General practice activity in Australia 2001–02

GP Statistics and Classification Unit

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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:

General Practice Statistics and Classification Unit 2000 [cited 22–12–2000]. SAND abstracts from the BEACH program. Sydney: AIHW/University of Sydney. Available from Internet: http:/www.fmrc.org.au/beach.htm

Britt H, Miller GC, Valenti L 2001. 'It's different in the bush': a comparison of general practice activity in metropolitan and rural areas of Australia 1998–2000. AIHW Cat. No. GEP 6. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 6).

Britt H, Miller GC, Knox S 2001. Imaging orders by general practitioners in Australia 1999–00. AIHW Cat. No. GEP 7. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 7).

Senes S & Britt H 2001. A general practice view of cardiovascular disease and diabetes in Australia. AIHW Cat. No. CVD 17. Canberra: Australian Institute of Health and Welfare (Cardiovascular Disease Series No. 17).

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).

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).

GENERAL PRACTICE SERIES
Number 10

BEACH
Bettering the Evaluation and Care of Health

General practice activity in Australia 2001–02

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December 2002

A joint report by the University of Sydney and the Australian Institute of Health and Welfare

AIHW Cat. No. GEP 10

This is the tenth publication of the General Practice Series, from the General Practice Statistics and Classification Unit, a collaborating unit of The University of Sydney and the Australian Institute of Health and Welfare. A complete list of the Institute's publications is available from the Media and Publishing Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601, or via the Institute's web site at http://www.aihw.gov.au.

ISBN 1 74024 217 3

ISSN 1442 3022

Suggested citation

Britt H, Miller GC, Knox S, Charles J, Valenti L, Henderson J, et al. 2002. General practice activity in Australia 2001–02. AIHW Cat. No. GEP 10. Canberra: Australian Institute of Health and Welfare (General Practice Series No. 10).

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Published by the Australian Institute of Health and Welfare

Printed by Elect Printing

Foreword

I am delighted to be able to introduce this publication which provides information on general practice consultations from 983 GPs who took part in the BEACH (Bettering the Evaluation and Care of Health) program between April 2001 and March 2002.

BEACH continues to be the only national data collection program in Australia that is derived from a large random and rolling sample of GPs. It provides an accurate and comprehensive description of general practice in this country today. As such, it is of immense value to general practitioners, policy makers, the pharmaceutical industry, health researchers, the media and the general public who can all make good use of the findings.

The report is certainly comprehensive. It touches on most aspects of the meetings that take place between patients and their doctors. There are numerous topics to draw the attention of readers. The information encapsulated in the flow-charts in the report is of special interest to me as it illustrates the complexity of general practice consultations.

Since BEACH began in 1998, the research team have examined 400,000 doctor-patient encounters and can now demonstrate changes over a 4-year period. This is the first time the reporting of such data has been possible in Australia and my attention was caught by several of these changes. I was not surprised that the proportion of female GPs has risen, but it seems that on average we GPs are also an ageing population, working fewer sessions per week and in larger practices, seeing fewer children and more holders of health care cards, dealing more often with chronic diseases, prescribing fewer medications and doing more counselling. We are changing as GPs, as is our role in as providers of high quality health care to the Australian public.

This year a section of the BEACH report focuses on encounters between Indigenous Australians and their GPs. This section tells us that they are younger on average than our other patients and are more likely to hold a health care card and live in rural areas. The patterns of morbidity we see in our Aboriginal and Torres Strait Islander patients are also different. These findings, which show that general practitioners play a major role in the health care of Indigenous people in Australia, should be a useful addition to the data needed to plan how we better work together to meet future health care needs.

The BEACH study will be invaluable to the profession as a whole, and I would especially like to acknowledge the GP participants in BEACH whose efforts are fundamental to this publication. Their dedication and persistence in their busy practice environments is admirable and my gratitude goes out to them. I note with interest the current trial of active computerised BEACH data collection with GPs who have previously participated in the paper-based version. Comparison of data from the two methods will be a test of the reliability of electronic collection and may allow GP participants a choice of recording methods in the future.

In conclusion, I recommend this report and the high-quality data source on which it draws to anyone with an interest in Australian general practice. It is important that the findings are widely shared.

Professor Michael Kidd MD FRACGP
President
The Royal Australian College of General Practitioners

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Acknowledgments

The General Practice Statistics and Classification Unit wishes to thank the 983 general practitioners who participated in BEACH 2001–02. This report would not have been possible without their valued cooperation and effort in providing the data.

We also thank the following organisations for their financial support and their contribution to the ongoing development of the BEACH program:

- the Commonwealth Department of Health and Ageing
- AstraZeneca (Australia)
- Aventis Pharma Pty Ltd
- Roche Products Pty Ltd
- Janssen-Cilag Pty Ltd
- Merck Sharp & Dohme (Australia) Pty Ltd

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

We are grateful for the strong administrative support provided by Gervaise Woods and Dulcie Bucksath and the valuable contribution of the general practitioner recruitment staff (particularly Errol Henderson) and data entry staff (particularly Rebecca Chapman). We recognise the contribution of past members of the BEACH team, particularly those in the research team during 2001—Zoe Kelly, Matt Hou and Corinna Schenker.

The cooperation of Carolynn Fredericks of the General Practice Branch of the Commonwealth Department of Health and Ageing in regularly supplying general practitioner random samples and national Health Insurance Commission data is also appreciated. At the Institute, Amanda Nobbs coordinated the printing and publication process.

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

Summary

Background

This report provides an overview of results form the fourth 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 4 years since the program began in March 1998.

Method

A random sample of GPs who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from the Health Insurance Commission (HIC) data by the General Practice Branch of the Department of Health and Ageing (DoHA). GPs are approached by letter and followed up by telephone recruitment. Each participating GP completes details about 100 consecutive patient encounters on structured paper encounter forms and provides information about themselves and their practice.

In the 2001–02 BEACH data year a random sample of 983 GPs provided details of 98,300 GP–patient encounters across Australia. 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 sub studies covered in the fourth year of BEACH are reported elsewhere (http://www.fmrc.org.au).

The participating general practitioners

The 983 participants represented 32.3% of those with whom contact could be established. Males made up 64.2% of participants and GPs aged 45 years or older accounted for 66.0%. Almost half (44.7%) were in practices of five or more GPs and about one-quarter had graduated in a country other than Australia. More than one-third (38.1%) were Fellows of the Royal Australian College of General Practitioners (RACGP) and 2.5% were currently in the Training Program. The majority (69.3%) practised in capital cities and 56.0% provided their own after-hours services or did so through a cooperative arrangement with other practices. Hours spent in direct patient care per week were between 41 and 60 hours for 43.7% of these GPs and 21–40 hours for 41.9%.

A comparison of characteristics of participating GPs with those of the GPs who declined showed that GPs aged less than 35 years were under-represented in the final BEACH GP sample. Post-stratification weighting adjusted for this difference. Participants were also less 'busy' in terms of A1 Medicare item number claims in the previous quarter. The weighting incorporated the differential activity level of each GP to increase the precision of national estimates.

The encounters

After post-stratification weighting for age (stratified by sex) and activity level, there were 96,973 encounters included in the analysis. Comparison of the age–sex distribution of patients at these encounters with that of encounters in the Medicare data demonstrated excellent precision of the final encounter sample.

Most encounters (97.7%) were direct encounters (patient seen). By far the majority (93.9%) were claimable from Medicare or the Department of Veterans' Affairs and 84.1% of these were standard surgery consultations.

The encounters involved 144,654 reasons for encounter, 139,092 problems managed, 101,350 medications, 50,308 non-pharmacological treatments, 10,167 referrals, 30,086 pathology test orders and 7,642 orders for imaging.

The patients

Children accounted for 13.2% of the encounters, 9.5% were with young adults, and 25.1% with elderly patients. The patient was female at 57.4% of encounters, held a health care card at 41.9%, and came from a non-English-speaking background at 9.3% of encounters. The patient identified themselves as an Aboriginal person or a Torres Strait Islander at 1% of encounters.

Patient reasons for encounter (RFEs) were recorded at a rate of 149 per 100 encounters. More than half related to the respiratory, musculoskeletal, skin, circulatory and digestive systems. RFEs were most commonly described in terms of symptoms and complaints. Requests for a prescription, a check-up or for immunisation/vaccination were common RFEs. The remainder of the top ten RFEs were largely symptomatic in nature.

Problems managed

Problems were managed at a rate of 143 per 100 encounters. Problems related to the respiratory, musculoskeletal and circulatory systems accounted for almost 40% of all problems managed. The most common individual problems were hypertension (9.0 per 100 encounters), upper respiratory tract infection (URTI) (6.2 per 100), immunisation/vaccination (4.7 per 100), depression (3.4 per 100) and diabetes (33.1). Together these problems represented almost 20% of all problems managed.

Management

There was no specific treatment recorded for 8.2% of problems managed. The most common treatment was medication alone (39.8% of problems) followed by clinical treatments only (10.1%) and then by medication plus clinical treatment (8.7%).

Medications

There were 105 medications recorded per 100 encounters, or 73 per 100 problems. These medications could be prescribed (84.1% of all medications), advised for over-the-counter purchase (8.5%), or supplied by the GP (7.3%).

- **Prescribed medications:** Medications were prescribed at a rate of 88.0 per 100 encounters or 61.4 per 100 problems managed, at least one being prescribed at 57.5% of encounters and for 49.8% of problems managed. Medication groups most frequently prescribed were antibiotics (16.3% of all prescriptions), cardiovascular (15.8%), central nervous system (12.1%), psychological (8.4%), musculoskeletal (7.3%) and respiratory (6.6%) medications. The most commonly prescribed generic medications were paracetamol (3.5% of all prescriptions), amoxycillin (3.3%), cephalexin (2.3%) and the paracetamol-codeine combination (2.5%).
- **Other medications:** Medications most often recommended for over-the-counter purchase were paracetamol, ibuprofen, loratadine and clotrimazole topical. Of the top ten medications supplied by the GP, eight were vaccines and two were Cox-2 inhibitors.

Non-pharmacological treatments

These were classified as clinical and procedural. At least one non-pharmacological treatment was provided for 31.4% of problems. Clinical treatments were more frequent (38.1 per 100 encounters or 26.5 per 100 problems) than procedures (13.8 and 9.6 respectively). General

advice and education (6.3 per 100 encounters) was the most common clinical treatment followed by counselling about nutrition and weight. The most frequent procedure was excision or removal of tissue (2.7 per 100 encounters).

Referrals, admissions, tests and investigations

At least one referral was given at 10.0% of encounters for 7.0% of problems. Referrals to medical specialists arose at a rate of 7.3 per 100 encounters, the most frequent being to surgeons. Referrals to allied health professionals occurred at a rate of 2.3 per 100 encounters, the majority being to physiotherapists. Admissions to hospital and referral to the emergency department were rare. Diabetes, malignant neoplasms, pregnancy and depression were the problems most often referred to a specialist while sprains/strains, back complaints and diabetes were those most commonly referred to an allied health professional.

Pathology was ordered for one in ten problems (at a rate of 31.0 tests per 100 encounters). Blood chemistry accounted for more than half the pathology 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 7.9 per 100 encounters. Plain x-rays accounted for almost two-thirds of these, chest x-rays being the most common. Fractures, back complaints and osteoarthritis were the problems for which imaging was most frequently ordered.

Encounters with Indigenous people

There were 916 encounters (1.0% of all encounters) at which the patient identified themselves as Aboriginal or Torres Strait Islander people. These patients were significantly younger than the total sample and more likely to hold a health care card. Their encounters represented 0.5% of those in capital cities but 13.0% of those in remote centres and 7.5% of those in other remote areas. There were no statistical differences in the morbidity and management patterns at these encounters but this is likely to be due to the small sample size. However, some interesting trends emerged.

Changes over time

Measurement of changes since 1998–99 demonstrated increased management rates of endocrine and metabolic problems (lipid disorders and diabetes in particular) and general and unspecified problems with decreased management rates of respiratory problems (particularly asthma and acute bronchitis), neurological problems and those related to the ear and the eye. There were measured decreases in overall prescribing rates for antibiotics, respiratory medications and simple and compound analgesics. Increased prescribing rates were demonstrated for medications acting on the musculoskeletal system (particularly NSAIDs). Increases in clinical treatment rates were apparent, particularly the provision of lifestyle counselling and advice.

Selected topics – changes over time

- There was a significant increase in the use of angiotensin II antagonists in the management of hypertension and a move away from ACE inhibitors.
- While there was no increase in the relative prescribing rate of anti-depressants for depression there was a significant increase in prescribing of SSRIs both for depression and for other psychological problems. This was offset by a decrease in rates for tricyclic anti-depressants and monoamine oxidase inhibitors.

- Prescribing of proton pump inhibitors, used in the treatment of oesophageal disease, doubled in this BEACH data year, with a parallel decrease in provision of H2-receptor antagonists.
- Prescribing rates of lipid-lowering medications increased from 1998–99 to 2001–02 but were accompanied by increased management rates of lipid disorders. However there was a significant increase in prescribing rates of statins, suggesting considerable use for preventive care in at-risk cardiovascular patients.
- Last year the management rate of asthma decreased as did the prescribing rate for bronchodilators. This decrease remained in the current year. However, the lower prescribing rate of bronchodilators was not fully explained by lower asthma management rates.
- The provision of non-steroidal anti-inflammatory drugs remained relatively steady from the previous BEACH year but rates of Cox-2 inhibitors continued to increase, with some substitution of Cox-2s for other NSAIDs, particularly in the management of arthritis.
- There was no change in the management rate of upper respiratory tract infection (URTI) but there was a significant decrease in antibiotic prescribing for URTI (particularly cephalosporins) and a marginal decrease in broad-spectrum penicillins for URTI.

Patient health risk behaviours

- *Body mass index:* Of 31,789 adult respondents (aged 18+ years), more than half were considered obese (21.4%) or overweight (33.5%). Men were more likely to be overweight or obese (61.0%) than women (50.9%). Eight per cent were underweight. There was a significant increase in prevalence of obesity over the 4 years (18.4–21.4) at about 1% per year.

  BMI was also calculated for 3,692 children aged 2–17 years. Overall, 13.0% of these children were considered obese and a further 17.6% were overweight.
- *Smoking:* Of the 31,966 responding adult patients (aged 18+ years), 18.4% were daily smokers, 4.1% were occasional smokers and 27.8% were previous smokers. Males were more likely to report daily smoking (21.6%) than females (16.4%).
- *Alcohol use:* 'At-risk' levels of alcohol intake were reported by 26.1% of the 31,559 adult respondents. Male patients were more likely to be at-risk drinkers (32.0%) than women (22.0%). Prevalence of at-risk drinking decreased with age for both sexes.
- *Risk factor profile:* Data for smoking, alcohol consumption and body mass index were all available for 30,642 patients. Almost half the adults had one of these risk factors, 19.9% had two and 3.7% had all three.

Conclusion

This report has described the contribution made by general practice to the health care of the Australian community, and the usefulness of a continuous data source for the measurement of changes in practice over time.

1 Introduction

General practice is recognised as the first port of call for most patients in the Australian health care system, with general practitioners (GPs) performing a gatekeeper role for entry into the secondary and tertiary sectors. Most of the 19 million Australians (82%) attended a GP at least once during the year 2000 (personal communication, GP Branch DoHA). By far the majority of visits to GPs are funded through the Commonwealth Medicare Benefits Schedule (MBS) scheme on a fee for service basis, Medicare paying for 85% of the government recommended consultation fee.[1] Some patients are not charged the additional 15% of the fee, the GPs accepting the Medicare payment as the total payment. Others are charged the difference between the Medicare payment and the government recommended fee, while still others may be asked to pay more for the service.

There are more than 17,000 recognised general practitioners in Australia and about 1,500 registrars enrolled in general practice training programs,[2] or one GP per 90 persons. GPs provide by far the majority of the 100 million non-specialist services to the population that were paid by Medicare[2], at an average rate of 5.4 per person.[3] 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.

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 fourth annual report of the program and provides a summary of results for the period April 2001 to March 2002 inclusive. It uses details of almost 100,000 encounters between general practitioners (GPs) and patients, from a random sample of 983 recognised practising GPs from across the country.

During the 4 years of the program to date there have been many government initiatives in specific areas of care. For example the Commonwealth Department of Health and Ageing has introduced the 'Enhanced Primary Care' package which aims to address the growing burden of chronic problems requiring complex care in an ageing population.[4] This provides specific new Medicare Benefits item numbers for GPs to participate in or to organise case conferences, to undertake annual health checks of elderly patients, and to develop care plans for patients with chronic or complex diseases. Other new Medicare item numbers have been introduced for general practice care of specific areas of morbidity. These include asthma and diabetes.[1]

Further, many of the local Divisions of General Practice, of which there are over 100 across the country, have introduced programs aiming to improve the quality of care of morbidity identified as important in their area. There is also an increasing range of quality assurance options that GPs can undertake to satisfy the requirements of the Royal Australian College of General Practitioners for their quality assurance activities, including self-audits and continuing medical education. Through the Practice Incentive Program the Commonwealth is also providing incentives to general practices for practice-based activities (such as the Childhood Immunisation Program).

With so many initiatives aimed to improve the care provided to the community through general practice, 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 fourth measured data point, allowing further measurement of changes over time. Changes that were identified in 2000–01 in the patterns of morbidity managed and the medications prescribed are followed up in this fourth year and additional changes are reported in this publication.

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.

1.1 Aims

The BEACH program has three main aims:

- to provide a reliable and valid data collection process for general practice which is responsive to the ever-changing needs of information users
- to establish an ongoing database of GP–patient encounter information
- to assess patient risk factors and health states and the relationship these factors have with health service activity.

This report aims to provide an updated reference point for the activities of general practice and to measure changes over the last 4 years in such activities.

2 Methods

The methods adopted in the BEACH program have been described in detail elsewhere.[5-7] 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 Health Insurance Commission (HIC) data period. This equates with 1,500 Medicare claims a year and ensures inclusion of the majority of part-time GPs while excluding those who are not in private practice but claim for a few consultations a year. The General Practice Branch of the Commonwealth Department of Health and Ageing (DoHA) draws a sample on a regular basis.

2.2 Recruitment methods

The randomly selected GPs are approached initially by letter, then by telephone follow-up. GPs who agree to participate are set an agreed recording date approximately 3 to 4 weeks ahead. A research pack is sent to each participant about 10 days before their 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.

Each participating GP earns 20–35 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 who 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), specified other payment source (tick boxes).

Information about **the patient** includes date of birth, sex, postcode of residence. Tick boxes are provided for health care card holder, Veterans' Affairs card holder, non-English-speaking background (NESB), an Aboriginal person (self-identification) and Torres Strait

Islander (self-identification). Space is provided for up to three patient reasons for encounter (RFEs).

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

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 fourth year of the program and not reported in this document are available through the web site of the Family Medicine Research Centre (of which the General Practice Statistics and Classification Unit (GPSCU) is a part) at http://www.fmrc.org.au.

2.4 The BEACH relational database

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

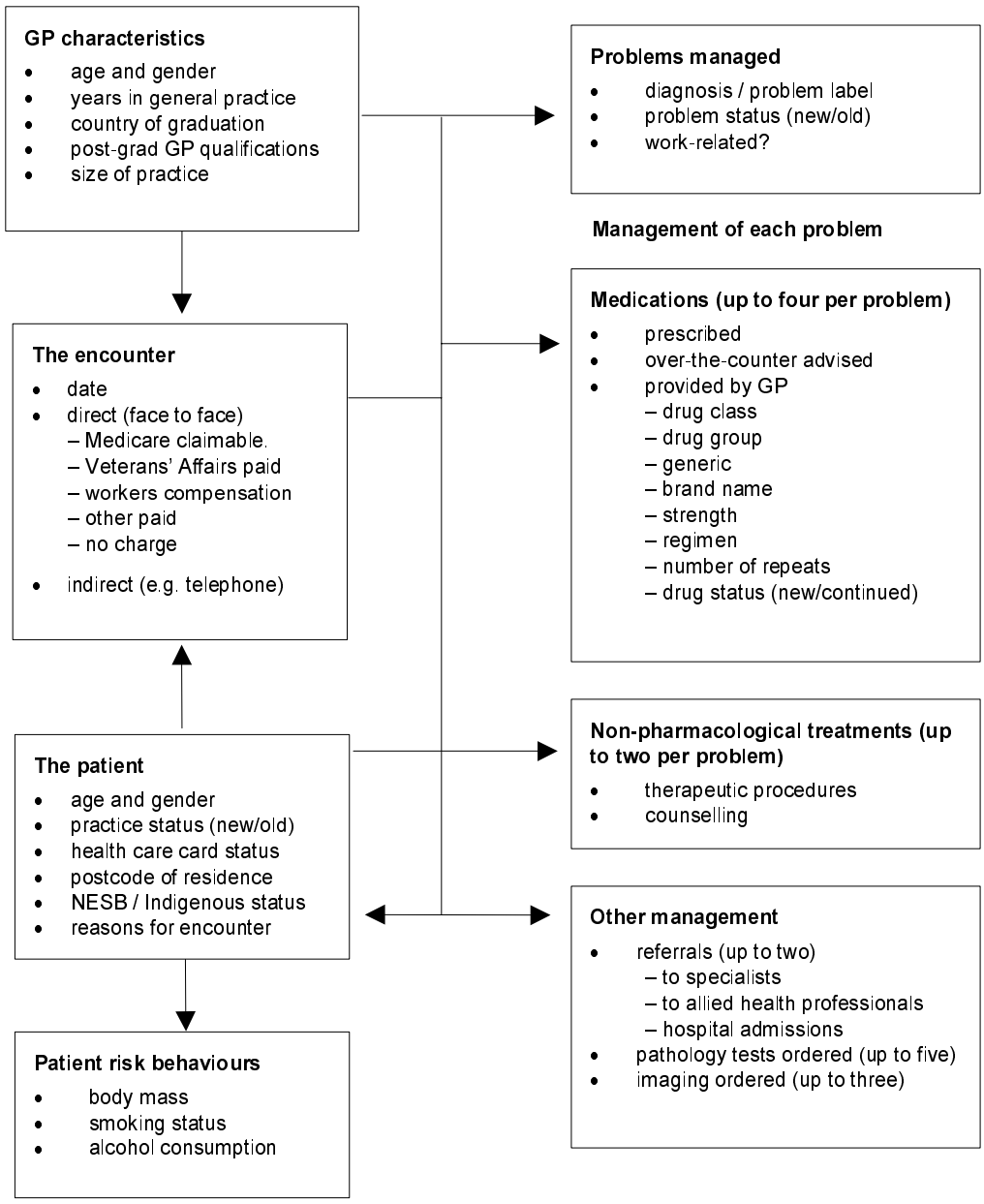


Figure 2.1: The BEACH relational database

2.5 Statistical methods

The analysis of the BEACH database is conducted with SAS version 6.12 [8] 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)*, 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.[9]

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.[10] 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 formulas. Post-stratification weighting was also applied to the raw data before analysis (see Chapter 4).

The analyses of trends over time were conducted with SAS 8.0[11] using methods to calculate robust standard error that adjust for the cluster sample. These statistical methods are described in more detail in Chapter 14. 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 15.

2.6 Classification of data

The imaging tests ordered, patient reasons for encounter, problems managed, procedures, other non-pharmacological treatments, referrals, pathology and imaging are coded using ICPC–2 PLUS.[12] This is an extended vocabulary of terms classified according to the International Classification of Primary Care 2nd edition (ICPC–2), a product of the World Organization of Family Doctors (WONCA).[13] The ICPC is used in over 45 countries as the standard for data classification in primary care.

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

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

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

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 6 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.[12]

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)[14] 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 quality assurance program to ensure reliability of data entry includes ongoing development of computer-aided error checks ('locks') at the data entry stage and a physical check of samples of data entered versus those on the original recording form. Further logical data checks are conducted through SAS on a regular basis.

2.8 Validity and reliability

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

The methods adopted to ensure maximum reliability of coding and data entry 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.[15] Other studies have reported the degree to which GP-reported patient reasons for encounter and problems managed accurately reflect those recalled by the patient[16] and the reliability of secondary coding of RFEs[17] and problems managed.[18] The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work.[19]

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.[20,21] 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.[22]

3 The general practitioners

3.1 Results of recruitment

Contact was attempted with 3,314 GPs, and established with 3,044 (92.0%) of these. Of the 270 who could not be contacted (8.1% of those approached), there were 42 for whom telephone numbers could not be established, 108 had moved and were untraceable, or were retired or deceased, and 55 were unavailable for other reasons (e.g. overseas, on maternity leave). A further 65 were unable to be contacted after five attempts by telephone recruiters. Of the 3,044 available practitioners, 1,268 (41.7%) agreed to participate but 285 (8.6%) failed to complete the study. The final participating sample consisted of 983 practitioners, representing 32.3% of those who were contacted and available, and 30.0% of those with whom contact was attempted (Table 3.1).

Table 3.1: Recruitment and participation rates

	Number	Per cent of approached (*n*=3,314)	Per cent of contacts established (*n*=3,044)
Letter sent and phone contact attempted	3,314	100.0	. .
No contact	270	8.1	. .
No phone number	42	1.3	. .
Moved/retired/deceased	108	3.3	. .
Unavailable	55	1.7	. .
No contact after five calls	65	2.0	. .
Telephone contact established	3,044	92.0	100.0
Declined to participate	1,176	53.6	58.3
Agreed but withdrew	285	8.6	9.4
Agreed and completed	983	30.0	32.3

3.2 The participating GPs

All participants returned a GP profile questionnaire although some were incomplete. Of the 983 participants, 64.2% were male and 66.0% were 45 years of age or older. Three-quarters of the participants (78.7%) had been in general practice for more than 10 years and 16.0% could be regarded as practising part-time, working fewer than six sessions per week. Less than one in six (15.3%) of the participants were in solo practice. The majority (76.1%) had graduated in Australia and more than two-thirds (69.3%) practised in capital cities. One-third (35.1%) were Fellows of the RACGP. Twenty-five GPs (2.5%) were currently undertaking the RACGP Training Program and 38.1% had already completed it.

Computers were used in 89.7% of practices, and 56.0% provided their own after-hours practice arrangements or worked in co-operation with other practices to provide after-hours services. Almost half of the participants (48.0%) spend more than 40 hours each week on direct patient care services. A similar proportion (46.3%) had provided patient care in a residential aged care facility during the month prior to their participation in this study but only 11.4% had worked as a salaried or sessional hospital medical officer during that period. More than half (57.5%) of the GPs worked in a teaching practice (either undergraduates or GP registrars), while 12.4% said their practice was a teaching facility for both (Table 3.2).

Table 3.2: Characteristics of participating GPs

GP characteristic	Number[(a)]	Per cent of GPs[(a)] (*n*=983)
Sex		
Male	631	64.2
Female	352	35.8
Age (missing=1)		
<35 years	70	7.1
35–44 years	263	26.8
45–54 years	359	36.5
55+ years	290	29.5
Years in general practice (missing=4)		
<2 years	3	0.3
2–5 years	71	7.2
6–10 years	132	13.4
11–19 years	279	28.4
20+ years	494	50.3
Sessions per week (missing=15)		
<6 per week	157	16.0
6–10 per week	666	67.8
11+ per week	145	14.8
Size of practice (missing=4)		
Solo	150	15.3
2–4 GPs	390	39.7
5+ GPs	439	44.7
Place of graduation		
Australia	748	76.1
UK	75	7.6
Asia	85	8.6
Europe	18	1.8
Africa	36	3.7
New Zealand	5	0.5
Other	16	1.6

(continued)

Table 3.2 (continued): Characteristics of participating GPs

GP characteristic	Number[(a)]	Per cent of GPs[(a)] (*n*=983)
Practice location		
Capital	681	69.3
Other metropolitan	80	8.1
Large rural	58	5.9
Small rural	48	4.9
Other rural	103	10.5
Remote central	5	0.5
Other remote, offshore	8	0.8
Currently in Training Program	25	2.5
Completed RACGP Training Program	375	38.1
Fellow of RACGP	345	35.1
Own or cooperative after-hours arrangements	550	56.0
Use computers in practice (admin+/-clinical)	883	89.7
Direct patient care hours per week (missing=6)		
<10 hours	8	0.8
10–20 hours	85	8.6
21–40 hours	412	41.9
41–60 hours	430	43.7
60+ hours	42	4.3
Patient care provided in previous month		
As a locum	61	6.2
In a deputising service	35	3.6
In a residential aged care facility	455	46.3
As a salaried/sessional hospital medical officer	112	11.4
Major practice a teaching practice		
For undergraduates	375	38.1
For GP registrars	191	19.4

(a) Missing data removed.
Note: RACGP—Royal Australian College of General Practitioners

3.3 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 was compared and is referred to as 'activity level'.

In Table 3.3 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 3.3) 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.

Differences between participants and non-participants were tested using the chi-square statistic (significance at the 5% level), using the DoHA characteristic data from both groups. There were no significant differences between participants and non-participants in terms of place of graduation and location of practice (categorised using the Rural, Remote Metropolitan Area (RRMA) classification).[23]

The sex and age distributions for participants and non-participants were significantly different. There were slightly fewer males in the participating group, and GPs under the age of 35 years were under-represented in the participant population while those aged 55 years or more were over-represented (Table 3.3). The difference in years since graduation of participants compared with non-participants reflected this age difference (results not shown).

For State or Territory, the statistically significant difference in distribution resulted from a higher participation rate by GPs from New South Wales. The proportion of participants in other States was similar to that of non-participants. There was no 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. However, GPs with an activity level of 375–750 services in the previous quarter were more likely to participate than those in the 751–1,500 group. Since there was no significant difference in mean activity level between the groups, this may be an artefact of groups (i.e. the cut-off points) selected. However, 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.

3.4 Discussion

The response rate of GPs to BEACH was 32.3% of those with whom contact was established. This rate is slightly higher than last year (29.8%) but still lower than in the previous 2 years of BEACH (38.4 and 39.1). This is probably a reflection of the change of triennium. For the first half of this BEACH year, recruitment was difficult as these were the last months of the triennium and many GPs had completed their quality assurance points requirements. From around mid November, recruitment became easier as GPs could be enrolled to record from the start of the new triennium in January.

The continued under-representation of GPs aged less than 35 years also possibly reflects the fact that GP registrars are not required to undertake QA activities during training or during the QA triennium on completion of training. Incentives are required to encourage the participation of these younger GPs to ensure their sufficient representation in the future.

Table 3.3: Comparison of characteristics of participating and non-participating GPs

GP characteristics	Participants[(a)] (*n*=983)		Non-participants[(a)] (*n*=2,061)	
	Number	Per cent of GPs[(b)]	Number	Per cent of GPs[(b)]
Sex (χ^2=11.31, p=0.003)				
Male	632	64.3	1,450	70.4
Female	351	35.7	611	29.6
Age (χ^2=13.2, p=0.0041)				
<35 years	68	6.9	198	9.6
35–44 years	236	24.0	547	26.5
45–54 years	346	35.2	693	33.6
55+ years	292	29.7	514	24.9
Missing	41	. .	109	. .
Place of graduation (χ^2=0.41, p=0.8124)				
Australia	755	76.8	1,561	75.7
Overseas	228	23.2	500	24.3
State (χ^2=20.6, p=0.004)				
New South Wales	352	35.8	615	29.8
Victoria	264	26.9	595	28.9
Queensland	177	18.0	369	17.9
South Australia	72	7.3	221	10.7
Western Australia	69	7.0	162	7.9
Tasmania	25	2.5	63	3.1
Australian Capital Territory	13	1.3	19	0.9
Northern Territory	11	1.1	13	0.6
Missing	. .	. .	4	0.2
RRMA (χ^2=3.19, p=0.784)				
Capital	680	69.2	1,403	68.1
Other metropolitan	81	8.0	176	8.5
Large rural	57	5.8	124	6.0
Small rural	48	4.9	130	6.3
Other rural	102	10.4	194	9.4
Remote centre	5	0.5	10	0.5
Other remote	8	0.8	17	0.8
Missing	2	0.2	7	0.3
Activity (χ^2=9.96, p=0.0068)				
375–750 services in previous quarter	230	23.4	384	18.6
751–1,500 services in previous quarter	409	41.6	939	45.6
>1,500 services in previous quarter	344	35.0	738	35.8
Mean activity level (*t* =0.827, p=0.41)	1,378.9	. .	1,403.3	. .

(a) Data drawn from that provided by the DoHA.
(b) Missing data removed.

3.5 Trends in characteristics of the GPs 1998–2002

Over the first 4 years of BEACH there were some notable trends in the characteristics of the GPs who participated in the program (see Appendix 4, Table 3.2).

The proportion of GP participants who are female has gradually increased from 30.0% to 35.8% since 1998–99. Participants in BEACH 2001–02 tended to be older than those of 1998–99, there being a gradual decrease in the proportion aged less than 45 years, and an increase (from 32.1% to 36.5%), in the proportion aged 45–54 years, and in those aged 55 years or more (from 25.2% to 29.5%). From comparisons with the national data in each year [6,7,24] these appear to reflect changes in the characteristics of the total practising GP population. Reflecting the ageing population of participating GPs, decreases were noted in the proportion who had practised for 6–10 years (17.2% to 13.4%) and for 11–19 years (33.7% to 28.4%), while the proportion who had spent more than 20 years in general practice increased from 42.2% to 50.3%.

While there was no obvious change in the proportion of GPs working six to ten sessions per week, there has been a general increase in the proportion working fewer than six sessions per week (12.3% to 16.0%) and a decrease in the proportion who work 11 or more sessions per week (19.1% to 14.8%). In parallel the proportion of participants working in larger practices of five or more GPs increased over the 4 years from 38.9% to 44.7%.

The proportion of GPs who conducted more than 50% of their consultations in a language other than English showed an upward trend over the first 3 years of BEACH, rising from 11.3% to 13.5%. These data were not collected for the fourth year of the program.

An increase from 30.4% to 38.1% was noted in the percentage of participating GPs who had completed the Training Program. The proportion of participants who held Fellowship of the Royal Australian College of General Practitioners also increased over the 4 years, from 27.3% to 35.1%. A summary of these results can be found in Appendix 4, Table A4.1. Statistical testing of these changes will be conducted at the end of the fifth year of the BEACH program.

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. The representativeness of a study can also be improved by calculating sample weights to standardise the sample characteristics against those population characteristics that may influence the final results. 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 3.3). 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 2001 (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 Commonwealth Department of Health and Ageing 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 =25.88, 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 the RACGP 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. In the majority these GPs would be less than 35 years.

GPs from New South Wales and Victoria were somewhat over-represented in the sample, while Western Australia was significantly under-represented, compared with the national profile of GPs (χ^2 =26.85, p=<0.001). GPs in small rural and remote areas were somewhat under-represented in the sample (χ^2 = 15.36, p=0.018).

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

	BEACH[(a)(b)]		Australia[(a)(c)(d)]	
Variable	Number	Per cent of GPs	Number	Per cent of GPs
Sex (χ^2=4.69, p =0.096)	. .	. .	. .	. .
Males	631	64.2	11,839	67.5
Females	352	35.8	5,695	32.5
Age (χ^2=25.88, p=<0.001)	. .	. .	. .	. .
<35	70	7.1	2,123	12.1
35–44	263	26.8	4,762	27.1
45–54	360	36.7	5,613	32.0
55+	289	29.4	5,060	28.8
Place of graduation (χ^2=2.57, p =0 .276)	. .	. .	. .	. .
Australia	748	76.1	12,955	73.8
Overseas	235	23.9	4,603	26.2
State (χ^2=26.85, p=<0.001)	. .	. .	. .	. .
New South Wales	352	35.8	5,932	33.8
Victoria	264	26.9	4,256	24.2
Queensland	178	18.1	3,266	18.6
South Australia	71	7.2	1,512	8.6
Western Australia	69	7.0	1,668	9.5
Tasmania	25	2.5	505	2.9
Australian Capital Territory	13	1.3	281	1.6
Northern Territory	11	1.1	138	0.8
RRMA (χ^2=15.36, p=0.018)	. .	. .	. .	. .
Capital	681	69.3	11,437	65.1
Other metropolitan	80	8.1	1,309	7.5
Large rural	58	5.9	1,063	6.1
Small rural	48	4.9	1,248	7.1
Other rural	103	10.5	2,097	11.9
Remote centre	5	0.5	174	1.0
Other remote	8	0.8	230	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, Department of Health and Ageing.
(d) All GPs who claimed at least 375 A1 Medicare items during the most recent 3-month HIC data period.

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 on the underlying 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. There was also a significant difference between the sample and the MBS data in terms the distribution across rural, remote and metropolitan area; however, comparisons of metropolitan and rural GPs have not demonstrated substantive differences between the GPs in terms of morbidity and management.[7]

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 age

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.

GP activity level

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.[25] 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, as 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. Therefore it was also necessary to calculate post-stratification weights reflecting the different sampling fractions. This means that the BEACH encounter details from the GP who had claimed 6,000 Medicare services in the previous 12 months should have greater weighting than those encounters from the GP who had claimed 3,000 services, when estimating national activity in general practice. It was therefore possible to calculate sample weighting that reflected the contribution that each GP made to the total number of services for the sample.

The values of the weighted data were a multiplicative function of the raw data values, GP age weighting and GP sampling fraction of services in the previous 12 months. Table 4.2 shows the precision ratio calculated after weighting the data. As can be seen, the fit of the MBS and BEACH age and sex distribution improved somewhat after weighting, especially when encounters paid for by the Department of Veterans' Affairs were excluded from the BEACH distribution.

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 Department of Health and Ageing provided the age–sex distribution of all A1 Medicare general practice items claimed during 2001, against which the age–sex distribution of the BEACH sample of patient encounters was compared.

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. To make the BEACH encounters equivalent to the Medicare data, only those BEACH encounters where a Medicare A1 item was recorded were included in the age and sex distributions in Table 4.2.

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.

Creating precision ratios (HIC %/BEACH %) for the age–sex distribution data contained in Table 4.2 revealed that the precision of the BEACH age–sex distribution was within the acceptable range of 0.8–1.2 except for men aged 75 years and older. Simply, BEACH A1 item encounters contained proportionally more encounters with men aged 75 years and older than did the national MBS A1 item data. It is possible that this was the result of having a greater proportion of older GPs in BEACH than for the national MBS GP data. However, it may also be influenced by the inclusion in BEACH but not in the MBS data of encounters not covered by the MBS (e.g. Department of Veterans' Affairs). To investigate the effect of including A1 item encounters claimed through the Department of Veterans' Affairs on the comparison of BEACH A1 item encounters with MBS A1 item encounters, the distributions were compared both with and without BEACH Veterans' Affairs' encounters. The precision ratios are reported for both comparisons in Table 4.2. After removing the encounters payable by the Department of Veterans' Affairs, the precision ratio for men aged 75 years and over improved to within the 20% precision range, suggesting that the inclusion of Veterans' Affairs encounters affected the distribution of encounters.

The precision ratios indicate that the BEACH sample of encounters is a good representation of Australian general practice patient encounters.

4.4 The weighted data set

The final unweighted data set from the fourth year of collection contained 983,000 encounters, 147,691 reasons for encounters, 144,372 problems managed and 102,352 medications. The apparent number of encounters, reasons for encounter, problems managed, medications, the numbers of referrals, imaging and pathology all decreased after weighting (Table 4.3).

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

	BEACH [(a)]		Australia[(b)]	Precision ratios		
Variable	Number	Per cent	Per cent	Raw[(a)]	Weighted[(c)]	No Vet Affairs[(d)]
Male	3,3038	40.4	41.7	1.03	0.98	0.99
<1 year	891	1.1	1.2	1.07	1.10	1.08
1–4 years	2,052	2.5	3.0	1.20	1.12	1.10
5–14 years	2,579	3.2	3.9	1.23	1.14	1.12
15–24 years	2,670	3.3	3.7	1.13	1.04	1.03
25–44 years	7,452	9.1	9.6	1.05	0.99	0.97
45–64 years	8,696	10.6	11.2	1.05	0.99	0.99
65–74 years	4,457	5.5	5.5	1.02	0.98	0.98
75+ years	4,241	5.2	3.6	0.70	0.72	0.84
Female	48,799	59.6	57.7	0.98	1.01	1.00
<1 year	848	1.0	1.0	0.97	0.98	0.96
1–4 years	1,934	2.4	2.5	1.13	1.05	1.03
5–14 years	2,646	3.2	3.4	1.15	1.10	1.08
15–24 years	4,939	6.0	6.0	1.03	1.03	1.02
25–44 years	13,024	15.9	15.5	0.99	1.01	0.99
45–64 years	12,729	15.6	14.7	0.95	1.01	0.99
65–74 years	5,790	7.1	6.8	0.91	0.95	0.95
75+ years	6,886	8.4	7.6	0.91	1.01	1.05

(a) Unweighted data, A1 items only.
(b) Data provided by GP Branch, DoHA.
(c) Calculated from BEACH weighted data, *including* encounters claimable from the Department of Veterans' Affairs.
(d) Calculated from BEACH weighted data, *excluding* encounters claimable from the Department of Veterans' Affairs.
Note: A1 Medicare services—see Glossary; only encounters with a valid age and sex are included in the comparison.

Table 4.3: The BEACH data set

Variable	Raw	Weighted
GPs	983	983
Encounters	98,300	96,973
Reasons for encounter	147,691	144,654
Problems managed	144,372	139,092
Medications	102,352	101,350
Other treatments	54,040	51,130
Referrals	8,207	7,761
Imaging	33,025	30,086
Pathology	11,850	10,943

5 The encounters

5.1 Overview of the data set

Using weighted data there were 96,973 encounters from 983 GPs. An average of 149 patient reasons for encounter were described per 100 encounters. Of the 139,092 problems managed (at an average rate of 143 per 100 encounters), 55.1 per 100 encounters were designated as new problems to the patient. Problems regarded by the GP as likely to be work related (irrespective of whether the encounter was covered by workers' compensation) occurred at a rate of 3.0 per 100 encounters.

Table 5.1: Summary of morbidity and management

Variable	Number	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL	Rate per 100 problems (*n*=139,092)	95% LCL	95% UCL
General practitioners	983	. .	. .	. .	. .	. .	. .
Encounters	96,973	. .	. .	. .	. .	. .	. .
Reasons for encounter	144,654	149.2	147.4	150.9	. .	. .	. .
Problems managed	139,092	143.4	141.7	145.2	. .	. .	. .
New problems	53,468	55.1	53.8	56.5	38.4	37.5	39.4
Work-related	2,879	3.0	2.7	3.2	2.1	1.9	2.2
Medications	101,350	104.5	102.2	106.9	72.9	71.4	74.3
Prescribed	85,332	88.0	85.6	90.4	61.4	59.8	62.9
Advised OTC	8,606	8.9	8.1	9.6	6.2	5.7	6.7
GP supplied	7,412	7.6	6.3	9.0	5.3	4.4	6.3
Other treatments	50,308	51.9	49.6	54.2	36.2	34.7	37.7
Clinical	36,909	38.1	36.1	40.1	26.5	25.2	27.9
Procedural	13,399	13.8	13.1	14.5	9.6	9.1	10.1
Referrals	10,167	10.5	10.1	10.9	7.3	7.0	7.6
Specialist	7,096	7.3	7.0	7.6	5.1	4.9	5.3
Allied health services	2,206	2.3	2.1	2.5	1.6	1.5	1.7
Hospital	423	0.4	0.3	0.6	0.3	0.2	0.4
Emergency department	123	0.1	0.0	0.4	0.1	0.0	0.3
Other referral*	320	0.3	0.0	0.6	0.2	0.0	0.4
Pathology	30,086	31.0	29.7	32.4	21.6	20.8	22.5
Imaging	7,642	7.9	7.6	8.2	5.5	5.3	5.7
Other investigation	880	0.9	0.8	1.0	0.6	0.5	0.7

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

Medications were prescribed, advised or supplied at a rate of 104.5 per 100 encounters. The prescription rate (88.0 per 100 encounters) does not take into account the number of repeats provided as part of a prescription. GPs advised patients to use over-the-counter (OTC) medications at a slightly higher rate (8.9 per 100 encounters) than they gave medications

directly to the patient (7.6 per 100 encounters), although these rates were not significantly different. Non-pharmacological treatments were recorded less often than medications, with clinical treatments (e.g. counselling, advice or psychotherapy) being recorded at a higher rate (38.1 per 100 encounters) than procedural treatments (13.8 per 100 encounters) such as excisions and physical therapies.

Approximately 10 referrals per 100 encounters were made to a specialist, allied health service, hospital or emergency departments. Specialist referrals were the most common (7.3 per 100 encounters), followed by those to allied health professionals (2.3 per 100 encounters). Referrals to hospitals and emergency departments were relatively rare.

Orders for a pathology test (or batch of tests, e.g. FBC, HIV) were recorded more frequently (31.0 per 100 encounters) than were referrals, while orders for imaging (e.g. x-rays, scans) occurred less often (7.9 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 (MBS) through Medicare, payment by other government programs (e.g. Department of Veterans' Affairs, Correctional Services) and insurance schemes (e.g. workers' compensation).

Encounters can be direct consultations (the patient was seen by the GP) or indirect consultations (the patient was not seen but a clinical service was provided). Direct consultations represented 97.7% of all encounters for which direct/indirect status was recorded, and these direct encounters could result in no charge, a claim to Medicare, a workers' compensation claim, or a charge to another government funding program. By far the majority (93.9%) of consultations and 96.2% of direct consultations were claimable through Medicare. This is not to say that in all cases the Medicare claim was 'bulk billed', nor does it mean no additional amount (above the Medicare rebate) was paid by the patient.

At least 94.5% of Medicare-paid consultations (88.7% of consultations) took place in the GP's consultation rooms. Note that some items grouped under 'other items' could also have taken place in the GP's rooms and that case conferences can occur in places other than the GP's rooms (e.g. nursing homes or offices of other health care professionals). Standard surgery consultations were the most frequent Medicare item recorded (79.0% of total encounters and 84.1% of Medicare-claimable encounters). Hospital, nursing home and home visits were relatively rare and accounted for only 2.6% of all encounters and 2.8% of Medicare-paid encounters. Workers' compensation claims represented 2.0% of all recorded encounters. This appears lower than would be expected if all work-related problems (3.0 per 100 encounters and 2.1 per 100 problems) were being managed at encounters paid by workers' compensation (Table 5.1).

Indirect consultations (2.3 per 100 encounters) are those at which the patient is not seen by the GP but which generate a prescription, a referral, a certificate or other service (Table 5.2). They are often the result of a phone call by a patient. Most indirect consultations are a free service provided by the GP (as they do not qualify for payment by Medicare), although they clearly generate costs to the health sector (prescriptions, referrals, etc.) and contribute to patient care and problem management. These results suggest that GP services provided free to patients (no charge and indirect consultations) made up approximately 2.9% of total clinical services provided by GPs.

Table 5.2: Type of encounter

Variable	Number	Rate per 100 encounters (*n*= 96,973) [(a)]	95% LCL	95% UCL	Per cent of direct encounters	Per cent of Medicare-paid
General practitioners	983	. .	. .	. .	. .	. .
Direct consultations	87,564	97.7	97.4	98.0	100.0	. .
No charge	552	0.6	0.2	1.1	0.6	. .
MBS items of service[(b)]	84,196	93.9	93.5	94.4	96.2	100.0
Short surgery consultations	937	1.0	0.5	1.6	. .	1.1
Standard surgery consultations	70,772	79.0	78.0	79.9	. .	84.1
Long surgery consultations	7,285	8.1	7.5	8.7	. .	8.7
Prolonged surgery consultations	554	0.6	0.0	1.2	. .	0.7
Home visits	1,358	1.5	0.8	2.2	. .	1.6
Hospital	160	0.2	0.0	1.4	. .	0.2
Nursing home	832	0.9	0.0	2.4	. .	1.0
Case conference[(c)]	2	0.0	0.0	2.3	. .	0.0
Care plan[(d)]	117	0.1	0.0	1.7	. .	0.1
Health assessments[(e)]	118	0.1	0.0	0.7	. .	0.1
Other items	2,060	2.1	1.0	3.2	. .	2.4
Workers' compensation	1,799	2.0	1.8	2.3	2.1	. .
Other paid (hospital, State, etc.)	1,019	1.1	0.2	2.0	1.2	. .
Indirect consultations	2,072	2.3	1.8	2.8	. .	. .
Missing	7,336	. .	. .	. .	. .	. .

(a) Missing data removed. Per cent base (*n*=89,636).
(b) Includes 1,799 encounters that were recorded as claimable for the Commonwealth Department of Veterans' Affairs.
(c) Medicare EPC item numbers 734–779.
(d) Medicare EPC item numbers 720–730.
(e) Medicare EPC item numbers 700–706.
Note: Both case conferences were indirect consultations. LCL—lower confidence limit, UCL—upper confidence limit.

5.3 Significant changes from 1998–99 to 2001–02

Over the 4 years of BEACH to date, the proportion of encounters where the patient was seen ('direct encounters') increased significantly from 96.7% (95% CI: 96.4–97.0 to 97.7%, 95% CI: 97.4–98.0). Therefore the number of GP services provided free to patients ('no charge' plus 'indirect' non-chargeable consultations) decreased significantly from 4.1% in 1998–99 to 2.9% in 2001–02). The 2000–01 report suggested that the decrease may be a reflection of the large amount of missing data for that year (12.6%), or the addition of new item numbers for indirect consultations now claimable through Medicare (e.g. case conferences, care plans, health assessments). However, these new items were recorded at a rate of only 0.2 per 100 encounters, and the number of services provided free to patients continued to fall. This may be a reflection of the current economic state of general practice.

