General practice activity in Australia 2004–05

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Recent related publications:

Knox S, Britt H, Pan Y, Miller GC, Bayram C, Valenti L, Charles J, Henderson J, Ng A, O'Halloran J 2005. Locality matters: the influence of geography on general practice activity in Australia 1998–2004. AIHW Cat. No. GEP 17. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 17).

Britt H, Miller GC, Knox S, Charles J, Valenti L, Pan Y, Henderson J, Bayram C, O'Halloran J, Ng A 2004. General practice activity in Australia 2003–04. AIHW Cat. No. GEP 16. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 16).

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Number 18

BEACH

Bettering the Evaluation and Care of Health

General practice activity in Australia 2004–05

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Foreword

The release of this seventh annual report on *General Practice Activity in Australia* is another milestone for the BEACH program, and will be the last while I am AIHW Director. I am therefore delighted to be able to make some introductory remarks.

Primary care practitioners are pivotal to the Australian health system. GPs provide a large volume of treatment and advice, and they are also gatekeepers for entry into the secondary and tertiary segments of the health system.

The BEACH survey provides unique and valuable insights into what happens *inside* Australian general practice. It delivers very rich information on doctor-patient encounters, on such matters as—the reasons for the encounter and the number and mix of problems managed; medications prescribed or advised; non-pharmacological management of health conditions; pathology and imaging investigations ordered; and referrals or admissions to other segments of the health system. It also describes practitioners and the ways they conduct their practices, including their use of computers. Around 85% of Australians visit a GP in any one year, and the survey provides information on the characteristics of patients, including important insights into risk factors that will influence the future course of Australians' health.

The database generated by the BEACH program over the past seven years now covers 700,000 patient encounters, and supports analyses of trends in general practice, practitioners and patients over time. Two recent reports—*General Practice Activity in the States and Territories of Australia 1998–2003* and *Locality Matters: the Influence of Geography on General Practice in Australia 1998–2004*—have demonstrated the power of the database to answer questions that cannot be addressed using any other data source. This latest annual report also draws on the cumulative value of the database, with its greater emphasis on changes in morbidity and management through the life of the BEACH survey. I find the topical presentations on health priority areas of particular interest, and think they provide a springboard for much further analysis and discussion.

The BEACH program is conducted under a collaborative arrangement between the University of Sydney and the Australian Institute of Health and Welfare. Professor Helena Britt and Professor Graeme Miller have been fine colleagues, and represent a strong team committed to high quality and vibrant general practice in Australia.

For most of its life, the BEACH program has been funded through a mix of government and private sector financial support and is, in my view, a very successful model of its kind. I trust that the program will be maintained and enhanced for many years to come.

These annual reports make a major contribution to the better understanding of primary care. And the data generated by the BEACH survey are an essential element of the statistical portraits of the whole health system that are presented in *Australia's Health* and other Institute publications.

Richard Madden B.SC (Hons), PhD, DSc (Hon), FIAA

Director, Australian Institute of Health and Welfare

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The Australian General Practice Statistics and Classification Centre (formerly the General Practice Statistics and Classification Unit) wishes to thank the 953 general practitioners who participated in BEACH between April 2004 and March 2005. This report would not have been possible without their valued cooperation and effort in providing the data.

We also thank the following organisations for their financial support and their contribution to the ongoing development of the BEACH program since it began in April 1998:

- Australian Government Department of Health and Ageing (1998–2004)
- AstraZeneca Pty Ltd (Australia) (1998–2005)
- Roche Products Pty Ltd (1998–2005)
- Janssen-Cilag Pty Ltd (2002–05)
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- Pfizer Australia (2004–05)
- National Occupational Health and Safety Commission (1998–2000)
- Australian Government Department of Veterans' Affairs (1998–2000)
- Aventis Pharma Pty Ltd (1998–2000).

Some financial support for the program was also provided by:

- National Occupational Health and Safety Commission (2004–05)
- Australian Government Department of Veterans' Affairs (2004–05).

We acknowledge the support of the Royal Australian College of General Practitioners, the Australian Medical Association, the Australian Divisions of General Practice, the Australian College of Rural and Remote Medicine, and the Consumers Health Forum, and the contribution of their representatives to the BEACH Advisory Board.

The research team is grateful to Clare Bayram for her coordination and editing of this report, for the IT support of Timothy Chambers and the administrative support of Gervaise Woods, to Dulcie Bucksath for the preparation of the appendices in this report, and for the valuable contribution of the general practitioner recruitment staff (Errol Henderson, Jan Fitzgerald) and data entry staff. We recognise the contribution of past members of the BEACH team.

We appreciate the cooperation of Anthony Lawrence of the Primary Care Division of the Australian Government Department of Health and Ageing in regularly supplying general practitioner random samples and national Health Insurance Commission data. At the Australian Institute of Health and Welfare, Ken Tallis edited the report and Ainsley Morrissey and Cecilia Burke coordinated the printing and publication process.

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

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Executive summary

The BEACH (Bettering the Evaluation and Care of Health) program provides us with knowledge about the content of the GP–patient encounters and of the services and treatments provided by GPs. It gives an important insight into the health of our community. BEACH is a continuous study of general practice activity that began in April 1998. It is unique. It is the only continuous randomised study of general practice activity in the world, and the only national program which provides direct linkage of management actions (such as prescriptions, referrals, investigations) with the problem under management.

In Australia:

- about 85% of the Australian population (approximately 19.8 million) visit a GP in any one year
- GPs perform a gatekeeper role for entry into the secondary and tertiary health sectors
- in 2003 there were 100 full-time equivalents GPs (based on a 45 hour working week) per 100,000 population
- in the 2004–05 financial year, there were about 94 million unreferred attendances paid by Medicare (A1 and A2 items) at an average rate of 4.5 GP visits per person
- primary costs for these general practice services were around $2 billion and secondary costs generated from these services totalled over $4 billion.

This report provides an overview of results from the seventh year of the program (April 2004 to March 2005). It also investigates changes in morbidity and management demonstrated over the last five to seven years. Summaries of results for each of the past five years are provided in Appendix 5, <www.aihw.gov.au/publications/index.cfm>.

The BEACH program relies on the cooperation of randomly selected GPs across the country. Each completes details for 100 consecutive GP–patient encounters on structured paper encounter forms. They each also provide information about themselves and their practice. About 1,000 GPs participate in BEACH each year and the sample is everchanging. Participants gain points towards their quality assurance requirements for continued vocational registration.

The sample frame for the study is all active medical practitioners who claimed at least 375 A1 Medicare items of service from the Health Insurance Commission (HIC) in the most recent data quarter. The Australian Government Department of Health and Ageing draw samples from HIC data. We approach the GPs by letter with telephone follow-up.

In the 2004–05 BEACH data year, 953 GPs provided details for 95,300 encounters. Results are reported in terms of GP and patient characteristics, patient reasons for encounter, problems managed and management techniques used. Questions about selected patient health risk factors were asked of a subsample of patients, and the results are included in this publication. Other substudies covered in the seventh year of BEACH are reported at <www.fmrc.org.au/publications/SAND_abstracts.htm>.

The format of this report is somewhat different from earlier BEACH annual reports. It concentrates more on the measurement of changes over time in each aspect of the data set. Chapter 2 provides an overview of all measured changes (red margin), and Chapter 3 (red margin) investigates in greater detail some specific topics, selected on the basis of topical

interest in terms of public health initiatives or developments in treatments. In particular, topics were examined that are associated with the National Health Priority Areas.

The annual results for BEACH 2004–05 are in Chapter 4 (blue margin). The methods are described in Chapter 5. Appendices 1 and 2 are included, and the remainder are on the web.

The GPs who participated in BEACH 2004–05 were found to be representative of all GPs in the original sample frame. For the first time since BEACH began in 1998–99 there was not an under-representation of younger GPs. This was probably because there has been a recent change in rules for quality assurance requirement—registrars are now required to undertake quality assurance activities towards the end of their training.

However, as in the past, the raw encounter data were weighted for GP age and sex, to ensure any minor discrepancies (though not statistically significant) in the age–sex distribution of the sample were dealt with. The raw encounter data were also weighted for the activity level of each participating GPs (as measured by the number of Medicare items claimed) to ensure each set of 100 encounter forms represents the relative contribution of each individual GP to the total encounters across the country. The final sample of GP–patient encounters demonstrated excellent precision in representing the age–sex distribution of patients at all Medicare-claimed A1 items of service.

The characteristics of the general practice profession continue to change. When compared with the GPs of 1998–99, GPs are getting older and a greater proportion is female. They are more likely to work 6–10 sessions and less likely to work longer hours. They are less likely to be in solo practice and more often work in relatively large practices and in computerised practices. They are less likely to have graduated in Australia but are more likely to hold Fellowship of the RACGP.

The distribution of the GPs' workload across patient age groups is also changing, a decreasing proportion of their encounters being with children aged less than 15 years and an increasing proportion being with older patients (particularly those aged 75 years or more), and with the 'baby boomers', now aged 45–64 years.

As in the past, the majority of patients present with only one reason for encounter (RFE), but there has been an increase in the rate of RFEs associated with a need for services such as prescriptions and referrals. More specifically, visits to obtain the results of tests and investigations have become more frequent. This may be the result of GP concerns about the changes in the Privacy Legislation released at the end of 2001 or may reflect increasing economic pressure on the profession as a whole, leading GPs to ask the patient to return for results rather than receive them over the telephone.

In light of the changing age distribution of the patients encountered, it is surprising there has not been any increase in the number of problems managed at the encounter. It has remained steady at 145 problems per 100 encounters. However, it is not surprising that there has been an increase in the management rate of chronic problems. One-third of the problems managed in general practice are now chronic in nature. At least one chronic problem was managed at 39% of encounters and they were managed at an average rate of 51 per 100 encounters.

The chronic problems managed most frequently in general practice are hypertension, depressive disorder, lipid disorders, diabetes, osteoarthritis, asthma and oesophageal disease. However, together these six chronic problems account for only 18% of all problems managed, demonstrating the very wide diversity of morbidity managed by GPs.

One in every five problems managed by GPs in Australia remains undiagnosed at the end of the consultation, the GPs describing the problem in terms of symptoms or complaints.

Acute conditions remain common reasons for seeing the GP. In 2004–05, upper respiratory tract infection (URTI) remained the second most common problem managed in general practice, a position it has held since problem management rates were first measured in the Australian Morbidity and Treatment Survey 1990–91. However, the management rate of URTI has significantly decreased since BEACH began, there now being an estimated 1.5 million fewer cases managed by GPs than in 1998–99. Other acute conditions being managed less often include acute bronchitis, sinusitis and tonsillitis.

In 2004–05 at least one management action was recorded by the GP for almost 90% of the problems managed. At least one medication was prescribed/supplied or advised (most commonly prescribed) for over half the problems managed. GPs used counselling and/or advice in the management of one in four problems and undertook procedure(s) for one in ten problems managed. Only about 10% of patients were referred elsewhere for their problem, and most of these referrals were to specialists. Ordering of tests and investigations was more likely than referral. For one in six problems the GP placed orders for tests, by far the majority being for pathology tests.

Some of these management activity patterns have altered since 1998–99. The total medication rate (prescribed, supplied and advised for over-the-counter purchase) decreased by about 7%. The decline has been greatest in the rate of prescriptions, which fell by almost 12% from 94 prescriptions per 100 encounters in 1998–99 to 83 per 100 in 2004–05. Although a 12% fall may not seem large, if we extrapolate this change to general practice across Australia it represents an average annual national decrease of 2.6 million prescriptions (i.e. there being an estimated 15.6 million fewer prescriptions given by GPs in 2004–05 than in 1998–99). It must also be remembered that this is a decrease in the number of occasions a prescription is written and does not consider the number of repeats involved or whether the prescription was filled. Considering the increased management rate of chronic conditions in general practice, this fall is even more important.

The decreasing prescription rate for medications was not consistent across all drug types. The largest decreases were seen in the prescribing of paracetamol and celecoxib. In contrast, tramadol was prescribed at an increasing rate, perhaps replacing some of the paracetamol and coxib scripts, and esomeprazole became more often prescribed than ranitidine in the management of acid-related disorders.

Clinical treatments (provision of advice and counselling) are on the increase in general practice. From BEACH we estimated GPs used such techniques on 5.4 million more occasions in 2004–05 than in 1998–99. Advice and counselling about nutrition/weight would account for about 1.5 million of these additional events. An increase in provision of psychological counselling was also found, but the change was smaller. We estimate that GPs provided psychological counselling at about 3 million consultations in 2004–05 and that this was about half a million more occasions than in 1998–99.

BEACH suggests that GPs undertook almost 15 million procedures across the country during 2004–05 and that this represents an increase of about 460,000 procedures per year since 1998 (i.e. an extra 2.8 million procedures in 2004–05 compared with 1998–99).

Pathology test ordering by GPs continues to increase, not only in total numbers, but also in terms of how often at least one pathology test is ordered. The proportion of encounters generating pathology test orders increased between 1998–99 and 2004–05 from 13% to 15% of encounters. This suggests there were 1.5 million more encounters at which the GP decided to order pathology tests in 2004–05 than in 1998–99. Further, the total number of pathology tests ordered increased (since 2000–01) by almost 25% from 29.7 to 36.7 per 100 encounters. Previous research has demonstrated that in the late 1990s an increase in pathology test

ordering was due not to increased likelihood of testing, but to increased numbers of tests ordered at any one time. It appears this is no longer the case; the data suggest a combination of these effects. In any case, the extrapolated effect of the increase suggests that GPs ordered 5.2 million more pathology tests in 2004–05 than they did in 2000–01.This increase was particularly apparent in ordering rates for chemical pathology and haematology.

There has also been an increase in the likelihood of GPs ordering imaging tests, but the change was far less than that for pathology. In 2004–05 GPs ordered imaging tests at a rate of 8.3 per 100 encounters. There was no significant change in overall referral rates, or in rates of referral to medical specialists, allied health professionals or hospital services.

Chapter 3 (red margin) investigates some selected topics in greater detail: non-steroidal anti-inflammatory drugs for arthritis and other musculoskeletal problems; anti-depressant medications and management of psychological problems; asthma inhalant medications and management of asthma; lipid-lowering agents and management of lipid disorders; injuries.

The investigation of the prescription, supply or advice for purchase of non-steroid anti-inflammatory drugs (NSAIDs) demonstrated that the NSAID medication rate peaked in 2000–01, largely due to the entry of the coxibs to the Pharmaceutical Benefits Scheme. There is evidence that some substitution for other NSAIDS was made at this time, but that the coxibs were also prescribed for many patients who were not already on a NSAID. Since 2000–01 the rate of NSAIDs has steadily decreased, particularly in the last 12 months, following withdrawal of rofecoxib. There has been some substitution of meloxicam.

Asthma is being less often managed in general practice than in the past. GPs continue to prescribe, supply or advise asthma preventives, and there was a decreasing rate of bronchodilator medications prescribed/supplied or advised. This pattern of medication use may indicate that patients are managing their asthma better than they were and requiring fewer visits to the GP for acute exacerbations.

Depression remained the fourth most common problem managed in general practice in 2004–05. Considering the large number of government initiatives in the areas of mental health it is somewhat surprising that there has been little change since 1998 in its management rate or in the rate of anti-depressant medication use for depression. However, selective serotonin reuptake inhibitors and serotonin-noradrenaline reuptake inhibitors have continued to increase as the medication of choice for the management of depression.

The management rate of lipid disorders continues to increase, suggesting an increasing prevalence of diagnosed cholesterolaemia in the Australian population. This is accompanied by a continued growth in prescriptions for lipid-lowering medications, particularly statins.

Physical injury is one of the National Health Priority Areas. For the first time we investigated the trend in physical injury management and found a significant decrease over time. However, this may merely suggest that patients are increasingly using other health professions (such as physiotherapists and hospital emergency departments) for first-line management for physical injuries.

The substudy of patient risk factors, combining smoking, BMI and alcohol intake, has been part of BEACH since 2000–01. In 2004–05 the proportion of adult respondents classed as obese (calculated on patient-reported height and weight) (22.4%) was similar to that of the previous year but remains significantly higher than in 2000–01 (20.2%). The proportion classed as overweight has remained steady over the period. The proportion of surveyed adults who reported at-risk alcohol consumption levels remained steady at about 26% since an initial increase in 2001–02. The prevalence of smoking among patients attending general practice and of overweight and obesity in children remained steady this year.

1 Overview

This publication is the seventh annual report of the BEACH (Bettering the Evaluation and Care of Health) program, a continuous national study of general practice activity in Australia. It provides results for the period April 2004 to March 2005 inclusive, using details of 95,300 encounters between general practitioners (GPs) and patients (about a 0.11% sample of all general practice encounters) from a random sample of 953 recognised practising GPs across the country. It also reports changes that have occurred in this activity since the inception of BEACH in 1998.

The BEACH program is unique. It is the only continuous randomised study of general practice activity in the world, and the only national program that provides direct linkage of management actions (such as prescriptions, referrals, investigations) with the problem under management. It began in April 1998 and the BEACH database now includes information for 697,400 encounters for 6,974 participants representing 5,929 individual GPs.

GPs provided by far the majority of the 96 million non-specialist services paid by Medicare in 2002–03, at an average rate of 4.9 visits per person per year.[1] BEACH provides us with knowledge of the content of these encounters and of the services and treatments they provide by giving an important insight into the health of a large proportion of the community.

1.1 Background

In 2003 the population of Australia was 19.9 million people,[1] and in 2002–03 the health care expenditure was A$72.2 billion, or 9.5% of Australia's gross domestic product (GDP) (personal communication, Australian Institute of Health and Welfare, September 2005).

- In 2003 in Australia there were 51,819 medical practitioners working as clinicians, of whom 42% were primary care providers.[2]
- There were 110 practising primary care practitioners per 100,000 people in Australia in 2003. Together they made up 100 full-time equivalents (based on a 45 hour working week) per 100,000 population.[2]
  - 80% of these were recognised general practitioners and 20% were other primary care medical practitioners.[3]
- GPs perform a gatekeeper role for entry into the secondary and tertiary sectors of the Australian health care system.
- People are free to visit multiple GPs of their choice and services are provided on a fee-for-service system.
- About 85% of Australians attend a GP at least once during any one year (personal communication, Primary Care Division, Australian Government Department of Health and Ageing, August 2002).
- By far the majority of visits to GPs are funded through the Commonwealth Medicare Benefits Schedule (MBS).
- In the 2004–05 financial year, there were about 94 million unreferred attendances paid by Medicare (A1 and A2 items) at an average rate of 4.5 GP visits per person.[4]

- In 2004–05 the primary cost to Medicare for GP services (A1 and A2 items) was over $2 billion.[4] In 2000 (the most recent reported data available) GP services resulted in additional secondary costs (for pathology, imaging, referred specialist visits and medications etc.) of over $4 billion.[5]
- For the previously reported BEACH years (1998–2004) Medicare covered 85% of the government schedule consultation fee.[6] Some patients were not charged the additional 15% of the fee, the GPs accepting the Medicare payment as total payment. Others were charged the difference between the Medicare payment and the government scheduled fee. Still others may pay more for these services. Just before the commencement of the BEACH data period April 2004 to March 2005, some changes occurred in the payment structure from Medicare for GP services:
    - From March 2004 the safety threshold for couples and families was extended to cover 80% of out-of-pocket expenses for out-of-hospital medical treatments once the threshold was reached.[7]
    - From 1 February 2004 Medicare payments to the GP were increased for all bulk-billed (direct to Medicare) consultations with patients who were aged less than 15 years and for those holding a Commonwealth concession card.[8]

Such changes in policy may affect attendance rates for some sectors of the community and in turn this may affect the types of problems managed by GPs and the management of these problems. The BEACH program can readily measure such effects.

1.2 The BEACH program

In summary, the BEACH (Bettering the Evaluation and Care of Health) program is a continuous national study of general practice activity in Australia. It uses details of about 100,000 encounters between general practitioners (GPs) and patients (about a 0.11% sample of all general practice encounters) from a random sample of approximately 1,000 recognised practising GPs from across the country. A full description of the BEACH methods is provided in Chapter 5 of this report.

A random sample of general practitioners (GPs) who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from Health Insurance Commission data by the Primary Care Division of the Australian Government Department of Health and Ageing. GPs are approached by letter and followed up by telephone recruitment. Participating GPs complete details about 100 consecutive patient encounters on structured paper encounter forms and provide information about themselves and their practice.

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 everchanging 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.

Current status of BEACH

BEACH began in April 1998 and is now in its eighth year. The database for the first 7 years includes data for approximately 700,000 GP–patient encounters from about 7,000 GPs. Each year the AGPSCC publishes an annual report of BEACH results through the Australian Institute of Health and Welfare.

This publication reports results from the previous BEACH data year on a national basis to provide an overview of general practice activity. It also investigates changes over time in some of the National Health Priority Areas and other selected clinical topics of interest.

Other reports use the database for secondary analyses of a selected topic or for a specific research question. The most recent examples are a study of the changes in pathology ordering by GPs between 1998–99 and 2000–01,[9] a comparative study of general practice activity in each of the states and territories of Australia[10] and a comparative study of activity in rural and metropolitan areas of Australia.[11] These and other BEACH reports can be downloaded from <www.fmrc.org.au/publications/> (go to Books—General Practice Series) or from <www.aihw.gov.au/publications/index.cfm>.

The advantages of BEACH

BEACH tells us about what happens at clinical encounters between patients and GPs. It tells us about the relationships between the characteristics of the GP workforce, the patients they manage, the problems that are presented to and managed by GPs, and the treatment provided for each problem. It also provides a reliable continuous measure of changes in general practice since 1998.

We are often asked to outline the advantages the BEACH program has over general practice activity data from other sources. These advantages are summarised below.

- BEACH is the only national study of general practice activity in the world that is continuous, relying on a random everchanging sample of GPs and directly linking management actions to the morbidity under management.
- The sheer size of the GP sample (1,000 per year) and the relatively small cluster of encounters around each GP provides more reliable estimates than a smaller number of GPs with large clusters of patients and/or encounters around each participating GP.[12]
- Our access to a regular random sample of recognised GPs currently in active practice, through the Australian Government Department of Health and Ageing (AGDHA), ensures that the sample of GPs is drawn from a very reliable sample frame of currently active GPs.
- We have sufficient details about the characteristics of all GPs in the sample frame to test the representativeness of the final sample and to apply post-stratification weighting to correct for any under-representation or over-representation in the sample.
- The everchanging nature of the sample (where each GP can participate only once per triennium) ensures reliable representation of what is happening in general practice across the country. The sampling methods ensure that new entrants to the profession are available for selection because the sample frame is based on the most recent HIC data.

  Where other data collection programs use a fixed set of GPs over a long period, they are measuring what that group is doing at any one time, or how that group has changed over time, and there may well be a 'training effect' inherent in longer term participation in such programs. Such measures cannot be generalised to the whole of general practice.

Further, where the GPs in the groups have a particular characteristic in common (e.g. all belong to a professional organisation to which not all GPs belong; all use a selected software system which is not used by all GPs), the group is biased and cannot represent all GPs.

- Each GP records for a set number of encounters (100), but there is wide variance among them in the number of patient consultations they conduct in any one year. The AGDHA therefore provides an individual count of activity level (i.e. number of A1 Medicare item numbers claimed in the previous period) for all randomly sampled GPs, allowing us to give a weighting to each GP's set of encounters commensurate with their contribution to total general practice encounters. This ensures that the final encounters represent encounters with all GPs.
- The structured paper encounter form leads the GP through each step in the encounter, encouraging entry of data for each element. In contrast, systems such as electronic health records rely on the GP to complete all fields of interest without guidance.
- The activities described in BEACH include all patient encounters, not just those covered by Medicare.
- The medication data include all prescriptions, rather than being limited to those prescribed medications covered by the Pharmaceutical Benefits Scheme, PBS (as are PBS data).
- BEACH is the only source of information on medications supplied directly to the patient by the GP, and about the medications GPs advise for over-the-counter (OTC) purchase, the patients to whom they provide such advice and the problems managed in this manner.
- The inclusion of other (non-pharmacological) treatments such as clinical counselling and procedural treatments provides a broader view of the interventions used by GPs in the care of their patients than other data sources.
- The link from all management actions (e.g. prescribing, ordering tests) to the problem under management provides the user with a measure of the 'quality' of care rather than just a count of the number of times an action has occurred (e.g. how frequently a specific drug has been prescribed).
- The use of a well-structured classification system designed specifically for general practice, together with the use of an extended vocabulary of terms which facilitates reliable classification of the data by trained secondary coders, removes the guesswork often applied in word searches of available records (in free text format) and in classification of a concept.
- The analytical techniques applied to the BEACH data ensure that the clustering inherent in the sampling methods is dealt with. Results are reported with 95% confidence intervals. Users are therefore aware of how reliable any estimate might be.
- Reliability of the methods is demonstrated by the consistency of results over time where change is not expected, and by the measurement of change when it might be expected.

A more detailed discussion of methodological issues associated with BEACH and of issues surrounding future computerised data collection is provided in Chapter 5—Methods, Section 5.10.

1.3 BEACH data and other national data sources

Users of the BEACH data might wish to consider the results in relation to data from other sources. Integration of data from multiple sources can provide a more comprehensive picture of the health and health care of the Australian community. This section summarises the differences between BEACH and other national sources of data about general practice in Australia.

The Pharmaceutical Benefits Scheme

Prescribed medications paid for under the Pharmaceutical Benefits Scheme (PBS) are recorded by the Health Insurance Commission. The PBS data:

- count the prescription each time it crosses the pharmacist's counter (so that one prescription written by the GP with five repeats in BEACH would be counted by the PBS six times if the patient filled all repeats)
- count only those prescribed medications subsidised by the PBS and costing more than the minimum subsidy (and therefore covered by the PBS for all patients), or medications prescribed for those holding a Commonwealth concession card or for those who have reached the safety net threshold
- will change with each change in the PBS safety net threshold—when the threshold increases, as it did in January 2005, fewer prescribed medications are counted in the PBS for non-Commonwealth concession card holders[13]
- have no record of the problem being managed, so that economic cost analyses must rely on assumptions about the indication for specific drug types.

In BEACH:

- total medications include those prescribed (whether or not covered by the PBS for all or some patients), those supplied to the patient directly by the GP, and those advised for OTC purchase
- each prescription recorded reflects the GP's intent that the patient receives the prescribed medication and the specified number of repeats; the prescription, irrespective of the number of repeats ordered, is counted only once
- the medication is directly linked to the problem being managed by the GP, allowing cost analyses of pharmacological management of specific morbidity
- there is no information on the number of prescriptions not filled by the patient (and this also applies to the PBS).

These differences influence not only the numbers of prescriptions counted but also their distribution. For example, the majority of broad spectrum antibiotics such as amoxycillin fall under the PBS minimum subsidy level and would not be counted in the PBS data except where patients received the medication under the PBS because they are a Commonwealth concession card holder or had reached the annual safety net threshold. The PBS would therefore under-estimate the number of antibiotic prescriptions filled and the proportion of total medications accounted for by antibiotics. Changes in the minimum subsidy level (such as the increase in 2004) make the measurement of changes in prescribing through the PBS extremely difficult.[13]

Medicare Benefits Schedule

Consultations with GPs that are paid for in part or in full by Medicare Benefits under the Schedule (MBS) are recorded by the HIC.

- The MBS consultation data provided by the AGDHA do not usually include data about patients and encounters funded through the Department of Veterans' Affairs.
- The MBS data include only those GP services that have been billed to Medicare. In contrast, the BEACH database includes data about all clinical activities, irrespective of who pays for them.
- The MBS data reflect the item number charged to Medicare for a service and hold no information about the content of the consultation.
- The BEACH participants have the opportunity to record only one Medicare item number on each encounter form. They are instructed to select the more general item number where two item numbers apply to the consultation. Additional services attracting their own item MBS number (e.g. 30026—repair of wound) are captured in BEACH as actions recorded in other parts of the form. This results in a lesser number of 'other' Medicare items than would be counted in the Medicare data.
- In activities of relatively low frequency with a skewed distribution across individual GPs, the relative frequency of the event in the BEACH data may not reflect that reported in the MBS data. For example, a study of early uptake of some enhanced primary care items by GPs demonstrated that almost half the enhanced primary care items claimed through the MBS came from about 6% of active GPs.[14] Where activity is so skewed across the practising population, a national random sample will provide an under-estimate of activity because the sample reflects the population rather than the minority.

Pathology data from the MBS

Pathology tests undertaken by the pathologists that are charged to Medicare are recorded by the Health Insurance Commission. However, this does not reflect tests ordered by the GP.

- Each pathology company can respond differently to a specific test order label recorded by the GP. So the tests completed by a pathologist in response to a GP order for a full blood count may differ between companies.
- The pathology companies can charge through the MBS only for the three most expensive tests undertaken even where more were actually done. This is called 'coning' and is part of the AGDHA pathology payment system. This means that the tests recorded in the MBS include only those charged for, not all those that were done.
- The effect of these factors is that the MBS pathology data include only those tests billed to the MBS after interpretation of the order by the pathologist and after selection of the three most expensive tests. This effect will not be random. For example, in an order for four tests to review the status of a patient with diabetes, it is likely that the HbA1c test will be the least expensive and will 'drop off' the billing process due to coning. This results in an under-estimate of the number of HbA1c tests being ordered by GPs.
- Pathology MBS items contain pathology tests that have been grouped on the basis of cost. An MBS item may not therefore give a clear picture of the precise tests performed.

In BEACH, the pathology data:

- include details of pathology tests ordered by the participating GPs
- reflect the GP's intent that the patient should have the pathology test(s) done, and information about the extent to which patients do not have the test done is not available (nor is it in the MBS data)
- reflect the terms used by GPs in their orders to pathologists, and for reporting purposes these have been grouped by the MBS pathology groups for comparability. The distributions of the two data sets will differ, reflecting on the one hand the GP order and on the other the MBS-billed services after coning and assignment of MBS item number.

Those interested in GP pathology ordering will find more detailed information from the BEACH program in *Pathology Ordering by General Practitioners in Australia 1998*.[15] A study of changes in pathology ordering patterns between 1998–99 and 2000–01 has also recently been released[9] and is available through the Family Medicine Research Centre website <www.fmrc.org.au/publications/> (go to Books—General Practice Series).

Imaging data from the MBS

Some of the issues discussed regarding pathology data also apply to imaging data. Although coning is not an issue for imaging, radiologists can decide whether the test ordered by the GP is the most suitable and whether to undertake other tests of their choosing. The MBS data therefore reflect the tests that are actually undertaken by the radiologist, whereas the BEACH data reflect those ordered by the GP. Those interested in GP imaging ordering should view *Imaging Orders by General Practitioners in Australia 1999–00*,[16] also available from the Family Medicine Research Centre website.

The National Health Survey (NHS)

The NHS can provide estimates of the population prevalence of specific diseases and a measure of the problems taken to the GP by people in the previous 2 weeks.

- Prevalence estimates are based on self-reported morbidity from a representative sample of the Australian population using a structured interview to elicit health-related information from participants.[17]
- Community surveys such as the NHS have the advantage of accessing people who do not go to a GP. They can therefore provide an estimate of population prevalence of disease and point estimates of incidence.
- Self-report has been demonstrated to be susceptible to misclassification, due to a lack of clinical corroboration of diagnoses.[18]

Management rates of health problems in general practice represent GP workload for a health problem. BEACH can be used to estimate the period incidence of diagnosed disease presenting in general practice through the number of new cases of that disease. However, problem management rates cannot be extrapolated to either patient–population prevalence or total population prevalence of a disease.

The general practice patient population sits between the more clinical hospital-based population and the general population,[19,20] with around 85% of Australians visiting a GP at least once in any one year (personal communication, Primary Care Division, Australian Government Department of Health and Ageing, August 2002). Disease management rates are a product of both the prevalence of the disease/health problem in the population and the frequency with which a patient visits a GP for the treatment of that problem. Those who are older and/or have more chronic disease are therefore likely to visit more often and have a greater chance of being sampled in the encounter data. Further, some diseases require more frequent visits so that the specific set of problems experienced by a patient will determine their visit frequency.

A section on the bottom of each encounter form is used to investigate aspects of patient health or health care delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data).

Many SAND substudies ask an opening question, to ascertain whether the patient present at the encounter has a named condition, or measure the prevalence of a number of diseases among the respondents. Using a qualified medical practitioner to record morbidity in conjunction with patient self-report may provide a more accurate classification of patients' major health problems than self-report alone.[18,20] In the substudies, we have overcome the effect of whether a particular problem happens to be under management at the encounter (and was or was not therefore recorded in the encounter data), but this still does not overcome the selection bias of the patient sample itself.

We are currently working on statistical methods using SAND prevalence estimates in combination with age–sex-specific attendance rates (from Medicare statistics) to gain a GP patient population estimate of prevalence of morbidities included in the National Health Priority Areas.

Access to BEACH data

Different bundles of BEACH data are available to the general public, to BEACH participating organisations, and to other organisations and researchers.

Public domain

In line with standard Australian Institute of Health and Welfare practice, this annual publication provides a comprehensive view of general practice activity in Australia. The BEACH program has generated many papers on a wide range of topics available in journals and professional magazines. Appendix 6 lists all published material from BEACH, available from <www.aihw.gov.au/publications/index.cfm>.

Since April 1998, a section on the bottom of each encounter form has been used to investigate aspects of patient health or health care delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data). The SAND methods are described in Chapter 5—Methods, Section 5.3). Abstracts of results for the substudies conducted in the seventh BEACH year and not reported here are on the website of the Family Medicine Research Centre (of which the AGPSCC is a part) <www.fmrc.org.au/publications/SAND_abstracts.htm>. The subjects covered in the abstracts are listed in Table 1.1 with the sample size for each topic.

Participating organisations

Organisations providing funding for the BEACH program receive summary reports of the encounter data quarterly and standard reports about their subjects of interest. Participating organisations have direct access to straightforward analyses on any selected problem, medication, pathology or imaging test through our interactive web server.

External purchasers of standard reports

Non-contributing organisations may purchase standard reports or other ad hoc analyses. Charges are available on request. The AGPSCC should be contacted for further information. Contact details are provided at the front of this publication.

Analysis of the BEACH data is a complex task. AGPSCC has designed standard reports that cover most aspects of the subject under investigation. Examples of a problem-based standard report (subject warts) and a pharmacological-based standard report (subject allopurinol) for a single year's data are available on <www.fmrc.org.au/purchase.htm>.

Standard reports are available for selected groups of patients (e.g. children aged less than 15 years, or all women with a cardiovascular problem, or all patients residing in New South Wales), or a for a specific non-pharmacological management action.

Individual data analyses can be conducted where the specific research question is not adequately answered through standard reports.

Table 1.1: SAND abstracts for 2004–05 and sample size for each

Abstract number	Subject	Number of respondents	Number of GPs
67	Risk factors of patients on lipid-lowering medications^	10,233	353
68	Patient weight, perception of weight and weight loss in adults^	2,116	82
69	Patient weight, methods and medications tried for weight loss in adults	1,721	70
70	Inhaled corticosteroid use for asthma management	7,919	269
71	Patient BMI, morbidity and medication use (in adults)	1,913	75
72	Contraceptive use among female general practice patients aged 16–44 years	536	76
73	Warfarin use in patients with qualifying morbidity	2,572	89
74	Smoking and passive smoking in the home	2,789	96
75	Prevalence, management and investigations for chronic heart failure	2,735	95
76	Patients with risk factors for metabolic syndrome	2,845	96
77	Heart failure—underlying causes and medication management	2,660	91
78	NSAID and acid suppressant use in general practice patients	2,783	96
79	Hypertension and dyslipidaemia—management and comorbidity in general practice patients	2,874	97
80	Employment status and workers compensation claims in general practice patients	5,513	211
81	Prevalence and indications for gabapentin use by patients attending general practice	3,095	105

^ Indicates that this is the second report on this topic, using additional data collected following publication of the previous abstract.

2 Summary of changes from 1998–99 to 2004–05

This chapter provides a summary of the significant changes that have occurred in each area covered by the BEACH program between 1998–99 and 2004–05. In the main, the comparisons are made across the full period, using data from alternating years: 1998–99, 2000–01, 2002–03 and 2004–05. Only significant changes are reported here. Statistical significance was judged on the basis of a linear trend (either positive or negative) over the years, with non-overlapping confidence intervals between the results from the earliest year available and the 2004–05 results.

These trends over time were further analysed using SAS V8.2 regression procedures that adjust the standard error to allow for the design effect of the cluster sample.[21] Test statistics and *p* values based on the adjusted standard error provide a more stringent test of significant changes over time.

Where we did detect a significant change over time, we calculated the estimated annual rate of change where such an estimate was appropriate. This is expressed as the mean annual increase (or decrease) over the study period in the number of general practice encounters for that problem/management occurring in Australia each year (see Chapter 5—Methods, Section 5.5).

These estimates are provided in the far right hand column of Tables 2.2 to 2.8 in this chapter. Extrapolated estimates were calculated by multiplying the encounter rate for 1998–99 by the number of unreferred attendances (A1 and A2 items) claimed through Medicare in that year to give the estimated number of encounters for that event in 1998–99. The same was done for 2004–05. Where the change was linear over time, the difference between the two estimates was averaged over six years to give the estimated annual rate of change in encounters. To estimate the total effect from 1998–99 to 2004–05, the effect must be multiplied by six, as there are six time intervals. Examples are provided in some sections of this chapter.

In Chapter 3 (red margin) we investigate more closely how changes in management rates of particular problems and in medication rates observed in this chapter were reflected in management provided for specific problems of interest using linear regression.

A summary of results for each of the five years from 2000–01 to 2004–05 is provided for the most frequent events, irrespective of whether any change occurred over that period, in Appendix 5 of this report (available from <www.aihw.gov.au/publications/index.cfm>).

2.1 Characteristics of the GPs

Some interesting changes were apparent in the characteristics of GPs who participated in BEACH between 1998–99 and 2004–05 (Table 2.1). Participants have been demonstrated to be representative of the GP workforce (see Chapter 4, blue margin) so these changes in participants reflect changes in the GP workforce.

In summary, since 1998–99 the participating GPs have become:

- more often female (see note below) and older
- more likely to work in practices with computers
- more likely to work 6–10 sessions and less likely to work 11+ sessions per week
- less likely to be in solo practice and more likely to work in practices of five or more GPs
- less likely to provide their own after-hours care
- less likely to have graduated in Australia for their primary medical degree
- more likely to hold Fellowship of the RACGP.

Note: Although the observations from the selected years of BEACH data (Table 2.1) showed no significant change in sex of GPs, previous work found that the GP workforce was becoming increasingly female over time.[22] This prompted us to statistically test the change using data from all years of BEACH, and the result showed a significant increase since 1998–99 in the proportion who were female (χ^2=13.73, p=0.032).

Table 2.1: Significant changes in characteristics of participating GPs 1998–99 to 2004–05

	1998–99	2000–01	2002–03	2004–05	
GP characteristic	**Per cent of GPs[(a)] (*n*=984)**	**Per cent of GPs[(a)] (*n*=999)**	**Per cent of GPs[(a)] (*n*=1,008)**	**Per cent of GPs[(a)] (*n*=953)**	**Chi square statistic**
Sex					χ^2=6.57, p<0.08
Male	70.0	68.4	64.8	67.9	—
Female	30.0	31.6	35.2	32.1	—
Age					χ^2=43.81, p<0.0001
< 35 years	6.3	6.7	7.3	8.9	
35–44 years	36.3	28.4	26.6	25.5	—
45–54 years	32.1	34.2	35.2	31.8	—
55+ years	25.2	29.7	30.9	33.6	—
Sessions per week					χ^2=40.1, p<0.0001
< 6 per week	12.4	15.9	18.7	14.4	—
6–10 per week	68.5	66.3	67.9	71.2	—
11+ per week	19.0	16.2	13.4	11.4	—
Size of practice					χ^2=45.64, p<0.0001
Solo	17.9	19.3	13.7	12.2	—
2–4 GPs	43.2	38.6	38.4	36.4	—
5+ GPs	38.9	42.1	47.9	51.3	—
Place of graduation					χ^2=11.37, p=0.009
Australia	76.5	72.7	72.0	69.9	—
Overseas	23.5	27.5	28.0	30.1	—
Fellow of RACGP	27.3	31.4	35.5	42.3	χ^2=52.05, p<0.0001
After-hours arrangements					χ^2=7.40, p=0.0246
Own or cooperative	NAv	64.7	62.5	52.1	—
Deputising service	NAv	44.5	47.7	45.8	—
Computer use	NAv	87.7	91.7	93.7	χ^2=22.05, p<0.0001

(a) Missing data removed. *Note:* NAv—Not available; RACGP—Royal Australian College of General Practitioners.

2.2 Encounter type

- Between 1998–99 and 2004–05 the proportion of all encounters that were chargeable to Medicare or to the Department of Veterans' Affairs increased significantly. The increase occurred in 2000–01 and the proportion has remained up. In contrast, there was a significant decrease in the proportion of encounters paid for by other funding sources, the major drop occurring in the same year, with later proportions remaining relatively steady (Table 2.2).
- There was a significant increase from 7.0% in 1998–99 to 9.9% in 2004–05 (a 38% increase) in the proportion of all encounters that were recorded as claimable as Medicare long consultation items. Extrapolated to all Medicare A1 and A2 items, we estimate there was an increase of about 380,000 long consultations claimed on average per year across the study period (i.e. 2.2 million more Medicare-claimed long consultations in 2004–05 than in 1998–99) (Table 2.2).

