

Measuring Health Outcomes within the context of the National Medicines Policy

A Discussion Paper

Produced for The Chairs of APAC, PBAC, NPS, PHARM and The Managing Directors of The Pharmaceutical Alliance: CSL, Eli Lilly, GlaxoSmithKline and Merck Sharp & Dohme.

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Executive Summary

The overall aim of the National Medicines Policy is to meet the medicine and related service needs of the Australian people, so that optimal health outcomes and economic objectives are achieved. There is a need for valid measures to monitor how well these aims are being met.

This paper has been developed to progress work on the measurement and monitoring of health outcomes associated with the use of medicines, within the context of the National Medicines Policy¹. The paper builds on existing work that has been conducted to monitor the implementation and effect of Australia's National Strategy for Quality Use of Medicines².

A range of issues have been identified that need to be addressed such as; the availability, quality and reliability of the necessary data, methods for the collection of outcomes information, access to data on medicine use, the role of different research designs and the interpretation of health outcomes information. Different information needs have been identified as being necessary to assist with decision making at the different points in the continuum between drug discovery and the end use of medicines by the consumer. These include the challenges between bridging the transition from research that is primarily designed to assess the efficacy and safety of medicines to research that can be undertaken under real world conditions to assess the effectiveness of medicines in normal clinical practice. The various sources of information, both local and international, that could be used to assist with the assessment of health outcomes are also discussed.

Australia already has a significant number of observational databases with varying strengths and limitations which provide an insight into how medicines are used. If these datasets were better linked, the information derived would progress the evaluation of the NMP, QUM and the PBS to better estimate the true value of medicine expenditure. Such an evaluation would enable the NMP to achieve its four objectives. Thus we could better ensure that consumers have access to the most appropriate medicines in a more timely manner and provide a quality outcome for the consumers, the government as funder and the pharmaceutical industry as the innovator of such medicines.

The following recommendations are made:

Health Outcomes data development

- Set up an APAC working party to assess the different data needs of the key stakeholders in the NMP. Use this needs analysis to identify what data is required and where such data may presently reside.
- Develop a Request for Tender (RFT) to progress the synthesis and linkages of existing data sets and explore options for better use of existing data. This group would need to provide a suggested order of priorities in linking such datasets. The RFT should be developed by an APAC working party and be complete by August 2003.
 - Such a group could explore alternatives as to how to progress the identified gaps in the existing health outcome data.
- One or two National Health Priority disease areas could be chosen to pilot such data synthesis. The present DUSC audit of databases will inform this tender.
- This work will inform the indicator development to see what data on what indicators are presently available.

Indicator development

- There is a need to progress a list of agreed indicators (process, impact and particularly outcome) for general medicine use and then specifically for

- key disease areas like the National Health Priorities. Such indicators need to consider clinical, humanistic and economic domains. This work should be progressed in a consultative way and build on work done in the Manual of Indicators to measure QUM in Australia, 2nd edition 2003 and in the combined workshops organised by National Health Priority Groups and PHARM (eg the NARG³/PHARM initiative of 2002).
- We recommend a similar sort of group who developed the QUM indicators be formed under the auspices of APAC. This work should align the work presently being done to develop indicators for the NMP. This indicator development must consider the different data needs as identified in the research discussed in the previous recommendation. A practical and pragmatic approach is required to ensure that the indicators developed have value and ongoing support by all stakeholders. It is important to not place excessive burden on present data collection mechanisms and people who input the data like general practitioners.
- A document outlining agreed indicators for some of the National Health Priority diseases should be developed in 2004.
- One or two National Health Priority disease areas could be chosen to pilot such data collection and assess the reliability and validity of the indicators developed.

1. Objective of this paper

The Managing Directors of The Pharmaceutical Alliance⁴ (CSL, Eli Lilly, GlaxoSmithKline and Merck Sharp & Dohme), together with the chairs of the Australian Pharmaceutical Advisory Council⁵ (APAC), the National Prescribing Service⁶ (NPS), the Pharmaceutical Health and Rational Use of Medicines committee⁷ (PHARM) and the Pharmaceutical Benefits Advisory Committee⁸ (PBAC), convened a workshop entitled “National Medicines Policy Partnerships: Delivering Better Health Outcomes & Value for Money” in October 2002. This workshop engaged key stakeholders with an interest in the National Medicines Policy (NMP) to discuss and agree on priorities and strategies for a collaborative approach to implementing the National Medicines Policy.

One of the agreed actions from the workshop was to progress work on the measurement and monitoring of health outcomes associated with medicines listed on the Pharmaceutical Benefits Scheme (PBS). In this paper we are broadening the focus to be on the National Medicines Policy and thereby considering the use of all medicines and their health outcomes.

The Pharmaceutical Alliance (TPA) agreed to initiate the development of a discussion paper to assist in measuring medicine use and determine net health benefits associated with medicines use.

2. Background

2.1 The National Medicines Policy

The overall aim of the National Medicines Policy (NMP) is “to meet the medication and related services needs, so that both optimal health outcomes and economic objectives are achieved”.

The Council of Australia Governments agreed in 1996 that health systems should:

- Provide quality care responsive to people’s needs
- Provide incentives for preventative health and cost effective care
- Give better value for taxpayer’s dollars
- More clearly define roles and responsibilities
- Retain the benefit of universal access to basic health services through Medicare.

In order to realise optimal health outcomes and economic objectives associated with the use of pharmaceutical interventions, the NMP focuses first on people’s needs and brings individual partners skills, experience and knowledge to bear on these four central objectives:

- Timely access to the medicines that Australians need, at a cost individuals and the community can afford
- Medicines meeting appropriate standards of quality, safety and efficacy
- Quality use of medicines
- Maintaining a responsible and viable medicines industry.

The NMP requires greater evaluation somewhat akin to rigorous program evaluation. There is a need for valid measures to monitor how well these objectives are being met by the NMP. An APAC Working Party is currently progressing the development of NMP Indicators for this purpose.

This paper progresses work on the measurement and monitoring of health outcomes associated with the use of medicines, within the context of the NMP and outlines a range of options to help deliver on these objectives. All four objectives are important for all medicines use (including medicines outside the PBS subsidy) and in all settings (eg hospital use). All stakeholders have an ongoing interest in the realisation of delivering on these four dynamic and interdependent “pillars” equally.

