General practice activity in Australia 2003–04

GP Statistics and Classification Unit

The Australian Institute of Health and Welfare is an independent health and welfare statistics and information agency. The Institute's mission is *better health and wellbeing for Australians through better health and welfare statistics and information.*

The General Practice Statistics and Classification Unit is a collaborating unit of the Australian Institute of Health and Welfare and the University of Sydney, situated within the Family Medicine Research Centre at Westmead Hospital. It fulfils the obligation of the Australian Institute of Health and Welfare to collect statistics regarding general practitioners, their patients and their patients' care.

Recent related publications:

Britt H, Miller GC, Knox S, Charles J, Valenti L, Bayram C, O'Halloran J, Henderson J, Pan Y, Harrison C 2004. General practice activity in the states and territories of Australia 1998–2003. AIHW Cat. No. GEP 15. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 15).

Britt H, Miller GC, Knox S, Charles J, Valenti L, Henderson J, Pan Y, Bayram C, Harrison C 2003. General practice activity in Australia 2002–03. AIHW Cat. No. GEP 14. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 14).

Britt H, Knox S, Miller GC 2003. Changes in pathology ordering by general practitioners in Australia, 1998–2001. AIHW Cat. No. GEP 13. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 13).

O'Halloran J, Britt H, Valenti L, Harrison C, Pan Y, Knox S 2003. Older patients attending general practice 2000–02. AIHW Cat. No. GEP 12. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 12).

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Henderson J, Pan Y, Britt H, Charles J, Miller GC, Knox S 2002. Cardiovascular problems and risk behaviours among patients at general practice encounters in Australia 1998–00. AIHW Cat. No. GEP 9. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 9).

Britt H, Miller GC, Knox S, Charles J, Valenti L, Henderson J, Kelly Z, Pan Y 2001. General practice activity in Australia 2000–01. AIHW Cat. No. GEP 8. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 8).

General Practice Statistics and Classification Unit 2000 [cited 01–12–2004]. SAND abstracts from the BEACH program. Sydney: AIHW & University of Sydney. Available from internet: http://www.fmrc.org.au/publications/SAND_abstracts.

A full list of publications emanating from the BEACH program are listed in Appendix 6.

GENERAL PRACTICE SERIES

Number 16

BEACH

Bettering the Evaluation and Care of Health

General practice activity in Australia 2003–04

Helena Britt, Graeme C Miller, Stephanie Knox, Janice Charles, Lisa Valenti, Ying Pan, Joan Henderson, Clare Bayram, Julie O'Halloran, Anthea Ng

December 2004

Foreword

There is an urgent need in all countries for accurate and detailed data on the contribution of family doctors to health care. Information on the role and value of primary care doctors in health care services is essential to assess and support calls for increased training of family doctors, and for shifts in budget allocations from high-tech specialist services to possibly more efficient and less costly primary care services, especially in developing countries. Unfortunately in most countries, unlike Australia, such information is not available.

Information on our patients, our workloads and how we behave in the clinical encounter is an essential starting point for meaningful quality improvement and management, and can also contribute to designing curricula for family medicine training.

The six annual reports on General Practice Activity in Australia by the BEACH program have demonstrated the enormous value of systematic collection of practice data from general practitioners. The 2003–04 report of 100 consecutive patient encounters managed by each of 1000 randomly recruited GPs across Australia once again sets a standard for surveys which can and should be duplicated across the globe. The data itself provides a benchmark against which national cross-sectional GP activity data collection and analysis can be compared and measured. The value of a database of over 600,000 patient encounters over 6 years cannot be over-emphasised. Similar but more limited personal gathering of data on an annual basis in South Africa has, for example, dramatically emphasised the changing profile of family practice in the wake of the HIV/AIDS epidemic. The extensive expertise and experience gained over the years by the team of BEACH researchers is immense, and hopefully can be tapped by others around the world wishing to embark on similar studies.

This 2003–04 report emphasises and, in many instances, mirrors the global burden of disease and the role of GPs in the management of health conditions. Of importance are the figures of common chronic/non infective conditions which also affect millions of people globally. Of concern is that over half (56.5%) of Australian adults and 31.2% of children aged 2–17 years are either overweight or obese, representing a 15.3% increase since the 2000–01 report. Hypertension, URTI, immunisation/vaccination, depression and diabetes accounted for almost 20% of problems managed by GPs.

For a global analytical perspective on the nature of general practice, it is essential that data be internationally comparable. Hence the use of a classification system which is able to easily define the elements of the primary care encounter, including reasons for encounter, diagnosis, and processes is fundamental. The system must also be user-friendly but with sufficient specificity to embrace the scope and domains of general practice/primary care. It should also be easily linked through cross-walks to other systems such as ICD10 which are used for national and international morbidity and mortality data coding and classification. The International Classification of Primary Care, Version 2 (ICPC-2) developed by Wonca (The World Organisation of Family Doctors) is such a tool and has recently been embraced by WHO as a member of its family of classification systems.

The ongoing activities of Wonca Collaborating Centres such as The Family Medicine Research Centre (FMRC) at Sydney University are essential for the continued development and support of ICPC-2 and its successors, to enable internationally standardised data sets and data linkages. The use of ICPC-2 as the basis for the reporting in this BEACH report makes international comparison of the data valid and reliable.

I personally look forward to the 7th annual report!

Professor Bruce Sparks

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Acknowledgments

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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.

Summary

Background

This report provides an overview of results from the sixth year of the BEACH (Bettering the Evaluation and Care of Health) program, a continuous study of general practice activity. It also investigates changes in morbidity and management demonstrated over the last 5 years from March 1999. Summaries of results for each year are provided in Appendix 5.

Method

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 General Practice Branch 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.

In the 2003–04 BEACH data year, a random sample of 1,000 GPs from across Australia provided details of 100,000 GP–patient 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 sixth year of BEACH are reported elsewhere: <http://www.fmrc.org.au/publications/SAND_abstracts.htm>.

The participating general practitioners

The 1,000 participants represented 23.7% of those with whom contact could be established. Males made up 67.3% of participants and GPs aged 45 years or older accounted for 69.2%. Most (82.6%) had been in general practice for more than ten years. The majority (73.5%) had graduated in Australia and two-thirds (62.4%) practised in capital cities. One-third (33.5%) were Fellows of the Royal Australian College of General Practitioners, and 4.4% were currently in a general practice vocational training program. One in ten (10.6%) were in solo practice, and four out of five (81.0%) worked in an accredited practice. More than half the practices (59.6%) provided their own after-hours services or worked through a cooperative arrangement with other practices. Hours spent in direct patient care per week were between 41 and 60 hours for 42.3% of these GPs and 21–40 hours for 42.4%. Computers were used in 95.0% of practices, mainly for prescribing (83.0%) and billing (79.9%) purposes.

A comparison of characteristics of participating GPs with those of GPs who declined showed that GPs aged less than 35 years were under-represented in the final BEACH GP sample. Participants also claimed significantly fewer Medicare items of service in the previous quarter. To increase the precision of national estimates post-stratification weighting corrected for under-representation of younger GPs and incorporated the differential activity level of each GP.

The encounters

After post-stratification weighting for age (stratified by sex) and activity level, there were 98,877 encounters included in the analysis. Comparison of the age–sex distribution of patients at the Medicare-claimable encounters with that of encounters in the Medicare data demonstrated excellent precision of the final encounter sample. Most encounters (97.0%) were direct encounters (patient seen). Almost all (93.8%) encounters were claimable from Medicare or the Department of Veterans' Affairs, and 82.4% of these services were standard surgery consultations. The encounters involved 148,521 reasons for encounter (RFEs), 144,674 problems managed, 103,210 medications, 50,775 non-pharmacological treatments, 11,495 referrals, 34,831 pathology test orders and 8,121 orders for imaging.

The patients

Children accounted for 12.3% of the encounters, 9.6% were with young adults and 26.8% with elderly patients. The patient was female at 57.4% of encounters, held a Commonwealth concession card at 42.5%, and came from a non-English-speaking background at 9.7% of encounters. Patients identified themselves as an Aboriginal person and/or a Torres Strait Islander at 1.6% of encounters.

Patient RFEs were recorded at a rate of 150 per 100 encounters. Approximately half the RFEs related to the respiratory, musculoskeletal, skin, digestive and circulatory systems. RFEs were most commonly described in terms of symptoms and complaints. Requests for a check-up, a prescription, or test results were also common.

Problems managed

Problems were managed at a rate of 146.3 per 100 encounters. Those relating to the respiratory system, musculoskeletal system, circulatory system and skin accounted for almost half of all problems managed. The most common individual problems were hypertension (9.2 per 100 encounters), upper respiratory tract infection (5.5 per 100), immunisation/vaccination (4.7 per 100), depression (3.7 per 100) and diabetes (3.3 per 100). Together these represented almost 20% of all problems managed.

Management

There was no specific treatment recorded for 13.2% of problems managed. At least one medication was prescribed for 47.8% of problems and at least one clinical treatment given for 22.2%. The most common treatment was medication alone (38.9% of problems), followed by clinical treatment alone (9.9%) then by medication plus clinical treatments (7.6%).

Medications

There were 104 medications recorded per 100 encounters, or 71 per 100 problems. These medications could be prescribed (82.4% of all medications), advised for over-the-counter purchase (9.4%) or supplied by the GP (8.2%).

Prescribed medications: Medications were prescribed at a rate of 86.0 per 100 encounters or 58.8 per 100 problems managed, at least one being prescribed at 55.7% of encounters and for 47.8% of problems managed. Medication groups most frequently prescribed were cardiovascular (16.8% of all prescriptions), antibiotics (16.5%), central nervous system (12.2%), psychological (8.8%), hormones (6.6%) and musculoskeletal (6.5%). The most commonly prescribed generic medications were amoxycillin (3.8% of all prescriptions), paracetamol (3.3%), the paracetamol–codeine combination (2.4%) and cephalexin (2.3%).

Other medications: Medications most often recommended for over-the-counter purchase were paracetamol, ibuprofen, loratadine and diclofenac topical. The medications most often supplied by the GP were the influenza, polio and meningitis vaccines, and amoxycillin.

Non-pharmacological treatments

These were classified as clinical and procedural. At least one non-pharmacological treatment was provided for 30.5% of problems. Clinical treatments were more frequent (36.6 per 100 encounters or 25.0 per 100 problems) than procedures (14.7 and 10.1 respectively). General advice and education (6.8 per 100 encounters) was the most common clinical treatment, followed by counselling about the problem managed. The most frequent procedure was excision or removal of tissue (3.1 per 100 encounters).

Referrals, admissions, tests and investigations

At least one referral was given at 11.0% of encounters for 7.5% of problems. Referrals to medical specialists arose at a rate of 7.9 per 100 encounters, the most frequent being to surgeons. Referrals to allied health professionals were made at a rate of 2.6 per 100 encounters, the majority being to physiotherapists. Admissions to hospital and referrals to the emergency department were rare. Malignant neoplasms of the skin, diabetes, pregnancy and back complaints were the problems most often referred to a specialist; back complaints, sprains/strains and depression were those most commonly referred to an allied health professional.

Pathology was ordered for more than one in ten problems (at a rate of 35.2 tests per 100 encounters). Blood chemistry accounted for more than half the tests ordered, but a full blood count was the most commonly ordered individual test. Problems for which pathology was most often ordered were diabetes, hypertension and lipid disorders. Imaging was ordered for one in twenty problems, at a rate of 8.2 per 100 encounters. Plain x-rays accounted for over half of these, chest x-rays being the most common. Back complaints, fractures and osteoarthritis were the problems for which imaging was most frequently ordered.

Selected topics—changes over time

The rate of non-steroidal anti-inflammatory drugs (NSAIDs) prescribed or supplied rose significantly over the period 1999–00 to 2000–01, but since then declined slowly over the three years 2001–02 to 2002–04. The increase in NSAIDs was explained by the rapid uptake of coxibs between 1999–00 and 2000–01. It appears that the level of coxibs prescribed or supplied by the GP has reached a plateau, with a slight decrease in the rates of coxibs since 2001–02. The pattern of NSAID medication rates was similar for both arthritis and other musculoskeletal problems, although the initial uptake of coxibs was more pronounced for arthritis.

The rate of anti-depressant medications for depression increased slightly from 1998–99 to 2003–04. This increase was explained by an increase in the rate of selective serotonin re-uptake inhibitors, which was partly offset by a decrease in the rates of tricyclic anti-depressants.

The management rate of asthma has decreased significantly since 1998–99. This has been accompanied by a significant decrease in the rates of bronchodilators prescribed, supplied or advised by the GP for asthma problems. The medication rates of asthma preventers has remained steady.

The management of lipid disorders increased significantly from 1998–99 to 2003–04, accompanied by a commensurate increase in the prescription and supply of statin medications. There has been a significant increase in the management rate of diabetes problems from 1998–99 to 2003–04.

Patient health risk factors

Body mass index: Of 31,890 adult respondents (aged 18 years and over), more than half (56.5%) were considered obese (22.0%) or overweight (34.5%). Approximately 7% were underweight. Men were more likely to be overweight or obese (62.9%) than women (52.3%). There was a significant increase in prevalence of obesity from 19.4% in 1999–00 to 22.0% in 2003–04. The increase in prevalence of being overweight (from 33.1% to 34.5%) just failed to reach significance. Body mass index was calculated for 3,301 children aged 2–17 years. Overall, 13.2% of these children were classed as obese and a further 19.0% as overweight. The proportion classified as overweight has increased significantly since 2000–01 (15.3%).

Smoking: Of the 32,718 responding adult patients (aged 18 years and over), 17.6% were daily smokers, 4.3% were occasional smokers and 28.0% were previous smokers. Males were more likely to report daily smoking (21.0%) than females (15.4%).

Alcohol consumption: 'At-risk' levels of alcohol intake were reported by 26.7% of the 31,721 adult respondents. Male patients were more likely to be at-risk drinkers (33.1%) than women (22.6%). Prevalence of at-risk drinking decreased with increasing age for both sexes.

Risk factor profile: Smoking status, alcohol consumption and body mass index were available for 30,713 adult patients. Almost half of these patients had one of these three risk factors, 19.8% had two and 4.0% had all three. These results are remarkably consistent with those reported last year.

Discussion

Some of the findings earlier reported are discussed in Chapter 15. While this report provides an overview of the clinical activity of general practitioners, the BEACH database now contains records of more than 600,000 GP–patient encounters. The size of the database allows detailed analysis of any specific topic, whether the subject be problem or morbidity or a particular type of management (e.g. GP use of a selected medication type). Access to the database and issues to consider when triangulating BEACH data with that from other sources (e.g. Pharmaceutical Benefits Scheme) are also outlined in Chapter 15, Section 15.2.

Conclusion

This report has described the clinical activities of GPs and their contribution to the health care of the Australian community. It has described some of the changes that have occurred over the last 5 years.

1 Introduction

The BEACH (Bettering the Evaluation and Care of Health) program is a continuous national study of general practice activity in Australia. This publication is the sixth annual report of the program and provides a summary of results for the period April 2003 to March 2004 inclusive. It uses details of 100,000 encounters between general practitioners (GPs) and patients (about a 0.11% sample of all general practice encounters) from a random sample of 1,000 recognised practising GPs from across the country.

The BEACH program 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 2001, the population of Australia was 19,413,240 people and there were 53,384 'employed' medical practitioners of whom 49,647 (93%) were clinicians. Of these, 44% were primary care practitioners and 35% were specialists.[1]

GPs perform a gatekeeper role for entry into the secondary and tertiary sectors of the Australian health care system. Most (85%) of the 19.7 million Australians attended a GP at least once during the year 2002 (personal communication, GP Branch, Australian Government Department of Health and Ageing, August 2002). An individual is free to visit multiple GPs of their choice and services are provided on a fee-for-service system. However, by far the majority of visits to GPs are funded through the Commonwealth Medicare Benefits Schedule (MBS) scheme, Medicare paying for 85% of the government schedule consultation fee.[2] Some patients are not charged the additional 15% of the fee, the GPs accepting the Medicare payment as total payment. Others are charged the difference between the Medicare payment and the government scheduled fee, while still others may be asked to pay more for the service.

There are more than 17,000 recognised GPs in Australia and about 1,500 registrars enrolled in general practice vocational training programs.[3] GPs provide 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] Knowledge of the content of these encounters and of the services and treatments provided by the GPs gives an important insight into the health of a large proportion of the community.

Recognised GPs accounted for about 80% of the 21,338 primary care practitioners, both recognised GPs and other medical practitioners (OMPs), who provided at least one Medicare item of service in the last quarter of 2001. This equated to 16,824.3 full-time workload equivalent (FWE) GPs/OMPs practising in Australia (personal communication, Health Insurance Commission, February 2004). Therefore, there were 867 FWE GPs or OMPs per 100,000 people.

Information on the number of Medicare-paid services per capita is readily available from the website of the Health Insurance Commission (HIC).[4] The HIC also holds data about pharmaceuticals purchased under the Commonwealth Pharmaceutical Benefits Scheme (PBS). However, these data only partially reflect the medications prescribed by GPs, for they only include those medications that are covered by the PBS. They do not include information about prescribed medications not covered by the Scheme, nor those directly supplied by the GP or those advised for over-the-counter purchase. Further, there is no information held in the PBS about the indication (problem being managed) for the medication because the HIC

does not hold data about the content of the encounters. These issues are discussed in more detail in Chapter 15 of this report.

The Australian Bureau of Statistics provides data on self-reported health through the National Health Survey.[5] The data differ from those collected in BEACH because they are self-reported by a random sample of people in the community.

BEACH provides a picture of what happens when people visit a GP, why they present, what problems are managed and the treatments that are provided. Its linkage of management to specific problems is one of its greatest advantages.

There have been many initiatives that aim to improve the care provided to the community through general practice, and it is important to ask what impact they have on practice behaviour at a national level. It is therefore essential to measure changes that occur in the clinical care of the population, even if we are unable to demonstrate a direct causal effect from any single intervention being undertaken.

This year of the program provides the sixth measured data point, allowing further measurement of changes over time. Changes that have occurred over the last 5 years of the program are described at the end of each chapter of the results and these results are summarised in Appendix 5 of this report. More detailed analyses of changes in the morbidity managed and the medications prescribed in areas associated with the National Health Priority Areas[6] are reported in Chapter 13.

A second part of the BEACH program collects information about patient health and risk factors. This section is called SAND (Supplementary Analysis of Nominated Data) and it relies on GPs asking patients questions about specific aspects of their health. Between ten and twenty topics are covered in SAND each year (depending on the subsample size for each topic). However, there are three that are consistent across the whole year and in which all participating GPs are involved. Due to their standard nature, summary results for patient-derived body mass index, smoking status and alcohol consumption are included in this annual report (Chapter 14).

1.1 The advantages of BEACH

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 ever-changing 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.[7]

- Our access to a regular random sample of recognised GPs who are currently in active practice, through the Australian Government Department of Health and Ageing (DoHA), ensures that the sample of GPs is drawn from a very reliable sample frame of currently active GPs.

- We are provided with sufficient details about the characteristics of all GPs in the sample frame to allow statistical testing of the representativeness of the final sample and to allow post-stratification weighting to correct for any under-representation or over-representation in the sample (e.g. in BEACH this applies to GPs aged less than 35 years).

- The ever-changing nature of the sample (where each GP can only participate 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 Medicare claims data.

  Where 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 terms of the number of patient consultations they conduct in any one year. We aim to represent all encounters conducted in general practice across the country. The DoHA therefore provides an individual count of activity level (i.e. number of A1 Medicare item numbers claimed in the previous quarter) 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 (see Chapter 4).

- The structured paper encounter form leads the GP through each step in the patient 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 that are covered by Medicare.

- The medication data include prescriptions, GP-supplied medications and advised over-the-counter (OTC) drugs, rather than being limited to those prescribed medications that are covered by the 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 OTC purchase, the patients to whom they provide such advice and the problems managed in this manner.

- The inclusion of non-pharmacological management such as clinical counselling and therapeutic procedures 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 and in the allocation of a concept to the correct place in the classification.

- The analytical techniques applied to the BEACH data ensure that the cluster sample inherent in the methods is dealt with and that results are provided with 95% confidence intervals. Users are therefore aware of how reliable (or unreliable) any estimate might be.

- The reliability of the methods is demonstrated by the consistency of the results over the 6 years in areas where change is not expected and by the ability to identify change when it might be expected (e.g. the pattern of coxib prescriptions since these medications were first released).

A more detailed discussion of methodological issues associated with BEACH is provided in Chapter 15 (Section 15.1) and the use of BEACH data in combination with other data sets is discussed in more detail in Section 15.2.

1.2 Aims

The BEACH program has three main aims:

- to provide a reliable and valid data collection process for general practice which is responsive to the ever-changing needs of information users

- to establish an ongoing database of GP–patient encounter information

- to assess patient risk factors and health states, and the relationship these factors have with health service activity.

2 Methods

The methods adopted in the BEACH program have been described in detail elsewhere.[8-10] In summary, each of the recognised GPs in a random sample of approximately 1,000 per year records details about 100 doctor–patient encounters of all types. The information is recorded on structured encounter forms (on paper). It is a rolling sample, recruited approximately 3 weeks ahead. Approximately 20 GPs participate each week, 50 weeks a year.

2.1 Sampling methods

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

2.2 Recruitment methods

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

Participating GPs earn up to 65 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 made. In addition, GPs receive some educational material related to the identification and management of patients who smoke or consume alcohol at hazardous levels.

2.3 Data elements

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

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

Information about **the patient** includes date of birth, sex and postcode of residence. Tick boxes are provided for Commonwealth concession card holder, holder of a Repatriation health card (from the Australian Department of Veterans' Affairs, DVA), non-English-

speaking background (NESB), an Aboriginal person (self-identification) and Torres Strait Islander (self-identification). Space is provided for up to three patient reasons for encounter (RFEs).

The **content of the encounter** is described in terms of the problems managed and the management techniques applied to each of these problems. Data elements include up to four diagnoses/problems. Tick boxes are provided to denote the status of each problem as new to the patient (if applicable).

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

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

Supplementary analysis of nominated data (SAND): A section on the bottom of each recording form investigates aspects of patient health or health care delivery in general practice not covered by the consultation-based data. The year-long data collection period is divided into 10 blocks, each of 5 weeks. Each block is designed to include data from 100 GPs. Each GP's recording pack of 100 forms is made up of 40 forms that contain questions about patient height and weight (for calculation of body mass index, BMI), alcohol intake and smoking status. The remaining 60 forms in each pack are divided into two blocks of 30 forms. Different questions are asked of the patient in each block and these vary throughout the year. The results of topics in the SAND substudies for alcohol consumption, smoking status and BMI are included in this report. Abstracts of results for the substudies conducted in the sixth year of the program and not reported in this document are available through the website of the Family Medicine Research Centre (of which the General Practice Statistics and Classification Unit is a part) at <http://www.fmrc.org.au/publications/ SAND_abstracts.htm>.

2.4 The BEACH relational database

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

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│  ┌──────────────────────────────────┐      ┌────────────────────────────────────┐ │
│  │ GP characteristics               │      │ Problems managed                   │ │
│  │  • age and sex                   │─────→│  • diagnosis/problem label         │ │
│  │  • years in general practice     │      │  • problem status (new/old to pat.)│ │
│  │  • country of graduation         │      └────────────────────────────────────┘ │
│  │  • FRACGP status                 │                                              │
│  │  • consults in other languages   │           Management of each problem         │
│  │  • sessions worked per week      │                                              │
│  │  • hours in direct patient care  │      ┌────────────────────────────────────┐ │
│  │  • use of computers at work      │      │ Medications (up to four per problem)│ │
│  ├──────────────────────────────────┤      │  • prescribed                      │ │
│  │ Practice characteristics         │─────→│  • over-the-counter advised        │ │
│  │  • practice size                 │      │  • provided by GP                  │ │
│  │  • practice nurse available      │      │     – drug class                   │ │
│  │  • after-hours arrangements      │      │     – drug group                   │ │
│  │  • bulk billing policy           │      │     – generic                      │ │
│  │  • computer availability         │      │     – brand name                   │ │
│  │  • teaching practice             │      │     – strength                     │ │
│  └──────────────────────────────────┘      │     – regimen                      │ │
│                                             │     – number of repeats            │ │
│  ┌──────────────────────────────────┐      │     – drug status (new/continued)  │ │
│  │ The encounter                    │      └────────────────────────────────────┘ │
│  │  • date                          │                                              │
│  │  • direct (face to face)         │      ┌────────────────────────────────────┐ │
│  │     – Medicare-claimable         │      │ Non-pharmacological treatments     │ │
│  │     – Veterans' Affairs paid     │      │ (up to two per problem)            │ │
│  │     – workers compensation       │─────→│  • therapeutic procedures          │ │
│  │     – other paid                 │      │  • counselling, advice             │ │
│  │     – no charge                  │      └────────────────────────────────────┘ │
│  │  • indirect (e.g. telephone)     │                                              │
│  └──────────────────────────────────┘      ┌────────────────────────────────────┐ │
│                                             │ Referrals                          │ │
│  ┌──────────────────────────────────┐      │  • referrals (up to two)           │ │
│  │ The patient                      │      │     – to specialists               │ │
│  │  • age and sex                   │─────→│     – to allied health professionals│ │
│  │  • practice status               │      │     – hospital admissions          │ │
│  │    (new/old patient)             │      └────────────────────────────────────┘ │
│  │  • concession card status        │                                              │
│  │  • postcode of residence         │      ┌────────────────────────────────────┐ │
│  │  • NESB status                   │      │ Tests and investigations           │ │
│  │  • Indigenous status             │      │  • pathology tests ordered         │ │
│  │  • reasons for encounter         │      │    (up to five)                    │ │
│  └──────────────────────────────────┘      │  • imaging ordered (up to three)   │ │
│                                             └────────────────────────────────────┘ │
│  ┌──────────────────────────────────┐                                              │
│  │ Patient risk factors (subsample) │                                              │
│  │  • body mass index               │                                              │
│  │  • smoking status                │                                              │
│  │  • alcohol consumption           │                                              │
│  └──────────────────────────────────┘                                              │
│                                                                                     │
│  Figure 2.1: The BEACH relational database                                          │
└─────────────────────────────────────────────────────────────────────────────────┘
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Figure 2.1: The BEACH relational database

2.5 Statistical methods

The analysis of the BEACH database is conducted with SAS versions 6.12[11] and 8.2[12] and the encounter is the primary unit of analysis. 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 following results present the number of observations *(n)*, the rate per 100 encounters and the 95% confidence intervals.

The BEACH study is essentially a random sample of GPs, each providing data about a cluster of encounters. Cluster sampling study designs in general practice research violate the simple random sample (SRS) assumption because the probability of an encounter being included is a function of the probability of the GP being selected.[13]

There is also a secondary probability function of particular encounters being included in the GP's cluster (associated with the characteristics of the GP or the type and place of the practice) and this increases the likelihood of sampling bias. In addition, there will be inherent relationships between encounters from the same cluster and this creates a potential statistical bias. The probability of gaining a representative sample of encounters is therefore reduced by the potential sampling and statistical bias, decreasing the accuracy 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.[14] 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. For comparability with previous years, we have continued to use SAS 6.12 for the tables in the body of the report. SAS version 8.2[12] now includes procedures that calculate the robust standard error to adjust for the intra-cluster correlation of the cluster sample. SAS version 8.2 procedures were used in the analysis of trends over time.

The investigation of the relationship between changes in medication rates and changes in the management rates of related morbidities used multiple linear regression and these methods are described in Chapter 13.

Post-stratification weighting was applied to the raw data before analysis (see Chapter 4). Weights are calculated for each year's sample and are used to estimate national general practice encounter rates for that year. Weights are valid for summarising a complete year's sample and for analysing trends from year to year. Sampling weights are therefore used for the summary tables in the report and the trend analysis across time.

Weights are specific for the total sample in each year so they are not valid for the analysis of subgroups of patients or when combining data across years. Therefore, in analyses of patient risk factors for a subsample of patients (Chapter 14), these weights are not applied.

2.6 Classification of data

The imaging tests ordered, patient RFEs, problems managed, procedures, other non-pharmacological treatments, referrals, pathology and imaging are coded using ICPC-2 PLUS.[15] 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).[16]

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[17] and has been declared the national standard in Australia for reporting of health data from general practice and patient self-reported health information.[18]

The ICPC has a bi-axial structure, with 17 chapters on one axis (each with an alphabetic code) and seven components on the other (numeric codes) (Figure 2.2). Chapters are based on body systems, with additional chapters for psychological and social problems. Component 1 includes symptoms and complaints. Component 7 covers diagnoses. These are independent in each chapter and both can be used for patient 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, 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).

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

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

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

The ICPC-2 is an excellent epidemiological tool. The diagnostic and symptomatic rubrics have been selected for inclusion on the basis of their relative frequency in primary care settings or because of their relative importance in describing the health of the community. It has only about 1,370 rubrics and these are sufficient for meaningful analyses. However, reliability of data entry, using ICPC-2 alone, would require a thorough knowledge of the classification if correct classification of a concept were to be ensured.

In 1995, recognising a need for a coding and classification system for general practice electronic health records, the Family Medicine Research Centre (then Unit) developed an extended vocabulary of terms classified according to the ICPC. These terms were derived from those recorded by GPs on more than half a million encounter forms. The terms have developed further over the past 8 years in response to the use of terminology by GPs participating in the BEACH program and in response to requests from GPs using ICPC-2 PLUS in their electronic clinical systems. This allows far greater specificity in data entry and ensures high inter-coder reliability between secondary coding staff. It also facilitates analyses of information about more specific problems when required.[15]

Classification of pharmaceuticals

Pharmaceuticals prescribed or provided and over-the-counter medications advised by the GP are coded and classified according to an in-house classification, the Coding Atlas for Pharmaceutical Substances (CAPS). This is a hierarchical structure that facilitates analysis of data at a variety of levels, such as medication class, medication group, generic composition and brand name. CAPS is mapped to the Anatomical Therapeutic Chemical classification (ATC)[19] which is the Australian standard for classifying medications at the generic level. Strength and regimen are independent fields which, when combined with the CAPS code, give an opportunity to derive prescribed daily dose for any medication or group of medications.

2.7 Quality assurance

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

2.8 Validity and reliability

In the development of a database such as BEACH, data gathering moves through specific stages: GP sample selection, cluster sampling around each GP, GP data recording, and secondary coding and data entry. At each stage, the data can be invalidated by the application of inappropriate methods. The methods adopted to ensure maximum reliability of coding and data entry have been described above. The statistical techniques adopted to ensure valid reporting of recorded data are described in Chapter 4.

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.[20] Other studies have reported the degree to which GP-reported patient RFEs and problems managed accurately reflect those recalled by the patient[21] and the reliability of secondary coding of RFEs[22] and problems managed.[23] The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work.[24]

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.[25,26] There is as yet no more reliable method of gaining detailed data about morbidity and its management in general practice. Further, irrespective of the differences between individual GPs in their labelling of problems, morbidity data collected by GPs in active data collection methods have been shown to provide a reliable overview of the morbidity managed in general practice.[27]

3 The general practitioners

3.1 Results of recruitment

Contact was attempted with 4,625 GPs, and established with 4,224 (91.3%) of these. Of the 401 who could not be contacted (8.7% of those approached), there were 40 for whom telephone numbers could not be established, 183 had moved and were untraceable, or were retired or deceased, and 66 were not currently practising (e.g. overseas, on maternity or other leave). A further 112 were unable to be contacted after five attempts by telephone recruiters. Of the 4,224 available practitioners, 1,314 (31.1%) agreed to participate but 314 (7.4%) failed to complete the study. The final participating sample consisted of 1,000 practitioners, representing 23.7% of those who were contacted and available, and 21.6% of those with whom contact was attempted (Table 3.1).

Table 3.1: Recruitment and participation rates

	Number	Per cent of approached (*n*=4,625)	Per cent of contacts established (*n*=4,224)
Letter sent and phone contact attempted	4,625	100.0	—
No contact	401	8.7	—
No phone number	40	0.9	—
Moved/retired/deceased	183	4.0	—
Unavailable	66	1.4	—
No contact after five calls	112	2.4	—
Telephone contact established	4,224	91.3	100.0
Declined to participate	2,910	62.9	68.9
Agreed but withdrew	314	6.8	7.4
Agreed and completed	1,000	21.6	23.7

3.2 The participating GPs

All participants returned a GP profile questionnaire although some were incomplete (Table 3.2). Of the 1,000 participants, 67.3% were male and 69.2% were 45 years of age or older. Four out of five (82.6%) had been in general practice for more than 10 years and 17.2% could be regarded as practising part-time, working fewer than six sessions per week. The majority (73.5%) had graduated in Australia and 43 GPs (4.4%) were currently undertaking a general practice vocational training program. One-third (33.5%) were Fellows of the RACGP. Almost half of participants (47.2%) spent more than 40 hours each week on direct patient care services. Nine out of ten GPs (88.6%) were registered with the DVA to provide care to ex-service personnel. Almost half the participants (46.0%) had provided patient care in a residential aged care facility during the month before their participation in this study but only 12.5% had worked as a salaried or sessional hospital medical officer during that period.

One-quarter of GPs bulk-billed Medicare for all their patient consultations, while nearly one-fifth bulk-billed for pensioners and Commonwealth concession card holders only. One in ten bulk-billed for a selected mixture of patients. About one-quarter of GPs (23.1%) conducted some of their consultations in a language other than English.

Table 3.2: Characteristics of participating GPs

GP characteristic	Number[a]	Per cent of GPs[a] (*n*=1,000)
Sex		
Male	673	67.3
Female	327	32.7
Age (missing=1)		
<35 years	58	5.8
35–44 years	249	24.9
45–54 years	365	36.5
55+ years	327	32.7
Years in general practice (missing=9)		
<2 years	13	1.3
2–5 years	53	5.3
6–10 years	106	10.7
11–19 years	278	28.1
20+ years	541	54.6
Sessions per week (missing=7)		
<6 per week	171	17.2
6–10 per week	687	68.2
11+ per week	135	13.6
Place of graduation (missing=1)		
Australia	735	73.5
United Kingdom	72	7.2
Asia	95	9.5
Europe	23	2.3
Africa	54	5.4
New Zealand	10	1.0
Other	10	1.0
Currently in general practice vocational training program (missing=14)	43	4.4
Fellow of RACGP (missing=10)	332	33.5
Direct patient care hours (worked) per week (missing=28)		
<10 hours	1	0.1
10–20 hours	100	10.3
21–40 hours	412	42.4
41–60 hours	411	42.3
60+ hours	48	4.9

(continued)

Table 3.2 (continued): Characteristics of participating GPs

GP characteristic	Number[a]	Per cent of GPs[a] (n=1,000)
DVA registered (missing=79)	816	88.6
Patient care provided in previous month		
As a locum	47	4.7
In a deputising service	25	2.5
In a residential aged care facility	460	46.0
As a salaried/sessional hospital medical officer	125	12.5
Bulk billing (missing=6)		
All patients	258	26.0
Pensioner/Commonwealth concession card only	175	17.6
Selected mixture of patients	101	10.2
Consultations in languages other than English (missing=6)		
<25%	177	17.8
25–50%	29	2.9
>50%	24	2.4
Size of practice (missing=10)		
Solo	105	10.6
2–4 GPs	374	37.8
5+ GPs	511	51.6
Practice location (missing=2)		
Capital	623	62.4
Other metropolitan	64	6.4
Large rural	70	7.0
Small rural	70	7.0
Other rural	142	14.2
Remote central	9	0.9
Other remote, offshore	20	2.0
Own or cooperative after-hours arrangements (missing=5)	593	59.6
Accredited practice (missing=8)	804	81.0
Major practice a teaching practice (missing=12)		
For undergraduates only	235	23.8
For GP registrars only	81	8.2
For both undergraduates and registrars	185	18.7
Practice nurse at major practice address (missing=8)		
Full time	405	40.8
Part-time	173	17.4

(a)   Missing data removed.

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

Fewer than one in ten GPs (10.6%) were in solo practice with more than half (51.6%) working in practices of 5 or more doctors. About two-thirds of GPs (62.4%) practised in capital cities. Over half (59.6%) provided their own after-hours practice arrangements or worked in cooperation with other practices to provide after-hours services. Four out of five GPs (81.0%) worked in accredited practices. Half (50.7%) of the GPs worked in a teaching practice, either for undergraduates only (23.8%), GP registrars only (8.2%) or both (18.7%). Over half the GPs (58.3%) worked at a practice which employed a practice nurse on either a full-time (40.8%) or part-time (17.4%) basis.

3.3 Computer use at GP practices

Computers were used in 95.0% of practices, mainly for prescribing (83.0%) and billing (79.9%) purposes. More than two-thirds (70.4%) of practices used computers for other administrative purposes, 68.8% for medical records and two-thirds (66.1%) used the internet or email (Table 3.3).

Table 3.3: GP computer use

Computer use	Number	Per cent of GPs (*n*=1,000)	Per cent of GPs with computers (*n*=950)[a]
Not at all	50	5.0	—
Billing	794	79.9	83.6
Prescribing	825	83.0	86.8
Medical records	684	68.8	72.0
Other administrative	700	70.4	73.7
Internet/email	657	66.1	69.2
Missing	6	—	—

(a)   Missing data removed.

Table 3.4: Top ten combinations of computer use for GPs

Combination	Number	Per cent of GPs (*n*=1,000)	Per cent of GPs with computers (*n*=950)[a]
All five uses	422	42.5	44.4
Billing + prescribing + medical records + other administrative	84	8.5	8.8
Billing + prescribing + other admin + internet/email	50	5.0	5.3
Billing + prescribing + medical records + internet/email	48	4.8	5.1
Billing + prescribing + medical records	46	4.6	4.8
Billing + prescribing + other administrative	28	2.8	2.9
Billing + prescribing	26	2.6	2.7
Billing + prescribing + internet/email	26	2.6	2.7
Prescribing + medical records + other admin + internet/email	21	2.1	2.2
Prescribing + medical records + internet/email	18	1.8	1.9

(a)   Missing data removed.

The top ten combinations of computer use in participants' practices are listed in Table 3.4. Two in 5 GPs (42.5%) indicated that their practice used computers for all five purposes: billing, prescribing, medical records, other administrative and internet/email. Prescribing was the only usage included in all of the top ten combinations. Billing was the second most common usage, with medical records third and email/internet usage ranking fourth. Half the GPs (51.2% of participants; 53.6% of participants with computers) reported computer use for both medical records and internet/email purposes at their major practice address.

3.4 Comparison of participating and non-participating GPs

The General Practice Branch of the DoHA provided some information about each of the GPs drawn in the initial sample from HIC data. This information was used to determine the extent to which the final participating GPs were representative of the initial sample of practitioners. These data included the number of general practice A1 Medicare items claimed in the previous 12 months, and in the previous quarter. For the purposes of this analysis, the number of items in the previous quarter is referred to as 'activity level'.

In Table 3.5 the characteristics of the final participants are compared with those of all other GPs drawn in the initial sample using DoHA data elements. There were considerable discrepancies between the DoHA information about the participants (Table 3.5) and that self-reported by the GPs (Table 3.2), suggesting that the reliability of DoHA GP characteristic data may be questionable. There is, however, no reason to assume that the accuracy of DoHA data should differ for the participants and non-participants, so for comparative purposes we have relied on the DoHA data for both participants and non-participants.

Differences between participants and non-participants were tested with the chi-square statistic (significance at the 5% level). There were no significant differences between participants and non-participants in terms of place of graduation. For the first time since the BEACH program began, there was no significant difference between participants and non-participants at state or territory level.

The sex and age distributions for participants and non-participants were significantly different. There were slightly fewer males and slightly more females in the participating group, and GPs under the age of 35 years were under-represented in the participant sample while those aged 55 years or more were over-represented (Table 3.5). The difference in years since graduation of participants compared with non-participants reflected this age difference (results not shown).

For the first time since BEACH began, there was a significant difference between participants and non-participants in the location of their practice in terms of the Rural, Remote and Metropolitan Area (RRMA) classification.[28] A greater proportion of participants were from large rural, other rural, remote centre and other remote/offshore categories when compared with non-participants.

There was a statistically significant difference in mean activity level in the previous quarter (measured by the number of A1 Medicare items of service claimed) between participants and non-participants. A greater proportion of GPs with an activity level of 375–750 services in the previous quarter participated, and fewer GPs in the >1,500 services category participated compared with non-participants. There was no difference between the proportions of participants and non-participants in the 751–1,500 services group. Comparisons of the

median scores for each group showed a significant difference of 10.6 consultations per week (χ^2=24.25, p<0.0001). It is possible that the time required to participate in BEACH may be a greater issue for full-time GPs than part-time GPs. BEACH also may offer an avenue for fulfilling RACGP Clinical Audit requirements to part-time GPs who may not be as able to take up other avenues.

Table 3.5: Comparison of characteristics of participating and non-participating GPs

GP characteristics	Participants[a] (*n*=1,000)		Non-participants[a] (*n*=3,224)	
	Number	Per cent of GPs[b]	Number	Per cent of GPs[b]
Sex (χ^2=6.75, p=0.03)				
Male	671	67.1	2,301	71.4
Female	329	32.9	922	28.6
Missing	—	—	1	—
Age (χ^2=14.65, p=0.002)				
<35 years	57	5.9	251	8.1
35–44 years	216	22.4	780	25.2
45–54 years	361	37.4	1,173	37.9
55+ years	331	34.3	890	28.8
Missing	35	—	130	—
Place of graduation (χ^2=2.759, p=0.25)				
Australia	737	73.7	2,288	71.0
Overseas	263	26.3	935	29.0
Missing	—	—	1	—
State (χ^2=11.992, p=0.10)				
New South Wales	354	35.4	1,083	33.6
Victoria	228	22.8	836	26.0
Queensland	187	18.7	538	16.7
South Australia	88	8.8	283	8.8
Western Australia	91	9.1	320	9.9
Tasmania	21	2.1	94	2.9
Australian Capital Territory	21	2.1	52	1.6
Northern Territory	9	0.9	14	0.4
Missing	1	—	4	—
RRMA (χ^2=13.65, p=0.034)				
Capital	626	62.6	2,104	65.3
Other metropolitan	65	6.5	217	6.7
Large rural	68	6.8	188	5.8
Small rural	70	7.0	257	8.0
Other rural	144	14.4	397	12.3
Remote centre	8	0.8	30	0.9
Other remote	19	1.9	27	0.8
Missing	—	—	4	—

(continued)

Table 3.5 (continued): Comparison of characteristics of participating and non-participating GPs

GP characteristics	Participants[a] (*n*=1,000)		Non-participants[a] (*n*=3,224)	
	Number of claims	Per cent of GPs[b]	Number of claims	Per cent of GPs[b]
Activity (χ^2=35.748, p<0.001)				
375–750 services in previous quarter	270	27.0	605	18.8
751–1,500 services in previous quarter	436	43.6	1,449	44.9
>1,500 services in previous quarter	294	29.4	1,170	36.3
Mean activity level (*t*=5.10, p<0.0001)	1,256.3	—	1,389.2	—
Median activity level	1,101.5	—	1,239.0	—
Standard deviation	771.3	—	758.1	—

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

(b)   Missing data removed.

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

3.5 Discussion

The response rate of GPs to BEACH was 23.7% of those with whom contact was established. This rate, viewed with the varied response rates from the previous five years of BEACH, continues to reflect the fluctuations associated with the stage of quality assurance (QA) triennium for each year of recruitment. The wide variety of QA options currently available to GPs may also affect the response rate. An increasing concern over the past two years is 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. 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. Another factor possibly affecting the response rate over the past year is the sampling frame itself. The sample frame includes all GPs who have claimed more than 375 A1 Medicare items of service in the previous quarter. There is no differentiation between recognised GPs and those other medical practitioners who can claim Medicare A1 service items through the MedicarePlus initiatives.[29] It also includes overseas trained doctors employed in areas of workforce shortage, the number of which is increasing. It is expected there will be an additional 725 such doctors working in Australia by 2007.[29] Until 2004 these groups of doctors were not required to undertake QA activities and were therefore unlikely to participate when approached. As the pool of overseas trained doctors and other medical practitioners who are paid A1 items of service increases,[29] the denominator used to calculate the response rate grows—yet these practitioners are not 'recognised' and do not really qualify for inclusion. Unfortunately there is no way we can identify the size of this effect. This issue is further discussed in Section 15.1—Methodological issues.

The continued under-representation of GPs aged less than 35 years also may reflect the fact that GP registrars are not required to undertake QA activities during training or during the QA triennium on completion of training. The BEACH substudy of a sample of GP registrars referred to in last year's report is continuing. It will be interesting to see whether registrars do practice differently from other GPs. If so, incentives are needed to encourage the participation of these younger GPs to ensure their sufficient representation in the future.

An interesting result was the 2.4% of GPs who reported conducting more than 50% of their consultations in a language other than English. This question was surveyed in the first three years of BEACH in the format 'do you conduct more than 50% of your consultations in a language other than English?' with options of 'yes' or 'no'. The positive responses for those three years were 11.3%, 10.6% and 13.5% respectively. The question was removed for years 4 and 5 of BEACH to allow for other investigations. It was reintroduced at the beginning of Year 6, but in the changed format of 'do you conduct any of your consultations in a language other than English?' with options of 'no'; 'yes—<25%'; 'yes—25–50%'; 'yes—>50%'. Perhaps GPs in previous years have felt the need to report their 'other than English language' consultations in some manner, and when given the option to report them only if they exceeded 50%, GPs over-estimated this item.

Of continuing interest is the combination of computerised medical records and internet/email use. Only 436 GPs (43.5% of participants; 47.4% of participants with computers) reported computer use for both purposes at their major practice. Given the increasing promotion of the internet as a tool for providing clinicians with guidelines and other information, to claim for bulk billing and PIP payments, and for transfer of information from computerised records via electronic download for data collection, this is a surprising outcome. In our report last year, we hypothesised that this result was an effect of rural GPs having limited internet access as a consequence of limited telecommunications infrastructure in many areas. The results of further analyses applying the RRMA classification did not support this hypothesis. This year's results were similar, again showing that rural and metropolitan GPs differed significantly in their internet/email use (χ^2=40.3623, p<0.0001) and, again, it was the rural GPs who (proportionally) use the internet/email the most. Four out of five (80.3%) rural GPs participating in BEACH work in practices with internet availability compared with 59.7% of their metropolitan counterparts. These results may have some bearing on the success of proposed ventures such as HealthConnect.

It should be emphasised 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.

3.6 Trends in characteristics of GPs

In last years annual report we reported trends in the characteristics of GPs who participated in BEACH from 1998–2003. Changes in the characteristics of the practising GP population have recently been reported in detail elsewhere.[30] In summary, Charles et al. found that the Australian GP workforce is becoming proportionally:

- more female
- older
- more likely to work fewer sessions per week
- more likely to hold Fellowship of the RACGP
- more likely to work in large practices
- increasingly more likely to have graduated overseas.

4 Representativeness

4.1 Comparison of BEACH GPs with GP population

The extent to which one can generalise results from a sample depends on how well the sample represents the population from which it is drawn. Random sampling of GPs improves the likelihood that a study will be representative, because each GP has an equal probability of being selected into the study sample. Random sampling error and GP response rates, however, may result in some under-representation or over-representation in the sample of certain population groups.

Inferences about population characteristics from a sample can be improved by calculating weights that adjust for any under-sampling or over-sampling of particular groups of GPs. Weights are assigned by comparing the distribution of the sample against the distribution in the benchmark population on those characteristics that may influence the final results (e.g. age group and sex). Distribution weights are calculated as the the proportion of each subgroup in the population divided by the proportion in the sample. Over-representation results in a weight less than one, under-representation in a weight greater than one.

When each observation is multiplied by its weight the weighted sample distribution will conform to the population distribution. The weights are then used to adjust the sample estimate to give a better representation of the true population value.

If 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. Comparisons of the characteristics of participants and non-participants were reported in Chapter 3 (Table 3.5).

Statistical comparisons, using the chi-square statistic (χ^2), were then made between BEACH participants and all recognised GPs in Australia who claimed 375 or more general practice Medicare item numbers in the last quarter of 2002 (Table 4.1). The GP characteristics data for the BEACH participants have been drawn from the GP profile questionnaire to ensure highest reliability. The GP Branch of the DoHA provided the data for Australia.

Results

No statistical differences were apparent for GP sex and place of graduation. However, as in previous BEACH samples, the BEACH participants were significantly less likely to be under 35 years of age (χ^2=29.5, p<0.001). This is likely to be due to the fact that the national GP profile utilises a sample frame that includes GPs who are currently undertaking a general practice vocational training program. These GPs are not required to complete QA activities during training, nor in the QA triennium in which they complete training. This means that the offer of QA points is less likely to attract them. Most of these GPs would be less than 35 years old.

All states and territories were well-represented in the sample (χ^2=11.7, p=0.11) and there were no significant differences in terms of metropolitan, rural or remote location of GPs (χ^2=9.5, p=0.15).

Table 4.1: Comparison of BEACH participants and all active recognised GPs in Australia

Variable	BEACH[a][b]		Australia[a][c][d]	
	Number	Per cent of GPs	Number	Per cent of GPs
Sex (χ^2=0.23, p=0.63)				
Males	673	67.3	12,022	66.6
Females	327	32.7	6,038	33.4
Age (χ^2=29.5, p<0.001)				
<35	58	5.8	1,987	11.0
35–44	249	24.9	4,666	25.8
45–54	365	36.5	6,000	33.2
55+	327	32.7	5,426	30.0
Place of graduation (χ^2=1.20, p=0.16)				
Australia	735	73.6	12,927	71.5
Overseas	264	26.4	5,152	28.5
State (χ^2=11.70, p=0.11)				
New South Wales	353	35.4	6,066	33.6
Victoria	227	22.7	4,430	24.5
Queensland	188	18.8	3,421	18.9
South Australia	87	8.7	1,531	8.5
Western Australia	92	9.2	1,723	9.5
Tasmania	21	2.1	495	2.7
Australian Capital Territory	21	2.1	270	1.5
Northern Territory	9	0.9	142	0.8
RRMA (χ^2=9.50, p=0.15)				
Capital	623	62.4	11,655	64.5
Other metropolitan	64	6.4	1,308	7.2
Large rural	70	7.0	1,069	5.9
Small rural	70	7.0	1,327	7.3
Other rural	142	14.2	2,284	12.6
Remote centre	9	0.9	202	1.1
Other remote	20	2.0	233	1.3

(a)   Missing data removed.

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

(c)   Data provided by GP Branch, Australian Government Department of Health and Ageing.

(d)   All GPs who claimed at least 375 A1 Medicare items during the most recent 3-month Health Insurance Commission data period.

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

4.2 Sample weights

Most research studies rely on random sampling to reduce the impact of any sampling bias. It is unusual to have information about the benchmark population from which the sample is drawn, with which the sample can be compared. When such information is available it is important to consider the possible effect of any differences between the sample and the

population on the generalisability of the findings. The data were only weighted for factors thought to have an important effect on morbidity and management. Although there were differences between the sample and the Medical Benefits Schedule (MBS) data in terms of the proportion of GPs from each state, it was assumed that the morbidity and management profile of GPs was similar across states and therefore weighting by state was not undertaken.

The raw data were, however, assigned sample weights according to GP age (stratified by sex) to adjust for the slight under-representation of younger GPs in the sample, and this age weighting was multiplied by the activity level of the participating GPs.

GP weights

We have shown (Table 4.1) that there was a difference in GP age between BEACH GPs and all GPs in Australia and this may influence any national estimates made from unweighted data. Therefore post-stratification weights were calculated for the BEACH GPs to match the age distribution of all GPs in Australia. Simply, the GPs aged less than 35 years were given greater weighting than GPs of other age groups. This increases the contribution of the encounters from these GPs to any national estimate. Weightings for age were stratified by sex, age weights being calculated separately for male and female GPs.

Encounter weights

The BEACH process requires that each GP provides details of 100 consecutive encounters. The assumption based on previous research is that 100 encounters provide a reliable sample of the GP's patients and practice style.[7] However, there is considerable variation in the number of services provided by different GPs in a given year. This may impact on the reliability of any estimate due to the differences in the sampling fraction for each GP—a GP who provides 6,000 services in a given year should make a greater contribution to any national estimate than a GP who provides 3,000 services. Encounters were therefore assigned an additional weight that was directly proportional to the busyness of the GP who recorded the encounter. GP activity level was measured as the number of A1 items claimed by the GP in the previous 12 months (MBS data supplied by the DoHA).

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 4.2 shows the precision ratio calculated before and after weighting the data.

4.3 Comparison of BEACH consultations with all GP consultations in Australia

The aim of this study is to gain a representative sample of GP–patient encounters. Representativeness of the GP sample is used to weight the encounters, based on the assumption that the characteristics of the patient encounter are related to the characteristics of the GP. It is therefore important to compare the distribution of the sample patient encounters to the population of general practice encounters in Australia, to assess the representativeness of the sample encounters. The GP Branch of the DoHA provided the age–sex distribution of all A1 Medicare general practice items claimed during 2002, against which the age–sex distribution of the BEACH sample of patient encounters was compared.

Table 4.2: Comparison of BEACH encounters with age–sex distribution of patients at MBS A1 services

Variable	BEACH[a] Number	BEACH[a] Per cent	Australia[b] Per cent	Precision ratios Raw[a]	Precision ratios Weighted[c]
Male					
<1 year	875	1.1	1.1	1.04	1.07
1–4 years	2,044	2.5	2.9	1.17	1.15
5–14 years	2,375	2.9	3.7	1.26	1.17
15–24 years	2,730	3.4	3.6	1.06	0.99
25–44 years	6,666	8.2	9.2	1.12	1.05
45–64 years	8,957	11.0	11.5	1.04	0.98
65–74 years	4,572	5.6	5.6	1.00	0.94
75+ years	4,008	4.9	4.2	0.85	0.86
Female					
<1 year	771	0.9	1.0	1.02	1.05
1–4 years	1,876	2.3	2.6	1.13	1.09
5–14 years	2,462	3.0	3.5	1.16	1.08
15–24 years	5,235	6.4	6.1	0.95	0.97
25–44 years	12,696	15.6	15.1	0.97	1.00
45–64 years	13,183	16.2	15.2	0.94	0.98
65–74 years	5,644	7.0	6.5	0.94	0.98
75+ years	7,045	8.7	8.0	0.92	1.00

(a) Unweighted data, A1 items only, *excluding* encounters claimable from the Australian Department of Veterans' Affairs.

(b) Data provided by GP Branch, DoHA.

(c) Calculated from BEACH weighted data, *excluding* encounters claimable from the Australian Department of Veterans' Affairs.

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

The BEACH data include patient encounters that are paid by funding sources other than the MBS and include indirect (and some direct) encounters that cannot be or are not (by GP choice) claimed against any funding body. Further, the BEACH program counts only a single Medicare item number for each encounter covered by the MBS. In reality, more than one Medicare claim can result from a single encounter. Due to the large size of the data sets used, any statistical comparison (e.g. χ^2) would generate statistical significance for even the most minor differences between the two sources of data. Therefore, it is necessary to consider whether any difference is likely to have a strong influence on the results and whether the precision of any estimate from BEACH complies with statistical standards. In determining whether any estimate is reliable, power calculations use a precision of 0.2 or 20% of the true proportion (or value). For example, if the true value were 15% then it would be desirable that any estimate was in the range of 12% to 18% if it is to be considered to have 20% precision.

The age–sex distribution of the final sample of encounters was compared with the known age–sex distribution of all MBS annual A1 claims data. For comparability with the equivalent Medicare data, only those BEACH encounters where a Medicare A1 item was recorded were included in the age and sex distributions shown in Table 4.2. BEACH encounters that were paid for by the Australian Department of Veterans Affairs were also excluded as these services are not included in the Medicare claims database.

As can be seen in Table 4.2, 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 (0.85–1.26) indicate that the BEACH sample of encounters is a good representation of Australian general practice patient encounters. After weighting, the range of precision ratios improved slightly to within 20% (range 0.86–1.17) of the population distribution.

4.4 The weighted data set

The final unweighted data set from the fifth 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 4.3.

Table 4.3: The BEACH data set

Variable	Raw	Weighted
General practitioners	1,000	1,000
Encounters	100,000	98,877
Reasons for encounter	150,126	144,674
Problems managed	151,222	148,521
Medications	103,774	103,210
Non-pharmacological treatments	54,964	52,315
Referrals	12,371	11,794
Imaging	8,644	8,121
Pathology	37,721	34,831

5 The encounters

5.1 Overview of the data set

Using weighted data, in 2003–04 there were 98,877 encounters from 1,000 GPs. Reasons for encounter were recorded at an average rate of 150.2 per 100 encounters. There were an average of 146.3 problems managed per 100 encounters (n=144,674). New problems were managed at a rate of 55.9 per 100 encounters. Chronic problems were managed at half the encounters (50.8 per 100 encounters), and just over one-third of all problems managed were of a chronic nature (34.7 per 100 problems managed) (Table 5.1).