Consultation length

In the subsample studies that included start and finish times for A1 Medicare-claimable encounters, there was no significant change in length of consultation. In 2000–01 (n=30,961), the mean length of consultations was 14.8 minutes (95% CI: 14.5–15.1) and the median length 13 minutes. In 2004–05 (n=30,683) the mean length was 15.1 minutes (95% CI: 14.8–15.3) and the median length remained 13.0 minutes (results not tabulated).

2.3 Characteristics of the patients at encounters

Table 2.3 shows that between 1998–99 and 2004–05:

- the proportion of encounters that were with children aged less than 15 years decreased from 16% to 12%, a decrease of approximately 25%
- the proportion of the GP workload accounted for by elderly patients (75 years and over) increased by about 20%, and by those aged 45–64 years by about 15%.

In 2004–05 there was a marginal increase in the proportion of patients who were aged 65–74 years but this represented a return to the result obtained in 1998–99.

The changes noted above represent:

- an estimated national annual decrease of 760,000 encounters with children (i.e. 4.5 million fewer encounters with children in 2004–05 than in 1998–99)
- an estimated national annual increase of 310,000 encounters (i.e. 1.8 million more encounters in 2004–05 than in 1998–99) with 45–64-year-old patients
- an estimated annual increase of 220,000 encounters with patients aged 75+ years (i.e. 1.1 million more encounters in 2004–05 than in 1998–99).

The proportion of patients holding a Commonwealth concession card fluctuated, decreasing in the 2000–01 and 2002–03 years, but returning to 1998–99 levels in 2004–05. This may reflect changes in GP attendance patterns of Commonwealth concession card holders during the years of decreasing bulk-billing, and then reversion to the previous pattern when new incentives were introduced for GPs to bulk-bill in 2004.[8]

Table 2.2: Significant changes in encounter types 1998–99 to 2004–05

	1998–99	2000–01	2002–03	2004–05		
	Per cent of encounters[(a)] (95% CI) (*n*=96,901)	Per cent of encounters[(a)] (95% CI) (*n*=99,307)	Per cent of encounters[(a)] (95% CI) (*n*=100,987)	Per cent of encounters[(a)] (95% CI) (*n*=78,711)	*p* value	Annual national change[(b)]
Direct encounters	96.7 (96.4–97.0)	98.1 (97.8–98.4)	98.4 (98.2–98.6)	97.4 (97.1–97.7)	N/S	N/A
MBS items of service[(c)]	90.3 (89.3–91.2)	94.6 (94.2–95.0)	95.0 (94.6–95.3)	93.7 (93.3–94.2)	<0.0001	N/A
Long surgery consultations	7.0 (6.4–7.6)	8.4 (7.7–9.0)	9.1 (8.5–9.7)	9.9 (9.2–10.6)	<0.0001	+380,000
Other paid (hospital, state, etc.)	3.7 (1.8–5.7)	1.9 (1.2–2.6)	1.0 (0.2–1.8)	0.7 (0.1–1.3)	<0.0001	-510,000

(a) Missing data removed from analysis.
(b) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.
(c) Includes encounters that were recorded with patients who held a Repatriation health card, funded through the Australian Department of Veterans' Affairs.
Note: CI—confidence interval; N/S—not statistically significant; N/A—not applicable.

Table 2.3: Significant changes in the characteristics of the patients 1998–99 to 2004–05

	1998–99	2000–01	2002–03	2004–05		
	Per cent of encounters[(a)] (95% CI) (*n*=96,901)	Per cent of encounters[(a)] (95% CI) (*n*=99,307)	Per cent of encounters[(a)] (95% CI) (*n*=100,987)	Per cent of encounters[(a)] (95% CI) (*n*=94,386)	*p* value	Annual national change[(b)]
Age group < 1 year	2.4 (2.2–2.7)	2.1 (1.9–2.4)	1.9 (1.8–2.1)	1.9 (1.7–2.1)	<0.0001	-100,000
1–4 years	5.7 (5.3–6.0)	5.4 (5.1–5.7)	5.0 (4.7–5.3)	4.3 (4.0–4.7)	<0.0001	-280,000
5–14 years	7.7 (7.3–8.1)	6.8 (6.4–7.2)	6.6 (6.3–6.9)	5.8 (5.5–6.1)	<0.0001	-380,000
15–24 years	9.8 (9.4–10.2)	10.3 (9.8–10.7)	10.1 (9.7–10.4)	9.0 (8.6–9.4)	0.0002	-230,000
25–44 years	26.0 (25.3–26.7)	26.3 (25.6–27.0)	25.7 (24.9–26.4)	24.4 (23.7–25.1)	<0.0001	-530,000
45–64 years	24.4 (23.8–25.0)	26.1 (25.5–26.7)	26.5 (25.9–27.0)	28.0 (27.4–28.6)	<0.0001	+310,000
65–74 years	12.3 (11.7–12.8)	11.7 (11.2–12.2)	11.6 (11.1–12.0)	12.6 (12.1–13.2)	N/S	N/A
75+ years	11.7 (11.1–12.4)	11.3 (10.7–12.0)	12.7 (11.9–13.4)	13.9 (13.1–14.7)	<0.0001	+220,000
Commonwealth concession card holder	47.3 (45.8–48.8)	36.7 (35.1–38.3)	40.4 (38.8–41.9)	43.2 (41.8–44.7)	0.003	N/A

(a) Missing data removed from analysis.
(b) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.
Note: CI—confidence interval; N/S—not statistically significant; N/A—not applicable.

2.4 Patient reasons for encounter

Overall, there was no change in the number of reasons for encounter per 100 encounters between 1998–99 and 2004–05. However, Table 2.4 shows significant changes in the types of patient reasons for encounter at general practice encounters.

Between 1998–99 and 2004–05 there was:

- a significant and steady increase in patient presentations of RFEs of a general and unspecific nature
- a significant increase in the rate at which RFEs were described in process terms such as: request/need for medications, treatments and therapeutics; a referral; results of tests and administrative processes
- a significant and steady decrease in the rate of presentations of RFEs related to the respiratory system, the ear, and the blood/blood-forming organs
- a significant decrease in the rate of presentation of RFEs expressed in terms of a diagnostic label (e.g. 'about my diabetes')
- a significant increase in the rate at which patients reported the need for prescription as their reason for attendance
- an increase in the rate at which test results were reported as a RFE
- a decrease in patient presentations for abdominal pain
- a significant decrease in the rate at which patients reported upper respiratory tract infections as their reason for presentation.

Examples of the effect of these changes on a national level are:

- an estimated national annual decrease of 930,000 presentations of respiratory problems as a reason for encounter (i.e. 5.6 million fewer occasions in 2004–05 at which the patient presented a respiratory problem as their reason for the encounter than in 1998–99)
- an estimated national annual increase of 0.5 million reasons for encounter associated with the receipt of results of tests already undertaken (i.e. 3 million more occasions at which 'test results' was a reason for the encounter in 2004–05 than in 1998–99).

Table 2.4: Significant changes in patient reasons for encounter 1998–99 and 2004–05

Patient RFEs	1998–99 Rate per 100 encounters (95% CI) (*n*=96,901)	2000–01 Rate per 100 encounters (95% CI) (*n*=99,307)	2002–03 Rate per 100 encounters (95% CI)) (*n*=100,987)	2004–05 Rate per 100 encounters (95% CI) (*n*=94,386)	*p* value	Annual national change[(a)]
ICPC-2 Chapter						
General & unspecified	26.6 (25.7–27.4)	28.3 (27.5–29.1)	34.6 (33.6–35.6)	36.5 (35.5–37.6)	<0.0001	+1,290,000
Respiratory	24.8 (24.0–25.6)	24.6 (23.7–25.4)	23.0 (22.0–24.0)	20.6 (19.8–21.4)	<0.0001	-930,000
Ear	4.5 (4.3–4.7)	4.2 (4.0–4.3)	4.0 (3.8–4.1)	3.9 (3.7–4.1)	<0.0001	-140,000
Blood	1.8 (1.6–2.0)	2.0 (1.8–2.2)	1.0 (0.8–1.2)	1.2 (1.0–1.5)	<0.0001	-110,000
ICPC-2 Component						
Diagnosis, diseases	33.6 (31.9–35.2)	29.0 (27.6–30.5)	26.0 (24.6–27.4)	24.5 (23.3–25.7)	<0.0001	-1,810,000
Medications/treatments /therapeutics	10.3 (9.8–10.9)	11.2 (10.6–11.8)	13.0 (12.4–13.6)	14.5 (13.8–15.3)	<0.0001	+550,000
Referral & other RFEs	4.4 (4.0–4.7)	6.5 (6.0–7.0)	7.0 (6.6–7.5)	7.4 (6.9–7.9)	<0.0001	+430,000
Results	3.4 (3.1–3.7)	4.2 (3.9–4.6)	5.4 (5.0–5.7)	6.8 (6.4–7.2)	<0.0001	+500,000
Administrative	1.1 (0.9–1.2)	1.1 (0.9–1.3)	1.6 (1.4–1.8)	1.7 (1.5–1.8)	<0.0001	+80,000
Individual RFE						
Prescription—all*	8.2 (7.7–8.7)	9.2 (8.7–9.8)	10.8 (10.2–11.3)	12.2 (11.5–12.9)	<0.0001	+540,000
Test results*	3.4 (3.1–3.7)	4.3 (3.9–4.6)	5.4 (5.0–5.7)	6.8 (6.4–7.2)	<0.0001	+500,000
Abdominal pain*	2.2 (2.1–2.4)	2.3 (2.1–2.4)	1.9 (1.8–2.1)	1.9 (1.7–2.0)	<0.0001	-80,000
Upper respiratory tract infection	2.9 (2.5–3.3)	2.6 (2.2–3.0)	2.2 (1.8–2.5)	1.8 (12.4–2.1)	<0.0001	-200,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: CI—confidence interval.

2.5 Problems managed

Overall, there was no change in the number of problems managed per 100 encounters between 1998–99 and 2004–05. There was also no change in the rate of new problems managed. However, Table 2.5 shows significant changes in the types of problems managed at general practice encounters. The significant differences observed between 1998–99 and 2004–05 are listed below.

- The rate of chronic problems managed significantly increased from 46.5 to 50.8 per 100 encounters. The extrapolated effect was an estimated average annual national average increase of 180,000 occasions of GP management of a chronic problem (i.e. 1.1 million more occasions of chronic problem management in 2004–05 than in 1998–99).
- There was an increase in the management rate of general and unspecified problems. This increase can be accounted for in part by the increased rates of recording 'prescription' and 'test result' as problems managed.
- Endocrine and metabolic problems were managed significantly more often over time. This was particularly evident in the increased management rates of both diabetes and lipid disorders.
- The management of disorders of the male genital system increased.
- There was a significant decline in the rate of respiratory problems managed. The extrapolated national result suggests six million fewer contacts with respiratory problems in 2004–05 than in 1998–99. This decrease is demonstrated in the management of many individual respiratory problems, particularly upper respiratory tract infection, acute bronchitis, asthma, sinusitis and tonsillitis, all of which were managed significantly less often in 2004–05 than in 1998–99. The management of asthma is investigated in greater detail in Chapter 3, Section 3.5.
- There was a decrease in the management of disorders of the ear. However, this decline appears to have occurred between 1998–99 and 2002–03, with the management of ear disorders remaining steady since this time. Specifically, the management of acute otitis media decreased steadily over the period examined.

There was no change in the overall rate of musculoskeletal and digestive problem management since 1998–99. However, osteoarthritis and oesophageal disease were managed at steadily increasing rates between 1998–99 and 2004–05.

The management of menopausal complaints decreased in frequency, but this fall occurred only between 2002–03 and 2004–05. We hypothesise that this is due to media attention surrounding the link between hormone replacement therapy and breast cancer.[23]

The greatest national effects on management rates were for osteoarthritis, oesophageal disease and diabetes. Their management rates all showed an average annual national increased of 70,000 occasions of GP services (i.e. for each of these conditions there were 420,000 more encounters in 2004–05 than in 1998–99).

Table 2.5: Significant changes in the problems managed at encounter 1998–99 to 2004–05

Problems managed	1998–99 Rate per 100 encounters (95% CI) (*n*=96,901)	2000–01 Rate per 100 encounters (95% CI) (*n*=99,307)	2002–03 Rate per 100 encounters (95% CI) (*n*=100,987)	2004–05 Rate per 100 encounters (95% CI) (*n*=94,386)	*p* value	Annual national change[(a)]
Problems managed (all)	145.3 (143.5–147.2)	144.5 (142.8–146.3)	144.9 (143.0–146.8)	145.5 (143.6–147.4)	N/S	N/A
Chronic problems	46.5 (44.9–48.0)	47.4 (45.8–48.9)	48.2 (46.5–49.8)	50.8 (49.1–52.5)	<0.0001	+180,000
Respiratory	24.3 (23.6–25.0)	22.5 (21.9–23.2)	20.6 (20.0–21.3)	19.2 (18.6–19.9)	<0.0001	-1,070,000
Upper respiratory tract infection	6.8 (6.4–7.3)	6.9 (6.5–7.4)	6.4 (5.9–6.8)	5.6 (5.1–6.0)	<0.0001	-260,000
Acute bronchitis/bronchiolitis	3.3 (3.0–3.6)	2.7 (2.5–3.0)	2.6 (2.3–2.8)	2.4 (2.1–2.7)	<0.0001	-170,000
Asthma	3.2 (3.0–3.4)	2.8 (2.7–3.0)	2.7 (2.5–2.9)	2.3 (2.2–2.5)	<0.0001	-160,000
Sinusitis acute/chronic	1.6 (1.4–1.7)	1.5 (1.3–1.7)	1.3 (1.1–1.4)	1.2 (1.0–1.3)	<0.0001	-80,000
Tonsillitis*	1.5 (1.3–1.6)	1.2 (1.1–1.4)	1.1 (0.9–1.3)	1.1 (0.9–1.2)	<0.0001	-80,000
General & unspecified	13.3 (12.7–13.7)	14.3 (13.7–14.7)	15.8 (15.2–16.3)	15.1 (14.5–15.7)	<0.0001	+150,000
Prescription—all*	1.4 (1.1–1.7)	1.7 (1.4–1.9)	2.0 (1.6–2.3)	2.1 (1.7–2.5)	<0.0001	+84,000
Test results*	0.8 (0.5–1.1)	0.8 (0.6–1.0)	1.1 (0.8–1.3)	1.4 (1.2–1.6)	<0.0001	+84,000
Endocrine & metabolic	8.8 (8.4–9.2)	9.8 (9.3–10.2)	10.6 (10.2–11.0)	11.8 (11.2–12.3)	<0.0001	+370,000
Diabetes*	2.6 (2.4–2.7)	2.8 (2.6–3.0)	2.9 (2.7–3.1)	3.2 (3.0–3.4)	<0.001	+70,000
Lipid disorder	2.5 (2.3–2.7)	2.9 (2.7–3.1)	3.0 (2.8–3.2)	3.3 (3.1–3.6)	<0.0001	+110,000
Ear	4.9 (4.7–5.1)	4.4 (4.2–4.6)	4.0 (3.8–4.2)	4.1 (3.9–4.2)	<0.0001	-180,000
Acute otitis media/myringitis	1.8 (1.6–2.0)	1.5 (1.3–1.7)	1.3 (1.1–1.5)	1.2 (1.0–1.3)	<0.0001	-120,000
Male genital system	1.4 (1.3–1.5)	1.5 (1.3–1.6)	1.4 (1.3–1.6)	1.8 (1.6–1.9)	<0.0001	+40,000
Other individual conditions						
Osteoarthritis*	2.2 (2.0–2.4)	2.5 (2.3–2.7)	2.6 (2.4–2.8)	2.8 (2.6–3.0)	<0.0001	+70,000
Oesophageal disease	1.5 (1.4–1.6)	1.5 (1.3–1.6)	1.9 (1.7–2.1)	2.1 (1.9–2.3)	<0.0001	+70,000
Menopausal complaint	1.5 (1.3–1.6)	1.4 (1.3–1.5)	1.5 (1.3–1.6)	0.9 (0.8–1.1)	<0.0001	-110,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

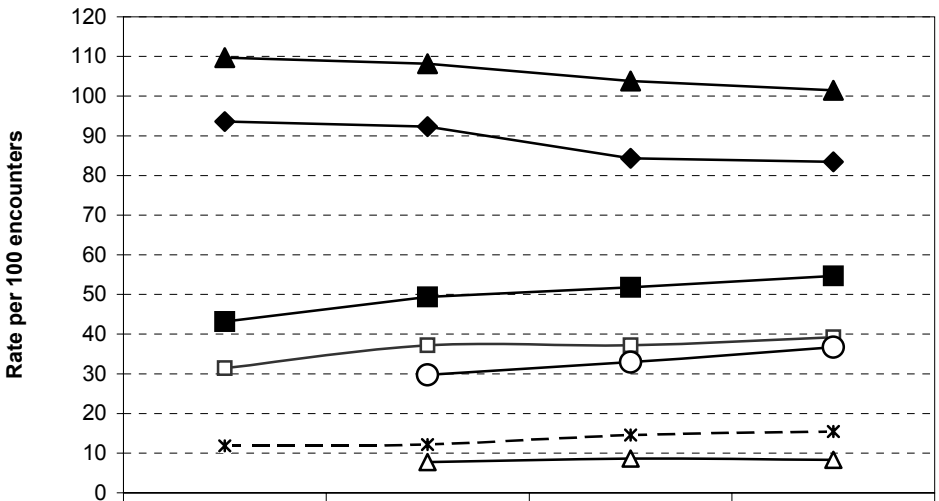
* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: CI—confidence interval; N/S—not statistically significant; N/A—not applicable

2.6 Overview of management 1998–99 to 2004–05

From 1998–99 to 2004–05 there were some significant changes in management activities. These are presented in Figure 2.1 and are summarised below, but are examined in more detail later in this chapter.

- There was a decrease per 100 encounters in the overall medication rate, prescribed medications in particular.
- There was an increase per 100 encounters in:
  - the rate of provision of other treatments
  - the rate of provision of clinical treatments
  - the rate of procedural treatments
  - the number of pathology tests ordered.
- There was a marginally significant increase in the number of imaging tests ordered.
- There was no significant change in overall referral rates, or in rates of referral to medical specialists, allied health professionals or hospital services (results not shown).



	1998–99	2000–01	2002–03	2004–05
Medications (all)	109.7	108.2	103.8	101.5
Prescriptions	93.6	92.3	84.3	83.4
Other treatments (all)	43.2	49.4	51.8	54.7
Clinical treatments	31.4	37.2	37.2	39.2
Procedures	11.8	12.2	14.6	15.5
Pathology orders	—	29.7	32.9	36.7
Imaging orders	—	7.7	8.6	8.3

BEACH data year

Figure 2.1: Rates of management per 100 encounters

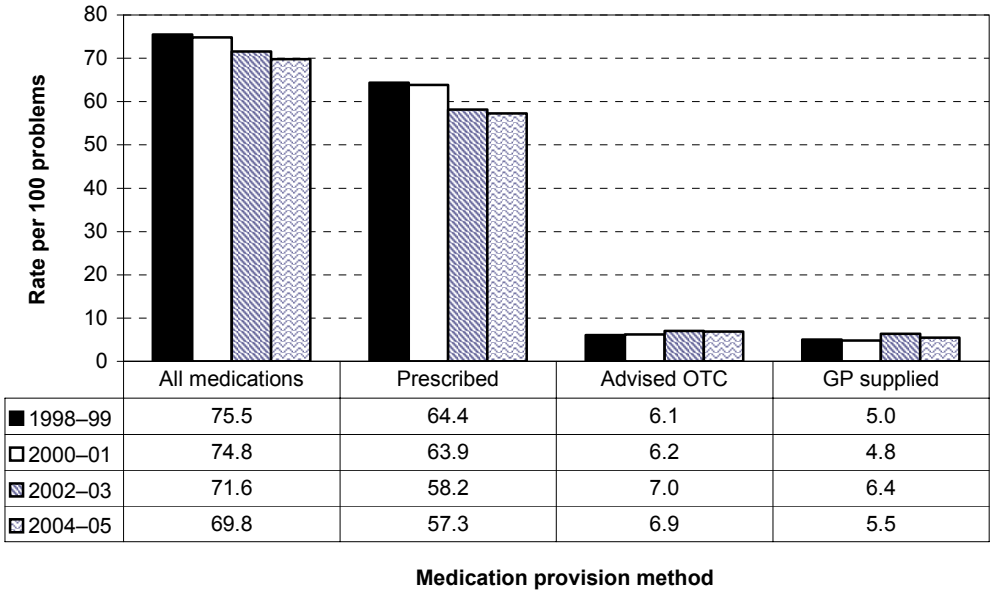
Note: Data collection and coding methods for pathology and imaging changed at the beginning of the third year of BEACH. Data from 1998–99 have therefore been omitted from this comparison.

2.7 Medications

The significant changes in the rates of medications (prescribed/supplied or advised) are listed below.

- There was a decrease in overall medication rates, from 110 per 100 encounters in 1998–99 to 102 per 100 in 2004–05 (Table 2.6).
- The rates of prescribed medications fell from 94 per 100 encounters to 83 per 100. The extrapolated effect of this change is an average annual national decrease in prescribed medications of 2.6 million prescriptions (i.e. there were an estimated 15.6 million fewer prescriptions given by GPs in 2004–05 than in 1998–99). It must be remembered that this decrease represents a change in the number of times a prescription is written by the GP. It does not take into consideration the number of repeat prescriptions involved or whether or not the patient actually filled the prescription (Table 2.6).
- The rate of advised OTC medications and those supplied by the GP showed no significant changes over this period (results not shown).

It has been demonstrated that the number of problems managed at encounters did not change over the period (Table 2.5). Therefore the decrease in the medication rate per 100 encounters is not due to a decrease in the number of problems managed at encounter. Figure 2.2 shows the changes in medication rates per 100 problems managed over time.



	All medications	Prescribed	Advised OTC	GP supplied
1998–99	75.5	64.4	6.1	5.0
2000–01	74.8	63.9	6.2	4.8
2002–03	71.6	58.2	7.0	6.4
2004–05	69.8	57.3	6.9	5.5

Figure 2.2: Changes in medication rates per 100 problems managed

Prescribed medications

Table 2.6 shows significant changes in prescribing rates. The Anatomical Therapeutic Chemical (ATC) drug group Level 2 has been chosen for the group comparisons over time because it is the most stable level. Individual generic medications are reported here in the Coding Atlas of Pharmaceutical Substances (CAPS) to ensure the most complete and comparable data are available over time. The effects of the measured changes at a national level are also presented in the right-hand column of this table. More details about the reasons for reporting in ATC Level 2 and CAPS are provided in Chapter 5—Methods, Section 5.6.

We have not included 1998–99 in this section because there was a change in the CAPS coding system at the end of the 1999–00 BEACH year to provide more detail about each prescribed medication. Although 1998–99 can be included in time series analyses for a specific topic, the mapping processes required make inclusion of these earlier data extremely time consuming in a general analysis such as this where so many individual medications need to be compared over time.

The following statistically significant changes in prescribing rates occurred between 2000–01 and 2004–05.

- There was only a marginal increase in the prescribing rate of drugs for acid-related disorders, affecting an extrapolated estimated increase of 50,000 such prescriptions per year. However, there was movement among individual generic medications in this group. There was a significant decrease in the prescribing rate of ranitidine after it became available over-the-counter in 2000 and there was a significant increase in the prescribing rate of esomeprazole following its introduction in April 2002. The extrapolated effect of this movement is that in 2004–05 GPs prescribed ranitidine on about 720,000 fewer occasions than in 2000–01, and esomeprazole was prescribed on about 680,000 occasions since its inception.
- GPs prescribed plain diuretics significantly less often, coinciding with the advent of diuretic-cardiovascular drug combinations, but there was no significant change in the prescribing of any of the individual generic medications in this group.
- Agents acting on the renin-angiotensin system (mainly ACE inhibitors and A2RAs) showed a significant increase in prescribing rates, about half of which was due to a marginal increase in prescribing of ramipril.
- Serum lipid-lowering agents were prescribed significantly more often, atorvastatin in particular. Changes in rates for this group of medications are investigated in more detail in Chapter 3, Section 3.6.
- There was a significant decrease in the prescribing rate of antibacterials for systemic use, particularly for cefaclor monohydrate, accompanied by only a marginal decrease in the prescribing rate of roxithromycin.
- There was a decrease in the prescribing of anti-inflammatory and antirheumatic drugs acting on the musculokeletal system (as a group). This was reflected particularly in the prescribing rate of celecoxib. In contrast there was a significant increase in the prescribing of meloxicam after its introduction in February 2002. Changes in prescribing patterns for this group of drugs are investigated in greater detail in Chapter 3, Section 3.3.
- While there was no significant change in the prescribing rate of analgesics (as a group) the prescribing rate of paracetamol decreased significantly. This decrease had the largest national effect of all the prescribing changes. The extrapolated national figures suggest

that GPs prescribed paracetamol on 1.3 million fewer occasions in 2004–05 than in 2000–01. At the same time, there was a significant increase in the prescribing rate of tramadol, suggesting that GPs prescribed it on 800,000 more occasions in 2004–05 than in 2000–01 when the slow-release presentation of the drug became available.

- There was a significant decrease in the prescribing rate of nasal preparations as a group, almost wholly accounted for by the decrease in prescriptions for topical nasal budesonide. This was probably due to an over-the-counter presentation of that medication coming onto the market in 2001.
- Drugs for obstructive airways disease (as a group) were prescribed significantly less often in 2004–05 than in 2000–01. However, there was also movement within this drug group, with a significant decrease in the prescribing rate of salbutamol once it was available over-the-counter, and a smaller but significant increase in prescriptions for the new fluticasone/salmeterol combination.

Advice or supply of medications

There were no significant changes in the rates of provision of advice for OTC purchase, nor the rate of GP direct supply of individual medications.

2.8 Other treatments 1998–99 to 2004–05

Clinical treatments

Table 2.6 shows the significant differences in clinical treatments between 1998–99 and 2004–05. These are described below.

- There was an increase in the number of clinical treatments provided. The extrapolated annual increase across the country was 900,000 more occasions each year at which such treatment was given (i.e. 5.4 million more occasions in 2004–05 than in 1998–99).
- The rate of provision of counselling relating to nutrition and weight increased. Extrapolated to all GP encounters in Australia, this result suggests that GPs provided counselling and advice about nutrition and weight on about 1.5 million more occasions in 2004–05 than they did in 1998–99. The SNAP (Smoking, Nutrition, Alcohol and Physical Activity) Framework for General Practice was introduced in June 2001. SNAP was developed by the Joint Advisory Group (JAG) on General Practice and Population Health.[24] This framework was possibly introduced in response to an increasing interest in these areas by GPs—reflected in the significant increase in the rate of counselling relating to nutrition/weight in 2000–01. It is interesting to note that the rate has continued at this high level in the subsequent three time intervals.
- The provision of general advice/education increased. At the same time, there was a relatively steady decrease in the rate of provision of advice and education about treatment. This could reflect the decrease in management rates of acute problems (particularly acute respiratory infections) and the increase in the management rate of chronic problems, demonstrated earlier in this chapter. On the other hand, it may simply reflect a shift in GP recording technique and the subsequent codes chosen to classify the data.

- There was an increase in the rate of provision of counselling for psychological problems. Extrapolated to all GP encounters in Australia, this result suggests that GPs provided psychological counselling on about 0.5 million more occasions in 2004–05 than they did in 1998–99.
- Sickness certificates were provided at higher rates in 2004–05 than in 1998–99.
- There was a steady increase between 1998–99 and 2002–03 in the rate of counselling for the problem under management. Overall there was a significant increase of one million occasions at which GPs provided counselling of this type in 2004–05 than in 1998–99.
- There was no significant change in the rate of advice/education regarding medication from 1998–99 to 2002–03 but there was a significant increase in 2004–05 and this recent change will be followed with interest next year.

Procedural treatments

Table 2.6 shows the significant differences in procedural treatments between 1998–99 and 2004–05. These are described below.

- There was an overall steady increase in the total number of procedural treatments provided by GPs.
- There was a significant increase in the rate of local injection/infiltration administered, especially in 2002–03. This could be partially due to development of more specific instructions to the GPs about completing the 'other treatment' section for each problem. Nevertheless, the increase in overall procedural rates has been steady and linear. It would appear to represent a real increase in the total amount of procedural work being undertaken in general practice irrespective of the effect of improved recording of local injection/infiltration.
- There were no significant changes for the majority of individual types of procedural treatments (results not tabulated).

Table 2.6: Significant changes in the rates of prescribed medications, clinical treatments and procedures 1998–99 to 2004–05

	1998–99	2000–01	2002–03	2004–05		
	Rate per 100 encounters (95% CI) (*n*=96,901)	Rate per 100 encounters (95% CI) (*n*=99,307)	Rate per 100 encounters (95% CI)) (*n*=100,987)	Rate per 100 encounters (95% CI) (*n*=94,386)	*p* value	Annual national change[a]
Medications						
Medications—all	109.7 (107.4–112.0)	108.2 (105.7–110.6)	103.8 (101.4–106.2)	101.5 (99.3–103.8)	<0.0001	-2,400,000
Prescribed medications	93.6 (91.2–96.1)	92.3 (89.9–94.7)	84.3 (81.8–86.9)	83.4 (81.2–85.5)	<0.0001	-2,630,000
ATC group (Level 2) and CAPS generic—prescribed[b]						
Drugs for acid-related disorders	—	2.4 (2.2–2.5)	2.5 (2.4–2.7)	2.7 (2.5–2.9)	<0.001	+50,000
Esomeprazole[+]	—	N/A	0.3 (0.2–0.3)	0.7 (0.6–0.8)	<0.0001	+170,000
Ranitidine	—	1.0 (0.9–1.2)	0.5 (0.3–0.6)	0.3 (0.3–0.5)	<0.0001	-180,000
Diuretics	—	1.8 (1.7–2.0)	1.6 (1.4–1.8)	1.3 (1.2–1.5)	<0.0001	-130,000
Agents acting on the renin-angiotensin system	—	4.5 (4.3–4.8)	4.9 (4.6–5.2)	5.5 (5.2–5.9)	<0.0001	+190,000
Ramipril	—	0.4 (0.2–0.6)	0.7 (0.5–0.8)	0.8 (0.6–1.0)	<0.0001	+80,000
Serum lipid-lowering agents	—	2.4 (2.2–2.6)	2.4 (2.2–2.6)	3.0 (2.8–3.2)	<0.0001	+140,000
Atorvastatin	—	0.9 (0.8–1.0)	1.0 (0.9–1.2)	1.4 (1.2–1.5)	<0.0001	+100,000
Antibacterials for systemic use	—	15.4 (14.8–16.0)	13.3 (12.8–13.9)	14.0 (13.5–14.6)	<0.01	-460,000
Cefaclor monohydrate	—	1.6 (1.3–2.0)	1.0 (0.7–1.3)	0.8 (0.4–1.2)	<0.0001	-210,000
Roxithromycin	—	1.6 (1.4–1.8)	1.3 (1.1–1.6)	1.1 (0.1–1.4)	<0.0001	-120,000
Anti-inflammatory & antirheumatic acting on musculosk'l system	—	5.7 (5.4–6.0)	4.8 (4.6–5.1)	4.5 (4.2–4.8)	<0.0001	-350,000
Celecoxib	—	2.1 (1.9–2.4)	1.1 (0.9–1.2)	0.9 (0.7–1.1)	<0.0001	-300,000
Meloxicam[+]	—	N/A	0.3 (0.0–0.6)	0.8 (0.6–1.0)	<0.0001	+190,000
Analgesics	—	8.9 (8.4–9.4)	8.5 (8.0–9.1)	8.3 (7.8–8.7)	N/S	N/A
Paracetamol	—	3.9 (3.5–4.4)	3.1 (2.7–3.6)	2.7 (2.4–3.0)	<0.0001	-320,000
Tramadol	—	0.2 (0.0–0.5)	1.0 (0.8–1.1)	1.0 (0.8–1.2)	<0.0001	+200,000

(continued)

Table 2.6 (continued): Significant changes in the rates of prescribed medications, clinical treatments and procedures 1998–99 to 2004–05

	1998–99	2000–01	2002–03	2004–05		
Medications *continued*	**Rate per 100 encounters (95% CI) (*n*=96,901)**	**Rate per 100 encounters (95% CI) (*n*=99,307)**	**Rate per 100 encounters (95% CI)) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=94,386)**	***p* value**	**Annual national change[(a)]**
Nasal preparations	—	1.5 (1.3–1.6)	0.8 (0.6–1.0)	0.8 (0.5–1.0)	<0.0001	-160,000
Budesonide topical nasal	—	0.9 (0.7–1.1)	0.3 (0.1–0.5)	0.3 (0.0–0.7)	<0.0001	-130,000
Drugs for obstructive airway disease	—	5.5 (5.2–5.9	4.6 (4.2–4.9)	3.8 (3.6–4.1)	<0.0001	-470,000
Salbutamol	—	2.1 (1.9–2.3)	1.7 (1.5–1.9)	1.4 (1.3–1.6)	<0.0001	-170,000
Fluticasone/salmeterol	—	0.2 (0.0–0.6)	0.9 (0.7–1.1)	0.9 (0.7–1.0)	<0.0001	+150,000
Clinical treatments						
Clinical treatments—all	**31.4 (29.7–33.0)**	**37.2 (35.1–39.3)**	**37.2 (35.0–39.4)**	**39.2 (37.1–41.4)**	<0.0001	+900,000
Advice/education—treatment*	6.2 (5.5–6.8)	5.9 (5.1–6.6)	4.2 (3.6–4.9)	4.6 (4.0–5.1)	<0.0001	-320,000
Counselling/advice—nutrition/weight*	3.8 (3.4–4.1)	5.6 (4.9–6.2)	5.2 (4.6–5.9)	5.3 (4.7–5.9)	<0.0001	+240,000
Advice/education*	3.5 (2.7–4.3)	5.8 (5.1–6.5)	6.9 (5.9–7.9)	7.0 (6.2–7.8)	<0.0001	+510,000
Counselling—problem*	2.9 (2.4–3.5)	3.4 (2.8–3.9)	5.5 (4.7–6.3)	4.2 (3.3–5.0)	<0.0001	+160,000
Counselling—psychological*	2.5 (2.2–2.8)	2.8 (2.5–3.2)	2.9 (2.6–3.2)	3.2 (2.9–3.5)	<0.0001	+90,000
Advice/education—medication*	2.4 (2.1–2.7)	2.6 (2.2–3.0)	2.5 (2.1–2.8)	3.4 (2.9–3.8)	<0.0001	+120,000
Sickness certificate	0.7 (0.3–1.1)	1.1 (0.4–1.8)	1.3 (0.8–1.8)	1.7 (1.3–2.1)	<0.0001	+140,000
Procedural treatments						
Procedural treatment—all	**11.8 (11.2–12.5)**	**12.2 (11.6–12.8)**	**14.6 (13.9–15.3)**	**15.5 (14.6–16.4)**	<0.0001	+460,000
Local injection/infiltration*	0.3 (0.0–1.6)	0.2 (0.0–0.5)	1.5 (1.2–1.8)	2.0 (1.6–2.3)	<0.0001	+260,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

(b) Prescribing data collected in 1998–99 are not reported here due to less coding precision in that year.

\+ Esomeprazole and Meloxicam were not available for purchase prior to 2002.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: CI—confidence interval; N/A—not applicable; musculosk'l—musculoskeletal; N/S—not significant.

2.9 Referrals 1998–99 to 2004–05

As previously stated, there were no significant changes in total referral rates over the study period and more specifically there was no change in referral rates to medical specialists allied health services, or hospital services.

2.10 Test ordering

At least one test ordered 1998–99 to 2004–05

- As shown in Table 2.7, between 1998–99 and 2004–05 there was a significant increase in the proportion of encounters generating one or more pathology test orders—the likelihood of having pathology ordered at the encounter increased from 13.2% to 15.7% of encounters (a 19% increase) over that period. The extrapolated national effect is an average annual increase of 250,000 encounters that resulted in an order for a pathology test (i.e. there were 1.5 million more encounters at which GPs decided to order pathology tests in 2004–05 than in 1998–99).
- There was a significant increase of approximately the same proportion in the likelihood of one or more imaging tests being ordered at encounters between 1998–99 and 2004–05. However, since imaging is less frequently ordered by GPs than is pathology, the national effect was not as large after extrapolation. We estimate that in 2004–05 there were approximately 360,000 more encounters that resulted in a GP order for an imaging test than there were in 1998–99 (Table 2.7).

Changes in distribution of test orders 2000–01 to 2004–05

Differences in the collection and coding of each pathology test from the first two years of BEACH data (1998–99 and 1999–00) mean that these data are not comparable with data from 2000–01 onward. Since the beginning of the third year of BEACH, this change in coding of pathology orders has allowed more specificity in recording these orders.

The change in pathology ordering over the first three years of the BEACH program was investigated in detail in a specific study of pathology ordering patterns undertaken for the Australian Government Department of Health and Ageing. The results have been reported in a separate publication.[9]

GPs can order more than one pathology test at any single encounter. Table 2.8 shows the changes in pathology ordering from 2000–01 to 2004–05.

- Since 2000–01 the number of pathology tests ordered per 100 encounters increased by almost 25% from 29.7 to 36.7. The extrapolated effect of the measured change in pathology test ordering in BEACH is an average annual increase of 1.4 million tests per year between 2000–01 and 2004–05 (i.e. GPs ordered 5.6 million more pathology tests in 2004–05 than they did in 2000–01).
- The significant increase in overall pathology order rates was particularly reflected in significant increases in ordering of chemical pathology and haematology.

There was only a marginally significant increase in the total number of imaging tests ordered per 100 encounters and there was no change in the distribution of imaging orders since 2000–01 (Table 2.8).

2.11 Patient risk behaviours 2000–01 to 2004–05

Although the patient risk factor questions were asked of subsamples of patients in 1998–99 and 1999–01, all three questions were not asked of the same patient. In 2000–01, the three questions were asked of the same patient subsample. The results presented here are therefore limited to the study years of 2000–01 to 2004–05 (Table 2.9).

- In 2000–01, 54.3% of patients were overweight or obese, compared with 57.0% in 2004–05. There was a significant increase in the proportion of adults classed as obese (from 20.2% to 22.4%) (Table 2.9).
- The proportion of adults reporting at-risk levels of alcohol consumption increased significantly (from 24.1% to 26.4%) over the four time intervals (Table 2.9).
- There was no significant change between 2000–01 and 2004–05 in:
  - the proportion of adults classed as overweight
  - the prevalence of self-reported daily smoking
  - the proportion of children who were overweight or the proportion who were obese.

Table 2.7: Significant changes in per cent of encounters with at least one test ordered 1998–99 to 2004–05

	1998–99	2000–01	2002–03	2004–05		
	Per cent of encounters (95% CI) (*n*=96,901)	Per cent of encounters (95% CI) (*n*=99,307)	Per cent of encounters (95% CI) (*n*=100,987)	Per cent of encounters (95% CI) (*n*=94,385)	*p* value	Annual national change[(a)]
At least one pathology test ordered	13.2 (12.8–13.7)	13.8 (13.3–14.3)	14.7 (14.2–15.3)	15.7 (15.2–16.3)	<0.0001	+250,000
At least one imaging ordered	6.3 (6.0–6.6)	6.8 (6.5–7.1)	7.5 (7.1–7.8)	7.3 (7.0–7.6)	<0.0001	+90,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.
Note: CI—confidence interval.

Table 2.8: Significant changes in pathology and imaging test ordering 2000–01 to 2004–05

	2000–01	2001–02	2002–03	2003–04	2004–05		
Pathology test ordered	Rate per 100 encounters (95% CI) (*n*=99,307)	Rate per 100 encounters (95% CI) (*n*=97,973)	Rate per 100 encounters (95% CI) (*n*=100,987)	Rate per 100 encounters (95% CI) (*n*=98,877)	Rate per 100 encounters (95% CI) (*n*=94,385)	*p* value	Annual national change[(a)]
Total pathology tests	**29.7 (28.4–30.9)**	**31.0 (29.7–32.4)**	**32.9 (31.5–34.4)**	**35.2 (33.7–36.7)**	**36.7 (35.2–38.2)**	<0.0001	+1,410,000
Chemical	15.7 (14.8–16.5)	16.5 (15.6–17.3)	17.7 (16.8–18.6)	19.1 (18.1–20.1)	20.4 (19.5–21.4)	<0.0001	+980,000
Haematology	5.8 (5.5–6.2)	6.2 (5.8–6.5)	6.3 (5.9–6.6)	6.8 (6.4–7.2)	7.0 (6.6–7.3)	<0.0001	+230,000
Total imaging tests	**7.7 (7.3–8.0)**	**7.9 (7.6–8.2)**	**8.6 (8.2–9.0)**	**8.2 (7.8–8.6)**	**8.3 (8.0–8.6)**	N/S	N/A

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.
Note: Data collection and coding method changed at the beginning of the third year of BEACH. Years 1 and 2 have therefore been excluded from this comparison. CI—confidence interval; N/S—not significant; N/A—not applicable.

Table 2.9: Significant changes in patient (aged 18 years and over) risk factors 2000–01 to 2004–05

	2000–01	2001–02	2002–03	2003–04	2004–05
Risk factor	Per cent (95% CI) (*n*=31,957)	Per cent (95% CI) (*n*=31,789)	Per cent (95% CI) (*n*=32,367)	Per cent (95% CI) (*n*=31,890)	Per cent (95% CI) (*n*=30,476)
Obese	20.2 (19.5–20.8)	21.4 (20.7–22.1)	20.9 (20.2–21.5)	22.0 (21.4–22.7)	22.4 (21.7–23.1)
Overweight	34.1 (33.4–34.7)	33.5 (32.9–34.1	33.8 (33.2–34.5)	34.5 (33.8–35.1)	34.6 (33.9–35.2)
	(*n*=31,543)	**(*n*=31,559)**	**(*n*=32,140)**	***(n*=31,721)**	**(*n*=30,414)**
At-risk alcohol level	24.1 (23.3–24.9)	26.0 (25.1–26.8)	26.2 (25.4–27.1)	26.7 (25.8–27.6)	26.4 (25.5–27.3)

Note: CI—confidence interval.

