatory changes will be required to implement the policy. However, Deloitte are not legal practitioners and we recommend that, as part of the implementation process, professional legal advice is sought.

1.1.1 Options for a Phased Approach remuneration model

The Business Case indicated that the ‘Base Case’ remuneration model would optimise uptake, and in turn, the health and net economic returns from the Program’s development.

Given the short term impact on the government’s budgetary position as a result of the global financial crisis, a further ‘Phased Approach’ to the PROMISE Program was also considered. This sixth remuneration option does not include a documentation incentive of \$20 per intervention but would instead be comprised of only:

- an upfront payment of \$4,000
- a quarterly payment of \$1,000 available to each pharmacy, contingent on the pharmacy documenting a minimum number of interventions
- CPD points for pharmacists from participation.

Results from the Choice Modelling survey conducted by DeBoos Associates indicated that uptake by pharmacists under this remuneration model would be 31 per cent, 37 per cent lower than the Base Case remuneration option (68 per cent). Table ES 14 presents estimates of the direct costs and benefits that would occur if this remuneration option was implemented. As shown in the table, because the participation in the Program would be expected to be far less under this Phased Approach remuneration model, the net benefit would be substantially less than the Base Case remuneration model which was identified to be the preferred remuneration model by the options analysis.

Nonetheless, the Program would still be expected to deliver a net economic benefit to the Community of approximately \$433 million, and a net savings to Government of approximately \$348 million.

Because the participation in the Program would be expected to be so much lower under this Phased Approach remuneration model there would need to be a very strong focus on the change management strategy as a part of the Program (which is required for the Base Case remuneration model as well).

It is recommended that if such a remuneration model is implemented that the Government review participation rates over time to ensure the objectives and outcomes of the Program are being achieved. The change management and training strategies, which should be strongly integrated, should be modified over time to ensure the goals of the Program are being achieved. It is recommended that a review of Program outcomes is undertaken at the end of Years 2, 3 and 4 in the implementation plan.

Table ES 14. Direct costs and benefits to Government and the Community of the Base Case and Phased Approach remuneration models (Sum over Yrs 1- 5)

Impact	Outcomes under Base Case	Outcomes under Phased Approach
Benefit to Government		
Saving from reduced healthcare utilisation costs	\$865 million	\$394 million
Savings from reduced healthcare utilisation from Prompt Campaigns	\$66 million	\$30 million
<i>Total Benefits to Government</i>	<i>\$931 million</i>	<i>\$424 million</i>
Benefits to Community (Government plus Households)		
Savings from reduced healthcare utilisation costs	\$1.0 billion	\$474 million
Savings from reduced healthcare utilisation from Prompt Campaigns	\$92 million	\$42 million
<i>Total Benefits to Community</i>	<i>\$1.1 billion</i>	<i>\$516 million</i>
Costs to Government		
Implementation costs	\$14 million	\$14 million
Cost of PROMISe Program	\$175 million	\$59 million
Additional costs from Clinical Intervention Prompt Campaigns	\$9 million	\$3 million
<i>Total Costs to Government</i>	<i>\$198 million</i>	<i>\$76 million</i>
Costs to Community (Government plus Households)		
Implementation costs	\$14 million	\$14 million
Cost of PROMISe Program	\$189 million	\$66 million
Additional costs from Clinical Intervention Prompt Campaigns	\$10 million	\$3 million
<i>Total Costs to Community</i>	<i>\$214 million</i>	<i>\$83 million</i>
Net Benefit to Government (Years 1-5)	\$732 million	\$348 million
Net Benefit to Community (Years 1-5)	\$918 million	\$433 million

Risk assessment and mitigation strategies

The implementation of any major project involves risks. To formulate a plan to mitigate the risks that the Government and the Pharmacy Guild will face in the implementation of the Base Case Option, a register of risks and mitigation strategies was developed as part of the Implementation Plan. Table ES 15 provides an overview of the types of risks associated with the PROMISe Program and the major mitigation strategies proposed to control these risks.

Table ES 15. Description of risks and their potential application to the PROMISe Program

Risk	Description	Example in PROMISe Program	Related mitigation strategies
Investment planning risk	Relates to the risk that the investment has not been robustly or rigorously prepared so that issues critical to its success have been overlooked.	Inadequate scoping of the ICT systems and costing	Peer review of plan through UMORE review and Advisory Committee. Consultations with multiple experts. Contingency allowances (10%).
Completion risk	Arises from the potential for the investment not to occur within the time and budget parameters set	A large number of dispense vendors developing the PROMISe software extend the development phase of the project	Stagger dispense vendor development schedules. Allow additional development time to reduce dependencies of subsequent tasks.
Demand risk	Risk that attaches to the demand for the product of service which is to be provided	The risk that more pharmacists participate than projected	Contingency costs built into financial modelling. Cap per pharmacy of \$15,000 p.a. (excluding upfront payment of \$4k) limits total risk to Government. Establishment of training program and change management strategy.
Implementation risk	Risk that the outcomes and outputs expected from a project are not able to be realised.	For the PROMISe Program, there is the potential risk that pharmacists will only perform low —value interventions	Ensure remuneration package maximises participation while minimising risk that Program delivers no value. The introduction of Clinical Intervention Prompt Campaigns. Establishment of education support desk. Establishment of training program and change management strategy.
Management risk	Risk that arises from relying on the skills of the proposed project team to deliver the project.	The risk that the Guild Project Office lacks the skills to deliver the project	Employ the same team that is managing Fourth Community Pharmacy Agreement Programs.
Operations risk	Risk related to the operation and management of a Program	Software release versions become out of sync between dispense vendors and the repository	Set up central management/control point to coordinate the development and deployment of future revisions and updates. Establishment of education support desk. Establishment of training program and change management strategy.
Financial risk	Risks such as unanticipated levels of expenditure.	Inadequate scoping of the Implementation Plan and costing	Peer review of plan through UMORE review and Advisory Committee. Consultations with multiple experts from the GUILD, PSA and Deloitte experts. Establishment of a monitoring and compliance scheme.

In particular, the Implementation Plan provides for three major strategies to be deployed as part of the ICT and Operations Phase that will significantly control the risks associated with the PROMISe Program. These include:

- The provision of education support and training to pharmacies
- The rollout of a comprehensive change management strategy
- The development of a monitoring and compliance framework.

Training and education support

DeBoos Associates research showed that one of the largest major non-monetary barriers to performing clinical interventions and documentation included inadequate knowledge of clinical interventions by pharmacists. Thus both training and ongoing education support for pharmacists was seen as essential

to ensuring that pharmacists are able to identify and classify appropriate clinical interventions and perform/document these interventions accurately.

It is recommended as part of the Implementation Plan and Risk Management Strategy that an Education Support help desk is established to support pharmacists with questions they may have regarding the nature of interventions (rather than software questions). It was expected that an email query function would be built-into the national website and a national hotline would be established. Such an approach would be consistent with the rollout of the Guild's Mirixa software, which provides, through the Pharmacy Guild, a help desk that employs 5 staff members. It was assumed that three additional people would be required in Year 2 (the first year of operation) but that this may be able to be scaled down over time.

