General practice activity in Australia 1998–99

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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.

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Bettering the Evaluation And Care of Health

General Practice Activity in Australia 1998–99

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Foreword

Almost all of us visit a general practitioner at least once in any two year period, most of us much more frequently. General practice is our usual point of entry into a complex health service. Thereafter we may need tests by pathologists or radiologists, opinions and treatment from medical specialists or allied health professionals, access to community services, or on occasions to be admitted to hospital. General practitioners have a pivotal role as gate-keepers and in coordinating our care in the health service.

Over the last forty years there have been only three major national studies of the activities of general practice, the last being almost a decade ago. In 1995 the urgent need for the collection of standardised information about primary care was identified as one of the highest priorities in the National Health Information Development Plan.

The Australian Institute of Health and Welfare is responsible for the development and provision of authoritative and timely information on the health and welfare of Australians. To date assessment of Australia's health has by necessity relied on self report through the ABS National Health Survey, and on Health Insurance Commission data which tell us about service utilisation. Data from hospitals, disease registers and mortality statistics have provided information about those with serious disease but not about the many health problems faced every day, often managed solely by general practitioners.

The Australian Institute of Health and Welfare, recognising the expertise and international reputation of the University of Sydney's Family Medicine Research Centre in this field, collaborated with the University to form the General Practictioner Statistics and Classification Unit (GPSCU). The GPSCU's primary responsibility is to make good the need for information about general practice.

The BEACH program operates on a continuous basis and relies on the efforts of about 1,000 general practitioners per year to record the information. I thank and congratulate the participating general gractitioners for recognising the need for such data and generously contributing their time.

This report describes general practice activity drawn from the first year of the BEACH program. It demonstrates the immense breadth of general practice- from the management of acute to chronic conditions, from minor illness to severe morbidity, from screening and prevention to the care of the terminally ill. It also gives us an insight into the management of these problems – the complex mix of pharmaceutical prescribing with therapeutic procedures and the provision of counseling, advice and support.

BEACH is an extension of the Family Medicine Research Centre's earlier work and includes new developments in classification and more sophisticated analytical techniques than earlier studies. It informs us about some aspects of health care where previously we have known nothing, such as the extent to which GPs provide care to our Indigenous population, the amount of work-related problems managed in primary care and extent to which GPs provide clinical services that are not covered by Medicare.

This report will provide general practice with a rich data source from which it may identify its strengths and weaknesses and build for its further growth. It will help us identify issues for teaching and research. For many others interested in health services research, population health, the burden of disease or the quality of health care, this report will be a valuable resource.

I congratulate the research team on this first years report and look forward to seeing many more reports of the BEACH data through the continued successful collaboration of the University with the AIHW.

Professor Stephen Leeder

Dean

Faculty of Medicine

University of Sydney

Contents

Foreword ..... **v**

List of tables ..... **x**

List of figures ..... **xii**

Summary ..... **xiv**

Acknowledgments ..... **xvii**

1. Introduction **1**

1.1 Aims 2

2. Methods **3**

2.1 Development of the BEACH methods 3

2.2 BEACH methods 4

3. The general practitioners **12**

3.1 Results of recruitment 12

3.2 The participating GPs 12

3.3 Comparison between participating and non-participating GPs 14

4. Representativeness **16**

4.1 Comparison of BEACH GPs with the national GP population 16

4.2 Comparison of BEACH consultations with all GP consultations in Australia 18

4.3 Sample weights 19

4.4 The weighted dataset 20

5. The encounters **21**

5.1 Overview of the dataset 21

5.2 Encounter type 22

6. The patients **24**

6.1 Patient characteristics 24

6.2 Patient reasons for encounter 29

7. Problems managed **39**

7.1 All problems 39

7.2 New problems 46

7.3 The inter-relationship of a problem managed with other variables. Example: Depression 48

8. Management **52**

8.1 Overview of management 52

8.2 Patterns of pharmacological and non-pharmacological treatment 54

9. Medications **55**

9.1 Source of medications 55

9.2 The inter-relationship of a medication with other variables. Example: Cephalosporins 58

9.3 Prescribed drugs 60

9.4 Advised drugs for over the counter purchase 72

9.5 General practitioner supplied drugs 78

10. Non-pharmacological management **84**

10.1 Clinical treatments 85

10.2 Procedural treatments 92

11. Referrals and admissions **96**

11.1 Number of referrals and admissions 96

11.2 Age–sex specific rates of referrals 97

11.3 Most frequent referrals 98

11.4 Problems that were referred 100

11.5 The inter-relationship of referrals with other variables 104

12. Investigations **108**

12.1 Pathology ordering 108

12.2 Imaging ordering 115

13. Changes since 1991 ..... **122**

13.1 Characteristics of participating GPs 123

13.2 Distribution of services 124

13.3 Age and sex of patient 125

13.4 Comparison of problems managed 126

13.5 Comparison of medications prescribed 130

13.6 Conclusion....133

14. Selected topics....134

14.1 Encounters with Indigenous people....134

14.2 Indirect encounters....140

14.3 The gender of the GP....143

14.4 State/Territory data based on patient residence....150

15. Conclusion....154

15.1 Access to the BEACH data....155

Appendices....I

Appendix I. Example of a recording form....II

Appendix II. GP characteristics questionnaire....III

Appendix III. Reasons for encounter and problems managed—code groups from ICPC-2 and ICPC-2 PLUS....IV

Appendix IV. Non-pharmacological treatment code groups from ICPC-2 PLUS....IX

Appendix V. Referrals—code groups from ICPC-2 and ICPC-2 PLUS....XXIII

Appendix VI. Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS XXIV

Appendix VII. Imaging test orders—code groups from ICPC-2 and ICPC-2 PLUS.. XXXI

Glossary....XXXIV

Abbreviations....XXXVII

Bibliography....XXXIX

List of tables

Table 3.1: Recruitment and participation 12
Table 3.2: GP characteristics 13
Table 3.3: Characteristics of participating and non-participating general practitioners 14
Table 4.1: Participating BEACH participants and all active recognised GPs in Australia 17
Table 4.2: Comparison of age–sex distribution of patients at A1 services from the MBS 19
Table 4.3: The BEACH dataset 20
Table 5.1: Summary of morbidity and management: BEACH, April 1998–March 1999 22
Table 5.2: Types of encounter: BEACH, April 1998–March 1999 23
Table 6.1: Characteristics of the patients at encounters 25
Table 6.2: Number of patient reasons for encounter at an encounter 30
Table 6.3: Distribution of patient reasons for encounter by ICPC-2 chapter and most frequent individual reasons for encounter within chapter 32
Table 6.4: Distribution of RFEs by ICPC-2 component 34
Table 6.5: Most frequent patient reasons for encounter 35
Table 7.1: Number of problems managed at an encounter 40
Table 7.2: Distribution of problems managed across ICPC-2 chapter and most frequent individual problems within chapter 41
Table 7.3: Distribution of problems managed by ICPC-2 component 44
Table 7.4: Most frequently managed problems 45
Table 7.5: Most frequently managed new problems 47
Table 8.1: Summary of management 52
Table 8.2: Encounters and problems in which treatments occurred 53
Table 8.3: Most frequent treatment combinations 54
Table 9.1: Distribution of most frequently used medications between the three recorded sources—prescribed, advised and GP supplied 56
Table 9.2: Distribution of drugs prescribed by group, sub-group, generic drug 65
Table 9.3: Most frequently prescribed drugs 69
Table 9.4: Distribution of drugs prescribed by ATC drug group 71
Table 9.5: Distribution of OTCs advised by group, sub-group and generic drug 74
Table 9.6: Most frequently advised OTC drugs 77
Table 9.7: Distribution of supplied drugs by group, sub-group and generic drug 80
Table 9.8: Most frequently GP supplied drugs 83
Table 10.1: Non-pharmacological treatments—summary table 84

Table 10.2: Number of clinical treatments provided 85
Table 10.3: Most frequent clinical treatments 87
Table 10.4: Top 30 problems managed with a clinical treatment 88
Table 10.5: Number of procedural treatments provided 92
Table 10.6: Most frequent procedural treatments 94
Table 10.7: Top 30 problems managed by a procedural treatment 95
Table 11.1: Referrals and admissions—summary table 96
Table 11.2: Most frequent referrals to specialists and allied health professionals 99
Table 11.3: Top 30 problems associated with a specialist referral 101
Table 11.4: Top 30 problems associated with a referral to allied health services 102
Table 11.5: Top 30 problems associated with a referral to hospital 103
Table 12.1: Number of encounters and problems at which pathology or imaging ordered 108
Table 12.2: Distribution of pathology orders across pathology groups and most frequent individual test orders within groups 110
Table 12.3: The 30 most common problems for which a pathology test was ordered 112
Table 12.4: Most frequent imaging tests ordered 116
Table 12.5: The 30 most frequent problems managed for which imaging test ordered 118
Table 13.1: Comparison of GP participants 1991––1998 124
Table 13.2: Distribution of items of service 125
Table 13.3: Age distribution of patients in AMTS and BEACH 126
Table 13.4: Comparison of most frequently managed problems 128
Table 13.5: Comparison of problems managed across ICPC-2 chapter 130
Table 13.6: Comparison of top 30 most frequent medications 132
Table 14.1: Distribution of problems managed by ICPC-2 chapter 138
Table 14.2: Most frequent individual problems managed 139
Table 14.3: Services provided at indirect encounters 140
Table 14.4: Most frequent problems managed (top 10) at indirect encounters 142
Table 14.5: Drugs most frequently prescribed (top 10) at indirect encounters 142
Table 14.6: Characteristics of patients seen by male and female GPs 145
Table 14.7: The type and content of encounters 147
Table 14.8: Distribution of problems managed across ICPC-2 chapters and most frequent individual problems within chapter 149
Table 14.9: Raw data size by State/Territory (unweighted data) 151
Table 14.10: Encounter based data 151
Table 14.11: Relative frequencies of the national top 20 problems managed by State 152

List of figures

Figure 2.1: The BEACH relational database 6
Figure 2.2: The structure of the International Classification of Primary Care (ICPC) 8
Figure 6.1: Age–sex distribution of patients at encounter 24
Figure 6.2: Age–sex specific rates of new patients 26
Figure 6.3: Age–sex specific rates of encounters with people holding a health care card 27
Figure 6.4: Age–sex specific rate of encounters with persons holding a Veterans' Affairs card 27
Figure 6.5: Age–sex specific rates of encounters with NESB patients 28
Figure 6.6: Age–sex specific RFE rates per 100 encounters 30
Figure 6.7: Inter-relationship of RFEs with other variables. Example:- Weakness/tiredness 37
Figure 7.1: Age–sex specific rates per 100 encounters for all problems managed 40
Figure 7.2: Age–sex specific rates per 100 encounters for new problems managed 46
Figure 7.3: Inter-relationship of a problem managed with other variables. Example: Depression 51
Figure 9.1: Percentage of drugs prescribed, advised and GP supplied 55
Figure 9.2: Inter-relationship of a drug with other variables. Example:- Cephalosporins 59
Figure 9.3: Number of drugs prescribed per encounter 60
Figure 9.4: Number of drugs prescribed per problem 61
Figure 9.5: Number of repeats ordered per prescription 61
Figure 9.6: Age–sex specific prescription rates per 100 encounters 62
Figure 9.7: Age–sex specific prescription rates per 100 problems 63
Figure 9.8: Distribution of drugs prescribed by major groups 63
Figure 9.9: Age–sex specific advised medication rates per 100 encounters 72
Figure 9.10: Drugs advised by major groups 73
Figure 9.11: Age–sex specific supplied medication rates per 100 encounters 78
Figure 9.12: GP supplied drugs by major groups 79
Figure 10.1: Age–sex specific rates—clinical treatments 86
Figure 10.2: Inter-relationship of counselling with other variables. Example: Counselling and advice for weight/nutrition 91
Figure 10.3: Age–sex specific rates—procedural treatments 93
Figure 11.1: Age–sex specific rates—referrals to medical specialists 97
Figure 11.2: Age–sex specific rates—referrals to allied health services 98
Figure 11.3: Inter-relationship of a referral with other variables. Example: Psychiatrist 105

Figure 11.4: Inter-relationship of a referral with other variables. Example: Physiotherapist 107
Figure 12.1: Age–sex specific rates of encounters with at least one pathology order, per 100 encounters 109
Figure 12.2: Inter-relationship of pathology with other variables. Example: Full blood count 114
Figure 12.3: Age–sex specific rates of encounters with at least one imaging order, per 100 encounters 115
Figure 12.4: Inter-relationship of imaging with other variables. Example: Chest X-ray 121
Figure 14.1: Distribution of Indigenous encounters by GP 135
Figure 14.2: Age–sex distribution of Indigenous patients seen by GPs 136
Figure 14.3: Geographic location of Indigenous and non-Indigenous patients by State/Territory 137
Figure 14.4: Geographic location of Indigenous and non-Indigenous persons by RRMA category 137
Figure 14.5: Age–sex distribution of patients at indirect encounters 141
Figure 14.6: Age–sex distribution of male and female GP participants 143
Figure 14.7: Geographic location of practice for male and female GPs by RRMA category 144
Figure 14.8: Age distribution of patients seen by male and female GPs 145

Summary

This report details findings from the first year (1998–99) of a study of general practice activity in Australia known as BEACH (Bettering the Evaluation and Care of Health). The concept of the BEACH program originated from members of the Family Medicine Research Centre, University of Sydney, who hoped to gather reliable general practice data and combine it with patient risk factors and health states. The aim was to provide users with up-to-date information from an ongoing national database of GP–patient encounters. A goal of 1,000 GP participants per year was set. To this end, the General Practice Statistics and Classification Unit, a component of the Family Medicine Research Centre, was formed as a collaborating body of the Australian Institute of Health and Welfare. A consortium of groups from government and industry agreed to support the program.