Table 5.1: Summary of morbidity and management

Variable	Number	Rate per 100 encounters (*n*=98,877)	95% LCL	95% UCL	Rate per 100 problems (*n*=144,674)	95% LCL	95% UCL
General practitioners	1,000	—	—	—	—	—	—
Encounters	98,877	—	—	—	—	—	—
Reasons for encounter	148,521	150.2	148.4	152.0	—	—	—
Problems managed	144,674	146.3	144.4	148.2	—	—	—
New problems	55,292	55.9	54.5	57.3	38.2	37.2	39.2
Chronic problems	50,183	50.8	49.0	52.5	34.7	33.8	35.6
Medications	103,210	104.4	102.1	106.7	71.3	70.0	72.7
Prescribed	85,073	86.0	83.6	88.5	58.8	57.3	60.3
Advised OTC	9,649	9.8	9.0	10.6	6.7	6.1	7.2
GP-supplied	8,488	8.6	7.4	9.8	5.9	5.1	6.7
Non-pharmacological treatments	50,775	51.4	48.9	53.8	35.1	33.5	36.7
Clinical*	36,211	36.6	34.5	38.8	25.0	23.6	26.4
Procedural*	14,564	14.7	14.0	15.5	10.1	9.6	10.6
Referrals	11,495	11.6	11.1	12.1	8.0	7.6	8.3
Specialist*	7,775	7.9	7.5	8.2	5.4	5.1	5.6
Allied health services*	2,600	2.6	2.4	2.9	1.8	1.6	2.0
Hospital*	544	0.6	0.3	0.8	0.4	0.2	0.5
Emergency department*	157	0.2	0.0	0.5	0.1	0.0	0.3
Other medical services*	138	0.1	0.0	0.6	0.1	0.0	0.4
Other referrals*	281	0.3	0.0	0.6	0.2	0.0	0.4
Pathology	34,831	35.2	33.7	36.7	24.1	23.1	25.0
Imaging	8,121	8.2	7.8	8.6	5.6	5.4	5.9
Other investigations	1,028	1.0	0.9	1.2	0.7	0.6	0.8

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

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

Medications were prescribed to the patient, advised for over-the-counter (OTC) purchase or supplied by the GP at an average rate of 104.4 per 100 encounters, equating to a rate of 71.3 medications per 100 problems managed. The majority of medications were prescribed to the patient (86.0 per 100 encounters). This figure only takes into account the rate at which prescriptions were given to patients, not the number of repeats recorded as part of the prescription. Medications were advised for OTC purchase at a rate of 9.8 per 100 encounters, and were supplied by the GP at a rate of 8.6 per 100 encounters. Non-pharmacological treatments were provided to patients at an average rate of 51.4 per 100 encounters. Clinical treatments (including advice, education and counselling) were provided to patients at a rate of 36.6 per 100 encounters, or at a rate of 25.0 per 100 problems managed. Procedural treatments were recorded less often than clinical treatments, at a rate of 14.7 per 100 encounters.

Referrals were given to patients at an average rate of 11.6 per 100 encounters. The majority of referrals were made to medical specialists (7.9 per 100 encounters). Referrals to allied health professionals were made at a rate of 2.6 per 100 encounters. Referrals to hospitals (0.6 per 100 encounters) and emergency departments (0.2 per 100 encounters) were relatively rare.

Pathology tests were ordered at a rate of 35.2 per 100 encounters, or at a rate of 24.1 per 100 problems managed. Orders for imaging tests were made less often, at a rate of 8.2 per 100 encounters (Table 5.1).

5.2 Encounter type

The distribution of encounter types shows the varied nature of general practice (Table 5.2). The funding of Australian general practice reflects this variety, with a mixture of patient contribution, government rebate scheme through the Medicare Benefits Schedule (MBS), payment by other government programs (e.g. Australian Department of Veterans' Affairs, Correctional Services) and insurance schemes (e.g. workers compensation).

Direct encounters, where the patient was seen by the GP, accounted for 97.0% of all general practice encounters. Almost all direct consultations were claimable either through Medicare or the Australian Department of Veterans' Affairs (96.7% of direct encounters, equating to 93.8% of total encounters). These figures indicate only that the consultation was claimable under the MBS, and do not give an indication of whether the consultation was bulk-billed. Standard surgery consultations accounted for the majority of Medicare-claimable consultations (82.4%), and 9.8% of Medicare encounters were long surgery consultations. Short surgery consultations and prolonged consultations were relatively rare (1.1% and 0.7% respectively). Encounters payable through workers' compensation accounted for 2.0% of GP encounters.

While the vast majority of encounters took place in the GPs' consulting rooms (at least 91.0% of direct consultations), encounters were also held at a number of other settings. Home visits accounted for 1.3% of all encounters, and encounters at residential aged care facilities equated to 1.1% of encounters. Very few GP consultations took place in hospitals (0.3%). It is important to 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, according to the relevant MBS regulations.

Indirect encounters, where the patient is not seen by the GP, are not eligible for payment through the MBS, with only one exception (case conferences). This type of encounter

accounted for 3.1% of total GP services. These encounters, which may consist of telephone calls, generally result in prescriptions, referrals or other such services. While it cannot be determined whether these services were provided free of charge to the patient, it can be assumed that, in general, they are a free service provided by the GP. However, they contribute considerably to patient care and problem management, and do generate costs to the health sector through the provision of prescriptions or referrals.

Table 5.2: Type of encounter

Variable	Number	Rate per 100 encounters[a]	95% LCL	95% UCL	Per cent of direct encounters	Per cent of Medicare-paid
General practitioners	1,000	—	—	—	—	—
Direct consultations	89,160	97.0	96.6	97.3	100.0	—
No charge	463	0.5	0.3	0.7	0.5	—
MBS items of service[b]	86,244	93.8	93.3	94.2	96.7	100.0
Short surgery consultations	989	1.1	0.4	1.7	—	1.1
Standard surgery consultations	71,106	77.3	76.2	78.4	—	82.4
Long surgery consultations	8,413	9.2	8.5	9.8	—	9.8
Prolonged surgery consultations	612	0.7	0.0	1.4	—	0.7
Home visits	1,210	1.3	0.1	2.5	—	1.4
Hospital	294	0.3	0.0	1.7	—	0.3
Residential aged care facility	974	1.1	0.0	2.3	—	1.1
Enhanced Primary Care items						
Case conference	1	0.0	0.0	1.2	—	0.0
Care plan	82	0.1	0.0	1.3	—	0.1
Health assessments	132	0.1	0.0	0.7	—	0.2
Other items	2,432	2.6	1.3	4.0	—	2.8
Workers compensation	1,872	2.0	1.8	2.3	2.1	—
Other paid (hospital, state, etc.)	581	0.6	0.0	1.4	0.7	—
Indirect consultations	2,805	3.1	2.5	3.6	—	—
Missing	6,912	—	—	—	—	—
Total encounters	98,877	—	—	—	—	—

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

(b)   Includes 1,806 encounters that were recorded as claimable through the Australian Department of Veterans' Affairs.

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

5.3 Changes from 1999–00 to 2003–04

Over the 5 years between 1999 and 2004, there were no significant differences observed in the types of encounter recorded by GP participants (Appendix 5, Table A5.4).

6 The patients

6.1 Patient characteristics

Age–sex distribution of patients

The age–sex distribution of patients at the 98,877 encounters recorded in the survey is shown in Figure 6.1. Age and/or sex was not recorded at 1.7% of encounters. Overall, there were more encounters with female than male patients (57.4% compared with 42.6%). This was reflected across all age groups except for patients aged less than 5 years, where there were slightly more male than female encounters. Differences in the distribution of male and female patients were greatest in the reproductive years (25–44 year age group) and in the middle age group (45–64 years) (Table 6.1).

Age group (years)	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
□ Female	0.8	2.2	3.0	6.1	15.0	15.3	6.5	8.6
■ Male	1.0	2.4	2.9	3.6	9.1	11.9	5.9	5.8

Figure 6.1: Age–sex distribution of patients at encounter
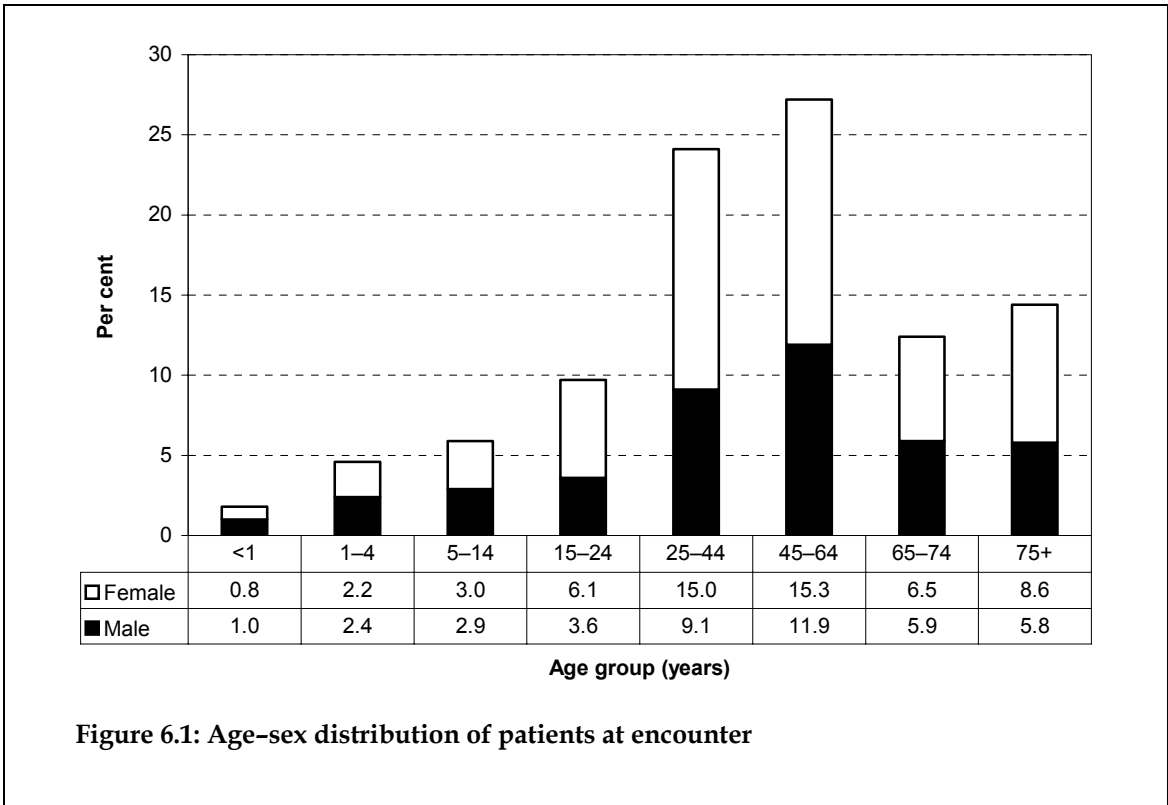
Note: Missing data removed. The distributions will not agree perfectly with those in Table 6.1 due to missing data in either age or sex fields.

Approximately one in eight encounters were with children aged less than 15 years (12.3%), one in ten were with young adults (9.6%), and approximately one in four with patients in each of the following age groups, 25–44 years (24.1%), 45–64 years (27.2%), and 65 years and older (26.8%) (Table 6.1).

Other patient characteristics

The patient was new to the practice at one in ten (9.3%) encounters. Two in five encounters were with patients who held a Commonwealth concession card (42.5%), and 3.5% were with persons who held a Repatriation health card. At 9.7% of encounters, the patient was from a non-English-speaking background, and at 1.6% the patient was an Aboriginal person and/or Torres Strait Islander.

Table 6.1: Characteristics of the patients at encounters

Patient variable	Number	Per cent of encounters (*n*=98,877)[(a)]	95% LCL	95% UCL
Sex				
Males	41,683	42.6	41.8	43.3
Females	56,261	57.4	56.7	58.2
Missing sex	932	—	—	—
Age group				
<1 year	1,754	1.8	1.6	2.0
1–4 years	4,463	4.6	4.3	4.8
5–14 years	5,824	5.9	5.6	6.3
15–24 years	9,424	9.6	9.2	10.1
25–44 years	23,584	24.1	23.4	24.8
45–64 years	26,658	27.2	26.7	27.7
65–74 years	12,183	12.4	11.9	12.9
75+ years	14,082	14.4	13.6	15.2
Missing age	905	—	—	—
Other characteristics				
New patient to practice	8,979	9.3	8.5	10.0
Commonwealth concession card	42,018	42.5	41.0	44.0
Repatriation health card	3,441	3.5	3.2	3.8
Non-English-speaking background	9,587	9.7	5.8	13.6
Aboriginal person	1,393	1.4	0.0	2.9
Torres Strait Islander	157	0.2	0.0	1.0
Aboriginal person and Torres Strait Islander	50	0.1	0.0	0.8

(a) Missing data removed.

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

6.2 Patient reasons for encounter

International interest in reasons for encounter (RFEs) has been developing over the past three decades. They 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.[31]

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 RFEs at encounter

There were 148,521 patient RFEs recorded at a rate of 150.2 per 100 encounters. For three out of five encounters (61.0%) only one RFE was recorded, and at 11.3% of encounters the maximum of three RFEs was recorded (Table 6.2).

Table 6.2: Number of patient reasons for encounter

Number of RFEs (*n*=148,521)	Number of encounters (*n*=98,877)	Per cent of encounters	95% LCL	95% UCL
One RFE	60,358	61.0	59.9	62.2
Two RFEs	27,393	27.7	27.0	28.4
Three RFEs	11,126	11.3	10.5	12.0
Total	**98,877**	**100.0**	—	—

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

	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	137	138	136	139	142	149	155	158
Female	132	138	136	148	147	159	164	159

Age group (years)
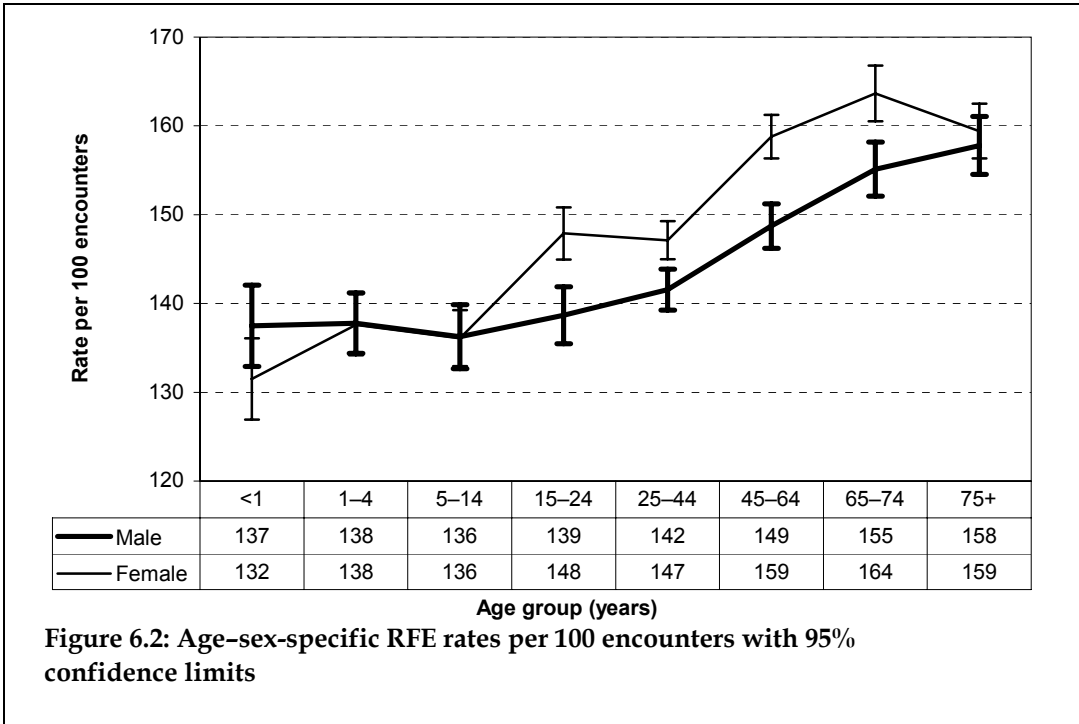
Figure 6.2: Age–sex-specific RFE rates per 100 encounters with 95% confidence limits

Note: Missing data removed.

Age–sex-specific rates of RFEs

Overall, significantly more RFEs were recorded at encounters with female patients (152.8 per 100 encounters, 95% CI: 150.9–154.7) than at those with male patients (146.8, 95% CI: 144.9–148.7), but particularly at encounters with females aged between 15 and 74 years.

Figure 6.2 shows the number of RFEs per 100 encounters for male and female patients in each age group. The age–sex-specific rate of RFEs per 100 encounters increased with advancing age for both males and females, with two exceptions: patients aged 1–4 years had more RFEs than the encounters with children aged between 5 and 14 years, and the rate of RFEs decreased in female patients aged 75 years and over.

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 6.3. Each chapter and individual RFE are expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence limits.

Almost one in five RFEs (24.1%, 36.2 per 100 encounters) were classified in the general chapter, not being associated with any particular body system. Of these, the most common were requests for a prescription, for test results or a check-up. However, there were also some general symptoms frequently described, such as fever, weakness and tiredness, and chest pain (of unspecified origin).

Approximately half the RFEs related to the respiratory, musculoskeletal, skin, digestive and circulatory systems. Less common were RFEs related to the eye, urological, blood and male genital systems, and those of a social nature.

RFEs related to the respiratory system arose at a rate of 21.4 per 100 encounters, the most common being cough, throat complaints, requests for respiratory system immunisation (mainly influenza vaccination) and upper respiratory tract infection (URTI) (often expressed as a 'cold'). Nasal congestion, asthma and short of breath were also relatively common RFEs.

RFEs related to the musculoskeletal system were described at a rate of 16.3 per 100 encounters and were most commonly for symptoms and complaints of specific skeletal body parts. Complaints related to the back were by far the most common (3.5 per 100 encounters), followed by those related to the knee, leg/thigh, foot/toe, shoulder and neck.

Reasons associated with the skin were described at a rate of 15.1 per 100 encounters, rash being the most frequent RFE, followed by skin complaints. Request for a skin check-up and localised/generalised swelling were also in the most frequent list of RFEs related to the skin.

Digestive problems accounted for 7.1% of all reasons described, arising at a rate of 10.7 per 100 encounters. Abdominal pain was most common, followed by diarrhoea and vomiting. Together these three symptoms represented approximately half of all digestive-related RFEs.

Table 6.3: Distribution of patient reasons for encounter, by ICPC-2 chapter and most frequent individual reasons for encounter within chapter

Patients reasons for encounter	Number	Per cent of total RFEs[a] (n=148,521)	Rate per 100 encounters[b] (n=98,877)	95% LCL	95% UCL
General & unspecified	**35,771**	**24.1**	**36.2**	**35.2**	**37.2**
Prescription NOS	8,027	5.4	8.1	7.6	8.7
Results tests/procedures NOS	4,628	3.1	4.7	4.3	5.0
Check-up NOS*	3,612	2.4	3.7	3.4	3.9
Fever	1,864	1.3	1.9	1.6	2.2
Immunisation/vaccination—general	1,807	1.2	1.8	1.6	2.0
Administrative procedure NOS	1,526	1.0	1.5	1.4	1.7
Weakness/tiredness	1,486	1.0	1.5	1.3	1.7
Chest pain NOS	1,241	0.8	1.3	1.1	1.4
Blood test NOS	1,076	0.7	1.1	0.8	1.4
Other reason for encounter NEC	1,051	0.7	1.1	0.7	1.4
Trauma/injury NOS	922	0.6	0.9	0.8	1.1
Follow-up encounter NOS	798	0.5	0.8	0.5	1.1
Clarify/discuss patient RFE NOS	791	0.5	0.8	0.6	1.0
Respiratory	**21,166**	**14.3**	**21.4**	**20.6**	**22.2**
Cough	6,160	4.2	6.2	5.8	6.6
Throat complaint	3,323	2.2	3.4	3.1	3.6
Immunisation/vaccination—respiratory	2,176	1.5	2.2	1.1	3.3
Upper respiratory tract infection	1,901	1.3	1.9	1.7	2.2
Nasal congestion/sneezing	1,295	0.9	1.3	1.0	1.7
Asthma	909	0.6	0.9	0.8	1.1
Shortness of breath, dyspnoea	848	0.6	0.9	0.7	1.0
Musculoskeletal	**16,123**	**10.9**	**16.3**	**15.7**	**16.9**
Back complaint*	3,433	2.3	3.5	3.3	3.7
Knee complaint	1,369	0.9	1.4	1.3	1.5
Leg/thigh complaint	1,116	0.8	1.1	1.0	1.3
Foot/toe complaint	1,094	0.7	1.1	1.0	1.2
Shoulder complaint	1,010	0.7	1.0	0.9	1.2
Neck complaint	934	0.6	0.9	0.8	1.1
Skin	**14,936**	**10.1**	**15.1**	**14.5**	**15.7**
Rash*	2,742	1.9	2.8	2.6	3.0
Skin complaint	1,353	0.9	1.4	1.2	1.5
Check-up—skin*	1,215	0.8	1.2	0.5	2.0
Swelling*	1,180	0.8	1.2	1.0	1.4

(continued)

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Table 6.3 (continued): Distribution of patient reasons for encounter, by ICPC-2 chapter and most frequent individual reasons for encounter within chapter

Patients reasons for encounter	Number	Per cent of total RFEs[a] (*n*=148,521)	Rate per 100 encounters[b] (*n*=98,877)	95% LCL	95% UCL
Digestive	**10,598**	**7.1**	**10.7**	**10.3**	**11.2**
Abdominal pain*	2,007	1.4	2.0	1.9	2.2
Diarrhoea	1,432	1.0	1.5	1.3	1.6
Vomiting	1,129	0.8	1.1	1.0	1.3
Circulatory	**10,528**	**7.1**	**10.7**	**10.1**	**11.2**
Check-up—cardiovascular*	4,931	3.3	5.0	4.6	5.4
Hypertension/high blood pressure*	1,843	1.2	1.9	1.5	2.3
Prescription—cardiovascular	835	0.6	0.8	0.5	1.2
Psychological	**7,245**	**4.9**	**7.3**	**6.9**	**7.7**
Depression*	1,784	1.2	1.8	1.6	2.0
Sleep disturbance	1,136	0.8	1.2	1.0	1.3
Anxiety*	1,008	0.7	1.0	0.9	1.2
Endocrine & metabolic	**6,092**	**4.1**	**6.2**	**5.8**	**6.5**
Diabetes (non-gestational)*	905	0.6	0.9	0.6	1.2
Prescription—endocrine/metabolic	902	0.6	0.9	0.7	1.1
Check-up—endocine/metabolic*	844	0.6	0.9	0.6	1.1
Neurological	**5,256**	**3.5**	**5.3**	**5.1**	**5.6**
Headache	1,768	1.2	1.8	1.6	2.0
Vertigo/dizziness	1,170	0.8	1.2	1.1	1.3
Female genital system	**5,076**	**3.4**	**5.1**	**4.8**	**5.5**
Check-up/Pap smear*	1,831	1.2	1.9	1.5	2.2
Ear	**3,700**	**2.5**	**3.7**	**3.6**	**3.9**
Ear pain	1,533	1.0	1.6	1.4	1.7
Pregnancy & family planning	**3,629**	**2.4**	**3.7**	**3.4**	**4.0**
Oral contraception*	1,000	0.7	1.0	0.8	1.2
Pre-/post-natal check-up*	876	0.6	0.9	0.5	1.3
Eye	**2,678**	**1.8**	**2.7**	**2.6**	**2.9**
Urology	**2,500**	**1.7**	**2.5**	**2.4**	**2.7**
Blood	**1,246**	**0.8**	**1.3**	**1.1**	**1.4**
Male genital system	**1,046**	**0.7**	**1.1**	**0.9**	**1.2**
Social	**931**	**0.6**	**0.9**	**0.8**	**1.1**
Total RFEs	**148,521**	**100.0**	**150.2**	**148.4**	**152.0**

(a) Only 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).

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

Requests for a cardiovascular check-up accounted for almost half of all RFEs associated with the circulatory system, which arose at a rate of 10.7 per 100 encounters. Patients also frequently presented for their 'hypertension' or 'high blood pressure' problems.

RFEs of a psychological nature were recorded at a rate of 7.3 per 100 encounters, and these were frequently described in terms of depression, sleep disturbance and anxiety. The relative frequencies of the remaining ICPC-2 chapters for patient reasons for encounter are provided in Table 6.3.

Distribution of RFEs by ICPC-2 component

Almost half of the RFEs were expressed in terms of a symptom or complaint (e.g. back pain, cough), presented at a rate of 71.7 per 100 encounters. RFEs expressed in diagnostic terms (e.g. 'about my diabetes') accounted for 16.7% of all RFEs and were described at a rate of 25.1 per 100 encounters. Requests for diagnostic and preventive procedures were made at a rate of 24.0 per 100 encounters, and these were most often requests for a check-up or for immunisation/vaccination (demonstrated in Table 6.5). Patient requests for medication and non-pharmacological treatments were made at a rate of 14.4 per 100 encounters, while requests for referrals, results, and administrative procedures were relatively few (Table 6.4).

Table 6.4: Distribution of RFEs by ICPC-2 component

ICPC-2 component	Number	Per cent of total RFEs (*n*=148,521)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Symptoms & complaints	70,879	47.7	71.7	69.8	73.5
Diagnoses, diseases	24,841	16.7	25.1	23.9	26.4
Diagnostic & preventive procedures	23,744	16.0	24.0	23.1	25.0
Medications, treatments & therapeutics	14,237	9.6	14.4	13.7	15.1
Referral & other RFE	7,120	4.8	7.2	6.8	7.6
Results	5,967	4.0	6.0	5.6	6.4
Administrative	1,734	1.2	1.8	1.6	1.9
Total RFEs	**148,521**	**100.0**	**150.2**	**148.4**	**152.0**

(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 6.5, accounted for 56.1% of all RFEs. In this analysis the specific ICPC-2 chapter to which an across-chapter RFE belongs is disregarded, such that 'check-up—all' includes all check-ups from all body systems irrespective of whether the type was specified (e.g. 'BP check') or whether the request was very general. Equally, 'immunisation/vaccination—all' includes influenza vaccination requests as well as those for childhood immunisation, hepatitis etc.

A request for a check-up was the most common RFE, accounting for 9.4% of all RFEs, being recorded at a rate of 14.1 per 100 encounters. Requests for medication were also frequent (12.1 per 100 encounters). It is notable that RFEs described as 'hypertension' or 'high blood pressure' also arose at a rate of 1.9 per 100 encounters, and these are likely to be closely

associated with the need for a check-up and/or medication. A request for test results was the fourth most often expressed RFE (6.0 per 100 encounters), followed by presentations for immunisation or vaccination (4.4 per 100 encounters).

Table 6.5: Most frequent patient reasons for encounter

Patient reason for encounter	Number	Per cent of total RFEs (*n*=148,521)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Check-up—all*	13,942	9.4	14.1	13.4	14.8
Prescription—all*	11,987	8.1	12.1	11.5	12.7
Cough	6,160	4.2	6.2	5.8	6.6
Test results*	5,967	4.0	6.0	5.6	6.4
Immunisation/vaccination—all*	4,385	3.0	4.4	3.9	4.9
Back complaint*	3,433	2.3	3.5	3.2	3.7
Throat complaint	3,323	2.2	3.4	3.1	3.6
Rash*	2,742	1.9	2.8	2.6	2.9
Abdominal pain*	2,007	1.4	2.0	1.9	2.2
Upper respiratory tract infection	1,901	1.3	1.9	1.7	2.2
Fever	1,864	1.3	1.9	1.6	2.2
Hypertension/high blood pressure*	1,843	1.2	1.9	1.5	2.3
Depression*	1,784	1.2	1.8	1.6	2.0
Headache	1,768	1.2	1.8	1.6	2.0
Ear pain	1,533	1.0	1.6	1.4	1.7
Administrative procedure NOS	1,526	1.0	1.5	1.4	1.7
Weakness/tiredness	1,486	1.0	1.5	1.3	1.7
Diarrhoea	1,432	1.0	1.5	1.3	1.6
Knee complaint	1,369	0.9	1.4	1.3	1.5
Skin complaint	1,353	0.9	1.4	1.2	1.5
Nasal congestion/sneezing	1,295	0.9	1.3	1.0	1.7
Chest pain NOS	1,241	0.8	1.3	1.1	1.4
Swelling*	1,180	0.8	1.2	1.0	1.4
Vertigo/dizziness	1,170	0.8	1.2	1.1	1.3
Sleep disturbance	1,136	0.8	1.2	1.0	1.3
Vomiting	1,129	0.8	1.1	1.0	1.3
Leg/thigh complaint	1,116	0.8	1.1	1.0	1.3
Foot/toe complaint	1,094	0.7	1.1	1.0	1.2
Blood test NOS	1,076	0.7	1.1	0.8	1.4
Other reason for encounter NEC	1,051	0.7	1.1	0.7	1.4
Subtotal	*83,295*	*56.1*	—	—	—
Total RFEs	**148,521**	**100.0**	**150.2**	**148.4**	**152.0**

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

*   Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 3).

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

The remaining RFEs in the top 30 were largely symptom-based, led by cough (6.2 per 100 encounters), back complaints (3.5 per 100 encounters), throat complaints (3.4 per 100 encounters), rash, abdominal pain, and URTI (often described as 'a cold').

Undifferentiated symptoms such as fever, headache, nasal congestion, ear pain, weakness, and diarrhoea were also common. Many musculoskeletal symptoms also appeared in the top 30 RFEs. It is notable that chronic conditions such as depression and sleep disturbance were also frequently recorded.

6.3 Changes from 1999–00 to 2003–04

Changes in characteristics of the patients at the encounters

The sex distribution of the patients encountered in 2003–04 did not differ significantly from that for every year of the BEACH program. However, the age distribution of patients encountered changed considerably between 1999–00 and 2003–04, with an overall trend for increased proportions of encounters with older people and decreased proportions with those aged less than 45 years. In 2003–04 the GPs' workloads included a significantly smaller proportion of encounters with children in each of the age groups under fifteen years, making a total decrease from 14.8% of the workload to 12.3%. The proportion of encounters with patients aged between 25 and 44 years also decreased (from 16.3% to 24.1%). In contrast patients aged between 45–64 years and those of 75 years or more accounted for a significantly increased proportion of the GP's workload (increasing from 24.5% to 27.2% and from 12.1% to 14.4% respectively (Figure 6.3 and Appendix 5, Table A5.4).

	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
☐ 1999–00	2.4	5.2	7.2	10.4	26.3	24.5	12.0	12.1
■ 2003–04	1.8	4.6	5.9	9.6	24.1	27.2	12.4	14.4

Age group (years)

Figure 6.3: Age distribution of patients at encounter in 1999–00 and 2003–04
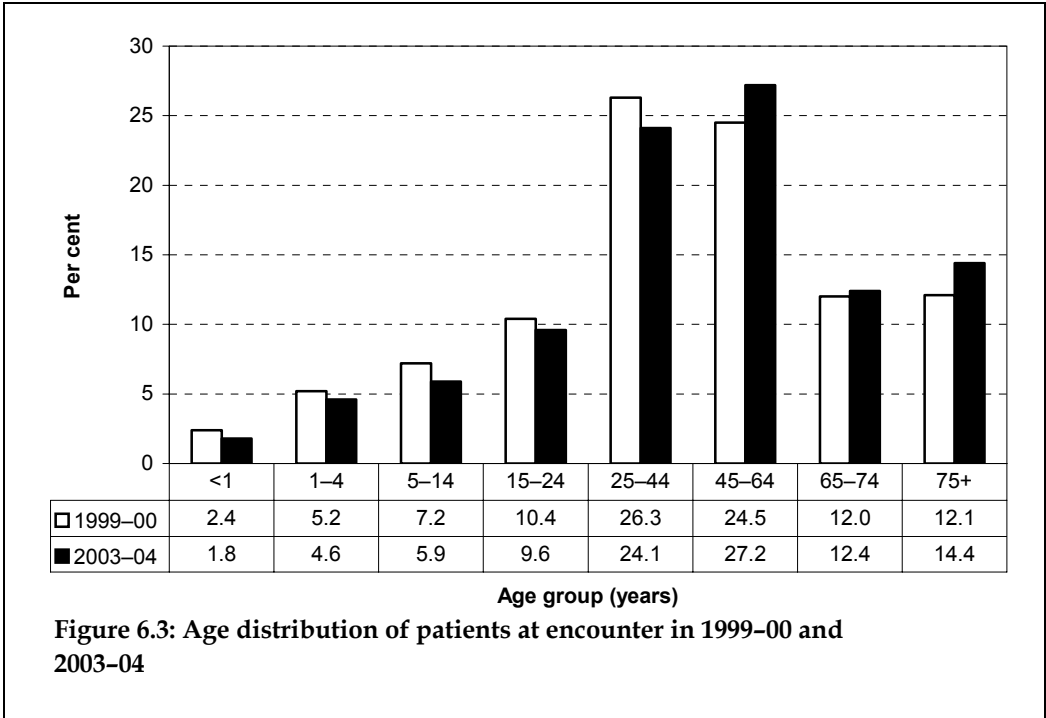
Since 1999–00 the proportion of encounters with patients who were new to the GP's practice increased from 7.3% (95% CI: 6.6–8.0) to 9.3% (95% CI: 8.5–10.0). Similar trends were noted in the proportion of encounters that were with people from a non-English-speaking background, which increased from 7.1% in 1999–00 to 9.7% in 2003–04; however, this change did not reach statistical significance due to relatively wide confidence intervals which suggest wide variance between individual participating GPs in the proportion of encounters that were with patients of this group. Both increases largely occurred between 2000–01 and 2001–02 and the proportions have remained relatively steady since then.

Encounters with people who held a Commonwealth concession card increased significantly from 38.6% (95% CI: 37.0–40.2) to 42.5% (95% CI: 41.0–44.0), as did the proportion holding a Repatriation health card, from 2.6% (95% CI: 2.3–2.9) to 3.5 (95% CI: 3.2–3.8).

The proportion of patients who identified themselves as being Indigenous people also increased, but the small sample size rendered this an insignificant change to date. The trend will be further investigated in the coming year of the BEACH program.

Changes in rates of RFEs by ICPC-2 chapter

The overall rate of RFEs per 100 encounters did not change significantly between 1999–00 and 2002–03, and the 2003–04 rate (150.2 per 100 encounters) was almost identical to that of the previous year (150.9 per 100). There was a significant increase in the rate of RFEs classified as general and unspecified, from 29.0 (95% CI: 28.1–29.9) per 100 encounters in 1999–00 to 36.2 (95% CI: 35.2–37.2) in 2003–04. The rate of presentation of RFEs related to the female genital system (5.1, 95% CI: 2.8–5.5) decreased significantly since the previous year (6.1, 95% CI: 5.7–6.6), reverting to the rates recorded in 1999–00 (5.3 per 100). There was a marginal decrease in the rate of RFEs related to the ear, from 4.2 (95% CI: 4.0–4.4) per 100 encounters in 1999–00 to 3.7 (95% CI: 3.6–3.9) per 100 in 2003–04.

An apparent significant decrease in RFEs related to the blood and blood-forming organs was found due to a change in classification 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 in 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 five years of this comparison (Appendix 5, Table A5.5).

Changes in rate of RFEs (ICPC-2 component)

The relative rate of RFEs classified as symptoms and complaints has significantly decreased since 2000–01, from 76.6 (95% CI: 74.6–78.6) per 100 encounters in 1998–99 to 71.7 (95% CI: 69.8–73.5) in 2003–04. Those described in terms of diagnosis/disease also decreased from a peak of 29.0 (95% CI: 27.6–30.5) per 100 encounters in 2000–01 to 25.1 (95% CI: 23.9–26.4) per 100 in 2003–04. In parallel, the number of RFEs described in terms of the processes of care, including requests for diagnostic and preventive procedures, medications, therapeutics, referrals, results and administrative processes increased significantly since 1999–00, from 47.4 (95% CI: 45.9–48.9) to 53.4 (95% CI: 51.9–54.9) per 100 encounters.

An increase in the relative rate of requests for results that had been identified in 2001–02 continued through the fifth and sixth years. The rate of such requests has increased 50% since 1999–00, from 4.0 (95% CI: 3.7–4.3) to 6.0 (95% CI: 5.6–6.4) in 2003–04. This represents a national increase of 1.8 million encounters at which a request for results was one of the patient's reasons for contacting the GP. This trend supported 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 (Appendix 5, Table A5.6).

7 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. It 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.

Problems were coded using ICPC-2 PLUS, an extended terminology classified according to the internationally recognised International Classification of Primary Care—Version 2 (ICPC-2). ICPC-2 has a bi-axial structure with 17 chapters on one axis and seven components on the other. Chapters are based on body systems, with additional chapters for psychological problems and for social problems (see Chapter 2—Methods).

The relative frequency of problems managed can be described in two ways: 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 oedema) 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 (those marked with an asterisk in the tables).

7.1 Number of problems managed at encounter

At the 98,877 patient encounters recorded during 2003–04, a total of 144,674 problems were managed, at an average rate of 146.3 problems per 100 encounters. One problem was managed at two-thirds of encounters (66.2%), while two problems were managed at almost one-quarter of encounters (23.8%). Three or four problems were managed at 10.1% of encounters (Table 7.1).

Table 7.1: Number of problems managed at an encounter

Number of problems managed at encounter	Number of encounters	Per cent	95% LCL	95% UCL
One problem	65,410	66.2	65.0	67.3
Two problems	23,513	23.8	23.1	24.5
Three problems	7,577	7.7	7.2	8.1
Four problems	2,377	2.4	2.0	2.8
Total	**98,877**	**100.0**	—	—

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

7.2 Age–sex-specific rates of problems managed

Significantly more problems were managed overall at encounters with female patients (149.0 per 100 encounters, 95% CI: 147.0–151.0) than at those with male patients (142.8 per 100 encounters, 95% CI: 140.8–144.8). This difference was particularly evident in the 15–24 year age group.

Figure 7.1 shows the age–sex-specific rates of problems managed per 100 encounters for each age group. There were more problems managed (per 100 encounters) for females than males in each of the age groups from 15–24 to 65–74 years. It is interesting to note that while the number of problems managed continued to increase for males between the 65–74 and 75+ age groups, the rates for females in these age groups reached a plateau.

These figures parallel those reported in Figure 6.2, showing the age–sex-specific rates of RFEs. In the age groups where significant differences were reported in the number of RFEs between males and females, a similar difference was apparent in the number of problems managed for the age group.

Age group (years)	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	118	115	115	120	130	151	163	168
Female	119	113	115	132	137	158	173	172

Figure 7.1: Age–sex-specific problems managed rates per 100 encounters with 95% confidence limits
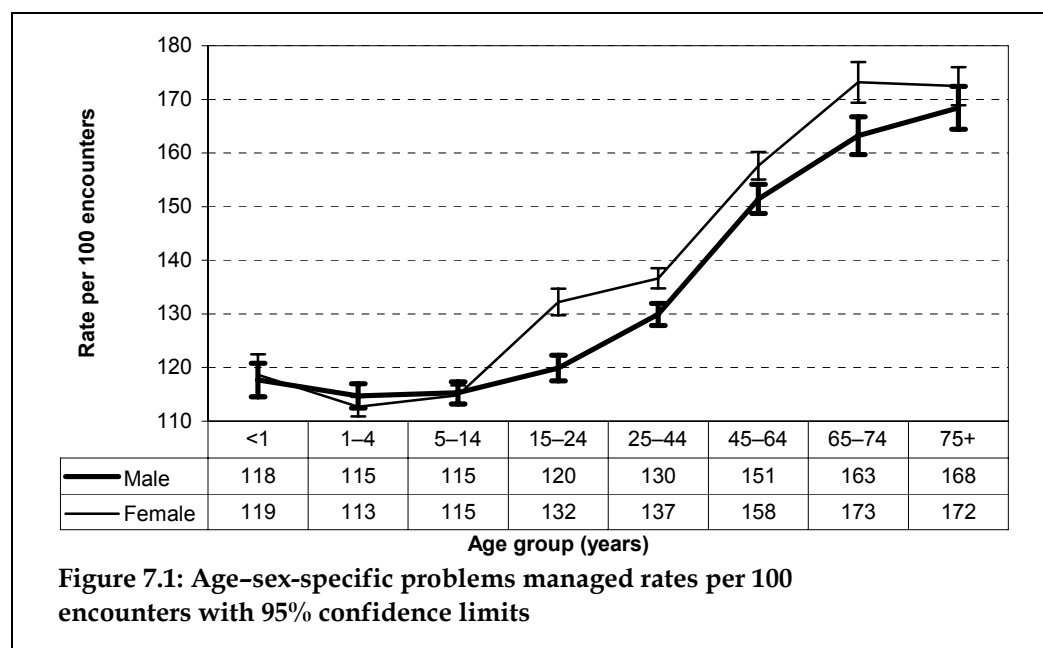
7.3 Nature of morbidity

Problems managed by ICPC-2 chapter

The frequency and distribution of problems managed are represented in Table 7.2, by ICPC-2 chapter. Individual problems with a proportion of at least 0.5% of all problems managed are listed in the table, in decreasing order of frequency. Rates per 100 encounters and the proportion of total problems are expressed both at the ICPC-2 chapter level and for individual problems.

The body system accounting for the highest proportion of problems managed in general practice was the respiratory system (13.7% of all problems managed). Respiratory problems were managed at a rate of 20.1 per 100 encounters. Upper respiratory tract infections (URTI) accounted for 3.7% of all problems managed in general practice, and for over 27% of respiratory problems managed. Other respiratory problems frequently managed included asthma (2.6 per 100 encounters), acute bronchitis/bronchiolitis and immunisations/vaccinations related to the respiratory system (each at a rate of 2.4 per 100 encounters).

Problems relating to the musculoskeletal system accounted for 11.7% of all problems managed, at a rate of 17.1 per 100 encounters. Osteoarthritis was the most frequently managed individual musculoskeletal problem, accounting for 1.9% of all problems managed, at a rate of 2.8 per 100 encounters. Other musculoskeletal problems commonly managed in general practice included back complaints (2.7 per 100 encounters), sprains and strains (1.6 per 100 encounters) and fractures (1.0 per 100 encounters).

Problems relating to the circulatory system, and those relating to the skin, each accounted for 11.5% of total problems managed in general practice. Skin problems were managed at a rate of 16.9 per 100 encounters. The skin conditions managed most frequently in general practice were contact dermatitis (1.8 per 100 encounters), solar keratosis/sunburn (1.3 per 100 encounters) and malignant neoplasms of the skin (1.1 per 100 encounters). Circulatory problems were managed at a rate of 16.8 per 100 encounters. Hypertension, the most commonly managed individual problem in general practice (9.2 per 100 encounters), was the main contributor to the high management rate of circulatory conditions, accounting for more than half of the circulatory problems managed. Other circulatory problems often managed in general practice included ischaemic heart disease, cardiac check-ups and atrial fibrillation/flutter.

Problems not relating directly to any one body system accounted for over 10% of the problems managed in general practice. Most of these problems related to general check-ups (1.3% of all problems managed) and general immunisations or vaccinations (1.2% of total problems managed).

Other problems managed frequently in general practice related to the endocrine and metabolic system (7.7% of total problems managed, at a rate of 11.3 per 100 encounters). Of these, lipid disorder and non-gestational diabetes together accounted for 57% of all endocrine problems managed.

Psychological problems accounted for 7.4% of all problems managed (at a rate of 10.8 per 100 encounters), the most common being depression, managed at a rate of 3.7 per 100 encounters. Problems relating to the blood and the male genital system, and those of a social nature, were the least frequently managed in general practice in 2003–04.

Table 7.2: Distribution of problems managed, by ICPC-2 chapter and most frequent individual problems within chapter

Problem managed	Number	Per cent total problems[a] (n=144,674)	Rate per 100 encounters[a] (n=98,877)	95% LCL	95% UCL
Respiratory	**19,883**	**13.7**	**20.1**	**19.5**	**20.7**
Upper respiratory tract infection	5,395	3.7	5.5	5.1	5.9
Asthma	2,530	1.8	2.6	2.4	2.7
Acute bronchitis/bronchiolitis	2,396	1.7	2.4	2.2	2.6
Immunisation/vaccination—respiratory	2,354	1.6	2.4	1.3	3.4
Sinusitis	1,281	0.9	1.3	1.1	1.5
Tonsillitis*	1,130	0.8	1.1	1.0	1.3
Chronic obstructive pulmonary disease	735	0.5	0.7	0.6	0.9
Musculoskeletal	**16,909**	**11.7**	**17.1**	**16.6**	**17.6**
Osteoarthritis*	2,748	1.9	2.8	2.6	3.0
Back complaint*	2,637	1.8	2.7	2.5	2.9
Sprain/strain*	1,564	1.1	1.6	1.4	1.7
Fracture*	984	0.7	1.0	0.9	1.1
Osteoporosis	802	0.6	0.8	0.6	1.0
Injury musculoskeletal NOS	761	0.5	0.8	0.6	0.9
Arthritis*	726	0.5	0.7	0.6	0.9
Skin	**16,688**	**11.5**	**16.9**	**16.2**	**17.6**
Contact dermatitis	1,747	1.2	1.8	1.6	1.9
Solar keratosis/sunburn	1,313	0.9	1.3	1.0	1.7
Malignant neoplasm skin	1,094	0.8	1.1	0.7	1.5
Skin disease, other	718	0.5	0.7	0.6	0.9
Circulatory	**16,630**	**11.5**	**16.8**	**16.1**	**17.5**
Hypertension*	9,099	6.3	9.2	8.7	9.7
Ischaemic heart disease*	1,346	0.9	1.4	1.2	1.5
Cardiac check-up*	1,144	0.8	1.2	0.8	1.5
Atrial fibrillation/flutter	786	0.5	0.8	0.6	1.0
Heart failure	722	0.5	0.7	0.6	0.9
General & unspecified	**14,834**	**10.3**	**15.0**	**14.5**	**15.5**
General check-up*	1,806	1.3	1.8	1.6	2.0
General immunisation/vaccination	1,757	1.2	1.8	1.6	2.0
Medication/request/renew/inject NOS	1,384	1.0	1.4	1.0	1.8
Viral disease, other/NOS	1,301	0.9	1.3	1.0	1.6
Results tests/procedures NOS	756	0.5	0.8	0.6	1.0
Endocrine & metabolic	**11,177**	**7.7**	**11.3**	**10.8**	**11.8**
Lipid disorder	3,244	2.2	3.3	3.0	3.5
Diabetes, non-gestational*	3,093	2.1	3.1	2.9	3.4

(continued)

Table 7.2 (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=144,674)	Rate per 100 encounters[a] (n=98,877)	95% LCL	95% UCL
Psychological	**10,716**	**7.4**	**10.8**	**10.3**	**11.4**
Depression*	3,606	2.5	3.7	3.4	3.8
Anxiety*	1,694	1.2	1.7	1.5	1.9
Sleep disturbance	1,593	1.1	1.6	1.5	1.8
Digestive	**10,403**	**7.2**	**10.5**	**10.2**	**10.8**
Oesophageal disease	2,154	1.5	2.2	2.0	2.4
Gastroenteritis, presumed infection	1,148	0.8	1.2	1.0	1.4
Female genital system	**5,864**	**4.1**	**5.9**	**5.5**	**6.3**
Female genital check-up/Pap smear*	1,759	1.2	1.8	1.4	2.1
Menopausal complaint	994	0.7	1.0	0.8	1.2
Pregnancy & family planning	**4,144**	**2.9**	**4.2**	**3.9**	**4.5**
Oral contraception*	1,338	0.9	1.4	1.2	1.5
Pregnancy*	790	0.6	0.8	0.6	1.0
Ear	**3,909**	**2.7**	**4.0**	**3.8**	**4.1**
Acute otitis media/myringitis	1,166	0.8	1.2	1.0	1.4
Neurological	**3,880**	**2.7**	**3.9**	**3.8**	**4.1**
Migraine	798	0.6	0.8	0.7	0.9
Urology	**2,972**	**2.1**	**3.0**	**2.9**	**3.2**
Urinary tract infection*	1,650	1.1	1.7	1.6	1.8
Eye	**2,709**	**1.9**	**2.7**	**2.6**	**2.9**
Infectious conjunctivitis	739	0.5	0.8	0.6	0.9
Blood	**1,634**	**1.1**	**1.7**	**1.5**	**1.8**
Male genital system	**1,561**	**1.1**	**1.6**	**1.4**	**1.7**
Social	**763**	**0.5**	**0.8**	**0.6**	**1.0**
Total problems	**144,674**	**100.0**	**146.3**	**144.4**	**148.2**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

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. This provides a more thorough understanding of the types of problems managed during general practice encounters.

In the BEACH program, participating GPs are instructed to record the problem being managed at the encounter using the most specific term possible. As such, the majority of problems are expressed as symptoms or complaints, as a diagnosis or disease, or as a diagnostic or preventive procedure (such as a check-up). 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.

Of the 144,674 problems managed, over two-thirds (64.8%) were recorded as a diagnosis or disease, at an average rate of 94.8 per 100 encounters. Over 20% of problems were expressed in terms of a symptom or complaint, at a rate of 30.8 per 100 encounters. Diagnostic and preventive procedures (e.g. immunisations/vaccinations and check-ups) were recorded at an average rate of 13.6 per 100 encounters, accounting for 9.3% of all problems managed. As discussed above, 'processes' comprised 4.9% of all problem labels. Problems related to medication or treatment accounted for 2.7% of all problems, at a rate of 4.0 per 100 encounters, while referrals (1.3 per 100 encounters), test results (1.2 per 100 encounters) and administrative procedures (0.6 per 100 encounters) comprised the remainder (Table 7.3).

Table 7.3: Distribution of problems managed, by ICPC-2 component

ICPC-2 component	Number	Per cent of total problems (n=144,674)	Rate per 100 encounters[a] (n=98,877)	95% LCL	95% UCL
Diagnosis, diseases	93,686	64.8	94.8	93.0	96.5
Symptoms & complaints	30,493	21.1	30.8	30.0	31.6
Diagnostic & preventive procedures	13,463	9.3	13.6	12.9	14.4
Medications, treatments & therapeutics	3,933	2.7	4.0	3.6	4.3
Referral & other RFE	1,244	0.9	1.3	1.0	1.5
Results	1,225	0.9	1.2	1.0	1.5
Administrative	630	0.4	0.6	0.4	0.8
Total problems	**144,674**	**100.0**	**146.3**	**144.4**	**148.2**

(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

Table 7.4 includes the most frequently managed individual problems in general practice, in decreasing order of frequency.

In this analysis, the specific chapter to which 'across chapter concepts' (immunisation/ vaccination, and prescriptions) apply is ignored and the concept grouped to all other similar concepts. For example, immunisation/vaccination includes influenza vaccinations (from Chapter R—respiratory) as well as those for childhood immunisation (Chapter A—general and unspecified), hepatitis immunisation (Chapter D—digestive) and neurological immunisations such as the haemophilus B vaccine (Chapter N).

The 30 most frequently managed problems accounted for almost half of all the problems managed in general practice (47.8%). Overall, 146.3 problems were managed per 100 encounters. The most frequently managed problem was hypertension, at an average rate of 9.2 per 100 encounters. The management of hypertension accounted for 6.3% of all problems in 2003–04. URTI was the second most commonly managed problem (5.5 per 100 encounters), accounting for 3.7% of all problems managed. Together, these two problems accounted for 10.0% of all problems managed in general practice.

Other problems that were managed frequently included immunisations/vaccinations (3.2 per 100 encounters), depression (2.5 per 100), diabetes (2.3 per 100), lipid disorders (2.1 per 100), osteoarthritis (1.9 per 100), back complaints (1.8 per 100), asthma (1.8 per 100) and acute bronchitis or bronchiolitis (1.7 per 100 encounters).

It is interesting to note that a number of non-diagnostic problem labels were included in the most frequently managed problems. Examples of these include preventive activities (immunisations/vaccinations), providing medication prescriptions or test results, and check-ups, both general check-ups and those specific to a body system (female genital and cardiac).

It is notable that oral contraception is included in the 30 most frequently managed problems in 2003–04, at an average rate of 1.4 per 100 encounters. This rate is significantly higher than the rate recorded in the previous year of BEACH (0.9 per 100 encounters, 95% CI: 0.7–1.1). It is thought that the increase in oral contraceptive use could partially be explained by a move away from the use of injected forms of contraception, such as implanon, following the medical indemnity issues regarding this form of contraception.[32]

Table 7.4: Most frequently managed problems

Problem managed	Number	Per cent of total problems (n=144,674)	Rate per 100 encounters[a] (n=98,877)	95% LCL	95% UCL
Hypertension*	9,099	6.3	9.2	8.7	9.7
Upper respiratory tract infection	5,395	3.7	5.5	5.1	5.9
Immunisation/vaccination—all*	4,674	3.2	4.7	4.2	5.2
Depression*	3,606	2.5	3.7	3.4	3.8
Diabetes—all*	3,264	2.3	3.3	3.1	3.5
Lipid disorders*	3,093	2.1	3.1	2.9	3.4
Osteoarthritis*	2,748	1.9	2.8	2.6	3.0
Back complaint*	2,637	1.8	2.7	2.5	2.9
Asthma	2,530	1.8	2.6	2.4	2.7
Acute bronchitis/bronchiolitis	2,396	1.7	2.4	2.2	2.6
Prescription—all*	2,281	1.6	2.3	1.8	2.8
Oesophageal disease	2,154	1.5	2.2	2.0	2.4
General check-up*	1,806	1.3	1.8	1.6	2.0
Female genital check-up/Pap smear*	1,759	1.2	1.8	1.4	2.1
Contact dermatitis	1,747	1.2	1.8	1.6	1.9
Anxiety*	1,694	1.2	1.7	1.5	1.9
Urinary tract infection*	1,650	1.1	1.7	1.6	1.8
Sleep disturbance	1,593	1.1	1.6	1.5	1.8
Sprain/strain*	1,564	1.1	1.6	1.4	1.7
Ischaemic heart disease*	1,346	0.9	1.4	1.2	1.5
Oral contraception*	1,338	0.9	1.4	1.2	1.5
Solar keratosis/sunburn	1,313	0.9	1.3	1.0	1.7
Viral disease, other/NOS	1,301	0.9	1.3	1.0	1.6
Sinusitis acute/chronic	1,281	0.9	1.3	1.1	1.5

(continued)

Table 7.4 (continued): Most frequently managed problems

Problem managed	Number	Per cent of total problems (*n*=144,674)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Test results*	1,225	0.9	1.2	1.0	1.5
Acute otitis media/myringitis	1,166	0.8	1.2	1.0	1.4
Gastroenteritis, presumed infection	1,148	0.8	1.2	1.0	1.4
Cardiac check-up*	1,144	0.8	1.2	0.8	1.5
Tonsillitis*	1,130	0.8	1.1	1.0	1.3
Malignant neoplasm, skin	1,094	0.8	1.1	0.7	1.5
Subtotal	*69,175*	*47.8*	—	—	—
Total problems	**144,674**	**100.0**	**146.3**	**144.4**	**148.2**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

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

Most frequently managed chronic problems

With increasing mortality rates due to chronic conditions,[33] it is becoming important to monitor the impact of chronic conditions in Australian general practice. We have applied a chronic condition list classified according to ICPC-2[34] to the BEACH data set, with the aim of providing data about the management rates and types of chronic conditions managed in Australian general practice.

Only problems regarded as 'chronic' have been included in the analysis for this section. Therefore, some of the groups (marked with a double asterisk) used in this analysis are different from those used in other parts of the chapter, due to the fact that both chronic (e.g. hypertension) and non-chronic (gestational hypertension) conditions may be found in the groups used in other sections in this chapter (e.g. hypertension*, Table 7.4). Where the group used for the chronic analysis (marked with a double asterisk) differs from that used in other analyses in this report, codes included in the group may be found in Appendix 4. It is also important to note that the condition labels and figures in this analysis may differ from those in Table 7.4 for this reason.

In 2003–04, 50,183 problems managed (34.7% of the total) were classified as 'chronic' (Table 7.5). At least one chronic problem was managed at 39.2% of encounters (95% CI: 38.1–40.2), and chronic problems were managed at an average rate of 50.8 per 100 encounters. In parallel with the most frequently managed problems overall, non-gestational hypertension was the most frequently managed chronic problem in Australian general practice, at a rate of 9.2 per 100 encounters. Non-gestational hypertension accounted for almost one-fifth of all chronic problems managed (18.1%). Depressive disorder was the second most frequently managed problem (3.6 per 100 encounters, 7.1% of all chronic problems), followed by non-gestational diabetes (3.3 per 100 encounters), lipid disorders (3.1 per 100 encounters) and osteoarthritis (2.8 per 100 encounters). Together, the top 5 chronic problems managed accounted for 43.4% of all chronic problems managed (Table 7.5).

The degenerative musculoskeletal disorders of osteoarthritis, osteoporosis, rheumatoid arthritis and unspecified arthritis together accounted for almost 10% of all chronic problems managed, while circulatory problems included in the 30 most frequently managed chronic problems together accounted for almost one-quarter of all chronic problems managed.

Although some chronic conditions individually were not managed at high rates, the long-term nature of chronic conditions, and the need for many of them to be managed and treated on an ongoing basis, indicates that these problems contribute to a considerable proportion of the workload of GPs.