Pharmacists would also be required to undertake basic training in the use of the software and the types of clinical interventions (the DOCUMENT system) in order to access payments from the PROMISE Program (specifically the \$4,000 up front Program payment to the pharmacy). Based partly on the experience of the Diabetes Program (DMAS), where a pharmacy employs multiple pharmacists, it is recommended that at least two pharmacists from each pharmacy be required to complete the training in order to ensure the information is translated back to the pharmacy.

It was recommended that training be provided through a mix of virtual classroom (online) courses and face-to-face seminars using case histories that include both classification and the likely outcome should an intervention not occur. This would provide for a minimisation of total training costs while also ensuring that some pharmacists, particularly older pharmacists, would not be discouraged to participate in the Program due to lack of comfort with an online delivery environment and ultimately assist with the procedural shift required in the pharmacy community.

To help facilitate ongoing support and education, feedback will be captured and disseminated using comparative reports on other pharmacies intervention rates by geographical region. In addition, newsletters with case histories with resultant estimated health cost savings will be disseminated to assist with the education process.

Change management strategy

DeBoos Associates research also revealed that the other major non-monetary barrier to clinical interventions and documentation was poorly trained staff and entrenched practices of non-recording, which have been developed as a result of pharmacists' inability to see any tangible purpose for the documentation of interventions.

To drive more frequent interventions by pharmacists that serve to improve the quality use of medicines and prevent avoidable GP visits and hospital admissions, it is recommended as part of the Implementation Plan and Risk Management Strategy that a comprehensive change management strategy be developed to support the successful deployment of the PROMISE Program nationally.

The goal of the change management program will be overcome people related barriers and in parallel utilise the drivers identified in DeBoos Associates research to ultimately improve the quality use of medicines. The change management program will be focussed on:

- Improving the *level of readiness* of pharmacists for change
- Increasing the *level of adoption* of the PROMISE Program
- Supporting changes to the way pharmacists *engage with and manage clients*
- *Increasing the rate of documentation* by pharmacists through the PROMISE Program.

Building on the analysis of barriers to implementation undertaken by DeBoos Associates, the change management program will include the following key streams of work:

- *Develop Change and Adoption Strategy* — This stream of work will involve a change and adoption team, engaged by the Pharmacy Guild, to work in collaboration with the Guild and other key bodies to establish the stakeholder engagement and communication activities that will assist pharmacies to overcome the barriers to clinical intervention and documentation at each step of the dispensing process. The stakeholder engagement and communication activities will need to be implemented in a manner that engages and addresses the unique

requirements of different pharmacy types. The Change and Adoption Strategy would define the strategies and activities to be conducted in the lead up to, and during, implementation of clinical intervention and documentation.

The major areas of the Change and Adoption Strategy will be:

- *Development of the Stakeholder Engagement Strategy:* The stakeholder engagement work stream will develop and implement a strategy to determine the activities needed to increase pharmacists' understanding, acceptance, and ownership of the PROMISE Program. The area will be managed nationally, and work on both a 'Program level' and 'product-specific' level.
- *Development of a Communications Strategy and Plan:* The communications work stream will develop a communication strategy and plan to ensure a coordinated and consistent approach to national communications. It will also provide a comprehensive view of the communication channels, timing and messages being sent to stakeholders. This area of work will also need to be managed nationally and work on both a 'Program level' and 'product-specific' level.
- *Conduct Change Readiness Assessment:* The change readiness work stream will assess stakeholder understanding of, and commitment to, clinical intervention and documentation. The work stream will develop and launch online surveys to key stakeholder groups and analyse the results.
- *Implementation of Change and Adoption Activities* — The implementation of stakeholder engagement and communication activities, identified in the Change and Adoption Strategy, will take place during the planning for, and implementation of the clinical intervention and documentation. Effective stakeholder engagement will ensure that results and issues are communicated with integrity and transparency and decisions are made with the involvement of key individuals. Communication will be critical to the success of the PROMISE Program as targeted, ongoing and two way communication will assist with building commitment, managing expectations and ultimately preparing pharmacists for the change in current dispensing routines. In support of the DeBoos Associated research it is recommended that a variety of communication channels are utilised as this will assist with reach and also understanding, potential mediums include newsletters, bench marking reports or pop ups linked to public health initiatives. The results from the change readiness assessment will enable early detection of high risk areas that left unresolved may put the PROMISE Program in jeopardy and erode the value of clinical intervention and documentation.
- *Ongoing Training Strategy and Needs Analysis* — This stream of work will determine the training needs of pharmacists and develop a strategy that will provide the direction, goals, and objectives of the training delivery. The delivery of the training strategy will be critical in driving sustained behavioural change. DeBoos Associated research suggests that many pharmacists find it difficult to recognise clinical interventions as a process as it is typically an instinct. Therefore one of the objectives of the training strategy and needs analysis will be to provide pharmacists with the information and skills to break down this instinct into specific components in dispensing and counselling. This will assist pharmacists recognise an intervention and subsequently document.

Monitoring and compliance framework

Finally, it was recommended that a rigorous monitoring and compliance framework is established as part of the Program: to prevent fraud within the system; to ensure documentation is compliant with the Program requirements; and to evaluate the quality of the clinical intervention. To meet these objectives there will be three levels of auditing that will be required:

- Identification of possible fraud through data analytics reviews and trending analysis
- Compliance and enforcement of documentation requirements through random audits of pharmacies
- Quality assurance of clinical interventions through peer audits.

Prevention of fraud

There will be a very significant volume of data available for the Guild and the Department to use to identify potential fraud within the system. For example, the data repository will provide the following information:

- De-identified patient key numbers
- Patient history, including the script that prompted the intervention
- Records of the drug related problem identified by the pharmacist
- Records of the pharmacist's recommendation
- The outcome of the intervention
- Pharmacist's initials or other form of ID.

This will enable very sophisticated data analysis to be undertaken to identify irregularities in pharmacist documentation behaviour, which will enable additional targeting of compliance actions to be undertaken as necessary. Auditing claims data using this forensic data analytics approach provides a highly cost effective mechanism for identifying and deterring fraud. This approach has been used across a range of industries to control and prevent inappropriate payments to health practitioners, including for example by hospital and ambulance services in Victoria.

In the context of the PROMISe Program, for example, data analysis would allow the Government to identify outlier claims in terms of:

- Abnormally high levels of interventions
- Frequency of interventions delivered to a patient or small group of patients.

