

2 Methods

This section provides an overview of the BEACH methods, describes the development of the SAND process and gives a brief summary of the methods adopted.

2.1 BEACH methods

The methods adopted in the BEACH program have been described in detail elsewhere (Britt et al. 1999a; Britt et al. 1999b). In summary, a random sample of approximately 1,000 recognised GPs per year each records details about 100 doctor-patient encounters of all types on structured paper encounter forms.

The source population includes all recognised GPs who have claimed a minimum of 375 general practice Medicare items (items 1-51) in the most recently available three-month Health Insurance Commission (HIC) data period. This equates with a cut-off of 1,500 Medicare claims per year and ensures inclusion of the majority of part-time GPs while excluding those who are not in active private practice but claim for a few consultations a year. The General Practice Branch of the Commonwealth Department of Health and Aged Care (DHAC) draws a sample every three months.

The randomly selected GPs are approached by letter and then by a telephone follow-up. GPs who agree to participate are set an agreed recording date approximately three to four weeks ahead. A research pack is sent to each participant about 10 days before the planned recording date.

The research pack contains:

- a covering letter;
- a project information sheet;
- a GP profile questionnaire;
- a pad of 105 recording forms (to allow for some error);
- a detailed set of instructions;
- a height and weight measure conversion (to metric) chart (for body mass index);
- a sample completed form with explanation;
- a pictorial 'standard drinks' chart to help patients answer questions on alcohol intake;
- additional instructions for completing supplementary questions on each form;
- a reply-paid envelope and several copies of a patient information sheet.

The patient information sheet gives patients the choice to 'opt out' and not have details of their consultation included in the study by informing their GP of this decision. A telephone reminder is made to each GP participant during the first days of the agreed recording period. Non-returns are followed up by regular telephone calls. An example of a recording form is provided at appendix 1.

Each participating GP earns 25 audit points from the Royal Australian College of General Practitioners (RACGP) towards his or her quality assurance (QA) requirements. As part of this QA process s/he receives an analysis of his/her own results compared with those of nine other unidentified practitioners who recorded at approximately the same time. Comparison with the national average and with targets relating to the National Health Priority Areas is also made. In addition, GPs receive some educational material related to the

identification and management of patients who smoke or who consume alcohol at hazardous levels.

2.2 Development of the SAND methods

In 1996 the Western Sydney Division of General Practice (WSDGP) provided funding for a local morbidity and treatment survey. The Division required current data concerning the health needs of the population in its region and the activities of GPs practising in Western Sydney in order to plan future projects and educational programs. This provided the opportunity to test:

- a detailed encounter form;
- the inclusion of patient-based questions on health risk factors;
- the application of extensive and detailed coding systems for diagnoses, pharmaceutical treatments and other management techniques; and
- a comprehensive database 'front-end' and direct computer assisted secondary data entry.

Interest in the possible use of the general practice patient population to measure aspects of population health led to the addition of a **new section** (SAND—Supplementary Analysis of Nominated Data) on each BEACH form, **concerning patient based risk factors** and health assessment. Items were asked of a sub-sample of patients seeing each participating GP.

Form type 1: Half the 100 forms in each recording pad included questions about the patient's:

- status in terms of being: of non-English-speaking background (NESB); an Aboriginal and/or a Torres Straight Islander person (ATSI);
- height and weight; and
- smoking status.

Form type 2: The remaining half of the pad included questions regarding the patient's:

- self-reported general health status; and
- alcohol consumption level.

The two blocks of form types were placed in alternate order through the recording pads so that for 50% of the participating GPs the first half of the recording pack was form type 1 and for the other 50% it was form type 2. The intent was to reduce (and later measure) any bias that such questions might impose on the morbidity managed or management provided during the consultation. Subsequent analysis revealed that there was no impact on the morbidity managed or management practices associated with the SAND items collected.

The program was approved by the RACGP as a quality assurance option (audit) for participants. All of the new aspects of the research method were found to be viable, with two exceptions. First, the layout of the sections asking for details of prescribed drugs was not ideal for reliable data gathering. Second, considering the overall lack of information available about the morbidity of people of NESB and ATSI status, it was felt these questions should be included on every form rather than on only a sub-sample. The recording form was revised after the Western Sydney pilot study to lead the GP in provision of more details about the drugs prescribed. The questions on NESB and ATSI status were also removed from the SAND section and placed on every recording form.