2.12 Discussion

The GPs

Many of the demonstrated changes in the characteristics of the participating GPs align with information from other sources. The increasing feminisation of the GP workforce, the ageing of the workforce and the move away from longer hours of work have all been reported by the AIHW.[2] The move away from solo general practice and from provision of their own after-hours patient care, the increasing proportion of GPs who hold the FRACGP, and the decrease in the proportion of GPs who have graduated in Australia show a continuation of the trends already demonstrated in a more detailed earlier study of changing characteristics of GPs between 1990–91 and 2002–03.[22]

The increase in the proportion of encounters that were said to be claimable as long surgery consultations from Medicare supports Medicare data which show that the number of Medicare item 36 claims rose annually on average by 400,000 over the six time intervals of this study.[4] This increase is hardly surprising in light of the changing age distribution of patients at encounters.

The patients at encounter

Earlier in this chapter we demonstrated that between 1998–99 and 2004–05 there were changes in the age distribution of patients encountered by the GPs. There were significant increases in the proportion of encounters with patients aged 45–64 and those aged 75 years and over. In parallel, there was a significant decrease in the proportion of the workload accounted for by children aged less than 15 years. This section investigates the relationship between these results and data drawn from other sources.

- Figure 2.3 provides a graphic view of the age distribution of patients encountered in the 2004–05 BEACH year compared with those encountered in the 1998–99 BEACH year, with the two older age groups combined into one (65 years and over) for comparability with other data sources.
- Figure 2.4 shows the age distribution of patients at services claimed as Medicare A1 items in each of these periods. These data show similar trends for children aged less than 15 years (decreasing from 17.1% to 14.3% of the MBS A1 items of service), and for patients aged 45–64 years (increasing from 24.1% to 27.1% of MBS A1 claims). However, in contrast to the BEACH data, Medicare shows that patients of 65 years and over accounted for a smaller proportion of the claims in 2004–05 than they did in 1998–99. This is probably because the Medicare data do not include claims made through the Department of Veterans' Affairs for patients who hold the Repatriation Card, a large proportion of whom would be in this older age group. Since BEACH includes samples of all encounters, those encounters paid for by both Medicare and the Department of Veterans' Affairs are included.
- Figure 2.5 shows changes in the age distribution of the population of Australia over the same period. It is apparent that children aged less than 15 years have decreased as a proportion of the population since 1998–99. Further, the largest increase in proportional distribution has occurred in the 45–64 years age group, which accounted for 24.3% of the population in 2004, an increase of over 2% since 1998–99. People aged 65 years and over

accounted for a larger proportion of the population in 2004 than in 1998, though the increase was not as large as in the 45–64 age group.

- Figure 2.6 shows the age-specific rates of Medicare-claimed A1 items of service in 2002–03.[10] It demonstrates that the age distribution of the patients at encounter will be affected to different degrees by both changes in population distribution and by the mean attendance rate of each age group. For example, although the proportion of the population accounted for by 45–64-year-olds increased by 2.2% over the study period, the attendance rate of this group of patients is on average 5.6 visits per year, so the effect may be less than the smaller increase of 0.7% in the proportion who are aged 65 years and over who visit more frequently.

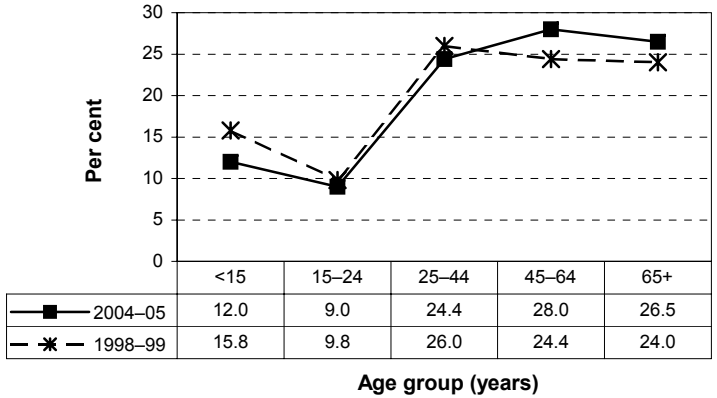
These data suggest that the increase in the proportion of BEACH encounters with patients of 45–64 years may reflect the baby boomer move into this age group—that is, there are more people in this age group in the population than there used to be, so they account for more services. Baby boomers are also moving into an age of increased GP service utilisation as they get older (moving from an average 4.1 Medicare A1 claims per year to 5.5 per year). So the increase reflects the increase in their proportion in the community multiplied by their high average attendance rates. It may also be the result of an increasing likelihood of people in this age group remaining in the community, and therefore seeing their GP regularly.

Patient reasons for encounter

The changing age distribution of the patients at GP–patient encounters has resulted in a change in the reasons the patients give for seeing the GP (patient RFEs). There were increases in RFEs associated with the need for services such as a prescription, a referral, and returning for the results of tests and other administrative processes. In conjunction, there was a decrease in the rate at which the patients described their reason in terms of a diagnostic label.

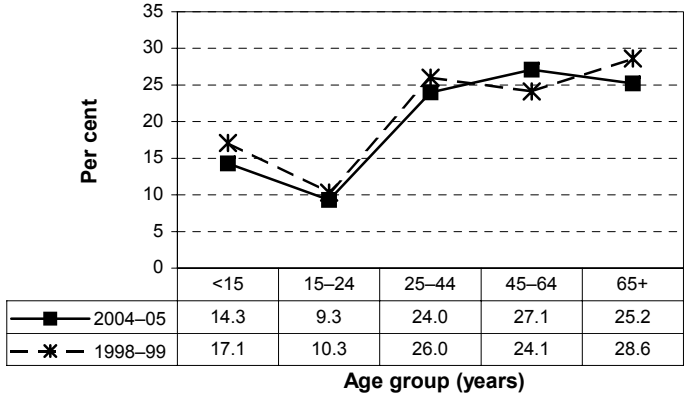
An apparent significant decrease in RFEs related to the blood and blood-forming organs was found to be due to a change in the coding of the RFE 'blood test results' in early 2001. In the previous years this was classified in the ICPC-2 chapter 'Blood and blood-forming organs'. In later years it was classified in the 'General and unspecified' chapter. This change would have made some contribution to the increase in RFEs of a general and unspecified nature over the six time intervals of this comparison.

Presentations of patients to receive test results doubled between 1998–99 and 2004–05, so that in the latter year there were 3 million more occasions of such presentations across the country than there were in 1998–99. This trend supports the hypothesis that there has been an increase in the rate at which patients are being asked to return to the GP to receive their test results (with a hypothesised decrease in the likelihood of GPs giving results over the telephone to their patients). The Privacy Legislation released at the end of 2001 together with economic reasons may have contributed to an increase in call-back of patients for receipt of test results.



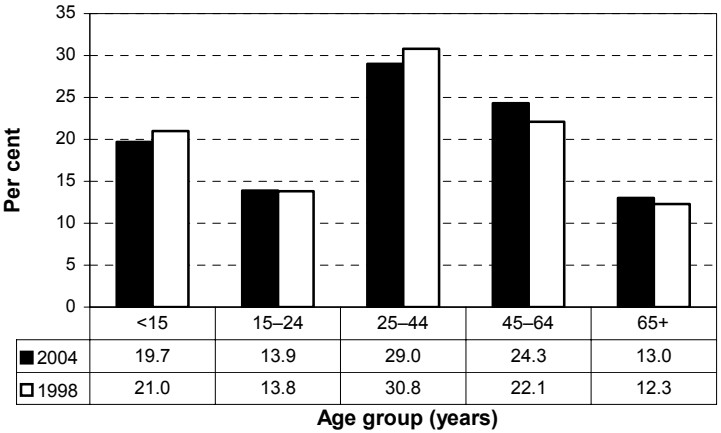
	<15	15–24	25–44	45–64	65+
2004–05	12.0	9.0	24.4	28.0	26.5
1998–99	15.8	9.8	26.0	24.4	24.0

Figure 2.3: Age distribution of patients at encounter 1998–99 and 2004–05



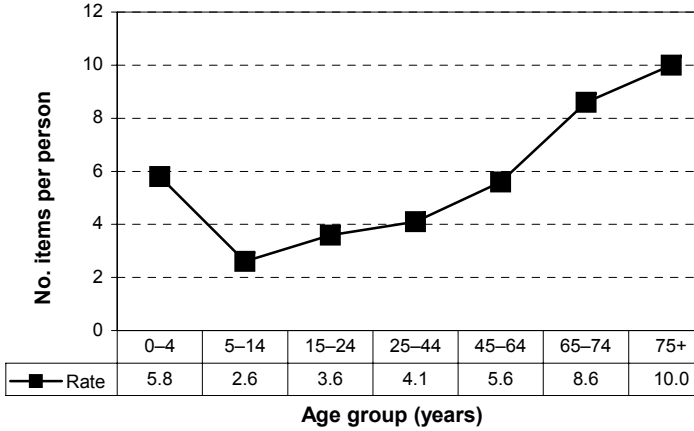
	<15	15–24	25–44	45–64	65+
2004–05	14.3	9.3	24.0	27.1	25.2
1998–99	17.1	10.3	26.0	24.1	28.6

Figure 2.4: Age distribution of patients claiming MBS A1 items of service



	<15	15–24	25–44	45–64	65+
2004	19.7	13.9	29.0	24.3	13.0
1998	21.0	13.8	30.8	22.1	12.3

Figure 2.5: Age distribution of the Australian population in 1998 and 2004



	0–4	5–14	15–24	25–44	45–64	65–74	75+
Rate	5.8	2.6	3.6	4.1	5.6	8.6	10.0

Figure 2.6: Age-specific Medicare (A1 and A2) population attendance rates

Sources: Figure 2.3—1998–99 data from G*eneral practice activity in Australia1998–99* (Table 6.1, p. 25), 2004–05 data from Chapter 4, Table 4.11 this report; Figure 2.4—1998 data from *General Practice Activity in Australia 1998–99* (Table 4.2, p. 19), 2004–05 data from Chapter 4, Table 4.4 this report; Figure 2.5—from ABS Population Census data; Figure 2.6—1998 data from *General Practice Activity in the States and Territories of Australia 1998–2003* (Figure 3.2, p. 12).

Problems managed at encounter

The decrease in the management rate of upper respiratory tract infection (URTI) is likely to be linked to the decrease in the proportion of encounters with children. In 2002–03, BEACH data showed that children aged less than 15 years accounted for 37% of all patients managed for URTI, while in that year they represented less than 7% of the attending patients for whom records were provided.[25] It is clear that the presentation rate for URTI in children is far higher than for adults, so that the overall decrease in attendance rates by children will have a marked effect on the management rate of URTI.

The changing age distribution of the patients may also partly or wholly explain the decrease in management rates of other acute respiratory problems such as tonsillitis and acute bronchitis, and acute otitis media—all of which decreased over the study period—since these problems were the fifth, sixth and second (respectively) most common problems managed at encounters with children in 2000–01.[26]

The increase in the management rate of chronic problems is also to be expected in light of the changing age distribution of the patients at encounter, particularly the increase in the proportion of 45–64-year-old and older patients. The increase in management rates of chronic problems was most apparent in the management rates of lipid disorders, diabetes, and osteoarthritis. The use of lipid-lowering agents in the management of lipid disorders is investigated in Chapter 3, Section 3.6 of this report.

The decrease in management rates of menopausal complaints occurred largely in 2004–05 and may well suggest a decrease in the use of hormone replacement therapy by menopausal women as a result of wide publicity of the link between hormone replacement therapy and breast cancer.[23]

A significant decrease in the management rate of asthma had an extrapolated national effect of almost one million fewer occasions at which GPs managed this problem in 2004–05 than in 1998–99, even though the estimated prevalence of asthma in the patient population has not changed over his period.[27] The introduction of a Medicare item for the Asthma 3+Visit Plan did not appear to be the cause of the initial drop in 2000–01, as the decrease occurred before its introduction. However, there were other types of asthma plans being promoted before the Asthma 3+Visit Plan and these may have caused the measured decrease in management rates in 2000–01. The extent to which such plans have improved patient education in self-management of this problem and in turn led to this decrease in management rate is not known. Those interested in more detail about the management of asthma should refer to Section 13.4 (p. 101) in *General Practice Activity in Australia 2003–04*.[25]

The steady but marginal annual increase in the management rate of diabetes resulting in about 420,000 additional encounters in 2004–05 compared with 1998–99 may be a result of the introduction of a Medicare incentive item number for completion of annual diabetes programs in 2001.[6] Those interested in more detail about the management of diabetes should refer to Section 13.6 (p. 109) in *General Practice Activity in Australia 2003–04*.[28]

It may have been expected that the introduction of MBS items specifically for the care of depression would lead to an increase in its management rate (i.e. in the number of encounters at which it is managed) and perhaps to the management rate of psychological problems over all. This proved not to be the case. There has been no significant change in the management rate of psychological problems, or of depression specifically, since 1998–99. As earlier noted, the rate at which GPs are providing psychological counselling has increased over the study period but the increase has been slow and steady rather than being a sudden response to the introduction of these MBS item numbers.

The management rate and medication management of psychological problems (and depression in particular) are investigated in greater detail in Chapter 3, Section 3.4. The results indicate that the selective serotonin reuptake inhibitors and the serotonin-noradrenaline reuptake inhibitors have continued to increase as the medication of choice for the management of depression. Those interested in more detail about the management of psychological problems should refer to Section 13.3 (p. 97) in *General Practice Activity in Australia 2003–04*.[28]

Management

The number of medications prescribed to patients decreased over the study period, to suggest an extrapolated effect of 15.8 million fewer prescriptions being written by GPs in 2004–05 than in 1998–99. This estimate does not consider the effect on the number of prescriptions filled at the pharmacy as a result of GP prescriptions. For example, if the prescriptions that were not written by GPs in 2004–05, had in the past, an average of one repeat, there would have been over 30 million fewer scripts crossing the counter in total in 2004–05 than in 1998–99.

In parallel with this decrease came increased use of clinical counselling/advice and increased use of procedural treatments. Both the chances of the GP ordering pathology and the total number of pathology tests ordered continued to rise. In 2004–05 one in every six encounters resulted in a pathology test order, and on average GPs ordered two tests on these occasions. The chances of the GP ordering an imaging test also increased, but it had a marginal effect on the total number of imaging tests ordered per 100 encounters. Both the pathology and imaging increases may be the result of increased fear of litigation.

It is notable that these changes did not appear to affect referral rates, which remained relatively constant. In 2004–05, one in 12 encounters resulted in patient referral to a specialist, and only 3% generated a referral to an allied health professional. Neither of these results differ from those of 1998–99. The lack of any increase in referrals to allied health professionals is somewhat surprising, in light of the general pressure on GPs in the last few years to involve allied health providers more in the care of patients with chronic and complex disease. However, the introduction of Medicare payments for some allied health services for some patients[29] in the latter half of 2004 may lead to an increase in such referrals in the coming years.

Although medication prescribing rates decreased overall, there was movement among some individual drug types in both directions. A number of the changes were caused by market shifts: either the introduction of new products or presentations, or the availability over-the-counter of medications that previously required a prescription. Prescriptions of tramadol increased following the introduction in 2001 of the slow-release tablet, which provided a more reliable prevention of breakthrough pain. Prescribing patterns for acid-related disorders were influenced by the release of ranitidine onto the over-the-counter market, and the advent of esomeprazole, which quickly showed significant increases.

Other changes in medication rates followed the management rates of the problems for which they are prescribed. For example, the increased prescribing rate of serum lipid-lowering agents occurred in parallel with the increased management rate of lipid problems. This topic is investigated in greater detail in Chapter 3, Section 3.6.

The largest decreases were seen in the prescribing of paracetamol and celecoxib. The reasons for the decrease in the prescribing of paracetamol are not clear, but may be due to the higher patient co-payment, required since January 2004 for Commonwealth concession card holders, making it less attractive to obtain paracetamol via a GP's prescription than to purchase it from

supermarkets. The decrease in the prescribing of celecoxib started in 2002–03 and has continued. This topic is investigated as part of the more detailed analysis of NSAID medications in Chapter 3, Section 3.3.

The 25% increase in provision of clinical treatments over the six time intervals since 1998–99 was reflected in increases in many different types of counselling (including psychological counselling as noted above).

The pathology test order rate continued to grow such that there were an estimated 5.6 million more tests ordered by GPs in 2004–05 than in 2000–01. In an earlier study of changes in pathology ordering by GPs between 1998 and 2001, the measured increase in ordering was found to be due to an increase in the number of tests ordered when the decision to order tests had been made, rather than to any increase in the likelihood of the GP ordering at least one pathology test at the encounter.[9] This is no longer the case. The chance of the GP ordering at least one pathology test increased by 19% so that GPs made the decision to order pathology at 1.5 million more encounters in 2004–05 than they did in 1998–99. Overall, there was a 24% increase in the actual number of tests ordered since 2000–01, indicating that together with the greater likelihood of ordering a test, more tests are being ordered on those occasions in 2004–05 than was the case in 2000–01.

External influences such as the introduction of new MBS item numbers, system changes such as increased computerisation, and possibly increased fear of litigation must be considered as possible influences on pathology ordering rates of GPs over the period of this study.

The likelihood of the GP ordering at least one imaging test also increased—possibly for similar reasons as those suggested above. However, this resulted in only a marginal increase in the total number of imaging tests ordered over the four time intervals for which comparable data were available on this topic.

2.13 Conclusion

This chapter has given an overview of the changes in the GPs, their patients and the content of the encounters. It has shown that the characteristics of the general practice workforce is changing and so are their patients. It has demonstrated that GPs are prescribing less, referring at the same rate, ordering more tests, and providing counselling and advice more often than they were in 1998–99. In the next chapter some specific topics have been selected for more detailed investigation of changes that have occurred over the period 1998–99 to 2004–05.

3 Selected topics—changes over time

3.1 Topic selection

This chapter uses linear regression to examine in more detail changes in management rates of particular problems and medications of interest.

Topic selection was based on:

- medications or problems of topical interest in terms of public health initiatives or developments in treatments. In particular, topics were examined that are associated with the National Health Priority Areas[30]
- any changes over time in the overall rates of management of a problem, or in the overall rates of a medication.

Based on these criteria, five topics were selected for examination of management over time:

- the use of non-steroidal anti-inflammatory drugs (NSAIDs) to manage all arthritis (including osteoarthritis and rheumatoid arthritis) and other musculoskeletal problems
- the use of anti-depressants and the management of depression and other psychological problems
- the use of inhalant medications (preventives and bronchodilators) in the management of asthma
- the use of statins in the management of lipid disorders
- the management rate of injuries.

3.2 Methods

All medications prescribed or supplied by the GP (referred to as 'medication rates' in this section) are included in the trends analyses.

As in previous years 'asthma inhalants' included over-the-counter (OTC) medications so we could gain an accurate estimate of the use of bronchodilators for asthma.

Medications advised by the GP for OTC purchase were also included in the count of the traditional (non-Cox-2 specific) NSAIDS medications to obtain a more accurate estimate of total medications used for arthritis. This differs from reports in previous years, which excluded OTC NSAIDs.[28]

In Chapter 2, changes in medication rates over time are reported for prescribed medications only. Therefore there may be differences in the trends over time between the medication rates reported here and the prescribing rates reported in Chapter 2.

Statistical methods

Trends over time were analysed using SAS V8.2 regression procedures that adjust the standard error to allow for the design effect of the cluster sample.[21] Test statistics and *p* values based on the adjusted standard error are more conservative than those that are calculated without taking into account the design effect of the cluster sample.

Changes over time in medications prescribed/supplied or advised were examined for specific problems of interest. Linear regression was performed to detect whether changes in medication rate were attributable to:

- changes in the medication management for the problem of interest, *or*
- changes in management rate of the problem(s) for which the medication is prescribed, *or*
- a combination of changes in both the medication management and the management rate of the problem of interest.

Outcomes are expressed as rates per 100 encounters for medications and problems managed. When examining changes in medication rates within specified morbidities (e.g. arthritis), rates are expressed per 100 specified problems. All analyses were weighted for the GP's age, sex and activity level.

Extrapolated estimates over time

Where we detected a significant change over time, we calculated the estimated annual rate of change. This is expressed as the mean annual increase (or decrease) over the study period in the number of general practice encounters for that problem or medication occurring in Australia each year.

Extrapolated estimates were calculated by multiplying the sample encounter rate for 1998–99 by the number of unreferred attendances (A1 and A2 items) claimed through Medicare in that year to give the estimated number of encounters in Australia for that event in 1998–99. The same was done for 2004–05. The difference between the two estimates was averaged over six years to give the estimated annual rate of change in the number of encounters.

In previous years extrapolated changes over time were calculated after adjustment for patient age and sex. However, since 1998 there have been real changes in the demographics of patients attending a GP as well as in the number of GP visits per head of population (see Chapter 2). Therefore, for this report, rates of change have been calculated from crude rates without adjustment for sample differences in patient age and sex.

3.3 Non-steroidal anti-inflammatory drugs for arthritis and other musculoskeletal problems over time

Definitions

Non-steroidal anti-inflammatory drugs (NSAIDs) were defined as the medications included in the Anatomical Therapeutic Chemical (ATC) classification index code M01A.[31] All NSAIDs prescribed/supplied or advised by the GP for over-the-counter (OTC) purchase were included in the analysis. (*Note:* in previous annual reports OTC NSAIDs were excluded).[28]

The NSAIDs were subdivided into Cox-2 inhibitors (which included the coxibs—ATC subgroup M01AH, plus meloxicam—M01AC06), and the other 'traditional' (not Cox-2 specific) NSAIDs. Coxibs alone (M01AH) were also analysed.

Musculoskeletal problems (ICPC Chapter 'L') were divided into all arthritis problems (rheumatoid arthritis, osteoarthritis and unspecified arthritis) versus all other musculoskeletal problems. These broad problem categories were derived from the recommended indications for the use of coxibs[32] and the problems for which NSAIDs were most often prescribed. The medication rate of NSAIDs over time was analysed separately within arthritis problems and within other musculoskeletal problems using linear regression.

Management rates of arthritis and other musculoskeletal problems

Figure 3.1 shows the management rates of arthritis and other musculoskeletal problems over the seven years of data collection.

- There was a significant increase in the management rate of arthritis over time (p=0.0003).
- There was no change in the management rate of other musculoskeletal problems between 1998–99 and 2004–05 (p=0.94).

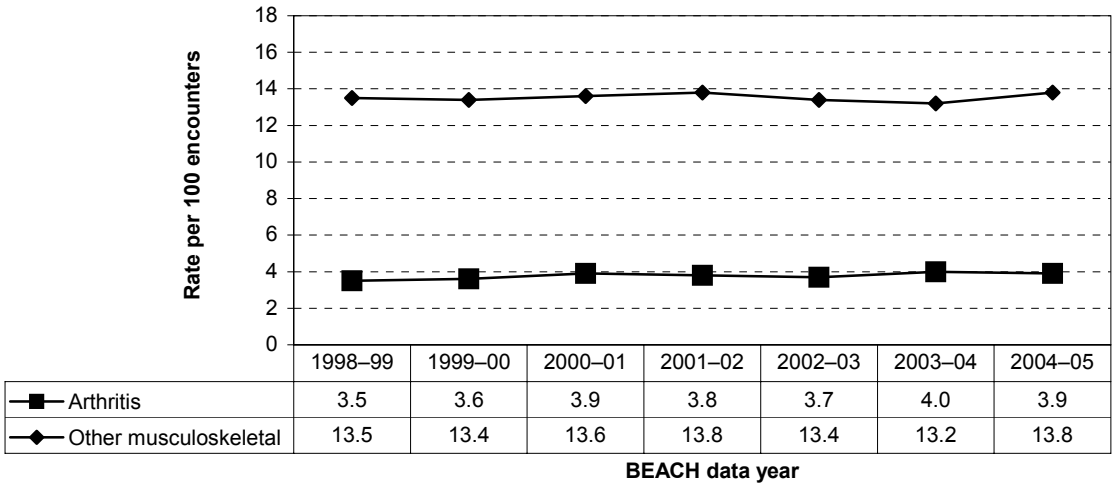


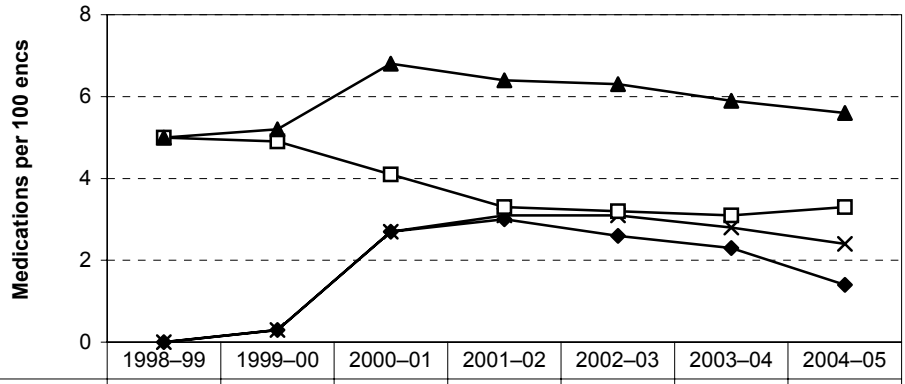
Figure 3.1: Management rate of arthritis and other musculoskeletal problems over time

NSAID medication rates for any problem

Figure 3.2 shows the medication rate of NSAIDs per 100 encounters unadjusted for problem under management.

- There was a marked increase in the rate of total NSAIDs prescribed/supplied or advised, from 5.0 per 100 encounters in 1998–99 to 6.8 per 100 encounters in 2000–01.
- The rate of NSAIDs then steadily decreased to 5.6 per 100 encounters in 2004–05.
- The rate of coxibs prescribed/supplied increased significantly in the period 1999–00 to 2001–02 and has since declined with a sharp drop in the most recent 12 months, following the withdrawal of rofecoxib.

- The rate of total Cox-2 inhibitors (including coxibs and meloxicam) declined less markedly, indicating that there was some substitution of meloxicam for the coxibs.



	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
Coxibs	0.0	0.3	2.7	3.0	2.6	2.3	1.4
Cox-2 inhibitors +	0.0	0.3	2.7	3.1	3.1	2.8	2.4
Traditional NSAIDS*	5.0	4.9	4.1	3.3	3.2	3.1	3.3
Total NSAIDs	5.0	5.2	6.8	6.4	6.3	5.9	5.6

BEACH data year

Figure 3.2: Rates of NSAIDs per 100 encounters over time

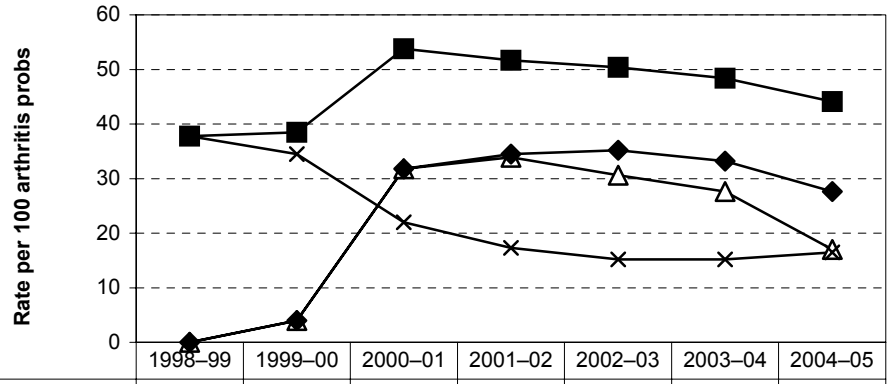
\+ Cox-2 inhibitors include meloxicam

* Traditional NSAIDs exclude meloxicam

NSAID medication rates for arthritis problems

- In managing arthritis problems, GPs increased the rate of NSAID medications (prescribed/supplied or advised) from 37.8 medications per 100 arthritis problems in 1998–99 to a peak of 53.8 per 100 arthritis problems in 2000–01 (Figure 3.3).
  - This increase was due to an increase in the rate of coxibs from 4.0 per 100 arthritis problems in 1999–00 to 31.8 per 100 arthritis problems in 2000–01, when they were first accepted on the PBS. This rate continued to rise to a peak of 33.9 per 100 arthritis problems in 2001–02.
- Since 2001–02 the rate of NSAIDs prescribed/supplied or advised steadily decreased to 44.1 medications per 100 arthritis problems in 2004–05 (Figure 3.3).
  - Over the last three years there has been a decrease in the prescription and supply of coxibs to 17.0 per 100 arthritis problems in 2004–05, with a substitution of meloxicam for coxibs.
- At the same time, the rate of traditional NSAIDs (without coxibs or meloxicam) decreased from 34.5 per 100 arthritis problems in 1999–00 to an average of 16 per 100 over the years 2001–02 to 2004–05.

This changing pattern of medication management indicates that the arrival of the coxibs was largely responsible for an overall increase in the total NSAID medication rate for arthritis problems. At the same time a decrease in other NSAIDs indicates that there was also considerable substitution of coxibs for other NSAIDs.



	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
Total NSAIDs	37.8	38.5	53.8	51.7	50.4	48.4	44.1
Coxibs	0.0	4.0	31.8	33.9	30.6	27.6	17.0
Cox-2 inhibitors+	0.0	4.0	31.8	34.5	35.2	33.2	27.6
Traditional NSAIDS*	37.8	34.5	22.0	17.3	15.2	15.2	16.5

BEACH data year

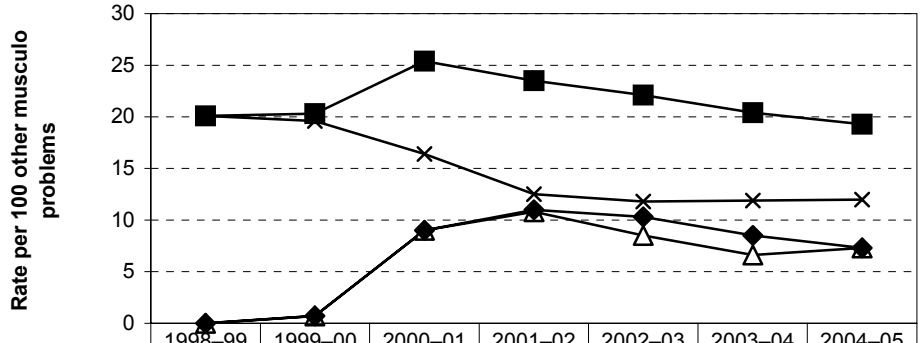
Figure 3.3: Medication rates of NSAIDs over time for all arthritis problems[(a)]

(a) Includes multiple ICPC-2 codes for osteoarthritis and arthritis (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>) and rheumatoid arthritis (ICPC rubric L88).

\+ Cox-2 inhibitors include meloxicam. * Traditional NSAIDs exclude meloxicam. *Note:* Probs—problems.

NSAID medication rates for other musculoskeletal problems

In 2004–05 the prescription/supply rate of NSAIDs for musculoskeletal problems other than arthritis continued to fall (Figure 3.4). The medication rate of Cox-2 inhibitors for other musculoskeletal problems peaked in 2001–02 (11.0 per 100 problems), and the rate of all traditional NSAIDs decreased. However, in the last three years there has been a decrease in the medication rate of Cox-2 inhibitors for other musculoskeletal problems to 7.3 per 100 problems in 2004–05, whereas the medication rates of traditional NSAIDs have remained steady.



	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
Total NSAIDS	20.1	20.3	25.4	23.5	22.1	20.4	19.3
Coxibs	0.0	0.7	9.0	10.8	8.5	6.6	7.3
Cox-2 inhibitors+	0.0	0.7	9.0	11.0	10.3	8.5	7.3
Traditional NSAIDs*	20.1	19.6	16.4	12.5	11.8	11.9	12.0

BEACH data year

Figure 3.4: Medication rates of NSAIDS over time for other musculoskeletal problems

\+ Cox-2 inhibitors include meloxicam.

* Traditional NSAIDs exclude meloxicam.

Conclusions

The investigation of prescription/supply or advice for purchase of NSAIDs demonstrates that the total medication rate peaked in 2000–01. This was probably largely due to the acceptance of the coxibs onto the Pharmaceutical Benefits Scheme and their immediate uptake in management of both arthritis and other musculoskeletal problems. There is evidence that some substitution for other NSAIDs was made at this time, but the coxibs were also prescribed for many patients who had not already been on a NSAID. Since this peak in 2000–01 the rate of NSAIDs has steadily decreased, particularly the rate for coxibs, and particularly in the most recent 12 months following the withdrawal of rofecoxib. However, there is evidence to suggest that the Cox-2 inhibitor meloxicam is being substituted for the coxibs.

A graphic view of the relationship between coxibs and other variables in the database is available in 2003–04 as Figure 13.1 (p. 93) in *General Practice Activity in Australia 2003–04*.[28]

3.4 Anti-depressant medications and the management of psychological problems over time

Definitions

A problem was defined as depression if the GP recorded it as:

- a depressive disorder (ICPC-2 rubric P76) *or*
- in terms of depressive symptoms (rubric P03).

'All anti-depressant medications' included the ATC medication group N06A.[31] This was subdivided into selective serotonin reuptake inhibitors and serotonin-noradrenaline reuptake inhibitors (SSRI/SNRI, ATC codes N06AB, N06AX16, N06AX18), non-selective monoamine reuptake inhibitors (tricyclics, ATC code N06AA) and monoamine oxidase inhibitors (MAOIs, ATC codes N06AG, N06AF). Prescribing rates of anti-depressant medications were compared for depression versus all other psychological problems.

Management rates of depression and other psychological problems

In 2004–05, depression:

- was the fourth most common problem managed in general practice
- was managed at a rate of 3.7 per 100 encounters
- accounted for 2.6% of all problems managed.

Figure 3.5 shows the overall management rates of depression and other psychological problems over time. From 1998–99 to 2004–05 the management of depression has remained steady at around 3.5 problems per 100 encounters.

An extrapolation based on 95 million general practice items (A1 and A2) claimed through Medicare each year estimates there were approximately 3.5 million encounters per year in Australia in which GPs managed depression. The management rate of other psychological problems changed little over the seven years of the study, at around 7.2 problems per 100 encounters.

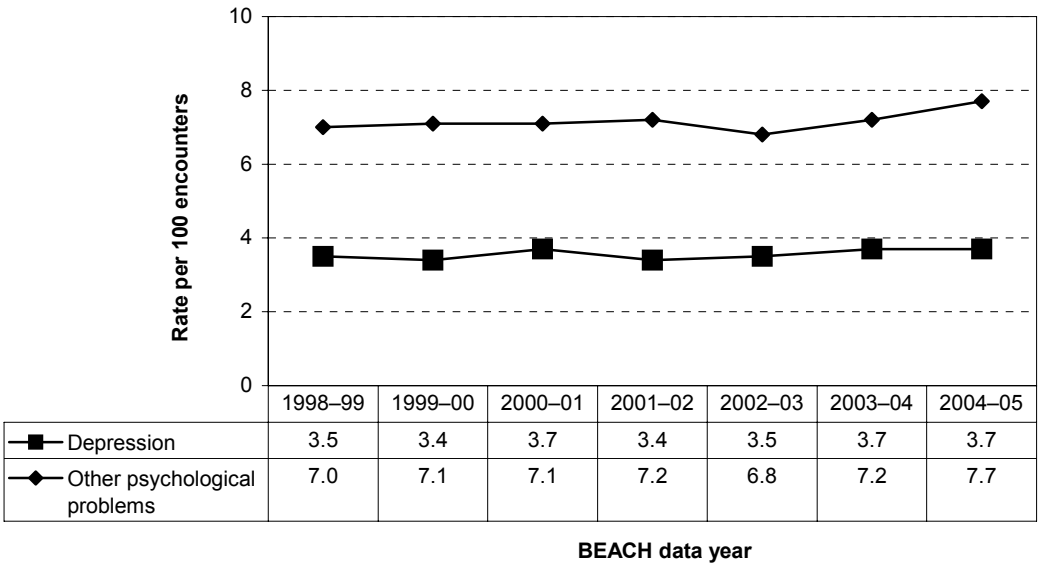
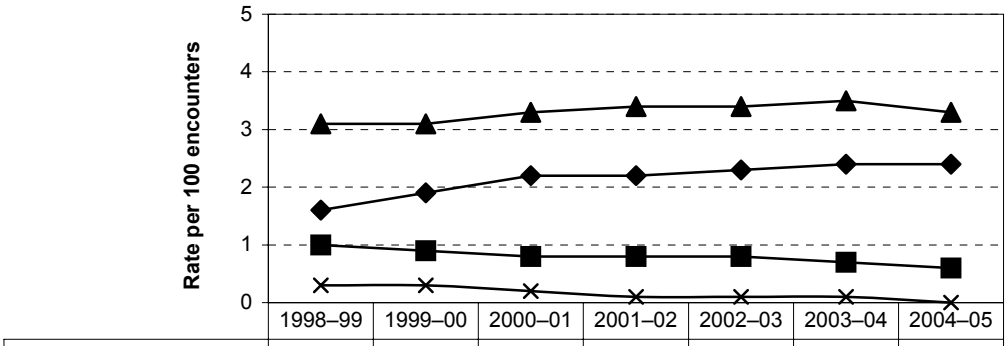


Figure 3.5: Management rate of depression and other psychological problems over time

Anti-depressant medication rates for any problem

Figure 3.6 shows the overall rates of selected anti-depressant medications per 100 encounters, unadjusted for problem under management.

- The rates of anti-depressant medication increased marginally from 3.1 per 100 encounters in 1998–99 to 3.5 per 100 encounters in 2003–04, with a slight drop in 2004–05 to 3.3 (p=0.009).
- There was a significant increase in the prescription/supply of selective serotinin reuptake inhibitors and serotonin-noradrenaline reuptake inhibitors (SSRI/SNRI) from 1.6 per 100 encounters in 1998–99 to 2.4 per 100 in 2004–05 (p<0.0001).
- The increase in the prescription and supply of SSRI/SNRI medications has been partly offset by a continuing decrease in the rates of other anti-depressant medications, in particular the tricyclic anti-depressants (p<0.0001) and MAOIs (p<0.0001).
- After adjustment for differences in the number of GP encounters in each year, there were an estimated 97,000 extra SSRI/SNRI medications prescribed or supplied by GPs each year.



	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
All anti-depressants	3.1	3.1	3.3	3.4	3.4	3.5	3.3
SSRI/SNRI	1.6	1.9	2.2	2.2	2.3	2.4	2.4
Tricyclics	1.0	0.9	0.8	0.8	0.8	0.7	0.6
MAOIs	0.3	0.3	0.2	0.1	0.1	0.1	0.0

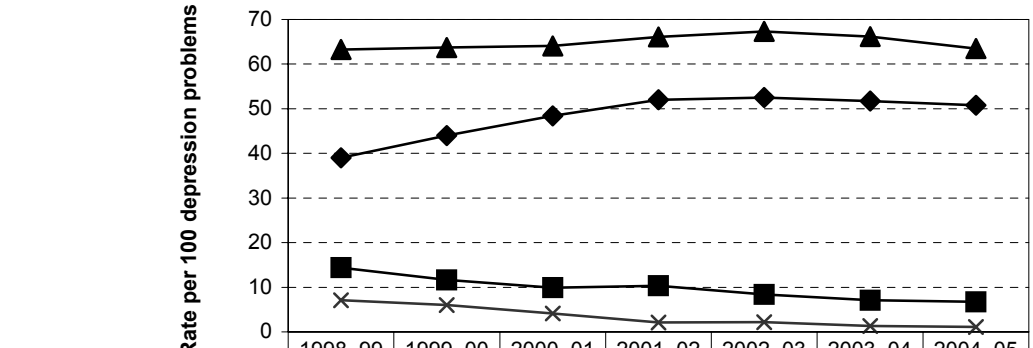
BEACH data year

Figure 3.6: Rates of anti-depressant medications per 100 encounters over time

Anti-depressant medication rates for depression

Figure 3.7 shows the rate of anti-depressant medications prescribed/supplied for the management of depression between 1998–99 and 2004–05.

- There was no change in the rate of anti-depressants for depression.
- There was an increase in the rate of SSRI/SNRI medications from 39.0 per 100 problems in 1998–99 to 50.8 per 100 problems in 2004–05.
- The increase in SSRI/SNRIs was offset by a decrease since 1998–99 in the rates of tricyclic anti-depressants (from 14.4 per 100 depression problems to 6.7 per 100, p <0.0001) and MAOIs (7.1 per 100 to 1.1 per 100, p <0.0001).



	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
All anti-depressants	63.3	63.7	64.1	66.1	67.3	66.2	63.5
SSRI/SNRI	39.0	44.0	48.4	52.0	52.5	51.7	50.8
Tricyclics	14.4	11.6	9.9	10.3	8.4	7.1	6.7
MAOIs	7.1	6.0	4.1	2.1	2.2	1.3	1.1

BEACH data year

Figure 3.7: Rates of anti-depressant medications per 100 depression problems over time

Conclusion

There has been little change between 1998–99 and 2004–05 in the management rate of depression in general practice or in the rate of anti-depressant medication use for depression. However the selective serotonin reuptake inhibitors and the serotonin-noradrenaline reuptake inhibitors have continued to increase as the medication of choice for the management of depression.