Table 7.5: Most frequently managed chronic problems

Chronic problem managed	Number	Per cent of total chronic problems (*n*=50,183)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Hypertension (non-gestational)**	9,091	18.1	9.2	8.7	9.7
Depressive disorder	3,579	7.1	3.6	3.4	3.8
Diabetes (non-gestational)**	3,244	6.5	3.3	3.0	3.5
Lipid disorders*	3,093	6.2	3.1	2.9	3.4
Osteoarthritis*	2,748	5.5	2.8	2.6	3.0
Asthma	2,530	5.0	2.6	2.4	2.7
Oesophageal disease	2,154	4.3	2.2	2.0	2.4
Ischaemic heart disease*	1,346	2.7	1.4	1.2	1.5
Malignant neoplasm, skin	1,094	2.2	1.1	0.7	1.5
Back syndrome with radiating pain	926	1.8	0.9	0.7	1.1
Osteoporosis	802	1.6	0.8	0.6	1.0
Migraine	798	1.6	0.8	0.7	0.9
Atrial fibrillation/flutter	786	1.6	0.8	0.6	1.0
Chronic obstructive pulmonary disease	735	1.5	0.7	0.6	0.9
Heart failure	722	1.4	0.7	0.6	0.9
Arthritis**	717	1.4	0.7	0.5	0.9
Obesity	682	1.4	0.7	0.5	0.9
Gout	566	1.1	0.6	0.4	0.7
Hypothyroidism/myxoedema	540	1.1	0.6	0.4	0.7
Anaemia (chronic)**	537	1.1	0.5	0.4	0.7
Rheumatoid arthritis	502	1.0	0.5	0.4	0.7
Dementia	466	0.9	0.5	0.1	0.8
Schizophrenia	465	0.9	0.5	0.3	0.6
Anxiety disorder	439	0.9	0.4	0.2	0.7
Acne (chronic)**	409	0.8	0.4	0.3	0.5
Shoulder syndrome	379	0.8	0.4	0.2	0.5
Sprain/strain**	359	0.7	0.4	0.1	0.6
Vertiginous syndromes	353	0.7	0.4	0.2	0.5
Epilepsy	321	0.6	0.3	0.2	0.5
Irritable bowel syndrome	310	0.6	0.3	0.1	0.5
Subtotal	*40,693*	*81.1*	—	—	—
Total chronic problems	**50,183**	**100.0**	**50.8**	**49.0**	**52.5**

(a)   Figures do not total 100 as more than one problem can be managed at each encounter.
*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).
**   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 for codes included in analysis of chronic conditions).
Note: LCL—lower confidence limit; UCL—upper confidence limit.

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. In 2003–04, 55,292 problems were specified as being 'new', being managed at a rate of 55.9 per 100 encounters (Table 7.6).

The most frequently managed new problem was acute URTI, managed at a rate of 4.2 per 100 encounters. This problem accounted for 7.5% of all new problems under management. Immunisations/vaccinations were the second most frequently managed new problem (2.9 per 100 encounters, accounting for 5.2% of all new problems). Another acute respiratory problem, acute bronchitis/bronchiolitis, was managed at an average rate of 1.8 per 100 encounters. Acute bronchitis and URTI together comprised 10.6% of all new problems managed in 2003–04.

It is interesting to note that some problems ranked considerably higher when comparing the status of the problem to the overall management rate. Urinary tract infections were the fourth most commonly managed new problem, at a rate of 1.1 per 100 encounters, while the overall management rate for this problem was 1.9 per 100 encounters. This indicates that the presentation of urinary tract infections is more likely to be a new presentation.

Some chronic conditions also fell into the top 30 list of new problems. Depression (0.6 per 100 encounters), hypertension (0.5 per 100 encounters) and osteoarthritis (0.5 per 100 encounters) are all listed among the 30 most frequently managed new problems, despite being characterised as conditions that require long-term, ongoing management.

Table 7.6: Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (*n*=55,292)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Upper respiratory tract infection	4,131	7.5	4.2	3.8	4.5
Immunisation/vaccination—all*	2,887	5.2	2.9	2.4	3.4
Acute bronchitis/bronchiolitis	1,738	3.1	1.8	1.6	2.0
Urinary tract infection*	1,054	1.9	1.1	1.0	1.2
Viral disease, other/NOS	991	1.8	1.0	0.7	1.3
Sprain/strain*	942	1.7	1.0	0.8	1.1
Tonsillitis*	896	1.6	0.9	0.7	1.1
Gastroenteritis, presumed infection	885	1.6	0.9	0.7	1.1
Sinusitis acute/chronic	874	1.6	0.9	0.7	1.1
Acute otitis media/myringitis	854	1.5	0.9	0.7	1.0
Contact dermatitis	841	1.5	0.9	0.7	1.0
General check-up*	819	1.5	0.8	0.6	1.1
Female genital check-up*	724	1.3	0.7	0.3	1.1
Back complaint*	633	1.1	0.6	0.5	0.8
Depression*	627	1.1	0.6	0.5	0.8
Solar keratosis/sunburn	599	1.1	0.6	0.3	0.9
Infectious conjunctivitis	591	1.1	0.6	0.4	0.8
Malignant neoplasm skin	587	1.1	0.6	0.2	0.9

(continued)

Table 7.6 (continued): Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (*n*=55,292)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Hypertension*	511	0.9	0.5	0.3	0.7
Otitis externa	462	0.8	0.5	0.3	0.7
Osteoarthritis*	451	0.8	0.5	0.3	0.6
Skin infection, post-traumatic	459	0.8	0.5	0.3	0.6
Respiratory infection, other	441	0.8	0.5	0.0	1.2
Oesophageal disease	431	0.8	0.4	0.3	0.6
Fracture*	434	0.8	0.4	0.3	0.6
Gastrointestinal infection	422	0.8	0.4	0.0	0.9
Asthma	426	0.8	0.4	0.2	0.6
Bursitis/tendonitis/synovitis NOS	415	0.8	0.4	0.3	0.5
Excessive ear wax	407	0.7	0.4	0.3	0.6
Subtotal	*25,531*	*46.1*	—	—	—
Total new problems	**55,292**	**100.0**	**55.9**	**54.5**	**57.3**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

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

7.4 Changes from 1999–00 to 2003–04

There has been no change in the number of problems managed per 100 encounters between 1999–00 and 2003–04. However, there has been a significant increase in the management rate of new problems over this time, from 45.3 per 100 encounters in 1999–00 to 55.9 per 100 encounters in 2003–04 (Appendix 5, Table A5.2).

Over the five years between 1999 and 2004, there has been a steady decline in the management rate of respiratory problems, from 24.2 to 20.1 per 100 encounters (Appendix 5, Table A5.7). This decline is largely due to a significant decrease in the management rates of: URTIs (7.2 compared with 5.5 per 100 encounters), acute bronchitis/bronchiolitis (3.2 compared with 2.4 per 100 encounters), and asthma (3.2 compared with 2.6 per 100 encounters) (Appendix 5, Table A5.8).

There has been a significant increase in the management rate of endocrine and metabolic conditions, partly due to a significant increase in diabetes management over this period (increasing from 2.7 per 100 encounters to 3.3 per 100 encounters). There was a similar trend observed in the management of lipid disorders, but the higher rate in 2003–04 compared with 1999–00 did not reach statistical significance. However, if the management rate of lipid disorders is examined using the full BEACH data set over six years (1998–99 to 2003–04), a significant increase is observed (from 2.5 per 100 encounters, 95% CI: 2.3–2.7, to 3.1 per 100 encounters).

A significant increase was also observed in the management rate of osteoarthritis (from 2.2 per 100 encounters to 2.8 per 100 encounters), while the management rate of problems related to the ear decreased significantly over the last 5 years (from 4.5 per 100 encounters to 4.0 per 100 encounters) (Appendix 5, Table A5.8).

8 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 a total of 209,460 management activities at a rate of 212 per 100 encounters and 145 per 100 problems managed. The most common management activity was medication prescribed, advised or supplied, at a rate of 104.4 per 100 encounters or 71.3 per 100 problems. Non-pharmacological treatments took place at the rate of 51.4 per 100 encounters, referrals at a rate of 11.6, pathology orders at a rate of 35.2 and imaging at a rate of 8.2 per 100 encounters (Table 8.1).

Table 8.1: Summary of management

Management type	Number	Rate per 100 encounters (*n*=98,877)	95% LCL	95% UCL	Rate per 100 problems (*n*=144,674)	95% LCL	95% UCL
Medications	103,210	104.4	102.1	106.7	71.3	70.0	72.7
Prescribed	85,073	86.0	83.6	88.5	58.8	57.3	60.3
Advised OTC	9,649	9.8	9.0	10.6	6.7	6.1	7.2
GP-supplied	8,488	8.6	7.4	9.8	5.9	5.1	6.7
Non-pharmacological treatments	50,775	51.4	48.9	53.8	35.1	33.5	36.7
Clinical	36,211	36.6	34.5	38.8	25.0	23.6	26.4
Procedural	14,564	14.7	14.0	15.5	10.1	9.6	10.6
Referrals	11,495	11.6	11.1	12.1	8.0	7.6	8.3
Specialist	7,775	7.9	7.5	8.2	5.4	5.1	5.6
Allied health	2,600	2.6	2.4	2.9	1.8	1.6	2.0
Hospital	544	0.6	0.3	0.8	0.4	0.2	0.5
Emergency dept	157	0.2	0.0	0.5	0.1	0.0	0.3
Other medical services	138	0.1	0.0	0.6	0.1	0.0	0.4
Other referral	281	0.3	0.0	0.6	0.2	0.0	0.4
Pathology	34,831	35.2	33.7	36.7	24.1	23.1	25.0
Imaging	8,121	8.2	7.8	8.6	5.6	5.4	5.9
Other investigations	1,028	1.0	0.9	1.2	0.7	0.6	0.8
Total management activities	**209,460**	**211.8**	—	—	**144.7**	—	—

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

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 91.5% of encounters and for 86.8% of problems managed. At least one medication was given at two-thirds (65.6%) of encounters and for 56.6% of problems. At least

one non-pharmacological treatment was given at 39.3% of encounters and for 30.5% of problems, a clinical treatment being more likely than a procedure. A referral was made at 11.0% of encounters and for 8.0% of problems. At least one test or investigation was ordered at 21.3% of encounters and for 16.5% of problems. These were most commonly pathology test orders, which were reported at 15.5% of encounters (for 11.9% of problems). Imaging orders were placed less often, at 7.2% of encounters and for 5.1% of problems (Table 8.2).

Table 8.2: Encounters and problems for which management was recorded

Management type	Number of encounters	Per cent of total encounters[a] (*n*=98,877)	Number of problems	Per cent of total problems[a] (*n*=144,674)
At least one management type	**90,445**	**91.5**	**125,555**	**86.8**
At least one medication or non-pharmacological treatment	**81,367**	**82.3**	**108,491**	**75.0**
At least one medication	**64,888**	**65.6**	**81,940**	**56.6**
At least one prescription	55,112	55.7	69,167	47.8
At least one OTC advised	8,564	8.7	8,709	6.0
At least one GP-supplied	6,470	6.5	6,918	4.8
At least one non-pharmacological treatment	**38,837**	**39.3**	**44,164**	**30.5**
At least one clinical treatment	28,555	28.9	32,050	22.2
At least one therapeutic procedure	13,149	13.3	13,585	9.4
At least one referral	**10,892**	**11.0**	**11,535**	**8.0**
At least one referral to a specialist	7,538	7.6	7,881	5.5
At least one referral to allied health	2,505	2.5	2,621	1.8
At least one referral to hospital	544	0.6	572	0.4
At least one referral to emergency dept	157	0.2	162	0.1
At least one referral to other medical services	138	0.1	150	0.1
At least one referral NOS	281	0.3	297	0.2
At least one investigation	**21,099**	**21.3**	**23,854**	**16.5**
At least one pathology order	15,326	15.5	17,277	11.9
At least one imaging order	7,083	7.2	7,332	5.1
At least one other investigation	987	1.0	1,000	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: LCL—lower confidence limit; UCL—upper confidence limit; OTC—over-the-counter; dept—department; NOS—not otherwise specified.

The combinations of management types related to each problem were then investigated. There were 19,119 problems (13.2%) for which no specific management was recorded by the GP. Check-ups (either partial or full) (11.7%), hypertension (8.8%), upper respiratory tract infections (3.8%) and test results (3.3%) together accounted for more than one-quarter of these (results not shown).

The majority of treatments occurred either as a single component or in combination with one other component. Single component management was provided for 63.5% of problems, and double component for 19.9%. More than two components were provided in the management of less than 4% of problems.

Table 8.3 provides a list of the most common problem management combinations (not all combinations shown; no combinations including 'other investigation' shown). The most common management choice was medication alone (for 38.9% of problems), followed by clinical treatment alone (9.9%), but the combination of medication and clinical treatment was also relatively frequently recorded (7.6%).

Table 8.3: Most common management combinations

1+ Medication	1+ Clinical treatment	1+ Therapeutic procedure	1+ Referral	1+ Imaging order	1+ Pathology order	Per cent of total encounters (n=98,877)	Per cent of total problems (n=144,674)
No recorded management						8.5	13.2
1+ management recorded						91.5	86.8
✓						33.3	38.9
✓	✓					11.9	7.6
	✓					7.3	9.9
✓					✓	4.0	2.7
✓		✓				3.7	2.3
		✓				3.5	4.1
			✓			3.2	4.0
					✓	2.8	4.5
✓			✓			2.6	1.3
✓	✓				✓	1.7	0.6
				✓		1.7	2.0
✓				✓		1.6	1.0
	✓				✓	1.2	1.1
✓	✓	✓				1.1	0.4
✓	✓		✓			1.1	0.4

Note: 1+—at least one specified management type. Within the top 15 management combinations, there were none containing more than two management components.

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9 Medications

9.1 Source of medications

The survey form allowed GPs to record up to four medications for each of four problems. A maximum of 16 medications could therefore be recorded at each encounter. Each medication could be recorded as prescribed (the default), recommended for over-the-counter (OTC) purchase or supplied by the GP from surgery stocks or samples. GPs were requested to enter the brand or generic name, the strength, regimen and number of repeats ordered for each medication and to designate if this was a new or continued medication for that patient for this problem. This structure allowed analysis of the medications prescribed, advised by GPs for OTC purchase and those supplied by the GP, and the prescribed daily dose (PDD) of medications. Generic or brand names were entered into the database in the form recorded by the GP. Medications were classified using the CAPS system (developed by the Family Medicine Research Centre) from which they were also mapped to the ATC classification (see Chapter 2—Methods).[19] In all but one table, results are reported at generic level.

Overall, GPs recorded 83.6% of medications by brand (proprietary) name and 16.4% by their generic (non-proprietary) name. Brand names were used for the recording of 85.4% of prescribed medications, 76.6% of GP-supplied medications and 74.1% of OTC advised medications.

A total of 103,210 medications were recorded at a rate of 104 per 100 encounters and 71 per 100 problems managed. Most medications (82.4%) were prescribed. However, 9.4% of medications were recommended by the GP for OTC purchase, and 8.2% were supplied to the patient by the GP (Figure 9.1). Extrapolated to the 90 million general practice encounters in Australia in 2003–04, GPs prescribed over 77 million medications (not counting repeats) and recommended just under nine million medications to their patients for OTC purchase. GPs also supplied almost eight million medications directly to the patient.

	Prescribed	Advised OTC	GP supplied
Per cent	82.4	9.4	8.2

Source of medication

Figure 9.1: Distribution of medications by source
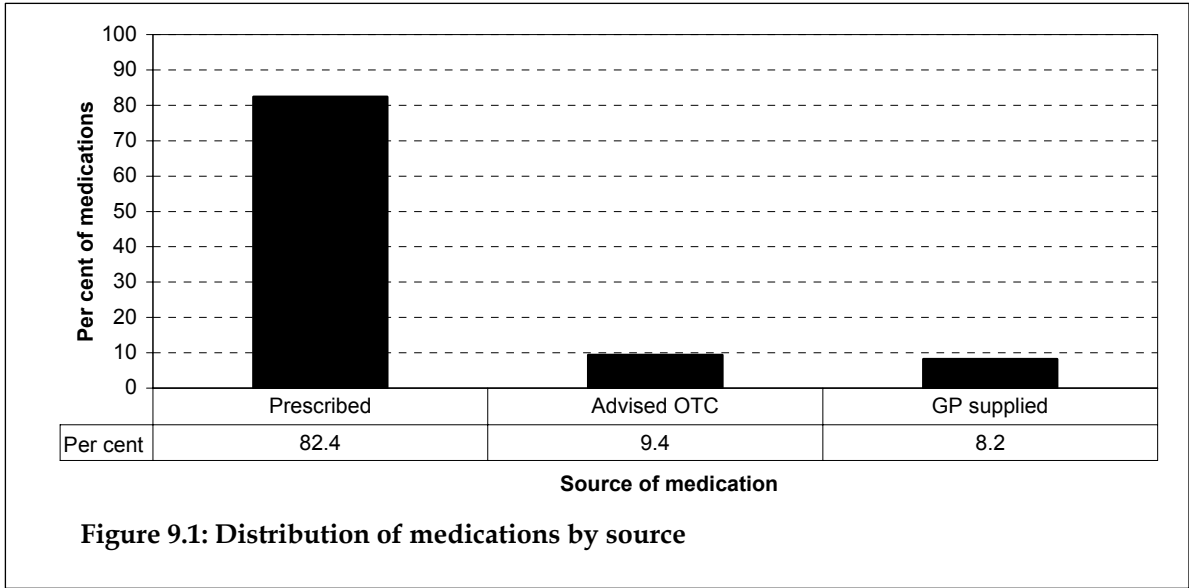
9.2 Prescribed medications

There were 85,073 prescriptions recorded, at a rate of 86.0 per 100 encounters and 58.8 per 100 problems managed. At least one prescription was recorded at 55.7% of encounters and for almost half (47.8%) of the problems managed.

No medications were prescribed at 44.3% of encounters, one medication at 36.4% of encounters, two at 12.5% and three at 4.2%. Four or more medications were prescribed at only 2.6% of encounters (Figure 9.2). No prescription was given for half (52.2%) of all problems managed, one for 39.3%, two for 6.6% and three or more for 2.0% (Figure 9.3).

Number of medications prescribed	nil	one	two	three	four	five	>five
Per cent	44.3	36.4	12.5	4.2	1.7	0.5	0.4

Figure 9.2: Number of medications prescribed per encounter

Number of medications prescribed	nil	one	two	three	four
Per cent	52.2	39.3	6.6	1.5	0.5

Figure 9.3: Number of medications prescribed per problem
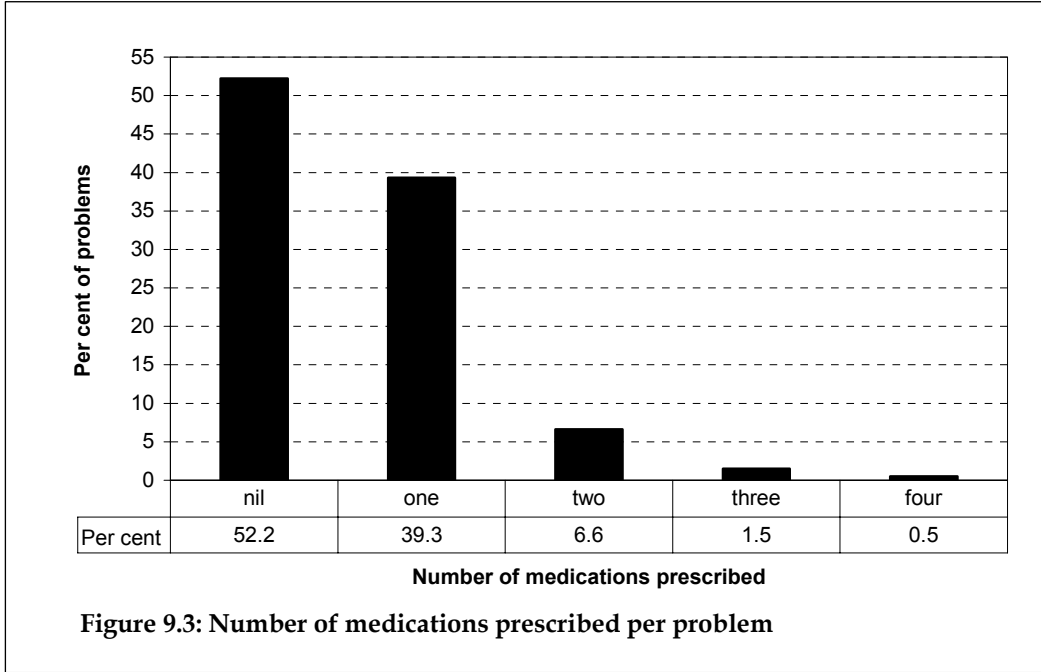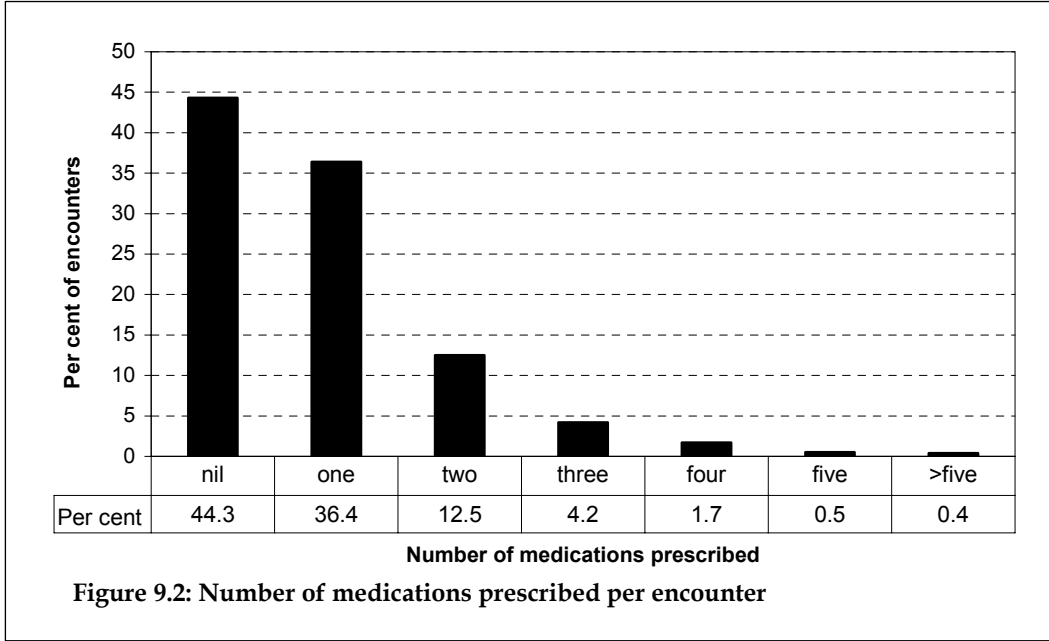
Number of repeats

GPs were also asked to record the number of repeat prescriptions ordered for each prescribed medication. In previous BEACH years, there was a very high level of missing data in this field (up to 50.0%). However, with an improved instruction sheet, which asked participating GPs to indicate with a zero or dash if there were no repeats, the missing rate dropped to 28.0%. For the 61,234 prescriptions for which data were available, the distribution of the specified number of repeats (from specified zero to 6+) is provided in Figure 9.4. For 37.8% of these prescriptions, the GP specified that no repeats had been prescribed and for 29.2%, 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 (16.6% and 11.4%) was also common.

	nil	one	two	three	four	five	>five
Per cent	37.8	16.6	11.4	4.4	0.6	29.2	0.1

Number of repeats ordered

Figure 9.4: Number of repeats ordered per prescription
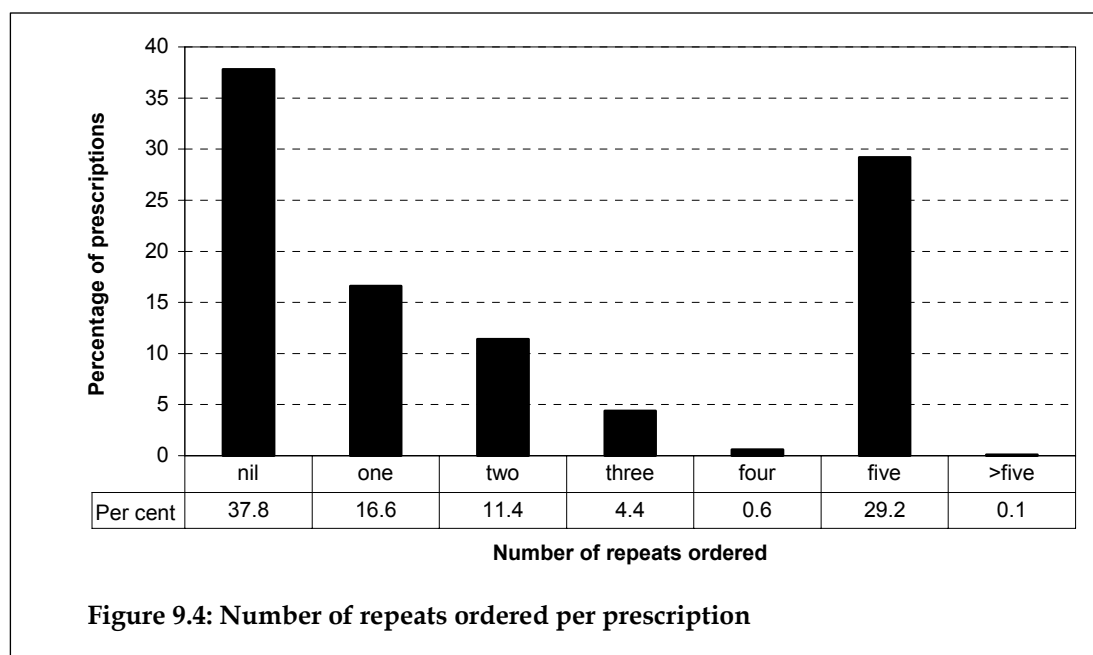
Age–sex-specific rates of prescribed medications

Age–sex-specific charts show the prescription rate per 100 encounters for all the male or female patients respectively in the age group under consideration. Figure 9.5 shows that the prescription rate per 100 encounters was similar for males and females. It also shows the well-described tendency for the number of prescriptions written at each encounter to rise with advancing age of the patient.

Figure 9.6, 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 that are managed for them in general practice.

Figure 9.5: Age–sex-specific prescription rates per 100 encounters

	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	61.5	63.2	61.4	64.2	72.8	92.9	108.4	108.0
Female	58.8	65.8	57.0	69.2	67.1	94.2	115.8	113.5

Age group (years)

Figure 9.6: Age–sex-specific prescription rates per 100 problems managed

	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	52.3	55.1	53.2	53.5	56.0	61.3	66.4	64.1
Female	49.6	58.4	49.6	52.3	49.1	59.7	66.9	65.8

Age group (years)

Types of medications prescribed

Medications prescribed by major groups

The distribution of prescribed medications by major groups is presented graphically in Figure 9.7. Cardiovascular medications were the most commonly prescribed group, representing 16.8% of all prescriptions. These were followed by antibiotics (16.5%), central

nervous system (12.2%) and psychological prescriptions (8.8%). Hormones were the fifth most commonly prescribed group (6.6%) followed by musculoskeletal medications (6.5%).

| Per cent | 16.8 | 16.5 | 12.2 | 8.8 | 6.6 | 6.5 |

Figure 9.7: Distribution of prescribed medications by group
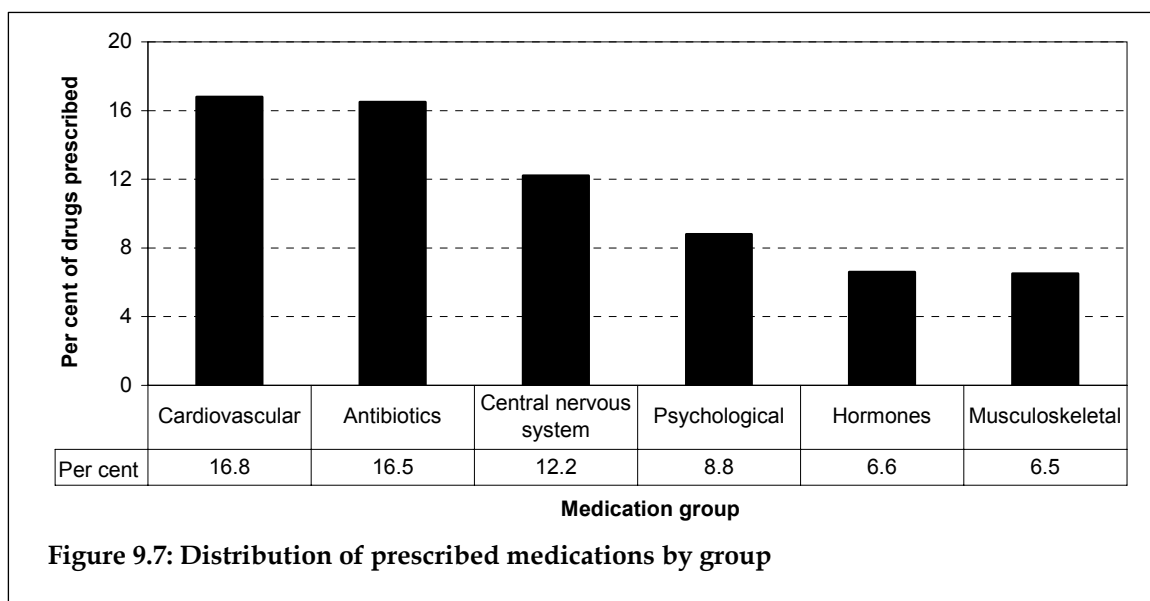
Table 9.1 shows the distribution of medications commonly prescribed by group, subgroup and generic name in order of medication group frequency. The in-house drug classification system CAPS has been used in the analysis of these results. Within cardiovascular medications, anti-hypertensives accounted for more than half the prescriptions (8.1 per 100 encounters). The 'other cardiovascular' group, principally lipid-lowering agents, contributed 2.9 prescriptions per 100 encounters. Beta-blockers were recorded at a rate of 1.7 per 100 encounters.

In the antibiotic group, broad-spectrum penicillins were prescribed at a rate of 5.0 per 100 encounters. Amoxycillin (3.3 per 100 encounters) and amoxycillin + potassium clavulanate (1.7) were the most frequently prescribed generic drugs in that subgroup. Cephalosporins were also prescribed often, at 2.9 per 100 encounters.

Prescribed central nervous system medications were mainly simple analgesics (3.6 per 100 encounters) and compound analgesics (2.5). The psychological medications most frequently prescribed were anti-depressants at a rate of 3.2 per 100 encounters.

Hormones were also commonly prescribed, particularly hypoglycaemics at 2.2 per 100 encounters. In other groups, non-steroidal anti-inflammatories were the most frequently prescribed (4.7 per 100 encounters) of the musculoskeletal medications, and bronchodilator/spasm relaxants (2.2) were the most common in the respiratory group. The wide range of medications prescribed reflects the extensive variety of problems managed in general practice.

Table 9.1: Distribution of medications prescribed, by group, subgroup and generic medication

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,073)	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
Cardiovascular			**14,277**	**16.8**	**14.4**	**13.6**	**15.2**
	Anti-hypertensive		7,971	9.4	8.1	7.6	8.5
		Irbesartan	872	1.0	0.9	0.7	1.0
		Ramipril	729	0.9	0.7	0.6	0.9
		Perindopril	723	0.9	0.7	0.5	0.9
		Irbesartan/hydrochlorothiazide	713	0.8	0.7	0.5	0.9
		Amlodipine	655	0.8	0.7	0.5	0.8
		Indapamide	451	0.5	0.5	0.3	0.6
	Other CVS drugs		2,833	3.3	2.9	2.7	3.1
		Atorvastatin	1,174	1.4	1.2	1.0	1.3
		Simvastatin	1,031	1.2	1.0	0.9	1.2
	Beta-blockers		1,680	2.0	1.7	1.5	1.9
		Atenolol	948	1.1	1.0	0.8	1.1
		Metoprolol	434	0.5	0.4	0.3	0.6
	Anti-angina		964	1.1	1.0	0.8	1.2
Antibiotics			**14,014**	**16.5**	**14.2**	**13.6**	**14.7**
	Broad spectrum penicillin		4,898	5.8	5.0	4.6	5.3
		Amoxycillin	3,217	3.8	3.3	3.0	3.6
		Amoxycillin/potass. clavulanate	1,664	2.0	1.7	1.5	1.9
	Cephalosporins		2,881	3.4	2.9	2.7	3.1
		Cephalexin	1,984	2.3	2.0	1.8	2.2
		Cefaclor monohydrate	818	1.0	0.8	0.5	1.1
	Other antibiotics		2,760	3.2	2.8	2.6	3.0
		Roxithromycin	1,121	1.3	1.1	1.0	1.3
		Erythromycin	548	0.6	0.6	0.3	0.8
		Trimethoprim	452	0.5	0.5	0.3	0.6
	Penicillin		1,314	1.5	1.3	1.2	1.5
	Tetracyclines		851	1.0	0.9	0.7	1.0
		Doxycycline	699	0.8	0.7	0.5	0.9
	Anti-infectives		726	0.9	0.7	0.5	0.9
Central Nervous System			**10,408**	**12.2**	**10.5**	**9.9**	**11.1**
	Simple analgesic		3,515	4.1	3.6	3.1	4.0
		Paracetamol	2,830	3.3	2.9	2.4	3.3
		Aspirin	672	0.8	0.7	0.5	0.9

(continued)

Table 9.1 (continued): Distribution of medications prescribed, by group, subgroup and generic medication

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,073)	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
	Compound analgesic		2,463	2.9	2.5	2.3	2.7
		Paracetamol/codeine	2,061	2.4	2.1	1.9	2.3
	Narcotic analgesic		2,318	2.7	2.3	2.1	2.6
		Tramadol	939	1.1	0.9	0.8	1.1
		Morphine sulphate	444	0.5	0.4	0.2	0.7
	Anti-emetic/anti-nauseant		1,381	1.6	1.4	1.3	1.5
		Prochlorperazine	665	0.8	0.7	0.5	0.8
		Metoclopramide	621	0.7	0.6	0.5	0.8
	Anti-convulsant		516	0.6	0.5	0.3	0.7
Psychological			**7,484**	**8.8**	**7.6**	**7.2**	**8.0**
	Anti-depressant		3,158	3.7	3.2	3.0	3.4
		Sertraline	610	0.7	0.6	0.5	0.8
		Citalopram	432	0.5	0.4	0.3	0.6
	Anti-anxiety		1,976	2.3	2.0	1.8	2.2
		Diazepam	1,064	1.3	1.1	0.9	1.3
		Oxazepam	680	0.8	0.7	0.5	0.9
	Sedative/hypnotics		1,792	2.1	1.8	1.7	2
		Temazepam	1,193	1.4	1.2	1.1	1.4
	Anti-psychotic		558	0.7	0.6	0.4	0.7
Hormones			**5,614**	**6.6**	**5.7**	**5.3**	**6.0**
	Hypoglycaemic		2,151	2.5	2.2	1.9	2.4
		Metformin	992	1.2	1.0	0.8	1.2
		Gliclazide	487	0.6	0.5	0.3	0.7
	Sex hormones		1,501	1.8	1.5	1.3	1.7
	Corticosteroids		1,242	1.5	1.3	1.1	1.4
		Prednisolone	529	0.6	0.5	0.3	0.8
	Other hormones		704	0.8	0.7	0.6	0.9
		Thyroxine	596	0.7	0.6	0.4	0.8
Musculoskeletal			**5,491**	**6.5**	**5.6**	**5.3**	**5.8**
	Non-steroidal anti-inflammatories		4,654	5.5	4.7	4.5	4.9
		Rofecoxib	993	1.2	1.0	0.9	1.2
		Celecoxib	991	1.2	1.0	0.9	1.1
		Diclofenac sodium systemic	823	1.0	0.8	0.6	1.0
	Urosuric agents		451	0.5	0.5	0.3	0.6

(continued)

Table 9.1 (continued): Distribution of medications prescribed, by group, subgroup and generic medications

Group	Subgroup	Generic	Number (*n*=85,073)	Per cent of scripts	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
Respiratory			**4,570**	**5.4**	**4.6**	**4.3**	**4.9**
	Bronchodilator/spasm relaxant		2,184	2.6	2.2	2	2.4
	Asthma preventives		1,828	2.1	1.8	1.7	2.0
		Salbutamol	1,507	1.8	1.5	1.4	1.7
		Fluticasone/salmeterol	808	1.0	0.8	0.7	1.0
Digestive			**4,158**	**4.9**	**4.2**	**4.0**	**4.4**
	Anti-ulcerants		2,714	3.2	2.7	2.6	2.9
		Omeprazole	686	0.8	0.7	0.6	0.8
		Esomeprazole	610	0.7	0.6	0.4	0.8
	Anti-diarrhoeals		473	0.6	0.5	0.3	0.6
Skin			**3,842**	**4.5**	**3.9**	**3.7**	**4.1**
	Topical steroid		2,552	3.0	2.6	2.4	2.8
		Betamethasone topical	826	1.0	0.8	0.7	1.0
		Mometasone	523	0.6	0.5	0.4	0.7
		Hydrocortisone topical	445	0.5	0.4	0.3	0.6
	Anti-infective skin		677	0.8	0.7	0.6	0.8
	Other skin		588	0.7	0.6	0.4	0.8
Allergy, immune system			**3,771**	**4.4**	**3.8**	**3.4**	**4.2**
	Immunisation		3,282	3.9	3.3	2.9	3.7
		Influenza virus vaccine	1,185	1.4	1.2	0.4	2.0
Blood			**2,062**	**2.4**	**2.1**	**1.9**	**2.3**
	Other blood drug		1,218	1.4	1.2	1.0	1.4
		Warfarin sodium	877	1.0	0.9	0.7	1.1
	Haemopoietic		841	1.0	0.9	0.7	1.0
		Vitamin B12 (cobalamin)	442	0.5	0.4	0.3	0.6
Urogenital			**1,825**	**2.1**	**1.8**	**1.7**	**2.0**
	Diuretic		1,081	1.3	1.1	0.9	1.3
		Frusemide (furosemide)	667	0.8	0.7	0.5	0.8
Contraceptives			**1,736**	**2.0**	**1.8**	**1.6**	**1.9**
	Contraceptives oral/systemic		1,728	2.0	1.7	1.6	1.9
		Levonorgestrel/ethinyloestradiol	1,144	1.3	1.2	1.0	1.3
Nutrition, metabolism	.		**1,616**	**1.9**	**1.6**	**1.5**	**1.8**
	Minerals/tonics		533	0.6	0.5	0.4	0.7
	Nutrition/metabolism other		539	0.6	0.5	0.4	0.7

(continued)

Table 9.1 (continued): Distribution of medications prescribed, by group, subgroup and generic medications

Group	Subgroup	Generic	Number (*n*=85,073)	Per cent of scripts	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
Eye medications			**1,653**	**1.9**	**1.7**	**1.5**	**1.8**
	Anti-infectives eye		1,036	1.2	1.0	0.9	1.2
		Chloramphenicol eye	893	1.0	0.9	0.8	1.0
	Other eye medication		448	0.5	0.5	0.3	0.6
Ear, nose topical			**1,620**	**1.9**	**1.6**	**1.5**	**1.8**
	Topical otic		894	1.1	0.9	0.7	1.1
		Dexamethasone/framycetin	451	0.5	0.5	0.3	0.7
	Topical nasal		726	0.9	0.7	0.5	0.9
Anti-neoplastics			**417**	**0.5**	**0.4**	**0.3**	**0.6**
Miscellaneous			**336**	**0.4**	**0.3**	**0.1**	**0.6**
Surgical preparations			**116**	**0.1**	**0.1**	**0.0**	**0.5**
Diagnostic agents			**65**	**0.1**	**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 subgroups and generic drugs are included.

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

Most frequently prescribed medications

The most frequently prescribed individual medications are reported at the generic level in Table 9.2. Together, these 30 medications accounted for more than half (55.1%) of all prescribed medications. Amoxycillin was the most frequently prescribed at a rate of 3.3 per 100 encounters. Antibiotics accounted for three of the top five medications.

Table 9.2: Most frequently prescribed medications (generic level)

Generic medication	Number	Per cent of scripts (*n*=85,073)	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
Amoxycillin	3,217	3.8	3.3	3.0	3.6
Paracetamol	2,830	3.3	2.9	2.4	3.3
Paracetamol/codeine	2,061	2.4	2.1	1.9	2.3
Cephalexin	1,984	2.3	2.0	1.8	2.2
Amoxycillin/potass. clavulanate	1,664	2.0	1.7	1.5	1.9
Salbutamol	1,507	1.8	1.5	1.4	1.7
Temazepam	1,193	1.4	1.2	1.1	1.4
Influenza virus vaccine	1,185	1.4	1.2	0.4	2.0
Atorvastatin	1,174	1.4	1.2	1.0	1.3
Levonorgestrel/ethinyloestradiol	1,144	1.3	1.2	1.0	1.3
Roxithromycin	1,121	1.3	1.1	1.0	1.3
Diazepam	1,064	1.3	1.1	0.9	1.3

(continued)

Table 9.2 (continued): Most frequently prescribed medications (generic level)

Generic medication	Number	Per cent of scripts (*n*=85,073)	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
Simvastatin	1,031	1.2	1.0	0.9	1.2
Rofecoxib	993	1.2	1.0	0.9	1.2
Metformin	992	1.2	1.0	0.8	1.2
Celecoxib	991	1.2	1.0	0.9	1.1
Atenolol	948	1.1	1.0	0.8	1.1
Tramadol	939	1.1	0.9	0.8	1.1
Chloramphenicol eye	893	1.0	0.9	0.8	1.0
Warfarin sodium	877	1.0	0.9	0.7	1.1
Irbesartan	872	1.0	0.9	0.7	1.0
Betamethasone topical	826	1.0	0.8	0.7	1.0
Diclofenac sodium systemic	823	1.0	0.8	0.6	1.0
Cefaclor monohydrate	818	1.0	0.8	0.5	1.1
Fluticasone/salmeterol	808	1.0	0.8	0.7	1.0
Ramipril	729	0.9	0.7	0.6	0.9
Perindopril	723	0.9	0.7	0.5	0.9
Irbesartan/hydrochlorothiazide	713	0.8	0.7	0.5	0.9
Doxycycline	699	0.8	0.7	0.5	0.9
Omeprazole	686	0.8	0.7	0.6	0.8
Subtotal	*46,919*	*55.1*	—	—	—
Total prescribed medications	**85,073**	**100.0**	**86.0**	**83.6**	**88.5**

(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.

Most commonly prescribed medications at generic and proprietary level

As stated at the beginning of this section, GPs specify about 85% of their prescriptions at the brand name or proprietary level. When medications were analysed at the CAPS product level, only one medication described in generic terms was recorded at sufficient frequency to rate in the top 20. This was paracetamol (Table 9.3). Other medications described in generic terms in the top 30% were temazepam, polio sabin and amoxycillin (results not shown).

Table 9.3: Most frequently prescribed medications (product level)

Medications	Number	Per cent of scripts (*n*=85,073)
Panadeine forte tablets 530 mg	1,817	2.14
Panamax tablets 500 mg	1,258	1.48
Keflex pulvules 500 mg	1,069	1.26
Augmentin duo forte tablets 875 mg	1,047	2.3
Fluvax injection 0.5 ml	1,020	1.20
Amoxil capsules 500 mg	943	1.11
Ventolin inhaler 100 mcg	857	1.01
Celebrex capsules 200 mg	845	0.99
Vioxx NOS	767	0.90
Voltaren tablets 50 mg	616	0.72
Stemetil tablets 5 mg	531	0.62
Panadol NOS	527	0.62
Paracetamol NOS	496	0.58
Rulide tablets 300 mg	473	0.56
Losec tablets 20 mg	473	0.56
Lipitor tablets 20 mg	447	0.53
Ceclor cd tablet 375 mg	433	0.51
Coversyl tablets 4 mg	427	0.50
Noten tablets 50 mg	423	0.50
Rulide tablets 150 mg	421	0.49
Subtotal	*14,890*	*17.5*
Total prescribed medications	**85,073**	**100.0**

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

Distribution of prescribed medications using the ATC classification

Table 9.4 shows the distribution of prescribed medications using the WHO ATC classification.[19] This allows comparison with other data classified in ATC such as those produced by the HIC for PBS data. Analysis by ATC groupings found that nervous system medications, which include analgesic and psychiatric medicines, were the most commonly recorded in BEACH.

Table 9.4: 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=85,073)	Rate per 100 encs[a] (n=98,877)	95% LCL	95% UCL
Nervous system			**17,694**	**20.8**	**17.9**	**17.1**	**18.7**
	Other analgesics and anti-pyretics		5,698	6.7	5.8	5.3	6.2
		Paracetamol	2,830	3.3	2.9	2.4	3.3
		Paracetamol, combinations excl. psycholeptics	2,182	2.6	2.2	2.0	2.4
		Acetylsalicylic acid	672	0.8	0.7	0.5	0.9
	Anti-depressants		3,158	3.7	3.2	3.0	3.4
		Sertraline	610	0.7	0.6	0.5	0.8
		Citalopram	432	0.5	0.4	0.3	0.6
	Opioids		2,435	2.9	2.5	2.2	2.7
		Tramadol	939	1.1	0.9	0.8	1.1
		Morphine	500	0.6	0.5	0.3	0.7
	Anxiolytics		1,976	2.3	2.0	1.8	2.2
		Diazepam	1,064	1.3	1.1	0.9	1.3
		Oxazepam	680	0.8	0.7	0.5	0.9
	Hypnotics and sedatives		1,788	2.1	1.8	1.6	2.0
		Temazepam	1,193	1.4	1.2	1.1	1.4
	Anti-psychotics		1,227	1.4	1.2	1.1	1.4
		Prochlorperazine	665	0.8	0.7	0.5	0.8
	Anti-epileptics		529	0.6	0.5	0.3	0.7
Anti-infectives for systemic use			**17,145**	**20.2**	**17.3**	**16.7**	**18.0**
	Beta-lactam anti-bacterials, penicillins		6,156	7.2	6.2	5.9	6.6
		Amoxicillin	3,217	3.8	3.3	3.0	3.6
		Amoxicillin and enzyme inhibitor	1,664	2.0	1.7	1.5	1.9
		Phenoxymethyl penicillin	520	0.6	0.5	0.3	0.7
	Other beta-lactam anti-bacterials		2,881	3.4	2.9	2.7	3.1
		Cefaclor	818	1.0	0.8	0.5	1.1
		Cefalexin	1,984	2.3	2.0	1.8	2.2
	Macrolides, lincosamides and streptogramins		2,089	2.5	2.1	1.9	2.3
		Roxithromycin	1,121	1.3	1.1	1.0	1.3
		Erythromycin	548	0.6	0.6	0.3	0.8
	Viral vaccines		2,027	2.4	2.1	1.7	2.4
		Influenza, inactivated, whole virus	1,185	1.4	1.2	0.4	2.0

(continued)

ATC Level 1	ATC Level 3	ATC Level 5	Number	Per cent of scripts (*n*=85,073)	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
	Bacterial vaccines		1,067	1.3	1.1	0.9	1.3
	Tetracyclines		851	1.0	0.9	0.7	1.0
		Doxycycline	699	0.8	0.7	0.5	0.9
	Sulfonamides and trimethoprim		714	0.8	0.7	0.6	0.9
		Trimethoprim	452	0.5	0.5	0.3	0.6
	Other anti-bacterials		509	0.6	0.5	0.4	0.7
Cardiovascular system			**15,050**	**17.7**	**15.2**	**14.4**	**16.1**
	Cholesterol and triglyceride reducers		2,732	3.2	2.8	2.6	3.0
		Atorvastatin	1,174	1.4	1.2	1.0	1.3
		Simvastatin	1,031	1.2	1.0	0.9	1.2
	ACE inhibitors, plain		2,503	2.9	2.5	2.3	2.7
		Ramipril	729	0.9	0.7	0.6	0.9
		Perindopril	723	0.9	0.7	0.5	0.9
	Beta-blocking agents		1,788	2.1	1.8	1.6	2.0
		Atenolol	948	1.1	1.0	0.8	1.1
		Metoprolol	434	0.5	0.4	0.3	0.6
	Selective calcium channel blockers with mainly vascular effects		1,447	1.7	1.5	1.3	1.6
		Amlodipine	655	0.8	0.7	0.5	0.8
	Selective calcium channel blockers with direct cardiac effects		687	0.8	0.7	0.5	0.8
	High-ceiling diuretics		684	0.8	0.7	0.5	0.9
		Furosemide	667	0.8	0.7	0.5	0.8
	Vasodilators used in cardiac disease		646	0.8	0.7	0.4	0.9
	Low-ceiling diuretics, excl. thiazides		470	0.6	0.5	0.3	0.6
		Indapamide	451	0.5	0.5	0.3	0.6
	ACE inhibitors, combinations		530	0.6	0.5	0.4	0.7
Alimentary tract and metabolism			**8,014**	**9.4**	**8.1**	**7.7**	**8.5**
	Drugs for peptic ulcer and GORD		2,740	3.2	2.8	2.6	3.0
		Omeprazole	686	0.8	0.7	0.6	0.8
		Esomeprazole	610	0.7	0.6	0.4	0.8
	Oral blood glucose lowering drugs		1,832	2.2	1.9	1.6	2.1
		Metformin	992	1.2	1.0	0.8	1.2
		Gliclazide	487	0.6	0.5	0.3	0.7
	Propulsives		719	0.8	0.7	0.6	0.9
		Metoclopramide	621	0.7	0.6	0.5	0.8

(continued)

Table 9.4 (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=85,073)	Rate per 100 encs[a] (n=98,877)	95% LCL	95% UCL
Musculoskeletal system			**5,955**	**7.0**	**6.0**	**5.7**	**6.3**
	Anti-inflammatory and anti-rheumatic products, non-steroids		4,676	5.5	4.7	4.5	5.0
		Diclofenac	1,060	1.2	1.1	0.9	1.3
		Rofecoxib	993	1.2	1.0	0.9	1.2
		Celecoxib	991	1.2	1.0	0.9	1.1
	Anti-gout preparations		451	0.5	0.5	0.3	0.6
	Drugs affecting bone structure and mineralization		442	0.5	0.4	0.3	0.6
Respiratory system			**5,729**	**6.7**	**5.8**	**5.5**	**6.1**
	Adrenergics, inhalants		2,774	3.3	2.8	2.6	3.0
		Salbutamol	1,466	1.7	1.5	1.3	1.6
		Salmeterol with other drugs for obstructive airway disease	808	1.0	0.8	0.7	1.0
	Other drugs for obstructive airway disease, inhalants		1,190	1.4	1.2	1.1	1.4
	Decongestants and other nasal preparations for topical use		730	0.9	0.7	0.5	0.9
	Anti-histamines for systemic use		475	0.6	0.5	0.3	0.7
Dermatologicals			**4,007**	**4.7**	**4.1**	**3.8**	**4.3**
	Corticosteroids, plain		2,368	2.8	2.4	2.2	2.6
		Betamethasone	826	1.0	0.8	0.7	1.0
		Mometasone	523	0.6	0.5	0.4	0.7
		Hydrocortisone	445	0.5	0.4	0.3	0.6
Genitourinary system and sex hormones			**3,929**	**4.6**	**4.0**	**3.7**	**4.2**
	Hormonal contraceptives for systemic use		2,152	2.5	2.2	2.0	2.4
		Levonorgestrel and oestrogen	1,144	1.3	1.2	1.0	1.3
	Oestrogens		628	0.7	0.6	0.5	0.8
Sensory organs			**2,548**	**3.0**	**2.6**	**2.4**	**2.7**
	Anti-infectives ophthalmological		1,036	1.2	1.0	0.9	1.2
		Chloramphenicol	893	1.0	0.9	0.8	1.0
	Corticosteroids with anti-infectives otological		679	0.8	0.7	0.5	0.9
		Dexamethasone with anti-infectives	451	0.5	0.5	0.3	0.7
Blood and blood-forming organs			**2,205**	**2.6**	**2.2**	**2.0**	**2.4**
	Anti-thrombotic agents		1,301	1.5	1.3	1.1	1.5
		Warfarin	877	1.0	0.9	0.7	1.1
	Vitamin B12 and folic acid		558	0.7	0.6	0.4	0.7
		Cyanocobalamin	442	0.5	0.4	0.3	0.6

(continued)

Table 9.4 (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*=85,073)	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
Systemic hormonal preparations, excl. sex hormones and insulins			**1,914**	**2.3**	**1.9**	**1.8**	**2.1**
	Corticosteroids for systemic use, plain		1,205	1.4	1.2	1.0	1.4
		Prednisolone	685	0.8	0.7	0.5	0.9
	Thyroid preparations		597	0.7	0.6	0.4	0.8
		Levothyroxine sodium	596	0.7	0.6	0.4	0.8
Anti-neoplastic and immunomodulating agents			**414**	**0.5**	**0.4**	**0.3**	**0.6**
Various			**353**	**0.4**	**0.4**	**0.1**	**0.6**
Anti-parasitic products, insecticides and repellents			**118**	**0.1**	**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; GORD—gastro-oesophageal reflux disease; ACE—angiotensin converting enzyme.

9.3 Medications advised for over-the-counter purchase

The total number of medications recorded as recommended by the GP for OTC purchase was 9,649, a rate of 9.8 per 100 encounters and 6.7 per 100 problems managed. At least one medication was recorded as advised at 8.7% of encounters and for 6.0% of problems.

Central nervous system medications predominated in those advised to patients, with almost one-third of the advised medications being in this group. They were followed by medications acting on the respiratory system (Figure 9.8).

	Central nervous system	Respiratory	Skin	Digestive	Musculoskeletal	Allergy
Per cent	30.3	12.5	11.8	10.3	9.8	6.5

Medication group

Figure 9.8: Distribution of advised medications by major groups
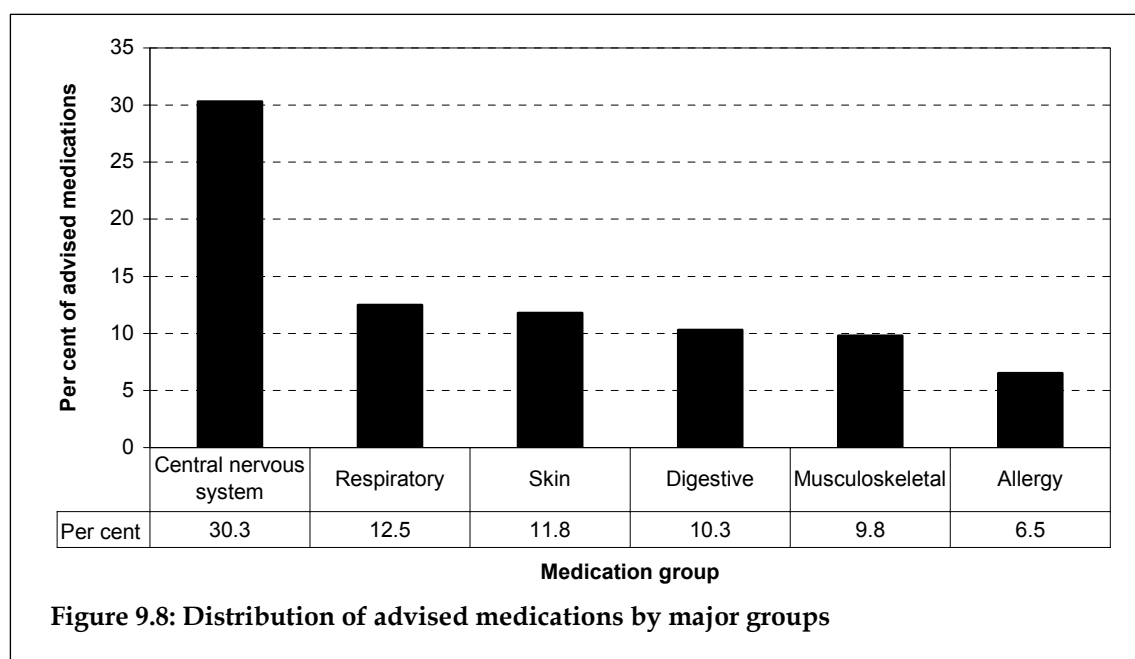
Paracetamol was the most frequently advised medication, accounting for 25.2% of all advised OTC medications (Table 9.5). There was a wide range of medications advised in relatively small numbers, including analgesics, and cold and skin preparations. The 30 medications listed in this table accounted for two-thirds of all OTC medications advised.

Table 9.5: Most frequently advised over-the-counter medications

Generic medication	Number	Per cent of OTCs (*n*=9,649)	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL
Paracetamol	2,432	25.2	2.5	1.9	3.0
Ibuprofen	543	5.6	0.5	0.2	0.9
Loratadine	219	2.3	0.2	0.0	0.5
Diclofenac topical	219	2.3	0.2	0.0	0.6
Clotrimazole topical	195	2.0	0.2	0.0	0.4
Aspirin	154	1.6	0.2	0.0	0.5
Fexofenadine	135	1.4	0.1	0.0	0.5
Paracetamol/codeine	129	1.3	0.1	0.0	0.5
Saline bath/solution/gargle	128	1.3	0.1	0.0	0.7
Sodium/potassium/citric/glucose	115	1.2	0.1	0.0	0.6
Clotrimazole vaginal	115	1.2	0.1	0.0	0.4
Cetirzine	108	1.1	0.1	0.0	0.5
Sodium chloride topical nasal	107	1.1	0.1	0.0	0.5
Sodium bicarbonate/citrate/tartaric/citric	105	1.1	0.1	0.0	0.6
Chlorpheniramine/pseudoephidrine	101	1.0	0.1	0.0	0.5
Brompheniramine/phenylephrine	99	1.0	0.1	0.0	0.7
Cold and flu medication NEC	96	1.0	0.1	0.0	1.0
Chlorpheniramine/phenylephrine	90	0.9	0.1	0.0	0.6
Sorbolene/glycerol/cetomac	90	0.9	0.1	0.0	0.4
Loperamide	89	0.9	0.1	0.0	0.5
Simple analgesic	86	0.9	0.1	0.0	0.9
Povidone-iodine topical	82	0.9	0.1	0.0	0.6
Codeine/paracetamol/pseudoephedrine	82	0.8	0.1	0.0	0.8
Mouthwash/gargle other	81	0.8	0.1	0.0	1.0
Folic acid	81	0.8	0.1	0.0	0.4
Promethazine hydrochloride	79	0.8	0.1	0.0	0.4
Calamine lotion	76	0.8	0.1	0.0	0.5
Benzydamine oropharyngeal	72	0.7	0.1	0.0	0.5
Glucosamine	70	0.7	0.1	0.0	0.4
Psyllium hydrophilic mucilloid	70	0.7	0.1	0.0	0.4
Subtotal	*6,556*	*67.5*	—	—	—
Total medications advised	**9,649**	**100.0**	**9.8**	**9.0**	**10.6**

(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.

