1 Overview

This publication is the ninth annual report and the 21st 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 results for the period April 2006 to March 2007 inclusive, using details of 91,805 encounters between general practitioners (GPs) and patients (about a 0.1% sample of all general practice encounters) from a random sample of 930 practising GPs across the country. It also reports changes that have occurred in this activity since BEACH began in 1998.

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 892,300 encounters from 8,923 participants representing about 7,000 individual GPs.

GPs provided by far the majority of the 103 million non-specialist services paid by Medicare in Australia in 2005–06, at an average rate of about five visits per person 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. They act as gatekeepers to the secondary and tertiary sectors of the health system. In 2006–07 they claimed more than 100 million items of service through Medicare and provided an estimated additional 6.6 million services that were paid for by other funders (such as workers compensation, state Government) or not charged for at all.[2]

About 80% of the Australian population visit a GP at least once in any year.[3] Previous research using BEACH data suggested that in the 12 months 2001–02, people in Australia spent on average 83 minutes with a GP per head of population. This compares with about 56 minutes per head in New Zealand and about 30 minutes per head in the United States during the same period.[4] The extent to which this affects health outcomes for the population cannot be measured. However, considering the important role general practice plays in the health care of the community, information about the clinical activities of GPs is essential.

In March 2007 the population of Australia was estimated to be 20.9 million people.[5] In 2005–06, national expenditure on health was 9.0% of gross domestic product, with governments funding two-thirds of the $86.9 billion total health expenditure.[6]

- In 2003 in Australia there were 51,819 medical practitioners working as clinicians, of whom 42% were primary care providers.[7] Of these, 80% were recognised general practitioners and 20% were other primary care medical practitioners.[8]

- 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.[7]

- By far the majority of visits to GPs are funded through the Commonwealth Medicare Benefits Schedule (MBS).

- In the 2006–07 financial year, there were about 103 million general practice services paid through Medicare at an average of 5 GP services per person.[1] This equates with approximately 280,000 services per day, every day of the year.[1]

- In 2005 the primary cost to Medicare for GP items was over $4 billion.[9] 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. A full description of the BEACH methods is provided 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 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 BEACH program has three main aims:

- to provide a reliable and valid data collection process for general practice which 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 10th year. The database for the first 9 years includes data for approximately 900,000 GP–patient encounters from almost 9,000 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 (April 2006 to March 2007) 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 Australia[10], a comparative study of activity in rural and metropolitan areas of Australia[11], and a report of more than 100 BEACH substudies (including abstracts of results and the research tools).[12] 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/criteria//subject/19>.

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, see <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 Section 2.5.

A recently published report *Patient-based substudies from BEACH: abstracts and research tools 1999–2006* provides details of more than 100 SAND substudies conducted in the BEACH program. Abstracts and research tools for substudies conducted in 2006–07 that were not included in that report are presented in Chapter 16. The subjects covered in the abstracts from the 2006–07 BEACH year are listed in Table 16.1 with the sample size for each topic.

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 is 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 or more), 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 on <www.fmrc.org.au/purchase.htm>.

Standard reports are available for selected groups of patients (for example 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, over any selected data period.

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

1.3 Future options for national representative data collection from general practice

The BEACH program is currently a paper-based data collection program. It is labour-intensive for the GPs and for secondary data entry by the research team. Further, the introduction of practice nurse item numbers and the growing role and number of practice nurses in general practice means that some of the work undertaken by GPs in the past will increasingly be transferred to practice nurses who are not completing BEACH forms. The AGPSCC believes that a move to national electronic data collection systems that draw data from both GPs and practice nurses will be essential in the future.

Requirements for electronic data collection

The structure of electronic clinical systems varies, as do the coding and classification systems used in each. National electronic data collection will require:

- **the development and full adoption of a standardised minimum data set**

  During 2005 we developed a minimum data set for the Electronic Communication Working Group of the General Practice Computing Group. The project was conducted under the auspices of the the Royal Australian College of General Practitioners (RACGP) with funding from DoHA. This was one of a series of projects designed to improve inter-operability of GP computer systems and to improve communication between systems by standardising data elements and database systems.

  This project developed a minimum set of data items necessary for reporting from GP computer systems. The data items were derived from established reporting data sets used in general practice in Australia including the Australian Childhood Immunisation Register, the Enhanced Divisional Quality Use of Medicines Program, BEACH and the Cardiab data sets. Although these data items were derived from reporting sets, all the data items have relevance to the clinical activities of GPs. After consultation it was decided to format the minimum data set in the National e-Health Transition Authority's (NeHTA) format to facilitate use in other related projects. Research was undertaken to elicit standardised data definitions based on commonly used definitions relevant in the context of general practice.

  The final minimum data set comprises 90 data elements and includes data groups of logically associated items and a linkage diagram to specify required linkages between data items. The report 'General practice EHR and data query minimum data set' is

available on the web at <www.gpcg.org.au/index.php?option=com_content&task=view&id=41&Itemid=54>.

The AGPSCC believes that the work already done on this minimum data set is extremely valuable and that the investment should be built on. The minimum data set would provide an excellent platform for standardising the data set available in every software system, to provide standard electronic data reporting to national data collection programs.

However, the minimum data set has not been incorporated into GP software and it appears unlikely to be adopted unless adequate incentives are in place.