A graphic view of the overall management of depression in 2003–04 is available as Figure 13.7 (p. 99) in *General Practice Activity in Australia 2003–04*.[28]

3.5 Asthma inhalant medications and management of asthma problems over time

Definitions

A problem was classified as asthma if the GP recorded it in the problem/diagnosis section of the form as asthma, allergic, wheezy or asthmatic bronchitis, or status asthmaticus (ICPC-2 rubric R96).

Asthma inhalant medications were classified as bronchodilators/spasm relaxers or preventives. These categories cross various ATC codes and were defined using the Coding Atlas of Pharmaceutical Substances (CAPS) that distinguishes between bronchodilator inhalants and preventive inhalants. Rates of asthma medications include medications advised for OTC purchase as well as those prescribed or supplied by the GP.

Management of asthma

In 2004–05, asthma:

- was the tenth most common problem managed in general practice
- was managed at a rate of 2.3 per 100 encounters
- accounted for 1.8% of all problems managed.

Extrapolating to 95 million general practice items (A1 and A2) claimed through Medicare in 2004, there were an estimated 2.2 million encounters in Australia at which GPs managed asthma.

Over the six time intervals of the BEACH study, the management rate of asthma problems has decreased steadily from 3.2 per 100 encounters in 1998–99 to 2.3 per 100 encounters in 2004–05 (p<0.0001). After adjusting for annual differences in the number of asthma encounters in general practice, we estimate that there has been a decrease of 160,000 asthma encounters per year since 1998–99 (Figure 3.8).

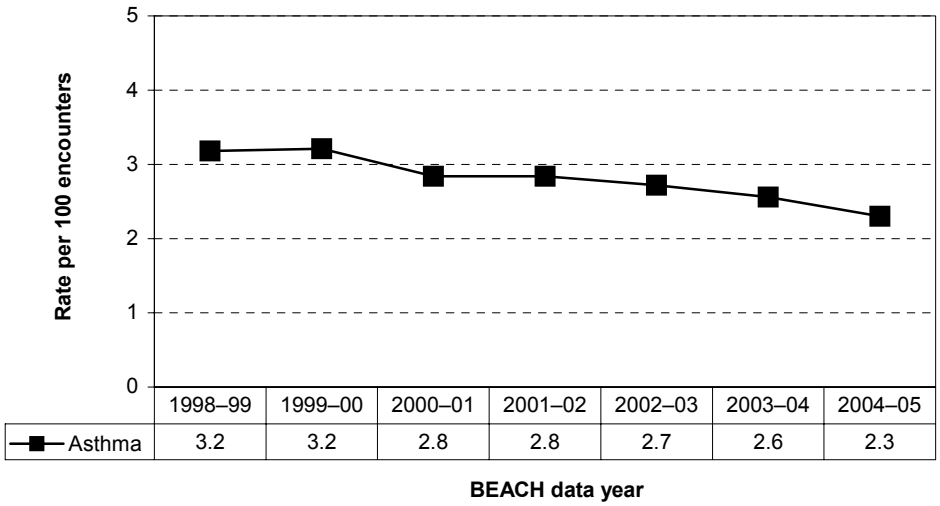


Figure 3.8: Management rate of asthma over time

Asthma inhalant medications for all problems

Figure 3.9 shows the rate of asthma inhalant medications per 100 encounters, unadjusted for the problem under management.

- There was a significant decrease in bronchodilators (prescribed/supplied or advised), from 3.9 per 100 encounters in 1998–99 to 1.9 per 100 encounters in 2004–05 (p<0.001).
- We estimate that since 1998–99 there have been 350,000 fewer occasions each year where the GP prescribed/ supplied or advised bronchodilator medications.
- The decrease in preventive medications was much smaller, from 2.3 per 100 encounters in 1998–99 to 1.8 per 100 encounters in 2004–05 (p<0.0001).

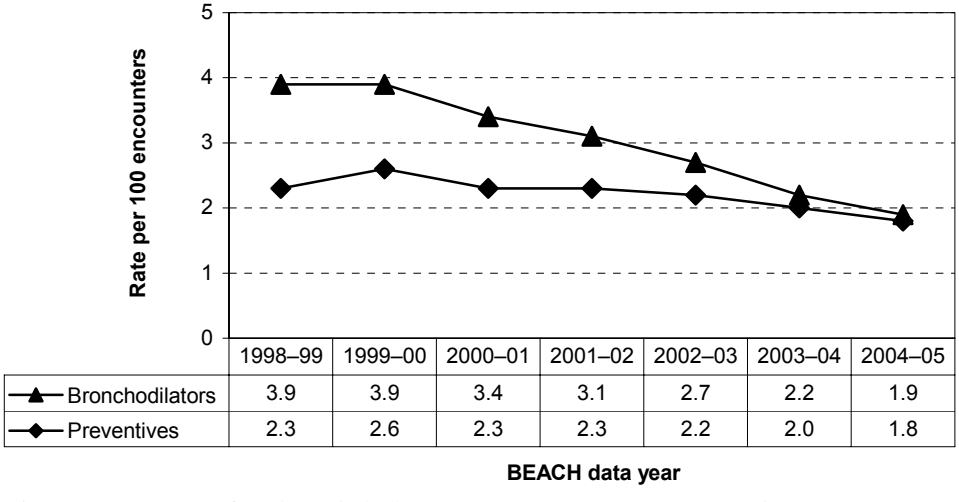
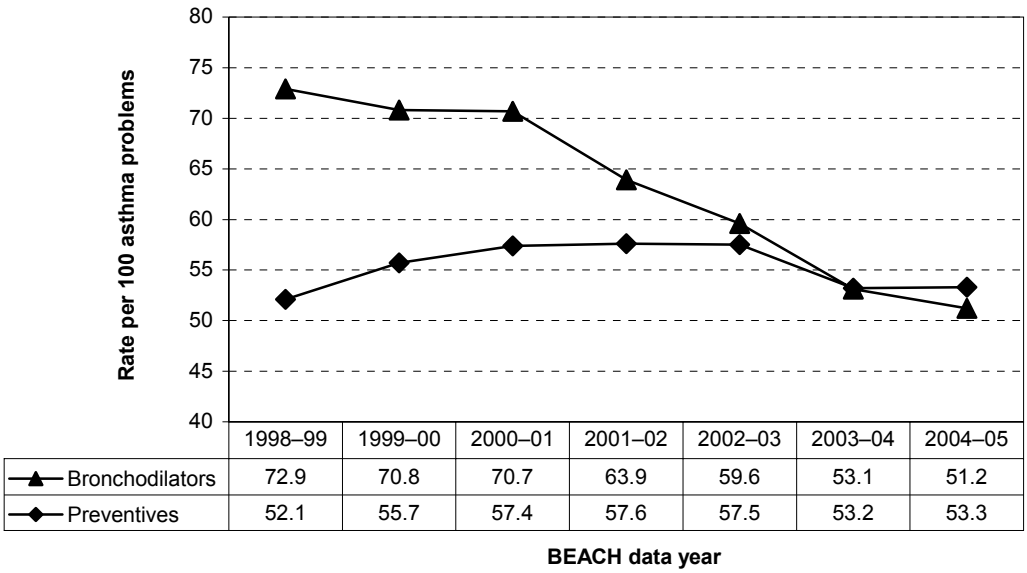


Figure 3.9: Rates of asthma inhalants per 100 encounters over time

Bronchodilator and preventive medications for asthma

Figure 3.10 shows the medications prescribed/supplied or advised specifically in the management of asthma problems.

- There was a significant decrease in the rate of bronchodilators over the six time intervals from 72.9 per 100 asthma problems in 1998–99 to 51.2 per 100 problems in 2004–05 (p<0.0001).
- The rate of asthma preventives for asthma problems remained steady over the period, at around 55.5 medications per 100 asthma problems (p=0.89).



	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05
Bronchodilators	72.9	70.8	70.7	63.9	59.6	53.1	51.2
Preventives	52.1	55.7	57.4	57.6	57.5	53.2	53.3

Figure 3.10: Rates of asthma inhalants per 100 asthma problems over time

Conclusion

Patients in Australia are visiting the GP less frequently for the management of asthma. There are a number of possible reasons for this trend, which have been discussed in detail elsewhere.[33] Possible explanations include reduced prevalence, differences in diagnostic labels, and better management and control of asthma.[33] A continuing drop in hospital admissions for asthma over the same time period provides a further indication of decreasing prevalence in the population over time.[33]

The current analysis also showed that for asthma patients, GPs continued to prescribe/supply or advise asthma preventives, whereas there was a decreasing rate of bronchodilator medications prescribed/supplied or advised. This pattern of medication use may also indicate that patients are managing their asthma better, thus requiring fewer visits to the GP for acute exacerbations.[27]

A graphic view of the overall management of asthma in 2003–04 is available as Figure 13.15 (p. 107) in *General Practice Activity in Australia 2003–04*.[28]

3.6 Lipid-lowering agents and management of lipid disorders over time

Management of lipid disorders

A problem was classified as a lipid disorder if the GP recorded it in the diagnosis/problem section of the form in terms such as high cholesterol, hypercholesterolaemia, hyperlipidaemia or raised lipids (ICPC-2 rubric T93).

Lipid-lowering agents were defined as medications included under the ATC code C10A.[31] For further analysis, lipid-lowering agents were divided into HMG CoA reductase inhibitors ('statins', ATC subgroup C10A A)[31] and all other lipid-lowering agents.

Management of lipid disorders

In 2004–05, lipid disorder:

- was the fifth most common problem managed in general practice
- was managed at a rate of 3.1 per 100 encounters
- accounted for 2.1% of all problems managed.

An extrapolation based on 95 million general practice items (A1 and A2) claimed through Medicare each year estimates that there were approximately 2.9 million encounters per year in Australia in which GPs managed lipid disorders.

The management of lipid disorders increased significantly from 1998–99 (2.5 per 100 encounters) to 2004–05 (3.3 per 100 encounters, $p<0.0001$).

After adjustment for differences in the number of GP encounters each year, there was an estimated increase of 111,000 extra lipid problems managed in general practice each year (Figure 3.11).

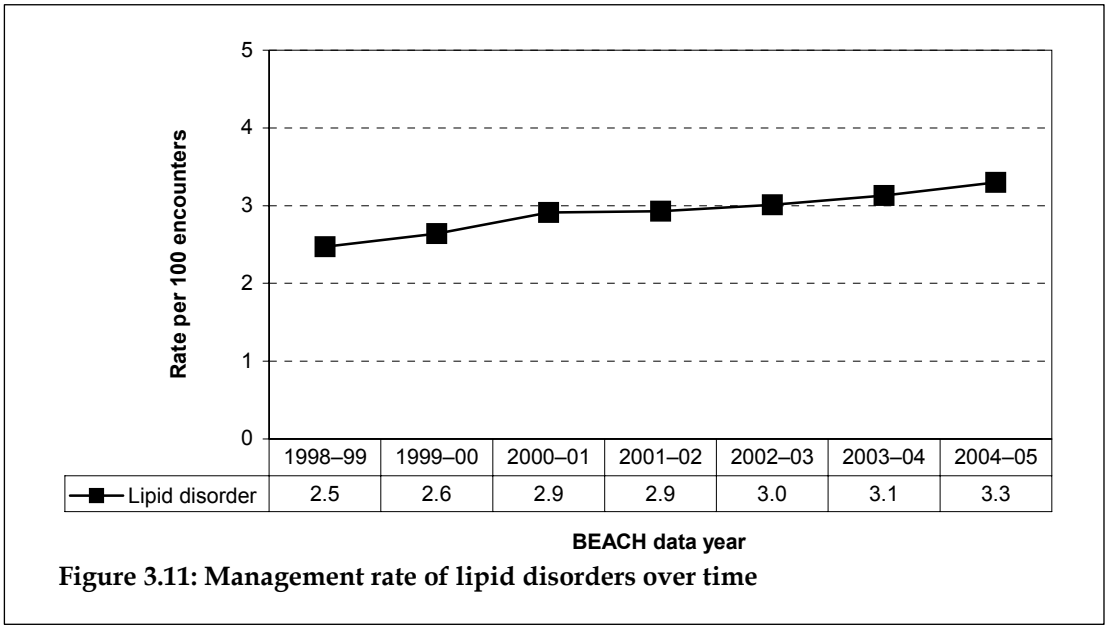


Figure 3.11: Management rate of lipid disorders over time

Statin medication rates for any problem

The rate of statins prescribed or supplied increased from 1.9 medications per 100 encounters in 1998–99 to 3.3 per 100 encounters in 2004–05 (p<0.0001).

After adjustment for differences in the number of GP encounters each year there were an estimated 150,000 extra occasions each year where a GP prescribed or supplied statin medications (Figure 3.12).

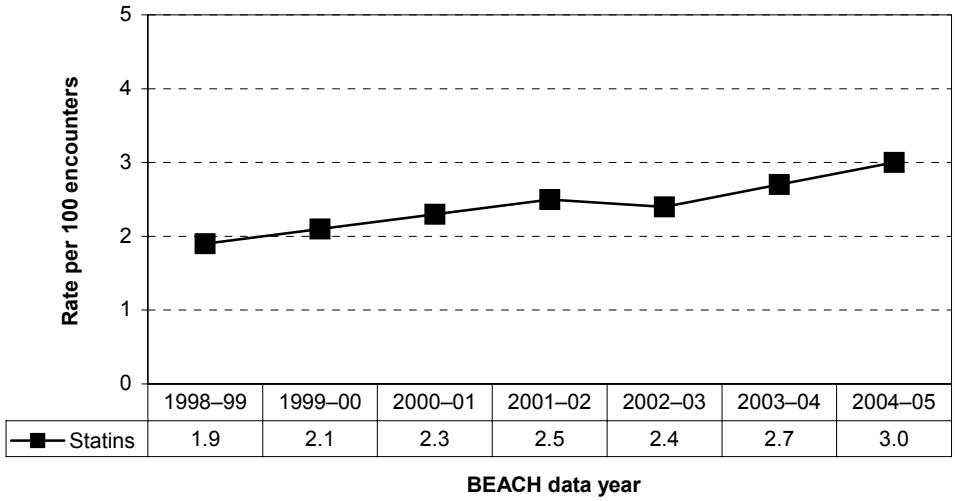


Figure 3.12: Management rate of lipid-lowering medications over time

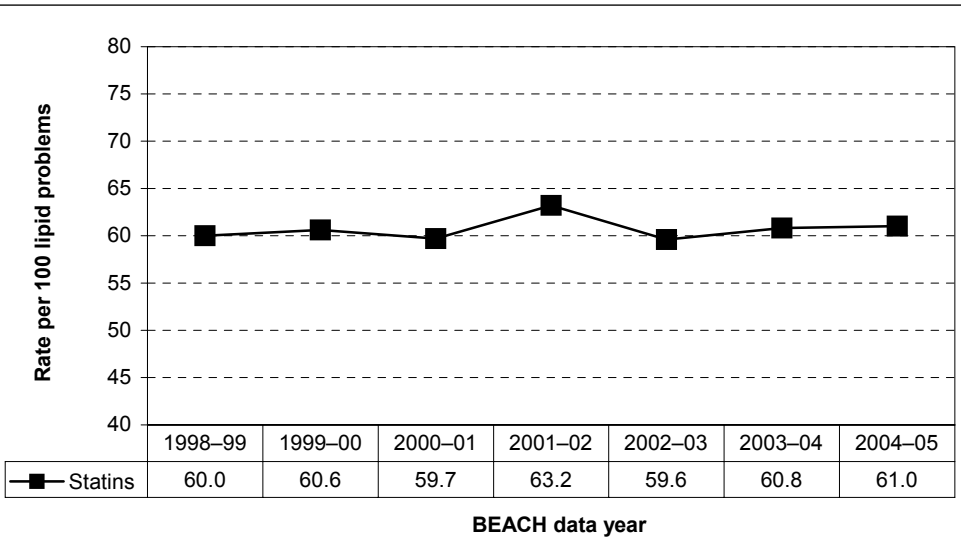


Figure 3.13: Management rate of lipid-lowering medications for lipid disorders over time

Lipid-lowering medications for lipid disorders over time

The increase in lipid medications was entirely explained by the increase in the management rate of lipid disorders. There was no significant change in the rate of statins prescribed or supplied for management of lipid disorder problems (Figure 3.13). Since 1998–99 they have been prescribed/supplied at about 61 medications per 100 lipid disorder problems (p=0.71).

Conclusion

The management rate of lipid disorders continues to increase, indicating an increasing prevalence of hypercholesterolaemia in the Australian population. This increase is accompanied by a continued growth in prescriptions for lipid-lowering medications, specifically the statins.

Graphic views of the relationship between statin prescribing and other variables, and in the management of diabetes 2003–04 are available as Figure 13.15 (p. 107) and Figure 13.19 (p. 100) in *General Practice Activity in Australia 2003–04*.[28]

3.7 The management of injuries over time

For the purpose of this analysis, 'injuries' includes all injury rubrics and terms across all ICPC-2 chapters (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>). In 2004–05 injuries were managed at a rate of 5.9 problems per 100 encounters. An extrapolation based on 95 million general practice items claimed through Medicare in 2004–05 estimates that there were approximately 5.6 million encounters per year in Australia in which GPs managed any injuries.

Changes over time

Figure 3.14 shows the management of injuries, which decreased from 7.7 per 100 encounters in 1998–99 to 7.1 per 100 encounters in 2004–05 (p=0.004). After adjustment for differences in the number of GP encounters each year there were an estimated 170,000 fewer injury problems managed each year (i.e. about 1 million fewer occasions in 2004–05 than in 1998–99 when injury was managed by a GP).

Most common injuries managed 2004–05

Table 3.1 shows the top ten injuries managed in 2004–05, which accounted for 90% of injuries managed. Musculoskeletal injuries (sprain/strain and fracture) and skin injuries were the most common physical injuries managed in 2004–05 and the distribution of the most common injuries managed has changed little since 1998–99 (results not shown).

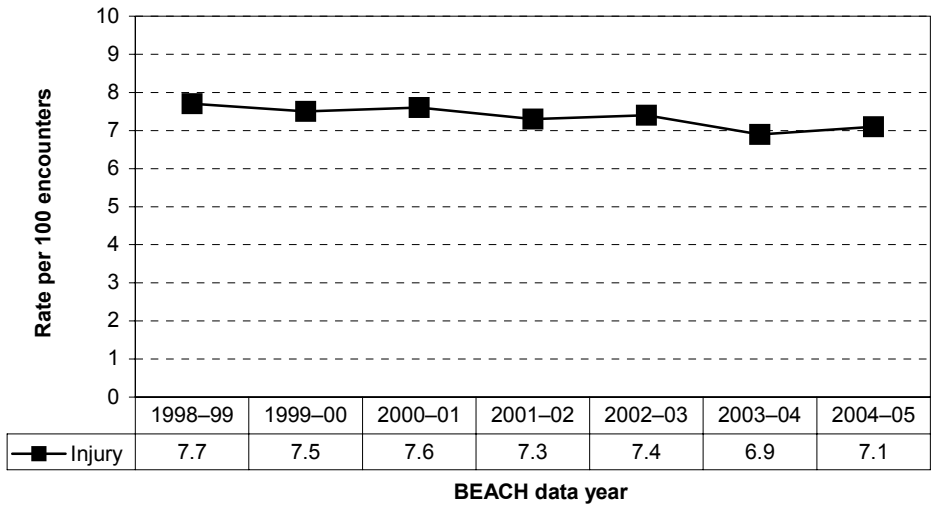


Figure 3.14: Management rate of injury problems over time

Table 3.1: Most common injury problems managed 2004–05

Injury	Number	Per cent of injury problems
Sprain/strain*	1,603	23.9
Fracture*	927	13.8
Laceration/cut	701	10.5
Injury skin, other	658	9.8
Bruise/contusion	401	6.0
Insect bite/sting	169	2.5
Trauma/injury, NOS	159	2.4
Abrasion/scratch/blister	149	2.2
Burns/scalds	120	1.8
Foreign body in skin	96	1.4
Subtotal	*6,020*	*89.7*
All injuries	**6,702**	**100.0**

* Includes multiple ICPC-2 or ICPC-2 Plus codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>)

Conclusion

This is the first time that the trend in physical injury management in general practice has been reported. The decrease over time in injury management may indicate that a proportion of patients are increasingly using other therapists such as physiotherapists and hospital emergency departments as the first line of management for physical injuries.

4 Annual results BEACH 2004–05

This chapter provides a summary of the annual results from the seventh year of the BEACH program, data collected between April 2004 and March 2005. The methods are only summarised in this chapter. For those wanting more detailed explanation, a full description of the BEACH methods and a discussion of methodological issues are provided in Chapter 5.

4.1 The sample

The sample frame

A random sample of general practitioners (GPs) who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from Health Insurance Commission (HIC) data by the Primary Care Division of the Australian Government Department of Health and Ageing (AGDHA) (see Chapter 5—Methods).

Response rate

Contact was attempted with 3,963 GPs—14.3% could not be contacted, the majority of whom had moved, retired or died and were untraceable. The final participating sample consisted of 953 practitioners, representing 28.1% of those who were contacted and available, and 24.0% of those with whom contact was attempted (Table 4.1).

Methodological issues related to response rate are discussed in Chapter 5—Methods, Section 5.10.

Table 4.1: Recruitment and participation rates

	Number	Per cent of approached (*n*=3,963)	Per cent of contacts established (*n*=3,395)
Letter sent and phone contact attempted	3,963	100.0	—
No contact	568	14.3	—
No phone number	51	1.3	—
Moved/retired/deceased	328	8.3	—
Unavailable	45	1.1	—
No contact after five calls	144	3.6	—
Telephone contact established	3,395	85.7	100.0
Declined to participate	2,148	54.2	63.3
Agreed but withdrew	293	7.4	8.6
Agreed and completed	953	24.0	28.1

Comparison of participating and non-participating GPs

The AGDHA provided some information from HIC data about each of the GPs drawn in the sample. This allowed us to determine the extent to which the final participating GPs were representative of the random sample of practitioners drawn. These data included the number of general practice A1 Medicare items claimed in the previous quarter, referred to in this analysis as 'activity level'.

Table 4.2 compares the characteristics of the final participants with those of all other GPs drawn in the initial sample. Differences between participants and non-participants were tested with the chi-square statistic (significance at the 5% level), using AGDHA GP characteristic data for both groups.

There were no significant differences between participants and non-participants in:

- sex
- place of graduation
- location of practice in terms of the Rural, Remote and Metropolitan Area (RRMA) classification
- GP activity level in the previous quarter.

There were some significant differences between the groups. In the participating sample:

- there was a lesser proportion of GPs aged 35–44 years
- there was a greater proportion of GPs aged 55 years and over
- a greater proportion of GPs were from New South Wales and the Northern Territory.

Table 4.2: Comparison of characteristics of participating and non-participating GPs

	Participants[(a)] (*n*=953)		Non-participants[(a)] (*n*=2,442)	
GP characteristics	**Number**	**Per cent of GPs[(b)]**	**Number**	**Per cent of GPs[(b)]**
Sex (χ^2=0.57, *p*=0.45)				
Male	649	68.1	1,630	66.7
Female	304	31.9	812	33.3
Missing	—	—	—	—
Age (χ^2=13.07, *p*=0.004)				
< 35 years	87	9.4	252	10.6
35–44 years	226	24.4	675	28.4
45–54 years	298	32.2	786	33.0
55+ years	315	34.0	666	28.0
Missing	27	—	63	—
Place of graduation (χ^2=0.155, *p*=0.69)				
Australia	669	70.2	1,731	70.9
Overseas	284	29.8	711	29.1
Missing	—	—	—	—

(continued)

Table 4.2 (continued): Comparison of characteristics of participating and non-participating GPs

GP characteristics	Participants[a] (*n*=953)		Non-participants[a] (*n*=2,442)	
	Number	Per cent of GPs[b]	Number	Per cent of GPs[b]
State (χ^2=19.964, *p*=0.005)				
New South Wales	336	35.3	779	31.9
Victoria	221	23.2	644	26.4
Queensland	187	19.6	440	18.0
South Australia	78	8.2	241	9.9
Western Australia	82	8.6	218	8.9
Tasmania	23	2.4	80	3.3
Australian Capital Territory	11	1.2	28	1.1
Northern Territory	15	1.6	12	0.5
Missing	—	—	—	—
RRMA (χ^2=8.23, *p*=0.22)				
Capital	622	65.3	1,598	65.4
Other metropolitan	65	6.8	176	7.2
Large rural	52	5.5	149	6.1
Small rural	61	6.4	173	7.1
Other rural	125	13.1	306	12.5
Remote centre	12	1.3	22	0.9
Other remote	16	1.7	18	0.7
Missing	—	—	—	—
Activity (χ^2=2.35, *p*<0.3)				
375–750 services in previous quarter	236	24.8	545	22.3
751–1,500 services in previous quarter	431	45.2	1,148	47.0
> 1,500 services in previous quarter	286	30.0	749	30.7
Mean activity level (*t*=0.47, *p*<0.6389)	1,277.1	—	1,289.8	—
Median activity level	1,098.0	—	1,149.0	—
Standard deviation	719.7	—	675.7	—

(a) Data drawn from that provided by the AGDHA.

(b) Missing data removed.

Note: RRMA—Rural, Remote and Metropolitan Area classification.

Representativeness of the GPs

Whenever possible, the final study group of GPs should be compared with the population from which the GPs were drawn in order to identify, and if necessary adjust for, any sample bias that may have an impact on the findings of the study.

Statistical comparisons, using the chi-square statistic (χ^2), were made between BEACH participants and all recognised GPs in the sample frame during the study period (Table 4.3). The GP characteristics data for BEACH participants were drawn from the GP profile questionnaire to ensure highest reliability. The AGDHA provided the data for all GPs in the sample frame.

Table 4.3 demonstrates that there were no significant differences in GP characteristics between the final sample and all GPs in the sample frame, with the exception of their state/territory distribution.

Table 4.3: Comparison of BEACH participants and all active recognised GPs in Australia

	BEACH[(a)(b)]		Australia[(a)(c)]	
Variable	**Number**	**Per cent of GPs**	**Number**	**Per cent of GPs**
Sex (χ^2=1.37, *p*=0.24)				
Males	647	67.9	11,963	66.0
Females	306	32.1	6,149	34.0
Age (χ^2=3.9, *p*=0.27)				
< 35	86	9.0	1,859	10.3
35–44	243	25.5	4,564	25.2
45–54	303	31.8	6,071	33.5
55+	320	33.6	5,638	31.1
Place of graduation (χ^2=1.04, *p*=0.30)				
Australia	665	69.9	12,961	71.5
Overseas	286	30.1	5,171	28.5
State (χ^2=25.4, *p*<0.001)				
New South Wales	334	35.1	6,103	33.7
Victoria	219	23.0	4,489	24.8
Queensland	188	19.8	3,416	18.8
South Australia	78	8.2	1,523	8.4
Western Australia	82	8.6	1,692	9.3
Tasmania	23	2.4	505	2.8
Australian Capital Territory	12	1.3	269	1.5
Northern Territory	16	1.7	135	0.7
RRMA (χ^2=6.38, *p*=0.38)				
Capital	618	64.9	11,802	65.1
Other metropolitan	64	6.7	1,358	7.5
Large rural	51	5.4	1,088	6.0
Small rural	66	6.9	1,272	7.0
Other rural	124	13.0	2,245	12.4
Remote centre	12	1.3	164	0.9
Other remote	17	1.8	203	1.1

(a) Missing data removed.

(b) Data drawn from the BEACH GP profile completed by each participating GP.

(c) All GPs who claimed at least 375 A1 Medicare items during the most recent 3-month Health Insurance Commission data period. Data provided by the Primary Care Division of the Australian Government Department of Health and Ageing.

Note: RRMA—Rural, Remote and Metropolitan Area classification.

Weighting the data

Activity weights: In BEACH each GP provides details of 100 consecutive encounters. There is considerable variation in the number of services provided by different GPs in a given year. Encounters were therefore assigned an additional weight that was directly proportional to the busyness of the recording GP. GP activity level was measured as the number of Medicare A1 items claimed by the GP in the previous 12 months (data supplied by the AGDHA).

Age–sex weights: In all previous years, BEACH has had an under-representation of young GPs. In order to achieve comparable estimates and precision we applied GP age–sex and activity level weights to the 2004–05 data in post-stratification weighting, as we did in previous years.

Total weights: The final weighted estimates were calculated by multiplying raw rates by the GP age–sex weight and the GP sampling fraction of services in the previous 12 months. Table 4.4 shows the precision ratio calculated before and after weighting the data.

Representativeness of the final encounter sample

BEACH aims to gain a representative sample of GP–patient encounters. To assess the representativeness of the final weighted sample of encounters we compared the age–sex distribution of patients at BEACH A1 Medicare-claimable encounters with that of all encounters claimed in 2004 (data provided by the AGDHA) as Medicare A1 items of service.

Table 4.4: Age–sex distribution of patients at BEACH and MBS A1 services

	BEACH[a]		Australia[b]	Precision ratios	
Variable	Number	Per cent	Per cent	Raw[a]	Weighted[c]
Male					
< 1 year	928	1.2	1.2	1.0	1.0
1–4 years	1,933	2.5	2.8	1.1	1.1
5–14 years	2,292	2.9	3.5	1.2	1.1
15–24 years	2,467	3.2	3.4	1.1	1.1
25–44 years	6,922	8.9	9.1	1.0	1.0
45–64 years	8,941	11.5	11.7	1.0	1.0
65–74 years	4,267	5.5	5.7	1.1	1.0
75+ years	3,284	4.2	4.6	1.1	1.1
Female					
< 1 year	747	1.0	1.0	1.0	1.1
1–4 years	1,686	2.2	2.5	1.2	1.2
5–14 years	2,258	2.9	3.3	1.1	1.1
15–24 years	4,669	6.0	5.9	1.0	1.0
25–44 years	12,017	15.4	14.9	1.0	1.0
45–64 years	12,420	15.9	15.4	1.0	1.0
65–74 years	5,404	6.9	6.7	1.0	1.0
75+ years	5,809	7.4	8.2	1.1	1.2

(a) Unweighted data, A1 items only, excluding encounters with patients who hold a DVA Repatriation health card.

(b) Data provided by the Primary Care Division of the Australian Government Department of Health and Ageing.

(c) Calculated from BEACH weighted data, excluding encounters with patients who hold a DVA Repatriation health card.

Note: A1 Medicare services—see Glossary. Only encounters with a valid age and sex are included in the comparison.

As shown in Table 4.4, there is a good fit of the MBS and BEACH age and sex distribution both with and without weighting, with no age–sex category varying by more than 20% from the population distribution. The range of raw precision ratios (1.0–1.2) indicate that the BEACH sample of encounters is a good representation of Australian general practice patient encounters. After weighting, the precision ratios improved slightly in some aspects, but remained within the 1.0–1.2 range.

The weighted data set

The final unweighted data set from the seventh year of collection contained encounters, reasons for encounters, problems and management/treatments. The apparent number of encounters, reasons for encounter, medications, problems managed, the numbers of referrals, imaging and pathology all decreased after weighting. Raw and weighted totals for each data element are shown in Table 4.5.

Table 4.5: The BEACH data set

Variable	Raw	Weighted
General practitioners	953	954
Encounters	95,300	94,386
Reasons for encounter	143,116	141,215
Problems managed	141,489	137,330
Medications	95,672	95,816
Other treatments	56,415	53,630
Referrals	11,589	10,881
Imaging	8,200	7,840
Pathology	38,019	34,652

4.2 The general practitioners

All participants returned a GP profile questionnaire although some were incomplete. The results are provided in Table 4.6. Of the 953 participants:

- more than two-thirds were male and two-thirds were 45 years of age or older
- three-quarters had been in general practice for more than 10 years
- just over one in ten were in solo practice
- seven in ten GPs had graduated in Australia, and two-thirds practised in capital cities
- more than one-quarter conducted some consultations in a language other than English
- nine in ten were registered with the Department of Veterans' Affairs
- two in five were Fellows of the Royal Australian College of General Practitioners
- four in five worked in accredited practices
- nearly two-thirds worked in practices that employed practice nurses
- two in five spent more than 40 hours each week on direct patient care services
- about half had provided care in a residential aged care facility in the previous month
- one in ten worked as a salaried/sessional hospital medical officer in the previous month

- nearly half employed a deputising service for after-hours patient care, and one-third provided their own or co-operative after-hours care
- more than one-quarter bulk-billed Medicare for all patients and nearly one in five bulk-billed for pensioner/Commonwealth concession card holders only
- half worked in a teaching practice for undergraduates, for registrars, or both.

Table 4.6: Characteristics of participating GPs

GP characteristic		Number[(a)]	Per cent of GPs[(a)] (*n*=953)
Sex	Male	647	67.9
	Female	306	32.1
Age (missing=1)			
	< 35 years	86	8.9
	35–44 years	243	25.5
	45–54 years	303	31.8
	55+ years	320	33.6
Years in general practice (missing=5)			
	< 2 years	4	0.4
	2–5 years	98	10.3
	6–10 years	119	12.6
	11–19 years	241	25.4
	20+ years	486	51.3
Size of practice (missing=6)			
	Solo	116	12.2
	2–4 GPs	345	36.4
	5+ GPs	486	51.3
Practice location (missing=1)			
	Capital	618	64.9
	Other metropolitan	64	6.7
	Large rural	51	5.4
	Small rural	66	6.9
	Other rural	124	13.0
	Remote central	12	1.3
	Other remote, offshore	17	1.8
Place of graduation (missing=1)			
	Australia	665	69.8
	United Kingdom	72	7.6
	Asia	104	10.9
	Europe	36	3.8
	Africa	51	5.4
	New Zealand	12	1.3
	Other	12	1.3

(continued)

Table 4.6 (continued): Characteristics of participating GPs

GP characteristic	Number[(a)]	Per cent of GPs[(a)] (*n*=953)
Consultations in languages other than English (missing=1)		
< 25%	207	21.7
25–50%	23	2.4
> 50%	32	3.4
Currently in general practice training program (missing=10)	33	3.5
DVA registered (missing=29)	829	87.0
Fellow of RACGP (missing=9)	399	42.3
Accredited practice (missing=10)	767	81.3
Practice nurse at major practice address (missing=9)	567	60.2
Sessions per week (missing=8)		
< 6 per week	136	14.4
6–10 per week	701	71.2
11+ per week	108	11.4
Direct patient care hours (worked) per week (missing=29)		
< 10 hours	2	0.2
10–20 hours	81	8.8
21–40 hours	455	49.2
41–60 hours	350	37.9
60+ hours	36	3.9
Patient care provided in previous month		
As a locum	55	5.8
In a deputising service	22	2.3
In a residential aged care facility	456	47.8
As a salaried/sessional hospital medical officer	107	11.2
After-hours arrangements (missing=8)		
Own or co-operative	492	52.1
Deputing service	433	45.8
Bulk-billing (missing=6)		
All patients	272	28.7
Pension/Commonwealth concession card holders	437	46.1
Children	239	25.2
Selected other patients	427	45.1
Major practice a teaching practice (missing=12)		
For undergraduates only	202	21.5
For GP registrars only	79	8.4
For both undergraduates and registrars	193	20.5
Aboriginal Community Controlled Health Service consultations (missing=9)	14	1.5

(a) Missing data removed.

Note: GP—general practitioner; RACGP—Royal Australian College of General Practitioners; DVA—Australian Department of Veterans' Affairs.

Computer use at GP practices

Table 4.7 shows the proportion of participating GPs who worked in a practice that had the computer capacity to provide each of five listed activities.

- Less than one in fifteen GPs worked in a non-computerised practice.
- Computers were mainly used for prescribing and billing purposes.
- Almost three-quarters had computers available for other administrative processes.
- More than two-thirds had computers available for medical records.
- Two-thirds of GPs had internet and/or email available.

Table 4.7: GP computer use

Computer use	Number	Per cent of GPs (*n*=953)[(a)]	Per cent of GPs with computers (*n*=880)[(a)]
Not at all	59	6.2	—
Billing	754	80.3	85.7
Prescribing	788	83.9	89.5
Medical records	672	71.6	76.4
Other administrative	702	74.8	79.8
Internet/email	642	68.4	72.9
Missing	14	—	—

(a) Missing data removed.

Table 4.8 lists the top ten combinations of computer use by participants' practices.

- Nearly half the GPs indicated that their practice used computers for all five listed purposes—billing, prescribing, medical records, other administrative purposes and internet/email.
- Nearly 60% of the GPs reported computer use for both medical records and internet/email purposes.
- Prescribing was the only usage included in all of the top ten combinations.
- Within other top ten combinations of purposes for computer use, billing was the second most frequently available function, with medical records and internet/email usage ranking equal third.

It must be remembered that these results refer to computer use at practice level. We are currently undertaking further research involving the extent of individual computer use by GPs for clinical activity.

Table 4.8: Top ten combinations of computer use for GPs

Combination	Number	Per cent of GPs (*n*=953)[(a)]	Per cent of GPs with computers (*n*=894)[(a)]
All five uses	450	47.9	51.1
Billing + prescribing + medical records + other administrative	68	7.2	7.7
Billing + prescribing + other admin + internet/email	42	4.5	4.8
Billing + prescribing + medical records + internet/email	38	4.0	4.3
Billing + prescribing + medical records	34	3.6	3.9
Prescribing + medical records + other admin + internet/email	29	3.1	3.3
Billing + prescribing + other administrative	28	3.0	3.2
Billing + prescribing	28	3.0	3.2
Billing + prescribing + internet/email	20	2.1	2.3
Prescribing + medical records + internet/email	8	1.1	0.9

(a) Missing data removed.

4.3 The encounters

Using weighted data, in 2004–05 there were 94,386 encounters from 954 GPs. The content of these encounters is summarised in Table 4.9. Reasons for encounter and problems managed are expressed as rates per 100 encounters. Each management action is presented in terms of both a rate per 100 encounters and a rate per 100 problems managed, with 95% confidence limits.

- On average, patients described 1.5 RFEs and GPs managed 1.5 problems per encounter (150 per 100 encounters).
- New problems accounted for about one-third of all problems, being managed at a rate of 55 per 100 encounters.
- Chronic problems accounted for 35% of all problems managed at encounter.
- Medications were the most common treatment choice (70 per 100 problems managed) followed by clinical treatments (such as advice and counselling), 26 per 100 problems.
- The patient was referred elsewhere for care on 8 occasions per 100 problems managed.
- Twenty-five pathology tests orders were placed for every 100 problems managed.

Encounter type

The breakdown of BEACH encounters by payment source, place and type (where appropriate) is provided in Table 4.10.

- Indirect encounters (patient not seen by the GP) were provided on average at one in every 40 encounters
- Direct encounters where no charge was made arose on average once per 200 encounters
- Direct encounters (patient was seen by the GP) accounted for 97.4% of all encounters.
- Almost 94% of all direct encounters were claimable either through Medicare or the Australian Department of Veterans' Affairs (DVA).

- Standard surgery consultations accounted for the majority (82.3%) of Medicare/DVA claimable consultations.
- One in ten Medicare/DVA encounters were long surgery consultations.
- Short and prolonged surgery consultations, home visits and residential aged care consultations were relatively rare, and those in hospitals were negligible
- Encounters payable through workers' compensation arose once per 40 encounters.
- Enhanced primary care items accounted for less than one in 250 encounters.

Note that other types of encounters, such as health assessments, care plans, case conferences and encounters listed as 'other items' may also have taken place either at the GPs' consulting rooms, or at the consulting rooms of other health professionals, at residential aged care facilities, or at the patient's home.

Table 4.9: Summary of morbidity and management

Variable	Number	Rate per 100 encounters (*n*=94,386)	95% LCL	95% UCL	Rate per 100 problems (*n*=137,330)	95% LCL	95% UCL
General practitioners	954	—	—	—	—	—	—
Encounters	94,386	—	—	—	—	—	—
Reasons for encounter	141,215	149.6	147.8	151.5	—	—	—
Problems managed	137,330	145.5	143.6	147.4	100.0	—	—
New problems	52,080	55.2	53.8	56.5	37.9	37.0	38.9
Work-related	2,972	3.1	2.8	3.5	2.2	1.9	2.4
Chronic problems	47,921	50.8	49.1	52.5	34.9	34.0	35.8
Medications	95,816	101.5	99.3	103.8	69.8	68.3	71.2
Prescribed	78,711	83.4	81.2	85.5	57.3	55.9	58.7
GP-supplied	7,613	8.1	7.3	8.9	5.5	5.0	6.1
Advised OTC	9,492	10.1	9.1	11.0	6.9	6.3	7.5
Other treatments	51,632	54.7	52.1	57.3	37.6	36.0	39.2
Clinical*	37,016	39.2	37.1	41.4	27.0	25.6	28.3
Procedural*	14,616	15.5	14.6	16.4	10.6	10.0	11.3
Referrals	10,881	11.5	11.1	12.0	7.9	7.6	8.2
Specialist*	7,291	7.7	7.4	8.0	5.3	5.1	5.5
Allied health services*	2,569	2.7	2.5	2.9	1.9	1.7	2.0
Hospital*	451	0.5	0.3	0.7	0.3	0.2	0.5
Emergency department*	152	0.2	0.0	0.4	0.1	0.0	0.3
Other medical services*	103	0.1	0.0	0.6	0.1	0.0	0.4
Other referrals*	315	0.3	0.1	0.6	0.2	0.1	0.4
Pathology	34,652	36.7	35.2	38.2	25.2	24.3	26.2
Imaging	7,840	8.3	8.0	8.6	5.7	5.5	5.9
Other investigations	1,040	1.1	0.9	1.3	0.8	0.6	0.9

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: LCL—lower confidence limit; UCL—upper confidence limit; OTC—over-the-counter.