9.4 Medications supplied by GPs

GPs supplied their patients with a total of 8,488 medications in this study, at a rate of 8.6 medications per 100 encounters and 5.9 per 100 problems. At least one medication was supplied at 6.5% of encounters for 4.8% of problems.

The distribution of supplied medications by group showed that those acting on the allergy/immune system constituted 38.1% of all medications supplied. Central nervous system medications made up 9.6%, and antibiotics accounted for 7.9% of GP-supplied medications (Figure 9.9).

	Allergy /immune	Central nervous system	Antibiotics	Musculoskeletal	Cardiovascular	Psychological
Per cent	38.1	9.6	7.9	6.1	5.9	5.6

Medication groups

Figure 9.9 Distribution of GP-supplied medications by major groups
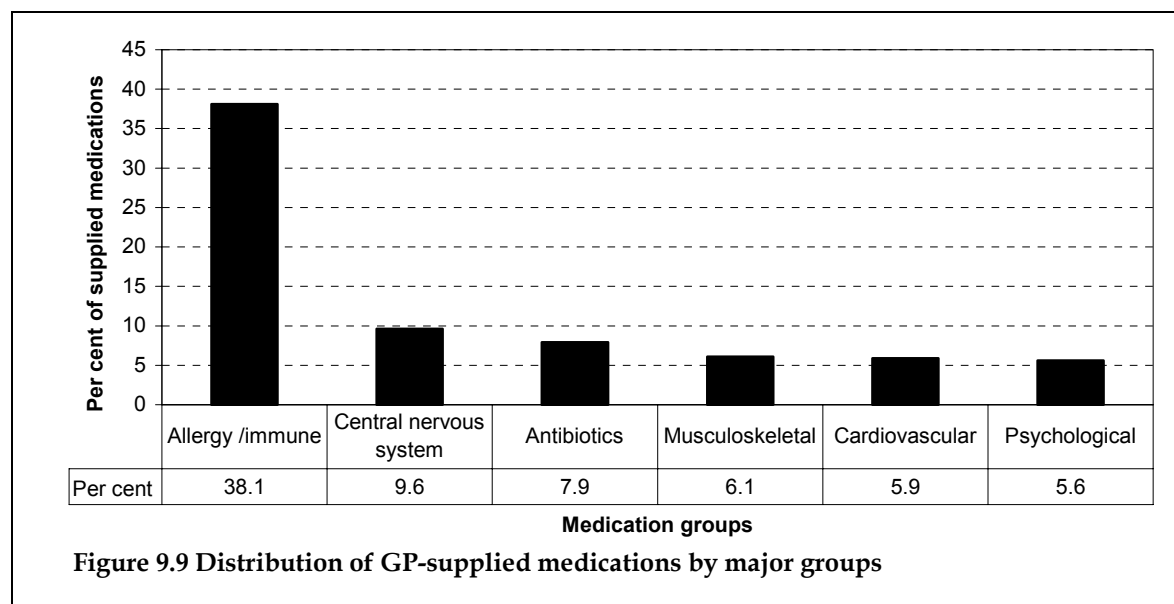
Of the ten most common medications supplied by the GP, seven were vaccines, principally influenza virus vaccine, which accounted for 13.5% of GP-supplied medications (Table 9.6). There was a wide spread of other medications supplied, mostly prescription medications. Presumably some were from manufacturers' sample packs and may have been supplied to test efficacy for a particular patient, or where cost is an issue. Others may have been supplied to meet an urgent need. The medications most commonly supplied were amoxycillin and metoclopramide, accounting for 2.3% and 2.1% respectively of all medications supplied.

Table 9.6: Medications most frequently supplied by GPs

Generic medication	Number	Per cent of GP-supplied (n=8,488)	Rate per 100 encs[a] (n=98,877)	95% LCL	95% UCL
Influenza virus vaccine	1,150	13.5	1.2	0.0	2.6
Polio vaccine oral sabin/injection	337	4.0	0.3	0.1	0.6
Meningitis vaccine	250	2.9	0.3	0.0	0.6
Amoxycillin	196	2.3	0.2	0.0	2.5
Triple antigen(Diphtheria/pertussis/tetanus)	191	2.2	0.2	0.0	0.5
Mumps/measles/rubella vaccine	185	2.2	0.2	0.0	0.5
Diphtheria/pertussis/tetanus/hepatitis B	182	2.1	0.2	0.0	0.6

(continued)

Table 9.6 (continued): Medications most frequently supplied by GPs

Generic medication	Number	Per cent of GP-supplied (n=8,488)	Rate per 100 encs[a] (n=98,877)	95% LCL	95% UCL
Metoclopramide	180	2.1	0.2	0.0	0.6
Haemophilus B vaccine	173	2.0	0.2	0.0	0.5
Meloxicam	151	1.8	0.2	0.0	0.7
ADT/CDT (diphtheria/tetanus) vaccine	148	1.7	0.1	0.0	0.4
Rofecoxib	145	1.7	0.1	0.0	0.5
Paracetamol	136	1.6	0.1	0.0	1.4
Hepatitis B vaccine	126	1.5	0.1	0.0	0.6
Vitamin B12 (cobalamin)	113	1.3	0.1	0.0	0.5
Salbutamol	107	1.3	0.1	0.0	0.6
Celecoxib	96	1.1	0.1	0.0	0.4
Pneumococcal vaccine	95	1.1	0.1	0.0	0.8
Prochlorperazine	94	1.1	0.1	0.0	0.6
Esomeprazole	88	1.0	0.1	0.0	0.4
Paracetamol/codeine	82	1.0	0.1	0.0	0.8
Promethazine hydrochloride	74	0.9	0.1	0.0	0.9
Cephalexin	72	0.8	0.1	0.0	0.9
Methylprednisolone	71	0.8	0.1	0.0	3.9
Levonorgestrel/ethinyloestradiol	69	0.8	0.1	0.0	0.7
Tramadol	67	0.8	0.1	0.0	0.5
Amoxycillin/potass. clavulanate	67	0.8	0.1	0.0	0.9
Sertraline	60	0.7	0.1	0.0	0.5
Chloramphenicol eye	58	0.7	0.1	0.0	1.3
Haemophilus B/hepatitis B vaccine	57	0.7	0.1	0.0	0.7
Subtotal	*4,820*	*56.8*	—	—	—
Total medications supplied	**8,488**	**100.0**	**8.6**	**7.4**	**9.8**

(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.

9.5 Changes from 1999–00 to 2003–04

There has been a significant decrease in overall medication rates, from 110.1 per 100 encounters (95% CI: 107.8–112.4) in 1999–00 to 104.4 (95% CI: 102.1–106.7) in 2003–04. The decrease in total medications was reflected particularly in the rates of prescribed medications which fell from 93.6 (95% CI: 91.2–96.1) per 100 encounters in 1999–00 to 86.0 (95% CI: 83.6–88.5) in 2003–04. The rate of advised OTC medications and those supplied by the GP showed no significant changes or trends over this period (Appendix 5, Table A5.2). Figure 9.10 provides a graphical view of the changes in medication rates per 100 problems managed over time. The graph demonstrates that decreased prescribing rates are not due to any decrease in total problem management rates.

	All medications	Prescribed	Advised OTC	GP supplied
■ 1999–00	75.0	63.9	6.4	4.7
□ 2000–01	74.8	63.9	6.2	4.8
▨ 2001–02	72.9	61.4	6.2	5.3
■ 2002–03	71.6	58.2	7.0	6.4
□ 2003–04	71.3	58.8	6.7	5.9

Medication provision method

Figure 9.10: Changes in medication rates over time
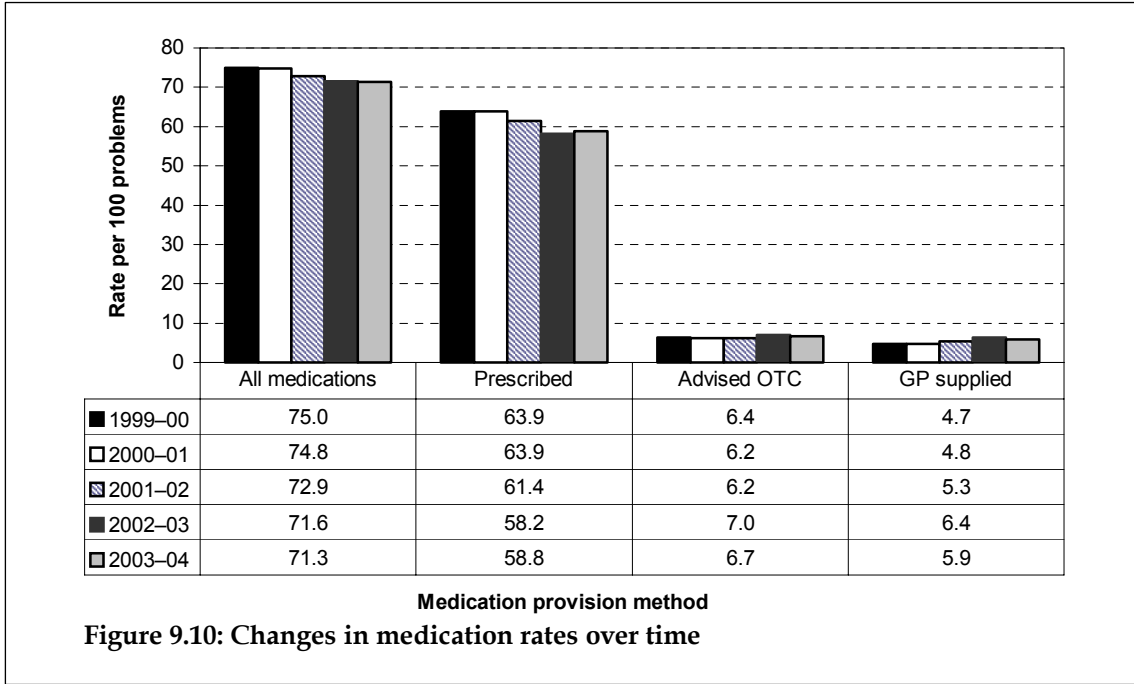
Changes in prescribed medications (classified in CAPS)

Appendix 5, Table A5.9 provides a summary of the annual results for prescribed medications, classified according to CAPS. A number of significant changes can be seen between 2003–04 and some of the earlier years. There has been a significant decline in prescribing rates of:

- total antibiotics, in particular cephalosporins, tetracyclines and 'other' antibiotics (which include macrolides)
- compound analgesics
- total respiratory medications, including bronchodilators and asthma preventives
- sex hormones
- total musculoskeletal medications, including NSAIDs and anti-rheumatoids
- total allergy, immune system medications, particularly immunisation
- total skin medications
- ear and nose topical medications, and topical nasal medications in particular.

A significant increase in 2003–04 prescribing rates of:

- narcotic analgesics

- medications for ulcers of the digestive system
- blood medications and particularly 'other' blood drugs which include all except haemopoietics
- medications relating to nutrition and metabolism, which include vitamins, supplements and anti-obesity drugs.

Changes in prescription rates of individual generic medications

Appendix 5, Table A5.10 shows the most frequently prescribed medications for each of the years from 1999–00 to 2003–04. Between 2003–04 and some of the earlier years significant decreases in prescribing rates of the following medications were noted:

- paracetamol
- salbutamol
- cefaclor monohydrate
- roxithromycin.
- diclofenac sodium systemic
- ranitidine
- celecoxib (from a peak in 2000–01)

Medications which increased significantly from any of the earlier years to 2003–04 were:

- atorvastatin
- tramadol
- rofecoxib (from its introduction in 2000–01)
- fluticasone/salmeterol.

Changes in prescribed medications (classified in ATC)

The comparative results for prescribed medication rates using the ATC classification are presented in Appendix 5, Table A5.11.

In comparison to some of the earlier years, 2003–04 demonstrated significant decreases in prescribing rates of:

- other analgesics and anti-pyretics
- anti-inflammatory/anti-rheumatic non-steroids
- other beta-lactam anti-bacterials
- plain ACE inhibitors
- macrolides/lincosamides/streptogramins
- other inhalants for obstructive airway diseases

Significant increases were apparent in the rate of prescribing of:

- cholesterol and triglyceride reducers
- opioids.

Changes in rates of advice or supply of individual generic medications

As shown in Appendix 5, Tables A5.12 and A5.13, 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.

10 Non-pharmacological management

The survey form allowed GPs to record up to two non-pharmacological treatments for each problem managed at the encounter. Non-pharmacological treatments included all clinical and procedural treatments provided by the GPs at the encounters. These groups are defined in Appendix 3.

Clinical treatments include general and specific advice, counselling or education, family planning, and administrative processes. Procedural treatments involve all procedures carried out by GPs, such as excision of skin lesion or application/removal of plaster.

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

10.1 Number of non-pharmacological treatments

Non-pharmacological treatments were frequently provided by GPs to manage patient morbidity. A total of 50,775 were recorded for the year, at a rate of 51.4 per 100 encounters and 35.1 per 100 problems managed. GPs provided more clinical treatments (25.0 per 100 problems) than procedural treatments (10.1 per 100 problems) (Table 10.1).

Table 10.1: Non-pharmacological treatments—summary table

	Number	Rate per 100 encs[a] (*n*=98,877)	95% LCL	95% UCL	Rate per 100 problems[a] (*n*=144,674)	95% LCL	95% UCL
Non-pharmacological treatments	50,775	51.4	48.9	53.8	35.1	33.5	36.7
Clinical treatments	36,211	36.6	34.5	38.8	25.0	23.6	26.4
Procedural treatments	14,564	14.7	14.0	15.5	10.1	9.6	10.6

(a)   Figures do not total 100 as more than one treatment can be described at each encounter and for each problem.

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

Table 10.2 shows the proportion of problems for which at least one non-pharmacological treatment was given. Pharmacological and non-pharmacological treatments were sometimes given simultaneously to manage the presenting problem. However, for two-thirds (60.1%) of the problems that were managed with at least one non-pharmacological treatment, no pharmacological treatment was provided. At least one non-pharmacological treatment was used in the management of 30.5% of problems, and for 18.4% of problems at least one non-pharmacological treatment was provided without the addition of any medications.

One in five problems were managed with a clinical treatment, and for more than half of these (57.9%) no medications were given. GPs used a procedural treatment for the management of one in ten problems, and for two-thirds of these no medications were provided. The results presented in Table 10.2 also indicate that problems managed with a procedure were less likely to involve concomitant pharmacological treatment than those managed with a clinical treatment (65.3% compared with 57.9%).

Table 10.2: Relationship of non-pharmacological management with pharmacological treatments

Co-management of problems with non-pharmacological treatments	Number of problems	Per cent within class	Per cent of problems (*n*=144,674)	95% LCL	95% UCL
At least one non-pharmacological treatment	44,164	100.0	30.5	29.3	31.7
Without pharmacological treatment	26,551	60.1	18.4	17.7	19.0
At least one clinical treatment	32,050	100.0	22.2	21.0	23.3
Without pharmacological treatment	18,557	57.9	12.8	12.2	13.4
At least one procedural treatment	13,585	100.0	9.4	8.9	9.8
Without pharmacological treatment	8,789	64.7	6.1	5.7	6.4

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

10.2 Clinical treatments

The total number of clinical treatments provided by GPs was 36,211, at a rate of 36.6 per 100 encounters (Table 10.1).

Most frequent clinical treatments

The three most common clinical treatments were advice and education in general (13.3% of all non-pharmacological treatments), counselling for the problem being managed (9.1%) and advice and education pertaining to nutrition and weight (9.0%).

General advice/education was given at a rate of 6.8 per 100 encounters, counselling for the problem being managed at a rate of 4.7 per 100 encounters, and advice/education on nutrition and weight at a rate of 4.6 per 100 encounters. Advice/education about treatment (4.4 per 100 encounters) and medication (3.4 per 100 encounters) were also relatively common. Other common clinical treatments provided by GPs include advice and counselling on a range of other health areas, such as exercise, smoking and alcohol issues.

Table 10.3: Most frequent clinical treatments

Treatment	Number	Per cent of non-pharmacological treatments (*n*=50,775)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Advice/education*	6,736	13.3	6.8	5.9	7.7
Counselling—problem*	4,603	9.1	4.7	3.8	5.5
Counselling/advice—nutrition/weight*	4,586	9.0	4.6	4.1	5.2
Advice/education—treatment*	4,304	8.5	4.4	3.7	5.0
Advice/education—medication*	3,340	6.6	3.4	3.0	3.8
Counselling—psychological*	2,840	5.6	2.9	2.6	3.1
Administrative procedure*	1,782	3.5	1.8	1.5	2.1
Counselling/advice—exercise*	1,471	2.9	1.5	1.1	1.9
Reassurance, support	1,462	2.9	1.5	1.0	1.9
Sickness certificate	997	2.0	1.0	0.6	1.4

(continued)

Table 10.3 (continued): Most frequent clinical treatments

Treatment	Number	Per cent of non-pharmacological treatments (*n*=50,775)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Counselling/advice—smoking*	631	1.2	0.6	0.4	0.9
Counselling/advice—prevention*	372	0.7	0.4	0.0	0.8
Counselling/advice—alcohol*	368	0.7	0.4	0.2	0.5
Family planning*	359	0.7	0.4	0.2	0.6
Observe/wait*	295	0.6	0.3	0.0	0.7
Counselling/advice—lifestyle*	281	0.6	0.3	0.0	0.8
Counselling/advice—health/body*	274	0.5	0.3	0.0	0.7
Counselling/advice—pregnancy*	267	0.5	0.3	0.0	0.5
Subtotal	*34,969*	*68.9*	—	—	—
Total clinical treatments	**36,211**	**71.3**	**36.6**	**34.5**	**38.8**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

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

Problems managed with clinical treatments

A total of 32,050 problems included a clinical treatment as part of their management. The top ten problems accounted for almost 30% of all problems for which a clinical treatment was provided. The problem most often managed with a clinical treatment was depression (5.3% of problems managed with a clinical treatment), followed by URTI (5.0%), hypertension (3.9%) and diabetes (2.8%) (Table 10.4).

The two right-hand columns in Table 10.4 show 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. It can be seen that 47.5% of depression contacts were managed with a clinical treatment, most likely counselling, and of these 44.5% were not given a prescription as part of the treatment. Likewise, 54.1% of gastroenteritis (presumed infectious) problems were managed with a clinical treatment, and 54.0% of these did not result in the provision of a medication. Asthma was less likely to be managed with a clinical treatment (20.4%) and less likely to be managed without medication when clinical treatment was given (29.3%). It is interesting to note that 26.8% of lipid disorders were managed with a clinical treatment and that 66.8% of these did not involve a medication.

Table 10.4: 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][b] (*n*=98,877)	95% LCL	95% UCL	Per cent this problem[c]	Per cent of treated problems– no meds[d]
Depression*	1,712	5.3	1.7	1.6	1.9	47.5	44.5
Acute upper respiratory infection	1,586	5.0	1.6	1.2	2.0	29.4	48.8
Hypertension*	1,252	3.9	1.3	1.0	1.5	13.8	48.8
Diabetes*	901	2.8	0.9	0.7	1.1	27.6	61.5
Lipid disorder	829	2.6	0.8	0.6	1.0	26.8	66.8
Anxiety*	770	2.4	0.8	0.6	1.0	45.5	64.0
Gastroenteritis, presumed infection	590	1.8	0.6	0.4	0.8	51.4	54.0
Viral disease, other/NOS	542	1.7	0.6	0.3	0.8	41.6	58.1
Back complaint*	540	1.7	0.6	0.4	0.7	20.5	50.7
Asthma	515	1.6	0.5	0.3	0.7	20.4	29.3
Subtotal	*9,239*	*28.8*	—	—	—	—	—
Total problems	**32,050**	**100.0**	**32.4**	**30.7**	**34.2**	**—**	**—**

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

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

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

(d)   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).

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

10.3 Procedural treatments

Procedural treatments included therapeutic actions and diagnostic procedures undertaken by the GP at the encounter. ICPC-2 codes were grouped across ICPC-2 chapters for this analysis because of small numbers within each chapter. There were 14,564 procedural treatments recorded, at a rate of 14.7 per 100 encounters (Table 10.1).

Most frequent procedures

Table 10.5 lists the most frequent procedural treatments. The most common procedure was the excision or removal of tissue (including destruction, debridement or cauterisation). It accounted for 6.1% of all non-pharmacological treatments and occurred at a rate of 3.1 per 100 encounters. This was followed by dressing/pressure/compression/tamponade, which occurred at a rate of 1.8 per 100 encounters, and accounted for 3.6% of all non-pharmacological treatments.

The most common diagnostic procedures undertaken were Pap smears, physical function tests such as peak flow readings, and electrical tracings. These results do not reflect the true rate of, for example, Pap smears because most diagnostic tests were recorded as a pathology order on the survey form and are described in Chapter 12—Investigations.

Table 10.5: Most frequent procedural treatments

Treatment	Number	Per cent of non-pharm treatments (*n*=50,775)	Rate per 100 encounters[a] (*n*=98,877)	95% LCL	95% UCL
Excision/removal tissue/biopsy/destruction/ debridement/cauterisation*	3,109	6.1	3.1	2.6	3.7
Dressing/pressure/compression/tamponade*	1,823	3.6	1.8	1.6	2.1
Physical medicine/rehabilitation*	1,661	3.3	1.7	1.3	2.0
Local injection/infiltration*	1,612	3.2	1.6	1.3	1.9
Incision/drainage/flushing/aspiration/removal body fluid*	1,165	2.3	1.2	1.0	1.3
Other therapeutic procedures/surgery NEC*	1,119	2.2	1.1	0.6	1.7
Pap smear*	1,083	2.1	1.1	0.7	1.5
Repair/fixation—suture/cast/prosthetic device (apply/remove)*	802	1.6	0.8	0.7	1.0
Physical function test*	409	0.8	0.4	0.1	0.7
Electrical tracings*	320	0.6	0.3	0.1	0.6
Urine test*	312	0.6	0.3	0.0	0.6
Other preventive procedures/high-risk medication, condition*	309	0.6	0.3	0.0	0.7
Glucose test	276	0.5	0.3	0.0	0.6
Subtotal	*13,684*	*27.0*	—	—	—
Total procedural treatments	**14,567**	**28.7**	**14.7**	**14.0**	**15.5**

(a)   Figures do not total 100 as more than one treatment can be described for each problem and only per cents >0.5% are included.

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

Note: non-pharm—non-pharmacological; LCL—lower confidence limit; UCL—upper confidence limit; NEC—not elsewhere classified.

Problems managed with a procedural treatment

A total of 13,586 problems involved a procedural treatment in their management. The top ten problems accounted for 37.1% of all problems for which a procedure was used (Table 10.6).

Solar keratosis/sunburn was the most common problem managed with a procedural treatment (6.8% of problems managed with a procedural treatment). Other problems frequently managed with a procedure were female genital check-ups (6.1%), excessive ear wax (3.8%) and malignant neoplasm of skin (3.6%).

Again, the two columns on the right side of the table show 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. Excessive ear wax was the problem most likely to result in a procedure (75.6%), followed by lacerations (74.5%). Many of the problems that were managed with a procedure did not have a medication prescribed, advised or given. More than 70% of solar keratosis cases were managed with a procedure; however, 98.3% of these cases did not require any pharmacological treatment.

Table 10.6: The ten most common problems managed with a procedural treatment

Problem managed	Number	Per cent of problems with procedure	Rate per 100 encs[a][b] (n=98,877)	95% LCL	95% UCL	Per cent of this problem[c]	Per cent of treated problems no meds[d]
Solar keratosis/sunburn	923	6.8	0.9	0.5	1.3	70.3	98.3
Female genital check-up*	824	6.1	0.8	0.5	1.2	46.8	97.9
Excessive ear wax	513	3.8	0.5	0.4	0.6	75.6	93.4
Malignant neoplasm skin	487	3.6	0.5	0.0	1.0	44.5	96.7
Laceration/cut	484	3.6	0.5	0.3	0.7	74.5	73.3
Warts	467	3.4	0.5	0.3	0.7	73.4	95.4
Back complaint*	376	2.8	0.4	0.0	0.7	14.3	56.1
Chronic ulcer skin (incl varicose ulcer)	370	2.7	0.4	0.1	0.6	65.8	75.9
Sprain/strain*	350	2.6	0.4	0.1	0.6	22.4	48.8
Asthma	240	1.8	0.2	0.0	0.6	9.5	18.6
Subtotal	*5,033*	*37.1*	—	—	—	—	—
Total problems	**13,586**	**100.0**	**13.7**	**13.1**	**14.4**	—	—

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

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

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

(d)   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).

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

10.4 Changes from 1999–00 to 2003–04

Over the last five years, there has been a significant increase in the rates of provision of non-pharmacological treatments, from 46.0 per 100 encounters (95% CI: 44.1–47.8) in 1999–00 to 51.4 (95% CI: 48.9–53.8) in 2003–04. This was reflected in the rate of clinical treatments which increased from 33.5 per 100 encounters (95% CI: 31.8–35.2) to 36.6 per 100 (95% CI: 34.5–38.8) and of therapeutic procedures (12.5 per 100, 95% CI: 11.9–13.0, to 14.7 per 100, 95% CI: 14.0–15.5) (Appendix 5, Table A5.2).

Figure 10.1 shows the rates of non-pharmacological treatments per 100 problems managed for the last 5 years of the BEACH program, and demonstrates that the increase was not due to a rise in the number of problems managed.

	Non-pharmacological treatment	Clinical treatment	Procedural treatment
■ 1999–00	31.3	22.8	8.5
□ 2000–01	34.2	25.8	8.4
▨ 2001–02	36.2	26.5	9.6
■ 2002–03	35.7	25.7	10.1
■ 2003–04	35.1	25.0	10.1

Non-pharmacological managements

Figure 10.1: Changes in rates of non-pharmacological treatment

11 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.

11.1 Number of referrals and admissions

The patient was given at least one referral at 11.0% of all encounters, and for 7.5% of all problems managed. More than one referral could be recorded at an encounter. As a result, there were 11,495 referrals made at a rate of 11.6 per 100 encounters. The most frequent were referrals to specialists (7.9 per 100 encounters), followed by referrals to allied health services (2.6 per 100). Very few patients were referred to hospital for admission (0.6 per 100 encounters), or to the hospital emergency department (0.2 per 100) or other medical services (0.1 per 100). Referrals to specialists were given at a higher rate per 100 problems managed (5.4), compared with referrals to allied health professionals (1.8 per 100 problems) (Table 11.1).

Table 11.1: Summary of referrals and admissions

	Number	Rate per 100 encounters (*n*=98,877)	95% LCL	95% UCL	Rate per 100 problems (*n*=144,674)	95% LCL	95% UCL
At least one referral	10,892	11.0	10.5	11.5	7.5	7.2	7.8
Referrals	11,495	11.6	11.1	12.1	8.0	7.6	8.3
Specialist	7,775	7.9	7.5	8.2	5.4	5.1	5.6
Allied health service	2,600	2.6	2.4	2.9	1.8	1.6	2.0
Hospital	544	0.6	0.3	0.8	0.4	0.2	0.5
Emergency department	156	0.2	0.0	0.5	0.1	0.0	0.3
Other medical services	138	0.1	0.0	0.6	0.1	0.0	0.4
Other referrals	280	0.3	0.0	0.6	0.2	0.0	0.4

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

11.2 Most frequent referrals

Of the 11,495 referrals, 91.5% (*n*=10,513) were referrals to specialists, allied health services or other medical services. Referrals to the ten most common specialists accounted for 71.1% of all referrals to medical specialists, and the top ten allied health professionals accounted for 78.1% of all allied health referrals (Table 11.2).

The most frequent referrals made to specialists were to surgeons (10.6% of referrals to medical specialists), ophthalmologists (10.3%), orthopaedic surgeons (9.1%) and dermatologists (8.2%).

Approximately 40% of referrals to allied health services were to physiotherapists, and these accounted for 9.7% of all referrals to specialists, allied health services and other medical services. These were followed by referrals to psychologists (7.1% of all referrals to allied health professionals), dietitians or nutritionists (6.9%), dentists (6.3%) and podiatrists or chiropodists (5.9%) (Table 11.2).

Referrals to other medical services include referrals to other GPs and to hospital outpatient departments. Referrals to other medical services were relatively rare (1.3% of all referrals).

Table 11.2: The most frequent referrals to specialists, and allied health and other medical services

Professional to whom patient referred	Number	Per cent of referrals[a]	Per cent of referral group	Rate per 100 encounters (n=98,877)	95% LCL	95% UCL
Medical specialist	**7,775**	**74.0**	**100.0**	**7.9**	**7.5**	**8.2**
Referral; surgeon	821	7.8	10.6	0.8	0.7	1.0
Referral; ophthalmologist	797	7.6	10.3	0.8	0.7	0.9
Referral; orthopaedic surgeon	709	6.7	9.1	0.7	0.6	0.8
Referral; dermatologist	636	6.1	8.2	0.6	0.5	0.8
Referral; gynaecologist	546	5.2	7.0	0.6	0.4	0.7
Referral; ear, nose and throat	528	5.0	6.8	0.5	0.4	0.7
Referral; cardiologist	504	4.8	6.5	0.5	0.3	0.7
Referral; gastroenterologist	418	4.0	5.4	0.4	0.2	0.6
Referral; urologist	311	3.0	4.0	0.3	0.1	0.5
Referral; psychiatrist	259	2.5	3.3	0.3	0.1	0.5
Subtotal: top ten specialist referrals	*5,529*	*52.6*	*71.1*	—	—	—
Allied health and other professionals	**2,600**	**24.7**	**100.0**	**2.6**	**2.4**	**2.9**
Referral; physiotherapy	1,024	9.7	39.4	1.0	0.9	1.2
Referral; psychologist	185	1.8	7.1	0.2	0.0	0.5
Referral; dietitian/nutrition	178	1.7	6.9	0.2	0.0	0.5
Referral; dentist	163	1.6	6.3	0.2	0.0	0.4
Referral; podiatrist/chiropodist	153	0.5	5.9	0.2	0.0	0.4
Referral; acoustic testing	77	0.7	3.0	0.1	0.0	0.5
Referral; drug and alcohol	72	0.7	2.8	0.1	0.0	0.5
Referral; optometrist	60	0.6	2.3	0.1	0.0	0.4
Referral; counsellor	59	0.6	2.3	0.1	0.0	0.4
Referral; mental health team	59	0.6	2.3	0.1	0.0	0.4
Subtotal: top ten allied health referrals	*2,029*	*19.3*	*78.1*	—	—	—
Other medical services	**138**	**1.3**	**100.0**	**0.1**	**0.0**	**0.6**
Total specialist, allied health & other medical service referrals	**10,513**	**100.0**	—	**10.6**	**10.1**	**11.1**

(a)   Percentage of referrals refers to the proportion of the combined number of specialist, allied health professional and other medical service referrals.

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

11.3 Problems that were referred

A referral to a specialist was provided as part of the management of 7,947 problems. The ten problems most commonly associated with a referral to a specialist accounted for 17.7% of all problems referred to a specialist. The problems most often referred were malignant neoplasms of the skin (accounting for 2.6% of problems referred to a specialist), diabetes (2.4%), pregnancy (2.4%) and back complaints (1.7%) (Table 11.3).

Table 11.3: The ten problems most frequently referred to a medical specialist

Problem managed	Number	Per cent of problems referred	Rate per 100 encounters (n=98,877)	95% LCL	95% UCL
Malignant skin neoplasm	208	2.6	0.2	0.0	0.4
Diabetes*	190	2.4	0.2	0.0	0.4
Pregnancy*	189	2.4	0.2	0.0	0.4
Back complaint*	137	1.7	0.1	0.0	0.4
Ischaemic heart disease*	137	1.7	0.1	0.0	0.4
Depression*	133	1.7	0.1	0.0	0.4
Osteoarthritis*	124	1.6	0.1	0.0	0.4
Hypertension*	105	1.3	0.1	0.0	0.4
Abnormal test results*	93	1.2	0.1	0.0	0.4
Solar keratosis/sunburn	92	1.2	0.1	0.0	0.4
Subtotal: top ten problems referred to a specialist	*1,408*	*17.7*	—	—	—
Total problems referred to specialist	**7,947**	**100.0**	**8.0**	**7.7**	**8.4**

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

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

Referrals to allied health services were fewer in number (*n*=2,600, Table 11.2) than medical specialist referrals, possibly because formal referrals to such services are not always required. There were 2,684 problems referred to an allied health professional or service. Table 11.4 shows the ten most common of these. They accounted for 42.4% of all problems referred to allied health services.

The problems most frequently referred to allied health professionals were back complaints (8.4% of problems referred) and sprains and strains (6.4%). These two problems are likely to be referred to physiotherapists. Depression (5.6%), diabetes (5.2%) and teeth/gum disease (4.0%) were also frequently referred to allied health services. Note that diabetes, back complaints and depression were referred relatively frequently to both allied health services and medical specialists.

There were 544 referrals for hospital admission (Table 11.1). The ten problems most commonly associated with hospital admission referrals are shown in Table 11.5. Although the numbers involved are very small, it is interesting to note the types of problems for which hospital admission was sought. These included ischaemic heart disease (4.7% of problems referred for admission), pneumonia (4.1%) and fracture (3.5%).

Table 11.4: The ten problems most frequently referred to allied health services

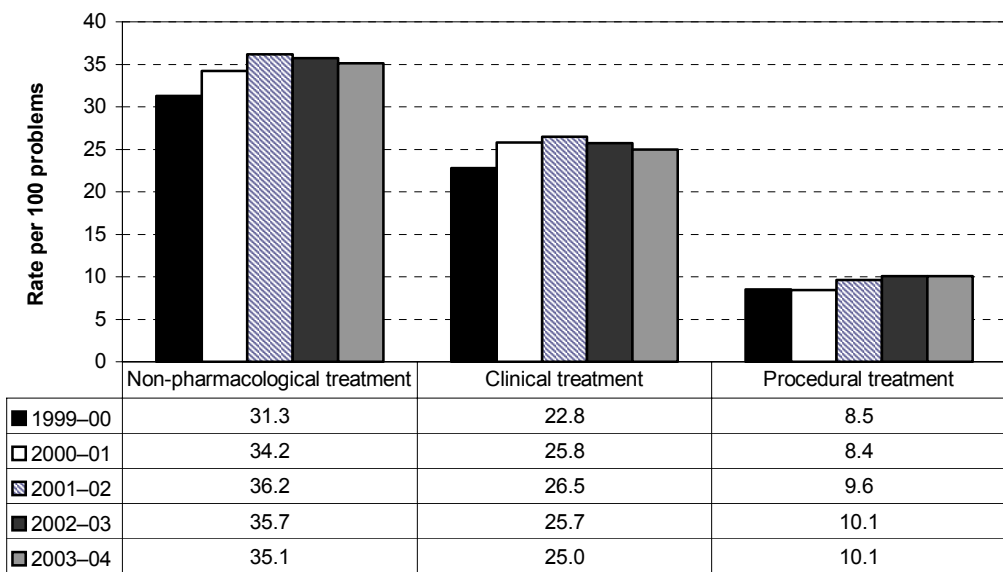| Problem managed	Number	Per cent of problems referred	Rate per 100 encounters (*n*=98,877)	95% LCL	95% UCL
Back complaint*	225	8.4	0.2	0.0	0.4
Sprain/strain*	171	6.4	0.2	0.0	0.4
Depression*	150	5.6	0.2	0.0	0.4
Diabetes*	140	5.2	0.1	0.0	0.4
Teeth/gum disease	107	4.0	0.1	0.0	0.4
Osteoarthritis*	102	3.8	0.1	0.0	0.4
Anxiety*	70	2.6	0.1	0.0	0.4
Musculoskeletal injury NOS	65	2.4	0.1	0.0	0.5
Bursitis/tendonitis/synovitis NOS	57	2.1	0.1	0.0	0.4
Obesity (BMI>30)	53	2.0	0.1	0.0	0.7
Subtotal: top ten problems referred to AHS	*1,139*	*42.4*	—	—	—
Total problems referred to AHS	**2,684**	**100.0**	**2.7**	**2.4**	**3.0**

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

Note: LCL—lower confidence limit; UCL—upper confidence limit; NOS—not otherwise specified; BMI—body mass index; AHS—allied health service.

Table 11.5: The ten problems most frequently referred to hospital

Problem managed	Number	Per cent of problems referred	Rate per 100 encounters (*n*=98,877)	95% LCL	95% UCL
Ischaemic heart disease*	27	4.7	0.03	0.0	0.5
Pneumonia	24	4.1	0.02	0.0	0.5
Fracture*	20	3.5	0.02	0.0	0.5
Pregnancy*	20	3.4	0.02	0.0	0.6
Appendicitis	16	2.8	0.02	0.0	0.6
Heart failure	15	2.7	0.02	0.0	0.6
Chest pain, NOS	14	2.4	0.01	0.0	0.7
Acute bronchitis/bronchiolitis	12	2.1	0.01	0.0	0.7
Chronic obstructive pulmonary disease	11	2.0	0.01	0.0	0.6
Skin infection, other	10	1.7	0.01	0.0	0.7
Subtotal: top ten problems referred for admission	*169*	*29.5*	—	—	—
Total problems referred to hospital	**572**	**100.0**	**0.6**	**0.3**	**0.8**

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

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

11.4 Changes from 1999–00 to 2003–04

There were no significant changes across the five years (1999–00 to 2003–04) of BEACH data in the rates of referral and the types of referral (Appendix 5, Table A5.2).

12 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).

There were no tests recorded at the vast majority (79.2%) of encounters. At least one pathology test order was recorded at 15.5% of encounters (for 11.9% of problems managed) and at least one imaging test was ordered at 7.2% of encounters (for 5.1% of problems managed) (Table 12.1).

Table 12.1: Number of encounters and problems at which a pathology or imaging test was ordered

	Number of encs	Per cent of encs (*n*=98,877)	95% LCL	95% UCL	Number of problems	Per cent of problems (*n*=144,674)	95% LCL	95% UCL
Pathology and imaging ordered	1,840	1.9	1.7	2.1	1,380	1.0	0.8	1.1
Pathology only ordered	13,486	13.6	13.2	14.1	15,897	11.0	10.6	11.4
Imaging only ordered	5,244	5.3	5.1	5.5	5,952	4.1	3.9	4.3
No tests ordered	78,307	79.2	78.5	79.9	121,445	83.9	83.4	84.4
At least one pathology ordered	15,326	15.5	14.9	16.1	17,277	11.9	11.5	12.4
At least one imaging ordered	7,083	7.2	6.9	7.5	7,332	5.1	4.8	5.3

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

12.1 Pathology ordering

A comprehensive report on pathology ordering by GPs in Australia in 1998, written by the General Practice Statistics and Classification Unit using BEACH data, was published on the internet by the Diagnostics and Technology Branch of the Department of Health and Aged Care during 2000.[35] For a more detailed study of pathology ordering, consult that publication; readers may wish to compare those results with the information presented below.

Nature of pathology orders at encounter

There were 34,831 pathology tests (or battery of tests) ordered at a rate of 35.2 per 100 encounters. Table 12.2 provides a summary of the different types of pathology tests that were ordered by the participating GPs.

The pathology tests recorded were grouped according to the categories set out in Appendix 3. The main pathology groups reflect those used in previous analyses of pathology tests recorded by the HIC.[36]

The top four pathology test groups were Chemistry, Haematology, Microbiology and Cytology, which together accounted for more than 90% of pathology test orders. The fifth largest group was Other NEC (other pathology test orders that could not be classified elsewhere), which made up 2.3% of pathology test orders. The size of this group was in part due to non-specificity of recording of some pathology orders by some GPs (e.g. blood test).

The largest of the groups, Chemistry, accounted for 54.2% of all tests and was recorded at a rate of 19.1 per 100 encounters. Within this group the most frequently ordered test was lipids (17.9%) followed by urea and creatinine (EUC, 12.8%). Full blood count (68.9%) was the largest group within Haematology and urine, microscopy, culture and sensitivity (urine MC&S) (32.7%) was the largest in Microbiology.

The most frequently ordered test types were full blood count; lipids; EUC; liver function; electrolytes, glucose; thyroid function; urine MC&S and Pap smear tests. Full blood counts accounted for 13.3% of tests and were ordered at a rate of 4.7 per 100 encounters. Pap smears accounted for 4.9% of all tests and made up the greater proportion of the Cytology group (98.1%). Lipid tests were ordered at a rate of 3.4 per 100 encounters (Table 12.2).

Table 12.2: 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*=98,877)	95% LCL	95% UCL
Chemistry	**18,881**	**54.2**	**100**	**19.1**	**18.1**	**20.1**
Lipids	3,384	9.7	17.9	3.4	3.2	3.7
EUC	2,418	6.9	12.8	2.5	2.1	2.8
Liver function	2,193	6.3	11.6	2.2	2.0	2.5
Glucose/tolerance	2,051	5.9	10.9	2.1	1.9	2.3
Thyroid function	1,905	5.5	10.1	1.9	1.7	2.1
Multibiochemical analysis	1,457	4.2	7.7	1.5	0.8	2.1
HbA1c	913	2.6	4.8	0.9	0.7	1.1
Chemistry; other	860	2.5	4.6	0.9	0.6	1.2
Ferritin	815	2.3	4.3	0.8	0.7	1.0
Hormone assay	814	2.3	4.3	0.8	0.4	1.3
Haematology	**6,699**	**19.2**	**100**	**6.8**	**6.4**	**7.2**
Full blood count	4,614	13.3	68.9	4.7	4.4	4.9
Erythrocyte sedimentation rate	998	2.9	14.9	1.0	0.8	1.2
Coagulation	775	2.2	11.6	0.8	0.6	1.0
Microbiology	**5,217**	**15.0**	**100**	**5.3**	**4.9**	**5.7**
Urine MC&S	1,708	4.9	32.7	1.7	1.6	1.9
Microbiology; other	624	1.8	12.0	0.6	0.5	0.8
Hepatitis serology	588	1.7	11.3	0.6	0.2	1.0
Faeces MC&S	317	0.9	6.1	0.3	0.1	0.5

(continued)

Table 12.2 (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*=98,877)	95% LCL	95% UCL
Microbiology (continued)						
HIV	302	0.9	5.8	0.3	0.0	0.6
Chlamydia	294	0.8	5.6	0.3	0.1	0.5
Vaginal swab and C&S	256	0.7	4.9	0.3	0.0	0.5
Cytology	**1,736**	**5.0**	**100**	**1.8**	**1.4**	**2.1**
Pap smear	1,703	4.9	98.1	1.7	1.4	2.1
Other NEC	**799**	**2.3**	**100**	**0.8**	**0.5**	**1.1**
Blood test	335	1.0	42.0	0.3	0.0	1.3
Other test NEC	289	0.8	36.2	0.3	0.0	0.6
Infertility/pregnancy	**240**	**0.7**	**100**	**0.2**	**0.0**	**0.5**
Tissue pathology	**685**	**2.0**	**100**	**1.8**	**1.4**	**2.1**
Histology, skin	625	1.8	91.2	0.6	0.1	1.2
Immunology	**474**	**1.4**	**100**	**0.7**	**0.2**	**1.2**
Anti-nuclear antibodies	130	0.4	27.5	0.1	0.0	0.4
Simple basic tests	**100**	**0.3**	**100**	**0.1**	**0.0**	**0.4**
Total pathology tests	**34,831**	**100**	**—**	**35.2**	**33.7**	**36.7**

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

Problems for which pathology tests were ordered

Table 12.3 describes, in decreasing order of frequency, the most common problems under management for which pathology was ordered. There were 17,277 problems to which pathology tests were linked (Table 12.1), the average number of pathology tests being 2.02 per tested problem. The five problems accounting for the highest number of pathology tests ordered were diabetes (6.6% of problem–pathology combinations), hypertension (6.1%), lipid disorder (5.2%), general check-up (3.9%), female genital check-up (including Pap smear) (3.9%) and weakness/tiredness (3.5%). This is not surprising given the distribution of pathology tests described in the previous table. However, the last two columns of the table provide some contrasts. The second-last column shows the percentage of contacts (with the selected problem) that resulted in an order for pathology. The last column shows the number of test orders placed when contact with the selected problem resulted in pathology tests.

Hypertension was the most common problem managed in general practice, and there were 9,099 hypertension problems recorded in the data set (6.3% of problems). Diabetes (2.2% of problems) was managed far less frequently but accounted for more pathology tests than hypertension. There were 2,359 test orders (6.6%) associated with diabetes and 2,178 test orders (6.1%) associated with hypertension. This is because 28.6% of diabetes contacts resulted in a pathology test compared with only 9.7% of contacts with hypertension.

Weakness/tiredness was not a problem label that ranked in the top 30 problems managed in general practice, yet it ranked sixth highest in the problems associated with pathology ordering. This is because the decision to order a pathology test for weakness/tiredness was relatively frequent (58.0% of contacts generating an order) and where such a decision was made, multiple pathology tests were likely (averaging 346.7 test orders per 100 problems).

The problem label of female genital check-up, and the associated Pap smear test, provide a useful contrast as multiple tests were rarely ordered.

Table 12.3: 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*	3,264	2,359	6.6	28.6	253.1
Hypertension*	9,099	2,178	6.1	9.7	246.0
Lipid disorders*	3,093	1,875	5.2	29.7	203.9
Female genital check-up*	1,759	1,396	3.9	68.2	116.4
General check-up*	1,806	1,256	3.5	23.4	296.8
Weakness/tiredness general	620	1,246	3.5	58.0	346.7
Urinary tract infection*	1,650	996	2.8	52.2	115.7
Abnormal test results*	810	608	1.7	46.4	161.8
Blood test NOS	225	574	1.6	78.5	324.9
Anaemia*	705	570	1.6	34.6	233.8
Subtotal	*23,031*	*13,058*	*36.0*	—	—
Total	**144,674**	**35,793**	**100.0**	**11.9**	**201.6**

(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 34,831 pathology test orders and 35,793 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).

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

12.2 Imaging ordering

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, was published by the AIHW in 2001.[37] Readers wishing a more detailed study of imaging orders should consult that publication and may wish to compare those results with the information presented below.

Nature of imaging orders at encounter

There were 8,121 orders for imaging and these were made at a rate of 8.2 per 100 encounters. At least one imaging test was ordered at 7.2% of encounters and for 5.1% of problems managed. The imaging tests recorded were grouped into one of five categories—Diagnostic radiology, Ultrasound, Computerised tomography (CT), Nuclear medicine imaging and Magnetic resonance imaging (MRI) (Appendix 3). Diagnostic radiology made up more than half (55.8%) of all imaging tests, while ultrasound accounted for 32.4%, CT scanning 10.0%, Nuclear medicine 1.3% and MRI 0.5% (Table 12.4).

Table 12.4: The most frequent imaging tests ordered, by MBS group and most frequent tests

Imaging test ordered	Number	Per cent of tests	Per cent of group	Rate per 100 encounters (*n*=98,877)	95% LCL	95% UCL
Diagnostic radiology	**4,533**	**55.8**	**100.0**	**4.6**	**4.3**	**4.8**
X-ray; chest	1,050	12.9	23.2	1.1	0.9	1.2
X-ray; knee	416	5.1	9.2	0.4	0.3	0.6
Mammography; female	351	4.3	7.8	0.4	0.0	0.7
X-ray; hip	206	2.5	4.5	0.2	0.0	0.4
X-ray; foot/feet	200	2.5	4.4	0.2	0.0	0.4
X-ray; ankle	198	2.4	4.4	0.2	0.0	0.4
X-ray; spine; lumbosacral	187	2.3	4.1	0.2	0.0	0.4
X-ray; shoulder	170	2.1	3.8	0.2	0.0	0.4
X-ray; wrist	162	2.0	3.6	0.2	0.0	0.4
Test; densiometry	144	1.8	3.2	0.2	0.0	0.4
X-ray; finger(s)/thumb	131	1.6	2.9	0.1	0.0	0.3
X-ray; hand	126	1.6	2.8	0.1	0.0	0.3
X-ray; spine; cervical	104	1.3	2.3	0.1	0.0	0.4
X-ray; spine; lumbar	89	1.1	2.0	0.1	0.0	0.4
X-ray; abdomen	87	1.1	1.9	0.1	0.0	0.4
Ultrasound	**2,631**	**32.4**	**100.0**	**2.7**	**2.5**	**2.8**
Ultrasound; pelvis	469	5.8	17.8	0.5	0.3	0.6
Ultrasound; abdomen	284	3.5	10.8	0.3	0.1	0.5
Ultrasound; breast; female	274	3.4	10.4	0.3	0.0	0.7
Ultrasound; obstetric	207	2.6	7.9	0.2	0.0	0.5
Ultrasound; shoulder	200	2.5	7.6	0.2	0.0	0.4
Ultrasound; renal tract	121	1.5	4.6	0.1	0.0	0.3
Ultrasound; abdomen upper	103	1.3	3.9	0.1	0.0	0.4
Test; doppler	101	1.2	3.8	0.1	0.0	0.4
Echocardiography	98	1.2	3.7	0.1	0.0	0.4
Ultrasound; leg	82	1.0	3.1	0.1	0.0	0.4
Computerised tomography	**813**	**10.0**	**100.0**	**0.8**	**0.7**	**0.9**
CT scan; brain	148	1.8	18.2	0.2	0.0	0.4
CT scan; abdomen	104	1.3	12.8	0.1	0.0	0.4
CT scan; head	88	1.1	10.8	0.1	0.0	0.4
CT scan; spine; lumbar	84	1.0	10.3	0.1	0.0	0.4
Nuclear medicine imaging	**106**	**1.3**	**100.0**	**0.1**	**0.0**	**0.3**
Scan; bone(s)	85	1.0	80.1	0.1	0.0	0.4
Magnetic resonance imaging	**38**	**0.5**	**100.0**	**0.0**	**0.0**	**0.5**
Total imaging tests	**8,121**	**100**	**—**	**8.2**	**7.8**	**8.6**

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

Chest x-rays were by far the most common subgroup in Diagnostic radiology (23.2%), followed by x-ray of the knee (9.2%) and mammography (7.8%). Ultrasound was commonly of the pelvis (17.8%), abdomen (10.8%), breast (10.4%), obstetric (7.9%) and shoulder (7.6%). CT scans were most commonly performed on the brain (18.2%), abdomen (12.8%) and head (10.8%). Most of the nuclear medicine tests involved bone scans (80.1%).

Overall, the most frequently ordered imaging test was chest x-ray, which accounted for 12.9% of all imaging and was ordered at a rate of 1.1 per 100 encounters. Pelvic ultrasound, the second most frequently ordered, accounted for 5.8% of all imaging tests and was ordered at a rate of 0.5 per 100 encounters (Table 12.4).

Problems for which imaging was ordered

Table 12.5 describes the problems for which an imaging test was most frequently ordered. They are presented in decreasing order of test frequency. There were 8,196 problem–imaging combinations. Five (including the top four) of the ten most common problems were related to the musculoskeletal system. The remaining problems were related to abdominal, female genital, breast, skin and chest problems.

Back complaint, the most common problem for which imaging was ordered, accounted for 5.0% of all imaging, and 13.6% of contacts with a back complaint resulted in an imaging order. Although fracture accounted for slightly fewer imaging orders (4.8%), 36.9% of contacts with this problem resulted in an order for imaging.

The ordering of multiple imaging for a single problem was far less common than the ordering of multiple pathology. Breast lump/mass (female) had the highest rate of multiple test orders in the top ten problems, 149.9 tests being ordered for every 100 problem contacts.

Table 12.5: 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*	2,637	413	5.0	13.6	115.2
Fracture*	984	393	4.8	36.9	108.2
Osteoarthritis*	2,748	374	4.6	12.2	111.6
Sprain/Strain*	1,564	328	4.0	18.4	114.1
Abdominal pain*	613	223	2.7	32.3	112.6
Injury musculoskeletal NOS	761	207	2.5	23.5	115.6
Female genital check-up*	1,759	192	2.3	9.0	121.4
Breast lump/mass (female)	190	172	2.1	60.1	149.9
Injury skin, other	653	165	2.0	21.9	115.3
Acute bronchitis/bronchiolitis	2,396	131	1.6	5.4	102.1
Subtotal	*14,306*	*2,599*	*31.7*	—	—
Total	**144,674**	**8,196**	**100.0**	**5.1**	**110.8**

(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 8,121 imaging test orders and 8,196 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).   *Note:* NOS—not otherwise specified.

12.3 Changes from 1999–00 to 2003–04

Changes in pathology

Differences in the collection and coding of pathology data 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. Over the most recent four years there has been a significant increase in the number of pathology tests ordered per 100 encounters, from 29.7 per 100 encounters (95% CI: 28.4–30.9) in 2000–01 to 35.2 per 100 (95% CI: 33.7–36.7) in 2003–04. This represents a linear increase of almost 20% over the last four years of the BEACH program. Two-thirds of this increase in pathology ordering was accounted for by an increase in chemical pathology from 15.7 per 100 encounters (95% CI: 14.8–16.5) in 2000–01 to 19.1 per 100 (95% CI: 18.1–20.1) in 2003–04 (Appendix 5, Table A5.16).

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.[38] Since the beginning of the third year of BEACH, a change in coding of pathology orders allowed more specificity in recording these orders.

Changes in imaging

Following an increase in the imaging order rate over the period 1999–00 to 2002–03, from 7.4 to 8.6 tests per 100 encounters, the rate steadied in 2003–04 (8.2 per 100 encounters) (Appendix 5, Table A5.17).

13 Selected topics—changes over time

This chapter uses multiple linear regression to examine in more detail any 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[6]

- whether there were significant changes in overall rates of management of a problem, in overall rates of a medication or non-pharmacological treatments.

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) versus other musculoskeletal problems

- the use of anti-depressants in the management of depression and other psychological problems

- management rates of non-gestational diabetes

- the use of statins in the management of lipid disorders

- the use of inhalant medications (preventives and bronchodilators) in the management of asthma.

13.1 Method

Medications included in trends analysis

All medications prescribed or supplied by the GP (referred to as 'medication rates' in this section), are included in the trends analyses in the following section. For most medications those advised for over-the-counter purchase (OTC) were not included in this analysis. The exception was asthma inhalants where OTC medications were included to obtain an accurate estimation of the use of bronchodilators for asthma. Chapter 9 reports medication rates separately for each of the prescribed medications, advised OTC medications and medications supplied by the GP. Therefore there may be differences in the trends over time between the medication rates reported here and the prescribing rates in Chapter 9.

Statistical analysis

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.[12] 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 and provide a more stringent test of significant changes over time.

Changes in the annual rates per 100 encounters were analysed both alone and after controlling for patient age and sex.

Linear regression was performed for changes over time in medications prescribed/supplied for specific problems of interest to detect:

- whether there has been a change over time in the medication management for the problem of interest (e.g. Has there been an increase over the last six years in the medication rate of 'statins' for lipid disorders?) or

- whether any observed change in medication rate is explained by a commensurate change in rates of management of the problems for which this medication is prescribed. For example, has there been any change in medication rate for a specific problem or is the observed change in medication rate due to the change in management rates of the selected problem?

Regression was performed for the medication while holding type of problem constant, for example by performing linear regression for anti-depressant medications over time for depression problems. Patient age and sex were included to control for any changes in patient age and sex distribution across sample years.

All analyses were weighted for the GP's age, sex and activity level.

13.2 Non-steroidal anti-inflammatory drugs and the management of arthritis and other musculoskeletal problems

NSAIDs were defined as the medications included in the Anatomical Therapeutic Chemical (ATC) classification index code M01A.[19] For analysis, the NSAIDs were further subdivided into coxibs (ATC subgroup M01A H)[19] and all other NSAIDs. Only those NSAIDs that were prescribed or supplied by the GP were included in the analysis to exclude OTC NSAIDs that may be used as general analgesics.

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[39] and the problems for which NSAIDs were most often prescribed. The medication rate of NSAIDs for arthritis problems was compared with the medication rate for other musculoskeletal problems. Multiple regression was used to examine trends over time in the medication rate of NSAIDs for arthritis, other musculoskeletal problems and non-musculoskeletal problems.

Arthritis problems were managed at a rate of 4.0 per 100 encounters in 2003–04. An extrapolation based on 90 million general practice items claimed through Medicare in 2003–04 estimates that there were approximately 3.6 million encounters that year in Australia in which GPs managed arthritis.

In 2003–04 NSAIDs were prescribed or supplied by the GP at a rate of 5.2 per 100 encounters and coxibs were prescribed or supplied at 2.3 per 100 encounters. These rates extrapolate to an estimated 4.6 million occasions where GPs prescribed or supplied a NSAID, of which 2.1 million were coxibs.

Current status of Cox-2 inhibitors (coxibs)

Figure 13.1 is a flow chart describing the patients and problems for which coxibs were prescribed or supplied directly by the GP to the patient.

Rate of prescription or supply

There were 2,225 occasions on which coxibs were prescribed or supplied, accounting for 2.2% of all medications prescribed, supplied or advised. They were given at a rate of 1.5 per 100 total problems. Rofecoxib was slightly more common than celecoxib, accounting for 51.1% of all the coxibs. The median prescribed daily dose for rofecoxib was 25 mg and for celecoxib 200 mg.

Patients

The sex distribution of the patients was similar to that of the total sample, but females were slightly more likely to receive these medications (2.3 per 100 encounters) than males (2.1 per 100). Patients over the age of 44 years accounted for more than 80% of those receiving a coxib, half of these being aged 45–64 years and half being older people. Those aged between 65 and 74 years were the most likely to receive this medication (4.1 medications per 100 contacts with patients in this age group), followed by those of 45–64 years and those aged 75 years or more (3.3 per 100 encounters in both cases).

Reasons for encounter: The most common patient reason for encounter was a request for a prescription (described at a rate of 29.0 per 100 coxib encounters) followed by back complaints (16.9 per 100) and knee complaints (10.0 per 100).