The NMP stakeholders include:

- APAC as the body who has responsibility for the NMP

- consumers of medicines (including patients, consumer representative groups, consumer support groups, CALD⁹ groups)
- Commonwealth and State government departments (Commonwealth Department of Health and Ageing branches, including the Pharmaceutical Access and Quality Branch, Pharmaceutical Benefits Branch, the Therapeutic Goods Administration, the Health Priorities Branch, Ageing and Aged Care Division, Acute Care Division, Primary Care Division, Population Health Division and the Department of Veterans’ Affairs as well as Departments of Industry, Tourism and Resources, Treasury and Finance and the Australian Health Ministers’ Advisory Council)
- the Pharmaceutical Benefits Advisory Council (PBAC)
- Government funded organisations (eg NPS) and expert committees (eg PHARM) devoted to improving the implementation of the quality use of medicines principles
- the Therapeutics Goods Administration (TGA)
- the medical profession (including general practitioners, specialists but also representative organisations like the Royal Australian College of General Practitioners, Royal Australian College of Physicians, the Australian Medical Association, the Australian Divisions of General Practice and the Australian Society of Clinical and Experimental Pharmacologists and Toxicologists)
- pharmacy (including the community and hospital pharmacists and their representative societies and organisations)
- Nurses (in both the primary care and secondary/tertiary settings and their respective representative organisations)
- Aboriginal and Torres Strait Islander people (including representative organisations like NACCHO¹⁰)
- the medicines industry (including individual manufacturers, wholesalers and representative organisations like Medicines Australia, Generics Medicines Industry Association and Australian Self-Medication Industry and the Complementary Healthcare Council of Australia)
- the Health Insurance Commission
- Health providers, including private health insurance funders
- Health organisations, including hospitals
- the medical press through the Australian Medical Writers Association

Each of these groups have their own needs and objectives and importantly evaluation needs requiring better health outcome data linked to medicine use.

2.2 Current issues for medicines data

There are many issues regarding the quality, availability and usefulness of information presently available on medicine use and the outcomes of such use. The escalating financial strain of an increased demand for health care treatment due to an ageing population, longer life expectancy and increasing prevalence of chronic diseases will in turn demand better accountability and efficiency of resource allocation for health care services including pharmaceuticals. The need to better measure the value of pharmaceutical expenditure will translate into greater demand for outcomes research. Current methodologies used to conduct outcomes research are heterogeneous and as such may create a need for more standardisation.

There are agreed hierarchies of evidence, which provide guidance as to the validity or strength of different data in answering different research questions (eg NHMRC recommendations¹¹). In establishing the access provisions concerning medicines in Australia, there is a strong preference for large randomised control trials (RCTs) and systematic reviews for PBAC and TGA submissions, almost to the exclusion of other forms of evidence. Some drug utilisation data is used to assess the use of a drug once listed on the PBS. Other forms of data not controlled or randomised as in RCTs are therefore deemed less reliable and less valid as it can be harder to attribute the effect to the medicine of interest. Whilst it is important to not substitute or weaken such rigorous quality requirements in the drug evaluation and PBS listing process, these “lower levels” of evidence can be valuable in providing complimentary evidence of the effects of medicines in the “real world”. Such data

can provide vital information on the effectiveness of medicines in practice where there are many intervening factors on the outcome other than the medicine. If multiple studies show consistency in the results, this will lead to increased confidence in the data and improve its usefulness. In addition, modelling of clinical trial data can be utilised to provide guidance on the long term effects and cost-effectiveness of a medicine.

Epidemiological data provides information on the incidence and prevalence of disease and thus can be used to monitor the change in burden of disease and therefore the extent of clinical need for specific interventions. Such studies are also very expensive and complex to conduct.

There are a number of data sources that can be used to assess drug utilisation (medicines prescribed) but little data available on the longer-term outcomes of treatment (health outcome data). This issue is relevant for all medicines, not just those which are eligible for PBS subsidy.

The PBS is the major program to deliver equitable and affordable access to medicines by all Australians and as such is integral to delivering on the objectives of the NMP. The PBAC has stated that it sees the PBS as purchasing health outcomes. While this is a very desirable goal, most purchasing decisions are based on clinical trial data. Similarly hospital drug committees rely heavily on RCTs and PBAC decisions in determining which medicines are eligible for the hospital formulary.

3. Health Outcomes Research – Policy and Practice

3.1 Why do we need Health Outcomes information?

Health outcome data is required to assess the performance of healthcare delivery according to standards of cost and quality. It is used to monitor and improve standards and to inform priority setting for resource allocation. Different sorts of data can answer different questions regarding medicine use. Whilst clinical trial data will generally be the only data available at the time of launch of a new product, once listed other data could be collected to assess the validity of the trial data in the usual practice setting or so called “real world” (eg more pharmacovigilance data if there are safety concerns). Outcomes research employs a range of data sources from observational to controlled data. It is complementary to the more commonly employed RCTs and modelled RCT data and just as relevant to the question of value of ongoing expenditure for a specific intervention.

Different stakeholders have divergent perspectives of the benefits and value of medicines and thus place a different emphasis on what health outcomes are important. These perspectives include those of the doctors as prescribers, the pharmaceutical industry as manufacturers, the government and consumers as funders and the consumers as final recipients of the medicine. For example a medicine which may reduce symptoms or visits to the doctor (ie clinical outcome of importance to the doctor and the funder) may not be considered as relevant to a consumer as being able to function in everyday activities of life and have an improved quality of life (humanistic outcomes). To adequately research and utilise the range of health outcomes which are relevant to all stakeholders, a variety of data sources is required.

What is Health Outcomes Research?

Health Outcomes have been simply described as the results of health care processes. Health Outcomes research identifies measures and evaluates the end results of clinical services (eg medicine use) in “real life” settings in terms of clinical, economic and humanistic consequences. Such a range of assessments provides the best evidence of the effect of an intervention eg a medicine on health outcomes, consumption of resources and thus, value for money. Clinical outcomes include mortality and medical events as a result of treatment. Humanistic outcomes include Quality of Life and patient satisfaction. Such data is usually captured by

validated questionnaires. Economic outcomes include direct health costs (eg costs of medical care), direct non-health costs (eg cost of care providers), indirect costs (eg productivity costs) and intangible costs (eg pain and suffering). In most situations, the focus is on clinical outcomes with normally only a limited amount of economic or humanistic outcomes collected.

