

1 Overview

This publication is the 10th annual report and the 22nd book in the series from the BEACH (Bettering the Evaluation And Care of Health) program, a continuous national study of general practice activity in Australia. It provides the annual results for the period April 2007 to March 2008 inclusive, using details of 95,300 encounters between general practitioners (GPs) and patients (about a 0.1% sample of all general practice encounters) from a random sample of 953 practising GPs across the country. In parallel with the release of this report, a summary of results from all 10 years of the BEACH program is published on the web in a report called *General practice activity in Australia 1998-99 to 2007-08: 10 year data tables*, at <www.aihw.gov.au/publications/index.cfm/subject/19> (AIHW catalogue number GEP 23). A third book using the 10 years of BEACH data collected to date will investigate in more detail changes in general practice activity in specific areas of interest, including the National Health Priority Areas. It will be published in mid-2009.

The BEACH program is conducted by the Australian General Practice Statistics and Classification Centre (AGPSCC). The AGPSCC is a collaborating unit of the Family Medicine Research Centre at the University of Sydney and the Australian Institute of Health and Welfare (AIHW). BEACH is currently supported financially by government instrumentalities and private industry.

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) to the problem under management. It began in April 1998, and the BEACH database now includes information for almost 1 million encounters from 9,874 participants representing about 7,400 individual GPs, or almost half of the GP sample frame from which the BEACH samples are drawn.

GPs provided by far the majority of the 111 million general practice services paid by Medicare in Australia in 2007-08, at an average rate of about five visits per head of population per year.¹ BEACH gives us some understanding of the content of these encounters and of the services and treatments that GPs provide.

1.1 Background

GPs are the first port of call in the Australian health care system. In 2007-08, they claimed about 107 million items of service (not including practice nurse item number claims) through Medicare and provided an estimated additional 5.4 million services that were paid for by other funders (such as workers compensation, state Government) or not charged for at all.²

About 88% of the Australian population visited a GP at least once in 2005-06.³ Previous research using BEACH data suggested that in 2001-02, people in Australia spent on average 83 minutes with a GP per head of population. This compared with about 56 minutes per head in New Zealand and about 30 minutes per head in the United States during the same period.⁴

In December 2007, the population of Australia was estimated to be 21.2 million people.⁵ In 2005-06, national expenditure on health was estimated to be \$86.9 billion, 9% of gross domestic product, with governments funding two-thirds the total health expenditure at an average of \$4,226 per person.^{6,7}

- In 2005, in Australia, 49,393 medical practitioners were working as clinicians, of whom 44% were primary care providers. Of these, 80% were recognised general practitioners and 20% were other primary care medical practitioners.⁸
- There were 98 full-time equivalent practising primary care practitioners per 100,000 people in Australia in 2005.⁸
- By far the majority of visits to GPs are funded through the Commonwealth Medicare Benefits Schedule (MBS). In the 2007–08 financial year, there were about 107 million general practice services (excluding practice nurse items) paid through Medicare at an average of about five GP services per person.¹ This equates to about 293,000 services per day, or more than 2 million per week.
- In 2007, the primary cost to Medicare for GP items was over \$4 billion.¹ Up-to-date estimates of secondary costs generated by GPs could not be located.

1.2 The BEACH program

In summary, the BEACH program is a continuous national study of general practice activity in Australia. It uses details of about 100,000 encounters between GPs and patients (about a 0.1% sample of all general practice encounters) from a random sample of approximately 1,000 recognised practising GPs from across the country. The BEACH methods are described in Chapter 2 of this report.

A random sample of GPs who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from Medicare Australia data by the Primary and Ambulatory Care Division of the Australian Government Department of Health and Ageing (DoHA). GPs are approached by letter and followed up by telephone recruitment. Each participating GP completes details for 100 consecutive GP–patient encounters on structured paper encounter forms (Appendix 1). They each also provide information about themselves and their major practice (Appendix 2).

Aims

The three main aims of the BEACH program are:

- to provide a reliable and valid data collection process for general practice that is responsive to the ever-changing 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 11th year. The database for the first 10 years includes data for approximately 990,000 GP–patient encounters from almost 9,900 participating GPs. Each year the AGPSCC publishes an annual report of BEACH results through the AIHW. This publication reports results from the previous BEACH data year (that is, April 2007 to March 2008) on a national basis to provide an overview of general practice activity.

Other reports use the database for secondary analyses of a selected topic or for a specific research question. Recent examples are a comparative study of general practice activity in each of the states and territories of Australia⁹, a comparative study of activity in rural and metropolitan areas of Australia¹⁰, and a report of more than 100 BEACH substudies (including abstracts of results and the research tools).¹¹ All annual reports 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/subject/19>.

The strengths of the BEACH program

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 strengths of the BEACH program when compared with general practice activity data from other sources. These strengths are summarised below.

- BEACH is the only national study of general practice activity in the world that is continuous, relying on a random ever-changing 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 provide more reliable estimates than a smaller number of GPs with large clusters of patients and/or encounters.¹²
- Our access to a regular random sample of recognised GPs in active practice, through the Australian Government Department of Health and Ageing (DoHA), ensures that the GP sample is drawn from a very reliable sample frame of currently active GPs.
- There are 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 compared with the original sample frame.
- The ever-changing 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 Medicare Australia data.

