Method

Summary

Each individual in a random sample of recognised GPs records details of 100 consecutive GP–patient encounters of all types (including indirect consultations which resulted in clinical action) on structured paper encounter forms. In a full-data collection year 1,000 GPs will participate and this will provide details of approximately 100,000 encounters.

Ethics approval for this study was obtained from the Human Ethics Committee of the University of Sydney and the Health Ethics Committee of the Australian Institute of Health and Welfare.

The *BEACH* program began on 1 April 1998. Data from the first six months have been entered, cleaned and analysed.

Data elements

BEACH includes three inter-related data collections: encounter data, patient risk factors and health states, and GP characteristics. An example of the form used to collect the encounter data and the data on patient risk factors and health states is included as Appendix 1. The GP characteristics form is included as Appendix 2.

1. Encounter data

The consultation

- Date of consultation
- Type of consultation

    Direct (face to face)

        Medicare item number (where applicable)

        Workers compensation paid

        Other paid

        No charge

    Indirect (patient not seen); action(s) resulting

        Script

        Referral

        Certificate

        Other

The patient

- Date of birth
- Gender
- Status to the practice (new / seen before)
- Postcode of residence
- Health Care Card status (yes / no)
- Veterans Affairs status (Gold / White)
- Non-English speaking background (yes / no)
- Aboriginal (yes / no) (self-identification)
- Torres Strait Islander (yes / no) (self-identification)
- Patient reasons for encounter (up to three)

Problems and their management at this encounter

- Diagnoses / problems managed at the encounter (up to four)
- Status of each problem (new to patient / managed before)
- Whether the problem was work related

Management for each problem

- Medications prescribed, over-the-counter drugs advised and other drugs supplied by the GP
    - Brand name
    - Form (where required)
    - Strength
    - Regimen
    - Status (new drug for this problem for this patient / continuation of previous script)
    - Number of repeats
- Other treatments, procedures, counselling (up to two per problem) undertaken at the consultation
- Referrals to specialist / health professional / emergency department / hospital admission (multiple allowed each problem)
- Pathology and imaging ordered

2. Patient risk factors and health states

Supplementary analysis of nominated data (SAND)

A section on the bottom of each recording form investigates aspects of patient health or health care delivery in general practice not covered by the consultation-based information (see Appendix 1).

The year-long data-collection period is divided into 10 blocks, each of five weeks and designed to include data from 100 GPs. Each GP's recording pack of 100 forms is made up of

- **40 A (Alcohol/BMI) forms,** which include questions about the patient's self-reported wellbeing, height and weight and alcohol intake (Appendix 1);
- **40 S (Short) forms,** which include a single question about the patient's smoking status together with questions on other subjects nominated for that block;
- **20 L (Long) forms,** which include questions on other subjects nominated for that block.

The order of these components is randomised so that 40 A forms may appear first, second or third in the pad. The aim is to ensure there is no order effect on the quality of the information collected.

3. GP characteristics data

Each participating GP completes a GP profile questionnaire, which includes the following data elements:

- age and gender
- years in general practice
- number of GP sessions worked per week
- number of full-time and part-time GPs working in the practice
- consultations in languages other than English
- postcode of major practice address
- country of graduation
- postgraduate general practice training and FRACGP status
- membership of professional organisations
- brand substitution behaviour.

An example of the GP profile questionnaire form is attached as Appendix 2.

The GP sample

The sample frame

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 data period. This equates with a cut-off of 1,500 Medicare claims a year and ensures inclusion of the majority of part-time GPs whilst excluding those who are not in private practice but claim for a few consultations a year. It also ensures cost-effective data collection because the maximum recording period for any GP will be approximately 3.5 weeks, while most will finish in less than one week.

Sample size

In collecting information about patients it is often easier, cheaper and more appropriate to enlist the support of a number of GPs who provide access to a number of patients. This type

of sampling is called 'cluster sampling' as clusters or groups of patients around a GP are used for the investigation (Sayer 1999). However, patients around GPs tend to have a degree of similarity in some characteristics, so it is important that sample size estimates consider the differential clustering effect for the different variables under investigation. Previous research (Meza et al. 1995) utilising the Australian Morbidity and Treatment Survey showed that GPs should only provide information on 100 consecutive encounters and that 1,000 GPs would provide reliable estimates of the most frequent problems managed and the most frequent medications prescribed. Experience with the AMTS has also shown that reliable estimates for the most frequent management practices are gained for most conditions with a sample of this size.