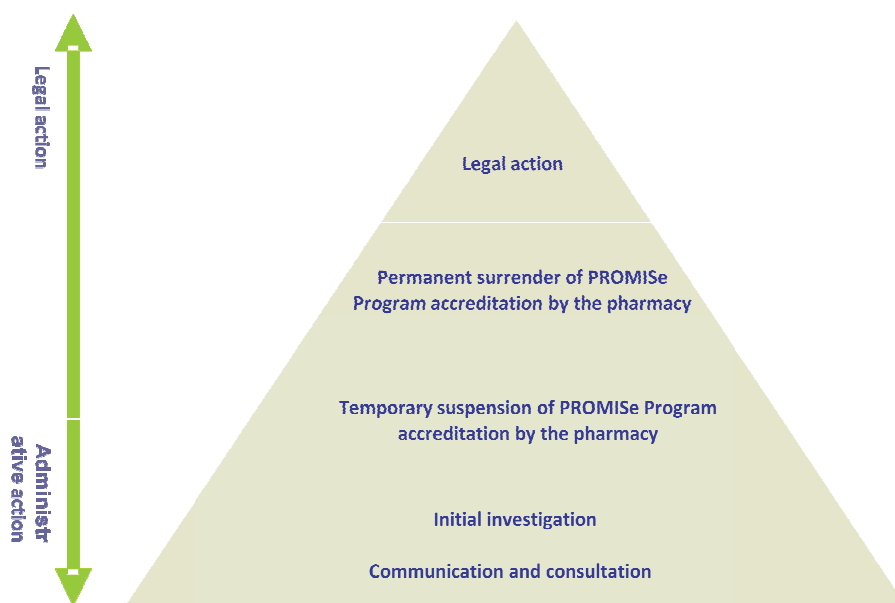
As the analysis of the claims data is undertaken, the project team would also be able to look for other patterns in the data that would enable the Government to audit the pharmacy for potential inappropriate claims.

Where inappropriate claims have been identified, an audit of the pharmacy's claims would be triggered, and, depending on the findings of the audit, a range of penalties may be enforced.

Response to fraud

The Government and the Guild will need to determine the enforcement approach to take in instances of fraud and non-compliance, taking into account all the circumstances of the matter. The enforcement measures that will be available to the Guild are likely to range from less formal and less punitive options to progressively more substantive legal responses. The Guild may proceed with more serious enforcement actions in appropriate circumstances and when other measures have not had the desired effect. This approach is consistent with the 'pyramid of enforcement' model (Figure ES 2), which has been adapted to illustrate the PROMISe Program enforcement activities that may be adopted by the Guild.

Figure ES 2. Compliance and enforcement framework — potential responses to fraud



The above pyramid of enforcement is consistent with other approaches to inappropriate payment claims that have been implemented by the Government as part of the establishment of universal funding schemes for the provision of medical services. It would be possible, for example, for the Government to establish a similar scheme of enforcement as the system that has been developed for instances of inappropriate service provision by medical practitioners making claims under Medicare and/or the Pharmaceutical Benefits Scheme through the Professional Services Review Scheme (PSR).¹² Under the PSR scheme, where it has been found that a medical practitioner has engaged in inappropriate practices, the Determining Authority may issue a range of sanctions commensurate with the nature of the breach, including:

- a reprimand by the Director of PSR or the Director's nominee
- counselling by the Director of PSR or the Director's nominee
- repayment of the whole or part of any Medicare benefit in respect of which the person under review has been found to have engaged in inappropriate practice
- revocation or suspension of the authority to prescribe or dispense where the person under review has been found to have engaged in inappropriate practice involving prescribing or dispensing a pharmaceutical benefit
- full or partial disqualification from Medicare for periods of up to three years.

¹² The Professional Services Review Scheme (the Scheme) gives the Professional Services Review (PSR) authority to investigate whether health practitioners, including include medical and dental practitioners, podiatrists, chiropractors, physiotherapists and optometrists, have engaged in inappropriate practice when providing Medicare services or when prescribing medication. The Scheme, including the Review process, is set out in the provisions of the *Health Insurance Act* (1973) (the Act).

Compliance and enforcement of documentation requirements: recommended approaches

The second level of auditing would be focused on ensuring pharmacists are compliant with all aspects of documentation required to receive payment, including the nature of the drug related problem (according to the DOCUMENT system) and their recommendation. There are two potential ways of providing this compliance function:

- *Minimum compliance framework* — The Guild, as the administrators of the Program, could engage a third party to undertake randomised audits of pharmacies, which would involve reviews of available information.
- *Enhanced compliance framework* — In this option, pharmacists would be required to obtain documentation from the patient at the time of service that the intervention did occur, including the reason for the intervention, the pharmacist's recommendation and the outcome of the intervention. This would be similar to the HICAPS requirements for patient signatures for dental claims. This would, however, constitute a more invasive approach to compliance that may adversely impact on documentation rates. In combination with the data analytics approach to managing fraud, this may be an unnecessary additional level of compliance.

Importantly, the documentation compliance and enforcement systems should be linked to the training and change management programs.

Where inappropriate documentation has been identified, a range of penalties may be enforced consistent with the 'pyramid of enforcement' scheme implemented to control fraud (See Figure ES 2 above).

Quality assurance of clinical interventions through peer audits

In addition, the Department of Health and Ageing and the Guild may wish to audit the quality of the clinical interventions being made by pharmacists. This could similarly be done through a randomised audit of pharmacies but would importantly require clinical input to ensure the validity of the audit findings. This could be accomplished through the introduction of a peer review process, which is currently undertaken in hospital settings.

Conclusions and recommendations

The PROMISE Program has four key objectives:

- To improve and promote the *safe* use of pharmaceutical products
- To *prevent* the inappropriate use of pharmaceutical products
- To promote the *fiscal sustainability* of the Australian healthcare system
- To promote the continuing *professional development* of pharmacists to strengthen the delivery of primary healthcare services.

These objectives are strongly aligned with the recent directions of Australian healthcare policy more broadly and the objectives of the National Medicines Policy. Consequently, a well implemented, well run PROMISE will deliver direct and indirect financial benefits as well as supporting the achievement of the Government's broader health policy objectives.

The analysis and Business Case presented in this report recommends that in order to optimise the net benefits to the Community, the Government should remunerate participating pharmacists as follows:

- \$4,000 upfront payment per pharmacy following completion of training in the DOCUMENT system
- \$20 per documented clinical intervention
- \$1,000 quarterly payment contingent on pharmacies meeting a prescribed intervention and documentation threshold per quarter
- Non-monetary allowance for the accrual of CPD points from participation in the Program.

A cap of \$15,000 per pharmacy per annum (excluding the upfront payment of \$4,000 per pharmacy) should also be implemented to limit the financial risk to the Government. This cap should be subject to review over time as the outcomes of the Program are also monitored and reviewed. The expected cost to the Government of a capped Base Case remuneration model would be \$370 million over five years (assuming an uptake rate of 68 per cent by all pharmacies). The potential total cost, if all pharmacies participated, would be \$601 million.

As an alternative to the Base Case remuneration model, the Government could also consider options for a Phased Approach remuneration model. Because the participation in the Program would be expected to be far less under this Phased Approach remuneration model than the Base Case remuneration model, the net benefit would be substantially less. The Program would still be expected, however, to deliver a net economic benefit to the Community of approximately \$433 million, and a net savings to Government of approximately \$348 million. The total cost to Government of the Program under this option would be expected to be \$76 million over five years, based on an expected uptake rate of 31 per cent by community pharmacy. The potential total cost, if all pharmacies participated, would be \$208 million.

