General practice activity in Australia 2002–03

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 01–12–2003]. 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).

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GENERAL PRACTICE SERIES
Number 14

BEACH

Bettering the Evaluation and Care of Health

General practice activity in Australia 2002–03

Helena Britt, Graeme C Miller, Stephanie Knox, Janice Charles, Lisa Valenti, Joan Henderson, Ying Pan, Clare Bayram, Christopher Harrison

December 2003

A joint report by the University of Sydney and the Australian Institute of Health and Welfare
AIHW Cat. No. GEP 14

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 Publications Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601, or via the Institute's web site: http://www.aihw.gov.au.

ISBN 1 74024 337 4

ISSN 1442 3022

Suggested citation

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

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Board Chair

Dr Sandra Hacker

Director

Dr Richard Madden

Any enquiries about or comments on this publication should be directed to:

General Practice Statistics and Classification Unit
The University of Sydney
Acacia House
Westmead Hospital
WESTMEAD New South Wales 2145
Phone: 61 2 9845 8151
Fax: 61 2 9845 8155
Email: gpscu@fmrc.org.au

Published by the Australian Institute of Health and Welfare

Printed by Panther Publishing and Printing

Foreword

Forty years on! And what a milestone!

Having participated in the first National Morbidity Survey of Australian general practice in 1962-63, and been involved with all the subsequent ones, it is wonderful to be able to introduce the 5th annual report of General Practice Activity in Australia 2002-03. Here is a story of persistence by many people over many years leading to great progress in an important endeavour.

Since the first survey the participant numbers are greater and more representative, the information is much more comprehensive, and the analysis more sophisticated. The first survey was conducted by NH&MRC with 85 participating general practitioners; the RACGP surveys from 1969 to 1974 had several hundred participants each year, and the University of Sydney AMTS (Australian Morbidity and Treatment Survey) of 1990-91 had 495. Now over 1000 GPs each year provide a statistically appropriate source of data for BEACH. The continuity of the BEACH surveys since 1998 adds a dimension that was not always possible in previous years and allows us to consider changes as they are occurring, such as the increasing rate of management of lipid disorders and diabetes reported here.

This survey includes far more information than could be considered in earlier ones. The first survey reported only upon patient age and sex and problems treated, though it did have both a longitudinal element and an indication of outcome, which it is still not feasible to capture within current constraints. Now, as well as problems managed, we have more demographic detail, reasons for encounter, investigations, treatments and referrals provided, and additional health related information, leading to a wealth of data for consideration.

Some recent developments are noteworthy. All encounters, including indirect as well as direct, and all locations, are now specified. Information about medications now includes those recommended for over-the-counter purchase as well as those prescribed, and includes prescribed daily doses. Great technical improvements have been made. A more specific coding system (ICPC-2 PLUS) allows more reliable classification of the terms recorded by the general practitioners. Better statistical techniques are now available and have been applied to deal with the effect of the cluster sampling method and adjust for confounding factors in analyses. Weighting of data makes it even more representative.

The report provides an overview of general practice in Australia, but goes beyond that. We learn for example, that children account for 14% of encounters and the elderly 24%, that the most common individual problems managed were hypertension and upper respiratory infection, and that the most frequently prescribed medication was antibiotics. It also provides information about less common aspects of general practice. As examples, the pattern of morbidity managed for indigenous people differs from that in the total sample, with more diabetes and infections; and the most frequent treatment procedure undertaken is excision. Most importantly, there is a wealth of information about almost any topic that is available for special analysis for those who need it, as I found when I used this facility to report on the management of dementia in general practice.

Of particular interest are the Supplementary Analysis of Nominated Data (SAND) sub-studies of aspects of patient health not necessarily related to the particular problems treated at the encounter. These cover a wide range of topics, such as smoking status, alcohol consumption and body mass index (BMI), which are so important in relation to health promotion and prevention.

That the BEACH survey continues each year shows its proven worth. What is even more important is the evidence of learning by doing that it demonstrates, as the project develops from year to year. We can all look forward to further refinements in subsequent years, hopefully including some indication of patient health outcomes for at least some subgroups.

The introduction to the report of the first survey of 40 years ago stated: "The diligence and interest of the participating doctors has provided an outstanding example of co-operative effort on the part of busy practitioners, without whose help such a survey could not be undertaken". I can do no better than repeat and reinforce that, but also include the talented team of BEACH researchers in my commendation.

Charles Bridges-Webb

Emeritus Professor of General Practice

Discipline of General Practice

University of Sydney

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Acknowledgments

The General Practice Statistics and Classification Unit wishes to thank the 1,008 general practitioners who participated in BEACH 2002–03. This report would not have been possible without their valued co-operation 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 Australian Department of Health and Ageing
- AstraZeneca (Australia)
- 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.

The research team is grateful for the intensive editing work undertaken on this report by Clare Bayram, for the strong IT support of Timothy Chambers, the research support of Julie O'Halloran, the administrative support of Gervaise Woods, the work of Dulcie Bucksath in the preparation of the appendices, and the valuable contribution of the general practitioner recruitment staff (particularly Errol Henderson) and data entry staff. We recognise the contribution of past members of the BEACH team.

We also appreciate the co-operation of Anthony Lawrence and Carolynn Fredericks of the General Practice Branch of the Australian Department of Health and Ageing in regularly supplying general practitioner random samples and national Health Insurance Commission data. At the Australian Institute of Health and Welfare, Jenny Hargreaves edited the report, Fadwa Al Yaman reviewed the chapter on encounters with Indigenous people and Ainsley Morrissey 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 from the fifth 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 five years since the program began in March 1998. Summaries of results for each year and for the total five years are provided in Appendix 4.

Method

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

In the 2002–03 BEACH data year, a random sample of 1,008 GPs from across Australia provided details of 100,800 GP–patient encounters. Results are reported in terms of GP and patient characteristics, patient reasons for encounter, problems managed and management techniques used. Questions about selected patient health risk factors were asked of a subsample of patients, and the results are included in this publication. Other substudies covered in the fifth year of BEACH are reported elsewhere (http://www.fmrc.org.au/beach-pubs.htm#6).

The participating general practitioners

The 1,008 participants represented 28.9% of those with whom contact could be established. Males made up 64.8% of participants and GPs aged 45 years or older accounted for 66.1%. Most (77.9%) had been in general practice for more than ten years. The majority (72.0%) had graduated in Australia and two-thirds (64.7%) practised in capital cities. More than one-third (35.5%) were Fellows of the Royal Australian College of General Practitioners (RACGP), 39.5% had completed the RACGP Training Program, and 2.9% were currently in the Training Program. Less than one in seven (13.7%) were in solo practice, and three-quarters 79.3%) worked in an accredited practice. More than half the practices (55.2%) provided their own after-hours services or worked through a co-operative arrangement with other practices. Hours spent in direct patient care per week were between 41 and 60 hours for 42.8% of these GPs and 21–40 hours for 41.6%. Computers were used in 97.1% of practices, mainly for prescribing (79.6%) and billing (73.5%) purposes.

A comparison of characteristics of participating GPs with those of GPs who declined showed that GPs aged less than 35 years were under-represented in the final BEACH GP sample. Post-stratification weighting adjusted for this difference. Participants were also marginally 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 100,987 encounters included in the analysis. Comparison of the age–sex distribution of patients at the Medicare-claimable encounters with that of encounters in the Medicare data demonstrated excellent precision of the final encounter sample. Most encounters (98.4%) were direct encounters (patient seen). The vast majority (95.0%) of these were claimable from Medicare or the Department of Veterans' Affairs, and 82.9% were standard surgery consultations. The encounters involved 152,341 reasons for encounter (RFEs), 146,336 problems managed, 104,813 medications, 52,292 non-pharmacological treatments, 11,254 referrals, 33,234 pathology test orders and 8,678 orders for imaging.

The patients

Children accounted for 13.6% of the encounters, 10.1% were with young adults, and 24.2% with elderly patients. The patient was female at 57.8% of encounters, held a Commonwealth health care card at 40.4%, and came from a non-English-speaking background at 10.6% of encounters. Patients identified themselves as an Aboriginal person and/or a Torres Strait Islander at 1.0% of encounters.

Patient RFEs were recorded at a rate of 151 per 100 encounters. Approximately half the RFEs related to the respiratory, musculoskeletal and 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, followed by RFEs largely of a symptomatic nature.

Problems managed

Problems were managed at a rate of 144.9 per 100 encounters. Those relating to the respiratory system, musculoskeletal system and skin accounted for almost 40% of all problems managed. The most common individual problems were hypertension (8.9 per 100 encounters), upper respiratory tract infection (URTI) (6.4 per 100), immunisation/ vaccination (4.6 per 100), depression (3.5 per 100) and lipid disorder (3.0 per 100). Together, these represented almost 20% of all problems managed.

Management

There was no specific treatment recorded for 8.7% of problems managed. The most common treatment was medication alone (33.8% of problems), followed by medication plus clinical treatments (12.1%) and then by clinical treatment alone (7.2%). There has been an increase in the combined use of a medication and clinical treatment, with a decrease in the individual use of these managements over the last five years.

Medications

There were 104 medications recorded per 100 encounters, or 72 per 100 problems. These medications could be prescribed (81.3% of all medications), advised for over-the-counter purchase (9.8%) or supplied by the GP (9.0%).

Prescribed medications: medications were prescribed at a rate of 84.3 per 100 encounters or 58.2 per 100 problems managed, at least one being prescribed at 54.9% of encounters and for 47.2% of problems managed. Medication groups most frequently prescribed were antibiotics (16.4% of all prescriptions), cardiovascular (15.5%), central nervous system (12.5%), psychological (8.3%), musculoskeletal (6.8%) and respiratory (6.3%). The most commonly

prescribed generic medications were paracetamol (3.7% of all prescriptions), amoxycillin (3.7%), the paracetamol-codeine combination (2.4%) and cephalexin (2.3%).

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

Non-pharmacological treatments

These were classified as clinical and procedural. At least one non-pharmacological treatment was provided for 30.9% of problems. Clinical treatments were more frequent (37.2 per 100 encounters or 25.7 per 100 problems) than procedures (14.6 and 10.1 respectively). General advice and education (6.9 per 100 encounters) was the most common clinical treatment, followed by counselling about the problem managed. The most frequent procedure was excision or removal of tissue (2.9 per 100).

Referrals, admissions, tests and investigations

At least one referral was given at 10.6% of encounters for 7.7% of problems. Referrals to medical specialists arose at a rate of 7.7 per 100 encounters, the most frequent being to orthopaedic surgeons. Referrals to allied health professionals were made at a rate of 2.5 per 100 encounters, the majority being to physiotherapists. Admissions to hospital and referrals to the emergency department were rare. Diabetes, pregnancy, malignant neoplasms of the skin and osteoarthritis were the problems most often referred to a specialist; back complaints, sprains/strains and depression were those most commonly referred to an allied health professional.

Pathology was ordered for more than one in ten problems (at a rate of 32.9 tests per 100 encounters). Blood chemistry accounted for more than half the tests ordered, but a full blood count was the most commonly ordered individual test. Problems for which pathology was most often ordered were hypertension, diabetes and lipid disorders. Imaging was ordered for one in twenty problems, at a rate of 8.6 per 100 encounters. Plain x-rays accounted for almost two-thirds of these, chest x-rays being the most common. Back complaints, fractures and osteoarthritis were the problems for which imaging was most frequently ordered.

Changes over time

Multiple regression was used to identify significant trends since 1998–99. The analysis demonstrated increased management rates of endocrine and metabolic problems (lipid disorders and diabetes in particular), with decreased management rates of respiratory problems (particularly asthma and acute bronchitis), ear problems, and problems related to the blood and blood-forming organs. There were measured decreases in overall prescribing rates for antibiotics and respiratory medications. Prescribing rates for simple and compound analgesics decreased over time, however there was a significant increase in prescription rates of narcotic analgesics. Increases in clinical treatment rates were apparent, however the provision of lifestyle counselling and advice fell in 2002–03 from the high levels observed in the previous year.

Selected topics—changes over time

The rate of non-steroidal anti-inflammatory drugs (NSAIDs) prescribed/supplied or advised over-the-counter rose significantly over the period 1999–00 to 2000–01, but remained relatively steady over the next two years 2001–02 to 2002–03 with no further increase in medication rates. The increase in NSAIDs was explained by the rapid uptake of Cox-2

inhibitors between 1999–00 and 2000–01. It appears that the level of Cox-2 inhibitor prescribed or supplied by the GP has reached a plateau with no further increase in the rates of Cox-2 inhibitors observed since 2000–01. The pattern of NSAID medication rates was similar for both arthritis and other musculoskeletal problems, although the uptake of Cox-2 inhibitors was more pronounced for arthritis.

There was no change in the management rate of upper respiratory tract infection (URTI). However, there has been a decrease in antibiotic prescribing for URTI problems, except for broad spectrum penicillin which in 2002–03 rose back to the level observed in 1998–99.

Patient health risk factors

Body mass index: Of 32,367 adult respondents (aged 18+ years), more than half were considered obese (20.9%) or overweight (33.8%). Men were more likely to be overweight or obese (61.4%) than women (50.4%). Approximately 8% were underweight. There was a significant increase in prevalence of obesity over the 5 years from 1998–99 (18.4%) to 2002–03 (20.9). BMI was calculated for 3,579 children aged 2–17 years. Overall, 14.1% of these children were considered obese and a further 18.1% were overweight.

Smoking: Of the 32,651 responding adult patients (aged 18+ years), 17.2% were daily smokers, 4.1% were occasional smokers and 27.2% were previous smokers. Males were more likely to report daily smoking (20.4%) than females (15.2%).

Alcohol consumption: 'At-risk' levels of alcohol intake were reported by 26.2% of the 32,140 adult respondents. Male patients were more likely to be 'at-risk' drinkers (32.9%) than women (22.1%). Prevalence of 'at-risk' drinking decreased with increasing age for both sexes.

Risk factor profile: Smoking status, alcohol consumption and body mass index were available for 31,152 adult patients. Almost half of these patients had one of these three risk factors, 19.6% had two and 3.6% had all three.

Encounters with Indigenous people

In 2002–03 there were 1,375 encounters (1.4% of all encounters) at which patients identified themselves as an Aboriginal or Torres Strait Islander person. From 1998 to 2003, there were 5,476 such encounters (unweighted), representing 1.1% of the total, seen by 1,354 GPs (27% of the sample). These patients were significantly younger than the total sample, were more often new patients to the practice and more likely to hold a Commonwealth health care card. Their encounters represented 0.5% of those in capital cities but 18.2% of those in remote centres and 9.3% of those in other remote areas. The pattern of morbidity at these encounters was significantly different from that of the total sample. In particular, there were significantly higher management rates of diabetes, asthma, acute bronchitis, otitis media, pregnancy, tonsillitis and boil/carbuncle.

These patients received significantly more medications than those at all encounters, with high rates of GP-supplied medications and low rates of advised over-the-counter drugs. Pathology ordering rates were also significantly higher at these Indigenous encounters than at total encounters. The substudies of some adult patient risk factors demonstrated that almost two-thirds of the Indigenous respondents were obese or overweight, 45.2% reported smoking daily, and almost 40% reported consuming 'at-risk' levels of alcohol.

Conclusion

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

1 Introduction

The BEACH (Bettering the Evaluation and Care of Health) program is a continuous national study of general practice activity in Australia. This publication is the fifth annual report of the program and provides a summary of results for the period April 2002 to March 2003 inclusive. It uses details of more than 100,000 encounters (about a 0.1% sample of total encounters) between general practitioners (GPs) and patients, from a random sample of 1,008 recognised practising GPs from across the country.

GPs perform a gatekeeper role for entry into the secondary and tertiary sectors of the Australian healthcare system. Most of the 19.7 million Australians (85%) attended a GP at least once during the year 2002 (personal communication, GP Branch, Australian Department of Health and Ageing 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 GPs 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 (approximately) 100 million non-specialist services to the population that were paid by Medicare,[2] at an average rate of 5.2 per person per year.[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.

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

This year of the program provides the fifth measured data point, allowing further measurement of changes over time. Changes that were identified in 2000–01 and 2001–02 in the patterns of morbidity managed and the medications prescribed are followed up in this fifth 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 in 2002–03. It also provides a summary of results for each year of the BEACH program to date and the total results for the five year data set.

2 Methods

The methods adopted in the BEACH program have been described in detail elsewhere.[4-6] 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 Australian Department of Health and Ageing (DoHA) draws a sample on a regular basis.

2.2 Recruitment methods

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

Participating GPs earn 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 consume alcohol at hazardous levels.

2.3 Data elements

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

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

Information about **the patient** includes date of birth, sex and postcode of residence. Tick boxes are provided for Commonwealth health care card holder, Veterans' Affairs white card

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

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

Management data for each problem include medications prescribed, over-the-counter medications advised and other medications supplied by the GP. Details for each **medication** comprise brand name, form (where required), strength, regimen, status (if new medication for this problem for this patient) and number of repeats. **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 healthcare 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 is a part) at http://www.fmrc.org.au/beach-pubs.htm#6.

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.

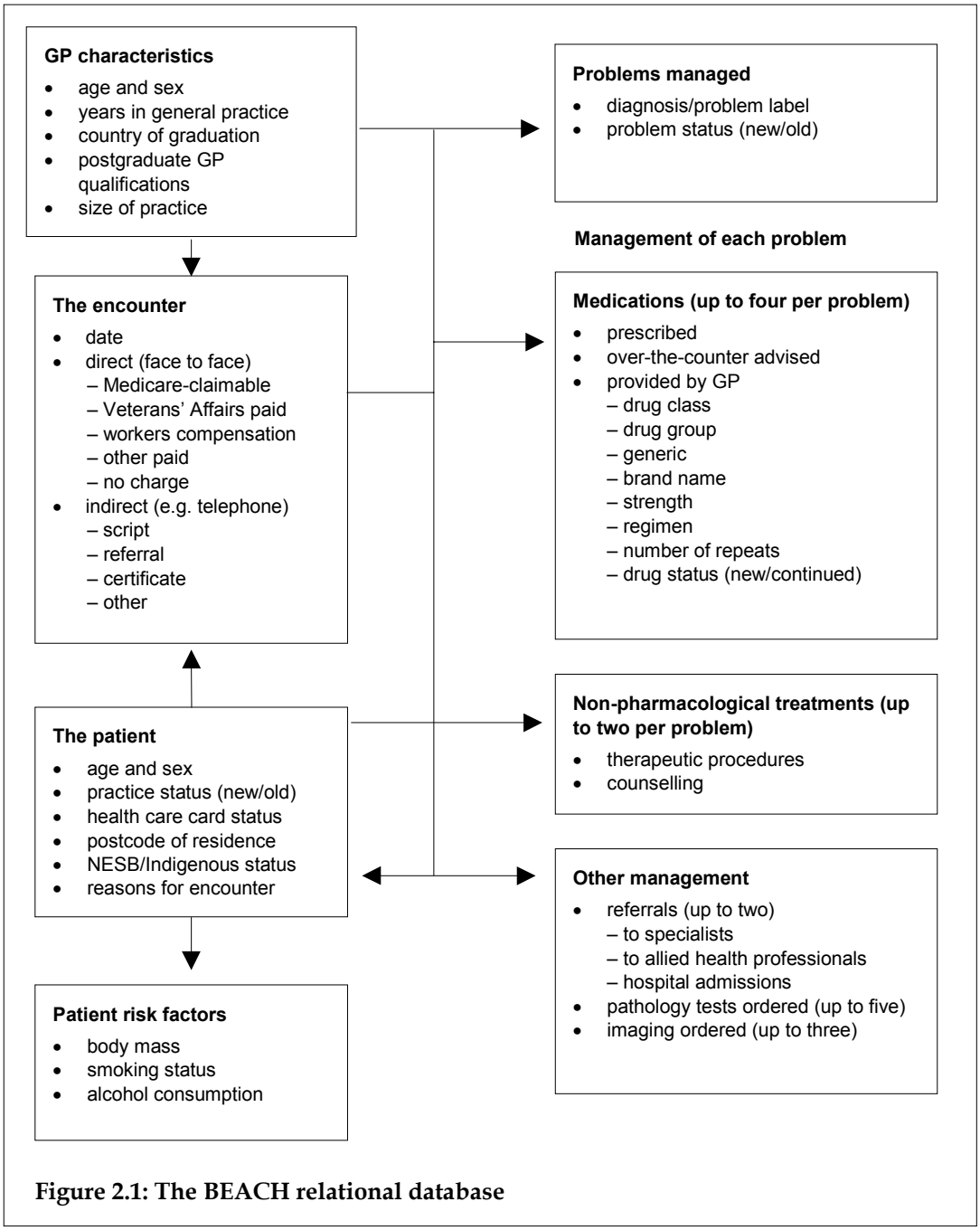


Figure 2.1: The BEACH relational database

2.5 Statistical methods

The analysis of the BEACH database is conducted with SAS versions 6.12[7] and 8.2[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 formulae. For comparability with previous years, we have continued to use SAS 6.12 for the tables in the body of the report. SAS version 8.2[8] now includes procedures that calculate the robust standard error to adjust for the intra-cluster correlation of the cluster sample. SAS version 8.2 procedures were used in the analysis of trends over time, the summary of Aboriginal and Torres Strait Islander encounters and the combined five year data.

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 14.

Post-stratification weighting was applied to the raw data before analysis (see Chapter 4).

Weights are calculated for each year's sample and are used to estimate national general practice encounter rates for that year. Weights are valid for summarising a complete year's sample and for analysing trends from year to year. Sampling weights are therefore used for the summary tables in the report and the trend analysis across time.

Because weights are specific for each sample year they are not valid for the analysis of subgroups of patients or when combining data across years. Therefore, the summary of the combined five year data appended to this document and the analysis of the encounters with Aboriginal and Torres Strait Island patients were unweighted.

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.[11] This is an extended vocabulary of terms classified according to the International Classification of Primary Care—Version 2 (ICPC-2), a product of the World Organization of Family Doctors (WONCA).[12] The ICPC is used in more than 45 countries as the standard for data classification in primary care.

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

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

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

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

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

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

The ICPC-2 is an excellent epidemiological tool. The diagnostic and symptomatic rubrics have been selected for inclusion on the basis of their relative frequency in primary care settings or because of their relative importance in describing the health of the community. It has only about 1,370 rubrics and these are sufficient for meaningful analyses. However, reliability of data entry, using ICPC-2 alone, would require a thorough knowledge of the classification if correct classification of a concept were to be ensured. In 1995, recognising a need for a coding and classification system for general practice electronic health records, the Family Medicine Research Centre (then Unit) developed an extended vocabulary of terms classified according to the ICPC. These terms were derived from those recorded by GPs on more than half a million encounter forms. The terms have developed further over the past 8 years in response to the use of terminology by GPs participating in the BEACH program and in response to requests from GPs using ICPC-2 PLUS in their electronic clinical systems. This allows far greater specificity in data entry and ensures high inter-coder reliability between secondary coding staff. It also facilitates analyses of information about more specific problems when required.[11]

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)[13] 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.[14] Other studies have reported the degree to which GP-reported patient reasons for encounter and problems managed accurately reflect those recalled by the patient[15] and the reliability of secondary coding of RFEs[16] and problems managed.[17] The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work.[18]

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.[19,20] 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.[21]

3 The general practitioners

3.1 Results of recruitment

Contact was attempted with 3,866 GPs, and established with 3,487 (90.2%) of these. Of the 379 who could not be contacted (9.8% of those approached), there were 60 for whom telephone numbers could not be established, 187 had moved and were untraceable, or were retired or deceased, and 49 were not currently practising (e.g. overseas, on maternity or other leave). A further 83 were unable to be contacted after five attempts by telephone recruiters. Of the 3,487 available practitioners, 1,248 (35.8%) agreed to participate but 240 (6.9%) failed to complete the study. The final participating sample consisted of 1,008 practitioners, representing 28.9% of those who were contacted and available, and 26.1% of those with whom contact was attempted (Table 3.1).

Table 3.1: Recruitment and participation rates

	Number	Per cent of approached (*n*=3,866)	Per cent of contacts established (*n*=3,487)
Letter sent and phone contact attempted	3,866	100.0	—
No contact	379	9.8	—
No phone number	60	1.6	—
Moved/retired/deceased	187	4.8	—
Unavailable	49	1.3	—
No contact after five calls	83	2.1	—
Telephone contact established	3,487	90.2	100.0
Declined to participate	2,239	57.9	64.2
Agreed but withdrew	240	6.2	6.9
Agreed and completed	1,008	26.1	28.9

3.2 The participating GPs

All participants returned a GP profile questionnaire although some were incomplete. Of the 1,008 participants, 64.8% were male and 66.1% were 45 years of age or older. Three-quarters (78.4%) had been in general practice for more than 10 years, and 18.7% could be regarded as practising part-time, working fewer than six sessions per week. Fewer than one in seven (13.7%) were in solo practice. The majority (72.0%) had graduated in Australia and just under two-thirds (64.7%) practised in capital cities. More than one-third (35.5%) were Fellows of the RACGP. Twenty-eight GPs (2.9%) were currently undertaking the RACGP Training Program, and 39.5% had already completed it. Just over half (55.2%) provided their own after-hours practice arrangements or worked in co-operation with other practices to provide after-hours services, rather than relying on locum services or not providing after-hours care. More than three-quarters (79.3%) of practices were accredited. Almost half of participants

(46.9%) spent more than 40 hours each week on direct patient care services. Fifty per cent spent additional time on call apart from their hours of direct patient care, with half of these (26.2%) spending more than 20 hours per week on call. The GPs who spent more than 60 hours per week on call (11.4%) were those who indicated that they are always on call when not on duty. Slightly fewer than half the participants (42.1%) had provided patient care in a residential aged care facility during the month prior to their participation in this study, but only 11.3% had worked as a salaried or sessional hospital medical officer during that period. Almost half (48.4%) of the GPs worked in a teaching practice, either for undergraduates only (25.5%), GP registrars only (8.8%) or both (14.1%) (Table 3.2).

Table 3.2: Characteristics of participating GPs

GP characteristic	Number[(a)]	Per cent of GPs[(a)] (*n*=1,008)
Sex		
Male	653	64.8
Female	355	35.2
Age		
< 35 years	74	7.3
35–44 years	268	26.6
45–54 years	355	35.2
55+ years	311	30.9
Years in general practice (missing=6)		
<2 years	6	0.6
2–5 years	75	7.5
6–10 years	135	13.5
11–19 years	281	28.0
20+ years	505	50.4
Sessions per week (missing=8)		
<6 per week	187	18.7
6–10 per week	679	67.9
11+ per week	134	13.4
Size of practice (missing=8)		
Solo	137	13.7
2–4 GPs	384	38.4
5+ GPs	479	47.9
Place of graduation		
Australia	726	72.0
UK	92	9.1
Asia	100	9.9
Europe	16	1.6
Africa	43	4.3
New Zealand	22	2.2
Other	9	0.9

(continued)

Table 3.2 (continued): Characteristics of participating GPs

GP characteristic	Number[(a)]	Per cent of GPs[(a)] (*n*=1,008)
Practice location		
Capital	652	64.7
Other metropolitan	86	8.5
Large rural	51	5.1
Small rural	78	7.7
Other rural	121	12.0
Remote central	6	0.6
Other remote, offshore	14	1.4
RACGP Training Program status (missing=53)		
Currently training	28	2.9
Completed training	377	39.5
Fellow of RACGP (missing=8)	355	35.5
Own or co-operative after-hours arrangements (missing=10)	551	55.2
Accredited practice (missing=19)	784	79.3
Direct patient care hours (worked) per week (missing=12)		
<10 hours	3	0.3
10–20 hours	112	11.2
21–40 hours	414	41.6
41–60 hours	426	42.8
60+ hours	41	4.1
Hours on call (not worked) per week (missing=46)		
0 hours	479	49.8
<10 hours	58	6.0
10–20 hours	173	18.0
21–40 hours	90	9.4
41–60 hours	52	5.4
60+ hours	110	11.4
Patient care provided in previous month		
As a locum	61	6.1
In a deputising service	29	2.9
In a residential aged care facility	424	42.1
As a salaried/sessional hospital medical officer	114	11.3
Major practice a teaching practice (missing=13)		
For undergraduates only	254	25.5
For GP registrars only	88	8.8
For both undergraduates and registrars	140	14.1

(a) Missing data removed.

Note: RACGP—Royal Australian College of General Practitioners

3.3 Computer use by participating GPs

Computers were used in 91.7% of practices, mainly for prescribing (79.6%) and billing (73.5%) purposes. Almost two-thirds (65.1%) of practices used computers for administrative processes and 60.9% used them for medical records. More than half (58.8%) used the Internet or email (Table 3.3).

Table 3.3: GP computer use

Computer use	Number	Per cent of GPs (*n*=1,008)	Per cent of GPs with computers (*n*=920)
Not at all	83	8.3	—
Billing	737	73.5	80.1
Prescribing	798	79.6	86.7
Medical records	611	60.9	66.4
Other administrative	653	65.1	71.0
Internet/email	590	58.8	64.1
Missing	5	0.5	—

The top ten combinations of computer use by participants are listed in Table 3.4. One-third of the GPs (33.7%) indicated that their practice used computers for all five purposes—billing, prescribing, medical records, other administrative and Internet/email. Prescribing was the only usage included in all of the top ten combinations. Billing was the second most common usage, with medical records and Internet/email usage ranking equal third. Fewer than half the GPs (43.5% of participants; 47.4% of participants with computers) reported computer use for both medical records and Internet/email purposes.

Table 3.4: Top ten combinations of computer use for GPs

Combination	Number	Per cent of GPs (*n*=1,008)	Per cent of GPs with computers (*n*=920)
All five uses	338	33.7	36.7
Billing + prescribing + medical records + other administrative	81	8.1	8.8
Billing + prescribing + other admin + Internet/email	58	5.8	6.3
Billing + prescribing + medical records	49	4.9	5.3
Billing + prescribing + other administrative	39	3.9	4.2
Billing + prescribing + medical records + Internet/email	36	3.6	3.9
Billing + prescribing	36	3.6	3.9
Billing + prescribing + Internet/email	30	3.0	3.3
Prescribing + medical records + other admin + Internet/email	26	2.6	2.8
Prescribing + medical records + Internet/email	25	2.5	2.7

3.4 Comparison of participating and non-participating GPs

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

In Table 3.5 the characteristics of the final participants are compared with those of all other GPs drawn in the initial sample using DoHA data elements. There were considerable discrepancies between the DoHA's information about participants (Table 3.5) and that self-reported by the GPs (Table 3.2), suggesting that the reliability of DoHA GP characteristic data may be questionable. There is, however, no reason to assume that the accuracy of DoHA data should differ for 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 place of graduation and location of practice in terms of the Rural, Remote and Metropolitan Area (RRMA) classification.[22]

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

For 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 a statistically significant difference in mean activity level in the previous quarter (measured by the number of A1 Medicare items of service claimed) between participants and non-participants. GPs with an activity level of 375–750 services in the previous quarter were considerably more likely to participate than those in the 751–1,500 or >1,500 groups. However, comparisons of the median scores for each group showed a difference of only six consultations per week. 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.

3.5 Discussion

The response rate of GPs to BEACH was 28.9% of those with whom contact was established. This rate is slightly lower than last year (32.3%) but similar to the previous year (29.8%) and lower than in the initial two years of BEACH (38.4% and 39.1%). These variations are possibly a reflection of the stage of triennium for each year of recruitment. The wide variety of QA options currently available to GPs may also affect the response rate. In recognition of the work involved in BEACH participation, the RACGP has recently announced an increase

in the number of points available commensurate with the amount of work involved. It will be interesting to see how this change affects response rates in the future.

The continued under-representation of GPs aged less than 35 years also may reflect the fact that GP registrars are not required to undertake QA activities during training or during the QA triennium on completion of training. We are currently undertaking a separate study (using BEACH methods) of a sample of registrars in city and rural practice. It will be interesting to see whether registrars do practise differently from other GPs. If not, the above adjustment for age of GP is not really necessary. If so, incentives are needed to encourage the participation of these younger GPs to ensure their sufficient representation in the future.

Of particular interest in the above results is the combination of computerised medical records and Internet/email use. Only 436 GPs (43.5% of participants; 47.4% of participants with computers) reported using computers for both purposes in their practice. Given the current trend toward supplying clinicians with guidelines and other information via the Internet, the use of these facilities to claim for bulk billed patients and the transfer of information from computerised records via electronic download for data collection, this is a surprising outcome. We hypothesised that this result was an effect of rural GPs having limited Internet access as a consequence of limited telecommunications infrastructure in many areas. On investigation of the location of GPs using Internet and email facilities, it appears that this is not the case. Applying the RRMA classification to investigate this group of participants, rural and metropolitan GPs were found to differ significantly in their Internet/email use (χ^2=8.4463, p=0.004), however, it is the rural GPs who (proportionally) use Internet/email facilities the most. It would seem that, although metropolitan GPs may have better access, they are less inclined to use these facilities.

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

	Participants[a] (*n*=1,008)		Non-participants[a] (*n*=2,479)	
GP characteristics	**Number**	**Per cent of GPs[b]**	**Number**	**Per cent of GPs[b]**
Sex (χ^2=7.88, p=0.0193)				
Male	653	64.8	1,727	69.7
Female	355	35.2	752	30.3
Age (χ^2=23.01, p=4.02E-05)				
< 35 years	73	7.5	226	9.5
35–44 years	240	24.7	660	27.7
45–54 years	338	34.8	900	37.8
55+ years	319	32.9	593	24.9
Missing	38	—	100	—
Place of graduation (χ^2=1.33, p=0.5127)				
Australia	734	72.8	1,852	74.7
Overseas	274	27.2	627	25.3
State (χ^2=15.64, p=0.0285)				
New South Wales	400	39.7	911	36.8
Victoria	190	18.8	497	20.1
Queensland	214	21.2	507	20.5
South Australia	62	6.2	202	8.2
Western Australia	90	8.9	239	9.7
Tasmania	28	2.7	62	2.5
Australian Capital Territory	13	1.3	47	1.9
Northern Territory	11	1.1	8	0.3
Missing	—	—	6	0.2
RRMA (χ^2=7.1, p=0.31)				
Capital	654	64.9	1,606	68.1
Other metropolitan	86	8.5	218	8.5
Large rural	51	5.1	170	6.0
Small rural	76	7.5	182	6.3
Other rural	121	12.0	259	9.4
Remote centre	6	0.6	16	0.5
Other remote	14	1.4	22	0.8
Missing	—	—	6	0.2
Activity (χ^2=18.74, p=8.51E-05)				
375–750 services in previous quarter	240	23.8	436	17.6
751–1,500 services in previous quarter	408	40.5	1,129	45.5
>1,500 services in previous quarter	360	35.7	914	36.9
Mean activity level (*t* =2.10, p=0.036)	1,362.9	—	1,422.7	—
Median activity level	1,182.0	—	1,264.0	—
Standard deviation	771.3	—	758.1	—

(a) Data provided by the GP Branch, Australian Department of Health and Ageing. (b) Missing data removed.

3.6 Trends in characteristics of the GPs, 1998–2003

Over the first 5 years of BEACH, there were some notable trends in the characteristics of the GPs who participated in the program (see Appendix 4, Table A4.1).

The proportion of GP participants who are female has maintained a gradual increase from 30.0% to 35.2% since 1998–99. Participants in BEACH 2002–03 tended to be older than those from 1998–99, there being a gradual decrease in the proportion younger than 45 years (from 42.5% to 33.9%). Although the proportion in the 44–54 year age group did not increase further during the past year, the proportion of participants aged 55 years and over continued an upward trend (from 25.2% to 30.9%). From comparisons with the national data in each year,[5,6,23,24] these changes 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 13.5%) and for 11–19 years (33.7% to 28.0%), and the proportion who had spent more than 20 years in general practice increased from 42.2% to 50.4%.

Although 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 18.7%) and a decrease in the proportion who work 11 or more sessions per week (19.1% to 13.4%). In parallel, the proportion of participants working in larger practices of five or more GPs increased over the 5 years from 38.9% to 47.9%. The greater proportion working fewer sessions per week, and the decrease in the proportion working more than 11 sessions per week probably reflect a combination of factors—an increasing proportion of females in the general practice workforce, who may tend to work part-time during child rearing years; older GPs may be working fewer sessions rather than retiring; the increasing size of practices may reduce pressure on individual GPs to work as many sessions as they may have previously.

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 in the fourth and fifth years of the program but will be reported again at the end of the sixth year, BEACH 2003–04. An increase from 30.4% to 39.5% 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 5 years, from 27.3% to 35.5%. Data on computer use by GPs has only been collected in BEACH since 2000–01, but has shown a steady increase in usage over the three years, from 87.4% to 91.3%. A summary of these results can be found in Appendix 4, Table A4.1.

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 in the study sample. Random sampling error and GP response rates, however, may result in some under-representation or over-representation in the sample of certain population groups.

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

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

If possible, the final study group of GPs should be compared with the population from which the GPs were drawn to identify and, if necessary, adjust for any sample bias that may have an impact on the findings of the study. Comparisons of the characteristics of participants and non-participants were reported in Chapter 3 (Table 3.5).

Statistical comparisons, using the chi-square statistic (χ^2), were then made between BEACH participants and all recognised GPs in Australia who claimed 375 or more general practice Medicare item numbers in the last quarter of 2002 (Table 4.1). The GP characteristics data for the BEACH participants have been drawn from the GP profile questionnaire to ensure highest reliability. The GP Branch of the Australian 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 ($\chi^2=8.23$, $p=0.04$). 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 Queensland were somewhat over-represented in the sample, while Victoria was under-represented, compared with the national profile of GPs ($\chi^2=65.9$, $p<0.001$). There were no significant differences in terms of metropolitan, rural or remote location of GPs ($\chi^2=6.16$, $p=0.41$).

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=1.72, p =0.19)				
Male	653	64.8	11,929	66.8
Female	355	35.2	5934	33.2
Age (χ^2=8.23, p=0.04)				
< 35 years	74	7.3	1,743	9.7
35–44 years	268	26.6	4,493	25.1
45–54 years	355	35.2	5,922	33.1
55+ years	311	30.9	5,726	32.0
Place of graduation (χ^2=0.21, p =0.65)				
Australia	726	72.0	12,999	72.7
Overseas	282	28.0	4,885	27.3
State (χ^2=65.90, p<0.001)				
New South Wales	399	39.6	5,949	33.6
Victoria	190	18.8	4,333	24.5
Queensland	214	21.2	3,282	18.5
South Australia	62	6.2	1,535	8.7
Western Australia	90	8.9	1,685	9.5
Tasmania	28	2.8	510	2.9
Australian Capital Territory	14	1.4	271	1.5
Northern Territory	11	1.1	142	0.8
RRMA (χ^2=6.16, p=0.41)				
Capital	652	64.7	11,519	65.1
Other metropolitan	86	8.5	1,302	7.4
Large rural	51	5.1	1,092	6.2
Small rural	78	7.7	1,253	7.1
Other rural	121	12.0	2,102	11.9
Remote centre	6	0.6	183	1.0
Other remote	14	1.4	256	1.4

(a) Missing data removed.

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

(c) Data provided by GP Branch, Australian 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 about the benchmark population from which the sample is drawn, with which the sample can be compared. When such information is available, it is important to consider the possible effect of any differences between the sample and the population on the generalisability of the findings. The data were only weighted for factors thought to have an important effect on morbidity and management. Although there were differences between the sample and the Medical Benefits Schedule (MBS) data in terms of the proportion of GPs from each State, it was assumed that the morbidity and management profile of GPs was similar across States and therefore weighting by State was not undertaken.

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

GP weights

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

Encounter weights

The BEACH process requires that each GP provides details of 100 consecutive encounters. The assumption based on previous research is that 100 encounters provide a reliable sample of the GP's patients and practice style.[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— a GP who provides 6,000 services in a given year should make a greater contribution to any national estimate than a GP who provides 3,000 services. Encounters were therefore assigned an additional weight that was directly proportional to the busyness of the GP who recorded the encounter. GP activity level was measured as the number of A1 items claimed by the GP in the previous 12 months (MBS data supplied by the Australian Department of Health and Ageing).

The values of the final encounter weights 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 before and after weighting the data.

4.3 Comparison of BEACH consultations with all GP consultations in Australia

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

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 or patient choice) claimed against any funding body. Further, the BEACH program counts only a single Medicare item number for each encounter covered by the MBS. In reality, more than one Medicare claim can result from a single encounter. Due to the large size of the data sets used, any statistical comparison (e.g. χ^2) would generate statistical significance for even the most minor differences between the two sources of data. Therefore, it is necessary to consider whether any difference is likely to have a strong influence on the results and whether the precision of any estimate from BEACH complies with statistical standards. In determining whether any estimate is reliable, power calculations use a precision of 0.2 or 20% of the true proportion (or value). For example, if the true value were 15% then it would be desirable that any estimate was in the range of 12% to 18% if it is to be considered to have 20% precision.

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

As can be seen in Table 4.2, there is a good fit of the MBS and BEACH age and sex distribution both with and without weighting, with no age–sex category varying by more than 20% from the population distribution. The range of raw precision ratios (0.92–1.17) indicate that the BEACH sample of encounters is a good representation of Australian general practice patient encounters. After weighting, the range of precision ratios improved slightly to within less than 15% (range 0.89–1.10) of the population distribution.

4.4 The weighted data set

The final unweighted data set from the fifth year of collection contained encounters, reasons for encounters, problems and management/treatments. The apparent number of encounters and medications increased after weighting, while reasons for encounter, problems managed, number of referrals and amount of imaging and pathology all decreased. Raw and weighted totals for each data element are shown in Table 4.3.

Table 4.2: Comparison of BEACH encounters 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]**
Male	32,996	39.3	41.7	1.06	1.00
< 1 year	886	1.1	1.1	1.07	1.10
1–4 years	2,304	2.7	3.0	1.10	1.03
5–14 years	2,778	3.3	3.9	1.17	1.07
15–24 years	2,863	3.4	3.6	1.06	1.01
25–44 years	7,529	9.0	9.3	1.04	0.97
45–64 years	8,879	10.6	11.3	1.07	1.00
65–74 years	4,163	5.0	5.5	1.12	1.06
75+ years	3,594	4.3	3.9	0.91	0.89
Female	50,613	60.2	58.3	0.97	1.00
< 1 year	862	1.0	1.0	0.95	0.95
1–4 years	2,038	2.4	2.7	1.11	1.05
5–14 years	2,761	3.3	3.7	1.13	1.07
15–24 years	5,660	6.7	6.2	0.92	0.94
25–44 years	13,732	16.3	15.4	0.94	0.96
45–64 years	13,474	16.0	15.1	0.94	0.99
65–74 years	5,551	6.6	6.5	0.98	1.02
75+ years	6,535	7.8	7.8	1.01	1.09

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

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

(c) 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	1,008	1,008
Encounters	100,800	100,987
Reasons for encounter	153,094	152,352
Problems managed	149,976	146,336
Medications	103,289	104,813
Non-pharmacological treatments	56,343	53,676
Referrals	13,002	12,265
Imaging	9,019	8,678
Pathology	36,332	33,234

5 The encounters

5.1 Overview of the data set

Using weighted data, there were 100,987 encounters from 1,008 GPs. An average of 151 patient reasons for encounter were described per 100 encounters. Of the 146,336 problems managed (at an average rate of 145 per 100 encounters), 39.3% were designated as new problems to the patient arising at a rate of 57.0 per 100 encounters (Table 5.1).

Table 5.1: Summary of morbidity and management

Variable	Number	Rate per 100 encounters (*n*=100,987)	95% LCL	95% UCL	Rate per 100 problems (*n*=146,336)	95% LCL	95% UCL
General practitioners	1,008	—	—	—	—	—	—
Encounters	100,987	—	—	—	—	—	—
Reasons for encounter	152,341	150.9	149.0	152.7	—	—	—
Problems managed	146,336	144.9	143.0	146.8	—	—	—
New problems	57,509	57.0	55.6	58.3	39.3	38.3	40.3
Medications	104,813	103.8	101.4	106.2	71.6	70.1	73.1
Prescribed	85,161	84.3	81.8	86.9	58.2	56.6	59.8
Advised OTC	10,270	10.2	9.2	11.1	7.0	6.3	7.7
GP supplied	9,382	9.3	7.6	11.0	6.4	5.3	7.5
Non-pharmacological treatments	52,292	51.8	49.3	54.3	35.7	34.1	37.3
Clinical	37,543	37.2	35.0	39.4	25.7	24.2	27.1
Procedural	14,748	14.6	13.9	15.3	10.1	9.6	10.6
Referrals	11,254	11.1	10.7	11.6	7.7	7.4	8.0
Specialist	7,743	7.7	7.3	8.0	5.3	5.1	5.5
Allied health services	2,536	2.5	2.3	2.8	1.7	1.6	1.9
Hospital	566	0.6	0.3	0.8	0.4	0.2	0.6
Emergency department	137	0.1	0.0	0.4	0.1	0.0	0.3
Other referral	271	0.3	0.0	0.5	0.2	0.0	0.4
Pathology	33,234	32.9	31.5	34.4	22.7	21.8	23.6
Imaging	8,678	8.6	8.2	9.0	5.9	5.7	6.2
Other investigation	1,012	1.0	0.8	1.2	0.7	0.5	0.8

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

Medications were prescribed, advised or supplied at a rate of 103.8 per 100 encounters. The prescription rate (84.3 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 (10.2 per 100 encounters) than they gave medications directly to the patient (9.3 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 more often (37.2 per 100 encounters) than procedural treatments (14.6 per 100 encounters) such as excisions and physical therapies.

Approximately 11 referrals per 100 encounters were made to specialists, allied health services, hospitals and emergency departments. Specialist referrals were the most common (7.7 per 100 encounters), followed by those to allied health professionals (2.5 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 (32.9 per 100 encounters) than were referrals (11.1 per 100), and orders for imaging (e.g. x-rays, scans) occurred less often (8.6 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 98.4% 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 (95.0%) of consultations and 96.5% 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.

More than 90% of Medicare-paid consultations (91.2% of direct consultations) took place in the GPs' consultation rooms. Note that some items grouped under 'other items' could also have taken place in the GPs' rooms and that case conferences can occur in places other than the GPs' rooms (e.g. nursing homes or offices of other healthcare professionals). Standard surgery consultations were the most frequent Medicare item recorded (78.7% of total encounters and 82.9% of Medicare-claimable encounters). Hospital, nursing home and home visits were relatively rare and accounted for only 2.6% of all encounters and 2.9% of Medicare-paid encounters. Workers compensation claims represented 1.9% of all recorded encounters.

Indirect consultations (1.6 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. They are often the result of a phone call by a patient. Many 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 of cost to Medicare or other formal funding sources (no charge and indirect consultations) made up approximately 2% of total clinical services provided by GPs. Whether or not these services were provided free of charge to the patient could not be determined (Table 5.2).

Table 5.2: Type of encounter

Variable	Number	Rate per 100 encounters (*n*=100,987)[(a)]	95% LCL	95% UCL	Per cent of direct encounters	Per cent of Medicare-paid
General practitioners	1,008	—	—	—	—	—
Direct consultations	92,256	98.4	98.2	98.6	100.0	—
No charge	485	0.5	0.2	0.8	0.5	—
MBS items of service[(b)]	89,068	95.0	94.6	95.3	96.5	100.0
Short surgery consultations	1,058	1.1	0.6	1.7	—	1.2
Standard surgery consultations	73,804	78.7	77.6	79.7	—	82.9
Long surgery consultations	8,551	9.1	8.5	9.7	—	9.6
Prolonged surgery consultations	674	0.7	0.0	1.5	—	0.8
Home visits	1,178	1.3	0.4	2.1	—	1.3
Hospital	345	0.4	0.0	2.7	—	0.4
Nursing home	1,078	1.2	0.0	2.9	—	1.2
Case conference*Ψ	8	0.0	0.0	1.4	—	0.0
Care plan Ψ	90	0.1	0.0	1.0	—	0.1
Health assessments Ψ	109	0.1	0.0	0.6	—	0.1
Other items	2,170	2.3	1.1	3.5	—	2.4
Workers compensation	1,806	1.9	1.6	2.2	2.0	—
Other paid (hospital, State, etc.)	899	1.0	0.2	1.8	1.0	—
Indirect consultations	1,542	1.6	1.2	2.0	—	—
Missing	7,190	—	—	—	—	—

(a) Missing data removed from analysis. Per cent base *n*=93,797.

(b) Include 1,760 encounters that were recorded as claimable for the Commonwealth Department of Veterans' Affairs.

* One case conference was indirect consultation.

Ψ Enhanced primary care (EPC) items include case conferences, care plans and health assessments.

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

5.3 Changes from 1998–99 to 2002–03

Over the five 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 98.4% (95% CI: 98.2–98.6). Therefore, the proportion of GP services that were provided free to Medicare or other formal funding sources ('no charge' plus 'indirect' non-chargeable consultations) decreased significantly from 4.1% in 1998–99 to 2.0% in 2002–03).