- **the adoption of standard coding and classification systems in all GP electronic clinical systems and uniform application of these within the clinical software**

  Currently there are about 12 software providers in Australia with finished product clinical systems being used in general practice that utilise the ICPC-2 PLUS[13], an interface terminology classified to the International Classification of Primary Care (Version 2) (ICPC-2). ICPC-2 PLUS allows speedy classification of 'problems managed' data (and, in some systems, presenting symptoms) to the international standard for classification of data collected in general practice, ICPC-2.[14] This is the same coding and classification system used in BEACH (see Section 5.8 Classification of data). However, the major software provider in Australia does not use ICPC-2 for the classification of any data.

  ICPC-2 and the PLUS terminology can be used for many other aspects of the patient record, including clinical treatments (such as counselling), diagnostic and therapeutic procedures, referrals, and pathology and imaging tests ordered. Generally, the software providers do not offer or do not encourage their use for these data.

  The Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT)[15], the pre-eminent clinical terminology, has been identified by NeHTA as the preferred national terminology for Australia. SNOMED CT remains freely available for e-health software developers to use in their Australian products, under NeHTA's new licensing arrangements. However, as SNOMED CT does not provide total coverage of all concepts and descriptions used in the Australian health sector, NeHTA will supplement SNOMED CT by developing specific extension terminologies to cover local clinical information requirements. This will include mapping to the existing classifications used for data coding in Australia, such as ICD-10-AM.[16]

  Pharmaceuticals also need to be coded and classified. Currently NeHTA is developing the Australian Medicines and Devices Terminology as a national standard linked to the SNOMED CT terminology. This system became available in 2007, but implementation across all IT systems in the health sector may take years.

- **resolution of privacy and confidentiality issues**

  Any consumer and professional concerns regarding electronic download of patient data from GP electronic health records (EHRs) software need to be identified and addressed even where data collections occur under the auspices of statutory authorities such as the AIHW.

Passive data collection

Passive data collection is where data are drawn by automatic download from general practice EHRs.

Many people have suggested that, with the increased GP uptake of electronic prescribing systems or full clinical systems (that is, EHRs), data can be drawn directly from the GPs' clinical computers. Some also suggest that patient-based longitudinal data could be gained by such means. This is being done in some divisions of general practice for selected morbidity topics in projects such as the National Primary Care Collaboratives program.[17] However, obtaining reliable data at the national level for all aspects of care and for all data elements collected in BEACH presents a major challenge.

To obtain a national random sample of practising GPs, each GP must have an equal chance of selection and this is not possible until all GPs are using EHRs. GPs who use computers for clinical practice differ from those who do not. They are younger and more likely to have graduated in Australia, be Fellows of the Royal Australian College of General Practitioners (FRACGP), work in larger practices, practise outside major cities, be female, and less likely to bulk-bill all patients, than those who do not use a computer for clinical purposes.[18] Sampling from only those GPs with EHRs would therefore give a biased national result.

Passive data collection also requires complete records with valid data in all compulsory fields. Proposals to randomly sample current EHRs are based on an assumption that all of the GPs (and the practice nurses) enter all of the required data, all of the time, for all patients—that is, that they are virtually paperless. Many GPs currently have electronic prescribing systems available but not full EHRs, or they use their EHRs for prescribing only (see Chapter 4). Henderson et al. recently published a more detailed analysis of the BEACH data demonstrating the extent to which individual GPs use their computers for clinical purposes. This study demonstrated that only about one in five GPs used all the functions that would be required to collect the BEACH data set and submit it electronically to the AGPSCC.[19]

Active electronic data collection

Active electronic data collection requires participants to manually enter all compulsory data into an electronic data collection tool (for example an Internet-based data collection form). Information would not be extracted from existing electronic records.

A longitudinal crossover study in 2002–03 by the FMRC, commissioned by the RACGP and the Western Sydney Division of General Practice, demonstrated that using a purpose-built data collection software module on the GPs' desktops resulted in low compliance by the GPs and poor data quality, with much less data recorded than in the paper-based BEACH collection. The results of this study clearly indicated that any active data collection program must use software that is integrated with, and automatically uses data already in, the GPs' EHRs.[20]

Possible ways to move forward

The methodological studies leading up to BEACH and the BEACH program itself have demonstrated that it is not necessary or practical to collect all of the data for all of the patients all of the time to gain a reliable national picture of GP activity.

Electronic data collection (PC- or web-based), in which randomly sampled GPs record data for all the necessary BEACH data elements for a sample of patients—on computer instead of paper—could be introduced as a process integrated with GPs' desktop EHR software. The relevant data already recorded in the EHR could be transferred to a 'plug in' data collection tool. Such a process has been used in a limited way in the National Primary Care

Collaboratives Program. At the end of the encounter any BEACH data fields that remain empty could be highlighted for the manual addition of information where required.

This method would mean that a GP only had to provide complete data for a sample of encounters, as is the case with the current BEACH program. However, the issues of standardised coding and classification system still apply in this model—standards will still be needed.

This approach could provide a way forward. When such a system proves reliable (as tested against parallel BEACH paper-based data), and random sampling is possible (when all GPs are using EHRs) paper-based data collection could be phased out. A move to passive data collection could be made once all GPs use complete EHRs and as standards are implemented and rigorously applied in all clinical systems.

However, for both options, the same methodological rigour should be applied as was the case in the development of valid and reliable paper-based methods of GP data collection over a period of more than 20 years. The BEACH instrument and methodology provide an excellent jumping-off point for developing any future electronic data collection from general practice.