

1 Introduction

The BEACH (Bettering the Evaluation and Care of Health) program is a continuous national study of general practice activity in Australia that began in April 1998. This publication is the first to report details of general practice activity in each state and territory of Australia. The study investigates similarities and differences between each of the states and territories and the national average in terms of: the characteristics of the practising general practitioners (GPs), the patients they see, the problems they manage and the treatments they provide. It uses details from 5,021 GPs about more than 500,000 GP-patient encounters conducted and reported between April 1998 and March 2003. This sample represents about 30% of the practising recognised general practitioner population and a one per 1,000 sample of all GP-patient encounters occurring during this 5-year period.

GPs perform a gatekeeper role for entry into the secondary and tertiary sectors of the Australian health care system. Most of the 19.7 million Australians (85%) attended a GP at least once during the year 2002 (personal communication, GP Branch, Australian Department of Health and Ageing). An individual is free to visit multiple general practitioners of their choice and it is a fee-for-service system. However, by far the majority of visits to GPs are funded through the Commonwealth Medicare Benefits Schedule (MBS) scheme on a fee-for-service basis, Medicare paying for 85% of the government recommended consultation fee.¹ Some patients are not charged the additional 15% of the fee, the GPs accepting the Medicare payment as total payment. Others are charged the difference between the Medicare payment and the government recommended fee, while still others may be asked to pay more for the service.

In 1998-99 there were about 17,000 recognised general practitioners claiming through Medicare, about 1,500 registrars enrolled in general practice vocational training programs and around 2,000 other (primary care) medical practitioners.² GPs provided by far the majority of the (approximately) 100 million non-specialist services to the population that were paid by Medicare,² at an average rate of 5.2 such services per person in 2000-01, decreasing to 4.9 per person in 2002-03.³

While information is readily available from the web site of the Health Insurance Commission (HIC),⁴ on the number of Medicare-paid services per capita in each state, and the Australian Bureau of Statistics provides data on self-reported health through the National Health Survey,⁵ to date there has been no state/territory based information published about the services provided by GPs, the problems managed or the management techniques utilised.

This report brings together some basic population statistics from the Census,⁶ some general practice utilisation data (source) and workforce availability data from the HIC, to provide a background of each state and territory against which GP service activity for that state or territory is considered. There is a chapter devoted to each state or territory, in which comparisons are made between the results for the individual state/territory and the national average. All results are tabulated in the Appendices.

1.1 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.

This report aims to:

- provide an overview of the activities of general practice in each state and territory
- identify areas in which the activities of general practice differ from the average for Australia as a whole
- investigate whether measured differences are due to the age distribution of the population in that state/territory or whether they represent independent variance in practice activities among these geographic areas
- describe the prevalence of some risk behaviours in patients attending general practice in each state/territory, including current smoking status, levels of alcohol consumption and body mass index (BMI).

2 Methods

The methods adopted in the BEACH program have been described in detail elsewhere.⁷⁻⁹ In summary, each of approximately 1,000 recognised GPs per year records details about 100 doctor-patient encounters of all types. The information is recorded on structured encounter forms (on paper). It is a rolling sample, recruited about 3 weeks ahead. Approximately 20 GPs participate each week, 50 weeks a year. The BEACH program began in April 1998.

2.1 Sampling methods

The source population includes all GPs who claimed a minimum of 375 general practice A1 Medicare items in the most recently available 3-month Health Insurance Commission (HIC) data period. This equates with 1,500 Medicare claims a year and ensures inclusion of the majority of part-time GPs while excluding those who are not in private practice but claim for a few consultations a year. The General Practice Branch of the Australian Department of Health and Ageing (DoHA) draws a sample on a regular basis.

2.2 Recruitment methods

The randomly selected GPs are approached initially by letter, then by telephone follow-up. GPs who agree to participate are set an agreed recording date approximately 3 to 4 weeks ahead. A research pack is sent to each participant about 10 days before the planned recording date. A telephone reminder is made to each participating GP in the first days of the agreed recording period. Non-returns are followed up by regular telephone calls.

Participating GPs earn Clinical Audit points towards their quality assurance (QA) requirements. As part of this QA process, each receives an analysis of his or her results compared with those of nine other de-identified GPs who recorded at approximately the same time. Comparisons with the national average and with targets relating to the National Health Priority Areas are also made. In addition, GPs receive some educational material related to the identification and management of patients who smoke or consume alcohol at hazardous levels.

2.3 Data elements

BEACH includes three interrelated data collections: encounter data, GP characteristics, and patient health status. An example of the forms used to collect the encounter data and the data on patient health status is included as Appendix 1. The GP characteristics questionnaire is included as Appendix 2.

Encounter data include date of consultation, type of consultation (direct, indirect), Medicare/Department of Veterans' Affairs item number (where applicable) and specified other payment source (tick boxes).

Information about **the patient** includes date of birth, sex and postcode of residence. Tick boxes are provided for Commonwealth Concession Card holder, Repatriation Health Card holder, non-English-speaking background (NESB), an Aboriginal person (self-identification) and Torres Strait Islander (self-identification). Space is provided for up to three patient reasons for encounter (RFEs).

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. Tick boxes are provided to denote the status of each problem as new to the patient (if applicable).

Management data for each problem include medications prescribed, over-the-counter medications advised and other medications supplied by the GP. Details for each **medication** comprise brand name, form (where required), strength, regimen, status (if new medication for this problem for this patient) and number of repeats. **Other management** techniques used for each problem, including counselling, procedures, new referrals, pathology and imaging ordered, are recorded.

GP characteristics include age and sex, years in general practice, number of GP sessions worked per week, number of GPs working in the practice (to generate a measure of practice size), postcode of major practice address, country of graduation, vocational general practice training and Fellow of the Royal Australian College of General Practitioners (FRACGP) status, after-hours care arrangements, use of computers in the practice, whether the practice is accredited and whether it is a teaching practice, work undertaken by the GP in other clinical settings, hours worked in direct patient care and hours on call per week.

Patient risk factors – 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 data. The year-long data collection period is divided into 10 blocks, each of 5 weeks. Each block is designed to include data from 100 GPs. Each GP's recording pack is made up of 100 forms. Forty of these contain questions about patient height and weight (for calculation of body mass index), alcohol intake and smoking status. The remaining 60 forms in each pack are divided into two blocks of 30 forms. Different questions are asked of the patient in each block and these vary throughout the year. The results of topics in the SAND substudies for alcohol consumption, smoking status and BMI are included for each state and territory in this report. Abstracts of results for other substudies are available through the web site of the Family Medicine Research Centre (of which the General Practice Statistics and Classification Unit is a part) at <<http://www.fmrc.org.au/beach-pubs.htm#6>>.

Calculation of body mass index (BMI)

The BMI for an individual is calculated by dividing weight (kilograms) by height (metres) squared. A person with a BMI less than 20 is considered underweight, 20–24 is normal, 25–29 overweight, and more than 30 is considered to be obese.

The GPs were instructed to ask the patients (or their carer in the case of children):

- What is your height in centimetres?
- What is your weight in kilograms?

Metric conversion tables (feet and inches; stones and pounds) were provided to the GP.

The standard BMI calculation described above is not appropriate in the case of children. Cole et al. have developed a method which calculates the age–sex-specific BMI cut-off levels for overweight and obesity specific to children.¹⁰ This method is based on international data from developed Western cultures and is therefore applicable within the Australian setting.

The BEACH data on BMI are presented separately for adults (aged 18 and over) and children. The standard BMI cut-offs have been applied for the adult population, and the method described by Cole et al. has been used for defining overweight and obesity in children (aged 2 to 17 years).¹⁰ There are three categories defined for childhood BMI: underweight/normal, overweight and obese.

Current smoking status

The GPs were instructed to ask the patients (18+ years):

- What best describes your smoking status? Smoke daily
Occasional smoker
Previous smoker
Never smoked

Respondents were limited to adults aged 18 years and over because there are ethical concerns about approaching this younger patient group to ask for information on smoking and alcohol consumption for survey purposes. In addition, the reliability of this information from patients aged 14–17 years may be compromised if a parent is present at the consultation.