Because the participation in the Program would be expected to be so much lower under this Phased Approach remuneration model there would need to be a very strong focus on the change management strategy as a part of the Program (which is required for the Base Case remuneration model as well). Moreover, it is recommended that if such a remuneration model is implemented that the Government review participation rates over time to ensure the objectives and outcomes of the Program are being achieved. The change management and training strategies, which should be strongly integrated, should be modified over time to ensure the goals of the Program are being achieved. It is recommended that a review of Program outcomes is undertaken at the end of Years 2, 3 and 4 in the implementation plan.

Examples of recorded interventions

Category	Example
D1	Patient was discharged from hospital and was unknowingly taking two brands of amlodipine at the same time, Norvasc and Amlodipine Sandoz
D2	Patient taking verapamil was prescribed clarithromycin (increased serum verapamil concentration)
D3	Child prescribed Aldomet 250mg tid (methyldopa), was meant to be prescribed as Amoxycillin 250mg tid
D4	Patient was dispensed Avapro HCT 300/12.5 from another pharmacy, patient should have been dispense Avapro HCT 300/25
D5	Patient was prescribed beclomethasone asthma inhaler, yet beclomethasone nasal spray was intended
D6	Lady in third trimester requested ibuprofen for pain relief which is harmful to the foetus
D7	Elderly patient was prescribed Diltiazem CD 180mg, pharmacist confirmed with Doctor that the patient did not have an associated medical condition
D0	Sofradex ear drops had been unavailable for several weeks, doctor contacted and ciprofloxacin drops prescribed
O1	Patient being prescribed Panadol Osteo (paracetamol 665mg) two tablets four times daily
O2	Patient stabilised on phenytoin 100mg 3 daily presented with a new prescription for phenytoin 30mg 3 daily
O3	Patient prescribed Norspan weekly patch to be applied every 3 days
O0	Pharmacist confirmed the quantity of diazepam to supply to patient
C1	Patient prescribed naproxen and pramipexole, but patient not taking pramipexole as patient thought it was the same as naproxen
C2	Patient administered 200 doses of salbutamol inhaler over two days to treat uncontrolled asthma
C3	Patient forgetful of when or what tablets she takes. Dose administration aid was initiated
C4	Pharmacist identified patient had obtained two supplies of diazepam from two different doctors within several days
C5	Arthritic patient having difficulty using eye drop bottle. Provided Eyeopt device to assist administration.
C0	Patient's relative read the carbamazepine consumer leaflet and advised patient not to use the carbamazepine as it caused liver problems
U1	Patient currently using blood pressure medication had blood pressure measured in pharmacy and it was very high 220/100
U2	Patient discharged from hospital with pain control, but nothing had been provided for the patient's severe nausea
U3	Patient experiencing gout attacks every one or two months was using colchicine and was unaware of preventative medication or dietary modifications
U0	Patient prescribed inadequate quantity of medication for malaria prophylaxis

M1	Patient had been using amiodarone for several years without laboratory monitoring
M2	Patient offered blood pressure measurement, blood pressure was measured on two separate days both times high
M0	Female patient taking multiple antibiotics, pharmacist explained what to look for regards candidal symptoms
E1	Patient taking atorvastatin was concerned about the increased risk of myopathy
E2	Patient using rabeprazole to reduce regurgitation symptoms. Lifestyle advice provided to manage condition
E0	Pharmacist obtained contact details and procedure for patient to order incontinence supplies from Independence Health Australia
N0	Patient provided prescription in another patient's name
T1	Patient experienced dizziness, nausea and drowsiness since commencing metoprolol 50mg

Table 1

Case	Significance	Disability Avoided	GP visits	Specialist visits	Cost of investigations avoided	Duration of admission (days)	Healthcare Utilisation Costs	Drug Cost	Total Cost
24 S1		0.006404	2.32	0.28	\$ 65.12	0.24	-\$ 391.64	-\$ 237.21	-\$ 628.84
46 S1		0.017437	1.36	0.30	\$ 24.96	0.13	-\$ 269.76	\$ -	-\$ 269.76
47 S1		0.005806	1.27	0.45	\$ 11.16	0.15	-\$ 221.82	\$ -	-\$ 221.82
55 S1		0.00096	0.55	0.13	\$ 3.45	0.09	-\$ 120.64	\$ -	-\$ 120.64
84 S1		0.010988	2.74	0.65	\$ 53.73	0.40	-\$ 525.43	\$ -	-\$ 525.43
85 S1		0.001017	0.22	0.01	\$ 3.58	0.04	-\$ 45.48	\$ 8.22	-\$ 37.26
86 S1		0.004216	1.17	0.15	\$ 47.21	0.13	-\$ 218.67	\$ -	-\$ 218.67
87 S1		0.002823	1.47	0.12	\$ 1.38	0.07	-\$ 122.66	-\$ 9.57	-\$ 132.22
90 S1		0.012729	0.93	0.17	\$ 2.76	0.08	-\$ 192.56	\$ -	-\$ 192.56
91 S1		0.01831	1.37	0.39	\$ 11.96	0.00	-\$ 79.54	\$ -	-\$ 79.54
109 S1		0.022361	1.70	0.47	\$ 14.63	0.00	-\$ 101.86	\$ -	-\$ 101.86
121 S1		0.005939	0.68	0.07	\$ 3.88	0.00	-\$ 30.60	\$ 103.03	\$ 72.43
135 S1		0.002605	0.50	0.20	\$ 1.74	0.00	-\$ 30.46	\$ -	-\$ 30.46
147 S1		0.020949	2.73	0.89	\$ 105.54	0.75	-\$ 938.96	\$ -	-\$ 938.96
177 S1		0.002159	0.63	0.19	\$ 7.57	0.00	-\$ 42.20	\$ -	-\$ 42.20
197 S1		0.003186	0.39	0.05	\$ 2.45	0.05	-\$ 66.32	\$ -	-\$ 66.32
198 S1		0.005249	1.43	0.61	\$ 15.42	0.38	-\$ 447.19	\$ -	-\$ 447.19
199 S1		0.004463	0.54	0.06	\$ 3.63	0.07	-\$ 89.09	\$ -	-\$ 89.09
200 S1		0.014316	1.10	0.51	\$ 4.02	0.40	-\$ 513.39	\$ -	-\$ 513.39
2 S2		0.005567	1.40	0.41	\$ 19.36	0.14	-\$ 213.94	-\$ 5.16	-\$ 219.10
5 S2		0.014545	-1.04	0.45	\$ 120.97	0.30	-\$ 316.67	\$ 258.58	-\$ 58.09
6 S2		0.002189	0.72	0.20	\$ 10.12	0.25	-\$ 279.24	\$ 23.60	-\$ 255.64
8 S2		0.010164	2.46	0.74	\$ 32.37	0.28	-\$ 400.31	\$ -	-\$ 400.31
10 S2		-0.00891	-2.14	0.63	\$ 80.64	0.78	-\$ 848.18	\$ 468.33	-\$ 379.85
20 S2		0.029561	2.56	0.45	\$ 11.53	0.14	-\$ 338.22	\$ -	-\$ 338.22
21 S2		0.017332	2.09	0.55	\$ 23.79	0.38	-\$ 560.43	\$ -	-\$ 560.43
25 S2		0.016835	3.25	0.83	\$ 158.42	0.63	-\$ 874.70	\$ -	-\$ 874.70
34 S2		0.008394	1.12	0.10	\$ 7.08	0.12	-\$ 156.74	\$ 23.26	-\$ 133.48
37 S2		0.007373	2.03	0.59	\$ 43.40	0.49	-\$ 597.30	\$ -	-\$ 597.30
38 S2		0.007223	1.48	0.13	\$ 6.52	0.12	-\$ 180.87	\$ -	-\$ 180.87