The GP recording period that generated the data for this report began in April 1998 and ended in March 1999. A random sample of 984 general practitioners (38.4% of those with whom contact was established) took part during that time, each recording details of 100 consecutive patient encounters. This produced a total dataset of 98,400 encounters. Each participant also provided information about themselves and their practice. Results are reported in terms of patient reasons for encounter, problems managed, medications and other treatments provided, referrals and tests ordered. Patient demographics such as age, sex, postcode and ethnic background are included. Data on patient health status, risk factors and other selected topics were also gathered and will be reported in a separate publication.

The general practitioners

Males made up 70% of participants and GPs aged 45 years or older accounted for 57.3%. One in five participants were in solo practice and 23.5% had graduated in a country other than Australia.

A comparison between participants and doctors from the random sample who declined to participate found no significant differences in GP charactieristics with the exception of age group. Participants were significantly older and GPs aged less than 35 years were under-represented. The encounter data went through post-stratification weighting to overcome the difference and ensure that the BEACH dataset was representative of Australian general practice. The weighting also incorporated the differential activity level of GPs to improve the national estimates.

The encounters

There were 96,901 encounters (weighted) included in the analysis. The majority were direct encounters (patient seen) though 3.3% were indirect (patient not seen). Over 90% of encounters were Medicare paid and of these most were conducted in the surgery (93.3%). The encounters involved 141,766 reasons for encounter, 140,824 problems managed and 106,320 medications, 41,839 non-pharmacological treatments, 10,866 referrals, 23,872 pathology test orders and 6,844 orders for imaging.

The patients

The age distribution of patients at encounter showed that 15.8% of encounters were with children, 9.8% with young adults and there was an even spread across the other age groups. Patients were female at 57.7% of encounters, were health care card holders at 47.3%, and

were from a non-English speaking background at 14.5% of encounters. A small number (1.1%) identified as Aboriginal people or Torres Strait Islanders.

Up to three reasons for encounter could be recorded at each consultation. Patients described an average of 146 reasons for encounter per 100 encounters. A request for a check-up was the most common, described at a rate of 13.7 per 100 encounters, followed by prescription request (8.2) and cough (6.2).

Problems managed

Doctors could record up to four problems at each encounter. Problems were managed at a rate of 145 per 100 encounters, and 48.5% of these were considered to be new to the patient. At 66.3% of encounters only one problem was recorded.

The most common problems managed were hypertension, at a rate of 8.3 per 100 encounters, upper respiratory tract infection (URTI) at 6.8 per 100, immunisation/vaccination at 5.2 per 100 and depression at 3.5 per 100 encounters.

Treatments

Participants could record up to four medications for each problem and these could be prescribed (85.3% of all medications), supplied by the GP or advised for over the counter purchase. Medications were recorded at a rate of 109 per 100 encounters, or, in terms of the problems managed, at a rate of 75 per 100 problems.

Medication groups most frequently prescribed were antibiotics, cardiovascular or central nervous system drugs. Overall, individual medications were most commonly paracetamol, which accounted for 5.8% of all medications, amoxycillin (3.0%) and the paracetamol/codeine combination (2.7%).

Up to two non-pharmacological treatments could be recorded per problem and they were divided into clinical treatments and procedures. At least one such treatment was provided at a rate of 25.4 per 100 encounters. The most frequently provided clinical treatment was advice about treatment of a problem (at a rate of 6.2 per 100 encounters), while the most common procedure was excision or removal of tissue (at 2.8 per 100).

Referrals, admissions and investigations

One or two new referrals could be recorded for each problem and at least one was given at 7.8% of encounters. The most frequent referrals to specialist medical practitioners were to surgeons while the majority of referrals to allied health services were to physiotherapists. Admissions to hospital occurred infrequently (0.7 per 100 encounters).

At least one pathology test was ordered at 13.2% of encounters with full blood count being the most common. At least one order for imaging was made at 6.3% of encounters and chest X-ray was the most common.

Comparison with data from 1991

A comparison with results from a similar study carried out in 1991 found statistically significant changes in the management rates of a number of problems including an increase in immunisation/vaccination and depression and a decrease in the rate of asthma management. There were significant changes in individual drug prescribing rates.

Selected topics

Data were analysed in terms of some specific areas of interest covered by BEACH.

Morbidity managed at encounters where the patient identified themselves as an Aboriginal person and/or Torres Strait Islander indicated that the age distribution of these patients differed markedly from that of non-Indigenous patients and about 40% lived in capital cities. URTI was the most common problem managed for these Indigenous patients, followed by acute bronchitis and diabetes.

Indirect encounters (where the patient is not seen and the GP receives no fee) represented 3.1% of encounters. The problem most frequently managed was a request for a prescription and the most frequent medication prescribed was temazepam.

Factors relating to gender of the GP were explored. Female GPs were generally younger with a younger patient population, two-thirds of whom were female. They recorded a higher rate of long consultations and number of problems managed per encounter.

Analysis of data across States showed that 37% occurred in New South Wales and 24% in Victoria. New South Wales had the highest rate of hypertension and Western Australia had a much higher rate of immunisation/vaccination than the other States.

Conclusion

This report has served to provide an overview of the activities of general practice and of the normative behaviour of almost 1,000 general practitioners who together have more than 10,000 years clinical experience. It gives an indication of the enormous potential of the database to answer questions about the majority of the population who visit a general practitioner each year, about the health issues they bring to the doctor and the ways in which these problems are managed in general practice. More detailed analyses of specific topics of interest will be undertaken in the future.

Acknowledgments

This report would not have been possible without the valued cooperation and effort of the 984 participating general practitioners who provided the data.

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

1. Introduction

At the World Health Organisation conference on primary care in 1978 the present health care goal of WHO was conceived—'Health for all by the year 200'. The key to this goal was recognised as adequate primary health care. However, any assessment of health care priorities was regarded as dependent on the availability of the right kind of information (1987; WHO 1985).

The concepts of 'primary' and 'secondary' care were introduced in the 1920s by Dawson. He also recognised that statistical population based data was essential for the organisation of health services, and the suitable allocation of funds (1920). However, it was some forty years before Yves Biraud reintroduced the term 'primary care' to describe the care provided at the patient's point of entry to the health care system. He further recognised that if a full system of health statistics data collection was ever to be established there was a need for realistic classification and coding of the problems encountered in primary care (Biraud 1960).

General practitioners began to record details of their work in the early 1950s. In Australia growing interest in the morbidity managed in the primary care system led the (then) Australian College of General Practitioners and the National Health and Medical Research Council (NHMRC) to undertake the first national survey of morbidity managed in general practice in 1962–63. Eighty-five volunteer general practitioners throughout Australia each recorded data for a 12 month period. Between 1969 and 1974 the Royal Australian College of General Practitioners (RACGP) undertook a morbidity and prescribing survey in conjunction with Intercontinental Medical Statistics (IMS), a market research firm (Bridges-Webb &RACGP, 1976). IMS continued the survey each year for market research purposes, but the RACGP ceased participation after 1974.

In 1990–91 a one year national survey of morbidity and treatment in general practice (the Australian Morbidity and Treatment Survey)(AMTS), funded by the NHMRC and the General Practice Evaluation Program, was conducted by the Family Medicine Research Unit at the University of Sydney. The study involved a national random sample of 495 GPs (stratified by State) who each recorded details of all surgery and home consultations for two periods of one week, six months apart. Encounter details were recorded on structured paper forms. The resulting database incorporated records of over 110,000 doctor–patient encounters and included more than 160,000 problem contacts (Bridges-Webb et al. 1992).

More recently the wide recognition of the need for continuous and timely information about general practice led to the formation of the General Practice Statistics and Classification Unit (GPSCU), a collaborating unit of the AIHW and the Family Medicine Research Centre (then Unit) of the University of Sydney. The GPSCU was established in 1998 and given the task of filling the void in up to date information about general practice activity in Australia.

The BEACH program began in April 1998. An interim six month report describing the BEACH methods was published earlier in 1999 (Britt et al. 1999). This is a report of the activities of general practitioners drawn from the first year of the BEACH program between 1 April 1998 and 31 March 1999. It provides an overview of the results and gives some examples of analyses to facilitate understanding of the many ways the database can be used to answer questions about specific areas of interest.

1.1 Aims

The BEACH program has three primary aims:

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

2. Methods

The methods adopted in the BEACH program have been described in detail elsewhere (Britt et al. 1999). This section describes the development of the BEACH process and provides a brief summary of the methods adopted.

2.1 Development of the BEACH methods

The 1990–91 AMTS provided a dataset on which to develop a sample size model for future National studies (Meza et al. 1995) and on which to test new statistical analytical techniques (Britt et al. 1996a; Sayer and Britt 1996; Sayer and Britt 1997). With the agreement of the RACGP, the AMTS process was also used as a quality assurance option (the Morbidity and Therapeutic Index) for GPs between 1991 and 1996. Over 4,000 GPs took up this option and further tested the process on a wider general practice population.

In 1996 the Western Sydney Division of General Practice provided funding for a local morbidity and treatment survey. The Division required current data concerning the health needs of the population in its region and the activities of GPs practising in Western Sydney in order to plan future projects and educational programs. This provided the opportunity to test a more detailed encounter form, inclusion of patient based questions on health risk factors, the application of extensive and detailed coding systems for diagnoses, pharmaceutical treatments and other management techniques, a comprehensive database 'front-end' and direct computer assisted secondary data entry.

As 85% of the population visit a GP in any one year and over 90% visit at least once in any two year period, there was also interest in the possible use of the GP patient population to measure aspects of population health. This led to the addition of a new section on each form concerning patient-based risk factors and health assessment. The revised program was approved by the RACGP as a quality assurance option (audit) for participants.

All of these aspects of the research method were found to be viable, with the exception of the layout of the prescription details to be recorded on the forms. GPs had been asked to record the daily dose of medication. Feedback from participants alerted the researchers to the fact that this involved the doctors making a calculation they would not normally make when writing a prescription or writing up their records. To eliminate this extra burden on busy GPs, daily dose of medication was replaced with drug strength and regimen fields (eg 500mg; 4 daily) to bring these fields into line with the usual manner in which a doctor records that information. The recording form was revised after the Western Sydney pilot study.

In 1997 the Department of Human Services, Victoria, commissioned a study of general practice activity in that State. The objective was to measure any changes in activity since 1990–91 (AMTS) and provide a new baseline for the measurement of future change. The revised recording form was used in this statewide study.

When establishing the consortium of government departments and instrumentalities and industry participants to support the BEACH program there were some additional data elements identified for which there was a current lack of national information. As a result a number of fields were added to the form for the national BEACH program. These included patient Veterans' Affairs card status, indication of problems regarded by the GP as likely to be work related and space for GP recording of specific orders for pathology tests and imaging.

2.2 BEACH methods

In summary, a random sample of approximately 1,000 recognised GPs per year each records details about 100 doctor–patient encounters of all types on structured paper encounter forms.

The source population includes all recognised GPs who have claimed a minimum of 375 general practice Medicare items (items 1–51) in the most recently available three-month Health Insurance Commission (HIC) data period. This equates with a cut-off of 1,500 Medicare claims a year and ensures inclusion of the majority of part-time GPs whilst excluding those who are not in private practice but claim for a few consultations a year. The General Practice Branch of the Commonwealth Department of Health and Aged Care (DHAC) draws a sample every three months.

The randomly selected GPs are approached by letter with telephone follow-up. GPs who agree to participate are set an agreed recording date approximately three to four weeks ahead. A research pack is sent to each participant about ten days before their planned recording date. The research pack contains a covering letter, a project information sheet, a GP profile questionnaire, a pad of 105 recording forms (to allow for some error), a detailed set of instructions, a height and weight measure conversion (to metric) chart (for body mass index), a sample completed form with explanation, a pictorial 'standard drinks' chart to help patients answer questions on alcohol intake, additional instructions for completing supplementary questions on each form, a reply-paid envelope and several copies of a patient information sheet. The patient information sheet gives patients the choice to 'opt out' and not have details of their consultation included in the study by informing their GP of this decision. A telephone reminder is made to each GP participant in the first days of the agreed recording period. Non-returns are followed up by regular telephone calls.

Each participating GP earns 25 audit points towards their quality assurance (QA) requirements. As part of this QA process they receive an analysis of their own results compared with those of nine other unidentified practitioners who recorded at approximately the same time. Comparison with the national average and with targets relating to the National Health Priority Areas is also made. In addition GPs receive some educational material related to the identification and management of patients who smoke or who consume alcohol at hazardous levels.

2.2.1 Data elements

The BEACH recording forms build on those used in the earlier work of the Family Medicine Research Centre but with considerably more detail about each encounter. In particular BEACH includes details of all types of encounters whether paid by Medicare, by another source, or unpaid. Indirect consultations for which GPs are not remunerated are also included and there are more details about the characteristics of patients attending general

practice. For the first time information was collected about pharmacological management including that for drugs advised for over the counter purchase (OTCs) and drugs supplied by the GP. More specific details of dosage and regimen have also been added to the data collection process. Unlike the AMTS, orders for pathology tests, imaging referrals to specialists, allied health professionals and emergency departments, and hospital admissions are related to the specific morbidity under management. The specific types of pathology tests and imaging ordered at the encounter are also included, whereas in earlier studies these orders were only broadly grouped (i.e. blood, urine, culture tissue).

BEACH includes three inter-related data collections: encounter data, GP characteristics, and patient health status. An example of the form used to collect the encounter data and the data on patient health status is included as Appendix I. The GP characteristics questionnaire is included as Appendix II.

Encounter data includes information about the consultation itself: date of consultation; type of consultation (direct, indirect); Medicare item number (where applicable); specified other forms of payment; clinical services provide at indirect encounters.