Problems managed

Osteoarthritis was the most common problem managed with coxibs, accounting for more than one-third of the coxib medications (37.3 per 100 coxib encounters). Back complaint was the second most frequent problem treated with coxibs (10.3 per 100 coxib encounters), followed by arthritis (not otherwise specified) and then by a range of other musculoskeletal problems.

Other management

Medication: A total of 755 other medications were prescribed, supplied or recommended at the same encounter, for the same problem for which the coxibs were used. Simple analgesics were the most common co-medications (7.5 per 100 of these problems), followed by compound and narcotic analgesics (5.2 and 4.0 per 100 respectively).

Non-pharmacological: Other treatments were utilised less often for these problems than in the total data set (22.8 per 100 problems managed with coxibs, compared with 35.1 per 100 total problems). Physical medicine/rehabilitation was the most common, at 5.4 per 100 coxib problems. Various types of advice and education made up the majority of the rest of these treatments.

Referrals and investigations: The patient was referred to other health professionals (specialists, allied health and hospital services) for these problems at a rate of 9.9 per 100 problems

managed, most commonly for physiotherapy (4.6 per 100). Pathology was ordered at a rate of 13.4 per 100 problems managed with coxibs, and, as would be expected considering the types of problems being managed, imaging was ordered at the high rate of 13.8 per 100 of these problems compared with a rate of 5.6 in the total sample.

The patients

Sex (*n*=2,204)	Per cent	Sex/age specific rate
Males	40.6	2.1
Females	59.4	2.3

Age group (*n*=2,220)		
15–24	2.1	0.5
25–44	14.4	1.4
45–64	39.7	3.3
65–74	22.7	4.1
75+	20.9	3.3

RFEs at coxib encounters[a] (*n*=3,875, 174/100)

Prescription—all*	29.0
Back complaint*	16.9
Knee complaint	10.0
Cardiac check-up*	6.4
Shoulder complaint	5.3
Test results*	5.0
Neck complaint	4.6
Osteoarthritis*	4.6
Arthritis*	4.3
General check-up	4.0

Referrals[b] (*n*=221, 9.9/100)

Physiotherapy	4.6
Orthopaedic surgeon	2.3
Rheumatologist	0.8

Pathology[b] (*n*=297, 13.4/100)

Chemistry	5.9
Haematology	4.4
Immunology	2.3
Microbiology	0.5

Imaging[b] (*n*=308, 13.8/100)

Diagnostic radiology	10.7
Ultrasound	1.6
Computerised tomography	1.3

Co-medications[b] (*n*=755, 33.9/100)

Simple analgesic	7.5
Compound analgesic	5.2
Narcotic analgesic	4.0
Anti-ulcerants	1.8
Corticosteroids	1.6
Anti-depressant	1.3
Anti-hypertensive	1.3
Rubs/liniments/topical	0.6
Anti-anxiety	1.1
Nutrition/metabolism other	0.9

Problems managed with coxibs[a] (*n*=2,224)

Osteoarthritis*	37.3
Back complaint*	10.3
Arthritis*	9.3
Prescription—all*	4.6
Sprain/strain*	3.6
Rheumatoid arthritis*	2.7
Bursitis/tendonitis/synovitis NOS	2.6
Shoulder syndrome (excl. osteoarthritis)	2.3
Neck syndrome (excl. osteoarthritis)	1.8
Back syndrome without radiating pain	1.8

Other treatments[b] (*n*=508, 22.8/100)

Physical medicine/rehabilitation*	5.4
Counselling—problem*	2.2
Counsel/advice—exercise*	2.0
Advice/education—treatment*	1.7
Advice/education—medication*	1.5
Dressing/compression*	1.3
Counsel/advice—nutrition/weight*	1.1

COXIBS
_n_=2,225 (2.2% of total medications)
2.3 per 100 encounters (*n*=2,224)
1.5 per 100 problems (*n*=2,224)

Generic	% group	Median PDD
Rofecoxib	51.1	25 mg
Celecoxib	48.9	200 mg

Figure 13.1: Interrelationship of coxibs with other variables

(a) Expressed as rates per 100 encounters at which coxibs were used (n=2,224).

(b) Expressed as rates per 100 problems for which coxibs were used (n=2,224).

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

Note: RFE—reasons for encounter, PDD—prescribed daily dose, NOS—not otherwise specified; excl.—excluding.

Changes over time

Figure 13.2 shows the unadjusted management rates of arthritis and other musculoskeletal problems over the six years of data collection. While there was a significant increase in the unadjusted management rates of arthritis over time (p=0.0006), after adjustment for patient age and sex this increase was not significant (p=0.34). There was no change in the management rate of other musculoskeletal problems over the six years.

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Arthritis	3.5	3.6	3.9	3.8	3.7	4.0
Other musculoskeletal	13.5	13.4	13.6	13.8	13.4	13.2

BEACH data year

Figure 13.2: Management rate of arthritis and other musculoskeletal problems over time
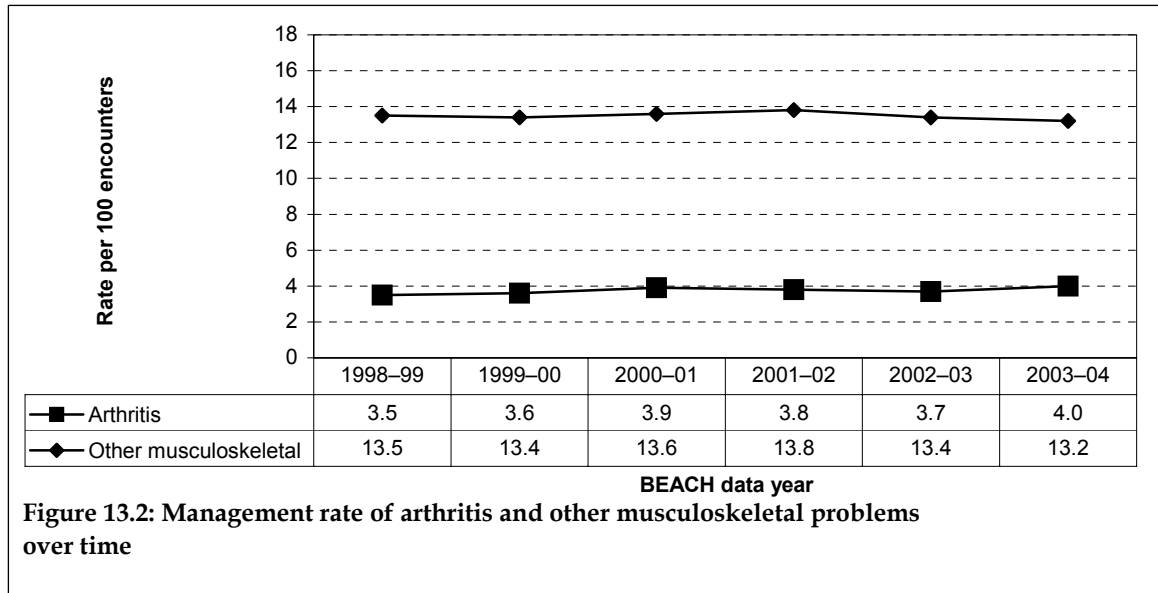
Figure 13.3 shows the medication rate of NSAIDs per 100 encounters unadjusted for problem under management. There was a marked increase in the prescription/supply rates of total NSAIDs from 4.8 per 100 encounters in 1999–00 to 6.2 per 100 encounters in 2000–01. The rate of NSAID prescribing and supply then slowly declined to 5.2 per 100 encounters in 2003–04. The rate of coxibs prescribed/supplied increased significantly in the period 1999–00 to 2001–02 and remained at this higher level over the last three years. The rate of prescribing/supply of the other NSAIDs declined from 4.6 per 100 encounters in 1999–00 to around 2.9 per 100 encounters in 2001–02 to 2003–04.

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Coxibs	0.0	0.3	2.7	3.0	2.6	2.3
Other NSAIDs	4.7	4.6	3.5	2.8	2.9	3.0
Total NSAIDs	4.7	4.8	6.2	5.8	5.5	5.2

BEACH data year

Figure 13.3: Rates of NSAIDs per 100 encounters over time
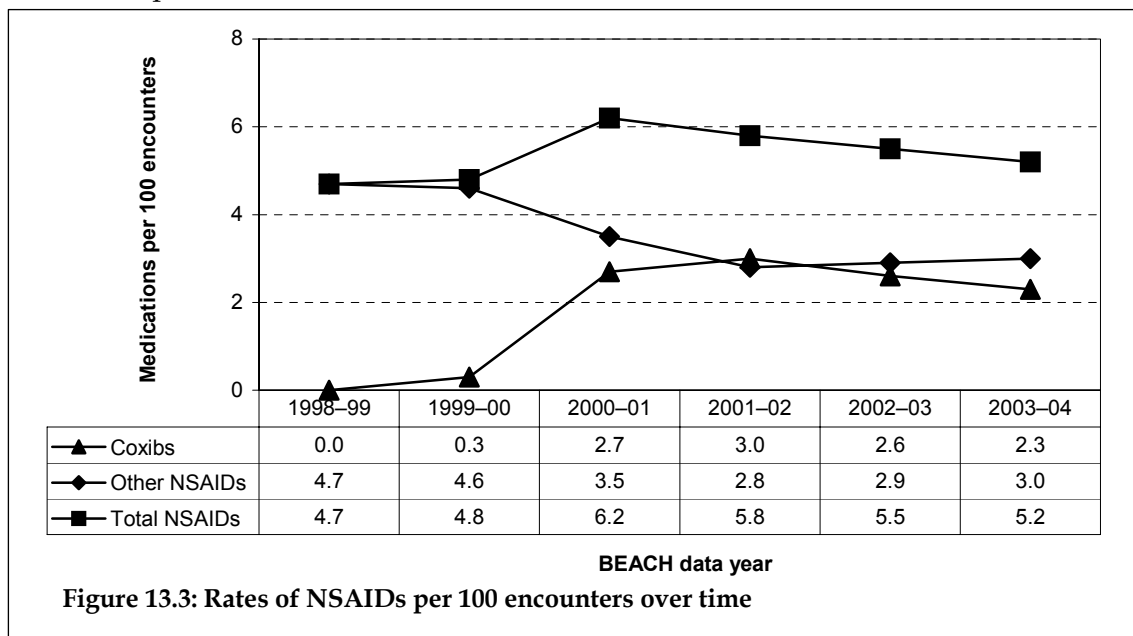
The rate of all NSAIDs prescribed or supplied specifically for arthritis problems increased from 38.5 medications per 100 arthritis problems in 1999–00 to a peak of 53.8 per 100 arthritis problems in 2000–01. Since then the rates of NSAID medications prescribed or supplied steadily decreased to 48.4 medications per 100 arthritis problems in 2003–04. The initial increase was due to an increase in the rate of coxibs from 4.0 per 100 arthritis problems in 1999–00 to 33.9 per 100 arthritis problems in 2001–02. The last two years has seen a decrease in the prescription and supply of coxibs to 27.6 per 100 arthritis problems in 2003–04. At the same time, the rate of other NSAIDs prescribed or supplied decreased from 34.5 per 100 arthritis problems in 1999–00 to an average of 20 per 100 over the years 2001–02 to 2003–04. This changing pattern of medication management indicates that the increase in coxibs was largely responsible for an overall increase in the total NSAID medication rate for arthritis problems. The decrease in other NSAIDs indicates that there has been considerable substitution of coxibs for other NSAIDs. However, the 2002–03 figures indicate that the medication rates for arthritis, including coxibs, have declined steadily since the peak around 2001 (Figure 13.4).

Rate per 100 arthritis problems	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Total NSAIDs	37.8	38.5	53.8	51.7	50.4	48.4
Coxibs	0.0	4.0	31.8	33.9	30.6	27.6
Other NSAIDs	37.8	34.5	22.0	17.8	19.7	20.8

BEACH data year

Figure 13.4: Medication rates of NSAIDs over time for all arthritis problems[(a)]
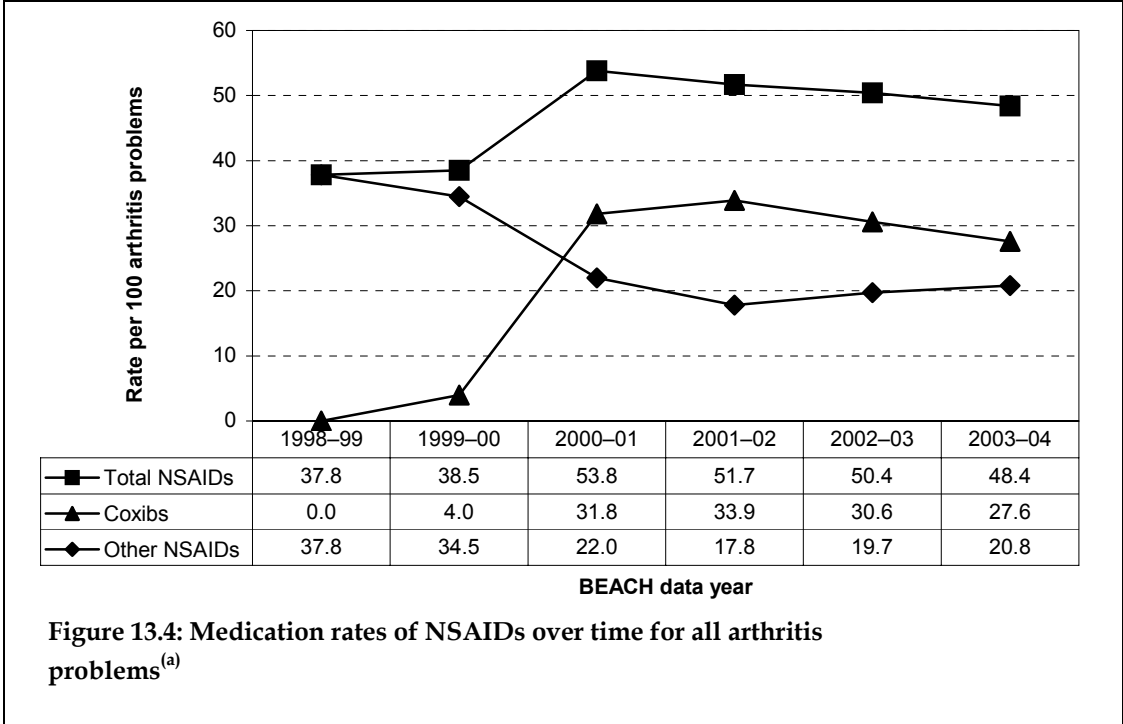
(a)   Includes multiple ICPC-2 codes for osteoarthritis and arthritis (see Appendix 3) and rheumatoid arthritis (ICPC rubric L88).

In 2003–04 the prescription/supply rate of NSAIDs for musculoskeletal problems other than arthritis has returned to the rate seen in 1998–99, before the introduction of coxibs (Figure 13.5). The medication rate of coxibs for other musculoskeletal problems peaked in 2001–02 (10.8 per 100 problems), while the rate of all other NSAIDs decreased. However, in the last two years there has been a decrease in the medication rate of coxibs for other musculoskeletal problems to 6.6 per 100 problems in 2003–04, while the medication rates of other NSAIDs have remained steady.

Figure 13.5: Medication rates of NSAIDS over time for other musculoskeletal problems

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Total NSAIDS	20.1	20.3	25.4	23.5	22.1	20.4
Coxibs	0.0	0.7	9.0	10.8	8.5	6.6
Other NSAIDS	20.1	19.6	16.4	12.7	13.7	13.9

BEACH data year
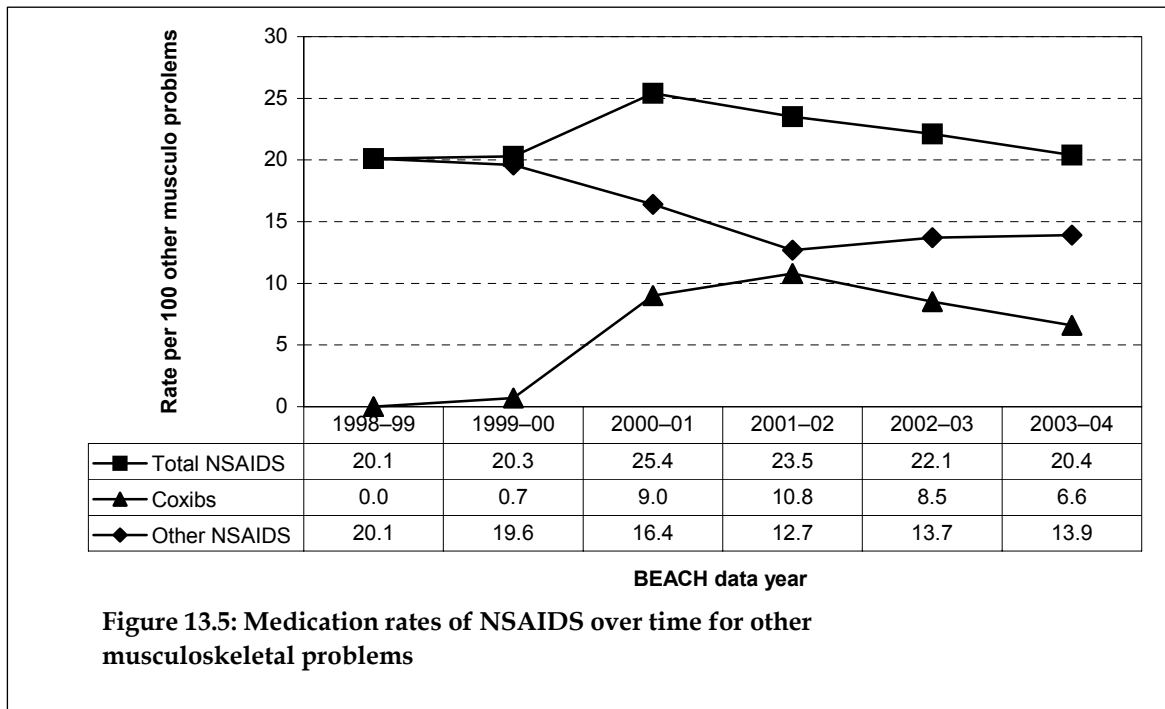
Figure 13.6 shows the distribution of the broad categories of problems for which coxibs were prescribed or supplied over time. In 1999–00, when coxibs began to be prescribed/supplied, 55.4% of the problems for which a coxib was prescribed or supplied were arthritis problems and 36.2% were other musculoskeletal problems. In 2001–02 only 42.0% of problems for which a coxib was prescribed or supplied were arthritis problems; however, by 2003–04 this had increased to 49.3%.

	1999–00	2000–01	2001–02	2002–03	2003–04
Arthritis	55.4	46.4	42.0	43.8	49.3
Other musculoskeletal	36.2	46.1	49.0	43.6	38.3
Non-musculoskeletal	8.5	7.6	9.0	12.6	12.4

BEACH data year

Figure 13.6: Distribution of problems receiving coxibs over time
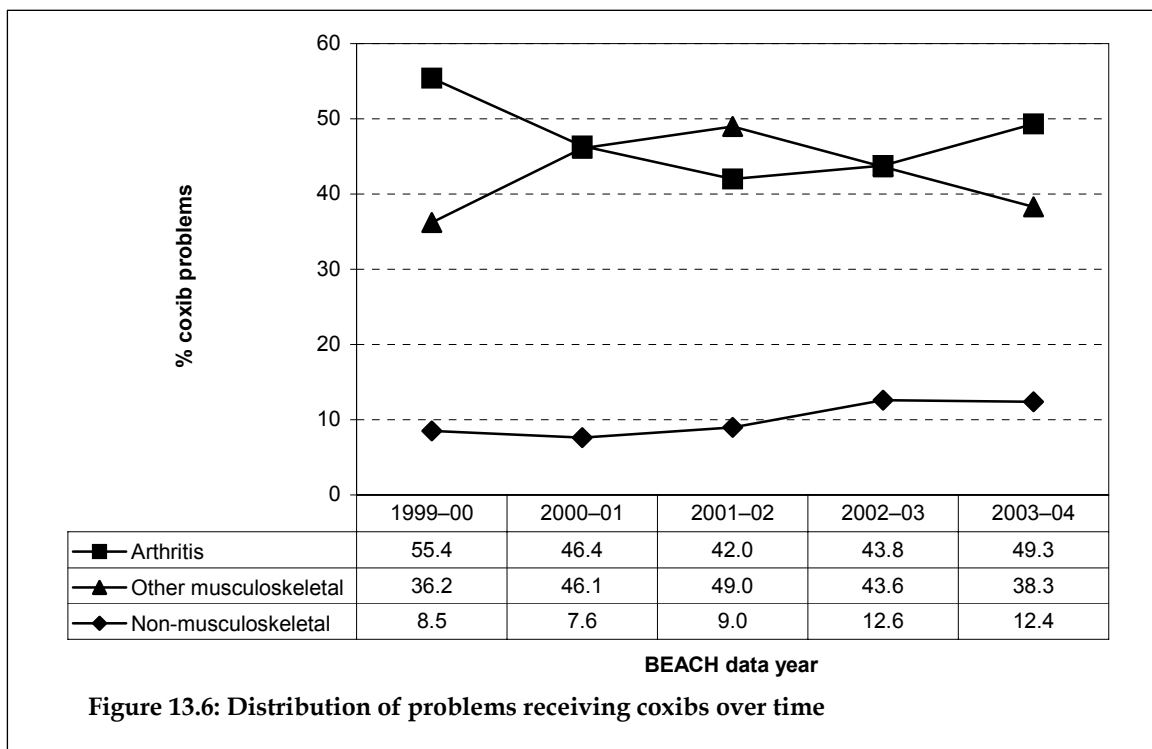
Multiple regression

All NSAIDs

Multiple regression, with the medication rate of total NSAIDs as the outcome, demonstrated a significant decrease in the prescribing/supply rate since 2000–01 (p<0.0001). This decrease was apparent for both arthritis problems (p=0.001) and other musculoskeletal problems (p<0.0001).

Coxibs

Multiple regression, with the medication rate of coxibs as the outcome, demonstrated a significant decrease in the medication rate of coxibs since 2000–01 (p<0.0001). This decrease was apparent for both arthritis problems (p=0.001) and other musculoskeletal problems (p<0.0001).

Conclusion

From 1999–00 to 2000–01, there was a marked increase in the medication rate for total NSAIDs for both arthritis problems and other musculoskeletal problems, an increase that was entirely explained by an increase in the medication rate of coxibs. There is evidence that, over the period, coxibs were substituted for other NSAIDs for both arthritis problems and other musculoskeletal problems. In 2003–04 around 28% of arthritis problems and around 7% of other musculoskeletal problems resulted in a coxib being supplied or prescribed at the encounter. However, the initial increase in the prescribing rate of total NSAIDs and the uptake of coxibs has significantly declined over the last three years.

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

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). Depression was the fourth most common problem managed in general practice in 2003–04. It was managed at a rate of 3.7 per 100 encounters and accounted for 2.5% of problems managed. Extrapolating to 90 million general practice items claimed through Medicare in 2003–04, there were an estimated 3.3 million encounters in Australia where the GP managed depression.

'All anti-depressant medications' included the ATC medication group N06A.[19] This was subdivided into selective serotonin re-uptake inhibitors (SSRIs, ATC code N06AB), non-selective monoamine re-uptake 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.

Current status of depression

Figure 13.7 is a flow chart summarising the management of depression in 2003–04.

Patients

The majority of patients at depression encounters were female (67.0%), and the highest proportion of patients (36.6%) were between 25 and 44 years of age. Depression was

managed at a rate of 4.3 per 100 encounters with females and 2.8 per 100 encounters with males. Patients aged 25–44 years had the highest age-specific management rate (5.5 per 100 encounters) followed by those aged 45–64 years (4.6 per 100). The management rate of depression for adolescents and young adults was also high at 3.3 contacts per 100 encounters.

Patient reasons for encounter: Reasons for encounters were recorded at a rate of 176.0 per 100 depression encounters, much higher than the average of 150.2 per 100. Depression was the most common reason for encounter (43.9 per 100 depression encounters) and a large proportion of patients came for prescriptions (22.0 per 100). Anxiety (4.9 per 100 encounters), weakness/tiredness (4.8) and sleep disturbance (4.5) were common RFEs at depression encounters. The average rates for these conditions were 1.0, 1.5 and 1.2 respectively.

Other problems managed

There were 94.1 other problems managed per 100 depression encounters, giving a total of 194.1 problems managed per 100 depression encounters. This rate was much higher than the average of 146.3 per 100 encounters. Hypertension (8.9 per 100 encounters) and back complaint (2.8 per 100) were managed at a similar rate to the average for all BEACH encounters whereas the rate of oesophageal disease (3.5 per 100) was somewhat higher than the average rate of 2.2 per 100 encounters.

Management

Medication: Medication rates for depression, at 78.1 medications per 100 depression problems, were higher than the medication rates for all problems managed in BEACH (71.3 per 100). SSRIs were the most common type of medication prescribed for depression (41.7 per 100 depression problems) Sertraline (15.2 per 100 depression problems) and citalopram (10.8 per 100) were the most common SSRI medications. Other anti-depressants were prescribed at a rate of 24.5 per 100 problems, the most common being venlafaxine (9.9 per 100). Anxiolytics were also commonly prescribed (5.6 per 100 depression problems).

Non-pharmacological treatments: The rate of other treatments for depression (52.7 per 100 problems) was much higher than the average for all problems managed in BEACH due to the high rate of psychological counselling, which was given at a rate of 38.1 per 100 depression problems.

Tests and referrals: Pathology tests were ordered at a rate of 11.4 per 100 depression problems which was less than half the average for all problems managed at BEACH encounters (24.1 per 100 problems). Referrals were made at a rate of 8.5 per 100 problems, which was just on the national average for all problems managed.

RFEs at depression encounters[a]
(n=6,345; rate=176.0/100)

Depression*	43.9
Prescription—all*	22.0
Anxiety	4.9
Weakness/tiredness	4.8
Sleep disturbance	4.5
Follow-up encounter unspecified	4.0
Test results*	3.9
Acute stress reaction	3.3
Cardiac check-up*	2.9
General check-up*	2.9
Back complaint*	2.6

The patients

Sex (n=3,573)	Per cent	Sex/age specific rates
Male	33.0	2.8
Female	67.0	4.3
Age group (n=3,570)		
5–14	0.5	0.3
15–24	8.7	3.3
25–44	36.6	5.5
45–64	34.3	4.6
65–74	9.5	2.8
75+	10.4	2.6

Referrals[b]
(n=306; rate=8.5/100)

Psychiatrist	3.3
Psychologist	2.1
Mental health team	0.8
Counsellor	0.7

DEPRESSION

n=3,606 problems (2.5% of problems)
n=3,606 encounters (3.6% of encounters)

Pathology[b]
(n=410; rate=11.4/100)

Chemistry	7.6
Haematology	2.9

Other problems managed with depression[a]
(n=3,393; rate=94.1/100)

Hypertension*	7.8
Oesophagus disease	3.5
Back complaint*	2.8
Osteoarthritis*	2.6
Lipid disorders*	2.4
Diabetes*	2.4
Asthma	1.9
Immunisation—all*	1.6
Female genital check-up*	1.6
URTI	1.6

Medications[b]
(n=2,815; rate=78.1/100)

SSRIs:	*41.7*
Sertraline	15.2
Citalopram	10.8
Paroxetine	6.5
Fluoxetine hcl	4.9
Other anti-depressants:	*24.5*
Venlafaxine	9.9
Mirtazapine	5.3
Dothiepin	2.6
Anxiolytics:	*5.6*
Diazepam	3.0

Non-pharmacological treatments[b]
(n=1,900; rate=52.7/100)

Counselling—psychological*	38.1
Advice/education—medication*	5.0
Advice/education*	2.6
Administrative procedure*	1.8
Counselling—problem*	1.0
Reassurance, support	0.7
Advice/education—treatment*	0.6
Sickness certificate	0.5
Counsel/advice—relaxation*	0.5

Figure 13.7: Interrelationship of depression with other variables

(a)   Expressed as rates per 100 encounters at which depression was managed (n=3,606).

(b)   Expressed as rates per 100 problems at which depression was managed (n=3,606).

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

Note: RFE—reason for encounter; URTI—upper respiratory tract infection; SSRI—selective serotonin re-uptake inhibitor

Changes over time

Figure 13.8 shows the overall management rates of depression and other psychological problems over time. The management of depression has remained steady at around 3.5 problems per 100 encounters. An extrapolation based on 90 million general practice items claimed through Medicare each year estimates that there were approximately 3.1 million encounters per year in Australia in which GPs managed depression. The management rate of other psychological problems has not changed over the six years of the study, remaining at around 7 problems per 100 encounters.

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
■ Depression	3.5	3.4	3.6	3.4	3.5	3.6
◆ Other psychological problems	7.0	7.1	7.1	7.1	7.2	6.8

BEACH data year

Figure 13.8: Management rate of depression and other psychological problems over time
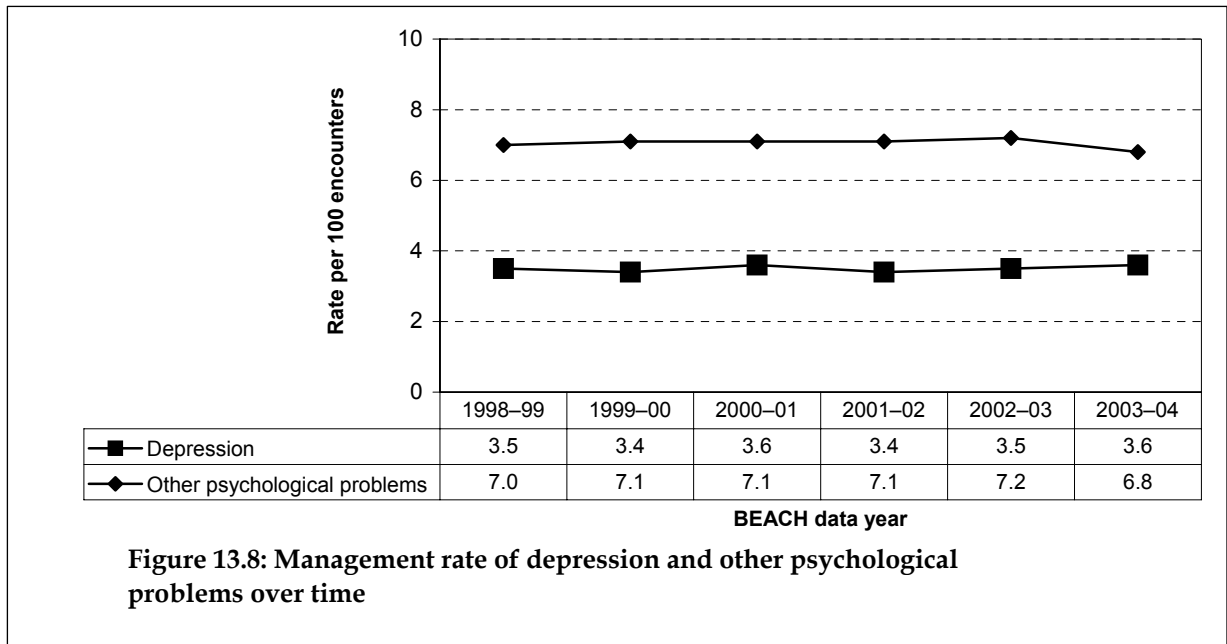
Figure 13.9 shows the overall rates of selected anti-depressant medications per 100 encounters, unadjusted for problem under management. The rates of anti-depressant medications increased somewhat from 3.1 per 100 encounters in 1998–99 to 3.5 per 100 encounters in 2003–04 (p=0.001). This increase was explained by a significant increase in the prescription/supply of SSRI medications from 1.5 per 100 encounters in 1998–99 to 2.0 per 100 in 2003–04 (p<0.0001). After adjusting for patient age and sex and extrapolating to 90 million GP–patient encounters annually, there has been an estimated average increase each year of 77,000 extra SSRIs medications prescribed or supplied in general practice.

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
▲ All anti-depressants	3.1	3.1	3.3	3.4	3.4	3.5
◆ SSRIs	1.5	1.7	1.9	1.9	2.0	2.0
■ Tricyclics	1.0	0.9	0.8	0.8	0.8	0.7
✕ MAOIs	0.3	0.3	0.2	0.1	0.1	0.1

BEACH data year

Figure 13.9: Rates of antidepressant medications per 100 encounters over time
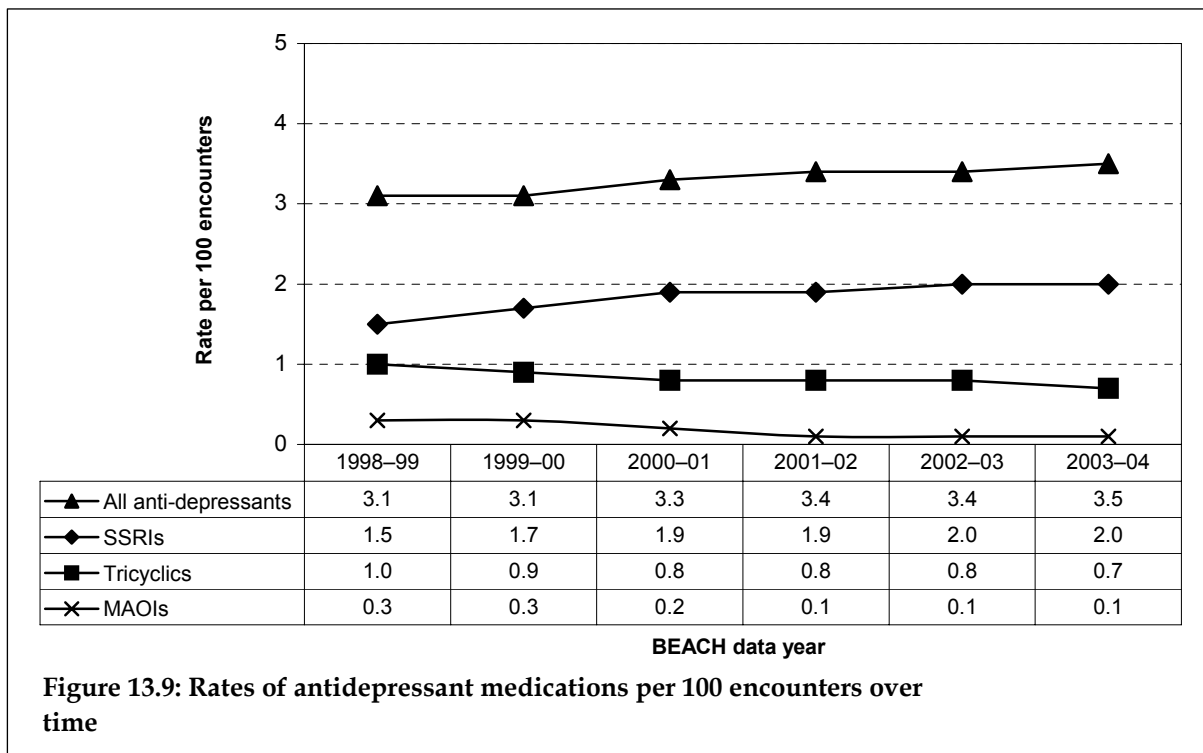
The increase in the prescription/supply of SSRIs has been partly offset by a significant decrease over time in the rates of other anti-depressant medications, in particular the tricyclic anti-depressants (p<0.0001) and MAOIs (p<0.0001).

Figure 13.10 shows the rate of anti-depressant medications prescribed/supplied for the management of depression. The rate of anti-depressant medications for depression increased slightly over time from 63.3 per 100 depression problems in 1998–99 to 66.2 per 100 in 2003–04 (p=0.005). This increase was explained by an increase in the rate of SSRIs from 35.3 per 100 problems in 1998–99 to 41.7 per 100 problems in 2003–04. The increase in SSRIs was accompanied by a significant decrease over the six years of the survey in the rates of tricyclic anti-depressants (from 14.4 per 100 depression problems to to 7.1 per 100, p<0.0001) and MAOIs (7.1 per 100 to 1.3 per 100, p<0.0001). There was an increase in the rate of other anti-depressants for depression (6.5 per 100 depression problems to 16.1 per 100 problems, p<0.0001) which was explained by an increase in the rate of selective noradrenaline re-uptake inhibitors (results not shown).

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
All anti-depressants	63.3	63.7	64.1	66.1	67.3	66.2
SSRIs	35.3	39.3	41.0	44.1	44.5	41.7
Tricyclics	14.4	11.6	9.9	10.3	8.4	7.1
MAOIs	7.1	6.0	4.1	2.1	2.2	1.3

BEACH data year

Figure 13.10: Rates of antidepressant medications per 100 depression problems over time
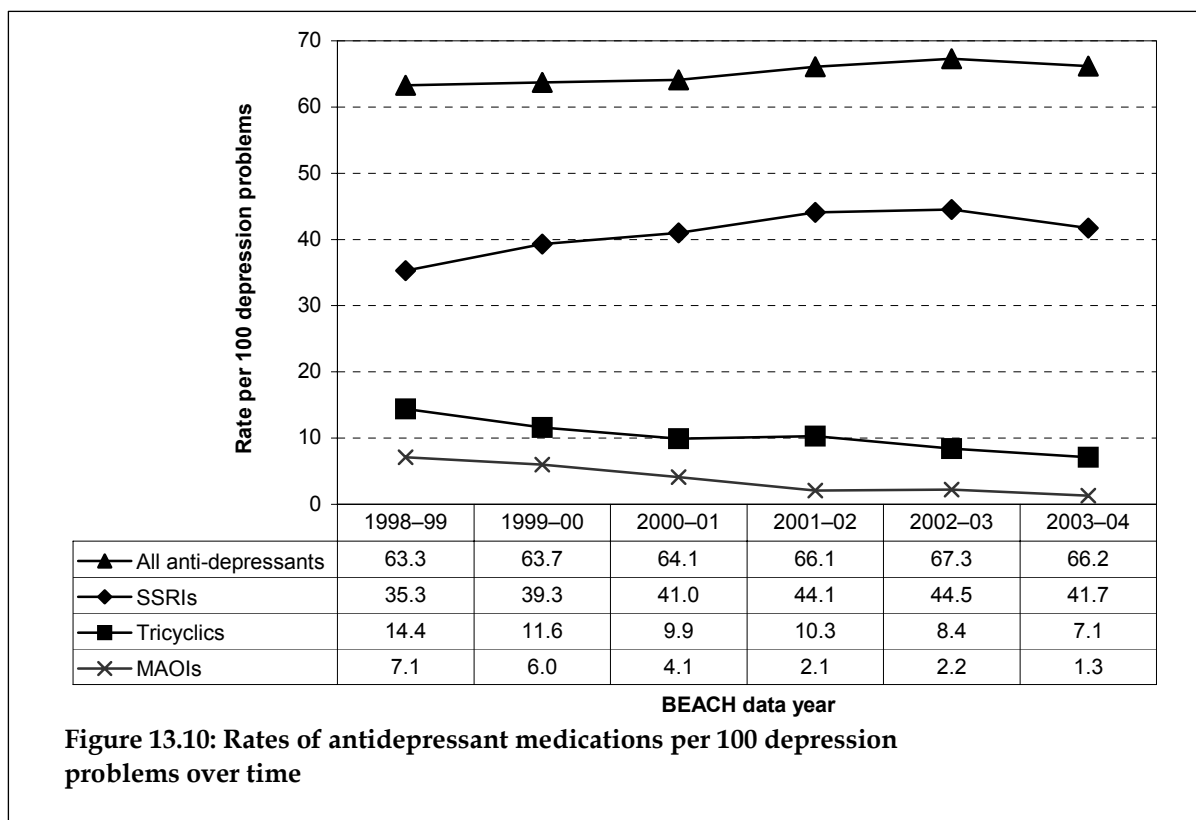
13.4 Asthma inhalant medications and management of asthma problems over time

Management of asthma in 2003–04

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 was the ninth most common problem managed in general practice in

2003–04. It was recorded at a rate of 2.6 per 100 encounters and accounted for 1.8% of problems managed. Extrapolating to 90 million general practice items claimed through Medicare in 2003–04, there were an estimated 2.3 million encounters in Australia at which GPs managed asthma.

Asthma inhalant medications where 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.

Current status of asthma

Figure 13.11 is a flow chart summarising the management of asthma in 2003–04.

Patients

The majority of patients at asthma encounters were female, but the sex-specific rate of management of asthma did not differ between males (2.5 per 100 encounters) and females (2.6 per 100). Asthma was most often managed for children aged 5–14 years (6.8 per 100 encounters), followed by those aged less than 5 years (4.3 per 100). The age-specific rate of asthma decreased steadily with age in adults.

Patient reasons for encounter: Patients gave 4,294 reasons for encounter, a rate of 170 per 100 asthma encounters. At about one-third of encounters involving the management of asthma, the patient gave asthma as a reason for encounter. Cough was also a relatively common reason for encounter (26.5 per 100 asthma contacts), followed by requests for a prescription (20.0), shortness of breath and wheezing.

Other problems managed

There were 2,074 other problems managed at these encounters, a rate of 82.0 other problems per 100 encounters. Hypertension (6.1 per 100 encounters) was the most common of these but this is likely to be due to its high management rate in the total database rather than to any specific relationship with asthma. This was followed by upper respiratory tract infection (4.7 per 100), immunisation/vaccination (3.5 per 100) and acute bronchitis (3.2).

Management

Medication: Medication rates for asthma, at 131.7 medications per 100 asthma contacts, were far higher than the average medication rate for all problems managed in BEACH (71.3 per 100). Salbutamol was the most common medication, provided at a rate of 42.1 per 100 asthma contacts, followed by fluticasone/salmeterol (24.0 per 100) and fluticasone propionate (11.0 (28.3 per 100 asthma problems). However, there was a wide range of medications prescribed/supplied or advised for the management of asthma.

Non-pharmacological treatments: Other treatments were provided in the management of asthma at a rate of 32.4 per 100 contacts, a slightly lower rate than for all problems. The most common was advice and education about the medication (8.4 per 100 asthma contacts), followed by general advice and education (6.0 per 100), and then physical function tests (5.3 per 100).

Tests and referrals: Pathology tests were ordered at a very low rate of 2.1 per 100 asthma contacts and referrals were extremely rare.

RFEs at asthma encounters[a]
(*n*=4,294; rate=1.69/100)

Asthma	31.8
Cough	26.5
Prescription—all*	20.0
Shortness of breath, dyspnoea	7.4
Wheezing	6.5
Follow-up encounter unspecified	4.8
Immunisation—all*	3.0
Cardiac check-up*	2.8
General check-up*	2.7
Upper respiratory tract infection	2.5
Throat symptom/complaint	2.3

The patients

Sex (*n*=3,195)	Per cent	Sex/age specific rates
Male	41.8	2.5
Female	58.2	2.6
Age group (*n*=2,507)		
<5	10.6	4.3
5–14	15.6	6.7
15–24	12.3	3.3
25–44	20.0	2.1
45–64	21.2	2.0
65–74	10.5	2.2
75+	9.8	1.7

Referrals[b]
(*n*=69; rate=2.7/100)

Respiratory physician	1.0
Paediatrician	0.3

ASTHMA

_n_=2,530 problems (1.7% of problems)
_n_=2,530 encounters (2.6% of encounters)

Pathology[b]
(*n*=53; rate=2.1/100)

Chemistry	0.9
Haematology	0.6

Other problems managed with asthma[a]
(*n*=2,074; rate=82.0/100)

Hypertension*	6.1
URTI	4.7
Immunisation—all*	3.5
Acute bronchitis/bronchiolitis	3.2
Depression*	2.7
Allergic rhinitis	2.3
Oesophageal disease	2.2
Contact/allergic dermatitis	1.9
Osteoarthritis*	1.9
Diabetes	1.8
Lipid disorders	1.7

Medications[b]
(*n*=3,333; rate=131.7/100)

Salbutamol	42.1
Fluticasone/salmeterol	24.0
Fluticasone propionate	11.0
Budesonide	6.9
Prednisolone	5.8
Terbutaline	5.7
Ipatropium inhaled	5.2
Budesonide/eformoterol	3.9
Beclamethasone	2.9
Prednisolone sod phos oral	0.9
Prednisolone	2.2
Amoxycillin	2.1

Non-pharmacological treatments[b]
(*n*=819; rate=32.4/100)

Advice/education—medication*	8.4
Advice/education*	6.0
Physical function test*	5.3
Other prevent procedure/ high-risk medication	3.2
Counselling—problem*	2.9
Advice/education—treatment*	1.7
Counsel/advice—smoking*	1.6

Figure 13.11: Interrelationship of asthma with other variables

(a)   Expressed as rates per 100 encounters at which asthma was managed (*n*=2,530).

(b)   Expressed as rates per 100 problems at which asthma was managed (*n*=2,530).

*   Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).

Note: RFE—reason for encounter; URTI—upper respiratory tract infection.

Changes over time

Over the six years of the BEACH study, the management rate of asthma problems has decreased steadily from 3.2 per 100 encounters in 1998–99 to 2.6 per 100 encounters in 2003–04 (p<0.0001). After adjusting for patient age and sex and extrapolating to all Australian GP–patient encounters, asthma encounters in general practice have been decreasing since 1998–99 at an average rate of 100,000 fewer asthma encounters per year (Figure 13.12).

Figure 13.12: Management rate of asthma over time

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Asthma	3.2	3.2	2.8	2.8	2.7	2.6
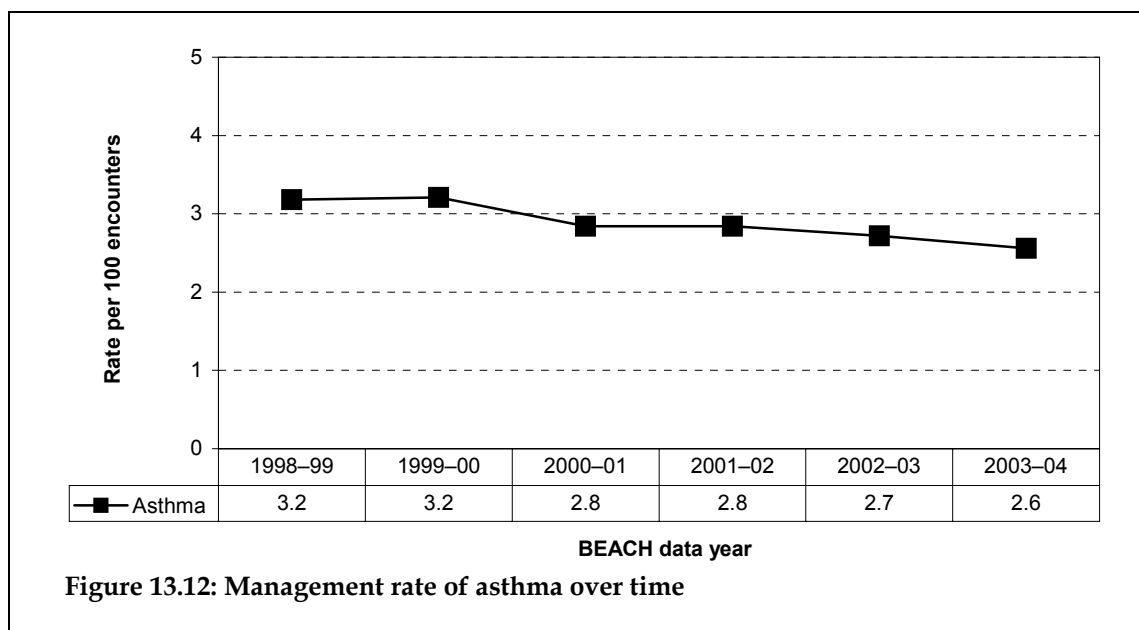
Figure 13.13 shows the rate of asthma medications per 100 encounters, unadjusted for the problem under management. There was a significant decrease in bronchodilators (prescribed, advised or supplied), from 3.9 per 100 encounters in 1998–99 to 2.2 per 100 encounters in 2003–04 (p<0.001). After adjusting for patient age and sex, bronchodilator medication rates have been decreasing since 1998–99 at an average rate of 300,000 fewer occasions each year where the GP prescribed/advised or supplied bronchodilator medications. The decrease in preventive medications was much smaller, from 2.3 per 100 encounters in 1998–99 to 2.0 per 100 encounters in 2003–04 (p<0.0001).

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Bronchodilators	3.9	3.9	3.4	3.1	2.7	2.2
Preventives	2.3	2.6	2.3	2.3	2.2	2.0

Figure 13.13: Rates of asthma inhalants per 100 encounters over time
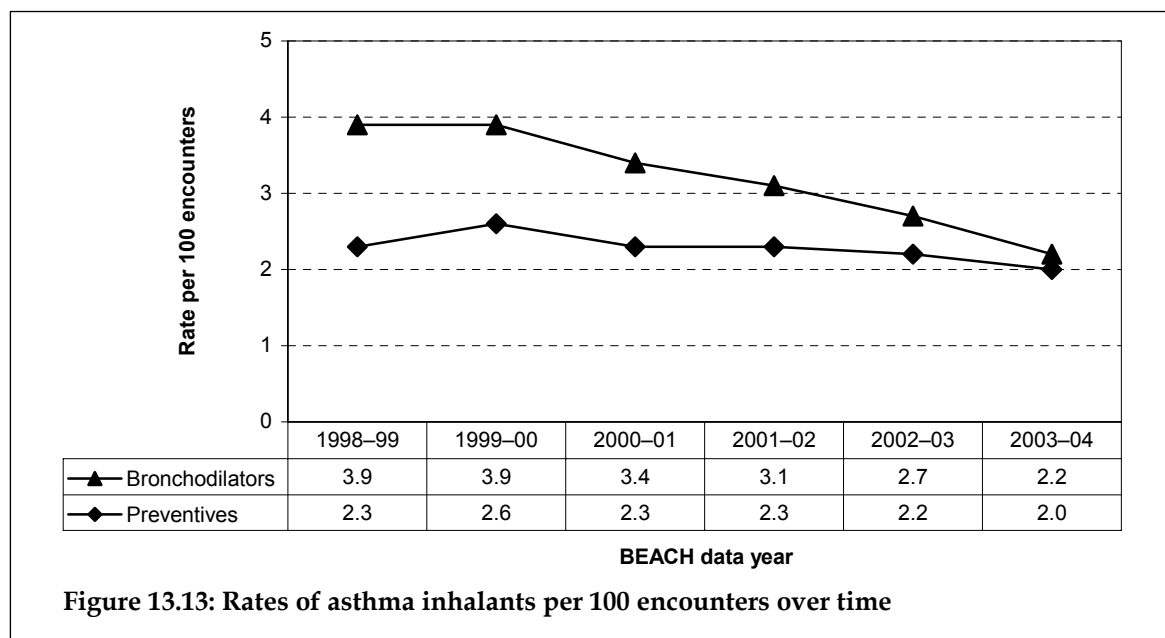
Figure 13.14 shows the medications prescribed/supplied or advised in the management of asthma problems. There was a significant decrease in the rate of bronchodilators over six years from 72.9 per 100 asthma problems in 1998–99 to 53.1 per 100 problems in 2003–04 (p<0.0001). However, the rate of asthma preventives for asthma problems remained steady over the period, at around 55.5 medications per 100 asthma problems (p=0.49).

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

BEACH data year

Figure 13.14: Rates of asthma inhalants per 100 asthma problems over time
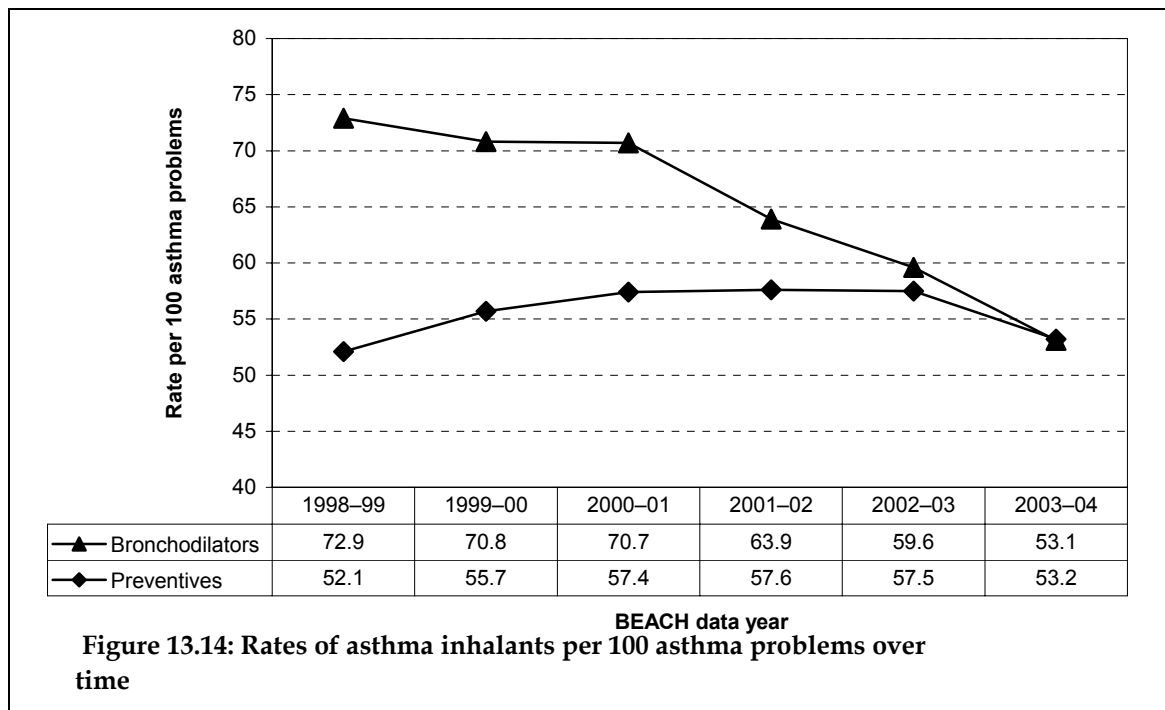
Discussion

It appears that patients in Australia are visiting the GP less frequently for the management of asthma. A steady medication rate of asthma preventives for asthma problems plus a decreasing rate of bronchodilators may support the argument that patients are managing their asthma better, thus requiring fewer visits to the GP for acute exacerbations.[40] Another explanation for the results is that because patients are obtaining bronchodilators directly from pharmacists, they have less need to visit the GP for repeat scripts, thus reducing the management rate of asthma in general practice.

13.5 Lipid lowering agents and the management of lipid disorders over time

Management of lipid disorders in 2003–04

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 disorder was the sixth most common problem managed in general practice in 2003–04, recorded at a rate of 3.1 per 100 encounters and accounting for 2.1% of problems. An extrapolation based on 90 million general practice items claimed through Medicare each year estimates that there were

approximately 2.8 million encounters per year in Australia in which GPs managed lipid disorders.

Lipid lowering agents were defined as medications included under the ATC code C10A.[19] For further analysis lipid lowering agents were divided into HMG CoA reductase inhibitors ('statins', ATC subgroup C10A A)[19] and all other lipid lowering agents.

Current status of statins

Figure 13.15 is a flow chart describing the patients and problems for which statins were prescribed or supplied directly by the GP to the patient.

Rate of prescription or supply

There were 2,703 occasions on which statins were prescribed or supplied, accounting for 2.6% of all medications prescribed, supplied or advised. They were given at a rate of 2.7 per 100 total encounters and at a rate of 1.9 per 100 total problems. Atorvastatin was the most common statin accounting for 44.6% of all the statins. Simvastatin accounted for a further 39.6% of the statin group. The median prescribed daily dose for both atorvastatin and simvastatin was 20 mg.

The patients

The sex distribution of the patients differed from that of the total sample, with males and females each accounting for 50% of the sample. Males were more likely to receive this medication (3.2 per 100 encounters) than females (2.4 per 100). Patients over the age of 44 years accounted for more than 90% of those receiving a statin, almost half of these being aged 45–64 years and half being older people. Those aged between 65 and 74 years were the most likely to receive this medication (6.8 medications per 100 contacts with patients in this age group), followed by those aged 75 years or more (4.2 per 100 encounters) and those aged between 45 and 64 years (4.1 per 100).

Reasons for encounter: The most common patient reason for encounter was a request for a prescription (described at a rate of 50.6 per 100 statin encounters), followed by requests for cardiac check-ups (13.8 per 100) and test results (13.7 per 100).

Problems managed

Lipid disorders were the most common problem managed with statins, accounting for more than two-thirds of the statin encounters (69.4 per 100 statin encounters). 'Prescription' (without a more specific problem label) was the second most frequent problem resulting in a statin being prescribed or supplied (8.8 per 100 statin encounters). It is likely these are related to prevention in patients without a high cholesterol reading. This was followed by ischaemic heart disease (7.0 per 100) and then by a range of other cardiovascular and endocrine/metabolic problems.

Other management

Other medications: A total of 3,871 other medications were prescribed, supplied or recommended at the same encounter, for the same problem for which the statins were used. Anti-hypertensives were the most common co-medications (14.5 per 100 statin problems), followed by beta-blockers (5.0 per 100) and simple analgesics (4.9 per 100 problems).

Non-pharmacological: Other treatments were utilised less often for statin problems than for all problems (17.5 per 100 problems managed with statins, compared with 35.1 per 100 total

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problems). Counselling/advice about nutrition and weight was most common (8.4 per 100 statin problems), followed by counselling/advice about exercise (2.3 per 100).

*Referrals and investigations:*The patient was referred to other health professionals for statin problems at a rate of 1.6 per 100 problems managed. Pathology was ordered at a very high rate of 45.5 per 100 statin problems. This was largely due to the ordering of Chemistry tests (including lipid profiles and liver function tests) (40.4 per 100 problems). There were very few imaging tests ordered for these problems (0.4 per 100 problems).