39 S2	-0.03144	-2.20	-0.10	\$	40.96	0.38	-\$	330.39	\$	53.61	-\$	276.78
40 S2	0.013522	0.28	0.63	\$	88.69	0.53	-\$	600.25	\$	55.72	-\$	544.53
41 S2	0.005589	1.82	0.34	\$	4.02	0.19	-\$	275.17	\$	0.61	-\$	274.56
48 S2	0.000744	0.58	0.10	\$	38.00	0.05	-\$	121.46	\$	-	-\$	121.46
56 S2	0.015845	1.32	0.79	\$	80.30	0.59	-\$	759.07	\$	666.24	-\$	92.83
60 S2	0.002027	0.59	0.10	\$	16.72	0.07	-\$	108.94	-\$	24.38	-\$	133.31
64 S2	0.01188	0.94	0.57	\$	56.42	0.40	-\$	526.76	\$	-	-\$	526.76
69 S2	0.012867	1.62	0.59	\$	23.33	0.18	-\$	267.72	-\$	93.08	-\$	360.80
77 S2	0.008396	1.67	0.49	\$	75.06	0.36	-\$	471.91	\$	70.42	-\$	401.48
81 S2	0.008921	1.34	0.38	\$	24.01	0.33	-\$	387.57	\$	1.93	-\$	385.64
83 S2	0.030526	0.79	0.43	\$	49.53	0.13	-\$	202.15	\$	-	-\$	202.15
88 S2	0.003708	0.93	0.10	\$	7.85	0.13	-\$	165.90	\$	1.95	-\$	163.95
92 S2	0.004014	1.04	0.13	\$	8.57	0.16	-\$	203.49	\$	1.57	-\$	201.92
94 S2	0.004177	1.04	0.10	\$	7.65	0.13	-\$	166.78	\$	0.16	-\$	166.62
96 S2	0.00493	0.53	0.14	\$	14.04	0.13	-\$	155.31	\$	103.73	-\$	51.58
97 S2	0.004326	1.23	0.39	\$	32.14	0.23	-\$	354.92	-\$	34.52	-\$	389.43
98 S2	0.008227	1.08	0.21	\$	16.65	0.22	-\$	264.77	-\$	2.62	-\$	267.39
100 S2	0.000246	0.24	0.05	\$	10.82	0.03	-\$	49.64	\$	-	-\$	49.64
102 S2	0.00445	0.58	0.06	\$	3.58	0.07	-\$	87.42	\$	-	-\$	87.42
103 S2	0.005327	0.74	0.13	\$	11.99	0.14	-\$	171.78	\$	-	-\$	171.78
107 S2	0.001998	0.46	0.02	\$	2.82	0.03	-\$	46.98	\$	2.36	-\$	44.62
110 S2	0.027903	4.26	1.36	\$	95.58	0.39	-\$	733.24	-\$	59.81	-\$	793.05
126 S2	0.021406	3.92	1.25	\$	167.56	0.85	-\$	1,189.22	\$	-	-\$	1,189.22
131 S2	0.003076	1.46	0.11	\$	41.27	0.11	-\$	201.70	-\$	146.01	-\$	347.71
132 S2	0.017674	1.51	0.15	\$	-	0.14	-\$	330.68	\$	-	-\$	330.68
140 S2	0.006953	1.97	0.46	\$	97.81	0.36	-\$	507.43	-\$	243.55	-\$	750.98
141 S2	0.026409	2.38	0.58	\$	74.24	0.70	-\$	620.40	\$	603.95	-\$	16.45
145 S2	0.011401	1.89	0.28	\$	78.05	0.33	-\$	363.82	\$	141.20	-\$	222.62
148 S2	0.008531	1.79	0.82	\$	52.32	0.49	-\$	672.00	\$	-	-\$	672.00
152 S2	0.012787	2.42	0.52	\$	92.90	0.42	-\$	573.75	\$	-	-\$	573.75
153 S2	0.000864	0.24	0.01	\$	5.87	0.06	-\$	66.61	\$	-	-\$	66.61
154 S2	0.018669	3.40	0.59	\$	101.99	0.45	-\$	570.15	\$	-	-\$	570.15
160 S2	0.005762	0.45	0.29	\$	28.83	0.23	-\$	261.77	\$	-	-\$	261.77

163 S2	0.008957	1.73	0.36	\$	38.49	0.32	-\$	317.60	\$	-	-\$	317.60
169 S2	0.003493	0.98	0.17	\$	13.45	0.14	-\$	203.90	-\$	49.16	-\$	253.06
170 S2	0.012168	1.98	0.55	\$	26.11	0.39	-\$	466.93	-\$	8.26	-\$	475.19
175 S2	0.003253	0.81	0.08	\$	6.19	0.10	-\$	129.87	\$	-	-\$	129.87
176 S2	0.00122	0.29	0.02	\$	2.22	0.03	-\$	40.20	-\$	7.81	-\$	48.01
179 S2	0.000294	0.39	0.09	\$	22.03	0.03	-\$	84.14	-\$	175.42	-\$	259.56
182 S2	0.000407	0.60	0.15	\$	36.85	0.04	-\$	135.94	-\$	225.81	-\$	361.75
183 S2	0.008027	1.10	0.10	\$	59.08	0.16	-\$	284.79	\$	4.55	-\$	280.23
184 S2	0.001014	0.71	0.10	\$	6.37	0.06	-\$	88.59	\$	-	-\$	88.59
185 S2	0.001134	0.30	0.04	\$	2.12	0.04	-\$	54.83	\$	-	-\$	54.83
187 S2	0.011258	1.71	0.27	\$	70.67	0.37	-\$	376.77	-\$	434.70	-\$	811.47
190 S2	0.009343	1.01	0.09	\$	0.24	0.08	-\$	175.74	\$	-	-\$	175.74
191 S2	0.000658	0.16	0.01	\$	0.71	0.01	-\$	17.69	\$	-	-\$	17.69
193 S2	0.00493	0.60	0.18	\$	14.74	0.12	-\$	150.16	\$	-	-\$	150.16
194 S2	0.002202	0.34	0.09	\$	5.55	0.03	-\$	51.61	\$	-	-\$	51.61
195 S2	0.006962	0.66	0.27	\$	25.27	0.16	-\$	226.79	\$	-	-\$	226.79
196 S2	0.00025	0.82	0.25	\$	65.05	0.02	-\$	162.90	\$	-	-\$	162.90
1 S3	0.006091	1.60	0.25	\$	56.56	0.22	-\$	332.75	-\$	287.06	-\$	619.81
9 S3	0.015821	1.29	0.76	\$	76.97	0.55	-\$	729.32	\$	62.62	-\$	666.70
11 S3	0.015499	1.32	0.33	\$	25.68	0.16	-\$	259.75	-\$	442.80	-\$	702.55
12 S3	0.00431	1.31	0.28	\$	3.27	0.16	-\$	218.05	-\$	740.59	-\$	958.64
13 S3	0.028065	2.82	0.87	\$	62.46	0.30	-\$	389.63	\$	14.80	-\$	374.83
14 S3	0.007842	2.04	0.74	\$	58.28	0.53	-\$	653.39	-\$	332.08	-\$	985.47
15 S3	0.007488	2.02	0.20	\$	66.51	0.22	-\$	352.30	-\$	257.91	-\$	610.21
16 S3	0.014459	3.64	1.04	\$	46.55	0.85	-\$	965.47	-\$	295.91	-\$	1,261.38
17 S3	0.001956	1.52	0.39	\$	47.08	0.26	-\$	372.20	\$	68.04	-\$	304.17
18 S3	0.053608	4.43	1.17	\$	71.78	0.64	-\$	972.28	-\$	488.37	-\$	1,460.65
19 S3	-0.01103	0.58	0.08	\$	9.72	0.04	\$	130.60	-\$	250.57	-\$	119.97
27 S3	0.022027	1.68	1.01	\$	101.24	0.73	-\$	972.28	\$	1,210.93	\$	238.66
28 S3	0.015592	2.33	1.16	\$	72.46	0.49	-\$	1,141.44	-\$	335.75	-\$	1,477.19
36 S3	0.003384	0.41	0.11	\$	9.99	0.09	-\$	112.88	-\$	212.67	-\$	325.55
42 S3	0.016691	1.63	0.50	\$	20.07	0.44	-\$	598.89	\$	-	-\$	598.89
43 S3	0.012744	2.07	0.40	\$	61.78	0.38	-\$	527.94	-\$	118.18	-\$	646.11