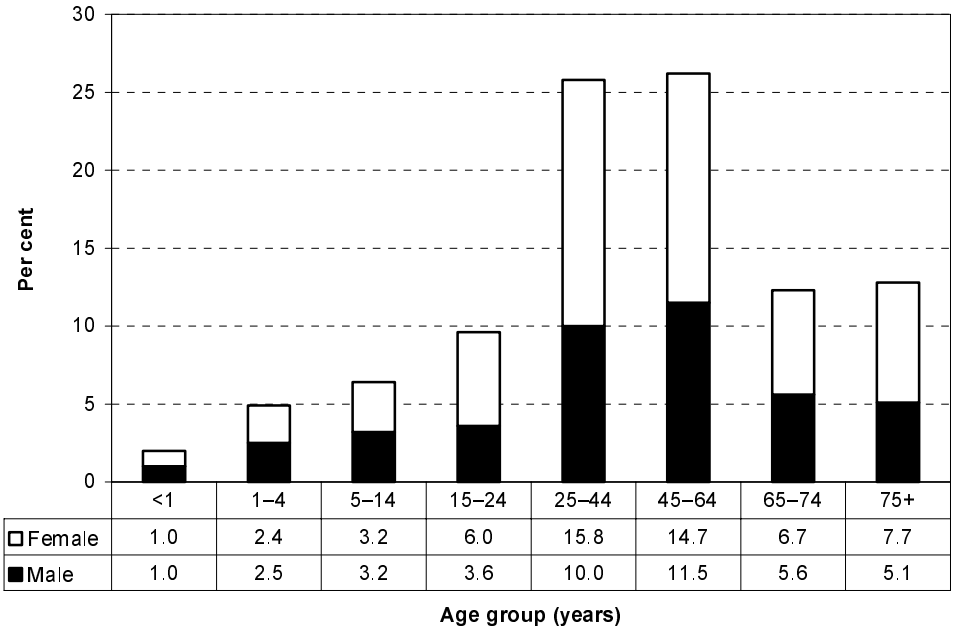
There was a significant increase in the proportion of encounters designated as standard surgery consultations, from 76.3 per 100 encounters (95% CI: 75.2–77.5) in 1998–99 to 79.0 per 100 (95% CI: 78.0–79.9) in 2001–02 (Appendix 4, Table A4.3).

6 The patients

6.1 Patient characteristics

Age–sex distribution of patients

Figure 6.1 shows the age–sex distribution of patients at the encounters recorded in the survey. Age was not recorded at 0.8% of encounters and sex was not recorded at 0.8% of encounters (Table 6.1). 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 1–4 years where there were slightly more male than female encounters. Gender differences were greatest in the reproductive years (25–44 years age group), and in the middle ages (45–64 years).



	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Female	1.0	2.4	3.2	6.0	15.8	14.7	6.7	7.7
Male	1.0	2.5	3.2	3.6	10.0	11.5	5.6	5.1

Figure 6.1: Agesex 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 seven encounters were with children aged less than 15 years (13.3%), one in ten were with young adults (9.5%), and approximately one in four with patients in each of the following age groups, 25–44 years (25.8%), 45–64 years (26.3%), and 65 years and older (25.1%) (Table 6.1).

Other patient characteristics

The patient was new to the practice at 9.2% of encounters. Approximately one in five encounters were with patients who held a health care card (41.9%) and 3.3% were with persons who held a Department of Veterans' Affairs card. At 9.3% of encounters the patient was from a non-English-speaking background, and at 1.0% the patient was an Aboriginal and/or Torres Strait Islander person.

Table 6.1: Characteristics of the patients at encounters

Patient variable	Number	Per cent of encounters (*n*=96,973)[(a)]	95% UCL	95% UCL
Sex				
Males	40,963	42.6	41.9	43.3
Females	55,202	57.4	56.7	58.1
Missing sex	809	. .	. .	. .
Age group				
< 1 year	1,917	2.0	1.8	2.1
1–4 years	4,732	4.9	4.6	5.2
5–14 years	6,157	6.4	6.1	6.7
15–24 years	9,177	9.5	9.1	10.0
25–44 years	24,786	25.8	25.1	26.5
45–64 years	25,281	26.3	25.7	26.8
65–74 years	11,873	12.3	11.8	12.8
75+ years	12,292	12.8	12.0	13.5
Missing age	760	. .	. .	. .
Other characteristics				
New patient to practice	8,589	9.2	8.5	9.9
Health care card	40,582	41.9	40.4	43.3
Veterans' Affairs card	3,187	3.3	3.0	3.6
Non-English-speaking background	9,051	9.3	5.9	12.7
Aboriginal person	855	0.9	0.0	2.0
Torres Strait Islander	96	0.1	0.0	0.6
Aboriginal person and Torres Strait Islander	31	1.0	0.0	1.5

(a) Missing data removed in calculation of rates.
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 [26].

RFEs are those concerns and expectations which 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 has begun. These reflect the patient's view of the 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 two 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 144,654 patient RFEs recorded at a rate of 149.2 per 100 encounters. For three out of five encounters (61.8%) only one RFE was recorded, while at 11.0% of encounters the maximum of three RFEs were recorded (Table 6.2).

Table 6.2: Number of patient reasons for encounter

Number of RFEs at encounter	Number of encounters	Per cent of encounters	95% LCL	95% UCL
One RFE	59,929	61.8	60.6	63.0
Two RFEs	26,407	27.2	26.5	28.0
Three RFEs	10,637	11.0	10.3	11.6
Total	**96,973**	**100.0**	. .	. .

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

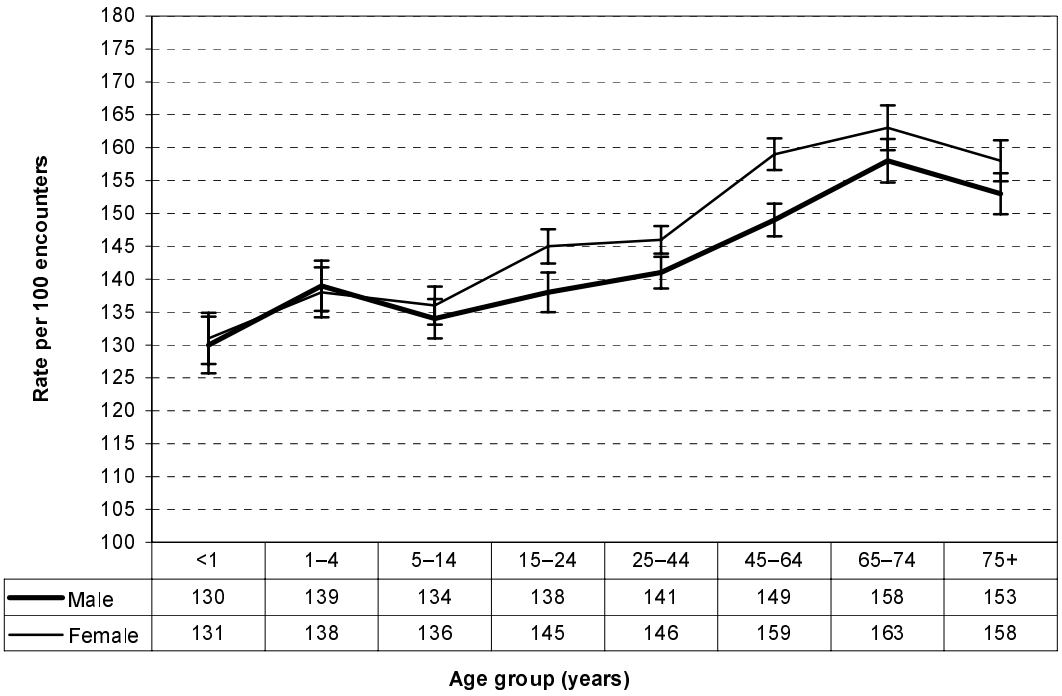


Figure 6.2: Age–sex-specific RFE rates per 100 encounters with 95% confidence limits

Note: Missing data removed.

Age–sex-specific rates of RFEs

Overall, significantly more RFEs were recorded at encounters with female patients (151.8, 95% CL 150.0–153.7) than at those with male patients (145.7, 95% CL 143.8–147.6).

Figure 6.2 shows the number of RFEs per 100 encounters for male and female patients in each age group. For encounters with children aged less than 15 years the age–sex-specific rate of RFEs per 100 encounters was steady at 130–139. It then gradually increased with advancing age for both males and females, reaching its maximum of 168 RFEs per 100 encounters for women of 65–74 years, though the rates of RFEs decreased in patients aged 75 years or more. Women aged 15–64 years had significantly more RFEs recorded than their male counterparts.

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 is expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence limits.

More than half the RFEs related to the respiratory, musculoskeletal, skin, circulatory and digestive systems. Less common were RFEs of a psychological or social nature and reasons related to the blood, ear, eye, urological, endocrine and genital systems.

Almost one in five RFEs (20.7%, 30.9 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 and chest pain (of unspecified origin).

Respiratory problems arose at a rate of 23.4 per 100 encounters, the most common being cough, throat complaints and upper respiratory tract infection (URTI) (often expressed as a 'cold'). Requests for influenza vaccination presented at a rate of 2.3 per 100 encounters while asthma and nasal congestion were also relatively common.

RFEs related to the musculoskeletal system were described at a rate of 17.7 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 (3.8 per 100 encounters), followed by those related to the knee, the foot/toe, the neck, leg and shoulder.

Reasons associated with the skin were described at a rate of 14.4 per 100 encounters, rash being the most frequent problem, followed by skin complaints (not otherwise classified). Localised or generalised swelling was also in the most frequent list of RFEs related to the skin.

Requests for a cardiovascular check-up accounted for almost half of all RFEs associated with the circulatory system, which arose at a rate of 11.4 per 100 encounters. Patients also frequently presented for their 'hypertension or 'high blood pressure' problem.

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

Patient reasons for encounter	Number	Per cent of total RFEs	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
General & unspecified	**29,914**	**20.7**	**30.9**	**29.9**	**31.8**
Prescription NOS	5,847	4.0	6.0	5.6	6.5
Results tests/procedures NOS	3,790	2.6	3.9	3.6	4.2
Check-up NOS*	3,038	2.1	3.1	2.9	3.4
Fever	1,926	1.3	2.0	1.7	2.3
Immunisation/vaccination—general	1,881	1.3	1.9	1.7	2.2
Weakness/tiredness	1,471	1.0	1.5	1.4	1.7
Chest pain NOS	1,192	0.8	1.2	1.1	1.4
Administrative procedure NOS	1,122	0.8	1.2	1.0	1.4
Blood test NOS	806	0.6	0.8	0.5	1.2
Respiratory	**22,693**	**15.7**	**23.4**	**22.6**	**24.2**
Cough	6,280	4.3	6.5	6.1	6.9
Throat symptom/complaint	3,642	2.5	3.8	3.4	4.1
Upper respiratory tract infection	2,234	1.5	2.3	2.0	2.7
Immunisation/vaccination—respiratory	2,228	1.5	2.3	1.3	3.3
Nasal congestion/sneeze	1,479	1.0	1.5	1.2	1.8
Asthma	1,039	0.7	1.1	0.9	1.2
Shortness of breath, dyspnoea	875	0.6	0.9	0.7	1.1
Musculoskeletal	**17,204**	**11.9**	**17.7**	**17.2**	**18.3**
Back complaint*	3,716	2.6	3.8	3.6	4.1
Knee complaint	1,374	1.0	1.4	1.3	1.6
Foot/toe complaint	1,175	0.8	1.2	1.1	1.3
Neck complaint	1,172	0.8	1.2	1.1	1.4
Shoulder complaint	1,163	0.8	1.2	1.1	1.4
Leg/thigh complaint	1,058	0.7	1.1	1.0	1.2
Skin	**13,962**	**9.7**	**14.4**	**13.9**	**14.9**
Rash*	2,724	1.9	2.8	2.6	3.0
Skin complaint	1,276	0.9	1.3	1.0	1.7
Swelling*	1,105	0.8	1.1	1.0	1.3
Circulatory	**11,035**	**7.6**	**11.4**	**10.8**	**11.9**
Cardiovascular check-up*	5,155	3.6	5.3	4.9	5.7
Hypertension/high blood pressure*	2,004	1.4	2.1	1.7	2.4
Prescription—cardiovascular	780	0.5	0.8	0.5	1.1

(continued)

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	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
Digestive	**10,280**	**7.1**	**10.6**	**10.2**	**11.0**
Abdominal pain*	2,041	1.4	2.1	2.0	2.3
Diarrhoea	1,358	0.9	1.4	1.3	1.6
Vomiting	1,084	0.8	1.1	0.9	1.3
Psychological	**7,551**	**5.2**	**7.8**	**7.3**	**8.3**
Depression*	1,836	1.3	1.9	1.7	2.1
Insomnia	1,243	0.9	1.3	1.1	1.5
Anxiety*	1,067	0.7	1.1	0.9	1.3
Endocrine & metabolic	**6,196**	**4.3**	**6.4**	**6.1**	**6.7**
Diabetes (non-gestational)*	993	0.7	1.0	0.8	1.2
Prescription—endocrine/metabolic	778	0.5	0.8	0.6	1.0
Check-up—endocrine/metabolic*	750	0.5	0.8	0.5	1.1
Neurological	**5,227**	**3.6**	**5.4**	**5.2**	**5.6**
Headache	1,972	1.4	2.0	1.9	2.2
Vertigo/dizziness	1,172	0.8	1.2	1.1	1.3
Female genital system	**5,339**	**3.7**	**5.5**	**5.1**	**5.9**
Check-up/Pap smear*	1,652	1.1	1.7	1.4	2.0
Menstrual problems*	823	0.6	0.9	0.7	1.0
Ear	**4,023**	**2.8**	**4.2**	**4.0**	**4.4**
Ear pain	1,679	1.2	1.7	1.6	1.9
Pregnancy & family planning	**3,387**	**2.3**	**3.5**	**3.2**	**3.8**
Pre/post natal check-up*	941	0.7	1.0	0.6	1.3
Oral contraception*	861	0.6	0.9	0.7	1.1
Eye	**2,464**	**1.7**	**2.5**	**2.4**	**2.7**
Urology	**2,458**	**1.7**	**2.5**	**2.4**	**2.7**
Blood	**1,035**	**0.7**	**1.1**	**0.9**	**1.2**
Male genital system	**955**	**0.7**	**1.0**	**0.9**	**1.1**
Social	**931**	**0.6**	**1.0**	**0.8**	**1.1**
Total RFEs	**144,654**	**100.0**	**149.2**	**147.4**	**150.9**

(a) 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: LCL—lower confidence limit, UCL—upper confidence limit, NOS—not otherwise specified, NEC—not elsewhere classified.

Digestive problems accounted for 7.1% of all reasons described, arising at a rate of 10.6 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. RFEs of a psychological nature were recorded at a rate of 7.8 per 100 encounters and these were frequently described in terms of depression, insomnia 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) and were presented by patients at a rate of 74.1 such symptoms per 100 encounters. RFEs expressed in diagnostic terms (e.g. 'about my diabetes') accounted for almost one-fifth of all RFEs and were described at a rate of 27.3 per 100 encounters. Requests for diagnostic and preventive procedures were made at a rate of 22.7 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 other treatments were made at a rate of 11.9 per 100 encounters, while request 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	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
Symptoms & complaints	71,853	49.7	74.1	72.3	75.9
Diagnosis, diseases	26,496	18.3	27.3	25.9	28.7
Diagnostic & preventive procedures	21,985	15.2	22.7	21.7	23.6
Medications, treatments & therapeutics	11,509	8.0	11.9	11.3	12.4
Referral & other RFE	6,957	4.8	7.2	6.7	7.7
Results	4,565	3.2	4.7	4.4	5.1
Administrative	1,288	0.9	1.3	1.1	1.5
Total RFEs	**144,654**	**100.0**	**149.2**	**147.4**	**150.9**

(a) Figures do not total 100 as more than one RFE can be recorded at each encounter.
Note: Encs—encounters, 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 over 50% 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 by far the most common RFE, accounting for 9.0% of all RFEs, being recorded at a rate of 13.4 per 100 encounters. Requests for medication were also frequent (9.8 per 100 encounters). It is notable that RFEs described as 'hypertension' or 'high blood pressure' also arose at a rate of 2.1 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 (4.7 per 100 encounters), followed by presentations for immunisation or vaccination (4.6 per 100 encounters).

The remaining RFEs in the top 30 were largely symptom-based, led by cough (6.5 per 100 encounters), back complaints (3.8 per 100 encounters), throat complaints (3.8 per 100 encounters), rash, and URTI (often described as 'a cold').

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

Table 6.5: Most frequent patient reasons for encounter

Patient reason for encounter	Number	Per cent of total RFEs	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
Check-up—all*	12,945	9.0	13.4	12.7	14.0
Prescription—all*	9,450	6.5	9.8	9.2	10.3
Cough	6,280	4.3	6.5	6.1	6.9
Test results*	4,565	3.2	4.7	4.4	5.1
Immunisation/vaccination—all*	4,452	3.1	4.6	4.1	5.1
Back complaint*	3,716	2.6	3.8	3.6	4.1
Throat complaint	3,642	2.5	3.8	3.4	4.1
Rash*	2,724	1.9	2.8	2.6	3.0
Upper respiratory tract infection	2,234	1.5	2.3	2.0	2.7
Abdominal pain*	2,041	1.4	2.1	2.0	2.3
Hypertension/high BP*	2,004	1.4	2.1	1.7	2.4
Headache	1,972	1.4	2.0	1.9	2.2
Fever	1,926	1.3	2.0	1.7	2.3
Depression*	1,836	1.3	1.9	1.7	2.1
Ear pain	1,679	1.2	1.7	1.6	1.9
Sneeze/nasal congestion/	1,479	1.0	1.5	1.2	1.8
Weakness/tiredness	1,471	1.0	1.5	1.3	1.7
Knee complaint	1,374	1.0	1.4	1.3	1.6
Diarrhoea	1,358	0.9	1.4	1.2	1.6
Skin complaint	1,276	0.9	1.3	1.0	1.7
Insomnia	1,243	0.9	1.3	1.1	1.5
Pain, chest NOS	1,192	0.8	1.2	1.1	1.4
Foot & toe complaint	1,175	0.8	1.2	1.1	1.3
Neck complaint	1,172	0.8	1.2	1.1	1.4
Vertigo/dizziness	1,172	0.8	1.2	1.1	1.3
Shoulder complaint	1,163	0.8	1.2	1.0	1.4
Administrative procedure NOS	1,122	0.8	1.2	1.0	1.3
Swelling*	1,105	0.8	1.1	1.0	1.3
Vomiting	1,084	0.8	1.1	0.9	1.3
Anxiety*	1,067	0.7	1.1	0.9	1.3
Subtotal	*79,919*	*55.2*	. .	. .	. .
Total RFEs	**144,654**	**100.0**	**149.2**	**147.4**	**150.9**

(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: LCL—lower confidence limit, UCL—upper confidence limit, NOS—not otherwise specified.

6.3 Significant changes from 1998–99 to 2001–02

The age distribution of patients encountered in general practice changed significantly over the first 4 years of the BEACH program. In 2001–02 the GPs' workload included a significantly smaller proportion of encounters with children under the age of 5 years than it did in 1998–99 (8.1% in 1998–99 compared with 6.9% in 2001–02). In contrast a greater proportion of the workload was devoted to the management of patients aged between 45 and 64 years (26.3% in 2001–02 compared with 24.4% in 1998–99).

There was a significant increase in the proportion of health care card holders (41.9, 95% CI: 40.4–43.3) when compared with BEACH 2000–01 (36.7, 95% CI: 35.1-38.3) and BEACH 999–00 (38.6%, 95% CI: 37.0–40.2), but a significant decrease was found when compared with BEACH 1998–99 (47.3, 95% CI: 45.8–48.8). This is perhaps due to the minor change of health care card item in BEACH data collection form (see Chapter 17). These results are summarised in Appendix 4, Table A4.4.

While there was some movement across ICPC–2 chapters in the relative rate of RFEs of particular types over the 4 years, only one statistically significant trend emerged, and this was in a specific type of RFE. The relative rate of requests for results of tests increased steadily over the 1998–99 to 2001–02 period, from 3.4 (95% CI: 3.1–3.7) per 100 encounters in 1998–99, to 4.0 (95% CI: 3.7–4.3) per 100 in 1999–00, 4.3 (95% CI: 3.9–4.6) in 2000–01 to 4.7 (95% CI: 4.4–5.1) per 100 encounters in the fourth BEACH year (results not presented). Whether this represents an increase in the rate at which patients are being asked to return to the GP to receive their test results (with a decrease in the likelihood of GPs giving results over the telephone to their patient) is not known. However, this hypothesis would align with the decrease in the proportion of encounters for which 'no charge' was made for the service and a decrease in the proportion of indirect encounters over the same period. It is also possible that the new Privacy Legislation released at the end of 2001 may be contributing to an increase in call-back rates to give patients the results of tests undertaken. If this is the case, a further increase in such RFEs should be apparent in the coming year.

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 presenting symptoms.

At each patient encounter up to four problems could be recorded by the GP, a minimum of one problem being 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 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 extension of the internationally recognised International Classification of Primary Care—2nd Edition (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 an additional chapter for psychological problems and one 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) could have been managed at a single encounter. In considering these results the reader must be mindful that while a rate per 100 encounters for a single ungrouped problem (e.g. asthma, 2.8 per 100 encounters) can be regarded as equivalent to 'asthma is managed at 2.8%', such a statement cannot be made for grouped concepts.

7.1 Number of problems managed at encounter

A total of 139,092 problems were managed at the 96,973 patient encounters, at an average rate of 143.4 problems per 100 encounters. At the majority of encounters (67.7%) only one problem was managed, while three or more problems were managed at 9.2% 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	65,662	67.7	66.6	68.8
Two problems	22,349	23.1	22.4	23.7
Three problems	7,117	7.3	6.9	7.7
Four problems	1,846	1.9	1.6	2.2
Total	**96,973**	**100.0**	. .	. .

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

7.2 Nature of morbidity

Problems managed by ICPC–2 chapter

Table 7.2 presents (in decreasing order of frequency) the frequency and distribution of problems managed by ICPC–2 chapter. Individual problem types most frequently recorded within each chapter are also included where they represent more than 0.5% of all problems managed. Each ICPC–2 chapter and problem managed is expressed as a percentage of all problems managed and as a rate per 100 encounters with 95% confidence intervals.

Overall, half of the problems managed in general practice related to four major body systems—the respiratory, skin, musculoskeletal and circulatory systems. Psychological problems were commonly managed as were problems relating to the digestive, endocrine and metabolic systems. Problems least frequently presented related to the blood and blood-forming organs, the male genital system or were of a social nature. Ten per cent of problems managed were not simply related to a single body system and were classified in the general and unspecified chapter.

At the chapter level, respiratory problems were the most frequently managed at a rate of 21.4 per 100 encounters, accounting for 14.9% of all problems managed. The high occurrence of asthma, URTI and bronchitis contributed to this result. Other common respiratory problems included influenza vaccination, sinusitis, tonsillitis, allergic rhinitis and chronic obstructive pulmonary disease.

The relative rate of problems managed associated with the musculoskeletal system was 17.5 per 100 encounters and back complaints (back pain and symptoms) were the most frequent (2.6 per 100 encounters). Other common musculoskeletal problems included tendonitis, arthritis and osteoarthritis as well as injuries such as sprains/strains and fractures.

Hypertension (9.0 per 100 encounters) constituted over half of all circulatory problems (16.1 per 100 encounters) and was the most frequently managed individual problem overall, accounting for 6.3% of all problems. Cardiac check-ups, ischaemic heart disease and heart failure were other circulatory conditions arising at a relatively high rate.

Skin-related problems were managed at a rate of 16.1 per 100 encounters, contact dermatitis (including non-specific dermatitis and eczema) being most common (1.9 per 100 encounters), followed by solar keratosis, malignant skin neoplasms, injuries to the skin (such as lacerations and cuts) and warts.

Table 7.2: Distribution of problems managed across ICPC–2 chapter and most frequent individual problems within chapter

Problem managed	Number	Per cent total problems (*n*=139,092)	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Respiratory	**20,714**	**14.9**	**21.4**	**20.7**	**22.0**
Upper respiratory tract infection	6,035	4.3	6.2	5.8	6.6
Asthma	2,756	2.0	2.8	2.6	3.0
Acute bronchitis/bronchiolitis	2,644	1.9	2.7	2.5	3.0
Immunisation/vaccination—respiratory	2,204	1.6	2.3	1.3	3.2
Sinusitis acute/chronic	1,333	1.0	1.4	1.2	1.5
Tonsillitis*	1,082	0.8	1.1	0.9	1.4
Allergic rhinitis	754	0.5	0.8	0.6	0.9
Chronic obstructive pulmonary disease	701	0.5	0.7	0.6	0.9
Musculoskeletal	**16,964**	**12.2**	**17.5**	**17.0**	**18.0**
Back complaint*	2,540	1.8	2.6	2.4	2.8
Osteoarthritis*	2,524	1.8	2.6	2.4	2.8
Sprain/strain*	1,750	1.3	1.8	1.6	2.0
Fracture*	980	0.7	1.0	0.9	1.1
Bursitis/tendonitis/synovitis NOS	744	0.5	0.8	0.6	0.9
Injury musculoskeletal NOS	732	0.5	0.8	0.6	0.9
Arthritis*	684	0.5	0.7	0.5	0.9
Osteoporosis	687	0.5	0.7	0.5	0.9
Circulatory	**15,654**	**11.3**	**16.1**	**15.5**	**16.8**
Hypertension*	8,735	6.3	9.0	8.6	9.5
Ischaemic heart disease*	1,219	0.9	1.3	1.1	1.4
Cardiac check-up*	1,090	0.8	1.1	0.9	1.4
Heart failure	703	0.5	0.7	0.5	0.9
Skin	**15,583**	**11.2**	**16.1**	**15.6**	**16.6**
Contact dermatitis	1,826	1.3	1.9	1.7	2.0
Solar keratosis/sunburn	999	0.7	1.0	0.8	1.3
Malignant neoplasm skin	830	0.6	0.9	0.6	1.1
Injury skin, other	688	0.5	0.7	0.5	1.0
Warts	665	0.5	0.7	0.6	0.8
General & unspecified	**14,289**	**10.3**	**14.7**	**14.0**	**15.5**
General immunisation/vaccination	1,965	1.4	2.0	1.8	2.3
General check-up*	1,723	1.2	1.8	1.6	2.0
Viral disease, other/NOS	1,421	1.0	1.5	1.1	1.8
Medication/request/renew/inject NOS	1,212	0.9	1.3	0.8	1.7
Results tests/procedures NOS	712	0.5	0.7	0.3	1.2
Weakness/tiredness general	702	0.5	0.7	0.4	1.0

(continued)

Table 7.2 (continued): Distribution of problems managed across ICPC–2 chapter and most frequent individual problems within chapter

Problem managed	Number	Per cent total problems (*n*=139,092)	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Psychological	**10,316**	**7.4**	**10.6**	**10.1**	**11.2**
Depression*	3,329	2.4	3.4	3.2	3.6
Anxiety*	1,587	1.1	1.6	1.5	1.8
Sleep disturbance	1,579	1.1	1.6	1.4	1.8
Endocrine & metabolic	**10,121**	**7.3**	**10.4**	**10.0**	**10.9**
Diabetes, non-gestational*	2,975	2.1	3.1	2.9	3.3
Lipid disorder	2,841	2.0	2.9	2.7	3.1
Obesity (BMI >30)	730	0.5	0.8	0.5	1.0
Digestive	**9,626**	**6.9**	**9.9**	**9.6**	**10.2**
Oesophageal disease	1,754	1.3	1.8	1.7	2.0
Gastroenteritis, presumed infection	1,034	0.7	1.1	0.9	1.2
Female genital system	**5,944**	**4.3**	**6.1**	**5.8**	**6.5**
Female genital check-up/Pap smear*	1,526	1.1	1.6	1.3	1.8
Menopausal complaint	1,339	1.0	1.4	1.2	1.5
Menstrual problems*	696	0.5	0.7	0.6	0.9
Ear	**4,072**	**2.9**	**4.2**	**4.0**	**4.4**
Acute otitis media/myringitis	1,273	0.9	1.3	1.2	1.5
Otitis externa	724	0.5	0.8	0.6	0.9
Excessive ear wax	717	0.5	0.7	0.6	0.9
Pregnancy & family planning	**3,852**	**2.8**	**4.0**	**3.7**	**4.3**
Pregnancy*	859	0.6	0.9	0.7	1.1
Contraception, other	820	0.6	0.9	0.6	1.0
Oral contraception*	813	0.6	0.8	0.7	1.0
Pre/post natal check-up*	722	0.5	0.7	0.4	1.1
Neurological	**3,603**	**2.6**	**3.7**	**3.5**	**3.9**
Migraine	810	0.6	0.8	0.7	1.0
Urology	**2,740**	**2.0**	**2.8**	**2.7**	**3.0**
Urinary tract infection*	1,556	1.1	1.6	1.5	1.7
Eye	**2,424**	**1.7**	**2.5**	**2.4**	**2.6**
Infectious conjunctivitis	671	0.5	0.7	0.6	0.8
Blood	**1,264**	**0.9**	**1.3**	**1.2**	**1.4**
Male genital system	**1,226**	**0.9**	**1.3**	**1.1**	**1.4**
Social problems	**701**	**0.5**	**0.7**	**0.5**	**0.9**
Total problems	**139,092**	**100.0**	**143.4**	**141.7**	**145.2**

(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.

The most common problem managed in the general and unspecified chapter was general immunisation/vaccination, followed by general check-ups, and ill-defined or unspecified viral illnesses. Medication provision for an unspecified diagnosis/problem, test results and general weakness/tiredness were also commonly recorded by GPs.

Problems managed by ICPC–2 component

Examination of problems managed across ICPC–2 components provides an alternative way of viewing the types of matters dealt with at general practice consultations (Table 7.3).

GPs were instructed to record problems managed in the most specific terms possible at the time of the encounter. In an ideal world we could therefore predict that problems managed should fall into three components of ICPC–2, namely the diagnosis/disease, symptoms and complaints, and diagnostic and preventive procedures (e.g. check-up) components. Although these components were the most frequently recorded, there were a small number of problems described in terms of a prescription, referral, test result or administrative procedure. In these circumstances the lack of clinical description of the underlying problem required the label to be coded in terms of the process described (e.g. problem was recorded as referral to dermatologist).

The majority of problems (65.3%) were described in terms of a diagnosis or disease (e.g. hypertension, depression, asthma) at an average rate of 93.7 per 100 encounters. Problems described in terms of a symptom or complaint (e.g. feeling tired) represented a fifth of all problems managed and were recorded at a rate of 31.4 per 100 encounters. Diagnostic screening and preventive procedures occurred at a rate of 12.4 per 100 encounters and were most commonly check-ups and vaccinations/immunisations. Problems related to the provision of medication and other treatments where no other diagnostic information was given were recorded at a rate of 2.9 per 100 encounters, while problems described in terms of a referral, test result, or administrative procedure were relatively few (less than 2% of all problems).

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

ICPC–2 component	Number	Per cent of total problems (n=139,092)	Rate per 100 encounters (n=96,973)	95% LCL	95% UCL
Diagnosis, diseases	90,853	65.3	93.7	92.1	95.2
Symptoms & complaints	30,485	21.9	31.4	30.7	32.2
Diagnostic & preventive procedures	12,036	8.7	12.4	11.8	13.0
Medications, treatments & therapeutics	3,173	2.3	3.3	2.9	3.6
Referral & other reason for encounter	1,090	0.8	1.1	0.9	1.4
Results	1,023	0.7	1.1	0.7	1.4
Administrative	433	0.3	0.5	0.2	0.7
Total problems	**139,092**	**100.0**	**143.4**	**141.7**	**145.2**

(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.

Table 7.4: Most frequently managed problems

Problem managed	Number	Per cent of total problems	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Hypertension*	8,735	6.3	9.0	8.6	9.5
Upper respiratory tract infection	6,035	4.3	6.2	5.8	6.6
Immunisation/vaccination all*	4,516	3.3	4.7	4.2	5.1
Depression*	3,329	2.4	3.4	3.2	3.6
Diabetes*	2,993	2.2	3.1	2.9	3.3
Lipid disorder	2,841	2.0	2.9	2.7	3.1
Asthma	2,756	2.0	2.8	2.6	3.0
Acute bronchitis/bronchiolitis	2,644	1.9	2.7	2.5	3.0
Back complaint*	2,540	1.8	2.6	2.4	2.8
Osteoarthritis*	2,524	1.8	2.6	2.4	2.8
Contact dermatitis	1,826	1.3	1.9	1.7	2.0
Prescription all*	1,805	1.3	1.9	1.4	2.3
Oesophageal disease	1,754	1.3	1.8	1.7	2.0
Sprain/strain*	1,750	1.3	1.8	1.6	2.0
General check-up*	1,723	1.2	1.8	1.6	2.0
Anxiety*	1,587	1.1	1.6	1.5	1.8
Sleep disturbance	1,579	1.1	1.6	1.4	1.8
Urinary tract infection*	1,556	1.1	1.6	1.5	1.7
Female genital check-up/Pap smear*	1,526	1.1	1.6	1.3	1.8
Viral disease, other/NOS	1,421	1.0	1.5	1.1	1.8
Menopausal symptom/complaint	1,339	1.0	1.4	1.2	1.5
Sinusitis acute/chronic	1,333	1.0	1.4	1.2	1.5
Acute otitis media/myringitis	1,273	0.9	1.3	1.2	1.5
Ischaemic heart disease*	1,219	0.9	1.3	1.1	1.4
Cardiac check-up*	1,090	0.8	1.1	0.9	1.4
Tonsillitis*	1,082	0.8	1.1	0.9	1.4
Gastroenteritis, presumed infection	1,034	0.7	1.1	0.9	1.2
Test results*	1,023	0.7	1.1	0.7	1.4
Solar keratosis/sunburn	999	0.7	1.0	0.8	1.3
Fracture*	980	0.7	1.0	0.9	1.1
Subtotal	*66,811*	*48.0*	. .	. .	. .
Total problems	**139,092**	**100.0**	**143.4**	**141.7**	**145.2**

(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.

Most frequently managed problems

The 30 most commonly recorded problems are listed in descending order of frequency in Table 7.4. 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) as well as those for childhood immunisation (chapter A), hepatitis immunisation (chapter D) and neurological immunisations such as hibtiter (chapter N).

The 30 most frequently managed problems accounted for almost half of all problems managed. Hypertension was the most common, accounting for 6.3% of all problems, managed at a rate of 9.0 per 100 encounters. This was followed by acute upper respiratory tract infection, which was recorded at a rate of 6.2 per 100 encounters and immunisation/vaccination (4.7 per 100 encounters). Together these top three problems accounted for 13.9% of all problems managed.

Depression was the fourth most commonly managed problem (3.4 per 100 encounters). Non-gestational diabetes (3.1 per 100 encounters) moved to the fifth most common problem managed, up from seventh position in the previous year. Lipid disorder, asthma, acute bronchitis, back complaint and osteoarthritis were all managed at a similar rate (2.9, 2.8, 2.7, 2.6 and 2.6 per 100 encounters respectively).

The remaining problems in the top 30 included some problems from body systems that were relatively low in frequency. Although all problems related to the ear accounted for only 2.9% of problems overall (Table 7.2), otitis media was among the top 30 problems managed. Similarly, while urological problems were relatively infrequent overall (only 2.0% of total problems—Table 7.2), urinary tract infections were among the most frequent individual problems.

It is also notable that a number of non-diagnostic problem labels fell into the top 30 problems most frequently managed by general practitioners. These included preventive care (immunisations/vaccinations), general and body system specific check-ups (female genital, and circulatory chapters), reviewing test results and medication provision or review.

Most common new problems

The 30 most common new problems managed are listed in Table 7.5. The order of new problems was different from the order of most common problems overall (Table 7.4).

Acute respiratory conditions (upper respiratory tract infection and acute bronchitis) were two of the most common new problems managed, together representing 12.0% of all new problems managed. New presentations of URTI were managed at a rate of 4.8 per 100 encounters, and new acute bronchitis at a rate of 1.9 problems per 100 encounters. Immunisation was the second most common new problem (2.7 per 100 encounters). Sprain/strain and unspecified viral disease were also frequent new presentations.

While depression was the fourth most common problem managed overall, it was only the thirteenth most common new problem (0.7 per 100 encounters). New cases of hypertension were even less common, managed at a rate of 0.5 per 100 encounters.

Table 7.5: Most frequently managed new problems

New problem managed	Number	Per cent of total problems (*n*=139,092)	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Upper respiratory tract infection	4,605	8.6	4.8	4.4	5.1
Immunisation all*	2,617	4.9	2.7	2.3	3.1
Acute bronchitis/bronchiolitis	1,805	3.4	1.9	1.7	2.1
Sprain/strain*	1,012	1.9	1.0	0.9	1.2
Viral disease, other/NOS	1,004	1.9	1.0	0.8	1.3
Urinary tract infection*	974	1.8	1.0	0.9	1.1
Acute otitis media/myringitis	926	1.7	1.0	0.8	1.1
Sinusitis acute/chronic	862	1.6	0.9	0.7	1.0
Dermatitis, contact/allergic	852	1.6	0.9	0.7	1.0
Tonsillitis*	806	1.5	0.8	0.6	1.1
General check-up*	778	1.5	0.8	0.6	1.0
Gastroenteritis, presumed infection	773	1.4	0.8	0.6	1.0
Depression*	688	1.3	0.7	0.6	0.9
Back complaint*	548	1.0	0.6	0.4	0.7
Female genital check-up*	538	1.0	0.6	0.3	0.8
Asthma	521	1.0	0.5	0.3	0.8
Conjunctivitis, infectious	516	1.0	0.5	0.4	0.7
Malignant neoplasm skin	491	0.9	0.5	0.2	0.8
Hypertension*	489	0.9	0.5	0.3	0.7
Otitis externa	470	0.9	0.5	0.3	0.7
Injury skin, other	453	0.9	0.5	0.2	0.7
Solar keratosis/sunburn	450	0.8	0.5	0.2	0.7
Excessive ear wax	442	0.8	0.5	0.3	0.6
Fracture*	441	0.8	0.5	0.3	0.6
Bursitis/tendonitis/synovitis NOS	432	0.8	0.5	0.3	0.6
Gastrointestinal infection	430	0.8	0.4	0.1	0.7
Pregnancy*	404	0.8	0.4	0.2	0.6
Osteoarthritis*	395	0.7	0.4	0.2	0.6
Oesophagus disease	382	0.7	0.4	0.3	0.5
Respiratory infection, other	336	0.7	0.4	0.0	1.0
Subtotal	*25,440*	*47.6*	. .	. .	. .
Total new problems	**53,468**	**100.0**	**55.1**	**53.8**	**56.5**

(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).
Note: LCL—lower confidence limit, UCL—upper confidence limit, NOS—not otherwise specified.

7.3 Significant changes from 1998–99 to 2001–02

There has been no change significant change in the number of problems managed per 100 encounters between 1998–99 and 2001–02, although a gradual but steady decrease is noted (from 145.3 to 143.4 problems per 100 encounters) and will be further investigated next year. The relative rate of management of work-related problems significantly decreased from 4.0 (95% CI: 3.7–4.3) to 3.0 (95% CI: 2.7–4.3) per 100 encounters (Appendix 4, Table A4.2).

There have been a number of significant changes in the relative rates of management of some broad condition groups. These include significant decrease in the relative rate of management of:

- respiratory problems (Table A4.5), in particular asthma and acute bronchitis (Table A4.6)
- problems associated with the ear (Table A4.5)
- problems related to the eye (Table A4.5).

Increased management rates were found for:

- problems related to the endocrine and metabolic system (Table A4.5), particularly lipid disorder (Table A4.6)
- problems of a general or unspecified nature (Table A4.5).

Other significant changes included:

- an increase in the management rate of osteoarthritis (Table A4.6)
- an increase in the management rate of diabetes (Table A4.6)
- a decrease in the relative management rate of both asthma and acute bronchitis (Table A4.6).

Many of these changes are investigated with more precise statistical methods in Chapter 14 and some are investigated in relationship to GP management behaviour in Chapter 15.

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 and linked to a patient problem. Other modes of treatment including clinical treatments (e.g. counselling) and procedures were recorded briefly in the GP's own words and 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 200,433 management activities at a rate of 206 per 100 encounters and 144 per 100 problems. The most common management activity was medication prescribed, advised or supplied, at a rate of 104.5 per 100 encounters or 72.9 per 100 problems. Other treatments took place at the rate of 51.9 per 100 encounters, referrals at a rate of 10.5, pathology orders at a rate of 31.0 and imaging at a rate of 7.9 per 100 encounters (Table 8.1).

Table 8.1: Summary of management

Management type	Number	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL	Rate per 100 problems (*n*=139,092)	95% LCL	95% UCL
Medications	101,350	104.5	102.2	106.9	72.9	71.4	74.3
Prescribed	85,332	88.0	85.6	90.4	61.4	59.8	62.9
Advised OTC	8,606	8.9	8.1	9.6	6.2	5.7	6.7
GP supplied	7,412	7.6	6.3	9.0	5.3	4.4	6.3
Other treatments	50,308	51.9	49.6	54.2	36.2	34.7	37.7
Clinical	36,909	38.1	36.1	40.1	26.5	25.2	27.9
Procedural	13,399	13.8	13.1	14.5	9.6	9.1	10.1
Referrals	10,167	10.5	10.1	10.9	7.3	7.0	7.6
Specialist	7,096	7.3	7.0	7.6	5.1	4.9	5.3
Allied health	2,206	2.3	2.1	2.5	1.6	1.5	1.7
Hospital	423	0.4	0.3	0.6	0.3	0.2	0.4
Emergency dept	123	0.1	0.0	0.4	0.1	0.0	0.3
Other referral	320	0.3	0.0	0.6	0.2	0.0	0.4
Pathology	30,086	31.0	29.7	32.4	21.6	20.8	22.5
Imaging	7,642	7.9	7.6	8.2	5.5	5.3	5.7
Other investigations	880	0.9	0.8	1.0	0.6	0.5	0.7
Total management activities	**200,433**	**206.7**	. .	. .	**144.1**	. .	. .

Note: LCL—lower confidence limit, UCL—upper confidence limit, OTC—over-the-counter, NOS—not otherwise specified.

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 91.8% of encounters and for 87.3% of problems managed. At least one medication was given at two-thirds (66.6%) of encounters and for 58.1% of problems. At least one non-pharmacological treatment was given at 39.6% of encounters and for 31.4% of

problems, a clinical treatment being more likely than a procedure. A referral was made at 9,681 encounters (10.1%) and for 7.3% of problems. At least one test or investigation was ordered at 19.7% of encounters and for 15.3% of problems. These were most commonly pathology orders, which were reported at 14.0% of encounters (for 10.8% of problems). Imaging orders were placed less frequently at 6.9% of encounters and for 5.0% 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*=96,973)	Number of problems	Per cent of total problems[(a)] (*n*=139,092)
At least one management type	**89,032**	**91.8**	**121,443**	**87.3**
At least one medication or non-pharmacological treatment	**80,727**	**83.3**	**106,400**	**76.5**
At least one medication	**64,572**	**66.6**	**80,737**	**58.1**
At least one prescription	55,710	57.5	69,268	49.8
At least one OTC advised	7,720	8.0	7,883	5.7
At least one GP supplied	5,619	5.8	6,021	4.3
At least one non-pharmacological treatment	**38,351**	**39.6**	**43,699**	**31.4**
At least one clinical treatment	28,835	29.7	32,540	23.4
At least one therapeutic procedure	12,268	12.7	12,665	9.1
At least one referral	**9,681**	**10.1**	**10,162**	**7.3**
At least one referral to a specialist	6,859	7.1	7,148	5.1
At least one referral to allied health	2,161	2.2	2,217	1.6
At least one referral to hospital	423	0.4	441	0.3
At least one referral to emergency dep't	123	0.1	133	0.1
At least one referral NOS	320	0.3	336	0.2
At least one investigation	**19,081**	**19.7**	**21,239**	**15.3**
At least one pathology order	13,561	14.0	15,073	10.8
At least one imaging order[(b)]	6,695	6.9	6,885	5.0
At least one other investigation[(b)]	852	0.9	867	0.6

(a) Figures will not total 100 as multiple events may occur in one encounter or in the management of one problem at encounter.
(b) In *General Practice Activity in Australia 1998–99*, *1999–00*, and *2000–01*, 'Imaging orders' included 'Other investigations'.
Note: LCL—lower confidence limit, UCL—upper confidence limit, OTC—over-the-counter, NOS—not otherwise specified.

The combinations of management types related to each problem were then investigated. There were 17,648 problems (12.7%) for which no specific management was recorded by the GP. Check-ups (either partial or full) (10.3%), hypertension (8.7%) and upper respiratory tract infections (4.9%) together accounted for almost 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 63.7% of problems, and double component for 18.1%. More than two components were provided in the management of less than 5% of problems.

Table 8.3 provides a list of the most common problem management combinations. The most common management choice was medication alone (for 39.8% of problems), followed by clinical treatment alone (10.1%), but the combination of medication and clinical treatment was also relatively frequently recorded (8.7%).

Table 8.3: Most common management combinations for problems

Management type	Number of problems	Per cent of total problems[(a)] (*n*=143,528)
No recorded management	**17,648**	**12.7**
Management recorded	**121,444**	**87.3**
Medication only	55,407	39.8
Clinical treatment only	13,996	10.1
Medication + clinical treatment	12,060	8.7
Therapeutic procedure only	5,871	4.2
Pathology order only	5,596	4.0
Referral only	5,192	3.7
Medication + pathology	3,447	2.5
Medication + procedure	2,866	2.1
Imaging order only	2,653	1.9
Medication + referral	1,716	1.2
Clinical + pathology	1,542	1.1
Medication + imaging	1,379	1.0
Procedure + pathology	1,151	0.8
Clinical treatment + referral	1,028	0.7

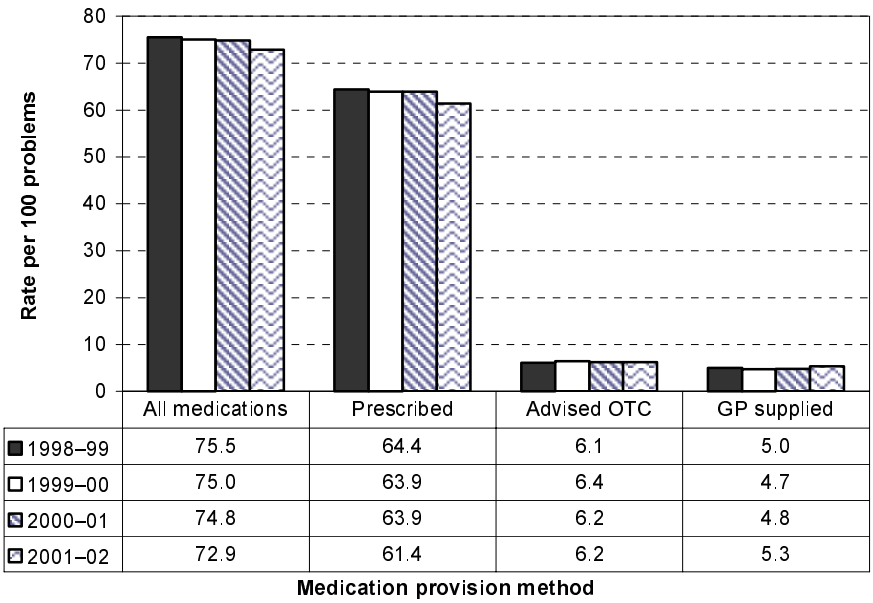
(a) Within the top 15 management combinations there were none containing more than 2 management components.

8.1 Significant changes from 1998–99 to 2001–02

There has been a significant decrease in overall medication rates, from 109.7 per 100 encounters (95% CI: 107.4–112.0) in 1998–99 to 104.5 (95% CI: 102.2–106.9) in 2001–02.

Medications

The decrease in total medications was reflected particularly in the rates of prescribed medications which fell steadily from 93.6 (95% CI: 91.2–96.1) per 100 encounters in 1998–99 to 88.0 (95% CI: 85.6–90.4) in 2001–02. The rate of advised over-the-counter medications and those supplied by the GP showed no significant changes or trends over the last 4 years (Appendix 4, Table A4.2). Figure 8.1 provides a graphic view of the changes in medication rates per 100 problems managed over time. The graph presents prescribing rates per 100 problems managed and demonstrates that decreased prescribing rates are not due to any decrease in problem management rates.

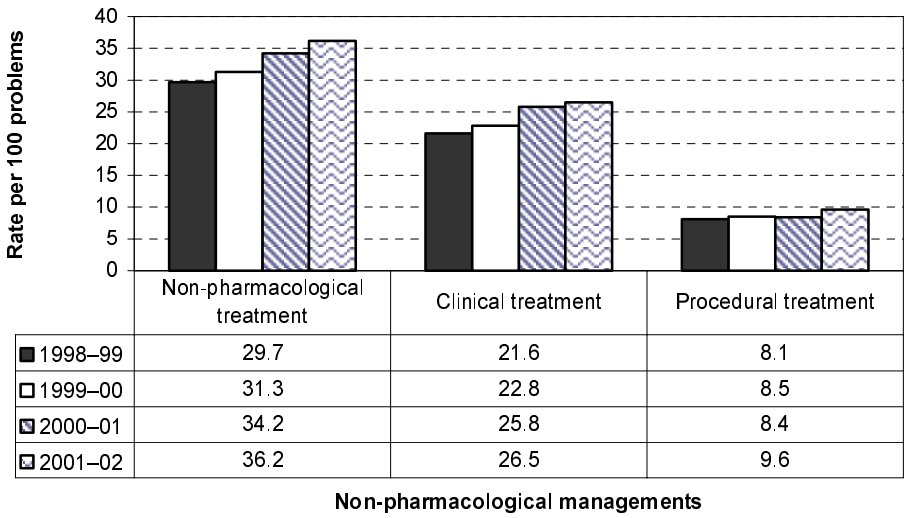


	All medications	Prescribed	Advised OTC	GP supplied
1998–99	75.5	64.4	6.1	5.0
1999–00	75.0	63.9	6.4	4.7
2000–01	74.8	63.9	6.2	4.8
2001–02	72.9	61.4	6.2	5.3

Figure 8.1: Changes in medication rates over time

Non-pharmacological treatments

In contrast there has been a significant increase in the relative rates of provision of other treatments, from 42.3 (95% CI: 41.3–45.0) per 100 encounters to 51.9 (95% CI: 49.6–54.2), and this was reflected in the rate of clinical treatments (such as advice and counselling) which increased from 31.4 per 100 encounters (95% CI: 29.7–33.0) to 38.1 per 100 (95% CI: 36.1–140.1) and of therapeutic procedures (11.8 per 100, 95% CI: 11.2–12.5, to 13.8 per 100, 95% CI: 13.1–14.5) (Appendix 4, Table A4.2). The rates of provision of other treatments are compared on the basis of rates per 100 problems managed in Figure 8.2.