The patients

Sex (*n*=2,681)	Per cent	Sex/age specific rate
Males	49.1	3.2
Females	50.9	2.4

Age group (*n*=2,677)		
15–24	0.2	0.1
25–44	5.6	0.6
45–64	41.2	4.1
65–74	31.0	6.8
75+	21.9	4.2

RFEs at statin encounters[a] (*n*=4,813, 178/100)

Prescription—all*	50.6
Cardiac check-up*	13.8
Test results*	13.7
Lipid disorders*	8.8
General check-up*	7.2
Hypertension*	5.5
Blood test—endo/meta	4.3
Immunisation—all	4.1
Diabetes*	3.4
Blood test NOS*	3.1

Referrals[b] (*n*=42, 1.6/100)

Cardiologist	0.6
Dietitian/nutritionist	0.3

Pathology[b] (*n*=1,229, 45.5/100)

Chemistry	40.4
Haematology	4.0
Other NEC	0.9

Imaging [b] (*n*=10, 0.4/100)

Diagnostic radiology	0.2

Co-medications[b] (*n*=3,871, 143.2/100)

Anti-hypertensive	14.5
Beta-blockers	5.0
Simple analgesic	4.9
Hypoglycaemic	3.3
Anti-angina	3.1
Other blood drugs	2.0
Anti-ulcerants	1.6
Diuretic	1.2
NSAID	1.1
Other cardiovascular drugs	0.9

Problems managed with statins[a] (*n*=2,703)

Lipid disorders*	69.4
Prescription—all*	8.9
Ischaemic heart disease*	7.0
Hypertension*	4.9
Diabetes*	2.5
Blood test—endocrine/metabolic	1.0
Test results*	0.6
Cardiac check-up*	0.5
Cerebrovascular accident	0.4
Atherosclerosis/PVD	0.4

Other treatments[b] (*n*=473, 17.5/100)

Counsel/advice—nutrition/weight*	8.4
Counsel/advice—exercise*	2.3
Advice/education—medication*	2.0
Counselling—problem*	1.2
Advice/education*	1.1
Counsel/advice—life style*	0.4

STATINS
n=2,707 (2.6% of total medications)
2.7 per 100 encounters (*n*=2,703)
1.9 per 100 problems (*n*=2,703)

Generic	% group	Median PDD
Atorvastatin	44.6	20 mg
Simvastatin	39.6	20 mg

Figure 13.15: Interrelationship of statins with other variables

(a)   Expressed as rates per 100 encounters at which statins were used (n=2,703).
(b)   Expressed as rates per 100 problems for which statins were used (*n*=2,703).
*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).
Note: RFEs—reasons for encounter; NSAID—non-steroidal anti-inflammatory drug; PVD—peripheral vascular disease; endo/meta—endocrine/metabolic; PDD–prescribed daily dose.

Changes over time

The management of lipid disorders increased significantly from 1998–99 (2.5 per 100 encounters) to 2003–04 (3.1 per 100 encounters, $p<0.0001$). After adjustment for patient age and sex, this was equivalent to an estimated increase of 75,000 extra lipid problems managed each year (Figure 13.16).

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Lipid disorder	2.5	2.6	2.9	2.9	3.0	3.1

BEACH data year

Figure 13.16: Management rate of lipid disorders over time

The rate of statins prescribed or supplied increased from 1.9 medications per 100 encounters in 1998–99 to 2.7 per 100 encounters in 2003–04 ($p<0.0001$). After adjustment for patient age and sex this was equivalent to an estimated 100,000 extra occasions each year where a GP prescribed or supplied statin medications (Figure 13.17).

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Statins	1.9	2.1	2.3	2.5	2.4	2.7

BEACH data year

Figure 13.17: Management rate of lipid lowering medications over time
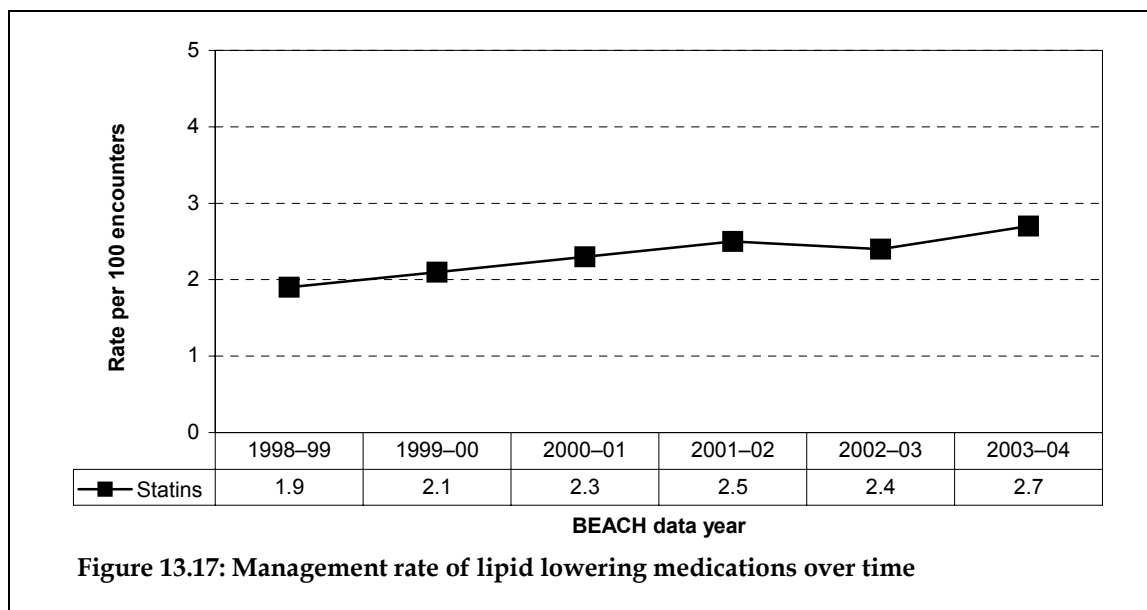
The increase in lipid medications was entirely explained by the increase in the management of lipid disorders. There has been no significant change in the rate of statins prescribed or supplied for the management of lipid disorder problems (Figure 13.18). Since 1998–99 statins have been prescribed/supplied at around 61 medications per 100 lipid disorder problems (p=0.86).

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Statins	60.0	60.6	59.7	63.2	59.6	60.8

BEACH data year

Figure 13.18: Management rate of lipid lowering medications for lipid disorders over time
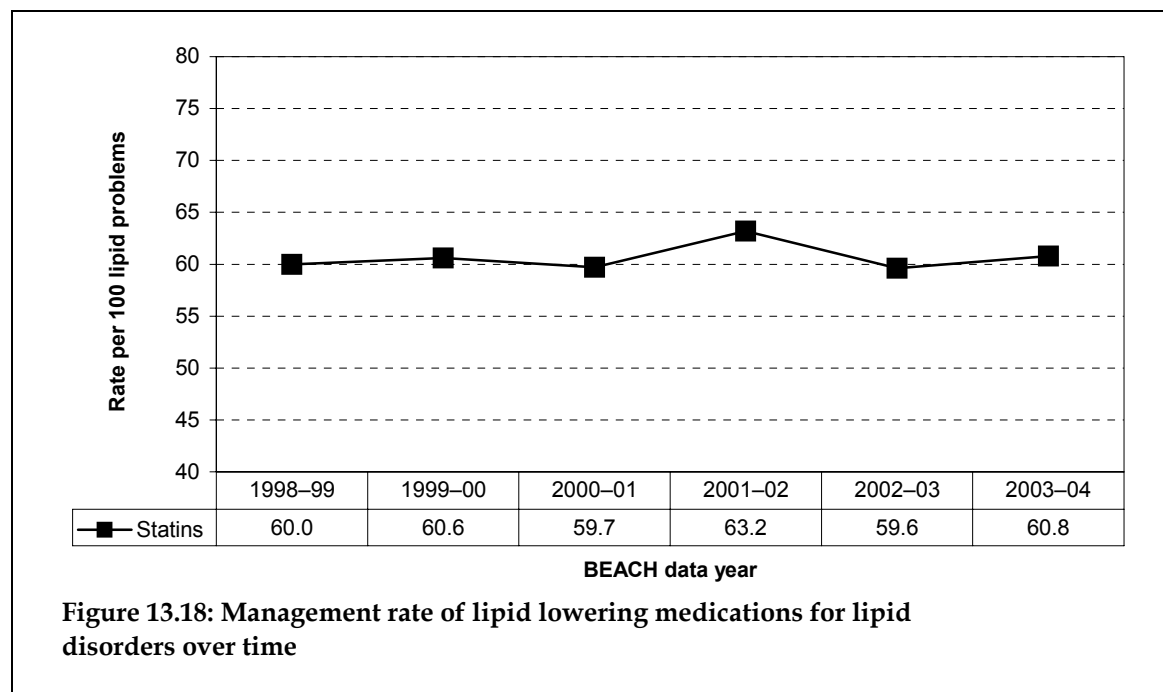
13.6 The management of diabetes over time

For the purpose of this analysis diabetes includes insulin dependent (ICPC-2 rubric T89) and non-insulin dependent diabetes (ICPC-2 rubric T90), but excluded gestational diabetes. In 2003–04 non-gestational diabetes was managed at a rate of 3.3 problems per 100 encounters. An extrapolation based on 90 million general practice items claimed through Medicare in 2003–04 estimates that there were approximately 3.0 million encounters per year in Australia in which GPs managed diabetes.

Current status of diabetes

Figure 13.19 is a flow chart summarising the management of diabetes in 2003–04.

Patients

The majority of patients at diabetes encounters were male and more than 90% were aged 45 years and over. Diabetes was managed more frequently for males (at 4.1% of encounters with male patients) than for females (2.7% of encounters with female patients), and for older patients (17.2% of encounters with patients aged 45 years and over).

Patient reasons for encounter: There were significantly more patient reasons for encounter (180 per 100 encounters) than the average for BEACH (150 per 100 encounters). Although

diabetes was the most common reason for encounter, a large proportion of patients requested prescriptions or endocrinology tests as a reason for encounter.

Other problems managed

There were 127.5 other problems managed per 100 diabetes encounters. This means that, on average, 228 problems were managed for every 100 encounters where diabetes was managed. This rate is significantly higher than 146.3 problems per encounter recorded for BEACH. Hypertension (27.9 per 100 encounters), lipid disorder (8.8 per 100), osteoarthritis (4.2 per 100) and ischaemic heart disease (4.1 per 100) were managed at diabetes encounters far more frequently than average for all BEACH encounters (9.2, 3.3, 2.8 and 1.4 per 100 encounters respectively). The older age of patients at diabetes encounters probably accounts for the higher rates of chronic disorders such as osteoarthritis and ischaemic heart failure managed at these encounters.

RFEs at diabetes encounters[a]
(n=5,817; rate=179.6/100)

Diabetes*	25.0
Prescription—all*	22.7
Endocrinology check-up*	14.7
Test results*	11.4
Cardiac check-up*	9.7
General check-up*	6.3
Hypertension*	6.2
Follow-up encounter unspecified*	5.1
Blood test endocrine/metabolic	4.4
Immunisation—all*	3.3
Blood test NOS	2.8

The patients

	Per cent	Sex/age specific rates
Sex (n=3,195)		
Male	53.1	4.1
Female	46.9	2.7
Age group (n=3,189)		
1–4	0.1	0.1
5–14	0.2	0.1
15–24	1.0	0.3
25–44	8.5	1.1
45–64	39.3	4.7
65–74	27.1	7.1
75+	23.8	5.4

Referrals[b]
(n=342; rate=10.5/100)

Ophthalmologist	2.9
Diabetes education	1.6
Dietitian/nutritionist	1.5
Endocrinologist	1.3
Podiatrist/chiropodist	0.8
Diabetes clinic	0.7

DIABETES

n=3,244 problems (2.5% of problems)
n=3,239 encounters (3.3% of encounters)

Pathology[b]
(n=2,350; rate=72.4/100)

Chemistry	64.0
Haematology	5.6
Other NEC	1.9

Other problems managed with diabetes[a]
(n=4,130; rate=127.5/100)

Hypertension*	27.9
Lipid disorder*	8.8
Osteoarthritis*	4.2
Ischaemic heart disease*	4.1
Immunisation—all*	3.6
Oesophageal disease	3.0
Depression*	2.6
Heart failure	1.9
URTI	1.9
Sleep disturbance	1.7

Medications[b]
(n=2,354; rate=72.6/100)

Metformin	28.3
Gliclazide	14.7
Insulin isophane	5.7
Glimepiride	4.8
Glibenclamide	2.5
Insulin	2.0
Glucose indicate	1.6
Glipizide	1.0
Simvastatin	0.9
Insulin aspart	0.9

Non-pharmacological treatments[b]
(n=1,317; rate=40.6/100)

Counsel/advice—nutrition/weight	13.6
Glucose test	5.0
Advice/education—treatment*	4.8
Counsel/advice—exercise*	4.1
Advice/education—medication	3.5
Counselling—problem*	3.3
Advice/education*	2.5
Other admin/document*	0.7
Dressing/pressure/compression*	0.5

Figure 13.19: Interrelationship of diabetes with other variables

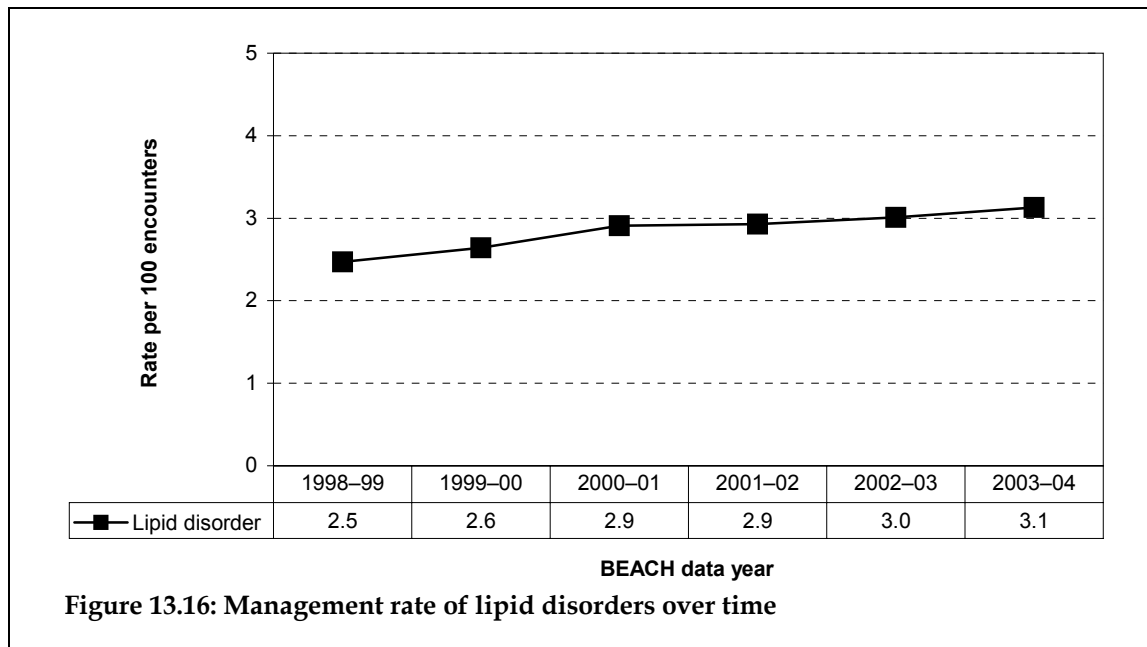(a)   Expressed as rates per 100 encounters at which diabetes was managed (n=3,239).

(b)   Expressed as rates per 100 diabetes problems (n=3,244).

*   Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).

Note: RFE—reason for encounter; NOS—not otherwise specified; NEC—not elsewhere classified; URTI—upper respiratory tract infection.
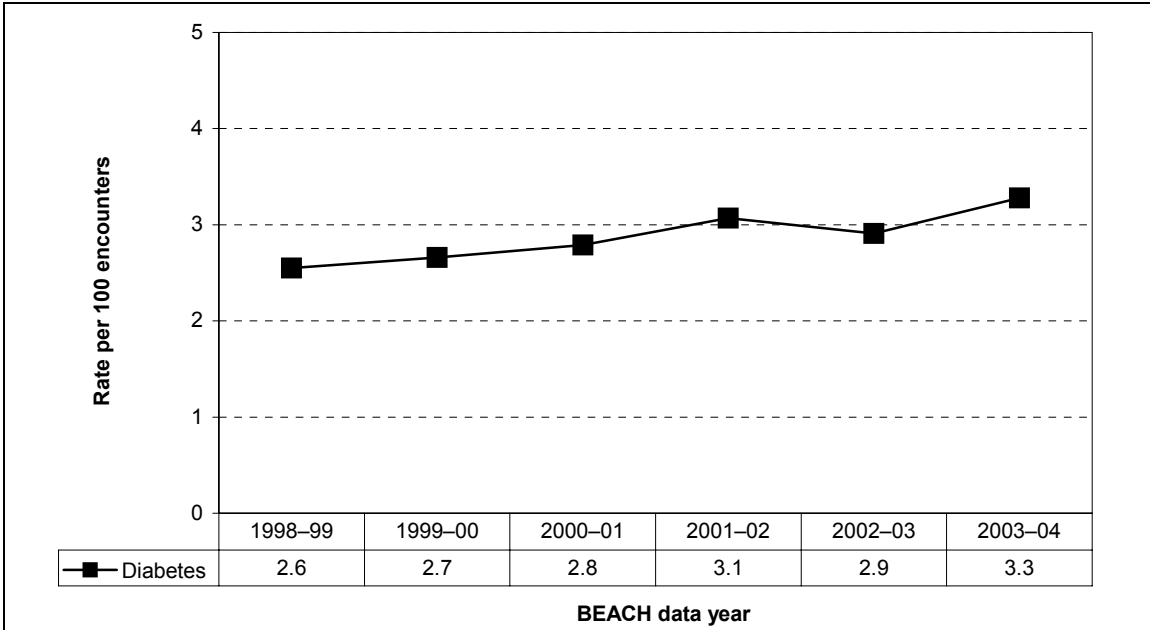
Management

Medication: Medication rates for diabetes, at 72.6 medications per 100 diabetes problems, were similar to medication rates for all problems managed in BEACH (71.3 per 100). Metformin (28.3 per 100 diabetes problems) and gliclaxide (14.7 per 100) were the most common medications prescribed for diabetes, followed by insulin isophane (5.7 per 100).

Non-pharmacological treatments: The rate of other treatments for diabetes (40.6 per 100 problems) was slightly higher than the average for all problems managed in BEACH. The most common were counselling/advice–nutrition/weight, followed by glucose test, advice/education–treatment, and counselling/advice–exercise.

Tests and referrals: Pathology tests were ordered at a rate of 21.2 per 100 diabetes problems which was close to double the average for all problems managed at BEACH encounters (11.9 per 100 problems). Nearly two-thirds of pathology requests were for chemistry, which was the most common pathology test ordered. Referrals were made at a rate of 10.5 per 100 problems, which was slightly higher than the BEACH average (8.0 per 100 problems). The most common referral was to an ophthalmologist.

Changes over time

Figure 13.20 shows the management of non-gestational diabetes, which increased from 2.6 per 100 encounters in 1998–99 to 3.3 per 100 encounters in 2003–04 ($p < 0.0001$). After adjusting for patient age and sex this was equivalent to an estimated increase of 75,000 extra diabetes problems managed each year.

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04
Diabetes	2.6	2.7	2.8	3.1	2.9	3.3

BEACH data year

Figure 13.20: Management rate of diabetes problems over time

14 Patient risk factors

14.1 Background

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. Approximately 85% of the population visited a GP in 2002 (personal communication, GP Branch, Australian Government Department of Health and Ageing). Therefore, general practice provides a suitable basis from which to monitor many aspects of the health of the population.

Since April 1998, when BEACH began, a section on the bottom of each encounter form has been allocated 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). Organisations supporting the BEACH program have access to a subsample of 6,000 encounter forms per year in which to insert a series of questions (or two sets of questions at 3,000 encounters each) on a subject of their choice.

14.2 Methods

The sixth annual BEACH data collection period was divided into ten blocks of 5 weeks. Each block included data from 100 GPs, with 20 GPs recording per week. The recording pads of 100 forms were divided into three sections (40 A forms, 30 B forms and 30 C forms). Form A topics remained constant over the ten blocks, while Form B and Form C topics changed from block to block. The order of SAND sections in the GP recording pack was rotated, so that the 40 A forms may appear first, second or third in the pad. Rotation of ordering of the components ensured there was no order effect on the quality of the information collected.

Form A contained questions about patient risk factors, including self-reported height and weight (for calculation of body mass index, BMI), alcohol consumption and smoking status.

The population risk factor questions for BMI, alcohol consumption and smoking status will remain constant in future years, and results are reported in each annual report. Abstracts of results for other topics covered in SAND are available on the Family Medicine Research Centre website <http://www.fmrc.org.au/publications/SAND_abstracts.htm>.

14.3 Body mass index

Overweight and obesity have been estimated to account for more than 4% of the total burden of disease in Australia.[41] The 1999–2000 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%).[42]

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.[43] This method, based on international data from developed Western cultures, is applicable within the Australian setting.

The BEACH data on BMI are presented separately for adults (aged 18 and over) and children. The standard BMI cut-offs have been applied for the adult population, and the method described by Cole et al. has been used for defining overweight and obesity in children (aged 2 to 17 years).[43] There are three categories defined for childhood BMI: underweight/normal, overweight and obese.

Body mass index of adults

BMI was calculated for 31,890 patients aged 18 years and over at encounters with 994 GPs. Overall, 56.5% of patients were overweight or obese—22.0% being defined as obese and 34.5% were defined as overweight. A further 7.2% were underweight patients, and 36.3% were patients whose BMI was in the normal range (Table 14.1).

A significantly greater proportion of males were overweight or obese (62.9%, 95% CI: 61.8–64.0) than females (52.3%, 95% CI: 51.3–53.4). The proportion of patients considered overweight or obese was greatest for male patients aged 45–64 years (Figure 14.1). These results are consistent with those of the 1999–00 AusDiab study[42] and the results reported for BEACH 2000–01, 2001–02 and 2002–03.[44]

The BEACH results reported above are broadly consistent with the Australian Bureau of Statistics 2001 figures from the National Health Survey, of 58% of adults ages 18 or more being overweight or obese.[5]

In the 18–24 year age group, 17.8% of women and 11.8% of men were considered underweight, as were 12.1% of women and 6.5% of men aged 75 years or more (Figure 14.2).

Table 14.1: Patient body mass index (aged 18 years and over)

BMI class	Male[a] Per cent	95% LCL	95% UCL	Female[a] Per cent	95% LCL	95% UCL	Total respondents Per cent	95% LCL	95% UCL
Obese	20.7	19.8	21.5	22.9	22.1	23.7	22.0	21.4	22.7
Overweight	42.3	41.3	43.2	29.4	28.7	30.1	34.5	33.8	35.1
Normal	33.1	32.1	34.2	38.5	37.6	39.4	36.3	35.6	37.1
Underweight	4.0	3.2	4.7	9.2	8.7	9.8	7.2	6.8	7.5
Total (*n*, %)	**12,434**	**100.0**	—	**19,214**	**100.0**	—	**31,890**	**100.0**	—

(a) Patient sex was unknown for 242 respondents.

Note: BMI—body mass index; LCL—lower confidence limit; UCL—upper confidence limit.
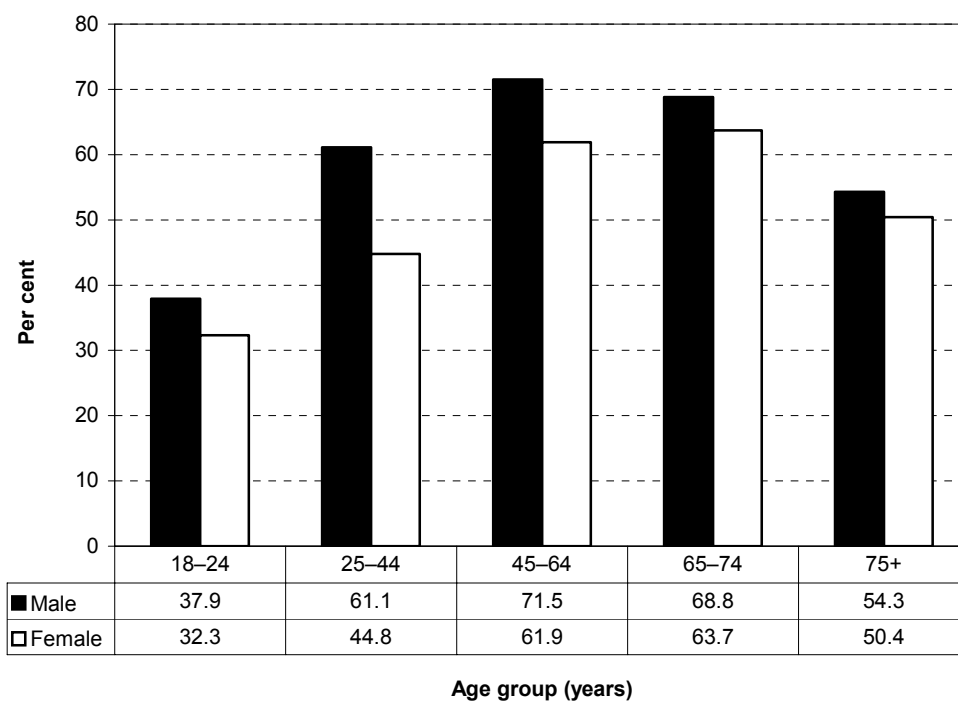
Figure 14.1: Age–sex-specific rates of overweight and obesity in adults

	18–24	25–44	45–64	65–74	75+
■ Male	37.9	61.1	71.5	68.8	54.3
□ Female	32.3	44.8	61.9	63.7	50.4

Age group (years)
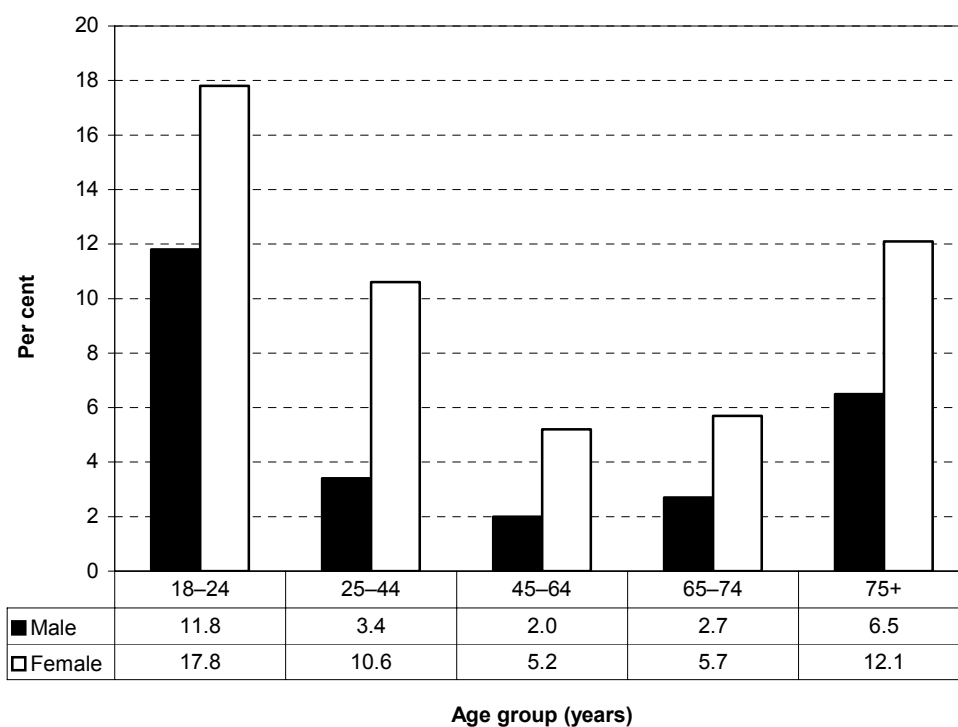
Figure 14.2: Age–sex-specific rates of underweight in adults

	18–24	25–44	45–64	65–74	75+
■ Male	11.8	3.4	2.0	2.7	6.5
□ Female	17.8	10.6	5.2	5.7	12.1

Age group (years)

Body mass index of children

BMI was calculated for 3,301 patients aged between 2 and 17 years at encounters with 908 GPs. About one-third of all children aged 2 to 17 (32.2%, 95% CI: 30.1–34.3) were considered overweight or obese; comprising 35.2% (95% CI: 32.0–38.3) of male children and 29.6% (95% CI: 26.7–32.4) of female children. Overall, 13.2% (95% CI: 10.5–16.0) of children were considered obese, and a further 19.0% (95% CI: 17.0–21.0) were defined as overweight (results not shown).

Being overweight or obese was most likely in the 9–12 age group (39.6%) and least likely in those aged 13–17 years (28.6%) (results not shown). Three-quarters of adolescent (13–17 years) females (75.4%, 95% CI: 72.3–78.5) were considered to be in the underweight/normal range, which was significantly higher than for females aged between 9 and 12 years (62.6%, 95% CI: 57.1–68.1) (Figures 14.3 and 14.4).

Age group (years)	2–4	5–8	9–12	13–17
Male obese	16.9	17.9	17.3	9.1
Male overweight	13.7	17.6	24.5	25.4
Male under/normal	69.4	64.6	58.2	65.5

Figure 14.3: BMI of children—male age-specific rates

Age group (years)	2–4	5–8	9–12	13–17
Female obese	14.3	18.0	12.5	6.5
Female overweight	12.2	16.7	24.9	18.1
Female under/normal	73.5	65.3	62.6	75.4

Figure 14.4: BMI of children—female age-specific rates

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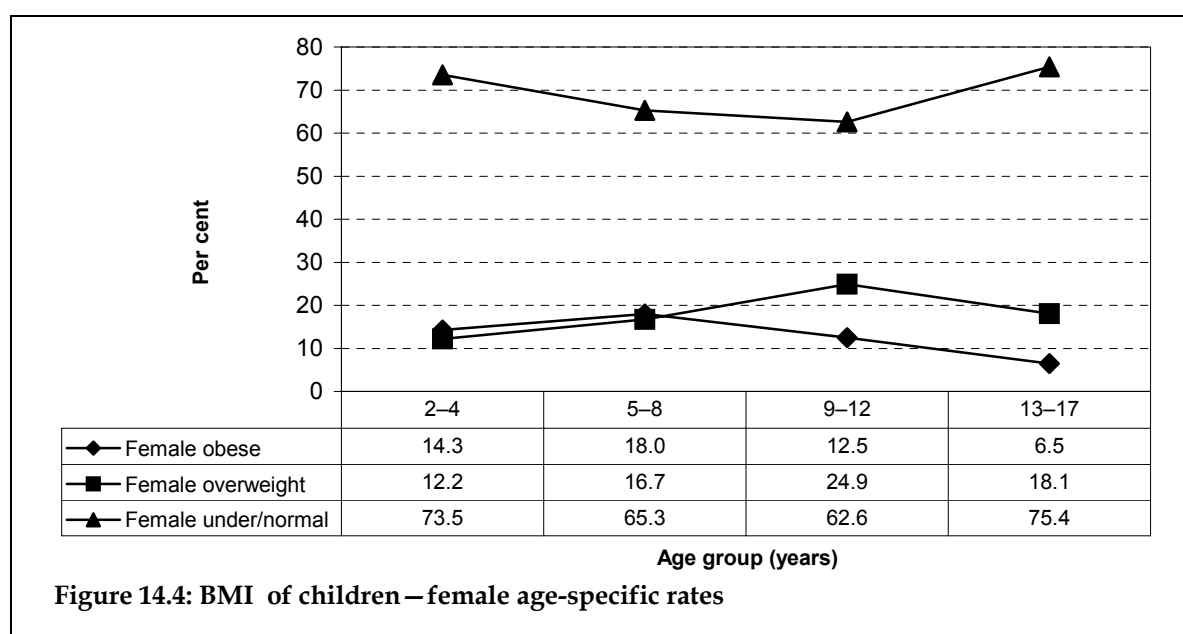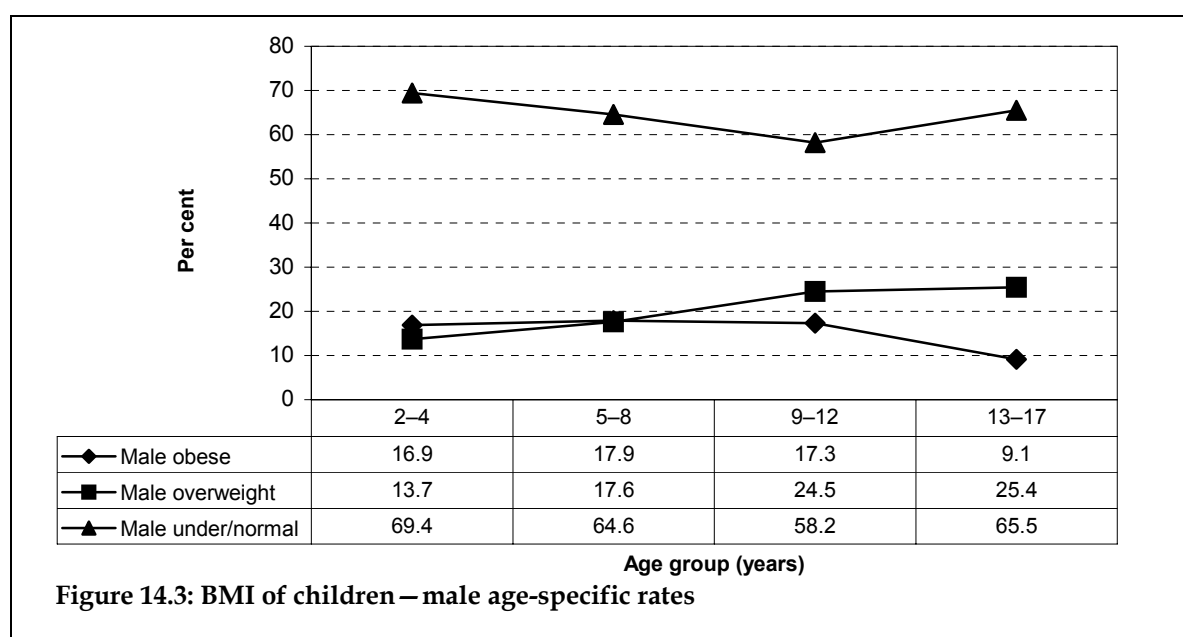
14.4 Smoking

Tobacco smoking is the leading cause of drug-related death and hospital separations in Australia.[45] 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 Australian.[41] 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.[46]

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 this younger patient group to ask for information on smoking and alcohol consumption for survey purposes. In addition, the reliability of this information from patients aged 14–17 years may be compromised if a parent is present at the consultation.

The smoking status of 32,718 adult patients was established at encounters with 996 GPs. Overall, 17.6% of adult patients were daily smokers, 4.3% were occasional smokers, and 28.0% were previous smokers. Significantly more male patients than female patients reported being daily smokers (21.0% compared with 15.4%) (Table 14.2).

It is notable that the prevalence of daily smoking is highest among young adult patients (aged 18–24 and 25–44), with 24.7% and 26.6% of patients respectively reporting daily smoking. The proportion of smokers decreased with age: only 6.2% of male and 4.3% of female patients aged 75 years and over reported daily smoking (Figures 14.5 and 14.6). However, 61.3% of male and 24.6% of female patients aged 75 years and over stated they were previous smokers.

Table 14.2: Patient smoking status (aged 18 years and over)

Smoking status	Male[a]			Female[a]			Total respondents		
	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL
Daily	21.0	20.0	22.1	15.4	14.6	16.1	17.6	16.8	18.3
Occasional	4.5	3.5	5.4	4.2	3.6	4.9	4.3	3.9	4.8
Previous	37.3	36.2	38.5	22.0	21.2	22.8	28.0	27.3	28.8
Never	37.2	36.0	38.3	58.4	57.3	59.5	50.1	49.1	51.0
Total (*n*, %)	**12,692**	**100.0**	**—**	**19,780**	**100.0**	**—**	**32,718**	**100.0**	**—**

(a)   Patient sex was unknown for 246 respondents.

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

	18–24	25–44	45–64	65–74	75+
Male daily	30.0	34.6	21.3	11.1	6.2
Male previous	11.1	17.9	37.8	53.1	61.3
Male never	49.0	40.4	36.8	33.3	31.7

Age group (years)
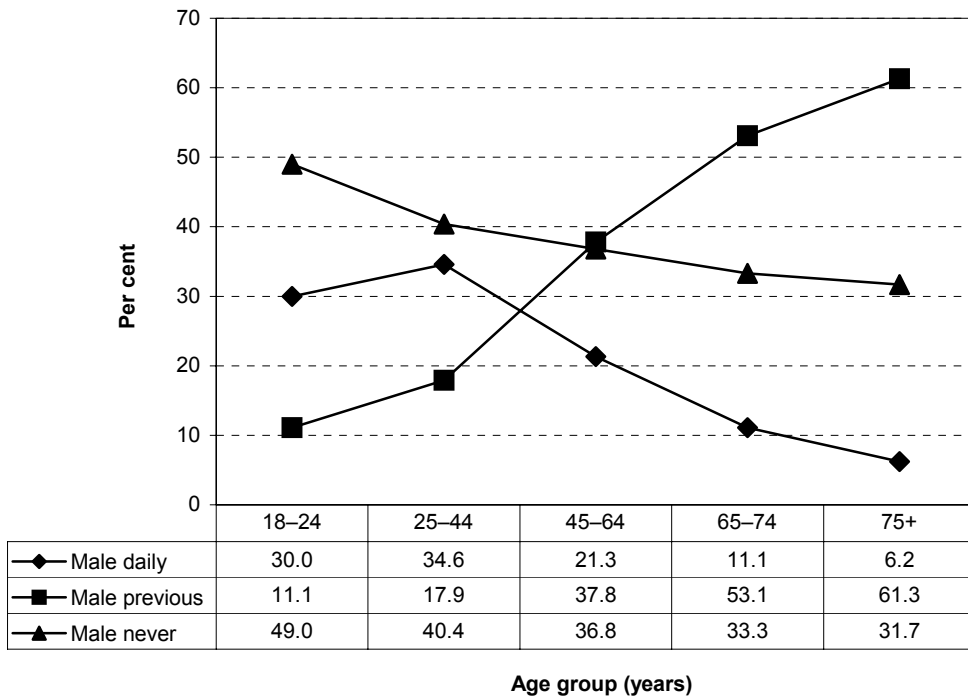
Figure 14.5: Smoking status—male age-specific rates

	18–24	25–44	45–64	65–74	75+
Female daily	22.0	22.1	16.3	7.7	4.3
Female previous	12.2	20.5	23.3	26.0	24.6
Female never	55.7	50.9	57.1	64.8	70.2

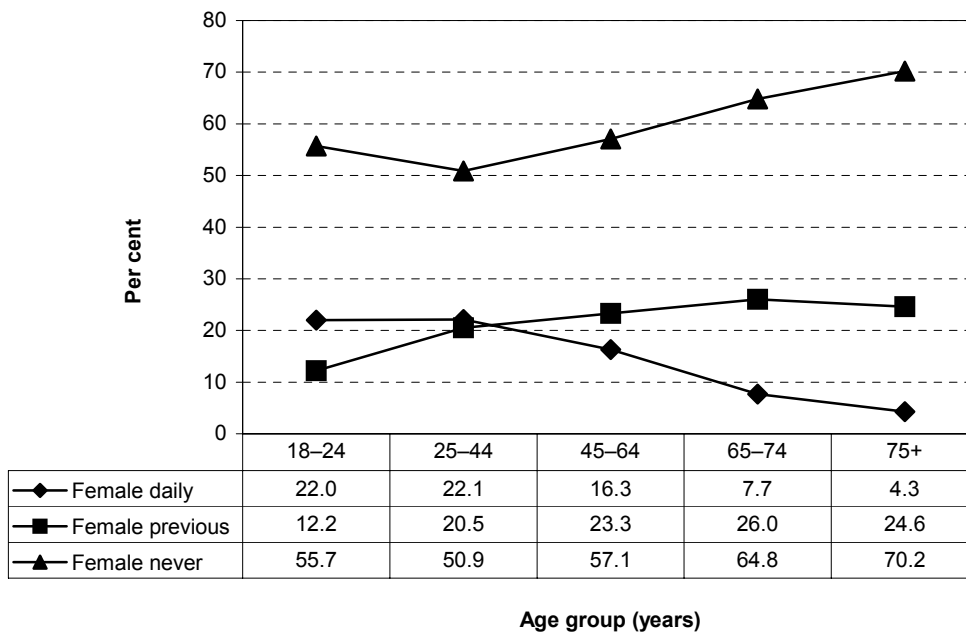Age group (years)

Figure 14.6: Smoking status—female age-specific rates

14.5 Alcohol consumption

In people aged 65 years and over, low to moderate consumption of alcohol has been found to have a preventative effect against selected causes of morbidity and mortality (e.g. cardiovascular disease).[45] The beneficial impact of low alcohol consumption has been found to prevent more mortality than harmful alcohol consumption causes.[45] 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%.[41]

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.[46] This risk level of alcohol consumption was based on the National Health and Medical Research Council 2001 Guidelines.[47] 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.[46]

To measure alcohol consumption, BEACH uses three items from the WHO Alcohol Use Disorders Identification Test (AUDIT),[48] with scoring for an Australian setting.[49] 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.[49]

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 were changed from 2001–02 onwards to reflect exactly the AUDIT instrument from which they 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 reported for the fourth, fifth and sixth years (2001–02, 2002–03 and 2003–04) compared with the first three years of the BEACH program. The data collected from 2001–02 onwards are a more accurate reflection of the alcohol consumption of general practice patients.

Responses to these questions were recorded at 31,721 patient encounters (18 years and over) from 994 GPs. Overall, 26.7% of patients reported drinking alcohol at risk levels. The proportion of at-risk drinkers was higher for male patients than for female patients (33.1% compared with 22.6%) (Table 14.3).
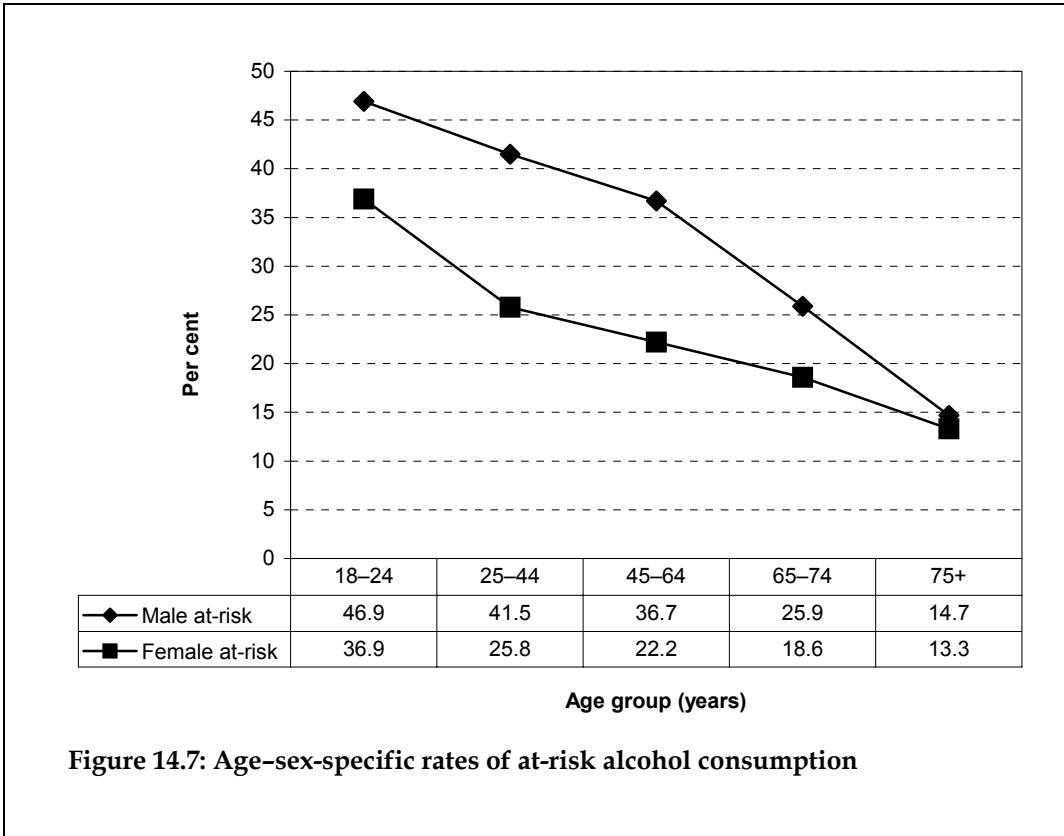
The highest proportion of at-risk drinkers was in the 18–24 age group, where almost half of the males (46.9%) and more than a third of females (36.9%) reported at-risk alcohol consumption. The proportion of patients who were at-risk drinkers decreased with age for both males and females (Figure 14.7).

These estimates are a little lower than those made from the NDSHS.[46] 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 less likely to report drinking alcohol at at-risk levels.

Table 14.3: Patient alcohol consumption (aged 18 years and over)

Alcohol consumption	Male			Female			Total respondents		
	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL	Per cent	95% LCL	95% UCL
At-risk drinker	33.1	31.9	34.3	22.6	21.7	23.6	26.7	25.8	27.6
Responsible drinker	47.3	46.1	48.5	43.5	42.4	44.5	45.0	44.1	45.8
Non-drinker	19.6	18.5	20.7	33.9	32.7	35.2	28.4	27.3	29.4
Total (*n*, %)	**12,334**	**100.0**	—	**19,387**	**100.0**	—	**31,721**	**100.0**	—

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

	18–24	25–44	45–64	65–74	75+
Male at-risk	46.9	41.5	36.7	25.9	14.7
Female at-risk	36.9	25.8	22.2	18.6	13.3

Age group (years)

Figure 14.7: Age–sex-specific rates of at-risk alcohol consumption

14.6 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, making it possible 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 to be risk factors.

A risk factor profile was prepared for 30,713 adult patients (aged 18 or more). Of the three measured risk factors, almost half of adult patients (49.0%) had one risk factor. Being overweight or obese accounted for three-quarters of these single risk factor patients (74.2%). One in five patients (19.8%) had two risk factors. The three most common combinations when a patient had two risk factors all involved drinking at risk levels. At-risk alcohol consumption in combination with being overweight was most common (35.5% of patients with two risk factors) followed by daily smoking (19.9%) then obesity (19.5%). A small minority (4.0%) of patients reported having all three risk factors (Table 14.4).

Overall, female patients reported significantly lower levels of risk factors than males. Almost a third of females (31.2%) reported not having any of the measured risk factors, compared with 21.2% of males. About a quarter of males (25.9%) had two risk factors compared with 15.9% of females (Table 14.5).

Table 14.4: Risk factor profile of patients (aged 18 years and over)

Number of risk factors	Number	Per cent of patients (*n*=30,713)	95% LCL	95% UCL
None	**8,365**	**27.2**	**26.4**	**28.1**
One	**15,060**	**49.0**	**48.4**	**49.7**
Overweight only	6,694	21.8	21.2	22.4
Obese only	4,480	14.6	14.1	15.1
At-risk alcohol level only	2,494	8.1	7.6	8.7
Current daily smoker only	1,392	4.5	4.1	4.9
Two	**6,072**	**19.8**	**19.2**	**20.4**
Overweight and at-risk alcohol level	2,153	7.0	6.6	7.4
Daily smoker and at-risk alcohol level	1,211	3.9	3.6	4.3
Obese and at-risk alcohol level	1,184	3.9	3.5	4.2
Overweight and current daily smoker	893	2.9	2.6	3.2
Obese and current daily smoker	631	2.1	1.7	2.4
Three	**1,216**	**4.0**	**3.6**	**4.4**
Overweight and current daily smoker and 'at-risk' alcohol level	758	2.5	2.1	2.8
Obese and current daily smoker and 'at-risk' alcohol level	458	1.5	1.1	1.9

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

Table 14.5: Number of risk factors, by patient sex

Number of risk factors	Number	Per cent of patients	95% LCL	95% UCL
Male patients	**11,999**	**100.0**	—	—
Zero	2,534	21.2	20.1	22.1
One	5,631	46.9	45.9	47.9
Two	3,105	25.9	25.0	26.8
Three	729	6.1	5.2	6.9
Female patients	**18,714**	**100.0**	—	—
Zero	5,831	31.2	30.2	32.1
One	9,429	50.4	49.6	51.2
Two	2,967	15.9	15.2	16.5
Three	487	2.6	2.0	3.2
Total patients	**30,713**	—	—	—

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

14.7 Changes from 1999–00 to 2003–04

The proportion of adults classified as obese according to their self-reported height and weight showed a significant increase over the five years (19.4% in 1999–00 compared with 22.0% in 2003–04). The proportion classified as overweight has increased (33.1% in 1999–00 compared with 34.5% in 2003–04), but just fails to reach significance. In 1999–00, 52.5% of patients were overweight or obese, compared with 56.5% in 2003–04 (Appendix 5, Table A5.18). The increase in obese patients over the period corresponds with a significant decrease in patients of normal weight from 39.1% in 1999–00 to 36.3% in 2003–04 (results not shown).

Overall, 13.2% (95% CI: 10.5–16.0) of children were considered obese, and a further 19.0% (95% CI: 17.0–21.0) were defined as overweight in 2003–04. The proportion classified as overweight (19.0%, 95% CI: 17.0–21.0) has increased significantly since 2000–01 (15.3%, 95% CI: 13.8–16.8) when BMI for children was first reported.[10]

The proportion of adults attending general practice who reported being daily smokers in 2003–04 (17.6%) was significantly lower than in 2000–01 (19.3%) (Appendix 5, Table A5.18).

The proportion of adult patients consuming at-risk levels of alcohol has remained consistent from 2001–02 to 2003–04 (Appendix 5, Table A5.18).

15 Discussion

This report has provided a picture of the current activities of GPs, particularly the more frequent events which together make up a large part of their workload. The generalist nature of their practice is clearly demonstrated by the breadth of problems managed and the wide variety of management techniques utilised. This report has shown that medication is the most common form of problem management, but that only 57% of problems managed generate a prescription and management of a problem by medication alone applies to less than 40% of all problems managed. It has demonstrated the importance of counselling and advice in a GP's working day as it is used in the management of one in five problems. Procedural work has also been shown to remain important, undertaken in the management of one in every ten problems. The relatively small number of patients admitted to hospital or referred to the emergency department indicates the extent to which patients are cared for in the community. The fact that one in every 13 problems is referred to a specialist reflects the collaborative approach to management of ambulatory patients by GPs and specialists in Australia. Rates of referrals to allied health services remain relatively low. However, the recent introduction of a Medicare item for some allied health services for selected patients[50] may affect such referral rates in the future.

These data provide other researchers with a national average against which they can compare smaller studies. The large sample size underlying these data and the consequent accuracy of the estimates reported also allow researchers to plan studies of specific problems and their management by providing better estimates of required GP sample size through a knowledge of the likely occurrence of the event of interest. They provide health care planners with an up-to-date view of the common issues taken to and managed by GPs, and an opportunity to relate prescribing patterns and costs to the management of specific types of conditions.

This report provides a national picture of general practice. Those interested in information about general practice activity in a single state or territory should consult the recent state and territory report of findings from the first five years of the BEACH program—*General Practice Activity in the States and Territories of Australia 1998–2003*.[51]

There have clearly been changes in the characteristics of the practising GP population over the last decade. Charles et al. found that the Australian GP workforce is becoming proportionally more female, older, more likely to work fewer sessions per week, more likely to hold Fellowship of the RACGP, more likely to work in large practices, and increasingly more likely to have graduated overseas.[30] We know from previous research that changes in such characteristics can influence style of practice. For example, the practice style of FRACGPs has been shown to differ from that of non-FRACGPs,[52] and women practice differently from men.[53]

There have also been changes in the patients encountered by GPs in Australia. For example, the proportion of encounters that are with children is decreasing while the proportion with older people is increasing—perhaps reflecting the ageing of the Australian population. This will also have an impact on the work undertaken by GPs and its effect will be gradual over time.

The top ten problems managed by GPs in Australia made up about 25% of the total morbidity workload of GPs. Hypertension remains the most frequently managed, as it has been for the past 15 years.[23] While upper respiratory tract infection remains in second place

its management rate is gradually decreasing, reflecting a measured decrease in patient presentations with this problem.

Some topics were selected for more detailed investigation and these were presented in Chapter 13. Such specific analyses can be applied to any problem, medication, test or referral type or patient group—the options are almost endless. The topics were therefore chosen on the basis of their topical interest in terms of public health initiatives or developments in treatments. Consideration was also given to whether a significant change in overall management had occurred during the last five years and to the relationship of the subject to the National Health Priority Areas.[6] While the number of topics in this report is limited, the reader should be aware that almost any subject included in the data set could be analysed in this manner (for access details see Section 16.2).

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 consultations at which it is managed). However, there has been no change in its management rate over the last five years. Further, there has been no increase in the rate at which psychological counselling has been recorded by GPs. However, Chapter 13 showed the movement away from the prescription of tricyclic anti-depressants and MAOIs, and towards SSRIs in the management of depression.

In earlier years we have reported the marked increase in the prescription or supply of NSAIDs, as a result of a strong uptake of the coxibs when they were released in 2000. We noted that a considerable proportion of this increase was due to provision of coxibs for musculoskeletal conditions other than arthritis. This year we have shown that the use of coxibs for conditions other than arthritis has decreased steadily since its peak in 2001–02, while their use in the management of arthritis has remained relatively steady.

A significant decrease in the management rate of asthma was found in 2000–01 and this decrease has continued at an average rate of 100,000 fewer encounters per year nationally, even though the estimated prevalence of asthma within the patient population has not changed over this period.[40] 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. A small decrease in the medication rate of asthma preventives together with a considerable decrease in the rate of prescribed/supplied/advised bronchodilators may support the argument that patients are managing their asthma better, thus requiring fewer visits to the GP for acute exacerbations. Alternatively, patients are obtaining bronchodilators directly from pharmacists, and have less need to visit the GP for repeat scripts.

BEACH is the only data source that provides an indication of GP use of clinical treatments such as counselling. With increasing attention being paid to the need for improved health preventive behaviour in the overall population, it is notable that there has been no significant change in the rate at which GPs provide counselling and advice to their patients since the beginning of BEACH in 1998–99. About 25% of patients for whom data were available about their BMI, alcohol consumption and smoking reported carrying two or three of these risk factors: daily smoking, overweight/obesity, and at-risk alcohol consumption. Only 27.2% had none of these risk factors. There would seem to be ample opportunity for GPs to attempt educational interventions with a very large proportion of their attending patients.

The effect of GP and patient educational interventions on practice patterns cannot easily be measured. Often, multiple interventions occur in parallel to system changes. For example, there has been a significant increase in the management rate of non-gestational diabetes from 2.6 per 100 encounters in 1998–99 to 3.3 per 100 encounters in 2003–04, representing an estimated increase of 75,000 extra GP contacts with diabetes each year. This may be a result of the introduction of a Medicare incentive item number for completion of annual diabetes programs.[2]

Increases in pathology order rates have been the subject of another study, the results of which are reported in *Changes in Pathology Ordering by General Practitioners in Australia, 1998–2001.*[38]

15.1 Methodological issues

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. While 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.[7] The cluster effect is dealt with through SAS 8.2 (see Chapter 4).

GP participation rates

The response rate of GPs in the sixth year of BEACH was disappointingly low, 23.7% of those with whom contact was established. This compares with 28.9% in the previous year (BEACH year 5), 32.3% in year 4, 29.8% in year 3, 39.1% in year 2 and 38.4% in the first year (1998–99). One of the difficulties in reliably reporting response rate is the changing size of the denominator. The GP Branch of the DoHA selects the samples from a sample frame made up of all non-specialists who have claimed at least 375 Medicare A1 items of service in the most recent 3 month period available from HIC data. Unfortunately this means that the sample frame includes current Registrars who are not required to undertake QA activities (the major attraction of BEACH to recognised GPs). It also includes temporary visa overseas trained doctors who work under arrangements with the Australian Government, who practice in areas of need and claim A1 items of service. Until 2004 these doctors have not been required to do QA and are not 'recognised GPs'. The annual intake of registrars to the training program for general practice recently increased by 50% from 400 to 600 per year. Added to this is an increase in the number of overseas trained doctors working in areas of need under these special arrangements.

The intent of BEACH is to describe the activities of recognised GPs, yet the denominator (the sample frame) is dynamic and likely to include a varying proportion of non-recognised GPs. Therefore the accuracy of the response rate reported each year for BEACH is limited. It would be preferable if the sample frame included only recognised GPs to provide a more accurate estimate of response rates.

However, the continued decreasing response rate is of concern and the research team believes that a number of system factors have contributed to it.

- One of the main reasons many GPs agree to participate in BEACH is because they receive audit points towards their QA requirements. In recent years a wide range of new options have become available to GPs through the QA Program. When refusing to participate, many GPs have voiced the opinion that there are many other options 'easier' than BEACH but which gain a similar number of points.

- There are increasing demands being made on GPs to participate in a wide range of non-clinical activities such as divisional projects and programs and other audits (such as those offered by the National Prescribing Service), and this may influence the extent to which they are willing to participate in BEACH.