45 S3	0.030577	2.19	0.60	\$	82.10	0.30	-\$	444.19	\$	326.73	-\$	117.46
49 S3	0.015417	1.61	0.44	\$	9.98	0.10	-\$	195.03	-\$	173.36	-\$	368.39
50 S3	0.017873	2.07	0.69	\$	46.73	0.45	-\$	592.61	\$	-	-\$	592.61
51 S3	0.024498	3.72	1.11	\$	90.60	0.91	-\$	1,263.59	\$	-	-\$	1,263.59
52 S3	0.000865	0.90	0.20	\$	37.79	0.10	-\$	176.19	\$	96.63	-\$	79.56
53 S3	0.018713	4.31	0.81	\$	90.12	0.52	-\$	835.77	-\$	36.88	-\$	872.65
54 S3	0.004296	1.30	0.31	\$	24.62	0.28	-\$	351.74	\$	-	-\$	351.74
57 S3	0.004468	1.56	0.16	\$	50.32	0.15	-\$	254.22	-\$	183.05	-\$	437.27
58 S3	0.001047	0.87	0.11	\$	7.81	0.05	-\$	86.93	\$	36.33	-\$	50.60
59 S3	0.019477	1.44	0.40	\$	13.47	0.05	-\$	139.50	-\$	10.36	-\$	149.86
61 S3	0.008541	1.17	0.10	\$	6.97	0.12	-\$	162.68	\$	387.51	\$	224.83
62 S3	0.010277	0.68	0.11	\$	0.25	0.09	-\$	210.87	\$	2.92	-\$	207.96
63 S3	0.002389	0.58	0.05	\$	4.14	0.06	-\$	83.89	\$	-	-\$	83.89
65 S3	0.03281	0.04	0.34	\$	55.72	0.11	-\$	163.07	\$	310.05	\$	146.98
66 S3	0.00377	1.46	0.22	\$	52.72	0.16	-\$	251.32	\$	74.28	-\$	177.04
67 S3	0.005102	1.30	0.16	\$	11.40	0.19	-\$	248.39	\$	-	-\$	248.39
68 S3	0.004899	0.57	0.05	\$	3.26	0.00	-\$	25.55	-\$	10.75	-\$	36.29
70 S3	0.019823	1.44	0.19	\$	-	0.18	-\$	401.90	\$	-	-\$	401.90
71 S3	0.06209	6.49	2.30	\$	136.05	1.46	-\$	1,775.73	-\$	72.63	-\$	1,848.37
72 S3	0.018928	1.69	0.37	\$	10.32	0.09	-\$	186.23	-\$	771.31	-\$	957.54
73 S3	0.011868	1.44	0.75	\$	46.80	0.49	-\$	711.71	-\$	63.76	-\$	775.47
74 S3	0.005795	1.96	0.36	\$	4.24	0.20	-\$	291.54	\$	2.05	-\$	289.49
75 S3	-0.00086	-1.88	-0.41	-\$	16.55	-0.11	\$	189.59	\$	-	\$	189.59
76 S3	0.016521	2.22	0.82	\$	106.82	0.59	-\$	789.32	\$	-	-\$	789.32
78 S3	0.006535	2.05	0.43	\$	5.05	0.24	-\$	337.36	\$	11.60	-\$	325.76
79 S3	0.00825	1.35	0.16	\$	34.78	0.23	-\$	231.52	\$	-	-\$	231.52
80 S3	0.001451	0.62	0.21	\$	-	0.07	-\$	123.62	-\$	3.70	-\$	127.33
82 S3	0.003638	0.97	0.14	\$	8.87	0.17	-\$	210.55	\$	2.88	-\$	207.67
93 S3	0.000569	0.30	0.06	\$	1.48	0.04	-\$	47.39	\$	-	-\$	47.39
95 S3	0.002911	0.81	0.26	\$	1.98	0.05	-\$	101.20	\$	4.09	-\$	97.10
99 S3	0.000894	0.25	0.04	\$	2.54	0.05	-\$	61.61	\$	-	-\$	61.61
101 S3	0.002558	0.43	0.08	\$	7.38	0.08	-\$	98.18	-\$	682.64	-\$	780.82
104 S3	0.001353	0.74	0.09	\$	23.71	0.07	-\$	110.52	\$	-	-\$	110.52