Alcohol consumption

To measure alcohol consumption, BEACH uses three items from the WHO Alcohol Use Disorders Identification Test (AUDIT),¹¹ with scoring for an Australian setting.¹² Together, these three questions assess ‘at-risk’ alcohol consumption. The scores for each question range from zero to four. A total (sum of all three questions) score of five or more for males or four or more for females suggests that the person’s drinking level is placing him or her at risk.¹²

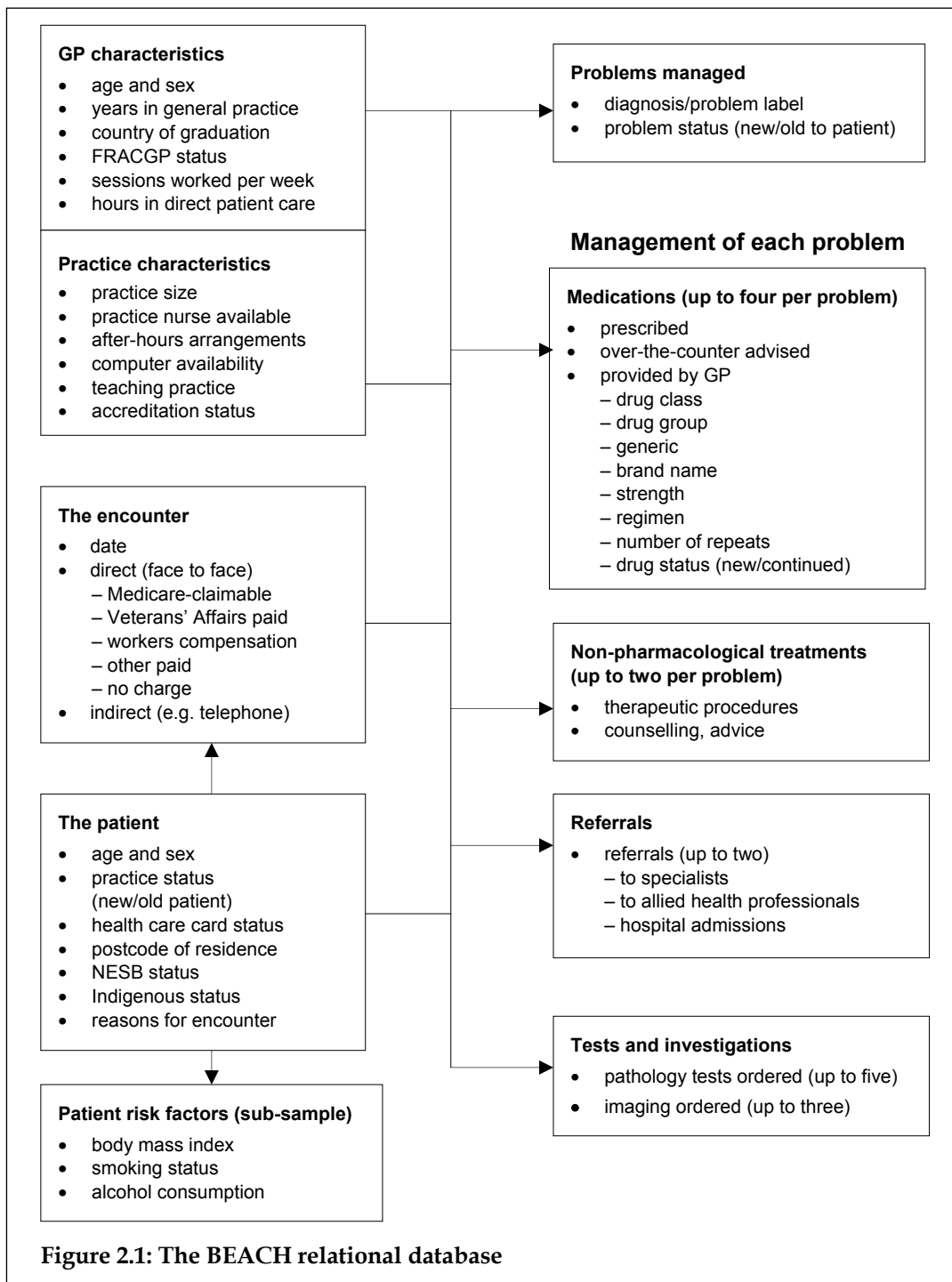
GPs were instructed to ask the patient (18+ years):

- How often do you have a drink containing alcohol? Never
Monthly or less
Once a week/fortnight
2–3 times a week
4+ times a week
- How many standard drinks do you have on a typical day when you are drinking? _____
- How often do you have 6 or more standard drinks on one occasion? Never
Less than monthly
Monthly
Weekly
Daily or almost daily

A standard drinks chart was provided to each GP to help the patient identify the number of standard drinks consumed.

2.4 The BEACH relational database

The BEACH relational database is described diagrammatically in Figure 2.1. Note that all variables can be directly related to GP and patient characteristics and to the encounter. Reasons for encounter have only an indirect relationship with problems managed. All types of management are directly related to the problem being treated.



2.5 Statistical methods

The analysis of the BEACH database was conducted with SAS version 8.2¹³ and the encounter is the primary unit of inference. Proportions (%) are used only when describing the distribution of an event that can arise only once at an encounter (e.g. age, sex or item numbers) or to describe the distribution of events within a class of events (e.g. problem A as a percentage of total problems). Rates per 100 encounters are used when an event can occur more than once at the encounter (e.g. RFEs, problems managed or medications). Rates per 100 problems are also sometimes used when a management event can occur more than once per problem managed. 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.¹⁴

There is also a secondary probability function of particular encounters being included in the GP's cluster (associated with the characteristics of the GP or the type and place of the practice) 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 potential statistical bias. The probability of gaining a representative sample of encounters is therefore reduced by the potential sampling and statistical bias, decreasing the precision of national estimates.

When a study design other than SRS is used, analytical techniques that consider the study design should be employed. In this report the standard errors and 95% confidence intervals are adjusted for the design effect of the single stage cluster sample. This was achieved using procedures in SAS version 8.2 procedures that adjust the standard error for the intra-cluster correlation of the cluster sample.

In this report we compared results for each state and territory with the national average. The comparisons of crude rates describe the real differences in general practitioners, the patients they encounter and the clinical content of their encounters. Encounter data have then been age-standardised to the age distribution of the Australian population in 2001.⁶ Differences in crude rates across states that remain after age-standardisation are differences not explained by the different age distribution of samples from each state or territory. Age-standardised differences are therefore considered to represent real differences in general practice activity in that geographic area, compared with activity on average across the country. Differences that disappear after age-standardisation are those that are explained by the age distribution of the patients encountered. Differences that are not apparent in the crude rate comparisons but appear after adjustment are those that were being hidden by the age distribution of the patients at encounters in that state or territory.

Statistical significance of differences is identified by non-overlapping 95% confidence intervals. Marginal differences (where the confidence intervals meet but do not overlap) are not noted here but can be identified in the tables in the Appendices. The confidence intervals (and hence the bounds for identifying differences between a given jurisdiction and the national average) tend to differ systematically with the size of the state or territory. Less populated states and territories generate a smaller sample of GPs and therefore of encounters, than those less populated. Confidence intervals in the smaller states/territories are therefore wider, reflecting lower precision of the estimate. This means that there will be a lesser chance of identifying real differences in these smaller states and territories.

The BEACH program as a data source is unique in Australia. Its strengths lie in the large size and representativeness of the sample, and the reliability of the research methods.¹⁵ However, due to the large number of comparisons that have been made, it is expected that some of the sample differences identified using 95% confidence intervals may not represent true differences in the underlying populations.