- Sampling issues also affect recruitment levels but these have been reasonably constant influences over the period of the BEACH program. In the sample of GPs provided by the DoHA from the HIC records 8% could not be contacted. A large proportion of these were not practising at the time of recruitment, having retired, died, gone overseas or taken maternity leave since their selection from the HIC records. As the aim is to represent active, practising GPs, the exclusion of these GPs from the sample is a valid and necessary action. However, there were also some GPs who had left the practice to which the BEACH approach letter was sent and could not be traced. In many of these cases, the practice informed recruiting staff that the GP selected had not been at the practice for some years. The number of GPs for whom the current address and/or phone number (provided by the DoHA for this study) are out of date has increased in recent years. This may reflect a change in processes of address recording with increased use by GPs of electronic payment mechanisms. In any case, these problems suggest that the HIC system of practice address registration is not error-free.

The participating GPs were found to be older and to have claimed fewer consultations on average from Medicare in the previous quarter (10.6 fewer consultations per week on average) than those who declined to participate. Some people suggest that this means the participants are 'less busy' than those who decline to participate. This is not necessarily true as the total number of claims depends on both the number of sessions worked per week and the number of consultations conducted per session. Female GPs were slightly over-represented in the sample and women are more likely than men to work part-time so will claim from Medicare fewer consultations over the year than will their male counterparts. Yet a person who works four sessions per week and claims 50 consultations cannot be regarded as 'less busy' than the GP who works 8 sessions per week and claims 100 consultations. Unfortunately there is no method by which we can test the 'busyness' hypothesis because the number of sessions usually worked per week is not available for non-participating GPs. It is possible that the time required to participate in BEACH may be a greater issue for full-time GPs than part-time GPs. BEACH also may offer an avenue for fulfilling RACGP Clinical Audit requirements to part-time GPs who may not be as able to take up other avenues. In any case, the post-stratification weights applied to the encounter data deal with these differences.

Sampling remote areas

It is often said that practising in remote areas is very different from practising in other locations. Only 2.4% of GPs practise in remote areas. As a result, when a random sample of all GPs is drawn, the final sample in remote areas is relatively small (*n*=27) (see Chapter 3). Earlier research has suggested that we should have a minimum of 40 GPs each providing

data regarding 100 encounters (giving a sample of 4,000 encounters) to reliably describe their activity and compare it with others.

A suitable sample could be gained for remote areas if we actively over-sampled these GPs. The cooperation of this small group of practitioners would first need to be established. As there are relatively few, a very high response rate would be required if sufficient numbers of GPs are to be recruited. Alternately, combining all data drawn from remote area GPs during the last few years may give a sufficiently reliable view of their practice activity.

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[54] 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 3). 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 only record problems 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.

Other BEACH applications

Under DoHA funding, the National Consortium for Education in Primary Medical Care offered an alternative pathway to general practice recognition between 2002 and 2004. Practitioners who wished to take this pathway to the FRACGP examination were required to complete 400 hours of education before sitting for the examination. These unrecognised GPs first assess their educational needs so that their educational program can be planned around the individual practitioner. Approximately 100 practitioners have undertaken BEACH for this purpose to date. The clinical activities of this group will be reported in a separate publication.

The General Practice Statistics and Classification Unit (GPSCU) is currently applying the BEACH methods in a study of the experience gained by GP registrars during each stage of their training. These data may assist in better defining the areas in which registrars should receive training and may identify areas in which they are not gaining experience.

15.2 Comparing BEACH data with those from other sources

Users of the data reported in this publication might wish to compare the results with those from other sources, such as that from the HIC.[36] Integration of data from multiple sources can provide a more comprehensive picture of the health and health care of the Australian community, but the user must keep in mind the limitations of each data set and the differences between them. Some examples are presented below.

The Pharmaceutical Benefits Scheme (PBS)

If comparing BEACH prescribing data with data from the PBS, the reader should be aware of the following:

- Total medications in BEACH include those prescribed, supplied to the patient directly by the GP, and those advised for OTC purchase.

- Each prescription recorded in the BEACH program 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.

- Prescriptions are counted in BEACH irrespective of whether the medication is covered by the PBS for all patients, for those holding a Commonwealth concession card or for those who have reached the safety net threshold.

- The BEACH data do not provide information on the number of prescriptions not filled by the patient (and neither does the PBS).

In contrast, the PBS data:

- count the prescription each time it crosses the pharmacist's counter

- count only prescribed medications subsidised by the PBS and costing more than the minimum subsidy and which are therefore covered by the PBS for all patients, or are prescribed for those holding a Commonwealth concession card or for those who have reached the safety net threshold. Note that the set of drugs that satisfy these criteria changes with each change in the PBS threshold—when the threshold increases, as it will in January 2005, there will be more drugs that are not counted in the PBS for non-Commonwealth concession card holders.

These differences will influence not only the numbers of prescriptions counted but also their distribution. For example, the majority of hormone replacement therapies (HRTs) currently fall under the PBS minimum subsidy level and would not be counted in the PBS data unless patients receive the medication under the PBS because they are a Commonwealth concession card holder or have reached the annual safety net threshold. The PBS would therefore under-estimate the number of HRT prescriptions filled and the proportion of total medications accounted for by HRTs.

Medicare Benefits Schedule (MBS) items

If comparing the BEACH data with Medicare data, the reader should remember the following:

- The MBS data provided by the DoHA do not usually include data about patients and encounters funded through the Department of Veterans' Affairs. The effect of this on comparisons between data sets was demonstrated in Chapter 4 (Section 4.3) in the comparison of the age–sex distribution of patients at A1 encounters in BEACH with that for the MBS A1 items of service.

- 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 because additional services attracting their own item number (e.g. 30026—repair of wound) are counted as actions in other parts of the form. This results in a lesser number of 'other' Medicare items than would be counted in the Medicare data.

- The BEACH database includes data about all clinical activities, not only those billed to the MBS. Both direct (patient seen) and indirect (patient not seen but a clinical activity undertaken) consultations are recorded. Some of these are paid by other funding sources (e.g. state health departments, private insurance companies, workers compensation), and some are provided free of charge by the GP (see Chapter 5). In contrast, the MBS data include only those GP services that have been billed to Medicare.

- 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.[55] 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 whole population rather than the minority.

Pathology data from the MBS

The BEACH database includes details of pathology tests ordered by the participating GPs. When comparing these data with those in the MBS, readers should remember the following:

- BEACH reflects the GP's intent that the patient have the pathology test(s) done, and information about the extent to which patients do not have the test done is not available.

- Each pathology company can respond differently to a specific test order label recorded by the GP. Further, the pathology companies can charge through the MBS only for the three most expensive tests undertaken even where more were actually undertaken. This is called 'coning' and is part of the DoHA pathology payment system.

- Pathology MBS items contain pathology tests grouped on the basis of cost. An item may therefore not give a clear picture of the precise tests performed.

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 would result in an under-estimate of the number of HbA1c tests being ordered by GPs.

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*.[35] A study of changes in pathology ordering patterns between 1998–99 and 2000–01 has also recently been released[38] and is available through the Family Medicine Research Centre website <http://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 are free to decide whether or not 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 will find more detailed information from the BEACH program in *Imaging Orders by General Practitioners in Australia 1999–00*,[37] also available from the Family Medicine Research Centre website.

16 Conclusion

This report has provided an updated description of the major aspects of general practice activity in Australia in 2003–04. It has also provided a further measure of the changes that have occurred in general practice since 1999–00.

Readers should be aware that Appendix 5 provides a summary of the results of the more common events recorded in BEACH in each of the last 5 years. This acts as an easy reference point for trends in data pertaining to the more common aspects of general practice. This appendix also includes a summary of the results for the total 5-year data set. This provides more accurate estimates with tighter confidence intervals for most events than do any single year's data.

16.1 Current status of BEACH

The BEACH program is now in its seventh year. The database for the first 6 years includes data pertaining to approximately 600,000 GP–patient encounters from about 6,000 GPs. Each year the GPSCU 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 for the more common events. 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 2001–02, and a comparative study of general practice activity in each of the states and territories of Australia. These and other BEACH reports can be downloaded from <http://www.fmrc.org.au/publications/> (go to Books—General Practice Series) or from <http://www.aihw.gov.au/publications/>.

16.2 Access to BEACH data

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.

There are also many papers on a wide range of topics available in journals and professional magazines. All published material is listed in Appendix 6 of this report.

Abstracts of results for the substudies conducted in the sixth year of the program and not reported in this document have been added to the list of abstracts on the website of the Family Medicine Research Centre (of which the GPSCU is a part) at <http://www.fmrc.org.au/publications/SAND_abstracts.htm>. The subjects covered in the abstracts are listed in Table 16.1 with an indication of the number of GPs and the number of encounters in each subsample.

Analysis of the BEACH data is a complex task. The GPSCU has therefore designed standard report formats that cover most aspects of the subject under investigation. Examples of a problem-based standard report (the subject is warts) and a pharmacological-based standard

report (subject allopurinol) for a single year's data are available on our website, <http://www.fmrc.org.au/purchase.htm>. They give potential users an opportunity to see the types of information provided in such a report.

Standard reports are also 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 (e.g. all recorded cases of provision of psychological counselling; all orders for a full blood count).

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

Table 16.1: SAND abstracts for 2002–03 and sample size for each

Abstract number	Subject	Number of encounters	Number of GPs
55	Patient weight, perception of weight and weight loss	2,969	99
56	Prevalence, cause and severity of adverse pharmacological events	8,215	282
57	Prevalence and management of chronic heart failure in general practice patients	2,641	91
58	Lipid lowering medications: patient eligibility under PBS	2,732	93
59	Hypertension management and control in general practice patients	2,647	92
60	Prevalence of GORD and associated proton pump inhibitor use	2,538	88
61	Prevalence of chronic illnesses identified as National Health Priority Areas among general practice patients	8,911	299
62	Use of proton pump inhibitors by general practice patients	5,245	182
63	Asthma—prevalence, management and medication side-effects	2,527	87
64	Current use of statins by general practice patients	3,202	109
65	Language and cultural background of general practice patients	9,245	311
66	Anti-psychotic medication use by general practice patients	3,338	117

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.

The GPSCU now provides participating organisations direct access to straightforward analyses on any selected problem or medication in real time, 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 GPSCU should be contacted for further information. Contact details are provided at the front of this publication.

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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*

  - *Surgery consultations:* Encounters identified by any one of MBS item numbers 3, 23, 36, 44.

  - *Home visits:* Encounters identified by any one of MBS item numbers 4, 24, 37, 47.

  - *Hospital 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.

- *Other institutional visits:* Encounters identified by any one of MBS item numbers 13, 25, 38, 40.

- *Other 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, advised for over-the-counter purchase or provided by the GP at the encounter.

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:

- *New:* The medication prescribed/advised/provided at the encounter is being used for the management of the problem for the first time.

- *Continuation:* The medication prescribed/advised/provided at the encounter 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.[2]

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 nursing home 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 re-uptake inhibitor medications for depression.

Statins: HMG CoA reductase inhibitors used to lower cholesterol.

Abbreviations

ACE	Angiotensin converting enzyme
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
DoHA	Australian Government Department of Health and Ageing
DVA	Australian Department of Veterans' Affairs
EHRs	Electronic health records
Enc	Encounter
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, University of Sydney, a collaborating unit of the Australian Institute of Health and Welfare
HbA1c	Haemoglobin, type A1c
HIC	Health Insurance Commission
HIV	Human immunodeficiency virus
HMG-CoA	3-hydroxy-3-methylglutaryl coenzyme A
HRT	Hormone replacement therapy
ICPC	International Classification of Primary Care
ICPC-2	International Classification of Primary Care (Version 2)
ICPC-2 PLUS	An extended vocabulary of terms classified according to ICPC-2
LCL	Lower confidence limit
MAOI	Monoamine oxidase inhibitor
MBS	Medicare Benefits Schedule
MC&S	Microscopy, culture and sensitivity
MRI	Magnetic resonance imaging
NDSHS	National Drug Strategy Household Survey 2001
NEC	Not elsewhere classified

NESB	Non-English-speaking background, i.e. a language other than English is spoken at home
NOS	Not otherwise 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 Area classification
SAND	Supplementary Analysis of Nominated Data
SAS	Statistical Analysis System
SRS	Simple random sample
SSRI	Selective serotonin re-uptake inhibitors
UCL	Upper confidence limit
URTI	Upper respiratory tract infection
WHO	World Health Organization
Wonca	World Organization of Family Doctors
—	Not applicable
. .	Not available

Appendices

Appendix 1: Example of a 2003–04 recording form

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

		Yes / No	
New Patient	☐ ☐	PATIENT SEEN .... ☐	
Health Care/Benefits Card	☐ ☐	PATIENT NOT SEEN ..... ☐	

START Time ⌊ : ⌋ AM / PM (please circle)	Patient Reasons for Encounter

1.
2.
3.

	Yes / No
Veterans Affairs Card	☐ ☐
NESB	☐ ☐
Aboriginal	☐ ☐
Torres Strait Islander	☐ ☐

Item No: (if applicable) ⌊ ⌋

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

Diagnosis/ Problem ① :   Problem Status   New ☐ Old ☐

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

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

Diagnosis/ Problem ② :   Problem Status   New ☐ Old ☐

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

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

Diagnosis/ Problem ③ :   Problem Status   New ☐ Old ☐

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

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

Diagnosis/ Problem ④ :   Problem Status   New ☐ Old ☐

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

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

NEW REFERRALS, ADMISSIONS Problem(s)	**IMAGING/Other tests** Body site Problem(s)	**PATHOLOGY** Problem(s)	**PATHOLOGY**(cont) Problem(s)
1. _____ 1 2 3 4	1. _____ - _____ 1 2 3 4	1. _____ 1 2 3 4	4. _____ 1 2 3 4
2. _____ 1 2 3 4	2. _____ - _____ 1 2 3 4	2. _____ 1 2 3 4	5. _____ 1 2 3 4
		3. _____ 1 2 3 4	

Patient reported Height ⌊ ⌋ cm Weight ⌊ ⌋ kg	To the patient if 18+: Which best describes your smoking status?	To the patient if 18+: How often do you have a drink containing alcohol?	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?	FINISH Time

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

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)

BA6

Appendix 2: GP characteristics questionnaire for 2003–04

The University of Sydney at Westmead Hospital

General Practice Statistics and Classification Unit
Family Medicine Research Centre

Doctor Identification Number   Please write your QA No. here

a collaborating unit of the
Australian Institute of
Health and Welfare   **AIHW**

Please fill in boxes or circle answers where appropriate

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 currently a GP registrar?............. Yes / No

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

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

12. Is this practice accredited ?.................... Yes / No

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

14. Do you bulk bill?
   - Yes - all patients...1
   - Yes - Pension/Healthcare Card only....................2
   - Yes - selected mixture of patients.......................3
   - No 4

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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 ....*(Please circle as many as 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. To what extent are computers used at your major practice address? *(Circle as many as apply)*
   - Not at all..1
   - Billing 2
   - Prescribing 3
   - Medical Records 4
   - Other Admin 5
   - Internet / Email 6

18. What are the normal after-hours arrangements for your practice? *(Circle as many as 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

19. Is your major practice site a teaching practice?
   - for undergraduates... 1
   - for GP registrars... 2
   - No.. 3

20. Is there a practice nurse at your major practice?
   - No... 1
   - Yes - full time 2
   - Yes - part time - _____days per week............. 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.

Appendix 3: Code groups from ICPC-2 and ICPC-2 PLUS

Table A3.1: Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
REASONS FOR ENCOUNTER AND PROBLEMS MANAGED			
Abdominal pain	D01		Pain/cramps; abdominal general
	D06		Pain; abdominal localised; other
Abnormal test results	A91		Abnormal results investigations NOS
	B84		Abnormal white cells
	U98		Abnormal urine test NOS
	X86		Abnormal Pap smear
Anaemia	B80		Iron deficiency anaemia
	B81		Anaemia; vitamin B12/folate deficiency
	B82		Anaemia other/unspecified
Anxiety	P01		Feeling anxious/nervous/tense
	P74		Anxiety disorder/anxiety state
Arthritis		L70009	Arthritis; pyogenic
		L70010	Arthritis; viral
		L81003	Arthritis; traumatic
		L83010	Arthritis; spine cervical
		L84003	Arthritis; spine
		L84023	Arthritis; spine thoracic
		L84024	Arthritis; spine lumbar
		L84025	Arthritis; lumbosacral
		L84026	Arthritis; sacroiliac
		L89004	Arthritis; hip
		L90004	Arthritis; knee
		L91007	Arthritis; degenerative
		L91009	Arthritis
		L91010	Arthritis; acute
		L91011	Arthritis; allergic
		L91012	Polyarthritis
		L91013	Arthritis; hands/finger(s)
		L91014	Arthritis; wrist
		L92006	Arthritis; shoulder
		S91002	Arthritis; psoriatic
		T99063	Arthritis; crystal (excl. gout)

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Back complaint	L02		Back symptom/complaint
	L03		Low back symptom/complaint
	L86		Back syndrome with radiating pain
Check-up—all	–30		Medical examination/health evaluation, complete
	–31		Medical examination/health evaluation, partial
	X37		Pap smear
Check-up—ICPC chapter	A30; A31		General
	B30; B31		Blood
	D30; D31		Digestive
	F30; F31		Eye
	H30; H31		Ear
	K30; K31		Cardiovascular
	L30; L31		Musculoskeletal
	N30; N31		Neurological
	P30; P31		Psychological
	R30; R31		Respiratory
	S30; S31		Skin
	T30; T31		Endocrine
	U30; U31		Urology
	W30; W31		Prenatal/postnatal
	X30; X31; X37		Female genital
	Y30; Y31		Male genital
	Z30; Z31		Social
Depression	P03		Feeling depressed
	P76		Depressive disorder
Diabetes—non-gestational	T89		Diabetes; insulin-dependent
	T90		Diabetes; non-insulin-dependent
Diabetes—all	T89		Diabetes; insulin-dependent
	T90		Diabetes; non-insulin-dependent
	W85		Gestational diabetes

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Fracture	L72		Fracture; radius/ulna
	L73		Fracture; tibia/fibia
	L74		Fracture; hand/foot bone
	L75		Fracture; femur
	L76		Fracture; other
		L84019	Fracture; compression; spine
		L99017	Fracture; non-union
		L99018	Fracture; pathological
		L99019	Fracture; malunion
		L99095	Fracture; stress
		N54005	Decompression; fracture; skull
		N80012	Fracture; skull (base)
		N80013	Fracture; skull
		N80014	Injury; head; fracture
Hypertension/high BP (RFEs)	K85		Elevated blood pressure without hypertension
	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
		W81002	Hypertension; pre-eclamptic
		W81003	Hypertension in pregnancy
Hypertension (problems)	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
		W81002	Hypertension; pre-eclamptic
		W81003	Hypertension in pregnancy
Immunisation	A44		Preventive immunisation/medication—general/unspecified
		D44002	Immunisation; typhoid
		D44003	Immunisation; mumps
		D44004	Immunisation; digestive
		D44007	Immunisation; hepatitis
		D44009	Immunisation; hepatitis A
		D44010	Immunisation; hepatitis B
		D44016	Medication; prevent; hepatitis
		D44018	Immunisation; hepatitis A & B
	N44		Preventive immunisation/medication; neurological
	R44		Preventive immunisation/medication; respiratory
Ischaemic heart disease	K74		Ischaemic heart disease without angina
	K76		Ischaemic heart disease with angina

(continued)

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Lipid disorders	T93		Lipid disorder
		T99075	Lipodystrophy
Menstrual problems	X02		Pain; menstrual
	X03		Pain; intermenstrual
	X05		Menstruation; absent/scanty
	X06		Menstruation; excessive
	X07		Menstruation; irregular/frequent
	X08		Intermenstrual bleeding
	X09		Premenstrual symptoms/complaint
	X10		Postponement of menstruation
Oral contraception	W10		Contraception; postcoital
	W11		Oral contraceptive
	W50		Medication; reproductive system
Osteoarthritis		L83011	Osteoarthritis; spine; cervical
		L84004	Osteoarthritis; spine
		L84009	Osteoarthritis; spine; thoracic
		L84010	Osteoarthritis; spine; lumbar
		L84011	Osteoarthritis; lumbosacral
		L84012	Osteoarthritis; sacroiliac
		L89001	Osteoarthritis; hip
		L90001	Osteoarthritis; knee
		L91001	Osteoarthritis; degenerative
		L91003	Osteoarthritis
		L91008	Heberdens nodes
		L91015	Osteoarthritis; wrist
		L92007	Osteoarthritis; shoulder
Pregnancy	W01		Question of pregnancy
	W78		Pregnancy
	W79		Unwanted pregnancy
Prescription	–50		Medication prescription/request/renewal/injection
Rash	S06		Localised redness/erythema/rash of skin
	S07		Generalised/multiple redness/erythema/rash skin
Rheumatoid arthritis	L88		Rheumatoid arthritis

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Sprain/strain		L19014	Strain; muscle(s)
	L77		Sprain/strain; ankle
	L78		Sprain/strain; knee
	L79		Sprain/strain; joint NOS
		L83023	Sprain; neck
		L83024	Strain; neck
		L83025	Whiplash injury; neck old
		L84020	Sprain; back
		L84021	Strain; back
Swelling (skin)	S04		Localised swelling/papules/lump/mass/skin/tissue
	S05		Generalised swelling/papules/lumps/mass/ skin/tissue
Test results	–60		Results test/procedures
	–61		Results examinations/test/record/letter other provider
Tonsillitis	R76		Tonsillitis; acute
	R90		Hypertrophy; tonsils/adenoids
Urinary tract infection	U70		Pyelonephritis/pyelitis
	U71		Cystitis/urinary infection other
CLINICAL TREATMENTS			
Advice/education		A45002	Advice/education
		B45002	Advice/education; blood
		D45002	Advice/education; digestive
		F45002	Advice/education; eye
		H45002	Advice/education; ear
		K45002	Advice/education; cardiovascular
		L45002	Advice/education; musculoskeletal
		N45002	Advice/education; neurological
		P45001	Advice/education; psychological
		R45002	Advice/education; respiratory
		S45002	Advice/education; skin
		T45002	Advice/education; endocrine/metabolic
		U45002	Advice/education; urology
		W45004	Advice/education; reproductive
		X45002	Advice/education; genital; female
		Y45002	Advice/education; genital; male
		Z45002	Advice/education; social

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical treatments (continued)		
Advice/education—medication	A45015	Advice/education; medication
	A48003	Review; medication
	A48005	Increased; drug dosage
	A48006	Decreased; drug dosage
	A48007	Change (in); drug dosage
	A48008	Stop medication
	A48009	Recommend medication
	A48010	Change (in); medication
	A48011	Medical; request; refusal
Advice/education—treatment	A45016	Advice/education; treatment
	A45019	Advice/education; time off work
	A45020	Advice/education; rest/fluids
	A45021	Advice/education; naturopathic treatment
	A48004	Review; treatment
	S45004	Advice/education; RICE
	T45004	Advice/education; diabetes
	T45009	Advice; home glucose monitoring
Counselling/advice—alcohol	P45005	Advice/education; alcohol
	P58009	Counselling; alcohol
Counselling/advice—exercise	A45004	Advice/education; exercise
	A58005	Counselling; exercise
Counselling/advice—health/body	A45005	Advice/education; health
	A45009	Health promotion
	A45010	Information; health
	A45011	Health promotion; injury
	A45018	Advice/education; body
	A45026	Advice/education; hygiene
	A45028	Advice/education; posture
	A58006	Counselling; health
Counselling/advice—lifestyle	P45008	Advice/education; lifestyle
	P58012	Counselling; lifestyle
Counselling/advice—nutrition/weight	A45006	Advice/education; diet
	T45005	Advice/education; nutritional
	T45007	Advice/education; weight management
	T45010	Weight management
	T58002	Counselling; weight management

(continued)

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical treatments (continued)		
Counselling/advice—prevention	A45025	Advice/education; immunisation
	A58007	Counselling; prevention
	X45004	Advice/education; breast self exam
	Z45005	Advice/education; environment
Counselling/advice—smoking	P45004	Advice/education; smoking
	P58008	Counselling; smoking
Counselling—problem	A58002	Counselling; problem
	A58003	Counselling; individual
	B58001	Counselling; problem; blood/blood-forming
	D58001	Counselling; problem; digestive
	F58001	Counselling; problem; eye
	H58001	Counselling; problem; ear
	K58001	Counselling; problem; cardiovascular
	L58001	Counselling; problem; musculoskeletal
	N58001	Counselling; problem; neurological
	R58001	Counselling; problem; respiratory
	S58001	Counselling; problem; skin
	T58001	Counselling; problem; endocrine/metabolic
	U58001	Counselling; problem; urology
	W58003	Counselling; problem; reproductive
	X58001	Counselling; problem; genital; female
	X58003	Counselling; sexual; physical; female
	Y58001	Counselling; problem; genital; male
	Y58003	Counselling; sexual; physical; male
	Z58002	Counselling; problem; social
Counselling—psychological	P58001	Counselling; psychiatric
	P58002	Psychotherapy
	P58004	Counselling; psychological
	P58005	Counselling; sexual; psychological
	P58006	Counselling; individual; psychological
	P58007	Counselling; bereavement
	P58013	Counselling; anger
	P58014	Counselling; self-esteem
	P58015	Counselling; assertiveness
	P58018	Therapy; group
	P58019	Cognitive behavioural therapy
Family planning	A98002	Counselling; genetic female
	A98003	Counselling; genetic male
	W45006	Advice/education; preconceptual

(continued)

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Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical treatments (continued)		
Family planning (continued)	W45007	Advice/education; contraception
	W45008	Advice/education; family plan; female
	W58001	Counselling; abortion
	W58005	Counselling; terminate pregnancy
	W58007	Counselling; preconceptual
	W58012	Counselling; sterilisation; female
	W58013	Counselling; family planning; female
	Y45006	Advice/education; family plan; male
	Y45007	Advice/education; contraception; female
	Y58005	Counselling; sterilisation; male
	Y58006	Counselling; family planning; male
Administrative procedure	–62 (excluding sickness certificate A62008	
Reassurance/support	A58010	Reassurance/support
Sickness certificate	A62008	Admin; certificate; sickness
PROCEDURES		
Incise/drainage/flushing/aspiration/ removal body fluid	–51	
Excision/removal tissue/biopsy/ destruction/debridement/cauterisation	–52	
Instrumentation/catheterisation/ intubation/dilation	–53	
Repair/fixation–suture/cast/prosthetic device (apply/remove)	–54	
Local injection/infiltration	–55	
	A50006	Injection
Dressing/pressure/compression/ tamponade	–56	
Physical therapy/rehabilitation	–57	
Other procedures/minor surgery NEC	–59	
CLINICAL MEASUREMENTS		
Electrical tracings	–42	
	K41003	Cardiogram
Pap smear	X37001	Pap smear
	X37003	Test; cytology; genital; female
	X37004	Vault smear
	X37005	Pap smear; thin prep
Physical function test	–39	
Urine test	A35001	Test; urine
	A35002	Urinalysis

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical measurements (continued)		
Urine test (continued)	B35001	Test; urine; blood
	P35001	Test; urine; psychological
	T35001	Test; urine; endocrine/metabolic
	U35002	Test; urine; urology
	W33001	Test; urine; pregnancy
	W35001	Test; urine; reproductive
	X35001	Test; urine; genital; female
	Y35001	Test; urine; genital; male
REFERRALS		
Allied health services	–66	Referral to other provider/nurse/therapist/social worker
	–68 excluding A68011; Z68003 and Z68004	Other referrals NEC
	Z67002	Referral; respite care
Specialist	–67 excluding A67010; A67011; A67015; A67018; A67020, P67005 and Z67002	Referral to physician/specialist/clinic/hospital
Emergency department	A67011	Referral; A & E
Hospital	A67010	Referral; hospital
	A67015	Referral; hospice
	P67005	Referral; hospital; psychiatrist
Other medical services	A67018	Referral; outpatient department
	A67020	Referral; general practitioner
Other referrals	A68011	Referral
	Z68003	Referral; financial/legal services
	Z68004	Referral; police
PATHOLOGY TEST ORDERS		
Chemistry		
Amylase	D34004	Test; amylase
B12	B34015	Test; B12
	D34009	Test; Schillings
C reactive protein	A34005	Test; C reactive protein
Calcium/phosphate	A34006	Test; calcium
	A34013	Test; phosphate
	A34024	Test; calcium phosphate
Cardiac enzymes	D34005	Test; aspartate aminotransferase
	K34003	Test; cardiac enzymes
	K34004	Test; creatine kinase

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Cardiac enzymes (continued)	T34031	Test; Vitamin D
Chemistry; other	A33023	Test; alpha fetoprotein
	A33026	Test; cancer antigen 125
	A33027	Test; cancer antigen 15.3
	A33028	Test; cancer antigen 19.9
	A33029	Test; carcinoembryonic antigen
	A33037	Test; TAG
	A33041	Test; cancer antigen
	A33050	Test; tumour marker
	A34015	Test; protein
	A34018	Vitamin assay
	A34019	Test; lead
	A34020	Test; blood gas analysis
	A34022	Test; mineral
	A34023	Test; zinc
	A34025	Test; DHEAS
	A34030	Test; biochemistry
	A34031	Test; blood alcohol
	A34032	Test; prolactin
	A34033	Test; testosterone
	A34037	Test; Glutathione S-transferase
	A34038	Test; magnesium
	A35004	Test; urine sodium
	A35007	Test; urine; albumin
	A35008	Test; albumin creatine ratio
	B34023	Test; transferrin
	D34002	Test; alanine aminotransferase
	D35002	Test; 5-HIAA
	K34001	Test; blood; digitalis
	K34006	Test; amino acids
	K34007	Test; troponin
	K34009	Test; homocysteine
	N34001	Test; blood; phenylhydantoin
	P34003	Test; methadone
	T34018	Test; androgens
	T34019	Test; insulin
	T34021	Test; C peptide
	T34029	Test; aldosterone

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Chemistry; other (continued)	T34030	Test; parathyroid hormone
	T35002	Test; catecholamines
	W38002	Amniocentesis
Drug screen	A34002	Drug assay
	A34026	Blood drug screen
	A34027	Blood screen
	A35003	Drug screen
	A35005	Urine drug screen
	K34005	Test; digoxin
	N34003	Test; phenytoin
	N34004	Test; valproate
	N34005	Test; carbamazepine
	P34002	Test; lithium
EUC	A34007	Test; chloride
	A34008	Test; electrolytes
	A34010	Test; EUC
	A34014	Test; potassium
	A34017	Test; sodium
	A34029	Test; U&E
	A34034	Test; E&C
	U34002	Test; creatinine
	U34003	Test; urea
	U34005	Test; BUN
HbA1c	T34010	Test; HbA1c
	T34017	Test; fructosamine
	T34022	Test; HBA1
Ferritin	B34016	Test; ferritin
	B34019	Test; iron studies
Folic acid	B34017	Test; folic acid
	B34024	Test; folate
Glucose—all	T34005	Test; glucose
	T34009	Test; glucose tolerance
	T34025	Test; glucose; fasting
	T34026	Test; glucose; random
Hormone assay	A34003	Hormone assay
	D33015	Test; anti-gliadin antibody
	T34007	Test; cortisol
	T34033	Test; anti-diuretic hormone

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Hormone assay (continued)	W34005	Test; HCG
	W34006	Test; B HCG level (titre/quant)
	X34002	Test; LH; female
	X34003	Test; progesterone; female
	X34004	Test; oestradiol; female
	X34005	Test; FSH; female
	X34006	Test; SHBG; female
	X34007	Test; free androgen index; female
	Y34004	Test; SHBG; male
	Y34005	Test; free androgen index; male
	Y34006	Test; FSH; male
	Y34007	Test; LH; male
	Y34008	Test; oestradiol; male
	Y34009	Test; progesterone; male
Lactose intolerance	D38002	Test; lactose intolerance
Lipids	T34004	Test; lipids profile
	T34006	Test; cholesterol
	T34011	Test; cholesterol HDL
	T34013	Test; cholesterol LDL
	T34016	Test; triglycerides
	T34020	Test; free fatty acids
	T34024	Test; chol/trig
Liver function	A34004	Test; albumin
	D34003	Test; alkaline phosphatase
	D34006	Test; bilirubin
	D34007	Test; gGT
	D34008	Test; liver function
	T34012	Test; LDH
Multibiochemical analysis	A34012	Test; multibiochemical analysis
	A34021	Test; E & LFT
Prostate specific antigen	Y34002	Test; acid phosphatase
	Y34003	Test; prostate specific antigen
Thyroid function	T34015	Test; thyroid function
	T34027	Test; thyroxine
	T34028	Test; tsh
	T34032	Test; anti-thyroglobulin antibody
Urate/uric acid	U34004	Test; urate/uric acid

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Cytopathology		
Cytology	A37002	Test; cytology
	B37003	Test; cytology; blood
	D37002	Test; cytology; digestive
	F37002	Test; cytology; eye
	H37002	Test; cytology; ear
	K37002	Test; cytology; cardiovascular
	L37002	Test; cytology; musculoskeletal
	N37002	Test; cytology; neurological
	R37002	Test; cytology; respiratory
	R37003	Test; sputum cytology
	S37002	Test; cytology; skin
	T37002	Test; cytology; endocr/metabol
	U37002	Test; cytology; urology
	W37002	Test; cytology; reproduction
	Y37002	Test; cytology; genital; male
Pap smear	X37001	Pap smear
	X37003	Test; cytology; genital; female
	X37004	Vault smear
	X37005	Pap smear; thin prep
Haematology		
Blood grouping & typing	B33001	Test; Coombs
	B33002	Test; blood grouping & typing
	B33009	Test; blood group
	B33013	Test; blood; cross match
Blood; other	A33042	Test; lymphocyte type & count
	A34035	Test; blood film
	A34036	Test; blood thick film
	B33003	RH; antibody titer
	B34005	Test; blood; platelets
	B34007	Test; blood; sickle cell
	B34021	Test; reticulocyte count
	B34031	Test; haemoglobin epg
	B34032	Test; packed cell volume
	B34033	Test; blood; blood
	B37001	Exam; bone marrow

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Coagulation	B34003	Test; coagulation time
	B34006	Test; part thromboplastin time
	B34009	Test; prothrombin time
	B34014	Test; APTT
	B34022	Test; thrombin time
	B34025	Test; INR
	B34026	Test; fibrinogen
	B34028	Test; bleeding time
	B34029	Test; coagulation screen
	K34008	Test; D-Dimer
ESR	A34009	Test; ESR
Full blood count	A34011	Test; full blood count
Haemoglobin	B34018	Test; haemoglobin
Histopathology		
Histology; skin	S37001	Test; histopathology; skin
Histology; other	A37001	Test; histopathology
	B37002	Test; histopathology; blood
	D37001	Test; histopathology; digestive
	F37001	Test; histopathology; eye
	H37001	Test; histopathology; ear
	K37001	Test; histopathology; cardiovas
	L37001	Test; histopathology; musculosk
	N37001	Test; histopathology; neuro
	R37001	Test; histopathology; respirat
	T37001	Test; histopathology; endo/meta
	U37001	Test; histopathology; urology
	W37001	Test; histopathology; reproduct
	X37002	Test; histopathology; genital; female
	X37006	Test; histopathology; breast; female
	Y37001	Test; histopathology; genital; male
	Y37003	Test; histopathology; breast; male
Immunology		
Anti-nuclear antibodies	L33004	Test; anti-nuclear antibodies
Immunology; other	A32001	Test; sensitivity
	A33005	Test; immunology
	A33011	Test; HLA
	A33024	Test; bone marrow surface mark

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Immunology; other (continued)	A33025	Test; serum electrophoresis
	A33048	Test; ENA
	A38004	Test; DNA
	B33005	Test; immunology; blood
	B33007	Test; immunoglobulins
	B33011	Test; IgE
	B34027	Test; FBC for surface markers
	B34030	Test; intrinsic factor
	D32001	Test; sensitivity; digestive
	D33004	Test; immunology; digestive
	D33014	Test; endomysial antibody
	D33028	Test; mitochondrial antibodies
	F33002	Test; immunology; eye
	H33002	Test; immunology; ear
	K33002	Test; immunology; cardiovascular
	K33003	Test; ANCA
	L33003	Test; immunology; musculoskeletal
	L34001	Test; lupus erythemat; cell prep
	N33002	Test; immunology; neurological
	R32004	Test; sensitivity; respiratory
	R33004	Test; immunology; respiratory
	S32001	Test; sensitivity; skin
	S33002	Test; immunology; skin
	S33004	Test; skin patch
	T33002	Test; immunology; endoc/metabol
	U33003	Test; immunology; urology
	W33007	Test; immunology; reproductive
	X33002	Test; immunology; genital; female
	Y33002	Test; immunology; genital; male
RAST	A34016	Test; RAST
Rheumatoid factor	L33001	Test; rheumatoid factor
Infertility/pregnancy	W33001	Test; urine; pregnancy
	W33002	Test; pregnancy
	W34002	Test; blood; pregnancy
	W34003	Test; antenatal
	W34007	Test; pregnancy screen
	W35003	Test; urine; HCG

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Infertility/pregnancy (continued)	Y38002	Test; sperm count
	Y38003	Test; semen examination
Microbiology		
Antibody	A33003	Test; antibody
Cervical swab	X33004	Test; cervical swab M&C
Chlamydia	A33006	Test; chlamydia
	A33034	Test; chlamydia direct immunofl
	X33006	Test; viral culture; genital; female
Ear swab and C&S	H33003	Test; ear swab M&C
Faeces MC&S	D33002	Stool(s); culture
	D33008	Test; faeces M&C
	D36001	Test; faeces; cyst/ova/parasite
Fungal ID/sensitivity	A33030	Test; skin scraping fungal M&C
Hepatitis serology	D33005	Test; hepatitis A serology
	D33006	Test; hepatitis B serology
	D33007	Test; hepatitis C serology
	D33010	Test; hepatitis D serology
	D33011	Test; hepatitis E serology
	D33013	Test; hepatitis serology
	D33016	Test; hepatitis C antibody
	D33017	Test; hepatitis B antigen
	D33018	Test; hepatitis A antibody
	D33019	Test; hepatitis B antibody
	D33020	Test; hepatitis D antibody
	D33021	Test; hepatitis E antibody
	D33022	Test; hepatitis A antigen
	D33023	Test; hepatitis C antigen
	D33024	Test; hepatitis D antigen
	D33025	Test; hepatitis E antigen
	D33026	Test; hepatitis antibody
	D33027	Test; hepatitis antigen
HIV	A33021	Test; cytomegalovirus serology
	B33006	Test; HIV
	B33008	Test; AIDS screen
	B33012	Test; HIV viral load
H pylori	D33009	Test; H Pylori
	D33029	Test; breath; H Pylori
	D33030	Test; blood; H Pylori

(continued)

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Microbiology; other	A33004	Test; microbiology
	A33007	Test; culture and sensitivity
	A33012	Test; mycoplasma serology
	A33013	Test; parvovirus serology
	A33015	Test; Barmah forest virus
	A33016	Test; antistreptolysin O Titre
	A33017	Test; herpes simplex culture
	A33019	Test; herpes simplex serology
	A33020	Test; toxoplasmosis serology
	A33033	Test; swab M&C
	A33035	Test; serology
	A33036	Antibodies screen
	A33038	Test; rapid plasma regain
	A33039	Test; viral swab M&C
	A33040	Test; viral serology
	A33043	Test; HPV
	A33044	Test; Brucella
	A33045	Test; fungal M&C
	A33046	Test; measles virus antibodies
	A33047	Test; Rickettsial serology
	A34028	Test; blood culture
	A34039	Test; Q fever
	B33004	Test; microbiology; blood
	B33010	Test; serum immunoglobulins
	D33003	Test; microbiology; digestive
	D33012	Test; rotavirus
	F33001	Test; microbiology; eye
	F33003	Test; eye swab M&C
	H33001	Test; microbiology; ear
	K33001	Test; microbiology; cardiovascul
	L33002	Test; microbiology; musculoskel
	N33001	Test; microbiology; neurological
	R33001	Culture; tuberculosis
	R33002	Culture; throat
	R33003	Test; microbiology; respiratory
	R33009	Test; influenza serology
	R33010	Test; Legionnaires antibodies
	R33011	Test; RSV

(continued)

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Microbiology; other	S33001	Test; microbiology; skin
	S33005	Test; varicella zoster serology
	S33006	Test; varicella zoster culture
	S33007	Test; nail M&C
	T33001	Test; microbiology; endoc/metabo
	U33002	Test; microbiology; urology
	W34004	Test; antenatal serology
	W33006	Test; microbiology; reproductive
	X33001	Test; microbiology; genital; female
	X33003	Culture; gonococcal; female
	Y33001	Test; microbiology; genital; male
	Y33003	Culture; gonococcal; male
	Y33004	Test; viral culture; genital; male
	Y33005	Test; urethral/penile swab
Monospot	A33002	Test; monospot
	A33014	Test; Paul Bunnell
	A33031	Test; Epstein Barr virus serol
	A33032	Test; Epstein Barr virus
	A33049	Test; infectious mononucleosis
Nose swab C&S	R33008	Test; nose swab M&C
Pertussis	R33007	Test; pertussis
Ross River fever	A33009	Test; Ross River Fever
Rubella	A33001	Test; rubella
Skin swab C&S	S33003	Test; skin swab M&C
Sputum C&S	R33005	Test; sputum M&C
Throat swab C&S	R33006	Test; throat swab M&C
Urine MC&S	U33001	Test; culture; urine
	U33004	Test; urine M&C
Vaginal swab and C&S	X33005	Test; vaginal swab M&C
Venereal disease	A33010	Test; venereal disease
	A33022	Test; syphilis serology
Simple test; other	R32002	Test; tuberculin
	B35001	Test; urine; blood
	D36003	Test; occult blood
	R32001	Test; Mantoux
Other NEC		
Blood test	A34001	Test; blood
Urine test	A35001	Test; urine

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Urinalysis	A35002	Urinalysis
Faeces test	A36001	Test; faeces
Other pathology test NEC	A35006	Test; urine; FWT
	A38001	Test; other lab
	A38002	Pathology
	A38003	Test; genetic
	A38005	Test; disease screen
	B38001	Test; other lab; blood
	D34001	Test; blood; digestive
	D35001	Test; urine; digestive
	D36002	Test; faeces; digestive
	D38001	Test; other lab; digestive
	F34001	Test; blood; eye
	F38001	Test; other lab; eye
	H34001	Test; blood; ear
	H38001	Test; other lab; ear
	K34002	Test; blood; cardiovascular
	K38001	Test; other lab; cardiovascular
	L34003	Test; blood; musculoskeletal
	L38001	Test; other lab; musculoskeletal
	N34002	Test; blood; neurological
	N38001	Test; other lab; neurological
	P34001	Test; blood; psychological
	P35001	Test; urine; psychological
	P38001	Test; other lab; psychological
	R34001	Test; blood; respiratory
	R38001	Test; other lab; respiratory
	S34001	Test; blood; skin
	S38001	Test; other lab; skin
	T34002	Test; blood; endocr/metabolic
	T35001	Test; urine; endocrine/metabolic
	T38001	Test; other lab; endocr/metabol
	U34001	Test; blood; urology
	U35002	Test; urine; urology
	U38001	Test; other lab; urology
	W34001	Test; blood; reproductive
	W35001	Test; urine; reproductive
	W38001	Test; other lab; reproductive

(continued)

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Other pathology test NEC (continued)	X34001	Test; blood; genital; female
	X35001	Test; urine; genital; female
	X38001	Test; other lab; genital; female
	Y34001	Test; blood; genital; male
	Y35001	Test; urine; genital; male
	Y38001	Test; other lab; genital; male
IMAGING TEST ORDERS (MBS)		
Diagnostic radiology	A41001	Radiology; diagnostic
	A41002	X-ray; chest
	A41006	X-ray; abdomen
	A41007	Imaging other
	A41010	Radiology
	A41014	Test; imaging; contrast/special
	B41001	Radiology; diagnostic; blood
	D41001	GI series
	D41003	Radiology; diagnostic; digestive
	D41006	X-ray; oesophagus
	D41007	X-ray; biliary ducts
	D41008	X-ray; digestive tract
	D41009	X-ray; mouth
	D41012	X-ray; dental
	D41015	Barium enema
	D41016	Barium meal
	D41017	Barium swallow
	D41019	Xray; salivary gland
	F41001	Radiology; diagnostic; eye
	F41002	X-ray; eye
	H41001	Radiology; diagnostic; ear
	H41002	X-ray; ear
	K41002	Radiology; diagnostic; cardiovas
	K41005	Angiography; coronary
	K41006	Angiography; femoral
	K41007	Angiography; cerebral
	K41011	Angiogram
	K41012	Angiogram; coronary
	K41013	Angiogram; cerebral
	K41014	Angiogram; femoral
	L41001	Arthrogram

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Imaging test orders (continued)		
Diagnostic radiology (continued)	L41003	X-ray; bone(s)
	L41004	Plain x-ray; bone(s)
	L41005	Radiology; diagnostic; musculo
	L41013	X-ray; elbow
	L41014	X-ray; hand
	L41015	X-ray; wrist
	L41016	X-ray; knee
	L41017	X-ray; hip
	L41018	X-ray; neck
	L41019	X-ray; pelvis
	L41020	X-ray; shoulder
	L41021	X-ray; spine; lumbosacral
	L41022	X-ray; spine; cervical
	L41023	X-ray; spine; thoracic
	L41024	X-ray; spinal
	L41025	X-ray; joint(s)
	L41026	X-ray; foot/feet
	L41027	X-ray; ankle
	L41028	X-ray; leg
	L41029	X-ray; ribs
	L41030	X-ray; facial bones
	L41032	X-ray; arm
	L41033	X-ray; spine; lumbar
	L41034	X-ray; spine; sacrum
	L41035	X-ray; spine; coccyx
	L41036	X-ray; finger(s)/thumb
	L41037	X-ray; toe(s)
	L41038	X-ray; heel
	L41039	X-ray; tibia/fibula
	L41040	X-ray; femur
	L41041	X-ray; radius/ulna
	L41042	X-ray; clavicle
	L41043	X-ray; humerus
	L41044	X-ray; jaw
	L41045	X-ray; temporomandibular joint
	L41060	X-ray; spine; cervicothoracic
	L41061	X-ray; spine; sacrococcygeal
	L41062	X-ray; spine; thoracolumbar

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Imaging test orders (continued)		
Diagnostic radiology (continued)	L41063	X-ray; back
	L41064	X-ray; back lower
	L41065	X-ray; forearm
	L41066	X-ray; leg lower
	L41067	X-ray; metacarpal
	L41068	X-ray; metatarsal
	L43003	Test; bone density
	N41001	Radiology; diagnostic neurolog
	N41004	X-ray; skull
	P41001	Radiology; diagnostic; psychol
	R41001	Radiology; diagnostic; respirat
	R41002	X-ray; sinus
	R41003	X-ray; nose
	S41001	Radiology; diagnostic; skin
	T41001	Radiology; diagnostic; endo/meta
	T41003	X-ray; endo/metabolic
	U41001	Pyelogram; intravenous
	U41002	Pyelogram; retrograde
	U41005	Radiology; diagnostic; urology
	U41007	X-ray; urinary tract
	U41008	X-ray; kidney/ureter/bladder
	U41011	Cystogram
	U41013	Intravenous urogram
	W41002	Radiology; diagnostic; reprod
	W41003	X-ray; uterus
	X41001	Mammography; female
	X41002	Mammography; request; female
	X41003	Thermography; breast
	X41005	Radiology; diagnostic; genital; female
	X41007	X-ray; breast; female
	Y41001	Radiology; diagnostic; genital; male
	Y41009	Mammography; male
	Y41010	Mammography; request; male
	Y41011	X-ray; breast; male
Ultrasound	A41012	Ultrasound
	A41015	Ultrasound; abdomen
	A41017	Ultrasound; chest
	A41021	Ultrasound; inguinal

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Imaging test orders (continued)		
Ultrasound (continued)	A41022	Ultrasound; abdomen; upper
	A41023	Ultrasound; abdomen; lower
	B41002	Ultrasound; spleen
	B41003	Ultrasound; lymph
	D41013	Ultrasound; gallbladder
	D41014	Ultrasound; liver
	K41001	Echocardiography
	K41016	Ultrasound; cardiac
	K43003	Test; Doppler
	K43004	Test; Doppler carotid
	K43005	Scan; duplex
	L41046	Ultrasound; neck
	L41047	Ultrasound; pelvis
	L41048	Ultrasound; shoulder
	L41049	Ultrasound; spine
	L41050	Ultrasound; knee
	L41051	Ultrasound; elbow
	L41070	Ultrasound; wrist
	L41071	Ultrasound; ankle
	L41072	Ultrasound; groin
	L41073	Ultrasound; back
	L41074	Ultrasound; back lower
	L41075	Ultrasound; hand/finger(s)
	L41076	Ultrasound; foot/toe(s)
	L41078	Ultrasound; arm
	L41079	Ultrasound; leg
	N41005	Ultrasound; brain
	N41007	Ultrasound; head
	T41004	Ultrasound; thyroid
	U41009	Ultrasound; renal tract
	U41010	Ultrasound; kidney
	U41012	Ultrasound; kidney/ureter/bladder
	W41004	Ultrasound; obstetric
	X41009	Ultrasound; breast; female
	X41011	Ultrasound; uterus (not preg)
	Y41005	Ultrasound; prostate
	Y41006	Ultrasound; scrotum
	Y41008	Ultrasound; breast; male

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Imaging test orders (continued)		
Computerised tomography	A41013	CT scan
	A41016	CT scan; abdomen
	A41018	CT scan; chest
	A41019	CT scan; abdomen; upper
	A41020	CT scan; abdomen; lower
	D41018	CT scan; liver
	K41017	CT scan; cardiac
	L41052	CT scan; neck
	L41053	CT scan; pelvis
	L41054	CT scan; spine
	L41055	CT scan; spine; cervical
	L41056	CT scan; spine; thoracic
	L41057	CT scan; spine; lumbar
	L41058	CT scan; spine; lumbosacral
	L41059	CT scan; spine; sacrum
	L41069	CT scan; spine; thoracolumbar
	L41077	CT scan; spine; cervicothoracic
	L41080	CT scan; leg
	N41006	CT scan; brain
	N41008	CT scan; head
	R41004	CT scan; sinus
	R41006	CT scan; lung
	U41014	CT scan; kidney
	U41015	CT scan; renal tract
	X41010	CT scan; breast; female
	Y41007	CT scan; breast; male
Nuclear medicine	A41009	Nuclear medicine
	A41011	Isotope scan
	K41015	Scan; thallium heart
	L41002	Scan; bone(s)
	R41005	Scan; VQ (lung)
Magnetic resonance imaging	A41008	MRI

Note: NOS—not otherwise specified; NEC—not elsewhere classified; A & E—accident and emergency; – (code) signifies that the concept includes all of the specified code across all chapters of ICPC-2 (excluding the Z social chapter).

Appendix 4: Chronic code groups from ICPC-2 and ICPC-2 PLUS

Table A4.1: Chronic code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
CHRONIC PROBLEMS MANAGED			
Acne (chronic)		S96007	Acne
		S96003	Acne; conglobulate
		S96002	Acne; vulgaris
Anaemia (chronic)	B81		Anaemia, vitamin B12/folate deficiency
	B82		Anaemia, other/unspecified
Arthritis		L83010	Arthritis; spine cervical
		L84003	Arthritis; spine
		L84023	Arthritis; spine thoracic
		L84024	Arthritis; spine lumbar
		L84025	Arthritis; lumbosacral
		L84026	Arthritis; sacroiliac
		L89004	Arthritis; hip
		L90004	Arthritis; knee
		L91007	Arthritis; degenerative
		L91009	Arthritis
		L91010	Arthritis; acute
		L91011	Arthritis; allergic
		L91012	Polyarthritis
		L91013	Arthritis; hands/fingers
		L91014	Arthritis; wrist
		L92006	Arthritis; shoulder
		S91002	Arthritis; psoriatic
Diabetes (non-gestational)	T89		Diabetes, insulin dependent
	T90		Diabetes, non-insulin dependent
Hypertension (non-gestational)	K86		Hypertension, uncomplicated
	K87		Hypertension, complicated
Sprain/strain		L83023	Sprain; neck
		L83024	Strain; neck
		L83025	Whiplash injury; neck old
		L84020	Sprain; back
		L84021	Strain; back

Appendix 5: Summary of annual results 1999–00 to 2003–04

Table A5.1: GP characteristics, summary of annual results BEACH 1999–00 to 2003–04

GP characteristic	1999–00		2000–01		2001–02		2002–03		2003–04	
	$n^{(a)}$	Per cent of GPs (n=1,047)	$n^{(a)}$	Per cent of GPs (n=999)	$n^{(a)}$	Per cent of GPs (n=983)	$n^{(a)}$	Per cent of GPs (n=1,008)	$n^{(a)}$	Per cent of GPs (n=1,000)
Sex (missing)	(0)	—	(0)	—	(0)	—	(0)	—	(0)	—
Male	729	69.6	683	68.4	631	64.2	653	64.8	673	67.3
Female	318	30.4	316	31.6	352	35.8	355	35.2	327	32.7
Age (missing)	(4)	—	(9)	—	(1)	—	(0)	—	(1)	—
<35 years	88	8.4	67	6.7	70	7.1	74	7.3	58	5.8
35–44 years	338	32.4	284	28.4	263	26.8	268	26.6	249	24.9
45–54 years	338	32.4	342	34.2	359	36.5	355	35.2	365	36.5
55+ years	279	26.7	297	29.7	290	29.5	311	30.9	327	32.7
Years in general practice (missing)	(8)	—	(6)	—	(4)	—	(6)	—	(9)	—
<2 years	7	0.7	5	0.5	3	0.3	6	0.6	13	1.3
2–5 years	83	8.0	64	6.4	71	7.2	75	7.5	53	5.3
6–10 years	166	15.9	137	13.7	132	13.4	135	13.5	106	10.7
11–19 years	331	31.9	299	29.9	279	28.4	281	28.0	278	28.1
20+ years	452	43.5	488	48.8	494	50.3	505	50.4	541	54.6
Sessions per week (missing)	(6)	—	(16)	—	(15)	—	(8)	—	(7)	—
<6 per week	159	15.3	159	15.9	157	16.0	187	18.7	171	17.2
6–10 per week	691	66.0	662	66.3	666	67.8	679	67.9	687	68.2
11+ per week	191	18.3	162	16.2	145	14.8	134	13.4	135	13.6

(continued)

Table A5.1 (continued): GP characteristics, summary of annual results BEACH 1999–00 to 2003–04

GP characteristic	1999–00 n[a]	Per cent of GPs (n=1,047)	2000–01 n[a]	Per cent of GPs (n=999)	2001–02 n[a]	Per cent of GPs (n=983)	2002–03 n[a]	Per cent of GPs (n=1,008)	2003–04 n[a]	Per cent of GPs (n=1,000)
Size of practice (missing)	(5)	—	(28)	—	(4)	—	(8)	—	(10)	—
Solo	189	18.1	187	19.3	150	15.3	137	13.7	105	10.6
2–4 GPs	480	46.1	375	38.6	390	39.7	384	38.4	374	37.8
5+ GPs	373	35.8	409	42.1	439	44.7	479	47.9	511	51.6
Place of graduation (missing)	(2)	—	(0)	—	(0)	—	(0)	—	(1)	—
Australia	767	73.3	726	72.7	748	76.1	726	72.6	735	73.5
United Kingdom	89	8.5	82	8.2	75	7.6	92	9.1	72	7.2
Asia	99	9.4	47	4.7	85	8.6	100	9.9	95	9.5
Europe	20	1.9	19	1.9	18	1.8	16	1.6	23	2.3
Africa	25	2.4	15	1.5	36	3.7	43	4.3	54	5.4
New Zealand	16	1.5	15	1.5	5	0.5	22	2.2	10	1.0
Other	29	2.8	95	9.5	16	1.6	9	0.9	10	1.0
Practice location (missing)	(0)	—	(0)	—	(1)	—	(0)	—	(2)	—
Capital	683	65.2	680	68.1	681	69.3	652	64.7	623	62.4
Other metropolitan	77	7.4	69	6.9	80	8.1	86	8.5	64	6.4
Large rural	80	7.6	55	5.6	58	5.9	51	5.1	70	7.0
Small rural	65	6.2	56	5.6	48	4.9	78	7.7	70	7.0
Other rural	128	12.2	122	12.2	103	10.5	121	12.0	142	14.2
Remote central	4	0.4	10	1.0	4	0.5	6	0.6	9	0.9
Other remote, offshore	10	1.0	7	0.7	8	0.8	14	1.4	20	2.0

(continued)

Table A5.1 (continued): GP characteristics, summary of annual results BEACH 1999–00 to 2003–04

GP characteristic	1999–00 $n^{(a)}$	Per cent of GPs (n=1,047)	2000–01 $n^{(a)}$	Per cent of GPs (n=999)	2001–02 $n^{(a)}$	Per cent of GPs (n=983)	2002–03 $n^{(a)}$	Per cent of GPs (n=1,008)	2003–04 $n^{(a)}$	Per cent of GPs (n=1,000)
Consultations in Languages other than English (missing)*	(0)	—	(0)	—	. .	. .	. .	. .	(6)	—
<25%	. .	. .	. .	. .	. .	. .	. .	. .	177	17.8
25–50%	. .	. .	. .	. .	. .	. .	. .	. .	29	2.9
>50%	105	10.6	135	13.5	. .	. .	. .	. .	24	2.4
Currently in a general practice vocational training program	23	2.2	25	2.5	25	2.5	28	2.9	43	4.4
Completed training program	348	43.5	316	31.6	375	38.1	377	39.5	. .	. .
Fellow of RACGP	325	31.0	314	31.4	345	35.1	355	35.5	332	33.5
Own or cooperative after-hours arrangements	. .	. .	646	64.7	550	56.0	551	55.2	593	59.6
Computer use at practice	. .	. .	873	87.4	883	89.7	920	91.3	950	95.0

(a)   Missing data removed.

*   Data for all three groupings only available from 2003–04.