	Non-pharmacological treatment	Clinical treatment	Procedural treatment
1998–99	29.7	21.6	8.1
1999–00	31.3	22.8	8.5
2000–01	34.2	25.8	8.4
2001–02	36.2	26.5	9.6

Figure 8.2: Changes in rates of non-pharmacological treatment

Referrals

There has been no significant change in the relative rate of all referrals or in those made specifically to medical specialists, allied health services or emergency departments. A consistent trend over the 4 years, of a decrease in referral rates to hospitals failed to reach statistical significance but will be worthy of further testing at the end of the next BEACH year (Appendix 4, Table A4.2).

Pathology orders

There was a significant increase in the number of pathology tests ordered per 100 encounters, from 24.6 per 100 encounters (95% CI: 23.5–25.7) in 1998–99 to 31.0 per 100 (95% CI: 29.7–32.4), representing an increase of approximately 25% over the 4 years of the BEACH program (Appendix 4, Table A4.2). This change is being investigated in detail in a specific study of pathology ordering patterns currently being undertaken for the Commonwealth Department of Health and Ageing and the results will be reported in a separate publication.

Imaging orders

While it would appear from the annual BEACH summary results that there has been a significant increase in the relative rate of orders for imaging, this is probably due to a change in the coding of imaging orders between years 2 and year 3 of the program, when more specific coding of the exact type of test ordered was introduced. In years 1 and 2 of BEACH only broad test types were coded. Next year it will be possible to investigate any apparent changes in ordering rates from 2000–01 to 2002–03 as three measurement points, using the same detailed coding system, will then be available.

9 Medications

9.1 Source of medications

The survey form allowed the recording of up to four medications for each problem managed. Each medication could be recorded as prescribed (the default), recommended for over-the-counter 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 over-the-counter purchase and medications 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,[14] (see Chapter 2—Methods). Although analysis can be conducted at brand name level, results in this chapter are reported only at the generic level.

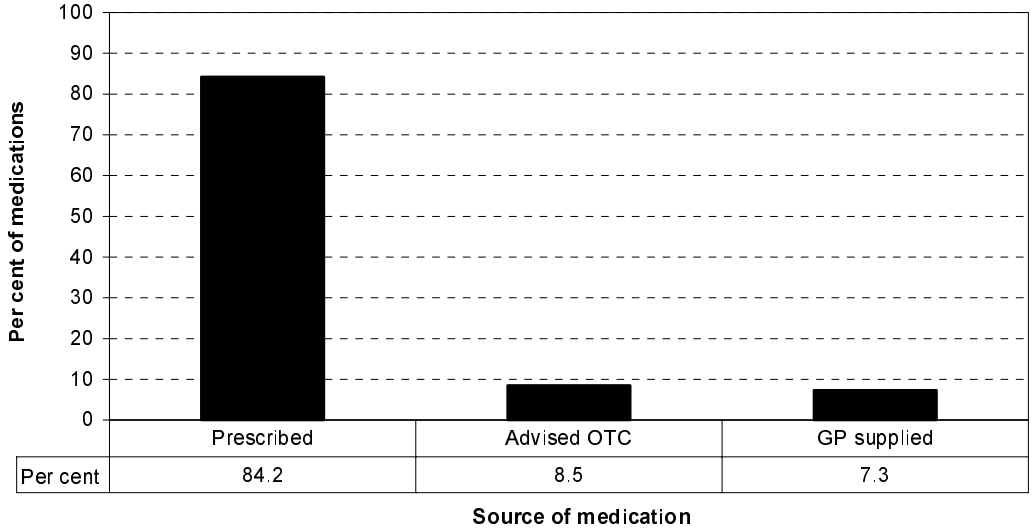


Figure 9.1: Distribution of medications by source

Overall, GPs recorded 85.0% of medications by brand name and 15.0% by their generic (non-proprietary) name. There were 86.3% of prescribed medications, 80.6% of GP supplied and 76.1% of over-the-counter medications recorded by their brand names.

A total of 101,350 medications were recorded during this year of the BEACH survey, at a rate of 105 per 100 encounters and 73 per 100 problems managed. Most medications (84.2%) were prescribed. However, 8.5% of medications were recommended by the GP for purchase over-the-counter and 7.3% were supplied to the patient by the GP (Figure 9.1). Extrapolated to the whole general practice population, GPs recommended 8.9 million medications to their patients for purchase over-the-counter at 8.5 million encounters per annum. GPs also supplied 7.6 million medications directly to the patient at 5.8 million encounters.

9.2 Prescribed medications

There were 85,332 prescriptions recorded, at a rate of 88.0 per 100 encounters and 61.4 per 100 problems managed. At least one prescription was recorded at 57.4% of encounters and for half (49.8%) of the problems managed.

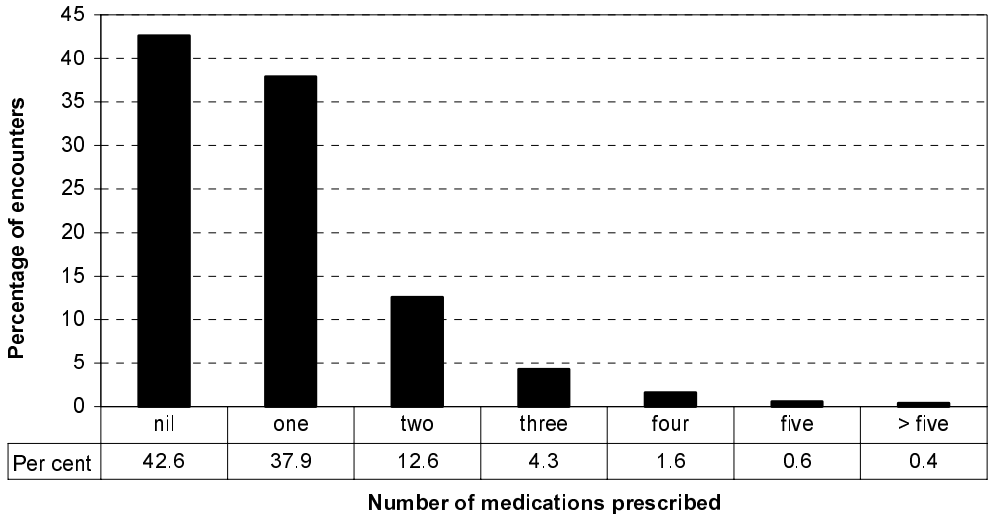


Figure 9.2: Number of medications prescribed per encounter

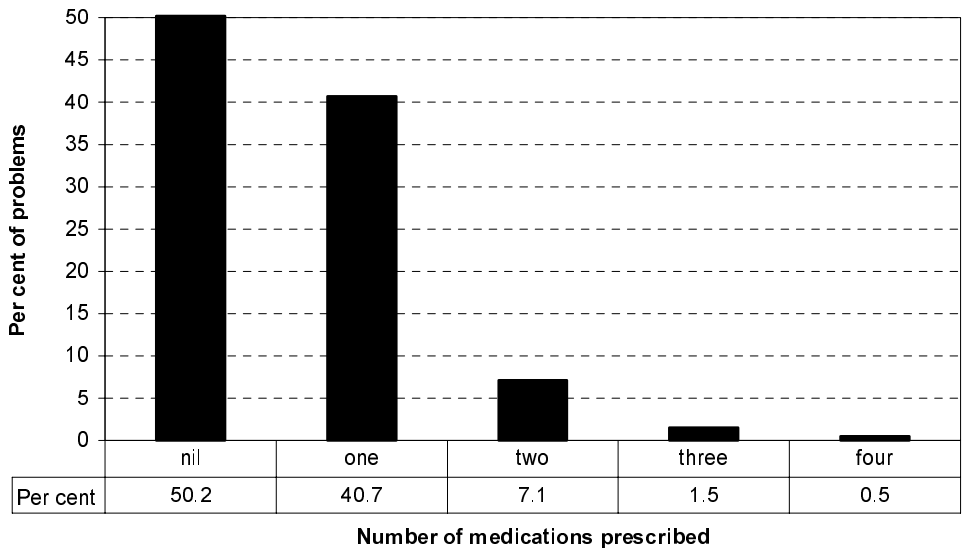


Figure 9.3: Number of medications prescribed per problem

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. They could be a mixture of medications prescribed, supplied or advised for over-the-counter purchase.

No medications were prescribed at 42.6% of encounters, one medication at 37.9% of encounters, two at 12.6% and three at 4.3%. Four or more medications were prescribed at

only 2.6% of encounters (Figure 9.2). No prescription was given for half (50.2%) of all problems managed, one for 40.7%, two for 7.1% and three or more for 2.0% (Figure 9.3).

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 just over one-third. For the 55,591 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 38.3% of these prescriptions the GP specified that no repeats had been prescribed and for 26.4% five repeats were ordered. The latter proportion reflects the PBS provision of one month's supply and five repeats for many medications used for chronic conditions such as hypertension. The ordering of one or two repeats (17.6% and 13.1%) was also not unusual.

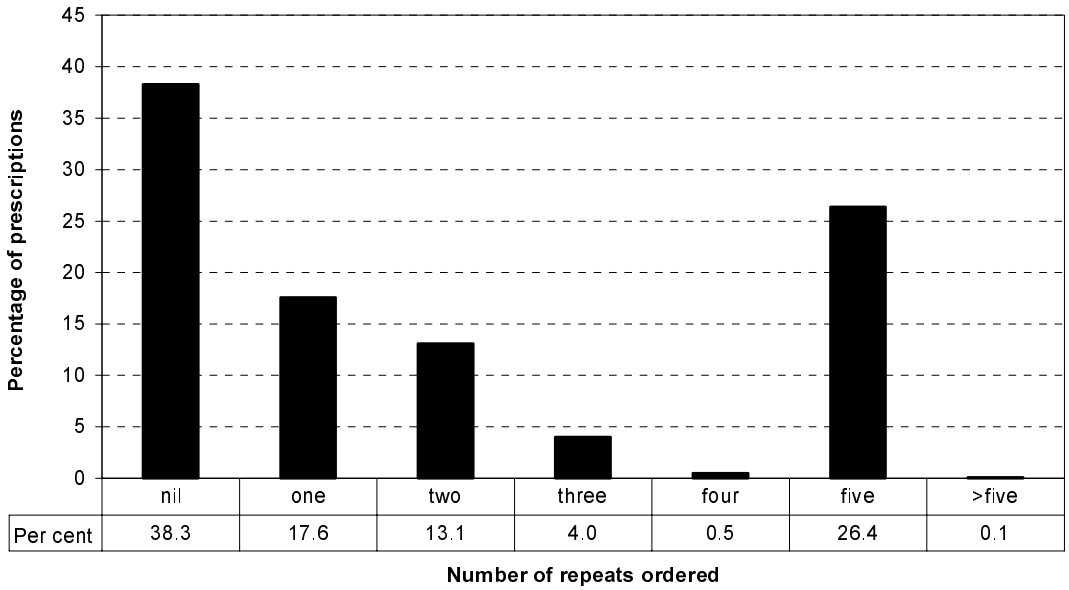


Figure 9.4: Number of repeats ordered per prescription

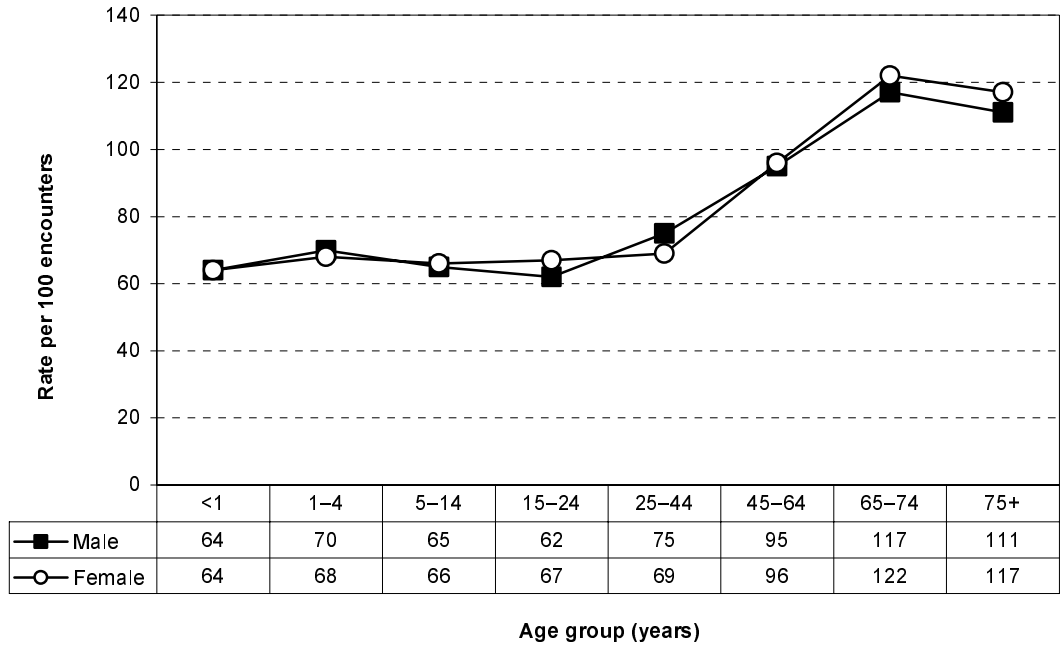
The level of missing data has dropped considerably from previous years (due to improved instructions to the GPs) but it is still difficult to extrapolate reliably to the total number of intended prescriptions (i.e. original plus repeats). However, if it is assumed that the missing data are random and distributed across all medication types in a similar manner to those for which repeat status was recorded, this would suggest that the participating GPs intended a total 217,726 medications to be dispensed as a result of these prescriptions. This extrapolates to about 218 million orders by recognised GPs in Australia per year. However, in the 2001 calendar year 138,446,840 dispensed prescriptions from recognised GPs were recorded in the PBS data (personal communication John Dudley, DoHA from HIC data).

While it could be expected that some prescriptions are not presented for dispensing, the non-redemption rates for prescriptions in overseas studies have varied between 5.2% in the United Kingdom[27] and 13% in a more comparable health system in New Zealand.[28] These non-redemption rates would not be sufficient to explain the difference here. The main cause of this discrepancy appears to be the lack of recording in the Pharmaceutical Benefits Scheme (PBS) data of medications that fall below the subsidy threshold and the lack of data on private prescriptions. This suggests that PBS data should not be used alone to monitor significant areas of general practice medication management.

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 they have managed in general practice.



	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	64	70	65	62	75	95	117	111
Female	64	68	66	67	69	96	122	117

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

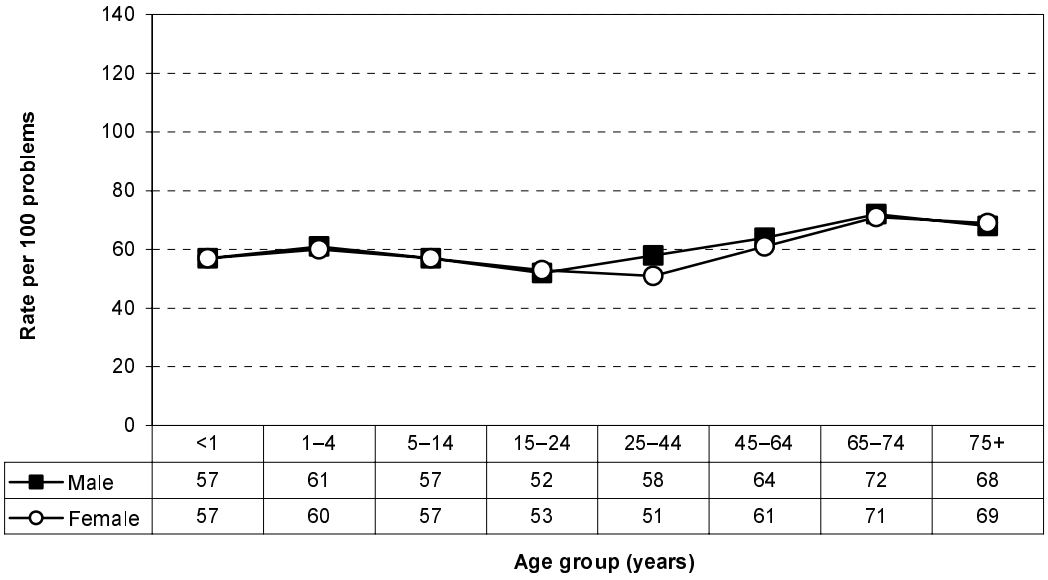


Figure 9.6: Age–sex-specific prescription rates per 100 problems

Types of medications prescribed

Medications prescribed by major groups

The distribution of prescribed medications by major groups is presented graphically in Figure 9.7. Antibiotics were the most commonly prescribed group, representing 16.3% of all prescriptions. These were followed by cardiovascular (15.8%), central nervous system (12.1%), psychological (8.4%), musculoskeletal (7.0%) and respiratory (6.6%) medications.

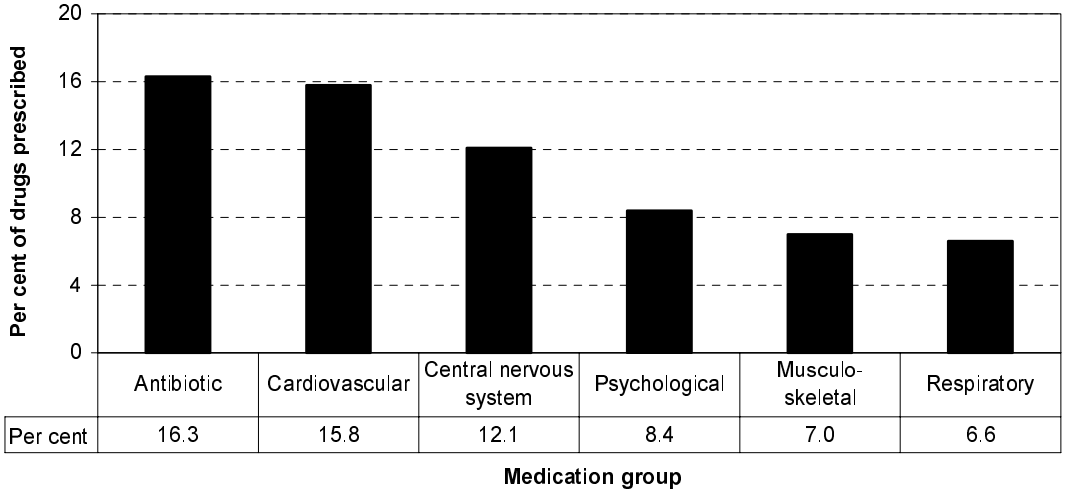


Figure 9.7: Distribution of prescribed medications by group

Table 9.1 shows the distribution of medications commonly prescribed by group, subgroup and generic name in order of medication group frequency. In the antibiotic group, broad-spectrum penicillins were prescribed at a rate of 4.5 per 100 encounters. Amoxycillin and

amoxycillin + potassium clavulanate were the most frequently prescribed generic drugs in that subgroup. Cephalosporins were prescribed almost as often, at 3.2 per 100 encounters.

Within cardiovascular medications, anti-hypertensives accounted for more than half the prescriptions (7.5 per 100 encounters). Other cardiovascular medications, principally lipid-lowering agents, contributed 2.7 prescriptions per 100 encounters. Beta-blockers and anti-angina medications were also frequently recorded.

Prescribed central nervous system medications were mainly simple analgesics (3.8 per 100 encounters) and compound analgesics (2.7). The psychological medications most frequently prescribed were anti-depressants. Musculoskeletal drugs were prescribed at a rate of 6.1 per 100 encounters. These were mainly non-steroidal anti-inflammatory drugs, in particular, celecoxib and rofecoxib.

Hormones were also commonly prescribed, with hypoglycaemics the most frequent followed by sex hormones and anabolic agents. In other groups, medications for the control or prevention of asthma were the most common in the respiratory group. Immunisation accounted for most of the allergy/immune system group, with influenza vaccine prescribed at a rate of 1.5 per 100 encounters. 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*=85,332)	Rate per 100 ens[(a)] (*n*=96,973)	95% LCL	95% UCL
Antibiotics			13,950	16.3	14.4	13.9	14.9
	Broad-spectrum penicillin		4,386	5.1	4.5	4.2	4.8
		Amoxycillin	2,825	3.3	2.9	2.7	3.2
		Amoxycillin/potass.clavulanate	1,506	1.8	1.6	1.3	1.8
	Cephalosporins		3,115	3.7	3.2	3.0	3.5
		Cephalexin	1,966	2.3	2.0	1.8	2.2
		Cefaclor monohydrate	1,053	1.2	1.1	0.8	1.3
	Other antibiotics		2,874	3.4	3.0	2.8	3.2
		Roxithromycin	1,367	1.6	1.4	1.2	1.6
		Erythromycin	577	0.7	0.6	0.4	0.8
	Penicillin		1,421	1.7	1.5	1.2	1.7
		Penicillin V (phen-meth benz)	463	0.5	0.5	0.1	0.8
	Tetracyclines		951	1.1	1.0	0.8	1.2
		Doxycycline	766	0.9	0.8	0.6	1.0
	Anti-infectives		614	0.7	0.6	0.5	0.8
Cardiovascular			13,487	15.8	13.9	13.2	14.7
	Anti-hypertensives		7,310	8.6	7.5	7.1	8.0
		Irbesartan	755	0.9	0.8	0.6	0.9
		Perindopril	724	0.8	0.7	0.6	0.9
		Amlodipine	699	0.8	0.7	0.6	0.9
		Ramipril	596	0.7	0.6	0.4	0.8
		Irbesartan/hydrochlorothiazide	503	0.6	0.5	0.3	0.7

(continued)

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

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,332)	Rate per 100 encs[(a)] (*n*=96,973)	95% LCL	95% UCL
	Other CVS drugs		2,598	3.0	2.7	2.5	2.9
		Atorvastatin	992	1.2	1.0	0.9	1.2
		Simvastatin	908	1.1	0.9	0.8	1.1
	Beta-blockers		1,635	1.9	1.7	1.5	1.9
		Atenolol	962	1.1	1.0	0.8	1.2
	Anti-angina		1,047	1.2	1.1	0.9	1.3
CNS			10,345	12.1	10.7	10.1	11.2
	Simple analgesics		3,663	4.3	3.8	3.4	4.1
		Paracetamol	2,984	3.5	3.1	2.7	3.4
		Aspirin	648	0.8	0.7	0.5	0.8
	Compound analgesics		2,634	3.1	2.7	2.5	2.9
		Paracetamol/codeine	2,170	2.5	2.2	2.0	2.4
	Narcotic analgesics		1,943	2.3	2.0	1.6	2.4
		Tramadol	661	0.8	0.7	0.4	0.9
	Anti-emetic/anti-nauseants		1,342	1.6	1.4	1.2	1.5
		Prochlorperazine	638	0.7	0.7	0.5	0.8
		Metoclopramide	617	0.7	0.6	0.5	0.8
	Anti-convulsants		526	0.6	0.5	0.3	0.7
Psychological			7,167	8.4	7.4	7.0	7.8
	Anti-depressants		2,811	3.3	2.9	2.7	3.1
		Sertraline	550	0.6	0.6	0.4	0.7
		Citalopram	429	0.5	0.4	0.3	0.6
	Anti-anxiety agents		1,866	2.2	1.9	1.7	2.2
		Diazepam	1,006	1.2	1.0	0.8	1.3
		Oxazepam	664	0.8	0.7	0.5	0.9
	Sedatives/hypnotics		1,848	2.2	1.9	1.7	2.1
		Temazepam	1,301	1.5	1.3	1.2	1.5
	Anti-psychotics		641	0.8	0.7	0.4	0.9
Musculoskeletal			5,933	7.0	6.1	5.8	6.4
	NSAID		5,120	6.0	5.3	5.0	5.5
		Celecoxib	1,365	1.6	1.4	1.3	1.6
		Rofecoxib	1,191	1.4	1.2	1.0	1.5
		Diclofenac sodium systemic	847	1.0	0.9	0.7	1.1
Hormones			5,925	6.9	6.1	5.8	6.4
	Hypoglycaemic agents		2,129	2.5	2.2	1.9	2.5
		Metformin	909	1.1	0.9	0.8	1.1
		Gliclazide	467	0.5	0.5	0.3	0.7

(continued)

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

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,332)	Rate per 100 encs[(a)] (*n*=96,973)	95% LCL	95% UCL
	Sex hormones/anabolic agents		1,897	2.2	2.0	1.8	2.1
	Cortico-steroids		1,300	1.5	1.3	1.2	1.5
		Prednisolone	478	0.6	0.5	0.3	0.7
	Other hormones		597	0.7	0.6	0.5	0.8
		Thyroxine	515	0.6	0.5	0.4	0.7
Respiratory			5,600	6.6	5.8	5.3	6.2
	Bronchodilator/spasm relaxants		2,773	3.2	2.9	2.6	3.1
		Salbutamol	1,917	2.2	2	1.8	2.2
		Terbutaline	429	0.5	0.4	0.2	0.7
	Asthma preventives		2,114	2.5	2.2	2.0	2.4
		Iticasone/salmeterol	600	0.7	0.6	0.4	0.8
		Budesonide	435	0.5	0.4	0.3	0.6
Allergy, immune system			4,316	5.1	4.5	4.1	4.8
	Immunisation		3,739	4.4	3.9	3.5	4.3
		Influenza virus vaccine	1,442	1.7	1.5	0.8	2.2
	Anti-histamines		428	0.5	0.4	0.2	0.7
Skin			3,992	4.7	4.1	3.9	4.4
	Topical steroids		2,757	3.2	2.8	2.6	3
		Betamethasonetopical	833	1.0	0.9	0.7	1.0
		Mometasone	741	0.9	0.8	0.6	0.9
		Hydrocortisone topical	489	0.6	0.5	0.3	0.7
	Anti-infective skin		652	0.8	0.7	0.5	0.8
	Other skin		560	0.7	0.6	0.4	0.8
Digestive			3,721	4.4	3.8	3.6	4.1
	Anti-ulcerants		2,300	2.7	2.4	2.2	2.5
		Omeprazole	821	1.0	0.8	0.7	1.0
		Ranitidine	618	0.7	0.6	0.5	0.8
	Anti-diarrhoeals		511	0.6	0.5	0.3	0.7
Blood			1,787	2.1	1.8	1.7	2.0
	Other blood drugs		1,029	1.2	1.1	0.9	1.3
		Warfarin sodium	852	1.0	0.9	0.7	1.1
	Haemopoietic agents		758	0.9	0.8	0.6	0.9
Ear, nose topical			1,752	2.1	1.8	1.7	2.0
	Topical otic		917	1.1	0.9	0.8	1.1
		Dexamethasone/framycetin	482	0.6	0.5	0.3	0.7

(continued)

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

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,332)	Rate per 100 encs[(a)] (*n*=96,973)	95% LCL	95% UCL
	Topical nasal		833	1.0	0.9	0.7	1.0
		Budesonidetopical nasal	450	0.5	0.5	0.3	0.6
Urogenital			1,712	2.0	1.8	1.6	2.0
	Diuretics		1,251	1.5	1.3	1.1	1.5
		Frusemide (furosemide)	715	0.8	0.7	0.5	0.9
Contraceptives			1,611	1.9	1.7	1.5	1.8
	Contraceptive oral/systemic		1,608	1.9	1.7	1.5	1.8
		Levonorgestrel/ethinyloestr	1,153	1.4	1.2	1.1	1.3
Nutrition, metabolism			1,606	1.9	1.7	1.1	2.2
	Minerals/tonics		550	0.6	0.6	0.3	0.8
Eye medications			1,450	1.7	1.5	1.4	1.6
	Anti-infectives eye		912	1.1	0.9	0.8	1.1
		Chloramphenicol eye	771	0.9	0.8	0.7	0.9
Miscellaneous			451	0.5	0.5	0.3	0.6
Anti-neoplastics			323	0.4	0.3	0.2	0.5
Surgical preps			131	0.2	0.1	0.0	0.5
Diagnostic agents			75	0.1	0.1	0.0	0.3

(a) Column will not add to 100 because multiple prescriptions could be written at each encounter.
Note: Scripts—prescriptions, encs—encounters, LCL—lower confidence limit, UCL—upper confidence limit, NSAIDs—non-steroidal anti-inflammatory drugs, CVS—cardiovascular system, CNS—central nervous system.

Most frequently prescribed medications

The 30 most frequently prescribed individual medications are listed in Table 9.2. Together these accounted for almost half (42.4%) of all prescribed medications. Antibiotics accounted for four of the top ten medications, and analgesics were also frequently prescribed.

Distribution of medications prescribed by ATC group

Table 9.3 shows the distribution of prescribed medications using the WHO ATC classification [14] as an alternative method of grouping. This allows comparison with other data classified in ATC such as those produced by the HIC.

With this classification 'other analgesics and anti-pyretics', which includes aspirin and paracetamol, was the most frequently prescribed group. They were followed by penicillins and non-steroidal anti-inflammatory drugs. Other beta-lactam anti-bacterials, principally cephalosporins, were fourth, followed by inhaled adrenergics and anti-depressants.

Table 9.2: Most frequently prescribed medications

Generic medication	Number	Per cent of prescriptions (*n*=85,332)	Rate per100 encounters (*n*=96,973)	95% LCL	95% UCL
Paracetamol	2,984	3.5	3.1	2.7	3.4
Amoxycillin	2,825	3.3	2.9	2.7	3.2
Paracetamol/Codeine	2,170	2.5	2.2	2.0	2.4
Cephalexin	1,966	2.3	2.0	1.8	2.2
Salbutamol	1,917	2.2	2.0	1.8	2.2
Amoxycillin/potass.clavulanate	1,506	1.8	1.6	1.3	1.8
Influenza virus vaccine	1,442	1.7	1.5	0.8	2.2
Roxithromycin	1,367	1.6	1.4	1.2	1.6
Celecoxib	1,365	1.6	1.4	1.3	1.6
Temazepam	1,301	1.5	1.3	1.2	1.5
Rofecoxib	1,191	1.4	1.2	1.0	1.5
Levonorgestrel/ethinyloestradiol	1,153	1.4	1.2	1.1	1.3
Cefaclor monohydrate	1,053	1.2	1.1	0.8	1.3
Diazepam	1,006	1.2	1.0	0.8	1.3
Atorvastatin	992	1.2	1.0	0.9	1.2
Atenolol	962	1.1	1.0	0.8	1.2
Metformin	909	1.1	0.9	0.8	1.1
Simvastatin	908	1.1	0.9	0.8	1.1
Warfarin sodium	852	1.0	0.9	0.7	1.1
Diclofenac sodium systemic	847	1.0	0.9	0.7	1.1
Betamethasone topical	833	1.0	0.9	0.7	1.0
Omeprazole	821	1.0	0.8	0.7	1.0
Chloramphenicol eye	771	0.9	0.8	0.7	0.9
Doxycycline	766	0.9	0.8	0.6	1.0
Irbesartan	755	0.9	0.8	0.6	0.9
Mometasone	741	0.9	0.8	0.6	0.9
Perindopril	724	0.8	0.7	0.6	0.9
Frusemide (furosemide)	715	0.8	0.7	0.5	0.9
Amlodipine	699	0.8	0.7	0.6	0.9
Oxazepam	664	0.8	0.7	0.5	0.9
Subtotal	*36,205*	*42.4*	. .	. .	. .
Total prescribed medications	**85,332**	**100.0**	**88.0**	**85.6**	**90.4**

(a) Column will not add to 100 because multiple prescriptions could be written at each encounter.
Note: LCL—lower confidence limit, UCL—upper confidence limit.

Table 9.3: Distribution of prescribed medications, by ATC medication group

Generic medication	Number	Per cent of prescriptions (*n*=85,332)	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Other analgesics and anti-pyretics	5,944	7.0	6.1	5.7	6.5
Beta-lactam anti-bacterials, penicillins	5,778	6.8	6.0	5.6	6.3
Anti-inflammatory and anti-rheumatic	5,117	6.0	5.3	5.0	5.5
Other beta-lactam anti-bacterials	3,115	3.7	3.2	3.0	3.5
Adrenergics, inhalants	3,060	3.6	3.2	2.9	3.4
Anti-depressants	3,020	3.5	3.1	2.9	3.3
Ace inhibitors, plain	2,694	3.2	2.8	2.6	3.0
Viral vaccines	2,531	3.0	2.6	2.2	3.0
Cholesterol and triglyceride reducers	2,366	2.8	2.4	2.3	2.6
Corticosteroids, plain	2,305	2.7	2.4	2.2	2.6
Drugs for peptic ulcer and GORD	2,300	2.7	2.4	2.2	2.5
Macrolides, lincosamides and streptogramins	2,286	2.7	2.4	2.2	2.6
Opioids	1,994	2.3	2.1	1.8	2.3
Anxiolytics	1,866	2.2	1.9	1.7	2.2
Other drugs for obstructive airway	1,863	2.2	1.9	1.7	2.1
Hypnotics and sedatives	1,842	2.2	1.9	1.7	2.1
Oral blood glucose lowering drugs	1,810	2.1	1.9	1.6	2.1
Hormonal contraceptives for systemic use	1,808	2.1	1.9	1.7	2.0
Beta blocking agents	1,719	2.0	1.8	1.6	2.0
Selective calcium channel blockers	1,454	1.7	1.5	1.3	1.7
Corticosteroids for systemic use, plain	1,283	1.5	1.3	1.1	1.5
Anti-psychotics	1,279	1.5	1.3	1.1	1.5
Angiotensin II antagonists, plain	1,253	1.5	1.3	1.1	1.5
Anti-thrombotic agents	1,097	1.3	1.1	0.9	1.3
Anti-infectives	1,003	1.2	1.0	0.9	1.2
Tetracyclines	951	1.1	1.0	0.8	1.2
Decongestants and other nasal preparations	800	0.9	0.8	0.7	1.0
Estrogens	794	0.9	0.8	0.7	0.9
High-ceiling diuretics	746	0.9	0.8	0.6	1.0
Corticosteroids and anti-infectives	719	0.8	0.7	0.5	0.9
Subtotal	*64,796*	*75.9*	. .	. .	. .
Total prescribed medications	**85,332**	**100.0**	**88.0**	**85.6**	**90.4**

(a) Column will not add to 100 because multiple prescriptions could be written at each encounter.
Note: UCL—upper confidence limit, LCL—lower confidence limit, GORD—gastro-oesophageal reflux disorder.

Significant changes from 1998–99 to 2001–02

Changes in medications when classified in CAPS

Table A4.7 (Appendix 4) provides a summary of the annual results for specific groups of medications (classified according to CAPS) prescribed over the period 1998–99 to 2001–02. They suggest there has been a significant decrease in prescribing rates of:

- total antibiotic and cephalosporins in particular with a possible decrease in tetracyclines
- simple and compound analgesics
- total respiratory medications, and in prescribing of bronchodilators in particular
- ear and nose topical medications, and topical nasal medications in particular.

The annual results suggest significant increases in prescribing rates of:

- other medications acting on the cardiovascular system including lipid-lowering drugs
- non-steroidal anti-inflammatory/anti-rheumatoid medications.

Changes in medications prescribed by ATC medication group

When the results for prescribed medication rates were compared using the ATC classification the following trends emerged:

Significant decreases were apparent in the rate of prescribing of:

- other analgesics and anti-pyretics
- other beta-lactam anti-bacterials
- plain ace inhibitors
- macrolides and lincosamides
- other asthmatic inhalants.

Significant increases were apparent in the rate of prescribing of:

- anti-inflammatory/anti-rheumatic non-steroids
- cholesterol & triglyceride reducers.

The comparative results are provided in Appendix 4, Table A4.9. These trends are further investigated with more sophisticated statistical techniques in Chapter 14 and some are evaluated relative to the management of selected morbidities in Chapter 15.

Changes in prescription rates of individual generic medications

Between 1998–99 and 2001–02 decreased prescribing rates of the following medications were noted (Appendix 4, Table A4.8):

- paracetamol, paracetamol and codeine
- salbutamol
- cefaclor monohydrate
- diclofenac sodium systemic
- ranitidine.

There were also trends for decreased prescribing rates of other medications but these have not yet reached statistical significance. These trends will be further investigated at the end of the fifth year of BEACH. They included the prescribing rates of:

- doxycycline hydrocholoride
- erythromycin
- salbutamol.

The only notable increases in prescribing rates related to celecoxib and rofecoxib, which were accepted on the PBS during years 3 and 4 of the BEACH program.

9.3 Medications advised for over-the-counter purchase

The total number of medications recorded as recommended by the GP for over-the-counter purchase was 8,606, a rate of 8.9 per 100 encounters and 6.2 per 100 problems managed. At least one medication was recorded as advised at 8.0% of encounters and for 5.7% of problems.

Types of medications advised

Medications advised by major groups

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 for the skin and those acting on the respiratory and digestive systems (Figure 9.8).

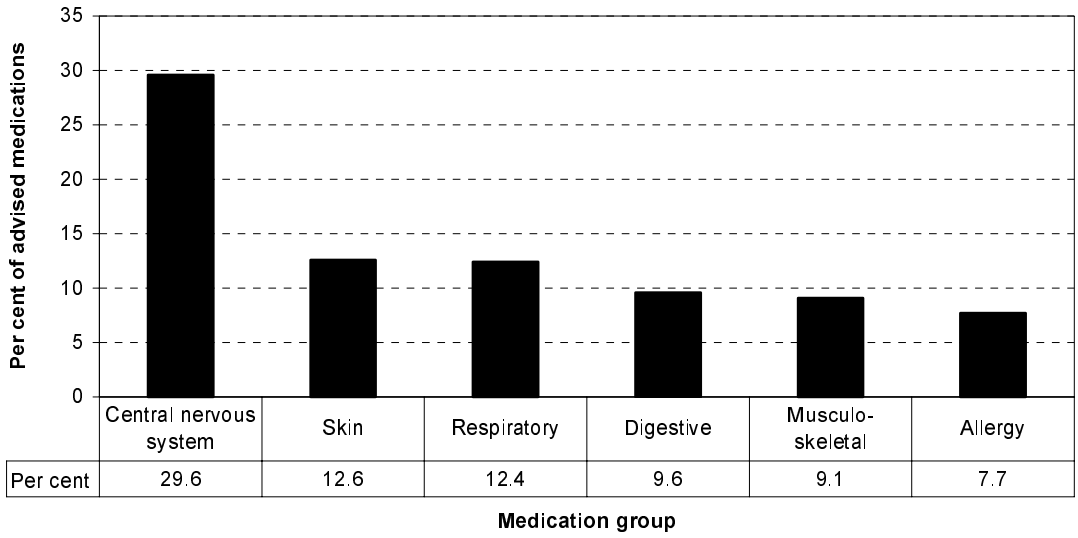


Figure 9.8: Distribution of advised medications by major groups

The distribution of the most frequently advised medications by generic name shows that paracetamol was the most common, accounting for 24.1% of all advised over-the-counter medications (Table 9.4). Although other medications were advised in relatively small numbers, the range of medications was wide. Most frequent of these included analgesics, anti-histamines and skin preparations. The 30 medications listed in this table accounted for two-thirds of all over-the-counter medications advised.

Table 9.4: Most frequently advised over-the-counter medications

Generic medication	Number	Per cent of OTCs (*n*=8,606)	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Paracetamol	2,073	24.1	2.1	1.7	2.6
Ibuprofen	481	5.6	0.5	0.2	0.8
Loratadine	262	3.0	0.3	0.0	0.5
Clotrimazole topical	208	2.4	0.2	0.0	0.4
Diclofenac topical	182	2.1	0.2	0.0	0.5
Paracetamol/codeine	171	2.0	0.2	0.0	0.5
Aspirin	150	1.7	0.2	0.0	0.5
Fexofenadine	143	1.7	0.1	0.0	0.5
Sodium/potassium/citric/glucose	141	1.6	0.1	0.0	0.6
Brompheniramine/phenylephrine	134	1.6	0.1	0.0	0.7
Clotrimazole vaginal	128	1.5	0.1	0.0	0.4
Sorbolene/glycerol/cetomac	121	1.4	0.1	0.0	0.5
Cetirzine	115	1.3	0.1	0.0	0.6
Chlorpheniramine/pseudoephidrine	111	1.3	0.1	0.0	0.5
Sodium chloride topical nasal	102	1.2	0.1	0.0	0.6
Bromhexine	85	1.0	0.1	0.0	0.6
Calamine lotion	82	1.0	0.1	0.0	0.6
Codeine/paracetamol/pseudoephedrine	78	0.9	0.1	0.0	0.9
Pholcodine	78	0.9	0.1	0.0	0.5
Mouthwash/gargle other	76	0.9	0.1	0.0	1.3
Pseudoephedrine	75	0.9	0.1	0.0	0.5
Beclomethasone nasal spray	74	0.9	0.1	0.0	0.5
Cold and flu medication NEC	71	0.8	0.1	0.0	0.8
Saline bath/solution/gargle	71	0.8	0.1	0.0	0.6
Simple analgesic	69	0.8	0.1	0.0	1.0
Povidone-iodine topical	68	0.8	0.1	0.0	0.5
Sodium citrotartrate/tartaric acid	67	0.8	0.1	0.0	0.6
Promethazine hydrochloride	64	0.7	0.1	0.0	0.4
Chlorpheniramine/phenylephrine	62	0.7	0.1	0.0	0.6
Hyoscine butylbromide	57	0.7	0.1	0.0	0.4
Subtotal	*5,599*	*65.1*	. .	. .	. .
Total medications advised	**8,606**	**100.0**	**8.9**	**8.1**	**9.6**

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

9.4 Medications supplied by general practitioners

General practitioners supplied their patients with a total of 7,413 medications in this study, at a rate of 7.6 medications per 100 encounters and 5.3 per 100 problems. At least one medication was supplied at 5.8% of encounters and for 4.3% of problems.

Types of medications supplied by GPs

GP-supplied medications by major groups

The distribution of supplied medications by group showed that those acting on the allergy/immune system constituted one-third of all medications supplied. Cardiovascular medications made up 9.8%, while central nervous system medications and antibiotics each accounted for 8.8% of GP-supplied medications (Figure 9.9).

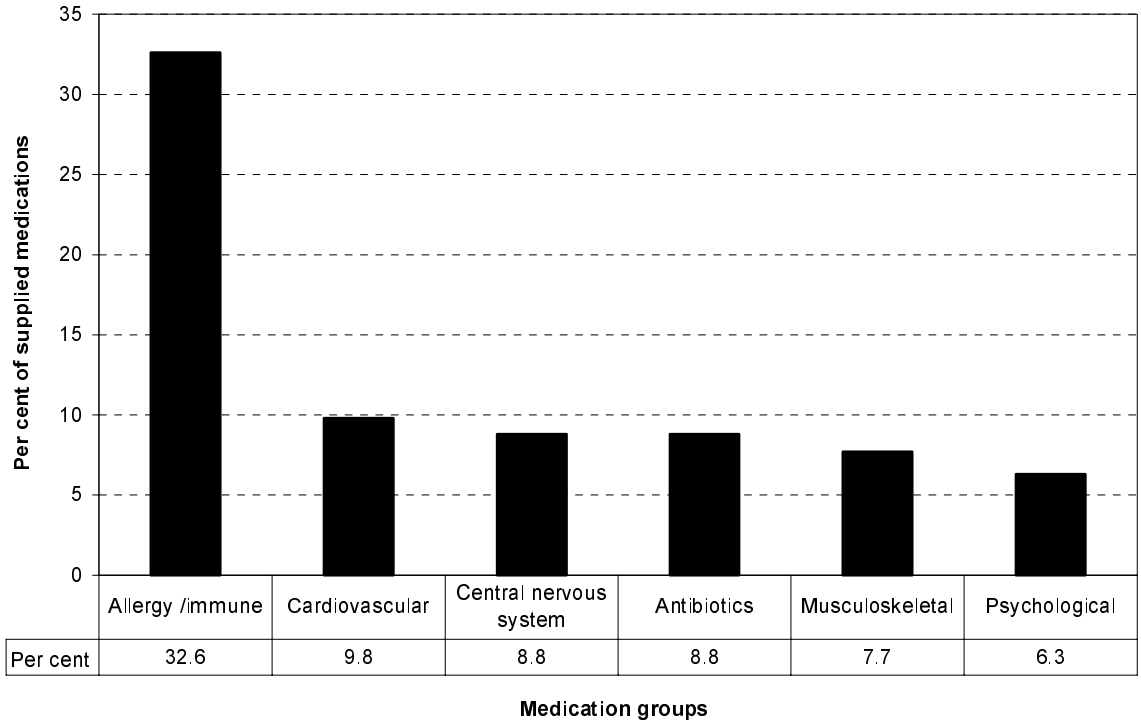


Figure 9.9: Distribution of GP-supplied medications by major groups

Of the ten most common medications supplied by the GP, seven were vaccines, principally influenza virus vaccine, which accounted for 11.7% of GP-supplied medications (Table 9.5). There was a wide spread of other medications supplied, mostly prescription medications, presumably from manufacturers' sample packs. They reflect a range of medications which are often supplied by the GP (e.g. vaccines). Others may be needed urgently, or samples may be supplied to test efficacy for a particular patient, or where cost is an issue. The most common of these were the non-steroidal anti-inflammatory drugs (NSAIDs) rofecoxib and celecoxib, accounting for 2.9% and 2.3% of all medications supplied.

Table 9.5: Medications most frequently supplied by GPs

Generic medication	Number	Per cent of GP-supplied (*n*=7,412)	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Influenza virus vaccine	866	11.7	0.9	0.0	2.1
Polio vaccine oral sabin/injection	312	4.2	0.3	0.0	0.7
Rofecoxib	216	2.9	0.2	0.0	0.5
Triple antigen (diphtheria/pertussis/tetanus)	172	2.3	0.2	0.0	0.6
Celecoxib	171	2.3	0.2	0.0	0.5
Haemophilus B vaccine	169	2.3	0.2	0.0	0.5
Mumps/measles/rubella vaccine	150	2.0	0.2	0.0	0.5
Diphtheria/pertussis/tetanus/Hep B	148	2.0	0.2	0.0	0.6
Amoxycillin	140	1.9	0.1	0.0	1.6
ADT/CDT (diphtheria/tetanus) vaccine	131	1.8	0.1	0.0	0.5
Hepatitis B vaccine	130	1.8	0.1	0.0	0.5
Metoclopramide	118	1.6	0.1	0.0	0.4
Salbutamol	117	1.6	0.1	0.0	0.8
Paracetamol/codeine	110	1.5	0.1	0.0	0.6
Omeprazole	108	1.5	0.1	0.0	0.6
Prochlorperazine	99	1.3	0.1	0.0	0.6
Levonorgestrel/ethinyloestradiol	98	1.3	0.1	0.0	0.4
Paracetamol	98	1.3	0.1	0.0	0.6
Cephalexin	76	1.0	0.1	0.0	1.0
Amoxycillin/potassium clavulanate	74	1.0	0.1	0.0	1.5
Sertraline	70	0.9	0.1	0.0	0.5
Citalopram	70	0.9	0.1	0.0	0.4
Pantoprazole	64	0.9	0.1	0.0	0.4
Mometasone	62	0.8	0.1	0.0	0.5
Roxithromycin	60	0.8	0.1	0.0	0.7
Atorvastatin	59	0.8	0.1	0.0	0.5
Diazepam	57	0.8	0.1	0.0	0.8
Pethidine	52	0.7	0.1	0.0	0.4
Chloramphenicol eye	52	0.7	0.1	0.0	0.7
Perindopril	50	0.7	0.1	0.0	0.6
Subtotal	*4,099*	*55.3*	. .	. .	. .
Total medications supplied	**7,412**	**100.0**	**7.6**	**6.3**	**9.0**

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

Changes from 1998–99 to 2001–02

As shown in Appendix 4, Tables A4.10 and A4.11, there were no significant changes apparent in the relative rate of provision of advice for over-the-counter purchase of any of the medications that were commonly available in 1998–99. However, for medications supplied directly by the GP, the availability of the Cox-2 inhibitors in the last 2 years of the BEACH program had a significant impact.

10 Non-pharmacological management

For each problem managed, GPs could record up to two non-pharmacological treatments provided at the encounter. These were divided into two categories:

- clinical treatments, including general and specific advice, counselling or education, family planning and administrative processes. Non-pharmacological treatments classified as 'clinical' are listed in Appendix 3; and
- procedural treatments, which encompassed all procedures carried out by general practitioners such as excision of skin lesion or application/removal of plaster cast. The procedural codes and groupings are listed in Appendix 3.

Observations of the patient such as measurements of blood pressure, regarded as routine clinical measurements, were not included in the data collection program.

Non-pharmacological treatments were frequently provided by general practitioners to manage patient morbidity. A total of 50,308 were recorded for the year, a rate of 51.9 per 100 encounters and 36.2 per 100 problems managed. A breakdown of the non-pharmacological treatments showed that clinical treatments were far more common than procedural treatments (Table 10.1).

Table 10.1: Non-pharmacological treatments—summary table

	Number	Rate per 100 encs[(a)] (*n*=96,973)	95% LCL	95% UCL	Rate per 100 problems[(a)] (*n*=139,092)	95% LCL	95% UCL
Non-pharmacological treatments	50,308	51.9	49.6	54.2	36.2	34.7	37.7
Clinical treatments	36,909	38.1	36.1	40.1	26.5	25.2	27.9
Procedural treatments	13,399	13.8	13.1	14.5	9.6	9.1	10.1

(a) Figures do not total 100.0 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 often combined to manage the presenting problem. However, for more than half 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 31.4% of problems, and for 18.4% of problems non-pharmacological treatment was not accompanied by any medication.

One in five problems were managed with a clinical treatment and for over half of these (55.5%) no pharmacological treatments were used. For less than one in ten problems, the GP used a procedural treatment, and for about two-thirds of them (66.2%) no medications were provided. The results presented in Table 10.2 also indicate that problems managed with a procedure were less likely to have concomitant pharmacological treatment than were those managed with a clinical treatment (66.2% compared with 55.5%).