One of the most substantial differences between outcomes research and RCTs is that outcomes research lacks the controls and highly structured and artificial environment of RCTs. The difference is often explained by the terms effectiveness and efficacy. Efficacy refers to the performance of a medicine in a RCT setting. Effectiveness is the generalisability of efficacy and refers to the performance of that medicine in the real world of routine clinical practice. RCTs are designed to eliminate the possibility of alternative explanations for observed differences between a treatment group and a control group (in order to maximise internal validity). Unfortunately the design features that maximise the reliability of a RCT results also reduce the generalisability of the results (external validity).

Subjects recruited for RCTs are often not typical of the whole range of people that, in practice, medicines are used to treat. People with multiple health conditions, the old, the young, the pregnant etc are often excluded from RCTs but the populations for whom medicines are prescribed often contain all of these groups. In the real world, doctors prescribe for more diverse populations than were included in RCTs. Observational studies of the “real world” by their nature give a better understanding of what happens in reality as opposed to the contrived setting of a RCT.

Whilst effectiveness studies may provide a more comprehensive assessment of the “real world” effect of a medicine, there are challenges in attributing the health outcome to the medicine used due to the heterogeneity of the study population and multiplicity of influences on the outcome. Nonetheless sophisticated statistical techniques have been developed to interpret the results. Such outcome studies are very expensive to conduct on a large scale (eg Heart Protection Study¹²) as are RCTs and therefore will not always be justified on economic grounds. On occasions, decisions on appropriate medicine use need to be made despite the limitations of the data and also due to the limitations on the capacity to derive the desired data due to expense, time and degree of complexity.

4. Strengths and Limitations of Different Health Outcomes Study Designs – what data do we have now?

There are various methodological designs that have been used or proposed to study the effectiveness of a drug. These include observational studies like cohort studies, case-control studies, patient record observational database studies and naturalistic studies (also called simplified clinical studies or sometimes phase 4 studies). These studies can be done prospectively (preferred) or retrospectively. Each design has its own strengths and weaknesses and they can be ranked according to a hierarchy of evidence. However there is no consensus on the specific methodology that can be considered the “gold standard” for effectiveness studies. Randomisation is recommended to minimise bias and confounding but this may not always be ideal or practical. As effectiveness studies are not as well controlled for bias and confounding, they are called “observational studies”. They provide better measures of effectiveness but causality is not as clear as RCTs.

4.1 Cohort studies

A cohort study is where a sample of patients is followed for long periods of time. Well designed cohort studies can provide very good health outcome data but they are expensive and time consuming and are prone to loss of subjects to follow up. Some examples of reasonably large cohorts in Australia are the Busselton Survey¹³, The Australian Longitudinal Study of Women’s Health¹⁴, The Dubbo Study of Ageing¹⁵ and The Blue Mountains Eye Study¹⁶. These datasets may not collect adequate data on medicine use and as such may be limited in use in

assessing the effect of medicines. In addition, there are often poor links between this cohort data and other datasets, particularly prescribing data. However, such studies may provide epidemiological data which is useful in defining the burden of disease and perhaps the suitable population size for a new medicine.

4.2 Case-control studies

In case-control studies a selection of cases with a specific disorder are matched with control patients sharing similar demographics and clinical characteristics. These studies may enable the comparison of multiple medicines for an extended period at a reasonable cost. These studies are generally for studying risk factors for a known disease and as such are not applicable to our objective of measuring prospective health outcomes of a specific medicine. They are useful for determining adverse drug reactions.

4.3 Patient Record Observational database studies

These studies provide good effectiveness data. These studies look at the effect of an intervention before and after its introduction, with or without the use of a comparator control group. This data may be presented in a time series analysis where multiple sampling is done at different time points. Internationally there are some very large observational databases that can provide powerful data. In Australia these observational databases require greater development.

4.3.1 Australian Observational databases

There are some longitudinal general practice prescribing data sets like HCN's GPRN¹⁷ and Medic GP¹⁸ from the Department of General Practice in Adelaide, however they do not yet have the desired power due to limited numbers of GPs and patients (Medic GP has about 150 GPs and GPRN is about double this but has five years less data). These datasets are some of the better ones available to measure health outcomes from medicine use as they link indication of use with the medicine. At present the level of detail of data collected is inadequate to accurately measure health outcomes. In addition, the collection of such data is expensive. This expense results in differing levels of access to such data amongst stakeholders. Interestingly some data sets are significantly cheaper to the Commonwealth than to the pharmaceutical industry making them not viable for the industry to purchase. Likewise some other datasets like IMS¹⁹ which the pharmaceutical industry use are expensive and are not subscribed to by the Commonwealth or simply not available for the other stakeholders and health researchers to obtain.

Cross sectional data is not as powerful as longitudinal data. The BEACH²⁰ collaboration provides long-term, GP based, cross-sectional data collection which includes indication of use, but it is also quite expensive. Eighty to ninety GPs a month provide a sample of 100 encounters. IMS is also cross-sectional and consists of several databases; the Australian Pharmaceutical Index (API), the Australian Medical Index (AMI) and the Australian Hospital Index (AHI). The API database is sales data from wholesalers to retail pharmacies. AHI data captures about 65% of sales to hospital pharmacies. AMI is a paper based script database (420 GPs) and can provide more precise utilisation data as the indication is captured. AMI data unlike BEACH data can provide analysis of the switching of medicines. 420 GPs a quarter record seven consecutive days of patient encounters.

In Western Australia (WA), the Centre for Health Services Research have created a data linkage unit²¹. The linkages are between core morbidity, mortality, mental health, cancer data sets and the WA electoral rolls. The linkages rely on the availability of similar demographic information in each data source. This type of system has great potential to follow patients longitudinally and capture key health outcome data. There is little focus on medicine use in these databases or the linkage studies.