Information about **the patient** includes: date of birth; gender; status to the practice (new/seen before); postcode of residence; health care card status (yes/no); Veterans' Affairs status (Gold/White); non-English speaking background (yes/no); Aboriginal (yes/no) (self-identification); Torres Strait Islander (yes/no) (self-identification); patient reasons for encounter (up to three).

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; the status of each problem (new to patient/managed before) and whether it was thought to be work related.

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

GP characteristics include: age and gender; years in general practice; number of GP sessions worked per week; number of full-time and part-time GPs working in the practice (to generate practice size); consultations in languages other than English; postcode of major practice address; country of graduation; postgraduate general practice training and FRACGP status; membership of professional organisations; brand substitution behaviour (Appendix II).

Supplementary analysis of nominated data (SAND): A section on the bottom of each recording form investigates aspects of patient health or health care delivery in general practice not covered by the consultation-based information (see Appendix I). The year-long data-collection period is divided into 10 blocks, each of five weeks and designed to include data from 100 GPs. Each GP's recording pack of 100 forms is made up of: 40 forms which contain questions about patient well-being, height, weight and alcohol intake; 40 which have a single question about the patient's smoking status together with questions on other subjects nominated for that block; and 20 forms with other nominated questions.

The results of the SAND sub-studies will be reported in a separate publication.

2.2.2 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.

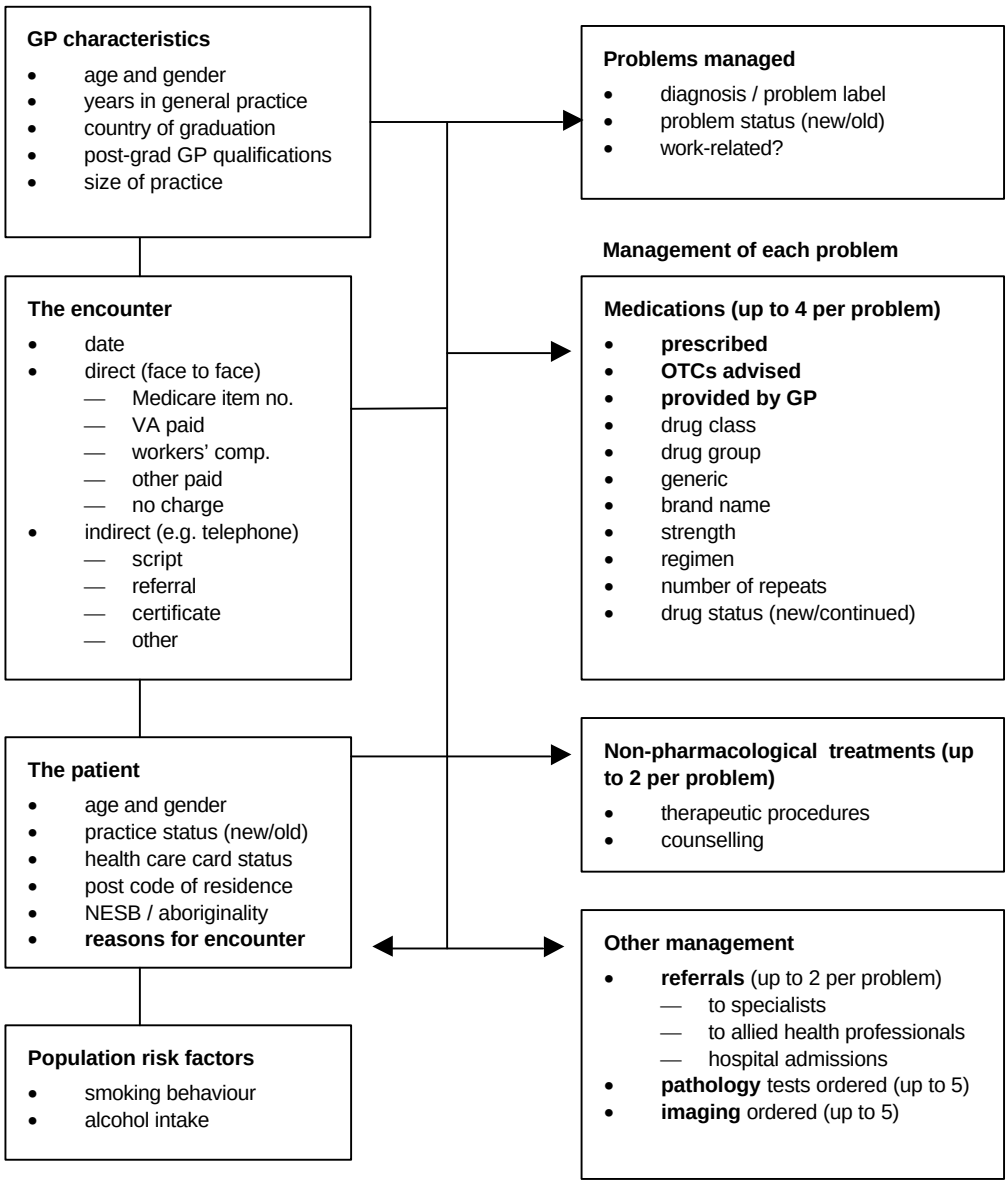


Figure 2.1: The BEACH relational database

2.2.3 Statistical methods

The analysis of the BEACH database is conducted through SAS version 6.12 (1996) and the encounter is the primary unit of analysis. Proportions (%) are only used when describing the distribution of an event that can arise only once at an consultation (e.g. age, gender or item numbers) or to describe the distribution of events within a class of events (e.g. problem *A* as a % 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 used when a management event can occur more than once per problem managed (e.g. prescribed drugs; orders for pathology). 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 (Sayer 1999).

There is also a secondary probability function of particular encounters being included in the GP's cluster 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 statistical bias. For example, female GPs tend to see more female patients than their male counterparts; a group of patients of one GP may receive different treatments to those received by patients of another GP, reflecting different practice styles. 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 an investigator violates the SRS assumption, analytical techniques that consider the study design should be employed. In this report the standard error calculations used in the 95% confidence intervals incorporate both the single-stage clustered study design and sample weighting according to Kish's description of the formulae (Kish 1965). SAS is limited in its capacity to calculate the standard error for the current study design, so additional programming has been required to incorporate the formulae.

2.2.4 Classification of data

Patient reasons for encounter, problems managed, therapeutic procedures, other non-pharmacological treatments, referrals, and pathology and imaging ordered are coded using ICPC-2 PLUS (Britt 1997a). 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) (Classification Committee of the World Organization of Family Doctors 1997). The ICPC is regarded as the international standard for data classification in primary care.

The International Classification of Primary Care

Until the mid 1970s most morbidity data collected in general practice research were classified according to the International Classification of Diseases (ICD). The many symptoms which present in general practice were difficult to code with a classification originally designed for application to mortality statistics and with a disease-based structure.

Recognising this problem, the Classification Committee of the World Organization of Family Doctors (WONCA) developed the International Classification of Health Problems in Primary Care (ICHPPC), first published in 1976 with a second edition in 1983 (WONCA 1983). Although this provided a section for the classification of some undiagnosed symptoms, it was still based on the ICD structure and the available symptom rubrics were inadequate. A new classification was needed to encompass both the patient's reasons for encounter (RFEs) and the patient's problems.

A RFE classification with a structure different from the ICD-9 framework was first tested in 1983 in an international field trial involving nine countries including Australia. After revisions and additions, the International Classification of Primary Care (ICPC) was first published in 1987. It included the majority of the diagnostic rubrics from ICHPPC and a series of process rubrics (drawn from IC-Process-PC) (1986) to describe the care provided. The second edition, ICPC-2, incorporates inclusion and exclusion criteria and was published in 1998. ICPC has been translated into more than 35 languages and is being used to classify patient reasons for encounter and/or problems managed in Norway, Denmark, Canada, the Netherlands, Belgium, France and the United States (Brage et al. 1996; Lavoie et al. 1995; Viner et al. 1994; Dupuits and Hasman 1995; Jamoulle et al. 1994; Klinkman and Green 1995; Vijlbrief et al. 1995; Zaat et al. 1995).

	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 (ICPC)

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

Components 2 to 6 cover the process of care and are common throughout all chapters, each rubric being equally able to be applied to any body system (Figure 2.2). 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).

ICPC-2 PLUS

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 measuring 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 is to be ensured. In 1995, recognising a need for a coding and classification system for general practice electronic health records, the Family Medicine Research Centre (then Unit) developed an extended vocabulary of terms classified according to the ICPC. These terms were derived from those recorded in more than half a million encounter forms by GPs participating in the quality assurance option mentioned earlier.

Each term has its own extended code. For example, while the ICPC code A77 is 'Other viral illness', the PLUS terms provide a list of some 33 specific viral illnesses under A77 (e.g. Ross River Fever—A77 001). This allows far greater specificity in data entry and ensures high inter-reliability between staff. It also facilitates analyses of information about more specific problems when required (Britt 1997a).

In this report some grouping of ICPC-2 rubrics has been made to overcome differences in the level of specificity recorded by GPs in describing patient RFEs or ascribing problem labels. The issue of variance in labelling is discussed below. For example, results are reported for the problem label 'rash'. Individual analysis of 'localised' and 'generalised' rash may have meant that the relative frequencies of each were insufficient to report. Another example is osteoarthritis. There are multiple rubrics into which this problem may fall depending on its body location (i.e. osteoarthritis of the knee has a different ICPC-2 code to osteoarthritis of the shoulder). Osteoarthritis of the back is only a small part of a broader rubric. In this case the grouper here reported as 'osteoarthritis' includes all the ICPC-2 PLUS terms associated with osteoarthritis rather than a number of ICPC-2 rubrics. The codes included in each grouped label are listed in Appendix III.

Classification of pharmaceuticals

Pharmaceuticals prescribed or provided and over the counter drugs 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, for example, drug class, drug group, generic composition and brand name. CAPS is mapped to the Anatomical Therapeutic Chemical classification (ATC) (WHO Collaborating Centre for Drug Statistics Methodology 1998) which is the Australian standard for classifying drugs 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 drug or group of drugs.

Quality assurance

All morbidity and therapeutic data elements are automatically coded and classified by the computer as 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 one in five physical check of data entered versus that on the original recording form.

2.2.5 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; 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 general practitioners (Driver et al. 1991). Other studies have reported the degree to which GP reported patient reasons for encounter and problems managed accurately reflect those recalled by the patient (Britt et al. 1992) and the reliability of secondary coding of RFEs (Britt 1998) and problems managed (Bridges-Webb et al. 1992). The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work (Britt 1997b).

However, the question of the extent to which the GP recorded data is a reliable and valid reflection of the content of the encounter must also be considered.

In many primary care consultations a clear pathophysiological diagnosis is not reached. Bentsen (1976) and Barsky (1981) suggest that a firm and clear diagnosis is not apparent in about half of general practitioners' consultations while others suggest the proportion may be even greater (Morrell et al. 1971). Further, studies of general ambulatory medical practice have shown that a large number of patients presenting to a primary care practitioner are without a serious physical disorder (Anderson 1980; Marsland et al. 1980). As a result it is often necessary for a practitioner to record a problem in terms of symptoms, signs, patient concerns, or the service which is requested, such as immunisation. For this reason this report refers to patient problems (and even 'problem' is not an ideal word) rather than diagnoses.

A number of studies have demonstrated wide variance in the way a GP perceives the patient's reasons for encounter and the manner in which s/he describes the problem under management. In a direct observational study of consultations via a one way mirror Bentsen demonstrated differences in the way practitioners labelled problems and suggested that clinical experience may be an important influence on the identification of problems within the consultation (Bentsen 1976). Two other factors that might affect GPs' descriptions of patient reasons for encounter have been identified: while individuals may select the same stimuli, some label each stimulus separately while others cluster them under one label; individuals differ in the number of stimuli they select (selective perception) (Bensing 1983).

The extent to which therapeutic decisions may influence the diagnostic label selected has also been discussed. Howie (1972) and Anderson (1980) argue that while it is assumed that the diagnostic process utilised in general practice is one of symptom → diagnosis → management, the therapeutic method may well be selected on the basis of the symptom,

and the diagnostic label chosen last. They suggest that the selection of the diagnostic label is therefore influenced by the management decision already made.

Anderson has also pointed out that the therapeutic decision may be influenced by fashion and in turn this affects the selection of the problem label. He gives the example of a rise in the occurrence of neurotic depression in parallel with a decrease in the use of menopause as a diagnosis in the United Kingdom, and suggests this may be the result of a change in the preferred treatment from oestrogen therapy to anti-depressants(Anderson 1980). This should be remembered when considering the results of Chapter 13 of this report which describes some changes in general practice over the past eight years.

Alderson contends that to many practitioners 'diagnostic accuracy is only important to the extent that it will assist them in helping the patient'. He further suggests that if major symptoms are readily treatable some practitioners may feel no need to define the problem in diagnostic terms (Alderson 1988). Crombie stated that in the second and third national morbidity surveys in the United Kingdom there was 'enormous variability in the rates at which doctors perceive and record illnesses'. He concluded that the probable cause arose from the different ways in which GPs gave priority in their perceptions and recording of certain morbidities while discounting or ignoring others. He was unable to account statistically for this variation by the effect of geographic, age, sex, or class differences in the practice populations (Crombie 1990). Differences in the way male and female GPs label problems have also been shown to be independent of such influences (Britt et al. 1996b).

These problems are inherent in the nature of general practice. Knottnerus argues that the GP is confronted with a fundamentally different pattern of problems from the specialist, the GP often having to draw up general diagnostic hypotheses related to probability, severity and consequences (Knottnerus 1991). Anderson suggests that morbidity statistics from family practice should therefore be seen as 'a reflection of the physician's diagnostic opinions about the problems that patients bring to them rather than an unarguable statement of the problems managed' (Anderso, 1980). In any case, doctors base their actions on problems as they perceive them.