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*=139,092)	95% LCL	95% UCL
At least one non-pharmacological treatment	43,699	100.0	31.4	30.2	32.6
Without pharmacological treatment	25,662	58.7	18.4	17.7	19.2
At least one clinical treatment	32,540	100.0	23.4	22.3	24.5
Without pharmacological treatment	18,064	55.5	13.0	12.4	13.6
At least one procedural treatment	12,665	100.0	9.1	8.6	9.6
Without pharmacological treatment	8,385	66.2	6.0	5.7	6.3

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

10.1 Clinical treatments

The total number of clinical treatments provided by GPs was 36,909, at a rate of 38.1 per 100 encounters (Table 10.1).

Most frequent clinical treatments

The three most common clinical treatments were advice and education in general (12.1% of total non-pharmacological treatments), advice/counselling pertaining to nutrition and weight (10.6%), and advice and education on the management of the patient's problem (9.8%).

General advice/education was provided at a rate of 6.3 per 100 encounters, while advice on nutrition was given at a rate of 5.5 and treatment advice at a rate of 5.1 per 100 encounters. Counselling on the problem managed (4.7 per 100 encounters), psychological counselling (3.2) and advice on medication (2.8) were also frequently provided. Table 10.3 lists a range of clinical treatments provided in order of decreasing frequency. These treatments relate to various aspects of health, such as medication, alcohol use, smoking, exercise, lifestyle, occupational and relationship issues.

Table 10.3: Most frequent clinical treatments

Treatment	Number	Per cent of non-pharmacological treatments (*n*=50,308)	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
Advice/education*	6,090	12.1	6.3	5.4	7.1
Counsel/advice—nutrition/weight*	5,318	10.6	5.5	5.0	6.0
Advice/education—treatment*	4,953	9.8	5.1	4.5	5.7
Counselling—problem*	4,514	9.0	4.7	3.8	5.5
Counselling—psychological*	3,056	6.1	3.2	2.8	3.5
Advice/education—medication*	2,755	5.5	2.8	2.5	3.2
Counsel/advice—exercise*	2,004	4.0	2.1	1.6	2.5
Other admin/document*	1,497	3.0	1.5	1.3	1.8
Reassurance, support	1,446	2.9	1.5	1.0	1.9

(continued)

Table 10.3 (continued): Most frequent clinical treatments

Treatment	Number	Per cent of non-pharmacological treatments (*n*=50,308)	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
Sickness certificate	1,049	2.1	1.1	0.5	1.6
Counsel/advice—smoking*	772	1.5	0.8	0.6	1.0
Counsel/advice—lifestyle*	427	0.9	0.4	0.0	1.0
Counsel/advice—alcohol*	370	0.7	0.4	0.2	0.6
Counsel/advice—relaxation*	343	0.7	0.4	0.1	0.6
Counsel/advice—health/body*	317	0.6	0.3	0.1	0.6
Family planning*	316	0.6	0.3	0.1	0.6
Observe/wait*	299	0.6	0.3	0.0	0.7
Counsel/advice—prevention*	292	0.6	0.3	0.0	0.6
Counsel/advice—pregnancy*	255	0.5	0.3	0.0	0.5
Subtotal	*36,071*	*71.7*	. .	. .	. .
Total clinical treatments	*36,909*	*73.4*	*38.1*	*36.1*	*40.1*
Total non-pharmacological treatment	**50,308**	**100.0**	**51.9**	**49.6**	**54.2**

(a) Figures do not total 100.0 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 32,540 problems included a clinical treatment as part of their management. The ten most common accounted for almost one-third (30.8%) of all problems for which a clinical treatment was provided. The problem most often managed with a clinical treatment was URTI (5.9% of problems managed with a clinical treatment), followed by depression (5.2%), hypertension (4.0%) and lipid disorder (3.0%) (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 50.5% of depression contacts were managed with a clinical treatment, most probably counselling, and of these 45.3% were not given a prescription as part of the treatment. Likewise, 50.9% of anxiety was managed with a clinical treatment and 57.8% of these did not receive a medication. Asthma was less likely to be managed with a clinical treatment (23.4%) and less likely to be managed without medication when clinical treatment was given.

Table 10.4: The ten most common problems managed with a clinical treatment

Problem managed	Number	Per cent of problems with clinical treatment[(a)]	Rate per 100 encounters[(b)] (*n*=96,973)	95% LCL	95% UCL	Per cent this problem[(c)]	Per cent of treated problems—no meds[(d)]
Upper respiratory infection, acute	1,910	5.9	2.0	1.6	2.4	31.6	48.6
Depression*	1,681	5.2	1.7	1.5	1.9	50.5	45.3
Hypertension*	1,307	4.0	1.4	1.1	1.6	15.0	43.1
Lipid disorder	988	3.0	1.0	0.8	1.2	34.8	60.0
Diabetes*	966	3.0	1.0	0.8	1.2	32.3	59.9
Anxiety*	808	2.5	0.8	0.7	1.0	50.9	57.8
Asthma	643	2.0	0.7	0.4	0.9	23.3	26.0
Back complaint*	573	1.8	0.6	0.4	0.8	22.6	48.0
Gastroenteritis, presumed infection	569	1.8	0.6	0.4	0.8	55.0	53.8
Sprain/Strain*	552	1.7	0.6	0.4	0.8	31.6	53.9
Subtotal	*9,997*	*30.8*	. .	. .	. .	. .	. .
Total problems	**32,540**	**100**	**33.6**	**31.9**	**35.2**	. .	. .

(a) Figures do not total 100.0 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) Per cent of contacts with problems that generated at least one clinical treatment without the provision of pharmacological treatment.
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).
Note: LCL—lower confidence limit, UCL—upper confidence limit, meds—medications.

10.2 Procedural treatments

Number of procedures at encounter

Procedural treatments included therapeutic actions and diagnostic procedures undertaken by the GP. ICPC–2 codes were grouped across ICPC–2 chapters for this analysis due to small numbers within each chapter. There were 13,399 procedural treatments recorded, at a rate of 13.8 per 100 encounters (Table 10.1).

Most frequent procedures

Table 10.5 lists the most frequent therapeutic procedures. The most common procedure was the excision or removal of tissue (including destruction, debridement or cauterisation). It accounted for 5.3% of all non-pharmacological treatments and occurred at a rate of 2.7 per 100 encounters. This was followed by physical medicine or rehabilitation (including physiotherapy, massage and therapeutic exercises) which occurred at a rate of 2.2 per 100 encounters, and accounted for 4.2% of all non-pharmacological treatments.

Diagnostic procedures included taking 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 in the Investigation section of the recording form and are therefore described in Chapter 12—Investigations.

Table 10.5: Most frequent procedural treatments

Treatment	Number	Per cent of non-pharmacological treatments	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
Excision/removal tissue/biopsy/ destruction/debridement/cauterisation*	2,653	5.3	2.7	2.4	3.0
Physical medicine/rehabilitation*	2,107	4.2	2.2	1.8	2.6
Dressing/pressure/compression/tamponade*	1,742	3.5	1.8	1.6	2.0
Other therapeutic procedures/surgery NEC*	1,361	2.7	1.4	0.8	2.0
Local injection/infiltration*	1,119	2.2	1.2	0.5	1.8
Incision/drainage/flushing/aspiration/removal body fluid*	1,114	2.2	1.2	1.0	1.3
Pap smear	865	1.7	0.9	0.6	1.1
Repair/fixation-suture/cast/prosthetic device (apply/remove)*	858	1.7	0.9	0.7	1.0
Physical function test*	399	0.8	0.4	0.0	0.9
Pregnancy test*	252	0.5	0.3	0.0	0.5
Subtotal	*12,468*	*24.8*	. .	. .	. .
Total procedural treatments	*13,399*	*26.6*	*13.8*	*13.1*	*14.5*
Total non-pharmacological treatment	**50,308**	**100.0**	**51.9**	**49.6**	**54.2**

(a) Figures do not total 100.0 as more than one treatment can be described for each problem and only per cents >=0.5% included.
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 5).
Note: LCL—lower confidence limit, UCL—upper confidence limit, NEC—not elsewhere classified.

Problems managed with a procedural treatment

A total of 12,665 problems involved a procedure in their management. The top ten problems accounted for 37.3% of all problems for which a procedure was used. These problems were commonly associated with skin complaints, injuries of various types, musculoskeletal problems and female genital check-ups (Table 10.6).

As was the case in 2000–01, solar keratosis/sunburn was the most common problem managed with a procedural treatment, accounting for 5.7% of problems managed with a procedural treatment. Other problems frequently managed with a procedure were female genital check-ups (4.6%), excessive ear wax (4.5%) and sprains/strains (4.2%).

Again, the two columns on the right side of the table show the proportion of the problem that was managed with a procedure and the rate of a problem being managed with a procedure without a concomitant medication. Many of the problems that were managed with a procedure did not have a medication prescribed, advised or given. Seventy-two per cent of solar keratoses cases were managed with a procedure and of these 98.0% did not have a medication associated with them.

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 encounters[(a) (b)] (*n*=96,973)	95% LCL	95% UCL	Per cent of this problem[(c)]	Per cent of treated problems no meds[(d)]
Solar keratosis/sunburn	724	5.7	0.8	0.5	1.0	72.4	98.0
Female genital check-up*	586	4.6	0.6	0.3	0.9	38.4	93.4
Excessive ear wax	565	4.5	0.6	0.4	0.7	78.8	93.5
Sprain/Strain*	526	4.2	0.5	0.3	0.8	30.1	51.3
Warts	488	3.9	0.5	0.3	0.7	73.4	95.1
Laceration/cut	468	3.7	0.5	0.3	0.6	70.8	77.5
Back complaint*	450	3.6	0.5	0.2	0.8	17.7	49.8
Malignant neoplasm skin	349	2.8	0.4	0.0	0.8	42.1	98.3
Chronic ulcer skin (incl varicose ulcer)	309	2.4	0.3	0.1	0.5	60.5	78.1
Osteoarthritis*	254	2.0	0.3	0.0	0.6	10.1	42.7
Subtotal	*4,719*	*37.3*	. .	. .	. .	. .	. .
Total problems	**12,665**	**100.0**	**13.1**	**12.4**	**13.7**	. .	. .

(a) Figures do not total 100.0 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) Percentage of contacts with problems that generated at least one procedural treatment, without the provision of pharmacological treatment.
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).
Note: LCL—lower confidence limit, UCL—upper confidence limit, meds—medications.

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 problem managed, GPs could record up to two referrals. These included referrals to specialists, to allied health professionals, to hospitals for admission or to the emergency department. Referrals to hospital outpatient clinics were classified as specialist referrals.

11.1 Number of referrals and admissions

The patient was given at least one referral at 10.0% of all encounters for 7.0% of all problems managed. More than one referral could be recorded at an encounter. As a result, there were 10,167 referrals made at a rate of 10.5 per 100 encounters. The most frequent were referrals to a medical specialist (7.3 per 100 encounters), followed by referrals to allied health services (2.3). Very few patients were referred to hospital for admission (0.4 per 100 encounters) or to the hospital emergency department (0.1 per 100). Referrals to a specialist were given more often (5.1 per 100 problems managed) than to an allied health professional (1.6) (Table 11.1).

Table 11.1: Summary of referrals and admissions

	Number	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL	Rate per 100 problems (*n*=139,092)	95% LCL	95% UCL
At least one referral	9,681	10.0	9.6	10.4	7.0	6.7	7.2
Referrals	10,167	10.5	10.1	10.9	7.3	7.0	7.6
Specialist	7,096	7.3	7.0	7.6	5.1	4.9	5.3
Allied health service	2,206	2.3	2.1	2.5	1.6	1.5	1.7
Hospital	423	0.4	0.3	0.6	0.3	0.2	0.4
Emergency department	123	0.1	0.0	0.4	0.1	0.0	0.3
Other referrals	319	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 10,167 referrals, 91.5% (*n*=9,302) were referrals to specialists or allied health services. The top ten provider types in each category accounted for 71.3% of all referrals to medical specialists and 82.9% of those to allied health services (Table 11.2).

The most frequent referrals made to specialist medical practitioners were to surgeons (10.6% of all referrals to medical specialists), ophthalmologists (10.2%), orthopaedic surgeons (9.8%) and dermatologists (8.3%).

Forty per cent of referrals to allied health services were to physiotherapists and these accounted for 9.5% of all referrals. These were followed by referrals to dieticians (7.5% of all referrals to allied health professionals), podiatrists and chiropodists (7.5%), dentists (7.2%) and psychologists (6.9%) (Table 11.2).

Table 11.2: The most frequent referrals to specialists and allied health professionals

Professional to whom patient referred	Number	Per cent of all referrals	Per cent of referral group	Rate per 100 encounters (*n*=96,973)	95% LCL	95% UCL
Medical specialist	**7,096**	**76.3**	**100.0**	**7.3**	**7.0**	**7.6**
Referral; surgeon	750	8.1	10.6	0.8	0.6	0.9
Referral; ophthalmologist	724	7.8	10.2	0.8	0.6	0.9
Referral; orthopaedic surgeon	698	7.5	9.8	0.7	0.6	0.8
Referral; dermatologist	591	6.4	8.3	0.6	0.5	0.7
Referral; ENT	508	5.5	7.2	0.5	0.4	0.7
Referral; gynaecologist	503	5.4	7.1	0.5	0.4	0.7
Referral; cardiologist	426	4.6	6.0	0.4	0.3	0.6
Referral; gastroenterologist	390	4.2	5.5	0.4	0.2	0.6
Referral; urologist	236	2.5	3.3	0.2	0.1	0.4
Referral; psychiatrist	234	2.5	3.3	0.2	0.1	0.4
Subtotal: top ten specialist referrals	*5,060*	*54.4*	*71.3*	. .	. .	. .
Allied health and other professionals	**2,206**	**23.7**	**100.0**	**2.3**	**2.1**	**2.5**
Referral; physiotherapy	886	9.5	40.1	0.9	0.7	1.1
Referral; dietician/nutrition	166	1.8	7.5	0.2	0.0	0.4
Referral; podiatrist/chiropodist	165	1.8	7.5	0.2	0.0	0.4
Referral; dentist	159	1.7	7.2	0.2	0.0	0.5
Referral; psychologist	153	1.6	6.9	0.2	0.0	0.4
Referral; acoustic testing	87	0.9	3.9	0.1	0.0	0.3
Referral; diabetes education	61	0.7	2.8	0.1	0.0	0.4
Referral; counsellor	60	0.7	2.7	0.1	0.0	0.5
Referral; optometrist	46	0.5	2.1	0.1	0.0	0.4
Referral; chiropractor	45	0.5	2.1	0.1	0.0	0.5
Subtotal: top ten allied health referrals	*1,829*	*19.7*	*82.9*	. .	. .	. .
Total specialist & allied health referrals	**9,302**	**100.0**	. .	**9.6**	**9.2**	**10.0**

Note: LCL—lower confidence limit, UCL—upper confidence limit, ENT—ear, nose and throat.

11.3 Problems that were referred

A referral to a specialist was provided for a total of 7,241 problems managed. The ten problems most commonly associated with a referral to a specialist accounted for 18.7% of all problems referred to a specialist. The problems most often referred were diabetes (accounting for 2.7% of problems referred to a specialist), malignant neoplasms of the skin (2.4%), and pregnancy (2.4%) (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*=96,973)	95% LCL	95% UCL
Diabetes*	197	2.7	0.2	0.0	0.4
Malignant skin neoplasm	173	2.4	0.2	0.0	0.4
Pregnancy*	171	2.4	0.2	0.0	0.4
Depression*	143	2.0	0.2	0.0	0.4
Osteoarthritis*	130	1.8	0.1	0.0	0.3
Ischaemic heart disease*	127	1.8	0.1	0.0	0.4
Back complaint*	120	1.7	0.1	0.0	0.4
Hypertension*	110	1.5	0.1	0.0	0.4
Menstrual problems*	93	1.3	0.1	0.0	0.4
Cataract	87	1.2	0.1	0.0	0.4
Subtotal: top ten problems referred to a specialist	*1,353*	*18.7*	. .	. .	. .
Total problems referred to specialist	**7,241**	**100.0**	**7.5**	**7.1**	**7.8**

* 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*=2,206), possibly because formal referrals to such services are not always required. There were 2,257 problems referred to an allied health professional or service. Table 11.4 shows the ten most common of these. They accounted for 42.2% of all problems referred to allied health services.

Sprains and strains were the problem type most frequently referred to allied health services (8.6% of problems referred), followed by back complaint (8.1%). These problems are those that would be likely to be referred to physiotherapists. Diabetes (5.6%), teeth/gum disease (4.7%) and depression (4.6%) also featured in the top ten problems referred to allied health services. Note that diabetes, depression and back complaints were referred relatively frequently to both allied health professionals and to medical specialists.

There were 423 referrals for hospital admission. The ten most commonly associated problems associated with hospital admission referral are shown in Table 11.5. While the numbers involved are very small it is interesting to note the types of problems for which hospital admission was sought. These included pregnancy (4.6% of problems referred for admission), fracture (4.0%) and appendicitis (3.7%). Cardiovascular problems such as ischaemic heart disease, stroke and heart failure were also referred to hospital relatively frequently.

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*=96,973)	95% LCL	95% UCL
Sprain/strain*	193	8.6	0.2	0.0	0.5
Back complaint*	182	8.1	0.2	0.0	0.4
Diabetes*	126	5.6	0.1	0.0	0.4
Teeth/gum disease	107	4.7	0.1	0.0	0.5
Depression*	103	4.6	0.1	0.0	0.3
Osteoarthritis*	58	2.6	0.1	0.0	0.4
Skin injury, other	48	2.1	0.1	0.0	0.4
Bursitis/tendonitis/synovitis NOS	48	2.1	0.1	0.0	0.4
Anxiety*	44	2.0	0.1	0.0	0.5
Obesity (BMI>30)	43	1.9	0.0	0.0	0.4
Subtotal: top ten problems referred to AHS	*952*	*42.2*	. .	. .	. .
Total problems referred to AHS	**2,257**	**100.0**	**2.3**	**2.1**	**2.5**

* 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, 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*=96,973)	95% LCL	95% UCL
Pregnancy*	20	4.6	0.02	0.0	0.6
Fracture*	18	4.0	0.02	0.0	0.5
Appendicitis	16	3.7	0.02	0.0	0.6
Ischaemic heart disease*	15	3.4	0.02	0.0	0.6
Acute bronchitis/bronchiolitis	11	2.6	0.01	0.0	0.7
Stroke/cerebrovascular accident	11	2.5	0.01	0.0	0.7
Pneumonia	9	2.0	0.01	0.0	0.8
Pre/post natal check-up*	9	2.0	0.01	0.0	1.1
Abdominal pain*	9	2.0	0.01	0.0	0.8
Heart failure	9	1.9	0.01	0.0	0.8
Subtotal: top ten problems referred for admission	*127*	*28.8*	. .	. .	. .
Total problems referred to hospital	**441**	**100.0**	**0.45**	**0.3**	**0.6**

* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).
Note: LCL—lower confidence limit, UCL—upper confidence limit.

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, FBC). 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 (80.8%) of encounters. At least one pathology test order was recorded at 14.0% of encounters (for 10.8% of problems managed) and at least one imaging test was ordered at 6.9% of encounters (for 5.0% 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*=96,973)	95% LCL	95% UCL	Number of problems (*n*=139,092)	Per cent of problems	95% LCL	95% UCL
Pathology and imaging ordered	1,625	1.7	1.5	1.8	1,244	0.9	0.8	1.0
Pathology only ordered	11,936	12.3	11.8	12.8	13,826	9.9	9.6	10.3
Imaging only ordered	5,071	5.2	5.0	5.5	5,641	4.1	3.9	4.2
No tests ordered	**78,341**	**80.8**	**80.2**	**81.4**	**118,380**	**85.1**	**84.7**	**85.6**
At least one pathology ordered	**13,561**	**14.0**	**13.5**	**14.5**	**15,071**	**10.8**	**10.4**	**11.2**
At least one imaging ordered	**6,696**	**6.9**	**6.6**	**7.2**	**6,885**	**5.0**	**4.7**	**5.2**

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

12.1 Pathology ordering

A comprehensive report on pathology ordering by general practitioners in Australia in 1998, written by the GP 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.[29] For a more detailed study of pathology ordering, consult that publication; readers may wish to compare those results with the information presented below. A report on trends in pathology ordering over the period 1998 to 2000 inclusive will be released early in 2003.

Nature of pathology orders at encounter

There were 30,086 orders for a pathology test (or battery of tests) and these were made at a rate of 31.0 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.[30]

The top four pathology test groups were Chemistry, Haematology, Microbiology and Cytology and together these accounted for over 90% of all pathology test orders. The fifth largest group was Other NEC (other pathology test orders that could not be classified elsewhere), which made up 2.2% of all pathology test orders. The size of this group was in part due to the non-specificity of the recording of some pathology orders by some GPs (e.g. blood test).

The largest of the groups, Chemistry, accounted for 53.1% of all tests and was recorded at a rate of 16.5 per 100 encounters. Within this group the most frequently ordered test was lipids (18.6%) followed by EUC (12.8%). Full blood count (68.1%) was the largest group within Haematology and urine, microscopy, culture and sensitivity (urine MC&S) (34.6%) was the largest in Microbiology.

The most frequently ordered test types were full blood count; lipids; electrolytes, urea and creatinine (EUC); liver function; glucose; urine MC&; and Pap smear tests. Full blood counts accounted for 13.5% of tests and were ordered at a rate of 4.2 per 100 encounters. Pap smears accounted for 4.9% of all tests and made up the greater proportion of the Cytology group (96.7%). Lipid tests were ordered at a rate of 3.1 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*=96,973)	95% LCL	95% UCL
Chemistry	**15,968**	**53.1**	**100.0**	**16.5**	**15.6**	**17.3**
Lipids	2,968	9.9	18.6	3.1	2.8	3.3
EUC	2,039	6.8	12.8	2.1	1.8	2.4
Liver function	1,993	6.6	12.5	2.1	1.8	2.3
Glucose—all	1,946	6.5	12.2	2.0	1.8	2.2
Thyroid function	1,607	5.3	10.1	1.7	1.5	1.8
Multi-biochemical analysis	1,086	3.6	6.8	1.1	0.6	1.7
Hormone assay	757	2.5	4.7	0.8	0.5	1.0
Ferritin	693	2.3	4.3	0.7	0.5	0.9
HbA1c	689	2.3	4.3	0.7	0.5	0.9
Chemistry; other	513	1.7	3.2	0.5	0.3	0.7
Haematology	**5,965**	**19.8**	**100.0**	**6.2**	**5.8**	**6.5**
Full blood count	4,060	13.5	68.1	4.2	4.0	4.4
Erythrocyte sedimentation rate	945	3.1	15.8	1.0	0.7	1.2
Coagulation	698	2.3	11.7	0.7	0.5	0.9

(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*=96,973)	95% LCL	95% UCL
Microbiology	**4,702**	**15.6**	**100.0**	**4.9**	**4.5**	**5.2**
Urine MC&S	1,627	5.4	34.6	1.7	1.5	1.8
Microbiology; other	578	1.9	12.3	0.6	0.4	0.8
Hepatitis serology	558	1.9	11.9	0.6	0.3	0.9
Vaginal swab and C&S	310	1.0	6.6	0.3	0.1	0.6
HIV	278	0.9	5.9	0.3	0.1	0.5
Faeces MC&S	244	0.8	5.2	0.3	0.0	0.5
Chlamydia	198	0.7	4.2	0.2	0.0	0.5
Cytology	**1,533**	**5.1**	**100.0**	**1.6**	**1.3**	**1.8**
Pap smear	1,481	4.9	96.7	1.5	1.3	1.8
Other NEC	**666**	**2.2**	**100.0**	**0.7**	**0.5**	**0.9**
Other test NEC	314	1.0	47.2	0.3	0.0	0.6
Blood test	161	0.5	24.2	0.2	0.0	0.5
Infertility/pregnancy	**286**	**1.0**	**100.0**	**0.3**	**0.1**	**0.5**
Tissue pathology	**459**	**1.5**	**100.0**	**0.5**	**0.1**	**0.8**
Histology; skin	459	1.5	100.0	0.5	0.1	0.8
Immunology	**452**	**1.5**	**100.0**	**0.5**	**0.3**	**0.7**
Rheumatoid factor	145	0.5	32.0	0.2	0.0	0.4
Simple basic tests	**55**	**0.2**	**100.0**	**0.1**	**0.0**	**0.4**
Total pathology tests	**30,086**	**100.0**	**100.0**	**31.0**	**29.7**	**32.4**

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

Problems associated with pathology tests

Table 12.3 describes, in decreasing order of frequency, the most common problems under management for which pathology was ordered. There were 15,071 problems to which pathology tests were linked (Table 12.1), the average number of pathology tests being 2.04 per tested problem. The five problems accounting for the highest number of pathology tests ordered were diabetes (5.9% of problem-combinations), hypertension (5.8%), lipid disorder (5.0%), weakness/tiredness general (4.2%), and female genital check-up (including Pap smear) (4.0%). 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 interesting contrasts. The second last column shows the per cent 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 8,735 hypertension problems recorded in the data set (6.3% of problems). Diabetes (2.2% of problems) was managed far less frequently. However, it accounted for more pathology tests than did hypertension. There were 1,816 test orders (5.9%) associated with diabetes and 1,794 test orders (5.8%) associated with hypertension. This is because 25.4% of diabetes contacts resulted in a pathology test compared with only 7.8% 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 fourth highest in the problems associated with pathology ordering. This is because the decision to order a pathology test for weakness/ tiredness was relatively frequent (50.3% of contacts generating an order) and where such a decision was made, multiple pathology tests were likely (averaging 364.7 test orders per 100 problems). The problem label of female genital check-up/Pap smear, 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*	2,993	1,816	5.9	25.4	238.8
Hypertension*	8,735	1,794	5.8	7.8	262.1
Lipid disorder	2,841	1,525	5.0	27.7	194.0
Weakness/tiredness general	702	1,287	4.2	50.3	364.7
Female genital check-up*	1,526	1,224	4.0	71.3	112.5
General check-up*	1,723	1,182	3.8	26.0	263.9
UTI*	1,556	919	3.0	51.7	114.3
Pregnancy*	859	613	2.0	35.9	198.8
Blood test NOS	203	528	1.7	77.3	336.4
Test results*	687	477	1.6	43.5	159.7
Subtotal	*21,825*	*11,365*	*37.0*	. .	. .
Total	**139,091**	**30,816**	**100.0**	**10.6**	**192.3**

(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 30,086 pathology test orders and 30,816 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 general practitioners in Australia in 1999–00, written by the GP Statistics and Classification Unit using Beach data, was published by the AIHW in 2001.[31] 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 7,643 orders for imaging and these were made at a rate of 7.9 per 100 encounters. At least one imaging test was ordered at 6.9% of encounters and for 5.0% of problems managed. The imaging tests recorded were grouped into one of five categories—Diagnostic radiology, Ultrasound, Computerised tomography, Nuclear medicine imaging and Magnetic resonance imaging (Appendix 3). Diagnostic radiology made up almost two-thirds (58.1%) of all imaging tests, Ultrasound accounted for 31.6%, CT scanning 9.5%, Nuclear medicine 0.5% and MRI 0.4%.

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*=96,973)	95% LCL	95% UCL
Diagnostic radiology	**4,437**	**58.1**	**100.0**	**4.6**	**4.4**	**4.8**
X-ray; chest	910	11.9	20.5	0.9	0.8	1.1
X-ray; knee	399	5.2	9.0	0.4	0.3	0.6
Mammography	363	4.8	8.2	0.4	0.2	0.5
X-ray; foot/feet	206	2.7	4.7	0.2	0.0	0.4
X-ray; hip	193	2.2	4.3	0.0	0.0	0.4
X-ray; shoulder	184	2.1	4.1	0.2	0.0	0.4
X-ray; ankle	179	2.4	4.0	0.2	0.0	0.4
X-ray; spine; lumbosacral	173	2.3	3.9	0.2	0.0	0.4
Test; densiometry	150	2.0	3.4	0.2	0.0	0.4
X-ray; wrist	149	2.0	3.4	0.2	0.0	0.4
X-ray; hand	140	1.8	3.2	0.1	0.0	0.4
X-ray; spine; cervical	99	1.3	2.2	0.1	0.0	0.4
X-ray; finger(s)/thumb	97	1.3	2.2	0.1	0.0	0.3
X-ray; spine; lumbar	96	1.3	2.2	0.1	0.0	0.4
Scan; bone(s)	90	1.2	2.0	0.1	0.0	0.4
X-ray; abdomen	84	1.1	1.9	0.1	0.0	0.4
X-ray; elbow	81	1.1	1.8	0.1	0.0	0.4
X-ray; spine; thoracic	56	0.7	1.3	0.1	0.0	0.3
Ultrasound	**2,416**	**31.6**	**100.0**	**2.5**	**2.3**	**2.7**
Ultrasound; pelvis	444	5.8	18.4	0.5	0.3	0.6
Ultrasound; abdomen	251	3.3	10.4	0.3	0.0	0.5
Ultrasound; shoulder	219	2.9	9.1	0.2	0.0	0.4
Ultrasound; breast	196	2.6	8.1	0.2	0.0	0.4
Ultrasound	127	1.7	5.3	0.1	0.0	0.4
Ultrasound; obstetric	124	1.6	5.1	0.1	0.0	0.5
Ultrasound; abdomen upper	123	1.6	5.1	0.1	0.0	0.4
Test; doppler	112	1.5	4.6	0.1	0.0	0.4
Ultrasound; renal tract	96	1.3	4.0	0.1	0.0	0.4
Computerised tomography	**723**	**9.5**	**100.0**	**0.8**	**0.6**	**0.9**
CT scan; brain	121	1.6	16.8	0.1	0.0	0.4
CT scan; spine; lumbosacral	88	1.2	12.1	0.1	0.0	0.5
CT scan; head	86	1.1	11.9	0.1	0.0	0.4
Nuclear medicine imaging	**35**	**0.5**	**100.0**	**0.0**	**0.0**	**0.4**
Magnetic resonance imaging	**31**	**0.4**	**100.0**	**0.0**	**0.0**	**0.5**
Total imaging tests	**7,643**	**100.0**	**. .**	**7.9**	**7.6**	**8.2**

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

Chest x-rays were by far the most common sub-group in Diagnostic radiology (20.5%) while x-ray of the knee (9.0%) and mammography (8.2%) followed. Ultrasound was commonly of the pelvis (18.4%) abdomen (10.4%), or shoulder (9.1%). CT scans were most commonly performed on the brain (16.8%) or lumbosacral spine (12.1%) or on the head (11.9%).

Overall the most frequently ordered imaging test was chest x-ray which accounted for 11.9% of all imaging and was ordered at a rate of 0.9 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 associated with orders for imaging

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 7,695 problem-imaging combinations. Six (including the top four) of the ten most common problems were related to the musculoskeletal system. The remaining problems were related to abdominal, breast, skin and chest problems.

Back complaint, the most common problem for which imaging was ordered, accounted for 5.9% of all imaging and 15.6% of contacts with a fracture resulted in an imaging order. Fracture accounted for slightly less imaging orders (4.7%). However, 34.5% of contacts with this problem resulted in an order for imaging.

The ordering of multiple imaging for a single problem was much 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, 146.6 tests being ordered for every 100 problems.

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[(a)]	Per cent of problems with test[(b)]	Rate of imaging orders per 100 tested problems[(c)]
Back complaint*	2,540	456.7	5.9	15.6	115.5
Fracture*	980	365.0	4.7	34.5	108.0
Osteoarthritis*	2524	329.7	4.3	11.6	112.7
Sprain/strain*	1,750	306.8	4.0	15.3	114.8
Abdominal pain*	577	189.6	2.5	30.6	107.5
Injury musculoskeletal NOS	732	188.3	2.5	23.3	110.3
Breast lump/mass (female)	152	145.7	1.9	65.2	146.6
Injury skin, other	688	139.9	1.8	17.8	114.1
Acute bronchitis/bronchiolitis	2,644	122.9	1.6	4.7	100.0
Bursitis/tendonitis/synovitis NOS	744	120.5	1.6	13.3	121.7
Subtotal	*13,331*	*2,365*	*30.8*	. .	. .
Total	**139,092**	**7,695**	**100.0**	. .	. .

(a) A test was counted more than once if it was ordered for the management of more than one problem at an encounter. There were 7,643 imaging test orders and 7,695 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.

13 Patient risk factors

13.1 Background

General practice is commonly identified as a significant intervention point for health care and health promotion because general practitioners have considerable exposure to the health of the population. As about 80% of the population visit a GP in any one year,[32] general practice appears to provide a suitable basis from which to monitor many aspects of the health of the population.

Since BEACH began in April 1998 a section on the bottom of each encounter form has been allocated to investigate aspects of patient health or healthcare delivery not covered by general practice consultation-based information. These additional substudies are referred to as the SAND (Supplementary Analysis of Nominated Data). Each organisation supporting the BEACH program has access to a subsample of 6,000 encounter forms per year in which to insert a series of questions (or two sets of questions in two smaller samples) on a subject of their choice as the SAND questions.

13.2 Methods

The fourth 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 is randomised, so that the 40 A forms may appear first, second or third in the pad. Randomised ordering of the components ensures that there is no order effect on the quality of the information collected.

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

The population risk factor questions for alcohol consumption, BMI and smoking status will remain constant in future years and results are reported in each annual report. Summaries of results for other topics covered in SAND are available to the general public on the FMRC web site (www.fmrc.org.au\beach.htm).

13.3 Body mass index

Overweight and obesity has been estimated to account for over 4% of the total burden of disease in Australia[33]. 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 (67%) were more likely to be overweight or obese than women (52%).[34]

The body mass index (BMI) for an individual is calculated by dividing weight (kilograms) by height (metres) squared. A person with a BMI that is 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.

There is considerable debate in the literature as to whether the standard BMI calculation described above is appropriate in the case of children. Cole et al. have developed a method which calculates age- and sex-specific BMI cut-off levels for overweight and obesity which are specific to children.[35] The BEACH data on BMI are therefore presented separately for adults (aged 18 or over) and children. The standard BMI cut-offs have been applied for the adult population whereas the method described by Cole et al. has been used to calculate BMI cut-off levels for defining overweight and obesity in children aged between 2 and 18 years. This method is based on international data from developed Western cultures and is therefore applicable within the Australian setting.

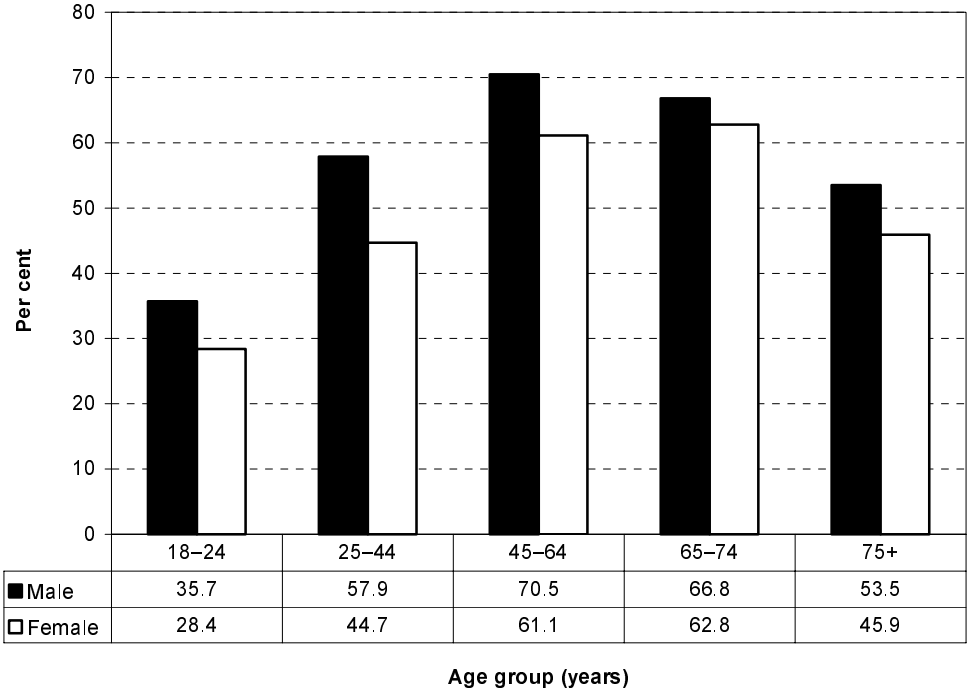
Body mass index of adult patients

BMI was calculated for 31,789 patients aged 18 years and over at encounters with 980 GPs. Overall, 21.4% (95% CI: 20.7–22.1) of these encounters were with patients considered obese, and 33.5% (95% CI: 32.9–34.1) were with those defined as overweight. A further 7.7% were with underweight patients and 37.4% were with patients whose BMI was in the normal range.

A greater proportion of males were overweight or obese (61.0%) than females (50.9%). The proportion of patients considered overweight or obese was greatest for males aged 45–64 years (Figure 13.1). These results are consistent with those of the 1999–2000 AusDiab study which estimated 67% of adult males (25 years and over) and 52% of adult females were overweight or obese.[34,36] They are also consistent with the results reported for BEACH 2000–01.[7]

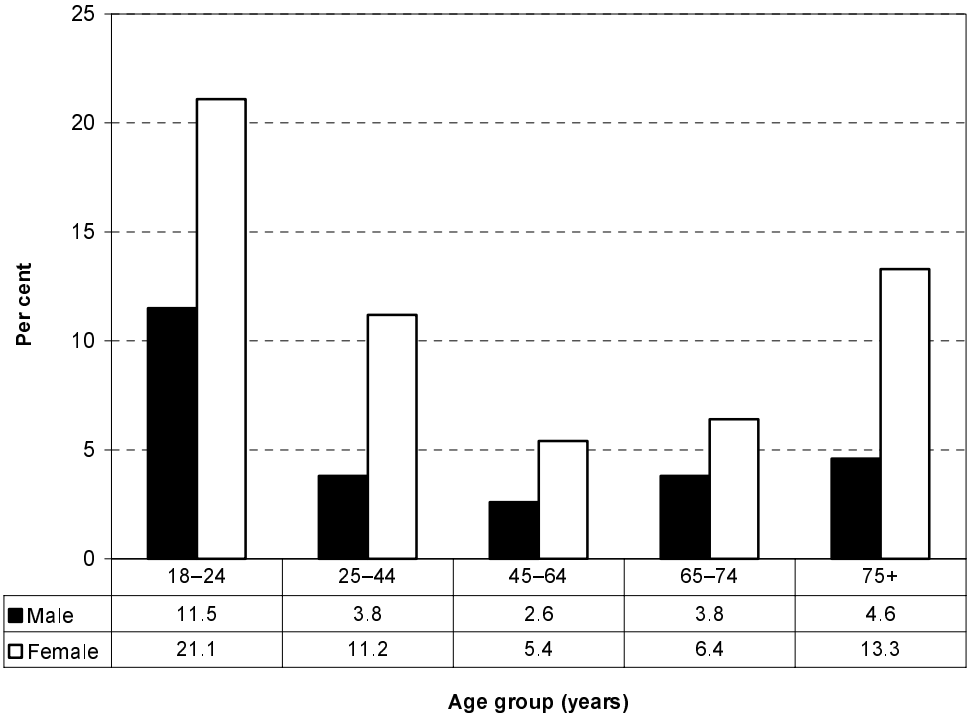
The patient was classified as underweight at 7.7% (95% CI: 7.3–8.0) of all adult encounters. In the 18–24 years age group, 21.1% of women and 11.5% of men were considered underweight, as were 13.3% of women and 4.6% of men in the 75 years and over age group (Figure 13.2).

These estimates are almost four times those made in the AusDiab study (underweight measured as BMI <18.5) when less than 1% of men and 2% of women were considered underweight. This difference is likely to be due to the use of different cut-off points between the two studies. In accepted clinical practice, GPs use a cut-off of BMI<20 rather than <18.5 to define 'underweight'.



	18–24	25–44	45–64	65–74	75+
■ Male	35.7	57.9	70.5	66.8	53.5
□ Female	28.4	44.7	61.1	62.8	45.9

Figure 13.1: Age–sex-specific rates of overweight and obesity in adults



	18–24	25–44	45–64	65–74	75+
■ Male	11.5	3.8	2.6	3.8	4.6
□ Female	21.1	11.2	5.4	6.4	13.3

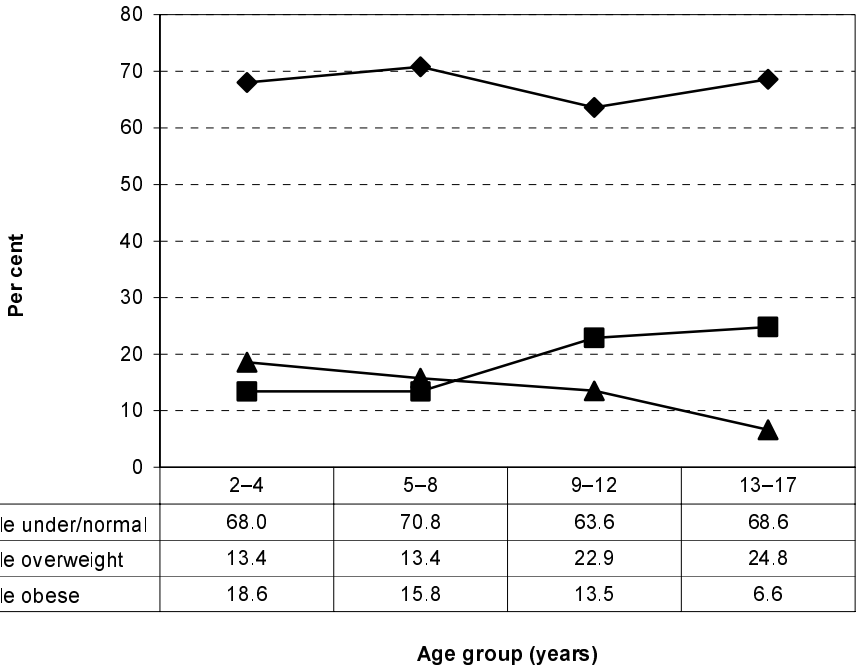
Figure 13.2: Age–sex-specific rates of underweight in adults

Body mass index of children attending general practice

BMI was calculated for 3,692 patients aged between 2 and 17 years at encounters with 869 GPs. A further 626 patients were in this age range, but BMI was not calculated due to missing height and/or weight data. Overall 13.0% (95% CI: 10.7–15.3) of encounters with children were with those considered obese, and a further 17.6% (95% CI: 15.9–19.3) were with children defined as overweight.

Almost one-third of all children aged 2 to 17 (30.6%; 95% CI: 28.6–32.5) were considered to be overweight or obese; comprising 32.2% (95% CI: 29.0–35.4) of male children and 29.5% (95% CI: 26.7–32.3) of female children.

Children aged 9–12 years were the most likely to be overweight or obese and this applied to both males (36.4%) and females (33.8%). In the adolescent age group (13–17 years) the rates of overweight and obesity were lower in both male (31.4%) and female (26.9%) patient groups (Figures 13.3 and 13.4).



	2–4	5–8	9–12	13–17
Male under/normal	68.0	70.8	63.6	68.6
Male overweight	13.4	13.4	22.9	24.8
Male obese	18.6	15.8	13.5	6.6

Figure 13.3: BMI in children—male age-specific rates

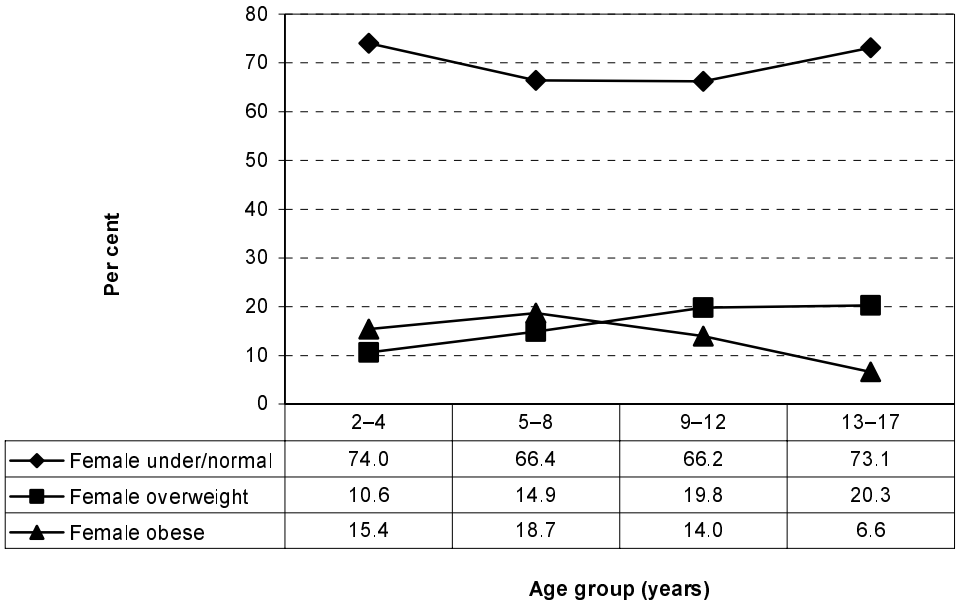


Figure 13.4: BMI in children—female age-specific rates

Errata:

The figures for childhood BMI were reported incorrectly in the previous annual report (*General Practice Activity in Australia 2000–01,* cat. no. GEP 8). Encounters where the BMI was missing were inadvertently included in the under/normal BMI grouping, in effect inflating the percentage classified as under/normal and deflating percentages classified as overweight and obese.

Below are the updated figures for the previous year (2000–01).

Table 13.1: Age–sex-specific rates of obesity and overweight in children (2000–01)

	2–4 years	5–8 years	9–12 years	13–17 years
Male				
Obese	22.6	18.9	9.7	8.4
Overweight	15.2	13.2	25.9	23.0
Under/normal	62.2	68.0	64.4	68.6
Female				
Obese	20.3	14.8	11.0	7.0
Overweight	12.2	19.1	22.5	15.6
Under/normal	67.5	66.0	66.6	77.5

13.4 Smoking

Tobacco smoking is the leading cause of drug related death and hospital separations in Australia.[37] It as been identified as the risk factor responsible for the greatest burden (9.7% of the total burden of disease) on the health of Australians.[33] According to the 2001 National Drug Strategic Household Survey 19.5% of Australians smoked daily, 21.1% of males and 18.0% of females.[34]

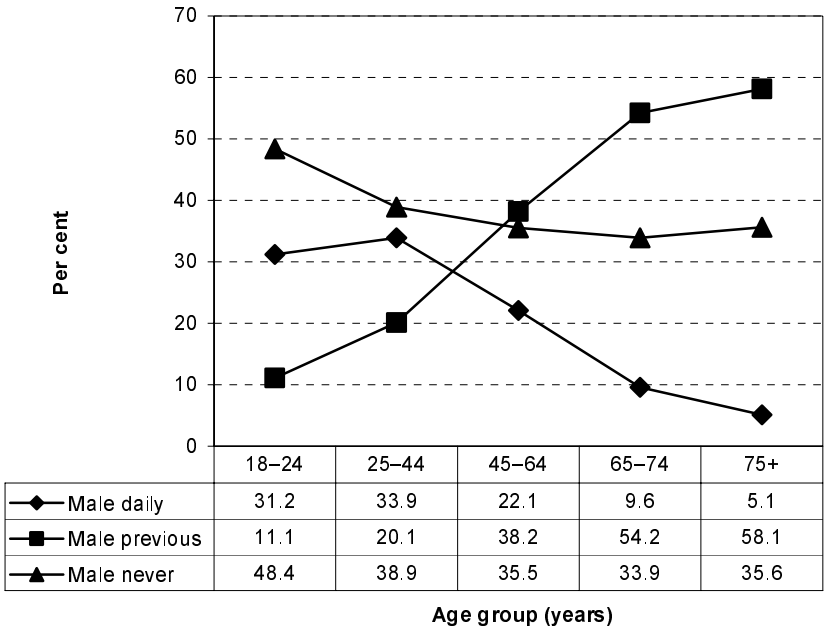
As part of the current study, the GPs were instructed to ask the patients (18+ years):

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

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

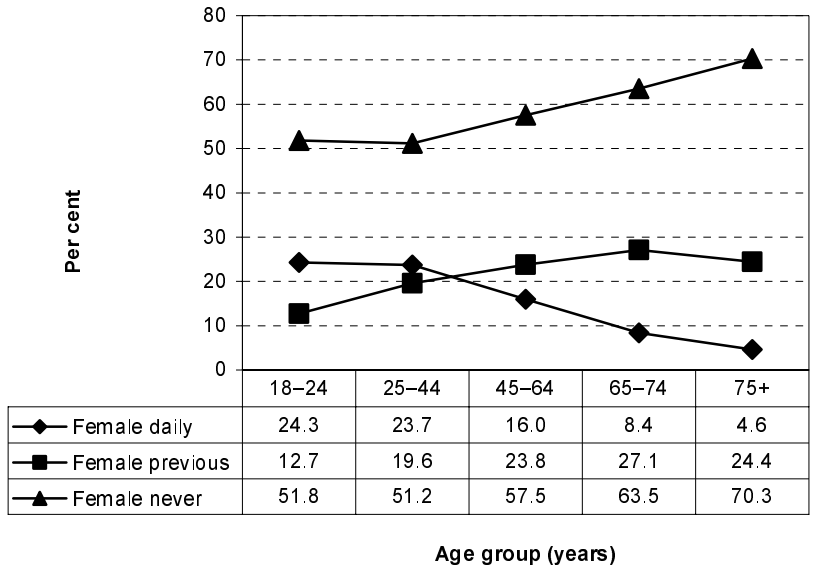
The smoking status of 31,966 adult patients aged 18 years and over was ascertained from encounters with 981 GPs. Overall, 18.4% (95% CI: 17.7–19.1) of patient encounters were with adults who were daily smokers, 4.1% (95% CI: 3.7–4.5) were with occasional smokers and 27.8% (95% CI: 27.0–28.6) were with previous smokers. A significantly greater proportion of males (21.6%, 95% CI: 20.5–22.6) than females (16.4%, 95% CI: 15.6–17.2) were daily smokers. As shown in previous BEACH reports, the proportion of smokers decreased with age. Only 5.1% of male and 4.6% of female patients aged 75 years and over were daily smokers (Figures 13.5 and 13.6); however, 58.1% of males and 24.4% of females aged 75 years or more were previous smokers.

