

2 Methods

This study is a secondary analysis of data collected through the Bettering the Evaluation and Care of Health (BEACH) study, and examines general practice encounters with patients aged 65 years or more.

2.1 The BEACH study

The methods adopted for use in the BEACH program have been detailed extensively elsewhere.⁷⁵⁻⁷⁸ BEACH is a continuous national study of general practice activity that began in April 1998. It relies on encounter data provided by 1,000 GPs who each record on structured forms detailed information about 100 consecutive patient-based encounters. All types of encounters can be recorded. Approximately 20 GPs are recruited each week, for 50 weeks a year, providing comprehensive data on 100,000 general practice consultations per year.

The GP population eligible to participate in BEACH includes all those GPs who claim at least 375 A1 Medicare items of service in the most recent three-month period, as collected by the Health Insurance Commission (HIC). This method ensures that most part-time GPs are included, but excludes GPs not in private practice who claim few GP A1 Medicare items. GPs who completed the survey during 2000–02 earned 25 Clinical Audit points for quality assurance from the Royal Australian College of General Practitioners (RACGP).

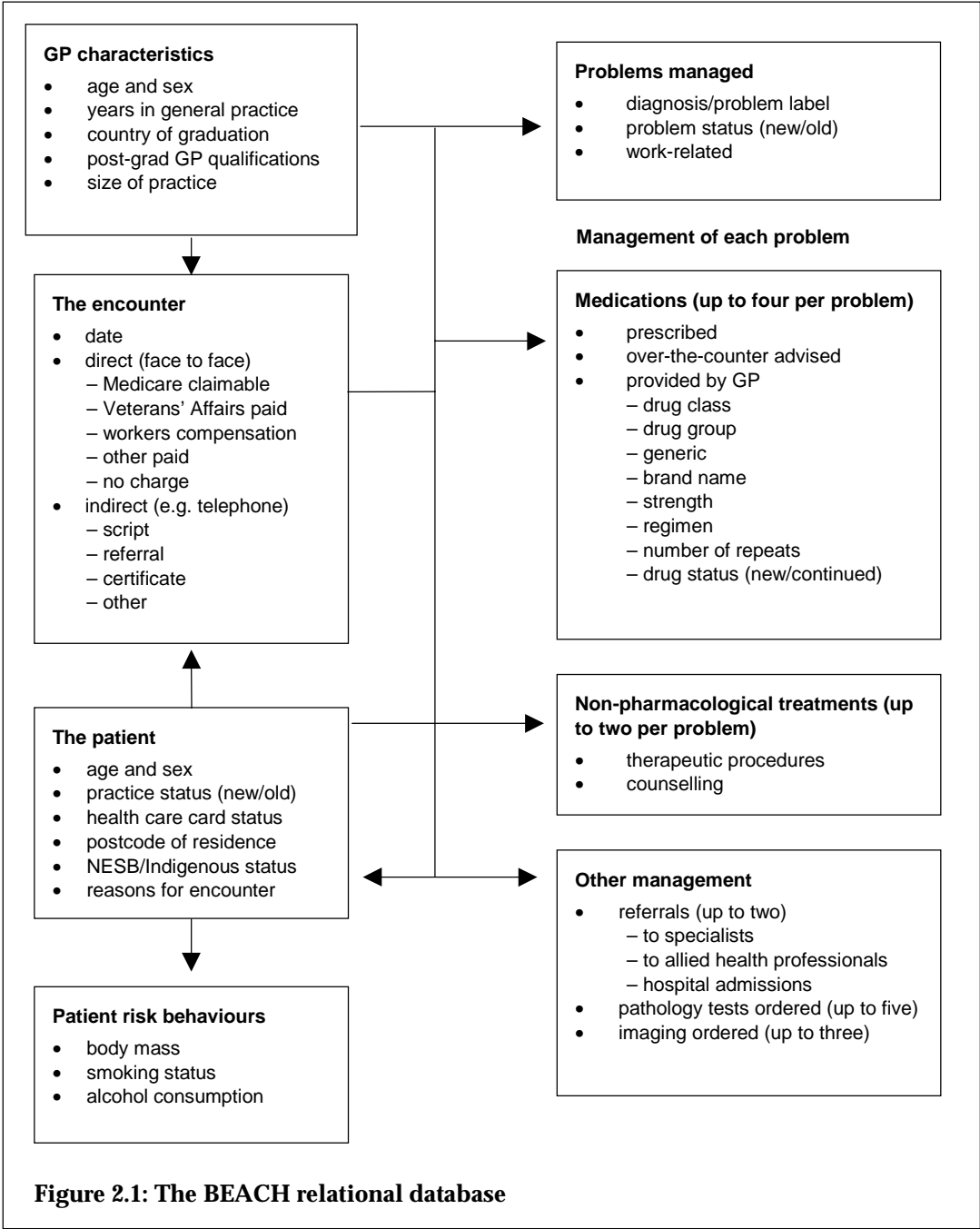
GPs randomly selected for inclusion in the sample are each sent a recruitment letter, which is then followed-up by telephone. GPs who agree to participate are set a date to begin recording approximately three to four weeks in advance. A research pack is sent to the participating GP 10 days before the agreed start date. Participants are given a telephone reminder in the first few days after they are due to start recording, and non-returns are followed up with regular phone calls.