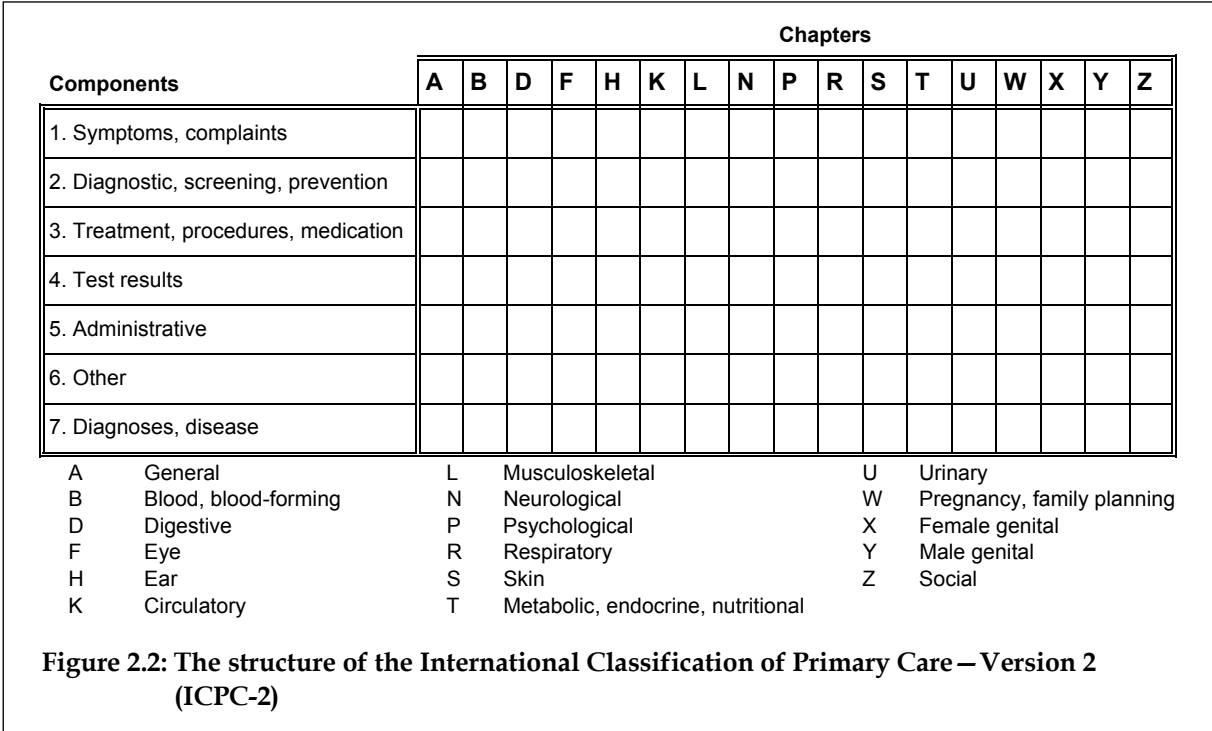
2.6 Classification of data

The patient reasons for encounter, problems managed, procedures, other non-pharmacological treatments, referrals, pathology and imaging orders are coded using ICPC-2 PLUS.¹⁶ 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).¹⁷ The ICPC is used in more than 45 countries as the standard for data classification in primary care.

The 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) (Figure 2.2). Chapters are based on body systems, with additional chapters for psychological and social problems. Component 1 includes symptoms and complaints. Component 7 covers diagnoses. These are independent in each chapter and both can be used for patient reasons for encounter or for problems managed.

Components 2 to 6 cover the process of care and are common throughout all chapters. The processes of care, including referrals, non-pharmacological treatments and orders for pathology and imaging, are classified in these process components of ICPC-2.

Component 2 (diagnostic screening and prevention) is also often applied in describing the problem managed (e.g. check-up, immunisation).



The ICPC-2 is an excellent epidemiological tool. The diagnostic and symptomatic rubrics have been selected for inclusion on the basis of their relative frequency in primary care settings or because of their relative importance in describing the health of the community. It has only about 1,370 rubrics and these are sufficient for meaningful analyses. However, reliability of data entry, using ICPC-2 alone, would require a thorough knowledge of the classification if correct classification of a concept were to be ensured. In 1995, recognising a need for a coding and classification system for general practice electronic health records, the Family Medicine Research Centre (then Unit) developed an extended vocabulary of terms classified according to the ICPC. These terms were derived from those recorded by GPs on more than half a million encounter forms. The terms have developed further over the past 8 years in response to the use of terminology by GPs participating in the BEACH program and in response to requests from GPs using ICPC-2 PLUS in their electronic clinical systems. This allows far greater specificity in data entry and ensures high inter-coder reliability between secondary coding staff. It also facilitates analyses of information about more specific problems when required.¹⁶

Classification of pharmaceuticals

Pharmaceuticals prescribed or provided and over-the-counter medications advised by the GP are coded and classified according to an in-house classification, the Coding Atlas for Pharmaceutical Substances (CAPS). This is a hierarchical structure that facilitates analysis of data at a variety of levels, such as medication class, medication group, generic composition and brand name. CAPS is mapped to the Anatomical Therapeutic Chemical classification (ATC)¹⁸ which is the Australian standard for classifying medications at the generic level. Strength and regimen are independent fields which, when combined with the CAPS code, give an opportunity to derive prescribed daily dose for any medication or group of medications.

2.7 Quality assurance

All morbidity and therapeutic data elements are automatically coded and classified by computer as secondary coding staff enter key words or word fragments and select the required term or label from a pick list. A quality assurance program to ensure reliability of data entry includes ongoing development of computer-aided error checks ('locks') at the data entry stage and a physical check of samples of data entered versus those on the original recording form. Further logical data checks are conducted through SAS on a regular basis.

2.8 Validity and reliability

In the development of a database such as BEACH, data gathering moves through specific stages: GP sample selection, cluster sampling around each GP, GP data recording, and secondary coding and data entry. At each stage, the data can be invalidated by the application of inappropriate methods.

The methods adopted to ensure maximum reliability of coding and data entry and the statistical techniques adopted to ensure valid reporting of recorded data have been described above.

Previous work has demonstrated the extent to which a random sample of GPs recording information about a cluster of patients represents all GPs and all patients attending GPs.¹⁹ Other studies have reported the degree to which GP-reported patient reasons for encounter and problems managed accurately reflect those recalled by the patient²⁰ and the reliability of secondary coding of RFEs²¹ and problems managed.²² The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work.²³

The expected age distribution of patients at the BEACH encounters in each state and territory was calculated from the age distribution of the population and the mean annual GP visits by age group. The observed age distribution of BEACH encounters in every state and territory did not differ from the expected age distribution ($p > 0.9$ for every state and territory). Therefore the sample of BEACH encounters for each state and territory was representative of its population in terms of age distribution and GP visit rates.

Limitations regarding the reliability and validity of practitioner-recorded morbidity have been discussed elsewhere and should always be borne in mind. However, these apply equally to data drawn from medical records (whether paper-based or electronic) and to active data collection methods.^{24,25} There is as yet no more reliable method of gaining detailed data about morbidity and its management in general practice. Further, irrespective of the differences between individual GPs in their labelling of problems, morbidity data collected by GPs in active data collection methods have been shown to provide a reliable overview of the morbidity managed in general practice.²⁶