Drawing the sample

Arrangements were made with the General Practice Branch of the Commonwealth Department of Health and Aged Care to draw a sample of 600 GPs per quarter, anticipating an overall response rate of 50%. Data elements supplied by the Department include

- age and gender
- year and place of graduation
- years in general practice
- number of Medicare claims in the previous 12 months and previous quarter.

These data allow for

- later comparison of the characteristics of participants with non-participants
- adjustment of results for any differences identified between the two groups
- weighting of individual GP results according to level of activity to ensure the encounter data represent encounters across Australia.

GP recruitment

The GP recording weeks are spread as evenly as possible over 50 weeks of the year. Data are not collected for two weeks over the Christmas - New Year period. GPs are recruited several weeks ahead throughout the year and constitute a rolling ever-changing sample.

As each of the random samples is received, GPs are approached in their randomised order by letter at a rate of approximately 50 per week. The letter outlines the study aims and method with particular reference to the time and work each doctor will need to contribute. The GPs are also informed about the benefits they will receive in return for their participation. A copy of the approach letter is attached as Appendix 3.

Approximately 10 days after the approach letter is posted a trained research assistant contacts each GP by telephone, inviting their participation in the study and answering any questions.

Where the GP agrees to take part in *BEACH* a date to begin recording is agreed by telephone. The GP is then allocated an individual GP identification number and their details are entered into the GP database as a participant.

Data collection

Approximately 10 days prior to the agreed recording dates a research pack is posted to each GP. This allows sufficient time for them to absorb the instructions and review the recording form prior to commencement of recording.

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 (see Appendix 4)
- 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 the SAND questions on alcohol
- additional instructions for completing each of the SAND questions
- a reply-paid envelope.

Also included are several copies of a patient information sheet to show each patient as they enter the waiting room. It summarises the project and offers the opportunity for the patients to 'opt out' by informing their GP if they do not wish to have their unidentified data included in the study.

On the agreed start date for recording a research assistant re-contacts the participating GP to remind him or her to begin recording and to answer any questions which may have arisen. The *BEACH* program also has a 'free call' phone number to allow GPs to ring the research team about any aspect of the study. Upon completion of the encounter forms the GP returns the pack together with the completed GP characteristics form in the reply-paid envelope to the General Practice Statistics and Classification Unit.

When a pack is not returned to the Unit within two weeks of the recording period, the GP is again contacted by telephone and asked to return the pack as soon as possible. Follow-up of non-returns continues for five phone calls over the ensuing weeks. Where the forms are not returned after three months the GP is regarded as a 'drop-out' from the program and is so informed.

Data entry and classification

Data are directly entered into an Access database designed specifically for this study.

Classification of data

Patient reasons for encounter, problems managed, therapeutic procedures, other non-pharmacological treatments, referrals, and pathology and imaging ordered are classified 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 Organisation of Family Doctors (WONCA) (WONCA 1998). The ICPC is regarded as the international standard for data classification in primary care. The extended

vocabulary of PLUS terms is derived from those used by GPs in over 800,000 encounter records completed in multiple studies by the Family Medicine Research Unit.

Pharmaceuticals prescribed or provided and over-the-counter drugs advised by the GP are coded and classified according to an in-house classification developed over the past 15 years by the Family Medicine Research Unit. The Coding Atlas for Pharmaceutical Substances (CAPS) is a hierarchical structure which facilitates analysis of data at a variety of levels, for example, drug class, drug group and generic brand name. Strength and regimen are independent fields which, when combined with the CAPS code, give an opportunity to derive prescribed daily dose for any drug or group of drugs.

The data elements are automatically coded and classified by the computer as staff enter key words or word fragments and select the required term or label from a pick list.

Data quality assurance program

A quality assurance program to ensure reliability of data entry has been established using multiple approach methods.

Checking of data entered into the database

A number of standardised data-checking and cleaning methods that have proved successful in previous studies have been adopted. These methods (e.g. a query to identify encounters which included the same drug prescribed twice) were hard coded into the data entry database and are run at regular intervals to detect clearly definable coding or GP transcription errors.

Checking of data against the encounter form

A random one in every five records is checked against the encounter form for any coding and transcription errors. This ongoing process identifies areas where further coder staff education and data-cleaning reports are required.