BEACH contains three interrelated data collections: GP characteristics, encounter data and patient health status. A copy of the questionnaire collecting GP characteristics for the 2000–01 BEACH recording year is included at Appendix 1, and at Appendix 2 for the 2002–02 BEACH recording year. Within the encounter, data collected relate to patient demographic information, reasons for encounter (RFEs), problems managed and management techniques used (including both pharmacological and non-pharmacological treatments). Relationships between the data elements are represented diagrammatically in Figure 2.1. It is important to note that all variables are directly related to GP characteristics, patient characteristics and the encounter. Patient RFEs have only an indirect relationship to the problems being managed, while all management techniques are directly related to the problem(s) managed. Examples of the encounter forms used in BEACH can be found at Appendix 3 for 2000–01, and Appendix 4 for 2001–02.

A section on the BEACH encounter form collects data related to patient health or health care delivery that are not examined as part of the encounter. The Supplementary Analysis of Nominated Data (SAND) are collected on subsamples of patients at BEACH encounters. Over the year, data collection is divided into ten blocks, each of five weeks duration. Each block should therefore include data from approximately 100 GPs. Each GPs' recording pack of 100 encounter forms includes 40 forms containing questions relating to the patient's height

and weight (to determine BMI), alcohol intake and smoking status. The remaining 60 forms are divided into two blocks, each of 30 forms. Questions asked on these forms vary throughout the year.

In this report, results presented on length of consultation, prevalence of chronic conditions and co-morbidities of chronic conditions, alcohol intake, smoking status and BMI have been collected using the SAND method. The methods employed for individual SAND substudies are described in their respective chapters.



Classification of data

Patient RFEs, problems managed, non-pharmacological treatments including clinical treatments and therapeutic procedures, referrals, imaging orders and orders for pathology are all coded according to ICPC-2 PLUS and classified according to the International Classification of Primary Care (ICPC-2). ICPC-2 was designed for primary care and developed by the World Organization of Family Doctors (Wonca).⁷⁹ Figure 2.2 is a graphical representation of the structure of ICPC-2. ICPC-2 PLUS is an extended terminology classified according to ICPC-2, designed specifically for use in Australian general practice. It includes more specific terms for symptoms, diagnoses and treatment methods.⁸⁰

Components	Chapters																
	A	B	D	F	H	K	L	N	P	R	S	T	U	W	X	Y	Z
1. Symptoms, complaints																	
2. Diagnostic, screening, prevention																	
3. Treatment, procedures, medication																	
4. Test results																	
5. Administrative																	
6. Other																	
7. Diagnoses, disease																	

A	General	L	Musculoskeletal	U	Urinary
B	Blood, blood-forming	N	Neurological	W	Pregnancy, family planning
D	Digestive	P	Psychological	X	Female genital
F	Eye	R	Respiratory	Y	Male genital
H	Ear	S	Skin	Z	Social
K	Circulatory	T	Metabolic, endocrine, nutritional		

Figure 2.2: The structure of the International Classification of Primary Care—Version 2 (ICPC-2)

The Coding Atlas for Pharmaceutical Substances (CAPS) is used to code and classify all medications in BEACH, whether prescribed, advised for over-the-counter (OTC) purchase or supplied by the GP. This coding system has been developed by the Family Medicine Research Centre, and has the ability to capture data at many levels, including medication class, group, generic composition and brand name. CAPS is mapped to the Anatomical Therapeutic Chemical classification (ATC), the Australian standard for classifying medications at the generic level.⁸¹ CAPS can classify pharmaceuticals at a variety of levels, providing meaningful analyses of pharmaceutical information related to Australian general practice.⁸²

2.2 Statistical method

SAS Versions 6.12⁸³ and 8⁸⁴ are used to analyse the BEACH data. The unit of primary analysis is the encounter. In this report, proportions (expressed as percentages) are used to describe an event that can occur only once in an encounter (for example, patient age or sex). Proportions are also used to describe the distribution of events within a class of events (for example, an individual problem as a percentage of total problems).