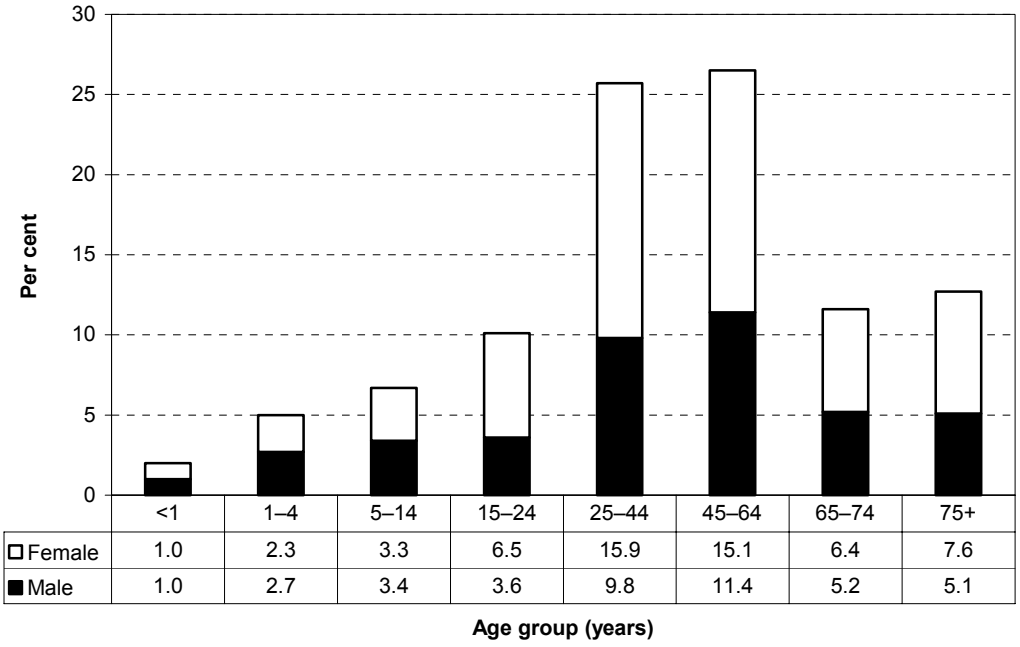
There was a significant increase in the proportion of encounters designated as standard surgery consultations, from 76.3 per 100 encounters (95% CI: 75.2–77.5) in 1998–99 to 79.0 per 100 (95% CI: 78.0–79.9) in 2001–02. This proportion remained stable in 2002–03 (78.7 per 100 encounters, 95% CI: 77.6–79.7) (Appendix 4, Table A4.3).

6 The patients

6.1 Patient characteristics

Age–sex distribution of patients

The age–sex distribution of patients at the 100,987 encounters recorded in the survey is shown in Figure 6.1. At 0.9% of encounters, age and sex were not recorded (Table 6.1). Overall, there were more encounters with female than male patients (57.8% compared with 42.2%). This was reflected across all age groups except for patients aged less than 15 years, where there were slightly more male than female encounters. Differences in the distribution of male and female patients were greatest in the reproductive years (25–44 year age group) and in the middle age group (45–64 years).



	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Female	1.0	2.3	3.3	6.5	15.9	15.1	6.4	7.6
Male	1.0	2.7	3.4	3.6	9.8	11.4	5.2	5.1

Figure 6.1: Age–sex distribution of patients at encounter

Note: Missing data removed. The distributions will not agree perfectly with those in Table 6.1 due to missing data in either age or sex fields.

Approximately one in seven encounters were with children aged less than 15 years (13.6%), one in ten were with young adults (10.1%), and approximately one in four with patients in each of the following age groups, 25–44 years (25.7%), 45–64 years (26.5%), and 65 years and older (24.2%) (Table 6.1).

Other patient characteristics

The patient was new to the practice at one in ten (9.9%) encounters. Two in five encounters were with patients who held a Commonwealth health care card (40.4%), and 3.3% were with persons who held a Department of Veterans' Affairs card. At 10.6% of encounters, the patient was from a non-English-speaking background, and at 1.0% the patient was an Aboriginal person and/or Torres Strait Islander.

Table 6.1: Characteristics of the patients at encounters

Patient variable	Number	Per cent of encounters (*n*=100,987)[(a)]	95% LCL	95% UCL
Sex	—	—	—	—
Male	42,189	42.2	41.4	42.9
Female	57,887	57.8	57.0	58.6
Missing sex	911	—	—	—
Age group	—	—	—	—
< 1 year	1,944	1.9	1.8	2.1
1–4 years	5,030	5.0	4.7	5.3
5–14 years	6,632	6.6	6.3	6.9
15–24 years	10,068	10.1	9.7	10.4
25–44 years	25,685	25.7	24.9	26.4
45–64 years	26,497	26.5	25.9	27.0
65–74 years	11,566	11.6	11.1	12.0
75+ years	12,671	12.7	11.9	13.4
Missing age	895	—	—	—
Other characteristics	—	—	—	—
New patient to practice	9,805	9.9	9.0	10.8
Commonwealth health care card	40,762	40.4	38.8	41.9
Veterans' Affairs Card	3,316	3.3	3.0	3.6
Non-English-speaking background	10,706	10.6	7.8	13.4
Aboriginal person	837	0.8	0.0	1.7
Torres Strait Islander	145	0.1	0.0	0.9
Aboriginal person and Torres Strait Islander	50	0.1	0.0	1.3

(a) Missing data removed.

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

6.2 Patient reasons for encounter

International interest in reasons for encounter (RFEs) has been developing over the past three decades. They reflect the patient's demand for care and can provide an indication of service utilisation patterns, which may benefit from intervention on a population level.[26]

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

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

Number of RFEs at encounter

There were 152,341 patient RFEs recorded at a rate of 150.9 per 100 encounters. For three out of five encounters (60.7%) only one RFE was recorded, and at 11.6% of encounters the maximum of three RFEs was recorded (Table 6.2).

Table 6.2: Number of patient reasons for encounter

Number of RFEs (*n*=152,341)	Number of encounters	Per cent of encounters	95% LCL	95% UCL
One RFE	61,297	60.7	59.5	61.9
Two RFEs	28,026	27.8	27.1	28.4
Three RFEs	11,664	11.6	10.8	12.3
Total	**100,987**	**100.0**	—	—

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

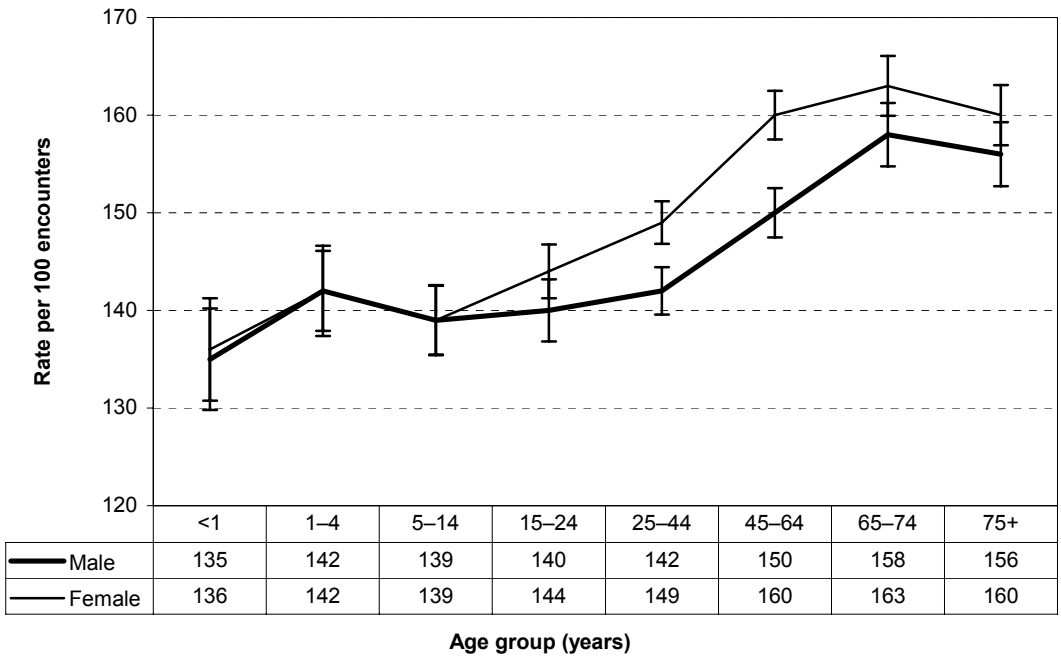


Figure 6.2: Age–sex-specific RFE rates per 100 encounters with 95% confidence limits

Note: Missing data removed.

Age–sex-specific rates of RFEs

Overall, significantly more RFEs were recorded at encounters with female patients (153.3 per 100 encounters, 95% CI: 151.5–155.2) than at those with male patients (147.5, 95% CI: 145.6–149.5), but particularly at encounters with females aged between 25 and 64 years.

Figure 6.2 shows the number of RFEs per 100 encounters for male and female patients in each age group. The age–sex-specific rate of RFEs per 100 encounters increased with advancing age for both males and females, with two exceptions: patients aged 1–4 years had more RFEs than the rest of encounters with children less than 15 years, and the rates of RFEs decreased in patients aged 75 years and over.

Reasons for encounter by ICPC-2 chapter

The distribution of patient RFEs by ICPC-2 chapter and the most common RFEs within each chapter are presented in Table 6.3. Each chapter and individual RFE are expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence limits.

Almost one in five RFEs (22.9%, 34.6 per 100 encounters) were classified in the general chapter, not being associated with any particular body system. Of these, the most common were requests for a prescription, for test results or a check-up. However, there were also some general symptoms frequently described, such as fever, weakness and tiredness, and chest pain (of unspecified origin).

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

RFEs related to the respiratory system arose at a rate of 23.0 per 100 encounters, the most common being cough, throat complaints and upper respiratory tract infection (URTI) (often expressed as a 'cold'). Requests for respiratory system immunisation (mainly influenza vaccination) presented at a rate of 2.0 per 100 encounters; asthma and nasal congestion were also relatively common RFEs.

RFEs related to the musculoskeletal system were described at a rate of 16.7 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 (3.5 per 100 encounters), followed by those related to the knee, foot/toe, neck, shoulder and leg.

Reasons associated with the skin were described at a rate of 14.7 per 100 encounters, rash being the most frequent RFE, followed by skin complaints (not elsewhere classified). Localised or generalised swelling and requests for a skin check-up were 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 10.6 per 100 encounters. Patients also frequently presented for their 'hypertension' or 'high blood pressure' problems.

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 (*n*=152,341)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
General & unspecified	**34,942**	**22.9**	**34.6**	**33.6**	**35.6**
Prescription NOS	7,222	4.7	7.2	6.7	7.6
Results tests/procedures NOS	4,492	3.0	4.5	4.1	4.8
Check-up NOS*	3,439	2.3	3.4	3.1	3.7
Fever	2,231	1.5	2.2	1.8	2.6
Immunisation/vaccination–general	2,125	1.4	2.1	1.8	2.4
Weakness/tiredness	1,480	1.0	1.5	1.3	1.6
Administrative procedure NOS	1,446	1.0	1.4	1.2	1.6
Chest pain NOS	1,114	0.7	1.1	1.0	1.2
Blood test NOS	1,043	0.7	1.0	0.7	1.4
Other reason for encounter NEC	1,036	0.7	1.0	0.6	1.4
Trauma/injury NOS	910	0.6	0.9	0.8	1.1
Follow-up encounter unspecified NOS	821	0.5	0.8	0.4	1.3
Respiratory	**23,226**	**15.3**	**23.0**	**22.0**	**24.0**
Cough	6,785	4.5	6.7	6.3	7.2
Throat symptom/complaint	3,835	2.5	3.8	3.4	4.2
Upper respiratory tract infection	2,187	1.4	2.2	1.8	2.5
Immunisation/vaccination–respiratory	1,995	1.3	2.0	1.1	2.8
Nasal congestion/sneezing	1,747	1.2	1.7	1.2	2.3
Asthma	1,072	0.7	1.1	0.9	1.3
Shortness of breath, dyspnoea	861	0.6	0.9	0.7	1.0
Musculoskeletal	**16,843**	**11.1**	**16.7**	**16.1**	**17.3**
Back complaint*	3,575	2.4	3.5	3.3	3.8
Knee complaint	1,342	0.9	1.3	1.2	1.5
Foot/toe complaint	1,196	0.8	1.2	1.1	1.3
Neck complaint	1,136	0.8	1.1	1.0	1.3
Shoulder complaint	1,118	0.7	1.1	1.0	1.2
Leg/thigh complaint	1,101	0.7	1.1	1.0	1.2
Skin	**14,885**	**9.8**	**14.7**	**14.3**	**15.2**
Rash*	2,830	1.9	2.8	2.7	3.0
Skin complaint	1,326	0.9	1.3	1.1	1.5
Swelling*	1,084	0.7	1.1	1.0	1.2
Skin check-up*	926	0.6	0.9	0.6	1.2
Circulatory	**10,692**	**7.0**	**10.6**	**10.0**	**11.1**
Cardiac check-up*	5,006	3.3	5.0	4.5	5.4
Hypertension/high blood pressure*	1,809	1.2	1.8	1.4	2.2

(continued)

Table 6.3 (continued): 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 (*n*=152,341)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
Digestive	**10,501**	**6.9**	**10.4**	**10.0**	**10.8**
Abdominal pain*	1,962	1.3	1.9	1.8	2.1
Diarrhoea	1,569	1.0	1.6	1.4	1.7
Vomiting	1,126	0.7	1.1	1.0	1.3
Psychological	**7,382**	**4.9**	**7.3**	**6.9**	**7.8**
Depression*	1,902	1.3	1.9	1.7	2.1
Insomnia	1,170	0.8	1.2	1.0	1.4
Anxiety*	937	0.6	0.9	0.8	1.1
Female genital system	**6,179**	**4.1**	**6.1**	**5.7**	**6.6**
Check-up/Pap smear*	1,907	1.3	1.9	1.6	2.2
Menstrual problems*	849	0.6	0.8	0.7	1.0
Endocrine & metabolic	**6,054**	**4.0**	**6.0**	**5.7**	**6.3**
Diabetes (non-gestational)*	828	0.5	0.8	0.6	1.0
Prescription–endocrine/metabolic	796	0.5	0.8	0.6	1.0
Neurological	**5,785**	**3.8**	**5.7**	**5.5**	**6.0**
Headache	2,148	1.4	2.1	1.9	2.4
Vertigo/dizziness	1,153	0.8	1.1	1.0	1.3
Ear	**3,997**	**2.6**	**4.0**	**3.8**	**4.1**
Ear pain	1,675	1.1	1.7	1.5	1.8
Pregnancy & family planning	**3,627**	**2.4**	**3.6**	**3.3**	**3.9**
Pre/postnatal check-up*	952	0.6	0.9	0.6	1.3
Oral contraception*	840	0.6	0.8	0.7	1.0
Eye	**2,734**	**1.8**	**2.7**	**2.6**	**2.9**
Urology	**2,473**	**1.6**	**2.5**	**2.3**	**2.6**
Male genital system	**1,042**	**0.7**	**1.0**	**0.9**	**1.2**
Blood	**993**	**0.7**	**1.0**	**0.8**	**1.2**
Social	**986**	**0.7**	**1.0**	**0.8**	**1.2**
Total RFEs	**152,341**	**100.0**	**150.9**	**149.0**	**152.7**

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

Digestive problems accounted for 6.9% of all reasons described, arising at a rate of 10.4 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 7.3 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), presented at a rate of 74.0 per 100 encounters. RFEs expressed in diagnostic terms (e.g. 'about my diabetes') accounted for 17.3% of all RFEs and were described at a rate of 26.0 per 100 encounters. Requests for diagnostic and preventive procedures were made at a rate of 23.8 per 100 encounters, and these were most often requests for a check-up or for immunisation/vaccination (demonstrated in Table 6.5). Patient requests for medication and non-pharmacological treatments were made at a rate of 13.0 per 100 encounters, while requests for referrals, results, and administrative procedures were relatively few (Table 6.4).

Table 6.4: Distribution of RFEs by ICPC-2 component

ICPC-2 component	Number	Per cent of total RFEs (*n*=152,341)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
Symptoms & complaints	74,755	49.1	74.0	72.0	76.1
Diagnoses, diseases	26,294	17.3	26.0	24.6	27.4
Diagnostic & preventive procedures	23,990	15.8	23.8	22.8	24.7
Medications, treatments & therapeutics	13,141	8.6	13.0	12.4	13.6
Referral & other RFEs	7,113	4.7	7.0	6.6	7.5
Results	5,408	3.6	5.4	5.0	5.7
Administrative	1,639	1.1	1.6	1.4	1.8
Total RFEs	**152,341**	**100.0**	**150.9**	**149.0**	**152.7**

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

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

Most frequent patient reasons for encounter

The 30 most commonly recorded RFEs, listed in order of frequency in Table 6.5, accounted for 55.6% of all RFEs. In this analysis the specific ICPC-2 chapter to which an across chapter RFE belongs is disregarded, such that 'check-up (all)' includes all check-ups from all body systems irrespective of whether the type was specified (e.g. 'BP check') or whether the request was very general. Equally, 'immunisation/vaccination (all)' includes influenza vaccination requests as well as those for childhood immunisation, hepatitis etc.

A request for a check-up was the most common RFE, accounting for 9.0% of all RFEs, being recorded at a rate of 13.6 per 100 encounters. Requests for medication were also frequent (10.8 per 100 encounters). It is notable that RFEs described as 'hypertension' or 'high blood pressure' also arose at a rate of 1.8 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 (5.4 per 100 encounters), followed by presentations for immunisation or vaccination (4.7 per 100 encounters).

The remaining RFEs in the top 30 were largely symptom-based, led by cough (6.7 per 100 encounters), throat complaints (3.8 per 100 encounters), back complaints (3.5 per 100 encounters), rash, fever and URTI (often described as 'a cold').

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

Table 6.5: Most frequent patient reasons for encounter

Patient reason for encounter	Number	Per cent of total RFEs (n=152,341)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
Check-up–all*	13,698	9.0	13.6	12.9	14.2
Prescription–all*	10,853	7.1	10.8	10.2	11.3
Cough	6,785	4.5	6.7	6.3	7.2
Test results*	5,408	3.6	5.4	5.0	5.7
Immunisation/vaccination–all*	4,732	3.1	4.7	4.2	5.1
Throat complaint	3,835	2.5	3.8	3.4	4.2
Back complaint*	3,575	2.3	3.5	3.3	3.8
Rash*	2,830	1.9	2.8	2.7	3.0
Fever	2,231	1.5	2.2	1.8	2.6
Upper respiratory tract infection	2,187	1.4	2.2	1.8	2.5
Headache	2,148	1.4	2.1	1.9	2.4
Abdominal pain*	1,962	1.3	1.9	1.8	2.1
Depression*	1,902	1.3	1.9	1.7	2.1
Hypertension/high blood pressure*	1,809	1.2	1.8	1.4	2.2
Nasal congestion/sneezing	1,747	1.2	1.7	1.1	2.3
Ear pain	1,675	1.1	1.7	1.5	1.8
Diarrhoea	1,569	1.0	1.6	1.4	1.7
Weakness/tiredness	1,480	1.0	1.5	1.3	1.6
Administrative procedure NOS	1,446	1.0	1.4	1.2	1.6
Knee complaint	1,342	0.9	1.3	1.2	1.5
Skin complaint	1,326	0.9	1.3	1.1	1.5
Foot & toe complaint	1,196	0.8	1.2	1.1	1.3
Insomnia	1,170	0.8	1.2	1.0	1.3
Vertigo/dizziness	1,153	0.8	1.1	1.0	1.3
Neck complaint	1,136	0.8	1.1	0.9	1.3
Vomiting	1,126	0.7	1.1	1.0	1.3
Shoulder complaint	1,118	0.7	1.1	1.0	1.2
Chest pain NOS	1,114	0.7	1.1	1.0	1.2
Leg/thigh complaint	1,101	0.7	1.1	1.0	1.2
Swelling*	1,084	0.7	1.1	1.0	1.2
Subtotal	*84,737*	*55.6*	—	—	—
Total RFEs	**152,341**	**100.0**	**150.9**	**149.0**	**152.7**

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

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

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

6.3 Changes from 1998–99 to 2002–03

Changes in characteristics of the patients at the encounters

The age distribution of patients encountered in general practice changed significantly over the first 5 years of the BEACH program. In 2002–03 the GPs' workloads included a significantly smaller proportion of encounters with children under the age of 15 years (13.6%, 95% CI: 13.0–14.2) than in 1998–99 (15.8%, 95% CI: 15.1–16.6). In contrast, a significantly greater proportion of the workload was devoted to the management of patients aged between 45 and 64 years (26.5%, 95% CI: 25.9–27.0) in 2002–03 than in 1998–99 (24.4%, 95% CI: 23.8–25.0 in 1998–99) (Appendix 4, Table A4.4).

Changes in rates of RFEs by ICPC-2 chapter

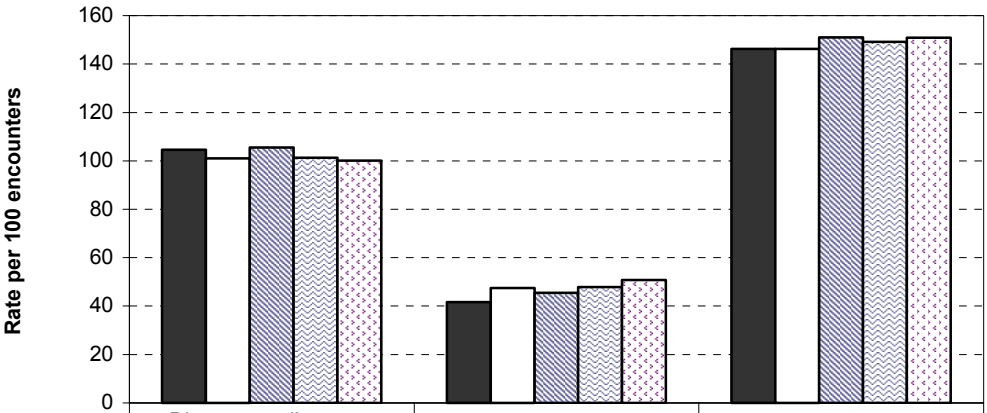
Total RFEs increased steadily from 146.3 (95% CI: 144.6–148.0) per 100 encounters in 1998–99 to 150.9 (95% CI: 149.0–152.7) in 2002–03. There was a significant increase in the rate of RFEs classified as general and unspecified, from 26.6 (95% CI: 25.7–27.4) per 100 encounters in 1998–99 to 34.6 (95% CI: 33.6–35.6) in 2002–03 (Appendix 4, Table A4.5).

Changes in rate of RFEs (ICPC-2 component)

The increase in total RFEs was reflected particularly in a rising rate of RFEs described in terms of the processes of care, including request for diagnostic & preventive procedures, medications, therapeutics, referrals, results and administrative processes. These types of RFEs increased significantly from 41.6 (95% CI: 40.1–43.1) per 100 encounters in 1998–99 to 50.8 (95% CI: 49.2–52.4) in 2002–03 (Figure 6.3 and Appendix 4, Table A4.6).

In parallel, there has been a decrease in RFEs described in terms of diagnoses/diseases from 33.6 (95% CI: 31.9–35.2) per 100 encounters in 1998–99 to 26.0 (95% CI: 24.6–27.4) in 2002–03. In contrast, the relative rate of RFEs classified as symptoms and complaints showed a steady but insignificant increase from 71.1 (95% CI: 69.4–72.9) per 100 encounters in 1998–99 to 74.0 (95% CI: 72.0–76.1) in 2002–03 (Appendix 4, Table 4.6).

The increase in the relative rate of requests for results identified in the fourth year of the BEACH program, continued through the fifth year. This trend again supported last year's hypothesis that there has been an increase in the rate at which patients are being asked to return to the GP to receive their test results (with a hypothesised decrease in the likelihood of GPs giving results over the telephone to their patients). This hypothesis also aligned with a further decrease in the proportion of encounters for which 'no charge' was made for the service and in the proportion of indirect encounters. The Privacy Legislation released at the end of 2001 together with economic reasons may have led to an increase in call-back of patients for receipt of test results.



	Diagnoses, diseases, symptoms, complaints	Process codes	Total RFEs
1998–99	104.7	41.6	146.3
1999–00	101.1	47.4	146.3
2000–01	105.6	45.4	151.0
2001–02	101.4	47.8	149.2
2002–03	100.1	50.8	150.9

RFEs

Figure 6.3: Changes in rates of reasons for encounter (RFEs) over time

Note: Diagnoses, disease, symptoms, complaints—Diagnoses, diseases (ICPC-2 component 7) and Symptoms & complaints (ICPC-2 component 1); Process codes—Diagnostic & preventive procedure, Medications, Treatments & therapeutics, Referral & other RFEs, Results, Administrative (ICPC-2 components 2–6).

7 Problems managed

A 'problem managed' is a formal statement of the provider's understanding of a health problem presented by the patient, family or community. It can be described in terms of a disease, symptom or complaint, social problem or ill-defined condition managed at the encounter. As GPs were instructed to record each problem to the most specific level possible from the information available, the problem managed may at times be limited to the level of 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—Version 2 (ICPC-2). ICPC-2 has a bi-axial structure with 17 chapters on one axis and seven components on the other. Chapters are based on body systems, with 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 although a rate per 100 encounters for a single ungrouped problem (e.g. asthma, 2.7 per 100 encounters) can be regarded as equivalent to 'asthma is managed at 2.7% of encounters', such a statement cannot be made for grouped concepts.

7.1 Number of problems managed at encounter

A total of 146,336 problems were managed at the 100,987 patient encounters, at an average rate of 144.9 problems per 100 encounters. At two-thirds of encounters (66.9%) only one problem was managed, while three or more problems were managed at 9.7% 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	67,588	66.9	65.8	68.1
Two problems	23,585	23.4	22.6	24.1
Three problems	7,678	7.6	7.2	8.0
Four problems	2,136	2.1	1.7	2.5
Total	**100,987**	**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, musculoskeletal, skin and circulatory systems. Problems related to the endocrine and metabolic system were commonly managed as were psychological problems and problems relating to the digestive system. Problems least frequently presented related to the blood and blood-forming organs, the male genital system or were of a social nature. Almost 11% 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 20.6 per 100 encounters, accounting for 14.2% of all problems managed. The high occurrence of upper respiratory tract infection, asthma and bronchitis contributed to this result. Other common respiratory problems included influenza vaccination, sinusitis, tonsillitis and chronic obstructive pulmonary disease.

The management rate of problems associated with the musculoskeletal system was 17.1 per 100 encounters. Back complaints (back pain and symptoms) were the most frequent musculoskeletal problem managed followed closely by osteoarthritis (both at a rate of 2.6 per 100 encounters). Other common musculoskeletal problems included arthritis and injuries such as sprains/strains and fractures.

Skin-related problems were managed at a rate of 16.5 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 and injuries to the skin (such as lacerations and cuts).

Hypertension (8.9 per 100 encounters) constituted over half of all circulatory problems (16.0 per 100 encounters) and was the most frequently managed individual problem overall, accounting for 6.1% of all problems. Ischaemic heart disease, cardiac check-ups and heart failure were other circulatory conditions managed at a relatively high rate.

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[(a)] (*n*=146,336)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
Respiratory	**20,828**	**14.2**	**20.6**	**20.0**	**21.3**
Upper respiratory tract infection	6,451	4.4	6.4	5.9	6.8
Asthma	2,752	1.9	2.7	2.5	2.9
Acute bronchitis/bronchiolitis	2,599	1.8	2.6	2.3	2.8
Immunisation/vaccination—respiratory	1,822	1.3	1.8	1.0	2.6
Sinusitis	1,294	0.9	1.3	1.1	1.4
Tonsillitis*	1,134	0.8	1.1	0.9	1.3
Chronic obstructive pulmonary disease	683	0.5	0.7	0.5	0.9
Musculoskeletal	**17,221**	**11.8**	**17.1**	**16.5**	**17.6**
Back complaint*	2,624	1.8	2.6	2.3	2.8
Osteoarthritis*	2,586	1.8	2.6	2.4	2.8
Sprain/strain*	1,702	1.2	1.7	1.5	1.9
Fracture*	992	0.7	1.0	0.8	1.1
Osteoporosis	807	0.6	0.8	0.6	1.0
Bursitis/tendonitis/synovitis NOS	784	0.5	0.8	0.6	0.9
Injury musculoskeletal NOS	724	0.5	0.7	0.6	0.9
Arthritis*	724	0.5	0.7	0.5	1.0
Musculoskeletal disease, other	681	0.5	0.7	0.6	0.8
Skin	**16,642**	**11.4**	**16.5**	**16.0**	**17.0**
Contact dermatitis	1,938	1.3	1.9	1.8	2.1
Solar keratosis/sunburn	1,174	0.8	1.2	0.9	1.4
Malignant neoplasm skin	845	0.6	0.8	0.6	1.1
Laceration/cut	801	0.6	0.8	0.7	0.9
Injury skin, other	734	0.5	0.7	0.4	1.0
Skin disease, other	688	0.5	0.7	0.5	0.8
Circulatory	**16,142**	**11.0**	**16.0**	**15.3**	**16.7**
Hypertension*	8,935	6.1	8.9	8.4	9.3
Ischaemic heart disease*	1,194	0.8	1.2	1.0	1.4
Cardiac check-up*	1,109	0.8	1.1	0.8	1.4
Heart failure	746	0.5	0.7	0.6	0.9
Atrial fibrillation/flutter	656	0.5	0.7	0.5	0.8
General & unspecified	**15,909**	**10.9**	**15.8**	**15.2**	**16.3**
General immunisation/vaccination	2,160	1.5	2.1	1.9	2.4
General check-up*	1,952	1.3	1.9	1.7	2.1
Viral disease, other/NOS	1,422	1.0	1.4	1.1	1.7
Medication/request/renew/inject NOS	1,304	0.9	1.3	0.9	1.7

(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[(a)] (*n*=146,336)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
General & unspecified (cont.)	**15,909**	**10.9**	**15.8**	**15.2**	**16.3**
Other reason for encounter NEC	859	0.6	0.9	0.4	1.3
Results tests/procedures NOS	775	0.5	0.8	0.6	1.0
Endocrine & metabolic	**10,717**	**7.3**	**10.6**	**10.2**	**11.0**
Lipid disorder	3,043	2.1	3.0	2.8	3.2
Diabetes, non-gestational*	2,936	2.0	2.9	2.7	3.1
Obesity (BMI >30)	749	0.5	0.7	0.5	1.0
Psychological	**10,405**	**7.1**	**10.3**	**9.8**	**10.8**
Depression*	3,560	2.4	3.5	3.3	3.8
Sleep disturbance	1,580	1.1	1.6	1.4	1.7
Anxiety*	1,562	1.1	1.6	1.4	1.7
Digestive	**10,186**	**7.0**	**10.1**	**9.8**	**10.4**
Oesophageal disease	1,917	1.3	1.9	1.7	2.1
Gastroenteritis, presumed infection	1,234	0.8	1.2	1.0	1.4
Female genital system	**6,727**	**4.6**	**6.7**	**6.2**	**7.1**
Female genital check-up/Pap smear*	1,781	1.2	1.8	1.5	2.1
Menopausal complaint	1,469	1.0	1.5	1.3	1.6
Menstrual problems*	753	0.5	0.8	0.6	0.9
Neurological	**4,278**	**2.9**	**4.2**	**4.0**	**4.4**
Migraine	783	0.5	0.8	0.6	0.9
Pregnancy & family planning	**4,203**	**2.9**	**4.2**	**3.8**	**4.5**
Oral contraception*	928	0.6	0.9	0.7	1.1
Pregnancy*	855	0.6	0.9	0.6	1.1
Contraception, other	845	0.6	0.8	0.6	1.0
Pre/postnatal check-up*	800	0.6	0.8	0.4	1.2
Ear	**4,035**	**2.8**	**4.0**	**3.8**	**4.2**
Acute otitis media/myringitis	1,314	0.9	1.3	1.1	1.5
Excessive ear wax	705	0.5	0.7	0.6	0.8
Urology	**2,844**	**1.9**	**2.8**	**2.7**	**3.0**
Urinary tract infection*	1,686	1.2	1.7	1.6	1.8
Eye	**2,639**	**1.8**	**2.6**	**2.5**	**2.7**
Infectious conjunctivitis	779	0.5	0.8	0.6	0.9
Male genital system	**1,458**	**1.0**	**1.4**	**1.3**	**1.6**
Blood	**1,383**	**1.0**	**1.4**	**1.2**	**1.5**
Social	**719**	**0.5**	**0.7**	**0.5**	**0.9**
Total problems	**146,336**	**100.0**	**144.9**	**143.0**	**146.8**

(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; NEC—not elsewhere classified.

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 and test results 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: diagnosis/disease; symptoms and complaints; and diagnostic and preventive procedures (e.g. check-up). 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 (64.3%) were described in terms of a diagnosis or disease (e.g. hypertension, depression, asthma) at an average rate of 93.1 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 were used as problem labels at a rate of 13.6 per 100 encounters and were most commonly check-ups and vaccinations/immunisations. Problems related to the provision of medication and non-pharmacological treatments where no other diagnostic information was given were recorded at a rate of 3.6 per 100 encounters. There were relatively few problems described in terms of a referral, test result or administrative procedure (2.2% of all problems).

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

ICPC-2 component	Number	Per cent of total problems (n=146,336)	Rate per 100 encounters[(a)] (n=100,987)	95% LCL	95% UCL
Diagnosis, diseases	94,061	64.3	93.1	91.5	94.8
Symptoms & complaints	31,663	21.6	31.4	30.5	32.2
Diagnostic & preventive procedures	13,718	9.4	13.6	12.9	14.3
Medications, treatments & therapeutics	3,609	2.5	3.6	3.3	3.9
Referral & other RFEs	1,675	1.1	1.7	1.3	2.0
Results	1,069	0.7	1.1	0.8	1.3
Administrative	542	0.4	0.5	0.3	0.7
Total problems	**146,336**	**100.0**	**144.9**	**143.0**	**146.8**

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

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

Most frequently managed problems

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 the haemophilus B vaccine (chapter N).

The 30 most frequently managed problems accounted for almost half of all problems managed. Hypertension was the most common, accounting for 6.1% of all problems, managed at a rate of 8.9 per 100 encounters. This was followed by URTI, which was recorded at a rate of 6.4 per 100 encounters and immunisation/ vaccination (4.6 per 100 encounters). Together these top three problems accounted for 13.7% of all problems managed.

Depression was the fourth most commonly managed problem (3.5 per 100 encounters). Lipid disorder, non-gestational diabetes, asthma, back complaint, acute bronchitis and osteoarthritis were all commonly managed at a similar rate (3.0, 2.9, 2.7, 2.6, 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 urological problems were relatively infrequent overall (only 1.9% of total problems—Table 7.2), urinary tract infections were among the most frequent individual problems. Similarly, although problems relating to the ear were uncommon (only 2.8% of total problems—Table 7.2), otitis media was 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 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 (URTI and acute bronchitis) were two of the most common new problems managed, together representing 12.3% of all new problems managed. New presentations of URTI were managed at a rate of 5.1 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 (2.9 per 100 encounters). Urinary tract infections, sprains/strains and unspecified viral disease were also frequent new presentations.

Although hypertension was the most common problem managed overall, new presentations of hypertension were uncommon, managed at a rate of 0.5 per 100 encounters.

Table 7.4: Most frequently managed problems

Problem managed	Number	Per cent of total problems (*n*=146,336)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
Hypertension*	8,935	6.1	8.9	8.4	9.3
Upper respiratory tract infection	6,451	4.4	6.4	5.9	6.8
Immunisation/vaccination—all*	4,678	3.2	4.6	4.2	5.1
Depression*	3,560	2.4	3.5	3.3	3.8
Lipid disorder	3,043	2.1	3.0	2.8	3.2
Diabetes* (non-gestational)	2,949	2.0	2.9	2.7	3.1
Asthma	2,752	1.9	2.7	2.5	2.9
Back complaint*	2,624	1.8	2.6	2.3	2.8
Acute bronchitis/bronchiolitis	2,599	1.8	2.6	2.3	2.8
Osteoarthritis*	2,586	1.8	2.6	2.4	2.8
Prescription—all*	2,003	1.4	2.0	1.6	2.3
General check-up*	1,952	1.3	1.9	1.7	2.1
Contact dermatitis	1,938	1.3	1.9	1.8	2.1
Oesophageal disease	1,917	1.3	1.9	1.7	2.1
Female genital check-up/Pap smear*	1,781	1.2	1.8	1.5	2.1
Sprain/strain*	1,702	1.2	1.7	1.5	1.9
Urinary tract infection*	1,686	1.2	1.7	1.6	1.8
Sleep disturbance	1,580	1.1	1.6	1.4	1.7
Anxiety*	1,562	1.1	1.6	1.4	1.7
Menopausal complaint	1,469	1.0	1.5	1.3	1.6
Viral disease, other/NOS	1,422	1.0	1.4	1.1	1.7
Acute otitis media/myringitis	1,314	0.9	1.3	1.1	1.5
Sinusitis acute/chronic	1,294	0.9	1.3	1.1	1.4
Gastroenteritis, presumed infection	1,234	0.8	1.2	1.0	1.4
Ischaemic heart disease*	1,194	0.8	1.2	1.0	1.4
Solar keratosis/sunburn	1,174	0.8	1.2	0.9	1.4
Tonsillitis*	1,134	0.8	1.1	0.9	1.3
Cardiac check-up*	1,109	0.8	1.1	0.8	1.4
Test results*	1,069	0.7	1.1	0.8	1.3
Fracture*	992	0.7	1.0	0.8	1.1
Subtotal	*69,702*	*47.6*	—	—	—
Total problems	**146,336**	**100.0**	**144.9**	**143.0**	**146.8**

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

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

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

Table 7.5: Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (*n*=57,509)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
Upper respiratory tract infection	5,158	9.0	5.1	4.7	5.5
Immunisation/vaccination—all*	2,939	5.1	2.9	2.5	3.3
Acute bronchitis/bronchiolitis	1,914	3.3	1.9	1.7	2.1
Urinary tract infection*	1,089	1.9	1.1	1.0	1.2
Viral disease, other/NOS	1,079	1.9	1.1	0.7	1.4
Sprain/strain*	1,017	1.8	1.0	0.9	1.2
Gastroenteritis, presumed infection	966	1.7	1.0	0.8	1.1
Acute otitis media/myringitis	950	1.7	0.9	0.8	1.1
Contact dermatitis	939	1.6	0.9	0.8	1.1
General check-up*	897	1.6	0.9	0.7	1.1
Sinusitis	892	1.6	0.9	0.7	1.0
Tonsillitis*	856	1.5	0.9	0.7	1.0
Female genital check-up*	708	1.2	0.7	0.3	1.1
Back complaint*	685	1.2	0.7	0.5	0.9
Depression*	658	1.1	0.7	0.5	0.8
Infectious conjunctivitis	613	1.1	0.6	0.5	0.7
Solar keratosis/sunburn	560	1.0	0.6	0.3	0.9
Hypertension*	537	0.9	0.5	0.4	0.7
Injury skin, other	496	0.9	0.5	0.1	0.8
Fracture*	475	0.8	0.5	0.3	0.6
Bursitis/tendonitis/synovitis NOS	456	0.8	0.5	0.3	0.6
Osteoarthritis*	444	0.8	0.4	0.2	0.6
Skin infection, post-traumatic	445	0.8	0.4	0.3	0.6
Malignant neoplasm skin	430	0.8	0.4	0.2	0.6
Oesophagus disease	429	0.8	0.4	0.3	0.6
Menstrual problems*	422	0.7	0.4	0.3	0.6
Laceration/cut	424	0.7	0.4	0.3	0.6
Otitis externa	410	0.7	0.4	0.3	0.6
Excessive ear wax	414	0.7	0.4	0.3	0.5
Subtotal	*27,303*	*47.5*	—	—	—
Total new problems	**57,509**	**100.0**	**57.0**	**55.6**	**58.3**

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

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

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

7.3 Changes from 1998–99 to 2002–03

There has been no significant change in the number of problems managed per 100 encounters between 1998–99 and 2002–03 (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 a significant decrease in the relative rate of management of:

- respiratory problems (Table A4.7), in particular asthma and acute bronchitis (Table A4.8)
- problems associated with the ear (Table A4.7).

Increased management rates were found for:

- problems related to the endocrine and metabolic system (Table A4.7), particularly lipid disorder (Table A4.8)
- problems of a general or unspecified nature (Table A4.7).

Other significant changes included an increase in the management rate of osteoarthritis (Table A4.8)

Many of these changes are investigated with more precise statistical methods in Chapter 13, and some are investigated in relationship to GP management behaviour in Chapter 14.

8 Overview of management

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

GPs undertook a total of 211,283 management activities at a rate of 209 per 100 encounters and 144 per 100 problems. The most common management activity was medication prescribed, advised or supplied, at a rate of 103.8 per 100 encounters or 71.6 per 100 problems. Non-pharmacological treatments took place at the rate of 51.8 per 100 encounters, referrals at a rate of 11.1, pathology orders at a rate of 32.9 and imaging at a rate of 8.6 per 100 encounters (Table 8.1).

Table 8.1: Summary of management

Management type	Number	Rate per 100 encounters (*n*=100,987)	95% LCL	95% UCL	Rate per 100 problems (*n*=146,336)	95% LCL	95% UCL
Medications	104,813	103.8	101.4	106.2	71.6	70.1	73.1
Prescribed	85,161	84.3	81.8	86.9	58.2	56.6	59.8
Advised OTC	10,270	10.2	9.2	11.1	7.0	6.3	7.7
GP supplied	9,382	9.3	7.6	11.0	6.4	5.3	7.5
Non-pharmacological treatments	52,292	51.8	49.3	54.3	35.7	34.1	37.3
Clinical	37,543	37.2	35.0	39.4	25.7	24.2	27.1
Procedural	14,748	14.6	13.9	15.3	10.1	9.6	10.6
Referrals	11,254	11.1	10.7	11.6	7.7	7.4	8.0
Specialist	7,743	7.7	7.3	8.0	5.3	5.1	5.5
Allied health	2,536	2.5	2.3	2.8	1.7	1.6	1.9
Hospital	566	0.6	0.3	0.8	0.4	0.2	0.6
Emergency dept	137	0.1	0.0	0.4	0.1	0.0	0.3
Other referral	271	0.3	0.0	0.5	0.2	0.0	0.4
Pathology	33,234	32.9	31.5	34.4	22.7	21.8	23.6
Imaging	8,678	8.6	8.2	9.0	5.9	5.7	6.2
Other investigations	1,012	1.0	0.8	1.2	0.7	0.5	0.8
Total management activities	**211,283**	**209.2**	—	—	**144.4**	—	—

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

Another perspective emerges in analysis of the number of encounters or problems for which at least one form of management was recorded by the GP. At least one management action was recorded at 91.3% of encounters and for 86.4% of problems managed. At least one medication was given at two-thirds (65.8%) of encounters and for 56.8% of problems. At least one non-pharmacological treatment was given at 39.4% of encounters and for 30.9% of problems, a clinical treatment being more likely than a procedure. A referral was made at

10,696 encounters (10.6%) and for 7.7% of problems. At least one test or investigation was ordered at 20.8% of encounters and for 16.2% of problems. These were most commonly pathology test orders, which were reported at 14.7% of encounters (for 11.4% of problems). Imaging orders were placed less frequently at 7.5% of encounters and for 5.3% 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*=100,987)	Number of problems	Per cent of total problems[(a)] (*n*=146,336)
At least one management type	92,168	91.3	126,466	86.4
At least one medication or non-pharmacological treatment	83,311	82.5	109,886	75.1
At least one medication	66,470	65.8	83,143	56.8
At least one prescription	55,428	54.9	69,031	47.2
At least one OTC advised	9,136	9.1	9,347	6.4
At least one GP supplied	6,898	6.8	7,663	5.2
At least one non-pharmacological treatment	39,762	39.4	45,257	30.9
At least one clinical treatment	29,448	29.2	33,165	22.7
At least one therapeutic procedure	13,340	13.2	13,749	9.4
At least one referral	10,696	10.6	11,276	7.7
At least one referral to a specialist	7,492	7.4	7,851	5.4
At least one referral to allied health	2,443	2.4	2,544	1.7
At least one referral to hospital	566	0.6	587	0.4
At least one referral to emergency dept	137	0.1	139	0.1
At least one referral NOS	271	0.3	278	0.2
At least one investigation	21,025	20.8	23,654	16.2
At least one pathology order	14,890	14.7	16,632	11.4
At least one imaging order[(b)]	7,524	7.5	7,799	5.3
At least one other investigation[(b)]	969	1.0	992	0.7

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

(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; dept—department; NOS—not otherwise specified.

The combinations of management types related to each problem were then investigated. There were 19,870 problems (13.6%) for which no specific management was recorded by the GP. Check-ups (either partial or full) (10.6%), hypertension (7.9%), upper respiratory tract infections (3.8%) and test results (3.1%) together accounted for 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 62.8% of problems, and double component for 20.1%. 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 38.7% of problems), followed by clinical treatment alone (9.7%), but the combination of medication and clinical treatment was also relatively frequently recorded (8.0%).

Table 8.3: Most common management combinations

1+ Medication	1+ Clinical treatment	1+ Therapeutic procedure	1+ Referral	1+ Imaging order	1+ Pathology order	Per cent of total encounters (*n*=100,987)	Per cent of total problems (*n*=146,336)
1+ management recorded						**91.3**	**86.4**
✓						33.8	38.7
✓	✓					12.1	8.0
	✓					7.2	9.7
✓					✓	3.8	2.5
		✓				3.6	4.1
✓		✓				3.6	2.2
			✓			3.0	3.9
					✓	2.7	4.2
✓			✓			2.4	1.2
✓				✓		1.8	1.1
✓	✓				✓	1.6	0.6
				✓		1.6	2.0
	✓				✓	1.2	1.2
✓	✓	✓				1.2	0.4
✓	✓		✓			1.0	0.3
No recorded management						**8.7**	**13.6**

Note: 1+ —at least one specified management type. Within the top 15 management combinations, there were none containing more than 2 management components.

8.1 Changes from 1998–99 to 2002–03

Changes in rates of medications, non-pharmacological treatments, referrals, pathology orders and imaging orders over the five years of BEACH are discussed in Chapters 9, 10, 11 and 12.

9 Medications

9.1 Source of medications

The survey form allowed GPs to record up to four medications for each of four problems. A maximum of 16 medications could therefore be recorded at each encounter. Each medication could be recorded as prescribed (the default), recommended for over-the-counter (OTC) purchase or supplied by the GP from surgery stocks or samples. GPs were requested to enter the brand or generic name, the strength, regimen and number of repeats ordered for each medication and to designate if this was a new or continued medication for that patient for this problem. This structure allowed analysis of the medications prescribed, advised by GPs for OTC purchase and those supplied by the GP, and the prescribed daily dose (PDD) of medications. Generic or brand names were entered into the database in the form recorded by the GP. Medications were classified using the CAPS system (developed by the Family Medicine Research Centre) from which they were also mapped to the ATC classification (see Chapter 2—Methods).[13] Although analysis can be conducted at brand name level, results in this chapter are reported only at the generic level.

Overall, GPs recorded 85.3% of medications by brand name and 14.7% by their generic (non-proprietary) name. Of those recorded by their brand names, 87.1% were prescribed, 80.1% were supplied by the GP and 75.0% were OTC medications.

A total of 104,814 medications were recorded at a rate of 104 per 100 encounters and 72 per 100 problems managed. Most medications (81.3%) were prescribed. However, 9.8% of medications were recommended by the GP for OTC purchase, and 9.0% were supplied to the patient by the GP (Figure 9.1). Extrapolated to the 100 million general practice encounters in Australia in 2002–03, GPs prescribed approximately 84 million medications (not counting repeats) and recommended 10 million medications to their patients for OTC purchase at 9.1 million encounters per annum. GPs also supplied 9.3 million medications directly to the patient at 6.8 million encounters.

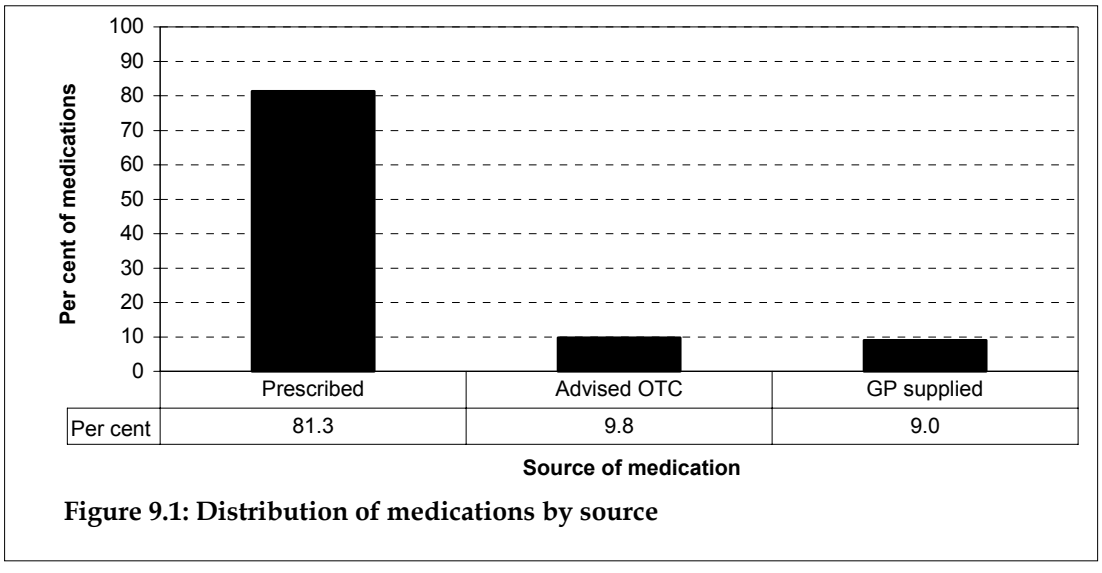


Figure 9.1: Distribution of medications by source

9.2 Prescribed medications

There were 85,162 prescriptions recorded, at a rate of 84.3 per 100 encounters and 58.2 per 100 problems managed. At least one prescription was recorded at 54.9% of encounters and for almost half (47.2%) of the problems managed.