Table 4.10: Type of encounter

Variable	Number	Rate per 100 encounters[a] (*n*=87,030)	95% LCL	95% UCL	Per cent of direct encounters (*n*=84,775)	Per cent of Medicare-paid (*n*=81,582)
General practitioners	954	—	—	—	—	—
Direct encounters	84,775	97.4	97.1	97.7	100.0	—
No charge	457	0.5	0.2	0.9	0.5	—
MBS items of service[b]	81,582	93.7	93.3	94.2	96.2	100.0
Short surgery consultations	850	1.0	0.3	1.6	—	1.0
Standard surgery consultations	67,140	77.2	76.0	78.2	—	82.3
Long surgery consultations	8,614	9.9	9.2	10.6	—	10.6
Prolonged surgery consultations	627	0.7	0.1	1.3	—	0.8
Home visits	790	0.9	0.2	1.6	—	1.0
Hospital	193	0.2	0.0	2.0	—	0.2
Residential aged care facility	979	1.1	0.0	3.2	—	1.2
Enhanced Primary Care items	311	0.4	0.0	0.9	—	0.4
Case conference	3	0.0[Ŧ]	0.0	1.4	—	0.0
Care plan	159	0.2	0.0	0.9	—	0.2
Health assessments	150	0.2	0.0	0.7	—	0.2
Other items	2,076	2.4	0.6	4.2	—	2.5
Workers compensation	2,132	2.5	2.1	2.8	2.5	—
Other paid (hospital, state, etc.)	605	0.7	0.1	1.3	0.7	—
Indirect encounters	2,256	2.6	2.1	3.1	—	—
Missing	7,355	—	—	—	—	—
Total encounters	**94,386**	**—**	**—**	**—**	**—**	**—**

(a) Missing data removed from analysis. Per cent base *n*=91,965.

(b) Includes 2,983 encounters that were recorded with patients who held an Australian Repatriation health card.

Ŧ Rates are reported to one decimal place. This indicates that the rate is <0.05 per 100 encounters.

Note: LCL—lower confidence limit; UCL—upper confidence limit; MBS—Medicare Benefits Schedule.

4.4 The patients

Age–sex distribution of patients at encounter

The age–sex distribution of patients at the 94,386 encounters is shown in Figure 4.1. Females accounted for the greater proportion of encounters (56.5%). This was reflected across all age groups except for children aged less than 15 years, and was greatest among the younger adults (15–24 years and 25–44 years) (Figure 4.1).

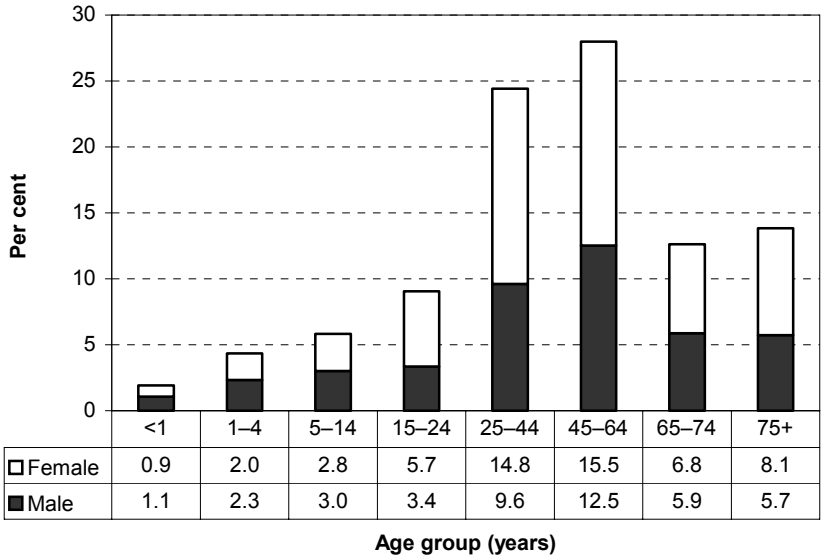


Figure 4.1: Age–sex distribution of patients at encounter

Note: Missing data removed. The distributions will not agree perfectly with those in Table 4.11 due to missing data in either age or sex fields.

Other patient characteristics

Table 4.11 provides a view of other characteristics of the patients. In summary:

- the patient was new to the practice at one in ten encounters (9.1%)
- almost half the encounters were with patients who held a Commonwealth concession card and 3.2% were with persons who held a Repatriation health card
- at one in ten encounters, the patient was from a non-English-speaking background
- at 1.4% of encounters the patient was an Indigenous person.

Table 4.11: Characteristics of the patients at encounters

Patient variable	Number	Per cent of encounters (*n*=94,386)[a]	95% UCL	95% UCL
Sex (Missing=809)				
Males	40,687	43.5	42.7	44.3
Females	52,890	56.5	55.7	57.3
Age group (Missing=925)				
< 1 year	1,789	1.9	1.7	2.1
1–4 years	4,059	4.3	4.0	4.7
5–14 years	5,442	5.8	5.5	6.1
15–24 years	8,442	9.0	8.6	9.4
25–44 years	22,810	24.4	23.7	25.1
45–64 years	26,167	28.0	27.4	28.6
65–74 years	11,797	12.6	12.1	13.2
75+ years	12,955	13.9	13.1	14.7

(continued)

Table 4.11 (continued): Characteristics of the patients at encounters

Patient variable	Number	Per cent of encounters (*n*=94,386)[(a)]	95% UCL	95% UCL
Other characteristics				
New patient to practice	8,386	9.1	8.3	9.9
Commonwealth concession card	40,814	43.2	41.8	44.7
Repatriation health card	2,983	3.2	2.8	3.5
Non-English-speaking background	10,185	10.8	7.2	14.4
Aboriginal person	1,073	1.1	0.0	3.0
Torres Strait Islander	159	0.2	0.0	1.8
Aboriginal person and Torres Strait Islander	39	0.0[Ŧ]	—	—

(a) Missing data removed.
Ŧ Rates are reported to one decimal place. This indicates that the rate is <0.05 per 100 encounters. The confidence interval could not be calculated due to the small sample size.
Note: LCL—lower confidence limit; UCL—upper confidence limit.

Patient reasons for encounter

International interest in reasons for encounter (RFEs) has been developing over the past three decades. RFEs reflect the patient's demand for care and can provide an indication of service utilisation patterns, which may benefit from intervention on a population level.[34]

RFEs are those concerns and expectations that patients bring to the GP. Participating GPs were asked to record at least one and up to three patient RFEs in words as close as possible to those used by the patient, before the diagnostic or management process had begun. These reflect the patient's view of their reasons for consulting the GP. RFEs can be expressed in terms of one or more symptoms (e.g. 'itchy eyes', 'chest pain'), in diagnostic terms (e.g. 'about my diabetes', 'for my hypertension'), a request for a service ('I need more scripts', 'I want a referral'), an expressed fear of disease, or a need for a check-up.

Patient RFEs have a many-to-many relationship to problems managed; that is, the patient may describe multiple symptoms that relate to a single problem managed at the encounter or may describe one RFE that relates to multiple problems.

Number of reasons for encounter

Table 4.12 shows the number of RFEs presented by patients at encounters. At almost two-thirds of encounters only one RFE was recorded. Patients presented on average with 149.6 RFEs per 100 encounters (Table 4.13). Females presented with significantly more RFEs (152.2 per 100 encounters, 95% CI: 150.3–154.4) than did males (146.5 per 100, 95%CI: 144.4–148.5) (results not tabulated).

Table 4.12: Number of patient reasons for encounter

Number of RFEs at encounter	Number of encounters (*n*=94,386)	Per cent of encounters	95% LCL	95% UCL
One RFE	57,967	61.4	60.2	62.6
Two RFEs	26,009	27.6	26.9	28.3
Three RFEs	10,410	11.0	10.3	11.7
Total	**94,386**	**100.0**	—	—

Note: RFEs—reasons for encounter; LCL—lower confidence limit; UCL—upper confidence limit.

Reasons for encounter by ICPC-2 chapter

The distribution of patient RFEs by ICPC-2 chapter and the most common RFEs within each chapter are presented in Table 4.13. Each chapter and individual RFE is expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence limits.

Table 4.13: Distribution of patient reasons for encounter, by ICPC-2 chapter and most frequent individual reasons for encounter within chapter

Reasons for encounter	Number	Per cent of total RFEs[(a)] (*n*=141,215)	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL
General & unspecified	**34,461**	**24.4**	**36.5**	**35.5**	**37.6**
Prescription NOS	7,562	5.4	8.0	7.5	8.5
Results tests/procedures NOS	5,079	3.6	5.4	5.1	5.7
Check-up—general*	3,294	2.3	3.5	3.2	3.8
Immunisation/vaccination—general	2,043	1.5	2.2	1.8	2.6
Fever	1,678	1.2	1.8	1.5	2.1
Weakness/tiredness	1,564	1.1	1.7	1.4	1.9
Administrative procedure NOS	1,338	1.0	1.4	1.3	1.6
Blood test NOS	1,062	0.8	1.1	0.8	1.4
Chest pain NOS	1,033	0.7	1.1	1.0	1.2
Other reason for encounter NEC	971	0.7	1.0	0.7	1.4
Clarify/discuss patient RFE NOS	866	0.6	0.9	0.6	1.3
Trauma/injury NOS	762	0.5	0.8	0.7	1.0
Respiratory	**19,423**	**13.8**	**20.6**	**19.8**	**21.4**
Cough	5,555	3.9	5.9	5.5	6.2
Throat complaint	3,336	2.4	3.5	3.2	3.9
Immunisation/vaccination—respiratory	1,760	1.3	1.9	0.9	2.9
Upper respiratory tract infection	1,652	1.2	1.8	1.4	2.1
Nasal congestion/sneezing	1,302	0.9	1.4	1.0	1.8
Shortness of breath, dyspnoea	779	0.6	0.8	0.6	1.0
Asthma	771	0.6	0.8	0.7	1.0
Musculoskeletal	**15,727**	**11.1**	**16.7**	**16.0**	**17.3**
Back complaint*	3,217	2.3	3.4	3.2	3.6
Knee complaint	1,299	0.9	1.4	1.3	1.5
Shoulder complaint	1,193	0.8	1.3	1.1	1.5
Foot/toe complaint	1,086	0.8	1.2	1.0	1.3
Leg/thigh complaint	1,023	0.7	1.1	1.0	1.2
Neck complaint	964	0.7	1.0	0.8	1.3
Skin	**14,702**	**10.4**	**15.6**	**15.0**	**16.2**
Rash*	2,720	1.9	2.9	2.7	3.1
Skin complaint	1,394	1.0	1.5	1.3	1.7
Check-up—skin*	1,170	0.8	1.2	0.7	1.8
Swelling*	1,038	0.7	1.1	1.0	1.2

(continued)

Table 4.13 (continued): Distribution of patient reasons for encounter, by ICPC-2 chapter and most frequent individual reasons for encounter within chapter

Reasons for encounter	Number	Per cent of total RFEs[(a)] (*n*=141,215)	Rate per 100 encounters[(b)] (*n*=94,386)	95% LCL	95% UCL
Circulatory	**9,892**	**7.0**	**10.5**	**10.0**	**11.0**
Check-up—cardiovascular*	4,483	3.2	4.8	4.4	5.1
Hypertension/high blood pressure*	1,587	1.1	1.7	1.3	2.1
Prescription—cardiovascular	851	0.6	0.9	0.5	1.3
Digestive	**9,364**	**6.6**	**9.9**	**9.5**	**10.3**
Abdominal pain*	1,776	1.3	1.9	1.7	2.0
Diarrhoea	1,311	0.9	1.4	1.2	1.5
Vomiting	884	0.6	0.9	0.8	1.1
Psychological	**7,178**	**5.1**	**7.6**	**7.2**	**8.0**
Depression*	1,773	1.3	1.9	1.7	2.1
Sleep disturbance	1,180	0.8	1.3	1.0	1.5
Anxiety*	916	0.7	1.0	0.8	1.1
Endocrine & metabolic	**5,816**	**4.1**	**6.2**	**5.8**	**6.5**
Prescription—endocrine/metabolic	916	0.7	1.0	0.7	1.2
Diabetes (non-gestational)*	722	0.5	0.8	0.6	1.0
Check-up—endocrine/metabolic*	699	0.5	0.7	0.5	1.0
Neurological	**4,855**	**3.4**	**5.1**	**4.9**	**5.4**
Headache	1,594	1.1	1.7	1.5	1.9
Vertigo/dizziness	1,136	0.8	1.2	1.1	1.3
Female genital system	**4,720**	**3.3**	**5.0**	**4.6**	**5.4**
Check-up/Pap smear*	1,707	1.2	1.8	1.5	2.1
Menstrual problems*	745	0.5	0.8	0.6	1.0
Ear	**3,701**	**2.6**	**3.9**	**3.7**	**4.1**
Ear pain	1,487	1.1	1.6	1.4	1.7
Pregnancy & family planning	**3,214**	**2.3**	**3.4**	**3.1**	**3.7**
Oral contraception*	904	0.6	1.0	0.8	1.1
Pre/postnatal check-up*	722	0.5	0.8	0.5	1.1
Eye	**2,567**	**1.8**	**2.7**	**2.6**	**2.9**
Urology	**2,376**	**1.7**	**2.5**	**2.4**	**2.7**
Male genital system	**1,156**	**0.8**	**1.2**	**1.1**	**1.4**
Blood	**1,142**	**0.8**	**1.2**	**1.0**	**1.5**
Social	**920**	**0.7**	**1.0**	**0.8**	**1.1**
Total RFEs	**141,215**	**100.0**	**149.6**	**147.8**	**151.5**

(a) Only those individual RFEs accounting for >=0.5% of total RFEs are included.

(b) Figures do not total 100 as more than one RFE can be recorded at each encounter.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: RFEs—reasons for encounter; LCL—lower confidence limit; UCL—upper confidence limit; NOS—not otherwise specified; NEC—not elsewhere classified.

Distribution of RFEs by ICPC-2 component

The distribution of patient RFEs by ICPC-2 component is presented in Table 4.14 expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence limits.

Table 4.14: Distribution of RFEs by ICPC-2 component

ICPC-2 component	Number	Per cent of total RFEs (*n*=141,215)	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL
Symptoms & complaints	67,323	47.7	71.3	69.4	73.2
Diagnoses, diseases	23,150	16.4	24.5	23.3	25.7
Diagnostic & preventive procedures	22,106	15.7	23.4	22.5	24.3
Medications, treatments & therapeutics	13,715	9.7	14.5	13.8	15.3
Referral & other RFE	6,940	4.9	7.4	6.9	7.9
Results	6,417	4.5	6.8	6.4	7.2
Administrative	1,564	1.1	1.7	1.5	1.8
Total RFEs	**141,215**	**100.0**	**149.6**	**147.8**	**151.5**

(a) Figures do not total 100 as more than one RFE can be recorded at each encounter.

Note: RFEs—reasons for encounter; LCL—lower confidence limit; UCL—upper confidence limit.

Most frequent patient reasons for encounter

The 30 most commonly recorded RFEs, listed in order of frequency in Table 4.15, accounted for more than half of all RFEs. In this analysis the specific ICPC-2 chapter to which an across-chapter RFE belongs is disregarded, such that, for example, 'check-up—all' includes all check-ups from all body systems irrespective of whether the type was specified.

Table 4.15: Most frequent patient reasons for encounter

Patient reason for encounter	Number	Per cent of total RFEs (*n*=141,215)	Rate per100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL
Check-up—all*	12,648	9.0	13.4	12.8	14.0
Prescription—all*	11,484	8.1	12.2	11.5	12.9
Test results*	6,417	4.5	6.8	6.4	7.2
Cough	5,555	3.9	5.9	5.5	6.2
Immunisation/vaccination—all*	4,088	2.9	4.3	3.8	4.9
Throat complaint	3,336	2.4	3.5	3.2	3.8
Back complaint*	3,217	2.3	3.4	3.2	3.6
Rash*	2,720	1.9	2.9	2.7	3.1
Abdominal pain*	1,776	1.3	1.9	1.7	2.0
Depression*	1,773	1.3	1.9	1.7	2.1
Fever	1,678	1.2	1.8	1.5	2.1
Upper respiratory tract infection	1,652	1.2	1.8	1.4	2.1
Headache	1,594	1.1	1.7	1.5	1.9
Hypertension/high blood pressure*	1,587	1.1	1.7	1.3	2.1

(continued)

Table 4.15 (continued): Most frequent patient reasons for encounter

Patient reason for encounter	Number	Per cent of total RFEs (*n*=141,215)	Rate per100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL
Weakness/tiredness	1,564	1.1	1.7	1.4	1.9
Ear pain	1,487	1.1	1.6	1.4	1.7
Skin complaint	1,394	1.0	1.5	1.3	1.7
Administrative procedure NOS	1,338	1.0	1.4	1.2	1.6
Diarrhoea	1,311	0.9	1.4	1.2	1.5
Nasal congestion/sneezing	1,302	0.9	1.4	1.0	1.8
Knee complaint	1,299	0.9	1.4	1.3	1.5
Shoulder complaint	1,193	0.8	1.3	1.1	1.5
Sleep disturbance	1,180	0.8	1.3	1.0	1.5
Vertigo/dizziness	1,136	0.8	1.2	1.1	1.3
Foot/toe complaint	1,086	0.8	1.2	1.0	1.3
Blood test NOS	1,062	0.8	1.1	0.8	1.4
Swelling*	1,038	0.7	1.1	1.0	1.2
Chest pain NOS	1,033	0.7	1.1	1.0	1.2
Leg/thigh complaint	1,023	0.7	1.1	0.9	1.2
Other reason for encounter NEC	971	0.7	1.0	0.7	1.4
Subtotal	*78,942*	*55.9*	–	–	–
Total RFEs	**141,215**	**100.0**	**149.6**	**147.8**	**151.5**

(a) Figures do not total 100 as more than one RFE can be recorded at each encounter. Also, only the most frequent RFEs are included.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: RFEs—reasons for encounter; LCL—lower confidence limit; UCL—upper confidence limit; NOS—not otherwise specified; NEC—not elsewhere classified.

4.5 Problems managed

A 'problem managed' is a formal statement of the provider's understanding of a health problem presented by the patient, family or community, and can be described in terms of a disease, symptom or complaint, social problem or ill-defined condition managed at the encounter. As GPs were instructed to record each problem to the most specific level possible from the information available, the problem managed may at times be limited to the level of a presenting symptom.

At each patient encounter, up to four problems could be recorded by the GP. A minimum of one problem was compulsory. The status of each problem to the patient—new (first presentation to a medical practitioner) or old (follow-up of previous problem)—was also indicated. The concept of a principal diagnosis, which is often used in hospital statistics, is not adopted in studies of general practice where multiple problem management is the norm rather than the exception. Further, the range of problems managed at the encounter often crosses multiple body systems and may include undiagnosed symptoms, psychosocial problems or chronic disease, which makes the designation of a principal diagnosis difficult. Thus the order in which the problems were recorded by the GP is not significant.

There are two ways to describe the relative frequency of problems managed: as a percentage of all problems managed in the study, or as a rate of problems managed per 100 encounters.

Where groups of problems are reported (e.g. circulatory problems), it must be remembered that more than one type of problem (e.g. hypertension and heart failure) may have been managed at a single encounter. In considering these results, the reader must be mindful that although a rate per 100 encounters for a single ungrouped problem (e.g. asthma, 2.6 per 100 encounters) can be regarded as equivalent to 'asthma is managed at 2.6% of encounters', such a statement cannot be made for grouped concepts (ICPC-2 chapters and those marked with an asterisk in the tables).

Number of problems managed at encounter

Table 4.16 shows the number of problems managed at each encounter. At two-thirds of encounters only one problem was managed.

Table 4.16: Number of problems managed at an encounter

Number of problems managed at encounter	Number of encounters	Per cent	95% LCL	95% UCL
One problem	62,803	66.5	65.3	67.7
Two problems	22,263	23.6	22.9	24.3
Three problems	7,277	7.7	7.3	8.2
Four problems	2,042	2.2	1.8	2.5
Total	**94,386**	**100.0**	**—**	**—**

Note: LCL—lower confidence limit; UCL—upper confidence limit.

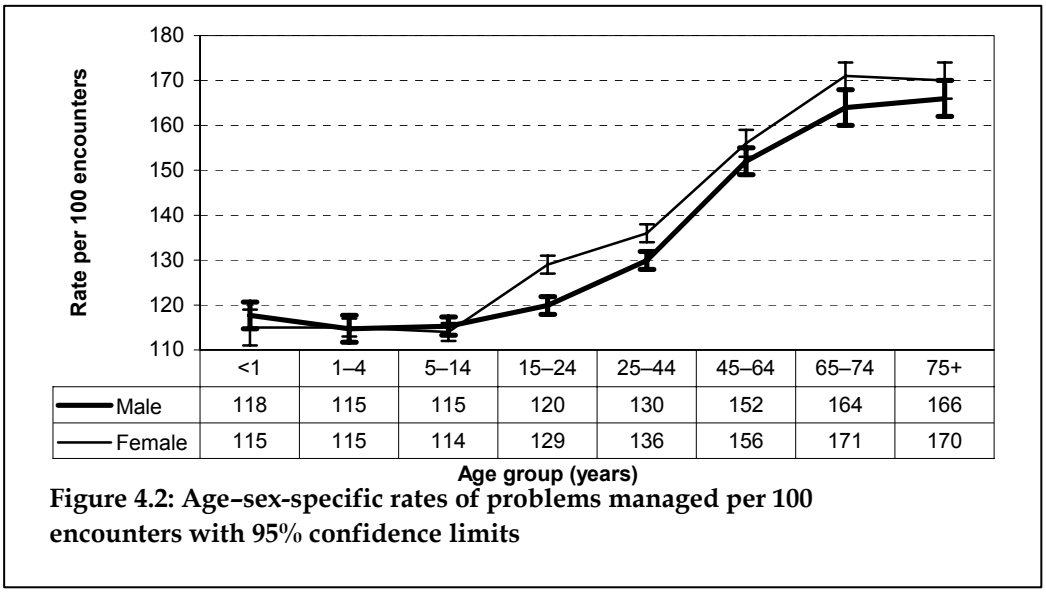


Figure 4.2: Age–sex-specific rates of problems managed per 100 encounters with 95% confidence limits

Age–sex-specific rates of problems managed

The number of problems managed at encounters increased steadily with the age of the patient. Significantly more problems were managed overall at encounters with female patients (148.0 per 100 encounters, 95% CI: 146.0–150.0) than at those with male patients (143.0 per 100 encounters, 95% CI: 141.0–145.0). Figure 4.2 shows the age–sex-specific rates of problems managed, and demonstrates that this difference was particularly evident in the 15–24 and 25–44 years age groups.

Nature of morbidity

Problems managed by ICPC-2 chapter

The frequency and the distribution of problems managed, by ICPC-2 chapter, are represented in Table 4.17. Rates per 100 encounters and the proportion of total problems are provided at the ICPC-2 chapter level and for individual problems. Only those problems accounting for at least 0.5% of all problems managed are listed in the table, in decreasing order of frequency within chapter.

Table 4.17: Distribution of problems managed, by ICPC-2 chapter and most frequent individual problems within chapter

Problem managed	Number	Per cent total problems[(a)] (*n*=137,330)	Rate per 100 encounters[(b)] (*n*=94,386)	95% LCL	95% UCL
Respiratory	**18,134**	**13.2**	**19.2**	**18.6**	**19.9**
Upper respiratory tract infection	5,241	3.8	5.6	5.1	6.0
Acute bronchitis/bronchiolitis	2,268	1.7	2.4	2.1	2.7
Asthma	2,206	1.6	2.3	2.2	2.5
Immunisation/vaccination—respiratory	2,062	1.5	2.2	1.1	3.2
Sinusitis	1,093	0.8	1.2	1.0	1.3
Tonsillitis*	991	0.7	1.1	0.9	1.2
Chronic obstructive pulmonary disease	716	0.5	0.8	0.6	1.0
Musculoskeletal	**16,676**	**12.1**	**17.7**	**17.1**	**18.3**
Back complaint*	2,673	2.0	2.8	2.6	3.0
Osteoarthritis*	2,614	1.9	2.8	2.6	3.0
Sprain/strain*	1,603	1.2	1.7	1.5	1.9
Fracture*	927	0.7	1.0	0.9	1.1
Osteoporosis	839	0.6	0.9	0.7	1.1
Injury musculoskeletal NOS	822	0.6	0.9	0.7	1.1
Bursitis/tendonitis/synovitis NOS	724	0.5	0.8	0.7	0.9
Skin	**16,267**	**11.8**	**17.2**	**16.6**	**17.9**
Contact dermatitis	1,798	1.3	1.9	1.7	2.1
Solar keratosis/sunburn	1,263	0.9	1.3	0.9	1.7
Malignant neoplasm skin	1,113	0.8	1.2	0.8	1.5
Skin disease, other	823	0.6	0.9	0.7	1.1
Circulatory	**15,301**	**11.1**	**16.2**	**15.5**	**16.9**
Hypertension*	8,406	6.1	8.9	8.4	9.4
Ischaemic heart disease*	1,116	0.8	1.2	1.0	1.4
Cardiac check-up*	924	0.7	1.0	0.7	1.2
Atrial fibrillation/flutter	778	0.6	0.8	0.6	1.0
Heart failure	654	0.5	0.7	0.5	0.9

(continued)

Table 4.17(continued): Distribution of problems managed, by ICPC-2 chapter and most frequent individual problems within chapter

Problem managed	Number	Per cent total problems[(a)] (*n*=137,330)	Rate per 100 encounters[(b)] (*n*=94,386)	95% LCL	95% UCL
General & unspecified	**14,279**	**10.4**	**15.1**	**14.5**	**15.7**
General check-up*	1,948	1.4	2.1	1.8	2.3
General immunisation/vaccination	1,914	1.4	2.0	1.7	2.4
Viral disease, other/NOS	1,144	0.8	1.2	0.9	1.5
Medication/request/renew/inject NOS	1,107	0.8	1.2	0.8	1.5
Results tests/procedures NOS	841	0.6	0.9	0.7	1.1
Endocrine & metabolic	**11,093**	**8.1**	**11.8**	**11.2**	**12.3**
Lipid disorder	3,148	2.3	3.3	3.1	3.6
Diabetes, non-gestational*	3,022	2.2	3.2	3.0	3.4
Psychological	**10,743**	**7.8**	**11.4**	**10.8**	**12.0**
Depression*	3,511	2.6	3.7	3.5	3.9
Anxiety*	1,639	1.2	1.7	1.5	1.9
Sleep disturbance	1,589	1.2	1.7	1.4	1.9
Digestive	**9,320**	**6.8**	**9.9**	**9.6**	**10.2**
Oesophageal disease	1,973	1.4	2.1	1.9	2.3
Gastroenteritis, presumed infection	999	0.7	1.1	0.9	1.2
Female genital system	**5,386**	**3.9**	**5.7**	**5.3**	**6.1**
Female genital check-up/Pap smear*	1,659	1.2	1.8	1.4	2.1
Menopausal complaint	879	0.6	0.9	0.8	1.1
Pregnancy & family planning	**3,601**	**2.6**	**3.8**	**3.5**	**4.1**
Oral contraception*	1,205	0.9	1.3	1.1	1.4
Pregnancy*	713	0.5	0.8	0.6	0.9
Ear	**3,829**	**2.8**	**4.1**	**3.9**	**4.2**
Acute otitis media/myringitis	1,098	0.8	1.2	1.0	1.3
Neurological	**3,427**	**2.5**	**3.6**	**3.5**	**3.8**
Migraine	669	0.5	0.7	0.6	0.8
Urology	**2,843**	**2.1**	**3.0**	**2.9**	**3.2**
Urinary tract infection*	1,622	1.2	1.7	1.6	1.8
Eye	**2,544**	**1.9**	**2.7**	**2.5**	**2.9**
Infectious conjunctivitis	686	0.5	0.7	0.6	0.9
Blood	**1,502**	**1.1**	**1.6**	**1.4**	**1.8**
Male genital system	**1,667**	**1.2**	**1.8**	**1.6**	**1.9**
Social	**720**	**0.5**	**0.8**	**0.6**	**1.0**
Total problems	**137,329.9**	**100.0**	**145.5**	**143.6**	**147.4**

(a) Figures do not total 100 as more than one problem can be recorded at each encounter.

(b) Only those individual problems accounting for >=0.5% of total problems are included.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: LCL—lower confidence limit; UCL—upper confidence limit; NOS—not otherwise specified.

Problems managed by ICPC-2 component

Problems managed in general practice may also be examined using the components of the ICPC-2 classification to provide a more thorough understanding of the types of problems managed during general practice encounters. Table 4.18 lists the distribution of problems managed by ICPC-2 component.

In the BEACH program, participating GPs are instructed to record the problem being managed at the encounter at the highest diagnostic level possible using the currently available evidence. As such, almost two-thirds of problems were expressed as diagnoses or diseases, with the majority of other problems expressed as symptoms or complaints, or as diagnostic or preventive procedures (such as check-ups). However, in some situations, rather than providing clinical details about the problem under management, a 'process' was recorded. That is, the problem was described in terms of a test result, an administrative procedure, or as a prescription.

Table 4.18: Distribution of problems managed, by ICPC-2 component

ICPC-2 component	Number	Per cent of total problems (*n*=137,330)	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL
Diagnosis, diseases	88,928	64.8	94.2	92.4	96.0
Symptoms & complaints	29,324	21.4	31.1	30.2	31.9
Diagnostic & preventive procedures	12,515	9.1	13.3	12.5	14.0
Medications, treatments & therapeutics	3,443	2.5	3.7	3.3	4.0
Referral & other RFE	1,316	1.0	1.4	1.2	1.6
Results	1,272	0.9	1.4	1.0	1.7
Administrative	531	0.4	0.6	0.4	0.7
Total problems	**137,330**	**100.0**	**145.5**	**143.6**	**147.4**

(a) Figures do not total 100 as more than one problem can be managed at each encounter.

Note: LCL—lower confidence limit; UCL—upper confidence limit, RFE—reason for encounter.

Most frequently managed problems

Overall, GPs managed 145.5 problems per 100 encounters. Table 4.19 shows the most frequently managed individual problems in general practice, in decreasing order of frequency. These 30 problems accounted for almost half of all problems managed.

In this analysis, the specific chapter to which 'across chapter concepts' (check-ups, immunisation/vaccination, and prescriptions) apply is ignored and the concept is grouped with all similar concepts. For example, immunisation/vaccination includes influenza vaccinations, along with immunisations for childhood diseases, and vaccinations for hepatitis.

The far right-hand column in Table 4.19 lists the percentage of a problem that was new to the patient, indicating the first presentation of a problem to a medical practitioner. This can provide a measure of general practice incidence. For example, only 5.6% of all contacts with hypertension were new problems to the patient. In contrast, more than three-quarters of URTI problems were new to the patient.

Table 4.19: Most frequently managed problems

Problem managed	Number	Per cent of total problems (*n*=137,330)	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL	Per cent new problems[(b)]
Hypertension*	8,406	6.1	8.9	8.4	9.4	5.6
Upper respiratory tract infection	5,241	3.8	5.6	5.1	6.0	77.5
Immunisation/vaccination—all*	4,382	3.2	4.6	4.1	5.2	58.9
Depression*	3,511	2.6	3.7	3.5	3.9	18.2
Lipid disorders*	3,148	2.3	3.3	3.1	3.6	12.1
Diabetes—all*	3,042	2.2	3.2	3.0	3.4	6.2
Back complaint*	2,673	2.0	2.8	2.6	3.0	24.5
Osteoarthritis*	2,613	1.9	2.8	2.6	3.0	17.6
Acute bronchitis/bronchiolitis	2,268	1.7	2.4	2.1	2.7	70.6
Asthma	2,206	1.6	2.3	2.2	2.5	19.3
Oesophageal disease	1,973	1.4	2.1	1.9	2.3	21.2
Prescription—all*	1,961	1.4	2.1	1.7	2.5	5.4
General check-up*	1,948	1.4	2.1	1.8	2.3	47.1
Contact dermatitis	1,798	1.3	1.9	1.7	2.1	44.5
Female genital check-up/Pap smear*	1,659	1.2	1.8	1.4	2.1	39.7
Anxiety*	1,639	1.2	1.7	1.5	1.9	20.0
Urinary tract infection*	1,622	1.2	1.7	1.6	1.8	61.4
Sprain/strain*	1,603	1.2	1.7	1.5	1.9	58.0
Sleep disturbance	1,589	1.2	1.7	1.4	1.9	18.0
Test results*	1,316	1.0	1.4	1.2	1.6	25.6
Solar keratosis/sunburn	1,263	0.9	1.3	0.9	1.7	45.2
Oral contraception*	1,205	0.9	1.3	1.1	1.4	17.5
Viral disease, other/NOS	1,144	0.8	1.2	0.9	1.5	76.1
Ischaemic heart disease*	1,116	0.8	1.2	1.0	1.4	9.5
Malignant neoplasm, skin	1,113	0.8	1.2	0.8	1.5	55.0
Acute otitis media/myringitis	1,098	0.8	1.2	1.0	1.3	72.2
Sinusitis acute/chronic	1,093	0.8	1.2	1.0	1.3	64.2
Gastroenteritis, presumed infection	999	0.7	1.1	0.9	1.2	74.8
Tonsillitis*	991	0.7	1.1	0.9	1.2	74.9
Fracture*	927	0.7	1.0	0.9	1.1	46.7
Subtotal	*65,548*	*47.7*	—	—	—	—
Total problems	**137,330**	**100.0**	**145.5**	**143.6**	**147.4**	**37.9**

(a) Figures do not total 100 as more than one problem can be recorded at each encounter. Also, only more frequently managed problems are included.

(b) The proportion of problems of this type that were new problems (the first presentation of a problem, including the first presentations of a recurrence of a previously resolved problem, but excluding the presentation of a problem first assessed by another provider).

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: UCL—upper confidence limit; LCL—lower confidence limit; NOS—not otherwise specified.

Most common new problems

For each problem managed, participating GPs are asked to indicate whether the problem under management is a new problem for the patient, or a problem that has been managed previously by any medical practitioner. Table 4.20 lists the most common new problems managed in general practice in 2004–05, in decreasing order of frequency. Overall, in 2004–05, 52,080 problems were specified as being 'new', being managed at a rate of 55.2 per 100 encounters.

The far right-hand column of this table shows the proportion of total contacts with this problem that were reported as being new problems to the patient. For example the 638 new cases of depression represented only 18% of all GP contacts with diagnosed depression. In contrast, almost three-quarters of the acute otitis media cases were first consultations to medical practitioners for this episode of acute otitis media. The balance (almost 30%) would have been follow-up consultations for this episode of this problem.

Most frequently managed chronic problems

Table 4.21 shows the most frequently managed chronic problems in Australian general practice in decreasing order of frequency. To identify chronic conditions, a chronic condition list classified according to ICPC-2 was applied to the BEACH data set.[35] One-third of the problems managed in general practice were chronic in nature in 2004–05. At least one chronic problem was managed at 39.2% of encounters (95% CI: 38.2–40.2), and chronic problems were managed at an average rate of 50.8 per 100 encounters.

In other parts of this chapter, both chronic and non-chronic conditions (e.g. hypertension and gestational hypertension) may be found in the groups reported (e.g. hypertension*, Table 4.19). However, in this section, only problems regarded as 'chronic' have been included in the analysis. Where the group used for the chronic analysis differs from that used in other analyses in this report, they are marked with a double asterisk. Codes included in the group may be found in Appendix 4, <www.aihw.gov.au/publications/index.cfm>. It is important to note that the condition labels and figures in this analysis may differ from those in Table 4.19 for this reason.

Table 4.20: Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (*n*=52,080)	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL	Per cent of this problem[(b)]
Upper respiratory tract infection	4,061	7.8	4.3	3.9	4.7	77.5
Immunisation/vaccination—all*	2,581	5.0	2.7	2.2	3.3	58.9
Acute bronchitis/bronchiolitis	1,601	3.1	1.7	1.5	1.9	70.6
Urinary tract infection*	997	1.9	1.1	0.9	1.2	61.4
Sprain/strain*	929	1.8	1.0	0.8	1.2	58.0
General check-up*	918	1.8	1.0	0.8	1.2	47.1
Viral disease, other/NOS	871	1.7	0.9	0.7	1.2	76.1
Contact dermatitis	801	1.5	0.9	0.7	1.0	44.5
Acute otitis media/myringitis	793	1.5	0.8	0.7	1.0	72.2
Gastroenteritis, presumed infection	747	1.4	0.8	0.6	1.0	74.8
Tonsillitis*	742	1.4	0.8	0.6	1.0	74.9
Sinusitis acute/chronic	702	1.4	0.7	0.6	0.9	64.2
Female genital check-up*	658	1.3	0.7	0.3	1.1	39.7
Back complaint*	655	1.3	0.7	0.6	0.8	24.5
Depression*	638	1.2	0.7	0.5	0.8	18.2
Malignant neoplasm skin	612	1.2	0.7	0.3	1.0	55.0
Solar keratosis/sunburn	571	1.1	0.6	0.3	0.9	45.2
Infectious conjunctivitis	554	1.1	0.6	0.4	0.7	80.7
Hypertension*	469	0.9	0.5	0.4	0.6	5.6
Osteoarthritis*	460	0.9	0.5	0.3	0.7	17.6
Skin disease, other	459	0.9	0.5	0.3	0.7	55.8
Excessive ear wax	443	0.9	0.5	0.3	0.6	62.8
Fracture*	433	0.8	0.5	0.3	0.6	46.7
Bursitis/tendonitis/synovitis NOS	425	0.8	0.5	0.3	0.6	58.7
Asthma	425	0.8	0.5	0.3	0.6	19.3
Oesophageal disease	418	0.8	0.4	0.3	0.6	21.2
Otitis externa	420	0.8	0.4	0.3	0.6	61.9
Skin injury, other	402	0.8	0.4	0.2	0.7	61.1
Dermatophytosis	389	0.8	0.4	0.3	0.6	64.7
Lipid disorders*	381	0.7	0.4	0.2	0.6	12.1
Subtotal	*24,555*	*47.1*	—	—	—	—
Total new problems	**52,080**	**100.0**	**55.2**	**53.8**	**56.5**	—

(a) Figures do not total 100 as more than one new problem can be recorded at each encounter. Also, only the most frequently managed new problems are included.

(b) The proportion of total contacts with this problem that were accounted for by new problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: LCL—lower confidence limit; UCL—upper confidence limit; NOS—not otherwise specified.

Table 4.21: Most frequently managed chronic problems

Chronic problem managed	Number	Per cent of total chronic problems (*n*=47,291)	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL
Hypertension (non-gestational)**	8,391	17.5	8.9	8.4	9.4
Depressive disorder	3,489	7.3	3.7	3.5	3.9
Lipid disorders*	3,148	6.6	3.3	3.1	3.6
Diabetes (non-gestational)**	3,022	6.3	3.2	3.0	3.4
Osteoarthritis*	2,613	5.5	2.8	2.6	3.0
Asthma	2,206	4.6	2.3	2.2	2.5
Oesophageal disease	1,973	4.1	2.1	1.9	2.3
Ischaemic heart disease*	1,116	2.3	1.2	1.0	1.4
Malignant neoplasm, skin	1,113	2.3	1.2	0.8	1.5
Back syndrome with radiating pain	896	1.9	1.0	0.8	1.1
Osteoporosis	839	1.8	0.9	0.7	1.1
Atrial fibrillation/flutter	778	1.6	0.8	0.6	1.0
Obesity	732	1.5	0.8	0.5	1.1
Chronic obstructive pulmonary disease	716	1.5	0.8	0.6	1.0
Migraine	668	1.4	0.7	0.6	0.8
Arthritis**	668	1.4	0.7	0.4	1.0
Heart failure	654	1.4	0.7	0.5	0.9
Hypothyroidism/myxoedema	588	1.2	0.6	0.5	0.8
Gout	583	1.2	0.6	0.5	0.8
Schizophrenia	468	1.0	0.5	0.1	0.9
Anxiety disorder	452	0.9	0.5	0.2	0.8
Anaemia (chronic)**	444	0.9	0.5	0.3	0.6
Dementia	436	0.9	0.5	0.0	1.0
Shoulder syndrome	421	0.9	0.5	0.2	0.6
Rheumatoid arthritis	417	0.9	0.4	0.3	0.6
Acne (chronic)**	410	0.9	0.4	0.3	0.6
Neck syndrome	355	0.7	0.4	0.1	0.6
Overweight	355	0.7	0.4	0.0	0.9
Sprain/strain**	346	0.7	0.4	0.1	0.6
Vertiginous syndromes	337	0.7	0.4	0.2	0.5
Back syndrome without radiating pain	333	0.7	0.4	0.0	0.7
Epilepsy	316	0.7	0.3	0.2	0.5
Subtotal	*39,283*	*83.1*	—	—	—
Total chronic problems	47,921	100.0	50.8	49.1	52.5

(a) Figures do not total 100 as more than one chronic problem can be recorded at each encounter. Also, only the most frequently managed chronic problems are included.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

** Indicates that this group differs from that used for analysis in other sections of this chapter, as only chronic conditions have been included in this analysis (see Appendix 4 <www.aihw.gov.au/publications/index.cfm> for codes included in analysis of chronic conditions).

Note: LCL—lower confidence limit; UCL—upper confidence limit.

