

1 Overview

This publication is the seventh annual report of the BEACH (Bettering the Evaluation and Care of Health) program, a continuous national study of general practice activity in Australia. It provides results for the period April 2004 to March 2005 inclusive, using details of 95,300 encounters between general practitioners (GPs) and patients (about a 0.11% sample of all general practice encounters) from a random sample of 953 recognised practising GPs across the country. It also reports changes that have occurred in this activity since the inception of BEACH in 1998.

The BEACH program is unique. It is the only continuous randomised study of general practice activity in the world, and the only national program that provides direct linkage of management actions (such as prescriptions, referrals, investigations) with the problem under management. It began in April 1998 and the BEACH database now includes information for 697,400 encounters for 6,974 participants representing 5,929 individual GPs.

GPs provided by far the majority of the 96 million non-specialist services paid by Medicare in 2002–03, at an average rate of 4.9 visits per person per year.¹ BEACH provides us with knowledge of the content of these encounters and of the services and treatments they provide by giving an important insight into the health of a large proportion of the community.

1.1 Background

In 2003 the population of Australia was 19.9 million people,¹ and in 2002–03 the health care expenditure was A\$72.2 billion, or 9.5% of Australia's gross domestic product (GDP) (personal communication, Australian Institute of Health and Welfare, September 2005).

- In 2003 in Australia there were 51,819 medical practitioners working as clinicians, of whom 42% were primary care providers.²
- There were 110 practising primary care practitioners per 100,000 people in Australia in 2003. Together they made up 100 full-time equivalents (based on a 45 hour working week) per 100,000 population.²
 - 80% of these were recognised general practitioners and 20% were other primary care medical practitioners.³
- GPs perform a gatekeeper role for entry into the secondary and tertiary sectors of the Australian health care system.
- People are free to visit multiple GPs of their choice and services are provided on a fee-for-service system.
- About 85% of Australians attend a GP at least once during any one year (personal communication, Primary Care Division, Australian Government Department of Health and Ageing, August 2002).
- By far the majority of visits to GPs are funded through the Commonwealth Medicare Benefits Schedule (MBS).
- In the 2004–05 financial year, there were about 94 million unreferral attendances paid by Medicare (A1 and A2 items) at an average rate of 4.5 GP visits per person.⁴

- In 2004–05 the primary cost to Medicare for GP services (A1 and A2 items) was over \$2 billion.⁴ In 2000 (the most recent reported data available) GP services resulted in additional secondary costs (for pathology, imaging, referred specialist visits and medications etc.) of over \$4 billion.⁵
- For the previously reported BEACH years (1998–2004) Medicare covered 85% of the government schedule consultation fee.⁶ Some patients were not charged the additional 15% of the fee, the GPs accepting the Medicare payment as total payment. Others were charged the difference between the Medicare payment and the government scheduled fee. Still others may pay more for these services. Just before the commencement of the BEACH data period April 2004 to March 2005, some changes occurred in the payment structure from Medicare for GP services:
 - From March 2004 the safety threshold for couples and families was extended to cover 80% of out-of-pocket expenses for out-of-hospital medical treatments once the threshold was reached.⁷
 - From 1 February 2004 Medicare payments to the GP were increased for all bulk-billed (direct to Medicare) consultations with patients who were aged less than 15 years and for those holding a Commonwealth concession card.⁸

Such changes in policy may affect attendance rates for some sectors of the community and in turn this may affect the types of problems managed by GPs and the management of these problems. The BEACH program can readily measure such effects.

1.2 The BEACH program

In summary, the BEACH (Bettering the Evaluation and Care of Health) program is a continuous national study of general practice activity in Australia. It uses details of about 100,000 encounters between general practitioners (GPs) and patients (about a 0.11% sample of all general practice encounters) from a random sample of approximately 1,000 recognised practising GPs from across the country. A full description of the BEACH methods is provided in Chapter 5 of this report.

A random sample of general practitioners (GPs) who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from Health Insurance Commission data by the Primary Care Division of the Australian Government Department of Health and Ageing. GPs are approached by letter and followed up by telephone recruitment. Participating GPs complete details about 100 consecutive patient encounters on structured paper encounter forms and provide information about themselves and their practice.