Note: RACGP—Royal Australian College of General Practitioners.

Table A5.2: Summary of morbidity and management, summary of annual results BEACH 1999–00 to 2003–04

Variable	1999–00 Rate per 100 encounters (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters (95% CI) (*n*=98,877)
Reasons for encounter	148.5 (146.7–150.2)	151.0 (149.2–152.8)	149.2 (147.4–150.9)	150.9 (149.0–152.7)	150.2 (148.4–152.0)
Problems managed	146.7 (144.9–148.6)	144.5 (142.8–146.3)	143.4 (141.7–145.2)	144.9 (143.0–146.8)	146.3 (144.4–148.2)
New problems	45.3 (43.6–46.9)	47.4 (45.7–49.0)	55.1 (53.8–56.5)	57.0 (55.6–58.3)	55.9 (54.5–57.3)
Work-related	3.2 (2.9–3.5)	3.3 (3.1–3.6)	3.0 (2.7–3.2)	. .	. .
Medications	110.1 (107.8–112.4)	108.2 (105.7–110.6)	104.5 (102.2–106.9)	103.8 (101.4–106.2)	104.4 (102.1–106.7)
Prescribed	93.8 (91.5–96.2)	92.3 (89.9–94.7)	88.0 (85.6–90.4)	84.3 (81.8–86.9)	86.0 (83.6–88.5)
Advised OTC	9.4 (8.6–10.2)	9.0 (8.1–9.8)	8.9 (8.1–9.6)	10.2 (9.2–11.1)	9.8 (9.0–10.6)
GP-supplied	6.9 (5.8–7.9)	6.9 (5.7–8.1)	7.6 (6.3–9.0)	9.3 (7.6–11.0)	8.6 (7.4–9.8)
Non-pharmacological treatments	46.0 (44.1–47.8)	49.4 (47.1–51.7)	51.9 (49.6–54.2)	51.8 (49.3–54.3)	51.4 (48.9–53.8)
Clinical	33.5 (31.8–35.2)	37.2 (35.1–39.3)	38.1 (36.1–40.1)	37.2 (35.0–39.4)	36.6 (34.5–38.8)
Procedural	12.5 (11.9–13.0)	12.2 (11.6–12.8)	13.8 (13.1–14.5)	14.6 (13.9–15.3)	14.7 (14.0–15.5)
Referrals	11.2 (10.8–11.7)	10.4 (10.0–10.8)	10.5 (10.1–10.9)	11.1 (10.7–11.6)	11.6 (11.1–12.1)
Specialist	7.3 (7.0–7.6)	7.4 (7.1–7.7)	7.3 (7.0–7.6)	7.7 (7.3–8.0)	7.9 (7.5–8.2)
Allied health services[+]	3.1 (2.9–3.4)	2.3 (2.1–2.5)	2.6 (2.3–2.9)	2.5 (2.3–2.8)	2.6 (2.4–2.9)
Hospital	0.7 (0.5–0.9)	0.5 (0.3–0.7)	0.4 (0.3–0.6)	0.6 (0.3–0.8)	0.6 (0.3–0.8)
Emergency department	0.1 (0.0–0.4)	0.1 (0.0–0.4)	0.1 (0.0–0.4)	0.1 (0.0–0.4)	0.2 (0.0–0.5)
Other referrals[+]	. .	0.1 (0.0–0.6)	0.3 (0.0–0.6)	0.3 (0.0–0.5)	0.3 (0.0–0.6)
Pathology[++]	26.3 (25.2–27.5)	29.7 (28.4–30.9)	31.0 (29.7–32.4)	32.9 (31.5–34.4)	35.2 (33.7–36.7)
Imaging[+++]	7.4 (7.1–7.8)	7.7 (7.3–8.0)	7.9 (7.6–8.2)	8.6 (8.2–9.0)	8.2 (7.8–8.6)
Other investigations[+++]	. .	0.6 (0.4–0.8)	0.9 (0.8–1.0)	1.0 (0.8–1.2)	1.0 (0.9–1.2)

+ In 1999–00 'allied health services' and 'other referrals' were grouped together and reported together.

++ From the third year of BEACH (2000–01) the data collection and coding system for pathology changed.

+++ In 1999–00 'Imaging' and 'other investigations' were grouped and reported together.

Note: CI—confidence interval; OTC—over-the-counter.

Table A5.3: Type of encounter, summary of annual results BEACH 1999–00 to 2003–04

Variable	1999–00 Rate per 100 encounters (95% CI)[a] (*n*=104,856)	2000–01 Rate per 100 encounters (95% CI)[a] (*n*=99,307)	2001–02 Rate per 100 encounters (95% CI)[a] (*n*=96,973)	2002–03 Rate per 100 encounters (95% CI)[a] (*n*=100,987)	2003–04 Rate per 100 encounters (95% CI)[a] (*n*=98,877)
Direct consultations	96.7 (96.3–97.0)	98.1 (97.8–98.4)	97.7 (97.4–98.0)	98.4 (98.2–98.6)	97.0 (96.6–97.3)
No charge	0.6 (0.3–0.8)	0.6 (0.0–1.5)	0.6 (0.2–1.1)	0.5 (0.2–0.8)	0.5 (0.3–0.7)
Medicare-claimable[b]	93.0 (92.4–93.5)	94.6 (94.2–95.0)	93.9 (93.5–94.4)	95.0 (94.6–95.3)	93.8 (93.3–94.2)
Short surgery consultations	1.3 (0.6–2.1)	1.5 (0.5–2.5)	1.0 (0.5–1.6)	1.1 (0.6–1.7)	1.1 (0.4–1.7)
Standard surgery consultations	78.1 (77.1–79.1)	79.4 (78.4–80.3)	79.0 (78.0–79.9)	78.7 (77.6–79.7)	77.3 (76.2–78.4)
Long surgery consultations	8.1 (7.4–8.7)	8.4 (7.7–9.0)	8.1 (7.5–8.7)	9.1 (8.5–9.7)	9.2 (8.5–9.8)
Prolonged surgery consultations	0.6 (0.1–1.0)	0.6 (0.0–1.2)	0.6 (0.0–1.2)	0.7 (0.0–1.5)	0.7 (0.0–1.4)
Home visits	1.4 (0.8–1.9)	1.5 (0.5–2.4)	1.5 (0.8–2.2)	1.3 (0.4–2.1)	1.3 (0.1–2.5)
Hospital	0.4 (0.0–2.2)	0.2 (0.0–1.7)	0.2 (0.0–1.4)	0.4 (0.0–2.7)	0.3 (0.0–1.7)
Residential aged care facility	0.9 (0.0–1.8)	0.7 (0.0–2.1)	0.9 (0.0–2.4)	1.2 (0.0–2.9)	1.1 (0.0–2.3)
Case conference	. .	. .	0.0 (0.0–2.3)	0.0 (0.0–1.4)	0.0 (0.0–1.2)
Care plans	. .	. .	0.1 (0.0–1.7)	0.1 (0.0–1.0)	0.1 (0.0–1.3)
Health assessments	. .	. .	0.1 (0.0–0.7)	0.1 (0.0–0.6)	0.1 (0.0–0.7)
Other items	2.1 (1.6–2.6)	2.4 (1.3–3.5)	2.4 (1.4–3.5)	2.3 (1.1–3.5)	2.6 (1.3–4.0)
Workers' compensation	2.0 (1.7–2.3)	2.1 (1.8–2.4)	2.0 (1.8–2.3)	1.9 (1.6–2.2)	2.0 (1.8–2.3)
Other paid (hospital, state, etc.)	1.2 (0.0–2.8)	0.8 (0.0–1.6)	1.1 (0.2–2.0)	1.0 (0.2–1.8)	0.6 (0.0–1.4)
Indirect consultations	3.3 (2.8–3.8)	1.9 (1.2–2.6)	2.3 (1.8–2.8)	1.6 (1.2–2.0)	3.1 (2.5–3.6)

(a)   Missing data removed.

(b)   Includes encounters that were recorded as claimable through the Australian Department of Veterans' Affairs.

Note: CI—confidence interval.

Table A5.4: Characteristics of the patients at encounters, summary of annual results BEACH 1999–00 to 2003–04

Patient variable	1999–00 Per cent of encounters (95% CI) (*n*=104,856)	2000–01 Per cent of encounters (95% CI) (*n*=99,307)	2001–02 Per cent of encounters (95% CI) (*n*=96,973)	2002–03 Per cent of encounters (95% CI) (*n*=100,987)	2003–04 Per cent of encounters (95% CI) (*n*=98,877)
Sex					
Male	42.7 (42.0–43.5)	42.9 (42.2–43.6)	42.6 (41.9–43.3)	42.2 (41.4–42.9)	42.6 (41.8–43.3)
Female	57.3 (56.5–58.0)	57.1 (56.4–57.8)	57.4 (56.7–58.1)	57.8 (57.0–58.6)	57.4 (56.7–58.2)
Age group					
<1 year	2.4 (2.2–2.5)	2.1 (1.9–2.4)	2.0 (1.8–2.1)	1.9 (1.8–2.1)	1.8 (1.6–2.0)
1–4 years	5.2 (4.9–5.5)	5.4 (5.1–5.7)	4.9 (4.6–5.2)	5.0 (4.7–5.3)	4.6 (4.3–4.8)
5–14 years	7.2 (6.9–7.5)	6.8 (6.4–7.2)	6.4 (6.1–6.7)	6.6 (6.3–6.9)	5.9 (5.6–6.3)
15–24 years	10.4 (9.9–10.8)	10.3 (9.8–10.7)	9.5 (9.1–10.0)	10.1 (9.7–10.4)	9.6 (9.2–10.1)
25–44 years	26.3 (25.5–27.0)	26.3 (25.6–27.0)	25.8 (25.1–26.5)	25.7 (24.9–26.4)	24.1 (23.4–24.8)
45–64 years	24.5 (24.0–25.0)	26.1 (25.5–26.7)	26.3 (25.7–26.8)	26.5 (25.9–27.0)	27.2 (26.7–27.7)
65–74 years	12.0 (11.5–12.5)	11.7 (11.2–12.2)	12.3 (11.8–12.8)	11.6 (11.1–12.0)	12.4 (11.9–12.9)
75+ years	12.1 (11.4–12.9)	11.3 (10.7–12.0)	12.8 (12.0–13.5)	12.7 (11.9–13.4)	14.4 (13.6–15.2)
Other characteristics					
New patient to practice	7.3 (6.6–8.0)	8.0 (7.1–8.8)	9.2 (8.5–9.9)	9.9 (9.0–10.8)	9.3 (8.5–10.0)
Commonwealth concession card	38.6 (37.0–40.2)	36.7 (35.1–38.3)	41.9 (40.4–43.3)	40.4 (38.8–41.9)	42.5 (41.0–44.0)
Repatriation health card[a]	2.6 (2.3–2.9)	3.1 (2.8–3.4)	3.3 (3.0–3.6)	3.3 (3.0–3.6)	3.5 (3.2–3.8)
Non-English-speaking background	7.1 (3.0–11.2)	8.0 (4.8–11.1)	9.3 (5.9–12.7)	10.6 (7.8–13.4)	9.7 (5.8–13.6)
Aboriginal person	0.7 (0.0–2.5)	0.7 (0.0–1.5)	0.9 (0.0–2.0)	0.8 (0.0–1.7)	1.4 (0.0–2.9)
Torres Strait Islander	0.1 (0.0–1.3)	0.1 (0.0–0.7)	0.1 (0.0–0.5)	0.1 (0.0–0.9)	0.2 (0.0–1.0)

(a)   The 1999–00 results reported here are for gold card holders only.

Note: CI—confidence interval.

Table A5.5: Rate of patient reasons for encounter by ICPC-2 chapter, summary of annual results BEACH 1999–00 to 2003–04

Reasons for encounter	1999–00 Rate per 100 encounters[a] (95% CI) (n=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (n=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (n=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (n=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (n=98,877)
General & unspecified	29.0 (28.1–29.9)	28.3 (27.5–29.1)	30.9 (29.9–31.8)	34.6 (33.6–35.6)	36.2 (35.2–37.2)
Respiratory	25.3 (24.3–26.2)	24.6 (23.7–25.4)	23.4(22.6–24.2)	23.0 (22.0–24.0)	21.4 (20.6–22.2)
Musculoskeletal	16.6 (16.1–17.1)	17.7 (17.1–18.2)	16.7 (16.1–17.3)	17.7 (17.2–18.3)	16.3 (15.7–16.9)
Skin	15.1 (14.7–15.6)	15.5 (15.0–16.0)	14.4 (13.9–14.9)	14.7 (14.3–15.2)	15.1 (14.5–15.7)
Circulatory	11.2 (10.6–11.8)	11.7 (11.1–12.2)	11.4 (10.8–11.9)	10.6 (10.0–11.1)	10.7 (10.1–11.2)
Digestive	10.4 (10.0–10.7)	11.1 (10.7–11.5)	10.6 (10.2–11.0)	10.4 (10.0–10.8)	10.7 (10.3–11.2)
Psychological	7.2 (6.8–7.6)	8.1 (7.7–8.6)	7.8 (7.3–8.3)	7.3 (6.9–7.8)	7.3 (6.9–7.7)
Endocrine & metabolic	5.4 (5.1–5.7)	6.2 (5.9–6.5)	6.4 (6.1–6.7)	6.0 (5.7–6.3)	6.2 (5.8–6.5)
Female genital system	5.3 (4.9–5.7)	5.5 (5.1–5.9)	5.5 (5.1–5.9)	6.1 (5.7–6.6)	5.1 (4.8–5.5)
Neurological	5.6 (5.4–5.8)	5.8 (5.5–6.0)	5.4 (5.2–5.6)	5.7 (5.5–6.0)	5.3 (5.1–5.6)
Ear	4.2 (4.0–4.4)	4.2 (4.0–4.3)	4.2 (4.0–4.4)	4.0 (3.8–4.1)	3.7 (3.6–3.9)
Pregnancy & family planning	3.8 (3.5–4.2)	3.5 (3.2–3.8)	3.5 (3.2–3.8)	3.6 (3.3–3.9)	3.7 (3.4–4.0)
Eye	2.8 (2.7–3.0)	2.7 (2.5–2.8)	2.5 (2.4–2.7)	2.7 (2.6–2.9)	2.7 (2.6–2.9)
Urology	2.6 (2.5–2.8)	2.4 (2.3–2.6)	2.5 (2.4–2.7)	2.5 (2.3–2.6)	2.5 (2.4–2.7)
Blood	2.1 (1.9–2.3)	2.0 (1.8–2.2)	1.1 (0.9–1.2)	1.0 (0.8–1.2)	1.3 (1.1–1.4)
Male genital system	1.0 (0.9–1.1)	1.1 (1.0–1.3)	1.0 (0.9–1.1)	1.0 (0.9–1.2)	1.1 (0.9–1.2)
Social problems	1.0 (0.8–1.1)	0.9 (0.7–1.1)	1.0 (0.8–1.1)	1.0 (0.8–1.2)	0.9 (0.8–1.1)
Total RFEs	**148.5 (146.7–150.2)**	**151.0 (149.2–152.8)**	**149.2 (147.4–150.9)**	**150.9 (149.0–152.7)**	**150.2 (148.4–152.0)**

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

Note: CI—confidence interval; RFE—reason for encounter.

Table A5.6: Rate of RFEs by ICPC–2 component, summary of annual results BEACH 1999–00 to 2003–04

ICPC–2 component	1999–00 Rate per 100 encounters[a] (95% CI) (n=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (n=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (n=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (n=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (n=98,877)
Symptoms & complaints	73.4 (71.5–75.3)	76.6 (74.6–78.6)	74.1 (72.3–75.9)	74.0 (72.0–76.1)	71.7 (69.8–73.5)
Diagnosis, diseases	27.7 (26.2–29.2)	29.0 (27.6–30.5)	27.3 (25.9–28.7)	26.0 (24.6–27.4)	25.1 (23.9–26.4)
Diagnostic & preventive procedures	22.9 (22.0–23.8)	22.3 (21.4–23.2)	22.7 (21.7–23.6)	23.8 (22.8–24.7)	24.0 (23.1–25.0)
Medications, treatments & therapeutics	12.0 (11.4–12.6)	11.2 (10.6–11.8)	11.9 (11.3–12.4)	13.0 (12.4–13.6)	14.4 (13.7–15.1)
Referral & other RFE	7.2 (6.7–7.7)	6.5 (6.0–7.0)	7.2 (6.7–7.7)	7.0 (6.6–7.5)	7.2 (6.8–7.6)
Results	4.0 (3.7–4.3)	4.2 (3.9–4.6)	4.7 (4.4–5.1)	5.4 (5.0–5.7)	6.0 (5.6–6.4)
Administrative	1.3 (1.1–1.4)	1.1 (0.9–1.3)	1.3 (1.1–1.5)	1.6 (1.4–1.8)	1.8 (1.6–1.9)
Total RFEs	**148.5 (146.7–150.2)**	**151.0 (149.2–152.8)**	**149.2 (147.4–150.9)**	**150.9 (149.0–152.7)**	**150.2 (148.4–152.0)**

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

Note: CI—confidence interval; RFE—reason for encounter.

Table A5.7: Distribution of problems managed, summary of annual results BEACH 1999–00 to 2003–04

Problem managed	1999–00 Rate per 100 encounters[a] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (*n*=98,877)
Respiratory	24.2 (23.5–24.9)	22.5 (21.9–23.2)	21.4 (20.7–22.0)	20.6 (20.0–21.3)	20.1 (19.5–20.7)
Musculoskeletal	16.9 (16.4–17.4)	17.4 (16.9–18.0)	17.5 (17.0–18.0)	17.1 (16.5–17.6)	17.1 (16.6–17.6)
Skin	17.0 (16.6–17.5)	16.7 (16.2–17.3)	16.1 (15.6–16.6)	16.5 (16.0–17.0)	16.9 (16.2–17.6)
Circulatory	16.3 (15.5–17.0)	16.0 (15.3–16.7)	16.1 (15.5–16.8)	16.0 (15.3–16.7)	16.8 (16.1–17.5)
General & unspecified	13.9 (13.4–14.5)	14.2 (13.7–14.7)	14.7 (14.0–15.5)	15.8 (15.2–16.3)	15.0 (14.5–15.5)
Psychological	10.5 (10.0–11.1)	10.8 (10.2–11.3)	10.6 (10.1–11.2)	10.3 (9.8–10.8)	10.8 (10.3–11.4)
Digestive	10.1 (9.7–10.3)	9.9 (9.6–10.2)	9.9 (9.6–10.2)	10.1 (9.8–10.4)	10.5 (10.2–10.8)
Endocrine & metabolic	9.1 (8.7–9.6)	9.8 (9.3–10.2)	10.4 (10.0–10.9)	10.6 (10.2–11.0)	11.3 (10.8–11.8)
Female genital system	6.2 (5.8–6.6)	6.1 (5.7–6.4)	6.1 (5.8–6.5)	6.7 (6.2–7.1)	5.9 (5.5–6.3)
Ear	4.5 (4.3–4.7)	4.4 (4.2–4.6)	4.2 (4.0–4.4)	4.0 (3.8–4.2)	4.0 (3.8–4.1)
Pregnancy & family planning	4.3 (4.0–4.6)	3.9 (3.6–4.2)	4.0 (3.7–4.3)	4.2 (3.8–4.5)	4.2 (3.9–4.5)
Neurological	3.9 (3.7–4.1)	3.8 (3.6–3.9)	3.7 (3.5–3.9)	4.2 (4.0–4.4)	3.9 (3.8–4.1)
Urology	3.0 (2.9–3.2)	2.7 (2.5–2.8)	2.8 (2.7–3.0)	2.8 (2.7–3.0)	3.0 (2.9–3.2)
Eye	2.7 (2.6–2.9)	2.6 (2.5–2.7)	2.5 (2.4–2.6)	2.6 (2.5–2.7)	2.7 (2.6–2.9)
Blood	1.7 (1.5–1.9)	1.7 (1.5–1.8)	1.3 (1.2–1.4)	1.4 (1.2–1.5)	1.7 (1.5–1.8)
Male genital system	1.4 (1.3–1.5)	1.5 (1.3–1.6)	1.3 (1.1–1.4)	1.4 (1.3–1.6)	1.6 (1.4–1.7)
Social problems	0.9 (0.7–1.1)	0.7 (0.5–0.9)	0.7 (0.5–0.9)	0.7 (0.5–0.9)	0.8 (1.6–1.0)
Total problems	**146.7 (144.9–148.6)**	**144.5 (142.8–146.3)**	**143.4 (141.7–145.2)**	**144.9 (143.0–146.8)**	**146.3 (144.4–148.2)**

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

Note: CI—confidence interval.

Table A5.8: Most frequently managed problems, summary of annual results BEACH 1999–00 to 2003–04

Problem managed	1999–00 Rate per 100 encounters[a] (95% CI) (n=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (n=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (n=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (n=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (n=98,877)
Hypertension*	8.4 (7.9–8.9)	8.6 (8.2–9.1)	9.0 (8.6–9.5)	8.9 (8.4–9.3)	9.2 (8.7–9.7)
Upper respiratory tract infection	7.2 (6.7–7.7)	6.9 (6.5–7.4)	6.2 (5.8–6.6)	6.4 (5.9–6.8)	5.5 (5.1–5.9)
Immunisation/vaccination—all*	4.6 (4.2–5.0)	4.6 (4.2–5.0)	4.7 (4.2–5.1)	4.6 (4.2–5.1)	4.7 (4.2–5.2)
Depression*	3.4 (3.2–3.6)	3.7 (3.4–3.9)	3.4 (3.2–3.6)	3.5 (3.3–3.8)	3.7 (3.4–3.8)
Acute bronchitis/bronchiolitis	3.2 (2.9–3.4)	2.7 (2.5–3.0)	2.7 (2.5–3.0)	2.6 (2.3–2.8)	2.4 (2.2–2.6)
Asthma	3.2 (3.0–3.4)	2.8 (2.7–3.0)	2.8 (2.6–3.0)	2.7 (2.5–2.9)	2.6 (2.4–2.7)
Back complaint*	2.8 (2.6–2.9)	2.6 (2.4–2.8)	2.6 (2.4–2.8)	2.6 (2.3–2.8)	2.7 (2.5–2.9)
Diabetes*	2.7 (2.5–2.9)	2.8 (2.6–3.0)	3.1 (2.9–3.3)	2.9 (2.7–3.1)	3.3 (3.1–3.5)
Lipid disorder	2.6 (2.4–2.9)	2.9 (2.7–3.1)	2.9 (2.7–3.1)	3.0 (2.8–3.2)	3.1 (2.9–3.4)
Osteoarthritis*	2.2 (2.0–2.4)	2.5 (2.3–2.7)	2.6 (2.4–2.8)	2.6 (2.4–2.8)	2.8 (2.6–3.0)
Total problems	**146.7 (144.9–148.6)**	**144.5 (142.8–146.3)**	**143.4 (141.7–145.2)**	**144.9 (143.0–146.8)**	**146.3 (144.4–148.2)**

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

*   Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).

Note: CI—confidence interval.

Table A5.9: Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1999–00 to 2003–04

Group and subgroup	1999–00 Rate per 100 encounters[a] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (*n*=98,877)
Antibiotics	16.3 (15.8–16.9)	15.9 (15.3–16.5)	14.4 (13.9–14.9)	13.8 (13.2–14.4)	14.2 (13.6–14.7)
Broad-spectrum penicillin	4.7 (4.4–5.1)	4.9 (4.6–5.2)	4.5 (4.2–4.8)	4.7 (4.4–5.1)	5.0 (4.6–5.3)
Cephalosporins	4.0 (3.7–4.4)	4.0 (3.6–4.3)	3.2 (3.0–3.5)	3.0 (2.8–3.2)	2.9 (2.7–3.1)
Other antibiotics	3.4 (3.2–3.7)	3.3 (3.1–3.6)	3.0 (2.8–3.2)	2.8 (2.6–3.0)	2.8 (2.6–3.0)
Penicillins	1.5 (1.3–1.7)	1.3 (1.1–1.4)	1.5 (1.2–1.7)	1.2 (1.0–1.4)	1.3 (1.2–1.5)
Tetracycline	1.1 (1.0–1.3)	1.1 (1.0–1.3)	1.0 (0.8–1.2)	0.9 (0.7–1.0)	0.9 (0.7–1.0)
Cardiovascular	13.7 (12.9–14.5)	13.6 (12.8–14.4)	13.9 (13.2–14.7)	13.1 (12.3–13.9)	14.4 (13.6–15.2)
Anti-hypertensives	7.1 (6.7–7.6)	7.3 (6.9–7.7)	7.5 (7.1–8.0)	7.3 (6.8–7.8)	8.1 (7.6–8.5)
Other cardiovascular drugs	2.4 (2.2–2.8)	2.6 (2.4–2.8)	2.7 (2.5–2.9)	2.6 (2.4–2.8)	2.9 (2.7–3.1)
Beta-blockers	1.8 (1.6–2.0)	1.6 (1.4–1.8)	1.7 (1.5–1.9)	1.5 (1.3–1.7)	1.7 (1.5–1.9)
Anti-angina	1.3 (1.1–1.5)	1.1 (0.9–1.3)	1.1 (0.9–1.3)	0.8 (0.6–1.1)	1.0 (0.8–1.2)
Central nervous system	11.6 (11.0–12.2)	11.1 (10.5–11.7)	10.7 (10.1–11.2)	10.5 (10.0–11.1)	10.5 (9.9–11.1)
Simple analgesics	5.0 (4.6–5.4)	4.8 (4.3–5.2)	3.8 (3.4–4.1)	3.9 (3.4–4.3)	3.6 (3.1–4.0)
Compound analgesics	3.0 (2.8–3.2)	2.7 (2.5–2.9)	2.7 (2.5–2.9)	2.4 (2.2–2.6)	2.5 (2.3–2.7)
Anti-emetic/anti-nausea	1.6 (1.5–1.7)	1.5 (1.3–1.6)	1.4 (1.2–1.5)	1.3 (1.2–1.5)	1.4 (1.3–1.5)
Narcotic analgesics	1.3 (0.9–1.8)	1.4 (1.0–1.8)	2.0 (1.6–2.4)	2.2 (1.9–2.6)	2.3 (2.1–2.6)
Psychological	7.5 (7.1–8.0)	7.5 (7.1–7.9)	7.4 (7.0–7.8)	7.0 (6.6–7.4)	7.6 (7.2–8.0)
Anti-depressants	2.9 (2.8–3.1)	3.1 (2.8–3.3)	2.9 (2.7–3.1)	2.9 (2.7–3.1)	3.2 (3.0–3.4)
Anti-anxiety	2.1 (1.9–2.3)	2.0 (1.8–2.2)	1.9 (1.7–2.2)	1.9 (1.7–2.1)	2.0 (1.8–2.2)
Sedative hypnotics	1.9 (1.7–2.1)	1.9 (1.7–2.1)	1.9 (1.7–2.2)	1.7 (1.6–1.9)	1.8 (1.7–2.0)

(continued)

Table A5.9 (continued): Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1999–00 to 2003–04

Group and subgroup	1999–00 Rate per 100 encounters[a] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (*n*=98,877)
Respiratory	7.4 (6.9–7.9)	6.3 (5.9–6.7)	5.8 (5.3–6.2)	5.3 (4.9–5.7)	4.6 (4.3–4.9)
Bronchodilators	3.8 (3.5–4.1)	3.2 (2.9–3.4)	2.9 (2.6–3.1)	2.5 (2.2–2.7)	2.2 (2.0–2.4)
Asthma preventives	2.5 (2.3–2.8)	2.2 (2.0–2.4)	2.2 (2.0–2.4)	2.0 (1.9–2.2)	1.8 (1.7–2.0)
Hormones	5.9 (5.5–6.2)	5.9 (5.6–6.2)	6.1 (5.8–6.4)	5.4 (5.1–5.7)	5.7 (5.3–6.0)
Sex/anabolic hormones	2.1 (1.9–2.2)	2.1 (1.9–2.2)	2.0 (1.8–2.1)	1.8 (1.6–1.9)	1.5 (1.3–1.7)
Hypoglycaemics	1.8 (1.5–2.1)	2.0 (1.7–2.3)	2.2 (1.9–2.5)	1.9 (1.6–2.2)	2.2 (1.9–2.4)
Corticosteroids	1.4 (1.2–1.6)	1.2 (1.1–1.4)	1.3 (1.2–1.5)	1.1 (0.9–1.2)	1.3 (1.1–1.4)
Other hormones	0.6 (0.4–0.7)	0.6 (0.5–0.7)	0.6 (0.5–0.8)	0.6 (0.5–0.8)	0.7 (0.6–0.9)
Musculoskeletal	5.7 (5.4–6.0)	6.8 (6.4–7.1)	6.1 (5.8–6.4)	5.7 (5.4–6.0)	5.6 (5.3–5.8)
NSAID/anti-rheumatoid	4.6 (4.3–4.8)	5.7 (5.4–6.0)	5.3 (5.0–5.5)	4.8 (4.5–5.0)	4.7 (4.5–4.9)
Allergy, immune system	5.2 (4.8–5.6)	4.6 (4.2–5.0)	4.5 (4.1–4.8)	4.8 (4.3–5.3)	3.8 (3.4–4.2)
Immunisation	4.4 (3.9–4.8)	3.9 (3.4–4.3)	3.9 (3.5–4.3)	4.2 (3.7–4.7)	3.3 (2.9–3.7)
Skin	4.6 (4.4–4.8)	4.8 (4.5–5.2)	4.1 (3.9–4.4)	3.9 (3.7–4.2)	3.9 (3.7–4.1)
Topical steroids	2.8 (2.7–3.0)	3.1 (2.8–3.3)	2.8 (2.6–3.0)	2.6 (2.5–2.8)	2.6 (2.4–2.8)
Anti-infection, skin	1.0 (0.8–1.1)	0.9 (0.7–1.1)	0.7 (0.5–0.8)	0.7 (0.5–0.8)	0.7 (0.6–0.8)
Other skin	0.8 (0.6–0.9)	0.9 (0.6–1.1)	0.6 (0.4–0.8)	0.6 (0.4–0.8)	0.6 (0.4–0.8)
Digestive	4.3 (4.1–4.5)	4.1 (3.8–4.3)	3.8 (3.6–4.1)	3.9 (3.6–4.1)	4.2 (4.0–4.8)
Anti-ulcerants	2.2 (2.0–2.4)	2.2 (2.0–2.3)	2.4 (2.2–2.5)	2.4 (2.2–2.6)	2.7 (2.6–2.9)
Anti-diarrhoeals	0.5 (0.4–0.7)	0.5 (0.3–0.8)	0.5 (0.3–0.7)	0.5 (0.3–0.7)	0.5 (0.3–0.6)

(continued)

Table A5.9 (continued): Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1999–00 to 2003–04

Group and subgroup	1999–00 Rate per 100 encounters[a] (95% CI) (n=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (n=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (n=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (n=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (n=98,877)
Urogenital	2.0 (1.8–2.2)	1.8 (1.7–2.0)	1.8 (1.6–2.0)	1.7 (1.5–1.9)	1.8 (1.7–2.0)
Diuretics	1.5 (1.3–1.7)	1.3 (1.1–1.4)	1.3 (1.1–1.5)	1.1 (0.9–1.3)	1.1 (0.9–1.3)
Ear, nose topical	2.5 (2.3–2.6)	2.3 (2.2–2.5)	1.8 (1.7–2.0)	1.6 (1.4–1.7)	1.6 (1.5–1.9)
Topical nasal	1.5 (1.3–1.7)	1.3 (1.2–1.5)	0.9 (0.7–1.0)	0.7 (0.5–0.9)	0.7 (0.5–0.9)
Topical otic	1.0 (0.8–1.1)	1.0 (0.8–1.1)	0.9 (0.8–1.1)	0.9 (0.7–1.0)	0.9 (0.7–1.1)
Contraceptives	1.7 (1.6–1.9)	1.6 (1.5–1.8)	1.7 (1.5–1.8)	1.7 (1.5–1.9)	1.8 (1.6–1.9)
Oral/systemic contraception	1.7 (1.6–1.9)	1.6 (1.5–1.8)	1.7 (1.5–1.8)	1.7 (1.5–1.9)	1.7 (1.6–1.9)
Blood	1.6 (1.4–1.7)	1.8 (1.7–2.0)	1.8 (1.7–2.0)	1.7 (1.6–1.9)	2.1 (1.9–2.3)
Other blood	0.8 (0.6–0.9)	0.9 (0.7–1.1)	1.1 (0.9–1.3)	1.0 (0.9–1.2)	1.2 (1.0–1.4)
Eye medications	1.7 (1.6–1.8)	1.6 (1.5–1.8)	1.5 (1.4–1.6)	1.6 (1.5–1.8)	1.7 (1.5–1.9)
Anti-infectives	1.1 (1.0–1.2)	1.0 (0.9–1.2)	0.9 (0.8–1.1)	1.0 (0.9–1.2)	1.0 (0.9–1.2)
Nutrition, metabolism	1.1 (0.9–1.3)	1.4 (1.2–1.5)	1.7 (1.1–2.2)	1.6 (1.4–1.8)	1.6 (1.5–1.8)
Mineral tonic	0.6 (0.4–0.7)	0.5 (0.4–0.7)	0.6 (0.3–0.8)	0.5 (0.3–0.7)	0.5 (0.4–0.7)
Miscellaneous	0.4 (0.0–0.8)	0.6 (0.4–0.8)	0.5 (0.3–0.6)	0.3 (0.1–0.6)	0.3 (0.1–0.6)

(a)   Column will not add to 100 because multiple prescriptions could be written at each encounter. Also only the most frequent medications are included.

Note: CI—confidence interval; NSAID—non-steroidal anti-inflammatory drug.

Table A5.10: Most frequently prescribed medications, summary of annual results BEACH 1999–00 to 2003–04

Generic drug	1999–00 Rate per 100 encounters[a] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (*n*=98,877)
Paracetamol	4.1 (3.7–4.4)	3.9 (3.5–4.4)	3.1 (2.7–3.4)	3.1 (2.7–3.6)	2.9 (2.4–3.3)
Amoxycillin	3.1 (2.8–3.4)	3.2 (2.9–3.5)	2.9 (2.7–3.2)	3.1 (2.8–3.5)	3.3 (3.0–3.6)
Paracetamol/codeine	2.4 (2.2–2.6)	2.2 (2.0–2.4)	2.2 (2.0–2.4)	2.0 (1.8–2.2)	2.1 (1.9–2.3)
Salbutamol	2.4 (2.2–2.6)	2.1 (1.9–2.3)	2.0 (1.8–2.2)	1.7 (1.5–1.9)	1.5 (1.4–1.7)
Cefaclor monohydrate	1.6 (1.3–2.0)	1.6 (1.3–2.0)	1.1 (0.8–1.3)	1.0 (0.7–1.3)	0.8 (0.5–1.1)
Cephalexin	2.1 (1.8–2.3)	2.2 (2.0–2.4)	2.0 (1.8–2.2)	1.9 (1.7–2.1)	2.0 (1.8–2.2)
Roxithromycin	1.8 (1.6–2.0)	1.6 (1.4–1.8)	1.4 (1.2–1.6)	1.3 (1.1–1.6)	1.1 (1.0–1.3)
Amoxycillin/potass. clavulanate	1.6 (1.4–1.8)	1.7 (1.4–1.9)	1.6 (1.3–1.8)	1.6 (1.4–1.8)	1.7 (1.5–1.9)
Influenza virus vaccine	1.5 (0.9–2.1)	1.5 (0.8–2.2)	1.5 (0.8–2.2)	1.4 (0.6–2.3)	1.2 (0.4–2.0)
Temazepam	1.4 (1.3–1.6)	1.4 (1.3–1.6)	1.3 (1.2–1.5)	1.2 (1.0–1.3)	1.2 (1.1–1.4)
Diclofenac sodium systemic	1.3 (1.1–1.5)	1.2 (0.9–1.4)	0.9 (0.7–1.1)	0.7 (0.5–0.9)	0.8 (0.6–1.0)
Levonorgestrel/ethinyloestradiol	1.3 (1.1–1.4)	1.2 (1.1–1.4)	1.2 (1.1–1.3)	1.1 (1.0–1.3)	1.2 (1.0–1.3)
Doxycycline hydrochloride	0.9 (0.7–1.1)	0.9 (0.7–1.1)	0.8 (0.6–1.0)	0.7 (0.5–0.9)	0.7 (0.5–0.9)
Diazepam	1.1 (0.9–1.3)	1.0 (0.9–1.2)	1.0 (0.8–1.3)	1.0 (0.8–1.2)	1.1 (0.9–1.3)
Erythromycin	0.7 (0.5–0.9)	0.8 (0.6–1.0)	0.6 (0.4–0.8)	0.5 (0.3–0.7)	0.6 (0.3–0.8)
Ranitidine	1.0 (0.8–1.1)	1.0 (0.9–1.2)	0.6 (0.5–0.8)	0.5 (0.3–0.6)	0.4 (0.2–0.6)
Atenolol	1.0 (0.8–1.2)	0.9 (0.7–1.1)	1.0 (0.7–1.2)	0.8 (0.6–1.0)	1.0 (0.8–1.1)
Frusemide (furosemide)	0.8 (0.6–1.0)	0.7 (0.7–0.9)	0.7 (0.5–0.9)	0.7 (0.5–0.9)	0.7 (0.5–0.8)
Betamethasone topical	0.9 (0.7–1.0)	1.0 (0.9–1.2)	0.9 (0.7–1.0)	0.7 (0.6–0.9)	0.8 (0.7–1.0)
Simvastatin	0.9 (0.7–1.1)	0.9 (0.7–1.1)	0.9 (0.8–1.1)	0.9 (0.7–1.0)	1.0 (0.9–1.2)
Chloramphenicol eye	0.9 (0.8–1.0)	0.9 (0.7–1.0)	0.8 (0.7–0.9)	0.9 (0.8–1.1)	0.9 (0.8–1.0)
Metformin	0.7 (0.5–0.9)	0.8 (0.6–1.0)	0.9 (0.8–1.1)	0.8 (0.7–1.0)	1.0 (0.8–1.2)

(continued)

Table A5.10: (continued) Most frequently prescribed medications, summary of annual results BEACH 1999–00 to 2003–04

Generic drug	1999–00 Rate per 100 encounters[a] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (*n*=98,877)
Atorvastatin	0.8 (0.6–0.9)	0.9 (0.8–1.0)	1.0 (0.9–1.2)	1.0 (0.9–1.2)	1.2 (1.0–1.3)
Omeprazole	0.4 (0.3–0.6)	0.5 (0.3–0.6)	0.8 (0.7–1.0)	0.8 (0.7–1.0)	0.7 (0.6–0.8)
Irbesartan	0.7 (0.5–0.9)	0.8 (0.6–0.9)	0.8 (0.6–0.9)	0.8 (0.7–1.0)	0.9 (0.7–1.0)
Tramadol	0.1 (0.0–1.1)	0.2 (0.0–0.5)	0.7 (0.4–0.9)	1.0 (0.8–1.1)	0.9 (0.8–1.1)
Celecoxib	0.2 (0.0–0.6)	2.1 (1.9–2.4)	1.4 (1.3–1.6)	1.1 (0.9–1.2)	1.0 (0.9–1.1)
Rofecoxib	. .	0.1 (0.0–0.8)	1.2 (1.0–1.5)	1.2 (0.9–1.4)	1.0 (0.9–1.2)
Fluticasone/salmeterol	. .	0.2 (0.0–0.6)	0.6 (0.4–0.8)	0.9 (0.7–1.1)	0.8 (0.7–1.0)
Total prescribed medications	**93.8 (91.5–96.2)**	**92.3 (89.9–94.7)**	**88.0 (85.6–90.4)**	**84.3 (81.8–86.9)**	**86.0 (83.6–88.5)**

(a)   Column will not add to 100 because multiple prescriptions could be written at each encounter.

Note: CI—confidence interval.

Table A5.11: Distribution of medications prescribed by ATC Level 3, summary of annual results BEACH 1999–00 to 2003–04

ATC medication group	1999–00 Rate per 100 encounters (95% CI) (n=104,856)	2000–01 Rate per 100 encounters (95% CI) (n=99,307)	2001–02 Rate per 100 encounters (95% CI) (n=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (n=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (n=98,877)
Other analgesics & anti-pyretics	7.5 (7.1–8.0)	7.1 (6.6–7.6)	6.1 (5.7–6.5)	6.0 (5.5–6.5)	5.8 (5.3–6.2)
Beta-lactam anti-bacterials, penicillins	6.2 (5.8–6.6)	6.1 (5.8–6.5)	6.0 (5.6–6.3)	5.9 (5.5–6.3)	6.2 (5.9–6.6)
Anti-inflammatory/anti-rheumatic non-steroids	4.5 (4.3–4.8)	5.7 (5.4–6.0)	5.3 (5.0–5.5)	4.8 (4.5–5.0)	4.7 (4.5–5.0)
Other beta-lactam anti-bacterials	4.0 (3.7–4.4)	4.0 (3.6–4.3)	3.2 (3.0–3.5)	3.0 (2.8–3.2)	2.9 (2.7–3.1)
ACE inhibitors, plain	3.3 (3.1–3.5)	2.9 (2.7–3.1)	2.8 (2.6–3.0)	2.5 (2.3–2.7)	2.5 (2.3–2.7)
Adrenergics inhalants	3.3 (3.1–3.6)	3.1 (2.9–3.3)	3.2 (2.9–3.4)	3.0 (2.8–3.3)	2.8 (2.6–3.1)
Macrolides/lincosamides/streptogramins	2.8 (2.6–3.0)	2.8 (2.5–3.0)	2.4 (2.2–2.6)	2.3 (2.0–2.5)	2.1 (1.9–2.3)
Anti-depressants	2.9 (2.8–3.1)	3.1 (2.8–3.3)	3.1 (2.9–3.3)	2.9 (2.7–3.1)	3.2 (3.0–3.4)
Other inhalants for obstructive airway diseases	3.0 (2.8–3.3)	2.3 (2.1–2.5)	1.9 (1.7–2.1)	1.5 (1.3–1.7)	1.2 (1.1–1.4)
Viral vaccines	2.6 (2.2–3.0)	2.6 (2.2–3.0)	2.6 (2.2–3.0)	2.4 (2.0–2.9)	2.1 (1.7–2.4)
Corticosteroids plain	2.3 (2.1–2.4)	2.6 (2.4–2.9)	2.4 (2.2–2.6)	2.2 (2.0–2.3)	2.4 (2.2–2.6)
Drugs for peptic ulcer and GORD	2.2 (2.0–2.4)	2.2 (2.0–2.3)	2.4 (2.2–2.5)	2.4 (2.2–2.6)	2.8 (2.6–3.0)
Anxiolytics	2.1 (1.9–2.3)	2.0 (1.8–2.2)	1.9 (1.7–2.2)	1.9 (1.7–2.1)	2.0 (1.8–2.2)
Hypnotics & sedatives	1.9 (1.7–2.1)	1.9 (1.7–2.1)	1.9 (1.7–2.1)	1.7 (1.5–1.9)	1.8 (1.6–2.0)
Cholesterol & triglyceride reducers	2.2 (2.0–2.4)	2.4 (2.2–2.5)	2.4 (2.3–2.6)	2.4 (2.2–2.6)	2.8 (2.6–3.0)
Beta-blocking agents	1.9 (1.7–2.1)	1.7 (1.5–1.9)	1.8 (1.6–2.1)	1.6 (1.4–1.8)	1.8 (1.6–2.0)
Hormonal contraceptives for systemic use	1.9 (1.7–2.0)	1.8 (1.7–2.0)	1.9 (1.7–2.0)	1.9 (1.7–2.1)	2.2 (2.0–2.4)
Selective calcium channel blockers with mainly vascular effects	1.6 (1.4–1.8)	1.6 (1.4–1.8)	1.5 (1.3–1.7)	1.3 (1.1–1.5)	1.5 (1.3–1.6)
Opioids	1.7 (1.3–2.1)	1.4 (1.2–1.6)	2.1 (1.8–2.3)	2.2 (2.0–2.5)	2.5 (2.2–2.7)
Oral blood glucose lowering drugs	1.5 (1.2–1.7)	1.7 (1.4–1.9)	1.9 (1.6–2.1)	1.6 (1.3–1.8)	1.9 (1.6–2.1)
Total prescribed medications	**93.8 (91.5–96.2)**	**92.3 (89.9–94.7)**	**88.0 (85.6–90.4)**	**84.3 (81.8–86.9)**	**86.0 (83.6–88.5)**

Note: CI—confidence interval.

Table A5.12: Most frequently advised over-the-counter medications, summary of annual results BEACH 1999–00 to 2003–04

Generic medication	1999–00 Rate per 100 encounters[a] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (*n*=98,877)
Paracetamol	2.5 (2.0–3.0)	2.4 (1.8–2.9)	2.1 (1.7–2.6)	2.6 (2.1–3.0)	2.5 (1.9–3.0)
Chlorpheniramine/phenylephrine	0.3 (0.0–0.7)	0.1 (0.0–0.5)	0.1 (0.0–0.4)	0.1 (0.0–0.7)	0.1 (0.0–0.5)
Clotrimazole topical	0.2 (0.0–0.4)	0.2 (0.0–0.5)	0.2 (0.0–0.4)	0.2 (0.0–0.4)	0.2 (0.0–0.4)
Paracetamol/codeine	0.3 (0.0–0.8)	0.2 (0.0–0.5)	0.2 (0.0–0.5)	0.1 (0.0–0.5)	0.1 (0.0–0.5)
Ibuprofen	0.3 (0.0–0.7)	0.5 (0.2–0.8)	0.5 (0.2–0.8)	0.7 (0.1–1.3)	0.2 (0.0–0.5)
Loratadine	0.3 (0.0–0.6)	0.2 (0.0–0.6)	0.3 (0.0–0.5)	0.3 (0.0–0.6)	0.2 (0.0–0.5)
Diclofenac diethyl topical	0.2 (0.0–0.5)	0.2 (0.0–0.6)	0.2 (0.0–0.5)	0.2 (0.0–0.5)	0.2 (0.0–0.6)
Aspirin	0.2 (0.0–0.6)	0.1 (0.0–0.5)	0.2 (0.0–0.5)	0.2 (0.0–0.4)	0.2 (0.0–0.5)
Pseudoephedrine	0.2 (0.0–0.6)	0.2 (0.0–0.6)	0.1 (0.0–0.5)	0.1 (0.0–0.6)	0.1 (0.0–0.5)
Total advised medications	**9.4 (8.6–10.2)**	**9.0 (8.1–9.8)**	**8.9 (8.1–9.6)**	**10.2 (9.2–11.1)**	**9.4 (8.6–10.1)**

(a)   Only those medications supplied at a rate of 0.2 per 100 encounters or more in 1999–00 are included.

Note: CI—confidence interval.

Table A5.13: Medications most frequently supplied by GPs, summary of annual results BEACH 1999–00 to 2003–04

Generic medication	1999–00 Rate per 100 encounters[a] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (*n*=98,877)
Influenza virus vaccine	0.7 (0.0–1.7)	0.6 (0.0–1.4)	0.9 (0.0–2.1)	0.7 (0.0–0.9)	1.2 (0.0–2.6)
Triple antigen(diphtheria/pertussis/tetanus)	0.3 (0.1–0.6)	0.2 (0.0–0.7)	0.2 (0.0–0.6)	0.1 (0.0–0.6)	0.2 (0.0–0.5)
Polio vaccine oral sabin/injection	0.4 (0.1–0.7)	0.3 (0.0–0.6)	0.3 (0.0–0.7)	0.3 (0.0–0.7)	0.3 (0.1–0.6)
Haemophilus B vaccine	0.3 (0.1–0.6)	0.2 (0.0–0.6)	0.2 (0.0–0.5)	0.2 (0.0–0.6)	0.2 (0.0–0.5)
Mumps/measles/rubella vaccine	0.2 (0.0–0.5)	0.2 (0.0–0.5)	0.2 (0.0–0.5)	0.1 (0.0–0.4)	0.2 (0.0–0.5)
ADT/CDT (diphtheria/tetanus) vaccine	0.3 (0.0–0.5)	0.2 (0.0–0.4)	0.1 (0.0–0.5)	0.1 (0.0–0.5)	0.1 (0.0–0.4)
Hepatitis B vaccine	0.2 (0.0–0.6)	0.2 (0.0–0.5)	0.1 (0.0–0.5)	0.1 (0.0–0.4)	0.1 (0.0–0.6)
Celecoxib	. .	0.3 (0.0–0.7)	0.2 (0.0–0.5)	0.1 (0.0–0.5)	0.1 (0.0–0.4)
Rofecoxib	. .	. .	0.3 (0.0–0.5)	0.2 (0.0–0.6)	0.1 (0.0–0.5)
Total GP-supplied medications	**6.9 (5.8–7.9)**	**6.9 (5.7–8.1)**	**7.6 (6.3–9.0)**	**9.3 (7.6–11.0)**	**8.6 (7.4–9.8)**

(a)   Only those medications supplied at a rate of 0.2 per 100 encounters or more in 1999–00 are included with the exception of celecoxib and rofecoxib which are reported for years after acceptance on the PBS.

Note: CI—confidence interval.

Table A5.14: The ten most common problems managed with a clinical treatment, summary of annual results BEACH 1999–00 to 2003–04

Problem managed	1999–00 Rate per 100 encounters[a] (95% CI) (n=104,856)	2000–01 Rate per 100 encounters[a] (95% CI) (n=99,307)	2001–02 Rate per 100 encounters[a] (95% CI) (n=96,973)	2002–03 Rate per 100 encounters[a] (95% CI) (n=100,987)	2003–04 Rate per 100 encounters[a] (95% CI) (n=98,877)
Depression*	1.6 (1.4–1.8)	1.8 (1.6–2.1)	1.7 (1.5–1.9)	1.7 (1.5–2.0)	1.7 (1.6–1.9)
Upper respiratory tract infection	1.4 (1.1–1.7)	1.7 (1.4–2.1)	2.0 (1.6–2.4)	1.8 (1.5–2.2)	1.6 (1.2–2.0)
Hypertension*	1.1 (0.8–1.3)	1.4 (1.0–1.8)	1.4 (1.1–1.6)	1.5 (1.1–1.9)	1.3 (1.0–1.5)
Anxiety*	0.8 (0.6–1.0)	0.8 (0.6–1.0)	0.8 (0.7–1.0)	0.7 (0.5–0.9)	0.8 (0.6–1.0)
Lipid disorder	0.8 (0.6–1.0)	1.0 (0.8–1.3)	1.0 (0.8–1.2)	0.9 (0.7–1.1)	0.8 (0.6–1.0)
Diabetes*	0.8 (0.6–1.0)	0.9 (0.7–1.1)	1.0 (0.8–1.2)	0.8 (0.7–1.0)	0.9 (0.7–1.1)
Gastroenteritis, presumed infection	0.5 (0.3–0.8)	0.6 (0.3–0.9)	0.6 (0.4–0.8)	0.6 (0.4–0.8)	0.6 (0.4–0.8)
Asthma	0.6 (0.3–0.8)	0.6 (0.4–0.8)	0.7 (0.4–0.9)	0.6 (0.3–0.8)	0.5 (0.3–0.7)
Back complaint*	0.6 (0.4–0.8)	0.6 (0.4–0.8)	0.6 (0.4–0.8)	0.6 (0.3–0.8)	0.6 (0.4–0.7)
Sprain/strain*	0.5 (0.3–0.7)	0.6 (0.4–0.9)	0.6 (0.4–0.8)	0.4 (0.4–0.5)	0.5 (0.3–0.6)
Total problems managed with clinical treatment	**30.4 (28.9–31.9)**	**32.8 (31.1–34.5)**	**33.5 (31.8–35.2)**	**32.8 (31.0–34.7)**	**32.4 (30.7–34.2)**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 3).

Note: CI—confidence interval.

Table A5.15: Number of encounters where pathology, imaging ordered, summary of annual results BEACH 1999–00 to 2003–04

	1999–00	2000–01	2001–02	2002–03	2003–04
	Per cent of encounters (95% CI) (*n*=104,856)	Per cent of encounters (95% CI) (*n*=99,307)	Per cent of encounters (95% CI) (*n*=96,973)	Per cent of encounters (95% CI) (*n*=100,987)	Per cent of encounters (95% CI) (*n*=98,877)
No tests ordered	81.1 (80.5–81.7)	80.7 (80.1–81.3)	80.8 (80.2–81.4)	79.7 (79.0–80.3)	79.2 (78.5–79.9)
At least one pathology test ordered	13.8 (13.3–14.3)	13.8 (13.3–14.3)	14.0 (13.5–14.5)	14.7 (14.2–15.3)	15.5 (14.9–16.1)
At least one imaging ordered	6.7 (6.4–7.0)	6.8 (6.5–7.1)	6.9 (6.6–7.2)	7.5 (7.1–7.8)	7.2 (6.9–7.5)

Note: CI—confidence interval.

Table A5.16: Distribution of pathology orders across pathology groups, summary of annual results BEACH 2000–01 to 2003–04

Pathology test ordered	2000–01[a] Rate per 100 encounters (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters (95% CI) (*n*=97,973)	2002–03 Rate per 100 encounters (95% CI) (*n*=100,987)	2003–04 Rate per 100 encounters (95% CI) (*n*=98,877)
Chemistry	15.7 (14.8–16.5)	16.5 (15.6–17.3)	17.7 (16.8–18.6)	19.1 (18.1–20.1)
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)
Microbiology	4.6 (4.3–4.9)	4.9 (4.5–5.2)	5.1 (4.8–5.5)	5.3 (4.9–5.7)
Cytology	1.5 (1.2–1.8)	1.6 (1.3–1.8)	1.7 (1.4–1.9)	1.8 (1.4–2.1)
Other NEC	0.8 (0.4–1.1)	0.7 (0.5–0.9)	0.8 (0.4–1.1)	0.8 (0.5–1.1)
Infertility/pregnancy	0.3 (0.0–0.6)	0.3 (0.1–0.5)	0.3 (0.1–0.5)	0.2 (0.0–0.5)
Tissue pathology	0.5 (0.2–0.7)	0.5 (0.1–0.8)	0.5 (0.2–0.8)	1.8 (1.4–2.1)
Immunology	0.5 (0.2–0.8)	0.5 (0.3–0.7)	0.5 (0.2–0.7	0.7 (0.2–1.2)
Simple test; other	0.1 (0.0–0.5)	0.1 (0.0–0.4)	0.1 (0.0–0.4)	0.1 (0.0–0.4)
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)**

(a)   Data collection and coding method changed at the end of the third year of BEACH (2000–01). Year 3 data were re-coded to be comparable with years 4 to 6.

Note: CI—confidence interval; NEC—not elsewhere classified.

Table A5.17: Most frequent imaging tests ordered BEACH 1999–00 and 2003–04

Imaging test ordered	1999–00[a] Rate per 100 encounters (95% CI) (n=104,856)	2000–01 Rate per 100 encounters (95% CI) (n=99,307)	2001–02 Rate per 100 encounters (95% CI) (n=96,973)	2002–03 Rate per 100 encounters (95% CI) (n=100,987)	2003–04 Rate per 100 encounters (95% CI) (n=98,877)
Diagnostic radiology	4.8 (4.5–5.1)	4.8 (4.6–5.1)	4.6 (4.4–4.8)	5.1 (4.9–5.4)	4.6 (4.3–4.8)
Ultrasound	1.9 (1.8–2.1)	2.1 (2.0–2.3)	2.5 (2.3–2.7)	2.6 (2.5–2.8)	2.7 (2.5–2.8)
Computerised tomography	0.6 (0.5–0.8)	0.7 (0.6–0.8)	0.8 (0.6–0.9)	0.8 (0.7–0.9)	0.8 (0.7–0.9)
Nuclear medicine imaging	0.0 (0.0–0.6)	0.0 (0.0–0.4)	0.0 (0.0–0.4)	0.0 (0.0–0.4)	0.1 (0.0–0.3)
Magnetic resonance imaging	0.0 (0.0–0.5)	0.0 (0.0–0.4)	0.0 (0.0–0.5)	0.0 (0.0–0.6)	0.0 (0.0–0.5)
Total imaging tests	**7.4 (7.1–7.8)**	**7.7 (7.3–8.0)**	**7.9 (7.6–8.2)**	**8.6 (8.2–9.0)**	**8.2 (7.8–8.6)**

(a)   Data collection and coding method changed at the end of the second BEACH year (1999–00). The second year's data were re-coded to be comparable with years 3 to 6.

Note: CI—confidence interval.

Table A5.18: Comparative results for patient (aged 18 years and over) risk factors, 1999–00 to 2003–04

Risk factor	1999–00 Per cent (95% CI)	2000–01 Per cent (95% CI)	2001–02 Per cent (95% CI)	2002–03 Per cent (95% CI)	2003–04 Per cent (95% CI)
Obese	19.4 (18.8–20.0)	20.2 (19.5–20.8)	21.4 (20.7–22.1)	20.9 (20.2–21.5)	22.0 (21.4–22.7)
Overweight	33.1 (32.5–33.8)	34.1 (33.4–34.7)	33.5 (32.9–34.1)	33.8 (33.2–34.5)	34.5 (33.8–35.1)
Current daily smoker	18.9 (18.2–19.6)	19.3 (18.5–20.1)	18.4 (17.7–19.1)	17.2 (16.5–17.9)	17.6 (16.8–18.3)
At-risk alcohol level	24.2 (23.4–24.9)	24.1 (23.3–24.9)	26.0 (25.1–26.8)	26.2 (25.4–27.1)	26.7 (25.8–27.6)

Note: CI—confidence interval.

Appendix 6: Dissemination of results from the BEACH program

A full list of BEACH publications is also available from the Family Medicine Research Centre website: <http://www.fmrc.org.au/publications/>.

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