While these findings regarding limitations in the reliability and validity of practitioner-recorded morbidity should be borne in mind, they apply equally to data drawn from medical records as to active data collection methods (Britt et al. 1996c;Gehlbach 1979). 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 the 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 (Britt et al. 1998).

3. The general practitioners

3.1 Results of recruitment

Telephone contact was established with 2,562 (90.2%) of the 2,839 general practitioners with whom contact was attempted. Of the 277 (9.8% of those approached) who could not be contacted, there were 71 for whom no phone number could be established while 145 had moved, retired or died and 30 were unavailable (e.g. overseas, on maternity leave). A further 31 were unable to be contacted after six calls. Of the remaining 2,562 available practitioners, 1,168 (45.6%) agreed to participate, but 184 (6.5%) failed to comply. The final participating sample was 984 practitioners, representing 38.4% of those contacted and available, and 34.7% of those for whom contact was attempted (Table 3.1).

Table 3.1: Recruitment and participation

	Number	% of approached (N=2,839)	% of contacts established (N=2,562)
Letter sent and phone contact attempted	2,839	100.0	. .
No contact	277	9.8	. .
No phone number	71	2.5	. .
Moved/retired/deceased	145	5.1	. .
Unavailable	30	1.1	. .
No contact after 6 calls	31	1.1	. .
Telephone contact established	2,562	90.2	100.0
Declined to participate	1,394	49.1	54.4
Agreed but withdrew	184	6.5	7.2
Agreed and completed	984	34.7	38.4

3.2 The participating GPs

GP profile questionnaires were returned by all of the 984 participants, although some were incomplete. Of the 984 participants 70.0% were male and 57.3% were aged 45 years or older. Three-quarters (75.9%) of the GPs had been in general practice for more than 10 years, and only 12.3% could be regarded as practising part time (fewer than six sessions per week). One in five respondents were in solo practice (17.9%). The majority (76.5%) had graduated in Australia and more than one-quarter (27.3%) were Fellows of the Royal Australian College of General Practitioners. Only 11.3% of GPs stated that more than 50% of their consultations were in languages other than English. There were 21 GPs (2.2%) who were currently in the RACGP training program and almost a third (30.4%) who had completed it (Table 3.2).

Table 3.2: GP characteristics

GP characteristic	Number[(a)]	% of GPs (N=984)
Sex	. .	. .
Male	689	70.0
Female	295	30.0
Age (missing=4)	. .	. .
<35 years	62	6.3
35–44 years	356	36.3
45–54 years	315	32.1
55+ years	247	25.2
Years in general practice (missing=12)	. .	. .
<2 years	8	0.8
2–5 years	59	6.1
6–10 years	167	17.2
11–19 years	328	33.7
20+ years	410	42.2
Sessions per week (missing=12)	. .	. .
<5 per week	120	12.3
6–10 per week	666	68.5
11+ per week	186	19.1
Size of practice (missing=62)	. .	. .
Solo	165	17.9
2–4 GPs	398	43.2
5+ GPs	359	38.9
Place of graduation (missing=4)	. .	. .
Australia	750	76.5
UK	88	9.0
Asia	84	8.6
Europe	24	2.4
Africa	15	1.5
New Zealand	11	1.1
Other	8	0.9
More than 50% consultations in languages other than English	111	11.3
Currently in RACGP training program	21	2.2
Completed RACGP training program	289	30.4
Member of AMA	441	44.8
Fellow of RACGP	263	27.3
Member of RACGP	411	41.8

(a) Missing data removed.

3.3 Comparison between participating and non-participating GPs

In any sampling study of this type the question of the extent to which the final participating GPs represent the initial random sample must be investigated. Some information about each of the GPs drawn in the initial sample was provided by the Department of Health and Aged Care (DHAC) for this purpose. These data included the number of general practice Medicare items claimed in the previous 12 months and this is referred to in this analysis as 'activity level'.

In Table 3.3 the characteristics of the final participating GPs and all other GPs drawn in the initial sample are compared, utilising DHAC elements. It is notable that there are considerable discrepancies between the DHAC information about participants (columns 2 & 3, Table 3.3) and that self-reported by these GPs (Table 3.2). While these discrepancies introduce questions about the reliability of the DHAC GP characteristic data, there is no reason to believe that the accuracy of the DHAC data should differ for the participants and non-participants.

The chi square statistic (at the 5% level) was used to test the significance of differences between the two groups. There was no significant difference between participants and non-participants in terms of gender, place of graduation and the Rural Remote Metropolitan classification (RRMA). The age distribution for participants and non-participants was significantly different, with GPs under the age of 35 years being under-represented in the participant population. This age difference would explain the difference in the years since graduation of participants compared to non-participants. The distributions of GPs by State were also demonstrated to be significantly different, a greater proportion of participants coming from the eastern States, the Australian Capital Territory and the Northern Territory, and a lesser proportion from the other States.

There was a small but statistical difference in activity level between participants and non-participants. Internal analysis has shown that younger doctors have higher activity levels in comparison to other ages, and as previously mentioned, this group was under-represented in the participant group.

Table 3.3: Characteristics of participating and non-participating general practitioners

	Participants (N=984)		Non-participants (N=1,578)	
GP Characteristics	**Number[(a)]**	**% of N**	**Number[(a)]**	**% of N**
Sex (χ^2=1.80, p=0.179)	. .	. .	. .	. .
Male	693	70.4	1150	72.9
Female	291	29.6	428	27.1
Age (χ^2=13.4, p=0.002)	. .	. .	. .	. .
<35 years	54	5.8	138	9.4
35–44 years	322	34.7	447	30.6
45–54 years	301	32.5	515	35.2
55+ years	250	27.0	362	24.8
Missing	57	. .	116	. .

(continued)

Table 3.3 (continued): Characteristics of participating and non-participating general practitioners

	Participants (N=984)		Non-participants (N=1,578)	
GP Characteristics	**Number[(a)]**	**% of N**	**Number[(a)]**	**% of N**
Years since graduation (χ^2=13.4, p=0.046)	. .	. .	. .	. .
2–5 years	6	0.6	15	0.9
6–10 years	52	5.3	121	7.7
>10 years	915	94.0	1,437	91.4
Missing	11	. .	. .	. .
Place of graduation (χ^2=1.4, p=0.228)	. .	. .	. .	. .
Australia	759	77.1	1,249	79.1
Overseas	225	22.9	329	20.9
State (χ^2=22.3, p=0.002)	. .	. .	. .	. .
New South Wales	364	36.7	525	33.3
Victoria	239	24.3	387	24.5
Queensland	184	18.7	276	17.5
South Australia	74	7.5	159	10.1
Western Australia	73	7.4	172	10.9
Tasmania	22	2.2	38	2.4
Australian Capital Territory	17	1.7	13	0.8
Northern Territory	11	1.1	8	0.5
RRMA (χ^2=4.8, p=0.689)	. .	. .	. .	. .
Capital	669	68.0	1,106	70.1
Other metropolitan	75	7.6	129	8.2
Large rural	60	6.1	76	4.8
Small rural	57	5.8	89	5.6
Other rural	106	10.8	155	9.8
Remote centre	5	0.5	11	0.7
Other remote	6	0.6	6	0.4
Activity (χ^2=6.6, p=0.036)	. .	. .	. .	. .
1,501–3,000 services in previous year	164	16.7	209	13.2
3,001–6,000	418	42.4	727	46.1
6,001+	402	40.9	642	40.7

(a) Missing data removed

4. Representativeness

4.1 Comparison of BEACH GPs with the national GP population

The generalisability of a study sample is a function of its ability to represent the population from which the sample is drawn. Random sampling of GPs improves the likelihood that a study will be representative, as each GP has an equal probability of being selected into the study sample. The representativeness of a study can also be improved through the calculation of sample weights to better reflect the population characteristics that may influence the final results. Wherever possible there should be a comparison between the final study group of GPs and the population from which the GPs were drawn in order to identify, consider and ameliorate any bias that may impact on the findings of the study.

Comparisons of the characteristics of participants and non-participants were reported in Chapter 3 (Table 3.3). Statistical comparisons (χ^2) were then made between BEACH participants and all recognised general practitioners in Australia who claimed more than 1,500 general practice Medicare item numbers during 1998–99 (Table 4.1). The GP characteristics for both groups were provided by the General Practice Branch of the Commonwealth Department of Health and Aged Care so that the inconsistencies between the BEACH GP profile and the details collected through the HIC (reported in Chapter 3) were eliminated.

No statistical differences were apparent for GP gender or place of practice (RRMA and State). However, BEACH participants were significantly less likely to be under 35 years of age ($\chi^2 = 65.89$; $p < 0.001$) and were significantly more likely to have graduated in Australia ($\chi^2 = 4.44$; $p = 0.035$).

Analysis (not shown) of participating GPs aged less 35 years would suggest a different morbidity and management profile than GPs of other ages. Principally there appeared to be a greater rate of the management of acute conditions and younger patients. Any examination of encounter details (RFEs, problems managed, medications, etc) may provide a lower precision of any national estimate due to the under-enumeration of young GPs. For example, it could be speculated that the management rate of respiratory infections would be lower than expected due to the under-representation of younger GPs. Therefore, post-stratification of the sample of encounters should reflect the age mix of GPs in Australia when determining national estimates of GP encounter activity.

Although Table 4.1 revealed differences in the activity level ($\chi^2 = 6.75$; $p = 0.034$), a comparison of means revealed no differences. It can therefore be concluded that the difference in activity level is a function of the activity groupings.

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

Variable	BEACH		Australia[(a)]	
	Number	% of GPs (N= 984)	Number	% of GPs (N=17,335)
Sex (χ^2= 0.84; p=0.773)	. .	. .	. .	. .
Males	693	70.4	12,279	70.8
Females	291	29.6	5,056	29.2
Age (χ^2= 65.89; p=<0.001)	. .	. .	. .	. .
<35	54	5.8	2,563	14.8
35–44	322	34.7	5,782	33.4
45–54	301	32.5	5,108	29.5
55+	250	27.0	3,882	22.4
Missing	57	. .	. .	. .
Place of graduation (χ^2=4.44; p=0.035)	. .	. .	. .	. .
Australia	759	77.1	12,877	74.3
Overseas	225	22.9	4,458	25.7
RRMA (χ^2=3.16; p=0.789)	. .	. .	. .	. .
Capital	669	68.0	11,843	68.3
Other metropolitan	75	7.6	1,328	7.7
Large rural	60	6.1	1,017	5.9
Small rural	57	5.8	1,043	6.0
Other rural	106	10.8	1,790	10.3
Remote centre	5	0.5	138	0.8
Other remote	6	0.6	176	1.0
State (χ^2=10.54; p=0.160)	. .	. .	. .	. .
New South Wales	364	36.7	6,061	35.0
Victoria	239	24.3	4,255	24.6
Queensland	184	18.7	3,082	17.8
South Australia	74	7.5	1,486	8.6
Western Australia	73	7.4	1,590	9.2
Tasmania	22	2.2	463	2.7
Australian Capital Territory	17	1.7	282	1.6
Northern Territory	11	1.1	116	0.7
Activity level (χ^2=6.75; p=0.034)	. .	. .	. .	. .
1,501–3,000 services in previous year	164	16.7	3,445	19.9
3,001–6,000	418	42.4	7,050	40.7
6,001+	402	40.9	6,840	39.5

(a) Data provided by GP Branch, Department of Health and Aged Care.

4.2 Comparison of BEACH consultations with all GP consultations in Australia

Another means of testing the extent to which the data are representative of general practice activity is to investigate whether the age–sex distribution of patients at the consultations is similar to the age–sex distribution for patients seen in all general practice Medicare claimed consultations for the same period. It is difficult to track and access in a timely fashion the multiple funding streams of Australian general practice ; however, the Medical Benefit Schedule (MBS) provides funding for most consultation types in Australia. Comparable age–sex data for general practice items of service (A1 services) were requested from the General Practice Branch of the Commonwealth Department of Health and Aged Care and these were compared (Table 4.2).

With the size of the datasets used, any statistical comparison (e.g. χ^2) would generate statistical significance for even the most minor differences between the two sources of data. Therefore, it is necessary to consider whether any difference is likely to have a strong influence on the results and whether the precision of any estimate from BEACH complies with statistical standards. In determining whether any estimate is reliable, power calculations use a precision of 0.2 or 20% of the true proportion (or value). For example, if the true value were 15% then it would be desirable that any estimate was in the range of 12% to 18% if it is to be considered to have 20% precision. Creating precision ratios (Australia %/ BEACH %) for the age–sex distribution data contained in Table 4.2 revealed that the precision of the BEACH age–sex distribution was only outside the acceptable range of (0.8–1.2) for males 75 years and older. Simply, BEACH contained proportionally more men 75 years and older than the national distribution. This may be the result of having more older GPs in the BEACH final dataset or the result of some other sampling effect.

Table 4.2: Comparison of age–sex distribution of patients at A1 services from the MBS

	BEACH		Australia[(a)]		Precision
Variable	Number	%	Number	%	Ratio
Sex	. .	. .	. .	. .	. .
Male	32,628	41.0	37,675,661	41.5	1.01
<1 year	964	1.2	1,163,265	1.3	1.06
1–4 years	2,334	2.9	2,979,604	3.3	1.12
5–14 years	2,897	3.6	3,906,073	4.3	1.18
15–24 years	2,820	3.5	3,484,737	3.8	1.08
25–44 years	7,244	9.1	8,929,883	9.8	1.08
45–64 years	7,935	10.0	9,429,569	10.4	1.04
65–74 years	4,516	5.7	4,669,422	5.1	0.91
75+ years	3,918	4.9	3,113,108	3.4	0.70
Female	47,048	59.1	53,081,968	58.5	0.99
<1 year	942	1.2	1,014,312	1.1	0.95
1–4 years	2,051	2.6	2,640,297	2.9	1.13
5–14 years	3,061	3.8	3,830,020	4.2	1.10
15–24 years	4,895	6.1	5,881,143	6.5	1.05
25–44 years	12,613	15.8	14,706,622	16.2	1.02
45–64 years	11,221	14.1	12,451,675	13.7	0.97
65–74 years	5,841	7.3	5,807,957	6.4	0.87
75+ years	6,424	8.1	6,749,942	7.4	0.92

.(a) Data provided by GP Branch, Department of Health and Aged Care.