4.6 Overview of management

The BEACH survey form allowed GPs to record several aspects of patient management for each problem managed at each encounter. Pharmaceutical management was recorded in detail. Other modes of treatment, including clinical treatments (e.g. counselling) and procedures recorded briefly in the GP's own words, were also related to a single problem. Provision was made on the form for referrals and hospital admissions, and for pathology and imaging orders to be related to multiple problems.

GPs undertook 201,861 management activities in total. Of these:

- the most common management activity was medication, either prescribed, GP-supplied, or advised for over-the-counter purchase
- other treatments were the second most common management activity, with clinical treatments occurring more frequently than procedural treatments (Table 4.22).

Table 4.22: Summary of management

Management type	Number	Rate per 100 encounters (*n*=94,386)	95% LCL	95% UCL	Rate per 100 problems (*n*=137,330)	95% LCL	95% UCL
Medications	95,816	101.5	99.3	103.8	69.8	68.9	71.2
Prescribed	78,711	83.4	81.2	85.5	57.3	55.9	58.7
GP-supplied	7,613	8.1	7.3	8.9	5.5	5.0	6.1
Advised OTC	9,492	10.1	9.1	11.0	6.9	6.3	7.5
Other treatments	51,632	54.7	52.1	57.3	37.6	36.0	39.2
Clinical	37,016	39.2	37.1	41.4	27.0	25.6	28.3
Procedural	14,616	15.5	14.6	16.4	10.6	10.0	11.3
Referrals	10,881	11.5	11.1	12.0	7.9	7.6	8.2
Specialist	7,291	7.7	7.4	8.0	5.3	5.1	5.5
Allied health	2,569	2.7	2.5	2.9	1.9	1.7	2.0
Hospital	451	0.5	0.3	0.7	0.3	0.2	0.5
Emergency dept	152	0.2	0.0	0.4	0.1	0.0	0.3
Other medical services	103	0.1	0.0	0.6	0.1	0.0	0.4
Other referral	315	0.3	0.1	0.6	0.2	0.1	0.4
Pathology	34,652	36.7	35.2	38.2	25.2	24.3	26.2
Imaging	7,840	8.3	8.0	8.6	5.7	5.5	5.9
Other investigations	1,040	1.1	0.9	1.3	0.8	0.6	0.9
Total management activities	**201,861**	**213.9**	**—**	**—**	**147.0**	**—**	**—**

Note: LCL—lower confidence limit; UCL—upper confidence limit; OTC—over-the-counter.

Another perspective emerges in analysis of the number of encounters or problems for which at least one form of management was recorded by the GP. At least one management action was recorded at 91.9% of encounters and for 87.1% of problems managed.

- At least one medication or other treatment was given for three-quarters of the problems managed.
- At least one medication (most commonly prescribed) was prescribed/supplied or advised for over half the problems managed.

- At least one other treatment (most commonly clinical) was provided for one-third of problems managed.
- At least one referral (most commonly to a specialist) was made for one in twelve problems managed.
- At least one investigation (most commonly pathology) was requested for one in six problems managed (Table 4.23).

Table 4.23: Encounters and problems for which management was recorded

Management type	Number of encounters	Per cent of total encs[(a)] (*n*=94,386)	Number of problems	Per cent of total probs[(a)] (*n*=137,330)
At least one management type	**86,742**	**91.9**	**119,591**	**87.1**
At least one medication or other treatment	**77,797**	**82.4**	**102,887**	**74.9**
At least one medication	**60,693**	**64.3**	**75,796**	**55.2**
At least one prescription	51,718	54.8	64,166	46.7
At least one GP-supplied	5,828	6.2	6,002	4.4
At least one OTC advised	8,244	8.7	8,508	6.2
At least one other treatment	**38,916**	**41.2**	**44,450**	**32.4**
At least one clinical treatment	28,808	30.5	32,505	23.7
At least one procedural treatment	13,060	13.8	13,470	9.8
At least one referral	**10,325**	**10.9**	**10,893**	**7.9**
At least one referral to a specialist	7,052	7.5	7,389	5.4
At least one referral to allied health	2,481	2.6	2,561	1.9
At least one referral to hospital	451	0.5	473	0.3
At least one referral to emergency department	152	0.2	157	0.1
At least one referral to other medical services	103	0.1	105	0.1
At least one referral NOS	315	0.3	335	0.2
At least one investigation	**20,533**	**21.8**	**23,191**	**16.9**
At least one pathology order	14,840	15.7	16,735	12.2
At least one imaging order	6,886	7.3	7,116	5.2
At least one other investigation	975	1.0	993	0.7

(a) Figures will not total 100 as multiple events may occur in one encounter or in the management of one problem at encounter.

Note: Encs—encounters; probs—problems; OTC—over-the-counter; NOS—not otherwise specified.

The combinations of management types related to each problem were then investigated. The majority of treatments occurred either as a single component or in combination with one other component. Management was provided:

- as a single component for almost two-thirds of the problems managed
- as a double component for just under one in five problems managed
- rarely with more than two components.

Table 4.24 lists the most common management combinations. Medication alone was the most common management, followed by the combination of medication and a clinical treatment.

Table 4.24: Most common management combinations

1+ medication	1+ clinical treatment	1+ procedural treatment	1+ referral	1+ imaging order	1+ pathology order	Per cent of total encs (*n*=94,386)	Per cent of total probs (*n*=137,330)
No recorded management						**8.1**	**12.9**
1+ management recorded						**91.9**	**87.1**
✓						31.7	37.0
✓	✓					12.1	7.9
	✓					8.0	10.8
✓					✓	4.0	2.8
✓		✓				3.9	2.5
		✓				3.7	4.3
			✓			3.3	4.1
					✓	2.9	4.7
✓			✓			2.5	1.3
✓	✓				✓	1.7	0.6
				✓		1.6	1.0
✓				✓		1.6	2.0
	✓				✓	1.4	1.3
✓	✓	✓				1.2	0.4
✓	✓		✓			1.1	0.3

Note: 1+—at least one specified management type; encs—encounters; probs—problems.

4.7 Medications

- GPs could record up to four medications for each of four problems—a maximum of 16 medications per encounter.
- Each medication could be recorded as prescribed (the default), supplied by the GP or recommended for over-the-counter (OTC) purchase.
- GPs were asked to:
  - enter the generic or brand name, the strength, regimen and number of repeats ordered for each medication
  - to designate this as a new or continued medication for that patient for this problem.
- Generic or brand names were entered into the database in the form recorded by the GP.
- Medications were coded using the CAPS system (developed by the Family Medicine Research Centre) from which they were classified to the international ATC classification (see Chapter 5—Methods).[31]
- Results are reported in this chapter at drug group and generic level using ATC Levels 3 and 5.

Source of medications

A total of 95,816 medications were recorded at rates of 102 per 100 encounters and 70 per 100 problems managed (Table 4.22).

- Four out of five medications (82.1%) were prescribed.
- Less than one in ten (8.0%) medications were supplied to the patient by the GP.
- One in ten medications (9.9%) were recommended by the GP for OTC purchase.

If we extrapolate to the 95 million A1 and A2 Medicare-claimed encounters in Australia in 2004, GPs in Australia:

- prescribed almost 79 million medications (not counting repeats)
- supplied almost eight million medications directly to the patient
- recommended almost 10 million medications for OTC purchase.

Prescribed medications

There were 78,711 prescriptions recorded, at rates of 83 per 100 encounters and 57 per 100 problems managed.

On a per problem basis:

- no prescription was given for half (53.3%) of all problems managed
- one prescription was given for almost 40% of problems managed
- two prescriptions were given for 6% of problems managed
- three or more prescriptions were rarely given (1.9% of problems managed) (Figure 4.3).

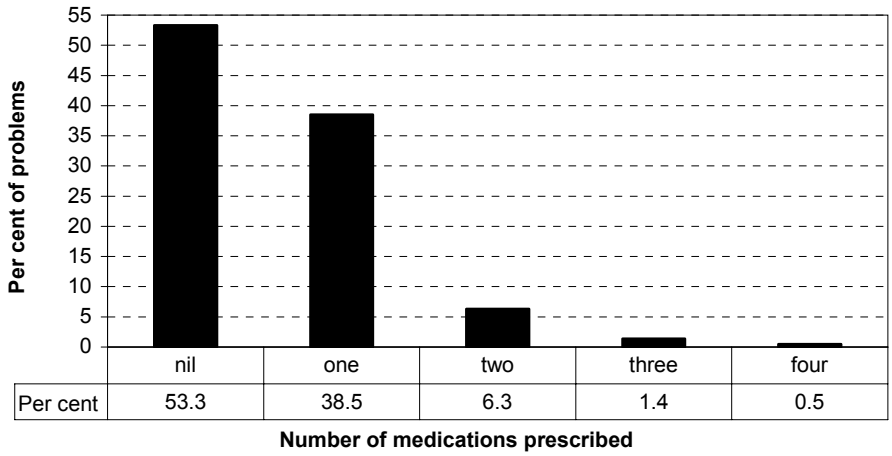


Figure 4.3: Number of medications prescribed per problem

Number of repeats

For the 57,625 prescriptions for which data were available, the distribution of the specified number of repeats (from zero to 6+) is provided in Figure 4.4. For 38.5% of these prescriptions, the GP specified that no repeats had been prescribed and for 28.3%, five repeats were ordered. The latter proportion reflects the Pharmaceutical Benefits Scheme (PBS) provision of one month's supply and five repeats for many medications used for chronic conditions such as hypertension. The ordering of one or two repeats (17.6% and 10.6%) was also common.

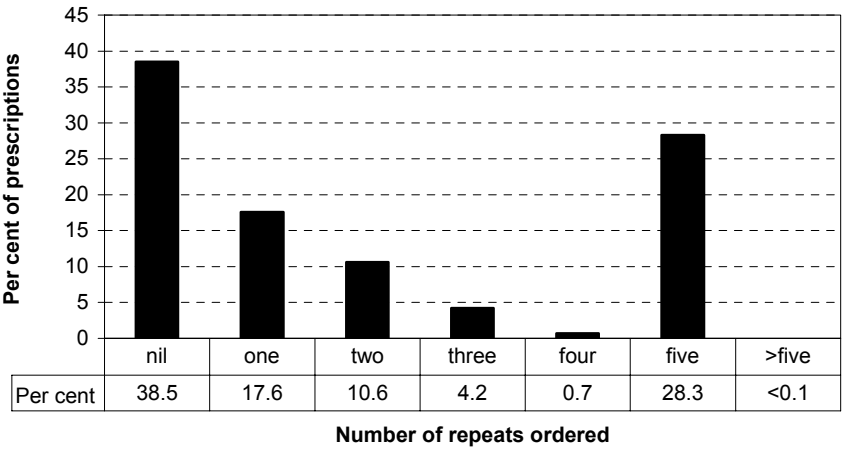


Figure 4.4: Number of repeats ordered per prescription

Age–sex-specific rates of prescribed medications

Age–sex-specific analysis found similar prescription rates per 100 encounters for males and females (results not shown). It also showed the well-described tendency for the number of prescriptions written at each encounter to rise with advancing age of the patient, with a rate of about 60 per 100 encounters with patients aged less than 25 years rising to over 100 per 100 encounters for patients aged 65 year or more (results not shown).

Figure 4.5, however, demonstrates that the age-based increase almost disappears if the prescription rate is related to problems. This suggests that the increased prescription rate in older patients is largely accounted for by the increased number of health problems they have managed in general practice.

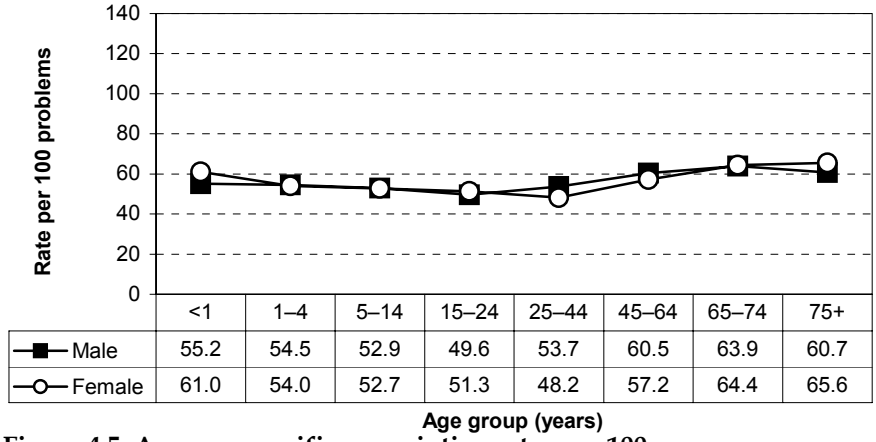


Figure 4.5: Age–sex-specific prescription rates per 100 problems managed

Types of medications prescribed

Table 4.25 shows the distribution of prescribed medications using the WHO ATC classification.[31] This allows comparison with other data sources such as those produced by the HIC for PBS data. The table lists medications in frequency order within ATC Levels 1, 3 and 5. Prescriptions are presented as a percentage of total prescriptions and as a rate per 100 encounters with 95% confidence intervals.

Table 4.25: Distribution of prescribed medications, by ATC Levels 1, 3 and 5

ATC Level 1	ATC Level 3	ATC Level 5	Number	Per cent of scripts (*n*=78,711)	Rate per 100 encs[(a)] (*n*=94,386)	95% LCL	95% UCL
Nervous system			**16,580**	**21.1**	**17.6**	**16.8**	**18.3**
	Other analgesics and anti-pyretics		5,157	6.6	5.5	5.1	5.8
		Paracetamol	2,540	3.2	2.7	2.4	3.0
		Paracetamol, combinations excl. psycholeptics	1,975	2.5	2.1	1.9	2.3
		Acetylsalicylic acid	622	0.8	0.7	0.5	0.8
	Anti-depressants		2,891	3.7	3.1	2.9	3.2
		Sertraline	558	0.7	0.6	0.5	0.7
	Opioids		2,380	3.0	2.5	2.3	2.8
		Tramadol	958	1.2	1.0	0.8	1.2
		Oxycodone	491	0.6	0.5	0.3	0.7
		Morphine	440	0.6	0.5	0.2	0.8
	Anxiolytics		1,843	2.3	2.0	1.7	2.2
		Diazepam	1,028	1.3	1.1	0.9	1.3
		Oxazepam	596	0.8	0.6	0.4	0.8
	Hypnotics and sedatives		1,743	2.2	1.8	1.7	2.0
		Temazepam	1,074	1.4	1.1	1.0	1.3
	Anti-psychotics		1,034	1.3	1.1	0.9	1.3
		Prochlorperazine	504	0.6	0.5	0.4	0.7
	Anti-epileptics		513	0.7	0.5	0.3	0.8
	Drugs used in addictive disorders		424	0.5	0.4	0.0	1.3
Anti-infectives for systemic use			**16,427**	**20.9**	**17.4**	**16.8**	**18.1**
	Beta-lactam antibacterials, penicillins		5,901	7.5	6.3	5.9	6.6
		Amoxycillin	3,317	4.2	3.5	3.2	3.8
		Amoxycillin and enzyme inhibitor	1,592	2.0	1.7	1.5	1.9
	Other beta-lactam antibacterials		3,107	3.9	3.3	3.0	3.6
		Cephalexin	2,260	2.9	2.4	2.2	2.6
		Cefaclor	764	1.0	0.8	0.4	1.2
	Macrolides, lincosamides and streptogramins		2,061	2.6	2.2	2.0	2.4
		Roxithromycin	1,069	1.4	1.1	0.9	1.4
		Erythromycin	473	0.6	0.5	0.3	0.7
		Clarithromycin	441	0.6	0.5	0.1	0.8
	Viral vaccines		1,595	2.0	1.7	1.2	2.1
		Influenza, inactivated, whole virus	820	1.0	0.9	0.0	1.8
	Bacterial vaccines		953	1.2	1.0	0.7	1.3
	Tetracyclines		861	1.1	0.9	0.8	1.1
		Doxycycline	696	0.9	0.7	0.6	0.9
	Sulfonamides and trimethoprim		636	0.8	0.7	0.5	0.8

(continued)

Table 4.25 (continued): Distribution of prescribed medications, by ATC Levels 1, 3 and 5

ATC Level 1	ATC Level 3	ATC Level 5	Number	Per cent of scripts (*n*=78,711)	Rate per 100 encs[a] (*n*=94,386)	95% LCL	95% UCL
		Trimethoprim	414	0.5	0.4	0.2	0.6
	Other antibacterials		457	0.6	0.5	0.3	0.6
Cardiovascular system			**13,899**	**17.7**	**14.7**	**13.9**	**15.5**
	Cholesterol and triglyceride reducers		2,860	3.6	3.0	2.8	3.2
		Atorvastatin	1,314	1.7	1.4	1.2	1.5
		Simvastatin	1,016	1.3	1.1	0.9	1.3
	ACE inhibitors, plain		2,300	2.9	2.4	2.2	2.6
		Perindopril	775	1.0	0.8	0.7	1.0
		Ramipril	746	0.9	0.8	0.6	1.0
	Angiotensin II antagonists, plain		1,463	1.9	1.6	1.4	1.7
	Beta-blocking agents		1,572	2.0	1.7	1.5	1.8
		Irbesartan	828	1.1	0.9	0.7	1.0
	Selective calcium channel blockers with mainly vascular effects		1,271	1.6	1.3	1.2	1.5
		Amlodipine	603	0.8	0.6	0.5	0.8
	Angiotensin II antagonists, combinations		899	1.1	1.0	0.8	1.1
		Irbesartan and diuretics	643	0.8	0.7	0.5	0.9
	Selective calcium channel blockers with direct cardiac effects		594	0.8	0.6	0.5	0.8
	High-ceiling diuretics		584	0.7	0.6	0.5	0.8
		Furosemide	579	0.7	0.6	0.4	0.8
	ACE inhibitors, combinations		542	0.7	0.6	0.4	0.7
	Vasodilators used in cardiac disease		441	0.6	0.5	0.3	0.7
	Low-ceiling diuretics, excl. thiazides		412	0.5	0.4	0.2	0.7
		Indapamide	398	0.5	0.4	0.2	0.7
Alimentary tract and metabolism			**6,912**	**8.8**	**7.3**	**7.0**	**7.7**
	Drugs for peptic ulcer and GORD		2,496	3.2	2.6	2.5	2.8
		Esomeprazole	673	0.9	0.7	0.6	0.8
		Omeprazole	600	0.8	0.6	0.5	0.8
	Oral blood glucose lowering drugs		1,630	2.1	1.7	1.5	1.9
		Metformin	899	1.1	1.0	0.8	1.1
		Gliclazide	415	0.5	0.4	0.2	0.6
	Propulsives		554	0.7	0.6	0.4	0.7
		Metoclopramide	467	0.6	0.5	0.3	0.7
Musculoskeletal system			**5,430**	**6.9**	**5.8**	**5.5**	**6.0**
	Anti-inflammatory and antirheumatic products, non-steroids		4,214	5.4	4.5	4.2	4.7
		Diclofenac	1,026	1.3	1.1	0.9	1.3
		Celecoxib	877	1.1	0.9	0.7	1.1
		Meloxicam	768	1.0	0.8	0.6	1.0

(continued)

Table 4.25 (continued): Distribution of prescribed medications, by ATC Levels 1, 3 and 5

ATC Level 1	ATC Level 3	ATC Level 5	Number	Per cent of scripts (*n*=78,711)	Rate per 100 encs[(a)] (*n*=94,386)	95% LCL	95% UCL
		Ibuprofen	447	0.6	0.5	0.3	0.6
	Anti-gout preparations		470	0.6	0.5	0.3	0.7
	Drugs affecting bone structure and mineralisation		443	0.6	0.5	0.3	0.6
Respiratory system			**5,108**	**6.5**	**5.4**	**5.1**	**5.8**
	Adrenergics, inhalants		2,583	3.3	2.7	2.5	2.9
		Salbutamol	1,309	1,7	1.4	1.2	1.5
		Salmeterol with other drugs for obstructive airways disease	813	1.0	0.9	0.7	1.0
	Other drugs for obstructive airway disease, inhalants		901	1.1	1.0	0.8	1.1
	Decongestants and other nasal preparations for topical use		700	0.9	0.7	0.5	1.0
	Antihistamines for systemic use		400	0.5	0.4	0.2	0.7
Dermatologicals			**3,896**	**4.9**	**4.1**	**3.9**	**4.4**
	Corticosteroids, plain		2,406	3.1	2.5	2.4	2.7
		Mometasone	761	1.0	0.8	0.7	1.0
		Betamethasone	678	0.9	0.7	0.6	0.9
Genitourinary system and sex hormones			**3,375**	**4.3**	**3.6**	**3.4**	**3.8**
	Hormonal contraceptives for systemic use		1,828	2.3	1.9	1.8	2.1
		Levonorgestrel and oestrogen	973	1.2	1.0	0.9	1.2
	Oestrogens		527	0.7	0.6	0.4	0.7
Sensory organs			**2,480**	**3.2**	**2.6**	**2.4**	**2.8**
	Anti-infectives ophthalmological		980	1.2	1.0	0.9	1.2
		Chloramphenicol	889	1.1	0.9	0.8	1.1
	Corticosteroids with anti-infectives otological		660	0.8	0.7	0.5	0.9
		Dexamethasone with anti-infectives	432	0.5	0.5	0.3	0.6
Blood and blood-forming organs			**1,987**	**2.5**	**2.1**	**1.9**	**2.3**
	Anti-thrombotic agents		1,225	1.6	1.3	1.1	1.5
		Warfarin	887	1.1	0.9	0.7	1.2
	Vitamin B12 and folic acid		434	0.6	0.5	0.2	0.7
Systemic hormonal preparations, excl. sex hormones and insulins			**1,815**	**2.3**	**1.9**	**1.7**	**2.1**
	Corticosteroids for systemic use, plain		1,156	1.5	1.2	1.0	1.4
		Prednisolone	650	0.8	0.7	0.5	0.9
	Thyroid preparations		583	0.7	0.6	0.4	0.8
		Levothyroxine sodium	573	0.7	0.6	0.4	0.8
Anti-neoplastic and immunomodulating agents			**355**	**0.5**	**0.4**	**0.1**	**0.7**
Various			**315**	**0.4**	**0.3**	**0.2**	**0.5**
Anti-parasitic products, insecticides and repellents			**132**	**0.2**	**0.1**	**0.0**	**0.4**

(a) Column will not add to 100 because multiple prescriptions could be written at each encounter and only the most frequent Level 3 and Level 5 drugs are included.

Note: Scripts—prescriptions; encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit; excl—excluding; ACE—angiotensin converting enzyme; GORD—gastro-oesophageal reflux disease.

Most frequently prescribed medications

The most frequently prescribed individual medications are reported at the generic level in Table 4.26. Together, these 30 medications accounted for 43.2% of all prescribed medications.

Table 4.26: Most frequently prescribed medications (CAPS generic level)

Generic medication	Number	Per cent of scripts (*n*=78,711)	Rate per 100 encs[(a)] (*n*=94,386)	95% LCL	95% UCL
Amoxycillin	3,317	4.2	3.5	3.2	3.8
Paracetamol	2,540	3.2	2.7	2.4	3.0
Cephalexin	2,260	2.9	2.4	2.2	2.6
Paracetamol/codeine	1,875	2.4	2.0	1.8	2.2
Amoxycillin/potassium clavulanate	1,592	2.0	1.7	1.5	1.9
Salbutamol	1,346	1.7	1.4	1.3	1.6
Atorvastatin	1,314	1.7	1.4	1.2	1.5
Temazepam	1,074	1.4	1.1	1.0	1.3
Roxithromycin	1,069	1.4	1.1	0.9	1.4
Diazepam	1,028	1.3	1.1	0.9	1.3
Simvastatin	1,016	1.3	1.1	0.9	1.3
Levonorgestrel/ethinyloestradiol	973	1.2	1.0	0.9	1.2
Tramadol	958	1.2	1.0	0.8	1.2
Metformin	899	1.1	1.0	0.8	1.1
Diclofenac sodium systemic	897	1.1	1.0	0.8	1.1
Chloramphenicol eye	889	1.1	0.9	0.8	1.1
Warfarin sodium	887	1.1	0.9	0.7	1.2
Celecoxib	877	1.1	0.9	0.7	1.1
Atenolol	851	1.1	0.9	0.7	1.1
Irbesartan	828	1.1	0.9	0.7	1.0
Influenza virus vaccine	820	1.0	0.9	0.0	1.8
Fluticasone/salmeterol	813	1.0	0.9	0.7	1.0
Perindopril	775	1.0	0.8	0.7	1.0
Meloxicam	768	1.0	0.8	0.6	1.0
Cefaclor monohydrate	764	1.0	0.8	0.4	1.2
Mometasone	761	1.0	0.8	0.7	1.0
Ramipril	746	0.9	0.8	0.6	1.0
Doxycycline	696	0.9	0.7	0.6	0.9
Betamethasone topical	678	0.9	0.7	0.6	0.9
Esomeprazole	673	0.9	0.7	0.6	0.8
Subtotal	*33,984*	*43.2*	—	—	—
Total prescribed medications	**78,711**	**100.0**	**83.4**	**81.2**	**85.5**

(a) Column will not add to 100 because multiple prescriptions could be written at each encounter and only the most frequently prescribed medications are included in this table.

Note: Scripts—prescriptions; encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit.

Medications supplied by GPs

GPs supplied their patients with a total of 7,613 medications in this study, at a rate of 8.1 medications per 100 encounters and 5.5 per 100 problems. At least one medication was supplied at 6.2% of encounters for 4.4% of problems.

The distribution of supplied medications by group showed that those acting on the allergy/immune system constituted 50.4% of all medications supplied. Hormones made up 5.7%, and central nervous system medications accounted for 5.4% of GP-supplied medications (results not presented). Table 4.27 shows the wide range of the most commonly supplied medications.

Table 4.27: Medications most frequently supplied by GPs

Generic medication	Number	Per cent of GP-supplied (*n*=7,613)	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL
Influenza virus vaccine	1,171	15.4	1.2	0.0	2.9
Pneumococcal vaccine	413	5.4	0.4	0.0	1.0
Polio vaccine oral sabin/injection	407	5.3	0.4	0.2	0.7
Triple antigen (diphtheria/pertussis/tetanus)	241	3.2	0.3	0.0	0.7
Mumps/measles/rubella vaccine	237	3.1	0.3	0.0	0.5
Haemophilus B vaccine	192	2.5	0.2	0.0	0.5
Vitamin B12 (cobalamin)	184	2.4	0.2	0.0	0.6
ADT/CDT (diphtheria/tetanus) vaccine	181	2.4	0.2	0.0	0.4
Meloxicam	177	2.3	0.2	0.0	0.6
Diphtheria/pertussis/tetanus/hepatitis B	177	2.3	0.2	0.0	0.5
Meningitis vaccine	161	2.1	0.2	0.0	0.5
Celecoxib	108	1.4	0.1	0.0	0.4
Hepatitis B vaccine	107	1.4	0.1	0.0	0.6
Metoclopramide	80	1.1	0.1	0.0	0.4
Allergen treatment	79	1.0	0.1	0.0	0.4
Amoxycillin	78	1.0	0.1	0.0	1.1
Esomeprazole	75	1.0	0.1	0.0	0.4
Betamethasone systemic	75	1.0	0.1	0.0	1.1
Rabeprazole	70	0.9	0.1	0.0	0.4
Tetanus toxoid vaccine	62	0.8	0.1	0.0	0.4
Hepatitis A and B vaccine	61	0.8	0.1	0.0	0.4
Sertraline	57	0.8	0.1	0.0	0.4
Salbutamol	57	0.8	0.1	0.0	0.4
Dressings other	57	0.8	0.1	0.0	0.7
Budesonide/eformoterol	57	0.7	0.1	0.0	0.4
Haemophilus B/hepatitis B vaccine	56	0.7	0.1	0.0	1.0
Chickenpox (Varicella zoster) vaccine	53	0.7	0.1	0.0	0.7

(continued)

Table 4.27 (continued): Medications most frequently supplied by GPs

Generic medication	Number	Per cent of GP-supplied (*n*=7,613)	Rate per 100 encs[(a)] (*n*=94,386)	95% LCL	95% UCL
Hepatitis A vaccine	52	0.7	0.1	0.0	0.5
Pantoprazole	52	0.7	0.1	0.0	0.5
Paracetamol/codeine	51	0.7	0.1	0.0	0.6
Subtotal	*4,828*	*63.4*	—	—	—
Total medications supplied	**7,613**	**100.0**	**8.1**	**7.3**	**8.9**

(a) Column will not add to 100 because multiple medications could be given at each encounter and only the medications most frequently supplied by GPs are included.

Note: Encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit.

Medications advised for over-the-counter purchase

The GPs recorded 9,492 medications as recommended for OTC purchase, at rates of 10.1 per 100 encounters and 6.9 per 100 problems managed. At least one OTC medication was recorded as advised at 8.7% of encounters and for 6.2% of problems.

Central nervous system medications predominated in those advised to patients, with almost 30% being in that group, followed by skin medications and digestive medications (results not presented).

Table 4.28 shows the wide range of advised medications. It includes analgesics, and cold and skin preparations. The 30 listed medications accounted for over 60% of all OTC medications.

Table 4.28: Most frequently advised over-the-counter medications

Generic medication	Number	Per cent of OTCs (*n*=9,492)	Rate per 100 encs[(a)] (*n*=94,386)	95% LCL	95% UCL
Paracetamol	2,197	23.1	2.3	1.8	2.8
Ibuprofen	506	5.3	0.5	0.2	0.9
Loratadine	212	2.2	0.2	0.0	0.6
Saline bath/solution/gargle	207	2.2	0.2	0.0	0.7
Diclofenac topical	198	2.1	0.2	0.0	0.5
Fexofenadine	175	1.8	0.2	0.0	0.5
Simple analgesics	147	1.5	0.2	0.0	0.8
Clotrimazole topical	146	1.5	0.2	0.0	0.4
Sodium chloride topical nasal	136	1.4	0.1	0.0	0.5
Mouthwash/gargle other	123	1.3	0.1	0.0	0.9
Paracetamol/codeine	120	1.3	0.1	0.0	0.6
Cetirzine	115	1.2	0.1	0.0	0.4
Sodium/potassium/citric/glucose	114	1.2	0.1	0.0	0.5
Glucosamine	113	1.2	0.1	0.0	0.4
Aspirin	109	1.1	0.1	0.0	0.5

(continued)

Table 4.28 (continued): Most frequently advised over-the-counter medications

Generic medication	Number	Per cent of OTCs (*n*=9,492)	Rate per 100 encs[(a)] (*n*=94,386)	95% LCL	95% UCL
Cream/ointment/lotion NEC	100	1.0	0.1	0.0	0.4
Sod bicarb/citrate/tartaric/citric	97	1.0	0.1	0.0	0.4
Loperamide	87	0.9	0.1	0.0	0.5
Hyoscine butylbromide	86	0.9	0.1	0.0	0.4
Vitamin C (ascorbic acid)	81	0.9	0.1	0.0	2.2
Sorbolene/glycerol/cetomac	78	0.8	0.1	0.0	0.4
Bromhexine	76	0.8	0.1	0.0	0.8
Chlorpheniramine/pseudoephidrine	72	0.8	0.1	0.0	1.0
Povidone-iodine topical	68	0.7	0.1	0.0	0.5
Cold and flu medication NEC	68	0.7	0.1	0.0	1.2
Calamine lotion	66	0.7	0.1	0.0	0.5
Brompheniramine/phenylephrine	65	0.7	0.1	0.0	0.7
Clotrimazole vaginal	64	0.7	0.1	0.0	0.4
Cinchocaine and hydrocortisone	63	0.7	0.1	0.0	0.4
Budesonide topical nasal	62	0.7	0.1	0.0	1.0
Subtotal	5,751	60.4	—	—	—
Total medications advised	9,492	100.0	**10.1**	**9.1**	**11.0**

(a) Column will not add to 100 because multiple medications could be given at each encounter and only the medications most frequently advised for over-the-counter purchase are included.

Note: OTCs—over-the-counter medications; encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit; NEC—not elsewhere classified.

4.8 Other treatments

The survey form allowed GPs to record up to two other treatments for each problem managed at the encounter. Other treatments included all clinical and procedural treatments provided by the GPs at the encounters. These groups are defined in Appendix 3, <www.aihw.gov.au/publications/index.cfm>.

Observations of the patient that were regarded as routine clinical measurements, such as measurements of blood pressure, were not included.

Number of other treatments

Other treatments were frequently provided by GPs to manage patient morbidity. A total of 51,632 were recorded for the year, at a rate of 54.7 per 100 encounters. More than two-thirds of these were clinical treatments (Table 4.29).

Table 4.29: Summary of other treatments

	Number	Rate per 100 encs (*n*=94,386)	95% LCL	95% UCL	Rate per 100 problems (*n*=137,330)	95% LCL	95% UCL
Other treatments	51,632	54.7	52.1	57.3	37.6	36.0	39.2
Clinical treatments	37,016	39.2	37.1	41.4	27.0	25.6	28.3
Procedural treatments	14,616	15.5	14.6	16.4	10.6	10.0	11.3

Note: Encs—encounters; UCL—upper confidence limit; LCL—lower confidence limit.

Table 4.30 shows the proportion of problems for which at least one other treatment was given. In summary:

- for two-thirds of the problems that were managed with another treatment, no pharmacological treatment was provided
- almost one in four problems were managed with a clinical treatment, and for more than half of these, no medications were given
- GPs undertook a procedure in the management of one in ten problems, and for two-thirds of these no medications were provided
- problems managed with a procedure were less likely to involve concomitant pharmacological treatment than those managed with a clinical treatment.

Table 4.30: Relationship of other treatments with pharmacological treatments

Co-management of problems with other treatments	Number of problems	Per cent within class	Per cent of problems (*n*=137,330)	95% LCL	95% UCL
At least one other treatment	44,450	100.0	32.4	31.1	33.6
Without pharmacological treatment	27,091	60.9	19.7	19.0	20.5
At least one clinical treatment	32,505	100.0	23.7	22.5	24.8
Without pharmacological treatment	19,250	59.2	14.0	13.3	14.7
At least one procedural treatment	13,470	100.0	9.8	9.3	10.3
Without pharmacological treatment	8,655	59.8	6.3	5.9	6.7

Note: LCL—lower confidence limit; UCL—upper confidence limit.

Clinical treatments

Clinical treatments include general and specific advice, counselling or education, family planning, and administrative processes. There were 37,016 clinical treatments provided by GPs during the study year (Table 4.29).

Most frequent clinical treatments

Table 4.31 lists the most common clinical treatments provided by GPs. Each treatment is expressed as a percentage of all other treatments and as a rate per 100 encounters with 95% confidence limits.

Table 4.31: Most frequent clinical treatments

Treatment	Number	Per cent of other treatments (n=51,632)	Rate per 100 encounters (n=94,386)	95% LCL	95% UCL
Advice/education*	6,589	12.8	7.0	6.2	7.8
Counselling/advice—nutrition/weight*	5,022	9.7	5.3	4.7	5.9
Advice/education—treatment*	4,323	8.4	4.6	4.0	5.1
Counselling—problem*	3,935	7.6	4.2	3.3	5.0
Advice/education—medication*	3,166	6.1	3.4	2.9	3.8
Counselling—psychological*	3,036	5.9	3.2	2.9	3.5
Counselling/advice—exercise*	1,771	3.4	1.9	1.4	2.3
Sickness certificate	1,584	3.1	1.7	1.3	2.1
Reassurance, support	1,474	2.9	1.6	1.2	1.9
Other admin/document*	1,234	2.4	1.3	1.1	1.5
Counselling/advice—smoking*	756	1.5	0.8	0.6	1.0
Counselling/advice—alcohol*	437	0.9	0.5	0.2	0.7
Counselling/advice—lifestyle*	415	0.8	0.4	0.0	0.1
Counselling/advice—prevention*	413	0.8	0.4	0.1	0.8
Observe/wait*	365	0.7	0.4	0.0	0.7
Family planning*	357	0.7	0.4	0.2	0.6
Counselling/advice—health/body*	337	0.7	0.4	0.1	0.6
Subtotal	*35,214*	*68.2*	—	—	—
Total clinical treatments	**37,016**	**71.7**	**39.2**	**37.1**	**41.4**

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: LCL—lower confidence limit; UCL—upper confidence limit.

Problems managed with clinical treatments

Table 4.32 lists the top ten problems managed with a clinical treatment. It also shows the extent to which a clinical treatment was used for that problem and the relationship between the use of a clinical treatment and a medication.

- A total of 32,505 problems included a clinical treatment as part of their management.
- The ten most common problems managed with a clinical treatment accounted for almost one-third of all problems for which a clinical treatment was provided.
- Two-thirds of all obesity problems were managed with a clinical treatment, with over four-fifths of these not managed with a medication.
- Almost half of the depression contacts were managed with a clinical treatment, and of these, less than half were not given a prescription as part of the treatment.
- Less than one in five hypertension contacts were managed with a clinical treatment, with almost half of these not managed with a medication.
- A third of all lipid disorder and diabetes contacts were managed with a clinical treatment and two-thirds of these did not involve a medication.

- Asthma was less likely to be managed with a clinical treatment and less likely to be managed without medication when a clinical treatment was given than, for example, depression.

Table 4.32: The ten most common problems managed with a clinical treatment

Problem managed	Number	Per cent of problems with clinical treatment	Rate per 100 encounters[(a)] (*n*=94,386)	95% LCL	95% UCL	Per cent of this problem[(b)]	Per cent of treated problems no meds[(c)]
Depression*	1,707	5.3	1.8	1.6	2.0	48.6	46.9
Acute upper respiratory infection	1,655	5.1	1.8	1.4	2.1	31.6	47.4
Hypertension*	1,261	3.9	1.3	1.0	1.7	15.0	47.0
Lipid disorder	930	2.9	1.0	0.7	1.2	29.6	63.9
Diabetes*	905	2.8	1.0	0.8	1.1	29.8	64.4
Anxiety*	765	2.4	0.8	0.6	1.0	46.7	64.3
Back complaint*	585	1.8	0.6	0.5	0.8	21.9	48.6
Gastroenteritis, presumed infection	541	1.7	0.6	0.3	0.8	54.2	57.3
Asthma	492	1.5	0.5	0.3	0.7	22.3	29.6
Obesity	491	1.5	0.5	0.2	0.9	67.0	88.4
Subtotal	*9,334*	*28.7*	—	—	—	—	—
Total problems	**32,505**	**100.0**	**34.4**	**32.6**	**36.2**	**—**	**—**

(a) Rate of provision of clinical treatment for selected problem per 100 total encounters.

(b) Per cent of contacts with this problem that generated at least one clinical treatment.

(c) The numerator is the number of cases of this problem that generated at least one clinical treatment but generated no medications. The denominator is the total number of contacts for this problem that generated at least one clinical treatment (with or without medications).

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: LCL—lower confidence limit; UCL—upper confidence limit; meds—medications.

Procedural treatments

Procedural treatments included therapeutic actions and diagnostic procedures undertaken by the GP at the encounter. There was a total number of 14,616 procedural treatments provided by GPs during the study year (Table 4.29).

Most frequent procedures

Table 4.33 lists the most common procedural treatments provided by GPs. Each treatment is expressed as a percentage of all other treatments and as a rate per 100 encounters with 95% confidence limits. To find the total number of diagnostic procedures ordered or performed by the GP, the numbers of investigations in Table 4.33 need to be added to those in Table 4.45 which reports the most common other investigations ordered by GPs.

Table 4.33: Most frequent procedural treatments

Treatment	Number	Per cent of other treatments[(a)] (*n*=51,632)	Rate per 100 encounters (*n*=94,386)	95% LCL	95% UCL
Excision/removal tissue/biopsy/destruction/ debridement/cauterisation*	3,118	6.0	3.3	2.9	3.7
Physical medicine/rehabilitation*	1,885	3.7	2.0	1.5	2.5
Dressing/pressure/compression/tamponade*	1,864	3.6	2.0	1.8	2.2
Local injection/infiltration*+	1,857	3.6	2.0	1.6	2.3
Other therapeutic procedures/surgery NEC*	1,126	2.2	1.2	0.3	2.1
Incision/drainage/flushing/aspiration/removal body fluid*	983	1.9	1.0	0.9	1.2
Pap smear*	920	1.8	1.0	0.6	1.3
Repair/fixation—suture/cast/prosthetic device (apply/remove)*	851	1.7	0.9	0.8	1.0
Physical function test*	370	0.7	0.4	0.1	0.7
Other preventive procedures/high-risk medication, condition*	310	0.6	0.3	0.0	0.7
Electrical tracings*	293	0.6	0.3	0.1	0.6
Urine test*	285	0.6	0.3	0.0	0.6
Subtotal	*13,862*	*26.9*	—	—	—
Total procedural treatments	**14,616**	**28.3**	**15.5**	**14.6**	**16.4**

(a) Only the most common procedural treatments are included, those accounting for >0.5% of all other treatments.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

\+ Excludes all local injection/infiltrations performed for immunisations.

Note: LCL—lower confidence limit; UCL—upper confidence limit; NEC—not elsewhere classified.

Problems managed with a procedural treatment

Table 4.34 lists the top ten problems managed with a procedural treatment. It also demonstrates the proportion of contacts with each problem that was managed with a procedure and the proportion of problems being managed with a procedure without a concomitant medication.