No medications were prescribed at 45.1% of encounters, one medication at 36.2% of encounters, two at 12.0% and three at 4.2%. Four or more medications were prescribed at only 2.5% of encounters (Figure 9.2). No prescription was given for half (52.8%) of all problems managed, one for 38.6%, two for 6.6% and three or more for 1.9% (Figure 9.3).

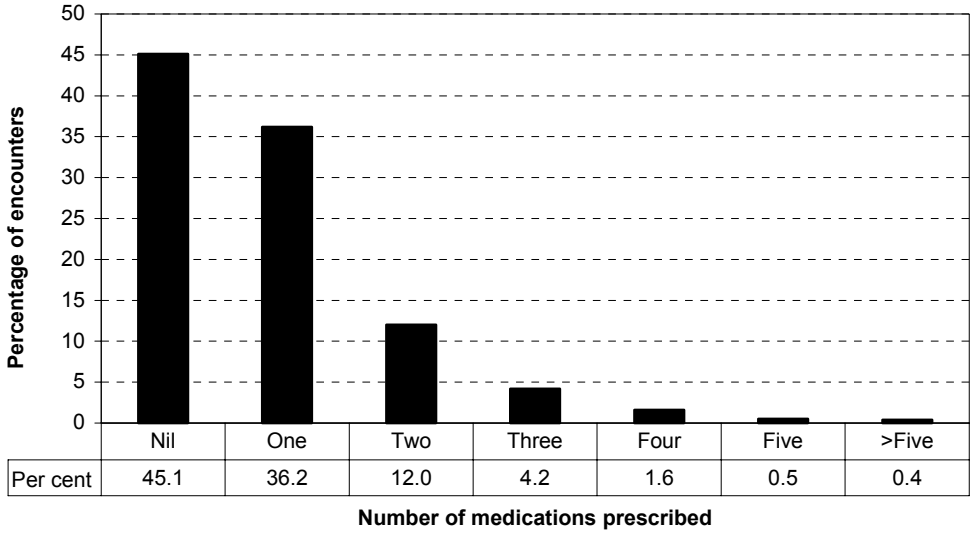


Figure 9.2: Number of medications prescribed per encounter

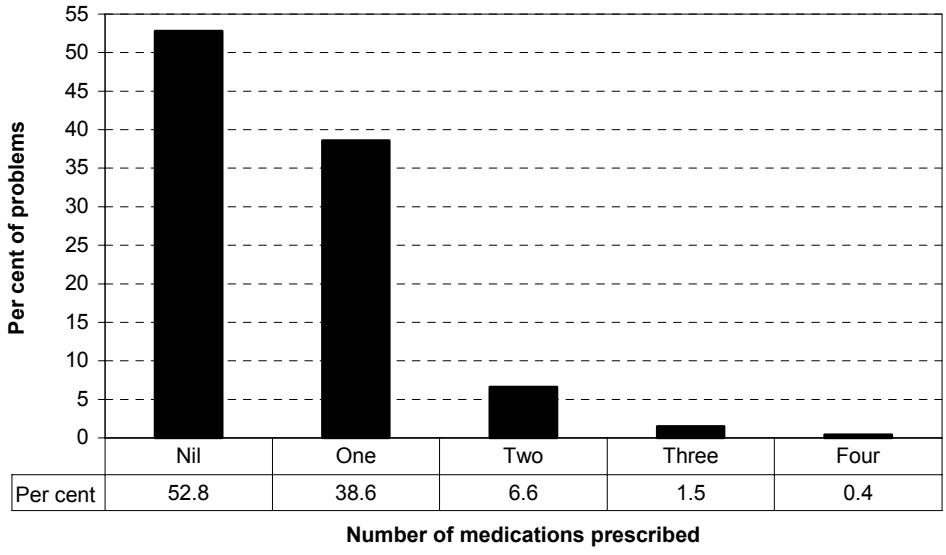


Figure 9.3: Number of medications prescribed per problem

Number of repeats

GPs were also asked to record the number of repeat prescriptions ordered for each prescribed medication. In previous BEACH years, there was a very high level of missing data in this field (up to 50.0%). However, with an improved instruction sheet, which asked participating GPs to indicate with a zero or dash if there were no repeats, the missing rate dropped to 30.1%. For the 59,557 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 38.0% of these prescriptions, the GP specified that no repeats had been prescribed and for 27.4%, five repeats were ordered. The latter proportion reflects the Pharmaceutical Benefits Scheme (PBS) provision of one month's supply and five repeats for many medications used for chronic conditions such as hypertension. The ordering of one or two repeats (17.7% and 12.0%) was also not unusual.

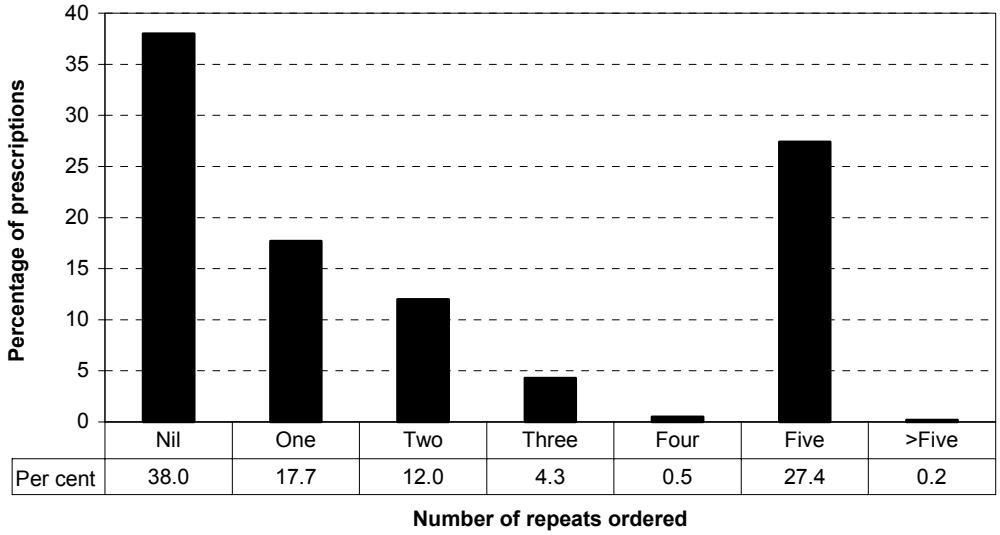
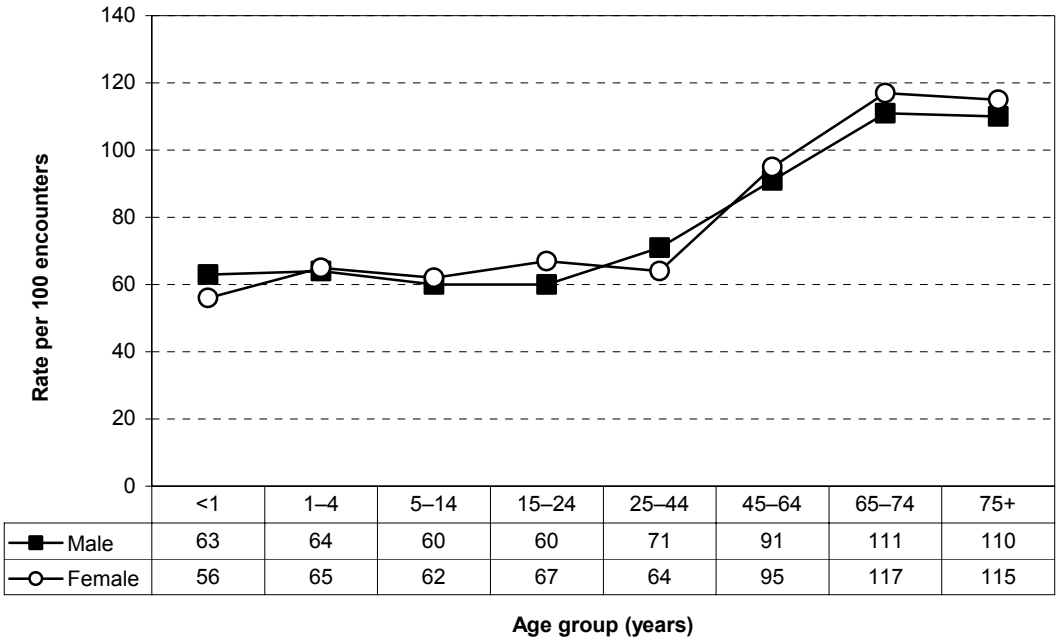


Figure 9.4: Number of repeats ordered per prescription

Age–sex-specific rates of prescribed medications

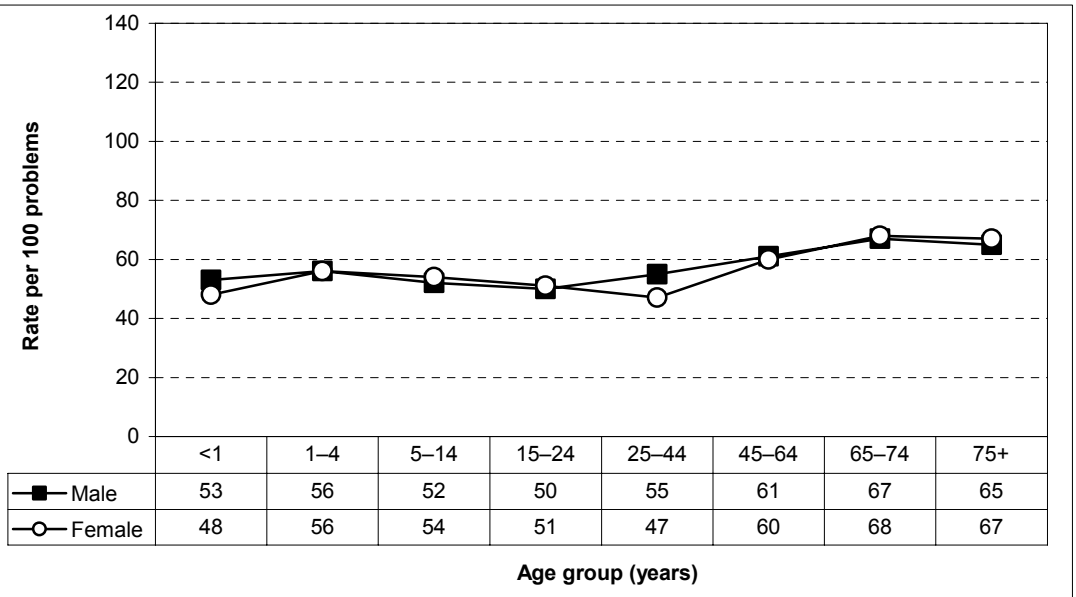
Age–sex-specific charts show the prescription rate per 100 encounters for all the male or female patients respectively in the age group under consideration. Figure 9.5 shows that the prescription rate per 100 encounters was similar for males and females. It also shows the well-described tendency for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

Figure 9.6, however, demonstrates that the age-based increase almost disappears if the prescription rate is related to problems. This suggests that the increased prescription rate in older patients is largely accounted for by the increased number of health problems that they have managed in general practice.



	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	63	64	60	60	71	91	111	110
Female	56	65	62	67	64	95	117	115

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



	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	53	56	52	50	55	61	67	65
Female	48	56	54	51	47	60	68	67

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

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 16.4% of all prescriptions. These were followed by cardiovascular (15.5%), central nervous system (12.5%), psychological (8.3%), musculoskeletal (6.8%) and respiratory (6.3%) medications.

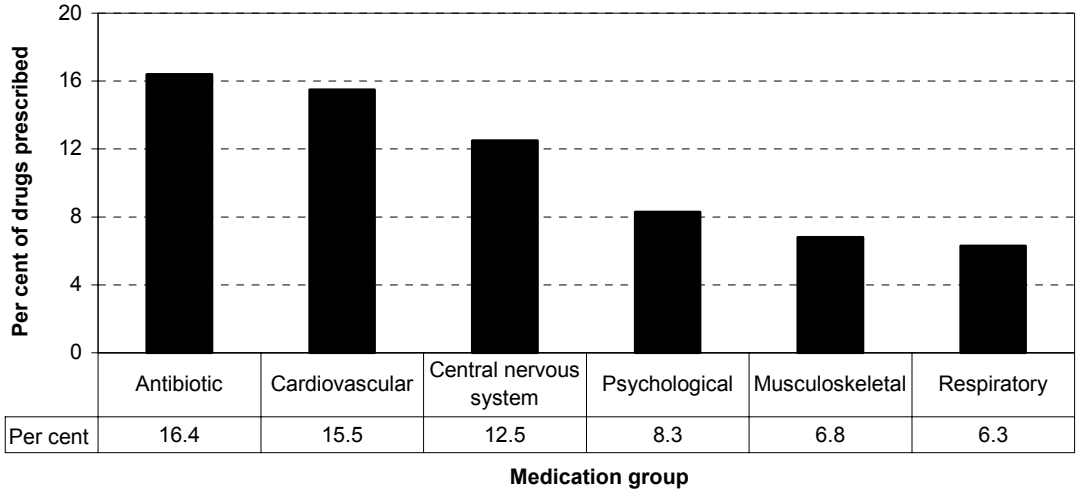


Figure 9.7: Distribution of prescribed medications by group

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 4.7 per 100 encounters. Amoxycillin and amoxycillin + potassium clavulanate were the most frequently prescribed generic drugs in that subgroup. Cephalosporins were also prescribed often, at 3.0 per 100 encounters.

Within cardiovascular medications, anti-hypertensives accounted for more than half the prescriptions (7.3 per 100 encounters). Other cardiovascular medications, principally lipid-lowering agents, contributed 2.6 prescriptions per 100 encounters. Beta-blockers were also frequently recorded.

Prescribed central nervous system medications were mainly simple analgesics (3.9 per 100 encounters) and compound analgesics (2.4). The psychological medications most frequently prescribed were anti-depressants. Musculoskeletal drugs were prescribed, at a rate of 5.7 per 100 encounters. These were mainly non-steroidal anti-inflammatory drugs, in particular, rofecoxib and celecoxib.

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 1.4 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*=85,161)	Rate per 100 encs[(a)] (*n*=100,987)	95% LCL	95% UCL
Antibiotics			13,950	16.4	13.8	13.2	14.4
	Broad spectrum penicillin		4,756	5.6	4.7	4.4	5.1
		Amoxycillin	3,145	3.7	3.1	2.8	3.5
		Amoxycillin/potass. clavulanate	1,593	1.9	1.6	1.4	1.8
	Cephalosporins		3,049	3.6	3.0	2.8	3.2
		Cephalexin	1,916	2.3	1.9	1.7	2.1
		Cefaclor monohydrate	1,026	1.2	1.0	0.7	1.3
	Other antibiotics		2,833	3.3	2.8	2.6	3.0
		Roxithromycin	1,355	1.6	1.3	1.1	1.6
		Erythromycin	517	0.6	0.5	0.3	0.7
	Penicillin		1,225	1.4	1.2	1.0	1.4
	Tetracyclines		879	1.0	0.9	0.7	1.0
		Doxycycline	721	0.8	0.7	0.5	0.9
	Anti-infectives		602	0.7	0.6	0.4	0.7
Cardiovascular			13,217	15.5	13.1	12.3	13.9
	Anti-hypertensive		7,384	8.7	7.3	6.8	7.8
		Irbesartan	830	1.0	0.8	0.7	1.0
		Perindopril	685	0.8	0.7	0.5	0.8
		Amlodipine	670	0.8	0.7	0.5	0.8
		Ramipril	663	0.8	0.7	0.5	0.8
		Irbesartan/hydrochlorothiazide	555	0.7	0.5	0.3	0.8
	Other cardiovascular drugs		2,648	3.1	2.6	2.4	2.8
		Atorvastatin	1,059	1.2	1.0	0.9	1.2
		Simvastatin	879	1.0	0.9	0.7	1.0
	Beta-blockers		1,529	1.8	1.5	1.3	1.7
		Atenolol	818	1.0	0.8	0.6	1.0
	Antiangina		847	1.0	0.8	0.6	1.1
Central nervous system			10,653	12.5	10.5	10.0	11.1
	Simple analgesic		3,898	4.6	3.9	3.4	4.3
		Paracetamol	3,148	3.7	3.1	2.7	3.6
		Aspirin	726	0.9	0.7	0.5	0.9
	Compound analgesic		2,405	2.8	2.4	2.2	2.6
		Paracetamol/codeine	2,020	2.4	2.0	1.8	2.2

(continued)

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

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,161)	Rate per 100 encs[(a)] (*n*=100,987)	95% LCL	95% UCL
	Narcotic analgesic		2,269	2.7	2.2	1.9	2.6
		Tramadol	984	1.2	1.0	0.8	1.1
	Anti-emetic/antinauseant		1,328	1.6	1.3	1.2	1.5
		Metoclopramide	663	0.8	0.7	0.5	0.8
		Prochlorperazine	590	0.7	0.6	0.4	0.7
	Anti-convulsant		549	0.6	0.5	0.4	0.7
Psychological			7,089	8.3	7.0	6.6	7.4
	Anti-depressant		2,953	3.5	2.9	2.7	3.1
		Sertraline	600	0.7	0.6	0.4	0.8
		Citalopram	459	0.5	0.5	0.3	0.6
	Anti-anxiety		1,871	2.2	1.9	1.7	2.1
		Diazepam	1,011	1.2	1.0	0.8	1.2
		Oxazepam	647	0.8	0.6	0.5	0.8
	Sedative/hypnotics		1,746	2.1	1.7	1.6	1.9
		Temazepam	1,177	1.4	1.2	1.0	1.3
	Anti-psychotic		518	0.6	0.5	0.3	0.8
Musculoskeletal			5,752	6.8	5.7	5.4	6.0
	Non-steroid anti-inflammatory		4,817	5.7	4.8	4.5	5.0
		Rofecoxib	1,161	1.4	1.2	0.9	1.4
		Celecoxib	1,069	1.3	1.1	0.9	1.2
		Diclofenac sodium systemic	740	0.9	0.7	0.5	0.9
	Urosuric agents		497	0.6	0.5	0.3	0.7
Hormones			5,435	6.4	5.4	5.1	5.7
	Hypoglycaemic		1,914	2.2	1.9	1.6	2.2
		Metformin	857	1.0	0.8	0.7	1.0
		Gliclazide	433	0.5	0.4	0.2	0.6
	Cortico steroids		1,090	1.3	1.1	0.9	1.2
	Sex hormones/anabolic		1,787	2.1	1.8	1.6	1.9
	Other hormone		643	0.8	0.6	0.5	0.8
		Thyroxine	542	0.6	0.5	0.4	0.7

(continued)

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

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,161)	Rate per 100 encs[(a)] (*n*=100,987)	95% LCL	95% UCL
Respiratory			5,345	6.3	5.3	4.9	5.7
	Bronchodilator/spasm relaxant		2,504	2.9	2.5	2.2	2.7
		Salbutamol	1,734	2.0	1.7	1.5	1.9
	Asthma preventives		2,057	2.4	2.0	1.9	2.2
		Fluticasone/salmeterol	916	1.1	0.9	0.7	1.1
Allergy, immune system			4,839	5.7	4.8	4.3	5.3
	Immunisation		4,225	5.0	4.2	3.7	4.7
		Influenza virus vaccine	1,454	1.7	1.4	0.6	2.3
	Antihistamine		473	0.6	0.5	0.0	1.0
Skin			3,978	4.7	3.9	3.7	4.2
	Topical steroid		2,661	3.1	2.6	2.5	2.8
		Betamethasone topical	725	0.9	0.7	0.6	0.9
		Mometasone	645	0.8	0.6	0.5	0.8
		Hydrocortisone topical	463	0.5	0.5	0.3	0.6
	Anti-infective, skin		657	0.8	0.7	0.5	0.8
	Other skin		630	0.7	0.6	0.4	0.8
Digestive			3,894	4.6	3.9	3.6	4.1
	Anti-ulcerants		2,420	2.8	2.4	2.2	2.6
		Omeprazole	851	1.0	0.8	0.7	1.0
		Ranitidine	466	0.5	0.5	0.3	0.6
	Antidiarrhoeals		517	0.6	0.5	0.3	0.7
Blood			1,754	2.1	1.7	1.6	1.9
	Other blood drug		1,047	1.2	1.0	0.9	1.2
		Warfarin sodium	791	0.9	0.8	0.6	1.0
	Haemopoietic		707	0.8	0.7	0.6	0.8
Contraceptives			1,739	2.0	1.7	1.5	1.9
	Contraceptive oral/systemic		1,733	2.0	1.7	1.5	1.9
		Levonorgestrel/ethinyloestradiol	1,148	1.3	1.1	1	1.3
Urogenital			1,692	2.0	1.7	1.5	1.9
	Diuretic		1,147	1.3	1.1	0.9	1.3
		Frusemide	689	0.8	0.7	0.5	0.9

(continued)

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

Group	Subgroup	Generic	Number	Per cent of scripts (*n*=85,161)	Rate per 100 encs[(a)] (*n*=100,987)	95% LCL	95% UCL
Nutrition, metabolism			1,658	1.9	1.6	1.4	1.8
	Minerals/tonics		519	0.6	0.5	0.3	0.7
	Nutrition/metabolism, other		480	0.6	0.5	0.3	0.7
	Anti-obesity		440	0.5	0.4	0.3	0.6
Eye medications			1,643	1.9	1.6	1.5	1.8
	Anti-infectives, eye		1,052	1.2	1.0	0.9	1.2
		Chloramphenicol, eye	927	1.1	0.9	0.8	1.1
Ear, nose topical			1,584	1.9	1.6	1.4	1.7
	Topical otic		866	1.0	0.9	0.7	1.0
	Topical nasal		716	0.8	0.7	0.5	0.9
Miscellaneous			353	0.4	0.3	0.1	0.6
Anti-neoplastics			352	0.4	0.3	0.2	0.5
Surgical preparations			159	0.2	0.2	0.0	0.4
Diagnostic agents			76	0.1	0.1	0	0.5

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

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

Most frequently prescribed medications

The most frequently prescribed individual medications are listed in Table 9.2. Together, these accounted for more than half (52.5%) 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[13] 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 paracetamol and aspirin, was the most frequently prescribed group. This was followed by penicillins, then non-steroid anti-inflammatory drugs. Inhaled adrenergics, other beta-lactam anti-bacterials (principally cephalosporins) and anti-depressants were also common.

Table 9.2: Most frequently prescribed medications

Generic medication	Number	Per cent of scripts (*n*=85,161)	Rate per 100 encs[a] (*n*=100,987)	95% LCL	95% UCL
Paracetamol	3,148	3.7	3.1	2.7	3.6
Amoxycillin	3,145	3.7	3.1	2.8	3.5
Paracetamol/codeine	2,020	2.4	2.0	1.8	2.2
Cephalexin	1,916	2.3	1.9	1.7	2.1
Salbutamol	1,734	2.0	1.7	1.5	1.9
Amoxycillin/potassium clavulanate	1,593	1.9	1.6	1.4	1.8
Influenza virus vaccine	1,454	1.7	1.4	0.6	2.3
Roxithromycin	1,355	1.6	1.3	1.1	1.6
Temazepam	1,177	1.4	1.2	1.0	1.3
Rofecoxib	1,161	1.4	1.2	0.9	1.4
Levonorgestrel/ethinyloestradiol	1,148	1.3	1.1	1.0	1.3
Celecoxib	1,069	1.3	1.1	0.9	1.2
Atorvastatin	1,059	1.2	1.0	0.9	1.2
Cefaclor monohydrate	1,026	1.2	1.0	0.7	1.3
Diazepam	1,011	1.2	1.0	0.8	1.2
Tramadol	984	1.2	1.0	0.8	1.1
Chloramphenicol, eye	927	1.1	0.9	0.8	1.1
Fluticasone/salmeterol	916	1.1	0.9	0.7	1.1
Simvastatin	879	1.0	0.9	0.7	1.0
Metformin	857	1.0	0.8	0.7	1.0
Omeprazole	851	1.0	0.8	0.7	1.0
Irbesartan	830	1.0	0.8	0.7	1.0
Atenolol	818	1.0	0.8	0.6	1.0
Warfarin sodium	791	0.9	0.8	0.6	1.0
Diclofenac sodium systemic	740	0.9	0.7	0.5	0.9
Aspirin	726	0.9	0.7	0.5	0.9
Betamethasone topical	725	0.9	0.7	0.6	0.9
Doxycycline	721	0.8	0.7	0.5	0.9
Frusemide	689	0.8	0.7	0.5	0.9
Subtotal	*44,496*	*52.5*	—	—	—
Total prescribed medications	**85,161**	**100.0**	**84.3**	**81.8**	**86.9**

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

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

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

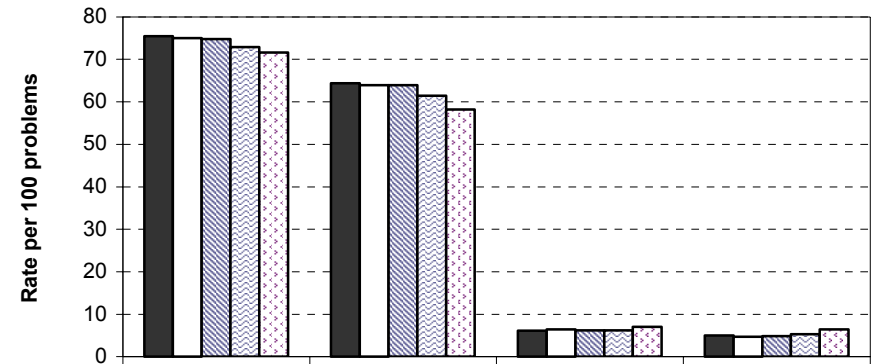
Generic medication	Number	Per cent of scripts (*n*=85,161)	Rate per 100 encs[(a)] (*n*=100,987)	95% LCL	95% UCL
Other analgesics and anti-pyretics	6,028	7.1	6.0	5.5	6.5
Beta-lactam anti-bacterials, penicillins	5,938	7.0	5.9	5.5	6.3
Anti-inflammatory/anti-rheumatic non-steroid	4,819	5.7	4.8	4.5	5.0
Adrenergics, inhalants	3,078	3.6	3.0	2.8	3.3
Other beta-lactam anti-bacterials	3,049	3.6	3.0	2.8	3.2
Anti-depressants	2,953	3.5	2.9	2.7	3.1
ACE inhibitors, plain	2,508	2.9	2.5	2.3	2.7
Viral vaccines	2,455	2.9	2.4	2.0	2.9
Drugs for peptic ulcer and GORD	2,420	2.8	2.4	2.2	2.6
Cholesterol and triglyceride reducers	2,406	2.8	2.4	2.2	2.6
Macrolides, lincosamides and streptogramins	2,288	2.7	2.3	2.0	2.5
Opioids	2,271	2.7	2.2	2.0	2.5
Corticosteroids, plain	2,181	2.6	2.2	2.0	2.3
Hormonal contraceptives for systemic use	1,910	2.2	1.9	1.7	2.1
Anxiolytics	1,871	2.2	1.9	1.7	2.1
Hypnotics and sedatives	1,739	2.0	1.7	1.5	1.9
Beta-blocking agents	1,617	1.9	1.6	1.4	1.8
Oral blood glucose lowering drugs	1,592	1.9	1.6	1.3	1.8
Other inhalants for obstructive airway diseases	1,506	1.8	1.5	1.3	1.7
Angiotensin II antagonists, plain	1,350	1.6	1.3	1.2	1.5
Selective calcium channel blockers	1,340	1.6	1.3	1.1	1.5
Bacterial vaccines	1,185	1.4	1.2	0.9	1.4
Anti-infectives, eye and ear	1,160	1.4	1.1	1.0	1.3
Anti-psychotics	1,108	1.3	1.1	0.9	1.3
Anti-thrombotic agents	1,105	1.3	1.1	0.9	1.3
Corticosteroids for systemic use, plain	1,077	1.3	1.1	0.9	1.2
Tetracyclines	879	1.0	0.9	0.7	1.0
Oestrogens	770	0.9	0.8	0.6	0.9
Propulsives	730	0.9	0.7	0.6	0.9
High-ceiling diuretics	714	0.8	0.7	0.5	0.9
Subtotal	*64,044*	*75.2*	—	—	—
Total prescribed medications	**85,161**	**100.0**	**84.3**	**81.8**	**86.9**

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

Note: Scripts—prescriptions; encs—encounters; UCL—upper confidence limit; LCL—lower confidence limit; GORD—gastro-oesophageal reflux disorder.

Significant changes from 1998–99 to 2002–03

Since 1998–99 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 103.8 (95% CI: 101.4–106.2) in 2002–03. 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 84.3 (95% CI: 81.8–86.9) in 2002–03. The rate of advised OTC medications and those supplied by the GP showed no significant changes or trends over this period (Appendix 4, Table A4.2). Figure 9.8 provides a graphic view of the changes in medication rates per 100 problems managed over time. The graph demonstrates that decreased prescribing rates are not due to any decrease in total problem management rates.



	All medications	Prescribed	Advised OTC	GP supplied
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
2002–03	71.6	58.2	7.0	6.4

Figure 9.8: Changes in medication rates over time

Changes in prescribed medications (classified in CAPS)

Table A4.9 (Appendix 4) provides a summary of the annual results for prescribed medications, classified according to CAPS. The overall decrease was reflected in results from specific medication groups. These results suggest there has been a significant decline in prescribing rates of:

- total antibiotics, in particular cephalosporins, tetracyclines and 'other' antibiotics (which include macrolides)
- anti-angina medications
- simple and compound analgesics
- total respiratory medications, and bronchodilators in particular
- total musculoskeletal medications; rates for these medications increased significantly in 2000–01 but returned to 1998–99 levels in 2002–03
- total skin medications (from 1999–2001 levels), probably due to recent OTC availability

- total urogenital medications, especially plain diuretics which are now available combined with anti-hypertensives
- ear and nose topical medications, and topical nasal medications in particular.

The annual results suggest a significant increase in prescribing rates of:

- 'other' cardiovascular medications, which include lipid-lowering drugs
- narcotic analgesics.

Changes in prescription rates of individual generic medications

Table A4.10 (Appendix 4) shows the most frequently prescribed medications for each of the years from 1998–99 to 2002–03. During that time, significant decreases in prescribing rates of the following medications were noted:

- paracetamol/codeine
- salbutamol
- cefaclor monohydrate
- diclofenac sodium systemic
- doxycycline.

The following medications were uncommon in 1998–99 but were significantly more frequent in the later studies:

- atorvastatin
- omeprazole
- tramadol.

The prescribing rate of celecoxib was seen to peak in 2000–01 and then decrease significantly over the next two years.

Medications which increased significantly over the more recent years were:

- rofecoxib
- fluticasone/salmeterol.

Changes in prescribed medications (classified in ATC)

The comparative results for prescribed medication rates using the ATC classification are presented in Table A4.11 (Appendix 4).

Significant decreases were apparent in prescribing rates of:

- other analgesics and anti-pyretics
- anti-inflammatory/anti-rheumatic non-steroids (down from 2000–01 levels)
- other beta-lactam anti-bacterials
- plain ACE inhibitors
- macrolides and lincosamides
- calcium channel blockers.

Significant increases were apparent in the rate of prescribing of:

- other inhalants for obstructive airway diseases; rates for these medications significantly decreased in 2000–02 but returned to 1999–00 levels in 2002–03
- cholesterol & triglyceride reducers
- opioids.

These trends are further investigated with statistical trend analyses in Chapter 13 and some are evaluated relative to the management of selected morbidities in Chapter 14.

9.3 Medications advised for over-the-counter purchase

The total number of medications recorded as recommended by the GP for OTC purchase was 10,270, a rate of 10.2 per 100 encounters and 7.0 per 100 problems managed. At least one medication was recorded as advised at 9.1% of encounters and for 6.4% 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 acting on the respiratory system (Figure 9.9).

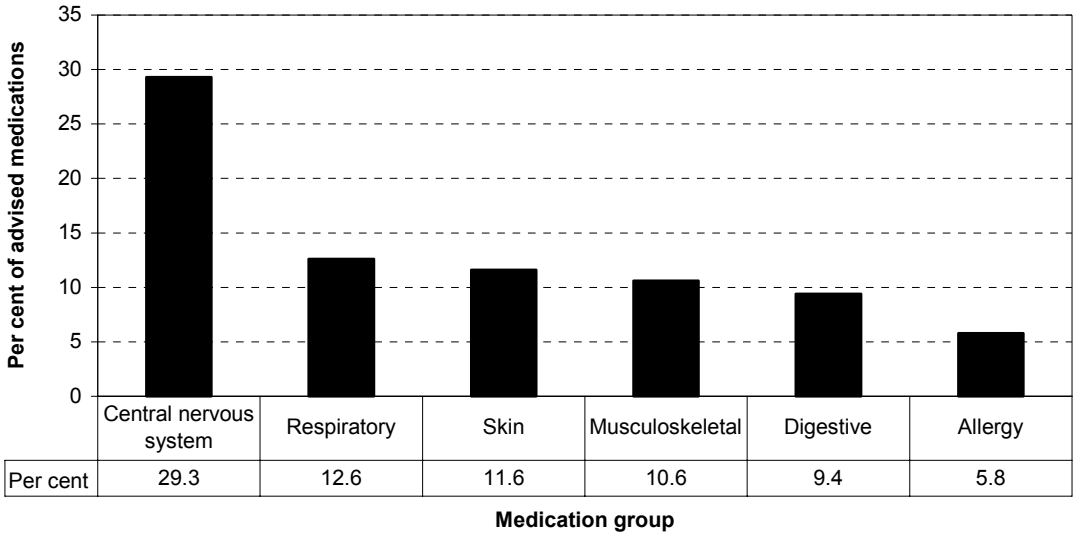


Figure 9.9: Distribution of advised medications by major groups

Paracetamol was the most frequently advised medication, accounting for 25.1% of all advised OTC medications (Table 9.4). There was a wide range of medications advised in relatively small numbers, including analgesics, cold and skin preparations. The 30 medications listed in this table accounted for two-thirds of all OTC medications advised.

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

Generic medication	Number	Per cent of OTCs (*n*=10,269)	Rate per 100 encs[(a)] (*n*=100,987)	95% LCL	95% UCL
Paracetamol	2,579	25.1	2.6	2.1	3.0
Ibuprofen	671	6.5	0.7	0.1	1.3
Loratadine	257	2.5	0.3	0.0	0.6
Diclofenac topical	228	2.2	0.2	0.0	0.5
Clotrimazole topical	201	2.0	0.2	0.0	0.4
Codeine/paraceamol/pseudoephedrine	168	1.6	0.2	0.0	1.4
Aspirin	159	1.5	0.2	0.0	0.4
Saline bath/solution/gargle	152	1.5	0.2	0.0	0.6
Chlorpheniramine/pseudoephidrine	149	1.5	0.1	0.0	0.7
Paracetamol/codeine	147	1.4	0.1	0.0	0.5
Sodium chloride topical nasal	143	1.4	0.1	0.0	0.7
Sodium/potassium/citric/glucose	141	1.4	0.1	0.0	0.5
Clotrimazole vaginal	133	1.3	0.1	0.0	0.4
Bromhexine	114	1.1	0.1	0.0	0.7
Sodium citrotartrate/tartaric acid	113	1.1	0.1	0.0	0.4
Brompheniramine/phenylephrine	102	1.0	0.1	0.0	0.6
Pseudoephedrine	100	1.0	0.1	0.0	0.6
Povidone-iodine topical	95	0.9	0.1	0.0	0.5
Fexofenadine	93	0.9	0.1	0.0	0.4
Sorbolene/glycerol/cetomac	93	0.9	0.1	0.0	0.4
Hyoscine butylbromide	92	0.9	0.1	0.0	0.4
Cetirzine	92	0.9	0.1	0.0	0.5
Loperamide	90	0.9	0.1	0.0	0.7
Chlorpheniramine/phenylephrine	75	0.7	0.1	0.0	0.7
Budesonide topical nasal	71	0.7	0.1	0.0	0.5
Cinchocaine/hydrocortisone	69	0.7	0.1	0.0	0.4
Pholcodine	65	0.6	0.1	0.0	0.7
Mouthwash/gargle, other	65	0.6	0.1	0.0	1.1
Calamine lotion	64	0.6	0.1	0.0	0.9
Dexchlorpheniram	63	0.6	0.1	0.0	0.9
Subtotal	*6,584*	*64.1*	—	—	—
Total medications advised	**10,268**	**100.0**	**10.2**	**9.2**	**11.1**

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

Note: OTCs—over-the-counter medications; encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit.

9.4 Medications supplied by GPs

GPs supplied their patients with a total of 9,384 medications in this study, at a rate of 9.3 medications per 100 encounters and 6.4 per 100 problems. At least one medication was supplied at 6.8% of encounters for 5.2% of problems.

Types of medications supplied by GPs

The distribution of supplied medications by group showed that those acting on the allergy/immune system constituted 26.1% of all medications supplied. Antibiotics made up 10.6%, and cardiovascular medications accounted for 10.3% of GP-supplied medications (Figure 9.10).

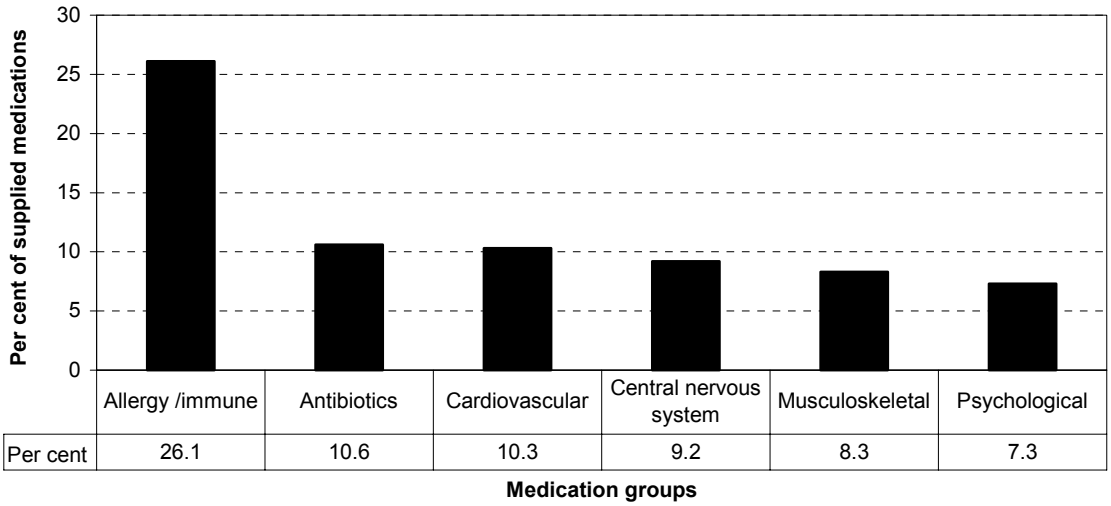


Figure 9.10: Distribution of GP-supplied medications by major groups

Of the ten most common medications supplied by the GP, seven were vaccines, principally influenza virus vaccine, which accounted for 7.5% 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 that 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 NSAID rofecoxib and the antibiotic amoxycillin, accounting for 2.6% and 2.4% respectively of all medications supplied.

9.5 Changes from 1998–99 to 2002–03

As shown in Appendix 4, Tables A4.12 and A4.13, there were no significant changes apparent in the relative rate of provision of advice for OTC purchase of any of the medications that were commonly available in 1998–99. However, for medications supplied directly by the GP, the impact of the introduction of Cox-2 inhibitors on the last 3 years of the BEACH program can be seen.

Table 9.5: Medications most frequently supplied by GPs

Generic medication	Number	Per cent of GP-supplied (*n*=9,382)	Rate per 100 encs[(a)] (*n*=100,987)	95% LCL	95% UCL
Influenza virus vaccine	705	7.5	0.7	0.0	1.9
Polio vaccine oral sabin/injection	290	3.1	0.3	0.0	0.7
Rofecoxib	245	2.6	0.2	0.0	0.6
Amoxycillin	230	2.4	0.2	0.0	1.5
Diphtheria/pertussis/tetanus/hepatitis B	184	2.0	0.2	0.0	0.7
Meningitis vaccine	158	1.7	0.2	0.0	0.9
Haemophilus B vaccine	157	1.7	0.2	0.0	0.6
Mumps/measles/Rubella vaccine	147	1.6	0.1	0.0	0.4
Celecoxib	147	1.6	0.1	0.0	0.5
Triple antigen(diphtheria/pertussis/tetanus)	146	1.6	0.1	0.0	0.6
ADT/CDT (diphtheria/tetanus) vaccine	144	1.5	0.1	0.0	0.5
Paracetamol	137	1.5	0.1	0.0	0.8
Metoclopramide	137	1.5	0.1	0.0	0.4
Salbutamol	135	1.4	0.1	0.0	0.7
Cephalexin	131	1.4	0.1	0.0	0.9
Paracetamol/codeine	128	1.4	0.1	0.0	0.8
Meloxicam	124	1.3	0.1	0.0	0.6
Sertraline	118	1.3	0.1	0.0	0.4
Amoxycillin/potassium clavulanate	108	1.2	0.1	0.0	0.9
Citalopram	90	1.0	0.1	0.0	0.4
Omeprazole	90	1.0	0.1	0.0	0.5
Tramadol	90	1.0	0.1	0.0	0.6
Mometasone	89	1.0	0.1	0.0	0.5
Fluticasone/salmeterol	87	0.9	0.1	0.0	0.5
Hepatitis B vaccine	86	0.9	0.1	0.0	0.4
Esomeprazole	85	0.9	0.1	0.0	0.5
Levonorgestrel/ethinyloestradiol	84	0.9	0.1	0.0	0.6
Roxithromycin	77	0.8	0.1	0.0	0.8
Prochlorperazine	74	0.8	0.1	0.0	0.4
Diclofenac sodium systemic	72	0.8	0.1	0.0	0.7
Subtotal	*4,495*	*55.3*	—	—	—
Total medications supplied	**9,382**	**100.0**	**9.3**	**7.6**	**11.0**

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

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

10 Non-pharmacological management

For each problem managed, GPs could record up to two non-pharmacological treatments provided at the encounter. Non-pharmacological treatments were divided into clinical and procedural treatments, and these groups are defined in Appendix 3.

- clinical treatments, include general and specific advice, counselling or education, family planning and administrative processes.
- procedural treatments, which encompass all procedures carried out by general practitioners such as excision of skin lesion or application/removal of plaster cast.

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 52,292 were recorded for the year, at a rate of 51.8 per 100 encounters and 35.7 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*=100,987)	95% LCL	95% UCL	Rate per 100 problems[(a)] (*n*=146,336)	95% LCL	95% UCL
Non-pharmacological treatments	52,292	51.8	49.3	54.3	35.7	34.1	37.3
Clinical treatments	37,543	37.2	35.0	39.4	25.7	24.2	27.1
Procedural treatments	14,748	14.6	13.9	15.3	10.1	9.6	10.6

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

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

Table 10.2 shows the proportion of problems for which at least one non-pharmacological treatment was given. Pharmacological and non-pharmacological treatments were 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 30.9% of problems, and for 18.3% of problems, non-pharmacological treatment was not accompanied by any medication.

One in five problems were managed with a clinical treatment, and for more than half of these (56.6%), no pharmacological treatments were used. GPs used a procedural treatment for the management of one in ten problems, in two-thirds (64.1%) of which 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 those managed with a clinical treatment (64.1% compared with 56.6%).

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*=146,336)	95% LCL	95% UCL
At least one non-pharmacological treatment	45,257	100.0	30.9	29.7	32.2
Without pharmacological treatment	26,743	59.1	18.3	17.6	19.0
At least one clinical treatment	33,165	100.0	22.7	21.5	23.8
Without pharmacological treatment	18,762	56.6	12.8	12.2	13.5
At least one procedural treatment	13,749	100.0	9.4	9.0	9.8
Without pharmacological treatment	8,810	64.1	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 37,543, at a rate of 37.2 per 100 encounters (Table 10.1).

Most frequent clinical treatments

The three most common clinical treatments were advice and education in general (13.3% of total non-pharmacological treatments), counselling on the problem managed (10.6%) and advice and education pertaining to nutrition and weight (10.1%).

General advice/education was provided at a rate of 6.9 per 100 encounters, while counselling on the problem managed was given at a rate of 5.5 per 100 encounters and advice and education on nutrition and weight at a rate of 5.2 per 100 encounters. Advice and education on the treatment of the problem (4.2 per 100 encounters), psychological counselling (2.9) and advice on medication (2.5) 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 consumption, smoking, exercise, lifestyle, occupational and relationship issues.

Problems managed with clinical treatments

A total of 33,165 problems included a clinical treatment as part of their management. The top ten problems accounted for almost 30% of all problems for which a clinical treatment was provided. The problem most often managed with a clinical treatment was URTI (5.6% of problems managed with a clinical treatment), followed by depression (5.3%), hypertension (4.6%) and lipid disorder (2.7%) (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 49.4% of depression contacts were managed with a clinical treatment, most probably counselling, and of these, 44.1% were not given a prescription as part of the treatment. Likewise, 45.0% of anxiety was managed with a clinical treatment, and 61.7% of these did not receive a medication. Asthma was less likely to be managed with a clinical treatment (20.1%) and less likely to be managed without medication when clinical treatment was given (26.1%).

Table 10.3: Most frequent clinical treatments

Treatment	Number	Per cent of non-pharmacological treatments (*n*=52,292)	Rate per 100 encounters[(a)] (*n*=100,987)	95% LCL	95% UCL
Advice/education*	6,955	13.3	6.9	5.9	7.9
Counselling—problem*	5,525	10.6	5.5	4.7	6.3
Counselling/advice—nutrition/weight*	5,266	10.1	5.2	4.6	5.9
Advice/education—treatment*	4,287	8.2	4.2	3.6	4.9
Counselling—psychological*	2,911	5.7	2.9	2.6	3.2
Advice/education—medication*	2,508	4.8	2.5	2.1	2.8
Counselling/advice—exercise*	1,626	3.1	1.6	1.2	2.0
Other admin/document*	1,563	3.0	1.6	1.3	1.8
Reassurance, support	1,389	2.7	1.4	1.0	1.7
Sickness certificate	1,311	2.5	1.3	0.8	1.8
Counselling/advice—smoking*	679	1.3	0.7	0.4	0.9
Counselling/advice—lifestyle*	508	1.0	0.5	0.0	1.5
Counselling/advice—alcohol*	378	0.7	0.4	0.1	0.6
Family planning*	368	0.7	0.4	0.1	0.6
Counselling/advice—health/body*	344	0.7	0.3	0.0	0.8
Counselling/advice—prevention*	315	0.6	0.3	0.0	0.8
Subtotal	*35,933*	*68.7*	—	—	—
Total clinical treatments	*37,543*	*71.8*	*37.2*	*35.0*	*39.4*
Total non-pharmacological treatments	**52,292**	**100.0**	**51.8**	**49.3**	**54.3**

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

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

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

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

Problem managed	Number	Per cent of problems with clinical treatment	Rate per 100 encounters[(a) (b)] (*n*=100,987)	95% LCL	95% UCL	Per cent this problem[(c)]	Per cent of treated problems– no meds[(d)]
Acute upper respiratory infection	1,853	5.6	1.8	1.5	2.2	28.7	48.7
Depression*	1,760	5.3	1.7	1.5	2.0	49.4	44.1
Hypertension*	1,510	4.6	1.5	1.1	1.9	16.9	46.4
Lipid disorder	904	2.7	0.9	0.7	1.1	29.7	67.8
Diabetes*	852	2.6	0.8	0.7	1.0	28.9	64.0
Anxiety*	703	2.1	0.7	0.5	0.9	45.0	61.7
Gastroenteritis, presumed infection	618	1.9	0.6	0.4	0.8	50.1	54.4
Viral disease, other/NOS	569	1.7	0.6	0.2	0.9	40.1	49.4
Back complaint*	560	1.7	0.6	0.3	0.8	21.4	49.5
Asthma	553	1.7	0.6	0.3	0.8	20.1	26.1
Subtotal	9,882	29.8	—	—	—	—	—
Total problems	**33,165**	**100.0**	**32.8**	**31.0**	**34.7**	—	—

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

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

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

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

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

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

10.2 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 because of small numbers within each chapter. There were 14,748 procedural treatments recorded, at a rate of 14.6 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 5.5% of all non-pharmacological treatments and occurred at a rate of 2.9 per 100 encounters. This was followed by physical medicine or rehabilitation (including physiotherapy, massage and therapeutic exercises) which occurred at a rate of 2.1 per 100 encounters, and accounted for 4.1% of all non-pharmacological treatments.