Note: A1 services include MBS 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; Only encounters with a valid age and sex are included in the comparison

4.3 Sample weights

Most research studies rely on random sampling to reduce the impact of any sampling bias. It is also unusual to know the true population because of the lack of available information. When there is information available it is important to consider the possible effect of any differences on the generalisability of the findings.

4.3.1 GP age

Already 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 estimate of 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 then 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.

4.3.2 GP activity level

The BEACH process requires that each GP provide 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 (Meza et al. 1995). However, there is considerable variation in the number of services that a GP provides in a given year. This may impact on the reliability of any estimate due to the differences in the sampling fraction for each GP, as a GP who provides 6,000 services in a given year makes a greater contribution to any national estimate than a GP who provides 3,000 services. Therefore it was also necessary to calculate post-stratification weights reflecting the different sampling fractions. This means that the BEACH encounter details from the GP who had 6,000 services should have greater weighting than those encounters from the GP who provides 3,000 services when estimating national activity in general practice. It was therefore possible to calculate sample weighting that reflected the contribution that each GP made to the total number of services for the sample. The final sample weights were a multiplicative function of the GP age weighting and GP sampling fraction of services in the previous 12 months.

4.4 The weighted dataset

Following post-stratification the BEACH dataset reduced in size (Table 4.3). The representation of encounters from the older GPs was reduced. The final dataset from the first year of collection contained 96,901 encounters, 141,766 reasons for encounters, 140,824 problems managed and 106,320 medications. The numbers of referrals, imaging and pathology were fewer after post-stratification weighting but to a lesser degree than reasons for encounter and problems managed.

Table 4.3: The BEACH dataset

Variable	Raw	Weighted
GPs	984	984
Encounters	98,400	96,901
Reasons for encounter	145,407	141,766
Problems managed	145,183	140,824
Medications	107,451	106,320
Other treatments	44,076	41,839
Referrals	11,615	10,866
Imaging	7,299	6,844
Pathology	25,727	23,872

5. The encounters

5.1 Overview of the dataset

Using weighted data there were 96,901 encounters from 984 GPs. There were an average 146 patient reasons for encounter described per 100 encounters and 145 problems managed. Unfortunately, the participating GPs poorly recorded status of the problem (32,089 missing). In comparison with the AMTS and other BEACH surveys, it appeared that GPs failed to record the status of old problems more often than they failed to record the status of new problems. When the missing data were removed, 48.5% of problems managed were considered new to the patient. Problems regarded by the GP as likely to be work related (irrespective of whether the encounter was covered by workers' compensation) arose at a rate of 4.0 per 100 encounters.

Medications were prescribed, advised or supplied at 109.7 per 100 encounters. The prescription rate (93.6 per 100 encounters) does not consider the number of repeats provided as part of a prescription. Patients were advised to use over the counter (OTC) medications at a similar rate (8.8 per 100 encounters) to the receipt of medications directly from the GP (7.3 per 100 encounters).

Non-pharmacological treatments were recorded less often than medications, with clinical treatments (e.g. counselling, advice or psychotherapy) occurring at a higher frequency (31.4 per 100 encounters) than procedural treatments (e.g. excise, physical therapies; 11.8 per 100 encounters).

Approximately 11 referrals per 100 encounters were made to an emergency department, hospital, specialist or allied health service. Specialist referrals were the most common (7.4 per 100 encounters), followed by those to allied health professionals (3.0 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 (18.1 per 100 encounters) than were referrals, while orders for imaging (e.g. X-rays, scans) occurred less often (5.2 per 100 encounters) (Table 5.1).

Table 5.1: Summary of morbidity and management: BEACH, April 1998–March 1999

Variable	Number	Rate per 100 encounters	95% LCI	95% UCI	Rate per 100 problems	95% LCI	95% UCI
General practitioners	984	. .	. .	. .	. .	. .	. .
Encounters	96,901	. .	. .	. .	. .	. .	. .
Reasons for encounter	141,766	146.3	140.8	151.8	. .	. .	. .
Problems managed	140,824	145.3	143.5	147.2	. .	. .	. .
New problems[(a)]	52,774	54.5	53	56	37.5	36.5	38.5
Old problems[(a)]	55,961	57.8	55.9	59.6	39.7	38.7	40.7
Work related	3,860	4.0	3.7	4.3	2.7	2.5	2.9
Medications	106,320	109.7	107.4	112	75.5	74.1	76.9
Prescribed	90,710	93.6	91.2	96.1	64.4	62.9	65.9
Advised OTC	8,538	8.8	8	9.6	6.1	5.5	6.6
GP supplied	7,072	7.3	6.3	8.3	5.0	4.3	5.7
Other treatments	41,839	43.2	41.3	45	29.7	28.5	30.9
Clinical	30,380	31.4	29.7	33	21.6	20.5	22.7
Procedural	11,458	11.8	11.2	12.5	8.1	7.7	8.6
Referrals	10,860	11.2	10.8	11.6	7.7	7.4	8
Emergency department	60	0.1	0	0.6	0.0	0	0.4
Hospital	717	0.7	0.6	0.9	0.5	0.4	0.6
Specialist	7,147	7.4	7.1	7.7	5.1	4.9	5.3
Allied health services	2,935	3.0	2.8	3.2	2.1	2	2.2
Pathology	23,872	18.1	17	19.3	12.8	12	13.5
Imaging	6,844	5.2	4.8	5.6	3.7	3.4	3.9

(a) Status of problem was missing for 32,089 problems (22.8%).

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval

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, a governmental rebate scheme (Medical Benefits Scheme 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 96.7% of all recorded encounters and 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 (90.3%) of consultations and 93.3% of direct consultations were billed to the Medicare. This is not to say that in all cases the Medicare claim was directly made by the GP ('bulk billed'), nor does it mean that no additional amount (above the Medicare rebate) was paid by the patient.

At least 85.2% of consultations take place in the GP's consultation rooms. (Note: Some of the items grouped under other items of services could also take place in the GP's rooms.) Standard surgery consultations were the most frequent Medicare item recorded. Hospital, nursing home and home visits were rare, accounting for only 3.0% of all encounters. Worker's compensation claims represented 1.9% of all recorded encounters. This appears lower than would be expected if all work related problems (4.0 per 100 encounters and 2.7 per 100 problems) were being managed at encounters covered by workers' compensation (Table 5.1).

Indirect consultations (3.3 per 100 encounters) are those at which the patient is not seen by the GP but which generate a prescription, a referral, a certificate or other service. They were not recorded in the AMTS and are usually the result of a phone call by a patient. Indirect consultations are a free service 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. Prescriptions were the most common result of an indirect consultation, occurring at 55.2 per 100 indirect consultations.

These results provide the first measured indication that free services to their patients (no charge and indirect consultations) make up approximately 5% of total clinical services provided by GPs in Australia.

Table 5.2: Types of encounter: BEACH, April 1998–March 1999

Variable	Number	Rate per 100 encounters	95% LCI	95% UCI
General practitioners	984	. .	. .	. .
Total encounters	96,901	. .	. .	. .
Direct consultations	88,700	96.7	96.4	97
No charge	1,390	1.5	1.1	1.9
Medicare paid	82,816	90.3	89.3	91.2
Short surgery consultations	1,241	1.4	0.9	1.8
Standard surgery consultations	70,024	76.3	75.2	77.5
Long surgery consultations	6,378	7.0	6.4	7.6
Prolonged surgery consultations	473	0.5	0	1.5
Home visits	1,604	1.8	1.2	2.3
Hospital	365	0.4	0	1.8
Nursing home	753	0.8	0	1.6
Other items	1,977	2.2	1.7	2.7
Worker's compensation	1,737	1.9	1.6	2.2
Other paid (hospital, State, etc)	3,432	3.7	1.8	5.7
Indirect consultations	3,025	3.3	2.8	3.8
Prescription	1,670	1.8	1.4	2.2
Referral	409	0.5	0.2	0.7
Certificate	115	0.1	0	0.4
Other	902	1.0	0.6	1.4
Missing	5,176	. .	. .	. .

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval

6. The patients

6.1 Patient characteristics

6.1.1 Age–sex distribution of patients

Figure 6.1 shows the age–sex distribution of patient encounters recorded in the survey. Age was not recorded at 1.1% of encounters and sex was missing at 1.5% of encounters (Table 6.1). Approximately one in six patient encounters were with children (15.8%), one in ten were with young adults (9.8%), and approximately one in four with patients in each of the following age groups, 25–44 years (26.0%), 45–64 years (24.4%), and 65 years and older (24.0%).

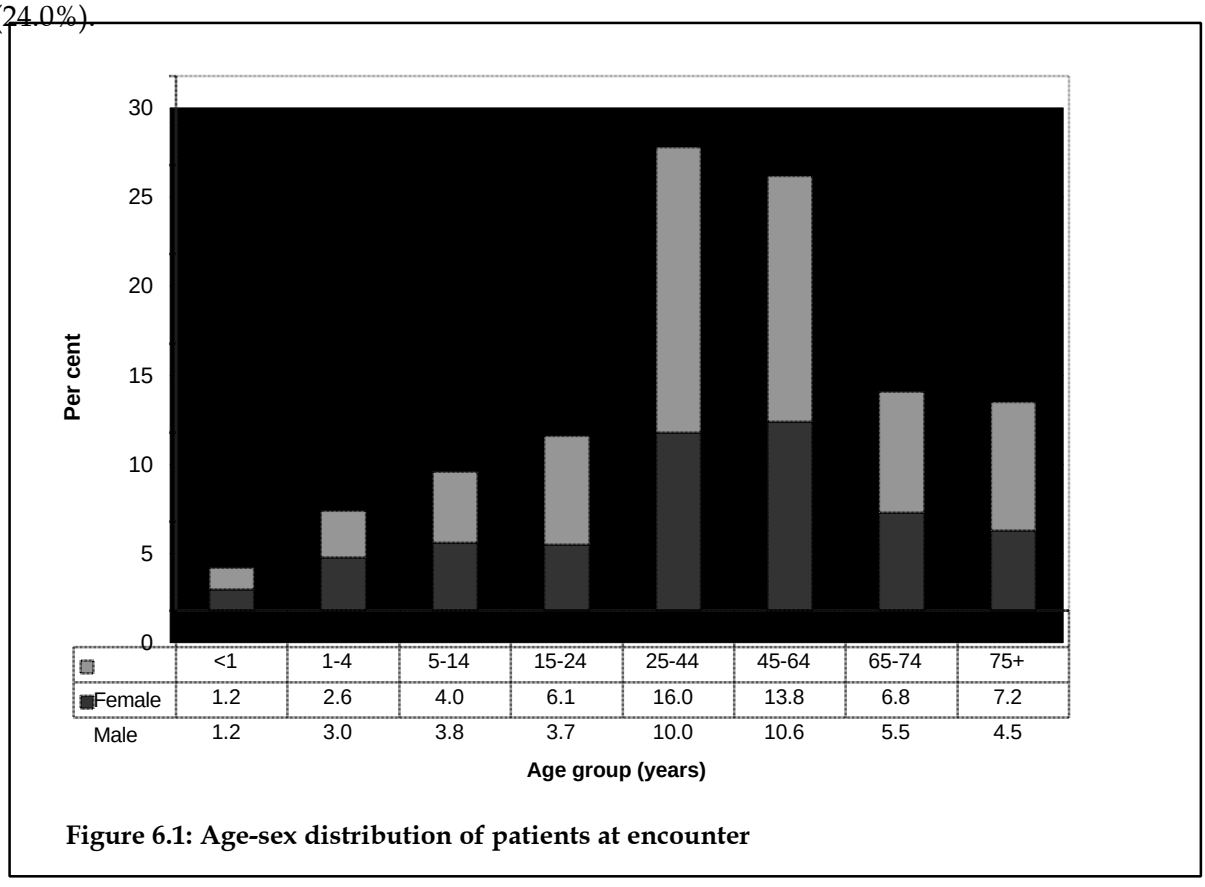


Figure 6.1: Age-sex distribution of patients at encounter

Overall there were more female than male patient encounters (57.7% compared with 42.3%). This was reflected across all age groups except for patients aged 1–4 years where there were slightly more male than female encounters. Gender differences were greatest in the reproductive years (25–44 years age group), and in the elderly (75+ years), where there are more females than males in the general population.

6.1.2 Other patient characteristics

For each encounter the GP indicated whether the patient was new to the practice or had been seen previously. The patient was new to the practice at 9.2% of encounters. Almost half of the encounters were with patients who held a health care card (47.3%) and 3.4% were with persons who held a Department of Veterans' Affairs card. At 14.5% of encounters the patient was from a non-English speaking background, and at only 1.1% was the patient Aboriginal and/or Torres Strait Islander.