Aims

The BEACH program has three main aims:

- to provide a reliable and valid data collection process for general practice which is responsive to the everchanging needs of information users
- to establish an ongoing database of GP–patient encounter information
- to assess patient risk factors and health states, and the relationship these factors have with health service activity.

Current status of BEACH

BEACH began in April 1998 and is now in its eighth year. The database for the first 7 years includes data for approximately 700,000 GP-patient encounters from about 7,000 GPs. Each year the AGPSCC publishes an annual report of BEACH results through the Australian Institute of Health and Welfare.

This publication reports results from the previous BEACH data year on a national basis to provide an overview of general practice activity. It also investigates changes over time in some of the National Health Priority Areas and other selected clinical topics of interest.

Other reports use the database for secondary analyses of a selected topic or for a specific research question. The most recent examples are a study of the changes in pathology ordering by GPs between 1998-99 and 2000-01,⁹ a comparative study of general practice activity in each of the states and territories of Australia¹⁰ and a comparative study of activity in rural and metropolitan areas of Australia.¹¹ These and other BEACH reports can be downloaded from <www.fmrc.org.au/publications/> (go to Books – General Practice Series) or from <www.aihw.gov.au/publications/index.cfm>.

The advantages of BEACH

BEACH tells us about what happens at clinical encounters between patients and GPs. It tells us about the relationships between the characteristics of the GP workforce, the patients they manage, the problems that are presented to and managed by GPs, and the treatment provided for each problem. It also provides a reliable continuous measure of changes in general practice since 1998.

We are often asked to outline the advantages the BEACH program has over general practice activity data from other sources. These advantages are summarised below.

- BEACH is the only national study of general practice activity in the world that is continuous, relying on a random everchanging sample of GPs and directly linking management actions to the morbidity under management.
- The sheer size of the GP sample (1,000 per year) and the relatively small cluster of encounters around each GP provides more reliable estimates than a smaller number of GPs with large clusters of patients and/or encounters around each participating GP.¹²
- Our access to a regular random sample of recognised GPs currently in active practice, through the Australian Government Department of Health and Ageing (AGDHA), ensures that the sample of GPs is drawn from a very reliable sample frame of currently active GPs.
- We have sufficient details about the characteristics of all GPs in the sample frame to test the representativeness of the final sample and to apply post-stratification weighting to correct for any under-representation or over-representation in the sample.
- The everchanging nature of the sample (where each GP can participate only once per triennium) ensures reliable representation of what is happening in general practice across the country. The sampling methods ensure that new entrants to the profession are available for selection because the sample frame is based on the most recent HIC data.

Where other data collection programs use a fixed set of GPs over a long period, they are measuring what that group is doing at any one time, or how that group has changed over time, and there may well be a 'training effect' inherent in longer term participation in such programs. Such measures cannot be generalised to the whole of general practice.

Further, where the GPs in the groups have a particular characteristic in common (e.g. all belong to a professional organisation to which not all GPs belong; all use a selected software system which is not used by all GPs), the group is biased and cannot represent all GPs.

- Each GP records for a set number of encounters (100), but there is wide variance among them in the number of patient consultations they conduct in any one year. The AGDHA therefore provides an individual count of activity level (i.e. number of A1 Medicare item numbers claimed in the previous period) for all randomly sampled GPs, allowing us to give a weighting to each GP's set of encounters commensurate with their contribution to total general practice encounters. This ensures that the final encounters represent encounters with all GPs.
- The structured paper encounter form leads the GP through each step in the encounter, encouraging entry of data for each element. In contrast, systems such as electronic health records rely on the GP to complete all fields of interest without guidance.
- The activities described in BEACH include all patient encounters, not just those covered by Medicare.
- The medication data include all prescriptions, rather than being limited to those prescribed medications covered by the Pharmaceutical Benefits Scheme, PBS (as are PBS data).
- BEACH is the only source of information on medications supplied directly to the patient by the GP, and about the medications GPs advise for over-the-counter (OTC) purchase, the patients to whom they provide such advice and the problems managed in this manner.
- The inclusion of other (non-pharmacological) treatments such as clinical counselling and procedural treatments provides a broader view of the interventions used by GPs in the care of their patients than other data sources.
- The link from all management actions (e.g. prescribing, ordering tests) to the problem under management provides the user with a measure of the 'quality' of care rather than just a count of the number of times an action has occurred (e.g. how frequently a specific drug has been prescribed).
- The use of a well-structured classification system designed specifically for general practice, together with the use of an extended vocabulary of terms which facilitates reliable classification of the data by trained secondary coders, removes the guesswork often applied in word searches of available records (in free text format) and in classification of a concept.
- The analytical techniques applied to the BEACH data ensure that the clustering inherent in the sampling methods is dealt with. Results are reported with 95% confidence intervals. Users are therefore aware of how reliable any estimate might be.
- Reliability of the methods is demonstrated by the consistency of results over time where change is not expected, and by the measurement of change when it might be expected.