Pap smears, physical function tests such as peak flow readings, and electrical tracings were the most common diagnostic procedures undertaken. 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*=100,987)	95% LCL	95% UCL
Excision/removal tissue/biopsy/ destruction/debridement/cauterisation*	2,876	5.5	2.9	2.6	3.1
Physical medicine/rehabilitation*	2,140	4.1	2.1	1.6	2.6
Dressing/pressure/compression/tamponade*	1,972	3.8	2.0	1.8	2.2
Local injection/infiltration*	1,477	2.8	1.5	1.2	1.8
Other therapeutic procedures/surgery NEC*	1,187	2.3	1.2	0.8	1.6
Incision/drainage/flushing/aspiration/removal body fluid*	1,134	2.2	1.1	1.0	1.3
Pap smear	1,090	2.1	1.1	0.8	1.4
Repair/fixation-suture/cast/prosthetic device (apply/remove)*	901	1.7	0.9	0.7	1.0
Physical function test*	538	1.0	0.5	0.0	1.1
Electrical tracings*	320	0.6	0.3	0.1	0.6
Urine test*	271	0.5	0.3	0.0	0.6
Subtotal	*13,906*	*26.6*	—	—	—
Total procedural treatments	*14,748*	*28.2*	*14.6*	*13.9*	*15.3*
Total non-pharmacological treatment	**52,292**	**100.0**	**51.8**	**49.3**	**54.3**

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

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

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

Problems managed with a procedural treatment

A total of 13,749 problems involved a procedure in their management. The top ten problems accounted for 37.5% of all problems for which a procedure was used (Table 10.6).

Solar keratosis/sunburn was the most common problem managed with a procedural treatment, accounting for 6.1% of problems managed with a procedural treatment. Other problems frequently managed with a procedure were female genital check-ups (5.7%), lacerations/cuts (4.4%), excessive ear wax (3.9%) and sprains/strains (3.5%).

Again, the two columns on the right side of the table show the proportion of contacts with each problem that was managed with a procedure and the proportion of problems being managed with a procedure without a concomitant medication. Contacts with warts or excessive ear wax were the most likely to result in a procedure (76.0%), followed by lacerations (74.6%). Many of the problems that were managed with a procedure did not have a medication prescribed, advised or given. More than 70% of solar keratoses cases were managed with a procedure, and of these, 98.1% did not have a concomitant medication used.

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*=100,987)	95% LCL	95% UCL	Per cent of this problem[c]	Per cent of treated problems no meds[d]
Solar keratosis/sunburn	832	6.1	0.8	0.5	1.1	70.9	98.1
Female genital check-up*	786	5.7	0.8	0.4	1.1	44.1	97.5
Laceration/cut	598	4.4	0.6	0.4	0.7	74.6	74.3
Excessive ear wax	536	3.9	0.5	0.4	0.7	76.0	89.9
Sprain/strain*	484	3.5	0.5	0.2	0.8	28.4	45.6
Warts	471	3.4	0.5	0.3	0.7	76.0	97.7
Back complaint*	446	3.3	0.4	0.0	1.0	17.0	49.8
Malignant neoplasm skin	376	2.7	0.4	0.0	0.7	44.5	97.1
Chronic ulcer skin (incl varicose ulcer)	317	2.3	0.3	0.1	0.6	59.8	74.1
Asthma	316	2.3	0.3	0.1	0.6	11.5	18.7
Subtotal	*5,162*	*37.5*	—	—	—	—	—
Total problems	**13,749**	**100.0**	**13.6**	**13.0**	**14.2**	—	—

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

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

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

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

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

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

10.3 Changes from 1998–99 to 2002–03

Over the last five years, there has been a significant increase in the relative rates of provision of non-pharmacological treatments, from 43.2 (95% CI: 41.3–45.0) per 100 encounters in 1998–99 to 51.8 (95% CI: 49.3–54.3) in 2002–03. 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 37.2 per 100 (95% CI: 35.0–39.4) and of therapeutic procedures (11.8 per 100, 95% CI: 11.2–12.5, to 14.6 per 100, 95% CI: 13.9–15.3) (Appendix 4, Table A4.2).

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

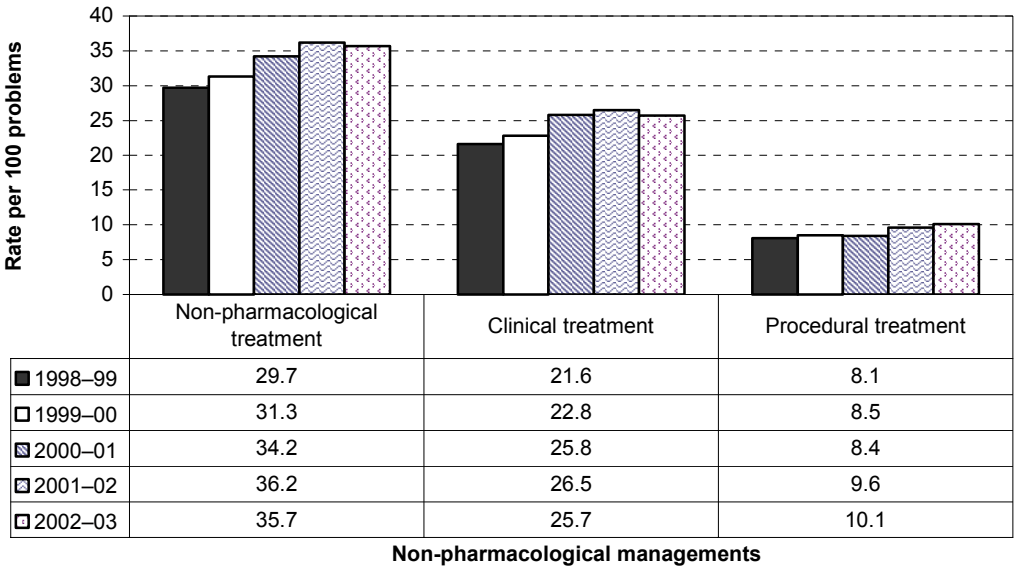


Figure 10.1: Changes in rates of non-pharmacological treatment

11 Referrals and admissions

A referral is defined as the process by which the responsibility for part or all of the care of a patient is temporarily transferred to another healthcare 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 10.6% of all encounters for 7.3% of all problems managed. More than one referral could be recorded at an encounter. As a result, there were 11,254 referrals made at a rate of 11.1 per 100 encounters. The most frequent were referrals to a medical specialist (7.7 per 100 encounters), followed by referrals to allied health services (2.5). Very few patients were referred to hospital for admission (0.6 per 100 encounters) or to the hospital emergency department (0.1 per 100). Referrals to a specialist were given more often (5.3 per 100 problems managed) than to an allied health professional (1.7) (Table 11.1).

Table 11.1: Summary of referrals and admissions

	Number	Rate per 100 encounters (*n*=100,987)	95% LCL	95% UCL	Rate per 100 problems (*n*=146,336)	95% LCL	95% UCL
At least one referral	10,696	10.6	10.2	11.0	7.3	7.0	7.6
Referrals	11,254	11.1	10.7	11.6	7.7	7.4	8.0
Specialist	7,743	7.7	7.3	8.0	5.3	5.1	5.5
Allied health service	2,536	2.5	2.3	2.8	1.7	1.6	1.9
Hospital	566	0.6	0.3	0.8	0.4	0.2	0.6
Emergency department	137	0.1	0.0	0.4	0.1	0.0	0.3
Other referrals	271	0.3	0.0	0.5	0.2	0.0	0.4

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

11.2 Most frequent referrals

Of the 11,254 referrals, 91.3% (*n*=10,279) were referrals to specialists or allied health services. The top ten provider types in each category accounted for 52.7% of all referrals to medical specialists and 20.3% of those to allied health services (Table 11.2).

The most frequent referrals made to specialist medical practitioners were to orthopaedic surgeons (9.9% of all referrals to medical specialists), ophthalmologists (9.7%), surgeons (9.7%) and gynaecologists (8.3%).

More than 40% of referrals to allied health services were to physiotherapists, and these accounted for 10.4% of all referrals to specialists and allied health services. These were followed by referrals to podiatrists or chiropodists (7.4% of all referrals to allied health professionals), dieticians (7.1%), psychologists (7.0%) and dentists (6.0%) (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 referrals[(a)]	Per cent of referral group	Rate per 100 encounters (*n*=100,987)	95% LCL	95% UCL
Medical specialist	**7,743**	**75.3**	**100.0**	**7.7**	**7.3**	**8.0**
Referral; orthopaedic surgeon	766	7.5	9.9	0.8	0.6	0.9
Referral; ophthalmologist	748	7.3	9.7	0.7	0.6	0.9
Referral; surgeon	747	7.3	9.7	0.7	0.6	0.9
Referral; gynaecologist	645	6.3	8.3	0.6	0.5	0.8
Referral; dermatologist	576	5.6	7.4	0.6	0.4	0.7
Referral; ENT	532	5.2	6.9	0.5	0.4	0.6
Referral; cardiologist	425	4.1	5.5	0.4	0.2	0.6
Referral; gastroenterologist	406	4.0	5.2	0.4	0.2	0.6
Referral; urologist	304	3.0	3.9	0.3	0.1	0.5
Referral; neurologist	265	2.6	3.4	0.3	0.1	0.4
Subtotal: top ten specialist referrals	*5,414*	*52.7*	*69.9*	—	—	—
Allied health and other professionals	**2,536**	**24.7**	**100.0**	**2.5**	**2.3**	**2.8**
Referral; physiotherapy	1,069	10.4	42.2	1.1	0.8	1.3
Referral; podiatrist/chiropodist	188	1.8	7.4	0.2	0.0	0.4
Referral; dietician/nutrition	180	1.8	7.1	0.2	0.0	0.4
Referral; psychologist	178	1.7	7.0	0.2	0.0	0.4
Referral; dentist	153	1.5	6.0	0.2	0.0	0.4
Referral; optometrist	93	0.9	3.7	0.1	0.0	0.4
Referral; counsellor	91	0.9	3.6	0.1	0.0	0.5
Referral; drug and alcohol	46	0.5	1.8	0.1	0.0	0.4
Referral; aged care assessment	43	0.4	1.7	0.0	0.0	0.4
Referral; diabetes education	43	0.4	1.7	0.0	0.0	0.4
Subtotal: top ten allied health referrals	*2,084*	*20.3*	*82.2*	—	—	—
Total specialist & allied health referrals	**10,279**	**100.0**	—	**10.2**	**9.7**	**10.6**

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

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 as part of the management of 7,928 problems. The ten problems most commonly associated with a referral to a specialist accounted for 17.4% of all problems referred to a specialist. The problems most often referred were diabetes (accounting for 2.4% of problems referred to a specialist), pregnancy (2.2%) and malignant neoplasms of the skin (2.2%) (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*=100,987)	95% LCL	95% UCL
Diabetes*	191	2.4	0.2	0.0	0.4
Pregnancy*	176	2.2	0.2	0.0	0.4
Malignant skin neoplasm	171	2.2	0.2	0.0	0.4
Osteoarthritis*	163	2.1	0.2	0.0	0.4
Depression*	146	1.8	0.1	0.0	0.4
Menstrual problems*	116	1.5	0.1	0.0	0.4
Back complaint*	115	1.5	0.1	0.0	0.4
Ischaemic heart disease*	113	1.4	0.1	0.0	0.4
Abnormal test results*	97	1.2	0.1	0.0	0.3
Carpal tunnel syndrome	95	1.2	0.1	0.0	0.4
Subtotal: top ten problems referred to a specialist	*1,383*	*17.4*	—	—	—
Total problems referred to specialist	**7,928**	**100.0**	**7.9**	**7.5**	**8.2**

* 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*=2,536, Table 11.2), possibly because formal referrals to such services are not always required. There were 2,621 problems referred to an allied health professional or service. Table 11.4 shows the ten most common of these. They accounted for 42.4% of all problems referred to allied health services.

Back complaints were the problem most frequently referred to allied health services (8.2% of problems referred), followed by sprains and strains (7.4%). These problems are those that would be likely to be referred to physiotherapists. Depression (5.5%), diabetes (4.8%) and teeth/gum disease (4.2%) 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 services and medical specialists.

There were 566 referrals for hospital admission (Table 11.1). The ten problems most commonly associated with hospital admission referral are shown in Table 11.5. Although the numbers involved are very small, it is interesting to note the types of problems for which hospital admission was sought. These included fracture (4.7% of problems referred for admission), appendicitis (2.9%) and pneumonia (2.7%). Cardiovascular problems such as heart failure, ischaemic heart disease and acute myocardial infarction 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*=100,987)	95% LCL	95% UCL
Back complaint*	215	8.2	0.2	0.0	0.4
Sprain/strain*	195	7.4	0.2	0.0	0.4
Depression*	144	5.5	0.1	0.0	0.4
Diabetes*	126	4.8	0.1	0.0	0.4
Teeth/gum disease	109	4.2	0.1	0.0	0.4
Osteoarthritis*	97	3.7	0.1	0.0	0.4
Musculoskeletal injury NOS	66	2.5	0.1	0.0	0.4
Skin injury, other	57	2.2	0.1	0.0	0.6
Bursitis/tendonitis/synovitis NOS	52	2.0	0.1	0.0	0.4
Musculoskeletal disease, other	50	1.9	0.1	0.0	0.5
Subtotal: top ten problems referred to AHS	*1,111*	*42.4*	—	—	—
Total problems referred to AHS	**2,621**	**100.0**	**2.6**	**2.3**	**2.9**

* 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*=100,987)	95% LCL	95% UCL
Fracture*	28	4.7	0.03	0.0	0.5
Appendicitis	17	2.9	0.02	0.0	0.6
Pneumonia	16	2.7	0.02	0.0	0.8
Heart failure	15	2.6	0.01	0.0	0.8
Pregnancy*	14	2.3	0.01	0.0	0.7
Ischaemic heart disease*	11	1.8	0.01	0.0	0.8
Abdominal pain*	11	1.8	0.01	0.0	0.9
Infectious disease, other/NOS	10	1.8	0.01	0.0	0.8
Acute myocardial infarction	10	1.8	0.01	0.0	0.8
Back complaint*	10	1.7	0.01	0.0	0.8
Subtotal: top ten problems referred for admission	*142*	*24.2*	—	—	—
Total problems referred to hospital	**586**	**100.0**	**0.58**	**0.3**	**0.8**

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

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

11.4 Changes from 1998–99 to 2002–03

There were no significant changes across the five years of BEACH data in the rates of referral and types of referral (Appendix 4, Table A4.2).

12 Investigations

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

A pathology test order may be for a single test (e.g. Pap smear, HbA1c) or for a battery of tests (e.g. lipids, 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 (79.7%) of encounters. At least one pathology test order was recorded at 14.7% of encounters (for 11.4% of problems managed) and at least one imaging test was ordered at 7.5% of encounters (for 5.3% 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*=100,987)	95% LCL	95% UCL	Number of problems	Per cent of problems (*n*=146,336)	95% LCL	95% UCL
Pathology and imaging ordered	1,896	1.9	1.7	2.1	1,378	0.9	0.8	1.1
Pathology only ordered	12,994	12.9	12.4	13.3	15,254	10.4	10.1	10.8
Imaging only ordered	5,628	5.6	5.3	5.8	6,419	4.4	4.2	4.6
No tests ordered	80,469	79.7	79.0	80.3	123,285	84.3	83.8	84.7
At least one pathology ordered	14,890	14.7	14.2	15.3	16,632	11.4	11.0	11.8
At least one imaging ordered	7,524	7.5	7.1	7.8	7,797	5.3	5.1	5.6

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

12.1 Pathology ordering

A comprehensive report on pathology ordering by GPs in Australia in 1998, written by the 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.[27] For a more detailed study of pathology ordering, consult that publication; readers may wish to compare those results with the information presented below.

Nature of pathology orders at encounter

There were 33,234 orders for a pathology test (or battery of tests) and these were made at a rate of 32.9 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.[28]

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

The largest of the groups, Chemistry, accounted for 53.8% of all tests and was recorded at a rate of 17.7 per 100 encounters. Within this group the most frequently ordered test was lipids (18.4%) followed by liver function tests (11.9%). Full blood count (69.0%) was the largest group within Haematology and urine, microscopy, culture and sensitivity (urine MC&S) (31.9%) was the largest in Microbiology.

The most frequently ordered test types were full blood count; lipids; liver function; electrolytes, urea and creatinine (EUC); glucose; thyroid function; urine MC&S and Pap smear tests. Full blood counts accounted for 13.2% of tests and were ordered at a rate of 4.3 per 100 encounters. Pap smears accounted for 4.9% of all tests and made up the greater proportion of the Cytology group (96.6%). Lipid tests were ordered at a rate of 3.3 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*=100,987)	95% LCL	95% UCL
Chemistry	**17,870**	**53.8**	**100.0**	**17.7**	**16.8**	**18.6**
Lipids	3,296	9.9	18.4	3.3	3.0	3.5
Liver function	2,120	6.4	11.9	2.1	1.9	2.3
EUC	2,114	6.4	11.8	2.1	1.8	2.4
Glucose—all*	2,110	6.4	11.8	2.1	1.9	2.3
Thyroid function	1,818	5.5	10.2	1.8	1.6	2.0
Multi-biochemical analysis	1,494	4.5	8.4	1.5	0.9	2.1
Hormone assay	863	2.6	4.8	0.9	0.6	1.2
Ferritin	778	2.3	4.4	0.8	0.6	0.9
HbA1c	773	2.3	4.3	0.8	0.6	0.9
Chemistry, other	625	1.9	3.5	0.6	0.4	0.8
Haematology	**6,354**	**19.1**	**100.0**	**6.3**	**5.9**	**6.6**
Full blood count	4,385	13.2	69.0	4.3	4.1	4.6
Erythrocyte sedimentation rate	997	3.0	15.7	1.0	0.8	1.2
Coagulation	722	2.2	11.4	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*=100,987)	95% LCL	95% UCL
Microbiology	**5,188**	**15.6**	**100.0**	**5.1**	**4.8**	**5.5**
Urine MC&S	1,653	5.0	31.9	1.6	1.5	1.8
Microbiology, other	682	2.1	13.2	0.7	0.5	0.8
Hepatitis serology	574	1.7	11.1	0.6	0.3	0.8
Vaginal swab and C&S	340	1.0	6.6	0.3	0.1	0.6
HIV	282	0.9	5.4	0.3	0.0	0.6
Faeces MC&S	280	0.8	5.4	0.3	0.1	0.5
Chlamydia	238	0.7	4.6	0.2	0.0	0.5
Cytology	**1,690**	**5.1**	**100.0**	**1.7**	**1.4**	**1.9**
Pap smear	1,631	4.9	96.6	1.6	1.4	1.9
Other NEC	**777**	**2.3**	**100.0**	**0.8**	**0.4**	**1.1**
Blood test	281	0.9	36.2	0.3	0.0	1.3
Other test NEC	281	0.9	36.1	0.3	0.1	0.5
Infertility/pregnancy	**290**	**0.9**	**100.0**	**0.3**	**0.1**	**0.5**
Tissue pathology	**528**	**1.6**	**100.0**	**0.5**	**0.2**	**0.8**
Histology, skin	417	1.3	79.0	0.4	0.1	0.8
Immunology	**454**	**1.4**	**100.0**	**0.5**	**0.2**	**0.7**
Anti nuclear antibodies	136	0.4	29.9	0.1	0.0	0.4
Simple basic tests	**84**	**0.3**	**100.0**	**0.1**	**0.0**	**0.4**
Total pathology tests	**33,234**	**100.0**	—	**32.9**	**31.5**	**34.4**

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 16,632 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 hypertension (6.0% of problem–pathology combinations), diabetes (5.8%), lipid disorder (5.0%), general check-up (4.0%), female genital check-up (including Pap smear) (3.9%) and weakness/tiredness (3.7%). This is not surprising given the distribution of pathology tests described in the previous table. However, the last two columns of the table provide some contrasts. The second last column shows the 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 8,935 hypertension problems recorded in the data set (6.1% of problems). Diabetes (2.0% of problems) was managed far less frequently but accounted for almost as many pathology tests as did hypertension. There were 1,981 test orders (5.8%) associated with diabetes and 2,022 test orders (6.0%) associated with hypertension. This is because 27.4% of diabetes contacts resulted in a pathology test compared with only 9.0% of contacts with hypertension.

Weakness/tiredness was not a problem label that ranked in the top 30 problems managed in general practice, yet it ranked sixth highest in the problems associated with pathology ordering. This is because the decision to order a pathology test for weakness/tiredness was relatively frequent (58.5% of contacts generating an order) and where such a decision was made, multiple pathology tests were likely (averaging 344.0 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)]
Hypertension*	8,935	2,022	6.0	9.0	252.4
Diabetes*	2,949	1,981	5.8	27.4	245.4
Lipid disorder	3,043	1,707	5.0	28.4	197.6
General check-up*	1,952	1,349	4.0	27.5	251.5
Female genital check-up*	1,781	1,333	3.9	66.3	112.9
Weakness/tiredness general	616	1,239	3.7	58.5	344.0
Urinary tract infection*	1,686	973	2.9	50.4	114.7
Blood test NOS	250	624	1.8	83.6	297.8
Abnormal test results*	770	577	1.7	44.5	168.5
Pregnancy*	855	558	1.6	33.1	197.2
Subtotal	*22,837*	*12,363*	*36.4*	—	—
Total	**146,336**	**33,961**	**100.0**	**11.4**	**199.8**

(a) A test was counted more than once if it was ordered for the management of more than one problem at an encounter. There were 33,234 pathology test orders and 33,961problem–pathology combinations.

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

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

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

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

12.2 Imaging ordering

A comprehensive report on imaging orders by GPs in Australia in 1999–00, written by the GP Statistics and Classification Unit using BEACH data, was published by the AIHW in 2001.[29] Readers wishing a more detailed study of imaging orders should consult that publication and may wish to compare those results with the information presented below.

Nature of imaging orders at encounter

There were 8,678 orders for imaging and these were made at a rate of 8.6 per 100 encounters. At least one imaging test was ordered at 7.5% of encounters and for 5.3% 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 (59.6%) of

all imaging tests, Ultrasound accounted for 30.5%, CT scanning 9.1%, Nuclear medicine 0.5% and MRI 0.4% (Table 12.4).

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

Imaging test ordered	Number	Per cent of tests	Per cent of group	Rate per 100 encounters (*n*=100,987)	95% LCL	95% UCL
Diagnostic radiology	**5,171**	**59.6**	**100.0**	**5.1**	**4.9**	**5.4**
X-ray; chest	1,138	13.1	22.0	1.1	1.0	1.3
X-ray; knee	430	5.0	8.3	0.4	0.3	0.6
Mammography	399	4.6	7.7	0.4	0.2	0.6
X-ray; shoulder	249	2.9	4.8	0.3	0.1	0.4
Test; densiometry	235	2.7	4.5	0.2	0.0	0.4
X-ray; hip	234	2.7	4.5	0.2	0.1	0.4
X-ray; foot/feet	219	2.5	4.2	0.2	0.0	0.4
X-ray; ankle	199	2.3	3.9	0.2	0.0	0.4
X-ray; spine, lumbosacral	198	2.3	3.8	0.2	0.0	0.4
X-ray; wrist	146	1.7	2.8	0.1	0.0	0.4
X-ray; spine, lumbar	141	1.6	2.7	0.1	0.0	0.4
X-ray; hand	140	1.6	2.7	0.1	0.0	0.4
X-ray; spine, cervical	139	1.6	2.7	0.1	0.0	0.4
X-ray; finger(s)/thumb	128	1.5	2.5	0.1	0.0	0.3
X-ray; abdomen	98	1.1	1.9	0.1	0.0	0.3
Scan; bone(s)	91	1.0	1.8	0.1	0.0	0.4
X-ray; spine, thoracic	82	1.0	1.6	0.1	0.0	0.4
X-ray; elbow	67	0.8	1.3	0.1	0.0	0.4
Ultrasound	**2,643**	**30.5**	**100.0**	**2.6**	**2.5**	**2.8**
Ultrasound; pelvis	521	6.0	19.7	0.5	0.3	0.7
Ultrasound; abdomen	287	3.3	10.8	0.3	0.1	0.4
Ultrasound; breast, F	264	3.0	10.0	0.3	0.0	0.5
Ultrasound; shoulder	247	2.8	9.3	0.2	0.1	0.4
Ultrasound; obstetric	176	2.0	6.7	0.2	0.0	0.4
Ultrasound	152	1.8	5.8	0.2	0.0	0.4
Ultrasound; renal tract	95	1.1	3.6	0.1	0.0	0.3
Echocardiography	94	1.1	3.6	0.1	0.0	0.4
Test; doppler	93	1.1	3.5	0.1	0.0	0.4
Computerised tomography	**793**	**9.1**	**100.0**	**0.8**	**0.7**	**0.9**
CT scan; brain	141	1.6	17.8	0.1	0.0	0.4
CT scan; head	107	1.2	13.5	0.1	0.0	0.4
CT scan; abdomen	86	1.0	10.9	0.1	0.0	0.4
Nuclear medicine imaging	**40**	**0.5**	**100.0**	**0.0**	**0.0**	**0.4**
Magnetic resonance imaging	**32**	**0.4**	**100.0**	**0.0**	**0.0**	**0.6**
Total imaging tests	**8,678**	**100.0**	—	**8.6**	**8.2**	**9.0**

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

Chest x-rays were by far the most common subgroup in Diagnostic radiology (22.0%), followed by x-ray of the knee (8.3%) and mammography (7.7%). Ultrasound was commonly of the pelvis (19.7%), abdomen (10.8%), breast (10.0%) and shoulder (9.3%). CT scans were most commonly performed on the brain (17.9%), head (13.5%) and abdomen (10.9%).

Overall, the most frequently ordered imaging test was chest x-ray which accounted for 13.1% of all imaging and was ordered at a rate of 1.1 per 100 encounters. Pelvic ultrasound, the second most frequently ordered, accounted for 6.0% 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 8,747 problem–imaging combinations. Six (including the top five) 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 5.5% of all imaging, and 15.7% of contacts with a back complaint resulted in an imaging order. Although fracture accounted for slightly fewer imaging orders (4.7%), 37.7% of contacts with this problem resulted in an order for imaging.

The ordering of multiple imaging for a single problem was far less common than the ordering of multiple pathology. Breast lump/mass (female) had the highest rate of multiple test orders in the top ten problems, 135.8 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	Per cent of problems with test[(b)]	Rate of imaging orders per 100 tested problems[(c)]
Back complaint*	2,624	479	5.5	15.7	116.2
Fracture*	992	406	4.7	37.7	108.5
Osteoarthritis*	2,586	399	4.6	13.2	117
Sprain/strain*	1,702	366	4.2	19.1	112.7
Injury musculoskeletal NOS	724	214	2.5	26.9	110
Abdominal pain*	560	210	2.4	32.8	114.5
Injury skin, other	734	185	2.1	21.4	117.5
Breast lump/mass (female)	192	165	1.9	63.3	135.8
Acute bronchitis/bronchiolitis	2,599	157	1.8	6.0	100.7
Bursitis/tendonitis/synovitis NOS	784	147	1.7	15.4	121.7
Subtotal	*13,497*	*2,728*	*31.2*	—	—
Total	**146,338**	**8,747**	**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.

12.3 Changes from 1998–99 to 2002–03

Changes in pathology

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 32.9 per 100 (95% CI: 31.5–34.4) in 2002–03, representing an increase of approximately 25% over the 5 years of the BEACH program (Appendix 4, Table A4.2). Two-thirds of the increase in pathology ordering in the last three years was accounted for by an increase in chemical pathology from 15.7 per 100 encounters (95% CI: 14.8–16.5) in 2000–01 to 17.7 per 100 (95% CI: 16.8–18.6) in 2002–03 (Appendix 4, Table A4.16(b)).

The general upward trend has continued annually, and the change over the first three years was investigated in detail in a specific study of pathology ordering patterns undertaken for the Commonwealth Department of Health and Ageing. The results have been reported in a separate publication.[30] Since the beginning of the third year of BEACH, a change in coding of pathology orders allowed more specificity in recording these orders.

Changes in imaging

Although it would appear from the annual BEACH summary results that there has been a significant increase in the relative rate of orders for imaging each year, this is partly due to a change in the coding of imaging orders between years 2 and 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. This year we were able to investigate apparent changes in ordering rates from 2000–01 to 2002–03 as three measurement points, using the same detailed coding system, are now available. There has been a significant increase in the rate of imaging tests ordered over the past three years from 7.7 per 100 encounters (95% CI: 7.3–8.0) in 2000–01 to 8.6 per 100 encounters (95% CI: 8.2–9.0) in 2002–03 (Appendix 4, Table A4.2).

13 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 (Chapter 14) 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 specific problems of interest.

13.1 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.[8] Test statistics and p-values based on the robust standard error are more conservative than those that are calculated without taking into account the design effect of the cluster sample. 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 problem 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 (100,000,000 per year).

13.2 Changes in annual management rates of problems between 1998–99 and 2002–03

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-2 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, neurological, cardiovascular, urinary, male and female genital systems, and rates of psychological and social problems, remained steady over the 5-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 10.6 problems per 100 encounters in 2002–03 ($p<0.0001$). The average yearly increase in endocrine/metabolic problems was 0.45 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 0.40 problems per 100 encounters ($p<0.0001$), equivalent to an extra 400,000 metabolic endocrine 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 3.0 per 100 encounters in 2002–03 ($p<0.0001$). The increase in the management rate of lipid disorders after adjusting for age and sex was 0.11 problems per 100 encounters per year ($p=0.0004$). This represents an average annual increase of 110,000 GP contacts with lipid disorder.

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 ($p=0.11$). This indicates that the increased management of lipid disorders is due to the need for ongoing long term management of patients with lipid disorders, rather than an increase in the diagnosis rate of lipid disorders.

The first 4 years of the study saw an increase in the management rate of diabetes from 2.6 per 100 encounters in 1998–99 to 3.1 per 100 encounters in 2001–02. This increase was sustained in 2002–03 with 2.9 diabetes problems per 100 encounters ($p=0.0002$), indicating that there has been a real increase in diabetes management rates since 1998–99. After adjustment for age and sex, there was a small average yearly increase of 0.08 problems per 100 encounters ($p=0.0025$), equivalent to an estimated increase of 80,000 diabetes contacts in general practice nationally.

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 20.6 problems per 100 encounters in 2002–03. This continued the decrease that had been observed between 1999–00 and 2001–02. Averaged

over the 5 years, it is estimated that after adjusting for age and sex, respiratory problem contacts have decreased at a rate of 910,000 encounters per year ($p<0.0001$).

The decrease over time in the management rate of respiratory problems was largely explained by a decrease in the rates for asthma ($p<0.0001$) and acute bronchitis ($p<0.0009$).

The management rate for asthma decreased from 3.2 problems per 100 encounters in 1998–99 to 2.7 problems per 100 encounters in 2002–03 ($p<0.0001$). This is an average annual reduction of 0.11 asthma problems per 100 encounters, equivalent to a decrease of 110,000 asthma encounters nationally per year. However the majority of the decrease in asthma management occurred between 1999–00 (3.2 per 100 encounters) and 2000–01 (2.8 per 100 encounters), with rates levelling off in the last two years.

The acute bronchitis rate decreased from 3.3 per 100 encounters in 1998–99 to 2.6 per 100 encounters in 2002–03 ($p<0.0001$).

The rate of management of problems related to the blood and blood-forming organs decreased significantly, from 1.69 in 1998–99 to 1.37 problems per 100 encounters in 2002–03 ($p<0.0001$). After adjusting for age and sex there was an estimated national annual decrease of 110,000 encounters in the management of blood related problems.

Management of ear problems decreased from 4.9 problems per 100 encounters in 1998–99 to 4.0 problems per 100 encounters in 2002–03 ($p<0.0001$). After adjusting for age and sex, it was estimated that the management of ear problems has been decreasing at an annual rate of 169,000 encounters nationally ($p<0.0001$).

There was a marginal decrease in the rates of eye problems ($p=0.006$), however the size of the trend was small and equivocal.

13.3 Changes in medication rates between 1998–99 and 2002–03

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 13.8 per 100 encounters in 2002–03 ($p<0.0001$). This translates to an estimated rate of decrease of 870,000 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 3.0 per 100 encounters in 2002–03 ($p<0.0001$), accounting for 37% of the decrease in antibiotic prescribing. The prescribing rates for penicillins and broad-spectrum penicillins remained steady over time (see Appendix 4, Table A4.9).

Respiratory medications decreased from 6.9 prescriptions per 100 encounters in 1998–99 to 5.3 prescriptions per 100 encounters in 2002–03 ($p<0.0001$). Prescriptions for bronchodilators significantly decreased, from 3.7 per 100 encounters in 1998–99 to 2.5 per 100 encounters in 2002–03 ($p<0.0001$). The prescription rate for asthma preventives remained steady over the five 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 2002–03, from 4.7 per 100 encounters to 3.9 per 100 encounters for simple analgesics ($p<0.0001$) and from 3.3 per 100 encounters to 2.4 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 medications acting on the musculoskeletal system, from 5.7 per 100 encounters in 1998–99 to 6.1 per 100 encounters in 2001–02; however in 2002–03 the rates of *prescribed* medications for musculoskeletal returned to 5.7 per 100 encounters. This is possibly due to the substitution of OTC medications for prescribed medications, in particular ibuprofen. See Appendix, Table A4.12 for trends in OTC medications. See also Chapter 14 for total rates of NSAIDs, prescribed, supplied and advised.

Prescription rates of narcotic analgesics doubled from 1.1 per 100 encounters in 1998–99 to 2.2 per 100 encounters in 2002–03 ($p<0.0001$). This represents an average increase of 270,000 prescriptions per year.

13.4 Changes in non-pharmacological treatments between 1998–99 and 2002–03

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 800,000 encounters where the GP performed therapeutic procedures.

Clinical treatments

Clinical treatments increased from 31.4 per 100 encounters in 1998–99 to 38.1 per 100 encounters in 2001–02. In 2002–03 this increase plateaued at 37.2 clinical treatments per 100 encounters ($p<0.0001$).

Lifestyle counselling

Provision of 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 ($p<0.0001$). However, in 2002–03 the rate of lifestyle counselling fell to 7.4% of encounters, below the rate observed in the previous two years.

14 Selected topics—changes over time

This chapter uses multiple linear 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 selected 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.

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

- the use of non-steroid 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 (URTIs).

14.1 Method

Trends over time were analysed by linear regression. SAS V8.2 regression procedures were used that calculate robust standard errors to correct for the design effect of the cluster sample.[8] Test statistics and p-values based on the robust standard error are more conservative than those that are calculated without taking into account the design effect of the cluster sample. Thus the robust standard error provides a more stringent test of significant changes over time.

Medications included in trends analysis

All medications prescribed, recommended for over-the-counter (OTC) purchase or supplied by the GP were included in the trends analyses in the following section (referred to as 'medication rates' in this section). In contrast, Chapter 9 reports medication rates separately for each of prescribed medications, advised OTC and supplied by the GP, and Chapter 13 reports the trends in prescribed only medications. For some medications, therefore, there are differences in the trends over time between the global medication rates reported here and the prescribing rates in Chapters 9 and 13.

Multiple linear regression of medication rates adjusting for problems

For special topics of interest, multiple linear regression was used to assess changes in selected medication rates over time, after adjusting for the main problems of interest related to that medication.

By adjusting for the problem 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. Has there been a decrease over the five years in the overall medication rate of antibiotics for URTI?); 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 five years of the study, and that the observed change 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, including prescribed, advised and supplied (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 changes in NSAID rates over time was more pronounced for the management of arthritis problems relative to other musculoskeletal problems.

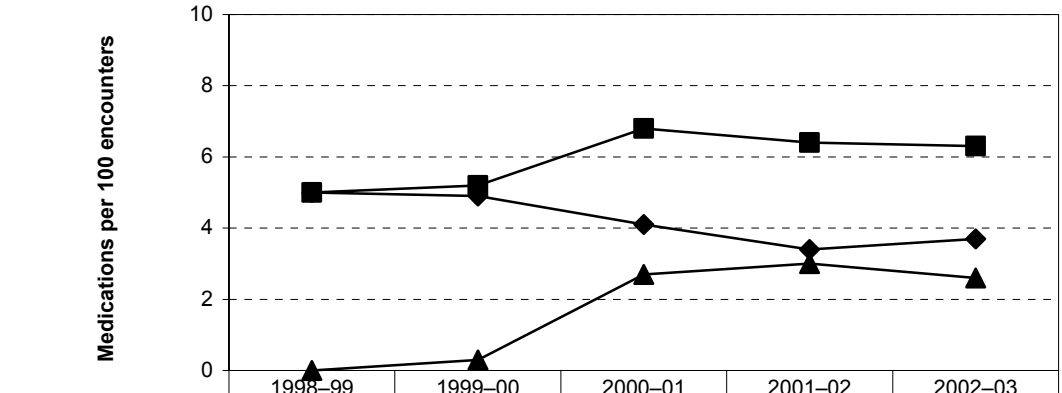
14.2 Non-steroid anti-inflammatory drugs and the management of arthritis and other musculoskeletal problems

Changes over time

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 arthritis problems (rheumatoid arthritis, osteoarthritis and unspecified arthritis) versus all other musculoskeletal problems. These broad problem categories were derived from the recommended indications for the use of Cox-2 inhibitors[31] and the problems for which NSAIDs were most often prescribed. The medication rate of NSAIDs for arthritis problems was compared with the medication rate for other musculoskeletal problems. Multiple regression was used to examine trends over time in the medication rate of NSAID for arthritis, other musculoskeletal problems and all other problems.

Figure 14.1 shows the medication rate of NSAIDs per 100 encounters unadjusted for problem type. There was an increase in NSAIDs observed between 1999-00 and 2000–01, which levelled off in 2001–02 and 2002–03. Specifically, the rate of Cox-2 inhibitors prescribed/supplied increased significantly in the period 1999–00 to 2001–02 with no further increase in 2002–03. The rate of the other NSAIDs declined from 1999–00 to 2001–02 with rates levelling off in 2002–03.



	1998–99	1999–00	2000–01	2001–02	2002–03
Cox-2 inhibitors	0.0	0.3	2.7	3.0	2.6
Other NSAIDs	5.0	4.9	4.1	3.4	3.7
Total NSAIDs	5.0	5.2	6.8	6.4	6.3

Figure 14.1: Rates of NSAIDs per 100 encounters over time

Figure 14.1 includes all NSAID medications prescribed, supplied or advised by the GP at the encounter. Table A4.9 in Appendix 4 indicates that when only prescribed medications were included there was a decrease in prescribed NSAIDs in 2002–03 relative to the previous two years. However, although non-Cox-2 inhibitors declined overall, there was an increase in the OTC rate of ibuprofen (Table A4.12 Appendix 4). The increase in NSAID OTC rates may account for the observed decline in NSAID *prescribing* over the last year, while the overall NSAID *medication* rate remained constant.

The rate of all NSAIDs prescribed, advised or supplied specifically for arthritis problems increased from around 38 medications per 100 arthritis problems in 1999–00 to 54 per 100 arthritis problems in 2000–01, with rates of medications prescribed, advised or supplied dropping slightly in 2002–03 to 50 medications per 100 arthritis problems (Figure 14.2). The increase was due to an increase in the rate of Cox–2 inhibitors from 4 per 100 arthritis problems in 1999–00 to 34 per 100 arthritis problems in 2001–02, with a slight decrease to 31 per 100 problems in 2002–03. At the same time, the rate of other NSAIDs prescribed, advised or supplied decreased from 35 per 100 arthritis 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 arthritis problems. The decrease in other NSAIDs indicates that there has been considerable substitution of Cox-2 inhibitors for other NSAIDs. However, the 2002–03 figures indicate that the medication rates for arthritis, including Cox-2 inhibitors have now stabilised at a new level.

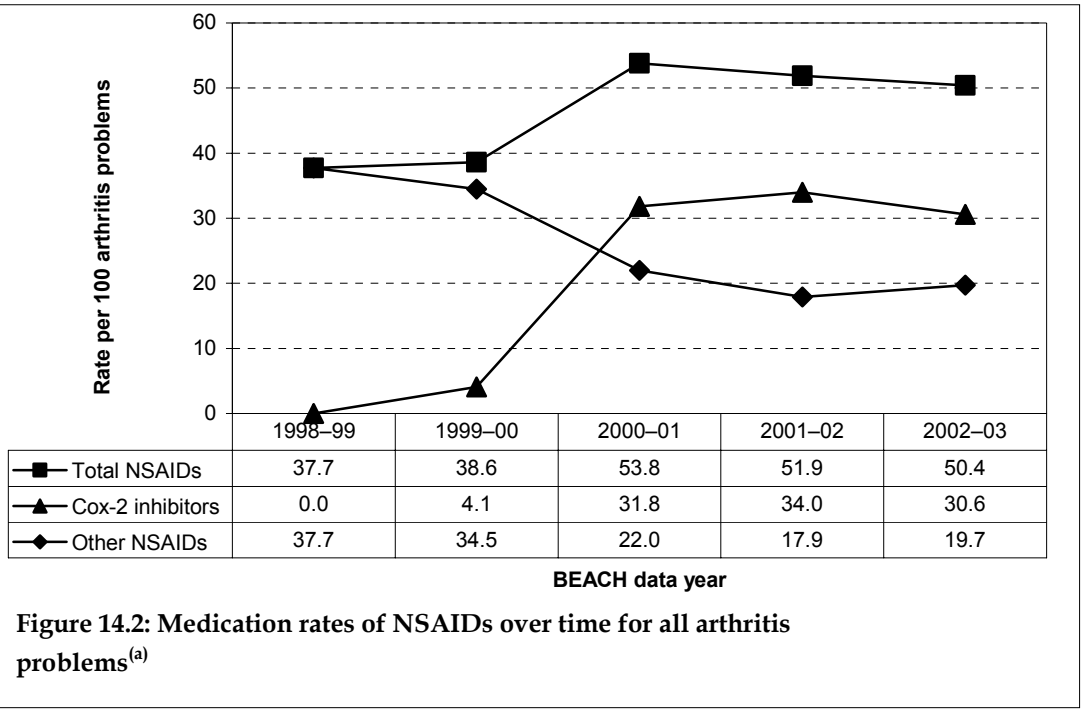


Figure 14.2: Medication rates of NSAIDs over time for all arthritis problems[(a)]

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

The medication 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 or 2002–03 (Figure 14.3). The medication rate of Cox-2 inhibitors for other musculoskeletal problems continued to increase in 2001–02, while the rate of all other NSAIDs decreased. These rates appeared to have stabilised over the most recent data period.

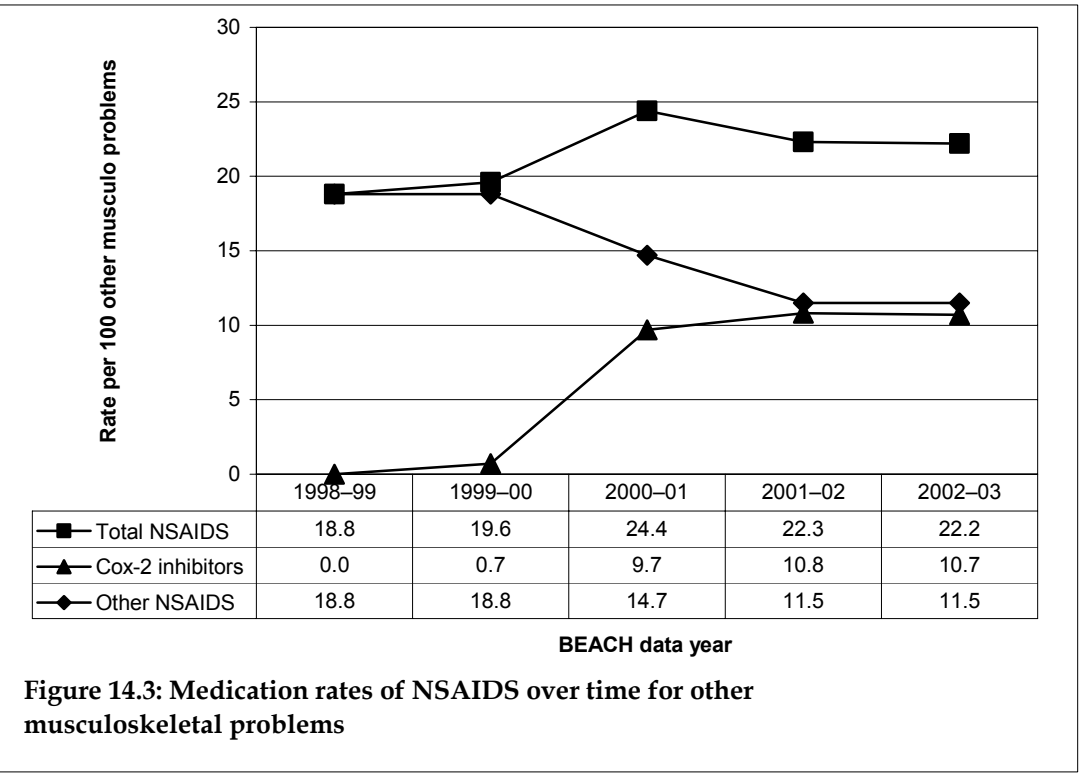


Figure 14.3: Medication rates of NSAIDS over time for other musculoskeletal problems

Multiple regression

All NSAIDs

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

Cox-2 inhibitors

Multiple regression, with the medication rate of Cox-2 inhibitors as the outcome, found a significant time by problem interaction for the medication rate of Cox-2 inhibitors ($p<0.0001$). This interaction indicates that the rate of prescribing of Cox-2 inhibitors from 1999–00 to 2002–03 was more pronounced for arthritis 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 ($p<0.0001$). This interaction indicates that, from 1999–00 to 2002–03, the decrease in the medication rate of other NSAIDs, was more pronounced for arthritis problems relative to other musculoskeletal problems.

Conclusion

From 1999–00 to 2000–01, there was a marked increase in the medication rate for total NSAIDs for both arthritis problems and other musculoskeletal problems, an increase which was entirely explained by an increase in the medication rate of Cox-2 inhibitors. There is evidence that, over the period, Cox-2 inhibitors were substituted for other NSAIDs for both arthritis problems and other musculoskeletal problems. In 2002–03 around 30% of arthritis problems and around 10% of other muskuloskelatal problems resulted in a Cox-2 inhibitor being supplied or prescribed at the encounter. However, the increase in the prescribing rate of total NSAIDs, the uptake of Cox-2 inhibitors and the discarding of other NSAIDs was significantly more pronounced for arthritis problems relative to other musculoskeletal problems. The pattern of medication rates of NSAIDs for both arthritis and other musculoskeletal problems appears to have settled in the last two years.

Current status of arthritis

Figure 14.4 is a flow chart summarising the management of arthritis in 2002–03.

Patients

The majority of patients at arthritis encounters were female, and more than 90% were aged 45 years and over.

Patient reasons for encounter: Though musculoskeletal problems were the most common reasons for encounter, a large proportion of patients requested prescriptions or tests results as a reason for encounter.

Other problems managed

There were 92.8 other problems managed per 100 arthritis encounters. Hypertension, lipid disorder, diabetes and depression were managed at arthritis encounters more frequently than average for all BEACH encounters. The older age of patients at arthritis encounters probably accounts for the higher rates of other chronic disorders managed at the encounter.

Management

Medication: Medication rates for arthritis were high at 94.7 medications per 100 problems (3,468/3,644). Taken together, the Cox-2 inhibitors were the most common medications prescribed or advised for arthritis, followed by paracetamol.

Non-pharmacological treatments: The number of non-pharmacological treatments for arthritis was relatively low; the most common were advice or education, followed by physical medicine/rehabilitation, and local injection/infiltration.

Tests and referrals: Pathology tests were ordered at a rate of 18.8 per 100 arthritis problems, imaging at 13.9 per 100 problems and referrals were made at a rate of 10.0 per 100 problems. The most common pathology tests were for chemistry and haematology. Nearly all imaging ordered for arthritis involved diagnostic radiology, and the most common referral was to an orthopaedic surgeon.

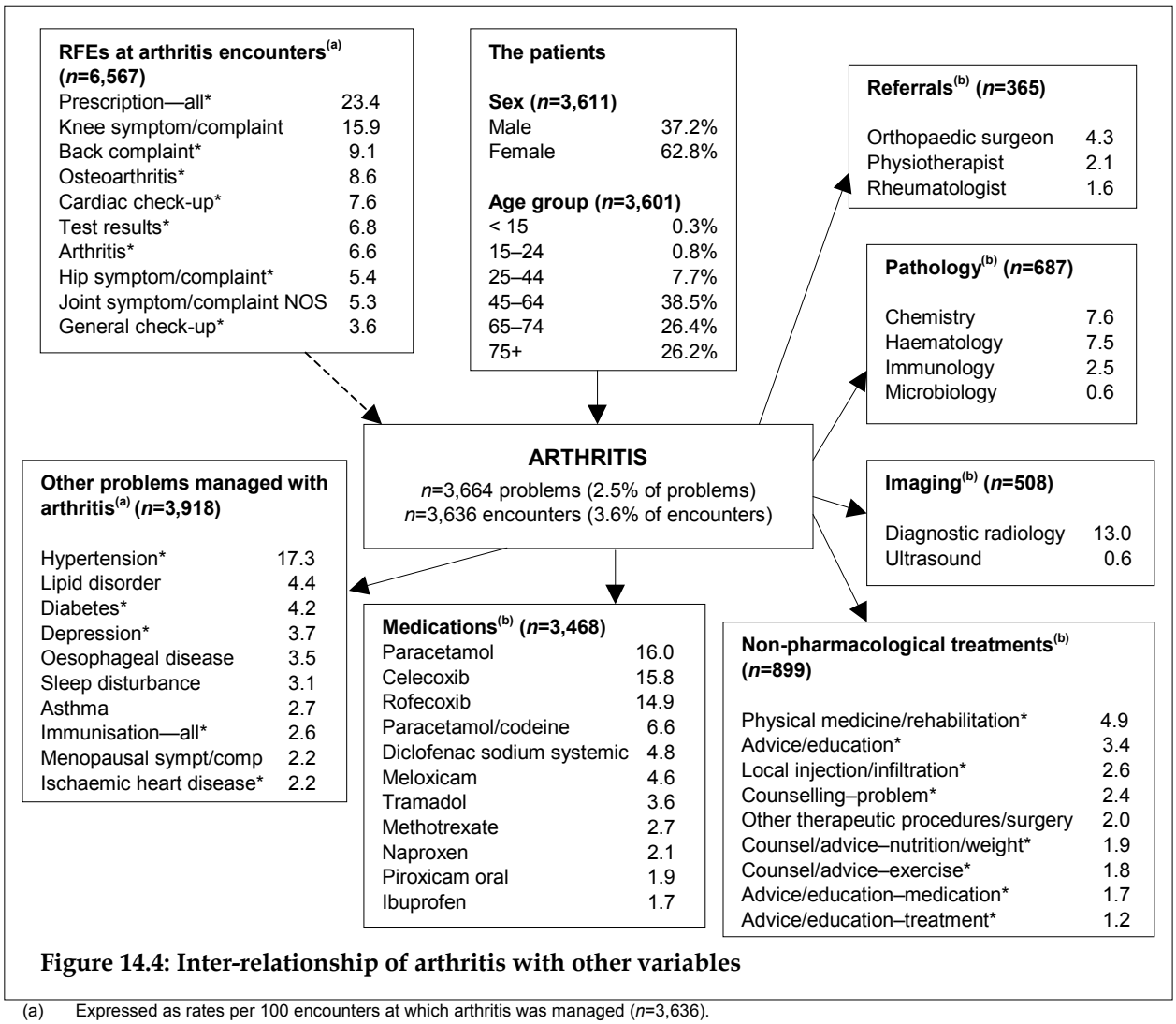


Figure 14.4: Inter-relationship of arthritis with other variables

(a) Expressed as rates per 100 encounters at which arthritis was managed (*n*=3,636).
(b) Expressed as rates per 100 problems at which arthritis was managed (*n*=3,664).
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 3).