105 S3	0.004713	1.00	0.08 \$	7.38	0.08 -\$	122.77 \$	-	-\$	122.77
106 S3	0.006141	0.56	0.31 \$	30.20	0.20 -\$	245.59 -\$	646.10	-\$	891.68
108 S3	0.0038	0.91	0.07 \$	6.01	0.09 -\$	121.84 \$	0.39	-\$	121.45
113 S3	0.003981	1.49	0.28 \$	47.36	0.23 -\$	314.89 -\$	255.35	-\$	570.24
114 S3	0.002119	1.43	0.20 \$	43.94	0.13 -\$	226.25 \$	143.52	-\$	82.73
117 S3	0.026998	3.01	0.65 \$	47.20	0.31 -\$	523.32 \$	0.65	-\$	522.67
118 S3	0.01054	2.18	0.47 \$	69.26	0.14 -\$	298.34 -\$	117.36	-\$	415.69
120 S3	0.013063	3.07	0.94 \$	11.10	0.53 -\$	693.20 \$	1.08	-\$	692.12
122 S3	0.014668	3.79	1.55 \$	179.08	0.53 -\$	1,781.14 -\$	137.20	-\$	1,918.34
125 S3	0.034908	6.29	1.45 \$	118.42	1.02 -\$	1,084.86 -\$	58.08	-\$	1,142.94
127 S3	0.032407	3.19	0.82 \$	53.28	0.17 -\$	381.37 -\$	272.41	-\$	653.78
128 S3	0.031202	5.32	1.94 \$	64.59	0.91 -\$	1,213.87 -\$	256.07	-\$	1,469.94
129 S3	0.003882	1.43	0.65 \$	13.10	0.36 -\$	430.12 \$	-	-\$	430.12
133 S3	0.02487	1.69	0.49 \$	13.84	0.12 -\$	229.47 \$	-	-\$	229.47
134 S3	0.008768	1.78	0.22 \$	20.30	0.14 -\$	220.82 \$	-	-\$	220.82
136 S3	0.008343	1.81	0.17 \$	10.79	0.17 -\$	241.41 -\$	3.06	-\$	244.47
137 S3	0.007605	1.75	0.39 \$	81.54	0.31 -\$	431.85 \$	122.54	-\$	309.32
139 S3	0.003995	0.72	0.27 \$	2.29	0.00 -\$	42.19 \$	-	-\$	42.19
142 S3	0.016173	1.93	0.55 \$	19.25	0.12 -\$	225.76 -\$	20.93	-\$	246.68
143 S3	0.001434	1.35	0.30 \$	36.56	0.17 -\$	267.34 \$	538.16	\$	270.82
146 S3	0.002985	0.68	0.03 \$	3.76	0.03 -\$	61.16 \$	-	-\$	61.16
149 S3	0.003989	0.77	0.27 \$	2.35	0.00 -\$	44.54 -\$	1.03	-\$	45.57
150 S3	0.00827	0.98	0.09 \$	5.53	0.01 -\$	50.39 \$	-	-\$	50.39
151 S3	0.016961	2.03	0.50 \$	34.80	0.13 -\$	257.12 \$	-	-\$	257.12
156 S3	0.000112	0.34	0.06 \$	0.68	0.03 -\$	42.71 -\$	856.52	-\$	899.23
157 S3	0.015584	3.01	0.87 \$	108.77	0.60 -\$	839.83 \$	-	-\$	839.83
158 S3	0.012676	1.29	0.35 \$	13.48	0.27 -\$	392.24 \$	-	-\$	392.24
159 S3	0.004828	1.64	0.12 \$	39.38	0.11 -\$	206.53 -\$	77.36	-\$	283.89
161 S3	0.002274	1.51	0.22 \$	12.34	0.14 -\$	197.26 \$	-	-\$	197.26
162 S3	0.002563	1.11	0.41 \$	9.80	0.23 -\$	281.73 \$	-	-\$	281.73
164 S3	0.018921	4.57	1.02 \$	70.06	0.60 -\$	905.25 -\$	214.57	-\$	1,119.82
165 S3	0.011841	2.49	0.53 \$	28.67	0.45 -\$	533.33 \$	-	-\$	533.33
166 S3	0.010539	1.90	0.47 \$	82.72	0.37 -\$	508.88 \$	51.74	-\$	457.14

168 S3	0.011971	2.35	0.78 \$	101.42	0.56 -\$	771.25 \$	- -\$	771.25
171 S3	0.036408	5.49	2.37 \$	133.76	1.33 -\$	2,047.85 \$	- -\$	2,047.85
172 S3	0.028663	3.43	0.47 \$	87.33	0.11 -\$	330.71 -\$	4.66 -\$	335.37
173 S3	0.008717	2.28	0.61 \$	7.21	0.34 -\$	459.82 -\$	2.09 -\$	461.91
174 S3	0.010239	2.42	0.53 \$	62.08	0.17 -\$	329.06 -\$	13.58 -\$	342.64
178 S3	0.001091	0.34	0.09 \$	4.77	0.11 -\$	120.80 \$	- -\$	120.80
180 S3	0.00391	0.84	0.15 \$	4.84	0.07 -\$	106.52 -\$	2.86 -\$	109.38
181 S3	0.00254	0.58	0.03 \$	3.42	0.03 -\$	54.47 \$	- -\$	54.47
186 S3	0.00159	0.47	0.12 \$	24.65	0.07 -\$	117.22 -\$	281.01 -\$	398.23
188 S3	0.001017	0.65	0.17 \$	-	0.03 -\$	68.20 \$	1.17 -\$	67.03
189 S3	0.002192	0.55	0.06 \$	4.04	0.07 -\$	90.21 \$	- -\$	90.21
192 S3	0.000856	0.44	0.07 \$	3.90	0.05 -\$	70.20 -\$	21.74 -\$	91.94
3 S4	0.028922	2.96	1.65 \$	134.00	0.96 -\$	1,554.15 \$	- -\$	1,554.15
4 S4	0.003006	1.04	0.30 \$	15.72	0.37 -\$	421.61 \$	- -\$	421.61
7 S4	0.02885	3.03	1.67 \$	132.76	0.95 -\$	1,648.82 -\$	687.60 -\$	2,336.41
22 S4	0.012667	3.03	0.91 \$	10.64	0.51 -\$	667.56 \$	9.63 -\$	657.93
23 S4	0.017738	1.94	0.91 \$	28.44	0.21 -\$	323.49 -\$	38.12 -\$	361.62
26 S4	0.000536	0.83	0.25 \$	5.93	0.09 -\$	137.98 \$	- -\$	137.98
29 S4	0.003831	-3.37	0.25 -\$	1.03	0.96 -\$	779.40 \$	- -\$	779.40
30 S4	0.04503	0.79	1.59 \$	94.08	2.70 -\$	1,491.33 \$	2,085.19 \$	593.86
31 S4	0.028453	4.64	1.88 \$	96.83	1.23 -\$	1,710.99 \$	- -\$	1,710.99
32 S4	0.016768	3.35	0.80 \$	77.72	0.37 -\$	580.72 -\$	196.76 -\$	777.48
33 S4	0.019391	2.39	0.99 \$	119.51	0.69 -\$	949.81 \$	416.92 -\$	532.90
35 S4	0.01184	2.18	0.61 \$	101.86	0.46 -\$	615.55 \$	83.41 -\$	532.14
44 S4	0.002089	0.55	0.15 \$	1.73	0.08 -\$	110.64 -\$	1.86 -\$	112.50
89 S4	0.008548	0.65	0.18 \$	5.54	0.00 -\$	36.90 \$	- -\$	36.90
111 S4	0.039277	5.31	0.89 \$	122.82	0.31 -\$	646.79 -\$	13.76 -\$	660.55
112 S4	0.016498	3.88	1.38 \$	113.58	0.31 -\$	689.16 -\$	478.22 -\$	1,167.39
115 S4	0.011843	2.88	0.84 \$	9.93	0.47 -\$	624.63 \$	1.10 -\$	623.53
116 S4	0.024536	4.77	1.49 \$	78.34	0.59 -\$	1,020.95 \$	- -\$	1,020.95
119 S4	0.014784	3.11	0.40 \$	99.77	0.43 -\$	634.51 -\$	615.99 -\$	1,250.50
123 S4	0.015736	1.75	0.79 \$	15.20	0.48 -\$	588.48 -\$	7.83 -\$	596.31
124 S4	0.00299	0.97	0.25 \$	13.52	0.31 -\$	354.01 \$	8.86 -\$	345.15