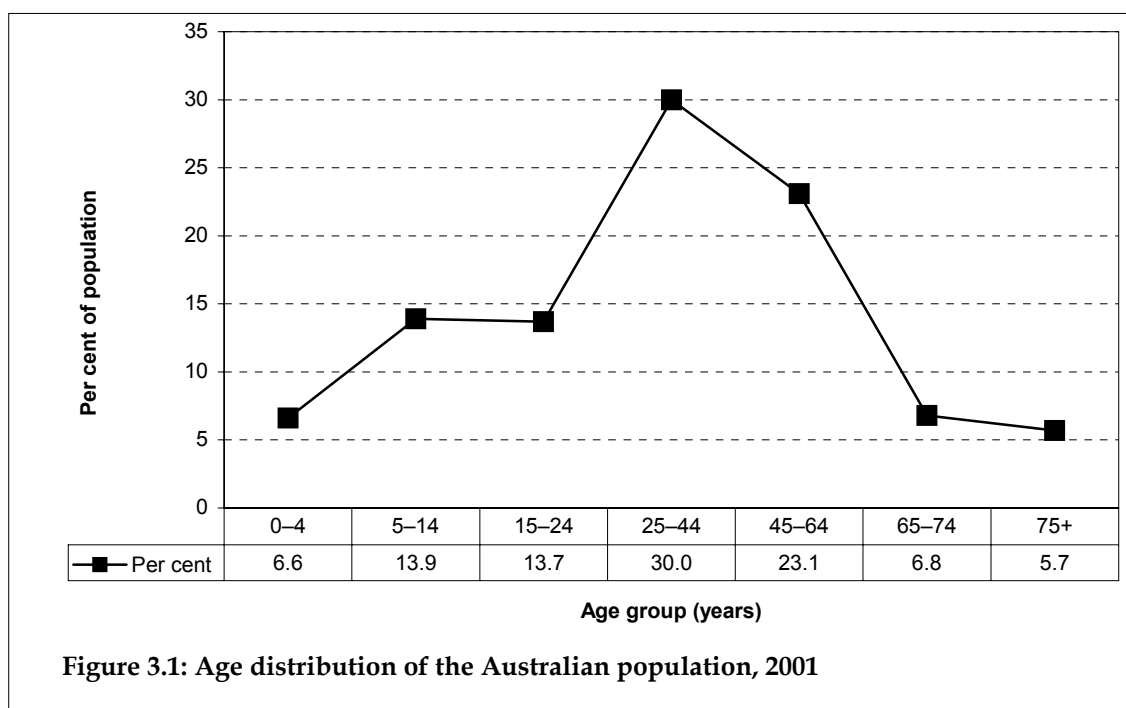
3 Australia

3.1 Background

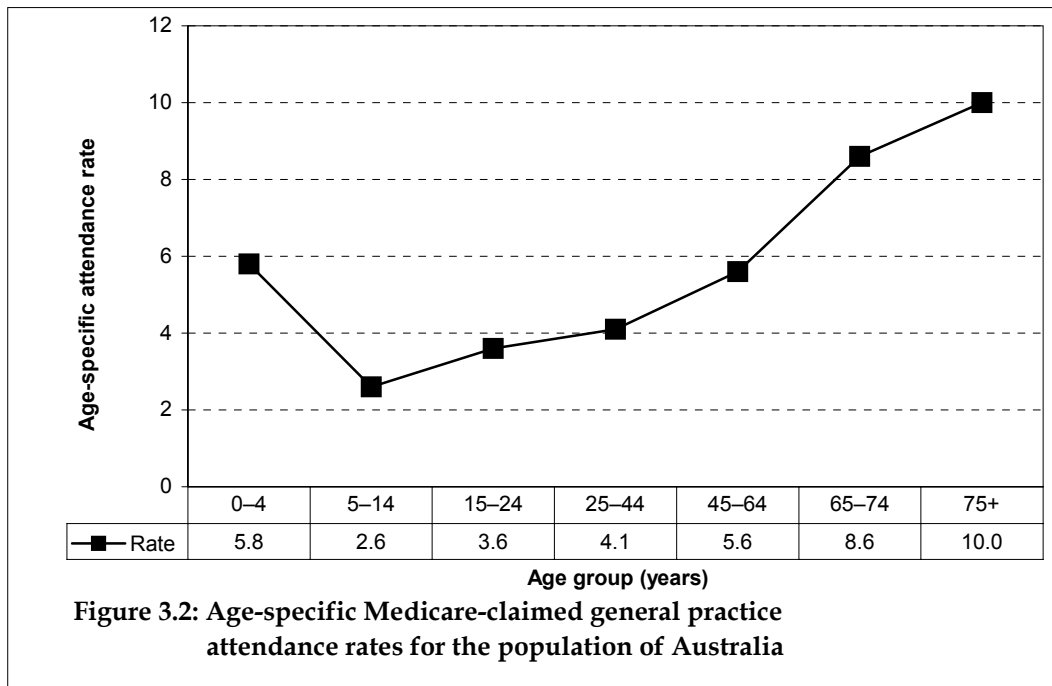
Figures relating to state and territory populations, the general practice workforce and services provided may be found in Appendix 3. In 2001, the population of Australia was 19,413,240 people. Males accounted for 49.6% of the population, while 50.4% of Australians were female. The median age of people in Australia was 36.1 years.

There were a total of 21,338 GPs and other medical practitioners (OMPs) who provided at least one Medicare service in the last 3 months of 2001. This equated to 16,824.3 full-time workload equivalent (FWE) GPs/OMPs practising in Australia. Therefore, there was one FWE GP or OMP per 1,153.9 people. One-quarter of the FWE GPs/OMPs were female, while 22% were aged more than 55 years (Table A3.1).

As shown in Figure 3.1, those aged between 25 and 44 years accounted for the greatest proportion of the Australian population in 2001 (30.0%), while 23.1% of the population were aged between 45 and 64 years. Only 5.7% of Australians were aged 75 years and over, and 6.6% were aged between 0 and 4 years.

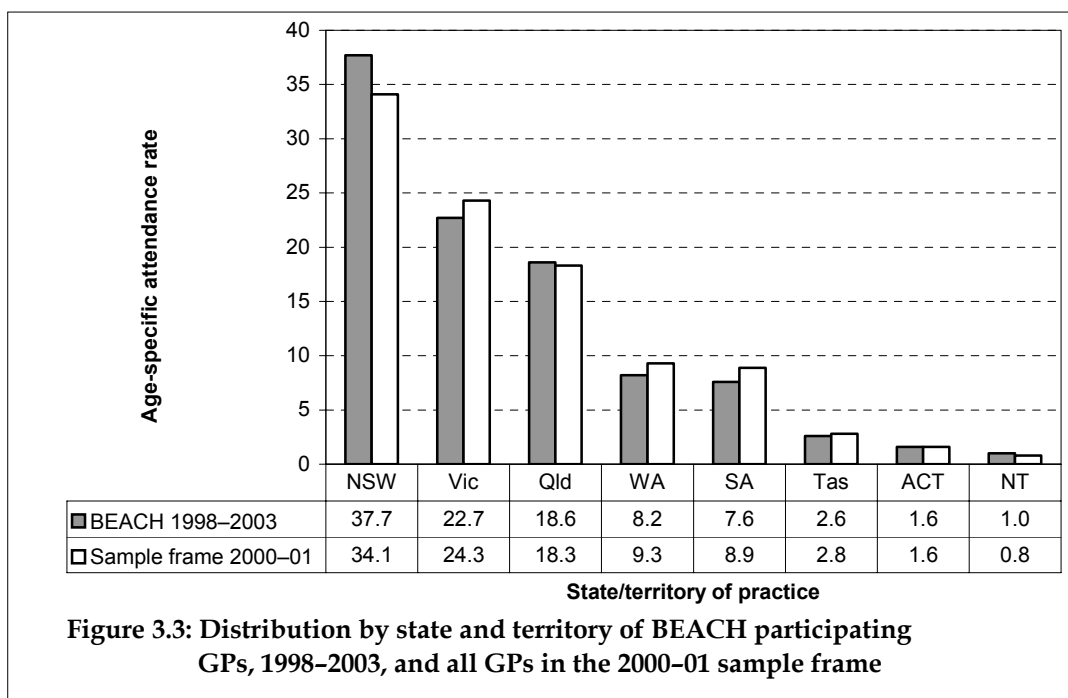


A total of 95,568,048 Medicare A1 and A2 items of service were processed by the Health Insurance Commission (HIC) throughout Australia between July 2002 and June 2003. On average, Australians attended general practice 4.9 times over that period. Those aged 75 years and over had the highest rates of Medicare-claimed general practice attendance, with an average of 10.0 attendances per person. Those aged between 65 and 74 years also attended at relatively high rates (8.6 attendances). Australians aged between 5 and 14 years attended general practice the least, with only 2.6 attendances per person, while those aged between 15 and 24 years also attended at relatively low rates (3.6 attendances per person) (Figure 3.2).



3.2 The BEACH data set 1998–2003

During the BEACH data collection period April 1998 – March 2003, 5,021 GPs participated in the program, providing details regarding 502,100 GP-patient encounters. The majority of the GPs, and therefore their encounters, were located in the eastern states of Australia, 37.7% being in New South Wales, 22.7% in Victoria, and 18.6% in Queensland. Smaller proportions were in Western Australia (8.2%), South Australia (7.6%), Tasmania (2.6%) and in the Territories (Australian Capital Territory 1.6% and the Northern Territory 1.0%).



This distribution of GP participants across the first 5 years of the BEACH program compares quite well with that of the total practising population in the middle year of the period (2000–01). Figure 3.3 provides the comparative geographic distribution of the BEACH GPs in 1998–2003 and all GPs in the 2000–01 sample frame.

As shown in Table A4.2, at the 502,100 encounters sampled over the 5 years, there were 753,925 patient reasons for encounter recorded, 743,625 problems managed, and 534,826 medications prescribed, advised for over-the-counter purchase or supplied directly by the GP. There were 255,617 clinical treatments or therapeutic procedures provided and 59,042 referrals made to specialists, allied health professionals, hospitals and emergency departments. The data pertaining to imaging and pathology orders by GPs are somewhat reduced due to methodological changes during the period. For imaging orders the results are based on all imaging test orders for 1999–2003 and number 40,386 in total. For pathology the results are based on 156,284 pathology test orders recorded in the three years 2000–03 period.

The results reported about patient body mass index (based on patient self-reported height and weight), self-reported alcohol consumption and smoking status are based on subsamples collected throughout the 5-year period. Data were available for 159,667 patients for BMI, 157,380 for alcohol consumption and 159,489 for current smoking status (Table A4.21).

In this report of GP activity in each state and territory, the national data are used as a measure of the national average against which each state/territory is compared. The national averages are presented in the far right-hand column of each table in Appendix 4.