14.3 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, including combinations (ATC codes J01CA, J01CR), cephalosporin (J01DA), and other antibiotics (the balance of J01). Acute upper respiratory tract infection (URTI) was selected on the ICPC-2 rubric R74.

There has been no change over time in the management rate of URTI (see Figure 14.5), which has been constant at around 6 to 7 problems per 100 encounters.

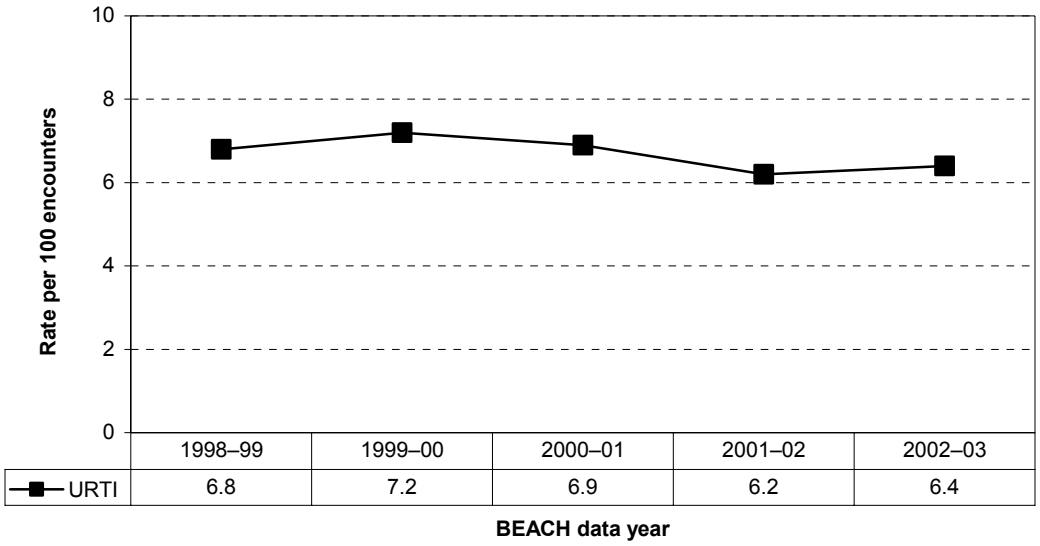
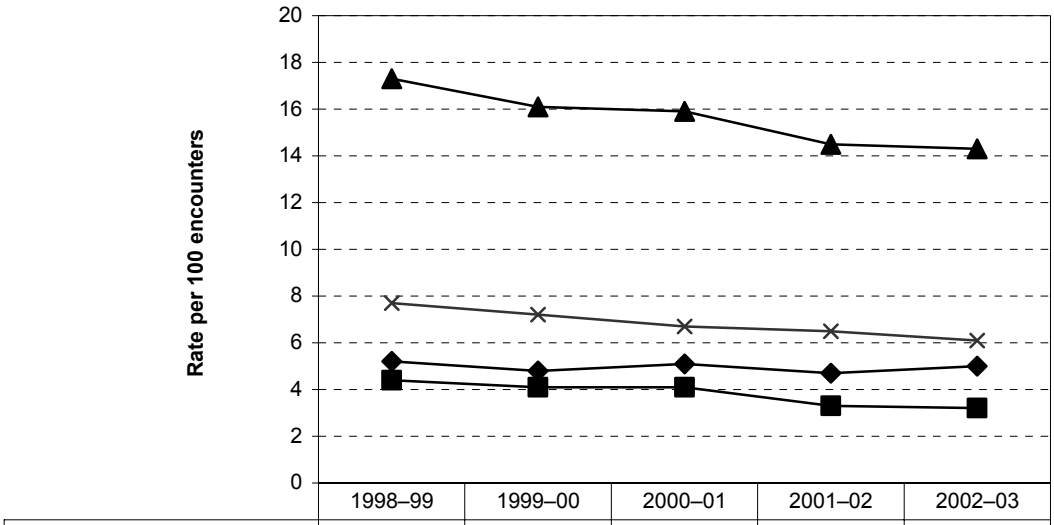


Figure 14.5: Management rate of acute upper respiratory tract infection over time

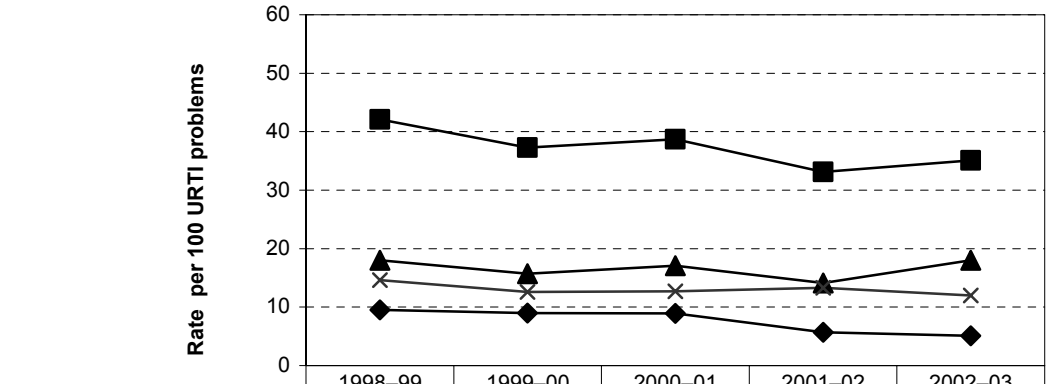
As described in Chapter 13, Section 13.3, there was a significant decrease in antibiotic medication rates per 100 encounters over time. A more detailed investigation of this decrease for particular classes of antibiotics, showed there was a significant decrease in medication rates of cephalosporins but no decrease in the medication rates of broad-spectrum penicillins (Figure 14.6).



	1998–99	1999–00	2000–01	2001–02	2002–03
antibiotics	17.3	16.1	15.9	14.5	14.3
broad-spectrum penicillin	5.2	4.8	5.1	4.7	5.0
cephalosporin	4.4	4.1	4.1	3.3	3.2
other antibiotics	7.7	7.2	6.7	6.5	6.1

BEACH data year

Figure 14.6: Rates of antibiotics per 100 encounters over time



	1998–99	1999–00	2000–01	2001–02	2002–03
antibiotics	42.1	37.3	38.7	33.1	35.1
broad spectrum penicillin	18.0	15.7	17.1	14.1	18.0
cephalosporin	9.5	9.0	8.9	5.7	5.1
other antibiotics	14.6	12.6	12.7	13.3	12.0

BEACH data year

Figure 14.7: Medication rates of antibiotics over time for all URTI problems

Multiple regression

As shown in Figure 14.7, after adjusting for URTI management, there has been a significant decrease over time in the overall rate of antibiotics prescribed or supplied for URTI ($p=0.0005$), which was reflected in a decrease in cephalosporins ($p<0.0001$). There was no change over the five year period in the rate of broad-spectrum penicillin prescribed or supplied for URTI.

The decrease seen in the medication rate for antibiotics, however, was not confined to URTI problems. URTI accounted for around 16% of antibiotics prescribed or supplied each year and accounted for 20% of the decrease in antibiotics over time.

Conclusion

There has been a general reduction in total antibiotics prescribed or supplied over the five year period, mainly explained by a decrease in antibiotics other than broad-spectrum penicillins, however, this decrease appears to have plateaued in 2002–03. There has been a decrease in antibiotic rates for URTI problems, except for broad spectrum penicillin which returned to the 1998–99 level in 2002–03. It appears that antibiotic medication rates have been reduced across a range of problems, including URTI.

Current status of acute upper respiratory infection (URTI)

Figure 14.8 is a flow chart summarising the management of upper respiratory tract infection in 2002–03.

Patients

More than half of patients at URTI encounters were female (54.5%), and just over half (52.4%) were less than 25 years old.

Reasons for encounter: The overwhelming reasons for encounter were cough, throat symptoms and acute upper respiratory symptoms, indicating that URTI symptoms were the specific reason for the encounter.

Other problems managed

The management rate of other problems was relatively low—35.6 other problems per 100 URTI encounters. After hypertension, asthma was the second most common other problem managed at URTI encounters. The low rate of other problems is explained by the younger age of patients. Because of the acute nature of URTI problems, the patient is likely to attend the encounter specifically and exclusively to deal with the URTI.

Management

Medications: There were 5,892 medications for URTI, a rate of 91.3 medications per 100 URTI problems. There were 23.5 paracetamol medications prescribed, supplied or advised per 100 URTI problems. Amoxicyllin and roxithromycin were the most common antibiotics prescribed for URTI.

Non-pharmacological treatments: The most common non-pharmacological treatments were advice and education.

Tests and referrals: There were very few other tests or referrals for URTI

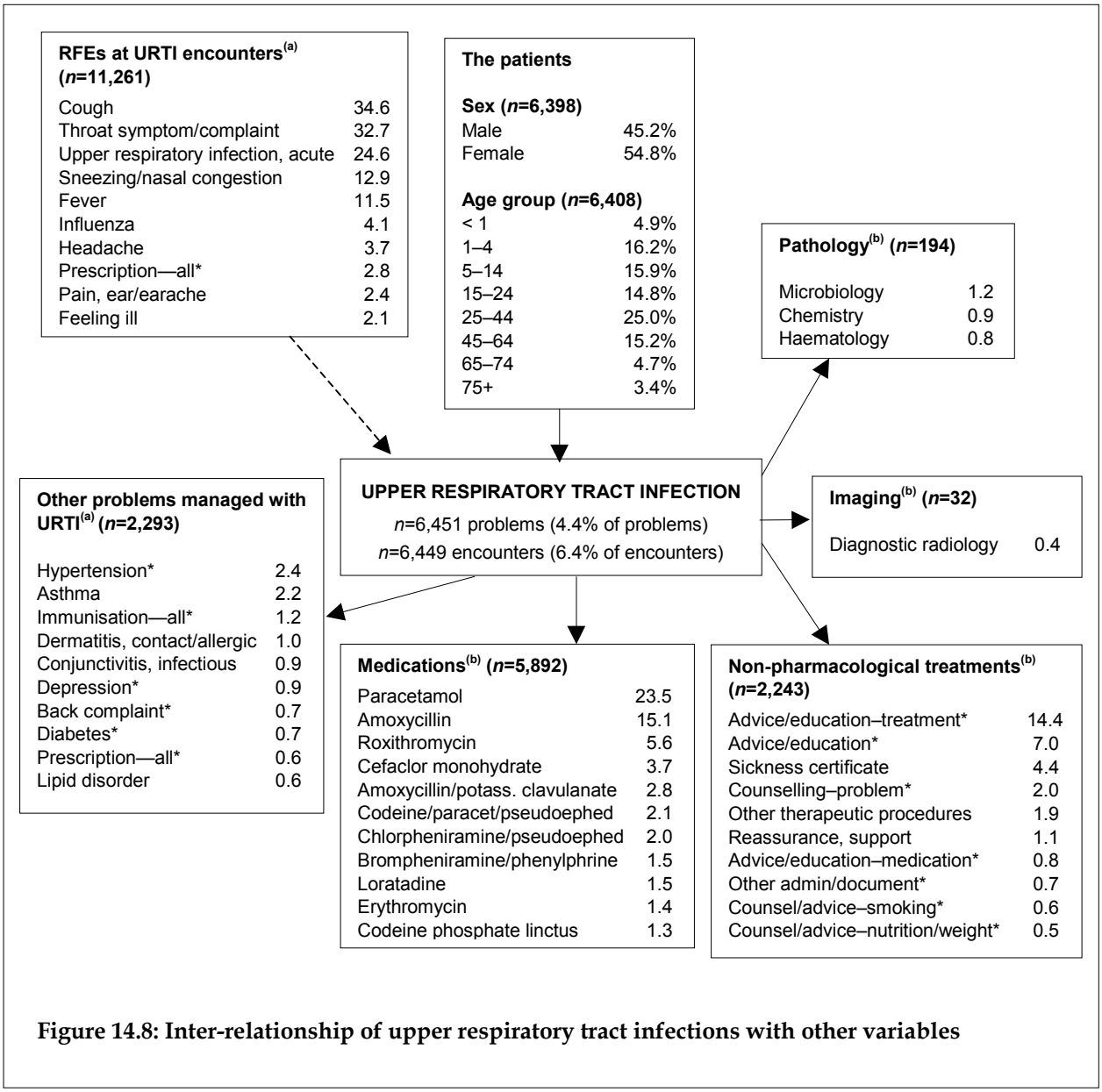


Figure 14.8: Inter-relationship of upper respiratory tract infections with other variables

(a) Expressed as rates per 100 encounters at which URTI was managed (*n*=6,451).

(b) Expressed as rates per 100 problems at which URTI was managed (*n*=6,449).

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

15 Patient risk factors

15.1 Background

General practice is commonly identified as a significant intervention point for healthcare and health promotion because general practitioners have considerable exposure to the health of the population. Approximately 85% of the population visited a GP in 2002 (personal communication, GP Branch, Australian Department of Health and Ageing DoHA). Therefore, general practice appears to provide a suitable basis from which to monitor many aspects of the health of the population.

Since April 1998 when BEACH began, a section on the bottom of each encounter form has been allocated to investigate aspects of patient health or healthcare delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data). Organisations supporting the BEACH program have access to a subsample of 6,000 encounter forms per year in which to insert a series of questions (or two sets of questions at 3,000 encounters each) on a subject of their choice.

15.2 Methods

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

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

The population risk factor questions for alcohol consumption, BMI and smoking status will remain constant in future years, and results are reported in each annual report. Abstracts of results for other topics covered in SAND are available on the Family Medicine Research Centre web site (http://www.fmrc.org.au/beach-pubs.htm#6).

15.3 Body mass index

Overweight and obesity have been estimated to account for more than 4% of the total burden of disease in Australia.[32] The 1999–2000 Australian diabetes, obesity and lifestyle study (AusDiab) estimated that 60% of Australians aged over 25 years were overweight or obese (BMI >25). Men were more likely to be overweight or obese than women (67% compared with 52%).[33]

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

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

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

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

The standard BMI calculation described above is not appropriate in the case of children. Cole et al. have developed a method which calculates the age–sex-specific BMI cut-off levels for overweight and obesity specific to children.[34] This method is based on international data from developed Western cultures and is therefore applicable within the Australian setting.

The BEACH data on BMI are presented separately for adults (aged 18 and over) and children. The standard BMI cut-offs have been applied for the adult population, and the method described by Cole et al. has been used for defining overweight and obesity in children (aged 2 to 17 years).[34] There are three categories defined for childhood BMI; underweight/normal, overweight and obese.

Body mass index of adults

BMI was calculated for 32,367 patients aged 18 years and over at encounters with 1,002 GPs. Overall, 54.7% of respondents were overweight or obese, 20.9% being defined as obese, and 33.8% were defined as overweight. A further 7.8% were underweight patients, and 37.6% were patients whose BMI was in the normal range (Table 15.1).

A significantly greater proportion of males were overweight or obese (61.4%; 95% CI: 60.3–62.5) than females (50.4%; 95% CI: 49.4–51.5). The proportion of patients considered overweight or obese was greatest for male patients aged 45–64 years (Figure 15.1). These results are consistent with those of the 1999–00 AusDiab study[33] and the results reported for BEACH 2000–01[6] and 2001–02.[24]

In the 18–24 year age group, 19.6% of women and 10.4% of men were considered underweight, as were 12.3% of women and 5.7% of men aged 75 years and over (Figure 15.2).

The BEACH results reported above are broadly consistent with the Australian Bureau of Statistics 2001 figures from the National Health Survey, of 58% overweight or obese.[35]

Table 15.1: Patient body mass index (aged 18+ years)

	Male[(a)]			Female[(a)]			Total respondents		
BMI class	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**
Obese	19.9	19.1	20.8	21.5	20.7	22.3	20.9	20.2	21.5
Overweight	41.5	40.5	42.4	29.0	28.2	29.7	33.8	33.2	34.5
Normal	34.6	33.5	35.6	39.5	38.5	40.4	37.6	36.8	38.3
Underweight	4.0	3.2	4.8	10.1	9.5	10.7	7.8	7.3	8.2
Total (*n*, %)	**12,450**	**100.0**	—	**19,670**	**100.0**	—	**32,367**	**100.0**	—

(a) Patient sex was unknown for 247 respondents.

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

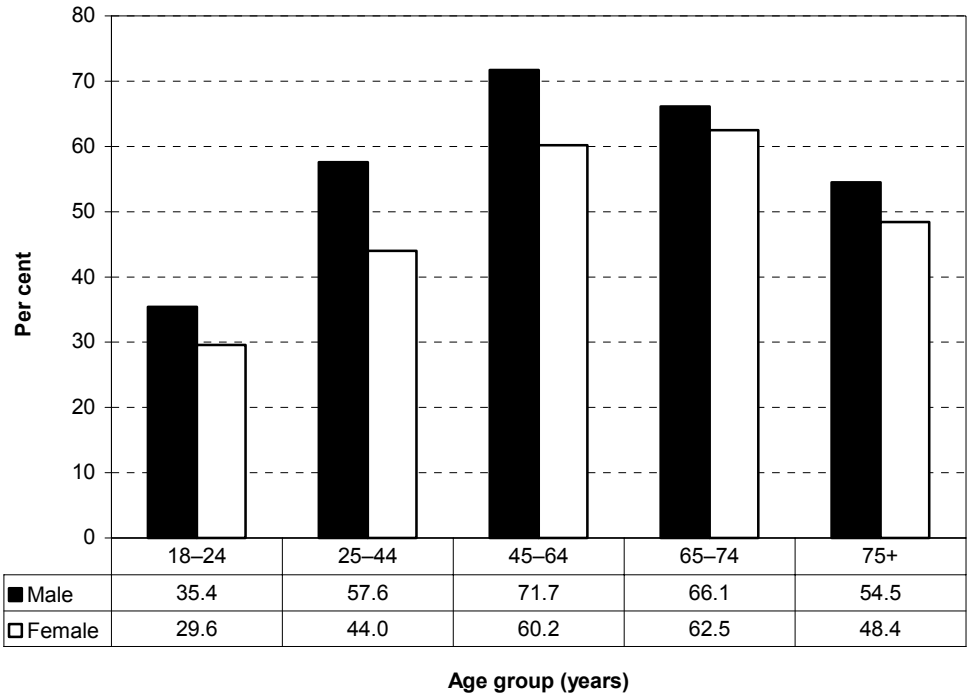


Figure 15.1: Age–sex-specific rates of overweight and obesity in adults

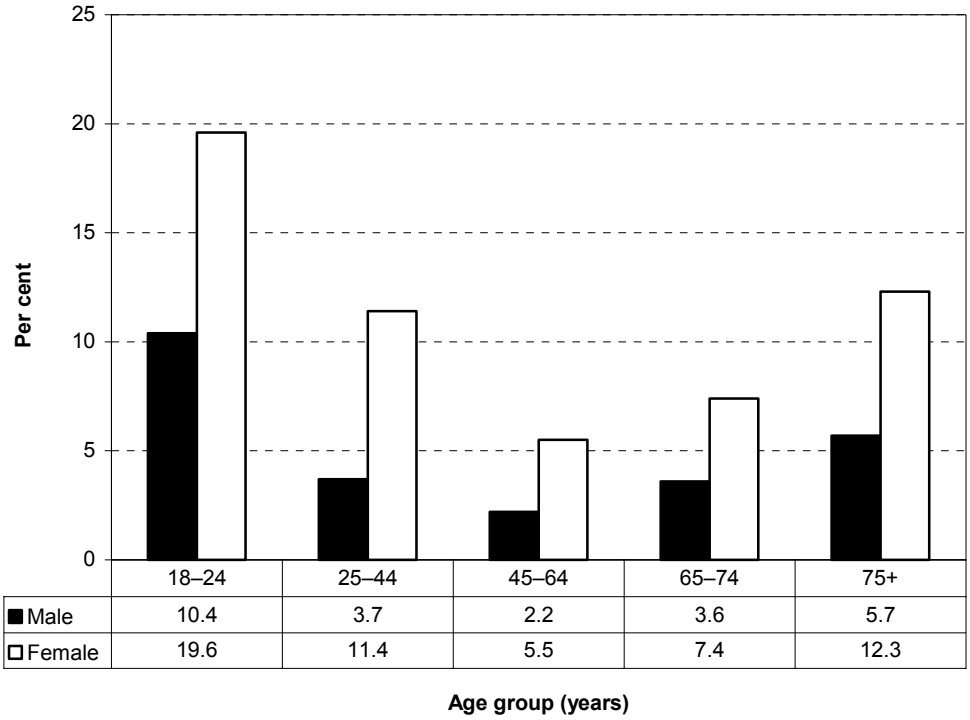


Figure 15.2: Age–sex-specific rates of underweight in adults

Body mass index of children

BMI was calculated for 3,579 patients aged between 2 and 17 years at encounters with 857 GPs. About one-third of all children aged 2 to 17 (32.1%; 95% CI: 30.1–34.2) were considered overweight or obese. Of these, 33.7% (95% CI: 30.4–37.0) were male and 31.1% (95% CI: 28.2–34.0) were female. Overall, 14.1% (95% CI: 11.4–16.8) of children were considered obese, and a further 18.1% (95% CI: 16.3–19.8) were defined as overweight (results not shown).

Being overweight or obese was most likely in the 9–12 age group (37.4%) and least likely in those aged 13–17 years (28.1%) (results not shown). Almost three-quarters of adolescent (13–17 years) females (73.3%; 95% CI: 70.6–75.9) were considered to be in the underweight/normal range, which was significantly higher than for females in this range in the 9–12 age group (65.7%; 95% CI: 61.1–70.2). A similar picture emerged for males. Male adolescents (13–17 years) were significantly more likely to be in the underweight/normal range than were males in the 9–12 age group (69.5% compared with 59.2%) (Figures 15.3 and 15.4).

It would have been interesting to compare underweight rates for pre-adolescent children (9–12 years) with those of adolescents (13–17 years). Unfortunately, we cannot identify children who are underweight from those in the normal weight range, as the method used defines cut-off levels for overweight and obesity only.[34]

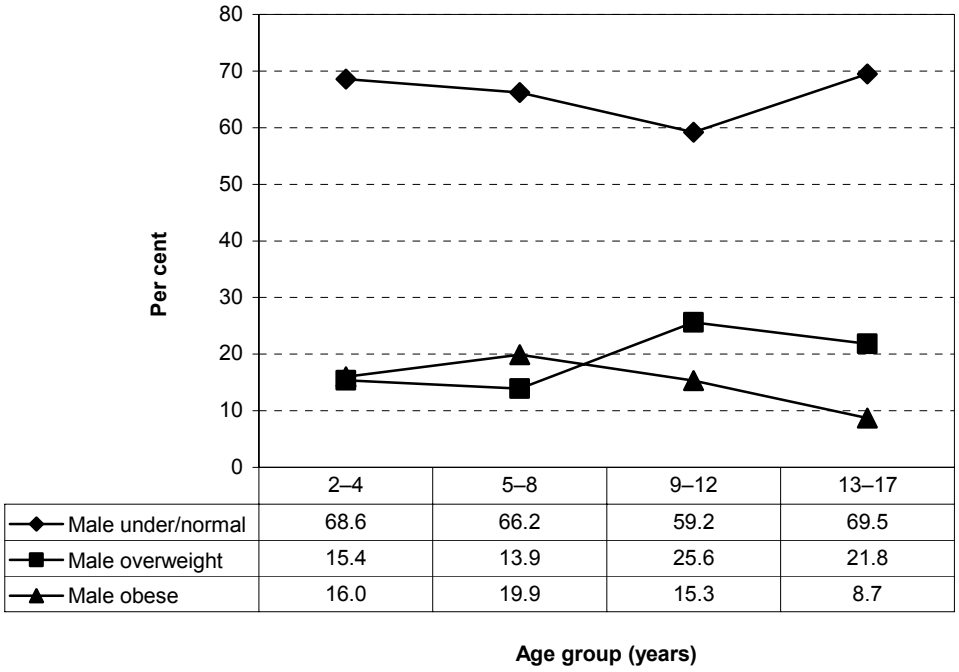


Figure 15.3: BMI in children—male age-specific rates

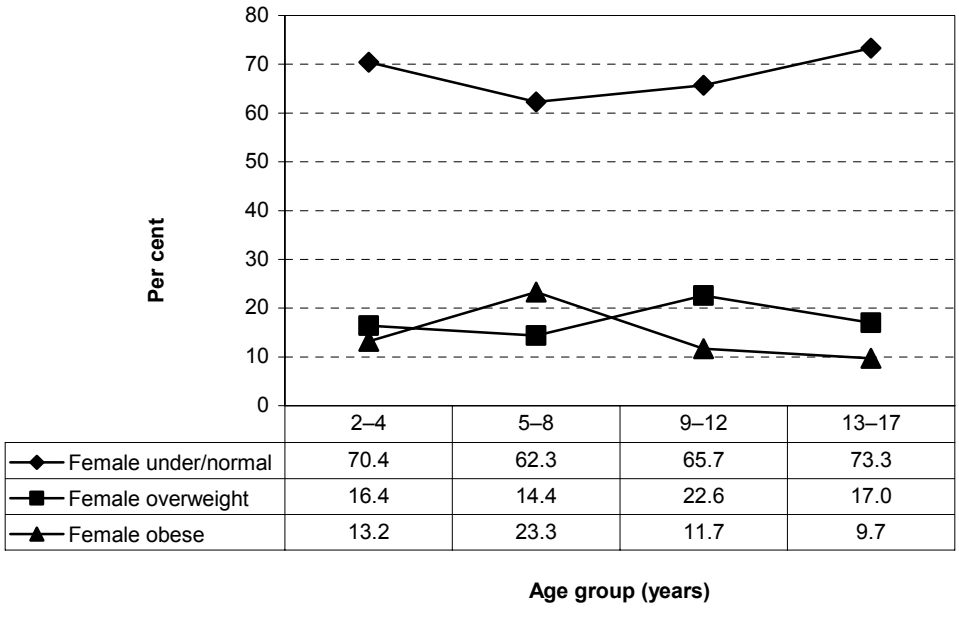


Figure 15.4: BMI in children—female age-specific rates

15.4 Smoking

Tobacco smoking is the leading cause of drug-related death and hospital separations in Australia.[36] It has been identified as the risk factor associated with the greatest disease burden, accounting for 9.7% of the total burden of disease in Australian.[32] According to the 2001 National Drug Strategy Household Survey, 19.5% of Australians aged 14 years and over smoked daily, 21.1% of males and 18.0% of females.[37]

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

The smoking status of 32,651 adult patients aged 18 years and over was established at encounters with 1,001 GPs. Overall, 17.2% of adult patients were daily smokers, 4.1% were occasional smokers, and 27.2% were previous smokers. Significantly more male patients than female patients reported being daily smokers (20.4% compared with 15.2%) (Table 15.2).

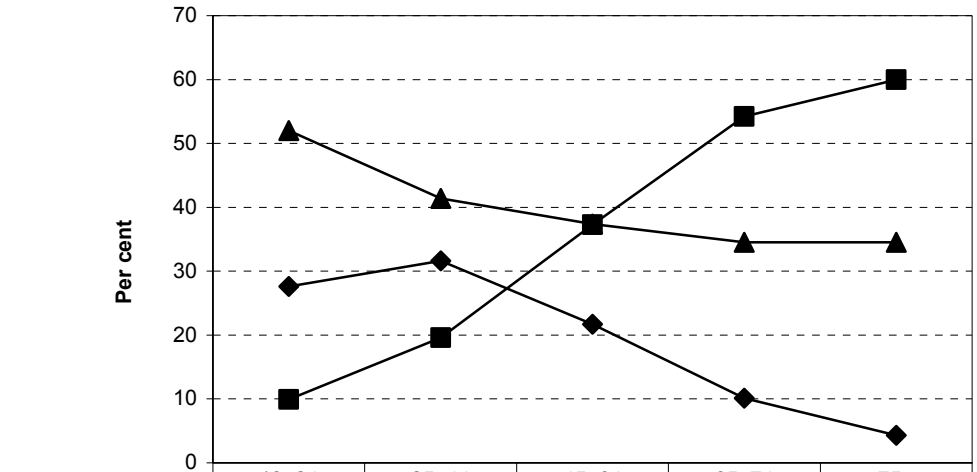
It is notable that the prevalence of daily smoking is highest among younger adult patients (aged 18–24), with 27.6% of young male and 23.7% of young female patients reporting daily smoking. The proportion of smokers decreased with age; only 4.3% of both male and female patients aged 75 years and over reported daily smoking (Figures 15.5 and 15.6). However, 60.0% of male and 24.3% of female patients aged 75 years and over stated they were previous smokers.

Table 15.2: Patient smoking status (aged 18+ years)

	Male[(a)]			Female[(a)]			Total respondents		
Smoking status	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**
Daily	20.4	19.4	21.4	15.2	14.4	15.9	17.2	16.5	17.9
Occasional	4.5	3.4	5.6	3.9	3.2	4.6	4.1	3.6	4.6
Previous	36.4	35.2	37.5	21.5	20.7	22.3	27.2	26.5	28.0
Never	38.7	37.5	40.0	59.4	58.3	60.5	51.4	50.4	52.4
Total (*n*, %)	**12,521**	**100.0**	—	**19,875**	**100.0**	—	**32,651**	**100.0**	—

(a) Patient sex was unknown for 255 respondents.

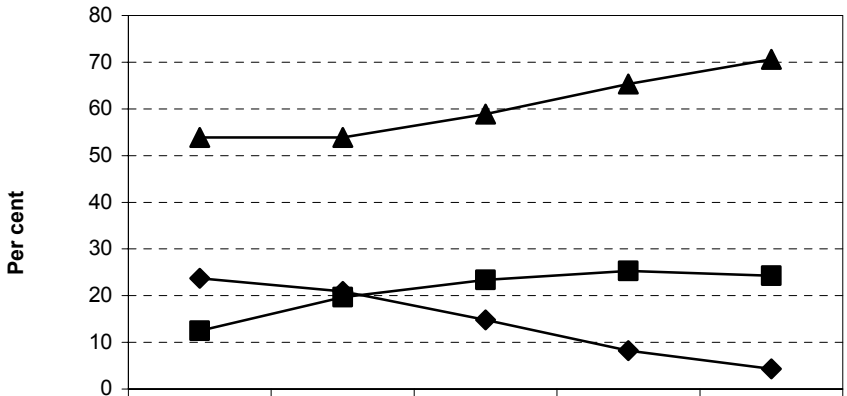
Note: LCL—lower confidence limit; UCL—upper confidence limit.



	18–24	25–44	45–64	65–74	75+
Male daily	27.6	31.6	21.7	10.1	4.3
Male previous	9.9	19.6	37.3	54.2	60.0
Male never	52.0	41.4	37.4	34.5	34.5

Age group (years)

Figure 15.5: Smoking status—male age-specific rates



	18–24	25–44	45–64	65–74	75+
Female daily	23.7	20.9	14.8	8.2	4.3
Female previous	12.5	19.7	23.4	25.3	24.3
Female never	53.9	53.9	58.9	65.3	70.6

Age group (years)

Figure 15.6: Smoking status—female age-specific rates

15.5 Alcohol consumption

In people aged 65 years and over, low to moderate consumption of alcohol has been found to have a preventative effect against selected causes of morbidity and mortality (e.g. cardiovascular disease).[36] The beneficial impact of low alcohol consumption has been found to prevent more mortality than harmful alcohol consumption causes.[36] Alcohol consumption accounted for 4.9% of the total burden of disease in Australia; however, after taking into account the benefit derived from low to moderate alcohol consumption, this fell to 2.2%.[32]

The 2001 National Drug Strategy Household Survey (NDSHS) found that 9.9% of people aged 14 years and over (10.2% of males and 9.4% of females) drank at levels considered to be risky or high risk for their health in the long term.[37] This risk level of alcohol consumption was based on the National Health and Medical Research Council 2001 Guidelines.[38] The NDSHS also found that 34.4% of people aged 14 years and above (39.3% of males and 29.6% of females) drank alcohol at levels which put their health at risk in the short term during the preceding 12 months.[37]

To measure alcohol consumption, BEACH uses three items from the WHO Alcohol Use Disorders Identification Test (AUDIT),[39] with scoring for an Australian setting.[40] Together, these three questions assess 'at-risk' alcohol consumption. The scores for each question range from zero to four. A total (sum of all three questions) score of five or more for males or four or more for females suggests that the person's drinking level is placing him or her at risk.[40]

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.

The wording of the responses to the first and third questions were changed from 2001–02 onwards to reflect exactly the AUDIT instrument from which they are derived. This update, along with a data entry change enabling more specific entry for the second question slightly increased the rates of 'at-risk' drinking reported for the fourth and fifth years (2001–02 and 2002–03) compared with the first three years of the program. The data collected in 2001–02 and 2002–03 are a more accurate reflection of the alcohol consumption in general practice patients.

Responses to these questions were recorded at 32,140 patient encounters (18+ years) from 1,001 GPs. Overall, 26.2% of patients reported drinking alcohol at risk levels. The proportion of 'at-risk' drinkers was higher for male patients than for female patients (32.9% compared with 22.1%) (Table 15.3).

The highest proportion of 'at-risk' drinkers was in the 18–24 age group where almost half of the males (44.4%) and more than a third of females (35.7%) reported 'at-risk' alcohol consumption. The proportion of patients who were 'at-risk' drinkers decreased with age for both males and females (Figure 15.7).

These estimates are a little lower than those made from the NDSHS.[37] This is likely to be due to the difference in the age ranges studied (14 + in NDSHS and 18+ in BEACH), and to differences in the age–sex distributions of the study populations. As older people attend the GP more frequently than young adults, they have a greater chance of being selected in the subsample and this leads to a greater proportion of older people, the group less likely to report drinking alcohol at 'at-risk' levels.

Table 15.3: Patient alcohol consumption (aged 18+ years)

	Male			Female			Total respondents		
Alcohol consumption	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**	**Per cent**	**95% LCL**	**95% UCL**
'At-risk' drinker	32.9	31.6	34.1	22.1	21.2	23.0	26.2	25.4	27.1
Responsible drinker	46.7	45.5	47.8	42.7	41.7	43.8	44.2	43.4	45.1
Non-drinker	20.5	19.5	21.6	35.2	33.9	36.5	29.5	28.5	30.6
Total (*n*, %)	**12,521**	**100.0**	—	**19,875**	**100.0**	—	**32,140**	**100.0**	—

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

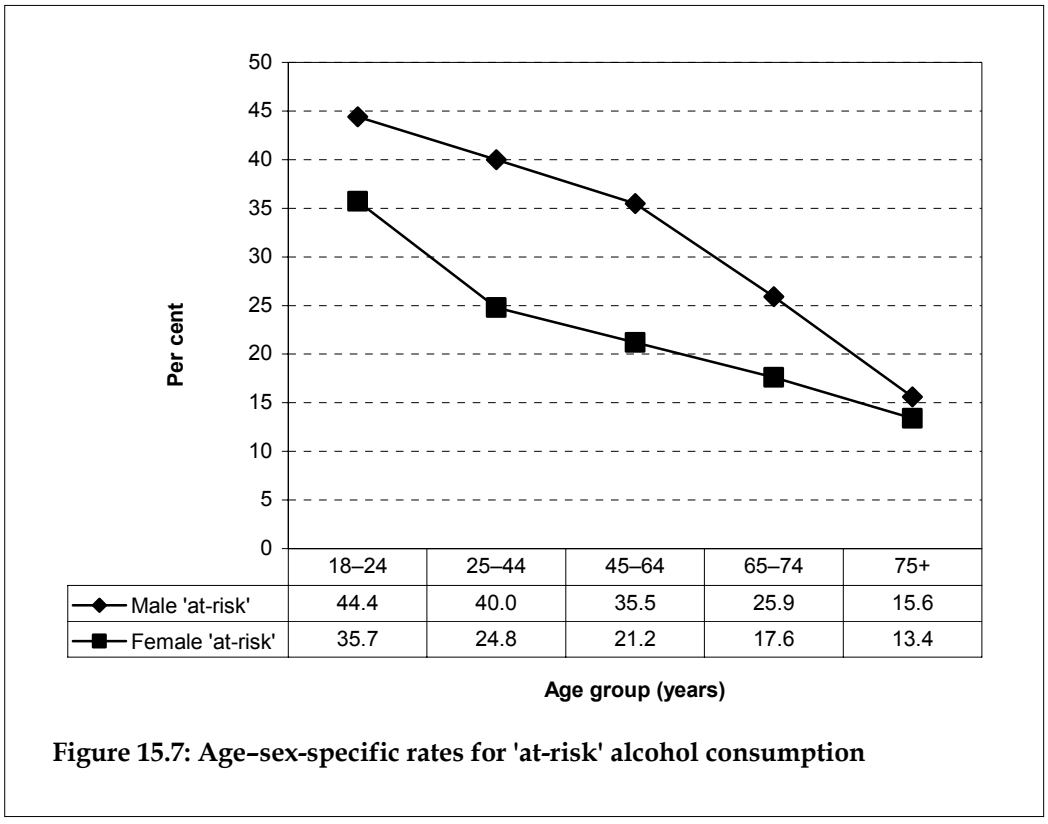


Figure 15.7: Age–sex-specific rates for 'at-risk' alcohol consumption

15.6 Risk factor profile of adult patients

From 2001–02 onwards, all patient risk factor questions (BMI, smoking and alcohol consumption) were asked of the same subsample of patients, making it possible to build up a risk profile of this sample of adult patients. For the purposes of this analysis, being overweight or obese, a daily smoker or an 'at-risk' drinker are considered to be risk factors.

A risk factor profile was prepared for 31,152 adult patients (aged 18 or more). Of the three measured risk factors, almost half of adult patients (48.2%) had one risk factor. Being overweight or obese accounted for almost three-quarters of these single risk factor patients (73.5%). One in five patients (19.6%) had two risk factors. The three most common combinations when a patient had two risk factors all involved drinking at risk levels. 'At-risk' alcohol consumption in combination with being overweight was most common (34.5%) followed by obesity (19.9%) then daily smoking (19.8%). A small minority (3.6%) of patients reported having all three risk factors (Table 15.4).

Overall, female patients reported significantly lower levels of risk factors than males. Almost a third of females (32.6%) reported not having any of the measured risk factors, compared with 22.3% of males. Half of females (49.4%) had only one risk factor compared with 46.2% of males (Table 15.5)

Table 15.4: Risk factor profile of patients (aged 18+ years)

Number of risk factors	Number	Per cent of patients (*n*=31,152)	95% LCL	95% UCL
None	**8,912**	**28.6**	**27.7**	**29.5**
One	**14,999**	**48.2**	**47.5**	**48.8**
Overweight only	6,774	21.7	21.1	22.3
Obese only	4,254	13.7	13.1	14.2
Current daily smoker only	1,400	4.5	4.1	4.9
'At-risk' alcohol level only	2,571	8.3	7.7	8.8
Two	**6,109**	**19.6**	**19.0**	**20.2**
Overweight and current daily smoker	948	3.0	2.7	3.4
Obese and current daily smoker	627	2.0	1.6	2.4
Overweight and 'at-risk' alcohol level	2,105	6.8	6.4	7.1
Obese and 'at-risk' alcohol level	1,217	3.9	3.6	4.2
Daily smoker and 'at-risk' alcohol level	1,212	3.9	3.5	4.3
Three	**1,132**	**3.6**	**3.3**	**4.0**
Overweight and current daily smoker and 'at-risk' alcohol level	728	2.3	2.0	2.7
Obese and current daily smoker and 'at-risk' alcohol level	404	1.3	0.9	1.7

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

Table 15.5: Number of risk factors, by patient sex

Number of risk factors	Number	Per cent of patients	95% LCL	95% UCL
Male patients	**12,058**	**100.0**	—	—
Zero	2,693	22.3	21.3	23.3
One	5,570	46.2	45.2	47.1
Two	3,123	25.9	25.0	26.8
Three	672	5.6	4.9	6.3
Female patients	**19,094**	**100.0**	—	—
Zero	6,219	32.6	31.5	33.6
One	9,429	49.4	48.5	50.3
Two	2,986	15.6	15.0	16.3
Three	460	2.4	1.7	3.1
Total patients	**31,152**	—	—	—

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

15.7 Changes from 1998–99 to 2002–03

The proportion of adults classified as obese according to their self-reported height and weight showed a significant increase over the five years (18.4% in 1998–99 compared with 20.9% in 2002–03). However, the proportion classed as obese appears fairly constant in 2001–02 (21.4%) and 2002–03 (20.9%). Rates of overweight were fairly stable over the five years. In 1998–99, 51.2% of patients were overweight or obese, compared with 54.7% in 2002–03 (Table 15.6). The increase in obese patients over the period corresponds with a significant decrease in patients of normal weight from 40.3% in 1998–98 to 37.6% in 2002–03.

The proportion of adults attending general practice who reported being daily smokers in 2002–03 (17.2%) was significantly lower than the first three years of BEACH, 1998–99, 1999–00 and 2000–01 (19.2%, 18.9% and 19.3% respectively).

The proportion of adult patients consuming 'at-risk' levels of alcohol was similar for the first three years of BEACH, and then slightly greater but consistent in 2001–02 and 2002–03, due to a slight change in the scoring method.

Table 15.6: Comparative results for patient risk factors, 1998–99 to 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03
Risk factor	**Per cent (95% CI)**	**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)	20.9 (20.2–21.5)
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	33.8 (33.2–34.5)
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)	17.2 (16.5–17.9)
'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)	26.2 (25.4–27.1)

Note: CI—confidence interval.

16 Encounters with Indigenous Australians

The gap in life expectancy between Indigenous and non-Indigenous Australians has been estimated to be 19–21 years.[41] Ring and Brown suggest that although there has been a substantial narrowing of such differences in other countries, in Australia the gap in median age death appears to have widened. They suggest that health professionals can play a major role in improving the health of the Indigenous population by providing high quality primary healthcare services for prevention and early treatment.[42]

Indigenous Australians represent 2.4% of the total population in Australia.[43] They are more likely to live outside urban areas than are non-Indigenous people, and this may affect their access to, and use of, general practice services. There are a number of Aboriginal Community Controlled Health Services (ACCHS) available in many parts of the country, including remote areas[44] and these may sometimes substitute for general practice services, or GPs may provide services in them, and in turn these may or may not be represented in BEACH.

Better knowledge of the extent to which Indigenous Australians utilise general practice and the problems they have managed in this setting will assist in developing an improved understanding of the health of the Indigenous community and in planning future health services for this population.

Each GP was instructed to ask the patient whether he or she identified as an Aboriginal person and/or as a Torres Strait Islander. Note that this chapter reports results based on unweighted encounters with Indigenous Australians during 2002–03, and the combined five year data for both Indigenous and total encounters (see Chapter 2, 'Methods'). Though the annual data are presented in the Tables for interested readers, the text refers to the more reliable data drawn from the total first five years of the BEACH program.

16.1 Number of encounters

In the most recent BEACH year (April 2002–March 2003) there were 1,375 encounters (1.4%) at which the patient responded positively to one or both questions. The vast majority of these (84.7%) stated they were Aboriginal persons, and 10.2% stated they were Torres Strait Islanders; 5.1% said they were both. The 1,375 encounters were distributed among 317 GPs, representing 31.4% of the GP participants.

There has been some variation over the five years of BEACH in the proportion of encounters at which the patient identified as an Aboriginal person or a Torres Strait Islander. This has ranged from 0.7% to 1.4% and has depended to some degree on the format of the question. Estimates have been lower in years when only a single 'yes' tick box was offered for each option than where both a 'yes' and a 'no' tick box were offered. It is notable however, that even with this variation in identification rates, and the high likelihood that these are an underestimate of the true proportion, the data pertaining to age, sex, morbidity and management at these subsamples of encounters have been remarkably consistent over each of the five years of the study. A more reliable estimate of the characteristics of encounters with Indigenous Australians can therefore be gained by combining data for the full five year period.

Over the first five years of the BEACH program, there were 502,100 records of encounters completed by 5,021 GPs. The GPs indicated the patient was an Aboriginal person and/or a Torres Strait Islander at 5,476 of these encounters. These represented 1.1% of total encounters.

The encounters with Indigenous Australians were recorded by 1,354 GPs, with an average of 4.0 contacts per GP. This means that about one in four GPs (27%) recorded at least one such encounter during their BEACH recording period. A simple extrapolation of these results to all GP–patient encounters across Australia in any one year would suggest, on average approximately 1.1 million Indigenous consultations annually with about 5,000 GPs.

Distribution of Indigenous encounters across GPs

It was thought that some of the GPs who recorded encounters with Indigenous Australians may have been working in an ACCHS, either part-time or full-time while participating in BEACH and therefore (correctly) recorded clinical activity claimed through Medicare but conducted in this clinical environment. If this was the case, the BEACH data could be counting some consultations that are also counted through the ACCHS. This possibility was investigated through a more detailed study of the distribution of Indigenous encounters across participating GPs.

The relative number of encounters with Indigenous Australians was calculated for each GP who recorded at least one such encounter. The distribution of these encounters across the 1,375 practitioners is shown in Figure 16.1. The range across these GPs was 1 to 96 encounters (where the maximum was 100 per GP) with Indigenous Australians, the mean being 4.0 consultations.

By far the majority (83.2%) of the 1,375 GPs recorded less than five of their 100 encounters as being with a patient who identified as an Indigenous person. This means that 95.5% of the 5,021 GPs participating over the five year period saw either no Indigenous Australians, or less than five during their recording period. A further 10.0% of the 1,375 GPs (2.7% of all participants) recorded between 5 and 9 encounters (accounting for 15.1% Indigenous encounters), and 4.1% recorded between 10 and 19 encounters with Indigenous Australians (accounting for 12.6% of the total). However, in total, encounters with these GPs accounted for only half (49.5%) of all encounters with Indigenous Australians. The remaining 37 GPs (2.7% of the subsample, 0.7% of all participants) who each recorded 20 or more encounters with Indigenous Australians, accounted for 37.9% of all encounters with Indigenous Australians. Of these 37 GPs, 20 recorded more than 60 such encounters. If we assume that these 37 GPs worked either full-time or part-time in an ACCHS during their BEACH recording period and that these consultations were undertaken in an ACCHS, their recorded encounters with Indigenous Australians should be removed before extrapolating from BEACH if private general practice is defined as excluding ACCHSs. After removal of encounters recorded by these 37 GPs, the estimated number of consultations with Indigenous Australians in the non-ACCHS private general practice environment was considerably reduced, to be approximately 700,000 per annum.

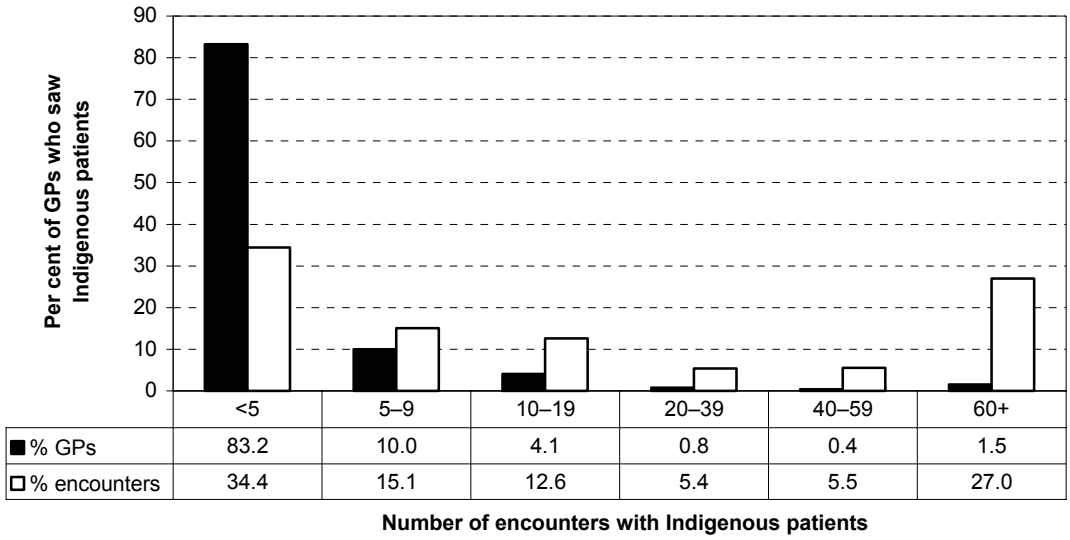


Figure 16.1: Distribution of Indigenous encounters by GP

16.2 The GPs

The characteristics of the 1,354 GPs who recorded at least one encounter with a patient identifying as an Indigenous Australian, between 1998 and 2003, are compared with those of the total GP sample for that period in Table 16.1. The age and sex distribution of these GPs parallelled that of the total GP sample. Only marginal differences were apparent in the number of sessions per week, the size of their practice and their place of graduation. However, only half of these GPs (52.3%) practised in capital cities compared with more than two-thirds (67.1%) of the total GP sample. They were more likely to be practising in other rural, remote or offshore locations (20.4%) when compared with the total sample (13.1%).