130 S4	0.098584	7.76	3.61	\$	214.53	0.95	-\$	1,564.64	\$	-	-\$	1,564.64
138 S4	0.024333	2.67	0.59	\$	108.37	1.09	-\$	908.18	\$	81.24	-\$	826.94
144 S4	0.006863	0.91	0.42	\$	13.74	0.05	-\$	113.40	\$	-	-\$	113.40
155 S4	0.014767	2.13	0.65	\$	9.97	0.29	-\$	393.79	-\$	10.30	-\$	404.09
167 S4	0.021238	3.50	0.94	\$	150.03	0.86	-\$	1,076.64	\$	-	-\$	1,076.64

Step 13: Calculating the Difference between Current Practice and PROMISE Practice

There are key differences between a pharmacy environment in which the PROMISE program has been introduced, and one which conforms to the current practice. Of these differences, there are a number which affect the economic outcomes: -

1. Intervention frequency
2. Time spent finding interventions
3. Time spent performing interventions
4. The significance of the interventions found

Points 2, 3 and 4 can be determined or assumed through methods previously described, and do not need to be repeated here. However, point 1 is a challenging problem. The frequency with which interventions were actually performed is only known in the observer data. However, it is also known that the presence of observers have an impact on the frequency of intervention. Thus, to determine what the intervention frequency will actually be in an unobserved environment requires that we attempt to remove the effect of observation from the observer data.

Observers documented the actual number of interventions undertaken, as well as the number of these that were documented. We used the observation information from the non-software pharmacies and the observed information from the prompted PROMISE software group (group 3) to estimate what the unobserved intervention frequencies would be in the current practice and PROMISE practice pharmacies, respectively.

This was done by:

1. Determining the effect of observation
 - a. The effect was calculated from the ratio of the observed versus the unobserved documented intervention frequency in the middle 6 weeks of the trial¹ in the Group 3 pharmacies.
2. Estimating the Actual (unobserved) PROMISE intervention frequency
 - a. The observer effect ratio was applied to the unobserved documented intervention rate
3. Estimating the Current Practice (unobserved) intervention frequency
 - a. The observer effect was applied to the actual (observed) intervention rate in the non-software pharmacies

An outline of how this estimate was made can be seen in Figure 1.

¹ The middle six weeks were chosen for two reasons. Firstly, they remove both the “enthusiasm” effect of the first 3 weeks and the “fatigue” effect of the last 3 weeks (there were no on-going payments in this PROMISE trial). Secondly, it allows us to perform logical sensitivity analysis using the first 3 weeks and last 3 weeks as representations for a “high” and “low” value respectively.

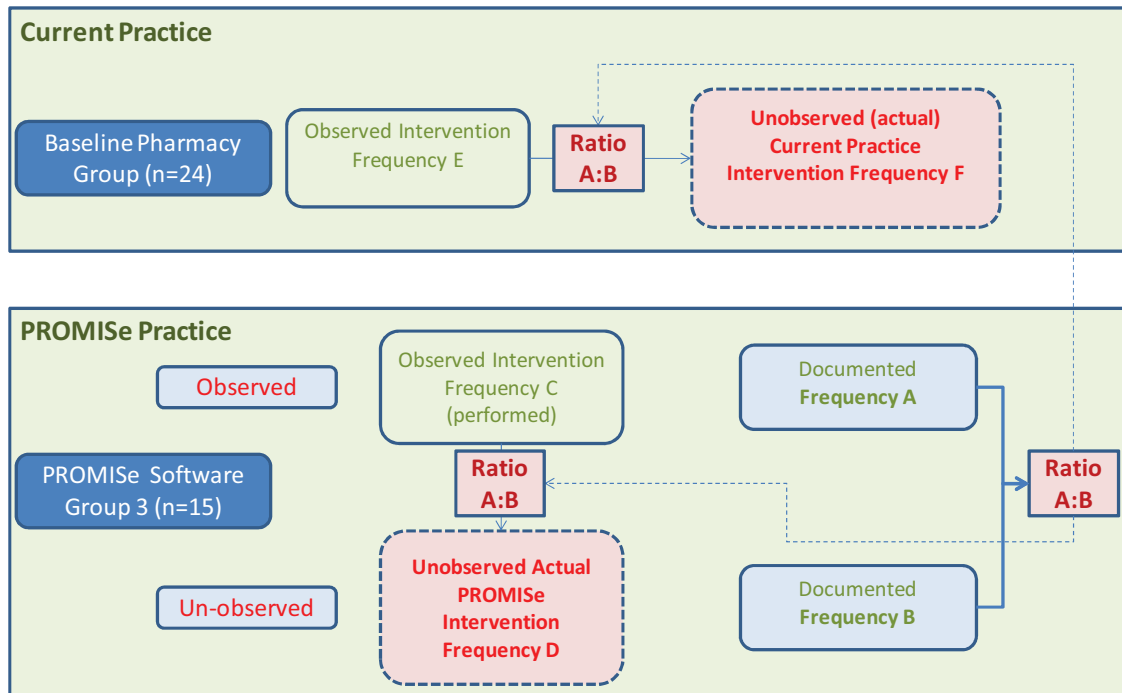


Figure 1: Calculating Current Practice and PROMiSe Intervention Performed Frequency

When applying this method, an ACI rate of 0.456 per 100 prescriptions for the Current Practice figure, and 0.898 per 100 prescriptions for PROMiSe practice is reached, using the following steps.

Determine the observation effect:

- Documented intervention frequency during middle 6 weeks in the software with prompts and reminders group = 0.003848 (0.3848 per 100 scripts)
- Observed documented intervention frequency in the same group was 0.01402 (1.402 per 100 scripts)
- Therefore the observation effect is $0.01402 / 0.003848 = 3.64$

Estimate the actual intervention rate in the no software group:

- The observed actual intervention rate in the no software group was 0.0166 (1.66 per 100 scripts)
- Therefore the non-observed intervention rate in this group can be estimated at $0.0166 / 3.64 = 0.00456$ (0.456 per 100 scripts)

Estimate the actual intervention rate in the PROMiSe practice group:

- The observed actual intervention rate in the software with prompts and reminders (PROMiSe practice) group was 0.03273 (3.273 per 100 scripts)
- Therefore the non-observed intervention rate in this group can be estimated at $0.03273 / 3.64 = 0.00898$ (0.898 per 100 scripts)

These figures suggest that the incremental improvement in the rate at which clinical interventions in the pharmacy are performed of PROMiSe practice over current practice is 0.4427 per 100 prescriptions.