To gain an overview of national general practice activity in Australia it is best to refer to the annual reports published from the BEACH study, the most recent of which is *General Practice Activity in Australia 2002–03*.¹⁵ The next annual report, for 2003–04, will be published in December 2004. All reports are available from the Institute's web site <<http://www.aihw.gov.au>> and can be downloaded as pdf files, or they can be accessed through the Family Medicine Research Centre's web site <<http://www.fmrc.org.au>>.

4 New South Wales

4.1 Background

New South Wales is the largest state in Australia in terms of population. In 2001, there were 6,575,217 residents of New South Wales, accounting for 33.9% of the total Australian population. Males accounted for 49.6% of those living in New South Wales and 50.4% of the population were female. This paralleled the sex distribution of the total population of Australia.

There were 7,247 GPs/OMPs who provided at least one general practice Medicare item of service in the last 3 months of 2001, who together made up 5,894.3 full-time workload equivalents (FWEs). This equated with one FWE GP per 1,115.5 people in New South Wales. Female GPs accounted for one-quarter of the FWEs and this was average for Australia. However, 26% of the FWEs, that is, 26% of the workload, was being taken by clinicians who were more than 55 years old, suggesting a somewhat older profession when compared with the national average, where 22% of the workload was being carried by this older age group (Table A3.1).

The median age of the population was 36.4 years, in line with the national median of 36.1 years (Table A3.1). The age distribution of the New South Wales population in 2001 (Figure 4.1) was almost identical to that of the country as a whole. Those aged between 25 and 44 years accounted for the greatest proportion (30.1%) and over one-fifth were aged between 45 and 64 years (23.0%). Only 6.0% of people were aged 75 years and over, and 6.7% were aged between 0 and 4 years.

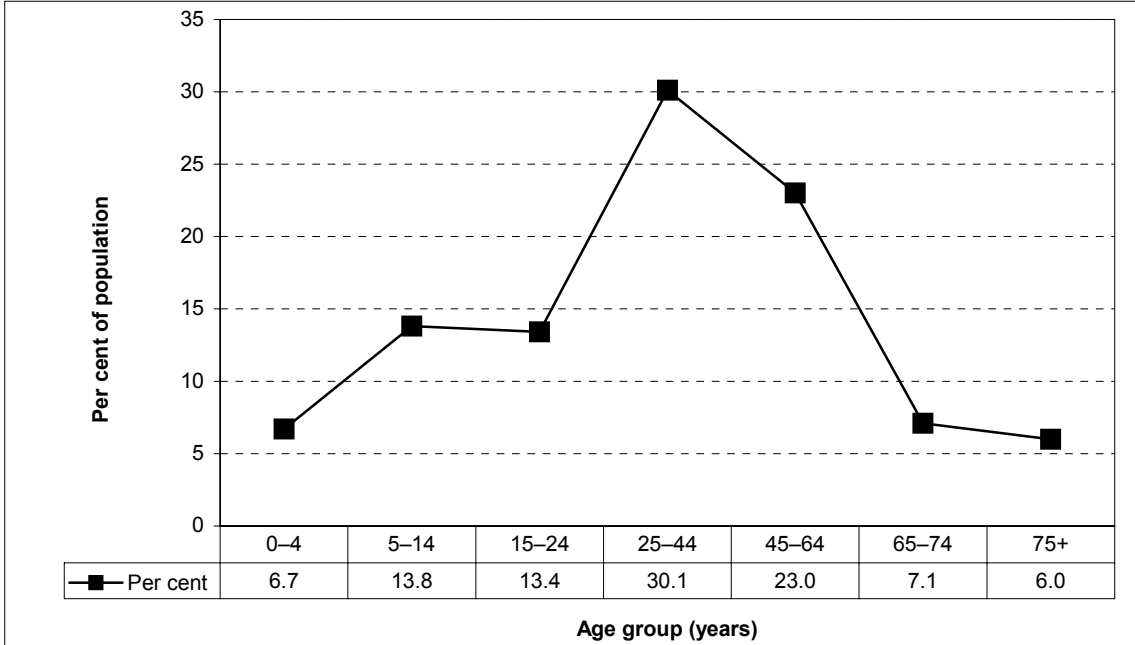
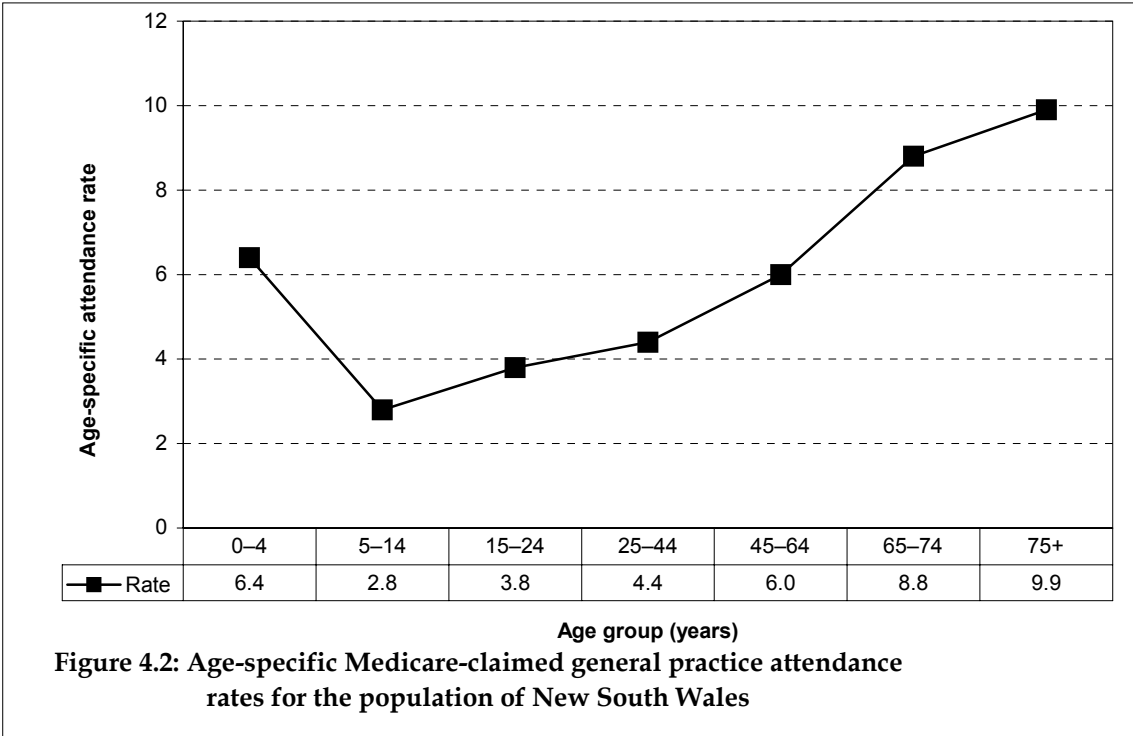


Figure 4.1: Age distribution of the New South Wales population, 2001

A total of 34,380,781 Medicare A1 and A2 items of service were processed by the Health Insurance Commission (HIC) for services provided to residents of New South Wales between July 2002 and June 2003. These accounted for 36.0% of total services processed throughout Australia over this period. On average, people living in New South Wales attended general practice 5.2 times in that year, a slightly higher rate than the population as a whole (4.9). This difference in attendance rates may appear small but actually represents an increase of 300 consultations per year per 1,000 persons, above the national average.

As shown in Figure 4.2, people aged 75 years or more had the highest rates of Medicare-claimed general practice attendance, with an average of 9.9 attendances per person. This was similar to the national average for this age group (10.0). Those aged between 65 and 74 years also attended at relatively high rates, at an average of 8.8 attendances. Children aged between 0 and 4 years attended general practice on average 6.4 times per year, while children aged between 5 and 14 years had the lowest rates, at an average of 2.8 attendances. In all age groups, except the elderly, these attendance rates were somewhat higher than the national average, ranging from +300 to +600 per 1,000 persons per year.



4.2 Results

There were 1,892 GPs from New South Wales who participated in BEACH between April 1998 and March 2003. They accounted for 37.7% of the total 5-year sample and provided details about 189,200 encounters. The New South Wales state results are compared with those for all of Australia in Appendix 4. The differences highlighted below are those identified by non-overlapping 95% confidence intervals. Marginal differences (where the confidence intervals meet but do not overlap) are not noted here but can be identified in the tables in the Appendix.

The general practitioners

The participating New South Wales GPs did not differ from all participants in terms of their sex (31.5% female), the number of sessions they worked per week on average (15.9% less than 6 sessions per week and 17.9% more than 10 sessions per week) and in terms of their practice location (68.9% in capital cities).