Clinical and medicine registers are being developed at Divisions of General Practice which may be useful in identifying patient's needs and the effects of different interventions (eg CARDIAB²² database for diabetes and cardiovascular disease). Commonwealth data like the National Health Survey²³ capture some aspects of medicine use as well as disease prevalence and can be useful in

determining health needs in the community. Likewise disease registries like the cancer and death registries can be useful in tracking patient's health outcomes.

4.3.2 International Observational databases

Health Management Organisations (HMOs) in the USA have claims databases (including medical and pharmaceutical use) which provide extensive information. Patients can thus be tracked throughout the health system but only whilst they stay in the same HMO. Unfortunately there can be considerable transfer by patients between HMOs as they change jobs. In order to address research questions of interest provided by a diverse patient and provider mix, a consortium was formed called the Centres for Education and Research on Therapeutics (CERTs) in 1999 in order to do multicentre research. This work is coordinated by the Agency for Healthcare Research and Quality (AHRQ)²⁴. Interestingly this reasonably new federal program proposes a more national public-private partnership involving academia, the federal government, the industry and the public.

In the United Kingdom there is the General Practice Research Database (GPRD²⁵), which is the world's largest computerised database of anonymised longitudinal records from general practice. This database collects data from 2.7 million patients from practices throughout the UK, representing 4.7% of the population. Initiated in 1987, this database has more than 35 million patient years worth of data. The research conducted has mostly examined drug safety issues but is beginning to focus on prescribing trends. There is a similar but less powerful database in New Zealand called the Computer Research Network²⁶.

Whilst internationally health providers and the pharmaceutical industry use such data to demonstrate effectiveness of new medicines, generally this data has not been considered relevant or valid for the Australian market. However it may be the best effectiveness data on medicines in the real world and inform, for example, the impact of a soon to be launched medicine on hospitalisation rates. Consideration would need to be given to the differences of the health systems, in interpreting the relevance of the results for the Australian health system.

4.4 Naturalistic studies (phase 4 studies)

Naturalistic studies are similar to RCTs but allow greater flexibility (eg dose adjustment, concomitant medicines, frequency of doctor visits and testing). The patients and doctors are aware of the treatment assigned. These studies are very expensive to perform and the outcomes chosen may require extended follow up and thus take years to complete. Whilst these studies may provide greater certainty as to the effectiveness of a medicine, the cost and logistics of such trials make them impractical in most situations.

5. Drug utilisation data: drug use not linked to health outcomes

Drug utilisation databases provide information on medicines prescribed in terms of type, number and possibly dose. This less comprehensive data can show trends in prescribing but not the health outcomes of such prescribing like hospitalisation and survival rates or other clinical, economic or humanistic outcomes. In Australia, there are a number of data sources to assess drug utilisation; some linked to the condition being treated by the medicine, like BEACH, HCN's GPRN, IMS and MedicGP. Others like the Health Insurance Commission (HIC) and Drug Utilisation Subcommittee (DUSC)²⁷ data are not linked to indication.

The HIC collect data on the PBS prescriptions dispensed and the Medicare items delivered by doctors²⁸. These data sets are not linked. Both data sets now have a common patient identifier, the Medicare number, providing potential for patient tracking studies on the medicine linked to provider use with the linkage of the data sets. Such tracking has enormous potential to better inform medicine use and would allow the HIC data to be used in different observational studies including cohort and case-control studies. Currently, without linkage this data has

significantly reduced utility and thus significant opportunity to assess medicines use is lost. The data does have other limitations including lack of indication for use and dose. It is only dispensed use and not actual use and does not capture medicine use below the copayment level. The HIC can do analyses but this can be expensive and not as complete as desired due to privacy restrictions. HIC data as it is a claims database is accurate and provides national data that can be aggregated in many ways to assess different issues and in different geographical locations.

The DUSC collect and analyse data on drug utilisation. This database complements the HIC database as it has a weighted sample of the under copayment scripts dispensed which are not captured by HIC. In addition it captures a sample of private prescription use. The HIC database does represent significant opportunities at present and if some relatively simple processes are altered its utility could be enhanced greatly. For example, pharmacists electronically record all scripts including those below the copayment and also private scripts. If this data was forwarded to the HIC together with the present above copayment script data, the value of the HIC data would be greatly improved for all stakeholders. Just this one initiative would have value for all the stakeholders in a variety of ways.

6. Datasets in progress

Over the last decade there have been significant advances in the development of computer prescribing packages for use by general practitioners such that now about 90% of Australian GPs use computers for prescribing and other clinical purposes. Electronic hospital prescribing and medical records are progressing but in an ad hoc way. A major concern with such electronic data is missing data and coding issues which prevent the collation of information. Standardised formats for data entry would limit this. Electronic health records should be able to provide real-time data collection and analysis. In addition, Australian research is hampered by there not being an agreed unique identifier used across the health system so that patients can be tracked (the Medicare number is deficient). *MediConnect*²⁹ is one initiative endeavouring to align the medical records of medicines for doctors, pharmacists and hospitals. It has recently begun a pilot³⁰. *PharmaNet*³¹ in the Canadian province of British Columbia has informed this development. This is part of an even larger project to advance electronic health records (*Health Connect*³²). The major barriers to creating integrated health data are issues around IT (standards, coding, agreed minimum datasets, expense), privacy concerns and the time and desire by organisations and individuals to record and share the data. As general practitioners will mostly enter such data, a system should limit the disruption to the normal interaction between a doctor and a patient.

7. Monitoring Health Outcomes associated with medicines use

Drug utilisation and health outcome data sets presently available are being “audited” by DUSC. It is hoped that this exercise will assist in identifying the strengths and weaknesses of the different datasets available and thus identify the gaps in the present data sources. This analysis will inform the Section 4 forecasting review for submissions to the PBAC and the type of data used in predicting prescription demand and thus expenditure once a new medicine is listed on the PBS. At present the PBS listing process primarily relies on evidence from RCTs to provide information on the efficacy and cost effectiveness of new medicines.

Monitoring the outcomes of medicines use is a core component of the National Strategy for Quality Use of Medicines in Australia. Indicators have demonstrated improvements in medicines use and outcome indicators have demonstrated improvements in health outcomes. However, this work has only been undertaken on a limited number of conditions and medicines and was undertaken independently of the other three arms of the National Medicines Policy, and so the improvements in health outcomes have not been considered in relation to pharmaceutical expenditure (i.e. PBS buying health outcomes has not been considered).

