Introduction

Cardiovascular disease is Australia's largest health problem. Around 2.8 million Australians, 16% of the population, suffer from a cardiovascular condition and in 1998 almost 51,000 people died as a result. Cardiovascular disease represented an estimated 22% of the disease burden in Australia in 1996, 33% of premature deaths and 9% of years of healthy life lost through disease, impairment and disability (AIHW 2001).

Eighty-five per cent of the population visit a general practitioner at least once in any one year, with a median number of five visits per person (Royal Australian College of General Practitioners 1998). GPs provide a range of services spanning from prevention of illness through to treatment and rehabilitation (Royal Australian College of General Practitioners 1998). GPs are usually the first port of call for a health problem and the coordinators of health care for most people.

This report provides a snapshot of general practice care of cardiovascular conditions, diabetes and some related risk behaviours, and is based on a study of general practice activity in Australia, the BEACH program. Cardiovascular disease refers to all conditions involving the heart and blood vessels. In Australia, the forms of cardiovascular disease that pose the largest threats are ischaemic heart disease, stroke, heart failure and peripheral vascular disease. Among the main risk factors for cardiovascular disease are hypertension, tobacco smoking, lipid disorders, overweight and obesity, atrial fibrillation and diabetes. The nature of each of these problems is defined briefly in subsequent chapters of this report, along with a description of the patients presenting to general practice with these problems and the care given by GPs to these patients.

Throughout this report, comparison is made with numbers and rates for the whole BEACH study sample for the period April 1998–March 1999. These are shown in Table 1 for easy reference (Britt et al. 1999b).

Table 1: Summary of morbidity and management for the whole BEACH study sample, April 1998–March 1999

Variable	Number	Rate per 100 encounters	Rate per 100 problems
General practitioners	984	. .	. .
Encounters	96,901	. .	. .
Reasons for encounter	141,766	146.3	. .
Problems managed	140,824	145.3	. .
Medications	106,320	109.7	75.5
Other treatments	41,839	43.2	29.7
Referrals	10,860	11.2	7.7
Pathology	23,872	24.6	17.0
Imaging	6,844	5.2	3.7

. .   Not applicable

General practitioners in the BEACH study managed in one year a total of 15,442 cardiovascular problems (11% of all problems), 2,485 diabetes problems (almost 2% of all problems) and 11,329 other cardiovascular risk factor problems (8% of all problems) including hypertension, lipid disorder, overweight and obesity and smoking. Table 2 puts

the problems analysed here in the context of all problems managed by general practitioners in the study.

Table 2: Distribution of selected cardiovascular problems and risk factors in general practice consultations

Problem	Number	Per cent of all problems managed in general practice
Hypertension*	7,994	5.7
Diabetes*	2,485	1.8
Lipid disorder	2,392	1.7
Ischaemic heart disease*	1,488	1.0
Cardiovascular check-up*	1,204	0.8
Heart failure	846	0.6
Overweight and obesity*	668	0.5
Atrial fibrillation or atrial flutter	554	0.4
Smoking	275	0.2
Peripheral vascular disease	215	0.1
Stroke	170	0.1
Transient cerebral ischaemia	156	0.1
Palpitations	138	0.1
All problems	**140,824**	**100**

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix A1).

The patients at encounters where a cardiovascular problem was managed in general practice were predominantly females (56.2%). The majority of patients were aged 45 years and over (Table 3).

Table 3: Patients at encounters where cardiovascular problems were managed

Age	Males	Females
	Per cent	
0–14	0.3	0.3
15–24	0.4	0.6
25–44	4.1	4.8
45–64	16.1	17.9
65–74	12.4	14.9
75+	10.4	17.7
All	**43.7**	**56.2**

The data in this report represent a baseline against which future patterns in general practice can be compared and, together with other information, will help to interpret trends in cardiovascular disease incidence. These data may also be useful in the development of guidelines for general practice care of patients with cardiovascular conditions and diabetes, and will help to guide the allocation of resources to improve practice.