It is notable that the prevalence of daily smoking remains high among younger adults (aged 18–24), 31.2% of young males and one in four young females reporting daily smoking.



	18–24	25–44	45–64	65–74	75+
Male daily	31.2	33.9	22.1	9.6	5.1
Male previous	11.1	20.1	38.2	54.2	58.1
Male never	48.4	38.9	35.5	33.9	35.6

Figure 13.5: Smoking status—male age-specific rates



	18–24	25–44	45–64	65–74	75+
Female daily	24.3	23.7	16.0	8.4	4.6
Female previous	12.7	19.6	23.8	27.1	24.4
Female never	51.8	51.2	57.5	63.5	70.3

Figure 13.6: Smoking status—female age-specific rates

13.5 Alcohol use

Alcohol consumption is the second leading cause of drug-related death and hospitalisation in Australia.[38] In people aged 65 years and over, low to moderate consumption of alcohol was found to have a preventative effect against selected causes of morbidity and mortality (e.g. cardiovascular disease).[37] The beneficial impact of low alcohol consumption has been found to prevent more mortality than harmful alcohol consumption causes.[37] Alcohol consumption accounted for 4.9% of the total burden of disease in Australia; however, after taking into account the benefit of low to moderate alcohol consumption this fell to 2.2% of the total burden of disease.[33]

The 2001 National Drug Strategic Household Survey (NDSHS) found that 10.2% of males and 9.4% of females (aged 14 years and over) drank at levels considered to be risky or high risk for their health in the long term,[34] based on the National Health and Medical Research Council 2001 Guidelines.[39] It also found that 39.3% of males and 29.6% of females (aged 14 years and above) drank alcohol at levels which put their health at-risk in the short term during the preceding 12 months.[34]

To measure alcohol consumption, BEACH uses three items from the WHO Alcohol Use Disorders Identification Test (AUDIT),[40] with slightly modified wording and scoring for an Australian setting.[41] Together these three questions assess 'at-risk' alcohol use. The scores for each question range from 0 to 4. A score of 5+ for males or 4+ for females suggests that the person's drinking level is placing them at-risk.

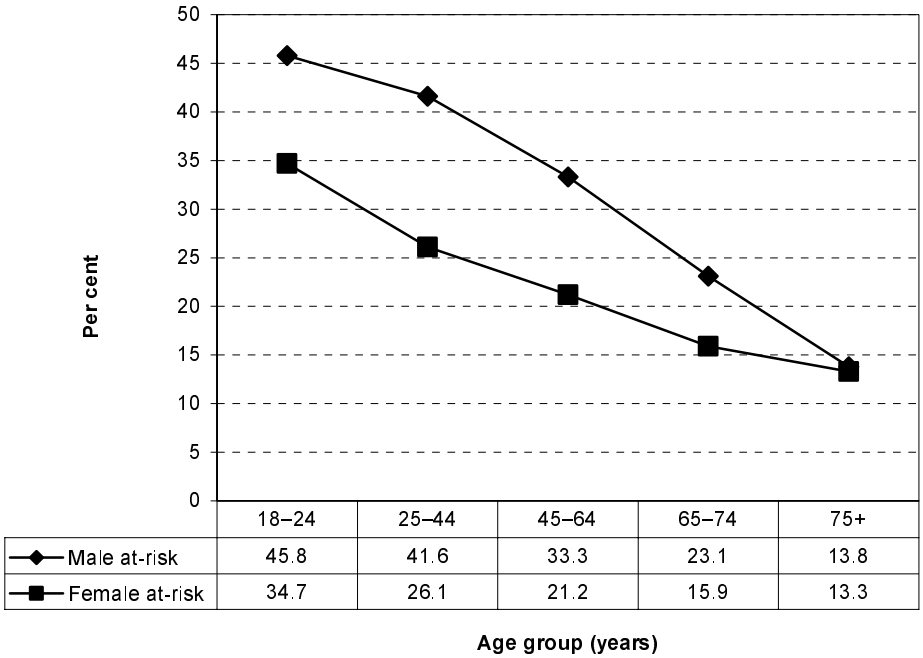
GPs were instructed to ask the patient (18+ years):

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

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

Responses to these questions were recorded at 31,559 patient encounters (18+ years) from 981 GPs. There were a further 1,539 encounters with adults for which an 'alcohol score' could not be calculated, due to missing data.

In this fourth year of BEACH the wording of the responses to the first and third questions was amended to exactly reflect the AUDIT instrument from which they are derived. This change, along with a data entry change allowing more specific entry of the response slightly increased the rates of 'at-risk' drinking this year compared with each of the first 3 years of the program. The rates of 'at-risk' drinking this year are more reflective of the true rates of alcohol consumption in patients encountered in general practice.



	18–24	25–44	45–64	65–74	75+
Male at-risk	45.8	41.6	33.3	23.1	13.8
Female at-risk	34.7	26.1	21.2	15.9	13.3

Figure 13.7: Age–sex-specific rates for at-risk alcohol use

The highest prevalence of at-risk drinkers was in the 18–24 years age group where almost half (45.8%) of the males and one-third (34.7%) of the females reported at-risk alcohol consumption. Overall, 26.1% (95% CI: 25.1–26.8) of patient encounters were with adults who reported drinking 'at-risk' levels of alcohol. The proportion of at-risk drinkers was higher for male patients (32.0%, 95% CI: 30.9–33.1) than for female patients (22.0%, 95% CI: 21.1–22.9). The proportion of patients who were at-risk drinkers decreased with age for both males and females (Figure 13.7). These estimates are a little lower than those made from the NDSHS.[34] This is likely to be due to the difference in the age bands studied (14 + in the NDSHS and 18+ in BEACH) and to differences in the age–sex distributions of the study populations.

13.6 Risk behaviour profile of adult patients

Due to a change in the placement of SAND questions in 2001–02, all patient risk factor questions (BMI, smoking and alcohol use) were asked to the same subsample of patients, making it possible to build up a risk profile of this subsample 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 behaviours.

Table 13.2: Risk behaviour profile of adult patients

Number of risk behaviours	Number	Per cent of patients (*n*=30,642)	95% LCL	95% UCL
None	8,530	27.8	27.0	28.7
One	14,891	48.6	47.9	49.3
Overweight only	6,517	21.3	20.7	21.8
Obese only	4,354	14.2	13.7	14.7
Current daily smoker only	1,576	5.1	4.7	5.5
At-risk alcohol level only	2,444	8.0	7.5	8.5
Two	6,083	19.9	19.3	20.5
Overweight and current daily smoker	934	3.1	2.7	3.4
Obese and current daily smoker	715	2.3	1.9	2.7
Overweight and at-risk alcohol level	2,075	6.8	6.4	7.1
Obese and at-risk alcohol level	1,089	3.6	3.2	3.9
Daily smoker and at-risk alcohol level	1,270	4.1	3.8	4.5
Three	1,138	3.7	3.4	4.1
Overweight and current daily smoker and at-risk alcohol level	746	2.4	2.1	2.8
Obese and current daily smoker and at-risk alcohol level	392	1.3	0.9	1.7

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

A risk factor profile was prepared for 30,642 adult patients. Of the three measured risk behaviours (BMI, smoking and alcohol use), almost half of adult patients (48.6%; 95% CI: 47.9–49.3) had one risk factor. Being overweight or obese accounted for 73% of these single risk factor patients. One in five patients (19.9%) had two risk behaviours, the most common combinations being overweight and drinking 'at-risk' levels, followed by being a daily smoker and drinking 'at-risk' levels. A small minority (3.7%; 95% CI: 3.4–4.1) of patients reported having all three risk behaviours (Table 13.2).

Overall, female patients reported significantly lower levels of risk behaviours than males. Almost a third of females (31.6%) reported not having any of the measured risk behaviours, compared with 22.2% of males. Half of females (49.9%) had only one risk factor compared with 46.7% of males.

Table 13.3: Number of risk behaviours, by sex of patient

Sex of patient and number of risk behaviours	Number	Rate per 100 encounters (*n*=30,642)	95% LCL	95% UCL
Male patients	**12,173**	**100**	. .	. .
Zero	2,697	22.2	21.2	23.1
One	5,680	46.7	45.7	47.6
Two	3,107	25.5	24.6	26.4
Three	689	5.7	4.9	6.4
Female patients	**18,469**	**100**	. .	. .
Zero	5,833	31.6	30.6	32.5
One	9,211	49.9	49.1	50.7
Two	2,976	16.1	15.5	16.8
Three	449	2.4	1.8	3.1

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

13.7 Changes in patient health risk behaviours since 1998–99

The proportion of adults attending general practice who reported being daily smokers showed no significant change with time over the first 4 years of the BEACH program. The proportion of adult patients consuming at-risk levels of alcohol appears to have increased in the fourth year, but this is probably due to a slight change in the scoring method employed. The proportion of adults who were classified as obese according to their self-reported height and weight, showed a significant increase over the 4 years. The proportion classed as obese rose from 18.4% in 1998–99 to 21.4% in 2000–01 (p=<0.0001).

Table 13.4: Comparative results for patient risk behaviours, 1998–99 to 2001–02

	BEACH 1998–99		BEACH 1999–00		BEACH 2000–01		BEACH 2001–02	
Risk factor	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI
Obese	18.4	17.7–18.9	19.4	18.8–20.0	20.2	19.5–20.8	21.4	20.7–22.1
Overweight	32.8	32.1–33.4	33.1	32.5–33.8	34.1	33.4–34.7	33.5	32.9–34.1
Current daily smoker	19.2	18.4–20.0	18.9	18.2–19.6	19.3	18.5–20.1	18.4	17.7–19.1
At-risk alcohol level	24.5	23.6–25.3	24.2	23.4–24.9	24.1	23.3–24.9	26.0	25.1–26.8

Note: CI—confidence interval.

14 Changes over time for problem, medication and treatment rates

In the previous chapters there were some significant differences noted across the years in terms of problems managed (Chapter 7), medication rates (Chapter 9) and non-pharmacological treatment rates (Chapter 10). Using simple linear regression this chapter investigates whether these observed changes represent significant linear trends in management and treatment rates over time.

The next chapter uses multiple regression to examine more closely how observed changes in management rates of particular problems and changes in medication rates were reflected in medication management for particular problems of interest.

14.1 Method

Trends over time were analysed by linear regression. SAS regression procedures were used that calculate robust standard errors to correct for the design effect of the cluster sample.[11] Test statistics and p-values based on the robust standard error are more conservative than those that are calculated without taking the design effect of the cluster sample into account. Thus the robust standard error provides a more stringent test of significant changes over time.

Unadjusted trends in problem and medication rates

Changes over time in problems rates per 100 encounters, medication rates per 100 encounters and clinical treatments per 100 encounters were analysed using simple linear regression.

Age and sex adjustment for trends in problem, medication and treatment rates

Where there was a significant change over time in the management rates of problems, medication rates or non-pharmacological treatments, the analysis was performed again, adjusting for age and sex of encounters to examine whether demographic differences across the samples were confounding the effect of time on rates per 100 encounters.

National estimated encounters

Where significant trends were found, the average annual increase or decrease in encounters nationally was estimated by multiplying the average change in management rates by the number of GP–patient encounters that occur in Australia annually (105,000,000).

14.2 Changes in annual management rates of problems between 1998–99 and 2001–02

Changes over time were first examined in terms of changes at the ICPC chapter level. For each chapter with significant changes in management rates over time, the most common problems in that chapter were further examined for specific trends at the ICPC rubric level (including groupers).

No changes in management rates over time

At the ICPC chapter level, rates of problems related to the skin, digestive, musculoskeletal, cardiovascular, urinary, male and female genital systems, and rates of psychological and social problems, remained steady over the 4-year period.

Increased management rates over time

There was a significant increase over time in the management rate of endocrine and metabolic problems, from 8.8 problems per 100 encounters in 1998–99 to 10.4 problems per 100 encounters in 2001–02 (p=<0.0001). The average yearly increase in endocrine/metabolic problems was 0.55 problems per 100 encounters.

After adjusting for age and sex there was little change in the size of the effect, with an adjusted average annual increase of 0.43 problems per 100 encounters (p=<0.0001). This equates to an estimated annual increase of 450,000 GP contacts with endocrine and metabolic problems nationally.

The increase in the management rate of endocrine and metabolic problems was partly explained by an increase in the management rate of lipid disorders, from 2.5 per 100 encounters in 1998–99 to 2.9 per 100 encounters in 2001–02 (p=0.0002). This represents an average annual increase of 0.17 problems per 100 encounters, equivalent to an estimated national annual increase of 180,000 GP contacts with lipid disorder. The increase in the management rate of lipid disorders remained after adjusting for age and sex (p=0.0038).

The increase in management rate of lipid disorder was not explained by the rate of new cases of lipid disorder, which, after adjusting for age and sex, did not increase significantly over time (p=0.21). The increase in management of lipid disorders therefore reflects an increasing workload in the ongoing management of lipid disorders rather than an increase of new cases presenting to general practice.

The first 3 years saw a small increase in the management rate of diabetes and this increase had become significant in the fourth year of the study. Diabetes management increased from 2.6 per 100 encounters in 1998–99 to 3.1 per 100 encounters in 2001–02 (p=<0.0001). After adjustment for age and sex there was an average yearly increase of 0.12 problems per 100 encounters (p=0.0015), equivalent to an estimated increase of 126,000 diabetes problems nationally per year.

The management rate of general and unspecified problems increased significantly over time from 13.2 per 100 encounters in 1998–99 to 14.7 per 100 encounters in 2001–02 (p=0.0004). After adjusting for age and sex there was an average annual increase in general and unspecified problems of 0.55 problems per 100 encounters (p=<0.0001), equivalent to an estimated increase of 570,000 encounters nationally per year.

Decreased management rates over time

There was a significant decrease in the rate of respiratory problems managed, from 24.3 problems per 100 encounters in 1998–99 to 21.4 problems per 100 encounters in 2001–02 (p=<0.0001). This confirmed the decrease that was observed between 1999–00 and 2000–01. Since 1999–00 there has been a total decrease of 2.8 respiratory problems per 100 encounters. Averaged over the 4 years, it is estimated that respiratory problems have decreased at a rate of 500,000 encounters per year. The estimated reduction in respiratory problems remained after adjusting for age and sex (p=<0.0001).

The decrease over time in the management rate of respiratory problems was largely explained by a decrease in the rates for asthma (p=0.0009) and acute bronchitis (p=<0.0009).

The management rate for asthma decreased from 3.2 problems per 100 encounters in 1998–99 to 2.8 problems per 100 encounters in 2001–02 (p=<0.0001). This trend was explained by a reduction between 1999–00 (3.2 problems per 100 encounters) and 2000–01 (2.8 per 100 encounters), a reduction of 0.35 problems per 100 encounters in that year. This equates nationally to an estimated 360,000 fewer GP contacts with asthma in the 2000–01 year compared with the previous 2 years. This lower rate of asthma management was sustained in 2001–02, with no further decrease, indicating that there has been a real reduction in the asthma management rate since 1999–00.

The acute bronchitis rate decreased from 3.3 per 100 encounters in 1998–99 to 2.7 per 100 encounters in 2000–01 (p=<0.0001), again confirming the decrease in management observed in 2000–01. After adjusting for age and sex, the lower management rates of asthma and bronchitis remained significant (p=<0.0001).

There was a marginal decrease over time in the management rate of neurological problems, from 4.0 problems per 100 encounters in 1998–99 to 3.7 problems per 100 encounters in 2001–02 (p=0.009). The average annual decrease was 0.11 problem per 100 encounters. The reduction in rate of neurological problems over time remained after adjusting for age and sex, with an adjusted estimated average annual decrease of 0.12 problems per 100 encounters (p=0.0027), equivalent to an estimated 63,000 fewer GP contacts with neurological problems nationally per year. Due to the relatively small numbers, there was no detectable decrease over time in the management rate of any specific neurological problem.

The rate of management of blood problems decreased significantly, to 13.0 problems per 100 encounters in 2001–02 (p=0.0003) from a steady rate of around 16.8 problems per 100 encounters in the previous 3 years. This represents an estimated of 3,700,000 fewer encounters with blood problems nationally in 2001–02 compared with 2000–01. After adjusting for age and sex this decrease remained significant (p=<0.0001).

Management of ear problems decreased from 4.9 problems per 100 encounters in 1998–99 to 4.2 problems per 100 encounters in 2001–02 (p=<0.0001). After adjusting for age and sex it was estimated that the management of ear problems has been decreasing at an annual rate of 180,000 encounters nationally (p=0.0003).

The rate of management of eye problems decreased somewhat, from 2.8 per 100 encounters in 1998–99 to 2.5 per 100 encounters in 2001–02 (p=0.0005). After adjusting for age and sex, it is estimated that the management of eye problems has been decreasing at an annual rate of 100,000 encounters nationally (p=0.0001).

14.3 Changes in medication rates between 1998–99 and 2001–02

Changes in prescribed medications CAPS

Decreases over time

For prescribed medications using the CAPs medication group level there has been a significant decrease in the prescription of antibiotics, from 17.3 prescriptions per 100 encounters in 1998–99 to 14.4 medications per 100 encounters in 2001–02 (p=<0.001). This translates to an estimated rate of decrease of 1,000,000 antibiotic prescriptions nationally per year. Within antibiotics, the prescription rate for the subgroup cephalosporins has decreased significantly, from 4.3 per 100 encounters in 1998–99 to 3.2 per 100 encounters in 2001–02 (p=<0.0001), accounting for 39% of the decrease in antibiotic prescribing. The prescribing rates for penicillins and broad-spectrum penicillins remained steady over time (see Chapter 9, Table 9.1).

Respiratory medications decreased from 6.9 prescriptions per 100 encounters in 1998–99 to 5.8 prescriptions per 100 encounters in 2001–02 (p=<0.0001). Prescriptions for bronchodilators have significantly decreased, from 3.7 per 100 encounters in 1998–99 to 2.9 per 100 encounters in 2001–02 (p=<0.0001). The prescription rate for asthma preventives has remained steady over the 4 years.

There has been little change in the overall prescription rate for central nervous system drugs. However prescription rates for simple and compound analgesics have decreased between 1998–99 and 2001–02, from 4.7 per 100 encounters to 3.8 per 100 encounters for simple analgesics (p=<0.0001) and from 3.3 per 100 encounters to 2.7 per 100 encounters for compound analgesics (p=<0.0001).

Increases in prescription rate over time

There was a significant increase in the prescription rate for musculoskeletal medications, from 5.7 per 100 encounters in 1998–99 to 6.1 per 100 encounters in 2001–02 (p=0.0003). There was a significant increase in the rate of prescribing of non-steroidal anti-inflammatory drugs (NSAIDs), from 4.5 per 100 encounters in 1998–99 to 5.3 per 100 encounters in 2001–02 (p=<0.0001).

14.4 Changes in other treatments between 1998–99 and 2001–02

Therapeutic procedures

Therapeutic procedures increased from 11.8 per 100 encounters in 1998–99 to 14.7 per 100 encounters in 2001–02, an annual rate of increase of 0.8 per 100 encounters (p=<0.0001). This is equivalent to an annual increase of 840,000 encounters where the GP performed therapeutic procedures. This increase remained after adjusting for age and sex (p=<0.0001).

Clinical treatments

Clinical treatments increased from 31.4 per 100 encounters in 1998–99 to 38.1 per 100 encounters in 2001–02, a significant increase of 2.4 per 100 encounters per year, an increase that remained after adjusting for age and sex (p=<0.0001). This is equivalent to a rate of increase of 2,500,000 clinical treatments nationally per year.

Lifestyle counselling

Lifestyle counselling increased from 6.4% of encounters in 1998–99 to 8.1% of encounters in 2001–02, a significant increase of 0.6% of encounters per year (p=<0.0001). This is equivalent to an annual rate of increase of 600,000 encounters at which the GP has given advice on lifestyle. This trend remained significant after adjusting for age and sex (p=<0.0001).

15 Selected topics—changes over time

This chapter uses multiple regression to examine more closely how observed changes in management rates of particular problems and changes in medication rates were reflected in medication management for particular problems of interest.

Topic selection was based on:

- medications or problems of topical interest in terms of public health initiatives or developments in treatments
- whether there were significant changes in overall rates of management of a problem, in overall rates of a medication or non-pharmacological treatments.

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

- Medication rates for depression, in particular the rates of selective serotonin reuptake inhibitors (SSRIs) versus other anti-depressants.
- Medication rates for lipid disorders over time, in particular the rates of HMG CoA reductase inhibitors (statins).
- Medication rates for asthma over time, in particular asthma preventives versus bronchodilators.
- 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 antibiotics to manage upper respiratory tract infections.

15.1 Method

Multiple linear regression of medication rates adjusting for problems

For the topics of interest, multiple linear regression was used to predict changes in selected medication rates over time, after adjusting for the main morbidities of interest related to that medication. By adjusting for the morbidity of interest it is possible to detect whether:

- there has been a change over time in the medication management for the problem of interest (e.g. Was there an increase over the 4 years in the overall prescribing rate of anti-depressants for depression?); OR
- the observed change in medication rate is explained by a commensurate change in rates of management of the problems for which this medication is prescribed. This would mean there had been no change in medication management for that problem over the 4-year period, and that the observed changes in medication rates are due to the change in management rates of the selected problem(s).

The outcome variable for each multiple regression model was medication rate (per 100 problem contacts). The predictors were problem managed and time. Patient age and sex were included as potential confounders of the effect of time and morbidity on medication rates.

'Time by problem' interaction terms were entered into the multiple regression models to test whether changes in medication rates over time differed for specific problems of interest. For example: For NSAIDs, two interaction terms ('time X arthritis' and 'time X other musculoskeletal problems)' were used to test whether any change in NSAID rates over time was more pronounced for the management of arthritic problems relative to other musculoskeletal problems.

SAS regression procedures were used that calculate robust standard errors to correct for the design effect of the cluster sample.[11] Test statistics and p-values based on the robust standard error are more conservative than those that are calculated without taking the design effect of the cluster sample into account. Thus the robust standard error provides a more stringent test of significant changes over time.

In this section, medications were grouped according to recommended use (e.g. medications for treating depression). Within these broad therapeutic groups the specific medications were further divided into pharmaceutical classes according to the ATC classification (e.g. selective serotonin reuptake inhibitors, tricyclic anti-depressants). Trends over time in the use of each medication class within each therapeutic group of drugs were analysed using linear regression. All medications whether prescribed, advised for over-the-counter purchase, or supplied by the GP, were included.

Changes in rates of selected medications were extrapolated to provide an estimate of the Australia-wide increase in the annual number of times the medication would have been prescribed, supplied or advised (where applicable). Note that this extrapolation does not provide an estimate of the increase or decrease in the number of prescriptions that cross the pharmacist's counter, as the number of repeats ordered by the GP has not been considered in these estimates.

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

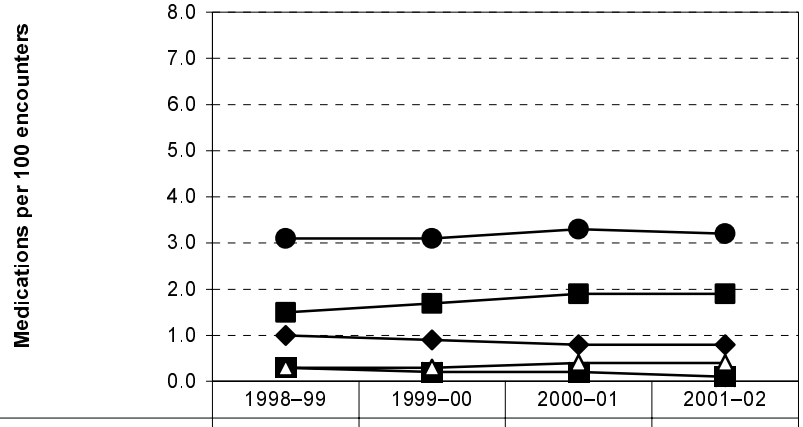
Medications for treatment of depression

All anti-depressant medication included ATC medication group N06A. This was subdivided into SSRIs (ATC code N06A B), non-selective monoamine reuptake inhibitors (tricyclics, ATC code N06A A) and monoamine oxidase inhibitors (MAOIs, ATC codes N06AG, N06AF). Rates of anti-depressant medications were compared for depression versus all other psychological problems.

All anti-depressants—changes over time

Figure 15.1 shows the overall rates of selected anti-depressant medications per 100 encounters, unadjusted for indication. The relative prescribing rate of all anti-depressants per 100 encounters did not change over the 4-year period; however, the prescribing rate of SSRIs rose significantly ($p=<0.0001$). After adjusting for age and sex, this represented an

estimated average annual increase of 136,000 SSRI medications prescribed or supplied in general practice in Australia. The increase in rates of SSRIs was offset by significant decreases in the rates for tricyclic anti-depressants (p=<0.0001) and monoamine oxidase inhibitors (p=<0.0001).



	1998–99	1999–00	2000–01	2001–02
SSRIs (a)	1.5	1.7	1.9	1.9
Tricyclics (b)	1.0	0.9	0.8	0.8
MAOIs (c)	0.3	0.2	0.2	0.1
Other (d)	0.3	0.3	0.4	0.4
All anti-depressants (e)	3.1	3.1	3.3	3.2

BEACH data year

Figure 15.1: Anti-depressant medication rates over time

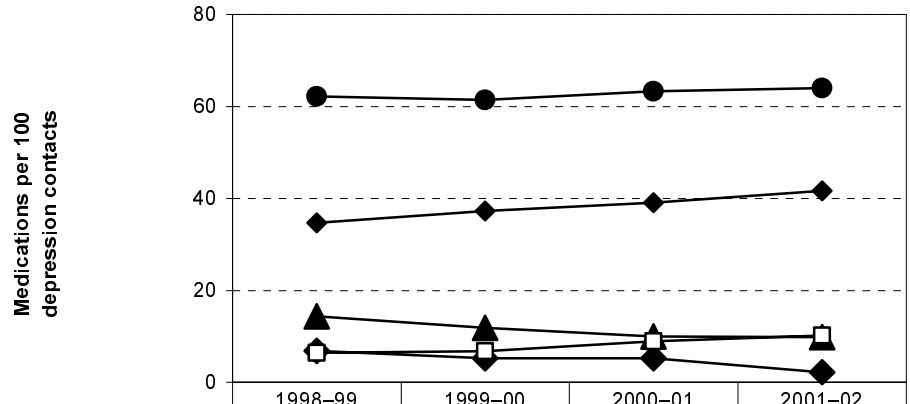
(a) SSRI —Selective serotonin reuptake inhibitors, ATC code N06AB.
(b) Non-selective monoamine reuptake inhibitors, ATC code N06AA.
(c) MAOIs—Monoamine oxidase inhibitors, ATC code N06AG, N06AF.
(d) Other anti-depressants, ATC code N06AX.
(e) All anti-depressants ATC code N06A.

Anti-depressants in the management of depression

Figure 15.2 shows the medication rates of anti-depressants specifically prescribed for depression. The rate of all anti-depressants prescribed for depression did not change over the 4 years. However the prescribing rate of SSRIs for depression increased significantly from 34.7 medications per 100 depression contacts in 1998–99 to 41.7 per 100 depression contacts in 2001–02. This was offset by a decrease over the period in the prescribing rate of non-selective monoamine reuptake inhibitors and monoamine oxidase inhibitors. There was also an increase in the prescribing rate of 'other' anti-depressants (ATC code N06A X) from 6.8 medications per 100 depression problems in 1999–00 to 10.2 per 100 in 2001–02. This pattern of results indicates that, although there was no overall increase in medication rates for depression managed in general practice over the 4 years of the study, SSRIs were being substituted for older classes of anti-depressants during the period.

Anti-depressants in management of other psychological problems

Figure 15.3 shows the prescribing rates over time of anti-depressant medications for all psychological problems other than depression. There was an increase in the rate of anti-depressants as a group for other psychological problems. This increase was explained by an increase in the prescribing rate of SSRIs for other psychological problems.

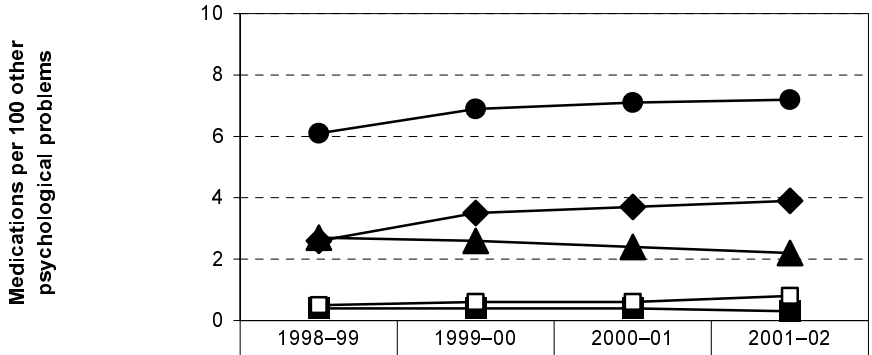


	1998–99	1999–00	2000–01	2001–02
SSRIs (a)	34.7	37.3	39.1	41.7
Tricyclics (b)	14.4	11.9	10.0	9.9
MAOIs (c)	6.9	5.3	5.3	2.2
Other (d)	6.5	6.8	9.0	10.2
All anti-depressants (e)	62.2	61.4	63.3	64.0

BEACH data year

Figure 15.2: Anti-depressant medication rates for depression over time

(a) SSRIs—Selective serotonin reuptake inhibitors, ATC code N06AB.
(b) Non-selective monoamine reuptake inhibitors, ATC code N06AA.
(c) MAOIs—Monoamine oxidase inhibitors, ATC code N06AG, N06AF.
(d) Other anti-depressants, ATC code N06AX.
(e) All anti-depressants ATC code N06A.



	1998–99	1999–00	2000–01	2001–02
SSRIs (a)	2.6	3.5	3.7	3.9
Tricyclics (b)	2.7	2.6	2.4	2.2
MAOIs (c)	0.4	0.4	0.4	0.3
Other (d)	0.5	0.6	0.6	0.8
All anti-depressants (e)	6.1	6.9	7.1	7.2

BEACH data year

Figure 15.3: Antidepressant rates for other psychological problems over time

(a) SSRIs—Selective serotonin reuptake inhibitors, ATC code N06AB.
(b) Non-selective monoamine reuptake inhibitors, ATC code N06AA.
(c) MAOIs—Monoamine oxidase inhibitors, ATC code N06AG, N06AF.
(d) Other anti-depressants, ATC code N06AX (excluding Bupropon N06AX12).
(e) All anti-depressants ATC code N06A.

Multiple regression

All anti-depressants

Multiple regression was performed to ascertain whether the patterns of anti-depressant prescribing rate for depression and for other psychological problems had changed over the period 1999–98 to 2001–02.

Multiple regression, with the prescribing rate of all anti-depressants as the outcome, found that the prescribing rate of all anti-depressants for depression had not changed significantly over time (time by depression interaction, $p=0.09$). The prescribing rate of anti-depressants for all other psychological problems, however, had increased significantly (time by other psychological problems, $p=<0.0001$).

SSRIs

Multiple regression with the prescribing rate of SSRIs as the outcome confirmed that the prescribing rate of SSRI medications for depression had risen, as had the rate of SSRI medications for all other psychological problems. However, a significant time by problem interaction term indicated that the increase in the SSRI prescribing rate was more marked for depression compared with other psychological problems (time by problem interaction, $p=<0.0001$).

Conclusion

Overall rates of depression and anti-depressant medication remained steady over the 4 years. There was no overall increase in anti-depressant medications prescribed specifically for depression. However there is evidence that during the period SSRIs have increasingly been substituted for older classes of anti-depressant medication. There has also been an increase in the relative prescribing rate of anti-depressants, in particular SSRIs for other psychological problems.

Current status of depression and its management

Figure 15.4 shows the relationship between depression and other variables during 2001–02. It gives an indication of the types of patients managed for depression, their reasons for encounter, co-morbidity managed and the treatments provided for their depression on that occasion.

Rate of depression management

There were 3,329 occasions on which depression was recorded by GPs. Depression was managed at 3.4% of encounters and accounted for 2.4% of all problems managed.

Age and sex distribution of patients

Depression was most common in patients from the middle age group, those between 25–64 years accounting for almost 75.0% of depression problems managed. The sex distribution of the patients was predominantly female (66.5% compared with 57.4% female patients in the total sample).

Reasons for encounter

The most commonly recorded patient reason for encounter was depression, described at a rate of 49.3 per 100 encounters at which depression was managed. A prescription request was also a common reason, recorded at 15.4 per 100 of these encounters. Several symptom descriptions were also relatively common including sleep disturbance and weakness/ tiredness.

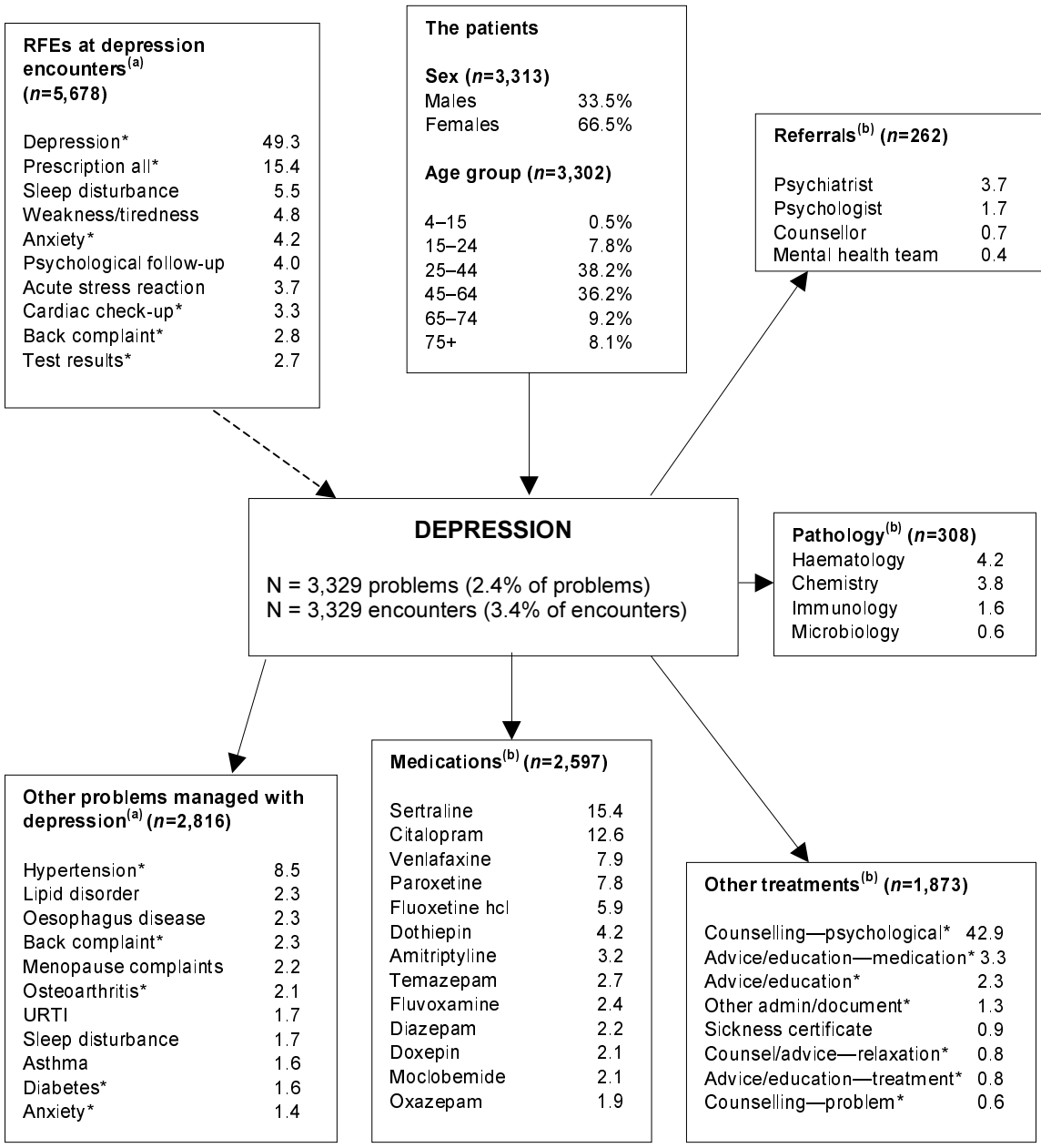


Figure 15.4: Interrelationship of depression with other variables

(a) Expressed as rates per 100 encounters at which depression was managed (N=3,329).
(b) Expressed as rates per 100 depression problems managed (N=3,329).
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).

Other problems managed

Hypertension was the most common other problem managed, at a rate of 8.5 per 100 depression encounters. This corresponds with results from the total sample where hypertension was the most common problem managed at a rate of 9.0 per 100 encounters.

Medications prescribed or supplied

A total of 2,597 medications were prescribed or supplied for depression, at rates of 78 per 100 depression problems. Sertraline and citalopram were the medications most frequently prescribed for depression, at rates of 15.4 and 12.6 respectively.

Other treatments

Other treatments were utilised at a much higher rate than in the total data set (56.3 per 100 depression problems managed, compared with 36.2 per 100 total problems). Psychological counselling was by far the most common, at 42.9 per 100 depression problems.

Referrals, tests and investigation

The patient was referred to other health professionals at a rate of 7.8 per 100 depression problems managed, most commonly to a psychiatrist. Pathology was ordered at a low rate of 9.8 per 100 depression problems.

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

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

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, hypertriglyceridaemia or raised lipids (ICPC–2 Rubric T93).

Changes over time

As described in Chapter 14 the management rate of lipid disorders increased significantly over the 4 year period and this change is graphically presented in Figure 15.5.

Figure 15.6 shows the rates of lipid-lowering medication per 100 encounters, unadjusted for morbidity. Statins represented the vast majority of lipid-lowering agents. There was a significant increase from 1998–99 to 2001–02 in the prescribing rate of lipid-lowering agents, almost entirely explained by an increase in the prescribing rate of statins over the period. After adjusting for age and sex it is estimated that the rate of increase represents an extra 170,000 statin medications nationally per year.

The rate of lipid-lowering agents prescribed specifically for lipid disorders appeared to remain steady for the period 1998–99 to 2001–02 (Figure 15.7).

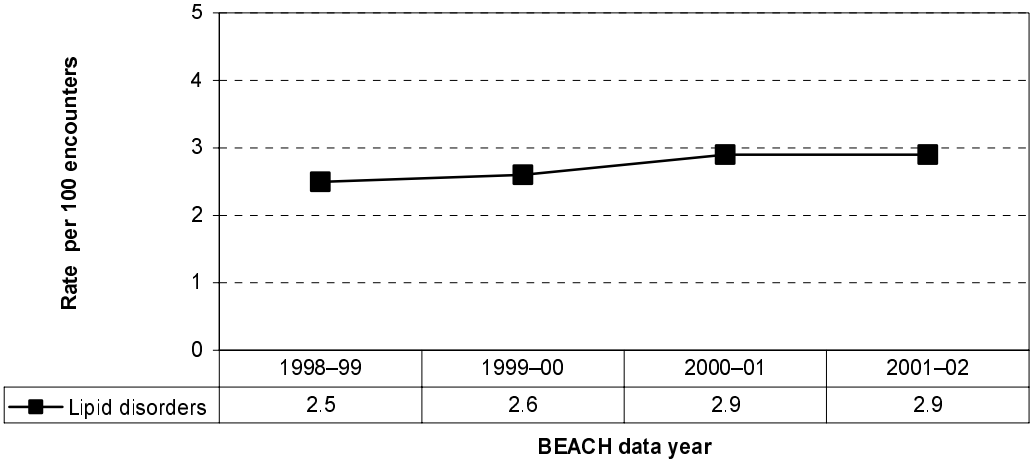


Figure 15.5: Management of lipid disorders over time

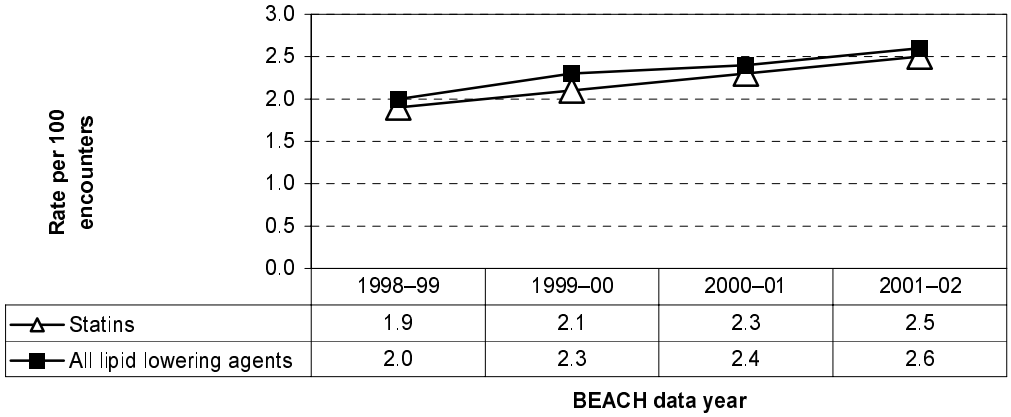


Figure 15.6: Prescribing rates of lipid-lowering agents over time

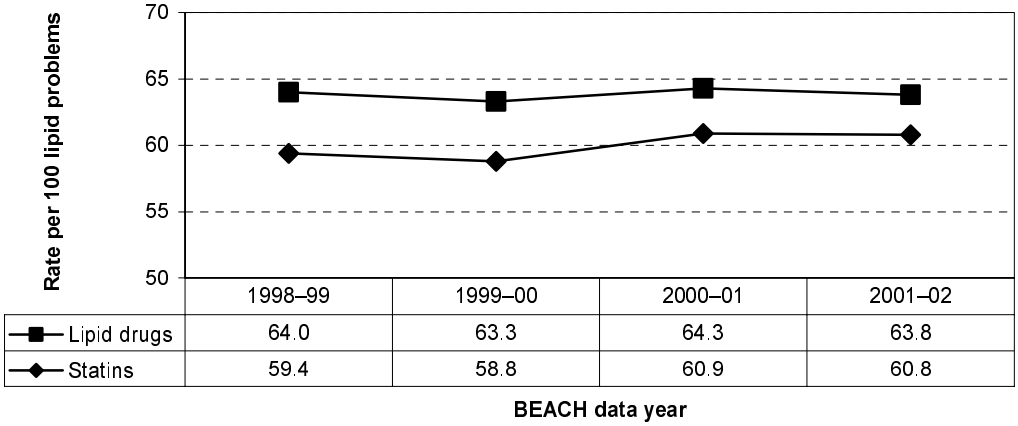


Figure 15.7: Prescribing rates of lipid-lowering agents for lipid disorders over time

Multiple regression

Total lipid-lowering agents

Multiple regression, with the rate of all lipid-lowering agents per 100 problems as the outcome, found a significant increase in the prescribing rate of lipid-lowering agents over time once changes in the management rate of lipid disorders were taken into account (p=<0.0001).

Statins

Multiple regression, with prescribing rate of statins per 100 problems as the outcome, found a significant increase over time in the prescribing rate of statins, even after the increase in the management rates of lipid disorders had been taken into account (time adjusted for lipids, p=<0.0001).

Problems (other than lipid disorders) for which lipid-lowering agents were prescribed in 1998–99 and in 2001–02

This unexplained increase in prescribing rates of lipid-lowering agents, and of statins in particular, was regarded as worthy of further investigation. Table 15.1 lists the most common labels other than a described lipid disorder) recorded by GPs for problems for which they prescribed lipid-lowering agents, in 1998–99 compared with 2001–02.

In 1998–99 about one in five lipid-lowering agents (20.9%) were prescribed for problems not labelled as a lipid problem. In 2001–02 this had risen to one in four (25.0%). The most common (non-lipid) problem for which lipid-lowering agents were prescribed in 1998–99 was ischaemic heart disease (29.1% of all non-lipid problems for which they were prescribed) followed by hypertension (18.3%) and by the simple label of 'prescription'. In 2001–02 ischaemic heart disease (16.9% of the non lipid problems) and hypertension (16.9%) remained important indications for the prescribing of lipid-lowering agents. However, lead position was taken by 'prescription'.

In reviewing some of the paper records of such encounters it appears that for patients who do not have a high cholesterol reading but who have one of the risk factors listed as PBS qualifying criteria (for example, patients with existing coronary heart disease with a cholesterol level >4.0),[42] some GPs record the lipid-lowering prescription under the coronary disease label (e.g. IHD) while others label the problem separately as 'prescription', being unable to label it as hypercholesterolaemia.

The increase in prescribing of lipid-lowering agents for morbidity other than lipid problems would explain the overall increase in lipid-lowering agents previously noted.

Table 15.1: Problems (other than lipid disorders) for which lipid-lowering agents were prescribed in 1998–99 and in 2001–02

	1998–99	2001–02
Morbidity managed with lipid-lowering agents	**Per cent of non-lipid problem labels (*n*=401)**	**Per cent of non-lipid problem labels (*n*=619)**
Ischaemic heart disease	29.4	22.2
Hypertension*	18.3	16.9
Prescription—all*	13.3	26.3
Blood test endocrine/nutritional	9.7	5.2
Test results*	2.9	2.8
Cardiac check-up*	2.5	1.7
Diabetes*	2.4	5.0
Acute myocardial infarction	2.1	0.6
General check-up*	2.0	1.2
Heart failure	1.7	0.6
Subtotal: top ten non-lipid problems	*84.1*	*82.5*
Total *(number)*	**404**	**620**
Per cent of total problems for which lipid-lowering medications prescribed	**20.9**	**25.0**

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

Conclusion

Although the crude prescribing rates of lipid-lowering medications increased in the 4 year period of the study, it was accompanied by an increase in the management rates of lipid disorders. While there was no evidence of any major change in medication rates of statins for lipid disorders, there was a significant increase over time in the prescription rate of statins that was not explained by the increase of lipid disorders. It appears that lipid-lowering medications are increasingly being prescribed for problems and risk factors other than lipid disorders per se.

15.4 Asthma inhalant medications and the management of asthma problems over time

The investigation of changes over time for asthma medications concentrated on the adrenergic and other inhalants (ATC codes R03A, R03B). The inhalants were classified as either preventive inhalants or as bronchodilaters/spasm relaxants according to CAPS (see Chapter 2, Section 2.6).

Changes over time

The management rate of asthma decreased significantly from 3.2 contacts per 100 encounters in 1999–00 to 2.8 per 100 encounters in 2001–02 (p=<0.0001) (Figure 15.8).

Figure 15.9 shows the prescribing rate of asthma medications per 100 encounters over the 4 years, unadjusted for morbidity. Since 1999–00 there has been a decrease in the prescribing rate of asthma medications, mainly explained by a decrease in the prescribing of bronchodilators (p=<0.0001).

When the decrease in the relative rate of management of asthma was taken into consideration there appeared to have been little change in the prescribing rates specifically for asthma problems over the last 4 years (Figure 15.10).

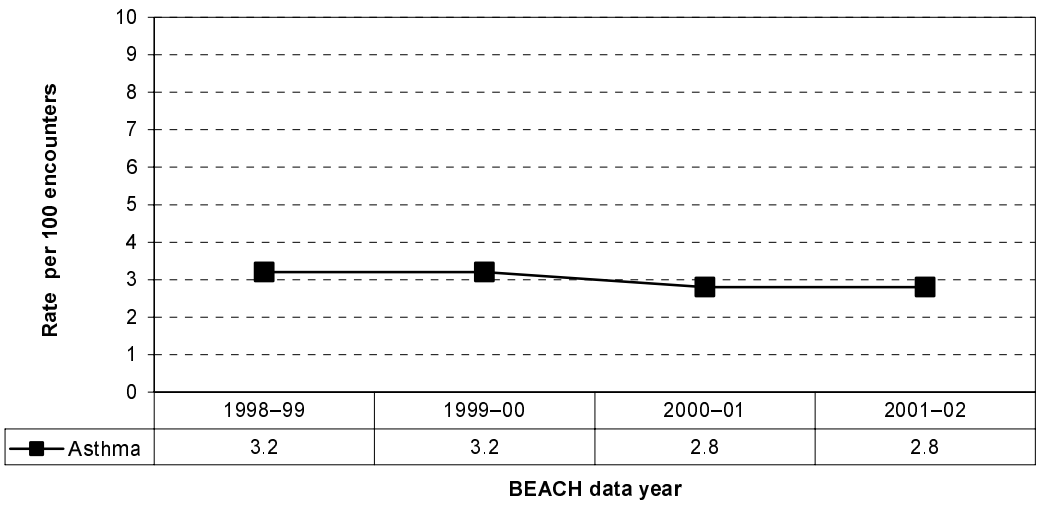


Figure 15.8: Management rate of asthma over time

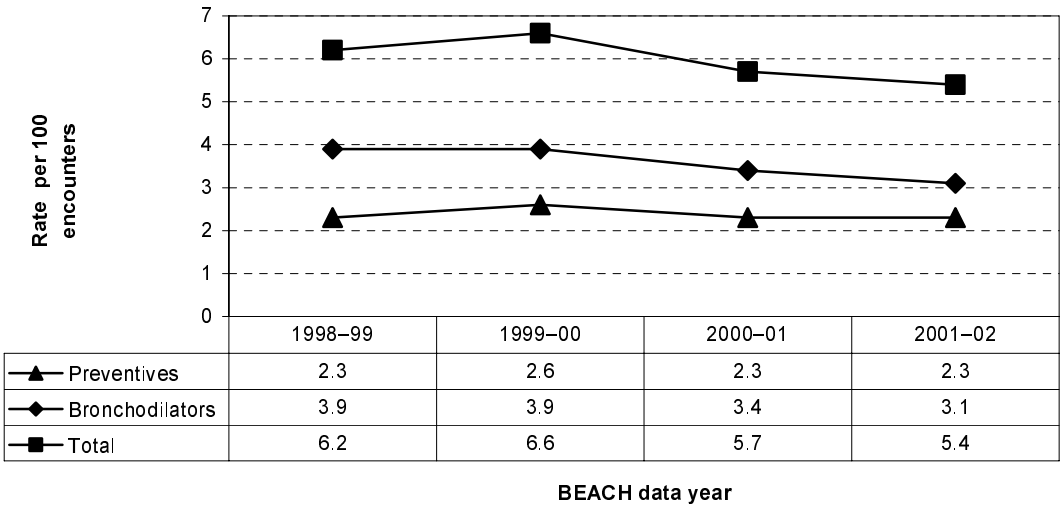
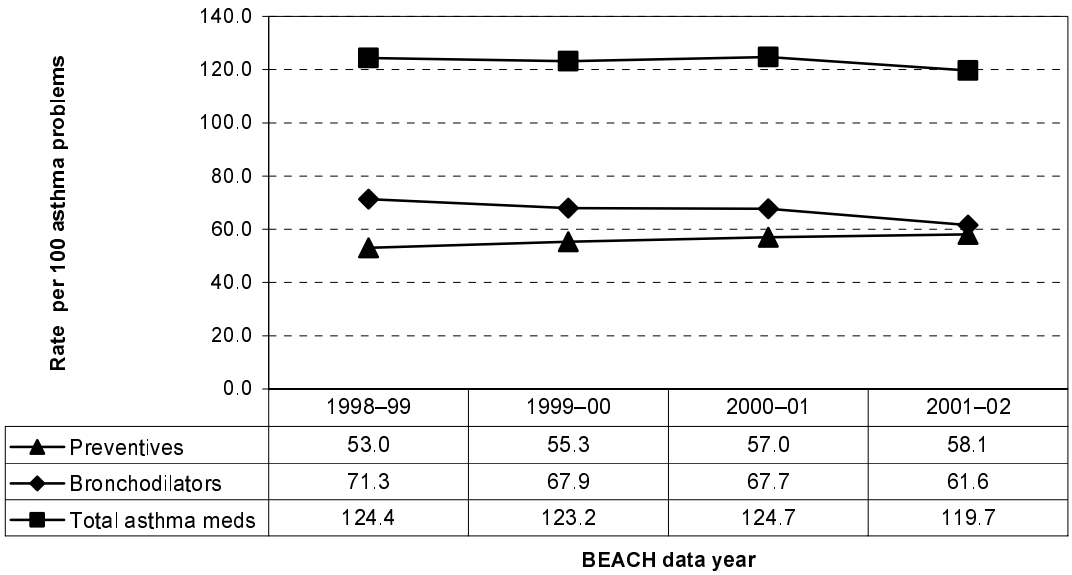


Figure 15.9: Prescribing rates of asthma medications over time



	1998–99	1999–00	2000–01	2001–02
Preventives	53.0	55.3	57.0	58.1
Bronchodilators	71.3	67.9	67.7	61.6
Total asthma meds	124.4	123.2	124.7	119.7

Figure 15.10: Prescribing rates of asthma medications over time for asthma problems

Multiple regression

Asthma preventives

Multiple regression, with the rate of asthma preventives per 100 problems as the outcome, found no significant effect of time on the prescribing rate of preventive medications once the management rate of asthma was taken into account (time adjusted for asthma, p=0. 42) (Figure 15.10).