However, they were a little older than average (67.5% being 45 years or more compared with 62.6% on average), and their years in general practice reflected this slight difference in age distribution. They were more likely to work as a solo practitioner (21.9%) than average (16.9%) and less likely to be in practices of 5 or more GPs (37.2% compared with 44.0%). A lesser proportion of these GPs had graduated in Australia (70.6% compared with 74.3%) and more had graduated in Asia (12.8% compared with 8.3%). They were also somewhat less likely than average to hold the FRACGP (27.4%) than average for Australia (32.2%) (Table A4.1).

The encounters

The raw figures showing the number of each variable available in the BEACH data set for Australia and for each state of Australia are provided in Table A4.2.

Content of the encounters

Table A4.3a provides an overview of the content of the encounters recorded by New South Wales GPs. At the 189,200 encounters reported by New South Wales GPs they recorded patient reasons for encounter at a rate of 153.0 per 100 encounters, a significantly higher rate than average for the country (150.2 per 100). However, the number of problems managed at encounters by New South Wales GPs (148.8 per 100 encounters) did not differ from the national average (148.1 per 100). New problems arose at a rate of 51.5 per 100 encounters, which equates with the national average of 51.2 per 100 and work-related problems were managed at exactly the same rate (3.4 per 100 encounters) as the national average.

Medications were prescribed, supplied or advised at a rate of 111.7 per 100 encounters, a significantly higher rate than average (106.5 per 100) and this was largely due to higher prescribing rates by the New South Wales GPs (94.6 prescriptions per 100 encounters compared with 89.4 per 100 average). They also advised over-the-counter purchase of medications significantly more often than average but the difference was not as large (10.0 compared with 9.0 per 100 encounters).

There was no significant difference between encounters with New South Wales GPs and the national average in terms of the number of other (non-pharmacological) treatments provided, clinical treatments being given at a rate of 37.2 per 100 encounters (compared with 37.1 average). However, they did slightly less procedural work, at a rate of 13.0 per 100 encounters compared with 13.8 per 100 on average.

While total referrals occurred at a rate of 12.4 per 100 encounters, only marginally higher than the national average (11.8 per 100), New South Wales GPs referred significantly more often to specialists, at a rate of 8.7 per 100 encounters (compared with 7.9 national average).

New South Wales GPs did not differ from average in terms of their referrals to hospitals (0.5 per 100 encounters) and emergency departments (0.1 per 100) or their ordering of pathology tests (31.9 tests per 100) and imaging (8.5 per 100).

Age-standardised results

After age-standardisation, all these significant differences remained and the total referral rate became significantly higher than average, though it had only been marginal in the descriptive results. No other new differences emerged (Table A4.3b).

Type of encounter

The types of encounters undertaken by GPs in New South Wales did not differ in any way from those conducted by all GPs in the national sample. At 97.0% of the 189,200 encounters recorded the patient was seen by the GP and for 92.7% a Medicare or Department of Veterans' Affairs item of service was claimable. Standard surgery consultations accounted for 75.6% of all encounters and a further 9.5% were long surgery consultations. While home visits accounted for only 2.0% of the total, hospital and aged care facility visits were even less common. Encounters claimable through workers compensation accounted for 2.0% and indirect consultations (where the patient was not seen) accounted for 3.0% of the total (Table A4.4a).

Age-standardised results

After age-standardisation, these results remained, no differences in distribution of GP services being identified between New South Wales and Australia (Table A4.4b).

Characteristics of the patients at encounter

The expected age distribution of patients at encounter in New South Wales was calculated from the age distribution of the New South Wales population (Figure 4.1) and mean annual GP visits by age group (Figure 4.2). The observed age distribution of BEACH encounters from New South Wales (Table A4.5a) did not differ from the expected age distribution (results not shown). Therefore, the New South Wales sample of BEACH encounters was representative of the New South Wales population in terms of age distribution and GP visit rates.

The patients at encounters with GPs in New South Wales were in most ways representative of the patients seen by all GPs in Australia. The majority were female (58.5% compared with 59.1% nationally) and the age distribution aligned with the national average – approximately 23% being young people of less than 25 years, and 26% being in each of the other age groups of 25–44 years, 45–64 years and 65 years and over.

The proportion of patients who were new to the practice (9.2%) and the proportion holding a Repatriation Health Card (3.5%) did not differ from the national average. However, a significantly lower proportion of patients at encounters with New South Wales GPs held a Commonwealth Concession Card (36.9% compared with 39.3%) and a greater proportion were from a non-English-speaking background (12.2% compared with 8.8%). The proportion of encounters with Indigenous patients (0.8%) did not differ statistically from the average (1.1%) (Table A4.5a).

Age-standardised results

After age-standardisation, the other characteristics of patients at encounter were compared (Table A4.5b). The differences already identified in the descriptive analysis remained after adjustment and no new differences were identified.

Patient reasons for encounter

The distribution of patient reasons for encounter (RFEs) described by patients attending GPs in New South Wales differed in some respects from those given by all patients at all encounters.

As shown in Table A4.6a, patients seeing GPs in New South Wales described relatively more respiratory problems (23.9 compared with 22.7 per 100 encounters), more circulatory problems (12.6 per 100 encounters) than in the national data set (11.4) and more problems related to the digestive system (10.9 compared with 10.4) and to the blood/blood-forming organs (1.8 compared with 1.6 per 100 encounters). Problems related to the skin were significantly less often described by patients as a RFE at these encounters (14.3 per 100) compared with the national average (15.0).

There were no significant differences in the rates at which patients described general and unspecific problems (31.4 per 100 encounters), problems related to the musculoskeletal system (17.2 per 100), to the female genital system (6.2 per 100), the endocrine/nutritional and metabolic system (6.1 per 100), the neurological system (5.7 per 100), the ear (4.0), pregnancy and family planning (3.6), the eye (2.8), the urinary system (2.6), the male genital system (1.0), nor those of a psychological (7.8 per 100 encounters), or social (1.0 per 100) nature.

Only two of the most common individual RFEs described by patients occurred at a more frequent rate in New South Wales than in the national data and these were cough (6.7 compared with 6.1 per 100 encounters) and throat complaints (3.8 compared with 3.5 per 100 encounters). In line with the total national data, the RFEs most frequently described were a request for check-up, either specific or general, (14.4 per 100 encounters) and requests for prescriptions (10.1 per 100 encounters) Requests for immunisation or vaccination (4.7 per 100), for test results (4.7 per 100) and back complaints (3.6 per 100) were other commonly described RFEs in both New South Wales and for the country as a whole (Table A4.7a).

Age-standardised results

After age-standardisation, all these significant differences remained and two new differences emerged. The presentation of both headaches and sneeze/nasal congestion were significantly more frequent as a patient RFE after standardisation (Tables A4.6b and A4.7b). These had been only marginally higher in the descriptive analysis.

Problems managed at encounter

Number of problems managed

As shown in Table A4.8a, the distribution of the number of problems managed at encounter did not differ for New South Wales when compared with the national average. At about two-thirds of encounters the GP managed only one problem and at 25% they managed two problems. Three problems (8.3%) and four problems (2.5%) were less often managed at a single encounter.

Types of problems managed

Table A4.9a shows that the distribution of the problems managed at encounters with GPs in New South Wales paralleled that of the national average, with three exceptions. Problems managed significantly more often were those associated with the circulatory (17.9 compared with 16.6 per 100 encounters) and digestive (10.5 compared with 10.0 per 100 encounters)

systems. Skin problems were managed less often than average (15.9 compared with 16.6 per 100 encounters).

As with the national average the most common problem managed in New South Wales was hypertension (9.7 per 100 encounters), followed by upper respiratory tract infection (URTI) (6.4 per 100 encounters), immunisation/vaccination (5.0 per 100), depression (3.5), lipid disorder (3.2), asthma (2.8), and diabetes (2.8 per 100). However, hypertension, lipid disorders and oesophageal disease were managed at a significantly higher rate in New South Wales than average (9.7 compared with 8.8 per 100 encounters; 3.2 compared with 2.8 per 100 encounters and 1.8 compared with 1.7 per 100 encounters respectively) (Table A4.10a).

There were no other significant differences in the rates of management of other common problems.