A more detailed discussion of methodological issues associated with BEACH and of issues surrounding future computerised data collection is provided in Chapter 5 – Methods, Section 5.10.

1.3 BEACH data and other national data sources

Users of the BEACH data might wish to consider the results in relation to data from other sources. Integration of data from multiple sources can provide a more comprehensive picture of the health and health care of the Australian community. This section summarises the differences between BEACH and other national sources of data about general practice in Australia.

The Pharmaceutical Benefits Scheme

Prescribed medications paid for under the Pharmaceutical Benefits Scheme (PBS) are recorded by the Health Insurance Commission. The PBS data:

- count the prescription each time it crosses the pharmacist's counter (so that one prescription written by the GP with five repeats in BEACH would be counted by the PBS six times if the patient filled all repeats)
- count only those prescribed medications subsidised by the PBS and costing more than the minimum subsidy (and therefore covered by the PBS for all patients), or medications prescribed for those holding a Commonwealth concession card or for those who have reached the safety net threshold
- will change with each change in the PBS safety net threshold – when the threshold increases, as it did in January 2005, fewer prescribed medications are counted in the PBS for non-Commonwealth concession card holders¹³
- have no record of the problem being managed, so that economic cost analyses must rely on assumptions about the indication for specific drug types.

In BEACH:

- total medications include those prescribed (whether or not covered by the PBS for all or some patients), those supplied to the patient directly by the GP, and those advised for OTC purchase
- each prescription recorded reflects the GP's intent that the patient receives the prescribed medication and the specified number of repeats; the prescription, irrespective of the number of repeats ordered, is counted only once
- the medication is directly linked to the problem being managed by the GP, allowing cost analyses of pharmacological management of specific morbidity
- there is no information on the number of prescriptions not filled by the patient (and this also applies to the PBS).

These differences influence not only the numbers of prescriptions counted but also their distribution. For example, the majority of broad spectrum antibiotics such as amoxycillin fall under the PBS minimum subsidy level and would not be counted in the PBS data except where patients received the medication under the PBS because they are a Commonwealth concession card holder or had reached the annual safety net threshold. The PBS would therefore under-estimate the number of antibiotic prescriptions filled and the proportion of total medications accounted for by antibiotics. Changes in the minimum subsidy level (such as the increase in 2004) make the measurement of changes in prescribing through the PBS extremely difficult.¹³

Medicare Benefits Schedule

Consultations with GPs that are paid for in part or in full by Medicare Benefits under the Schedule (MBS) are recorded by the HIC.

- The MBS consultation data provided by the AGDHA do not usually include data about patients and encounters funded through the Department of Veterans' Affairs.
- The MBS data include only those GP services that have been billed to Medicare. In contrast, the BEACH database includes data about all clinical activities, irrespective of who pays for them.
- The MBS data reflect the item number charged to Medicare for a service and hold no information about the content of the consultation.
- The BEACH participants have the opportunity to record only one Medicare item number on each encounter form. They are instructed to select the more general item number where two item numbers apply to the consultation. Additional services attracting their own item MBS number (e.g. 30026 – repair of wound) are captured in BEACH as actions recorded in other parts of the form. This results in a lesser number of 'other' Medicare items than would be counted in the Medicare data.
- In activities of relatively low frequency with a skewed distribution across individual GPs, the relative frequency of the event in the BEACH data may not reflect that reported in the MBS data. For example, a study of early uptake of some enhanced primary care items by GPs demonstrated that almost half the enhanced primary care items claimed through the MBS came from about 6% of active GPs.¹⁴ Where activity is so skewed across the practising population, a national random sample will provide an under-estimate of activity because the sample reflects the population rather than the minority.