Bronchodilators

Multiple regression, with the rate of bronchodilators as the outcome, indicated a significant decrease in the prescribing of bronchodilators for all problems, but this decrease was more pronounced for the management of asthma (time by asthma, p=0.0008) (Figure 15.9).

Conclusion

The relative rate of management of asthma decreased between 1999-00 and 2001–02. The rate of bronchodilator medications also decreased during this period. The multiple regression analyses indicated that after changes over time in the management rate of asthma were taken into account there was some evidence that the use of bronchodilators in the management for asthma decreased in the last 2 years of the study.

15.5 Non-steroidal anti-inflammatory drugs (NSAIDs) and the management of arthritis and other musculoskeletal problems

Changes over time

Non-steroidal anti-inflammatory drugs (NSAIDs) were defined as the medications grouped in the ATC code M01A. For analysis the NSAIDs were further subdivided into Cox-2 inhibitors (ATC subgroup M01A H) and all other NSAIDs.

Musculoskeletal problems (ICPC chapter 'L') were divided into all arthritic problems (rheumatoid arthritis, osteoarthritis, and unspecified arthritis) versus all other musculoskeletal problems. These broad categories of problems of interest were derived from the recommended indications for the use of Cox-2 inhibitors[43] and the problems for which NSAIDs were most often prescribed (shown later in Figure 15.14). The prescribing rate of NSAIDs for arthritic problems was compared with the prescribing rate for other musculoskeletal problems. Multiple regression was used to examine trends over time in the prescribing rate of NSAIDs for arthritis, other musculoskeletal problems and all other problems.

Figure 15.11 shows the prescribing rate of NSAIDs per 100 encounters unadjusted for morbidity. As reported in Chapter 9, the univariate analysis indicated that the overall prescribing rate of NSAIDs had increased over the 4 year period. Specifically, the prescribing rate of Cox-2 inhibitors had increased significantly from 1999–00 to 2001–02, while the prescribing rate of the other NSAIDs had declined.

The rate of total NSAID prescribing specifically for arthritic problems increased from around 38 medications per 100 arthritic problems in 1999–00 to 54 per 100 arthritic problems in 2000–01, with no further rise in 2001–02 (Figure 15.12). This increase was entirely due to an increase in the prescribing rate of Cox-2 inhibitors from 4 per 100 arthritic problems in 1999–00 to 34 per 100 arthritic problems in 2001–02. At the same time the prescribing rate of other NSAIDs decreased from 35 per 100 arthritic problems in 1999–00 to 18 per 100 in 2001–02. This changing pattern of medication management indicates that the increase in Cox-2 inhibitors was largely responsible for an overall increase in the total NSAID medication rate for arthritic problems. The decrease in other NSAIDs indicates that there has been considerable substitution of Cox-2 inhibitors for other NSAIDs.

The prescribing rate of NSAIDs for musculoskeletal problems other than arthritis rose over the period 1999–00 to 2000–01, with no further increase in 2001–02 (Figure 15.13). The prescribing rate of Cox-2 inhibitors for other musculoskeletal problems continued to increase in 2001–02, while the rate of all other NSAIDs decreased. Again, substitution of Cox-2 inhibitors for other NSAIDs was demonstrated.

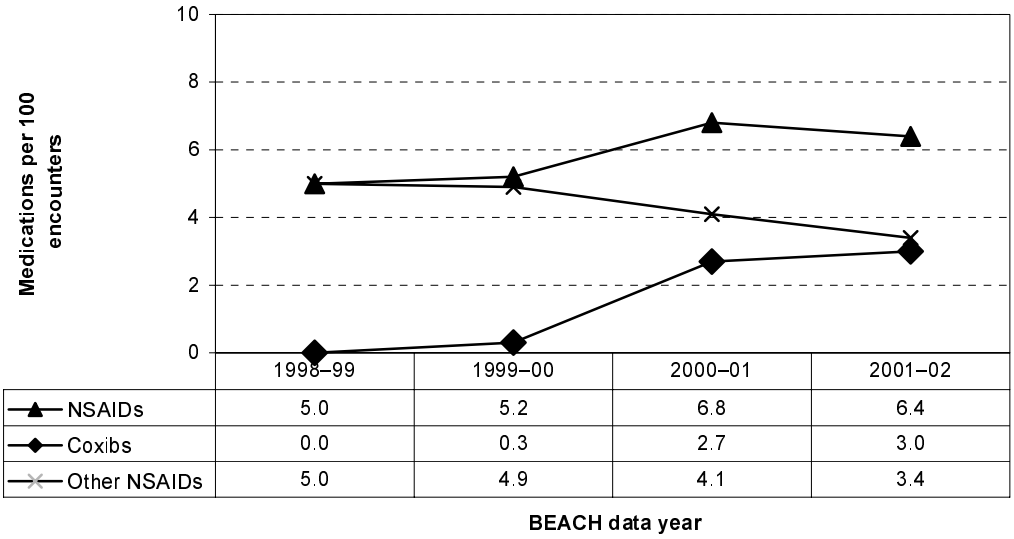


Figure 15.11: Rates of NSAIDs per 100 encounters over time

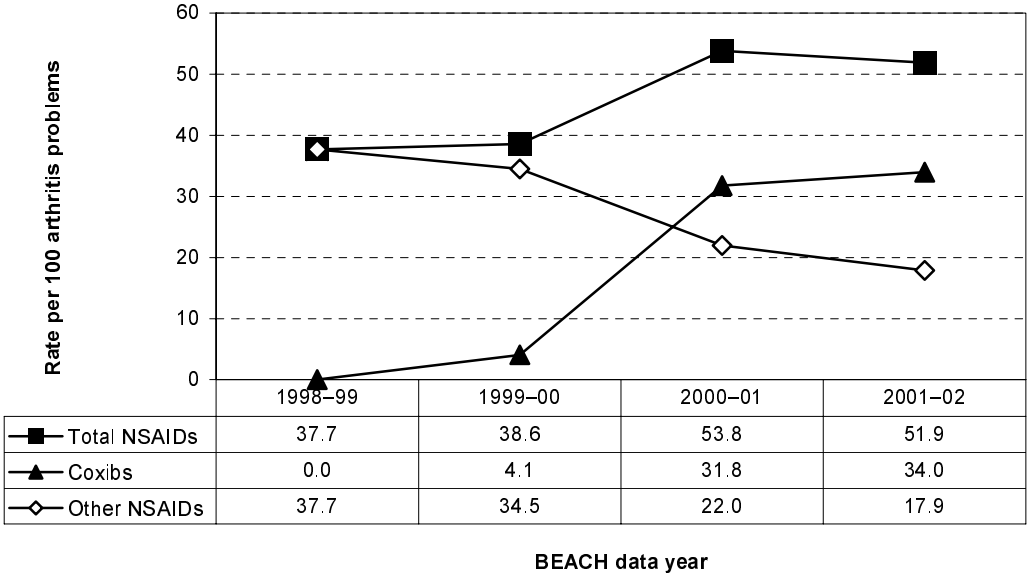
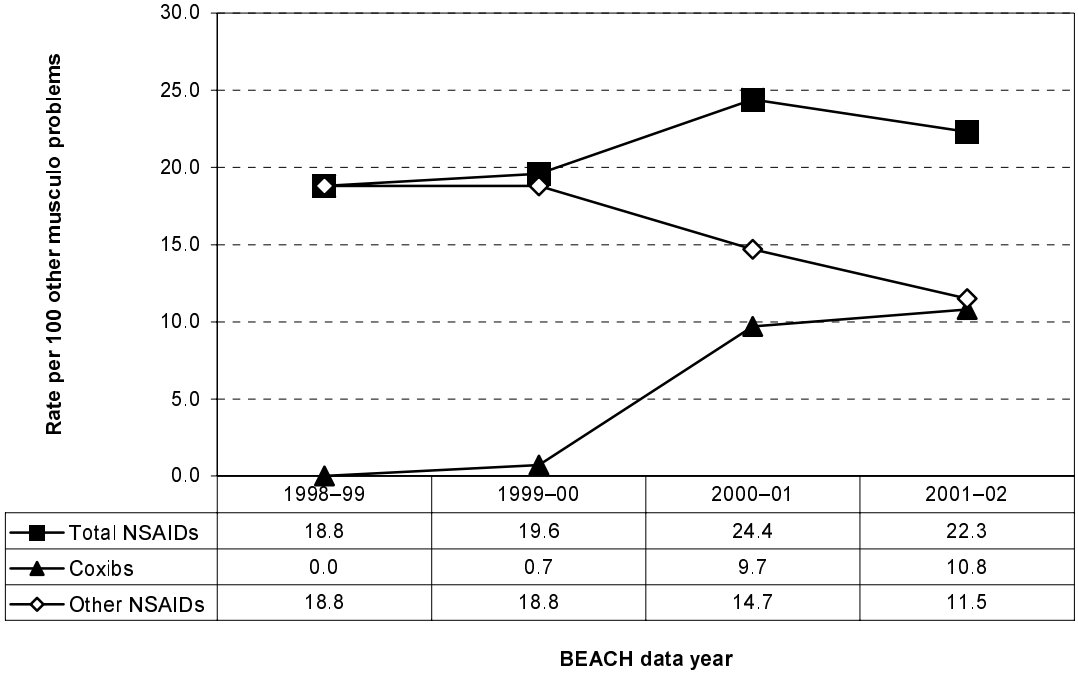


Figure 15.12: Prescribing rates of NSAIDs over time for all arthritis problems (a)

(a) Includes multiple ICPC–2 codes for osteoarthritis and arthritis (see Appendix 3) and rheumatoid arthritis (ICPC rubric L88).



	1998–99	1999–00	2000–01	2001–02
Total NSAIDs	18.8	19.6	24.4	22.3
Coxibs	0.0	0.7	9.7	10.8
Other NSAIDs	18.8	18.8	14.7	11.5

Figure 15.13: Prescribin g rates of NSAIDs over time for other musculoskeletal problems

Multiple regression

All NSAIDs

Multiple regression, with the prescribing rate of total NSAIDs as the outcome, found a significant time by problem interaction for the prescribing rate of total NSAIDs (p=<0.0001). This interaction indicates that since 1999–00 the increase in the prescribing rate of total NSAIDs for arthritic problems has been more pronounced than the increase in the prescribing rate of total NSAIDs for other musculoskeletal problems.

Cox-2 inhibitors

Multiple regression, with the prescribing rate of Cox-2 inhibitors as the outcome, found a significant time by problem interaction for the prescribing rate of Cox-2 inhibitors (p=<0.0001). This interaction indicates that the rate of uptake of Cox-2 inhibitors from 1999–00 to 2001–02 was more pronounced for arthritic problems than for other musculoskeletal problems.

Other NSAIDs (not Cox-2 inhibitors)

Multiple regression, with the rate of NSAIDs other than Cox-2 inhibitors as the outcome, found a significant time by problem interaction (p=<0.001). This interaction indicates that, from 1999–00 to 2000–01, the decrease in the prescribing rate of other NSAIDs was more pronounced for arthritic problems relative to other musculoskeletal problems.

Conclusion

From 1999–00 to 2000–01, there was a marked increase in the prescribing rate of total NSAIDs for both arthritic problems and other musculoskeletal problems, an increase which was entirely explained by an increase in the rate of Cox-2 inhibitors. This increase levelled off somewhat in 2001–02. There was evidence that Cox-2 inhibitors were substituted for other NSAIDs for both arthritic problems and other musculoskeletal problems, as there was a decrease in medication rates of other NSAIDs. Significant time by problem interactions indicated that the increase in the prescribing rate of total NSAIDs, the uptake of Cox-2 inhibitors and the discarding of other NSAIDs were significantly more pronounced for arthritic problems relative to other musculoskeletal problems.

Current status of Cox-2 inhibitors

Considering the changes in pattern of prescribing of NSAIDs, reflecting the introduction of Cox-2 inhibitors on the PBS investigation of the patients and problems for whom Cox-2 inhibitors were prescribed in 2001–02 may be of interest. Figure 15.14 shows the relationship between prescriptions for Cox-2 inhibitors and other variables in the fourth year of the BEACH program.

Rate of prescription, supply or recommendation

There were 2,942 occasions on which Cox-2 prescriptions were recorded by GPs, accounting for 2.9% of all medications recorded. They were given at a rate of 3.0 per 100 total encounters and at a rate of 2.1 per 100 total problems. Of the two Cox-2 inhibitors available during this recording period, celecoxib was slightly more common than rofecoxib.

Prescribed daily dose

Celecoxib had a median PDD of 200 mg, which is the lowest recommended dose suggested in MIMS. The 25 mg median PDD for rofecoxib was the highest dose recommended in MIMS.[43]

Age and sex distribution of patients

Patients over the age of 44 years accounted for 80.0% of patients at coxib encounters compared with 51.4% in the total sample. Half of these were aged between 45 and 64 years and half were older patients. The sex distribution of the patients was the same as that of the total sample.

Reasons for encounter

The most commonly described patient reason for encounter was back complaint, described at a rate of 19.8 per 100 encounters at which Cox-2 inhibitors were prescribed or given. A prescription request and knee complaint were also common reasons, at rates of 15.7 and 11.0 per 100 of these encounters.

Problems managed

Osteoarthritis was the most common problem managed with Cox-2s, at a rate of 30.3 per 100 coxib encounters. Back complaint was the second most frequent problem treated with Cox-2 inhibitors (at a rate of 12.8 per 100 coxib encounters), followed by arthritis (not otherwise specified) and then by a range of other musculoskeletal problems.

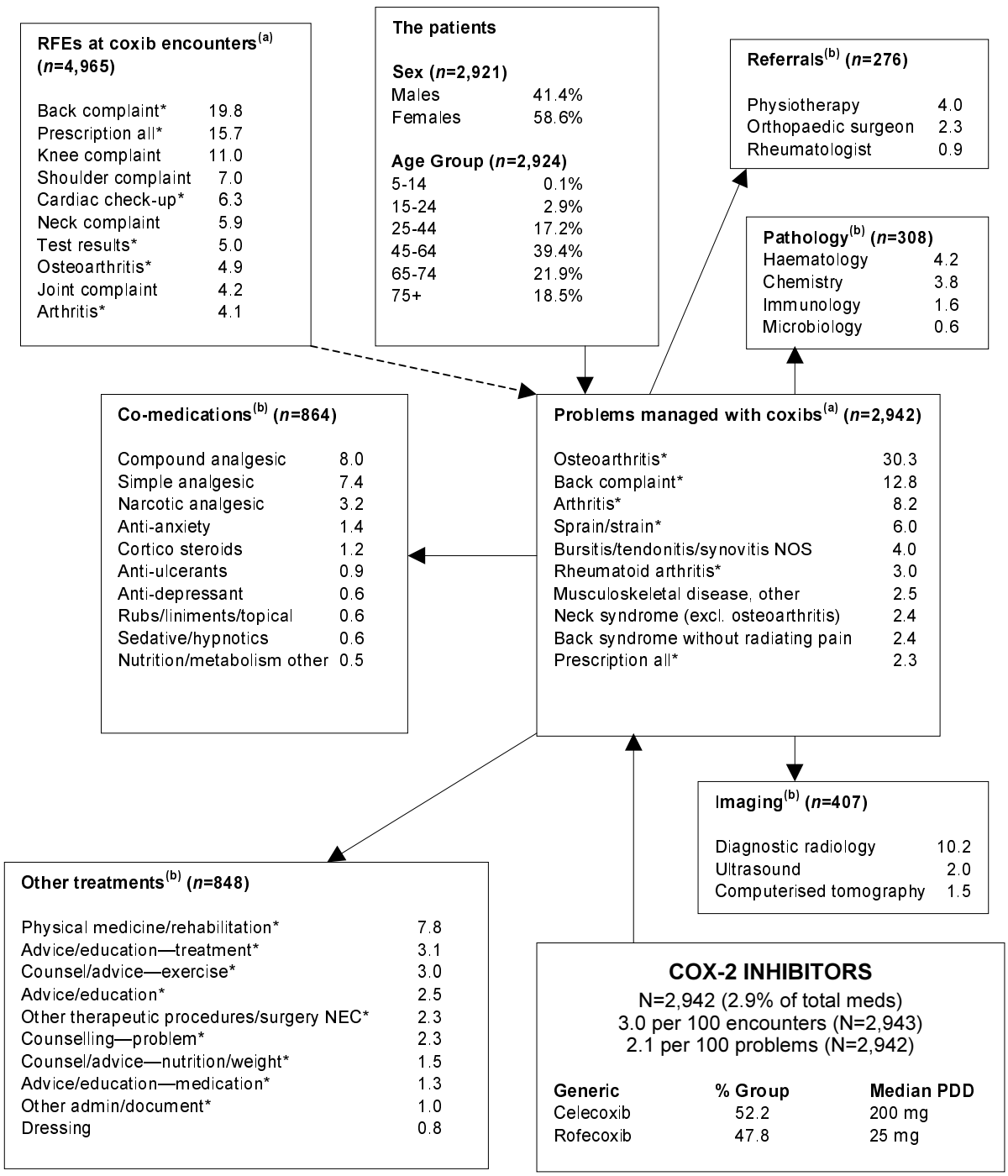


Figure 15.14: Interrelationship of Cox-2 inhibitors with other variables

(a) Expressed as rates per 100 encounters at which Cox-2 inhibitors were used (N=2,943).
(b) Expressed as rates per 100 problems for which Cox-2 inhibitors were used (N=2,942).
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).
Note: Meds—medications prescribed or supplied by the GP, PDD—prescribed daily dose.

Other medications prescribed or supplied

A total of 864 medications were prescribed, supplied or recommended at the same encounter and for the same problem for which the Cox-2s were used. Compound and simple analgesics were the most common co-medications, at rates of 8.0 and 7.4 per 100 of these problems.

Other treatments

Other treatments were utilised at a lower rate than in the total data set (29.0 per 100 problems managed with coxibs, compared with 36.2 per 100 total problems). Physical medicine/rehabilitation was the most common, at 7.8 per 100 coxib problems. Various types of advice and education made up the majority of the rest of these treatments.

Referrals, tests and investigation

The patient was referred to other health professionals for these problems at a rate of 9.4 per 100 problems managed, most commonly for physiotherapy. Pathology was ordered at a rate of 10.5 per 100 problems managed with coxibs, and, as would be expected, imaging was ordered at the high rate of 13.8 compared with a rate of 5.5 in the total sample.

15.6 Antibiotics and the management of acute upper respiratory tract infection

Changes over time

Antibiotics were defined as the medications grouped in ATC code J01. Antibiotics were further subdivided into broad-spectrum penicillin (ATC code J01CA), cephalosporin (J01DA), and other antibiotics (the balance of J01). Acute upper respiratory tract infection (URTI) was selected on the ICPC rubric R74.

There has been no change over time in the management rate of URTI over the period 1998–99 to 2001–02 (see Figure 15.15).

As described in Chapter 14, Section 14.3, there was a significant decrease in antibiotic rates per 100 encounters over time. When this decrease was investigated in more detail for particular classes of antibiotics, there was a significant decrease in rates of cephalosporins but there was no decrease in the rates of broad-spectrum penicillin (Figure 15.16).

Multiple regression

As shown in Figure 15.17, after adjusting for URTI management there was a significant decrease over time in the overall rate of antibiotic prescribing ($p=<0.0001$), which was reflected in a decrease in cephalosporins ($p=<0.0001$). This indicates that the decrease in the prescribing rate for antibiotics was not confined to a decrease in antibiotics for URTI. There was a marginally significant decrease in the rate of broad-spectrum penicillin prescribed for URTI, but no change in the rate of broad-spectrum penicillin prescribed for all other problems (problem by time interaction, $p=0.034$).

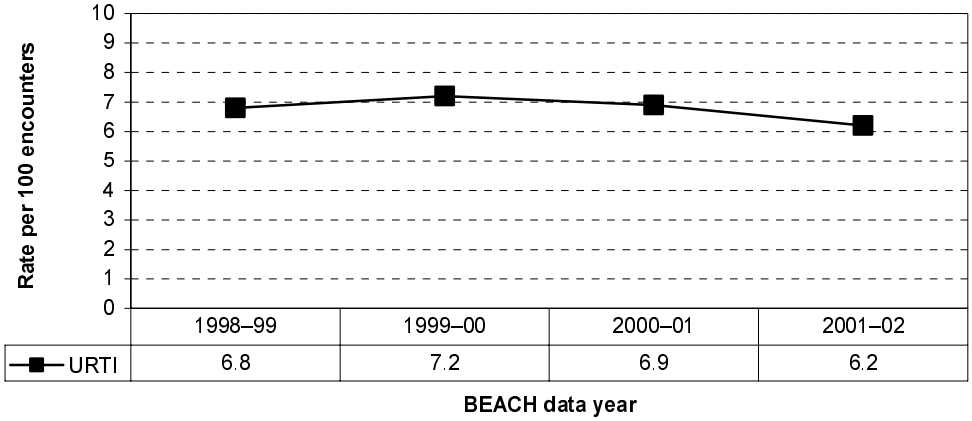


Figure 15.15: Management rate of acute upper respiratory tract infection over time

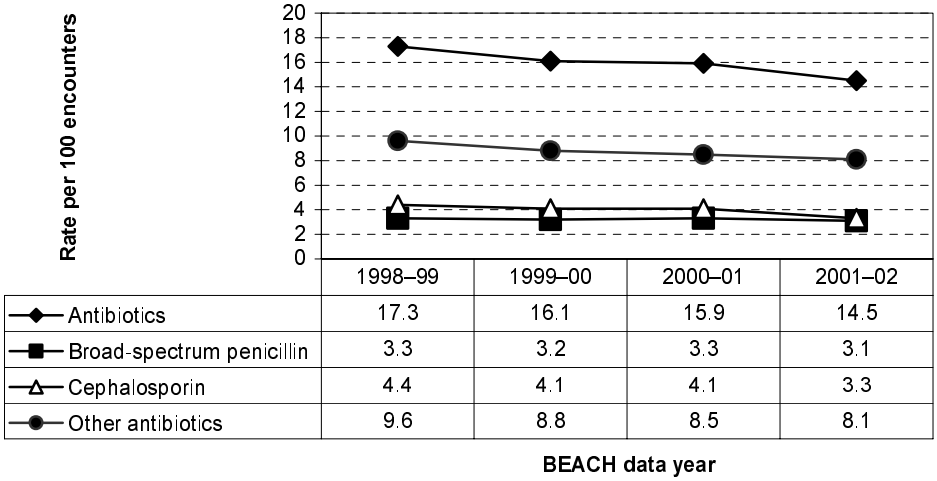


Figure 15.16: Rates of antibiotics per 100 encounters over time

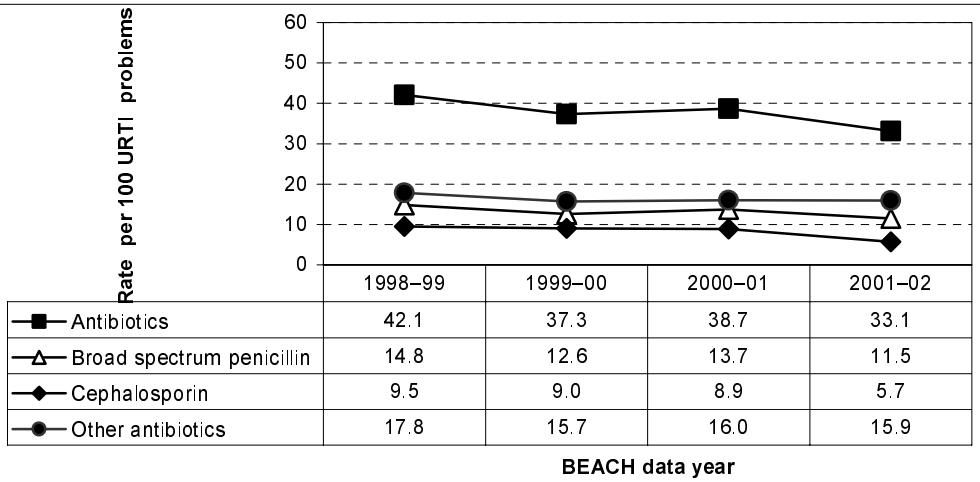


Figure 15.17: Prescribing rates of antibiotics over time for all URTI problems

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Conclusion

There has been a general reduction in total antibiotic prescribing over the 4 year period, mainly explained by a decrease in antibiotics other than broad-spectrum penicillins. There has been a decrease in antibiotic prescribing rates for URTI problems, including broad-spectrum penicillin.

Current status of antibiotic prescribing

Considering the changes in antibiotic prescribing patterns in the management over the last 4 years an investigation of the characteristics of the patients for whom it was prescribed, the problem for which it was prescribed and the other management processes recorded in conjunction with the antibiotic prescriptions may be of interest. Figure 15.18 shows the relationship between antibiotics and other variables.

Rate of prescription, supply or recommendation

There were 14,085 occasions on which antibiotics were recorded by GPs, accounting for 13.9% of all medications recorded. They were given at a rate of 14.5 per 100 total encounters and at a rate of 10.1 per 100 total problems. Amoxycillin was the most common individual antibiotic, followed by cephalexin.

Prescribed daily dose

Amoxycillin had a median PDD of 1,500 mg, which is the maximum recommended dose suggested in MIMS.[43]

Age and sex distribution of patients

Patients under 25 years of age accounted for about 23.0% of all patients but almost 36.0% of patients at antibiotic encounters. On the other hand, those aged 65 years and over were under-represented at antibiotic encounters, accounting for only 17.0% of all patients receiving them (compared with 24.9% of the total sample). The sex distribution of the patients was the same as that of the total encounter population.

Reasons for encounter

The most commonly described patient reason for encounter was cough, described at a rate of 22.9 per 100 encounters at which antibiotics were prescribed or given. Throat symptom/complaint was also a commonly cited reason, at 15.1 per 100 of these encounters. The other relatively common reasons for encounter were largely symptomatic in nature.

Problems managed with antibiotics

Acute bronchitis was the most common problem managed with antibiotics (15.3 per 100 antibiotic encounters), followed by upper respiratory tract infections (14.4 per 100), urinary tract infections (8.6 per 100), sinusitis (7.9), (acute otitis media (7.7) and tonsillitis (7.3 per 100 antibiotic encounters).

Other medications prescribed or supplied with antibiotics (for the same problem)

A total of 3,804 co-medications were prescribed, supplied or recommended for the same problem at the same encounter. Simple analgesics were the most common, at a rate of 5.0 per 100 problems managed with antibiotics.

Other treatments, referrals, tests and investigations

Other treatments were utilised at a lower rate than in the total data set (22.1 per 100 problems managed with antibiotics, compared with 36.2 per 100 total problems). Various types of advice and education made up the majority of these treatments.

The patient was referred to other health professionals for these problems at a rate of only 2.9 per 100 problems managed, most commonly to dentists. Pathology was ordered at a very low rate of 5.0 tests per 100 problems managed with antibiotics (compared with a rate of 21.6 in the total data) and imaging at a rate of 2.6 per 100.

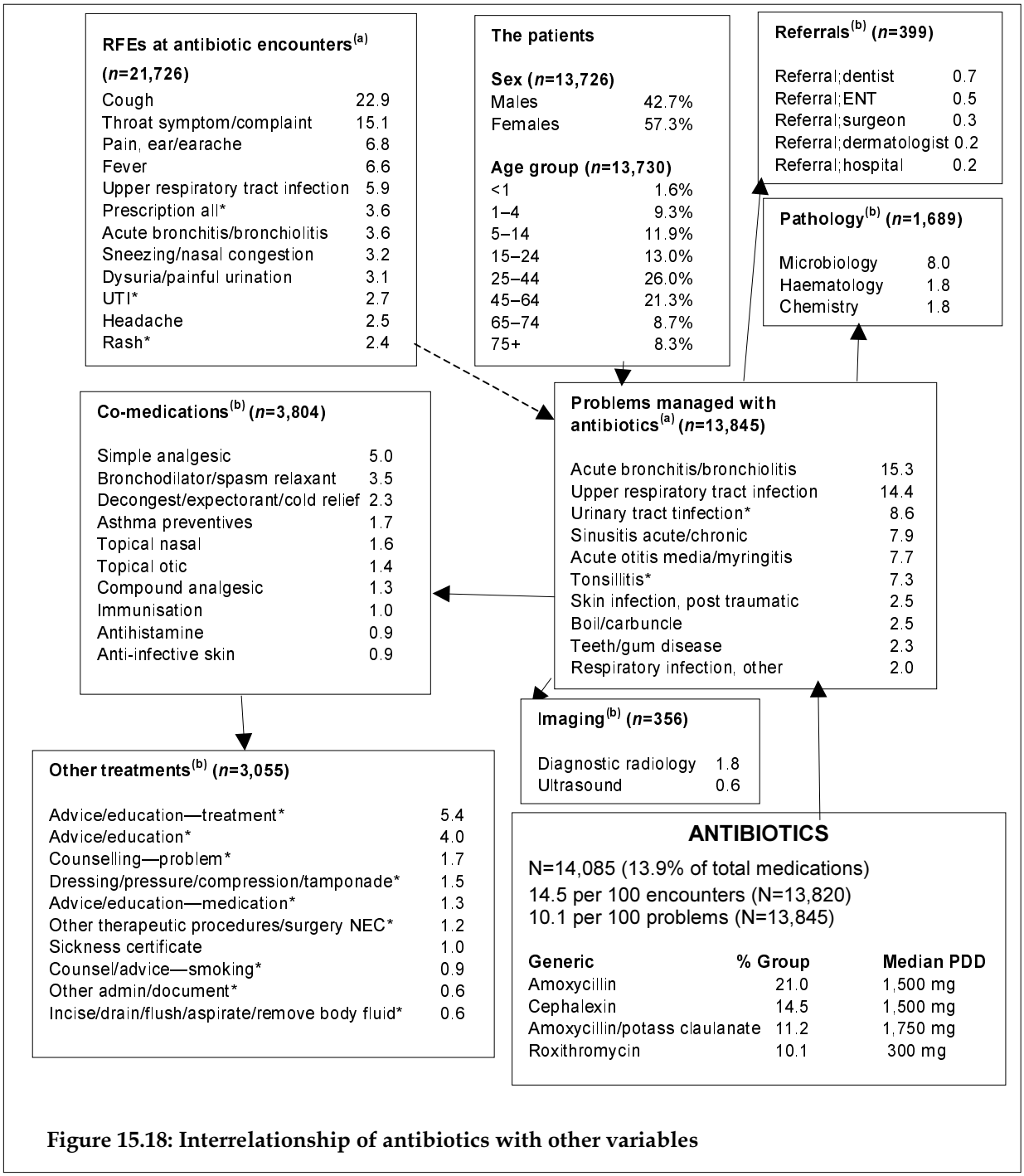

Figure 15.18: Interrelationship of antibiotics with other variables

(a) Expressed as rates per 100 encounters at which antibiotics were used (N=13,820)
(b) Expressed as rates per 100 problems at which antibiotics were used (N=13,845)
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3)
Note: Meds—medications prescribed or supplied by the GP, PDD—prescribed daily dose.

16 Encounters with Indigenous people

Indigenous people represent 2.2% of the total population in Australia. They are more likely to live outside urban areas than non-Indigenous people and this may affect their access to, and use of, general practice services. There are some Aboriginal Community Controlled Health Services (ACCHS) available in many parts of the country, including remote areas.[44] Better knowledge of the extent to which Indigenous people utilise general practice and the problems that are managed in general practice will assist in the development of an improved understanding of the health of the Indigenous community and in the planning of future health services for this sector of the population.

The participating GPs were instructed to ask the patient whether they identified as an Aboriginal person and/or as a Torres Strait Islander.

16.1 Number of encounters

At 982 encounters (1.0%) the patient responded positively to one or both questions. The vast majority of these (87.1%) stated they were Aboriginal persons while 9.7% stated they were Torres Strait Islanders and 3.2% said they were both.

In terms of the total data set 1.0% is not large. However, a simple extrapolation to the (approximately) 105 million general practice Medicare items of service claimed per year in Australia would suggest that about 1 million GP consultations occur with Indigenous people. It was thought that some of the participating GPs may have recorded activity conducted in Aboriginal Community Controlled Health Services, and claimed through Medicare. If so, this would be an over-estimate of the number of consultations with private general practitioners by Indigenous people. An investigation of the distribution of these encounters across individual GPs was therefore warranted.

The 982 encounters were distributed among 272 GPs, representing 27.7% of the GP participants. The relative number of encounters with Indigenous people was calculated for each GP who recorded at least one encounter with an Indigenous person. The range across these GPs was 1 to 79 consultations with Indigenous persons, the median being 1, the mean 4.4 with a standard deviation of 10.5. The distribution of these encounters across the 272 practitioners is shown in Figure 16.1.

By far the majority of these GPs (84.0%) had less than five of their 100 encounters in which the patient identified as an Indigenous person and only seven GPs (2.6% of those GPs who saw at least one Indigenous person, and less than 1% of the total GP sample) had 40 or more. All seven GPs in the latter category practised in areas in which an (ACCHS) exists. If we assume that these GPS worked either full or part-time in an ACCHS and that these consultations were undertaken in an ACCHS, their recorded encounters with Indigenous persons should be removed prior to extrapolation from BEACH to limit the extrapolation to private general practice. After removal of these encounters the estimated number of consultations with Indigenous persons in the non-ACCHS private general practice environment was considerably reduced, to be approximately 600,000 per annum.

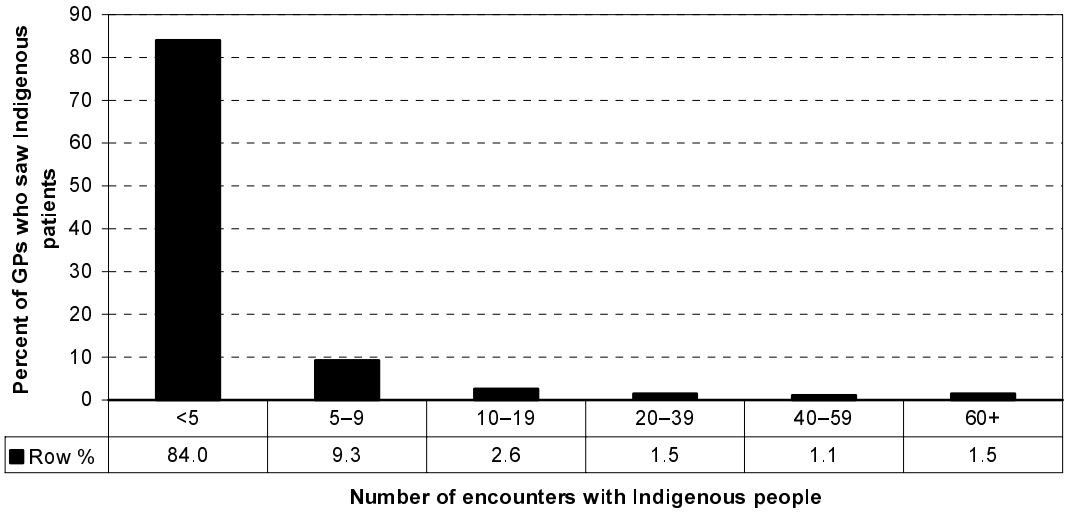

Figure 16.1: Distribution of Indigenous encounters by GP

16.2 The general practitioners

The characteristics of the 272 GPs who recorded at least one encounter with a patient identifying themselves as Aboriginal or Torres Strait Islander are compared with the those of the total GP sample in Table 16.1. These GPs tended to be younger than the total sample, 13.6% of them being aged less than 35 years (compared with 7.1% of the total sample) and 31.5% being aged 35–44 years (compared with 26.8%). Only marginal differences were apparent in the number of sessions per week, the size of their practice or their place of graduation. However, the distribution of practices by location was markedly different from that of the total GP sample. Only 54.6% of these GPs practised in capital cities, compared with almost 70% of the total sample. In contrast, 4.4% of these GPs practised in remote areas compared with 0.5% of the total sample and one-quarter (24.6%) practised in small rural or other rural areas (compared with 15.4% of the total sample).

Table 16.1: Characteristics of GPs who saw Indigenous people compared with the total GP sample

	GPs who saw Indigenous people		Total GP sample
GP characteristic	Number	Per cent of GPs[(a)] (*n*=272)	Per cent of GPs[(a)] (*n*=983)
Sex	. .	. .	. .
Male	171	62.7	64.2
Female	101	37.3	35.8
Age (missing)	(0)	. .	(1)
<35 years	37	13.6	7.1
35–44 years	86	31.5	26.8
45–54 years	75	27.5	36.5
55+ years	75	27.4	29.5

(continued)

Table 16.1 (continued): Characteristics of GPs who saw Indigenous people compared the total GP sample

	GPs who saw Indigenous people		Total GP sample
GP characteristic	Number	Per cent of GPs[(a)] (*n*=272)	Per cent of GPs[(a)] (*n*=983)
Sessions per week (missing)	(3)	. .	(15)
<6 per week	46	17.0	16.0
6–10 per week	183	68.2	67.8
11+ per week	40	14.8	14.8
Size of practice (missing)	(3)	. .	(4)
Solo	49	18.1	15.3
2–4 GPs	100	37.3	39.7
5+ GPs	120	44.6	44.7
Place of graduation	. .	. .	. .
Australia	200	73.3	76.1
United Kingdom	23	8.5	7.6
Asia	21	7.9	8.6
Other	28	10.3	7.6
Practice location	. .	. .	. .
Capital	148	54.6	69.3
Other metropolitan	23	8.3	8.1
Large rural	22	8.0	5.9
Small rural	23	8.4	4.9
Other rural	44	16.2	10.5
Remote central	6	2.3	0.5
Other remote, offshore	6	2.3	0.8

(a) Missing data removed.

16.3 Patient characteristics

Age and sex

The patient was male at 40.3% (95% CI: 41.9–43.3) of encounters and this parallelled the result for the total data set (42.3%, 95% CI: 41.9–43.3, Table 6.1). However, the age distribution of the Indigenous patients differed markedly from that of patients at all encounters (Figure 16.2).

Overall, Indigenous patients were significantly younger than the total sample of patients encountered, the proportion of persons aged less than 44 years being 68.2% compared with 48.6% in the total data set. This difference was apparent in all the younger age groups. In contrast the proportion of encounters with older Indigenous people was lower than that of the total data set, 21.9% being between 45 and 64 years of age (compared with 26.3% of the total sample) and only 8.9% being aged 65 years or more (compared with one in four in the total sample).

The age-specific rates of encounters with Indigenous persons are presented in Figure 16.3 and more clearly demonstrate these trends.

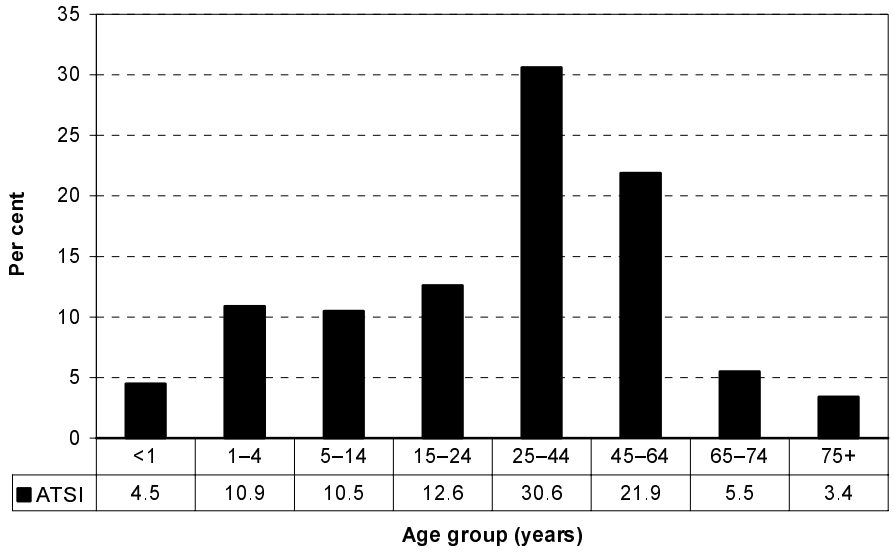

Figure 16.2: Age distribution of Indigenous persons

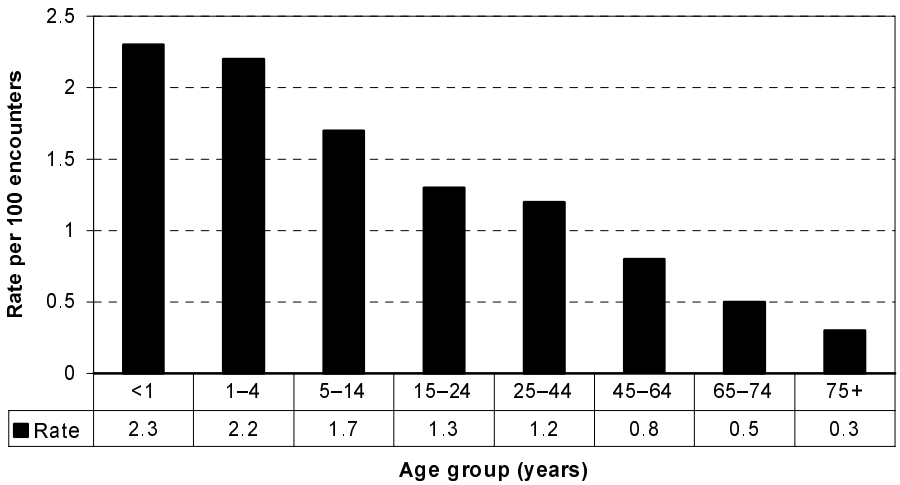

Figure 16.3: Age–specific rates of Indigenous encounters

Other patient characteristics

Table 16.2 describes the other characteristics of Indigenous patients and can be compared with Table 5.1 which describes the total sample. There were no statistically significant differences in the other characteristics of this group when compared with the total sample, the small sample size of encounters with Indigenous people providing wide confidence intervals. However, it is interesting to note that almost 70% of Indigenous people held a health care card, compared with 41.9% in the total sample.

The proportion of Indigenous persons who held a Commonwealth Department of Veterans' Affairs card was only slightly less than the proportion in the total data set (2.7% compared with 3.3% in the total data). Patients who had not been seen before at that practice ('new patients') represented 15.0% of the Indigenous sample compared with 9.2% of the total sample. Those patients who reported being from a non-English-speaking background represented 3.1% of the Indigenous subsample and 9.3 % of all patients.

Table 16.2: Other characteristics of patients at encounters with Indigenous people

Patient characteristic	Number	Per cent of encounters (*n*=982)[(a)]	95% LCL	95% UCL
New patient to practice	137	15.0	8.6	21.3
Health care card holder	666	67.8	58.8	76.9
Veterans' Affairs card holder	26	2.7	0.0	17.9
Non-English-speaking background	31	3.1	0.0	20.3

(a) Missing data removed in calculation of rates.
Note: LCL—lower confidence limit, UCL—upper confidence limit.

Geographic location

The GPs were asked to record the postcode of the patient's home residence at each encounter. After missing data were removed (n=36) the postcodes were classified according to State and by the Rural, Remote and Metropolitan Area (RRMA) classification.

Distribution by State

The distribution of Indigenous patient residence by state is presented in Figure 16.4. One-third of the Indigenous patients resided in Queensland and almost as many resided in New South Wales. Over 10% lived in Western Australia and there was only a small proportion living in each of the other States and Territories.

State-specific encounter rate

When the number of encounters with Indigenous people was viewed relative to the total number of encounters in each State/Territory it was apparent that their relative frequency was highest in the Northern Territory (6.2%), followed by Western Australia (2.0%) and then by Queensland (1.7%). In each of the remaining States and Territories the rate of Indigenous encounters was below 1.0% (Figure 16.5).

Distribution by RRMA

More than one-third (36.0%) of these Indigenous patients lived in capital cities and 26.9% in 'other rural areas'. Those living in remote areas represented 8.5% of the subsample and more than half of these were in remote centres (Figure 16.6).

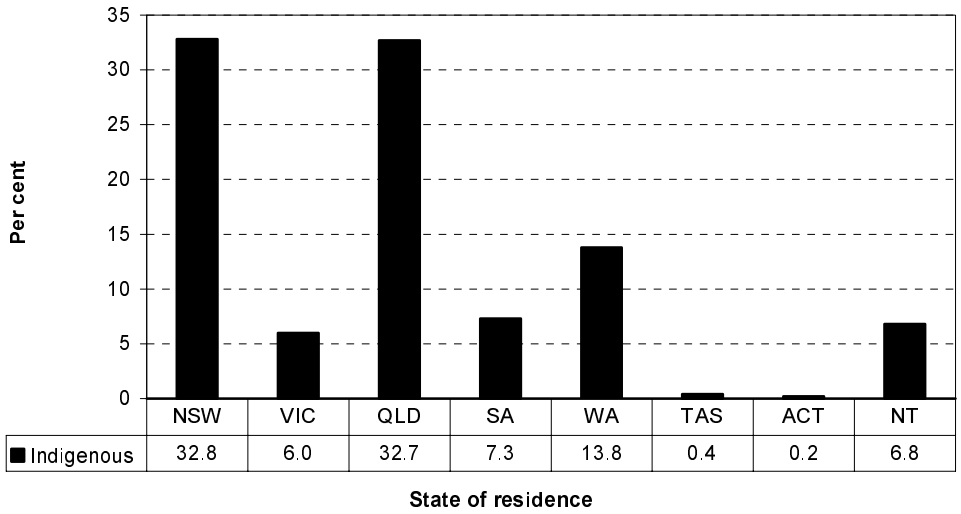

Figure 16.4: State distribution of Indigenous encounters

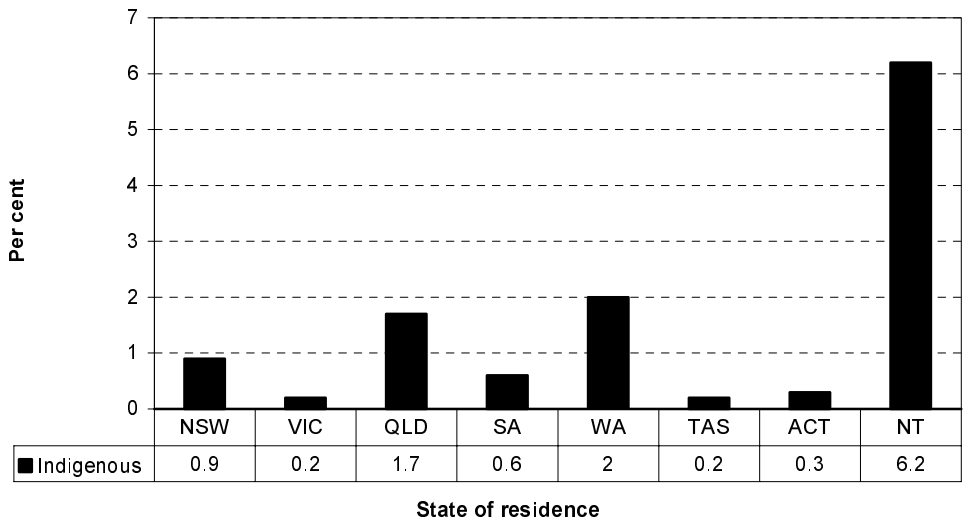

Figure 16.5: State-specific rate of Indigenous encounters

RRMA-specific encounter rates

However, when the distribution of encounters with Indigenous people was considered in relation to the distribution of all encounters across RRMAs a different picture emerged. Encounters with Indigenous people accounted for 13.0% of the total in remote centres and for 7.5% of those in other remote/offshore locations. There was also a relatively high rate of encounters with Indigenous people in other metropolitan areas (11.5%) but the rate was very low in capital cities (0.5%) (Figure 16.7).