New problems managed at encounter

When compared with the national average there were no significant differences in the rates of management of the more common new problems. The most commonly managed new problems in general practice in New South Wales paralleled those most frequently managed nationally. URTI was the most frequently managed at a rate of 4.5 per 100 encounters, followed by immunisations/vaccinations (2.4 per 100), acute bronchitis (1.6), urinary tract infection (1.0), and unspecified viral diseases (1.0 per 100) (Table A4.11a).

Age-standardised results

No significant differences emerged after age-standardisation in terms of numbers of problems managed (Table A4.8b).

After age-standardisation, all but one of the significant differences in the management rates of problems remained. The small difference in the management rate of oesophageal disease disappeared. No new differences emerged (Tables A4.9b, A4.10b and A4.11b).

Management rates

Earlier in this chapter we reported the rates of each management type provided per 100 encounters. In this section we view management in two other ways. First, we compare the rate of each management variable per 100 problems managed. This removes any bias introduced by differing number of problems managed between states. Second, we look at the likelihood of GPs providing at least one of each management action at the encounter. This provides a simple picture of the chance the patient has of receiving, for example, a prescribed medication or a referral when they attend the GP.

Management rates per 100 problems managed

Table A4.12a shows that GPs in New South Wales prescribed, supplied or advised significantly more medications per 100 problems managed (75.1) than the national average (71.9). This was due to significantly higher prescribing rates (63.6 compared with 60.4 per 100 problems managed) and more frequent advice for over-the-counter purchase of medications (6.7 compared with 6.1 per 100 problems). They did not differ from the average in terms of the number of supplied medications per 100 problems managed (4.8).

In terms of total problems managed, they provided fewer procedural treatments (8.7 compared with 9.3 per 100 problems managed) but did not differ from the average in use of clinical treatments such as advice and counselling (25.0 per 100).

Whereas the specialist referral rate per 100 encounters had been significantly higher than in the earlier analysis, when considered in terms of the number of problems being managed, there was no significant difference in specialist referrals. Total referral rates and those to other services also did not differ from the average. The pathology test order rate was significantly lower than the national average in terms of rate per 100 problems managed (20.0 compared with 21.0 per 100 problems managed).

Age-standardised results

After age-standardisation, the higher medication rate, higher prescribing rate, and more frequent advice to the patient for purchase of over-the-counter medications remained. However, the specialist referral rate became significantly higher and the pathology order rate no longer differed from the national average. The latter result suggests that the lower pathology test order rates by New South Wales GPs identified in the descriptive analysis is due to the age distribution of the New South Wales population, rather than to a difference in management style (Table A4.12b).

Encounters at which management was recorded

This section considers the relative likelihood of at least one management action of each type, at encounter. The results are presented in Table A4.13a as a percentage of total encounters at which each event occurred at least once.

Patients attending a GP in New South Wales were significantly more likely to receive at least one prescription, advice for purchase of an over-the-counter medication, or a medication directly from the GP (68.4% of encounters) than average for Australia (66.5%). This was due to the higher proportion of encounters resulting in at least one prescription (59.5% compared with 57.3%) and the higher proportion resulting in advice to the patient to purchase an over-the-counter medication (8.7% compared with 8.0%). There was no difference in the chance the GP would supply some medication directly to the patient. There was also no significant difference in the proportion of encounters with New South Wales GPs that involved the provision of clinical treatment such as advice and counselling. However, they provided a therapeutic procedure at fewer encounters (11.8% of encounters) than average for all of Australia (12.6%) at encounter.

The patients were more likely to be referred to a specialist at encounters with New South Wales GPs (4.9% of encounters compared with 4.5%). However, there were no significant differences in the proportion of encounters generating at least one pathology test order or at least one imaging test order.

Age-standardised results

After age-standardisation, all these significant differences remained, although the higher overall referral rate and the higher rate of referrals to specialists became marginal. No new differences emerged (Table A4.13b).

Medications

As demonstrated in Table A4.14a, some medication groups were prescribed significantly more often in New South Wales than the average for the nation.

- Medications acting on the cardiovascular system were prescribed at a significantly higher rate in New South Wales (15.5 per 100 encounters) than in Australia as a whole (13.7) and this was reflected in higher prescribing rates of anti-hypertensives (8.4

compared with 7.4 per 100 encounters), 'other cardiovascular drugs' (2.9 compared with 2.5) and anti-angina medications (1.3 compared with 1.2).

- Medications acting on the central nervous system were prescribed at a significantly higher rate than average in New South Wales, at 11.4 prescriptions per 100 encounters compared with 10.7 per 100. The only subgroup in which this significant difference was reflected was for simple analgesics, which were prescribed at a rate of 4.8 per 100 encounters compared with 4.2 per 100 national average.
- Drugs acting on the musculoskeletal system were prescribed at a rate of 6.2 per 100 encounters in New South Wales, significantly higher than the average rate of 5.8 per 100.
- Respiratory medications were prescribed at a significantly higher rate than average, at 6.7 per 100 encounters (compared with 6.0 per 100 nationally).
- Medications for the skin were also prescribed more frequently in New South Wales (4.6 per 100 encounters) than average (4.3 per 100).
- Medications acting on the digestive system were prescribed at a rate of 4.6 per 100 encounters in New South Wales, significantly higher than average (4.0 per 100) and this was reflected in the prescribing of anti-ulcerants in particular (2.5 per 100 encounters in New South Wales compared with 2.3 nationally).

Two medication groups were prescribed significantly less often in New South Wales when compared with the national average. These were psychological medications (7.2 compared with 7.6 per 100 encounters) and the contraceptives (1.6 compared with 1.8 per 100 encounters).

There were no significant differences in the prescribing rates of the other drug groups, including antibiotics, topical ear/nose medications, drugs acting on the urogenital system, hormones, allergy and immune system drugs and eye medications.

Most commonly prescribed medications

Table A4.15a provides comparative results for the prescribing rates of each of the most commonly prescribed medications in the country as a whole. Only three significant differences appeared for New South Wales when compared with the national average: higher prescribing rate of paracetamol (4.0 compared with 3.4 per 100 encounters), cephalexin (2.2 compared with 1.9 per 100), and simvastatin (1.0 compared with 0.9 per 100 encounters).

Age-standardised results

After age-standardisation, the majority of these significant differences remained. However, differences in prescribing rates for psychological medications, contraceptives, drugs acting on the central nervous system and simvastatin were reduced to only marginal significance. No new differences emerged (Tables A4.14b and A4.15b).

Other (non-pharmacological) treatments

As previously stated in 'Content of the encounters' (Table A4.3a), New South Wales GPs provided clinical treatments at the same rate as the average for all of Australia. This was reflected more specifically in their provision of advice and counselling. However, they undertook significantly fewer procedural treatments than the national average.

Clinical treatments

There were no significant differences in the rate of provision of any of the most frequent individual types of clinical treatments when compared with the national average. The most common were general advice/education (5.0 per 100 encounters), advice and education about treatment of the problem (5.6 per 100), and counselling/advice about nutrition/weight (5.2). Psychological counselling was also commonly provided (3.1 per 100 encounters) (Table A4.16a).

Procedural treatments

The single significant difference in the use of individual procedures for New South Wales was a lower rate of excision/removal of tissues (including destruction, debridement or cauterisation), being recorded at a rate of 2.4 per 100 encounters compared with 2.8 per 100 nationally (Table A4.17a).

Age-standardised results

After age-standardisation, these results did not change (Tables A4.16b and A4.17b).

Referrals

As earlier stated (see 'Content of the encounters', Table A4.3a), the overall referral rate by New South Wales GPs was marginally higher than average, but the referral rate to specialists was significantly higher than average while referrals to hospitals, emergency departments and allied health services did not differ from the average.

Referrals to medical specialists

New South Wales GPs referred patients to a medical specialist at a higher rate of 8.7 per 100 encounters than at all encounters in Australia (7.9 per 100). This was reflected in higher referral rates to cardiologists (0.5 compared with 0.4 per 100 encounters) but not to any other specific type of specialist. As with the national results, referrals were most commonly made to surgeons (0.9 per 100 encounter), ophthalmologists (0.9) and orthopaedic surgeons (0.7 per 100 encounters) (Table A4.18a).

Referrals to allied health professionals

As shown in Table A4.18a, New South Wales GPs referred patients to allied health services at the same rate as the national average. The most common referrals were to physiotherapists (1.1 per 100 encounters), psychologists, dietitians/nutritionists, dentists and 'other' allied health professionals (each at a rate of 0.2 per 100 encounters).

Age-standardised results

After age-standardisation, the higher referral rate to specialists and specifically to cardiologists remained and no new differences emerged (Table A4.18b).