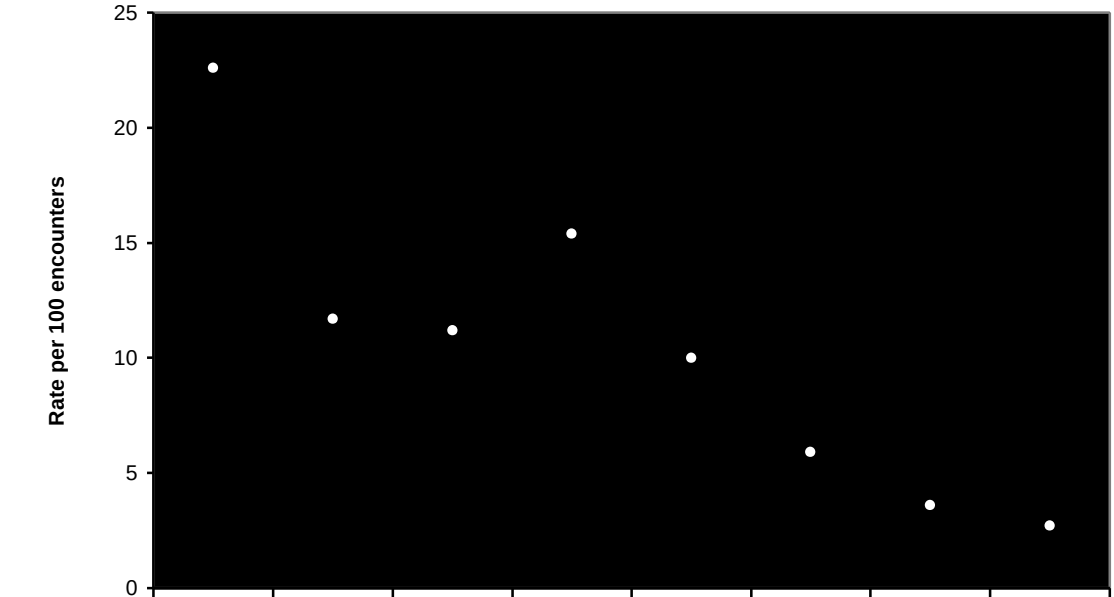
Table 6.1: Characteristics of the patients at encounters

Patient variable	Number	% of encounters (N=96,901)	95% LCI	95% UCI
Sex	. .	. .	. .	. .
Males	40,370	42.3	41.6	43.0
Females	55,057	57.7	57.0	58.4
Missing	1,474	. .	. .	. .
Age group	. .	. .	. .	. .
<1 year	2,337	2.4	2.2	2.7
1–4 years	5,417	5.7	5.3	6.0
5–14 years	7,411	7.7	7.3	8.1
15–24 years	9,433	9.8	9.4	10.2
25–44 years	24,886	26.0	25.3	26.7
45–64 years	23,393	24.4	23.8	25.0
65–74 years	11,756	12.3	11.7	12.8
75+ years	11,245	11.7	11.1	12.4
Missing age	1,023	. .	. .	. .
Other characteristics	. .	. .	. .	. .
New patient to practice	8,824	9.2	8.6	9.8
Health care card	41,748	47.3	45.8	48.8
Veterans' Affairs Gold Card	2,910	3.0	2.7	3.3
Veterans' Affairs White Card	366	0.4	0.2	0.5
Non-English speaking background	14,021	14.5	13.0	16.7
Aboriginal	1,011	1.0	0.3	1.8
Torres Strait Islander	115	0.1	0.0	0.5
Aboriginal & Torres Strait Islander	36	0.04	0.0	0.9

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval

6.1.3 Age–sex specific rates of new patients

The relative rate of new patient presentations for each age–sex patient group demonstrated that about one in four male and female patients aged less than one year were new to the practice. The relative number of new patients decreased with age so that by far the majority of elderly patients had been to the practice on prior occasions. Figure 6.2 demonstrates that only 10–15% of older children were new to the practice but that of young adults, particularly young men (15–24 years), about one in five encounters are with new patients.



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	22.4	10.4	12.7	19.9	14.4	6.6	3.4	2.9
Female	22.6	11.7	11.2	15.4	10.0	5.9	3.6	2.7

Age group (years)

Figure 6.2: Age-sex specific rates of new patients

6.1.4 Age–sex specific rates of encounters with persons holding a health care card

The age–sex specific rates of health care card holders demonstrated that at one-third of encounters with children (aged less than 15 years) and adults aged less than 45 years the patient held a health care card. This rate then increased to approximately 40% of encounters with patients in the 45–64 years age group and then sharply increased for encounters with the elderly. At three-quarters of all encounters with women of 65 years or more, the patient held a health care card. A somewhat lesser proportion of encounters with adult males in all age groups were with a health care card holder than encounters with adult females (Figure 6.3).

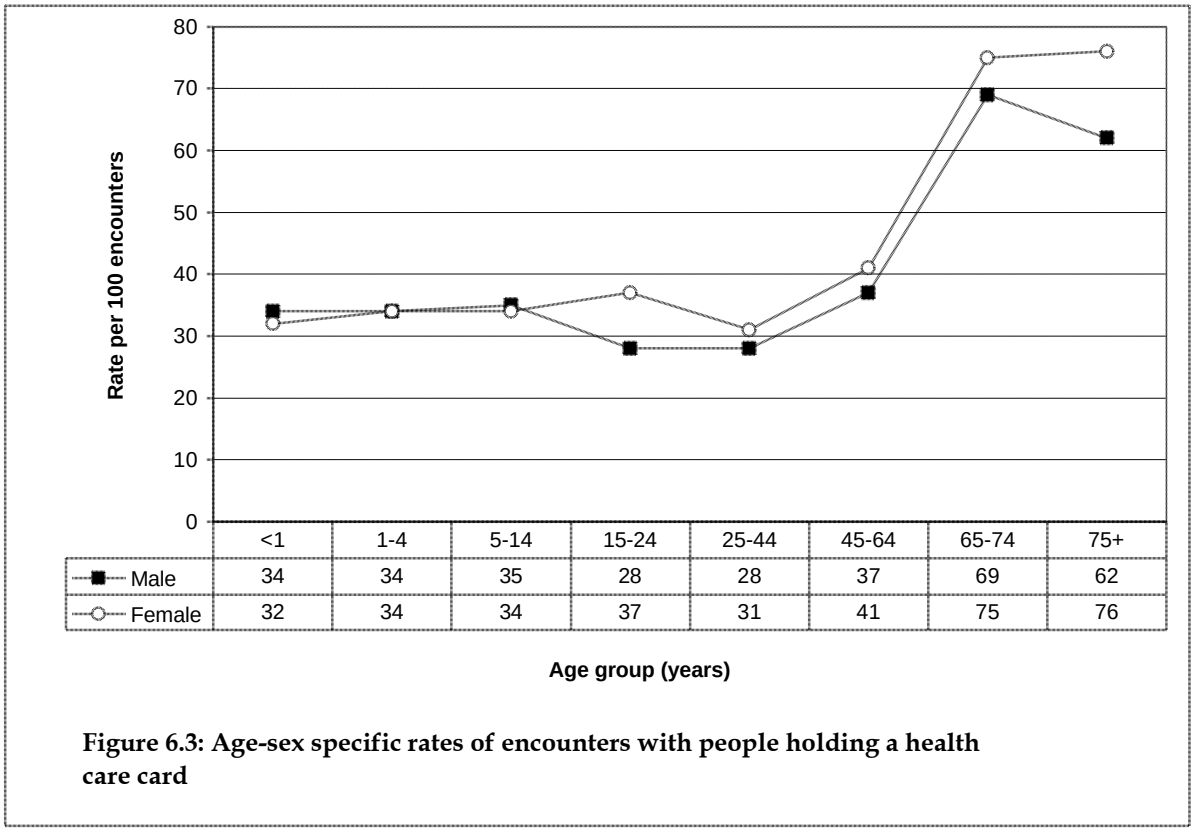


Figure 6.3: Age-sex specific rates of encounters with people holding a health care card

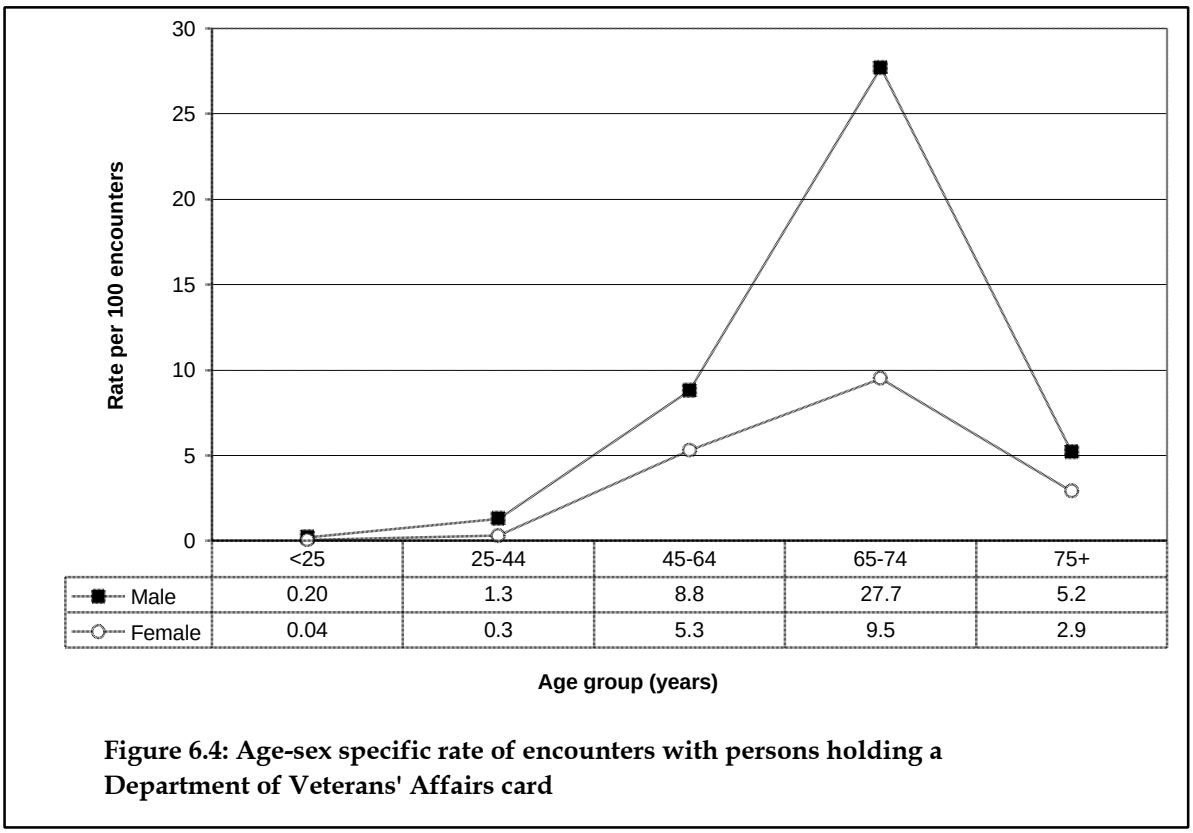


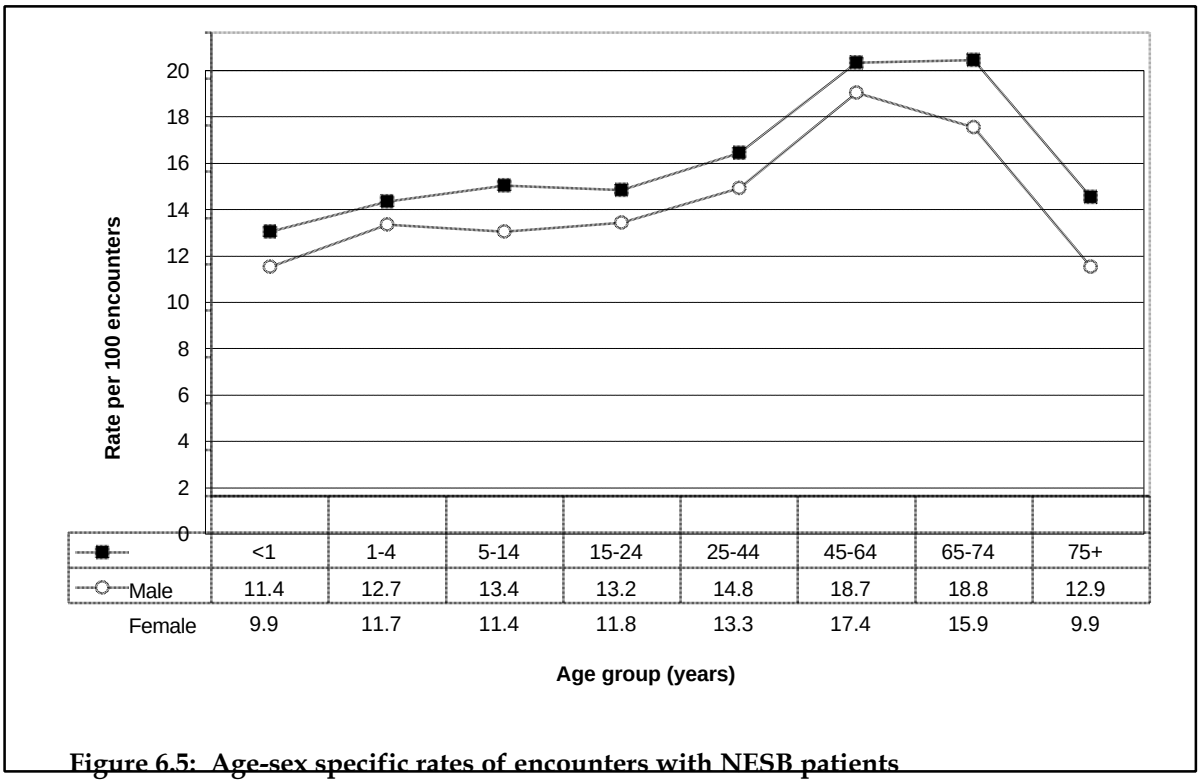
Figure 6.4: Age-sex specific rate of encounters with persons holding a Department of Veterans' Affairs card

6.1.5 Age–sex specific rates of encounters with persons holding a Department of Veterans' Affairs card

As could be expected men were more likely than women to hold a Department of Veterans' Affairs card. At very few encounters with patients aged under 44 years did the patient hold a card of this type but more than a quarter of all encounters with men in the 65–74 years age group held a Veterans' Affairs card (Figure 6.4).