Pathology data from the MBS

Pathology tests undertaken by the pathologists that are charged to Medicare are recorded by the Health Insurance Commission. However, this does not reflect tests ordered by the GP.

- Each pathology company can respond differently to a specific test order label recorded by the GP. So the tests completed by a pathologist in response to a GP order for a full blood count may differ between companies.
- The pathology companies can charge through the MBS only for the three most expensive tests undertaken even where more were actually done. This is called 'coning' and is part of the AGDHA pathology payment system. This means that the tests recorded in the MBS include only those charged for, not all those that were done.
- The effect of these factors is that the MBS pathology data include only those tests billed to the MBS after interpretation of the order by the pathologist and after selection of the three most expensive tests. This effect will not be random. For example, in an order for four tests to review the status of a patient with diabetes, it is likely that the HbA1c test will be the least expensive and will 'drop off' the billing process due to coning. This results in an under-estimate of the number of HbA1c tests being ordered by GPs.
- Pathology MBS items contain pathology tests that have been grouped on the basis of cost. An MBS item may not therefore give a clear picture of the precise tests performed.

In BEACH, the pathology data:

- include details of pathology tests ordered by the participating GPs
- reflect the GP's intent that the patient should have the pathology test(s) done, and information about the extent to which patients do not have the test done is not available (nor is it in the MBS data)
- reflect the terms used by GPs in their orders to pathologists, and for reporting purposes these have been grouped by the MBS pathology groups for comparability. The distributions of the two data sets will differ, reflecting on the one hand the GP order and on the other the MBS-billed services after coning and assignment of MBS item number.

Those interested in GP pathology ordering will find more detailed information from the BEACH program in *Pathology Ordering by General Practitioners in Australia 1998*.¹⁵ A study of changes in pathology ordering patterns between 1998–99 and 2000–01 has also recently been released⁹ and is available through the Family Medicine Research Centre website <www.fmrc.org.au/publications/> (go to Books – General Practice Series).

Imaging data from the MBS

Some of the issues discussed regarding pathology data also apply to imaging data. Although coning is not an issue for imaging, radiologists can decide whether the test ordered by the GP is the most suitable and whether to undertake other tests of their choosing. The MBS data therefore reflect the tests that are actually undertaken by the radiologist, whereas the BEACH data reflect those ordered by the GP. Those interested in GP imaging ordering should view *Imaging Orders by General Practitioners in Australia 1999–00*,¹⁶ also available from the Family Medicine Research Centre website.

The National Health Survey (NHS)

The NHS can provide estimates of the population prevalence of specific diseases and a measure of the problems taken to the GP by people in the previous 2 weeks.

- Prevalence estimates are based on self-reported morbidity from a representative sample of the Australian population using a structured interview to elicit health-related information from participants.¹⁷
- Community surveys such as the NHS have the advantage of accessing people who do not go to a GP. They can therefore provide an estimate of population prevalence of disease and point estimates of incidence.
- Self-report has been demonstrated to be susceptible to misclassification, due to a lack of clinical corroboration of diagnoses.¹⁸

Management rates of health problems in general practice represent GP workload for a health problem. BEACH can be used to estimate the period incidence of diagnosed disease presenting in general practice through the number of new cases of that disease. However, problem management rates cannot be extrapolated to either patient–population prevalence or total population prevalence of a disease.

The general practice patient population sits between the more clinical hospital-based population and the general population,^{19,20} with around 85% of Australians visiting a GP at least once in any one year (personal communication, Primary Care Division, Australian Government Department of Health and Ageing, August 2002). Disease management rates are a product of both the prevalence of the disease/health problem in the population and the frequency with which a patient visits a GP for the treatment of that problem. Those who are older and/or have more chronic disease are therefore likely to visit more often and have a greater chance of being sampled in the encounter data. Further, some diseases require more frequent visits so that the specific set of problems experienced by a patient will determine their visit frequency.