Where 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 GPs in the groups have a particular characteristic in common (for example, 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. DoHA therefore provides an individual count of activity level (that is, 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 his or her 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 (see Appendix 1). 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 (for example, 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 (for example, how often 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.

1.3 Issues when using BEACH data with other national data

Users of the BEACH data might wish to consolidate information from multiple national data sources. Integration of data from multiple sources can provide a more comprehensive picture of the health and health care of the Australian community. It is therefore important that readers are aware of how the BEACH data differ from those drawn from others. This section summarises 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 Medicare Australia. 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, those that then fall under the threshold will no longer be counted in the PBS for non-Commonwealth concession cardholders¹³
- have no record of the problem being managed.

In BEACH:

- total medications include those prescribed (whether 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
- there is no information on the number of prescriptions not filled by the patient (and this also applies to the PBS).

These differences have a major impact on the numbers of prescriptions counted but also affect their distribution. For example, the majority of broad spectrum antibiotics such as amoxicillin 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 Commonwealth concession cardholders or had reached the annual safety net threshold.¹³

Medicare Benefits Schedule

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

- The MBS consultation data provided by DoHA do not usually include data about patients and encounters funded through DVA.
- The MBS data include those GP services that have been billed to Medicare. BEACH includes all consultations, irrespective of who pays for them (if anyone).
- The MBS data reflect the item number charged to Medicare for a service, and some patient demographics, but hold no information about the content of the consultation.
- In 2007–08, BEACH participants were limited to recording three Medicare item numbers for each encounter. In contrast, MBS data include all Medicare item numbers claimed. In the BEACH data set this may result in a lower 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 underestimate of activity because the sample reflects the population rather than the minority.

Pathology data from the MBS

Pathology tests undertaken by pathologists that are charged to Medicare are recorded by Medicare Australia. However, these Medicare data are not comparable with BEACH data.

- 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 items undertaken, even when more were actually done. This is called 'coning' and is part of the DoHA pathology payment system. This means that the tests recorded in the MBS include only those charged for, not all those that were done.
- This means that the MBS pathology data reflect those tests billed to the MBS after interpretation of the order by the pathologist and after selection of the three most expensive items.
- Pathology MBS items contain pathology tests that have been grouped on the basis of cost (for example, 'any two of the following ... tests'). Therefore an MBS item often does not give a clear picture of the precise tests performed.

In BEACH, the pathology data:

- include details of pathology tests ordered by the participating GPs, however the GP is limited to the recording of five tests or battery of tests at each encounter, and as the number of tests/batteries ordered on any single occasion is increasing², an increasing number of additional tests ordered will be lost.
- 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 therefore differ, reflecting on the one hand the GP order and on the other the MBS-billed services from the pathologist.

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 2000–01¹⁶ is also available through the Family Medicine Research Centre (FMRC) website <www.fmrc.org.au/publications/> (go to Books – General Practice Series). We are currently investigating recent trends in pathology ordering by GPs under a Quality Use of Pathology project funded by the Diagnostics and Technology Branch of DoHA.

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*¹⁷, at the Family Medicine Research Centre website.

The National Health Survey

The National Health Survey, conducted by the Australian Bureau of Statistics, provides estimates of population prevalence of specific diseases, and a measure of the problems taken to the GP by people in the 2 weeks before the survey.

- 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.¹⁸
- Community surveys such as the National Health Survey have the advantage of accessing people who do not go to a GP as well as those who do. 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 because of a lack of clinical corroboration of diagnoses.¹⁹

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. The management rates of individual health problems and management actions can be extrapolated to national management rates.

The general practice patient population sits between the more clinical hospital-based population and the general population^{20,21}, with around 88% of Australians visiting a GP at least once in any year.³ 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.

There has been a SAND (Supplementary Analysis of Nominated Data) substudy (see Section 2.4) of disease prevalence among patients seen in general practice. Those interested in disease prevalence should refer to the recently published papers: *Estimating prevalence of common chronic morbidities in Australia*³, and *Prevalence and patterns of multimorbidity in Australia*.²²

1.4 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

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 in journals and professional magazines. Appendix 3 lists all published material from BEACH, available from <www.aihw.gov.au/publications/index.cfm/subject/19>.

Since April 1998, a section at 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 Section 2.4.

Abstracts for all SAND substudies from April 1999 to July 2006 inclusive were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*.¹¹ Abstracts of results and the research tools used in SAND substudies conducted between August 2006 and March 2007 were published in *General practice activity in Australia 2006–07*² and those conducted from April 2007 to January 2008 are included in Chapter 15 of this report.

Abstracts of results for all SAND substudies are also available on the FMRC's website <www.fmrc.org.au/publications/SAND_abstracts.htm>.

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 also have direct access to straightforward analyses on any selected problem, medication, pathology or imaging test through an interactive web server. All data made available to participating organisations are further 'de-identified'. Patient data are not identifiable, but are further stripped of date of birth (replaced with age in years and months) and postcode of residence (replaced with state and area type). GP characteristics data are only provided in the form of grouped output (for example, GPs aged less than 35 years) to any external organisation.

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. The AGPSCC has designed standard reports that cover most aspects of a subject under investigation. Examples of a problem-based standard report (subject: ischaemic heart disease in patients aged 45 years and over), a group report (subject: female patients aged 15–24 years) and a pharmacological-based standard report (subject: allopurinol) for a single year's data are available at <www.fmrc.org.au/purchase.htm>.

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