In 1997 the Department of Human Services, Victoria, commissioned a study of general practice activity in that State. The objective was to measure any changes in morbidity and its

management since measured in 1990–91 in the Australian Morbidity and Treatment Survey (AMTS) (Bridges-Webb et al. 1992) and provide a new baseline for the measurement of future change. The revised recording form was used in this study.

The successful completion of the SAND questions, and the valuable data provided through this method, demonstrated that GP collection of data about risk factor status from their patients was a feasible approach. Feedback from the GPs also showed that they considered this type of information valuable in providing a better understanding of the health of their patients from a population health view.

The success and usefulness of the method encouraged the implementation of optional blocks of brief questions as part of the national BEACH program of monitoring general practice activity. Not only risk factors would be investigated, but also aspects of health care delivery would also be included in the study program.

2.3 SAND methods

SAND investigates other aspects of patient health or health care delivery not covered by general practice consultation based information. The annual BEACH data collection period is broken down into 10 blocks of recording, each block comprising five weeks. Each block should include data from 100 GPs, 20 GPs recording per week. Each GP's recording pad is made up of three components (40 A forms, 40 S forms and 20 L forms). Each component covers a different SAND topic, and involves a line of questioning that is asked of the patient or the GP in addition to the encounter based information.

The order of SAND the components in the GPs recording pack is randomised, so that 40 A forms may appear first, second or third in the pad. Although analysis of the pilots in WSDGP and Victoria suggested that when GPs were required to ask questions related to body mass, alcohol use and smoking status there was no impact on the encounter details collected, the possibility of an effect for other lines of questioning must be considered. Randomised ordering of the components ensures that there is no order effect on the quality of the information collected.

Two parts of SAND remain constant for the year across the 10 blocks of the BEACH program. All GPs have 40 A forms in their recording pads and these investigate height, weight, patient-assessed well being and alcohol use. A single smoking status item is also included on all 40 S forms. Questions in the remaining space vary from block to block, and address other aspects of patient health/health care delivery in general practice, effectively sub-sampling the overall sample.

2.4 Classification of morbidity data

Problems managed at encounter and problems recorded as part of the SAND sub-sample questions were coded using ICPC-2 PLUS (Britt 1997). This is an extended vocabulary of terms classified according to the International Classification of Primary Care (Version 2) (ICPC-2), a product of the World Organization of Family Doctors (WONCA) (Classification Committee of the World Organization of Family Doctors 1997).

ICPC has a bi-axial structure with 17 chapters on one axis (each with an alphabetic code) and seven components on the other (numeric codes). Chapters are based on body systems, with additional chapters for psychological and social problems. Component 1 includes symptoms and complaints while Component 7 covers diagnoses. These are independent in each chapter and either can be used for problems managed.

2.5 Statistical methods

The analyses of the SAND databases are conducted through SAS version 6.12 (1996) with the encounter as the primary unit of analysis. Proportions (%) are used only when describing the distribution of an event that can arise only once at a consultation (e.g. age, gender or smoking status) or to describe the distribution of events within a class of events (e.g. condition A as a % of total conditions).

Rates per 100 encounters are used when an event can occur more than once at the consultation (e.g. patient reasons for encounter [RFEs], problems managed or medications). Rates per 100 problems are also used when a management event can occur more than once per problem managed (e.g. prescribed drugs, orders for pathology). In general, the following results present the number of observations (n), rate per 100 encounters and the 95% confidence intervals.

The BEACH study is essentially a random sample of GPs, each providing data about a cluster of encounters. Cluster sampling study designs in general practice research violate the simple random sample (SRS) assumption because the probability of an encounter being included is a function of the probability of the GP being selected (Sayer 1999).

There is also a secondary probability function of particular encounters being included in the GP's cluster and this increases the likelihood of sampling bias. In addition, there will be inherent relationships between encounters from the same cluster and this creates a statistical bias. For example, female GPs tend to see more female patients than their male counterparts; a group of patients of one GP may receive different treatments from those received by patients of another GP, reflecting different practice styles. The probability of gaining a representative sample of encounters is therefore reduced by the potential sampling and statistical bias, decreasing the accuracy of national estimates.

When an investigator violates the SRS assumption, analytical techniques that consider the study design should be employed. In this report the standard error calculations used in the 95% confidence intervals incorporate both the single-stage clustered study design and sample weighting according to Kish's description of the formulas (Kish 1965). SAS is limited in its capacity to calculate the standard error for the current study design, so additional programming has been required to incorporate the formulae.