6.1.6 Age–sex specific rates of encounters with persons from a non-English speaking background

Patients were defined as being from a non-English speaking background (NESB) if they reported usually speaking a language other than English in their home. The relative rate of encounters with people from a non-English speaking background is shown in Figure 6.5. Males in all age groups were slightly more likely to be from a non-English speaking background than were females and the proportion of encounters with such people ranged from about one in ten for children aged less than one year and for elderly persons over 75 years old, to a peak of 19 encounters per 100 for males of 45–74 years.



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	11.4	12.7	13.4	13.2	14.8	18.7	18.8	12.9
Female	9.9	11.7	11.4	11.8	13.3	17.4	15.9	9.9

Figure 6.5: Age-sex specific rates of encounters with NESB patients

6.2 Patient reasons for encounter

Reasons for encounter (RFEs) are those concerns and expectations which patients bring to the doctor. They may be symptoms or complaints (headache or fear of cancer), known diseases (flu or diabetes), requests for preventive or diagnostic services (a blood pressure check or an ECG), requests for treatment (repeat prescription), to get test results, or request an administrative action (e.g. a medical certificate). These reasons are usually related to one or more underlying problems which the doctor formulates during the encounter as the conditions that have been treated, and those may or may not be the same as the reasons for encounter.

International interest in RFEs has been developing over the past two 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.

Balint's work in the 1950s led to a strong shift in approach by many practitioners, towards a 'patient-centred' rather than a 'disease-centred' approach (Balint, 1961). McWhinney has continued to promote this concept. He feels that the traditional disease-centred approach aims 'to interpret symptoms and signs in terms of physical pathological findings'. In contrast, the patient-centred method aims to see the patient's illness through the patient's eyes, relying on empathy, reflective listening and self knowledge on the part of the practitioner (McWhinney 1986).

The movement towards the patient-centred approach in turn stimulated increasing interest in the patient's role in the primary care setting, the way he/she reacts to pain, discomfort and stress; his/her attitudes to illness and disease and the factors which influence his/her decision to attend a medical practitioner (Barsky 1981; Stewart et al. 1975; Weyrauch 1984).

The importance of the patient's reason for attending the practitioner was emphasised by Morrell in 1971, who saw it as 'the logical point at which to start prospective studies into the natural history of illness and of the diagnostic method in general practice' (Morrell et al. 1971).

Clearly the collection of morbidity data based solely on the doctor's diagnostic decision is insufficient, especially in view of the difficulties in 'labelling' noted earlier in this report. The whole process of care needs to be described. A large part of the resources spent on health is applied to primary care and the efficient application of these resources requires greater knowledge of the reasons people decide to attend a general practitioner; why they move from self care to the primary care stage; and the economic costs related to different symptomatology.

Participating GPs were asked to record at least one and up to three patient reasons for the encounter (RFEs). These reflect the patient's view of the reasons s/he has 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.

RFEs were coded using ICPC-2 PLUS. The bi-axial structure of ICPC-2 has been used to formulate the analytical structure presented in this Chapter. GPs were instructed to record the reasons for the encounter in words as close as possible to the patients, prior to the commencement of the diagnostic or management process.

6.2.1 Number of RFEs at encounter

There were 141,766 patient RFEs recorded at a rate of 146.3 per 100 encounters. For almost two-thirds of encounters (63.4%) only one RFE was recorded, while at almost 10% of encounters the maximum of three RFEs were noted (Table 6.2).

Table 6.2: Number of patient reasons for encounter at an encounter

Number of RFEs at encounter	Number of encounters	Col %	95% LCI	95% UCI
One RFE	61,480	63.4	62.3	64.59
Two RFEs	25,977	26.8	26.1	27.51
Three RFEs	9,444	9.7	9.15	10.35
Total	**96,901**	**100.0**	. .	. .

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval.

6.2.2 Age–sex specific rates of RFEs

For encounters with children aged less than 15 years the age–sex specific rate of RFEs per 100 encounters was steady at 130-133. It then gradually increased with patient age for both males and females reaching its maximum of 163 RFEs per 100 encounters for females of 65–74 years. Women of 15 years or more consistently had more RFEs than their male counterparts, though the difference decreased in patients aged 75 years or more (Figure 6.6).

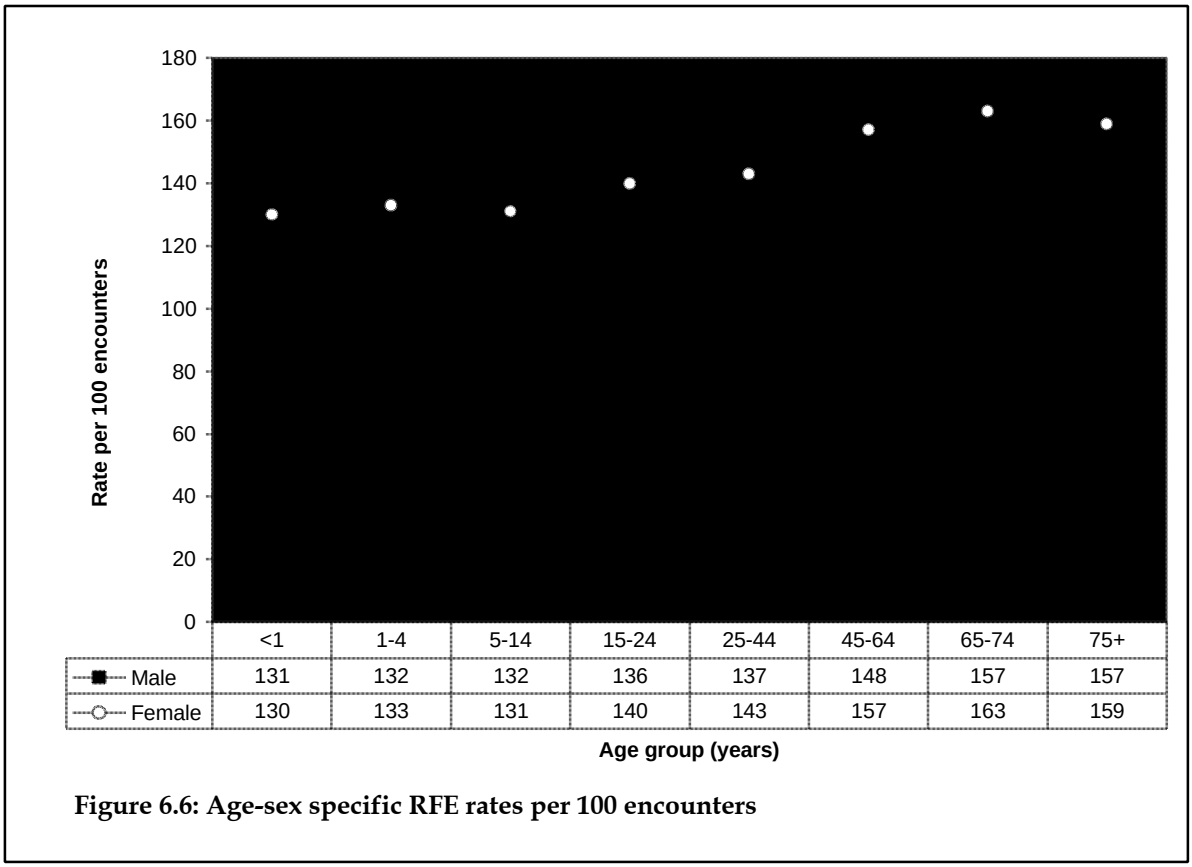


Figure 6.6: Age-sex specific RFE rates per 100 encounters

6.2.3 Nature of reasons for encounter

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 shown in Table 6.3. Each chapter and individual RFE is expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence intervals.

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

Eighteen per cent of RFEs did not relate to a specific body system and were classified in the **general** chapter. The most common general RFE was a request for a prescription (of unspecified type), followed by a request for a check-up and a need for immunisation or vaccination. Other general RFEs that also arose relatively frequently were of a symptomatic nature. These included fever, weakness/tiredness and chest pain (of unspecified origin).

Respiratory problems arose at a rate of 24.8 per 100 encounters, the most common being cough, throat complaints and URTI (often expressed as a 'cold'). Requests for influenza vaccines presented at a rate of 2.3 per 100 encounters while asthma, nasal congestion and acute bronchitis were also relatively common.

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 (3.6 per 100 encounters), followed by those related to the knee, the foot/toe, the neck, shoulder and leg.

Reasons associated with the **skin** were described at a rate of 15.1 per 100 encounters, rash being the most frequent problemn followed by skin compaints (not othersie classified). 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 11.4 per 100 encounters. Patients also frequently presented for their hypertension or 'high blood pressure' problem.

Digestive problems accounted for 7.2% of all reasons described, arising at a rate of 10.6 per 100 encounters. Abdominal pain was most common, followed by diarrhoea and vomiting Together these three symptoms represented approximately half of all digestive related RFEs.

Less frequently recorded were RFEs of a **psychological** nature (7.6 per 100 encounters) and these were frequently described in terms of depression, insomnia and anxiety. The relative frequency of the remaining ICPC-2 chapters for patient reasons for encounter is demonstrated in Table 6.3.

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	% total RFEs	Rate per 100 encs[(a)]	95% LCI	95% UCI
General & unspecified	**25,739**	**18.2**	**26.6**	**25.7**	**27.4**
Prescription NOS	5,452	3.9	5.6	5.2	6.0
Check-up NOS*	3,032	2.1	3.1	2.9	3.4
Immunisation/vaccination –general	2,003	1.4	2.1	1.9	2.3
Fever	1,768	1.3	1.8	1.5	2.1
Weakness/tiredness	1,515	1.1	1.6	1.4	1.7
Chest pain NOS	1,269	0.9	1.3	1.2	1.4
Administrative procedure NOS	819	0.6	0.9	0.7	1.0
Blood test NOS	719	0.5	0.7	0.4	1.0
Trauma/injury NOS	717	0.5	0.7	0.6	0.9
Respiratory	**24,027**	**16.9**	**24.8**	**24.0**	**25.6**
Cough	6,019	4.3	6.2	5.8	6.6
Throat complaint	3,696	2.6	3.8	3.5	4.1
URTI	2,794	2.0	2.9	2.5	3.3
Immunisation/vaccination –respiratory	2,271	1.6	2.3	1.2	3.4
Asthma	1,327	0.9	1.4	1.2	1.5
Nasal congestion/sneeze	1,307	0.9	1.4	1.1	1.6
Acute bronchitis/bronchiolitis	975	0.7	1.0	0.7	1.3
Shortness of breath, dyspnoea	761	0.5	0.8	0.6	0.9
Musculoskeletal	**16,236**	**11.5**	**16.7**	**16.1**	**17.4**
Back complaint*	3,435	2.4	3.6	3.3	3.8
Knee complaint	1,200	0.9	1.2	1.1	1.4
Foot/toe complaint	1,162	0.8	1.2	1.1	1.3
Neck complaint	1,141	0.8	1.2	1.0	1.4
Shoulder complaint	1,055	0.7	1.1	0.9	1.2
Leg/thigh complaint	1,014	0.7	1.1	0.9	1.2
Skin	**14,584**	**10.3**	**15.1**	**14.6**	**15.5**
Rash*	2,539	1.8	2.6	2.4	2.8
Skin complaint	1,192	0.8	1.2	1.1	1.4
Swelling*	1,080	0.8	1.1	1.0	1.2
Check-up*	793	0.6	0.8	0.6	1.0
Circulatory	**11,085**	**7.8**	**11.4**	**10.9**	**12.0**
Check-up*	4,986	3.5	5.2	4.7	5.5
Hypertension/high BP*	2,452	1.7	2.5	2.1	3.0

(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	% total RFEs	Rate per 100 encs[(a)]	95% LCI	95% UCI
Digestive	**10,265**	**7.2**	**10.6**	**10.3**	**10.9**
Abdominal pain*	2,174	1.5	2.2	2.1	2.4
Diarrhoea	1,355	1.0	1.4	1.3	1.5
Vomiting	1,031	0.7	1.1	0.9	1.2
Psychological	**7,374**	**5.2**	**7.6**	**7.2**	**8.0**
Depression*	2,047	1.4	2.1	1.9	2.3
Insomnia	1,149	0.8	1.2	1.0	1.3
Anxiety*	1,093	0.8	1.1	1.0	1.3
Endocrine & metabolic	**5,429**	**3.8**	**5.6**	**5.3**	**5.9**
Diabetes *	1,033	0.7	1.1	0.9	1.3
Blood test endocrine/metabolic	723	0.5	0.8	0.5	0.9
Lipid disorder	677	0.5	0.7	0.4	1.0
Female genital system	**5,171**	**3.6**	**5.3**	**5.0**	**5.7**
Check-up/Pap smear*	1,652	1.2	1.7	1.5	1.9
Menstrual problems*	830	0.6	0.9	0.7	1.0
Neurological	**5,136**	**3.6**	**5.3**	**5.1**	**5.5**
Headache	1,876	1.3	1.9	1.8	2.1
Vertigo/dizziness	1,061	0.8	1.1	1.0	1.2
Ear	**4,379**	**3.1**	**4.5**	**4.3**	**4.7**
Ear pain	1,882	1.3	1.9	1.8	2.1
Pregnancy & family planning	**3,576**	**2.5**	**3.7**	**3.4**	**4.0**
Pre/post natal check*	1,149	0.8	1.2	0.8	1.6
Oral contraception*	871	0.6	0.9	0.7	1.1
Eye	**2,741**	**1.9**	**2.8**	**2.7**	**3.0**
Eye pain	545	0.2	0.6	0.4	0.7
Urology	**2,375**	**1.7**	**2.5**	**2.3**	**2.6**
Blood	**1,739**	**1.2**	**1.8**	**1.6**	**2.0**
Male genital system	**1,031**	**0.7**	**1.1**	**0.9**	**1.2**
Social problems	**877**	**0.6**	**0.9**	**0.7**	**1.1**
Total RFEs	**141,766**	**100.0**	**146.3**	**144.6**	**148.0**

(a) Figures do not total 100 as more than one RFE can be recorded at each encounter. Also only frequencies >0.5 are included.