- A total of 13,470 problems involved a procedural treatment in their management.
- The top ten problems accounted for less than two-fifths of all problems for which a procedure was used.
- Solar keratosis/sunburn was the most common problem managed with a procedure; for more than two-thirds of all solar keratosis/sunburn contacts, a procedure was undertaken.
- Almost half of malignant skin neoplasms were managed with a procedural treatment, and the vast majority of these did not have a medication prescribed/supplied or advised.
- Excessive ear wax was the problem most likely to result in a procedure, with more than 3 out of 4 contacts involving a procedural treatment.

Table 4.34: The ten most common problems managed with a procedural treatment

Problem managed	Number	Per cent of problems with procedure	Rate per 100 encs[a] (*n*=94,386)	95% LCL	95% UCL	Per cent of this problem[b]	Per cent of treated problems no meds[c]
Solar keratosis/sunburn	843	6.3	0.9	0.5	1.3	66.8	95.0
Female genital check-up*	777	5.8	0.8	0.5	1.2	46.8	97.5
Excessive ear wax	537	4.0	0.6	0.4	0.7	76.2	91.4
Malignant neoplasm skin	515	3.8	0.6	0.1	1.0	46.3	95.0
Laceration/cut	511	3.8	0.5	0.4	0.7	72.9	69.3
Back complaint*	461	3.4	0.5	0.1	0.9	17.2	49.3
Warts	456	3.4	0.5	0.3	0.7	74.8	93.9
Sprain/strain*	430	3.2	0.5	0.1	0.8	26.8	53.2
Chronic ulcer skin (incl varicose ulcer)	329	2.4	0.4	0.1	0.6	63.6	77.7
Skin disease, other	281	2.1	0.3	0.1	0.5	34.2	92.9
Subtotal	*5,140*	*38.2*	—	—	—	—	—
Total problems	**13,470**	**100.0**	**14.3**	**13.5**	**15.0**	**—**	**—**

(a) Rate of provision of procedural treatment for selected problem per 100 total encounters.

(b) Percentage of contacts with this problem that generated at least one procedural treatment.

(c) The numerator is the number of cases of this problem that generated at least one procedural treatment but generated no medications The denominator is the total number of contacts (for this problem) that generated at least one procedural treatment (with or without medications).

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: Encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit; meds—medications; incl—including.

4.9 Referrals and admissions

A referral is defined as the process by which the responsibility for part or all of the care of a patient is temporarily transferred to another health care provider. Only new referrals arising at the encounter were included (i.e. continuations were not recorded). For each encounter, GPs could record up to two referrals. These included referrals to specialists, allied health professionals, hospitals for admission, emergency departments or other medical services. Referrals to hospital outpatient clinics and other GPs were classified as referrals to other medical services.

Number of referrals and admissions

Table 4.35 provides a summary of referrals and admissions, the rates per 100 encounters and per 100 problems that referrals were provided. The patient was given at least one referral at 10.9% of all encounters, and for 7.9% of all problems managed. The most frequent referrals were to specialists, followed by referrals to allied health services. Very few patients were referred to hospitals, to the hospital emergency department, or to other medical services.

Table 4.35: Summary of referrals and admissions

Variable	Number	Rate per 100 encounters (*n*=94,386)	95% LCL	95% UCL	Rate per 100 problems (*n*=137,330)	95% LCL	95% UCL
At least one referral	10,325	10.9	10.5	11.3	7.9	7.7	8.2
Referrals	10,881	11.5	11.1	12.0	7.9	7.6	8.2
Specialist	7,291	7.7	7.4	8.0	5.3	5.1	5.5
Allied health service	2,569	2.7	2.5	2.9	1.9	1.7	2.0
Hospital	451	0.5	0.3	0.7	0.3	0.2	0.5
Emergency department	152	0.2	0.0	0.4	0.1	0.0	0.3
Other medical services	103	0.1	0.0	0.6	0.1	0.0	0.4
Other referrals	315	0.3	0.1	0.6	0.2	0.1	0.4

Note: LCL—lower confidence limit; UCL—upper confidence limit.

Most frequent referrals

Table 4.36 shows the specialists and allied health service group to whom GPs most often refer. The most common referrals were to ophthalmologists, surgeons and orthopaedic surgeons. Almost 40% of referrals to allied health services were to physiotherapists. Referrals to other medical services (including to other GPs and hospital outpatient departments) were relatively rare.

Problems most often referred

A referral to a specialist was provided in the management of 7,441 problems. The ten problems most commonly referred to a specialist accounted for 18.7% of all problems referred to a specialist. The problems most often referred were malignant skin neoplasms (2.8% of all problems referred to a specialist), diabetes and osteoarthritis (Table 4.37).

Table 4.36: The most frequent referrals by type

Professional/organisation	Number	Per cent of referrals	Per cent of referral group	Rate per 100 encounters (*n*=94,386)	95% LCL	95% UCL
Medical specialist	**7,291**	**73.2**	**100.0**	**7.7**	**7.4**	**8.0**
Ophthalmologist	764	7.7	10.5	0.8	0.7	0.9
Surgeon	761	7.6	10.4	0.8	0.7	0.9
Orthopaedic surgeon	652	6.5	8.9	0.7	0.6	0.8
Dermatologist	646	6.5	8.9	0.7	0.5	0.8
Ear, nose and throat	485	4.9	6.7	0.5	0.4	0.6
Cardiologist	482	4.8	6.6	0.5	0.4	0.7
Gynaecologist	480	4.8	6.6	0.5	0.4	0.6
Gastroenterologist	361	3.6	5.0	0.4	0.2	0.6
Psychiatrist	265	2.7	3.6	0.3	0.1	0.5
Urologist	262	2.6	3.6	0.3	0.1	0.4
Subtotal: top ten specialist referrals	*5,159*	*51.8*	*70.8*	—	—	—

(continued)

Table 4.36 (continued): The most frequent referrals by type

Professional/organisation	Number	Per cent of referrals	Per cent of referral group	Rate per 100 encounters (*n*=94,386)	95% LCL	95% UCL
Allied health and other professionals	**2,569**	**25.8**	**100.0**	**2.7**	**2.5**	**2.9**
Physiotherapy	989	9.9	38.5	1.1	0.9	1.2
Podiatrist/chiropodist	213	2.1	8.3	0.2	0.0	0.4
Psychologist	208	2.1	8.1	0.2	0.0	0.5
Dietitian/nutritionist	180	1.8	7.0	0.2	0.0	0.5
Dentist	166	1.7	6.5	0.2	0.0	0.4
Acoustic testing	89	0.9	3.5	0.1	0.0	0.4
Counsellor	70	0.7	2.7	0.1	0.0	0.4
Diabetes education	64	0.6	2.5	0.1	0.0	0.5
Optometrist	54	0.5	2.1	0.1	0.0	0.4
Drug and alcohol	49	0.5	1.9	0.1	0.0	0.6
Subtotal: top ten allied health referrals	*2,083*	*20.9*	*81.1*	—	—	—
Other medical services	**103**	**1.0**	**100.0**	**0.1**	**0.0**	**0.6**
Total specialist, allied health & other medical service referrals	**9,963**	**100.0**	**—**	**10.6**	**10.1**	**11.0**

Note: LCL—lower confidence limit; UCL—upper confidence limit.

Table 4.37 also shows the rate of referral per 100 contacts for each problem. Although malignant skin neoplasms accounted for the greatest proportion of problems referred, the problem most likely to result in a referral to a specialist was cataract with GPs referring at two out of every three contacts with a cataract problem.

Table 4.37: The ten problems most frequently referred to a medical specialist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts of this problem[(a)]	Rate per 100 encs (*n*=94,386)	95% LCL	95% UCL
Malignant skin neoplasm	206	2.8	18.5	0.2	0.0	0.4
Diabetes*	197	2.7	6.5	0.2	0.0	0.4
Osteoarthritis*	168	2.3	6.4	0.2	0.0	0.4
Pregnancy*	166	2.2	23.3	0.2	0.0	0.4
Depression*	163	2.2	4.6	0.2	0.0	0.4
Back complaint*	126	1.7	4.7	0.1	0.0	0.4
Ischaemic heart disease*	121	1.6	10.8	0.1	0.0	0.4
Abnormal test results*	87	1.2	11.2	0.1	0.0	0.3
Cataract	81	1.1	70.6	0.1	0.0	0.4
Skin symptom/complaint	80	1.1	20.1	0.1	0.0	0.4
Subtotal: top ten problems referred to a specialist	*1,395*	*18.7*	—	—	—	—
Total problems referred to specialist	**7,441**	**100.0**	**—**	**7.9**	**7.6**	**8.2**

(a) The percentage of total contacts with the problem that generated at least one order for pathology.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: Encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit.

There were 2,627 problems referred to an allied health professional or service. Table 4.38 shows the ten most common of these, which together accounted for 44.9% of all problems referred. Table 4.38 also shows the rate of referral per 100 contacts for each problem. One in three teeth/gum disease problems resulted in a referral to allied health services.

The ten problems most commonly associated with hospital admission referrals are shown in Table 4.39.

Table 4.38: The ten problems most frequently referred to allied health services

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts of this problem[(a)]	Rate per 100 encs (*n*=94,386)	95% LCL	95% UCL
Back complaint*	273	10.4	10.2	0.3	0.1	0.5
Sprain/strain*	171	6.5	10.7	0.2	0.0	0.4
Depression*	160	6.1	4.6	0.2	0.0	0.4
Diabetes*	132	5.0	4.4	0.1	0.0	0.4
Teeth/gum disease	126	4.8	32.4	0.1	0.0	0.4
Osteoarthritis*	97	3.7	3.7	0.1	0.0	0.4
Musculoskeletal disease, other	58	2.2	9.1	0.1	0.0	0.4
Bursitis/tendonitis/synovitis NOS	57	2.2	7.9	0.1	0.0	0.5
Obesity (BMI > 30)	56	2.1	7.6	0.1	0.0	0.4
Musculoskeletal injury NOS	51	1.9	6.2	0.1	0.0	0.4
Subtotal: top ten problems referred to AHS	*1,180*	*44.9*	—	—	—	—
Total problems referred to AHS	**2,627**	**100.0**	**—**	**2.8**	**2.6**	**3.0**

(a) The percentage of total contacts with the problem that generated at least one order for pathology.
* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).
Note: Encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit; NOS—not otherwise specified; BMI—body mass index; AHS—allied health service.

Table 4.39: The ten problems most frequently referred to hospital

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts of this problem[(a)]	Rate per 100 encs (*n*=94,386)	95% LCL	95% UCL
Fracture*	17	3.7	1.8	0.02	0.0	0.6
Ischaemic heart disease*	17	3.6	1.5	0.02	0.0	0.5
Digestive system disease, other	16	3.5	6.2	0.02	0.0	0.7
Pregnancy*	14	3.0	1.9	0.02	0.0	0.6
Pre/postnatal check-up	11	2.4	1.9	0.01	0.0	0.8
Abdominal pain*	11	2.3	2.1	0.01	0.0	0.6
Appendicitis	10	2.2	30.9	0.01	0.0	0.7
Pneumonia	10	2.1	3.9	0.01	0.0	0.6
Depression*	9	1.9	0.3	0.01	0.0	0.7
Chronic obstructive pulmonary disease	9	1.9	1.3	0.01	0.0	0.7
Subtotal: top ten problems referred for admission	*125*	*26.6*	—	—	—	—
Total problems referred to hospital	**473**	**100.0**	**—**	**0.5**	**0.3**	**0.7**

(a) The percentage of total contacts with the problem that generated at least one order for pathology.
* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).
Note: Encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit.

4.10 Investigations

The GPs participating in the study were asked to record (in free text) any pathology, imaging or other tests ordered or undertaken at the encounter and to nominate the patient problem(s) associated with each test order placed. This allows the linkage of test orders to a single problem or multiple problems. Up to five orders for pathology and two for imaging and other tests could be recorded at each encounter. A single test may have been ordered for the management of multiple problems, and multiple tests may have been used in the management of a single problem.

A pathology test order may be for a single test (e.g. Pap smear, HbA1c) or for a battery of tests (e.g. lipids, full blood count). Where a battery of tests was ordered, the battery name was recorded rather than each individual test. GPs also recorded the body site for any imaging ordered (e.g. X-ray chest, CT head).

Numbers of investigations

Table 4.40 shows the number of encounters and problems at which a pathology or imaging test was ordered. There were no tests recorded at the vast majority (78.8%) of encounters.

At least one pathology test order was recorded at 15.7% of encounters (for 12.2% of problems managed) and at least one imaging test was ordered at 7.3% of encounters (for 5.2% of problems managed).

Table 4.40: Number of encounters and problems for which pathology or imaging ordered

Variable	Number of encs	Per cent of encs (*n*=94,385)	95% LCL	95% UCL	Number of problems	Per cent of problems (*n*=137,330)	95% LCL	95% UCL
Pathology and imaging ordered	1,751	1.9	1.7	2.0	1,316	1.0	0.9	1.1
Pathology only ordered	13,090	13.9	13.4	14.4	15,419	11.2	10.9	11.6
Imaging only ordered	5,135	5.4	5.2	5.7	5,800	4.2	4.1	4.4
No tests ordered	74,410	78.8	78.2	79.5	114,795	83.6	83.1	84.0
At least one pathology ordered	14,840	15.7	15.2	16.3	16,735	12.2	11.8	12.6
At least one imaging ordered	6,886	7.3	7.0	7.6	7,116	5.2	5.0	5.4

Note: Encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit.

Pathology ordering

A comprehensive report on pathology ordering by GPs in Australia in 1998, written by the General Practice Statistics and Classification Unit (GPSCU)using BEACH data, was published on the internet by the Diagnostics and Technology Branch of the Department of Health and Aged Care during 2000.[15] For a more detailed study of pathology ordering, consult that publication. A report on changes in pathology ordering by GPs from 1998 to 2001 was also published by the GPSCU in 2003.[9] Readers may wish to compare those results with the information presented below.

Nature of pathology orders at encounter

The distribution of pathology tests by MBS group and the most common tests within each group are presented in Table 4.41. Each group and individual test is expressed as a percentage of all pathology tests, as a percentage of the group and as a rate per 100 encounters with 95% confidence limits.

The pathology tests recorded were grouped according to the categories set out in Appendix 3, <www.aihw.gov.au/publications/index.cfm>. The main pathology groups reflect those used in previous analyses of pathology tests recorded by the HIC.[36]

Table 4.41: Distribution of pathology orders across MBS pathology groups and most frequent individual test orders within group

Pathology test ordered	Number	Per cent of all pathology	Per cent of group	Rate per 100 encs (*n*=94,385)	95% LCL	95% UCL
Chemistry	**19,283**	**55.7**	**100.0**	**20.4**	**19.5**	**21.4**
Lipids	3,378	9.8	17.5	3.6	3.3	3.8
EUC	2,493	7.2	12.9	2.6	2.3	3.0
Liver function	2,347	6.8	12.2	2.5	2.2	2.8
Glucose/tolerance	2,087	6.0	10.8	2.2	2.0	2.4
Thyroid function	2,044	5.9	10.6	2.2	2.0	2.4
Multibiochemical analysis	1,394	4.0	7.2	1.5	0.9	2.1
Chemistry; other	886	2.6	4.6	0.9	0.7	1.2
HbA1c	860	2.5	4.5	0.9	0.8	1.1
Ferritin	835	2.4	4.3	0.9	0.7	1.0
Hormone assay	647	1.9	3.4	0.7	0.5	0.9
Prostate specific antigen	566	1.6	2.9	0.6	0.4	0.8
C reactive protein	400	1.2	2.1	0.4	0.2	0.6
Haematology	**6,569**	**19.0**	**100.0**	**7.0**	**6.6**	**7.3**
Full blood count	4,561	13.2	69.4	4.8	4.6	5.1
ESR	903	2.6	13.7	1.0	0.7	1.2
Coagulation	827	2.4	12.6	0.9	0.7	1.1
Microbiology	**4,934**	**14.2**	**100.0**	**5.2**	**4.8**	**5.6**
Urine MC&S	1,607	4.6	32.6	1.7	1.6	1.8
Microbiology; other	670	1.9	13.6	0.7	0.5	0.9
Hepatitis serology	479	1.4	9.7	0.5	0.2	0.8
HIV	307	0.9	6.2	0.3	0.0	0.7
Chlamydia	294	0.9	6.0	0.3	0.0	0.6
Faeces MC&S	278	0.8	5.6	0.3	0.0	0.6
Vaginal swab and C&S	270	0.8	5.5	0.3	0.1	0.5
Cytology	**1,551**	**4.5**	**100.0**	**1.6**	**1.3**	**2.0**
Pap smear	1,531	4.4	98.7	1.6	1.3	2.0

(continued)

Table 4.41 (continued): Distribution of pathology orders across MBS pathology groups and most frequent individual test orders within group

Pathology test ordered	Number	Per cent of all pathology	Per cent of group	Rate per 100 encs (*n*=94,385)	95% LCL	95% UCL
Other NEC	**787**	**2.3**	**100.0**	**0.8**	**0.5**	**1.2**
Blood test	330	1.0	41.9	0.4	0.0	1.1
Other test NEC	263	0.8	33.4	0.3	0.0	0.5
Infertility/pregnancy	**251**	**0.7**	**100.0**	**0.3**	**0.0**	**0.6**
Tissue pathology	**713**	**2.1**	**100.0**	**0.8**	**0.3**	**1.2**
Histology, skin	668	1.9	93.8	0.7	0.2	1.2
Immunology	**487**	**1.4**	**100.0**	**0.5**	**0.3**	**0.8**
Anti-nuclear antibodies	106	0.3	21.8	0.1	0.0	0.4
Simple basic tests	**78**	**0.2**	**100.0**	**0.1**	**0.0**	**0.4**
Total pathology tests	**34,652**	**100.0**	**—**	**36.7**	**35.2**	**38.2**

Note: Encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit; NEC—not elsewhere classified.

Problems for which pathology tests were ordered

Table 4.42 describes, in decreasing frequency order of problem–pathology combinations, the most common problems for which pathology was ordered.

Table 4.42: The ten problems for which pathology was most frequently ordered

Problem managed	Number of problems	Number of problem–path combinations[(a)]	Per cent of problem–path combinations[(a)]	Per cent of problems with test[(b)]	Rate of path orders per 100 problems with pathology[(c)]
Diabetes*	3,042	2,293	6.4	29.2	258.6
Hypertension*	8,406	2,111	5.9	9.6	260.6
Lipid disorders*	3,148	1,851	5.2	29.6	198.8
General check-up*	1,948	1,532	4.3	26.0	302.6
Female genital check-up*	1,659	1,419	4.0	69.5	123.0
Weakness/tiredness general	658	1,357	3.8	56.1	367.7
Urinary tract infection*	1,622	948	2.7	51.6	113.2
Blood test NOS	273	763	2.1	85.8	325.2
Abnormal test results*	773	574	1.6	45.7	162.3
Pregnancy*	713	571	1.6	37.5	213.2
Subtotal	*22,242*	*13,419*	*37.6*	—	—
Total	**137,330**	**39,144**	**100.0**	**12.2**	**207.1**

(a) A test was counted more than once if it was ordered for the management of more than one problem at an encounter. There were 34,652 pathology test orders and 39,144 problem–pathology combinations.

(b) The percentage of total contacts with the problem that generated at least one order for pathology.

(c) The rate of pathology orders placed per 100 contacts with that problem generating at least one order for pathology.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: Path—pathology; NOS—not otherwise specified.

Imaging ordering

Readers wanting a more detailed study of imaging orders should consult a comprehensive report on imaging orders by GPs in Australia in 1999–00, written by the General Practice Statistics and Classification Unit using BEACH data, published by the AIHW in 2001.[16]

Nature of imaging orders at encounter

The distribution of imaging tests by MBS group and the most common tests within each group are presented in Table 4.43. Each group and individual test is expressed as a percentage of all imaging tests, as a percentage of the group and as a rate per 100 encounters with 95% confidence limits.

Table 4.43: The most frequent imaging tests ordered, by MBS group

Imaging test ordered	Number	Per cent of tests	Per cent of group	Rate per 100 encounters (*n*=94,385)	95% LCL	95% UCL
Diagnostic radiology	**4,237**	**54.1**	**100**	**4.5**	**4.3**	**4.7**
X-ray; chest	971	12.4	22.9	1.0	0.9	1.1
X-ray; knee	434	5.5	10.2	0.5	0.3	0.6
Mammography; female	312	4.0	7.4	0.3	0.1	0.5
X-ray; foot/feet	225	2.9	5.3	0.2	0.1	0.4
X-ray; ankle	212	2.7	5.0	0.2	0.0	0.4
X-ray; shoulder	206	2.6	4.9	0.2	0.0	0.4
Test; densitometry	177	2.3	4.2	0.2	0.0	0.4
X-ray; hip	174	2.2	4.1	0.2	0.0	0.4
X-ray; wrist	156	2.0	3.7	0.2	0.0	0.4
X-ray; spine; lumbosacral	136	1.7	3.2	0.1	0.0	0.4
X-ray; spine; cervical	117	1.5	2.8	0.1	0.0	0.4
X-ray; hand	110	1.4	2.6	0.1	0.0	0.4
X-ray; spine; lumbar	96	1.2	2.3	0.1	0.0	0.4
X-ray; finger(s)/thumb	78	1.0	1.8	0.1	0.0	0.4
X-ray; abdomen	76	1.0	1.8	0.1	0.0	0.4
Ultrasound	**2,513**	**32.1**	**100.0**	**2.7**	**2.5**	**2.8**
Ultrasound; pelvis	431	5.5	17.1	0.5	0.3	0.6
Ultrasound; abdomen	297	3.8	11.8	0.3	0.1	0.5
Ultrasound; shoulder	242	3.1	9.6	0.3	0.1	0.4
Ultrasound; obstetric	204	2.6	8.1	0.2	0.0	0.4
Ultrasound; breast; female	200	2.6	8.0	0.2	0.0	0.4
Echocardiography	107	1.4	4.3	0.1	0.0	0.4
Test; doppler	106	1.4	4.2	0.1	0.0	0.3
Ultrasound; renal tract	85	1.1	3.4	0.1	0.0	0.4
Ultrasound; abdomen upper	82	1.0	3.3	0.1	0.0	0.4
Ultrasound; scrotum	80	1.0	3.2	0.1	0.0	0.4

(continued)

Table 4.43 (continued): The most frequent imaging tests ordered, by MBS group

Imaging test ordered	Number	Per cent of tests	Per cent of group	Rate per 100 encounters (*n*=94,385)	95% LCL	95% UCL
Computerised tomography	**964**	**12.3**	**100.0**	**1.0**	**0.9**	**1.2**
CT scan; brain	184	2.4	19.1	0.2	0.0	0.4
CT scan; abdomen	106	1.4	11.0	0.1	0.0	0.3
CT scan; head	105	1.3	10.9	0.1	0.0	0.4
CT scan; spine; lumbar	96	1.2	10.0	0.1	0.0	0.4
Nuclear medicine imaging	**94**	**1.2**	**100.0**	**0.1**	**0.0**	**0.3**
Scan; bone(s)	65	0.8	69.5	0.1	0.0	0.4
Magnetic resonance imaging	**31**	**0.4**	**100.0**	**0.0**[Ŧ]	**0.0**	**0.5**
Total imaging tests	**7,840**	**100.0**	**—**	**8.3**	**8.0**	**8.6**

Ŧ Rates are reported to one decimal place. This indicates that the rate is <0.05 per 100 encounters.

Note: LCL—lower confidence limit; UCL—upper confidence limit; CT—computerised tomography.

Problems for which imaging tests were ordered

Table 4.44 describes, in decreasing frequency order of problem–imaging combinations, the most common problems for which imaging was ordered.

Table 4.44: The ten problems for which an imaging test was most frequently ordered

Problem managed	Number of problems	Number of problem–imaging combinations[(a)]	Per cent of problem–imaging combinations	Per cent of problems with test[(b)]	Rate of imaging orders per 100 tested problems[(c)]
Back complaint*	2,673	445.8	5.6	14.4	115.9
Osteoarthritis*	2,613	383.0	4.9	13.0	113.2
Fracture*	927	379.1	4.8	38.2	107.0
Sprain/strain*	1,603	323.3	4.1	17.2	117.5
Injury musculoskeletal NOS	822	234.5	3.0	25.7	110.8
Abdominal pain*	524	202.9	2.6	33.1	117.0
Injury skin, other	658	172.7	2.2	23.3	112.6
Pregnancy*	713	139.1	1.8	19.5	100.0
Bursitis/tendonitis/synovitis NOS	724	138.6	1.8	16.8	113.7
Breast lump/mass (female)	146	138.1	1.8	63.6	148.6
Subtotal	*11,403*	*2,557*	*32.6*	—	—
Total	**137,340**	**8,286**	**100.0**	**5.2**	**110.2**

(a) A test was counted more than once if it was ordered for the management of more than one problem at an encounter. There were 7,840 imaging test orders and 8,286 problem–imaging combinations.

(b) The percentage of total contacts with the problem that generated at least one order for imaging.

(c) The rate of imaging orders placed per 100 contacts with that problem generating at least one order for imaging.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: NOS—not otherwise specified.

Other investigations ordered

Other investigations include diagnostic procedures ordered by the GP at the encounter. There were a total of 1,040 other investigations ordered by GPs during the study year (Table 4.9).

Most frequent procedures

Table 4.45 lists the most common other investigations provided by GPs. Each investigation is expressed as a percentage of all 'other investigations' and as a rate per 100 encounters with 95% confidence limits.

To find the total number of these investigations ordered or performed by the GP, the numbers of investigations in Table 4.45 need to be added to those in Table 4.33 which reports the diagnostic procedures performed by the GP at the encounter.

Table 4.45: Most frequent other investigations

Treatment	Number	Per cent of other investigations	Rate per 100 encounters (*n*=94,386)	95% LCL	95% UCL
Electrical tracings*	515	49.5	0.55	0.4	0.7
Diagnostic endoscopy*	306	29.4	0.32	0.1	0.5
Physical function test*	136	13.1	0.22	0.0	0.9
Subtotal	*957*	*92.0*	—	—	—
Total other investigations	**1040**	**100.0**	**1.1**	**0.9**	**1.3**

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3, <www.aihw.gov.au/publications/index.cfm>).

Note: LCL—lower confidence limit; UCL—upper confidence limit.

4.11 Patient risk factors

General practice is commonly identified as a significant intervention point for health care and health promotion because GPs have considerable exposure to the health of the population.

Since April 1998, a section on the bottom of each encounter form has been used to investigate aspects of patient health or health care delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data). The SAND methods and the methods used in the substudies reported here are described in Chapter 5—Methods, Section 5.7)

Body mass index

Overweight and obesity have been estimated to account for more than 4% of the total burden of disease in Australia.[37] The 1999–00 Australian diabetes, obesity and lifestyle study (AusDiab) estimated that 60% of Australians aged over 25 years were overweight or obese (BMI > 25). Men were more likely to be overweight or obese than women (67% compared with 52%).[38]

Body mass index of adults

The sample size was 30,476 patients aged 18 years and over at encounters with 948 GPs.

- More than half (57.0%) of patients were overweight or obese—22.4% being obese and 34.6% overweight.
- One in fifteen (7.2%) patients were underweight.
- Approximately a third (35.8%) of patients had a BMI that was in the normal range (Table 4.46).
- Males were more likely to be overweight or obese (63.3%, 95% CI: 62.2–64.0) than females (52.6%, 95% CI: 51.5–53.6).
- Overweight/obesity was most prevalent in male patients aged 45–64 years (Figure 4.6).
- In the 18–24 years age group, 20.2% of women and 9.0% of men were underweight, as were 12.8% of women and 5.4% of men aged 75 years or more (Figure 4.7).

These results are consistent with those of the 1999–00 AusDiab study[38] and the results reported for each BEACH year from 2000–01 onward.[39] They are also broadly consistent with the Australian Bureau of Statistics 2001 figures from the National Health Survey of 58% of adults aged 18 or more being overweight or obese.[40]

Table 4.46: Patient body mass index (aged 18 years and over)

	Male[(a)]			Female[(a)]			Total respondents		
BMI class	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL
Obese	21.3	20.4	22.3	23.2	22.4	24.1	22.4	21.7	23.1
Overweight	42.0	41.0	43.0	29.4	28.6	30.1	34.6	33.9	35.2
Normal	32.8	31.7	33.8	37.9	37.0	38.9	35.8	35.0	36.6
Underweight	3.9	3.5	4.3	9.5	9.0	10.0	7.2	6.9	7.6
Total (*n*, %)	**12,288**	**100.0**	**—**	**17,976**	**100.0**	**—**	**30,476**	**100.0**	**—**

(a) Patient sex was unknown for 212 respondents.
Note: BMI—body mass index; LCL—lower confidence limit; UCL—upper confidence limit.

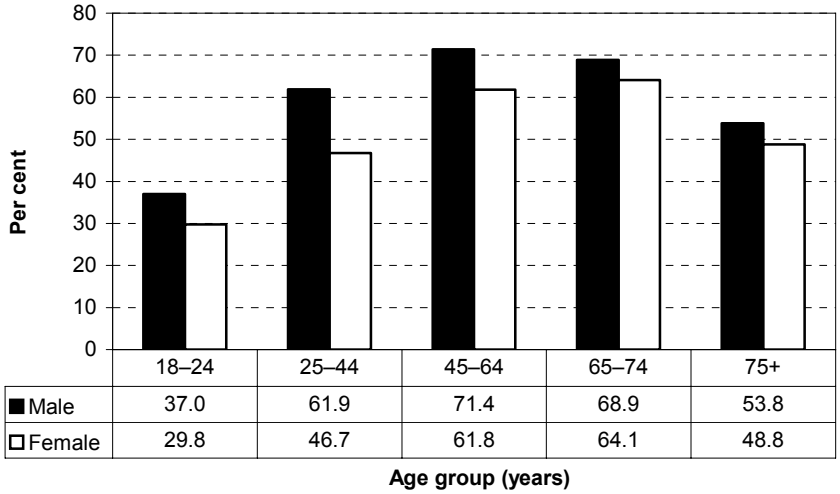


Figure 4.6: Age–sex-specific rates of overweight and obesity in adults

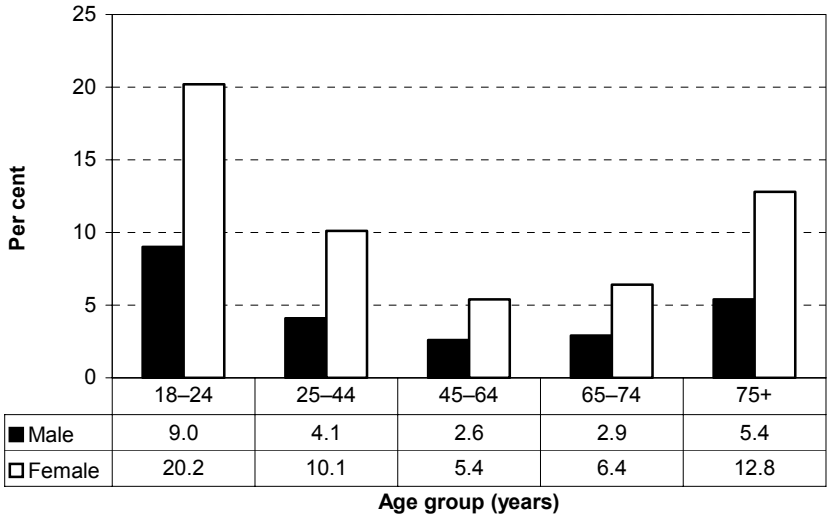


Figure 4.7: Age–sex-specific rates of underweight in adults

Body mass index of children

BMI was calculated for 3,148 patients aged 2–17 years at encounters with 860 GPs.

- Three in ten children (30.2%, 95% CI: 28.3.1–32.1) were considered overweight or obese; 12.1% (95% CI: 10.7–13.6) of all children were considered obese (results not tabulated).
- One in five (18.1%, 95% CI: 16.7–19.4) children were defined as overweight (results not tabulated).
- There was no difference in prevalence of overweight/obesity between males (30.4%, 95% CI: 27.8–32.9) and female children (30.1%, 95% CI: 27.7–32.5).
- The age-specific rates of being obese follow very similar patterns for both sexes (Figures 4.8 and 4.9).

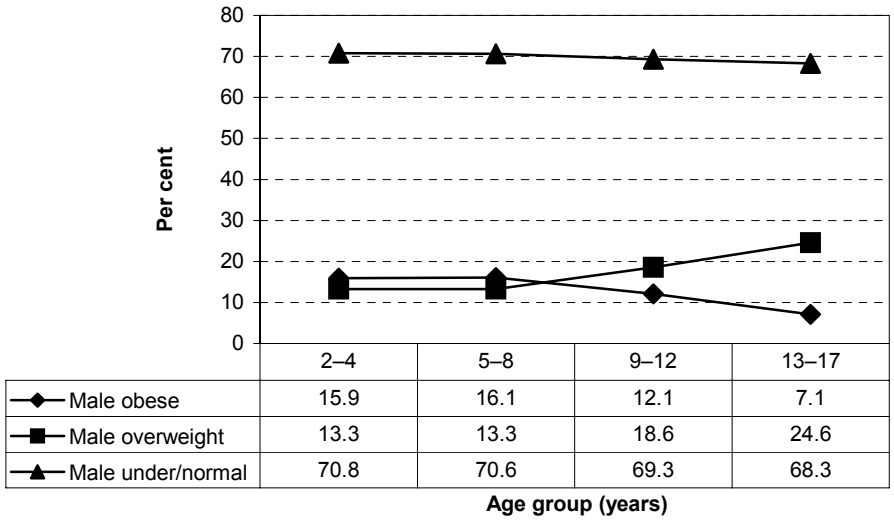


Figure 4.8: Age-specific rates of obesity, overweight and normal/underweight in male children

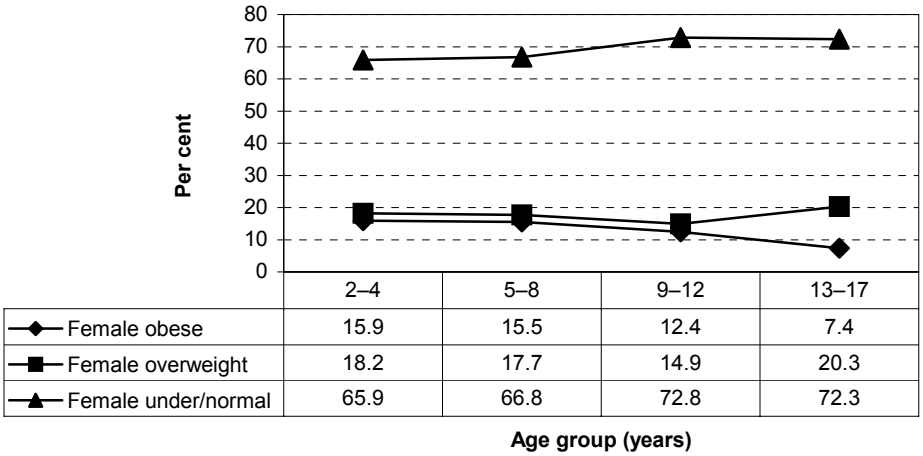


Figure 4.9: Age-specific rates of obesity, overweight and normal/underweight in female children

Smoking

Tobacco smoking is the leading cause of drug-related death and hospital separations in Australia.[41] It has been identified as the risk factor associated with the greatest disease burden, accounting for 9.7% of the total burden of disease in Australia.[37] According to the 2001 National Drug Strategy Household Survey (NDSHS), 19.5% of Australians aged 14 years and over smoked daily, 21.1% of males and 18.0% of females.[42]

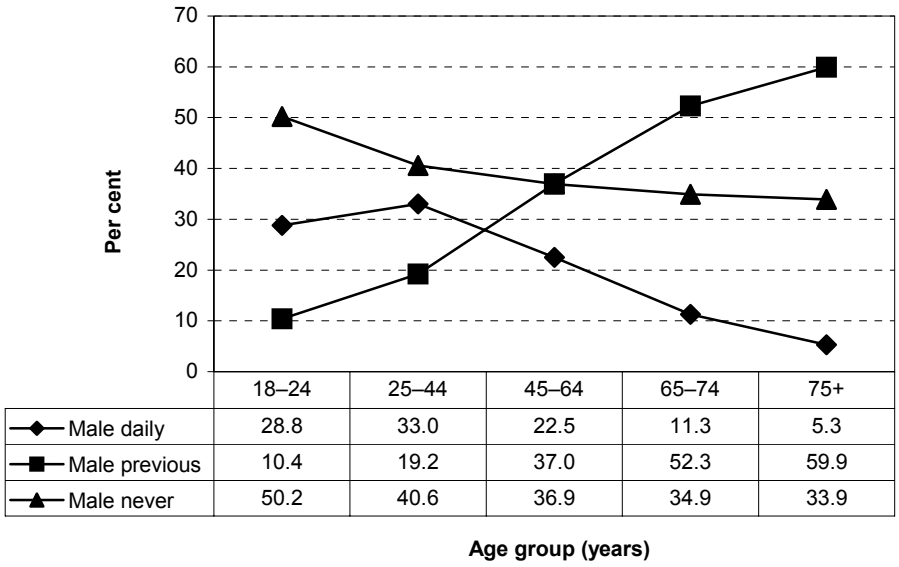
The smoking status of 31,295 adult patients was established at encounters with 949 GPs.

- One in five (18.0%) adult patients were daily smokers.
- Significantly more male (21.2%) than female patients (15.7%) reported being daily smokers (Table 4.47).
- Daily smoking was most prevalent among young adult patients (aged 18–24 and 25–44) with one in four of these patients reporting daily smoking.
- Only 3.7% of adult patients were occasional smokers.
- More than a quarter of the adults (28.0%) were previous smokers.
- Almost two-thirds of male and one-quarter of the female patients aged 75 years and over stated they were previous smokers but only one in twenty patients in this age group were current smokers (Figures 4.10 and 4.11).

Table 4.47: Patient smoking status (aged 18 years and over)

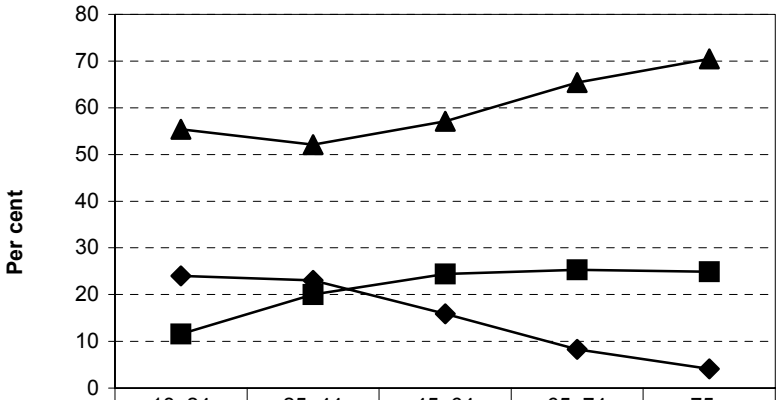
	Male[(a)]			Female[(a)]			Total respondents		
Smoking status	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**
Daily	21.2	20.2	22.3	15.7	15.0	16.5	18.0	17.2	18.7
Occasional	4.3	3.9	4.7	3.3	3.0	3.7	3.7	3.4	4.0
Previous	36.5	35.3	37.7	22.2	21.3	23.0	28.0	27.2	28.8
Never	38.0	36.8	39.2	58.8	57.7	59.9	50.3	49.4	51.3
Total (*n*, %)	**12,6913**	**100.0**	**—**	**18,468**	**100.0**	**—**	**31,295**	**100.0**	**—**

(a) Patient sex was unknown for 214 respondents.
Note: LCL—lower confidence limit; UCL—upper confidence limit.



	18–24	25–44	45–64	65–74	75+
Male daily	28.8	33.0	22.5	11.3	5.3
Male previous	10.4	19.2	37.0	52.3	59.9
Male never	50.2	40.6	36.9	34.9	33.9

Figure 4.10: Smoking status—male age-specific rates



	18–24	25–44	45–64	65–74	75+
Female daily	24.0	23.0	15.9	8.3	4.1
Female previous	11.6	20.0	24.4	25.3	24.9
Female never	55.4	52.1	57.1	65.4	70.5

Figure 4.11: Smoking status—female age-specific rates

Alcohol consumption

In people aged 65 years and over, low to moderate consumption of alcohol has been found to have a preventive effect against selected causes of morbidity and mortality (e.g. cardiovascular disease).[41] The beneficial impact of low alcohol consumption has been found to prevent more mortality than is caused by harmful alcohol consumption.[41] Alcohol consumption accounted for 4.9% of the total burden of disease in Australia; however, after taking into account the benefit derived from low to moderate alcohol consumption, this fell to 2.2%.[37]

The 2001 NDSHS found that 9.9% of people aged 14 years and over (10.2% of males and 9.4% of females) drank at levels considered to be risky or high risk for their health in the long term.[42] This risk level of alcohol consumption was based on the National Health and Medical Research Council 2001 Guidelines.[43] The NDSHS also found that 34.4% of people aged 14 years and above (39.3% of males and 29.6% of females) drank alcohol at levels which put their health at risk in the short term during the preceding 12 months.[42]

The questions asked of the patients and the methods used to classify at-risk levels of alcohol consumption are described in Chapter 5—Methods, Section 5.7. Patient self-reported alcohol consumption was recorded at 30,414 adult patient (18 years and over) encounters with 949 GPs.

- One in four patients reported drinking alcohol at at–risk levels.
- At-risk drinking was more prevalent in male (32.6% than in female patients 22.2%) (Table 4.48).
- At-risk drinking was most prevalent in the 18–24 age group, where almost half of the males and more than a third of females reported at-risk alcohol consumption.
- The proportion of patients who were at-risk drinkers decreased with age for both males and females (Figure 4.12).