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

	2002–03			1998–99 to 2002–03		
	GPs who saw Indigenous people		Total GP sample	GPs who saw Indigenous people		Total GP sample
GP characteristic	Number	Per cent of GPs[(a)] (*n*=317)	Per cent of GPs[(a)] (*n*=1,008)	Number	Per cent of GPs[(a)(b)] (*n*=1,354)	Per cent of GPs[(a)(b)] (*n*=5,021)
Sex (missing)	(0)	—	(0)	(4)	—	(0)
Male	206	65.0	64.8	912	67.6	67.4
Female	111	35.0	35.2	438	32.4	32.6
Age (missing)	(0)	—	(0)	(4)	—	(18)
< 35 years	25	7.9	7.3	101	7.6	7.2
35–44 years	82	25.9	26.6	421	31.2	30.2
45–54 years	109	34.4	35.2	450	33.3	34.2
55+ years	101	31.9	30.9	378	28.0	28.4
Sessions per week (missing)	(3)	—	(8)	(13)	—	(58)
<6 per week	56	17.8	18.7	197	14.7	15.8
6–10 per week	219	69.5	67.9	934	69.6	67.7
11+ per week	40	12.7	13.4	210	15.7	16.5
Size of practice (missing)	(2)	—	(8)	(35)	—	(121)
Solo	46	14.6	13.7	234	17.7	16.9
2–4 GPs	138	43.8	38.4	536	40.6	39.2
5+ GPs	131	41.6	47.9	549	41.6	44.0
Place of graduation (missing)	(0)	—	(0)	(0)	—	(35)
Australia	226	71.3	72.0	972	72.2	74.3
United Kingdom	35	11.0	9.1	146	10.8	8.5
Asia	29	9.1	9.9	117	8.7	8.3
Other	27	8.5	8.9	119	8.8	8.8
Practice location	—	—	—	—	—	—
Capital	161	50.8	64.7	708	52.3	67.1
Other metropolitan	33	10.4	8.5	106	7.8	7.7
Large rural	26	8.2	5.1	131	9.7	6.1
Small rural	36	11.4	7.7	133	9.8	6.1
Other rural	47	14.8	12.0	222	16.4	11.6
Remote central	4	1.3	0.6	25	1.8	0.6
Other remote, offshore	10	3.2	1.4	29	2.1	0.9

(a) Missing data removed.

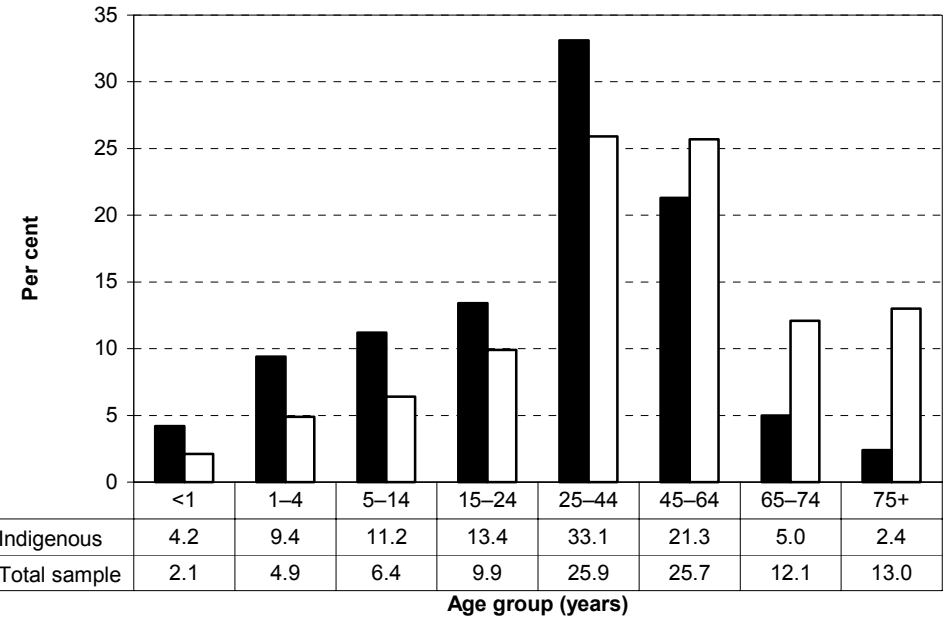
(b) Unweighted data.

16.3 Patient characteristics

Age and sex

The sex distribution of the 5,476 Aboriginal and Torres Strait Islander patients was identical to that of the total sample of patients at 502,000 encounters (40.9% male). However, the age distribution of the Indigenous Australians differed markedly from that of patients at all encounters (Figure 16.2 and Table 16.2).

Overall, Indigenous Australians were significantly younger than the total sample of patients encountered, the proportion of persons aged under 45 years being 71.3% compared with 49.3% in the total data set. This difference was apparent in all the younger age groups. In contrast, the proportion of encounters with older Indigenous Australians was lower than that of the total data set, 21.3% being between 45 and 64 years of age (compared with 25.7% of the total sample) and only 7.4% being 65 years or more (compared with 25.1% in the total sample).



	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
■ Indigenous	4.2	9.4	11.2	13.4	33.1	21.3	5.0	2.4
□ Total sample	2.1	4.9	6.4	9.9	25.9	25.7	12.1	13.0

Figure 16.2: Age distribution of Indigenous persons encounters and the total sample 1998–2003

Age-specific rates

The age-specific rates of encounters with Indigenous Australians are presented in Figure 16.3 and more clearly demonstrate these trends. Although more than 4% of total encounters with children aged under five years were with Indigenous Australians, this proportion steadily decreased with increasing age to less than 1% for the 45–64 age group, and less than 0.5% in older age groups.

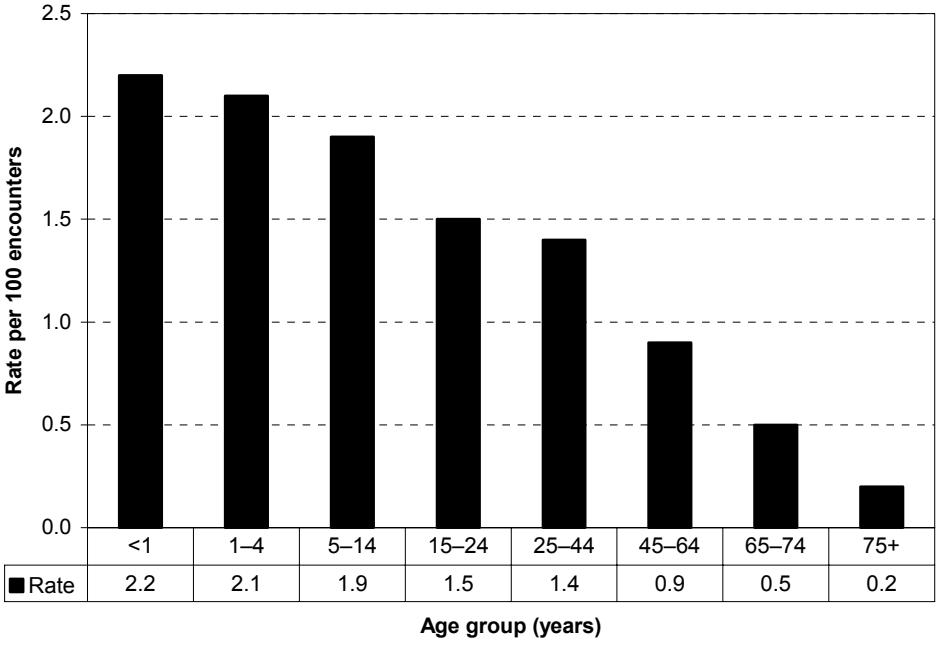


Figure 16.3: Age-specific rates of encounters with Indigenous people 1998–2003

Other patient characteristics

Table 16.2 describes the other characteristics of Indigenous Australians compared with the total sample. These patients were more likely to be new to the practice (11.6%) compared with the patients at all encounters (9.2%). They were significantly more likely than all sampled patients to hold a Commonwealth health care card (59.2% of Indigenous Australians compared with 39.3% of all patients). In contrast, they were significantly less likely to hold a Department of Veterans' Affairs card (1.4% of Indigenous Australians compared with 3.4% of the total sample). Those patients who reported being from a non-English-speaking background represented 6.6% of the Indigenous subsample which did not differ significantly from the total sample (8.8%).

Table 16.2: Comparison of characteristics of Indigenous Australians and patients at all encounters: 2002–03 and 1998–2003

	2002–03				1998–99 to 2002–03			
	Encounters with Indigenous people		Total encounters		Encounters with Indigenous people		Total encounters	
Patient variable	Number	Per cent of encs (*n*=1,375) 95% CI	Number	Per cent of encs (*n*=100,987) 95% CI	Number	Per cent of encs (*n*=5,476)[a] 95% CI	Number	Per cent of encs (*n*=502,100) 95% CI
Sex (Missing)	(20)	—	(911)	—	(69)	—	(5,652)	—
Males	525	38.8 (32.3–45.2)	42,189	42.2 (41.4–42.9)	2,209	40.9 (38.8–42.9)	202,881	40.9 (40.5–41.2)
Females	830	61.3 (54.8–67.7)	57,887	57.8 (57.0–58.6)	3,198	59.1 (57.1–61.2)	293,567	59.1 (58.8–59.5)
Age group (Missing)	(8)	—	895	—	47	—	4,354	—
< 1 year	46	3.4 (2.2–4.5)	1,944	1.9 (1.8–2.1)	230	4.2 (3.7–4.8)	10,560	2.1 (2.1–2.2)
1–4 years	113	8.3 (6.6–9.9)	5,030	5.0 (4.7–5.3)	509	9.4 (8.5–10.2)	24,232	4.9 (4.8–5.0)
5–14 years	129	9.4 (7.4–11.5)	6,632	6.6 (6.3–6.9)	607	11.2 (10.1–12.3)	32,049	6.4 (6.3–6.6)
15–24 years	174	12.7 (10.8–14.6)	10,068	10.1 (9.7–10.4)	728	13.4 (12.4–14.5)	49,237	9.9 (9.7–10.1)
25–44 years	470	34.4 (31.2–37.6)	25,685	25.7 (24.9–26.4)	1,799	33.1 (31.7–34.6)	129,060	25.9 (25.6–26.2)
45–64 years	331	24.2 (20.6–27.9)	26,497	26.5 (25.9–27.0)	1,155	21.3 (19.7–22.8)	127,705	25.7 (25.4–25.9)
65–74 years	72	5.3 (4.1–6.5)	11,566	11.6 (11.1–12.0)	273	5.0 (4.3–5.8)	60,316	12.1 (11.9–12.3)
75+ years	32	2.3 (1.4–3.3)	12,671	12.7 (11.9–13.4)	128	2.4 (1.9–2.8)	64,587	13.0 (12.7–13.3)
Other characteristics	—	—	—	—	—	—	—	—
New patient to practice	140	10.3 (7.9–12.7)	9,805	9.9 (9.0–10.8)	627	11.6 (10.2–13.1)	45,678	9.2 (8.9–9.5)
Commonwealth health care card	822	59.8 (49.8–69.7)	41,762	40.4 (38.8–41.9)	3,243	59.2 (54.6–63.8)	197,164	39.3 (38.7–39.9)
Veterans' Affairs card	26	1.9 (0.9–2.9)	3,316	3.3 (3.0–3.6)	78	1.4 (1.0–1.8)	17,205	3.4 (3.3–3.5)
Non-English-speaking background	183	13.3 (2.6–24.0)	10,706	10.6 (7.8–13.4)	356	6.6 (3.4–9.8)	42,975	8.8 (8.3–9.3)
Aboriginal only	1,165	84.7 (76.0–93.5)	837	0.8 (0.0–1.7)	4,833	88.34 (85.6–90.9)	4,833	1.0 (0.8–1.1)
Torres Strait Islander (TSI) only	140	10.2 (5.1–15.2)	145	0.1 (0.0–0.9)	494	9.0 (7.1–10.9)	494	0.1 (0.1–0.1)
Aboriginal person and TSI	70	5.1 (1.0–9.2)	50	0.1 (0.0–1.3)	149	2.7 (1.6–3.9	149	0.03 (0.0–0.0)

(a) Missing data removed in calculation of rates. *Note:* Encs—encounters; CI—confidence interval; TSI–Torres Strait Islander; shading indicates statistically significant difference between groups.

Geographic location

The GPs were asked to record the postcode of the patient's home residence at each encounter. The postcodes were classified by state/territory and by the Rural, Remote and Metropolitan Area (RRMA) classification.[22]

Distribution by state

The distribution of Indigenous patient residence by state is presented in Figure 16.4. More than a quarter of these patients resided in New South Wales (28.8%) o and another quarter in Queensland (27.8%). Approximately one in five (19.2%) lived in Western Australia and almost one in ten (8.7%) in the Northern Territory. Few resided in South Australia (7.1%), Victoria (6.9%), Tasmania (1.4%) and the Australian Capital Territory (0.6%).

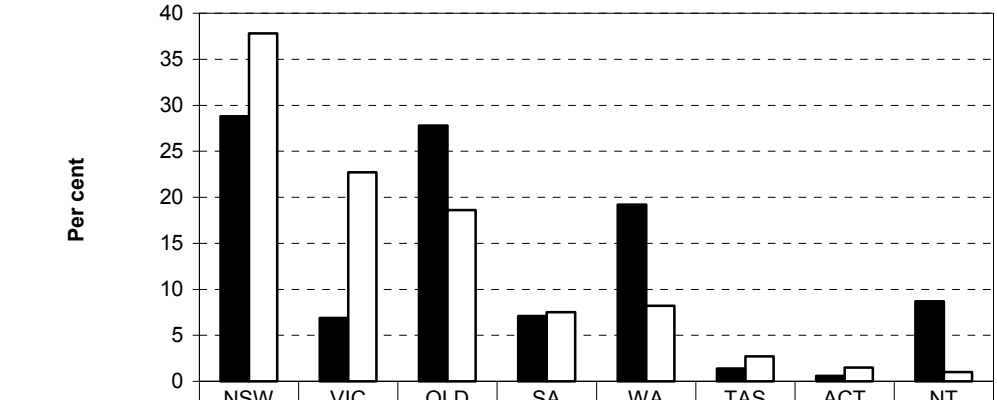


Figure 16.4: State distribution of Indigenous encounters and total encounters 1998–2003

State-specific encounter rate

When the number of encounters with Indigenous Australians 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 (9.1%), followed by Western Australia (2.5%) and then by Queensland (1.6%). In each of the remaining states and territories, the rate of Indigenous encounters was 1.0% or less (Figure 16.5).

Figure 16.5: State-specific rate of Indigenous encounters 1998–2003

Distribution by RRMA

These Indigenous Australians were far less likely to live in capital cities (30.2%) than were patients in the total sample (66.4%). More than 20% resided in remote areas and a further 20% were from 'other rural' areas (Figure 16.6).

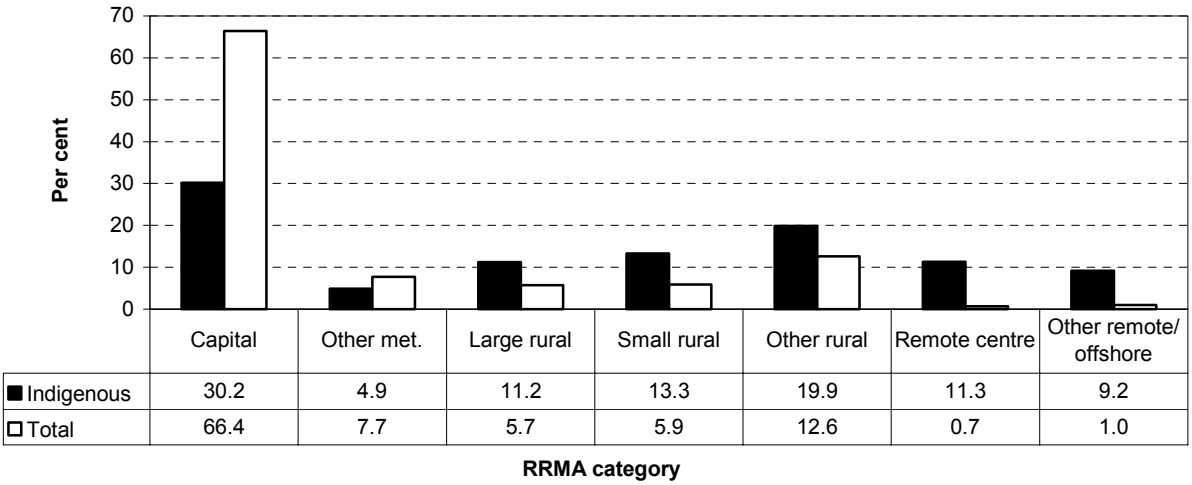


Figure 16.6: Distribution of Indigenous and total encounters 1998–2003, by RRMA

RRMA-specific encounter rates

The distribution of encounters with Indigenous Australians was considered in relation to the distribution of all encounters across RRMAs. Encounters with Indigenous Australians accounted for 18.2% of the total in remote centres and for 9.6% of those in other remote/offshore locations. The lowest relative rate of encounters with Indigeous people was in capital cities, where they accounted for less than 1% of the sample. Relative rates in other RRMAs were also small (Figure 16.7).

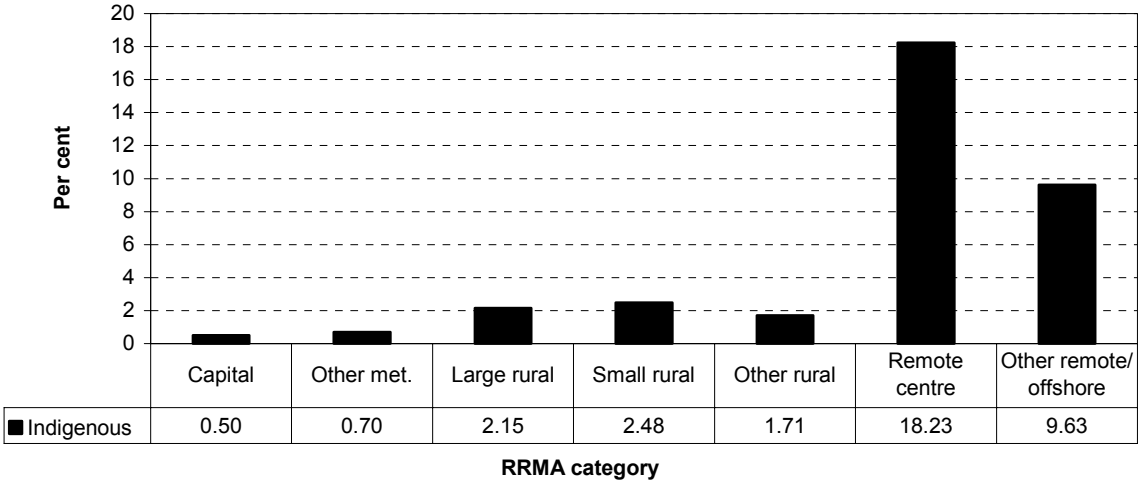


Figure 16.7: RRMA-specific rates of Indigencous encounters 1998–2003

16.4 Characteristics of the encounters

In the five year data set there was only one significant differences in the distribution of encounters across payment source or by Medicare item number for encounters with Indigenous Australians compared with all encounters. Encounters with Indigenous Australians were significantly less likely to be claimable through workers compensation. The main categories are compared in Table 16.3.

Table 16.3: Type of encounter with Indigenous Australians and total sample: 2002–03 and 1998–2003

	2002–03			1998–99 to 2002–03		
	Encounters with Indigenous people		Total encounters	Encounters with Indigenous people		Total encounters
Variable	Number	Rate per 100 encs[(a)] (*n*=1,375) 95% CI	Rate per 100 encs[(a)] (*n*=100,987) 95% CI	Number	Rate per 100 encs[(a)] (*n*=5,476) 95% CI	Rate per 100 encs[(a)] (*n*=502,100) 95% CI
Direct consultations	1,187	97.8 (96.6–98.9)	98.4 (98.2–98.6)	4,954	97.8 (96.6–98.9)	97.1 (96.9–97.2)
No charge	7	0.6 (0.1–1.0)	0.5 (0.2–0.8)	49	1.0 (0.5–1.5)	0.7 (0.6–0.8)
Medicare claimable[(b)]	1,131	93.2 (90.8–95.5)	95.0 (94.6–95.3)	4,686	92.5 (91.1–93.9)	92.6 (92.3–92.9)
Standard surgery consultations	855	70.4 (64.0–76.8)	78.7 (77.6–79.7)	3,710	73.3 (70.3–76.2)	75.2 (74.7–75.7)
Workers compensation	15	1.2 (0.5–2.0)	1.9 (1.6–2.2)	56	1.1 (0.8–1.4)	1.9 (1.8–2.0)
Other paid (hospital, state etc.)	34	2.8 (1.0–4.6)	1.0 (0.2–1.8)	149	2.9 (1.9–4.0)	1.8 (1.6–2.1)
Indirect consultations	27	2.2 (1.1–3.4)	1.6 (1.2–2.0)	125	2.5 (1.8–3.1)	2.9 (2.8–3.1)

(a) Missing data removed.

(b) Includes encounters that were recorded as claimable for the Commonwealth Department of Veterans' Affairs.

Note: Encs—encounters; CI—confidence interval; shading indicates statistically significant difference between groups.

16.5 Content of encounters

Table 16.4 summarises the major elements of encounters with Indigenous Australians and these are compared with total encounters, for the BEACH 2002–03 year and for the full five year period. Between 1998 and 2003, patients who identified themselves as Indigenous described significantly fewer reasons for encounter (145.5 per 100 encounters) than did those at all encounters (150.2). However, the number of problems managed at encounter was almost identical (147.7 per 100 Indigenous encounters compared with 148.1 per 100 total encounters). There were significantly more new problems managed with Indigenous Australians (56.5 per 100 encounters) than for the total sample (51.2).

Total medication rates were significantly higher at encounters with Indigenous Australians (115.8 per 100 encounters) than for the total sample (106.5 per 100) but this difference was almost entirely due to far higher rates of medications supplied by the GP direct to the patient (18.9 per 100 Indigenous encounters compared with 8.1 per 100 total encounters). Conversely GPs advised over-the-counter medications significantly less often at encounters with Indigenous Australians (6.2 per 100) than at all encounters (9.0 per 100). There was no significant difference in the relative rate of prescribed medications.

There were also no significant differences in the relative rate of provision of non-pharmacological treatments, nor more specifically in rates of clinical treatments or procedures, between encounters with Indigenous Australians and all encounters. Data for referrals, pathology and imaging cannot be combined for the full five year period, either for Indigenous encounters or total encounters, because of changes in data collection or coding methods over the period of the study. However, these data elements can be compared for the single year 2002–03, though the small sample size gives less statistical power to the comparisons.

In 2002–03, pathology test order rates were significantly higher at Indigenous encounters (46.8 per 100 encounters) than at all encounters (32.9). Though there was a trend for higher referral rates, reflected particularly in referrals to allied health services rather than to medical specialists, these failed to reach statistical significance in this single year.

16.6 Patient reasons for encounter

Over the five years of BEACH, patients who identified as Aborignal people or Torres Strait Islanders described significantly more reasons for encounter associated with pregnancy and family planning (5.6 per 100 encounters compared with 3.9 per 100 in the total sample) and more of a social nature (2.1 per 100 compared with 1.0). In contrast they described significantly fewer reasons associated with the musculoskeletal (14.7 compared with 16.9 per 100), circulatory (7.4 compared with 11.4 per 100) and female genital (4.7 compared with 6.4 per 100) systems (results not shown).

16.7 Morbidity managed

Distribution by ICPC-2 chapter

The distribution of the problems managed in encounters with Indigenous Australians across ICPC–2 chapters are compared with the distributions for all encounters in Table 16.5. Results

are listed in decreasing order of frequency for all Indigenous encounters over the five years. The five year data demonstrate a considerable number of significant differences in the relative rate of management of some types of morbidities.

When compared with all encounters, those with Indigenous Australians involved significantly fewer problems that were:

- related to the musculoskeletal system (13.6 per 100 compared with 17.4)
- associated with the circulatory system (13.0 per 100 compared with 16.6)
- of a general and unspecified nature (12.9 compared with 15.0 per 100)
- related to the female genital system (5.5 compared with7.3 per 100).

In contrast these encounters involved significantly more problems that were:

- associated with pregnancy and family planning (6.6 compared with 4.3 per 100)
- related to the ear (5.9 compared with 4.3 per 100)
- of the endocrine and metabolic system (13.0 compared with 9.9 per 100)
- of a social nature (1.7 compared with 0.9).

Most common problems managed

Table 16.6 provides comparative results for the most frequently managed problems at encounters with Indigenous Australians in decreasing order of frequency in the five year data set, and provides comparative data from the annual sample in 2002–03 and for the full five year period. The top 17 problems (arising at a rate of 1.5 per 100 encounters or more) accounted for 36% of all problems managed at Indigenous encounters, and this set of problems accounted for 31% of all problems at all encounters.

Diabetes was the problem most frequently managed at encounters with Indigenous Australians, at a significantly higher rate (2.5 times as often) than at all encounters (7.1 per 100 Indigenous encounters compared with 2.8 per 100 total encounters). This was followed by hypertension which was managed significantly less often at Indigenous encounters (6.7 per 100) than at all encounters (8.8 per 100). Also less frequently managed at Indigenous encounters was immunisation/vaccination.

Both asthma (4.3 per 100 encounters) and acute bronchitis (3.8 per 100) were managed more frequently at Indigenous encounters than average (2.9 and 2.8 per 100 respectively). Other problems with significantly higher management rates at Indigenous encounters were:

- acute otitis media, managed at more than twice the average for all encounters
- pre/postnatal care, managed at a rate more than twice the average
- pregnancy (1.6 per 100 compared with the average 0.8)
- tonsillitis (1.8 per 100 Indigenous encounters compared with 1.2 per 100 average) and
- boil/carbuncle (1.5 per 100 compared with 0.5).

Table 16.4: Summary of morbidity and management at encounters with Indigenous Australians and in the total sample: 2002–03 and 1998–2003

	2002–03				1998–99 to 2002–03			
	Encounters with Indigenous people		Total encounters		Encounters with Indigenous people		Total encounters	
Variable	Number	Rate per 100 encs[a] (*n*=1,375) 95% CI	Number	Rate per 100 encs[a] (*n*=100,987) 95% CI	Number	Rate per 100 encs[a] (*n*=5,476) 95% CI	Number	Rate per 100 encs[a] (*n*=502,100) 95% CI
Reasons for encounter	1,968	143.1 (134.9–151.3)	152,341	150.9 (149.0–152.7)	7,968	145.5 (142.1–148.9)	753,925	150.2 (149.5–150.8)
Problems managed	2,033	147.9 (137.0–158.7)	146,336	144.9 (143.0–146.8)	8,086	147.7 (143.7–151.6)	743,625	148.1 (147.3–148.9)
New problems	832	60.5 (53.9–67.2)	57,509	57.0 (55.6–58.3)	3,094	56.5 (52.9–60.1)	257,027	51.2 (50.6–51.8)
Medications	1,576	114.6 (99.6–129.7)	104,813	103.8 (101.4–106.2)	6,343	115.8 (110.0–121.7)	534,826	106.5 (105.5–107.5)
Prescribed	1,118	81.3 (67.2–95.4)	85,161	84.3 (81.8–86.9)	4,970	90.8 (83.8–97.8)	449,013	89.4 (88.4–90.4)
Advised OTC	88	6.4 (4.2–8.6)	10,270	10.2 (9.2–11.1)	337	6.2 (5.2–7.1)	45,141	9.0 (8.7–9.2)
GP supplied	370	26.9 (3.6–50.2)	9,382	9.3 (7.6–11.0)	1,036	18.9 (11.4–26.4)	40,672	8.1 (7.7–8.5)
Other treatments	902	65.6 (54.6–76.6)	52,292	51.8 (49.3–54.3)	2,915	53.2 (48.1–58.4)	255,617	50.9 (50.0–51.8)
Clinical	667	48.5 (38.0–59.0)	37,543	37.2 (35.0–39.4)	2,218	40.5 (36.0–45.0)	186,268	37.1 (36.3–37.9)
Procedural	235	17.1 (14.4–19.7)	14,748	14.6 (13.9–15.3)	697	12.7 (11.2–14.3)	69,349	13.8 (13.5–14.1)
Referrals	191	13.9 (10.9–16.9)	11,254	11.1 (10.7–11.6)	. .	. .	. .	. .
Specialist	86	6.3 (4.8–7.7)	7,743	7.7 (7.3–8.0)	. .	. .	. .	. .
Allied health services	58	4.2 (2.7–5.7)	2,536	2.5 (2.3–2.8)	. .	. .	. .	. .
Pathology	644	46.8 (36.7–57.0)	33,234	32.9 (31.5–34.4)	. .	. .	. .	. .
Imaging	114	8.3 (5.8–10.8)	8,678	8.6 (8.2–9.0)	. .	. .	. .	. .

Note: Encs—encounters; CI—confidence interval; OTC—over-the-counter; shading indicates statistically significant difference between groups. Changes in recording format during the five years do not allow the production of five year total results for some management actions.

Table 16.5: Distribution of problems managed at Indigenous encounters by ICPC–2 chapter for 2002–03 and 1998–2003, compared with the total sample

	2002–03				1998–99 to 2002–03			
	Encounters with Indigenous people		Total encounters		Encounters with Indigenous people		Total encounters	
Variable	Number	Rate per 100 encs[(a)] (*n*=1,375) 95% CI	Number	Rate per 100 encs[(a)] (*n*=100,987) 95% CI	Number	Rate per 100 encs[(a)] (*n*=5,476) 95% CI	Number	Rate per 100 encs[(a)] (*n*=502,100) 95% CI
Respiratory	261	19.0 (15.4–21.6)	20,828	20.6 (20.0–21.3)	1,235	22.5 (21.0–24.1)	108,865	21.7 (21.4–21.9)
Skin	208	15.1 (13.3–16.9)	16,642	16.5 (16.0–17.0)	891	16.3 (14.8–17.8)	83,469	16.6 (16.4–16.8)
Musculoskeletal	185	13.5 (10.8–16.1)	17,221	17.1 (16.5–17.6)	747	13.6 (12.5–14.8)	87,092	17.4 (17.1–17.6)
Psychological	183	13.3 (10.2–16.4)	10,405	10.3 (9.8–10.8)	734	13.4 (11.9–14.9)	56,950	11.3 (11.1–11.6)
Circulatory	193	14.0 (11.2–16.9)	16,142	16.0 (15.3–16.7)	712	13.0 (11.6–14.4)	83,461	16.6 (16.3–16.9)
Endocrine and metabolic	210	15.3 (12.1–18.5)	10,717	10.6 (10.2–11.0)	712	13.0 (11.6–14.4)	49,906	9.9 (9.8–10.1)
General and unspecified	180	13.1 (10.5–15.7)	15,909	15.8 (15.2–16.3)	704	12.9 (11.7–14.0)	75,522	15.0 (14.8–15.3)
Digestive	144	10.5 (8.5–12.5)	10,186	10.1 (9.8–10.4)	571	10.4 (9.5–11.3)	50,412	10.0 (9.9–10.2)
Pregnancy, family planning	87	6.3 (4.3–8.3)	4,203	4.2 (3.8–4.5)	359	6.6 (5.7–7.5)	21,757	4.3 (4.2–4.5)
Ear	79	5.8 (4.3–7.2)	4,035	4.0 (3.8–4.2)	325	5.9 (5.2–6.6)	21,611	4.3 (4.2–4.4)
Female genital system	82	6.0 (4.4–7.5)	6,727	6.7 (6.2–7.1)	302	5.5 (4.7–6.3)	36,601	7.3 (7.1–7.5)
Neurological	61	4.4 (3.1–5.8)	4,278	4.2 (4.0–4.4)	221	4.0 (3.4–4.7)	20,133	4.0 (3.9–4.1)
Urology	71	5.2 (2.0–8.3)	2,844	2.8 (2.7–3.0)	214	3.9 (2.9–4.9)	14,871	3.0 (2.9–3.0)
Eye	24	1.8 (0.9–2.6)	2,639	2.6 (2.5–2.7)	124	2.3 (1.8–2.7)	13,386	2.7 (2.6–2.7)
Social problems	27	2.0 (0.3–3.6)	719	0.7 (0.5–0.9)	91	1.7 (1.2–2.2)	4,585	0.9 (0.9–1.0)
Male genital system	17	1.2 (0.5–2.0)	1,458	1.4 (1.3–1.6)	84	1.5 (1.2–1.9)	6,974	1.4 (1.3–1.4)
Blood	21	1.5 (0.9–2.1)	1,383	1.4 (1.2–1.5)	60	1.1 (0.8–1.4)	8,030	1.6 (1.5–1.7)
Total problems	**2,033**	**147.9 (137.0–158.7)**	146,336	**144.9 (143.0–146.8)**	**8,086**	**147.7 (143.7–151.6)**	**743,625**	**148.1 (147.3–148.9)**

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

Note: Encs—encounters; CI—confidence interval; shading indicates statistically significant difference between groups.

Table 16.6: Most frequent individual problems managed (in decreasing order of frequency for all Indigenous encounters: 1998–2003)

	2002–03				1998–99 to 2002–03			
	Encounters with Indigenous people		Total encounters		Encounters with Indigenous people		Total encounters	
Variable	Number	Rate per 100 encs[(a)] (*n*=1,375) 95% CI	Number	Rate per 100 encs[(a)] (*n*=100,987) 95% CI	Number	Rate per 100 encs[(a)] (*n*=5,476) 95% CI	Number	Rate per 100 encs[(a)] (*n*=502,100) 95% CI
Diabetes, non-gestational*	126	9.2 (6.8–11.5)	2,936	4.6 (4.2–5.1)	389	7.1 (6.0–8.2)	14,019	2.8 (2.7–2.9)
Hypertension*	111	8.1 (5.6–10.5)	8,935	8.9 (8.4–9.3)	368	6.7 (5.7–7.7)	44,315	8.8 (8.6–9.0)
Upper respiratory tract infection	65	4.7 (3.4–6.0)	6,451	6.4 (5.9–6.8)	310	5.7 (4.8–6.5)	30,348	6.0 (5.9–6.2)
Asthma	52	3.8 (2.7–4.6)	2,752	2.7 (2.5–2.9)	236	4.3 (3.6–5.0)	14,492	2.9 (2.8–3.0)
Acute bronchitis/bronchiolitis	52	3.8 (2.6–4.9)	2,599	2.6 (2.3–2.8)	210	3.8 (3.2–4.5)	13,853	2.8 (2.7–2.8)
Depression*	50	3.6 (2.7–4.6)	3,560	3.5 (3.3–3.8)	185	3.4 (2.9–3.9)	19,008	3.8 (3.7–3.9)
Immunisation all*	41	3.0 (1.9–4.0)	4,678	4.6 (4.2–5.1)	180	3.3 (2.6–3.9)	24,195	4.8 (4.6–5.0)
Acute otitis media/myringitis	38	2.8 (1.5–4.0)	1,314	1.3 (1.1–1.5)	167	3.1 (2.5–3.6)	7,126	1.4 (1.4–1.5)
Back complaint*	35	2.6 (1.6–3.5)	2,624	2.6 (2.3–2.8)	120	2.2 (1.7–2.6)	13,234	2.6 (2.5–2.7)
Pre/postnatal check*	29	2.1 (1.1–3.1)	800	0.8 (0.4–1.2)	112	2.1 (1.5–2.5)	4,785	1.0 (0.9–1.0)
Anxiety	15	1.1 (0.4–1.8)	1,562	1.6 (1.4–1.7)	103	1.9 (1.4–2.3)	8,737	1.7 (1.7–1.8)
Urinary tract infection*	28	2.0 (1.2–2.9)	1,686	1.7 (1.6–1.8)	102	1.9 (1.5–2.3)	8,515	1.7 (1.7–1.7)
Tonsillitis	18	1.3 (0.6–2.1)	1,134	1.1 (0.9–1.3)	98	1.8 (1.4–2.2)	5,921	1.2 (1.1–1.2)
Sprain/strain*	28	2.0 (1.1–3.0)	1,702	1.7 (1.5–1.9)	91	1.7 (1.3–2.1)	8,875	1.8 (1.7–1.8)
Pregnancy*	20	1.5 (0.7–2.2)	855	0.9 (0.6–1.1)	89	1.6 (1.2–2.0)	4,218	0.8 (0.8–0.9)
General check-up*	23	1.7 (0.7–2.6)	1,952	1.9 (1.7–2.1)	88	1.6 (1.2–2.1)	9,431	1.9 (1.8–1.9)
Boil/carbuncle	21	1.5 (0.9–2.2)	532	0.5 (0.5–0.6)	84	1.5 (1.1–2.0)	2,410	0.5 (0.5–0.5)
Subtotal (n, % of total problems)	*752*	*37.0*	*46,072*	*27.4*	*2,932*	*36.2*	*233,482*	*31.4*
Total problems	**2,033**	**147.9 (137.0–158.7)**	**146,336**	**144.9 (143.0–146.8)**	**8,086**	**147.7 (143.7–151.6)**	**743,625**	**148.1 (147.3–148.9)**

(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: Encs—encounters; CI—confidence interval; shading indicates statistically significant difference between groups. The table includes only morbidities that arose at a rate of 1.5 per 100 encounters or more in the five year data 1998–2003.

16.8 Patient risk factors

The methods used to collect data pertaining to patient BMI, smoking status and alcohol consumption for subsamples of patients have been reported in Chapter 15. Because of the relatively small size of the subsamples for risk factors of Aboriginal or Torres Strait Island people, this section again utilises the data for all five years of the BEACH program. In 1998–99 and 1999–00, the question asked of patients about their current smoking status was on a different subsample of forms from those asking about alcohol consumption and body mass index. The sizes of the subsamples for both Indigenous Australians, and for all respondents therefore vary according to the risk factor measured.

Body mass index of Indigenous Australians

BMI was calculated for 159,667 patients aged 18 years and over. Of these, 1,480 patients identified themselves as Aboriginal people or Torres Strait Islanders.

Overall, 31.8% of these Indigenous Australians were classed as obese and a further 30.6% as overweight. Those defined as underweight accounted for 6.7% of the total, and the remaining 31.0% were in the normal range. Almost two-thirds of the respondents of both sexes were classed as obese or overweight with females being significantly more likely to be obese than males. A significantly larger proportion of the Indigenous patient sample were classed as obese (31.8%) than total respondents (20.0%), but the Indigenous Australians were less likely to be classed as overweight (30.6%) than the total sample (33.5%). A significantly lower proportion were of normal BMI than in the total sample (Table 16.7).

In total, about 62% of the Indigenous respondents were overweight or obese compared with 53.5% of all respondents (Table 16.7). Indigenous Australians aged between 45 and 64 years had the highest prevalence of obesity/overweight at 73.2% and two-thirds of those aged 25-44 years and 65–74 years fell into this category. When compared with the total sample over the five years, the higher obesity/overweight rates in Indigenous Australians were particularly apparent in those aged 18–64 years, there being no difference in age-specific rates of the two samples in older age groups (Figure 16.8).

Table 16.7: Patient body mass index of Indigenous adult respondents (aged 18+ years) and the total subsample

	Indigenous respondents						All respondents	
	Male[(a)] (*n*=551)		Female[(a)] (*n*=907)		Total (*n*=1,480)		Total (*n*=159,667)	
BMI	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI
Obese	26.5	22.6–30.4	34.4	30.9–37.9	31.8	29.0–34.5	20.0	19.8–20.3
Overweight	34.5	30.2–38.7	28.2	25.2–31.2	30.6	28.1–33.1	33.5	33.2–22.8
Normal	34.5	30.4–38.6	29.2	26.0–32.5	31.0	28.4–33.5	38.4	38.1–38.8
Underweight	4.5	2.8–6.3	8.2	6.1–10.2	6.7	5.3–8.1	8.1	7.9–8.3

(a) Missing data removed—patient sex was not recorded for 22 respondents.

Note: BMI—body mass index; CI—confidence interval.; shading indicates statistically significant difference between groups.

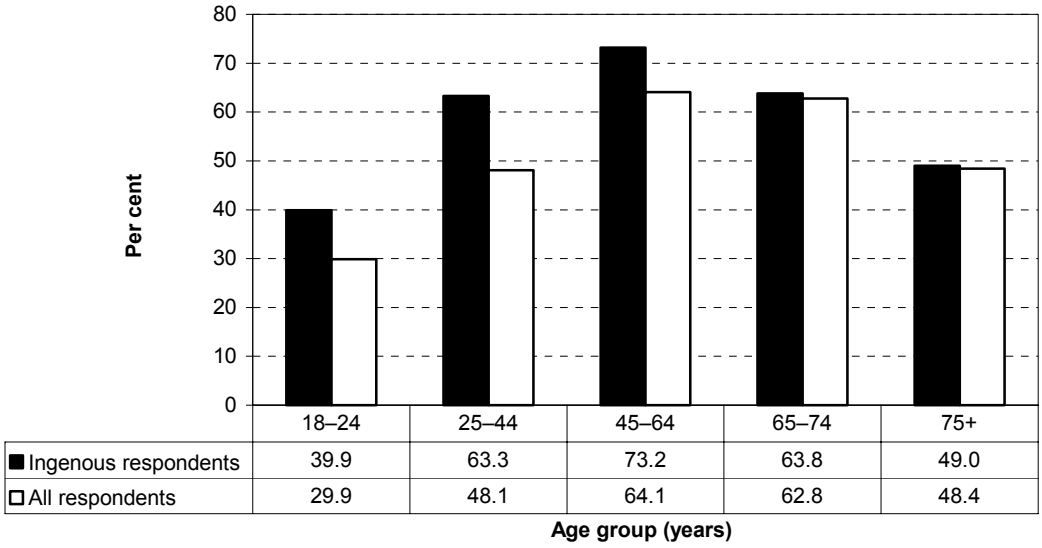


Figure 16.8: Age-specific rates of overweight and obesity in Indigenous adults and in the total subsample

Note: Missing data removed—age was missing for 82 Indigenous Australians and for 7,684 patients in the total subsample

Smoking

The smoking status of 159,489 patients aged 18 years and over was recorded and 1,454 of these were identified as Indigenous Australians.

Almost half (45.2%) of the Indigenous respondents reported they were daily smokers and a further 8.5% were occasional smokers. The prevalence of daily smoking was 2.5 times higher than in the total sample surveyed over the five years of BEACH (18.6%). Further, a significantly greater proportion of Indigenous respondents reported smoking occasionally (8.5%) than in the total sample (4.7%).

A significantly larger proportion of Indigenous women than men had never smoked (29.9% and 18.8% respectively). However, although there was an indication of higher daily smoking prevalence among Indigenous male respondents, this did not reach statistical significance (Table 16.8).

Table 16.8: Smoking status of Indigenous adult respondents (aged 18+ years) and the total subsample

	Indigenous respondents						All respondents	
	Male[(a)] (*n*=537)		Female[(a)] (*n*=897)		Total (*n*=1,454)		Total (*n*=159,489)	
Smoking status	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI
Daily	49.4	44.5–54.2	42.7	38.8–46.6	45.2	42.0–48.4	18.6	18.3–18.9
Occasional	8.0	4.4–11.6	8.8	6.5–11.1	8.5	6.3–10.6	4.7	4.5–4.8
Previous	23.8	20.0–22.3	18.6	16.0–21.3	20.7	18.5–22.9	27.3	26.9–27.6
Never	18.8	15.4–22.3	29.9	26.6–38.2	25.7	23.1–28.2	49.5	49.0–49.9

(a) Missing data removed—patient sex was unknown for 20 Indigenous respondents.

Note: CI—confidence interval; shading indicates statistically significant difference between groups.

More than half (57.1%) the Indigenous respondents in the 18–24 age group reported smoking daily and the proportion was almost as high in the 25–44 age group (52.2%). These rates were about double those from the total subsample who responded to the smoking questions. The age-specific rate of daily smoking in the Indigenous sample was less than 10% in patients aged 75 years or more but this was still about double that of the total sample (Figure 16.9).

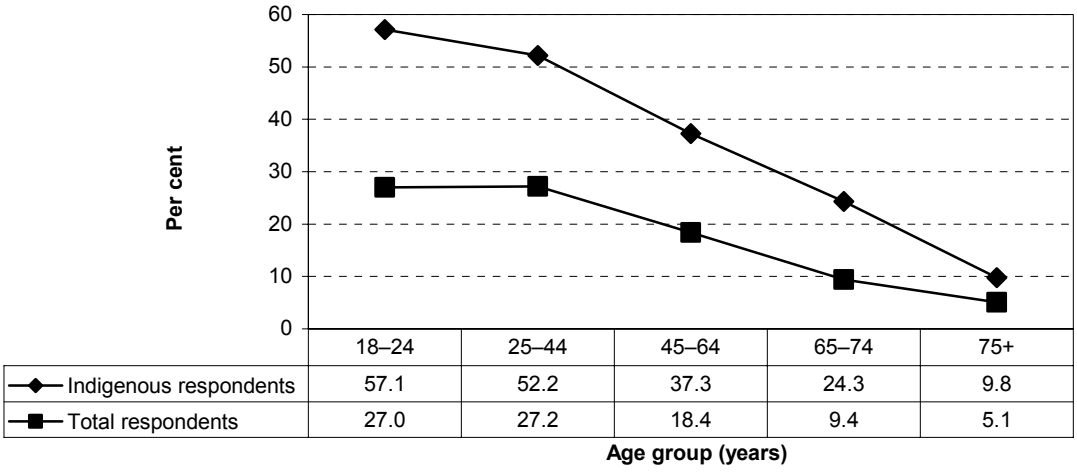


Figure 16.9: Age-specific rates of smoking status of Indigenous adults and the total subsample

Note: Missing data removed—age was missing for 71 Indigenous respondents and 7,888 patients in the total subsample.

Alcohol consumption

Responses to the questions on alcohol consumption were recorded for 157,380 adult patients (18+ years), of which 1,436 identified themselves as Indigenous Australians. Overall, 60.2% of Indigenous respondents reported drinking alcohol, and 63.1% of these (38.0% of respondents) reported drinking at 'at-risk' levels. The proportion of 'at-risk' drinkers was significantly higher among males (45.6%, 67.5% of those who consumed any alcohol) than female patients (33.4%, 59.8% of those who drank at all). About one in five respondents (both male and female) reported drinking alcohol at responsible levels and two in five were non-drinkers (Table 16.9).

Table 16.9: Alcohol consumption among adult Indigenous respondents (18+ years) and the total subsample

	Indigenous respondents						All respondents	
	Male (*n*=537)		Female (*n*=899)		Total (*n*=1,436)		Total (*n*=157,380)	
Alcohol consumption	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI	Per cent	95% CI
'At-risk' drinker	45.6	40.8–50.5	33.4	30.0–36.8	38.0	34.9–41.1	25.0	24.6–25.4
Responsible drinker	22.0	18.1–25.8	22.4	19.0–25.7	22.2	19.4–24.5	43.9	43.4–44.3
Non-drinker	32.4	28.2–36.7	44.3	40.1–48.4	39.8	36.6–43.1	31.2	30.7–31.6

Note: CI—confidence interval; shading indicates statistically significant difference between groups.

'At-risk' drinking was most commonly reported by Indigenous Australians aged 25–44 years (47.9%), a considerably higher proportion than in the total subsample (29.0%). Prevalence of 'at-risk' drinking in the youger adults aged 18–24 years (40.4%) was only marginally higher than in the total subsample (36.4%). 'At-risk' drinking levels in older Indignous patients decreased dramatically, to sit at lower levels than in the wider population (Figure 16.10).