Methods

This report is based on analysis of data collected for the period April 1998 to March 1999 as part of the *Bettering the Evaluation and Care of Health* (BEACH) study, a study of general practice activity in Australia. The methods adopted in the BEACH program have been described in detail elsewhere (Britt et al. 1999a). Briefly, each of a random sample of approximately 1,000 recognised GPs per year records details of 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 data period. This equates to 1,500 Medicare claims a year and ensures the majority of part-time GPs are included while excluding those who are not in 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 for the BEACH study every three months (Britt et al. 1999b).

The randomly selected GPs are approached by letter with telephone follow-up. GPs who agree to participate are set an agreed recording date and sent a research pack. The 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 chart, a sample completed form with explanation, a 'standard drinks' chart to help patients answer questions on alcohol intake, 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. A telephone reminder is made to each GP in the first days of the agreed recording period. Non-returns are followed up by regular telephone calls.

Each participating GP earns 25 audit points towards their quality assurance requirements and receives an analysis of their own results compared with those of nine other unidentified practitioners who recorded at approximately the same time. GPs also receive educational material on the identification and management of patients who smoke or consume alcohol at hazardous levels.

Data recorded

BEACH includes three inter-related data collections: encounter data, GP characteristics and patient health status. An example of the form used to collect the encounter data and the data on patient health status is included as Appendix 1. The GP characteristics section is beyond the scope of this report.

Encounter data include information about the consultation itself:

- date of consultation;
- type of consultation (direct, indirect);
- Medicare item number (where applicable);
- specified other forms of payment; and
- clinical services provided at indirect encounters.

Patient data include:

- 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); and
- patient reasons for encounter (up to three).

The **content of the encounter** is described in terms of the problems managed and the management techniques applied to each of these problems. Data elements include:

- up to four diagnoses/problems;
- status of each problem (new to patient/managed before); and
- whether it was thought to be work-related.

Management data for each problem include medications and non-pharmacological treatments. Data on **medications** comprise:

- up to four medications per problem;
- whether medication prescribed, over the counter advised or supplied by the GP;
- brand name;
- form (where required);
- strength;
- regimen;
- status (new medication for this problem and this patient/continuation); and
- number of repeats.

Non-pharmacological management of each problem includes:

- counselling;
- therapeutic procedures;
- new referrals to specialists, allied health professionals or for hospital admission (up to 2 per problem);
- pathology tests ordered (up to 5 per problem); and
- imaging ordered (up to 5 per problem).

Supplementary analysis of nominated data (SAND): The study also investigates specific aspects of patient health or health care delivery in general practice not covered by the consultation-based information. However, this section is not investigated in this report.

Coding systems are given in the appendix and data elements are explained in the glossary (Britt et al. 1999b).

Statistical analysis

Analysis of the BEACH data was done with SAS version 6.12 (1996). Analytical techniques that consider the cluster sampling design of this study were used. The standard error calculations used to estimate 95% confidence intervals incorporate both the single-stage clustered study design and sample weighting according to Kish's description of the formulae (Kish 1965).

Proportions (%) are used when describing the distribution of an event that can arise only once at a consultation (e.g. age, gender or item numbers) or to describe the distribution of events within a class of events (e.g. problem A as a % of total problems).

Rates per 100 encounters are used when an event can occur more than once at the consultation (e.g. reasons for encounter, problems managed). Rates per 100 problems are used when a management event can occur more than once per problem managed (e.g. prescribed medications, orders for pathology). In general, the results presented are the number of observations (n) and the rate per 100 encounters or rate per 100 problems.

Analysis of data was generally restricted to those problems for which there were at least 100 encounters recorded in the period under study. Where the number of encounters is very low, as with new cases of some of the problems analysed, results should be interpreted with caution as they may be inaccurate. This has been indicated wherever it applies.