A full data check and clean is undertaken every three months utilising the above methods in addition to randomised one-off data searches (e.g. new problems for which the drug prescribed has a 'continued' status). Ad hoc data searches as requested by the ***BEACH*** project team are also run at regular intervals and hard coded into the standardised checking process wherever necessary.

Statistical methods

BEACH results are reported in SAS (SAS 1996). In general, reports present number of observations (n), rate per 100 patients, 95% confidence intervals and relative standard error (RSE) for each data element. The standard error calculations incorporate the study design (single-stage clustered study design) according to Kish's formula (Kish 1965). SAS is limited in its capacity to calculate the standard error for the current study design, so additional programming has been required.

The RSE, commonly used by the Australian Bureau of Statistics, is a function of the standard error and the rate estimate and also provides a measure of reliability of the rate estimate. For general purposes an RSE of 0–15 can be regarded as reliable, 16–33 as slightly unreliable, and 34–50 as extremely unreliable. A RSE of 51–100 indicates that the estimate

should not be used. However, there is considerable argument that the 95% confidence interval provides the best estimate of utility of the finding.

Limitations of *BEACH*

General practitioners participating in this survey are all recognised GPs who work in private practice on a fee-for-service basis. No salaried practitioners in either the public or private sector are included.

The study provides a cross-sectional view of the management of problems in general practice. No conclusions can be drawn in terms of disease episodes, nor in terms of long-term treatment of patients with chronic conditions.

The survey is largely an encounter-based study of the patients for whom a general practice service is provided. Except where SAND specifically addresses the question of co-morbidity not managed during the course of the recorded encounter, the morbidity patterns reflect only the problems managed during the recorded encounters. There may be other co-morbidity managed at other encounters not occurring during the recording period.

Prescription and drugs advised or provided include only those medications that were prescribed, given or advised for over-the-counter purchase during the course of the recorded encounter. If a prescription was not provided for a given problem it does not necessarily mean that the patient was not already taking medication for the problem. Similarly, the absence of a procedure or a referral does not preclude the possibility that these events occurred at a prior encounter or might happen at a subsequent encounter.

Data output

The participating GPs

Each participating GP receives an analysis of their own results compared with those of nine other unidentified practitioners who recorded at approximately the same time. Comparison with the national average is also made for their interest. GPs also receive some educational material related to the management of patients who smoke or who have reported hazardous levels of alcohol consumption.

Interim sampling results

GP characteristics: participants compared with non-participants

Due to the rolling nature of the recruitment process it is impossible to have a clear cut-off point to calculate response rates and to compare the characteristics of participants and non-participants. This is because a GP approached in the fifth month of the program may agree to participate in month seven.

The following interim recruitment results and comparison of the characteristics of the two groups were undertaken at the end of the eighth month and are included only as an indication of the trends. A final comparison of those who actually finished the program

with those who refused or dropped out will be undertaken at the end of the first year of data collection, when a clear cut-off date can be established.

At the end of the eighth month of study, contact had been established and a definite decision regarding participation obtained from 2,241 of the randomly selected GPs. Of these, 977 (43.6%) agreed to participate and 1,264 (56.4%) declined.

The chi square statistic (for categorical data) and Anova (for continuous data) were used to measure the significance of differences between the two groups. Results indicated there were no significant differences (at the 5% level) between participants and non-participants in terms of age, gender, years in general practice, and level of service activity (Table 1).

Table 1: Comparison of GP characteristics: GPs who agreed to participate and those who refused (at the end of the eighth month of the study)

Characteristic	GPs agreed (n= 977)	GPs refused (n=1,264)
Gender [a)]		
% female	28.9	26.6
Age group (%)[(a)]		
<35 years	8.9	11.5
35–44 years	31.6	30.4
45–54 years	30.7	29.9
55+ years	28.8	28.2
Years since graduation (%)[(a)]		
< 6 years	1.8	1.7
6–10 years	8.5	9.1
>10 years	89.7	89.2
Services the previous year (n) [(b)]		
Mean	5,737.7	5,545.1
Standard deviation	3,046.5	2,868.5
Range	467–20,698	397–18,780
Services in the previous quarter (n) [(b)]		
Mean	1,425.7	1,369.6
Standard deviation	759.8	689.5
Range	376–5,808	377–5,253

(a) Chi square statistic demonstrated no significant differences in any of these characteristics between participants and non-participants at the 95% level.

(b) Anova demonstrated no significant differences between participants and non-participants at the 95% level