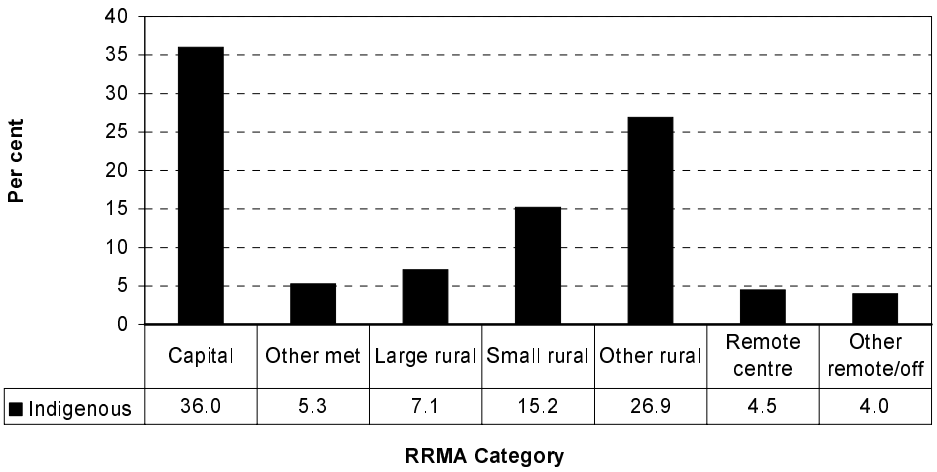

Figure 16.6: Distribution of Indigenous encounters, by RRMA

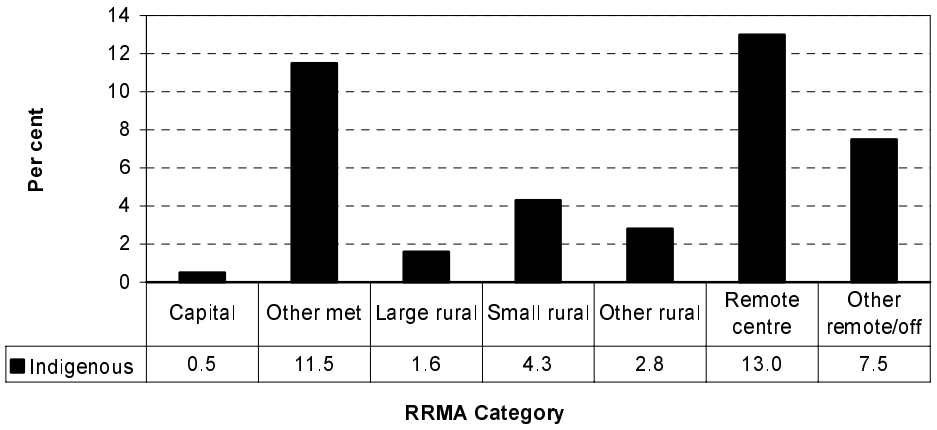

Figure 16.7: RRMA-specific rates of Indigenous encounters

16.4 Characteristics of the encounters

There were no significant differences in the distribution of encounters across payment source or by Medicare item number for encounters with Indigenous people (Table 16.3) compared with the total data set (Table 5.2). However, there were some minor trends.
A slightly lower proportion of total encounters with Indigenous people were recorded as standard surgery consultations (73.2% compared with 79.0% in the total data set) and encounters related to workers compensation were also less common (1.3 compared with 2.0 in the total data set). A slightly larger proportion of Indigenous encounters were marked as 'no charge' (1.3% compared with 0.6% in the total data set). However, the numbers involved were very small.

Table 16.3: Type of encounter with Indigenous people

Variable	Number	Rate per 100 encounters[(a)] (*n*=983)	95% LCL	95% UCL
Direct consultations	916	97.6	96.5	98.6
No charge	12	1.3	0.0	21.3
MBS items of service	870	92.7	89.8	95.7
Standard surgery consultations	689	73.2	67.7	79.1
Workers' compensation	12	1.3	0.0	25.9
Other paid (hospital, State, etc.)	22	2.3	0.0	17.7
Indirect consultations	23	2.4	0.0	5.5
Missing	44	. .	. .	. .

(a) Missing data removed

16.5 Morbidity and management

Table 16.4 summarises the major elements of encounters with Indigenous people. The results can be compared with those of the total data set in Table 5.1. The relative rate of patient reasons for encounter and the rate of problems managed at encounter were almost identical in the Indigenous encounters and in the total data set. There were no statistically significant differences in any of the other encounter variables due to wide confidence intervals generated by the small size of the Indigenous encounter sample. However, there were some trends in the data worthy of comment.

Table 16.4: Summary of morbidity and management at encounters with Indigenous people

Variable	Number	Rate per 100 encounters (*n*=983)	95% LCL	95% UCL
Reasons for encounter	1,469	149.5	143.6	155.5
Problems managed	1,422	144.7	136.8	152.7
New problems	606	61.7	52.9	70.5
Work-related	19	1.9	0.0	6.6
Medications	1,176	119.7	105.5	134.0
Prescribed	1,001	101.0	85.8	118.0
Advised OTC	58	5.9	0.9	10.9
GP supplied	117	11.9	0.0	28.8
Other treatments	559	56.9	46.9	66.9
Clinical	427	43.5	35.2	51.8
Procedural	132	13.4	10.0	16.9
Referrals	106	11.9	7.6	16.2
Specialist	62	6.3	3.0	9.7
Allied health services	35	3.5	0.3	6.8
Pathology	375	38.1	22.6	53.7
Imaging	92	9.3	5.4	13.2

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

The relative rate of new problems managed was somewhat higher among the Indigenous encounters (61.7 per 100 encounters compared with 55.1 in the total data set) and this may be related to the slightly higher proportion of new patients in the Indigenous sample. The total medication rate of 119.7 per 100 Indigenous encounters was also higher than average across all encounters (104.5 per 100). This was reflected in slightly higher prescribing rates (101.0 per 100 Indigenous encounters compared with 88.0 per 100 on average) and in the rate of GP-supplied medications (11.9 compared with 7.6 per 100 encounters in the total data set). However, it was not reflected in the rate of advised over-the-counter medications which was somewhat lower at Indigenous encounters (5.9 per 100) than average (8.9 per 100).

The relative rate of clinical treatments (such as advice and counselling) was a little higher at encounters with Indigenous people (43.5 per 100 encounters) than in the total data set (38.1 per 100), as were pathology order rates (38.1 compared with 31.0 per 100 encounters on average). Referral rates were similar to those in the total data set, though referrals to specialists were a little less frequent while those to allied health services were a little more common. The latter trends may be a reflection of the higher relative rates in Indigenous encounters in remote areas.

16.6 Patient reasons for encounter

Table 16.5: Most frequent patient reasons for encounter at encounters with Indigenous people

	Indigenous encounters				All encounters		
Patient reasons for encounter	Number	Rate per 100 encounters[(a)] (*n=982*)	95% LCL	95% UCL	Rate per 100 encounters[(a)] (*n*=96,973)	95% LCL	95% UCL
Prescription—all*	81	8.3	5.2	11.3	9.8	9.2	10.3
Cough	68	6.9	2.8	11.0	6.5	6.1	6.9
Check-up—all*	51	5.2	1.2	9.1	13.4	12.7	14.0
Back complaint*	43	4.4	0.0	9.2	3.8	3.6	4.1
Test results*	41	4.2	0.0	11.9	4.7	4.4	5.1
Immunisation all*	41	3.9	0.0	8.3	4.6	4.1	5.1
Fever	38	3.9	0.0	8.3	2.0	1.7	2.3
Abdominal pain*	28	2.9	0.0	6.1	2.1	2.0	2.3
Throat symptom/complaint	27	2.7	0.0	6.5	3.8	3.4	4.1
Rash*	26	2.7	0.0	7.1	2.8	2.6	3.0
Diabetes (non-gestational)*	23	2.4	0.0	5.6	1.0	0.8	1.2
Nasal congestion/sneeze	23	2.4	0.0	6.4	2.3	2.0	2.7
Asthma	22	2.3	0.0	5.9	2.1	2.0	2.3
Hypertension/high BP*	22	2.3	0.0	6.5	2.1	1.7	2.4
Chest pain NOS	22	2.2	0.0	4.7	1.2	1.1	1.4
Subtotal (n, % of RFEs)	*556*	*37.8*	. .	. .	*36.8*	. .	. .
Total RFEs	**1,469**	**149.5**	**143.6**	**155.5**	**149.2**	**147.4**	**150.9**

(a) Figures do not total 100 as more than one problem can be managed at each encounter.
* Includes multiple ICPC–2 and ICPC–2 PLUS codes (see Appendix 3).
Note: NOS—not otherwise specified, BP—blood pressure.

The fifteen most commonly recorded patient reasons for encounter are provided in decreasing order of frequency of the encounters with Indigenous people, together with the comparative results from the total data set in Table 16.5.

The only significant difference between the more common RFEs at encounters with Indigenous people and the total data set was the rate of requests for a check-up (either of a general nature or of a specific body system) which was significantly lower at Indigenous encounters than average and the difference was very large (5.2 per 100 Indigenous encounters compared with 13.4 per 100 total encounters). Other trends were apparent but these did not reach statistical significance. These included higher rates of presentation for diabetes (2.4 per 100 Indigenous encounters and 1.0 per 100 total) and for fever, chest pain, and abdominal pain. There were slightly lower rates of requests for a prescription, test results and immunisation and of throat complaints.

16.7 Morbidity managed

The distribution of the problems managed in encounters with Indigenous people is presented in terms of ICPC–2 chapters and compared with the distributions for all encounters in Table 16.6. Due to the relatively small sample size the confidence intervals around the results for Indigenous people are broad and this rendered any differences in the management rates of no statistical significance.

Table 16.6: Distribution of problems at Indigenous encounters by ICPC–2 chapter

	Indigenous encounters				All encounters		
Problems managed	Number	Rate per 100 encounters[(a)] (*n*=1,163)	95% LCL	95% UCL	Rate per 100 encounters[(a)] (*n*=140,824)	95% LCL	95% UCL
Respiratory	221	22.5	17.7	27.3	21.4	20.7	22.0
Skin	163	16.6	12.4	20.8	16.1	15.6	16.8
General & unspecified	143	14.6	9.6	19.6	14.7	14.0	15.5
Circulatory	134	13.6	9.2	18.1	16.1	15.5	16.8
Musculoskeletal	129	13.1	9.4	16.8	17.5	17.0	18.0
Endocrine and metabolic	126	12.9	8.7	17.0	10.4	10.0	10.9
Psychological	106	10.8	6.3	15.3	10.6	10.1	11.2
Digestive	101	10.3	6.9	13.5	9.9	9.6	10.2
Pregnancy, family planning	62	6.3	3.4	9.3	4.0	3.7	4.3
Ear	55	5.6	2.6	8.7	4.2	4.0	4.4
Female genital system	45	4.6	2.1	7.1	6.1	5.8	6.5
Urology	43	4.4	0.0	8.9	2.8	2.7	3.0
Neurological	33	3.4	0.0	7.3	3.7	3.5	3.9
Eye	27	2.8	0.0	6.5	2.5	2.4	2.6
Social problems	14	1.4	0.0	4.4	0.7	0.5	0.9
Male genital system	11	1.1	0.0	4.5	1.3	1.1	1.4
Blood	7	0.8	0.0	3.0	1.3	1.2	1.4
Total problems	**1,422**	**144.7**	**136.8**	**152.7**	**143.4**	**141.7**	**145.2**

(a) Figures do not total 100 as more than one problem can be managed at each encounter.
Note: UCL—upper confidence limit, LCL—lower confidence limit.

There were however some interesting trends. These included a slightly lower management rate of problems related to the circulatory system at 13.6 per 100 encounters compared with 16.1 per 100 in the total data set (probably reflecting the younger age of the Indigenous encounter sample), and of the musculoskeletal (13.1 and 17.5) and the female genital (4.6 and 6.1) systems. Somewhat higher rates of management appeared for problems related to the endocrine and metabolic system (12.9 per 100 encounters compared with 10.4 on average), pregnancy and family planning (6.3 compared with 4.0), the ear (5.6 and 4.2) and urological problems (4.4 per 100 encounters compared with the average 2.8). However, it must be remembered that the numbers in some of these cells are very small.

Table 16.7: Most frequent individual problems managed

	Indigenous encounters				All encounters		
Problems managed	**Number**	**Rate per 100 encounters[(a)] (*n*=982)**	**95% LCL**	**95% UCL**	**Rate per 100 encounters[(a)] (*n*=96,973)**	**95% LCL**	**95% UCL**
Hypertension*	65	6.6	3.1	10.2	9.0	8.6	9.5
Diabetes*	59	6.0	3.1	8.9	3.1	2.9	3.3
Asthma	49	5.0	0.0	10.5	2.8	2.6	3.0
Upper respiratory tract infection	49	4.9	1.0	8.8	6.2	5.8	6.6
Immunisation all*	45	4.6	0.0	12.2	4.7	4.2	5.1
Acute bronchitis/bronchiolitis	38	3.9	0.3	7.5	2.7	2.5	3.0
Depression*	32	3.2	0.0	6.7	3.4	3.2	3.6
Back complaint*	31	3.1	0.0	8.5	2.6	2.4	2.8
Acute otitis media/myringitis	29	3.0	0.0	6.1	1.3	1.2	1.5
Lipid disorder	22	2.3	0.0	5.7	2.9	2.7	3.1
General check-up*	21	2.2	0.0	6.0	1.8	1.6	2.0
Urinary tract infection*	20	2.1	0.0	5.8	1.6	1.5	1.7
Impetigo	20	2.1	0.0	11.0	0.2	0.0	0.5
Pregnancy*	20	2.0	0.0	5.0	0.9	0.7	1.1
Subtotal (n, % of total problems	*500*	*35.2*	. .	. .	*26.9*	. .	. .
Total problems	**1,422**	**144.7**	**136.8**	**152.7**	**143.4**	**141.7**	**145.2**

(a) Figures do not total 100 as more than one problem can be managed at each encounter. Also only the top ten are included.
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).
Note: LCL—Lower confidence limit, UCL—upper confidence limit.

The ten most common problems managed at encounters with Indigenous people are listed in decreasing order of frequency in Table 16.7 with comparative results for the total data set. Although the wide confidence intervals generated by the small sample size rendered none of the differences statistically significant, some interesting patterns emerged. The relative rate of problems related to the endocrine and metabolic system as a whole was earlier demonstrated to be slightly higher at encounters with Indigenous people. This would largely be due to the management rate of diabetes, which was about double the average rate (6.0 per 100 Indigenous encounters compared with 3.1 for the total data set).

In contrast, reflecting the generally lower rate of management of circulatory problems, hypertension was managed at a rate of only 6.6 per 100 Indigenous encounters compared with 9.0 per 100 total encounters. The rate of management of acute otitis media was notable at 3.0 per 100 encounters (compared with 1.3 on average), as was the rate of impetigo (2.1

per 100 compared with 0.2), and pregnancy (2.0 compared with 0.9 per 100). It is also interesting to note the slightly lower rate reported for upper respiratory tract infections and the reverse result for acute bronchitis.

16.8 Discussion

The proportion of total encounters that were identified as being with Indigenous people (1.0%) was low, relative to the proportion of Indigenous people in the total population (2.2% at 30 June 1999.[44] Nevertheless, this year represents approximately one million private general practice consultations with Indigenous people across the country in the 12 months 2001–02. We do not know the extent to which GPs regularly ask the question and the manner in which they ask it. Nor do we know the extent to which Indigenous people, when asked the question, are willing to identify themselves as such in this environment.

There are also methodological issues that may affect the reliability of these data. Throughout the BEACH program, GPs have been instructed to ask the patient whether they identify as an Aboriginal person and/or as a Torres Strait Islander. In the first year of the study (1998–99) both a 'Yes' and a 'No' box were offered for these and other questions about the characteristics of the patients (such as health care card status and non-English-speaking background). In that year the proportion of total encounters that was identified as being with Indigenous persons was 1.2%. In the second and third years of the program GPs were only offered a 'Yes' box for each of the patient characteristics being measured. This was because the first year's data had suggested that when offered both a positive and negative option they were inclined to tick only the 'Yes' boxes and leave the 'No' boxes blank. It was thought that removing the 'No' box would therefore not affect their responses.

However, between 1999 and 2001 the positive response rate to the Indigenous questions (and to other patient characteristics questions) decreased considerably, though the decrease was not statistically significant due to the small sample involved. In 1999–00 the proportion of total encounters identified as being with Indigenous persons was 0.7%[6] and in 2000–01 it was 0.8%.[7]

In the fourth BEACH year, 2001–02 (here reported), the form again included both a positive and negative option for each patient characteristic. While the GPs still tended to leave the 'No' box blank and only tick the 'Yes' box where appropriate, the proportion of encounters in which the patient responded positively to the questions on Indigenous status rose to 1.0%.

The extent to which these figures merely represent variance over the years in a very small proportion of encounters, or the extent to which the change in format of the recording form has affected these results, is not known. In the fifth year of BEACH a substudy is to be conducted to try to measure the extent to which these figures are likely to be an under-representation of the true attendance rates of Indigenous people.

This brief summary of the characteristics of Indigenous people who visited GPs participating in BEACH and the outline of the morbidity managed provide an indication of the health services provided to the Indigenous population by private general practitioners. The extent to which these services were provided in Aboriginal Community Controlled Health Services can only be roughly estimated from the current data. However, the estimates of the total number of private general practice consultations with Indigenous people in Australia suggest that private general practice has an important role in the care of the Indigenous population. In any assessment of the health of the Indigenous population these services must be considered.

17 Discussion

17.1 Overview of results

This report has provided a picture of the current activities of general practitioners, particularly the more frequent events, which together made up a large part of the GPs workload in Australia in 2001–02. The generalist nature of their practice has been 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 the management of a problem by a prescription alone only applies to 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 four problems managed. The small number of patients admitted to hospital or referred to the emergency department or to specialists indicates the extent to which patients are cared for by GPs in the community.

These data provide other researchers with a national average against which they can compare smaller study samples. The relatively large sample size underlying these national data, and the consequent relatively accurate estimates of the frequency of more common events, also allow researchers to plan studies of specific morbidity and its management by providing better estimates of required GP sample size through a knowledge of the likely occurrence of the event of interest. They provide healthcare 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 morbidity.

Changes over time

This fourth annual report of the BEACH program has provided the opportunity to further investigate changes in rates of management of selected morbidity and changes in treatments provided by GPs over the 4 years since April 1998. It has allowed us to test the extent to which changes in practice patterns suggested in the third year of the program[7] continued through its fourth year. Where changes identified in the third year were demonstrated to remain steady in the fourth, or in fact to continue to change, the reader can be assured that real change is occurring and that the first measure of change was not a chance statistical event.

Changes in rates of management of specific types of morbidity, changes in prescribing rates of some medications and in use of selected types of counselling were demonstrated in Chapter 14. On the basis of these findings, some topics were selected for further investigation into the relationship between changes in pharmacological management and changes in morbidity rates (Chapter 15). Some of these results are further discussed below.

Over the last few years there has been media attention given to a hypothesised increase in the prevalence of depression in the community. Last year it was shown that there had been a considerable increase in the rates of management of depression in general practice during the 1990s. However, there had been no significant increase in management rates of depression since BEACH began in April 1998. This fourth year of data supported this

finding, there being no significant increase in management rates between 1998–99 and 2001–02.

New MBS items for the management of psychological problems are being introduced during 2002 but GPs will be required to undertake some specific training in depression management prior to claiming this item. As BEACH continues, it has the potential to measure the effect of the introduction of these and other new MBS item numbers on GP practice.

The shift away from tricyclic anti-depressants and the monoamine oxidase inhibitors, towards prescription of SSRIs, identified in the third year of the BEACH program, continued through the fourth year. As SSRIs are the pharmacological treatment of first choice by Australian psychiatrists for all forms of depression,[45] this change can be seen as a continued improvement in quality of care. Future trends in this practice will be measurable over time.

The BEACH data also provides an opportunity to measure the impact of the listing (on the PBS) of a new pharmacological preparation and then investigate the longer term effect on prescribing practice after initial GP reaction to the listing. One type of NSAID, the Cox-2 inhibitors, were listed on the PBS in month four of the BEACH program 2000–01. In last year's report it was shown that over a decade ago GPs prescribed NSAIDs at a relative rate of 5.9 per 100 encounters.[18] In 1998–99 this rate had dropped to 5.0 per 100 encounters, increased to 5.7 per 100 in the second year of BEACH and then to 6.8 per 100 encounters in 2000–01. A large proportion of the increase in 2000–01 was due to a rise in prescribing of Cox-2 inhibitors, from 0.3 per 100 encounter in 1999–00 (when available on private prescription) to 2.7 per 100 encounters (when listed for 8 months of the data year, on the PBS).[7]

In 2001–02 the rate of NSAID prescribing levelled off to 6.4 per 100 encounters. However, this was not due to any levelling of prescribing rates for the Cox-2 inhibitors. These rose again from 2.7 medications per 100 encounters to 3.0 per 100. Some substitution of Cox-2 inhibitors for other NSAIDs was apparent.

There are two medications in the Cox–2 inhibitor group: celecoxib, which was first listed in late 2000 and rofecoxib, which was first listed in early 2001. In 2000–01 it was reported that 11% of the celecoxib medications recorded in BEACH had been supplied by the GP directly to the patient. In 2001–02 this distribution between supplied and prescribed remained constant for celecoxib. However, while last year celecoxib was the medication in second place of those drugs supplied by the GP, it took fourth place in 2001–02. In contrast, rofecoxib entered the PBS list in only the last 3 months of the third year of the BEACH program, having little impact on the third year prescribing results. However, in the 2001–02 BEACH year, rofecoxib was the eleventh most frequently prescribed medication and the second most frequently supplied by the GP. GP supply of rofecoxib accounted for 15.1% of its total provision in the current BEACH year.

In Chapter 15 it was found that total NSAID prescribing for arthritic conditions (for which prescription of Cox-2s is approved) increased significantly in 2001–02 and this was almost entirely due to increased prescribing of the Cox-2 inhibitors, with some shift from other NSAIDs to the Cox-2s. In the management of other musculoskeletal conditions the NSAID prescribing rate remained constant in 2001–02 but there was evidence of increasing substitution of Cox-2 inhibitors for other NSAIDs, as was the case in the management of arthritis.

BEACH is the only data source that provides an indication of GP use of non-pharmacological management. With increasing attention being paid to the need for improved health preventive behaviour in the overall population, it is encouraging to see that GP provision of lifestyle counselling and advice has increased significantly since 1998–99, from a rate of 6.4 per 100 encounters to 8.1 per 100 in 2001–02, equivalent to an increase of about 600,000 encounters in which patients are receiving such advice across the country over the year.

The effect of GP and patient educational interventions on practice patterns can less easily be measured. Often, multiple interventions occur in parallel to system changes. For example, Chapter 14 showed a measured increase in the relative rate of management of diabetes since 1998–99, from 2.6 per 100 encounters to 3.1 per 100 encounters in 2001–02. This may be reflecting the early effect of the new Medicare incentive item number for completion of annual diabetes programs.[1] It may also be the result of the many programs being operated by Divisions of General Practice to effect improvement in the diagnosis and ongoing management of diabetes. These results suggest there has been a small but consistent impact of such measures on management rates of diabetes in general practice. It will be interesting to further investigate the management rates of diabetes next year, when the Medicare incentive payment will have been available for the full 12 months of the BEACH data year.

Last year a decrease in GP contacts for the management of asthma was noted from the previous year. This change was quite sudden, no suggestion of a decrease in management rates being made by earlier BEACH data. It was interesting to note that this lower management rate remained in the fourth year of BEACH but it did not decrease further. Since November 2001 GPs have been able to claim from Medicare for completion of the Asthma 3+Visit Plan.[1] To date its introduction appears not to have effected a change in management rates for asthma, as the decrease in management rates occurred before its introduction. However, there were other types of asthma plans being promoted prior to the Asthma 3+Visit Plan and these may have caused the measured decrease in management rates. 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. However, management rates of asthma will continue to be monitored in the coming years, when the MBS incentive item for asthma management will have been available for the full BEACH data year.

Changes in pathology order rates are currently being investigated in detail and will be reported elsewhere.

Encounters with Indigenous people

This report includes an overview of encounters at which the patient identified themselves as being an Aboriginal person or a Torres Strait Islander. This subject has not been reported since the first BEACH report.[46]

The 916 patients who stated they identified as Aboriginal or Torres Strait Islander people (1.0% of all encounters) were significantly younger than the total sample and more likely to hold a health care card. Their encounters represented 0.5% of those in capital cities but 13.0% of those in remote centres and 7.5% of those in other remote areas. The issues surrounding sample size and geographic distribution are discussed later in this chapter (see 'Methodological issues').

While there were no statistically significant differences between encounters with these Indigenous people and the total data set, this was probably due to a large extent to the size

of the sample. Certainly there were many trends of clinical significance, including higher rates of management of diabetes and acute bronchitis which should be investigated further in private general practice (see 'Methological issues' in this chapter).

Patient health risk factors

The fourth year of measurement of the risk behaviours of adults attending general practice provided interesting results. The extent to which patients in the sample smoked on a regular basis and the proportion of the population who reported at-risk alcohol consumption remained reasonably constant at about 19% and 25% respectively. While the proportion of patients who were overweight increased significantly between 1998–99 and 2001–02, the change was only about 1% over the 4-year period. In contrast, the proportion classed as obese increased steadily each year, providing an overall increase between 1998–99 and 2001–02 of 3%, from 18.4% to 21.4% (a 16% increase in obesity prevalence in patients encountered in general practice). At this rate of increase it could be expected that, by 2010, almost 30% of patients encountered by GPs in their normal working day will be obese.

For the first time in the BEACH program all three risk behaviour questions were asked of the same subsample of patients. The results indicated that only 27.8% of these patients had normal BMI, did not smoke and did not consume alcohol at at-risk levels. One in five patients were found to carry two of these three risk behaviours and 3.7% responded positively to all three.

These results demonstrate that their patients provide GPs with ample reason to give them better education of the potential harm of such risk behaviours. The significant increase in provision of lifestyle counselling and advice to patients over the past 4 years (noted above) suggest increased GP awareness of the need for many of their patients to alter their current health risk behaviours.

17.2 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.[25]

GP participation rates

The participation rate of GPs in this fourth year of BEACH was 32.3% of those with whom contact could be established. This was a little higher than the response rate for the third BEACH year (29.8%)[7] but far lower than that gained in the first (38.4%)[46] and second (39.1%) BEACH years.[6] The participating GPs were found to be older and less busy than those who

declined to participate, and post-stratification weighting was applied to the encounter data to deal with these differences.

Nevertheless, the continuation of this lower 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 Quality Assurance requirements. It was hypothesised in BEACH 2000–01 that the decrease in response rate in the third BEACH year was due to some extent to the phase in the QA cycle. It was suggested that the fourth year may show improvement in response because the data collection period covered the last 9 months of the QA cycle and the first 3 months of a new cycle. It was thought that GPs who had not yet gained their audit points for the last triennium would be keen to participate and that the new triennium would provide a new incentive for participation. This did not prove to be the case and other reasons for the decreased participation rate must be considered.
- In 2001, a wide range of new options were offered to GPs through the Quality Assurance 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. This may well have influenced GPs to complete an alternative option.
- 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. In fact, there is widespread concern about the extent of the demands being made on GPs for such activities. In response to this concern, the DoHA has recently established the Statistical Clearing House in which all projects funded by the department will be registered. This may provide an opportunity to unify some programs and decrease the demands on GPs for their time.
- As in previous BEACH years, GPs aged less than 35 years were under-represented in the final GP sample and this could be due to the fact that general practice registrars are not required to undertake QA activities during training and during the QA triennium of completion of training. Some incentives need to be introduced to encourage participation of these younger GPs in BEACH.
- A similar issue is arising with recruitment of the increasing number of unrecognised GPs now allowed to practice in needy rural areas, who by special arrangement can claim A1 Medicare items of service but who are not required to undertake QA activities. The majority of these practitioners work in rural and remote areas, and these are areas in which more detailed information about clinical activity is currently needed. Incentives are also needed to encourage the participation of these practitioners to ensure sufficient representation of general practice in the more remote areas.
- Sampling issues also affect recruitment levels but these have been reasonably constant influences over the period of the BEACH program.

  Eight per cent of the GPs in the sample provided by the DoHA from the HIC records 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 HIC for this study) is out of date is increasing very quickly. 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 increasing impact of these issues on recruitment of GPs to BEACH cannot be ignored. The research team is currently investigating means by which future BEACH participating GPs could be better rewarded for the considerable investment of their time and effort in undertaking the program.

Sample sizes for Indigenous patients and remote areas

The small sample of Indigenous persons identified in this study (*n*=916) clearly reflects the extent to which remote areas are sampled in a total national sample. Indigenous people represent about 2% of the Australian population and it could be expected that the number identified in BEACH should represent approximately the same proportion of patients encountered. It must be remembered that many Indigenous persons are being seen in Aboriginal Community Controlled Health Services, and this may account for some of the difference. However, currently we do not know if encounters with Indigenous people are actually under-estimated in BEACH or whether, in fact, Indigenous people attend GPs far less than the rest of the community. The GPSCU is conducting a substudy in the current BEACH year to investigate the extent to which encounters with Indigenous persons are being under-estimated (if this is indeed the case).

A number of factors impact on this subject. The issues surrounding the extent to which GPs actually ask their patients whether they do or do not identify as an Indigenous person and the extent to which patient preference may impact on such self-identification were discussed in Chapter 13. However, there is an overall methodological issue in sampling that must also be considered. Quite rightly, the number of GPs participating in BEACH from remote centres and other remote areas is small, reflecting the small proportion of practising recognised GPs working in these areas. The result indicated far higher proportions of encounters with Indigenous persons in these regions than in metropolitan areas. The small number of GPs in the sample working in remote centres and other remote areas must therefore impact on the likelihood of Indigenous persons being encountered by the sampled GPs.

If we want a true picture of the provision of private general practice services to Indigenous people over-sampling of these areas is essential. The cooperation of this small group of practitioners would first need to be established. As they number only about 140 a very high response rate would be required from them if sufficient numbers of GPs are to be recruited. Further, as discussed above, with increasing numbers of non-recognised GPs working in these areas (GPs who are not required to complete the Quality Assurance Program), efforts would need to be made to include them in the over-sample. Not only would this provide a more reliable picture of Indigenous health services provided by private general practice but it would provide both the Government and the profession with a far better understanding of the health needs of these communities and the type of work being undertaken by these providers. In turn this may assist in planning of educational programs for practitioners intending to work in these areas.

Response rates to specific variables

In the second year of the BEACH study some changes were made to the layout of the forms based on the experience gained in the first year of the program. The second annual report raised some methodological issues regarding the effect of these changes on GP completion rates for some variables, including some patient characteristics and the number of repeat prescriptions.[6] These effects were noted only during analysis of the Year 2 data which was conducted in parallel with the Year 3 data collection. Therefore changes could not be made for the third year.

Changes in layout were made at the end of the third year in an effort to improve completion rates for some variables. These included changes to the layout of the patient characteristic questions and more-specific instructions regarding number of repeats.

This year's results indicate that these changes improved response rates in a number of areas. The proportion of missing data in responses to each of the patient characteristic questions improved, as did the recording of the number of medication repeats prescribed.

Electronic BEACH data collection: a controlled trial

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 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[47] it is likely that those who do not have EHRs differ from those who do. Sampling of only GPs with EHRs would therefore give a biased national result.
- Many GPs currently use electronic prescribing systems rather than full EHRs. The extent to which data are entered at encounters that do not involve a prescription is not known. 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. Drawing reliable and representative data from electronic clinical systems is likely to require the introduction of a standardised minimum data set and use of standard coding and classification systems in all electronic clinical systems. Such coding systems will be required for each of the data elements within the minimum data set (i.e. such variables as patient cultural background, pathology orders, clinical services, procedures etc.) as well as the problems under management.
- Issues of privacy and confidentiality also need to be resolved.

It may therefore be many years before data collection programs aiming to describe national general practice activity will be able to rely on passive data collection directly from EHRs.

Another possibility is for data to be actively collected on computer, either as the sole method of data collection (when all GPs have EHRs), or in parallel with paper-based data collection.

The GPSCU is currently undertaking a longitudinal matched controlled trail of active computerised data collection compared with paper-based data collection, in the western, northwestern and southwestern areas of Sydney. Interactive software was developed that reflects the data elements collected in BEACH. This initial trial software does not interact with any clinical system being used by the GP so that s/he is required to actively complete each field covered by the recording form. However, the system does include the ICPC–2 PLUS coding system and the CAPS pharmaceutical coding system with their search engines. This will ensure that on term selection or entry, the data will be coded and classified automatically in the background.

The trial is being conducted with a sample of GPs who participated in BEACH during 2000–01 and, apart from the method of data collection, the process is the same as that normally used in the BEACH program. The results of the two data sets will be compared after statistical adjustment for differences in the age–sex distribution of the patients seen. Management patterns will be compared after adjustment for the morbidity managed in the two time frames. If this trial demonstrates that the data collected by active computerised methods are not significantly different from those collected on paper and the method is found to be acceptable to the participating GPs, future participants in BEACH could be offered the option of paper- or computer-based methods. A separate report on the findings of this study will be made in the future.

Other BEACH applications

Under DoHA funding, the National Consortium for Education in Primary Medical Care (NCEPMC) has recently established an alternative pathway to general practice recognition. Practitioners who wish to take this pathway to the FRACGP examination must complete 400 hours of education prior to sitting the examination. They first must assess their educational needs so that the educational program can be planned around the individual practitioner. The general practitioners complete the BEACH process as a tool to assist in the identification of specific educational needs. Currently these practitioners complete BEACH on paper. However, if the trial of active computerised collection described above proves valid and acceptable to the GPs, participants in the Alternative Pathway program will be offered this method.

17.3 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.[30] Although integration of data from multiple sources can provide a more comprehensive picture of the health of the Australian community, 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 over-the-counter 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 or not the medication is covered by the PBS for all patients, for those holding a health care 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 health care card or for those who have reached the safety net threshold.

These differences will influence not only the numbers of prescriptions counted but also their distribution. For example, the majority of hormone replacement therapies (HRTs) 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 health care 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.

The Medicare Benefits Schedule (MBS) items

If comparing the BEACH data with Medicare data, remember that

- the MBS data provided by the DoHA does 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 those of 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; and

- 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 (such as State health departments, private insurance companies, workers compensation, etc.) 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.

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, remember that

- BEACH reflects the GP's intent that the patient have the pathology test(s) done and information as to 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; and
- 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 includes 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 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 HbA1cs 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*.[29] A study of changes in pathology ordering patterns between 1998–99 and 2000–01 is currently being undertaken and will be reported elsewhere.

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*.[31]

18 Conclusion

This report has provided an updated description of the major aspects of general practice activity in Australia 2001–02. It has also provided a further measure of the changes that have occurred in general practice since 1998–99, the extent to which changes noted in the last report have continued to progress, or have settled during the last year.

Readers should be aware that a summary of the results of the more common events recorded in BEACH in each of the 4 years reported to date is provided as Appendix 4. This provides an easy reference point for trends in data pertaining to specific topics of interest.

18.1 Current status of BEACH

The BEACH program is now in its fifth year. The database for the first 4 years includes data pertaining to approximately 400,000 GP–patient encounters from about 4,000 GPs. Each year the GPSCU publishes an annual report of BEACH results through the Australian Institute of Health and Welfare in which the results from the previous BEACH data year are reported 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 example is a study of the patients for whom cardiovascular problems are managed in general practice, their risk behaviours, and cardiovascular disease prevalence. Current studies which will be reported in the near future include: the care of males in general practice 2000–01; the care of the elderly in general practice 2000–02; defining chronic disease in Australian general practice; changes between 1998–99 and 2000–01 in GPs' ordering of pathology, and (in association with the Family Medicine Research Centre, University of Sydney) a comparative study of the practice patterns of Fellows of the Royal Australian College of General Practitioners and those who are not.

18.2 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.

Abstracts of results for the substudies conducted in the third year of the program and not reported in this document are available through the web site of the Family Medicine Research Centre (of which the GPSCU is a part) at http://www.fmrc.org.au. The subjects covered in the abstracts are listed below, together with an indication of the number of GPs and the number of encounters in each subsample.

Abstract Number	Subject	Number of encounters	Number of GPs
25	Prevalence of diabetes, medications and control	2,746	93
26	Prevalence of diagnosed hypertension and difficulties in treatment	2,810	95
27	Prevalence and management of influenza	2,784	94
28	Prevalence of Alzheimers disease and dementia	2,194	88
29	Non-steroidal anti-inflammatory drugs (NSAIDs) and acid suppressant use	2,551	88
30	Lipid-lowering medications and coronary heart disease	2,661	90
31	Prevalence and severity of chronic heart failure	2,618	89
32	Patient use of after-hours medical services	2,544	88
33	Prevalence and management of cardiovascular risk factors	3,108	105
34	Gastro-oesophageal reflux disease	3,018	102
35	Smoking status of adults and their attempts to quit	5,823	231
36	Patients use of complementary therapy	5,567	193
37	Prevalence of common morbidities in patients encountered in general practice	11,373	379

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. Analysis of the data is a complex task. The General Practice Statistics and Classification Unit has therefore designed standard report formats that cover most aspects of the subject under investigation. Individual data analyses are conducted where the specific research question is not adequately answered through standard reports. The GPSCU now provides participating organisations direct web access to straightforward analyses on any selected problem or medication in real time.

External purchasers of standard reports

Non-contributing organisations may purchase standard reports or other ad hoc analyses. Charges are available on request. The General Practice Statistics and Classification Unit 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 general practitioner.

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*

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
  - *nursing home visits:* 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).

Grouper: Multiple ICPC–2 or ICPC–2 PLUS codes which are grouped together for purposes of analysis.

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

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.

Problem managed: See *Diagnosis/problem*

Provider: A person to whom a patient has access when contacting the healthcare 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. (Medicare Benefits Schedule book, 1 November 1998).

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 specialist, 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 PLUS.

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

Tricyclics: non-selective monoamine reuptake inhibitor medications.

Statins: HMG CoA reductase inhibitors.

Abbreviations

ABS	Australian Bureau of Statistics
ACCHS	Aboriginal Community Controlled Health Services
AHP	Allied health professional
AHS	Allied health service
AIHW	Australian Institute of Health and Welfare
AMA	Australian Medical Association
AMTS	Australian Morbidity and Treatment Survey 1990–91
ATC	Anatomical Therapeutic Chemical (classification)
AUDIT	Alcohol Use Disorders Identification Test
BEACH	Bettering the Evaluation And Care of Health
BMI	Body mass index
BMMS	Better Medication Management System
C&S	Culture and sensitivity
CAPS	Coding Atlas for Pharmaceutical Substances
CI	Confidence interval (in this report 95% CI is used)
CNS	Central nervous system
COAD	Chronic obstructive airways disease
CT	Computed tomography
CVS	Cardiovascular system
DoHA	Commonwealth Department of Health and Ageing
DHAC	Commonwealth Department of Health and Aged Care
DHHCS	Commonwealth Department of Health, Housing and Community Services
DHSH	Commonwealth Department of Human Services and Health
DPIE	Department of Primary Industries and Energy
EHRs	Electronic health records
Enc	Encounter
EPC	Enhanced primary care
ESR	Erythrocyte sedimentation rate
EUC	Electrolytes, urea and creatinine
FBC	Full blood count
FMRC	Family Medicine Research Centre, University of Sydney
FRACGP	Fellow of the Royal Australian College of General Practitioners
GISCA	National Centre for Social Applications of Geographic Information Systems
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
IHD	Ischaemic heart disease
LCL	Lower confidence limit
MAOIs	Monoamine oxidase inhibitors (medications)
MBS	Medicare Benefits Schedule
MC&S	Microscopy, culture and sensitivity
MRI	Magnetic resonance imaging
NDSHS	National Drug Strategic Household Survey 2001
NEC	Not elsewhere classified
NESB	The patient reports coming from a non-English-speaking background, i.e. a language other than English is spoken at home.
NHMRC	National Health and Medical Research Council
NOS	Not otherwise specified
NSAID	Non-steroidal anti-inflammatory drugs
OA	Osteoarthritis
OTCs	Medications advised for over-the-counter purchase
PBS	Pharmaceutical Benefits Scheme
PDD	Prescribed daily dose
PIP	Practice Incentive Program of the Commonwealth Department of Health and Aged Care
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 for encounter(s) (see Glossary)
RICE	Rest, ice, compression and elevation
RRMA	Rural, Remote and Metropolitan Area classification
SAND	Supplementary Analysis of Nominated Data

SAS	Statistical Analysis System
SSRIs	Serotonin reuptake inhibitors (medications)
UCL	Upper confidence limit
URTI	Upper respiratory tract infection
UTI	Urinary tract infection
VA	Veterans' Affairs
WHO	World Health Organization
WONCA	World Organization of Family Doctors

Appendix 1: Example of a recording form

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

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

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

PATIENT SEEN ☐
PATIENT NOT SEEN ☐

Item No: (if applicable)

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

START Time ___:___ AM / PM (please circle)

Patient Reasons for Encounter
1.
2.
3.

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

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

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

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

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

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

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

Drug Name for this problem	Strengthof product	Dose and form	Frequency	No. of Rpts	OTC	GP Supply	Drug status New	Drug status Cont.
1.								
2.								
3.								
4.								

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

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

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

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

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

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

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

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

Patient's Height: ___ cm
Weight: ___ kg

To the patient if 18+: How often do you have a drink containing alcohol?
Never ☐
Monthly or less ☐
Once a week/fortnight ☐
2-3 times a week ☐
4+ times a week ☐

How many 'standard' drinks do you have on a typical day when you are drinking? ___

How often do you have 6 or more standard drinks on one occasion?
Never ☐
Less than monthly ☐
Monthly ☐
Weekly ☐
Daily or almost daily ☐

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

FINISH Time ___:___ AM / PM (please circle)

BA4

Appendix 2: GP characteristics questionnaire

The University of Sydney
at Westmead Hospital

General Practice Statistics and Classification Unit
Family Medicine Research Centre

Doctor Identification Number

a collaborating unit of the
Australian Institute of Health and Welfare

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 general practitioners work with you at this practice? ..... [ ]
(Practice = shared medical records)

5. What is the postcode of your 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. General Practice training status (CSCT or RACGP training programme)?
- Presently training..... 1
- Completed training..... 2
- Not Applicable 3

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

10. Number of general practice sessions you usually work per week?.... [ ]

11. Direct patient care hours worked per week?
(Please estimate the hours usually spent on service provision to patients including direct patient care, instructions, counselling etc and other related services such as writing referrals, prescriptions, phone calls etc.) ..... [ ]

12. Hours on call but not worked per week?..... [ ]

13. 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

14. How do you routinely instruct pharmacists on the substitution of generic drugs?
- Substitute allowed 1
- No substitute allowed..... 2

15. 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

16. Is this practice accredited ?..... **Yes / No**

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

18. Is your major practice site a teaching practice?
- for undergraduates..... 1
- for GP registrars 2
- No..... 3

*Thank you for participating in the **BEACH PROGRAM**.*

GPS&CU, Acacia House, Westmead Hospital, WESTMEAD, 2145.
Ph: 02 98458151 fax: 02 98458155 email: janc@genprac.wsahs.nsw.gov.au Web http://www.fmrc.org.au

Appendix 3: Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC 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
		L91009	Arthritis
		L91010	Arthritis; acute
		L91011	Arthritis; allergic
		L91012	Polyarthritis
		L92006	Arthritis; shoulder
		S91002	Arthritis; psoriatic
		T99063	Arthritis; crystal (excl. gout)

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC 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)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC 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
		L99017	Fracture; non-union
		L99018	Fracture; pathological
		L99019	Fracture; malunion
		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
		W81003	Hypertension in pregnancy
Hypertension (problems)	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
		W81003	Hypertension in pregnancy
Immunisation	A44		Preventive immunisation/medication–general/unspecified
	D44		Preventive immunisation/medication; hepatitis
	N44		Preventive immunisation/medication; tetanus
	R44		Preventive immunisation/medication; influenza
Ischaemic heart disease	K74		Ischaemic heart disease without angina
	K76		Ischaemic heart disease with angina
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

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC rubric	ICPC–2 PLUS code	ICPC/ICPC–2 PLUS label
Reasons for encounter and problems managed (continued)			
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
		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
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
		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

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
CLINICAL TREATMENTS		
Advice—care of other person	A45022	Advice; care of sick 3rd person
	A45023	Advice; care of well 3rd person
	A58001	Counselling; terminal care
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
Advice/education—legal/other	A45017	Advice/education; compensation
	Z45009	Advice/education; legal
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
Advice/education—mothercare	A45024	Advice; mothercare
Advice/education—treatment	A45016	Advice/education; treatment
	A45019	Advice; time off work
	A45020	Advice; rest/fluids
	A45021	Advice; naturopathic treatment
	A48004	Review; treatment
	S45004	Advice/education; RICE
	T45004	Advice/education; diabetes

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Clinical treatments (continued)		
Consultation with primary care provider	–46	
Consultation with specialist	–47	
Counsel/advice—STDs	A45012	Advice/education; STD
	A58008	Counselling; STDs
	X58004	Counselling; STDs; female
	Y58004	Counselling; STDs; male
Counsel/advice—alcohol	P45005	Advice/education; alcohol
	P58009	Counselling; alcohol
	P58020	Rehabilitation; alcohol
Counsel/advice—drug abuse	P45006	Advice/education; illicit drugs
	P58010	Counselling; drug abuse
	P58020	Rehabilitation; drug
Counsel/advice—exercise	A45004	Advice/education; exercise
	A58005	Counselling; exercise
Counsel/advice—health/body	A45005	Advice/education; health
	A45009	Health promotion
	A45010	Information; health
	A45011	Health promotion; injury
	A45018	Advice/education; body
	A58006	Counselling; health
Counsel/advice—lifestyle	P45008	Advice/education; lifestyle
	P58012	Counselling; lifestyle
Counsel/advice—nutrition/weight	A45006	Advice/education; diet
	T45005	Advice/education; nutritional
	T45007	Advice/education; weight management
	T58002	Counselling; weight management
Counsel/advice—occupational	Z45004	Advice/education; occupation
	Z45010	Advice/education; work practice
	Z58004	Counselling; occupational
Counsel/advice—other	A45014	Advice/education; travel
	P45009	Advice/education; sexuality
	P45010	Advice/education; life stage
	P58016	Counselling; life stage
	Z58005	Counselling; environment
Counsel/advice—pregnancy	W45009	Advice/education; pregnancy
	W58004	Counselling; prenatal
	W58006	Counselling; problem; pregnancy

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Clinical treatments (continued)		
Counsel/advice—prevention	A45025	Advice/education; immunisation
	A58007	Counselling; prevention
	X45004	Advice/education; breast self exam
	Z45005	Advice/education; environment
Counsel/advice—relationship	Z45006	Advice/education; parenting
	Z45007	Advice/education; mothering
	Z45008	Advice/education; fathering
	Z58001	Counselling; conjugal; partner
	Z58003	Counselling; marriage/relationship
	Z58006	Counselling; parenting
	Z58007	Counselling; mothering
	Z58008	Counselling; fathering
	Z58009	Counselling; family
Counsel/advice—relaxation	P45007	Advice/education; relaxation
	P58011	Counselling; relaxation
	P58017	Counselling; stress management
Counsel/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

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Clinical treatments (continued)		
Counselling—psychological (continued)	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	W14015	Counselling; genetic; female
	W45006	Advice/education; preconceptual
	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
	Y14006	Counselling; genetic; male
	Y45006	Advice/education; family plan; male
	Y58005	Counselling; sterilisation; male
	Y58006	Counselling; family planning; male
Observe/wait	A45001	Observe/wait
	B45001	Observe/wait; blood/blood-forming organs
	D45001	Observe/wait; digestive
	F45001	Observe/wait; eye
	H45001	Observe/wait; ear
	K45001	Observe/wait; cardiovascular
	L45001	Observe/wait; musculoskeletal
	N45001	Observe/wait; neurological
	P45002	Observe/wait; psychological
	R45001	Observe/wait; respiratory
	S45001	Observe/wait; skin
	T45001	Observe/wait; endocrine/metabolic
	U45001	Observe/wait; urology
	W45003	Observe/wait; reproductive
	X45001	Observe/wait; genital; female
	Y45001	Observe/wait; genital; male
	Z45001	Observe/wait; social

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Clinical treatments (continued)		
Other admin/document	–62 (excluding sickness certificate A62008	
Reassurance support	A58010	Reassurance/support
Sickness certificate	A62008	Admin; certificate; sickness
CLINICAL MEASUREMENTS		
Diagnostic radiology/imaging	–41	
Electrical tracings	–42	
Physical medicine/rehabilitation	–57	
PROCEDURES		
Assist at operation	A69006	Assist at operation
	B69002	Assist at operation; blood
	D69002	Assist at operation; digestive
	F69002	Assist at operation; eye
	H69002	Assist at operation; ear
	L69002	Assist at operation; musculoskeletal
	N69002	Assist at operation; neurological
	P69002	Assist at operation; psycho
	R69002	Assist at operation; respiratory
	S69002	Assist at operation; skin
	T69002	Assist at operation; endo/metab
	U69002	Assist at operation; urological
	W69002	Assist at operation; reproductive
	X69002	Assist at operation; genital; female
	Y69002	Assist at operation; genital; male
	Z69003	Assist at operation; social
Contraceptive device fit/supply/remove	W12003	Contraception; IUD
	W12004	Insertion; IUCD
	W12005	Removal; IUCD
	W14010	Contraception; diaphragm
	W14012	Fitting (of); diaphragm
	W14013	Supply; diaphragm
	W14014	Removal; diaphragm
Electrical tracings	–42	
Other diagnostic procedures	–43	
Other preventive procedures/high-risk medication/condition	–49	
Incise/drainage/flushing/aspiration/ removal body fluid	–51	