There are a number of reasons for this including the lack of suitable data collection

systems, the fragmented nature of data collection relating to medication prescription and supply, the potential delay in listing associated with such a process, the costs of establishing data collection systems and the lack of resources to analyse and interpret such data. Overall, it is inappropriate to attempt to routinely tie requirements for extensive data collection to PBS listing decisions. However, there is growing conviction amongst key opinion leaders that collection of information on the health outcomes associated with the use of medicines is necessary and important in order to monitor and evaluate outcomes gains being achieved by medicines use, of which most is publicly funded via the PBS.

It is unclear as to the best way to progress the creation of health outcome data. A first step would be to better collate the present datasets rather than embarking on new data collection. This could be achieved by creating better record linkages. This would include the drug utilisation databases, the epidemiological databases, the hospital casemix data, GP prescribing data, and disease and drug registries, claims databases including those of HIC and possibly private health insurance databases. Prior experience of linking the PBS and MBS datasets has demonstrated this is possible. The WA dataset, demonstrates that further linkages with the other datasets is also possible. Progress in data linkage in Australia has been slow due to the cost, privacy considerations and the complexity of the task. Once such a system has been set up, the expense should be minimised compared to doing ad hoc observational studies. A range of pragmatic and feasible options need to be considered in order to create the infrastructure to progress. International health outcome data from the large observational databases could be of assistance in predicting health outcomes from new medicines until better data is generated locally.

An alternative approach to collecting health outcome data involves the development of performance indicators that would provide a framework for the collection and interpretation of data relating to the usage of medicines.

8. The Compromise - a pragmatic approach to collecting health outcome data by the use of indicators

The time between the effect of medicine use and ultimate health outcomes can be very long, particularly for chronic diseases. For most medicines the ultimate outcome of therapy is to improve quality of life and/or survival. However other outcomes can be measured like symptom relief, patient satisfaction and impact on other resources used in the health system. In these examples, health outcome indicators are a surrogate approach to determine the effect of a medicine without having to wait until the final outcome occurs.

There are a number of important criteria which an indicator must satisfy. The measure must be acceptable, meaningful and relevant to its audience (eg doctor, consumer, government). In addition the different audiences need consistent interpretation of the measure. The measure must be valid, thus measure what it is supposed to measure. The measure should be reliable and thus within acceptable limits provide reproducible results. The measure must have sufficient sensitivity to change. However, even if all these criteria are met and a change has been detected, the determinations of the factors attributing to that change can be complex and challenging.

Different terminology is used for the different types of indicators. We have presented here the terminology used in the Manual of Indicators to measure QUM in Australia, 2003. Three types of indicators are discussed:

- Process indicators
- Impact (or surrogate) indicators
- Outcome indicators.

Surrogate measures in particular could be used to inform the creation of minimum data sets for particular diseases. Once agreed, the existing medical software could incorporate such fields in their packages and thus assist in the collection of such data.

An alternative approach is to develop the indicators under the framework of clinical, humanistic and economic outcomes. The two latter outcome indicators could be fairly consistent across therapy areas. This would provide a greater understanding of the true effect of a medicine and deliver on the requirements of the different stakeholders' perspectives on health outcomes. A good approach may be to consider process, impact and outcome indicators stratified into clinical, humanistic and economic domains. Thus adequate data would be captured in the correct context.

8.1 The role of indicators

Performance indicators can be developed to provide a set of objective criteria to monitor the impact of health care services, policies and interventions.

Performance indicators have been developed to measure QUM in Australia; similarly indicators could be developed to monitor the impact of new medicines following listing on the PBS. This work could incorporate the development of key performance indicators for the NMP. As QUM is one of the four pillars of the NMP and has the objective of improving health outcomes, the work done on QUM principles and indicators should be considered in the development of health outcome indicators. Both indicator developments need to consider the domains of clinical, humanistic and economic outcomes. QUM should deliver better value on pharmaceutical spend and limit the risk of inappropriate use and waste.

8.1.1 Process Indicators

These are largely qualitative in nature and reflect the extent to which infrastructure has been established which facilitates the collection of health outcome data or the implementation of evidence based tools to improve health outcomes. Their value is often greatest in the early stages of policy development and implementation. Process indicators are generally expressed in the form of a series of questions determining the stage of development, implementation and evaluation.

Examples of process clinical indicators that could be used to measure health outcomes include:

- Do nationally recognised evidence-based guidelines exist for the diagnosis and management of the condition of concern?
- Do these guidelines include recommendations on the use of the medicine of concern?
- Are the national guidelines consistent with PBS listing?
- Is there objective information available for consumers on the medicine of concern?
- Is there a national mechanism for collecting information on utilisation of the medicine of concern?
- Is there a national mechanism for collecting related health service utilisation relevant to the medicine/condition of concern?
- Are prescribing data including linkage to diagnosis available?
- Is Australian data available on the prevalence/incidence of the condition available? Is there a national mechanism for collecting information on incidents, errors or adverse events of the medicine of concern?

8.1.2 Impact (surrogate) indicators

These are largely quantitative in nature and are predictive of changes in health outcomes. Many clinical trials use such indicators and similar measures could be used for "real-world" evaluation of medicines. Disease markers/indicators whether laboratory or physical manifestations of disease to assess the response to prevent or delay long term health outcomes are based on the assumption that changing the level of the indicator will correspondingly change the prognosis for the long term outcome. This assumption is implicit in many clinical trials and underlies the assessment of many disease measures. Inappropriate medicine use (eg use of beta blockers in asthma) or inadequate medicine use (eg lack of preventer medicine use

in moderate to severe asthma) needs to be monitored and then acted on. Failure of medicine needs to be monitored and the causes assessed in order to ensure the quality use of a medicine and also to ensure the best value from medicine use is realised. Some surrogate indicators are more validated than others.