Classification of data

Patient reasons for encounter, problems managed, therapeutic procedures, other non-pharmacological treatments, referrals, and pathology and imaging ordered are 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). The ICPC is regarded as the international standard for data classification in primary care. Sections of ICPC-2 PLUS relevant to the results presented in this report appear in Appendixes 2, 3, 4, 5 and 6.

Pharmaceuticals prescribed or provided and over the counter medications advised by the GP are coded and classified according to a classification developed by the Family Medicine Research Centre at the University of Sydney, the Coding Atlas for Pharmaceutical Substances (CAPS). This is a hierarchical structure that facilitates analysis of data at a variety of levels—for example, medication class, medication group, generic composition and brand name. CAPS is mapped to the Anatomical Therapeutic Chemical classification (WHO Collaborating Centre for Drug Statistics Methodology 1998), which is the Australian standard for classifying medications at the generic level. The CAPS classification appears in Appendix 7 (Britt et al. 1999b).

Representativeness of the BEACH sample

There was no statistically significant difference between participating and non-participating GPs in terms of gender, place of graduation and the Rural Remote Metropolitan Area (RRMA) classification. However, GPs aged less than 35 years were statistically significantly

under-represented in the participant population. There was also a small but statistically significant difference in activity level between participants and non-participants. The distribution of GPs by State differed significantly as well, a greater proportion of participants coming from the eastern States, the Australian Capital Territory and the Northern Territory (Britt et al. 1999b).

Comparison of BEACH participants and all recognised general practitioners in Australia who claimed more than 1,500 general practice Medicare item numbers in 1998–99 revealed no statistically significant differences for GP gender, mean activity level or place of practice (RRMA and State). However, BEACH participants were statistically significantly less likely to be under 35 years of age and more likely to have graduated in Australia.

Comparison of the age–sex distribution of patients at the consultations recorded in BEACH with that of patients seen in all general practice consultations claimed on Medicare for the same period showed that the only major difference was that the BEACH study included a greater proportion of events with men aged 75 years and over than the national distribution (Britt et al. 1999b).

The data set

Weights were applied to the study sample to take account of the difference in age between BEACH GPs and all GPs in Australia. Simply, GPs aged less than 35 years were given greater weighting than GPs of other age groups. This increases the contribution of the encounters from these GPs to any national estimate.

Weights were also applied to the sample to take account of the number of services that a GP provides in a year. Greater weighting was given to encounters from GPs who provided more services per year than to those from GPs who provided less, as the former make a greater contribution to any national estimate of activity than the latter. The final sample weights were a multiplicative function of the GP age weighting and GP sampling fraction of services in the previous 12 months.

The final data set contained 96,901 encounters, 141,766 reasons for encounters, 140,824 problems managed and 106,320 medications (Table 4) (Britt et al. 1999b).

Table 4: The BEACH data set

Variable	Raw	Weighted
GPs	984	984
Encounters	98,400	96,901
Reasons for encounter	145,407	141,766
Problems managed	145,183	140,824
Medications	107,451	106,320
Other treatments	44,076	41,839
Referrals	11,615	10,866
Imaging	7,299	6,844
Pathology	25,727	23,872

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. It tells us the sort of problems and issues GPs encounter and how they deal with them. No conclusions can be drawn in terms of disease episodes, nor in terms of long-term treatment of patients with chronic conditions because the survey is not patient-based and individual records are not linked. Therefore it would be invalid to compare patterns observed with accepted good clinical practice, and we have made no attempt to do this in this report.

The survey is largely an encounter-based study of the patients for whom a general practice service is provided. Although the term 'patients' is used for convenience in this report, the correct description is 'patient encounters'. The morbidity patterns reflect only the problems managed during the recorded encounters. There may be other comorbidity managed at other encounters outside the recording period that would therefore not be included in the database.

Prescription and medications 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 or that it may be given at a subsequent encounter for the same 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.

Medication status was not well recorded by GPs for the 12 months of data analysed. Therefore, where these data are presented, the extent of missing values is given and the denominators have been adjusted accordingly to give an appropriate estimate of the proportion of new medications used.