These estimates are a little lower than those made from the NDSHS.[42] This is likely to be due to the difference in the age ranges studied (14 and over in NDSHS and 18 and over in BEACH), and to differences in the age–sex distributions of the study populations. As older people attend the GP more frequently than young adults, they have a greater chance of being selected in the subsample and this leads to a greater proportion of older people, the group least likely to report drinking alcohol at at-risk levels.

Table 4.48: Patient alcohol consumption (aged 18 years and over)

	Male			Female			Total respondents		
Alcohol consumption	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL
At-risk drinker	32.6	31.3	33.8	22.2	21.3	23.2	26.4	25.5	27.3
Responsible drinker	47.7	46.4	48.9	43.0	41.9	44.0	44.9	44.0	45.8
Non-drinker	19.8	18.7	20.9	34.8	33.5	36.2	28.7	27.7	29.8
Total (*n*, %)	**12,294**	**100.0**	**—**	**18,120**	**100.0**	**—**	**30,414**	**100.0**	**—**

Note: LCL—lower confidence limit; UCL—upper confidence limit.

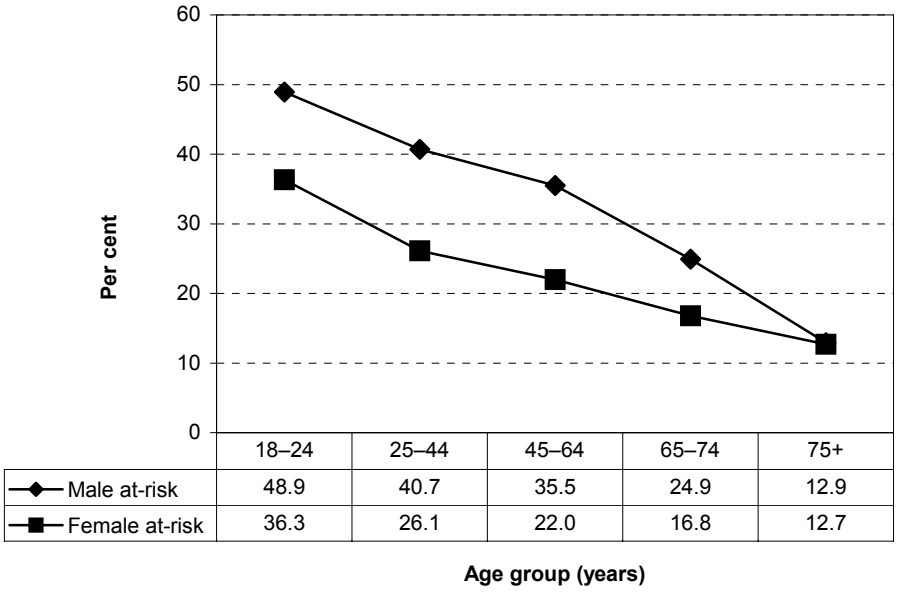


Figure 4.12: Age–sex-specific rates of at-risk alcohol consumption

Risk factor profile of adult patients

From 2001–02 onwards, all patient risk factor questions (BMI, smoking and alcohol consumption) were asked of the same subsample of patients. This allows us to build a risk profile of this sample of adult patients. For the purposes of this analysis, being overweight or obese, a daily smoker or an at-risk drinker are considered risk factors. A risk factor profile was prepared for 29,418 adult patients (aged 18 or more). Results are provided in Table 4.49.

- Almost half of adult patients had one risk factor. Being overweight or obese accounted for three-quarters of these patients.
- One in five patients had two risk factors, the most common combinations being:
  - at-risk alcohol consumption + being overweight—7.2% of surveyed patients
  - at-risk alcohol consumption + daily smoking—3.9% of surveyed patients
  - at-risk alcohol consumption + obesity—3.8% of surveyed patients.
- A small minority (4.0%) of patients reported having all three risk factors.

Table 4.50 shows the number of risk factors by patient sex. Female patients reported significantly lower levels of risk factors than males:

- only one in five males compared with almost a third of females reported none of the measured risk factors
- one in four males compared with one in seven females reported two risk factors.

Table 4.49: Risk factor profile of patients (aged 18 years and over)

Number of risk factors	Number	Per cent of patients (*n*=29,418)	95% LCL	95% UCL
None	**7,927**	**27.0**	**26.1**	**27.8**
One	**14,367**	**48.8**	**48.1**	**49.6**
Overweight only	6,320	21.5	20.9	22.1
Obese only	4,367	14.8	14.3	15.4
At-risk alcohol level only	2,313	7.9	7.4	8.3
Current daily smoker only	1,367	4.7	4.3	5.0
Two	**5,958**	**20.3**	**19.6**	**20.9**
Overweight and at-risk alcohol level	2,112	7.2	6.8	7.6
Daily smoker and at-risk alcohol level	1,136	3.9	3.6	4.2
Obese and at-risk alcohol level	1,113	3.8	3.5	4.0
Overweight and current daily smoker	929	3.2	2.9	3.4
Obese and current daily smoker	668	2.3	2.1	2.42.5
Three	**1,166**	**4.0**	**3.7**	**4.2**
Overweight and current daily smoker and ‘at-risk’ alcohol level	713	2.4	2.2	2.6
Obese and current daily smoker and ‘at-risk’ alcohol level	453	1.5	1.4	1.7

Note: LCL—lower confidence limit; UCL—upper confidence limit.

Table 4.50: Number of risk factors, by patient sex

Number of risk factors	Number	Per cent of patients	95% LCL	95% UCL
Male patients	**11,900**	**100.0**	**—**	**—**
Zero	2,464	20.7	19.8	21.6
One	5,596	47.0	46.0	48.1
Two	3,171	26.7	25.7	27.6
Three	669	5.6	5.1	6.1
Female patients	**17,518**	**100.0**	**—**	**—**
Zero	5,463	31.2	30.2	32.2
One	8,771	50.1	49.2	50.9
Two	2,787	15.9	15.3	16.6
Three	497	2.8	2.6	3.1
Total patients	**29,418**	**—**	**—**	**—**

Note: LCL—lower confidence limit; UCL—upper confidence limit.

5. Methods

In summary:

- each year BEACH involves a random sample of approximately 1,000 GPs.
- each GP records details about 100 doctor–patient encounters of all types.
- the GP sample is a rolling (everchanging) sample.
- approximately 20 GPs participate each week, 50 weeks a year.
- each GP can be selected only once per quality assurance triennium.
- the information is recorded by the GPs on structured encounter forms (on paper).

5.1 Sampling methods

- The source population includes all medical practitioners who claimed a minimum of 375 general practice A1 Medicare items in the most recently available 3-month HIC data period which equates with 1,500 A1 Medicare claims a year.
- This 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.
- On a quarterly basis the Primary Care Division of the AGDHA updates the sample frame from the HIC records, leaving out of the sample frame any GPs already randomly sampled in the current triennium, and draws a new sample from those currently in the sample frame. This ensures the timely addition of new entries to the profession, and timely exclusion of those GPs who have stopped practising.

5.2 Recruitment methods

We approach the randomly selected GPs by letter, posted to the address provided by the AGDHA.

- During the following 10 days we use the electronic white and yellow pages to check the telephone numbers generated from the HIC data. This is necessary because many of the telephone numbers provided from the HIC data are incorrect.
- We then telephone the GPs in the order they were approached and, referring to the approach letter, ask if they will participate.
- On initial telephone contact with the practice we often find that the selected GP has moved elsewhere, but is still in practice. Where forward address and/or telephone number can be obtained, these GPs are followed up at their new address.
- GPs who agree to participate are set a recording date approximately 3 to 4 weeks ahead.
- We send a research pack to each participant about 10 days before the planned start date.
- We make a telephone reminder to each GP in the first days of the agreed recording period—this also provides the GP with an opportunity to ask any questions they have about the recording process.

- We follow up non-returns by regular telephone calls for up to three months after the set recording time.
- Participating GPs earn up to 60 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 unidentified 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 provided. In addition, GPs receive some educational material related to the identification and management of patients who smoke or consume alcohol at hazardous levels.

5.3 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 in Appendix 1. The GP characteristics questionnaire is provided in Appendix 2.

- **Encounter data:** date of consultation, type of consultation (direct, indirect), Medicare/Veterans' Affairs item number (where applicable) and other payment source (tick boxes).
- T**he patient:** date of birth, sex and postcode of residence. Tick boxes are provided for Commonwealth concession card holder, holder of a Repatriation health card (from the Australian Department of Veterans' Affairs, DVA), non-English-speaking background (NESB) (patient self-report—a language other than English is the primary language at home), an Aboriginal person (self-identification) and Torres Strait Islander (self-identification). Space is provided for up to three patient reasons for encounter (RFEs).
- **The problems managed** at encounter (at least one and up to four). Tick boxes are provided to denote the status of each problem as new or continuing for the patient (if applicable).
- **Management of** each problem including:
  - **medications** prescribed, supplied by the GP and medications advised for over-the-counter purchase including: brand name, form (where required), strength, regimen, status (if new or continuing medication for this problem for this patient) and number of repeats
  - **other treatments** provided for each problem including counselling, advice and education, and procedures undertaken
  - new **referrals** to medical specialists, allied health professionals and hospital
  - **investigations** including pathology tests, imaging and other investigations ordered at the encounter.
- **GP characteristics:** age and sex, years in general practice, number of GP sessions worked per week, number of GPs working in the practice, postcode of major practice address, country of graduation, postgraduate general practice training and FRACGP status, after-hours care arrangements, use of computers in the practice, whether the practice is accredited, whether it is a teaching practice, work undertaken in other clinical settings, hours worked in direct patient care and hours on call per week.

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 period is divided into 10 blocks, each of 5 weeks. Each block includes data from 100 GPs.
- Each GP's pack of 100 forms is made up of 40 forms that contain questions about patient risk factors: patient height and weight (used to calculate body mass index, BMI), alcohol intake and smoking status (patient self-report).
- The remaining 60 forms in each pack are divided into two blocks of 30. Different questions are asked of the patient in each block and these vary throughout the year.
- The order of SAND sections in the GP recording pack is rotated, so that the 40 patient risk factor forms may appear first, second or third in the pad. Rotation of ordering of the components ensures there was no order effect on the quality of the information collected.

The results of topics in the SAND substudies for alcohol consumption, smoking status and BMI are included in this report. Abstracts of results for other substudies are available through the website of the Family Medicine Research Centre (of which the AGPSCC is a part), at <www.fmrc.org.au/publications/SAND_abstracts.htm>.

5.4 The BEACH relational database

The BEACH relational database is described diagrammatically in Figure 5.1. Note that:

- all variables can be directly related to GP, patient characteristics and to the encounter
- RFEs have only an indirect relationship with problems managed
- all types of management are directly related to the problem being treated.

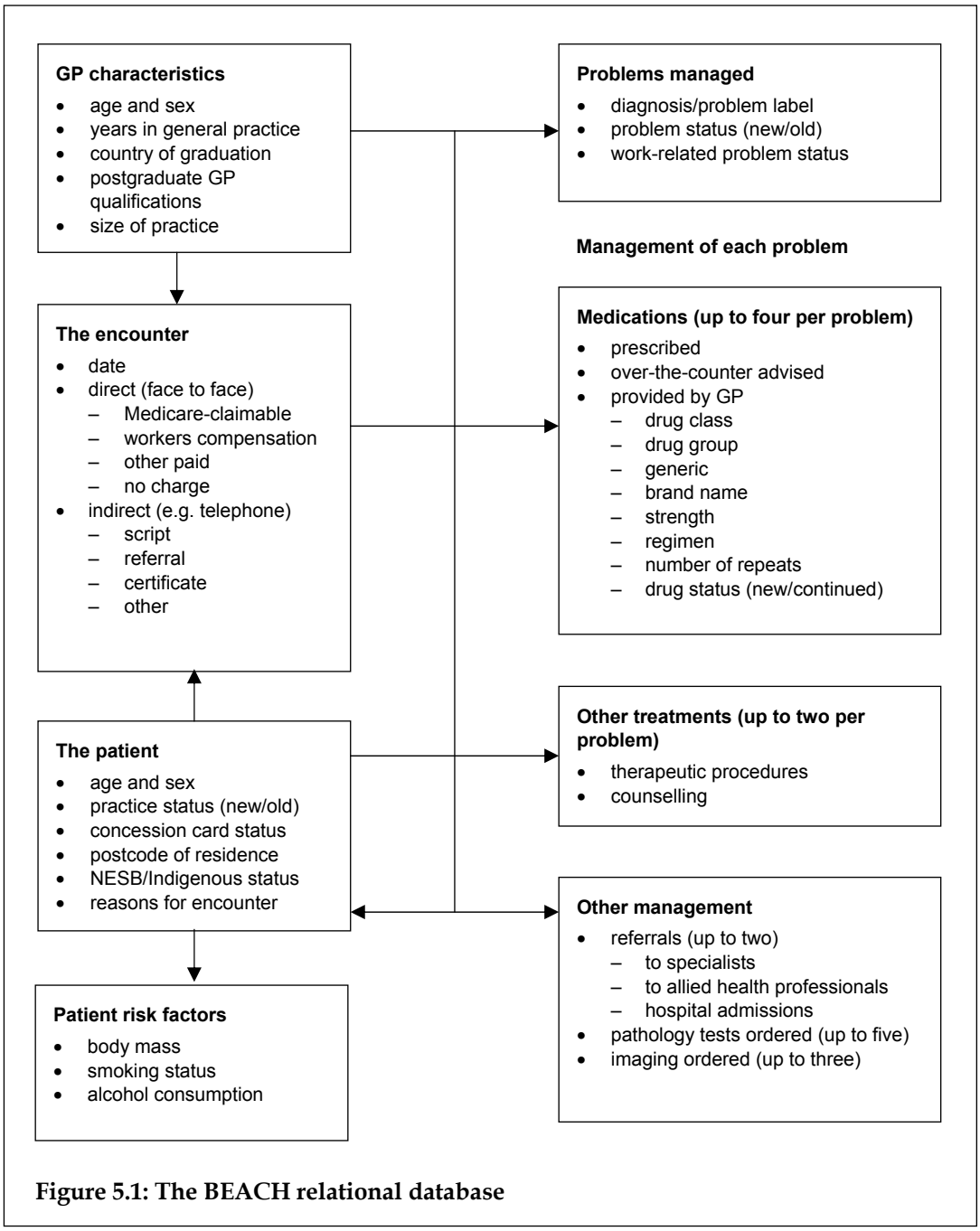


Figure 5.1: The BEACH relational database

5.5 Statistical methods

The analysis of the BEACH database is conducted with SAS versions 6.12[44] and 8.2[21] 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 a consultation (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 consultation (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 results present the number of observations *(n)*, the rate per 100 encounters and the 95% confidence intervals.

The BEACH study is a random sample of GPs, each providing data about a cluster of encounters. When the encounter is the unit of inference, the cluster sampling study design violates the simple random sample (SRS) assumption of equal probability of selection of observations, because the probability of an encounter being included is a function of the probability of the GP being selected.[45] Cluster samples also violate the assumption of independence of observations as there is an inherent relationship or correlation between encounters sampled in the same cluster. Therefore the certainty that the sample estimates reflect the true underlying population values is reduced by cluster sampling, thus 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 error calculations used in the 95% confidence intervals accommodate both the single-stage clustered study design and sample weighting according to Kish's description of the formulae.[46] For comparability with previous years, we have continued to use SAS 6.12 for the tables in Chapter 2—Summary of changes from 1998–99 to 2004–05 (red margin), Chapter 4—Annual results BEACH 2004–05 (blue margin) and in Appendix 5 (comparative data from each of five years 2000–01 to 2004–05, available from <www.aihw.gov.au/publications/index.cfm>).

Changes over time

SAS 6.12 is limited in its capacity to calculate the standard error for the current study design, so additional programming was required to incorporate the formulae. SAS version 8.2[21] now includes procedures that calculate the robust standard error to adjust for the intra-cluster correlation of the cluster sample.

In Chapter 3—Selected topics—changes over time (red margin), we used SAS V8.2 regression procedures that adjust the standard error to allow for the design effect of the cluster sample.[21] The adjusted standard error gives more conservative tests of statistical significance than would be calculated if the data were analysed using simple random sample methods.

Changes over time in medications prescribed/supplied or advised were examined for specific problems of interest. Linear regression was performed to detect:

- a change over time in the medication management for the problem of interest, *or*
- whether a change in medication rate was explained by a commensurate change in management rate of the problem(s) for which the medication is prescribed.

Outcomes are expressed as rates per 100 encounters for medications and problems managed. When examining changes in medication rates within specified morbidities (e.g. arthritis), rates are expressed per 100 specified problems. All analyses were weighted for the GP's age, sex and activity level.

Extrapolated national estimates

- Where we detected a significant change over time, we calculated the estimated annual rate of change.
- We extrapolated the national estimates by multiplying the encounter rate for 1998–99 by the number of unreferred attendances (A1 and A2 items) claimed through Medicare in that year to give the estimated number of encounters for that event in 1998–99. The same

was done for 2004–05. The difference between the two estimates was averaged over six years to give the estimated annual rate of change in encounters.

- This is expressed as the mean annual increase (or decrease) over the study period, in the number of general practice encounters for that problem or medication occurring in Australia each year.

5.6 Classification of data

The patient RFEs, problems managed, other (non-pharmacological) treatments, referrals, and pathology and imaging tests ordered are coded using ICPC-2 PLUS.[47] 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).[48]

The ICPC is used in more than 45 countries as the standard for data classification in primary care. It has recently been accepted by the World Health Organization (WHO) in the WHO Family of Classifications[49] and has been declared the national standard in Australia for reporting of health data from general practice and patient self-reported health information.[50]

	Chapters																
Components	**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 5.2: The structure of the International Classification of Primary Care—Version 2 (ICPC–2)

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 5.2). 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 RFEs 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, other (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, requires a thorough knowledge of the classification if correct classification of a concept is 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 been 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.[47]

Classification of pharmaceuticals

Pharmaceuticals that are prescribed, provided by the GP and those advised for over-the-counter purchase 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.
- Strength and regimen are independent fields which, when combined with the CAPS code, give an opportunity to derive prescribed daily dose for any prescribed medication or group of medications.
- CAPS is mapped to the Anatomical Therapeutic Chemical (ATC)[31] classification which is the Australian standard for classifying medications at the generic level.

The ATC has a hierarchical structure with five levels. For example:

- Level 1: C—Cardiovascular system
- Level 2: C10—Serum lipid reducing agents
- Level 3: C10A—cholesterol and triglyceride reducers
- Level 4:C10AA—HMG CoA reductase inhibitors
- Level 5: C10AA01—Simvastatin (the generic drug).

Use of the medication classifications in reporting

When reporting pharmaceutical data we have the choice of reporting in terms of the CAPS coding scheme or the ATC. They each have advantages in different circumstances.

In the CAPS system a new drug enters at the product and generic level, and it is immediately allocated a generic code. Therefore, the CAPS classification uses a bottom–up approach.

In the ATC a new generic may initially enter the classification at any level (1 to 5), not necessarily always at the generic level. Reclassification to lower ATC levels may then occur later. Therefore, the ATC uses a top–down approach.

When analysing medications across time, a generic medication that is initially classified to a higher ATC level will not be identifiable in that data period and may result in under-enumeration of that drug during earlier data collection periods.

- When reporting the 2004–05 annual results for pharmaceutical data, we have used the CAPS database in the tables reporting the 'most frequent medications' (Tables 4.26 to 4.28 inclusive).
- When reporting the annual results for pharmaceutical in terms of the ATC hierarchy (Table 4.25), we have reported using ATC Levels 1, 3, and 5. The reader should be aware that the results reported at the generic level (Level 5) may differ slightly from those reported in the 'most frequent medication' tables described above.
- In measuring changes in medications over time (in Chapter 2–red margin), we have chosen to report at Level 2 of the ATC (which is more stable over time than Level 3), and in CAPS for the generic level drugs.

5.7 Patient risk factor methods

Patient risk factors are investigated for a subsample of patients using the SAND methods (see Section 5.3). The patient risk factors measured include self-reported height and weight (for calculation of body mass index, BMI), alcohol consumption and smoking status.

Body mass index

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.[51] This method, based on international data from developed Western cultures, is applicable in 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 2–17 years).[51] There are three categories defined for childhood BMI: underweight/normal, overweight and obese.

Smoking

As part of the current study, the GPs were instructed to ask the patients (18 years and over):

- 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 the 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),[52] with scoring for an Australian setting.[53] 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.[53]

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

- 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.

The wording of the responses to the first and third questions was changed from 2001–02 onwards to reflect exactly the AUDIT instrument from which the responses are derived. This update, along with a data entry change enabling more specific entry for the second question, slightly increased the rates of at-risk drinking. The data collected from 2001–02 onwards are a more accurate reflection of the alcohol consumption of general practice patients and these are the years compared in this report.

5.8 Quality assurance

All morbidity and therapeutic data elements were secondarily coded by staff entering key words or word fragments and selecting the required term or label from a pick list. This was

then automatically coded and classified by the computer. A QA 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.

5.9 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 applied 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.[54] Other studies have reported agreement between GP-reported patient RFEs and problems managed and those recalled by the patient,[55] the reliability of secondary coding of RFEs[56] and problems managed,[57] and the validity of ICPC as a tool for classifying the data.[58]

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.[59,60] 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.[61]

5.10 Methodological issues

How many individual GPs have participated in BEACH to date?

Over the first seven years of the BEACH program, 697,400 encounters have been recorded by 6,974 GPs. Since GPs may be sampled from the HIC data once in each QA triennium, we are often asked the extent to which GPs have participated more than once over the seven years.

This year we investigated the extent of 'double ups' and found that the 6,974 participants represented 5,929 individuals. GPs who had participated twice since March 1998 number 970. A further 37 GPs had participated three times. This means that we have to date sampled more than one-third of the GPs (approximately 17,500 in any one year) who have qualified for inclusion in the original sample frame (for definition see Section 5.1).

Cluster sampling

The statistical techniques applied in BEACH recognise that the sampling is based on GPs and that for each GP there is a cluster of encounters. Each cluster may have its own characteristics, being influenced by the characteristics of the GP. Although ideally the sample should be a random sample of GP–patient encounters, such a sampling method is impractical in the Australian health care system. The reader should, however, be aware that the larger the GP sample and the smaller the cluster, the better. The sample size of 100,000 encounters from a

random sample of 1,000 GPs has been demonstrated to be the most suitable balance between cost and statistical power and validity.[12] The cluster effect is dealt with through SAS 8.2 (see Section 5.5).

GP participation rates

The response rate of GPs in the seventh year of BEACH was 28.1% of those we could contact—somewhat of an improvement since the previous year when it was 23.7%. The 2004–05 result is comparable with the 28.9% in the fifth BEACH year (2002–03), 32.3% in the fourth year, and the 29.8% in the third year. In the first two years of BEACH, response rates were far higher, at 39.1% in the second year and 38.4% in the first year (1998–99).

But what is the denominator?

One of the difficulties in reliably reporting response rate is the changing size of the denominator. The sample frame includes all non-specialists who have claimed more than 375 A1 Medicare items of service in the previous quarter. This means that the sample frame includes:

- current registrars, who in the past, were not required to undertake QA until the triennium after graduation but who are now required to undertake QA activities in the triennium in which they complete training. The annual intake of registrars to the training program for general practice is now close to 600 per year.
- overseas trained doctors employed in areas of workforce shortage, the number of whom is increasing. It is expected there will be an additional 725 such doctors working in Australia by 2007.[62] Until 2004 these doctors were not required to do QA but they were counted in the denominator. Now they are required to do QA.

There is no differentiation between recognised GPs and those other medical practitioners who can claim Medicare A1 service items through the MedicarePlus initiatives.[62] As the pool of overseas trained doctors and other medical practitioners who are paid A1 items of service increases,[62] the denominator used to calculate the response rate grows. Unfortunately there is no way we can identify the size of this effect.

How many can we contact?

In recent years we have expressed increasing concern over the (in)accuracy of the contact details provided by the HIC for sampled GPs. About 15–20% of addresses provided are no longer current and approximately 90% of telephone numbers are incorrect when the sample is received. A considerable amount of time is invested by the recruitment team in locating practitioners, and this is not always successful as GPs don't usually have a work telephone number in their own name. In spite of these inaccuracies we have, in all previous years, still established contact with a minimum of 90% of the GPs for whom details were provided in our HIC sample. This year we managed to contact only 85.7%. The proportion of all sampled GPs who were found to have died, moved to an untraceable location, or to have retired doubled from 4.0% in 2003–04 to 8.3% this year. As the aim is to represent active, practising GPs, the exclusion of these GPs from the sample is a valid and necessary action.

What about the young GPs?

In all previous years we have had an under-representation of GPs aged less than 35 years. We corrected for this under-representation in the final BEACH data set each year using post stratification weighting. This year we do not have an under-representation of young GPs. In the past we have hypothesised that the under-representation of young GPs reflected the lack of requirement for GP registrars to undertake QA activities during training or during the QA triennium on completion of training. This hypothesis appears to have been correct—recent changes have meant that the registrars now have to complete QA during the triennium in which they complete their training—and this year was the first since BEACH commenced in which GPs aged less that 35 years were not under-represented in the participating sample.

Electronic BEACH data collection

The BEACH program is currently a paper-based data collection program. Many people have suggested that with the increased GP uptake of electronic prescribing systems or full clinical systems (electronic health records—EHRs), national data could soon be drawn passively, directly from the GPs' computers. Although an attractive proposition, there are still many barriers to its implementation.

- To obtain a national random sample of practising GPs, each GP must have an equal chance of selection. Until all GPs are using EHRs, this would not be the case. Further, with the recognised variance between GPs[63] it is likely that those who do not have EHRs differ from those who do. Sampling from only those GPs with EHRs would therefore give a biased national result.
- Many GPs currently use electronic prescribing systems rather than full EHRs, or use their EHRs for prescribing only (see Chapter 4, blue margin). The extent to which data are entered at encounters that do not involve a prescription is not known. Where GPs do not record the problem managed unless a prescription is provided, measurement of changes in prescribing behaviour over time becomes impossible. For example, if GPs significantly decrease the prescribing of antibiotics for URTI, and in parallel record problems only where a medication is prescribed, the recorded rate of antibiotic prescriptions for URTI will either not change or may increase. Further, this report has demonstrated that drug prescription is only one of many management techniques used by GPs. The measurement of GP clinical activity should not be confined to the measurement of prescribing behaviour any more than it should be limited to activities claimed only through the MBS.
- The structure of electronic clinical systems varies, as do the coding and classification systems used in each. Drawing reliable and representative data from electronic clinical systems will require the introduction of a standardised minimum data set and use of standard coding and classification systems in all electronic clinical systems.
- Issues of privacy and confidentiality also need to be resolved.

5.11 Other BEACH applications

The AGPSCC has recently completed the data collection phase of a study measuring the experience gained by GP registrars during each stage of their training. The BEACH methods have been applied in this study which is being conducted in collaboration with Monash University and the Victoria Metropolitan Alliance. The results may help to better define the areas in which registrars should receive training and may identify areas in which they are not gaining experience.

Another parallel BEACH study is being conducted in Victoria Community Health Centres, for the Victoria Department of Human Services. There is currently limited information available about the clinical role of Community Health Service GPs and the characteristics of the patients they see, and how these may differ from the 'average' GP in Australia.

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Glossary

A1 Medicare items: Medicare item numbers 1, 2, 3, 4, 13, 19, 20, 23, 24, 25, 33, 35, 36, 37, 38, 40, 43, 44, 47, 48, 50, 51, 601, 602, 720, 722, 724, 726, 728, 730, 734, 738, 740, 742, 744, 746, 749, 757, 759, 762, 765, 768, 771, 773, 775, 778, 779, 801, 803, 805, 807, 809, 811, 813, 815.

Aboriginal: The patient identifies himself or herself as an Aboriginal person.

Activity level: The number of general practice A1 Medicare items claimed during the previous 3 months by a participating GP.

Allied and other health professionals: Those who provide clinical and other specialised services in the management of patients, including physiotherapists, occupational therapists, dietitians, dentists and pharmacists.

Chapters (ICPC-2): The main divisions within ICPC-2. There are 17 chapters primarily representing the body systems.

Complaint: A symptom or disorder expressed by the patient when seeking care.

Component (ICPC-2): In ICPC-2 there are seven components which act as a second axis across all chapters.

Consultation: See *Encounter.*

Coxibs: A non-steroidal anti-inflammatory drug classified within the Anatomical Therapeutic Chemical classification as subgroup M01A H.

Diagnosis/problem: A statement of the provider's understanding of a health problem presented by a patient, family or community. GPs are instructed to record at the most specific level possible from the information available at the time. It may be limited to the level of symptoms.

- *New problem:* The first presentation of a problem, including the first presentation of a recurrence of a previously resolved problem but excluding the presentation of a problem first assessed by another provider.
- *Old problem:* A previously assessed problem that requires ongoing care. Includes follow-up for a problem or an initial presentation of a problem previously assessed by another provider.

Encounter (enc): Any professional interchange between a patient and a GP.

- *Indirect:* Encounter where there is no face-to-face meeting between the patient and the GP but a service is provided (e.g. prescription, referral).
- *Direct:* Encounter where there is a face-to-face meeting of the patient and the GP.

Direct encounters can be further divided into:

Medicare-claimable

- A1 items of service: See *A1 Medicare items*
  - S*urgery consultations:* Encounters identified by any one of MBS item numbers 3, 23, 36, 44.
  - H*ome visits:* Encounters identified by any one of MBS item numbers 4, 24, 37, 47.
  - H*ospital encounters:* Encounters identified by any one of MBS item numbers 19, 33, 40, 50.

- *Residential aged care facility:* Encounters identified by any one of MBS item numbers 20, 35, 43, 51.
- O*ther institutional visits:* Encounters identified by any one of MBS item numbers 13, 25, 38, 40.
- O*ther MBS encounters:* Encounters identified by an MBS item number that does not identify place of encounter (see *A1 Medicare items*).

- *Workers compensation:* Encounters paid by workers compensation insurance.
- *Other paid:* Encounters paid from another source (e.g. state).

General practitioner (GP): A medical practitioner who provides primary comprehensive and continuing care to patients and their families within the community (Royal Australian College of General Practitioners).

Medication: Medication that is prescribed, provided by the GP at the encounter or advised for over-the-counter purchase.

Medication rates: The rate of use of all medications including medications that were prescribed, supplied by the GP and advised for over-the-counter purchase.

Medication status:

- N*ew:* The medication prescribed/provided at the encounter/advised is being used for the management of the problem for the first time.
- C*ontinuation:* The medication prescribed/provided at the encounter/advised is a continuation or repeat of previous therapy for this problem.
- *Old:* see *Continuation.*

Morbidity: Any departure, subjective or objective, from a state of physiological wellbeing. In this sense, sickness, illness and morbid conditions are synonymous.

Patient status: The status of the patient to the practice.

- *New patient*: The patient has not been seen before in the practice.
- *Old patient:* The patient has attended the practice before.

Prescribed rates: The rate of use of prescribed medications (i.e. does not include medications that were GP-supplied or advised for over-the-counter purchase).

Problem managed: See *Diagnosis/problem.*

Provider: A person to whom a patient has access when contacting the health care system.

Reasons for encounter (RFEs): The subjective reasons given by the patient for seeing or contacting the general practitioner. These can be expressed in terms of symptoms, diagnoses or the need for a service.

Recognised GP: A medical practitioner who is:

- vocationally recognised under Section 3F of the Health Insurance Act, ***or***
- a holder of the Fellowship of the Royal Australian College of General Practitioners who participates in, and meets the requirements for, quality assurance and continuing medical education as defined in the RACGP Quality Assurance and Continuing Medical Education Program, ***or***

- undertaking an approved placement in general practice as part of a training program for general practice leading to the award of the Fellowship of the Royal Australian College of General Practitioners or undertaking an approved placement in general practice as part of some other training program recognised by the RACGP as being of equivalent standard.[6]

Referral: The process by which the responsibility for part or all of the care of a patient is temporarily transferred to another health care provider. Only new referrals to specialists and allied health professionals and for hospital and residential aged care facility admissions arising at a recorded encounter are included. Continuation referrals are not included. Multiple referrals can be recorded at any one encounter.

Rubric: The title of an individual code in ICPC-2.

Torres Strait Islander: The patient identifies himself or herself as a Torres Strait Islander person.

Tricyclics: non-selective monoamine reuptake inhibitor medications for depression.

Statins: HMG CoA reductase inhibitors used to lower cholesterol.

Abbreviations

ACE	Angiotensin converting enzyme
AGDHA	Australian Government Department of Health and Ageing
AGPSCC	Australian General Practice Statistics and Classification Centre, University of Sydney, a collaborating unit of the Australian Institute of Health and Welfare
AIHW	Australian Institute of Health and Welfare
ATC	Anatomical Therapeutic Chemical (classification)
AUDIT	Alcohol Use Disorders Identification Test
BEACH	Bettering the Evaluation And Care of Health
BMI	Body mass index
CAPS	Coding Atlas for Pharmaceutical Substances
CI	Confidence interval (in this report 95% CI is used)
CT	Computerised tomography
DVA	Australian Department of Veterans' Affairs
EHRs	Electronic health records
Enc	Encounter
ESR	Erythrocyte sedimentation rate
EUC	Electrolytes, urea and creatinine
FRACGP	Fellow of the Royal Australian College of General Practitioners
GORD	Gastro-oesophageal reflux disorder
GP	General practitioner
GPSCU	General Practice Statistics and Classification Unit (now the Australian General Practice Statistics and Classification Centre, AGPSCC)
HbA1c	Haemoglobin, type A1c
HIC	Health Insurance Commission
HIV	Human immunodeficiency virus
HMG-CoA	3-hydroxy-3-methylglutaryl coenzyme A
ICPC	International Classification of Primary Care
ICPC-2	International Classification of Primary Care (Version 2)
ICPC-2 PLUS	A terminology classified according to ICPC-2
LCL	Lower confidence limit
MAOI	Monoamine oxidase inhibitor
MBS	Medicare Benefits Schedule
MC&S	Microscopy, culture and sensitivity
N/A	Not applicable

NAv	Not available
NEC	Not elsewhere classified
NESB	Non-English-speaking background (i.e. a language other than English is spoken at home)
NOS	Not otherwise specified
N/S	Not specified
NSAID	Non-steroidal anti-inflammatory drug
OTCs	Over-the-counter (i.e. medications advised for over-the-counter purchase)
PBS	Pharmaceutical Benefits Scheme
PDD	Prescribed daily dose
PIP	Practice incentive payment
QA	Quality assurance (in this case the Quality Assurance Program of the Royal Australian College of General Practitioners)
RACGP	Royal Australian College of General Practitioners
RFE(s)	Reason(s) for encounter (see Glossary)
RRMA	Rural, Remote and Metropolitan Areas (classification)
SAND	Supplementary Analysis of Nominated Data
SAS	Statistical Analysis System
SLA	Statistical local area
SNRI	Serotonin-noradrenaline reuptake inhibitors
SRS	Simple random sample
SSRI	Selective serotonin reuptake inhibitors
UCL	Upper confidence limit
URTI	Upper respiratory tract infection
WHO	World Health Organization
Wonca	World Organization of Family Doctors

Appendices

Appendix 1: Example of a 2004–05 recording form

BEACH (Bettering the Evaluation And Care of Health) - Morbidity and Treatment Survey - National DOC ID

Encounter Number	Date of encounter ___/___/___	Date of Birth ___/___/____	Sex M ☐ F ☐	Patient Postcode

START Time : AM / PM (please circle)	Patient Reasons for Encounter	1. 2. 3.

Yes / No	
New Patient	☐ ☐
Health Care/Benefits Card	☐ ☐
Veterans Affairs Card	☐ ☐
NESB	☐ ☐
Aboriginal	☐ ☐
Torres Strait Islander	☐ ☐

PATIENT SEEN ☐
PATIENT NOT SEEN ☐

Item No: (if applicable)

Workers comp paid ☐
State Govt/Other paid ☐
No charge ☐

Diagnosis/ Problem ① : Problem Status New ☐ Old ☐ Work related ☐

Drug Name AND Form for this problem	Strength of product	Dose	Frequency	No. of Rpts	OTC	GP Supply	Drug status New	Drug status Cont.
1.								
2.								
3.								
4.								

Procedures, other treatments, counselling this consult for this problem
1. 2.

Diagnosis/ Problem ② : Problem Status New ☐ Old ☐ Work related ☐

Drug Name AND Form for this problem	Strength of product	Dose	Frequency	No. of Rpts	OTC	GP Supply	Drug status New	Drug status Cont.
1.								
2.								
3.								
4.								

Procedures, other treatments, counselling this consult for this problem
1. 2.

Diagnosis/ Problem ③ : Problem Status New ☐ Old ☐ Work related ☐

Drug Name AND Form for this problem	Strength of product	Dose	Frequency	No. of Rpts	OTC	GP Supply	Drug status New	Drug status Cont.
1.								
2.								
3.								
4.								

Procedures, other treatments, counselling this consult for this problem
1. 2.

Diagnosis/ Problem ④ : Problem Status New ☐ Old ☐ Work related ☐

Drug Name AND Form for this problem	Strength of product	Dose	Frequency	No. of Rpts	OTC	GP Supply	Drug status New	Drug status Cont.
1.								
2.								
3.								
4.								

Procedures, other treatments, counselling this consult for this problem
1. 2.

NEW REFERRALS, ADMISSIONS Problem(s)
1. _____ 1 2 3 4
2. _____ 1 2 3 4

IMAGING/Other tests Body site Problem(s)
1. _____ - _____ 1 2 3 4
2. _____ - _____ 1 2 3 4

PATHOLOGY Problem(s)
1. _____ 1 2 3 4
2. _____ 1 2 3 4
3. _____ 1 2 3 4

PATHOLOGY(cont) Problem(s)
4. _____ 1 2 3 4
5. _____ 1 2 3 4

Patient reported
Height: ____ cm
Weight: ____ kg

To the patient if 18+:
Which best describes your smoking status?
Smoke daily ☐
Smoke occasionally ☐
Previous smoker ☐
Never smoked ☐

To the patient if 18+:
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 ☐

FINISH Time : AM / PM (please circle)

BA7

Appendix 2: GP characteristics questionnaire 2004–05

The University of Sydney
at Westmead Hospital

General Practice Statistics and Classification Unit
Family Medicine Research Centre

a collaborating unit of the
Australian Institute of Health and Welfare

Doctor Identification Number

Your QA No. _____

Please fill in boxes or circle answers

1. Sex ..... **Male / Female**

2. Age.....

3. How many years have you spent in general practice?.....

4. How many GPs work with you at this practice? .....
(Practice = shared medical records)

5. Postcode of major practice address ..

6. Year of graduation .....

7. Place of graduation *(primary medical degree)*:
- Aust 1
- NZ 2
- Asia 3
- UK / Ireland 4
- Other: (specify) 5

8. Do you conduct any of your consultations in a language other than English?
- No 1
- Yes - <25% 2
- Yes - 25 to 50% 3
- Yes - >50% 4

9. Are you a GP registrar (i.e. in training)?... **Yes / No**

10. Are you DVA registered? ..... **Yes / No**

11. Do you hold FRACGP ?..... **Yes / No**

12. Is your major practice accredited ?..... **Yes / No**

13. Is there a practice nurse at your major practice address ?..... **Yes / No**

14. Number of general practice sessions you usually work per week?
(1 session = ~4 hrs eg a morning session) ....

15. Direct patient care hours worked per week?
(Include hours of direct patient care, instructions, counselling etc and other services such as referrals, prescriptions, phone calls etc.) .....

16. Over the past four weeks have you provided any patient care ....*(Circle all that apply)*
- As a locum 1
- In a deputising service..... 2
- In a residential aged care facility..... 3
- As a salaried/sessional hospital medical officer 4

17. What are the normal after-hours arrangements for your practice? *(Circle all that apply)*
- Practice does its own 1
- Co-operative with other practices..... 2
- Deputising service..... 3
- Referral to other service (eg A&E)..... 4
- Other 5
- None 6

18. Do you bulk bill? *(Circle all that apply)*
- Yes - all patients 1
- Yes - Pension/Healthcare Card holders 2
- Yes - children..... 3
- Yes - selected other patients..... 4
- No 5

19. To what extent are computers used -

(i) at your major practice?		(ii) by you (at work)?	
Not at all.....	1	Not at all	1
Billing.....	2	Test ordering	2
Prescribing.....	3	Prescribing	3
Medical Records	4	Medical Records	4
Other Admin	5	Internet	5
Internet / Email	6	Email	6

(iii) Prescribing / Health record software used is —

_____

20. Is your major practice site a teaching practice? *(Circle all that apply)*
- for undergraduates..... 1
- for GP registrars 2
- No 3

21. Did any of your BEACH consultations take place in an Aboriginal Community Controlled Health Service (ACCHS)?
- No 1
- Yes - all..... 2
- Yes - some (which dates?) _____ 3

*Thank you for participating in the **BEACH PROGRAM**.*

GPS&CU, Acacia House, Westmead Hospital, WESTMEAD, 2145.
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Appendix 3: Code groups from ICPC-2 and ICPC-2 PLUS

Available from <http://www.aihw.gov.au/publications/index.cfm>

Appendix 4: Chronic code groups from ICPC-2 and ICPC-2 PLUS

Available from <http://www.aihw.gov.au/publications/index.cfm>

Appendix 5: Summary of annual results 2000–01 to 2004–05

Available from <http://www.aihw.gov.au/publications/index.cfm>

Appendix 6: Published articles from the BEACH program

Available from <http://www.aihw.gov.au/publications/index.cfm>