Examples of impact clinical indicators include:

- glycaemic control as indicated by HBA1c measurement for diabetes
- blood pressure for cardiac disease
- lung function and bronchial reversibility as indicated by FEV1 and FVC
- ratio of preventer use to reliever use by asthmatics
- number of visits to a GP for a particular health priority like asthma compared with best practice standards and to visits for another health priority like diabetes (also used for economic domain). This may assist schemes like the Asthma 3+ Plan and the similar diabetes initiative
- cholesterol level or use of a statin in a population of designated need
- CD4+ in AIDS.

There are relevant QUM indicators already developed. (Commonwealth Department of Health and Ageing - Manual of Indicators to measure the quality use of medicines component of Australia's National Medicines Policy 2nd edition Canberra: 2003). Indicators are defined and a purpose is given. Many of the indicators listed are able to be monitored using the current HIC, DUSC or BEACH datasets. Such already developed indicators are very useful.

For example impact indicator 2.20 below.

Impact Indicator 2.20

Definition: Calculate the following ratio:

Number of prescriptions written for selected conditions in accordance with therapeutic guidelines/Number of prescriptions written for key conditions.

Purpose: Measuring the proportion of prescriptions for key conditions written in accordance with nationally recognised therapeutic guidelines.

8.1.3 Outcome indicators

These indicators seek to measure changes in health outcomes. Such indicators can be the most powerful but can be difficult to interpret. Firstly, the multi-factorial nature of health status makes it difficult in many cases to attribute causality in any changes in health status to a specific intervention or interventions. Secondly, there are significant methodological difficulties in selecting outcome indicators directly related to the use of medicines. Finally, the effects of medicines may be long-term, which, when considered in conjunction with the previous limitations, make interpretation of the data difficult.

Examples of outcome indicators that could be used include:

- the number of hospital admissions per annum e.g. acute exacerbation of asthma, peptic ulcer disease, depression, schizophrenia, congestive heart failure, (clinical, humanistic and economic outcomes).
- productivity gain represented as less absence from the workplace or decreased efficiency in the workplace as a result of the medicine used (humanistic and economic outcomes).
- Quality of Life gain which incorporate qualitative measures like physical, social and emotional domains. Both general and disease specific instruments could be used (humanistic and economic outcomes).
- incidence of adverse drug events (clinical, humanistic and economic outcomes). This will assist to assess net health gain by the use of a medicine.
- mortality data where this is a relevant outcome eg cardiovascular disease, cancer or suicide.

See the Appendix for an example of how process, impact and outcome indicators may be developed for a specific National Health Priority disease (asthma is illustrated here).

9. How to progress and bridge the gaps in data needs?

As discussed, the different stakeholders have different data needs. It is important that a data needs analysis is done initially. This will inform the data requirements which either may already be met by existing data, may exist after minimal intervention or be created by the linking of datasets or by the development of new data. Some such developments may be better progressed at a local level whilst others will require a national approach. It is crucial that as better health outcome data are collected there are corresponding developments of how the data will be used and acted on. As stated early in this paper, one of the pressing requirements is to develop better health outcome data on the use of PBS listed medicines and create a mechanism to improve the assessment of the value derived from PBS expenditure. However numerous stakeholders would benefit from this improved data in many ways.

There are numerous important benefits of such an initiative for many stakeholders. These include:

- APAC being able to better evaluate the NMP and ensure the objectives of the NMP are being delivered
- The Pharmaceutical Benefits Branch including the PBAC and DUSC being able to better evaluate usage patterns compared to PBS indications
- The pharmaceutical industry being able to better evaluate the value and safety of their medicines and ensure use according to approved indications
- The NPS being able to provide better prescriber feedback and information on appropriate prescribing and thus improve prescribing behaviour
- The Pharmacy Guild could better analyse the use of S3 medicines as required by the Pharmacy Guild Agreement and thus ensure patients are receiving adequate counselling
- The Federal Government could better assess the impact of medicines on reducing the morbidity of Australians, particularly those with National Health Priority diseases
- The Divisions of General Practice could better assess quality use of medicines initiatives being coordinated at the division level
- Private health insurers may be better able to assess their funding of medicines
- NDPCS³³ may be better able to assess switching of the scheduling of products from prescription only to over the counter use (eg asthma relievers)
- PHARM will be better placed to better assess QUM initiatives and advise on gaps that need addressing in order to achieve QUM
- Researchers would have a comprehensive data set to better evaluate the quality use of medicines and provide options on how to improve health outcomes via improved medicines use.

Defined health outcomes need to be monitored over time and the effects of specific medicines need to be linked to the health outcome. Whilst mortality and morbidity data will assist in health outcome measurement, there are disease specific measures and instruments to improve our understanding. Medicines use is driven by prescriber, consumer, industry, media, provider and government behaviours. Thus there needs to be a broad approach in monitoring medicines use. Ideally inappropriate medicines use can be identified early by monitoring indicators as signals which may highlight the need for a change in medicine use and provide a quality feedback mechanism. The challenge is to limit the “noise” of the real life data and get a stronger signal.

To progress such developments of health outcome data requires collaboration by numerous stakeholders. In addition, there would need to be sufficient incentives to

engage all players. The science of outcomes measurement is currently underdeveloped. The continuing development of integrated and comprehensive electronic health information systems and improved methodology of using outcome measures to monitor performance throughout the system is recommended.

Australia already has a significant number of observational databases (see Section 4, pages 3-4), which provide an insight into how medicines are used. As demonstrated they all have different strengths and limitations; let’s imagine that they could be linked. Rather than having a somewhat compromised insight, we would have a magnified view of how medicines are used. Such data would progress the evaluation of the NMP, QUM and the PBS to better estimate the true value of medicines expenditure. Such an evaluation would enable the NMP to achieve its four objectives. Thus we could better ensure that consumers have access to the most appropriate medicines in a more timely manner and provide a quality outcome for the consumers, the government as funder and the pharmaceutical industry as the innovator of such medicines.

What is the order of priorities for such developments? Who should fund these developments? Currently, cohort studies in Australia are largely funded by the NHMRC and these funding decisions are made in an academic environment where the collective value to all stakeholders of the study may not be fully explored or valued. There may be a need to create a separate NHMRC group where, for example, consumers, health professionals, government funders and industry are involved in the review and assessment and possibly some funding (eg the current NHMRC centre grant approach shares the cost half and half between government and industry). Such large well designed cohorts that are being independently monitored and assessed offer a significant opportunity for outcomes assessment in the long term. Other funding mechanisms should be considered. For example, whilst DUSC does not presently have funds to progress such cohort studies or even data linking of the present disparate databases, funds should be considered for these initiatives and similar groups be drivers of such initiatives.