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Procedures (continued)		
Excision/removal tissue/biopsy/ destruction/debridement/cauterisation	–52	
Instrumentation/catheterisation/ intubation/dilution	–53	
Repair/fixation–suture/cast/prosthetic device (apply/remove)	–54	
Local injection/infiltration	–55	
Dressing/pressure/compression/ tamponade	–56	
Physical therapy/rehabilitation	–57	
Other procedures/minor surgery NEC	–59	
Test; glucose	T34005	Test; glucose
REFERRALS		
Allied health services	–66	Referral to other provider/nurse/therapist/ social worker
	–68 excluding A68009 and A68011	Other referrals NEC
	Z67002	Referral; respite care
Specialist	–67 excluding A67010; A67011; P67005 and Z67002	Referral to physician/specialist/clinic/hospital
	A68009	Referral; oncologist
Emergency department	A67011	Referral; A & E
Hospital	A67010	Referral; hospital
	P67005	Referral; hospital; psychiatrist
Other referrals	A68011	Referral
	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
Cardiac enzymes	D34005	Test; aspartate aminotransferas
	K34003	Test; cardiac enzymes
	K34004	Test; creatine kinase

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
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
	A33041	Test; cancer antigen
	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
	K34001	Test; blood; digitalis
	K34006	Test; amino acids
	K34007	Test; troponin
	N34001	Test; blood; phenylhydantoin
	P34003	Test; methadone
	T34018	Test; androgens
	T34019	Test; insulin
	T34021	Test; C peptide
	T34029	Test; aldosterone
	T34030	Test; parathyroid hormone
	T35002	Test; catecholamines
	W38002	Amniocentesis

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
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
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/tolerance	T34005	Test; glucose
	T34009	Test; glucose tolerance
	T34023	Test; glucose (fasting/random)
	T34025	Test; glucose; fasting
	T34026	Test; glucose; random
Hormone assay	A34003	Hormone assay
	D33015	Test; Anti gliadin antibody
	T33018	T33018
	T33019	T33019

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
Hormone assay (continued)	T34007	Test; cortisol
	W34005	Test; HCG
	W34006	Test; B HCG level (titre/quant)
	X34002	Test; LH
	X34003	Test; progesterone
	X34004	Test; oestradiol
	X34005	Test; FSH
Lipids	T34001	Check-up; cholesterol
	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
Urate/uric acid	U34004	Test; urate/uric acid
	A34013	Test; phosphate
	A34024	Test; calcium phosphate

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

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; M
Pap smear	X37001	Pap smear
	X37003	Test; cytology; genital; F
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
	B37001	Exam; bone marrow
Coagulation	B34002	Test; coagulation time
	B34003	Test; coagulation time
	B34006	Test; part thromboplastin time
	B34008	Test; coagulation time

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
Coagulation (continued)	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	A37001	Test; histopathology
	D37001	Test; histopathology; digestive
	F37001	Test; histopathology; eye
	H37001	Test; histopathology; ear
	L37001	Test; histopathology; musculosk
	S37001	Test; histopathology; skin
	T37001	Test; histopathology; endo/meta
	U37001	Test; histopathology; urology
	X37002	Test; histopathology; genital; F
	Y37001	Test; histopathology; genital; M
Histology; other	B37002	Test; histopathology; blood
	K37001	Test; histopathology; cardiovas
	N37001	Test; histopathology; neuro
	R37001	Test; histopathology; respirat
	W37001	Test; histopathology; reproduct
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
	A33025	Test; serum electrophoresis
	A38004	Test; DNA
	B33005	Test; immunology; blood
	B33007	Test; immunoglobulins

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Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
Immunology; other (continued)	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; musculoskel
	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; F
	Y33002	Test; immunology; genital; M
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
	Y38002	Test; sperm count
	Y38003	Test; semen examination
Microbiology		
Antibody	A33003	Test; antibody

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
Cervical swab	X33004	Test; cervical swab M&C
	X33006	Test; viral culture; genital; F
Chlamydia	A33006	Test; chlamydia
	A33034	Test; chlamydia direct immunofl
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	A33008	Test; 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
	D33013	Test; hepatitis serology
	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
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
	A33035	Test; serology

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
Microbiology; other (continued)	A33020	Test; toxoplasmosis serology
	A33033	Test; swab M&C
	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
	B33004	Test; microbiology; blood
	B33010	Test; serum immunoglobulins
	D33003	Test; microbiology; digestive
	D33010	Test; hepatitis D serology
	D33011	Test; hepatitis E serology
	D33012	Test; rotavirus
	D33016	Test; hepatitis C antibody
	D33017	Test; hepatitis B antigen
	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
	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

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
Microbiology; other (continued)	W34004	Test; antenatal serology
	W33006	Test; microbiology; reproductive
	X33001	Test; microbiology; genital; F
	X33003	Culture; gonococcal; F
	Y33001	Test; microbiology; genital; M
	Y33003	Culture; gonococcal; M
	Y33004	Test; viral culture; genital; M
	Y33005	Test; urethral/penile swab
Monospot	A33002	Test; monospot
	A33014	Test; Paul Bunnell
	A33031	Test; Epstein Barr virus serol
	A33032	Test; Epstein Barr virus
	A33022	Test; syphilis serology
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
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
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
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
	D34001	Test; blood; digestive

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Pathology test orders (continued)		
Other pathology test NEC (continued)	A38005	Test; disease screen
	B38001	Test; other lab; blood
	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
	X34001	Test; blood; genital; F
	X35001	Test; urine; genital; F
	X38001	Test; other lab; genital; F
	Y34001	Test; blood; genital; M
	Y35001	Test; urine; genital; M
	Y38001	Test; other lab; genital; M
	Z38001	Test; other lab; social

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
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
	F41001	Radiology; diagnostic; eye
	F41002	X-ray; eye
	H41001	Radiology; diagnostic; ear
	H41002	X-ray; ear
	K41002	Radiology; diagnostic; cardiovas
	K41003	Cardiogram
	K41005	Angiography; coronary
	K41006	Angiography; femoral
	K41007	Angiography; cerebral
	K41011	Angiogram
	K41012	Angiogram; coronary
	K41013	Angiogram; cerebral
	K41014	Angiogram; femoral
	L41001	Arthrogram
	L41002	Scan; bone(s)
	L41003	X-ray; bone(s)
	L41004	Plain x-ray; bone(s)
	L41005	Radiology; diagnostic; musculo

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Imaging test orders (continued)		
Diagnostic radiology (continued)	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; lumbosacral
	L41022	X-ray; cervical
	L41023	X-ray; 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; face
	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
	L41063	X-ray; back
	L41064	X-ray; back lower

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Imaging test orders (continued)		
Diagnostic radiology (continued)	L41065	X-ray; forearm
	L41066	X-ray; eg lower
	L41067	X-ray; metacarpal
	L41068	X-ray; metatarsal
	L43003	Test; bone marrow 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
	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
Ultrasound	A41012	Ultrasound
	A41015	Ultrasound; abdomen
	A41017	Ultrasound; chest
	A41021	Ultrasound; inguinal
	A41022	Ultrasound; abdomen; upper
	A41023	Ultrasound; abdomen; lower
	B41002	Ultrasound; spleen
	D41013	Ultrasound; gallbladder
	D41014	Ultrasound; liver
	K41001	Echocardiography

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Imaging test orders (continued)		
Ultrasound (continued)	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
	W41004	Ultrasound; obstetric
	X41009	Ultrasound; breast; female
	X41011	Ultrasound; uterus (not preg)
	Y41005	Ultrasound; prostate
	Y41006	Ultrasound; scrotum
Computed 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

(continued)

Appendix 3 (continued): Code groups from ICPC–2 and ICPC–2 PLUS

Group	ICPC–2 PLUS code	ICPC–2 PLUS label
Imaging test orders (continued)		
Computed tomography (continued)	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
	N41006	CT scan; brain
	N41008	CT scan; head
	R41004	CT scan; sinus
	X41010	CT scan; breast; female
	Y41007	CT scan; breast; male
Nuclear medicine	A41009	Nuclear medicine
	A41011	Isotope scan
	K41015	Scan; thallium heart
	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.

Appendix 4: Summary of annual results 1998–99 to 2000–02

Table A4.1: GP characteristics, summary of annual results BEACH 1998–99 to BEACH 2001–02

GP characteristic	1998–99 Number[(a)]	1998–99 Per cent of GPs (*n*=984)	1999–00 Number[(a)]	1999–00 Per cent of GPs (*n*=1,047)	2000–01 Number[(a)]	2000–01 Per cent of GPs (*n*=999)	2001–02 Number[(a)]	2001–02 Per cent of GPs (*n*=983)
Sex	. .	. .	. .	. .	. .	. .	. .	. .
Male	689	70.0	729	69.6	683	68.4	631	64.2
Female	295	30.0	318	30.4	316	31.6	352	35.8
Age	. .	. .	. .	. .	. .	. .		
<35 years	62	6.3	88	8.4	67	6.7	70	7.1
35–44 years	356	36.3	338	32.4	284	28.4	263	26.8
45–54 years	315	32.1	338	32.4	342	34.2	359	36.5
55+ years	247	25.2	279	26.7	297	29.7	290	29.5
Years in general practice	. .	. .	. .	. .	. .	. .	. .	. .
<2 years	8	0.8	7	0.7	5	0.5	3	0.3
2–5 years	59	6.1	83	8.0	64	6.4	71	7.2
6–10 years	167	17.2	166	15.9	137	13.7	132	13.4
11–19 years	328	33.7	331	31.9	299	29.9	279	28.4
20+ years	410	42.2	452	43.5	488	48.8	494	50.3
Sessions per week	. .	. .	. .	. .	. .	. .		
<6 per week	120	12.3	159	15.3	159	15.9	157	16.0
6–10 per week	666	68.5	691	66.0	662	66.3	666	67.8
11+ per week	186	19.1	191	18.3	162	16.2	145	14.8
Size of practice	. .	. .	. .	. .	. .	. .	. .	. .
Solo	165	17.9	189	18.1	187	19.3	150	15.3
2–4 GPs	398	43.2	480	46.1	375	38.6	390	39.7
5+ GPs	359	38.9	373	35.8	409	42.1	439	44.7

(continued)

Table A4.1 (continued): GP characteristics, summary of annual results BEACH 1998–99 to BEACH 2001–02

GP characteristic	1998–99 Number[(a)]	1998–99 Per cent of GPs (*n*=984)	1999–00 Number[(a)]	1999–00 Per cent of GPs (*n*=1,047)	2000–01 Number[(a)]	2000–01 Per cent of GPs (*n*=999)	2001–02 Number[(a)]	2001–02 Per cent of GPs (*n*=983)
Place of graduation	. .	. .	. .	. .	. .	. .	. .	. .
Australia	750	76.5	767	73.3	726	72.7	748	76.1
UK	88	9.0	89	8.5	82	8.2	75	7.6
Asia	84	8.6	99	9.4	47	4.7	85	8.6
Europe	24	2.4	20	1.9	19	1.9	18	1.8
Africa	15	1.5	25	2.4	15	1.5	36	3.7
New Zealand	11	1.1	16	1.5	15	1.5	5	0.5
Other	8	0.9	29	2.8	95	9.5	16	1.6
Practice location	. .	. .	. .	. .	. .	. .	. .	. .
Capital	671	68.2	683	65.2	680	68.1	681	69.3
Other metropolitan	74	7.5	77	7.4	69	6.9	80	8.1
Large rural	61	6.2	80	7.6	55	5.6	58	5.9
Small rural	60	6.1	65	6.2	56	5.6	48	4.9
Other rural	108	11.0	128	12.2	122	12.2	103	10.5
Remote central	5	0.5	4	0.4	10	1.0	4	0.5
Other remote, offshore	5	0.5	10	1.0	7	0.7	8	0.8
More than 50% consultations in languages other than English	111	11.3	105	10.6	135	13.5	NA	NA
Currently in RACGP Training Program	21	2.2	23	2.2	25	2.5	25	2.5
Completed RACGP Training Program	289	30.4	348	43.5	316	31.6	375	38.1
Fellow of RACGP	263	27.3	325	31.0	314	31.4	345	35.1
Own or cooperative after-hours arrangements	NA	NA	NA	NA	646	64.7	550	56.0
Computer use	NA	NA	NA	NA	873	87.4	883	89.7

(a) Missing data removed *Note:* NA—not applicable. These questions were not asked in all years.

Table A4.2: Summary of morbidity and management, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Variable	Rate per 100 encounters (*n*=96,901)	95% CI	Rate per 100 encounters (*n*=104,856)	95% CI	Rate per 100 encounters (*n*=99,307)	95% CI	Rate per 100 encounters (*n*=96,973)	95% CI
Reasons for encounter	146.3	140.8–151.8	148.5	146.7–150.2	151.0	149.2–152.8	149.2	147.4–150.9
Problems managed	145.3	143.5–147.2	146.7	144.9–148.6	144.5	142.8–146.3	143.4	141.7–145.2
New problems	54.5	53.0–56.0	45.3	43.6–46.9	47.4	45.7–49.0	55.1	53.8–56.5
Work-related	4.0	3.7–4.3	3.2	2.9–3.5	3.3	3.1–3.6	3.0	2.7–3.2
Medications	109.7	107.4–112.0	110.1	107.8–112.4	108.2	105.7–110.6	104.5	102.2–106.9
Prescribed	93.6	91.2–96.1	93.8	91.5–96.2	92.3	89.9–94.7	88.0	85.6–90.4
Advised OTC	8.8	8.0–9.6	9.4	8.6–10.2	9.0	8.1–9.8	8.9	8.1–9.6
GP supplied	7.3	6.3–8.3	6.9	5.8–7.9	6.9	5.7–8.1	7.6	6.3–9.0
Other treatments	43.2	41.3–45.0	46.0	44.1–47.8	49.4	47.1–51.7	51.9	49.6–54.2
Clinical	31.4	29.7–33.0	33.5	31.8–35.2	37.2	35.1–39.3	38.1	36.1–40.1
Procedural	11.8	11.2–12.5	12.5	11.9–13.0	12.2	11.6–12.8	13.8	13.1–14.5
Referrals	11.2	10.8–11.6	11.2	10.8–11.7	10.7	10.0–10.8	10.5	10.1–10.9
Specialist	7.4	7.1–7.7	7.3	7.0–7.6	7.4	7.1–7.7	7.3	7.0–7.6
Allied health services & other referrals	3.0	2.8–3.2	3.1	2.9–3.4	2.3	2.1–2.5	2.6	2.3–2.9
Hospital	0.7	0.6–0.9	0.7	0.5–0.9	0.5	0.3–0.7	0.4	0.3–0.6
Emergency department	0.1	0.0–0.6	0.1	0.0–0.4	0.1	0.0–0.4	0.1	0.0–0.4
Pathology	24.6	23.5–25.7	26.3	25.2–27.5	29.4	28.2–30.7	31.0	29.7–32.4
Imaging & other investigations	7.1	6.8–7.5	7.5	7.1–7.8	8.3	7.9–8.7	8.8	8.5–9.2

Note: CI—confidence interval.

Table A4.3: Type of encounter, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Variable	Rate per 100 encounters (*n*=96,901)	95% CI	Rate per 100 encounters (*n*=104,856)	95% CI	Rate per 100 encounters (*n*=99,307)	95% CI	Rate per 100 encounters (*n*=96,973)	95% CI
Direct consultations	96.7	96.4–97.0	96.7	96.3–97.0	98.1	97.8–98.4	97.7	97.4–98.0
No charge	0.8	0.4–1.2	0.6	0.3–0.8	0.6	0.0–1.5	0.6	0.2–1.1
Medicare-claimable	90.3	89.3–91.2	93.0	92.4–93.5	94.6	94.2–95.0	93.9	93.5–94.4
Short surgery consultations	1.4	0.9–1.8	1.3	0.6–2.1	1.5	0.5– 2.5	1.0	0.5–1.6
Standard surgery consultations	76.3	75.2–77.5	78.1	77.1–79.1	79.4	78.4–80.3	79.0	78.0–79.9
Long surgery consultations	7.0	6.4–7.6	8.1	7.4–8.7	8.4	7.7–9.0	8.1	7.5–8.7
Prolonged surgery consultations	0.5	0.0–1.5	0.6	0.1–1.0	0.6	0.0–1.2	0.6	0.0–1.2
Home visits	1.8	1.2–2.3	1.4	0.8–1.9	1.5	0.5–2.4	1.5	0.8–2.2
Hospital	0.4	0.0–1.8	0.4	0.0–2.2	0.2	0.0–1.7	0.2	0.0–1.4
Nursing home	0.8	0.0–1.6	0.9	0.0–1.8	0.7	0.0–2.1	0.9	0.0–2.4
Case conference	NA	NA	NA	NA	NA	NA	0.0	0.0–2.3
Care plans	NA	NA	NA	NA	NA	NA	0.1	0.0–1.7
Health assessments	NA	NA	NA	NA	NA	NA	0.1	0.0–0.7
Other items	2.2	1.7–2.7	2.1	1.6–2.6	2.4	1.3–3.5	2.4	1.4–3.5
Workers compensation	1.9	1.6–2.1	2.0	1.7–2.3	2.1	1.8–2.4	2.0	1.8–2.3
Other paid (hospital, State, etc.)	3.7	1.7–5.7	1.2	0.0–2.8	0.8	0.0–1.6	1.1	0.2–2.0
Indirect consultations	3.3	2.8–3.8	3.3	2.8–3.8	1.9	1.2–2.6	2.3	1.8–2.8

Note: CI—confidence interval, NA—Not applicable in earlier years of the BEACH study.

Table A4.4: Characteristics of the patients at encounters, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Patient variable	Per cent of encounters (*n*=96,901)	95% CI	Per cent of encounters (*n*=104,856)	95% CI	Per cent of encounters (*n*=99,307)	95% CI	Per cent encounters (*n*=96,973)	95% CI
Sex	. .	. .	. .	. .	. .	. .	. .	. .
Males	42.3	41.6–43.0	42.7	42.0–43.5	42.9	42.2–43.6	42.6	41.9–43.3
Females	57.7	57.0–58.4	57.3	56.5–58.0	57.1	56.4–57.8	57.4	56.7–58.1
Age group	. .	. .	. .	. .	. .	. .	. .	. .
< 1 year	2.4	2.2–2.7	2.4	2.2–2.5	2.1	1.9–2.4	2.0	1.8–2.1
1–4 years	5.7	5.3–6.0	5.2	4.9–5.5	5.4	5.1–5.7	4.9	4.6–5.2
5–14 years	7.7	7.3–8.1	7.2	6.9–7.5	6.8	6.4–7.2	6.4	4.6–5.2
15–24 years	9.8	9.4–10.2	10.4	9.9–10.8	10.3	9.8–10.7	9.5	9.1–10.0
25–44 years	26.0	25.3–26.7	26.3	25.5–27.0	26.3	25.6–27.0	25.8	25.1–26.5
45–64 years	24.4	23.8–25.0	24.5	24.0–25.0	26.1	25.5–26.7	26.3	25.7–26.8
65–74 years	12.3	11.7–12.8	12.0	11.5–12.5	11.7	11.2–12.2	12.3	11.8–12.8
75+ years	11.7	11.1–12.4	12.1	11.4–12.9	11.3	10.7–12.0	12.8	12.0–13.5
Other characteristics	. .	. .	. .	. .	. .	. .	. .	. .
New patient to practice	9.2	8.6–9.8	7.3	6.6–8.0	8.0	7.1–8.8	9.2	8.5–9.9
Health care card	47.3	45.8–48.8	38.6	37.0–40.2	36.7	35.1–38.3	41.9	40.4–43.3
Veterans' Affairs card[(a)]	3.0	2.7–3.3	2.6	2.3–2.9	3.1	2.8–3.4	3.3	3.0–3.6
Non-English-speaking background	14.5	13.0–16.7	7.1	3.0–11.2	8.0	4.8–11.1	9.3	5.9-12.7
Aboriginal person	1.0	0.3–1.8	0.7	0.0–2.5	0.7	0.0–1.5	0.9	0.0–2.0
Torres Strait Islander	0.1	0.0–0.5	0.1	0.0–1.3	0.1	0.0–0.7	0.1	0.0–0.5

(a) The 1998–99 and 1999–00 results reported here are for gold card holders only.
Note: CI—confidence interval.

Table A4.5: Distribution of problems managed, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Problem managed	Rate per 100 encounters[(a)] (*n*=96,901)	95% CI	Rate per 100 encounters[(a)] (*n*=104,856)	95% CI	Rate per 100 encounters[(a)] (*n*=99,307)	95% CI	Rate per 100 encounters[(a)] (*n*=96,973)	95% CI
Respiratory	24.3	23.6–25.0	24.2	23.5–24.9	22.5	21.9–23.2	21.4	20.7–22.0
Musculoskeletal	16.9	16.3–17.5	16.9	16.4–17.4	17.4	16.9–18.0	17.5	17.0–18.0
Skin	16.5	16.0–17.0	17.0	16.6–17.5	16.7	16.2–17.3	16.1	15.6–16.6
Circulatory	16.1	15.4–16.8	16.3	15.5–17.0	16.0	15.3–16.7	16.1	15.5–16.8
General & unspecified	13.2	12.7–13.7	13.9	13.4–14.5	14.2	13.7–14.7	14.7	14.0–15.5
Psychological	10.5	10.0–11.0	10.5	10.0–11.1	10.8	10.2–11.3	10.6	10.1–11.2
Digestive	10.2	9.9–10.5	10.1	9.7–10.3	9.9	9.6–10.2	9.9	9.6–10.2
Endocrine & metabolic	8.8	8.4–9.2	9.1	8.7–9.6	9.8	9.3–10.2	10.4	10.0–10.9
Female genital system	6.3	5.9–6.6	6.2	5.8–6.6	6.1	5.7–6.4	6.1	5.8–6.5
Ear	4.9	4.7–5.1	4.5	4.3–4.7	4.4	4.2–4.6	4.2	4.0–4.4
Pregnancy & family planning	4.1	3.7–4.4	4.3	4.0–4.6	3.9	3.6–4.2	4.0	3.7–4.3
Neurological	4.0	3.8–4.2	3.9	3.7–4.1	3.8	3.6–3.9	3.7	3.5–3.9
Urology	2.8	2.7–3.0	3.0	2.9–3.2	2.7	2.5–2.8	2.8	2.7–3.0
Eye	2.8	2.7–3.0	2.7	2.6–2.9	2.6	2.5–2.7	2.5	2.4–2.6
Blood	1.7	1.5–1.9	1.7	1.5–1.9	1.7	1.5–1.8	1.3	1.2–1.4
Male genital system	1.4	1.3–1.5	1.4	1.3–1.5	1.5	1.3–1.6	1.3	1.1–1.4
Social problems	0.8	0.6–0.9	0.9	0.7–1.1	0.7	0.5–0.9	0.7	0.5–0.9
Total problems	**145.3**	**143.5–147.2**	**146.7**	**144.9–148.6**	**144.5**	**142.8–146.3**	**143.4**	**141.7–145.2**

(a) Figures do not total 100% as more than one problem can be managed at each encounter.
Note: CI—confidence interval.

Table A4.6: Most frequently managed problems, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Problem managed	**Rate per 100 encounters[(a)] (*n*=96,901)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=104,856)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=99,307)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=96,973)**	**95% CI**
Hypertension*	8.3	7.8–8.7	8.4	7.9–8.9	8.6	8.2–9.1	9.0	8.6–9.5
Upper respiratory tract infection	6.8	6.4–7.3	7.2	6.7–7.7	6.9	6.5–7.4	6.2	5.8–6.6
Immunisation/vaccination—all*	5.2	4.7–5.7	4.6	4.2–5.0	4.6	4.2–5.0	4.7	4.2–5.1
Depression*	3.5	3.3–3.7	3.4	3.2–3.6	3.7	3.4–3.9	3.4	3.2–3.6
Acute bronchitis/bronchiolitis	3.3	3.0–3.6	3.2	2.9–3.4	2.7	2.5–3.0	2.7	2.5–3.0
Asthma	3.2	3.0–3.4	3.2	3.0–3.4	2.8	2.7–3.0	2.8	2.6–3.0
Back complaint*	2.7	2.4–2.9	2.8	2.6–2.9	2.6	2.4–2.8	2.6	2.4–2.8
Diabetes*	2.6	2.4–2.7	2.7	2.5–2.9	2.8	2.6–3.0	3.1	2.9–3.3
Lipid disorder	2.5	2.3–2.7	2.6	2.4–2.9	2.9	2.7–3.1	2.9	2.7–3.1
Osteoarthritis*	2.2	2.0–2.4	2.2	2.0–2.4	2.5	2.3–2.7	2.6	2.4–2.8
Total problems	**145.3**	**143.5–147.2**	**146.7**	**144.9–148.6**	**144.5**	**142.8–146.3**	**143.4**	**141.7–145.2**

(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 A4.7: Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Group and subgroup	Rate per 100 encounters[(a)] (*n*=96,901)	95% CI	Rate per 100 encounters[(a)] (*n*=104,856)	95% CI	Rate per 100 encounters[(a)] (*n*=99,307)	95% CI	Rate per 100 encounters[(a)] (*n*=96,973)	95% CI
Antibiotics	17.3	16.7–18.0	16.3	15.8–16.9	15.9	15.3–16.5	14.4	13.9–14.9
Broad-spectrum penicillin	5.0	4.7–5.4	4.7	4.4–5.1	4.9	4.6–5.2	4.5	4.2–4.8
Cephalosporins	4.3	4.0–4.7	4.0	3.7–4.4	4.0	3.6–4.3	3.2	3.0–3.5
Other antibiotics	3.5	3.2–3.7	3.4	3.2–3.7	3.3	3.1–3.6	3.0	2.8–3.2
Penicillins	1.5	1.3–1.7	1.5	1.3–1.7	1.3	1.1–1.4	1.5	1.2–1.7
Tetracycline	1.4	1.2–1.6	1.1	1.0–1.3	1.1	1.0–1.3	1.0	0.8–1.2
Cardiovascular	13.7	12.9–14.5	13.7	12.9–14.5	13.6	12.8–14.4	13.9	13.2–14.7
Anti-hypertensives	7.2	6.8–7.6	7.1	6.7–7.6	7.3	6.9–7.7	7.5	7.1–8.0
Other CVS drugs	2.1	1.9–2.3	2.4	2.2–2.8	2.6	2.4–2.8	2.7	2.5–2.9
Anti-angina	1.5	1.3–1.7	1.3	1.1–1.5	1.1	0.9–1.3	1.1	0.9–1.3
Beta-blockers	1.7	1.6–1.9	1.8	1.6–2.0	1.6	1.4–1.8	1.7	1.5–1.9
Central nervous system	11.4	10.8–11.9	11.6	11.0–12.2	11.1	10.5–11.7	10.7	10.1–11.2
Simple analgesics	4.7	4.4–5.1	5.0	4.6–5.4	4.8	4.3–5.2	3.8	3.4–4.1
Compound analgesics	3.3	3.1–3.6	3.0	2.8–3.2	2.7	2.5–2.9	2.7	2.5–2.9
Narcotic analgesics	1.1	0.6–1.6	1.3	0.9–1.8	1.4	1.0–1.8	2.0	1.6–2.4
Anti-emetic/anti-nausea	1.4	1.3–1.6	1.6	1.5–1.7	1.5	1.3–1.6	1.4	1.2–1.5
Psychological	7.6	7.2–7.9	7.5	7.1–8.0	7.5	7.1–7.9	7.4	7.0–7.8
Sedative hypnotics	2.0	1.8–2.2	1.9	1.7–2.1	1.9	1.7–2.1	1.9	1.7–2.2

(continued)

Table A4.7 (continued): Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Group and subgroup	Rate per 100 encounters[(a)] (*n*=96,901)	95% CI	Rate per 100 encounters[(a)] (*n*=104,856)	95% CI	Rate per 100 encounters[(a)] (*n*=99,307)	95% CI	Rate per 100 encounters[(a)] (*n*=96,973)	95% CI
Anti anxiety	2.1	1.9–2.3	2.1	1.9–2.3	2.0	1.8–2.2	1.9	1.7–2.2
Anti-depressants	2.9	2.7–3.1	2.9	2.8–3.1	3.1	2.8–3.3	2.9	2.7–3.1
Respiratory	6.9	6.5–7.3	7.4	6.9–7.9	6.3	5.9–6.7	5.8	5.3–6.2
Bronchodilators	3.7	3.5–4.0	3.8	3.5–4.1	3.2	2.9–3.4	2.9	2.6–3.1
Asthma preventives	2.2	2.1–2.4	2.5	2.3–2.8	2.2	2.0–2.4	2.2	2.0–2.4
Hormones	5.8	5.5–6.1	5.9	5.5–6.2	5.9	5.6–6.2	6.1	5.8–6.4
Sex hormones	2.2	2.0–2.4	2.1	1.9–2.2	2.1	1.9–2.2	2.0	1.8–2.1
Cortico steroids	1.2	1.1–1.4	1.4	1.2–1.6	1.2	1.1–1.4	1.3	1.2–1.5
Hypoglycaemics	1.8	1.5–2.0	1.8	1.5–2.1	2.0	1.7–2.3	2.2	1.9–2.5
Other hormones	0.6	0.4–0.7	0.6	0.4–0.7	0.6	0.5–0.7	0.6	0.5–0.8
Musculoskeletal	5.7	5.4–6.0	5.7	5.4–6.0	6.8	6.4–7.1	6.1	5.8–6.4
NSAID/anti-rheumatoid	4.5	4.2–4.7	4.6	4.3–4.8	5.7	5.4–6.0	5.3	5.0–5.5
Allergy, immune system	4.8	4.3–5.4	5.2	4.8–5.6	4.6	4.2–5.0	4.5	4.1–4.8
Anti-histamine	0.8	0.5–1.1	0.7	0.5–0.9	0.6	0.4–0.8	0.4	0.2–0.7
Vaccines	3.9	3.3–4.6	4.4	3.9–4.8	3.9	3.4–4.3	3.9	3.5–4.3
Skin	4.5	4.2–4.7	4.6	4.4–4.8	4.8	4.5–5.2	4.1	3.9–4.4
Anti-infection skin	1.0	0.8–1.1	1.0	0.8–1.1	0.9	0.7–1.1	0.7	0.5–0.8
Topical steroids	2.8	2.7–3.0	2.8	2.7–3.0	3.1	2.8–3.3	2.8	2.6–3.0
Other skin	0.6	0.5–0.8	0.8	0.6–0.9	0.9	0.6–1.1	0.6	0.4–0.8

(continued)

Table A4.7 (continued): Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Group and subgroup	Rate per 100 encounters[(a)] (*n*=96,901)	95% CI	Rate per 100 encounters[(a)] (*n*=104,856)	95% CI	Rate per 100 encounters[(a)] (*n*=99,307)	95% CI	Rate per 100 encounters[(a)] (*n*=96,973)	95% CI
Digestive	4.3	4.1–4.5	4.3	4.1–4.5	4.1	3.8–4.3	3.8	3.6–4.1
Anti-spasmodics	0.5	0.3–0.6	. .	. .	. .	. .	. .	. .
Anti-ulcerants	2.2	2.1–2.4	2.2	2.0–2.4	2.2	2.0–2.3	2.4	2.2–2.5
Antidiarrhoeals	0.6	0.5–0.8	0.5	0.4–0.7	0.5	0.3–0.8	0.5	0.3–0.7
Urogenital	2.2	2.0–2.4	2.0	1.8–2.2	1.8	1.7–2.0	1.8	1.6–2.0
Diuretics	1.7	1.5–1.9	1.5	1.3–1.7	1.3	1.1–1.4	1.3	1.1–1.5
Ear, nose topical	2.3	2.1–2.5	2.5	2.3–2.6	2.3	2.2–2.5	1.8	1.7–2.0
Topical otic	1.0	0.8–1.2	1.0	0.8–1.1	1.0	0.8–1.1	0.9	0.8–1.1
Topical nasal	1.3	1.1–1.4	1.5	1.3–1.7	1.3	1.2–1.5	0.9	0.7–1.0
Contraceptives	1.7	1.5–1.8	1.7	1.6–1.9	1.6	1.5–1.8	1.7	1.5–1.8
Oral contraception	1.7	1.5–1.8	1.7	1.6–1.9	1.6	1.5–1.8	1.7	1.5–1.8
Blood	1.6	1.4–1.8	1.6	1.4–1.7	1.8	1.7–2.0	1.8	1.7–2.0
Other blood	0.7	0.6–0.9	0.8	0.6–0.9	0.9	0.7–1.1	1.1	0.9–1.3
Eye medications	1.7	1.5–1.8	1.7	1.6–1.8	1.6	1.5–1.8	1.5	1.4–1.6
Anti-infectives	1.1	1.0–1.2	1.1	1.0–1.2	1.0	0.9–1.2	0.9	0.8–1.1
Nutrition, metabolism	1.2	1.1–1.4	1.1	0.9–1.3	1.4	1.2–1.5	1.7	1.1–2.2
Mineral tonic	0.7	0.5–0.8	0.6	0.4–0.7	0.5	0.4–0.7	0.6	0.3–0.8
Miscellaneous	0.5	0.0–1.2	0.4	0.0–0.8	0.6	0.4–0.8	0.5	0.3–0.6

(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.

Table A4.8: Most frequently prescribed medications, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Generic drug	**Rate per 100 encounters[(a)] (*n*=96,901)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=104,856)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=99,307)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=96,973)**	**95% CI**
Paracetamol	3.9	3.6–4.3	4.1	3.7–4.4	3.9	3.5–4.4	3.1	2.7–3.4
Amoxycillin	3.2	2.9–3.5	3.1	2.8–3.4	3.2	2.9–3.5	2.9	2.7–3.2
Paracetamol/codeine	2.7	2.4–2.9	2.4	2.2–2.6	2.2	2.0–2.4	2.2	2.0–2.4
Salbutamol	2.4	2.2–2.6	2.4	2.2–2.6	2.1	1.9–2.3	2.0	1.8–2.2
Cefaclor monohydrate	2.2	1.8–2.6	1.6	1.3–2.0	1.6	1.3–2.0	1.1	0.8–1.3
Cephalexin	2.1	1.9–2.4	2.1	1.8–2.3	2.2	2.0–2.4	2.0	1.8–2.2
Roxithromycin	1.8	1.5–2.0	1.8	1.6–2.0	1.6	1.4–1.8	1.4	1.2–1.6
Amoxycillin/potass.clavulanate	1.8	1.5–2.0	1.6	1.4–1.8	1.7	1.4–1.9	1.6	1.3–1.8
Influenza virus vaccine	1.7	0.4–3.0	1.5	0.9–2.1	1.5	0.8–2.2	1.5	0.8–2.2
Temazepam	1.4	1.3–1.6	1.4	1.3–1.6	1.4	1.3–1.6	1.3	1.2–1.5
Diclofenac sodium systemic	1.3	1.1–1.5	1.3	1.1–1.5	1.2	0.9–1.4	0.9	0.7–1.1
Levonorgestrel/ethinyloestradiol	1.2	1.1–1.4	1.3	1.1–1.4	1.2	1.1–1.4	1.2	1.1–1.3
Doxycycline hydrochloride	1.2	1.0–1.3	0.9	0.7–1.1	0.9	0.7–1.1	0.8	0.6–1.0
Diazepam	1.1	0.9–1.3	1.1	0.9–1.3	1.0	0.9–1.2	1.0	0.8–1.3
Erythromycin	1.1	0.8–1.3	0.7	0.5–0.9	0.8	0.6–1.0	0.6	0.4–0.8
Ranitidine	1.0	0.9–1.1	1.0	0.8–1.1	1.0	0.9–1.2	0.6	0.5–0.8
Atenolol	1.0	0.8–1.1	1.0	0.8–1.2	0.9	0.7–1.1	1.0	0.7 –1.2
Frusemide (furosemide)	1.0	0.8–1.1	0.8	0.6–1.0	0.7	0.7–0.9	0.7	0.5–0.9
Betamethasone topical	0.9	0.8–1.1	0.9	0.7–1.0	1.0	0.9–1.2	0.9	0.7–1.0
Simvastatin	0.9	0.8–1.1	0.9	0.7–1.1	0.9	0.7–1.1	0.9	0.8–1.1
Celecoxib	. .	. .	. .	. .	2.1	1.9–2.4	1.4	1.3–1.6
Rofecoxib	. .	. .	. .	. .	. .	. .	1.2	1.0–1.5
Total prescribed medications	**93.6**	**91.2–96.1**	**93.8**	**91.5–96.2**	**92.3**	**899.–94.7**	**88.0**	**85.6—90.4**

(a) Column will not add to 100 because multiple prescriptions could be written at each encounter. Also only the 20 most frequent medications are included with the exception of celecoxib and rofecoxib for which results are reported after their acceptance on the PBS. *Note:* CI—confidence interval.

Table A4.9: Distribution of medications prescribed by ATC medication group, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
ATC medication group	Rate per 100 encounters (*n*=96,901)	95% CI	Rate per 100 encounters (*n*=104,856)	95% CI	Rate per 100 encounters (*n*=99,307)	95% CI	Rate per 100 encounters (*n*=96,973)	95% CI
Other analgesics & antipyretics	7.7	7.2–8.1	7.5	7.1–8.0	7.1	6.6–7.6	6.1	5.7–6.5
Beta-lactam antibacterials penicillins	6.2	5.8–6.5	6.2	5.8–6.6	6.1	5.8–6.5	6.0	5.6–6.3
Antiinflammatory/antirheumatic non-steroidal	4.5	4.2–4.7	4.5	4.3–4.8	5.7	5.4–6.0	5.3	5.0–5.5
Other beta-lactam antibacterials	4.3	4.0–4.7	4.0	3.7–4.4	4.0	3.6–4.3	3.2	3.0–3.5
ACE inhibitors plain	3.4	3.2–3.7	3.3	3.1–3.5	2.9	2.7–3.1	2.8	2.6–3.0
Adrenergics inhalants	3.2	3.0–3.5	3.3	3.1–3.6	3.1	2.9–3.3	3.2	2.9–3.4
Macrolides & lincosamides	2.9	2.7–3.2	2.8	2.6–3.0	2.8	2.5–3.0	2.4	2.2–2.6
Anti-depressants	2.9	2.7–3.1	2.9	2.8–3.1	3.1	2.8–3.3	3.1	2.9–3.3
Other anti-asthmatic inhalants*	2.8	2.6–3.0	3.0	2.8–3.3	2.3	2.1–2.5	1.9	1.7–2.1
Viral vaccines	2.6	1.9–3.3	2.6	2.2–3.0	2.6	2.2–3.0	2.6	2.2–3.0
Corticosteroids plain	2.2	2.1–2.4	2.3	2.1–2.4	2.6	2.4–2.9	2.4	2.2–2.6
Drugs for treatment of peptic ulcer**	2.2	2.1–2.4	2.2	2.0–2.4	2.2	2.0–2.3	2.4	2.2–2.5
Anxiolytics	2.1	1.9–2.3	2.1	1.9–2.3	2.0	1.8–2.2	1.9	1.7–2.2
Hypnotics & sedatives	1.1	1.8–2.2	1.9	1.7–2.1	1.9	1.7–2.1	1.9	1.7–2.1
Cholesterol & triglyceride reducers	1.9	1.7–2.1	2.2	2.0–2.4	2.4	2.2–2.5	2.4	2.3–2.6
Beta blocking agents plain	1.8	1.6–2.0	1.9	1.7–2.1	1.7	1.5–1.9	1.8	1.6–2.1
Hormonal contraceptives for systemic use	1.8	1.6–1.9	1.9	1.7–2.0	1.8	1.7–2.0	1.9	1.7–2.0
Selective calcium channel blockers with mainly vascular effects	1.8	1.6–1.9	1.6	1.4–1.8	1.6	1.4–1.8	1.5	1.3–1.7
Opioids	1.5	1.1–1.9	1.7	1.3–2.1	1.4	1.2–1.6	2.1	1.8–2.3
Oral blood glucose lowering drugs	1.5	1.2–1.7	1.5	1.2–1.7	1.7	1.4–1.9	1.9	1.6–2.1
Total prescribed medications	**93.6**	**91.2–96.1**	**93.8**	**91.5–96.2**	**92.3**	**89.9–94.7**	**88.0**	**85.6–90.4**

Note: CI—confidence interval.

* Now called Other drugs for obstructive airways disease, inhalants.

** Now called Drugs for peptic ulcer and gastro-o

Table A4.10: Most frequently advised over-the-counter medications, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Generic medication	**Rate per 100 encounters (*n*=96,901)**	**95% CI**	**Rate per 100 encounters (*n*=104,856)**	**95% CI**	**Rate per 100 encounters (*n*=99,307)**	**95% CI**	**Rate per 100 encounters (*n*=96,973)**	**95% CI**
Paracetamol	2.4	1.8–2.9	2.5	2–.0	2.4	1.8–2.9	2.1	1.7–2.6
Chlorpheniramine/phenylephrine	0.3	0.0–0.7	0.3	0.0–0.7	0.1	0.0–0.5	0.1	0.0–0.4
Clotrimazole topical	0.2	0.0–0.4	0.2	0.0–0.4	0.2	0.0–0.5	0.2	0.0–0.4
Paracetamol/Codeine	0.2	0.0–0.6	0.3	0.0–0.8	0.2	0.0–0.5	0.2	0.0–0.5
Ibuprofen	0.2	0.0–0.5	0.3	0.0–0.7	0.5	0.2–0.8	0.5	0.2–0.8
Loratadine	0.2	0.0–0.5	0.3	0.0–0.6	0.2	0.0–0.6	0.3	0.0–0.5
Diclofenac diethyl topical	0.2	0.0–0.5	0.2	0.0–0.5	0.2	0.0–0.6	0.2	0.0–0.5
Aspirin	0.2	0.0–0.4	0.2	0.0–0.6	0.1	0.0–0.5	0.2	0.0–0.5
Pseudoephedrine	0.2	0.0–0.5	0.2	0.0–0.6	0.2	0.0–0.6	0.1	0.0–0.5
Total advised medications	**8.8**	**8.0–9.6**	**9.4**	**8.6–10.2**	**9.0**	**8.1–9.8**	**8.9**	**8.1–9.6**

Note: CI—confidence interval. Only those medications supplied at a rate of 0.2 per 100 encounters or more in 1998–99 are included.

Table A4.11: Medications most frequently supplied by GPs, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Generic medication	**Rate per 100 encounters (*n*=96,901)**	**95% CI**	**Rate per 100 encounters (*n*=104,856)**	**95% CI**	**Rate per 100 encounters (*n*=99,307)**	**95% CI**	**Rate per 100 encounters (*n*=96,973)**	**95% CI**
Influenza virus vaccine	0.8	0.0–2.2	0.7	0.0–1.7	0.6	0.0–1.4	0.9	0.0–2.1
Triple antigen(diphtheria/pertussis/tetanus)	0.4	0.1–0.7	0.3	0.1–0.6	0.2	0.0–0.7	0.2	0.0–0.6
Polio sabin oral	0.4	0.1–0.6	0.4	0.1–0.7	0.3	0.0–0.6	0.3	0.0–0.7
Haemophilus B vaccine	0.3	0.0–0.6	0.3	0.1–0.6	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	0.2	0.0–0.5
ADT/CDT (diphtheria/tetanus) vaccine	0.2	0.0–0.6	0.3	0.0–0.5	0.2	0.0–0.4	0.1	0.0–0.5
Hepatitis B vaccine	0.2	0.0–0.6	0.2	0.0–0.6	0.2	0.0–0.5	0.1	0.0–0.5
Celecoxib	. .	. .	. .	. .	0.3	0.0–0.7	0.2	0.0–0.5
Rofecoxib	. .	. .	. .	. .	. .	. .	0.3	0.0–0.5
Total GP supplied medications	**8.8**	**8.0–9.6**	**6.9**	**5.8–7.9**	**6.9**	**5.7–8.1**	**7.6**	**6.3–9.0**

Note: CI—confidence interval. Only those medications supplied at a rate of 0.2 per 100 encounters or more in 1998–99 are included with the exception of celecoxib and rofecoxib which are reported for the years after they was accepted on the PBS.

Table A4.12: The ten most common problems managed with a clinical treatment, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Problem managed	**Rate per 100 encounters[(a)] (*n*=96,901)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=104,856)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=99,307)**	**95% CI**	**Rate per 100 encounters[(a)] (*n*=96,973)**	**95% CI**
Depression*	1.6	1.4–1.8	1.6	1.4–1.8	1.8	1.6–2.1	1.7	1.5–1.9
URTI	1.2	0.9–1.6	1.4	1.1–1.7	1.7	1.4–2.1	2.0	1.6–2.4
Hypertension*	0.9	0.7–1.1	1.1	0.8–1.3	1.4	1.0–1.8	1.4	1.1–1.6
Anxiety*	0.8	0.6–0.9	0.8	0.6–1.0	0.8	0.6–1.0	0.8	0.7–1.0
Lipid disorder	0.7	0.5–0.9	0.8	0.6–1.0	1.0	0.8–1.3	1.0	0.8–1.2
Diabetes*	0.7	0.5–0.9	0.8	0.6–1.0	0.9	0.7–1.1	1.0	0.8–1.2
Gastroenteritis, presumed infection	0.6	0.3–0.8	0.5	0.3–0.8	0.6	0.3–0.9	0.6	0.4–0.8
Asthma	0.6	0.3–0.8	0.6	0.3–0.8	0.6	0.4–0.8	0.7	0.4–0.9
Back complaint*	0.5	0.3–0.8	0.6	0.4–0.8	0.6	0.4–0.8	0.6	0.4–0.8
Sprain/strain*	0.5	0.3–0.7	0.5	0.3–0.7	0.6	0.4–0.9	0.6	0.4–0.8
Total problems managed with clinical treatment	**28.7**	**27.3–30.2**	**30.4**	**28.9–31.9**	**32.8**	**31.1–34.5**	33.51	**31.8–35.2**

Rate of provision of clinical treatment for selected problem per 100 total encounters.
* Includes multiple ICPC2 or ICPC2 PLUS codes (see Appendix 3).
Note: CI—confidence interval.

Table A4.13: Number of encounters where pathology, imaging ordered, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
	Per cent of encounters (*n*=96,901)	95% CI	Per cent of encounters (*n*=104,856)	95% CI	Per cent of encounters (*n*=99,307)	95% CI	Per cent of encounters (*n*=96,973)	95% CI
Pathology, imaging or other investigations ordered	1.5	1.3–1.6	1.5	1.4–1.7	1.7	1.5–1.8	0.9	0.8–1.0
Pathology only ordered	11.8	11.4–12.2	12.2	11.8–12.7	12.1	11.7–12.5	9.9	9.6–10.3
Imaging only ordered	4.8	4.6–5.1	5.2	4.9–5.4	5.4	5.2–5.7	4.1	3.9–4.2
No tests ordered	81.9	81.3–82.5	81.1	80.5–81.7	80.7	80.1–81.3	85.1	84.7–85.6
At least one pathology test ordered	13.2	12.8–13.7	13.8	13.3–14.3	13.8	13.3–14.3	10.8	10.4–11.2
At least one imaging ordered	6.3	6.0–6.6	6.7	6.4–7.0	6.8	6.5–7.1	5.0	4.7–5.2

Note: CI—confidence interval.

Table A4.14: Distribution of pathology orders across pathology groups, summary of annual results BEACH 1998–99 to BEACH 2001–02

	1998–99		1999–00		2000–01		2001–02	
Pathology test ordered	Rate per 100 encounters (*n*=96,901)	95% CI	Rate per 100 encounters (*n*=104,700)	95% CI	Rate per 100 encounters (*n*=99,307)	95% CI	Rate per 100 encounters (*n*=97,973)	95% CI
Chemical	11.3	10.6–11.9	12.1	11.4–12.8	15.4	14.6–16.2	16.5	15.6–17.3
Haematology	5.1	4.8–5.4	5.1	4.8–5.4	5.7	5.3–6.0	6.2	5.8–6.5
Microbiology	4.1	3.8–4.4	4.6	4.3–4.9	4.5	4.2–4.7	4.9	4.5–5.2
Cytology	1.6	1.3–1.8	1.5	1.3–1.8	1.5	1.2–1.8	1.6	1.3–1.8
Other NEC	1.3	0.9–1.7	1.6	1.2–2.0	1.1	0.8–1.3	0.7	0.5–0.9
Infertility/pregnancy	0.5	0.3–0.6	0.4	0.2–0.6	0.3	0.0–0.6	0.3	0.1–0.5
Tissue pathology	0.4	0.3–0.6	0.5	0.3–0.7	0.5	0.2–0.7	0.5	0.1–0.8
Immunology	0.4	0.1–0.7	0.5	0.2–0.8	0.5	0.3–0.8	0.5	0.3–0.7
Simple test; other	0.0	0.0–0.4	0.0	0.0–0.7	0.1	0.0–0.5	0.1	0.0–0.4
Total pathology tests	**24.6**	**23.6–25.7**	**26.3**	**25.2–27.5**	**29.4**	**28.2–30.7**	31.0	29.7–32.4

Note: CI—confidence interval.

Table A4.15 (a): Most frequent imaging tests ordered, BEACH 1998–99 and 1999–00

	1998–99		1999–00	
Imaging test ordered	Rate per 100 encounters (*n*=96,901)	95% CI	Rate per 100 encounters (*n*=104,856)	95% CI
Plain	4.3	4.0–4.5	4.4	4.2–4.7
Contrast / US / CT	2.5	2.3–2.6	2.6	2.4–2.8
Other	0.3	0.1–0.5	0.5	0.2–0.7
Total imaging tests	**7.1**	**6.7–7.4**	**7.5**	**7.1–7.8**

Table A4.15 (b): Most frequent imaging tests ordered BEACH 2000–01 and 2001–02

	2000–01		2001–02	
Imaging test ordered	Rate per 100 encounters (*n*=99,307)	95% CI	Rate per 100 encounters (*n*=96,973)	95% CI
Diagnostic radiology	4.8	4.6–5.1	4.6	4.4–4.8
Ultrasound	2.1	2.0–2.3	2.5	2.3–2.7
Computerised tomography	0.7	0.6–0.8	0.8	0.6–0.9
Nuclear medicine imaging	0.0	0.0–0.4	0.0	0.0–0.4
Magnetic resonance imaging	0.0	0.0–0.4	0.0	0.0–0.5
Total imaging tests	**7.7**	**7.3–8.0**	**7.9**	**7.6–8.2**

Note: CI—confidence interval. Data collection method and coding system changed at the end of the second year of BEACH. Years 1 and 2 are not comparable with years 3 and 4.