Pathology test orders

As earlier shown (see 'Content of the encounters', Table A4.3a), New South Wales GPs ordered pathology tests at a rate of 31.9 tests per 100 encounters, a rate which did not differ from the national average. This also applied to each of the ten groups of pathology tests, the rates for which are provided in Table A4.19a. As in the national results, pathology tests

classified as Chemistry were most the common type ordered at a rate of 16.7 per 100 encounters, followed by Haematology (6.1) and Microbiology (4.8).

The order rate for thyroid function tests was significantly lower in New South Wales (1.5 per 100 encounters) than for Australia as a whole (1.8 per 100).

Age-standardised results

After age-standardisation, the order rates for each of the ten major groups of pathology tests remained representative of the national average. Further, the thyroid function test order rate remained lower than average. However, two new differences also emerged: New South Wales GPs ordered relatively fewer multi-biochemical analyses and full blood counts than average (Table A4.19b).

Imaging orders

As earlier stated in 'Contents of the encounters', New South Wales GPs ordered imaging at the same rate as the national average. Table A4.20a shows that this result applied across all the most commonly ordered tests. Chest x-rays were by far the most often ordered (1.1 per 100 encounters). The ultrasounds most often ordered by New South Wales GPs and nationally were pelvic ultrasounds (0.5 per 100 encounters).

Age-standardised results

These results remained the same after age-standardisation (Table A4.20b).

Patient risk factors

There have been three major ongoing subsample studies of selected patient risk factors: patient body mass index (BMI) calculated from patient self-reported height and weight, their self-reported alcohol consumption and their current smoking status. The methods applied to these subsample studies are described in Chapter 2 – Methods.

Body mass index

Adults

There were 59,957 adult patients (aged 18 years and over) for whom BMI could be calculated. Their results reflected those found in the total national data, 33.4% being classed as overweight and a further 19.2% being classed as obese. Almost one in ten respondents (8.2%) were classed as underweight (Table A4.21).

Children

There were 7,164 children aged between 2 and 17 years for whom a BMI could be calculated. Of these, 32.0% were classified as either overweight (18.2%) or obese (13.8%). This estimate did not differ significantly from that for all of Australia (Table A4.21).

Alcohol consumption

Respondents to the questions on alcohol consumption numbered 59,079 adults (aged 18 years or more). A significantly greater proportion of these patients reported being non-drinkers (32.8%) than in the total national data (31.1%) and a significantly lower proportion

reported drinking alcohol at at-risk levels (23.8% compared with the national average of 25.0%) (Table A4.21).

Smoking status

Of the 59,796 responding adult patients (aged 18 years and over), 17.7% reported smoking daily and this was a significantly lower proportion than in the total national data set (18.6%). In parallel, a significantly greater proportion (51.0%) reported having never smoked than in the national sample overall (49.5%) (Table A4.21).

4.3 Discussion

These data fill a gap in information that has been available to date about the health of the population of New South Wales. Information has been available about hospital in-patient attendances,²⁷ mortality rates and cause of death,²⁸ but these statistics only reflect what happens to a minority of the population. The National Health Survey collects information about the health of the broader community but this survey is only conducted every four years and relies on self-reported problems.⁵ About 85% of the population visit a GP at least once in any given year and it could be assumed that close to all residents would have visited at least once in the 5-year period of the BEACH study period here reported. The BEACH data therefore provide an additional view of the health of the New South Wales population.

There are some real strengths in the BEACH data in the way they reflect what happens at the more than 34 million GP-patient encounters conducted each year in New South Wales. BEACH draws on a very large sample of GPs, which is randomly selected from a reliable sample frame of GPs claiming Medicare payments for services provided; the reliability and validity of the methods have been demonstrated;¹⁹⁻²⁵ the age and sex distribution of patients seen in the final national sample of Medicare-paid encounters is very precise in its representation of the age-sex distribution of patients attending all Medicare-paid encounters. However, it must be remembered that some of the differences identified between general practice encounters in New South Wales and those across the country could represent Type 1 error due to the large number of comparisons that have been made. Relying on 95% confidence intervals for identification of differences means that 5% of identified differences may be false.

This chapter has shown that residents of New South Wales attend GPs somewhat more frequently than average for the total population, though the age and sex distribution of the population and the GP to population ratio were very similar to the national average. About one-quarter of the clinical Medicare-paid workload was being carried by GPs aged 55 years and over. However, the sample of general practitioners found in the first 5 years of the BEACH program did not differ from all participating GPs in terms of their age or sex distribution. These GPs were however more likely to work in solo practices and less likely to work in larger practices of 5 or more GPs. They were more likely to have graduated in Asia and were less likely to hold the Fellowship of the RACGP than average for all BEACH participating GPs.

The patients at encounters with New South Wales GPs differed from the national average in only two ways: they were less often holders of a Commonwealth Concession Card, and were more often from a non-English-speaking background. Their encounters were also similar to the national average in terms of the site and funding source for payment. However, patients in New South Wales described more reasons for their encounters than did patients as a

whole, though this did not affect the number of problems that were managed at the encounters, which was the same as the national average.

The higher presentation rates of reasons for encounter related to the respiratory system, particularly cough and throat complaints, and those related to the circulatory and digestive systems, and the lower management rate of problems related to the skin and the blood/blood-forming organs were not explained by the age distribution of the New South Wales population, as these differences remained after adjustment. In fact, there were also higher presentation rates of headache and sneeze/nasal congestion which were masked in the descriptive analysis but emerged after adjustment.

The problems more often managed in New South Wales general practice to some degree reflected these differences in patient presentations, there being higher management rates of cardiovascular problems, digestive problems and skin problems. More specifically, there were higher management rates of hypertension, lipid disorders and oesophageal disease. The medications prescribed at higher than average rates by New South Wales GPs in turn reflected these more frequently managed problems. The higher prescription rates for medications acting on the digestive system and the cardiovascular system, particularly anti-hypertensives and anti-angina agents, reflect the more frequent management of digestive and cardiovascular problems in this state. However, medications acting on the respiratory system were prescribed more often at New South Wales encounters, even though the management rate of respiratory problems did not differ from the national average. The higher prescribing rate of paracetamol did not disappear after adjustment. A higher prescribing rate of paracetamol by GPs has been shown to be associated with the Commonwealth Concession Card status of the patient,²⁹ for it is cheaper for a patient holding a Commonwealth Concession Card to purchase paracetamol on prescription than over-the-counter. However, the proportion of encounters in New South Wales that were with patients who held a Commonwealth Concession Card was lower than in the nation as a whole. This difference therefore remains unexplained. The higher prescribing rate of simvastatin reflects the higher management rate of lipid disorders but was also partially explained by the age distribution of the population, as the difference became marginal after adjustment. In contrast, the higher prescribing of medications acting on the central nervous system and on the musculoskeletal system and the lower rates of psychological medications and contraceptives could not easily be explained by the morbidity pattern managed at encounters in New South Wales, though most of these differences became marginal after adjustment so were partially due to the age distribution of the population.

GPs practising in New South Wales provided clinical treatments such as advice and counselling at a similar rate to the national average. However, they recorded significantly fewer procedural treatments, excisions/removal particularly. They also referred more often to specialists, to cardiologists in particular. While they ordered pathology tests at the average rate, they ordered fewer thyroid function tests than average. All these differences remained after adjustment and were therefore not explained by the age of the populations. More detailed investigation of these differences could highlight clearer relationships between morbidity patterns and procedures, referral and pathology test ordering behaviour.

The descriptive analysis demonstrated that, in general, patients attending GPs in New South Wales had slightly fewer risk factors than those attending all GPs on average. There were no more or less obese/overweight patients than average, fewer at-risk drinkers, and fewer daily smokers. After adjustment for the age distribution of the New South Wales population, there were fewer who were obese, no difference in the proportion classed as 'at-risk drinkers', a

lesser proportion who had been previous smokers and the higher proportion of non-smokers remained significant.

4.4 Conclusion

The clinical activities of GPs practising in New South Wales do not differ markedly from the average of all GPs across Australia. State authorities can feel comfortable relying on the national data reported regularly by the AIHW and the University of Sydney in such publications as *General Practice Activity in Australia 2002–03*¹⁵ to gain a reliable assessment of the current practise style of GPs in this state. However, where differences have been demonstrated, state authorities should consider requesting more detailed analysis of the BEACH data to gain a greater understanding of the problems managed and treatments provided by GPs in this state. The New South Wales sample in BEACH is of a sufficient size and power to allow state based annual analysis and the measurement of changes over time.