10. Governance Issues in Health Outcomes data collection

If we progress to a synthesis of present datasets or a new health outcome database, there are governance issues to consider. There are significant issues with privacy and ownership. Whilst potential funders of such a database like members of the pharmaceutical industry want access to de-identified data, there will be concerns as to the application of such data. A system of management and/or advisory boards would be required to ensure the integrity of the database and its participants. The governance structure of the BEACH collaboration between government, industry and academia is worth consideration.

11. Recommendations

11.1. Health Outcomes data development

- Set up an APAC working party to assess the different data needs of the key stakeholders in the NMP. Use this needs analysis to identify what data is required and where such data may presently reside.
- Develop a Request for Tender (RFT) to progress the synthesis and linkages of existing data sets and explore options for better use of existing data. This group would need to provide a suggested order of priorities in linking such datasets. The RFT should be developed by an APAC working party and be complete by August 2003. Such a group could explore alternatives as to how to progress the identified gaps in the existing health outcome data.
- One or two National Health Priority disease areas could be chosen to pilot such data synthesis. The present DUSC audit of databases will inform this tender.
- This work will inform the indicator development to see what data on what indicators are presently available.

11.2. Indicator development

- There is a need to progress a list of agreed indicators (process, impact and particularly outcome) for general medicine use and then specifically for key disease areas like the National Health Priorities. Such indicators need to consider clinical, humanistic and economic domains. This work should be progressed in a consultative way and build on work done in the Manual of Indicators to measure QUM in Australia, 2nd edition, 2003 and in the combined workshops organised by National Health Priority Groups and PHARM (eg the NARG³⁴/PHARM initiative of 2002).
- We recommend a similar sort of group who developed the QUM indicators be formed under the auspices of APAC. This work should align the work presently being done to develop indicators for the NMP. This indicator development must consider the different data needs as identified in the research discussed in the previous recommendation. A practical and pragmatic approach is required to ensure that the indicators developed have value and ongoing support by all stakeholders. It is important to not place excessive burden on present data collection mechanisms and people who input the data like general practitioners.
- A document outlining agreed indicators for some of the National Health Priority diseases should be developed in 2004.
- One or two National Health Priority disease areas could be chosen to pilot such data collection and assess the reliability and validity of the indicators developed.

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- 25 <http://www.gprd.com/26> <http://healthsci.otago.ac.nz/division/medicine/dnschmed/gp/mzcgpcgpddata.html>
- 27 The Drug Utilisation Committee (DUSC) is a subcommittee of the PBAC
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- 29 Formerly the Better Medication Management System (BMMS).
- 30 Are we ready for the Better Medication Management System, J. P. Wrobel
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- 31 <http://www.bcpharmacists.org/pharmanet/index.php>
- 32 <http://www.healthconnect.gov.au/>
- 33 NDPCS is the National Drugs and Poisons Schedule Committee.
- 34 National Asthma Reference Group (NARG)
<http://www.health.gov.au/pq/asthma/narg.htm>
- 35 Process indicators have been developed for each of the QUM building blocks as outlined in the National Strategy for Quality Use of Medicines
- 36 http://www.asthmasa.org.au/learningabout/3plus_visit_plan.html

Appendix 1

An Example of how indicators could be developed and used in a National Health Priority Disease like Asthma.

Asthma and Quality Use of Medicines: Activities and Outcomes

Numerous activities have been developed and implemented in Australia to promote quality use of medicines. This section details some of the activities, as measured by process, impact and outcome indicators (developed for the Quality Use of Medicines component), that apply to asthma management in Australia.

1. Process indicators³⁵

1.1 Policy development

Are there policies supporting quality use of medicines and asthma?

The National Strategy for Quality Use of Medicines has been developed to provide an overall framework and approach to achieving quality use of medicines in Australia.

The National Asthma Action Plan has been developed to provide an overall framework to improve quality of life and health outcomes for people with asthma.

1.2 Facilitation

Are there mechanisms to facilitate and co-ordinate quality use of medicines and asthma initiatives?

Formal mechanisms developed specifically to facilitate and co-ordinate QUM and asthma include:

- at the national level, The Pharmaceutical Health And Rational use of Medicines (PHARM) Committee, the Australian Pharmaceutical Advisory Council and the National Prescribing Service
- within hospitals this responsibility often lies with Drug and Therapeutics Committees
- within aged-care facilities, Medicine Advisory Committees have this responsibility
- within Divisions of General Practice, the National Prescribing Service fund facilitators to support quality use of medicines at the local level, as do the Pharmacy Guild Home Medication Review facilitators.

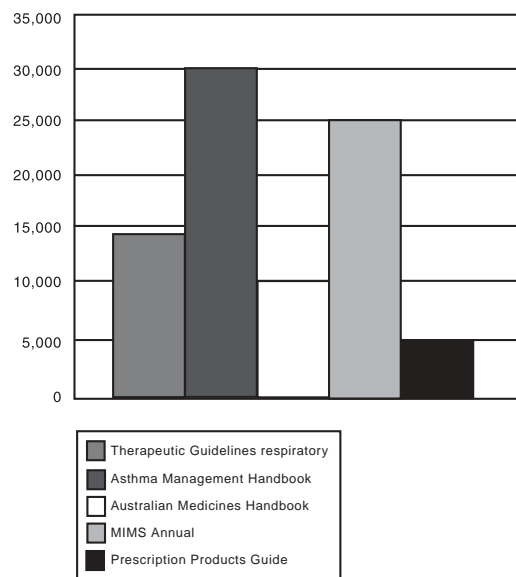
Other less formal mechanisms, such as disease management and educational tools like those developed by the pharmaceutical industry, support QUM and may be enhanced by even broader stakeholder input and partnership.

The National Asthma Reference Group provides the Commonwealth government with expert advice on key asthma issues and on specific activities funded under the Commonwealth's Asthma Initiative. Its goal is to support national initiatives that will improve the health status and quality of life for all Australians with asthma.