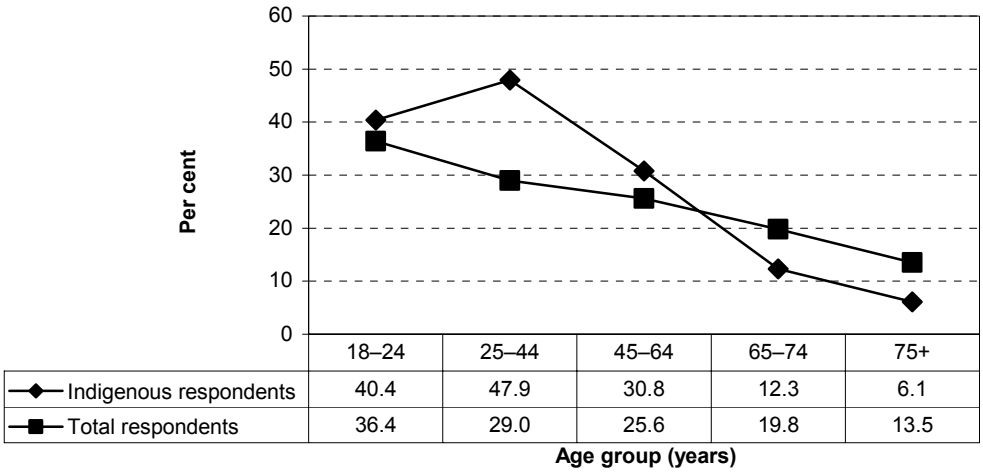


Figure 16.10: Age-specific rates of 'at-risk' alcohol consumption by Indigenous respondents and by all respondents

Risk factor profile

Data about all three risk factors were available for 92,343 patients encountered in general practice between 2000 and 2003, and 867 of these respondents were Indigenous Australians. These data allow a comparison of the multiple nature of risk factors in the Indigenous subsample and in the total sample. As shown in Table 16.11 only 12.0% of the Indigenous respondents reported none of the three risk factors, a significantly lower proportion than in the total sample (28.4%). Two of the three measured risk factors were present in ovemore than one-third (35.6%) of the Indigenous Australians, a significantly greater proportion than in the total subsample (19.6%). All three risk factors were three times more likely to be present among the Indigenous respondents (10.8%) than in the total subsample (3.6%) (Table 16.10).

Table 16.10: Risk factor profile of Indigenous adult respondents and the total subsample

	Indigenous respondents		All respondents	
Number of risk factors	Per cent (*n*=867)[(a)]	95% CI	Per cent (*n*=92,343)[(a)]	95% CI
None	12.0	9.7–14.3	28.4	27.9–28.9
One	41.5	37.8–45.2	48.4	48.0–48.8
Two	35.6	32.2–39.1	19.5	19.2–19.9
Three	10.8	8.6–13.1	3.6	3.4–3.8

(a) Missing data removed. Data for at least one risk factor data was missing for 109 of 976 Indigenous respondents who were asked all three questions, and for 7,914 of the 100,257 patients in the total sample who were asked all three questions.

Note: CI—confidence interval; shading indicates statistically significant difference between groups.

16.9 Discussion

The proportion of total encounters over the 1998–2003 period that were identified as being with Indigenous Australians (1.1%) was low, relative to the proportion of Indigenous Australians in the total population (2.4% at 30 June 1999).[44] We do not know the extent to which GPs regularly ask the questions about Indigenous status and the manner in which they ask it; nor do we know the extent to which Indigenous Australians, when asked the question, are willing to identify themselves as such in this environment. In early 2003, we conducted a SAND study which investigated the cultural background of patients attending general practice, among a subsample of 8,943 patients attending 294 GPs. One question, asking patients if they identified themselves as an Aboriginal person and/or as a Torres Strait Islander was included in a series of broader questions regarding cultural background and languages spoken. This substudy suggested that 2.4% (95% CI: 1.3–3.4) of the respondents identified as Indigenous Australians, more than double the proportion estimated in the encounter data reported here.[45] The results of this SAND study suggest that the structured question may be more successful in identifying Aboriginal and Torres Strait Islander respondents in general practice than the unstructured tick box. However further research is needed before any firm conclusions can be drawn.

In Section 16.1 we discussed the extent to which some encounters with Indigenous Australians recorded in the BEACH program are likely to have been conducted in an ACCHS. We estimated that some 37 GPs could have been working in such an environment and removed them from our extrapolation to the total estimated number of encounters with Indigenous Australians that would be conducted in non-ACCHS private general practice. However, it is notable that the proportion of total encounters that were claimable through Medicare was the same for encounters with Indigenous Australians as in the total sample (see Section 16.4), so the encounters likely to have occurred in an ACCHS still fall under the Medicare arrangements. They seem not to include GPs working in ACCHSs that are funded under other Commonwealth arrangements, since such GPs would not be claiming from Medicare and would not be in the sample frame from which the BEACH samples are drawn.

One could therefore combine the total extrapolated figure (1.1 million per year) with any data available from non-Medicare-claiming ACCHSs to provide a more reliable indication of the total number of encounters conducted in general practice (both private and ACCHS) with Indigenous Australians.

In spite of the fact that the encounters reported here are clearly an under-representation of the total GP encounters with Indigenous Australians, the reliability of the results surrounding the problems managed is supported by other evidence.

Characteristics of the patients at encounter

The relatively small proportion of these encounters that were with people of Torres Strait Islander origin (9.0%) or as both Aboriginal and Torres Strait Islander origin (2.7%) reflected the distribution within the Indigenous population, where the comparable proportions are 6% and 4% respectively.[43]

The relatively small proportion of encounters with older Indigenous people (7.4% over 65 years) clearly reflects their shorter life expectancy, which leads to a generally younger age distribution with a lesser proportion of older people than for the total population. In fact, the age-specific rates of encounters by age group reflected well the overall age distribution of the Indigenous population.[43]

The distribution of the encounters across states was a relatively good reflection of the geographic distribution of the Indigenous population as a whole, 29% of whom reside in New South Wales, 27% in Queensland, 14% in Western Australia and 12% in the Northern Territory. The distribution of the encounters across rural and metropolitan areas also reflected the population distribution, 30% of encounters and 30% of the population being in metropolitan areas and 20% of the encounters (compared with 25% of the population) being in remote or very remote areas.[43]

Problems and management

Endocrine and metabolic problems were managed significantly more often at encounters with Indigenous Australians than at all encounters. This was almost entirely explained by the very high management rate of diabetes, which was the most frequently managed problem at Indigenous encounters, at a rate that was 2.5 times the rate for all encounters. This probably reflects its high self-reported prevalence in this community (11%, age-standardised, compared with 3% in the non-Indigenous population)[43] and suggests that GPs are playing an important role in its management for Indigenous Australians. Although hypertension has consistently been the most frequently managed problem at all BEACH encounters, it rated second place at encounters with Indigenous Australians.

The high management rate of asthma may well reflect its prevalence in the Indigenous population (17% compared with 12% in non-Indigenous people)[43] and together with the relatively high management rate of acute bronchitis may be associated with the high proportion of daily smokers in this population.

Management rates of ear problems were significantly higher at encounters with Indigenous Australians than at all encounters but this was wholly explained by the relatively high management rate of otitis media.

The significantly lower management rates of circulatory problems and female genital problems are of some concern in light of the known prevalence of circulatory disease in the Indigenous population[43] and the need for regular Pap smears in women.

The relative rate of immunisations and vaccinations was significantly lower at Indigenous encounters. This was surprising considering that special government funded vaccination programs for the influenza vaccine are available to Indigenous Australians at a lower age than for other Australians and a greater proportion of encounters with Indigenous patients are with young children who should be receiving their childhood immunisations.

It is possible that such preventive care is being accessed through services other than private general practice.

The GPs managed issues related to pregnancy and family planning far more often at encounters with Indigenous Australians than at all encounters, particularly pre/postnatal care. This may explain the very high proportion of encounters with Indigenous people in the 25-44 age group, when compared with the total sample.

Otitis media, tonsillitis, acute bronchitis and boil/carbuncle were infections often managed at Indigenous patient encounters, all at significantly higher rates than average. Together, these four infectious diseases were managed more often than diabetes, at a rate of more than 9 per 100 encounters. This may reflect the poor socioeconomic situation of many Indigenous Australians.

The results pertaining to pharmacological management demonstrated that encounters with Indigenous Australians resulted in far higher relative rates of direct supply of medications to the patient by the GPs, almost three times higher than encounters with non-Indigenous people. This may well reflect the introduction of the 'Section 100 Scheme' for Aboriginal health services in remote areas, which allows the service to receive medications that are on the PBS in bulk from the community pharmacy and supply these direct to the patient.[46] This gives further support to the hypothesis that some of the GPs in the sample were recording in an ACCHS environment.

Risk factors

The substudy investigating BMI showed that Indigenous Australians were more likely to be overweight and obese (62.4%) than was the total sample (53.5%). These results align well with those from the National Health Survey (NHS) which found that 61% of Indigenous Australians were classified as overweight or obese (based on self-reported weight and height) compared with non-Indigenous Australians (48%).[47] Both studies found that males and females were more likely to be classified as obese than their comparison groups.

We found that 45.2% of the Indigenous respondents in the SAND subsample study were current daily smokers compared with 18.6% of the total subsample. These estimates are a little lower than those made from the NHS after age standardisation (51% and 24% respectively)[47] but parallel the findings of the 2001 National Drug Strategy Household Survey (NDSHS), of 45% of adult (14+) Indigenous people and 19% of non-Indigenous people being daily smokers.[43] It must be remembered however, that both the NHS and NDSHS are population based studies, while BEACH samples the patient at the GP encounter, so that frequent attenders have more chance of being included than infrequent attenders, and non-attenders are not in the sample at all.

The comparability of findings from BEACH and the NHS does not extend to those for alcohol consumption. The 2001 NHS found that Indigenous adults were less likely (42%) than non-Indigenous adults (62%) to have consumed alcohol in the week prior to interview. In the BEACH study a far greater proportion of Indigenous respondents reported drinking alcohol (60.2%), though this was still a lower proportion than in the total sample (68.9%).

More importantly, however, we found far higher rates of 'at-risk' alcohol consumption among the Indigenous patients (38%) than among the total sample (25.0%). Viewed in terms of the porportion who do consume some alcohol, 67.5% of Indigenous people who drink were drinking levels defined as 'at risk', compared with 58.9% of the drinkers in the total sample. The comparable figures from the 2001 NHS for 'at-risk' drinkers are 12% of

Indigenous Australians (29% of those who drink) and 11% for non-Indigenous Australians (17% of those who drink).[43] The age groups included in the studies were identical (18 + years) and both used the National Health and Medical Research Council (NHMRC) guidelines to define 'at-risk' drinking levels. However the calculation of 'at-risk' in the NHS is based on a single reference week and may not therefore include counts of 'binge drinking' where high levels of alcohol are consumed less often than weekly.

Further analysis of the BEACH data for all patients who had been classified as 'at-risk' consumers of alcohol showed that a considerable proportion of these patients reported drinking alcohol weekly or less often. Since their consumption still led them to be classified as 'at-risk', this would suggest they may ' binge drink'. The proportion was far higher in the Indigenous subsample (46.6%) than in the total sample (22.0%). However, if we remove this group of patients from our estimates of the prevalence of 'at-risk' drinking, the results remain far higher than those of the NHS, at 20.3% of Indigenous Australians and 19.5% of the total patient sample. It is possible that the difference lies in our reliance on reports of 'usual' behaviour whereas the NHS relies on information about the current week.

The risk factor profile suggested that multiple risk factors were more common among the Indigenous Australians (almost half having more than one) than in the total patient subsample, 24.1% of whom had more than one of the three measured risk factors.

16.10 Conclusion

This comparative summary of the characteristics of Indigenous Australians who visited GPs participating in BEACH over a five year period provides an indication of the health services provided to the Indigenous population by GPs. The distribution of the Indigenous patients by state broadly reflects the state distribution of the estimated Indigenous resident population. Further, the proportion living in capital cities parallels the estimated proportion of the Indigenous population living in major cities. However, the proportion of Indigenous people in the BEACH program who reside in remote and very remote areas appears to be somewhat under-representative of the proportion of the Indigenous population who live in such areas. This suggests a greater reliance by the Indigenous people on other services, such as ACCHS, in more remote locations.[43]

The data demonstrate large differences in the relative rates of management of some problems when compared with those at all GP encounters, particularly diabetes, asthma and some infectious conditions. It also demonstrates high levels of measured risk factors in the Indigenous patient population when compared with all patients. In particular, the relatively high prevalence of 'at-risk' alcohol consumption among the Indigenous respondents, particularly in light of the irregular consumption by nearly half the drinkers, should raise concern. Almost half the Indigenous respondents in this study carried two or more risk factors out of the three measured—BMI, smoking and alcohol consumption. In light of the relatively high rates of management of diabetes and asthma, together with usual management levels of hypertension, this pattern of behaviour should raise concern.

The extent to which these services were provided in ACCHS can only be roughly estimated from the current data. However, the results suggest that private general practice has an important role to play in the care of the Indigenous population. In any assessment of the healthcare of the Indigenous population, these services must be considered.

17 Discussion

This report has provided a picture of the current activities of GPs, particularly the more frequent events which together make up a large part of their workload. The generalist nature of their practice 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 medication alone applies to less than 40% of all problems managed. It has demonstrated the importance of counselling and advice in a GP's working day as it is used in the management of one in five problems. The relatively 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 large sample size underlying these national data and the consequent accuracy of the estimates reported also allow researchers to plan studies of specific problems and their management by providing better estimates of required GP sample size through a knowledge of the likely occurrence of the event of interest. They provide 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 conditions.

17.1 The advantages of BEACH

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

- We have access to a regular random sample of recognised GPs who are currently in active practice, through the Australian Department of Health and Ageing. This ensures that the sample of GPs is drawn from a very reliable sample frame of currently active GPs.
- The ever-changing nature of the sample (where each GP can only participate once per triennium) ensures reliable representation of what is happening in general practice across the country. Where programs use a fixed set of GPs over the long term practise, they are measuring what that group is doing at any one time, or how that group has changed over time. Such measures cannot be generalised to the whole of general practice. Further, where the GPs in the groups have a particular characteristic in common (e.g. they all belong to a professional organisation to which not all GPs belong; they all use a selected software system which is not used by all GPs), the group is biased and cannot be said to represent all GPs.
- We are provided with sufficient details about the characteristics of all GPs in the sample frame to allow statistical testing of the representativeness of the final sample and to allow post-stratification weighting to correct for any under-representation or over-representation in the sample (e.g. in BEACH this applies to GPs aged less than 35 years).

- Each GP records for a set number of 100 encounters, but there is wide variance among them in terms of the number of patient consultations they conduct in any one year. We aim to represent all encounters conducted in general practice across the country. The Department of Health and Ageing (DoHA) therefore provides an individual count of activity level (i.e. number of A1 Medicare item numbers claimed in the previous quarter) for all randomly sampled GPs, allowing us to give a weighting to each GP's set of encounters, commensurate with their contribution to total general practice encounters. This ensures that the final encounter data set represents encounters with all GPs (demonstrated in Chapter 4).
- The structured paper encounter form leads the GP participants through each step in the patient encounter, encouraging entry of data for each element. This is in contrast to relying on such systems as electronic health records, which may not be completed in all data fields of interest.
- The activities described in BEACH include all clinical activity associated with a specific patient, not just those that are covered by Medicare.
- The sheer size of the GP sample (1,000 per year) and the relatively small cluster of encounters around each GP provides more reliable estimates than a smaller number of GPs with large clusters of patients and/or encounters around each participating GP.[25]
- The medication data include prescriptions, GP-supplied medications and advised over-the-counter (OTC) drugs, rather than being limited to those prescribed medications covered by the Commonwealth Pharmaceutical Benefits Scheme. BEACH is the only source of information about the medications supplied directly to the patient by the GP.
- The inclusion of non-pharmacological management such as clinical counselling and therapeutic procedures provides a broader view of the interventions used by GPs in the care of their patients, than other data sources.
- The link from all management actions (e.g. prescribing, ordering tests etc.) to the problem under management provides the user with a measure of the 'quality' of care rather than just a count of the number of times an action has occurred (e.g. how frequently a specific drug has been prescribed).
- The use of a well structured classification system designed specifically for general practice, together with the use of an extended vocabulary of terms which facilitates reliable classification of the data by trained secondary coders, removes the guesswork often applied in word searches of available records and in the allocation of a concept to the correct place in the classification.
- The analytical techniques applied to the BEACH data ensure that the cluster sample inherent in the methods is dealt with and that results are provided with 95% confidence intervals. Users are therefore aware of how reliable (or unreliable) any estimate might be.
- The reliability of the methods is demonstrated by the consistency of the results over the five years in areas where change is not expected and by the ability to identify change when it might be expected (e.g. the pattern of Cox-2 prescriptions since these medications were first released).

17.2 Changes over time

In this report we have presented a summary of the results from each of the first five years of the BEACH program and given the estimates based on the five year data set as a whole (Appendix 4). The five year data clearly provides the most precise estimates of the frequency of a selected event, if the reader is not interested in looking at changes over the period of the study.

We further investigated changes in rates of management of selected morbidity and changes in treatments provided by GPs since April 1998. Where changes identified in earlier years of BEACH have remained steady or have continued, the reader can be assured that real change is occurring and that the measured change was not a chance statistical event.

Changes in rates of management of specific types of morbidity and changes in prescribing rates of some medications were demonstrated in Chapter 13. On the basis of these findings, some topics were selected to investigate the relationship between changes in pharmacological management and changes in morbidity rates (Chapter 14). Some of these results are further discussed below.

The steady increase in the management rate of lipid disorders continued in the fifth BEACH year but the number of new cases identified was no higher than in each of the previous years. The measured increase in attendance rates for this problem suggested that each year across the country there has been an average of 110,000 additional GP contacts for this problems—that is, in 2002–03, there would have been an additional 550,000 such contacts in Australia than in 1998–99. This suggests that each year a relatively small number of new cases of lipid disorder are identified and this, combined with the long term nature of treatment, produces an ever increasing number of GP visits involving its management.

BEACH data also provide an opportunity to measure the short and long term impact of PBS listing of new pharmacological preparations. In 1998–99 the provision/prescription rate of NSAIDs was 5.0 per 100 encounters. This rose by 14% (to 5.7 per 100 encounters) in 2000–01 and a further 19% (to 6.8 per 100) in 2001–02, largely due to the rise in Cox-2 inhibitors which were listed on the PBS in 2000–01.[6] This early adoption of the Cox-2 medications by GPs in Australia after the PBS listing has been noted in earlier reports and has recently been been supported by Kerr et al.[48] In 2001–02 the rate of NSAID prescribing levelled off to 6.4 per 100 encounters but this was not due to any levelling of the Cox-2 inhibitors, which rose again from 2.7 medications per 100 encounters to 3.0 per 100. This year (2002–03) the prescribing rate of NSAIDs remained steady as did the rate for Cox-2 inhibitors. However, as noted in Chapter 14, the established steadying in overall NSAID prescribing rates could reflect an increased patient reliance on OTC purchase of ibuprofen.

A significant decrease in the management rate of asthma was found in 2000–01. This change was quite sudden and has remained in the fourth and fifth years of BEACH but there was no further decrease in either year. Since November 2001, GPs have been able to claim from Medicare for completion of the Asthma 3+Visit Plan.[1] Its introduction appears not to have affected a change in management rates for asthma, as the decrease occurred before its introduction. However, there were other types of asthma plans being promoted before the Asthma 3+Visit Plan and these may have caused the measured decrease in management rates in 2000–01. The extent to which such plans have improved patient education in self-management of this problem and in turn led to this decrease in management rate is not known.

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 was notable last year to see that GP provision of lifestyle counselling and advice had increased significantly since 1998–99. However, in 2002–03 the rate remained steady, no additional increase in the rate of lifestyle counselling being apparent. It will be interesting to see next year whether this is just a settling period, with the use of lifestyle counselling increasing again in future.

The effect of GP and patient educational interventions on practice patterns cannot easily be measured. Often, multiple interventions occur in parallel to system changes. For example, Chapter 13 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 a result of the introduction of a Medicare incentive item number for completion of annual diabetes programs.[1] This year the Medicare incentive payment was available for the full 12 month study period, and one might have expected a further increase in management rates of diabetes as a result. No increase was apparent, the rate remaining steady.

Changes in pathology order rates have recently been the subject of another study, the results of which are reported in *Changes in pathology ordering by general practitioners in Australia, 1998–2001*.[30]

17.3 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 healthcare 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 response rate of GPs in the fifth year of BEACH was 28.9% of those with whom contact could be established. This was a little lower than the response rate for the fourth (32.3%)[24] BEACH year, similar to the previous year (29.8%)[6], but far lower than that gained in the first (38.4%)[23] and second (39.1%) BEACH years.[5] The participating GPs were found to be older and slightly less busy than those who declined to participate, and post-stratification weighting was applied to the encounter data to deal with these differences.

The continued low 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. In recent years a wide range of new options have become available 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. These comments led us to request the RACGP to reconsider the point allocation for completion of the BEACH program. In mid 2003 the RACGP increased the points for BEACH from a maximum of 35 to a maximum of 65 (if the cycle is competed). This increase was made retrospective to the beginning of the current QA triennium and all GPs who participated earlier in the triennium have been allocated the additional points by the RACGP. All GPs who had declined to participate since the beginning of the current BEACH year (April 1 2003) were notified of the increased point allocation and offered the opportunity to reconsider their decision. It will be interesting to see the overall impact of this increase in QA points on the final response rate in year 6 of the BEACH program.
- 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.
- 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. While post-stratification weighting of the final dataset overcomes this problem, it would be better id some incentives were to be introduced to encourage participation of these younger GPs in BEACH.
- A similar issue has arisen with recruitment of the increasing number of unrecognised GPs now allowed to practise 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.
- Sampling issues also affect recruitment levels but these have been reasonably constant influences over the period of the BEACH program. In the sample of GPs provided by the DoHA from the HIC records 8% could not be contacted. A large proportion of these were not practising at the time of recruitment, having retired, died, gone overseas or taken maternity leave since their selection from the HIC records. As the aim is to represent active, practising GPs, the exclusion of these GPs from the sample is a valid and necessary action. However, there were also some GPs who had left the practice to which the BEACH approach letter was sent and could not be traced. In many of these cases, the practice informed recruiting staff that the GP selected had not been at the practice for some years. The number of GPs for whom the current address and/or phone number (provided by the DoHA for this study) are out of date has increased in recent years. This may reflect a change in processes of address recording with increased use by GPs of electronic payment mechanisms. In any case, these problems suggest that the HIC system of practice address registration is not error-free.

Sampling issues

Encounters with Indigenous people

In Chapter 16 we reported that the annual estimates on the proportion of all GP encounters with Indigenous people (around 1% per annum) are clearly an under-representation. The SAND substudy found that if the question is asked of the patient within the context of a series of questions about origin, 2.2% will identify as Aboriginal or Torres Strait Island people.

It is possible that where GPs are offered a simple yes/no tick box for this question at every encounter, they often do not ask the patient the question. However, there is remarkable consistency in the age–sex distribution of these patients each year, and in the patterns of problems managed. These patterns also reflect what is known from other sources about the prevalence of certain diseases in the Indigenous population. Therefore, while the reader should keep the under-representation of these encounters in mind, there is no reason to believe it is biased in any consistent way. The use of the full five years data for reporting encounters with Indigenous people in this report provides a more reliable picture of what happens at encounters with Aboriginal people and Torres Strait Islanders.

The large disparity between the five year BEACH result and the SAND sub-study merits further investigation, and it is hoped that further use of SAND for this purpose will be possible in the near future.

Remote areas

It is often said that practising in remote areas is very different from practising in other locations. Only 2.4% of GPs practise in remote areas. As a result, when a random sample of all GPs is drawn, the final sample in remote areas is relatively small (n=20) (see Chapter 4). Earlier research has suggested that we should have a minimum of 40 GPs each providing data regarding 100 encounters (giving a sample of 4,000 encounters) to reliably describe their activity and compare it with others.

A suitable sample could be gained for remote areas if we actively over-sample these GPs. The co-operation of this small group of practitioners would first need to be established. As there are relatively few, a very high response rate would be required if sufficient numbers of GPs are to be recruited. 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. Such a study would provide 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 educational programs for practitioners intending to work in these areas.

Electronic BEACH data collection

The BEACH program is currently a paper-based data collection program. Many people have suggested that with the increased GP uptake of electronic prescribing systems or full clinical systems (electronic health records, EHRs), national data could soon be drawn passively, directly from the GPs' computers. Although an attractive proposition, there are 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[49] 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. variables such 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.

Active electronic data collection: a controlled trial

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 General Practice Statistics and Classification Unit (GPSCU) recently completed a longitudinal, matched, controlled trial of active computerised data collection compared with paper-based data collection in the western, north-western and south-western areas of Sydney. Interactive software was developed that reflects the data elements collected in BEACH. This software does not interact with any clinical system being used by GPs so that they had to actively complete each field covered by the recording form.

The trial aimed to demonstrate that electronic data collection systems can be used for the systematic collection of general practice activity data; to assess the validity and reliability of data collected in this manner compared with paper-based collection; to assess the acceptability and feasibility of data collection by this mechanism for use in the national program, for use by divisions of general practice and for use in GP training program evaluation and assessment.

GPs who participated in this trial had completed BEACH (on paper) within the previous 18 months. Matched comparisons were made between the data collected on paper with that collected on computer.

Response rates and completion rates were poor, and subjective responses from GPs indicated that in the vast majority they would prefer to collect the BEACH data on paper.

The results demonstrated that a semi-forced entry of patient characteristics resulted in extremely complete data sets for each of the characteristics investigated: age, sex, Commonwealth health care card status, non-English speaking background status, Veterans' Affairs Card status and patient status to the practice (new/seen before). Whereas many of these data elements have a response rate of less than 80% in Paper BEACH, missing data in Computer BEACH for these elements was extremely rare. In contrast, the completeness of the remainder of the data elements was poor. When compared with Paper BEACH,

Computer BEACH had significantly lower recording rates of almost all variables, including patient reasons for encounter, problems managed, medications, non-pharmacological treatments, pathology tests ordered imaging ordered and referrals. The majority of these differences were very large.

Investigation of the types of encounters recorded suggested the GPs were not being particularly selective in the encounters they chose to record. Rather there was a general move to record fewer cases of every event.

This study demonstrated that active GP computerised data collection in structured, stand alone software does not provide a reliable and valid measure of GP activity and could not be adopted at this stage as an acceptable alternative to paper based data collection methods currently being used.

A more detailed report of the results of this study is currently being prepared for publication.

Other BEACH applications

Under DoHA funding, the National Consortium for Education in Primary Medical Care 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 before sitting for the examination. These unrecognised GPs first must assess their educational needs so that the educational program can be planned around the individual practitioner. The GPs complete the BEACH process as a tool to assist in identifying specific educational needs.

The GPSCU is currently applying the BEACH methods in a small study of the experience gained by GP registrars. These data may assist in better defining the areas in which registrars should receive training and may identify areas in which they are not gaining experience. Combined with the BEACH encounters data from registrars who have completed BEACH in the last few years, this will provide a comparative picture of their clinical activity compared with the 'average' GP in Australia.

17.4 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.[28] Although integration of data from multiple sources can provide a more comprehensive picture of the health and healthcare 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 OTC purchase.

- Each prescription recorded in the BEACH program reflects the GP's intent that the patient receives the prescribed medication and the specified number of repeats. The prescription, irrespective of the number of repeats ordered, is counted only once.
- Prescriptions are counted in BEACH irrespective of whether the medication is covered by the PBS for all patients, for those holding a Commonwealth 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 Commonwealth 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 Commonwealth health care card holder or have reached the annual safety net threshold. The PBS would therefore underestimate 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, the reader should remember the following:

- The MBS data provided by the DoHA do not usually include data about patients and encounters funded through the Department of Veterans' Affairs. The effect of this on comparisons between data sets was demonstrated in Chapter 4 (Section 4.3) in the comparison of the age–sex distribution of patients at A1 encounters in BEACH with that for the MBS A1 items of service.
- The BEACH participants have the opportunity to record only one Medicare item number on each encounter form. They are instructed to select the more general item number where two item numbers apply to the consultation because additional services attracting their own item number (e.g. 30026—repair of wound) are counted as actions in other parts of the form. This results in a lesser number of 'other' Medicare items than would be counted in the Medicare data.
- The BEACH database includes data about all clinical activities, not only those billed to the MBS. Both direct (patient seen) and indirect (patient not seen but a clinical activity undertaken) consultations are recorded. Some of these are paid by other funding sources (e.g. State health departments, private insurance companies, workers compensation), and some are provided free of charge by the GP (see Chapter 5). In contrast, the MBS data include only those GP services that have been billed to Medicare.

- In activities of relatively low frequency with a skewed distribution across individual GPs, the relative frequency of the event in the BEACH data may not reflect that reported in the MBS data. For example, a study of early uptake of some ECP items by GPs, demonstrated that almost half the EPC items claimed through the MBS came from about 6% of active GPs.[50] Where activity is so skewed across the practising population, a national random sample will provide an under-estimate of activity because the sample reflects the whole population rather than the minority.

Pathology data from the MBS

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

- BEACH reflects the GP's intent that the patient have the pathology test(s) done, and information about the extent to which patients do not have the test done is not available.
- Each pathology company can respond differently to a specific test order label recorded by the GP. Further, the pathology companies can charge through the MBS only for the three most expensive tests undertaken even where more were actually undertaken. This is called 'coning' and is part of the DoHA pathology payment system.
- Pathology MBS items contain pathology tests grouped on the basis of cost. An item may therefore not give a clear picture of the precise tests performed.

The effect of these factors is that the MBS pathology data 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*.[27] A study of changes in pathology ordering patterns between 1998–99 and 2000–01 has also recently been released [30] and is available through our web site http://www.fmrc.org.au/publications/ (go to Books—General Practice Series).

Imaging data from the MBS

Some of the issues discussed regarding pathology data also apply to imaging data. Although coning is not an issue for imaging, radiologists are free to decide whether or not the test ordered by the GP is the most suitable and whether to undertake other tests of their choosing. The MBS data therefore reflect the tests that are actually undertaken by the radiologist, whereas the BEACH data reflect those ordered by the GP. Those interested in GP imaging ordering will find more detailed information from the BEACH program in *Imaging orders by general practitioners in Australia 1999–00,*[29] also available from our web site.

18 Conclusion

This report has provided an updated description of the major aspects of general practice activity in Australia in 2002–03. It has also provided a further measure of the changes that have occurred in general practice since 1998–99.

Readers should be aware that Appendix 4 provides a summary of the results of the more common events recorded in BEACH in each of the 5 years reported to date. This acts as an easy reference point for trends in data pertaining to the more common aspects of general practice. This appendix also includes a summary of the results for the total five year data set. This provides more accurate estimates with tighter confidence intervals for most events than does any single year's data.

18.1 Current status of BEACH

The BEACH program is now in its sixth year. The database for the first 5 years includes data pertaining to approximately 500,000 GP–patient encounters from about 5,000 GPs. Each year the GPSCU publishes an annual report of BEACH results through the Australian Institute of Health and Welfare. This publication reports results from the previous BEACH data year on a national basis for the more common events. Other reports use the database for secondary analyses of a selected topic or for a specific research question. The most recent examples are a study of encounters with male patients in general practice and a study investigating data about older patients (aged 65 years and over) in general practice. These and other BEACH reports can be downloaded from http://www.fmrc.org.au/publications/ (go to Books — General Practice Series) or from http://www.aihw.gov.au/publications/.

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 fifth 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/beach-pubs.htm#6. The subjects covered in the abstracts are listed in Table 18.1 with an indication of the number of GPs and the number of encounters in each subsample.

Analysis of the BEACH data is a complex task. The GPSCU has therefore designed standard report formats that cover most aspects of the subject under investigation. Examples of a problem based standard report (the subject is Warts) and a pharmacological based standard report (subject Allopurinol) for a single year's data are available on our web site, http://www.fmrc.org.au/purchase.htm. They give potential users an opportunity to see the types of information provided in such a report.

Standard reports are also available for selected groups of patients (e.g. children aged less than 15 years, or all women with a cardiovascular problem, or all patients residing in NSW), or a for a specific non-pharmacological management action (e.g. all recorded cases of provision of psychological counselling; all orders for a full blood count).

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

Table 18.1: SAND abstracts for 2002–03 and sample size for each

Abstract Number	Subject	Number of encounters	Number of GPs
38	Prevalence of chronic heart failure, its management and control	3,082	106
39	Severity of asthma, medications and management	3,070	105
40	Type 2 diabetes mellitus, prevalence and management	2,876	97
41	After-hours consultations and billing	5,546	200
42	Prevalence and management of chronic pain	2,800	99
43	Initiation and purpose of pathology orders	3,001	100
44	Severity of illness	6,742	225
45	Diabetes mellitus, management and risk factors	3,165	108
46	CHD, risk factors and lipids	3,151	108
47	Management of depression and anxiety disorders	2,698	92
48	Asthma prevalence and management	2,686	92
49	Health status and management of patients on non-steroidal anti-inflammatory drugs	5,554	192
50	Risk factors of patients on lipid lowering medications	2,701	94
51	Use of proton pump inhibitors for gastrointestinal problems	2,648	91
52	Language and cultural background of patients	8,943	294
53	Smoking status of adults and their attempts to quit (repeat from 2001–02)	2,510	97
54	Secondary prevention of heart attack or stroke	2,833	97

Participating organisations

Organisations providing funding for the BEACH program receive summary reports of the encounter data quarterly and standard reports about their subjects of interest.

The GPSCU now provides participating organisations direct access to straightforward analyses on any selected problem or medication in real time, through our interactive web server.

External purchasers of standard reports

Non-contributing organisations may purchase standard reports or other ad hoc analyses. Charges are available on request. The 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 GP.

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

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

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

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

Consultation: See *Encounter*

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

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

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

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

Direct encounters can be further divided into:

Medicare-claimable

- A1 items of service: See *A1 Medicare items*
  - S*urgery consultations:* Encounters identified by any one of MBS item numbers 3; 23; 36; 44.
  - H*ome visits:* Encounters identified by any one of MBS item numbers 4; 24; 37; 47.
  - H*ospital encounters:* Encounters identified by any one of MBS item numbers 19; 33; 40; 50.
  - N*ursing home visits:* Encounters identified by any one of MBS item numbers 20; 35; 43; 51.

- O*ther institutional visits:* Encounters identified by any one of MBS item numbers 13; 25; 38; 40.
- O*ther MBS encounters:* Encounters identified by an MBS item number that does not identify place of encounter (see *A1 Medicare items*).

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

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

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

Medication status:

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

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

Patient status: The status of the patient to the practice

- *new patient*: The patient has not been seen before in the practice.
- *old patient:* The patient has attended the practice before.

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

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 healthcare provider. Only new referrals to specialists and allied health professionals, and for hospital and nursing home admissions arising at a recorded encounter are included. Continuation referrals are not included. Multiple referrals can be recorded at any one encounter.

Rubric: The title of an individual code in ICPC–2 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

–	Not applicable
. .	Not available
ABS	Australian Bureau of Statistics
ACCHS	Aboriginal Community Controlled Health Services
AHS	Allied health service
AIHW	Australian Institute of Health and Welfare
ATC	Anatomical Therapeutic Chemical (classification)
AUDIT	Alcohol Use Disorders Identification Test
BEACH	Bettering the Evaluation And Care of Health
BMI	Body mass index
C&S	Culture and sensitivity
CAPS	Coding Atlas for Pharmaceutical Substances
CI	Confidence interval (in this report 95% CI is used)
CT	Computerised tomography
DoHA	Commonwealth Department of Health and Ageing
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
GORD	Gastro-oesophageal reflux disorder
GP	General practitioner
GPSCU	General Practice Statistics and Classification Unit, University of Sydney, a collaborating unit of the Australian Institute of Health and Welfare
HbA1c	Haemoglobin, type A1c
HIC	Health Insurance Commission
HIV	Human immunodeficiency virus
HMG-CoA	3-hydroxy-3-methylglutaryl coenzyme A
HRT	Hormone replacement therapy
ICPC	International Classification of Primary Care
ICPC–2	International Classification of Primary Care (Version 2)
ICPC–2 PLUS	An extended vocabulary of terms classified according to ICPC–2

LCL	Lower confidence limit
MBS	Medicare Benefits Schedule
MC&S	Microscopy, culture and sensitivity
MRI	Magnetic resonance imaging
NDSHS	National Drug Strategy Household Survey 2001
NEC	Not elsewhere classified
NESB	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
NHS	National Health Survey
NOS	Not otherwise specified
NSAID	Non-steroidal anti-inflammatory drugs
OTCs	Medications advised for over-the-counter purchase
PBS	Pharmaceutical Benefits Scheme
PDD	Prescribed daily dose
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
SRS	Simple random sample
UCL	Upper confidence limit
URTI	Upper respiratory tract infection
WHO	World Health Organization
WONCA	World Organization of Family Doctors

Appendices

Appendix 1: Example of a 2002–03 recording form

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

DOC ID

Encounter Number

Date of encounter ____/____/____

Date of Birth ____/____/_ _ _ _

Sex M ☐ F ☐

Patient Postcode

	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 ☐

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

Procedures, other treatments, counselling this consult for this problem

1. 2.

Diagnosis/ Problem ② :

Problem Status New ☐ Old ☐

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

Procedures, other treatments, counselling this consult for this problem

1. 2.

Diagnosis/ Problem ③ :

Problem Status New ☐ Old ☐

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

Procedures, other treatments, counselling this consult for this problem

1. 2.

Diagnosis/ Problem ④ :

Problem Status New ☐ Old ☐

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

Procedures, other treatments, counselling this consult for this problem

1. 2.

NEW REFERRALS, ADMISSIONS

Problem(s)

1. _____ 1 2 3 4

2. _____ 1 2 3 4

IMAGING/Other tests

Body site Problem(s)

1. _____ - _____ 1 2 3 4

2. _____ - _____ 1 2 3 4

PATHOLOGY

Problem(s)

1. _____ 1 2 3 4

2. _____ 1 2 3 4

3. _____ 1 2 3 4

PATHOLOGY (cont)

Problem(s)

4. _____ 1 2 3 4

5. _____ 1 2 3 4

Patient'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)

BA5

Appendix 2: GP characteristics questionnaire for 2002–03

The University of Sydney
at Westmead Hospital

General Practice Statistics and Classification Unit
Family Medicine Research Centre

a collaborating unit of the
Australian Institute of Health and Welfare

AIHW

Doctor Identification Number

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

Table A3.1: Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
REASONS FOR ENCOUNTER AND PROBLEMS MANAGED			
Abdominal pain	D01		Pain/cramps; abdominal general
	D06		Pain; abdominal localised; other
Abnormal test results	A91		Abnormal results investigations NOS
	B84		Abnormal white cells
	U98		Abnormal urine test NOS
	X86		Abnormal Pap smear
Anaemia	B80		Iron deficiency anaemia
	B81		Anaemia; vitamin B12/folate deficiency
	B82		Anaemia other/unspecified
Anxiety	P01		Feeling anxious/nervous/tense
	P74		Anxiety disorder/anxiety state
Arthritis		L70009	Arthritis; pyogenic
		L70010	Arthritis; viral
		L81003	Arthritis; traumatic
		L83010	Arthritis; spine cervical
		L84003	Arthritis; spine
		L84023	Arthritis; spine thoracic
		L84024	Arthritis; spine lumbar
		L84025	Arthritis; lumbosacral
		L84026	Arthritis; sacroiliac
		L89004	Arthritis; hip
		L90004	Arthritis; knee
		L91007	Arthritis; degenerative
		L91009	Arthritis
		L91010	Arthritis; acute
		L91011	Arthritis; allergic
		L91012	Polyarthritis
		L91013	Arthritis; hands/finger(s)
		L91014	Arthritis; wrist
		L92006	Arthritis; shoulder
		S91002	Arthritis; psoriatic
		T99063	Arthritis; crystal (excl. gout)

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Back complaint	L02		Back symptom/complaint
	L03		Low back symptom/complaint
	L86		Back syndrome with radiating pain
Check-up—all	–30		Medical examination/health evaluation, complete
	–31		Medical examination/health evaluation, partial
	X37		Pap smear
Check-up—ICPC chapter	A30; A31		General
	B30; B31		Blood
	D30; D31		Digestive
	F30; F31		Eye
	H30; H31		Ear
	K30; K31		Cardiovascular
	L30; L31		Musculoskeletal
	N30; N31		Neurological
	P30; P31		Psychological
	R30; R31		Respiratory
	S30; S31		Skin
	T30; T31		Endocrine
	U30; U31		Urology
	W30; W31		Prenatal/postnatal
	X30; X31; X37		Female genital
	Y30; Y31		Male genital
	Z30; Z31		Social
Depression	P03		Feeling depressed
	P76		Depressive disorder
Diabetes—non-gestational)	T89		Diabetes; insulin-dependent
	T90		Diabetes; non-insulin-dependent
Diabetes—all	T89		Diabetes; insulin-dependent
	T90		Diabetes; non-insulin-dependent
	W85		Gestational diabetes

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Fracture	L72		Fracture; radius/ulna
	L73		Fracture; tibia/fibia
	L74		Fracture; hand/foot bone
	L75		Fracture; femur
	L76		Fracture; other
		L84019	Fracture; compression; spine
		L99017	Fracture; non-union
		L99018	Fracture; pathological
		L99019	Fracture; malunion
		L99095	Fracture; stress
		N54005	Decompression; fracture; skull
		N80012	Fracture; skull (base)
		N80013	Fracture; skull
		N80014	Injury; head; fracture
Hypertension/high BP (RFEs)	K85		Elevated blood pressure without hypertension
	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
		W81002	Hypertension; pre-eclamptic
		W81003	Hypertension in pregnancy
Hypertension (problems)	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
		W81002	Hypertension; pre-eclamptic
		W81003	Hypertension in pregnancy
Immunisation	A44		Preventive immunisation/medication–general/unspecified
		D44002	Immunisation; typhoid
		D44003	Immunisation; mumps
		D44004	Immunisation; digestive
		D44007	Immunisation; hepatitis
		D44009	Immunisation; hepatitis A
		D44010	Immunisation; hepatitis B
		D44016	Medication; prevent; hepatitis
		D44018	Immunisation; hepatitis A & B
	N44		Preventive immunisation/medication; neurological
	R44		Preventive immunisation/medication; respiratory
Ischaemic heart disease	K74		Ischaemic heart disease without angina
	K76		Ischaemic heart disease with angina

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Menstrual problems	X02		Pain; menstrual
	X03		Pain; intermenstrual
	X05		Menstruation; absent/scanty
	X06		Menstruation; excessive
	X07		Menstruation; irregular/frequent
	X08		Intermenstrual bleeding
	X09		Premenstrual symptoms/complaint
	X10		Postponement of menstruation
Oral contraception	W10		Contraception; postcoital
	W11		Oral contraceptive
	W50		Medication; reproductive system
Osteoarthritis		L83011	Osteoarthritis; spine; cervical
		L84004	Osteoarthritis; spine
		L84009	Osteoarthritis; spine; thoracic
		L84010	Osteoarthritis; spine; lumbar
		L84011	Osteoarthritis; lumbosacral
		L84012	Osteoarthritis; sacroiliac
		L89001	Osteoarthritis; hip
		L90001	Osteoarthritis; knee
		L91001	Osteoarthritis; degenerative
		L91003	Osteoarthritis
		L91008	Heberdens nodes
		L91015	Osteoarthritis; wrist
		L92007	Osteoarthritis; shoulder
Pregnancy	W01		Question of pregnancy
	W78		Pregnancy
	W79		Unwanted pregnancy
Prescription	–50		Medication prescription/request/renewal/injection
Rash	S06		Localised redness/erythema/rash of skin
	S07		Generalised/multiple redness/erythema/rash skin
Rheumatoid arthritis	L88		Rheumatoid arthritis
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

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Reasons for encounter and problems managed (continued)			
Sprain/strain (continued)		L83025	Whiplash injury; neck old
		L84020	Sprain; back
		L84021	Strain; back
Swelling (skin)	S04		Localised swelling/papules/ lump/mass/ skin/ tissue
	S05		Generalised swelling/papules/ lumps/mass/ skin/tissue
Test results	–60		Results test/procedures
	–61		Results examinations/test/record/letter other provider
Tonsillitis	R76		Tonsillitis; acute
	R90		Hypertrophy; tonsils/adenoids
Urinary tract infection	U70		Pyelonephritis/pyelitis
	U71		Cystitis/urinary infection other
CLINICAL TREATMENTS			
Advice/education		A45002	Advice/education
		B45002	Advice/education; blood
		D45002	Advice/education; digestive
		F45002	Advice/education; eye
		H45002	Advice/education; ear
		K45002	Advice/education; cardiovascular
		L45002	Advice/education; musculoskeletal
		N45002	Advice/education; neurological
		P45001	Advice/education; psychological
		R45002	Advice/education; respiratory
		S45002	Advice/education; skin
		T45002	Advice/education; endocrine/metabolic
		U45002	Advice/education; urology
		W45004	Advice/education; reproductive
		X45002	Advice/education; genital; female
		Y45002	Advice/education; genital; male
		Z45002	Advice/education; social
Advice/education—medication		A45015	Advice/education; medication
		A48003	Review; medication
		A48005	Increased; drug dosage
		A48006	Decreased; drug dosage
		A48007	Change (in); drug dosage
		A48008	Stop medication
		A48009	Recommend medication
		A48010	Change (in); medication
		A48011	Medical; request; refusal

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical treatments (continued)		
Advice/education—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
	T45009	Advice; home glucose monitoring
Counselling/advice—alcohol	P45005	Advice/education; alcohol
	P58009	Counselling; alcohol
Counselling/advice—exercise	A45004	Advice/education; exercise
	A58005	Counselling; exercise
Counselling/advice—health/body	A45005	Advice/education; health
	A45009	Health promotion
	A45010	Information; health
	A45011	Health promotion; injury
	A45018	Advice/education; body
	A45026	Advice/education; hygiene
	A58006	Counselling; health
	A98001	Health maintenance
Counselling/advice—lifestyle	P45008	Advice/education; lifestyle
	P58012	Counselling; lifestyle
Counselling/advice—nutrition/weight	A45006	Advice/education; diet
	T45005	Advice/education; nutritional
	T45007	Advice/education; weight management
	T58002	Counselling; weight management
Counselling/advice—prevention	A45025	Advice/education; immunisation
	A58007	Counselling; prevention
	X45004	Advice/education; breast self exam
	Z45005	Advice/education; environment
Counselling/advice—smoking	P45004	Advice/education; smoking
	P58008	Counselling; smoking
Counselling—problem	A58002	Counselling; problem
	A58003	Counselling; individual
	B58001	Counselling; problem; blood/blood-forming
	D58001	Counselling; problem; digestive
	F58001	Counselling; problem; eye
	H58001	Counselling; problem; ear
	K58001	Counselling; problem; cardiovascular

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical treatments (continued)		
Counselling—problem (continued)	L58001	Counselling; problem; musculoskeletal
	N58001	Counselling; problem; neurological
	R58001	Counselling; problem; respiratory
	S58001	Counselling; problem; skin
	T58001	Counselling; problem; endocrine/metabolic
	U58001	Counselling; problem; urology
	W58003	Counselling; problem; reproductive
	X58001	Counselling; problem; genital; female
	X58003	Counselling; sexual; physical; female
	Y58001	Counselling; problem; genital; male
	Y58003	Counselling; sexual; physical; male
	Z58002	Counselling; problem; social
Counselling—psychological	P58001	Counselling; psychiatric
	P58002	Psychotherapy
	P58004	Counselling; psychological
	P58005	Counselling; sexual; psychological
	P58006	Counselling; individual; psychological
	P58007	Counselling; bereavement
	P58013	Counselling; anger
	P58014	Counselling; self-esteem
	P58015	Counselling; assertiveness
	P58018	Therapy; group
	P58019	Cognitive behavioural therapy
Family planning	A98002	Counselling; genetic female
	A98003	Counselling; genetic male
	W14002	Family planning; 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
	Y14001	Family planning; male
	Y45006	Advice/education; family plan; male
	Y45007	Advice/education; contraception; female
	Y58005	Counselling; sterilisation; male
	Y58006	Counselling; family planning; male

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical treatments (continued)		
Other admin/document	–62 (excluding sickness certificate A62008	
Reassurance support	A58010	Reassurance/support
Sickness certificate	A62008	Admin; certificate; sickness
PROCEDURES		
Incise/drainage/flushing/aspiration/ removal body fluid	–51	
Excision/removal tissue/biopsy/ destruction/debridement/cauterisation	–52	
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	
CLINICAL MEASUREMENTS		
Electrical tracings	–42	
Pap smear	X37001	Pap smear
	X37003	Test; cytology; genital; female
Physical function test	–39	
Urine test	A35001	Test; urine
	A35002	Urinalysis
	B35001	Test; urine; blood
	D35001	Test; urine; digestive
	P35001	Test; urine; psychological
	T35001	Test; urine; endocrine/metabolic
	U35002	Test; urine; urology
	W35001	Test; urine; reproductive
	Y35001	Test; urine; genital; male
REFERRALS		
Allied health services	–66	Referral to other provider/nurse/therapist/ social worker
	–68 excluding A68011; Z68003 and Z68004	Other referrals NEC
	Z67002	Referral; respite care

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Referrals (continued)		
Specialist	–67 excluding A67010; A67011; A67015; P67005 and Z67002	Referral to physician/specialist/clinic/hospital
	A68009	Referral; oncologist
Emergency department	A67011	Referral; A & E
Hospital	A67010	Referral; hospital
	A67015	Referral; hospice
	P67005	Referral; hospital; psychiatrist
Other referrals	A68011	Referral
	Z68003	Referral; financial/legal services
	Z68004	Referral; police
PATHOLOGY TEST ORDERS		
Chemistry		
Amylase	D34004	Test; amylase
B12	B34015	Test; B12
	D34009	Test; Schillings
C reactive protein	A34005	Test; C reactive protein
Calcium/phosphate	A34006	Test; calcium
	A34013	Test; phosphate
	A34024	Test; calcium phosphate
Cardiac enzymes	D34005	Test; aspartate aminotransferas
	K34003	Test; cardiac enzymes
	K34004	Test; creatine kinase
	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

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Cardiac enzymes (continued)	A34031	Test; blood alcohol
	A34032	Test; prolactin
	A34033	Test; testosterone
	A34037	Test; Glutathione S-transferase
	A34038	Test; magnesium
	A35004	Test; urine sodium
	A35007	Test; urine; albumin
	A35008	Test; albumin creatine ratio
	B34023	Test; transferrin
	D34002	Test; alanine aminotransferase
	D35002	Test; 5-HIAA
	K34001	Test; blood; digitalis
	K34006	Test; amino acids
	K34007	Test; troponin
Chemistry; other	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
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

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
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
	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
	X34006	Test; SHBG; female
	X34007	Test; free androgen index; female
	Y34004	Test; SHBG; male
	Y34005	Test; free androgen index; male
Lactose intolerance	D38002	Test; lactose intolerance

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
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
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

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Pap smear	X37001	Pap smear
	X37003	Test; cytology; genital; F
	X37004	Vault smear
Haematology		
Blood grouping & typing	B33001	Test; Coombs
	B33002	Test; blood grouping & typing
	B33009	Test; blood group
	B33013	Test; blood; cross match
Blood; other	A33042	Test; lymphocyte type & count
	A34035	Test; blood film
	A34036	Test; blood thick film
	B33003	RH; antibody titer
	B34005	Test; blood; platelets
	B34007	Test; blood; sickle cell
	B34021	Test; reticulocyte count
	B34031	Test; haemoglobin epg
	B34032	Test; packed cell volume
	B34033	Test; blood; blood
	B37001	Exam; bone marrow
Coagulation	B34003	Test; coagulation time
	B34006	Test; part thromboplastin time
	B34009	Test; prothrombin time
	B34014	Test; APTT
	B34022	Test; thrombin time
	B34025	Test; INR
	B34026	Test; fibrinogen
	B34028	Test; bleeding time
	B34029	Test; coagulation screen
	K34008	Test; D-Dimer
ESR	A34009	Test; ESR
Full blood count	A34011	Test; full blood count
Haemoglobin	B34018	Test; haemoglobin

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Histopathology		
Histology; skin	S37001	Test; histopathology; skin
Histology; other	A37001	Test; histopathology
	B37002	Test; histopathology; blood
	D37001	Test; histopathology; digestive
	F37001	Test; histopathology; eye
	H37001	Test; histopathology; ear
	K37001	Test; histopathology; cardiovas
	L37001	Test; histopathology; musculosk
	N37001	Test; histopathology; neuro
	R37001	Test; histopathology; respirat
	T37001	Test; histopathology; endo/meta
	U37001	Test; histopathology; urology
	W37001	Test; histopathology; reproduct
	X37002	Test; histopathology; genital; F
	Y37001	Test; histopathology; genital; M
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
	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

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Immunology; other (continued)	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
Cervical swab	X33004	Test; cervical swab M&C
Chlamydia	A33006	Test; chlamydia
	A33034	Test; chlamydia direct immunofl
	X33006	Test; viral culture; genital; F
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

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
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
	A33020	Test; toxoplasmosis serology
	A33033	Test; swab M&C
	A33035	Test; serology
	A33036	Antibodies screen
	A33038	Test; rapid plasma regain
	A33039	Test; viral swab M&C
	A33040	Test; viral serology
	A33043	Test; HPV
	A33044	Test; Brucella
	A33045	Test; fungal M&C

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Microbiology; other (continued)	A33046	Test; measles virus antibodies
	A33047	Test; Rickettsial serology
	A34028	Test; blood culture
	A34039	Test; Q fever
	B33004	Test; microbiology; blood
	B33010	Test; serum immunoglobulins
	D33003	Test; microbiology; digestive
	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
	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

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Monospot	A33002	Test; monospot
	A33014	Test; Paul Bunnell
	A33031	Test; Epstein Barr virus serol
	A33032	Test; Epstein Barr virus
Nose swab C&S	R33008	Test; nose swab M&C
Pertussis	R33007	Test; pertussis
Ross River fever	A33009	Test; Ross River Fever
Rubella	A33001	Test; rubella
Skin swab C&S	S33003	Test; skin swab M&C
Sputum C&S	R33005	Test; sputum M&C
Throat swab C&S	R33006	Test; throat swab M&C
Urine MC&S	U33001	Test; culture; urine
	U33004	Test; urine M&C
Vaginal swab and C&S	X33005	Test; vaginal swab M&C
Venereal disease	A33010	Test; venereal disease
	A33022	Test; syphilis serology
Simple test; other	R32002	Test; tuberculin
	B35001	Test; urine; blood
	D36003	Test; occult blood
	R32001	Test; Mantoux
Other NEC		
Blood test	A34001	Test; blood
Urine test	A35001	Test; urine
Urinalysis	A35002	Urinalysis
Faeces test	A36001	Test; faeces
Other pathology test NEC	A35006	Test; urine; FWT
	A38001	Test; other lab
	A38002	Pathology
	A38003	Test; genetic
	A38005	Test; disease screen
	B38001	Test; other lab; blood
	D34001	Test; blood; digestive
	D35001	Test; urine; digestive
	D36002	Test; faeces; digestive
	D38001	Test; other lab; digestive
	F34001	Test; blood; eye
	F38001	Test; other lab; eye
	H34001	Test; blood; ear

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Pathology test orders (continued)		
Other pathology test NEC (continued)	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
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

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Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Imaging test orders (continued)		
Diagnostic radiology (continued)	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
	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

(continued)

Table A3.1 (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)	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
	L41065	X-ray; forearm
	L41066	X-ray; leg 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

(continued)

Table A3.1 (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)	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
	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

(continued)

Table A3.1 (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)	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
	Y41008	Ultrasound; breast; male
Computerised tomography	A41013	CT scan
	A41016	CT scan; abdomen
	A41018	CT scan; chest
	A41019	CT scan; abdomen; upper
	A41020	CT scan; abdomen; lower
	D41018	CT scan; liver
	K41017	CT scan; cardiac
	L41052	CT scan; neck
	L41053	CT scan; pelvis
	L41054	CT scan; spine
	L41055	CT scan; spine; cervical
	L41056	CT scan; spine; thoracic
	L41057	CT scan; spine; lumbar
	L41058	CT scan; spine; lumbosacral
	L41059	CT scan; spine; sacrum
	L41069	CT scan; spine; thoracolumbar
	L41077	CT scan; spine; cervicothoracic
	L41080	CT scan; leg
	N41006	CT scan; brain
	N41008	CT scan; head

(continued)

Table A3.1 (continued): Code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC-2 PLUS code	ICPC-2 PLUS label
Imaging test orders (continued)		
Computerised tomography (continued)	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 (excluding the Z social chapter).