A section on the bottom of each encounter form is used to investigate aspects of patient health or health care delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data).

Many SAND substudies ask an opening question, to ascertain whether the patient present at the encounter has a named condition, or measure the prevalence of a number of diseases among the respondents. Using a qualified medical practitioner to record morbidity in conjunction with patient self-report may provide a more accurate classification of patients' major health problems than self-report alone.^{18,20} In the substudies, we have overcome the effect of whether a particular problem happens to be under management at the encounter (and was or was not therefore recorded in the encounter data), but this still does not overcome the selection bias of the patient sample itself.

We are currently working on statistical methods using SAND prevalence estimates in combination with age-sex-specific attendance rates (from Medicare statistics) to gain a GP patient population estimate of prevalence of morbidities included in the National Health Priority Areas.

Access to BEACH data

Different bundles of BEACH data are available to the general public, to BEACH participating organisations, and to other organisations and researchers.

Public domain

In line with standard Australian Institute of Health and Welfare practice, this annual publication provides a comprehensive view of general practice activity in Australia. The BEACH program has generated many papers on a wide range of topics available in journals and professional magazines. Appendix 6 lists all published material from BEACH, available from <www.aihw.gov.au/publications/index.cfm>.

Since April 1998, a section on the bottom of each encounter form has been used to investigate aspects of patient health or health care delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data). The SAND methods are described in Chapter 5 – Methods, Section 5.3). Abstracts of results for the substudies conducted in the seventh BEACH year and not reported here are on the website of the Family Medicine Research Centre (of which the AGPSCC is a part) <www.fmrc.org.au/publications/SAND_abstracts.htm>. The subjects covered in the abstracts are listed in Table 1.1 with the sample size for each topic.

Participating organisations

Organisations providing funding for the BEACH program receive summary reports of the encounter data quarterly and standard reports about their subjects of interest. Participating organisations have direct access to straightforward analyses on any selected problem, medication, pathology or imaging test through our interactive web server.

External purchasers of standard reports

Non-contributing organisations may purchase standard reports or other ad hoc analyses. Charges are available on request. The AGPSCC should be contacted for further information. Contact details are provided at the front of this publication.

Analysis of the BEACH data is a complex task. AGPSCC has designed standard reports that cover most aspects of the subject under investigation. Examples of a problem-based standard report (subject warts) and a pharmacological-based standard report (subject allopurinol) for a single year's data are available on <www.fmrc.org.au/purchase.htm>.

Standard reports are available for selected groups of patients (e.g. children aged less than 15 years, or all women with a cardiovascular problem, or all patients residing in New South Wales), or a for a specific non-pharmacological management action.

Individual data analyses can be conducted where the specific research question is not adequately answered through standard reports.

Table 1.1: SAND abstracts for 2004–05 and sample size for each

Abstract number	Subject	Number of respondents	Number of GPs
67	Risk factors of patients on lipid-lowering medications [^]	10,233	353
68	Patient weight, perception of weight and weight loss in adults [^]	2,116	82
69	Patient weight, methods and medications tried for weight loss in adults	1,721	70
70	Inhaled corticosteroid use for asthma management	7,919	269
71	Patient BMI, morbidity and medication use (in adults)	1,913	75
72	Contraceptive use among female general practice patients aged 16–44 years	536	76
73	Warfarin use in patients with qualifying morbidity	2,572	89
74	Smoking and passive smoking in the home	2,789	96
75	Prevalence, management and investigations for chronic heart failure	2,735	95
76	Patients with risk factors for metabolic syndrome	2,845	96
77	Heart failure—underlying causes and medication management	2,660	91
78	NSAID and acid suppressant use in general practice patients	2,783	96
79	Hypertension and dyslipidaemia—management and comorbidity in general practice patients	2,874	97
80	Employment status and workers compensation claims in general practice patients	5,513	211
81	Prevalence and indications for gabapentin use by patients attending general practice	3,095	105

[^] Indicates that this is the second report on this topic, using additional data collected following publication of the previous abstract.