1.3 Objective information and ethical promotion

Distribution of objective information for quality use of medicines and asthma?

Distribution/print runs of sources of objective information in Australia



Ethical Promotion

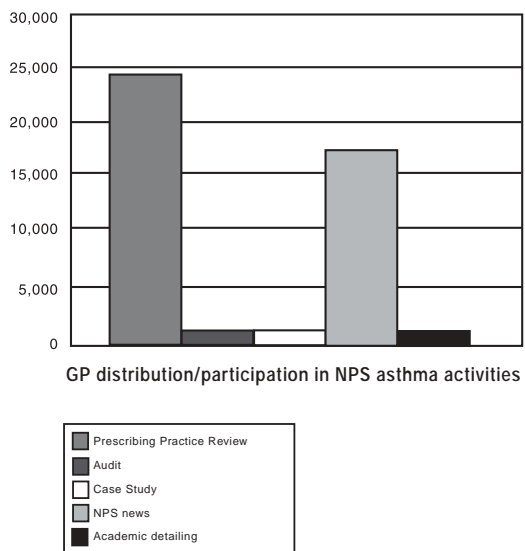
The pharmaceutical industry has to abide by the standards within the Medicines Australia Code of Conduct. These requirements include that promotional materials list the approved PBS indications and medical representatives provide the approved consumer medical information (CMI) and product information (PI). The development of such materials should be based on QUM principles and be evidence based and have broad input from key stakeholders.

1.4 Education and Training

Participation in education and training opportunities for asthma management and quality use of medicines?

There are many stakeholders involved in education and training on asthma management including the NPS, the National Asthma Council (NAC), consumer groups like the Asthma Foundation, the pharmaceutical industry, asthma educators and pharmacists. The NPS have evaluated some of their activities as demonstrated below.

Medical Practitioner distribution/participation in NPS asthma activities



1.5 Appropriate services and interventions Participation in QUM services for people with asthma?

General practitioners are the key to improving asthma management in the community. They are involved in the initial diagnosis and ongoing management of asthma. The appropriate steps in medicine management are highlighted in the Asthma 3+ Visit Plan³⁶. Many other activities are done in collaboration with other stakeholders like pharmacists (eg provision of over the counter reliever medicine and counselling on appropriate medicine use and medication reviews) and others involved in asthma education.

- In 2002, over 14000 home medication reviews were funded. Implementation trials suggest approximately 14% of participants are those with respiratory conditions
- In 2001-02, 23,580 services reimbursed for Asthma 3+ Visit Plan.

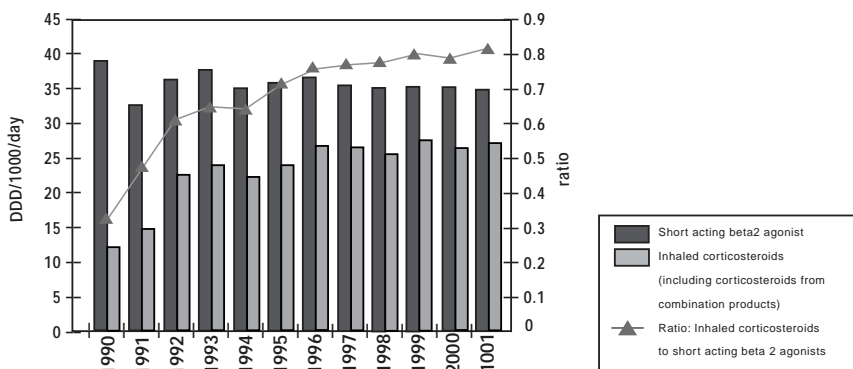
2. Monitoring outcomes

2.1 Impact Indicators

An impact indicator pertinent to asthma management is:

- Rate of utilisation of inhaled corticosteroids
- Rate of utilisation of inhaled bronchodilators (short acting)

Inhaled corticosteroid and short acting beta 2 agonist use: Australia



Because these medicines could be used for asthma or COPD and other conditions BEACH data should be monitored to confirm this trend by assessing medication use by indication. In addition, future versions of this indicator should include drug use for the population 1 to 49 years (where diagnostic uncertainty is reduced).

2.2 Outcome Indicators

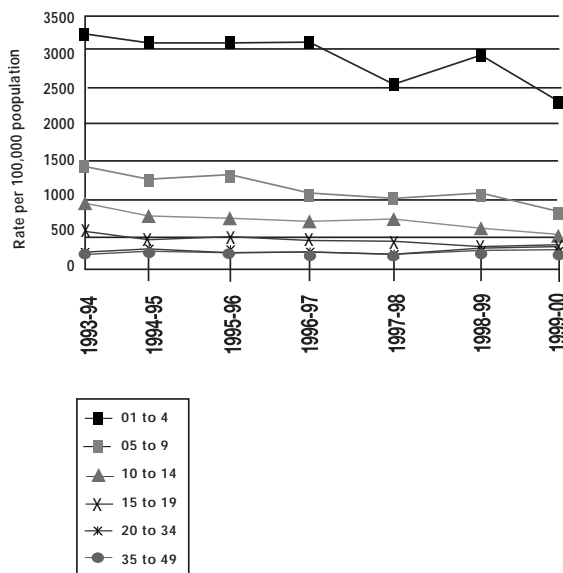
An outcome indicator pertinent to asthma management is:

Rate of hospital separations per annum as a consequence of asthma.

Purpose: Monitoring the rate of hospital admissions for asthma.

Hospitalisation rates need to be interpreted in line with change prevalence and severity of diseases. Currently in Australia, hospital rates for asthma are falling, while prevalence of asthma is stable, suggesting improvements in health outcomes.

Crude rate of hospital separations with a primary diagnosis of asthma in the population aged 1 to 49 years, Australia



(Source: Australian Institute of Health and Welfare, ABS. Note: Only the population aged 1 to 49 years is included as asthma may be misclassified in the very young as bronchiolitis, or in older persons as chronic obstructive pulmonary disease or emphysema.)

There should also be a corresponding indicator that shows what is happening with adverse drug events. Economic and humanistic indicators could also be included.