When an event can occur multiple times in an encounter, rates per 100 encounters are used (for example, RFEs or problems managed). In general, results in this report present the number of observations (n), rate per 100 encounters and the 95% confidence intervals (CIs).

Where analyses have been conducted to examine the presence and extent of age-related differences in the morbidity and management of older patients, statistically significant differences are identified by shading.

Sampling and analysis

The BEACH study is based on a random sample of GPs each recording information about a cluster of encounters. Cluster sampling violates the assumptions of a simple random sample, i.e. that each individual within a population has an equal chance of inclusion within the sample,⁸⁵ and the unit of analysis is the unit of randomisation.⁸⁶ In a cluster sample, 'the probability of a person being chosen is principally a function of the probability of their GP being chosen'.⁸⁵ Patients may choose to attend a particular GP due to his/her characteristics, for example the doctor's age, sex, primary language or years in practice. This may result in a lack of variation in responses from within a cluster.⁸⁶

Statistically, the loss of variation within cluster samples also causes a loss of efficiency, which renders invalid the statistical methods used for simple random samples. Therefore, analyses must take into consideration the cluster design of the study, otherwise the impact of clustering may distort significance levels, suggesting statistical differences where none exist.⁸⁶ This report uses standard error calculations in the 95% CIs which accommodate the single-stage cluster study design according to Kish's description of the formulae.⁸⁷ As SAS Version 6.12 is limited in its capacity to calculate the standard error of the cluster design, additional programming was performed to incorporate the formulae.

Despite the statistical difficulties of cluster sampling, this form of sampling has been shown to be justified in terms of cost-effectiveness and logistics. Studies using simple random samples are often not feasible within a large population, in particular when the population is not easily defined,⁸⁸ as is the case for general practice encounters.

Validity and reliability

Various studies have been conducted to ensure the validity and reliability of the methods used in BEACH. Such studies have examined the:

- representativeness of the sample⁸⁹ and the number and size of clusters needed for a representative national sample⁹⁰
- reliability⁹¹ and limitations⁹² of patient data reported by GPs
- reliability of secondary coding of RFEs⁹³ and problems managed⁹⁴
- validity of ICPC as a tool to classify morbidity data in general practice.⁹⁵

Representativeness

In order for a study to be regarded as representative, the sample must represent the population from which it is drawn. The random sample of GPs who participated in BEACH over the two-year period between 2000–02 has been shown to be largely representative of the Australian GP population as a whole, but GPs aged less than 35 years were underrepresented in the sample.^{75,96}

The only data readily available with which to compare the BEACH data for testing reliability is that produced by the HIC for claims made for GP encounters against the Medicare Benefits Schedule (MBS). Comparison of the age–sex distribution of patients at encounters in BEACH and HIC (MBS) data has shown that BEACH contains a greater proportion of encounters with males aged 75 years and over. However, BEACH includes encounters not paid through the MBS, for example, encounters paid for by the Department of Veterans' Affairs (DVA). When DVA-paid encounters are removed, calculations of precision ratios show that the age–sex distribution of patients at BEACH encounters paid by the MBS is very similar to the age–sex distribution shown by HIC data. To determine the reliability of estimates, power calculations use a precision of 0.2 or 20% of the true proportion (or value). Removing encounters paid by the DVA improved precision estimates to within this 20% range, indicating that the BEACH study provides an accurate representation of general practice encounters in Australia.^{75,96}

To ensure the representativeness of BEACH encounters with older patients, the BEACH sample of encounters with patients aged 65 years and over was compared with GP encounters with the general practice population aged 65 years or more claimed through Medicare.⁹⁷ A1 items of service for professional general practice attendances were examined for the period between April 2000 and March 2002 (see Section 4.1).

For this report, analyses have been conducted on the total sample of encounters with patients aged 65 years or more. This group has been further broken down into encounters with those aged 65–74 years, and those aged 75 years or more, to determine the existence of differences in the morbidities and management of older patients in general practice. While it would have been interesting to look at encounters with patients aged 80 or 85 years or more, sample sizes would have precluded meaningful conclusions.