Appendix 4: Summary of annual results 1998–99 to 2002–03

Table A4.1: GP characteristics, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99		1999–00		2000–01		2001–02		2002–03		5 years	
GP characteristic	*n*[(a)]	Per cent of GPs (*n*=984)	*n*[(a)]	Per cent of GPs (*n*=1,047)	*n*[(a)]	Per cent of GPs (*n*=999)	*n*[(a)]	Per cent of GPs (*n*=983)	*n*[(a)]	Per cent of GPs (*n*=1,008)	*n*[(a)]	Per cent of GPs (*n*=5,021)
Sex (missing)	(0)	—	(0)	—	(0)	—	(0)	—	(0)	—	(0)	—
Male	689	70.0	729	69.6	683	68.4	631	64.2	653	64.8	3,385	67.4
Female	295	30.0	318	30.4	316	31.6	352	35.8	355	35.2	1,636	32.6
Age (missing)	(4)	—	(4)	—	(9)	—	(1)		(0)		(18)	
< 35 years	62	6.3	88	8.4	67	6.7	70	7.1	74	7.3	361	7.2
35–44 years	356	36.3	338	32.4	284	28.4	263	26.8	268	26.6	1,509	30.2
45–54 years	315	32.1	338	32.4	342	34.2	359	36.5	355	35.2	1,710	34.2
55+ years	247	25.2	279	26.7	297	29.7	290	29.5	311	30.9	1,423	28.4
Years in general practice (missing)	(12)	—	(8)	—	(6)	—	(4)	—	(6)	—	(36)	—
<2 years	8	0.8	7	0.7	5	0.5	3	0.3	6	0.6	29	0.6
2–5 years	59	6.1	83	8.0	64	6.4	71	7.2	75	7.5	352	7.1
6–10 years	167	17.2	166	15.9	137	13.7	132	13.4	135	13.5	737	14.8
11–19 years	328	33.7	331	31.9	299	29.9	279	28.4	281	28.0	1,518	30.5
20+ years	410	42.2	452	43.5	488	48.8	494	50.3	505	50.4	2,349	47.1
Sessions per week (missing)	(12)	—	(6)	—	(16)	—	(15)	—	(8)	—	(58)	—
<6 per week	121	12.4	159	15.3	159	15.9	157	16.0	187	18.7	784	15.8
6–10 per week	666	68.5	691	66.0	662	66.3	666	67.8	679	67.9	3,362	67.7
11+ per week	185	19.0	191	18.3	162	16.2	145	14.8	134	13.4	817	16.5

(continued)

Table A4.1 (continued): GP characteristics, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99		1999–00		2000–01		2001–02		2002–03		5 years	
GP characteristic	*n*[(a)]	Per cent of GPs (*n*=984)	*n*[(a)]	Per cent of GPs (*n*=1,047)	*n*[(a)]	Per cent of GPs (*n*=999)	*n*[(a)]	Per cent of GPs (*n*=983)	*n*[(a)]	Per cent of GPs (*n*=1,008)	*n*[(a)]	Per cent of GPs (*n*=5,021)
Size of practice (missing)	(62)	—	(5)	—	(28)	—	(4)	—	(8)	—	(121)	—
Solo	165	17.9	189	18.1	187	19.3	150	15.3	137	13.7	826	16.9
2–4 GPs	398	43.2	480	46.1	375	38.6	390	39.7	384	38.4	1,920	39.2
5+ GPs	359	38.9	373	35.8	409	42.1	439	44.7	479	47.9	2,154	44.0
Place of graduation (missing)	(4)	—	(2)	—	(0)	—	(0)	—	(0)	—	(35)	—
Australia	750	76.5	767	73.3	726	72.7	748	76.1	726	72.6	3,713	74.3
UK	88	9.0	89	8.5	82	8.2	75	7.6	92	9.1	425	8.5
Asia	84	8.6	99	9.4	47	4.7	85	8.6	100	9.9	414	8.3
Europe	24	2.4	20	1.9	19	1.9	18	1.8	16	1.6	90	1.8
Africa	15	1.5	25	2.4	15	1.5	36	3.7	43	4.3	128	2.6
New Zealand	11	1.1	16	1.5	15	1.5	5	0.5	22	2.2	68	1.4
Other	8	0.9	29	2.8	95	9.5	16	1.6	9	0.9	148	3.0
Practice location (missing)	(0)	—	(0)	—	(0)	—	(1)	—	(0)	—	(0)	—
Capital	671	68.2	683	65.2	680	68.1	681	69.3	652	64.7	3,367	67.1
Other metropolitan	74	7.5	77	7.4	69	6.9	80	8.1	86	8.5	386	7.7
Large rural	61	6.2	80	7.6	55	5.6	58	5.9	51	5.1	305	6.1
Small rural	60	6.1	65	6.2	56	5.6	48	4.9	78	7.7	307	6.1
Other rural	108	11.0	128	12.2	122	12.2	103	10.5	121	12.0	582	11.6
Remote central	5	0.5	4	0.4	10	1.0	4	0.5	6	0.6	30	0.6
Other remote, offshore	5	0.5	10	1.0	7	0.7	8	0.8	14	1.4	44	0.9

(continued)

Table A4.1 (continued): GP characteristics, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99		1999–00		2000–01		2001–02		2002–03		5 years	
GP characteristic	***n*** [(a)]	**Per cent of GPs (*n*=984)**	***n*** [(a)]	**Per cent of GPs (*n*=1,047)**	***n*** [(a)]	**Per cent of GPs (*n*=999)**	***n*** [(a)]	**Per cent of GPs (*n*=983)**	***n*** [(a)]	**Per cent of GPs (*n*=1,008)**	***n*** [(a)]	**Per cent of GPs (*n*=5,021)**
More than 50% consultations in Languages other than English	111	11.3	105	10.6	135	13.5	. .	. .	. .	. .	351	11.6*
Currently in RACGP Training Program	21	2.2	23	2.2	25	2.5	25	2.5	28	2.9	122	2.5
Completed RACGP Training Program	289	30.4	348	43.5	316	31.6	375	38.1	377	39.5	1,705	34.0
Fellow of RACGP	263	27.3	325	31.0	314	31.4	345	35.1	355	35.5	1,602	32.2
Own or co-operative after-hours arrangements	. .	. .	. .	. .	646	64.7	550	56.0	551	55.2	1,747	58.4*
Computer use	. .	. .	. .	. .	873	87.4	883	89.7	920	91.3	2,676	59.5*

(a) Missing data removed.

* Percentages based on 3 year denominator.

Table A4.2: Summary of morbidity and management, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Variable	**Rate per 100 encounters (95% CI) (*n*=96,901)**	**Rate per 100 encounters (95% CI) (*n*=104,856)**	**Rate per 100 encounters (95% CI) (*n*=99,307)**	**Rate per 100 encounters (95% CI) (*n*=96,973)**	**Rate per 100 encounters (95% CI) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=502,100)**
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)	150.9 (149.0–152.7)	150.2 (149.5–150.8)
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)	144.9 (143.0–146.8)	148.1 (147.3–148.9)
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)	57.0 (55.6–58.3)	51.2 (50.6–51.8)
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)	103.8 (101.4–106.2)	106.5 (105.5–107.5)
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)	84.3 (81.8–86.9)	89.4 (88.4–90.4)
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)	10.2 (9.2–11.1)	9.0 (8.7–9.2)
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)	9.3 (7.6–11.0)	8.1 (7.7–8.5)
Non-pharmacological 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)	51.8 (49.3–54.3)	50.9 (50.0–51.8)
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)	37.2 (35.0–39.4)	37.1 (36.3–37.9)
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)	14.6 (13.9–15.3)	13.8 (13.5–14.1)
Referrals	11.2 (10.8–11.6)	11.2 (10.8–11.7)	10.4 (10.0–10.8)	10.5 (10.1–10.9)	11.1 (10.7–11.6)	. .
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)	7.7 (7.3–8.0)	. .
Allied health services*	3.0 (2.8–3.2)	3.1 (2.9–3.4)	2.3 (2.1–2.5)	2.6 (2.3–2.9)	2.5 (2.3–2.8)	. .
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)	0.6 (0.3–0.8)	. .
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)	0.1 (0.0–0.4)	. .
Other referrals*	. .	. .	0.1 (0.0–0.6)	0.3 (0.0–0.6)	0.3 (0.0–0.5)	. .
Pathology+	24.6 (23.5–25.7)	26.3 (25.2–27.5)	29.7 (28.4–30.9)	31.0 (29.7–32.4)	32.9 (31.5–34.4)	. .
Imaging**	7.1 (6.8–7.5)	7.5 (7.1–7.8)	7.7 (7.3–8.0)	7.9 (7.6–8.2)	8.6 (8.2–9.0)	. .
Other investigations**	. .	. .	0.6 (0.4–0.8)	0.9 (0.8–1.0)	1.0 (0.8–1.2)	. .

* In the first 2 years 'allied health services' and 'other referrals' were grouped together and reported together.

\+ In the third year of BEACH the data collection and data coding system for pathology changed.

** In the first 2 years 'Imaging' and 'other investigations' were grouped and reported together.

Note: CI—confidence interval; UK—United Kingdom.

Table A4.3: Type of encounter, summary of annual results BEACH 1998–99 to BEACH 2002–03

Variable	1998–99 Rate per 100 encounters (95% CI) (*n*=96,901)	1999–00 Rate per 100 encounters (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters (95% CI) (*n*=100,987)	5 years Rate per 100 encounters (95% CI) (*n*=502,100)
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)	98.4 (98.2–98.6)	97.1 (96.9–97.2)
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)	0.5 (0.2–0.8)	0.7 (0.6–0.8)
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)	95.0 (94.6–95.3)	92.6 (92.3–92.9)
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)	1.1 (0.6–1.7)	1.2 (1.1–1.3)
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)	78.7 (77.6–79.7)	75.2 (74.7–75.7)
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)	9.1 (8.5–9.7)	9.6 (9.3–9.9)
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)	0.7 (0.0–1.5)	1.0 (0.8–1.1)
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)	1.3 (0.4–2.1)	1.7 (1.6–1.9)
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)	0.4 (0.0–2.7)	0.4 (0.3–0.5)
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)	1.2 (0.0–2.9)	1.0 (0.9–1.1)
Case conference	. .	. .	. .	0.0 (0.0–2.3)	0.0 (0.0–1.4)	. .
Care plans	. .	. .	. .	0.1 (0.0–1.7)	0.1 (0.0–1.0)	. .
Health assessments	. .	. .	. .	0.1 (0.0–0.7)	0.1 (0.0–0.6)	. .
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)	2.3 (1.1–3.5)	. .
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)	1.9 (1.6–2.2)	1.9 (1.8–2.0)
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)	1.0 (0.2–1.8)	1.8 (1.6–2.1)
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)	1.6 (1.2–2.0)	2.9 (2.8–3.1)

Note: CI—confidence interval.

Table A4.4: Characteristics of the patients at encounters, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Patient variable	**Per cent of encounters (95% CI) (*n*=96,901)**	**Per cent of encounters (95% CI) (*n*=104,856)**	**Per cent of encounters (95% CI) (*n*=99,307)**	**Per cent of encounters (95% CI) (*n*=96,973)**	**Per cent of encounters (95% CI) (*n*=100,987)**	**Per cent of encounters (95% CI) (*n*=502,100)**
Sex						
Male	42.3 (41.6–43.0)	42.7 (42.0–43.5)	42.9 (42.2–43.6)	42.6 (41.9–43.3)	42.2 (41.4–42.9)	40.9 (40.5–41.2)
Female	57.7 (57.0–58.4)	57.3 (56.5–58.0)	57.1 (56.4–57.8)	57.4 (56.7–58.1)	57.8 (57.0–58.6)	59.1 (58.8–59.5)
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)	1.9 (1.8–2.1)	2.1 (2.1–2.2)
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)	5.0 (4.7–5.3)	4.9 (4.8–5.0)
5–14 years	7.7 (7.3–8.1)	7.2 (6.9–7.5)	6.8 (6.4–7.2)	6.4 (6.1–6.7)	6.6 (6.3–6.9)	6.4 (6.3–6.6)
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)	10.1 (9.7–10.4)	9.9 (9.7–10.1)
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)	25.7 (24.9–26.4)	25.9 (25.6–26.2)
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)	26.5 (25.9–27.0)	25.7 (25.4–25.9)
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)	11.6 (11.1–12.0)	12.1 (11.9–12.3)
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)	12.7 (11.9–13.4)	13.0 (12.7–13.3)
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)	9.9 (9.0–10.8)	9.2 (8.9–9.5)
Commonwealth 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)	40.4 (38.8–41.9)	39.3 (38.7–39.9)
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)	3.3 (3.0–3.6)	3.4 (3.3–3.5)
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)	10.6 (7.8–13.4)	8.8 (8.3–9.3)
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)	0.8 (0.0–1.7)	1.0 (0.8–1.1)
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)	0.1 (0.0–0.9)	0.1 (0.1–0.1)

(a) The 1998–99 and 1999–00 results reported here are for gold card holders only.

Note: CI—confidence interval.

Table A4.5: Rate of patient reasons for encounter (RFEs) by ICPC-2 chapter, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Reasons for encounter	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters (95% CI) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=502,100)**
General & unspecified	26.6 (25.7–27.4)	29.0 (28.1–29.9)	28.3 (27.5–29.1)	30.9 (29.9–31.8)	34.6 (33.6–35.6)	31.1 (30.7–31.5)
Respiratory	24.8 (24.0–25.6)	25.3 (24.3–26.2)	24.6 (23.7–25.4)	23.4(22.6–24.2)	23.0 (22.0–24.0)	22.7 (22.4–23.0)
Musculoskeletal	16.7 (16.1–17.4)	16.6 (16.1–17.1)	17.7 (17.1–18.2)	16.7 (16.1–17.3)	17.7 (17.2–18.3)	16.9 (16.7–17.2)
Skin	15.1 (14.6–15.5)	15.1 (14.7–15.6)	15.5 (15.0–16.0)	14.4 (13.9–14.9)	14.7 (14.3–15.2)	15.0 (14.8–15.2)
Circulatory	11.4 (10.9–12.0)	11.2 (10.6–11.8)	11.7 (11.1–12.2)	11.4 (10.8–11.9)	10.6 (10.0–11.1)	11.4 (11.2–11.6)
Digestive	10.6 (10.3–10.9)	10.4 (10.0–10.7)	11.1 (10.7–11.5)	10.6 (10.2–11.0)	10.4 (10.0–10.8)	10.4 (10.3–10.5)
Psychological	7.6 (7.2–8.0)	7.2 (6.8–7.6)	8.1 (7.7–8.6)	7.8 (7.3–8.3)	7.3 (6.9–7.8)	8.0 (7.8–8.2)
Endocrine & metabolic	5.6 (5.3–5.9)	5.4 (5.1–5.7)	6.2 (5.9–6.5)	6.4 (6.1–6.7)	6.0 (5.7–6.3)	6.0 (5.8–6.1)
Female genital system	5.3 (5.0–5.7)	5.3 (4.9–5.7)	5.5 (5.1–5.9)	5.5 (5.1–5.9)	6.1 (5.7–6.6)	6.4 (6.2–6.6)
Neurological	5.3 (5.1–5.5)	5.6 (5.4–5.8)	5.8 (5.5–6.0)	5.4 (5.2–5.6)	5.7 (5.5–6.0)	5.5 (5.4–5.6)
Ear	4.5 (4.3–4.7)	4.2 (4.0–4.4)	4.2 (4.0–4.3)	4.2 (4.0–4.4)	4.0 (3.8–4.1)	4.1 (4.0–4.2)
Pregnancy & family planning	3.4 (3.4–4.0)	3.8 (3.5–4.2)	3.5 (3.2–3.8)	3.5 (3.2–3.8)	3.6 (3.3–3.9)	3.9 (3.7–4.0)
Eye	2.7 (2.7–3.0)	2.8 (2.7–3.0)	2.7 (2.5–2.8)	2.5 (2.4–2.7)	2.7 (2.6–2.9)	2.7 (2.6–2.7)
Urology	2.5 (2.3–2.6)	2.6 (2.5–2.8)	2.4 (2.3–2.6)	2.5 (2.4–2.7)	2.5 (2.3–2.6)	2.5 (2.5–2.6)
Blood	1.8 (1.6–2.0)	2.1 (1.9–2.3)	2.0 (1.8–2.2)	1.1 (0.9–1.2)	1.0 (0.8–1.2)	1.6 (1.5–1.6)
Male genital system	1.1 (0.9–1.2)	1.0 (0.9–1.1)	1.1 (1.0–1.3)	1.0 (0.9–1.1)	1.0 (0.9–1.2)	1.0 (1.0–1.1)
Social problems	0.9 (0.7–1.1)	1.0 (0.8–1.1)	0.9 (0.7–1.1)	1.0 (0.8–1.1)	1.0 (0.8–1.2)	1.1 (1.0–1.1)
Total RFEs	**146.3 (144.6–148.0)**	**148.5 (146.7–150.2)**	**151.0 (149.2–152.8)**	**149.2 (147.4–150.9)**	**150.9 (149.0–152.7)**	**150.2 (149.5–150.8)**

(a) Figures do not total 100% as more than one RFEs can be recorded for each encounter.

Note: CI—confidence interval.

Table A4.6: Rate of RFEs by ICPC–2 component, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
ICPC–2 component	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters (95% CI) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=753,925)**
Symptoms & complaints	71.1 (69.4–72.9)	73.4 (71.5–75.3)	76.6 (74.6–78.6)	74.1 (72.3–75.9)	74.0 (72.0–76.1)	72.5 (71.8–73.1)
Diagnosis, diseases	33.6 (31.9–35.2)	27.7 (26.2–29.2)	29.0 (27.6–30.5)	27.3 (25.9–28.7)	26.0 (24.6–27.4)	28.5 (28.0–29.1)
Diagnostic & preventive procedures	22.4 (21.5–23.3)	22.9 (22.0–23.8)	22.3 (21.4–23.2)	22.7 (21.7–23.6)	23.8 (22.8–24.7)	24.1 (23.7–24.5)
Medications, treatments & therapeutics	10.3 (9.8–10.9)	12.0 (11.4–12.6)	11.2 (10.6–11.8)	11.9 (11.3–12.4)	13.0 (12.4–13.6)	12.2 (11.9–12.4)
Referral & other RFEs	4.4 (4.0–4.7)	7.2 (6.7–7.7)	6.5 (6.0–7.0)	7.2 (6.7–7.7)	7.0 (6.6–7.5)	6.9 (6.7–7.1)
Results	3.4 (3.1–3.7)	4.0 (3.7–4.3)	4.2 (3.9–4.6)	4.7 (4.4–5.1)	5.4 (5.0–5.7)	4.6 (4.4–4.7)
Administrative	1.1 (0.9–1.2)	1.3 (1.1–1.4)	1.1 (0.9–1.3)	1.3 (1.1–1.5)	1.6 (1.4–1.8)	1.4 (1.3–1.4)
Total RFEs	**146.3 (144.6–148.0)**	**148.5 (146.7–150.2)**	**151.0 (149.2–152.8)**	**149.2 (147.4–150.9)**	**150.9 (149.0–152.7)**	**150.2 (149.5–150.8)**

(a) Figures do not total 100% as more than one RFEs can be recorded for each encounter.

Note: CI—confidence interval.

Table A4.7: Distribution of problems managed, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Problem managed	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters (95% CI) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=502,100)**
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)	20.6 (20.0–21.3)	21.7 (21.4–21.9)
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)	17.1 (16.5–17.6)	17.4 (17.1–17.6)
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)	16.5 (16.0–17.0)	16.6 (16.4–16.8)
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)	16.0 (15.3–16.7)	16.6 (16.3–16.9)
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)	15.8 (15.2–16.3)	15.0 (14.8–15.3)
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)	10.3 (9.8–10.8)	11.3 (11.1–11.6)
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)	10.1 (9.8–10.4)	10.0 (9.9–10.2)
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)	10.6 (10.2–11.0)	9.9 (9.8–10.1)
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)	6.7 (6.2–7.1)	7.3 (7.1–7.5)
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)	4.0 (3.8–4.2)	4.3 (4.2–4.4)
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)	4.2 (3.8–4.5)	4.3 (4.2–4.5)
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)	4.2 (4.0–4.4)	4.0 (3.9–4.1)
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)	2.8 (2.7–3.0)	3.0 (2.9–3.0)
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)	2.6 (2.5–2.7)	2.7 (2.6–2.7)
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)	1.4 (1.2–1.5)	1.6 (1.5–1.7)
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)	1.4 (1.3–1.6)	1.4 (1.3–1.4)
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)	0.7 (0.5–0.9)	0.9 (0.9–1.0)
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)**	**144.9 (143.0–146.8)**	**148.1 (147.3–148.9)**

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

Note: CI—confidence interval.

Table A4.8: Most frequently managed problems, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Problem managed	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*= 100,987)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=502,100)**
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)	8.9 (8.4–9.3)	8.8 (8.6–9.0)
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)	6.4 (5.9–6.8)	6.0 (5.9–6.2)
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)	4.6 (4.2–5.1)	4.8 (4.6–5.0)
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)	3.5 (3.3–3.8)	3.8 (3.7–3.9)
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)	2.6 (2.3–2.8)	2.8 (2.7–2.8)
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)	2.7 (2.5–2.9)	2.9 (2.8–3.0)
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)	2.6 (2.3–2.8)	2.6 (2.5–2.7)
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)	2.9 (2.7–3.1)	2.8 (2.7–2.9)
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)	3.0 (2.8–3.2)	2.8 (2.7–2.9)
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)	2.6 (2.4–2.8)	2.4 (2.4–2.5)
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)**	**144.9 (143.0–146.8)**	**148.1 (147.3–148.9)**

(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 A4.9: Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1998–99 to BEACH 2002–03

Group and subgroup	1998–99 Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)	1999–00 Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)	2000–01 Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)	2001–02 Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)	2002–03 Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)	5 years Rate per 100 encounters[(a)] (95% CI) (*n*=502,100)
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)	13.8 (13.2–14.4)	14.9 (14.6–15.1)
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)	4.7 (4.4–5.1)	5.1 (5.0–5.3)
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)	3.0 (2.8–3.2)	2.7 (2.6–2.8)
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)	2.8 (2.6–3.0)	3.2 (3.1–3.3)
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)	1.2 (1.0–1.4)	1.4 (1.3–1.4)
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)	0.9 (0.7–1.0)	1.1 (1.0–1.2)
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)	13.1 (12.3–13.9)	13.7 (13.3–14.0)
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)	7.3 (6.8–7.8)	7.3 (7.2–7.5)
Other cardiovascular 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)	2.6 (2.4–2.8)	2.5 (2.4–2.5)
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)	0.8 (0.6–1.1)	1.2 (1.1–1.2)
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)	1.5 (1.3–1.7)	1.7 (1.6–1.8)
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)	10.5 (10.0–11.1)	10.7 (10.5–10.9)
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)	3.9 (3.4–4.3)	4.2 (4.0–4.3)
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)	2.4 (2.2–2.6)	2.7 (2.6–2.8)
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)	2.2 (1.9–2.6)	1.7 (1.5–1.8)
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)	1.3 (1.2–1.5)	1.4 (1.3–1.5)
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)	7.0 (6.6–7.4)	7.6 (7.5–7.8)
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)	1.7 (1.6–1.9)	1.9 (1.9–2.0)
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)	1.9 (1.7–2.1)	2.0 (1.9–2.1)
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)	2.9 (2.7–3.1)	3.1 (3.0–3.2)

(continued)

Table A4.9 (continued): Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Group and subgroup	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=502,100)**
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)	5.3 (4.9–5.7)	6.0 (5.9–6.2)
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)	2.5 (2.2–2.7)	3.0 (2.9–3.1)
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)	2.0 (1.9–2.2)	2.2 (2.1–2.3)
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)	5.4 (5.1–5.7)	6.0 (5.9–6.1)
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)	1.8 (1.6–1.9)	2.2 (2.1–2.3)
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)	1.1 (0.9–1.2)	1.3 (1.2–1.3)
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)	1.9 (1.6–2.2)	1.9 (1.8–2.0)
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)	0.6 (0.5–0.8)	0.6 (0.6–0.7)
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)	5.7 (5.4–6.0)	5.8 (5.7–5.9)
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)	4.8 (4.5–5.0)	4.8 (4.7–4.9)
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)	4.8 (4.3–5.3)	4.8 (4.6–4.9)
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)	0.5 (0.0–1.0)	0.6 (0.5–0.6)
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)	4.2 (3.7–4.7)	4.1 (3.9–4.3)
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)	3.9 (3.7–4.2)	4.3 (4.2–4.4)
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)	0.7 (0.5–0.8)	0.8 (0.8–0.9)
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)	2.6 (2.5–2.8)	2.7 (2.7–2.8)
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)	0.6 (0.4–0.8)	0.7 (0.6–0.8)
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)	3.9 (3.6–4.1)	4.0 (3.9–4.1)
Anti-spasmodics	0.5 (0.3–0.6)	0.4 (0.3–0.6)	0.3 (0.1–0.5)	0.2 (0.0–0.4)	0.2 (0.0–0.4)	0.3 (0.3–0.4)
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)	2.4 (2.2–2.6)	2.2 (2.2–2.3)
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)	0.5 (0.3–0.7)	0.5 (0.4–0.6)

(continued)

Table A4.9 (continued): Distribution of medications prescribed by group and subgroup, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Group and subgroup	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=502,100)**
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)	1.7 (1.5–1.9)	2.1 (2.0–2.1)
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)	1.1 (0.9–1.3)	1.5 (1.4–1.6)
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)	1.6 (1.4–1.7)	2.0 (2.0–2.1)
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)	0.9 (0.7–1.0)	0.9 (0.9–1.0)
Topical nasal	1.3 (1.1–1.4)	1.5 (1.3–1.7)	1.3 (1.2–1.50	0.9 (0.7–1.0)	0.7 (0.5–0.9)	1.1 (1.1–1.2)
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)	1.7 (1.5–1.9)	1.8 (1.7–1.9)
Oral/systemic 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)	1.7 (1.5–1.9)	1.8 (1.7–1.9)
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)	1.7 (1.6–1.9)	1.8 (1.7–1.8)
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)	1.0 (0.9–1.2)	0.9 (0.8–1.0)
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)	1.6 (1.5–1.8)	1.6 (1.5–1.6)
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)	1.0 (0.9–1.2)	1.0 (0.9–1.0)
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)	1.6 (1.4–1.8)	1.5 (1.4–1.6)
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)	0.5 (0.3–0.7)	0.6 (0.5–0.7)
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)	0.3 (0.1–0.6)	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 A4.10: Most frequently prescribed medications, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Generic drug	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters[(a)] (95% CI) (*n*= 502,100)**
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)	3.1 (2.7–3.6)	3.4 (3.2–3.5)
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)	3.1 (2.8–3.5)	2.9 (2.8–3.0)
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)	2.0 (1.8–2.2)	2.2 (2.1–2.3)
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)	1.7 (1.5–1.9)	2.0 (1.9–2.0)
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)	1.0 (0.7–1.3)	0.7 (0.5–0.9)
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)	1.9 (1.7–2.1)	1.9 (1.9–2.0)
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)	1.3 (1.1–1.6)	1.6 (1.5–1.7)
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)	1.6 (1.4–1.8)	1.5 (1.5–1.6)
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)	1.4 (0.6–2.3)	1.5 (1.2–1.9)
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)	1.2 (1.0–1.3)	1.4 (1.3–1.5)
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)	0.7 (0.5–0.9)	1.0 (0.9–1.1)
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)	1.1 (1.0–1.3)	1.3 (1.2–1.3)
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)	0.7 (0.5–0.9)	0.9 (0.8–1.0)
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)	1.0 (0.8–1.2)	1.1 (1.0–1.2)
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)	0.5 (0.3–0.7)	0.7 (0.6–0.8)
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)	0.5 (0.3–0.6)	1.8 (0.8–0.9)
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)	0.8 (0.6–1.0)	0.9 (0.9–1.0)
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)	0.7 (0.5–0.9)	0.8 (0.7–0.9)
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)	0.7 (0.6–0.9)	0.9 (0.8–0.9)
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)	0.9 (0.7–1.0)	0.9 (0.8–1.0)
Chloramphenicol eye	0.9 (0.8–1.1)	0.9 (0.8–1.0)	0.9 (0.7–1.0)	0.8 (0.7–0.9)	0.9 (0.8–1.1)	0.8 (0.8–0.9)
Metformin	0.7 (0.5–0.9)	0.7 (0.5–0.9)	0.8 (0.6–1.0)	0.9 (0.8–1.1)	0.8 (0.7–1.0)	0.8 (0.7–0.8)
Atorvastatin	0.6 (0.4–0.8)	0.8 (0.6–0.9)	0.9 (0.8–1.0)	1.0 (0.9–1.2)	1.0 (0.9–1.2)	0.9 (0.8–1.0)

(continued)

Table A4.10 (continued): Most frequently prescribed medications, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Generic drug	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=502,100)**
Omeprazole	0.5 (0.3–0.6)	0.4 (0.3–0.6)	0.5 (0.3–0.6)	0.8 (0.7–1.0)	0.8 (0.7–1.0)	0.8 (0.8–0.9)
Irbesartan	0.5 (0.3–0.8)	0.7 (0.5–0.9)	0.8 (0.6–0.9)	0.8 (0.6–0.9)	0.8 (0.7–1.0)	0.7 (0.6–0.8)
Tramadol	0.0 (0.0–0.0)	0.1 (0.0–1.1)	0.2 (0.0–0.5)	0.7 (0.4–0.9)	1.0 (0.8–1.1)	0.3 (0.2–0.5)
Celecoxib	. .	0.2 (0.0–0.6)	2.1 (1.9–2.4)	1.4 (1.3–1.6)	1.1 (0.9–1.2)	1.0 (0.9–1.1)
Rofecoxib	. .	. .	0.1 (0.0–0.8)	1.2 (1.0–1.5)	1.2 (0.9–1.4)	0.5 (0.3–0.6)
Fluticasone/salmeterol	. .	. .	0.2 (0.0–0.6)	0.6 (0.4–0.8)	0.9 (0.7–1.1)	0.3 (0.2–0.4)
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)**	**84.3 (81.8–86.9)**	**89.4 (88.4–90.4)**

(a) Column will not add to 100 because multiple prescriptions could be written at each encounter.

Note: CI—confidence interval.

Table A4.11: Distribution of medications prescribed by ATC medication group, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
ATC medication group	**Rate per 100 encounters (95% CI) (*n*=96,901)**	**Rate per 100 encounters (95% CI) (*n*=104,856)**	**Rate per 100 encounters (95% CI) (*n*=99,307)**	**Rate per 100 encounters (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=502,100)**
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)	6.0 (5.5–6.5)	6.5 (6.4–6.7)
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)	5.9 (5.5–6.3)	5.7 (5.6–5.9)
Antiinflammatory/antirheumatic non-steroid	4.5 (4.2–4.7)	4.5 (4.3–4.8)	5.7 (5.4–6.0)	5.3 (5.0–5.5)	4.8 (4.5–5.0)	4.8 (4.7–4.9)
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)	3.0 (2.8–3.2)	3.4 (3.3–3.5)
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)	2.5 (2.3–2.7)	3.0 (2.9–3.1)
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)	3.0 (2.8–3.3)	3.0 (2.9–3.1)
Macrolides /lincosamides/streptogramins	2.9 (2.7–3.2)	2.8 (2.6–3.0)	2.8 (2.5–3.0)	2.4 (2.2–2.6)	2.3 (2.0–2.5)	2.6 (2.5–2.6)
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)	2.9 (2.7–3.1)	3.1 (3.0–3.2)
Other inhalants for obstructive airway diseases	2.8 (2.6–3.0)	3.0 (2.8–3.3)	2.3 (2.1–2.5)	1.9 (1.7–2.1)	3.0 (2.8–3.3)	2.3 (2.2–2.3)
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)	2.4 (2.0–2.9)	2.6 (2.4–2.7)
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)	2.2 (2.0–2.3)	2.2 (2.2–2.3)
Drugs for peptic ulcer and GORD	2.2 (2.1–2.4)	2.2 (2.0–2.4)	2.2 (2.0–2.3)	2.4 (2.2–2.5)	2.4 (2.2–2.6)	2.2 (2.2–2.3)
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)	1.9 (1.7–2.1)	2.0 (1.9–2.1)
Hypnotics & sedatives	1.9 (1.8–2.2)	1.9 (1.7–2.1)	1.9 (1.7–2.1)	1.9 (1.7–2.1)	1.7 (1.5–1.9)	1.9 (1.8–2.0)
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)	2.4 (2.2–2.6)	2.2 (2.2–2.3)
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)	1.6 (1.4–1.8)	1.8 (1.7–1.8)
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)	1.9 (1.7–2.1)	2.0 (1.9–2.1)
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)	1.3 (1.1–1.5)	1.6 (1.5–1.6)
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)	2.2 (2.0–2.5)	1.8 (1.7–2.0)
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)	1.6 (1.3–1.8)	1.5 (1.4–1.6)
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)**	**84.3 (81.8–86.9)**	**89.4 (88.4–90.4)**

Note: CI—confidence interval.

Table A4.12: 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	2002–03	5 years
Generic medication	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters (95% CI) (*n*=104,856)**	**Rate per 100 encounters (95% CI) (*n*=99,307)**	**Rate per 100 encounters (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=502,100)**
Paracetamol	2.4 (1.8–2.9)	2.5 (2.0–3.0)	2.4 (1.8–2.9)	2.1 (1.7–2.6)	2.6 (2.1–3.0)	2.2 (2.1–2.4)
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)	0.1 (0.0–0.7)	0.1 (0.0–0.3)
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)	0.2 (0.0–0.4)	0.2 (0.1–0.3)
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)	0.1 (0.0–0.5)	0.2 (0.1–0.4)
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)	0.7 (0.1–1.3)	0.4 (0.3–0.5)
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)	0.3 (0.0–0.6)	0.2 (0.1–0.4)
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)	0.2 (0.0–0.5)	0.2 (0.1–0.3)
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)	0.2 (0.0–0.4)	0.2 (0.1–0.3)
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)	0.1 (0.0–0.6)	0.1 (0.0–0.3)
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)**	**10.2 (9.2–11.1)**	**9.0 (8.8–9.3)**

(a) Only those medications supplied at a rate of 0.2 per 100 encounters or more in 1998–99 are included.

Note: CI—confidence interval.

Table A4.13: 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	2002–03	5 years
Generic medication	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters (95% CI) (*n*=104,856)**	**Rate per 100 encounters (95% CI) (*n*=99,307)**	**Rate per 100 encounters (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters (95% CI) (*n*=502,100)**
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)	0.7 (0.0–0.9)	0.8 (0.3–1.3)
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)	0.1 (0.0–0.6)	0.3 (0.1–0.4)
Polio vaccine oral sabin/injection	0.4 (0.1–0.6)	0.4 (0.1–0.7)	0.3 (0.0–0.6)	0.3 (0.0–0.7)	0.3 (0.0–0.7)	0.3 (0.2–0.5)
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)	0.2 (0.0–0.6)	0.2 (0.1–0.4)
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)	0.1 (0.0–0.4)	0.2 (0.0–0.3)
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)	0.1 (0.0–0.5)	0.2 (0.1–0.3)
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)	0.1 (0.0–0.4)	0.2 (0.0–0.3)
Celecoxib	. .	. .	0.3 (0.0–0.7)	0.2 (0.0–0.5)	0.1 (0.0–0.5)	0.1 (0.0–0.3)
Rofecoxib	. .	. .	. .	0.3 (0.0–0.5)	0.2 (0.0–0.6)	0.1 (0.0–0.3)
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)**	**9.3 (7.6–11.0)**	**8.1 (7.7–8.6)**

(a) 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 years after acceptance on the PBS.

Note: CI—confidence interval.

Table A4.14: The ten most common problems managed with a clinical treatment, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
Problem managed	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,901)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=104,856)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=99,307)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=96,973)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=100,987)**	**Rate per 100 encounters[(a)] (95% CI) (*n*=502,100)**
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)	1.7 (1.5–2.0)	1.9 (1.8–2.0)
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)	1.8 (1.5–2.2)	1.5 (1.5–1.6)
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)	1.5 (1.1–1.9)	1.3 (1.2–1.3)
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)	0.7 (0.5–0.9)	0.8 (0.8–0.9)
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)	0.9 (0.7–1.1)	0.9 (0.8–0.9)
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)	0.8 (0.7–1.0)	0.8 (0.8–0.9)
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)	0.6 (0.4–0.8)	0.5 (0.5–0.6)
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)	0.6 (0.3–0.8)	0.6 (0.6–0.6)
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)	0.6 (0.3–0.8)	0.6 (0.6–0.6)
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)	0.4 (0.4–0.5)	0.5 (0.5–0.6)
Total problems managed with clinical treatment	**28.7 (27.3–30.2)**	**30.4 (28.9–31.9)**	**32.8 (31.1–34.5)**	**33.5 (31.8–35.2)**	**32.8 (31.0–34.7)**	**33.2 (32.5–33.9)**

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

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

Note: CI—confidence interval.

Table A4.15: Number of encounters where pathology, imaging ordered, summary of annual results BEACH 1998–99 to BEACH 2002–03

	1998–99	1999–00	2000–01	2001–02	2002–03	5 years
	Per cent of encounters (95% CI) (*n*=96,901)	Per cent of encounters (95% CI) (*n*=104,856)	Per cent of encounters (95% CI) (*n*=99,307)	Per cent of encounters (95% CI) (*n*=96,973)	Per cent of encounters (95% CI) (*n*=100,987)	Per cent of encounters (95% CI) (*n*=502,100)
No tests ordered	81.9 (81.3–82.5)	81.1 (80.5–81.7)	80.7 (80.1–81.3)	80.8 (80.2–81.4)	79.7 (79.0–80.3)	79.8 (79.5–80.1)
At least one pathology test ordered	13.2 (12.8–13.7)	13.8 (13.3–14.3)	13.8 (13.3–14.3)	14.0 (13.5–14.5)	14.7 (14.2–15.3)	14.9 (14.7–15.1)
At least one imaging ordered	6.3 (6.0–6.6)	6.7 (6.4–7.0)	6.8 (6.5–7.1)	6.9 (6.6–7.2)	7.5 (7.1–7.8)	7.1 (7.0–7.3)

Note: CI—confidence interval.

Table A4.16 (a): Distribution of pathology orders across pathology groups, summary of annual results BEACH 1998–99 to BEACH 2000–01

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

(a) Data collection method and coding system changed at the end of the third year of BEACH. Years 1 and 2 are not comparable with years 3 to 5.

Note: CI—confidence interval.

Table A4.16 (b): Distribution of pathology orders across pathology groups, summary of annual results BEACH 2000–01 to BEACH 2002–03

	2000–01[(a)]	2001–02	2002–03	3 years
Pathology test ordered	**Rate per 100 encs (95% CI) (*n*=99,307)**	**Rate per 100 encs (95% CI) (*n*=97,973)**	**Rate per 100 encs (95% CI) (*n*=100,987)**	**Rate per 100 encs (95% CI) (*n*=297,267)**
Chemical	15.7 (14.8–16.5)	16.5 (15.6–17.3)	17.7 (16.8–18.6)	16.6 (16.1–17.1)
Haematology	5.8 (5.5–6.2)	6.2 (5.8–6.5)	6.3 (5.9–6.6)	6.1 (5.9–6.3)
Microbiology	4.6 (4.3–4.9)	4.9 (4.5–5.2)	5.1 (4.8–5.5)	4.9 (4.7–5.0)
Cytology	1.5 (1.2–1.8)	1.6 (1.3–1.8)	1.7 (1.4–1.9)	1.6 (1.4–1.7)
Other NEC	0.8 (0.4–1.1)	0.7 (0.5–0.9)	0.8 (0.4–1.1)	0.7 (0.6–0.9)
Infertility/pregnancy	0.3 (0.0–0.6)	0.3 (0.1–0.5)	0.3 (0.1–0.5)	0.3 (0.1–0.4)
Tissue pathology	0.5 (0.2–0.7)	0.5 (0.1–0.8)	0.5 (0.2–0.8)	0.5 (0.3–0.7)
Immunology	0.5 (0.2–0.8)	0.5 (0.3–0.7)	0.5 (0.2–0.7	0.5 (0.3–0.6)
Simple test; other	0.1 (0.0–0.5)	0.1 (0.0–0.4)	0.1 (0.0–0.4)	0.1 (0.0–0.3)
Total pathology tests	**29.7 (28.4–30.9)**	**31.0 (29.7–32.4)**	**32.9 (31.5–34.4)**	**31.2 (30.4–32.0)**

(a) Data collection and coding method changed at the end of the third year of BEACH. Years 1 and 2 are not comparable with years 3 to 5.

Note: Encs—encounters; CI—confidence interval.

Table A4.17 (a): Most frequent imaging tests ordered, BEACH 1998–99 and 1999–00

	1998–99	1999–00[(a)]
Imaging test ordered	**Rate per 100 encounters (95% CI) (*n*=96,901)**	**Rate per 100 encounters (95% CI) (*n*=104,856)**
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)**

(a) Data collection and coding method changed at the end of the second BEACH year. Years 1 and 2 are not comparable with years 3 and 4.

Note: CI—confidence interval.

Table A4.17 (b): Most frequent imaging tests ordered BEACH 2000–01 and 2002–03

	1999–00[(a)]	2000–01	2001–02	2002–03	4 years
Imaging test ordered	**Rate per 100 encs (95% CI) (*n*=104,856)**	**Rate per 100 encs (95% CI) (*n*=99,307)**	**Rate per 100 encs (95% CI) (*n*=96,973)**	**Rate per 100 encs (95% CI) (*n*=100,987)**	**Rate per 100 encs (95% CI) (*n*=402,119)**
Diagnostic radiology	4.8 (4.5–5.1)	4.8 (4.6–5.1)	4.6 (4.4–4.8)	5.1 (4.9–5.4)	4.8 (4.7–5.0)
Ultrasound	1.9 (1.8–2.1)	2.1 (2.0–2.3)	2.5 (2.3–2.7)	2.6 (2.5–2.8)	2.3 (2.2–2.4)
Computerised tomography	0.6 (0.5–0.8)	0.7 (0.6–0.8)	0.8 (0.6–0.9)	0.8 (0.7–0.9)	0.7 (0.6–0.8)
Nuclear medicine imaging	0.0 (0.0–0.6)	0.0 (0.0–0.4)	0.0 (0.0–0.4)	0.0 (0.0–0.4)	0.0 (0.0–0.2)
Magnetic resonance imaging	0.0 (0.0–0.5)	0.0 (0.0–0.4	0.0 (0.0–0.5)	0.0 (0.0–0.6)	0.0 (0.0–0.3)
Total imaging tests	**7.4 (7.1–7.8)**	**7.7 (7.3–8.0)**	**7.9 (7.6–8.2)**	**8.6 (8.2–9.0)**	**7.9 (7.7–8.1)**

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