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

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval, NOS – Not otherwise specified.

Reasons for encounter by ICPC-2 component

Almost half of the RFEs presented were expressed in terms of a symptom or complaint (e.g. feeling tired, sore feet, pain in back), described by patients at a rate of 71.1 such symptoms per 100 encounters. Diagnostic terms represented almost one-quarter of all RFEs and were described at a rate of 33.6 per 100 encounters. Requests for diagnostic and preventive procedures were made at a rate of 22.4 per 100 encounters and (as demonstrated in later Tables) these were most commonly requests for check-ups and vaccination/immunisation. Patient requests for medication and other treatments were made at a rate of 10 per 100 encounters while requests for referral, results, and administrative procedures were relatively few (Table 6.4).

Table 6.4: Distribution of RFEs by ICPC-2 component

ICPC-2 component	Number	% total RFEs	Rate per 100 encs[(a)]	95% LCI	95% UCI
Symptoms & complaints	68,933	48.6	71.1	69.4	72.9
Diagnosis, diseases	32,540	23.0	33.6	31.9	35.2
Diagnostic & preventive procedures	21,721	15.3	22.4	21.5	23.3
Medications, treatments & therapeutics	10,011	7.1	10.3	9.8	10.9
Referral & other RFE	4,231	3.0	4.4	4.0	4.7
Results	3,306	2.3	3.4	3.1	3.7
Administrative	1,023	0.7	1.1	0.9	1.2
Total RFEs	**141,766**	**100.0**	**146.3**	**144.6**	**148.0**

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

Table 6.5: Most frequent patient reasons for encounter

Patient reason for encounter	Number	% total RFEs	Rate per 100 encs[(a)]	95% LCI	95% UCI
Check-up (all)*	13,223	9.3	13.7	13.0	14.3
Prescription (all)*	7,946	5.6	8.2	7.7	8.7
Cough	6,019	4.3	6.2	5.8	6.6
Immunisation/vaccination (all)*	4,742	3.4	4.9	4.4	5.4
Throat complaint	3,696	2.6	3.8	3.5	4.1
Back complaint*	3,435	2.4	3.6	3.3	3.8
Test results*	3,306	2.3	3.4	3.1	3.7
URTI	2,794	2.0	2.9	2.5	3.3
Rash*	2,539	1.8	2.6	2.4	2.8
Hypertension/high BP*	2,452	1.7	2.5	2.1	3.0
Abdominal pain*	2,174	1.5	2.2	2.1	2.4
Depression*	2,047	1.4	2.1	1.9	2.3
Ear pain	1,882	1.3	1.9	1.8	2.1
Headache	1,876	1.3	1.9	1.8	2.1
Fever	1,768	1.3	1.8	1.5	2.1
Weakness/tiredness	1,515	1.1	1.6	1.4	1.7
Diarrhoea	1,355	1.0	1.4	1.3	1.5
Asthma	1,327	0.9	1.4	1.2	1.5
Nasal congestion/sneeze	1,307	0.9	1.4	1.1	1.6
Chest pain (NOS)	1,269	0.9	1.3	1.2	1.4
Knee complaint	1,200	0.9	1.2	1.1	1.4
Skin complaint	1,192	0.8	1.2	1.1	1.4
Foot/toe complaint	1,162	0.8	1.2	1.1	1.3
Insomnia	1,149	0.8	1.2	1.0	1.3
Neck complaint	1,141	0.8	1.2	1.0	1.4
Anxiety*	1,093	0.8	1.1	1.0	1.3
Swelling*	1,080	0.8	1.1	1.0	1.2
Vertigo/dizziness	1,061	0.8	1.1	1.0	1.2
Shoulder symptom/complaint	1,055	0.7	1.1	0.9	1.2
Diabetes*	1,033	0.7	1.1	0.9	1.3
Subtotal	*76,689*	*54.1*	. .	. .	. .
Total RFEs	**141,766**	**100.0**	**146.3**	**144.6**	**148.0**

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

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

Most frequent patient reasons for encounter

The 30 most commonly recorded RFEs are listed in order of frequency in Table 6.5. In this analysis the specific ICPC-2 chapter to which an across chapter RFE concept 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 flu vaccination requests as well as those for childhood immunisation, hepatitis, etc.

The need for a check-up was by far the most common RFE, accounting for almost 10% of all RFEs recorded at a rate of 13.7 per 100 encounters. Requests for medication were also frequent (8.2 per 100 encounters). It is notable that RFEs described as 'hypertension' and 'high BP' also arose at a rate of 2.5 per 100 encounters and these are likely to be closely associated with the need for a check-up and/or medication. RFEs associated with the need for immunisation or vaccination were the fourth most often expressed RFE (4.9 per 100), perhaps reflecting an increasing understanding of the advantages of such preventive care.

The remaining RFEs in the top 30 were largely symptom based, led by cough (6.2 per 100) and throat complaints (3.8 per 100), back complaints, URTI (often described as 'a cold') and rash. Undifferentiated symptoms such as weakness/tiredness, headache, fever, abdominal pain, diarrhoea, chest pain and vertigo were also common. Many musculoskeletal symptoms also appeared in the top 30 RFEs. It is notable that chronic conditions such as asthma, depression, insomnia, anxiety and diabetes were also frequently described in diagnostic terms by patients in describing their reasons for encounter.

6.2.4 The inter-relationship of RFEs with other variables. Example: Weakness/tiredness

An RFE was classified as 'weakness/tiredness' if the patient described their reason for the encounter in terms of any of the labels classified under the ICPC-2 rubric A04 (General weakness/tiredness). In ICPC-2 PLUS this rubric includes a number of more specific symptoms and complaints codes, such as 'rundown' (ICPC-2 PLUS code A04018) and 'feeling weak' (ICPC-2 PLUS code A04011). As multiple ICPC-2 PLUS codes fall into the general weakness/tiredness rubric in cases where a patient described more than one of these terms at an encounter, the RFE would have been classified twice to A04.

General weakness/tiredness was one of the most frequently described patient RFEs (Table 6.3). It was described on 1,515 occasions, representing 1.1% of all RFEs and occurring at a rate of 1.6 per 100 encounters. Encounters involving at least one RFE of this type numbered 1,433 (1.5% of all encounters).

Figure 6.7 illustrates the relationship of an RFE of weakness/tiredness with other variables that are collected at the general practice encounter. Weakness/tiredness can be directly linked to patient characteristics such as age and sex (solid arrows); however, a RFE can only be indirectly linked (dotted arrows) to the problems and managements (i.e. Prescriptions written, tests and investigations ordered, and referrals transcribed) provided at the encounter. In addition, other RFEs presenting with weakness/tiredness have also been included to give an indication of other reasons why the patient attended the encounter.

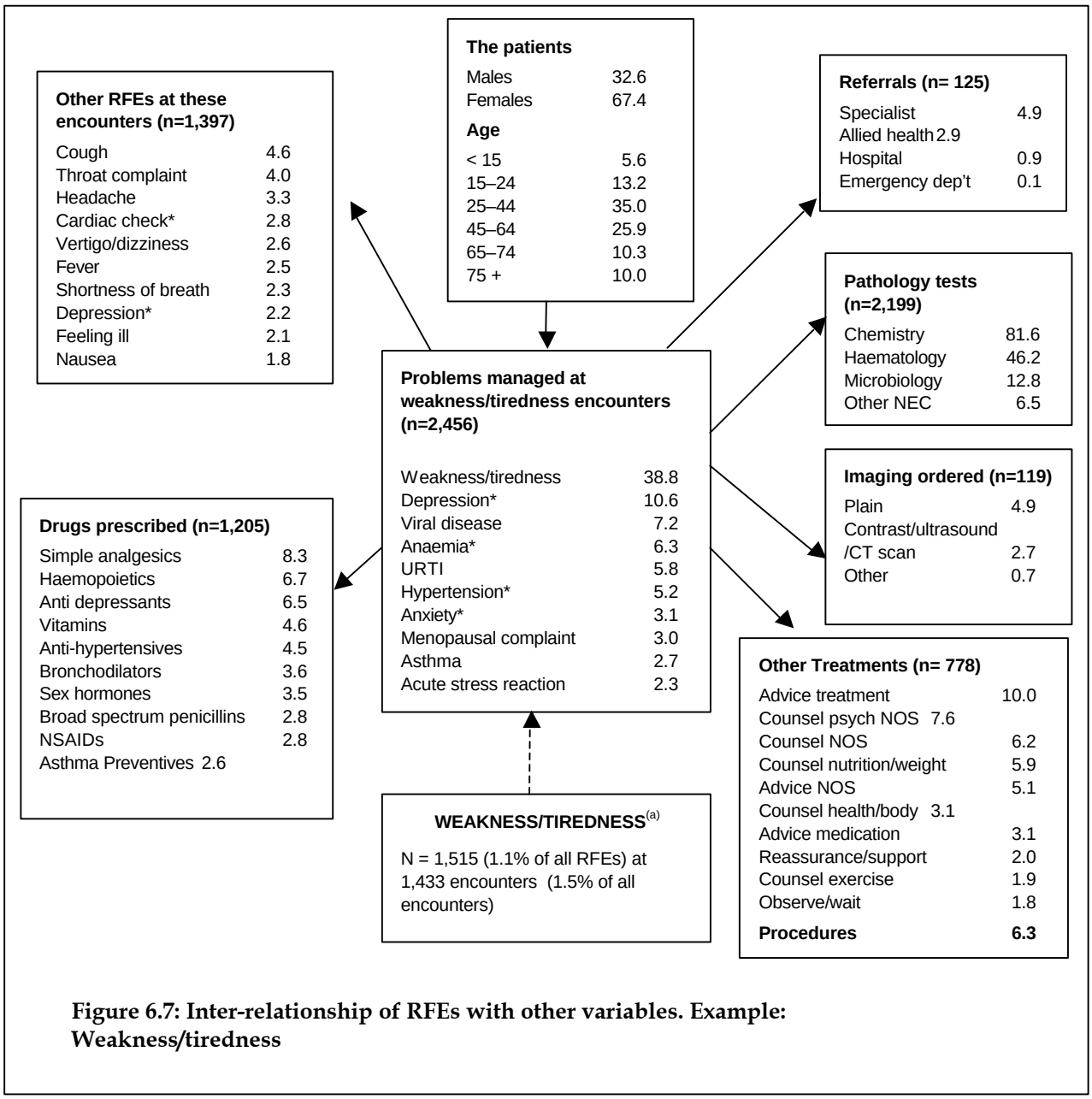


Figure 6.7: Inter-relationship of RFEs with other variables. Example: Weakness/tiredness

Other reasons for encounter

At each encounter where a RFE of weakness/tiredness was described, a number of other patient RFEs were also presented to the GP. A total of 1,397 other RFEs were described at these encounters, the most frequent being symptoms of cough (4.6 per 100 encounters), throat complaints (4.0) and headache (3.3).

Problems managed

At the 1,433 encounters where tiredness/weakness presented as an RFE, more problems (171 per 100 encounters) were managed than in the total dataset (145 per 100). The most common problem managed at these encounters was described in the same symptomatic terms as the RFE, demonstrating that in 38.8 per 100 encounters no further definition of the underlying problem could yet be determined. This was followed by depression (10.6 per 100 encounters), viral illness (7.2) and anaemia (6.3). The inclusion of hypertension in the top ten problems managed at weakness encounters could purely reflect the high rate of management of this problem throughout the total dataset. Alternatively some of these cases of hypertension may be associated with symptoms, such as weakness/tiredness, which present as side effects of anti-hypertensive medication. Anxiety, menopausal complaints, asthma and acute stress were also common problems managed at these encounters.

Prescriptions and other treatments

Prescriptions given at these encounters numbered 1,205 (84.1 per 100 encounters). This was somewhat less than the rate for the total data (93.6 per 100). Simple analgesics were the most frequently prescribed drug group and these were more likely to be given than usual (8.3 per 100 encounters compared with 4.7). Haemopoietics were prescribed at a rate of 6.7 per 100 weakness encounters (compared with <0.5 per 100 in the total dataset). Almost half of these were Vitamin B12 injections (cyanocobalamin). Anti-depressants were 2.5 times more frequently prescribed at the encounters compared with the total dataset and vitamins were almost 10 times more frequent. Bronchodilators, anti-hypertensives, broad spectrum penicillins and NSAIDS were less frequently prescribed than usual while prescription rates for hormones paralleled the total findings.

Referrals, tests and investigations

Other clinical treatments were provided at 778 of these encounters (53 per 100) and again this was more frequent than usual (31 per 100). Advice about treatment for the problem being managed was most common, followed by psychological counselling and counselling of an unspecified nature. Other forms of counselling and advice provided to these patients covered nutrition and weight, exercise and advice about medication.

Referrals numbered 125 (8.7 per 100 weakness encounters). While specialist referrals were relatively less frequent than in the total dataset (4.9 per 100 encounters compared with 7.4), referrals to allied health professionals were consistent with usual levels (2.9 compared with 2.8 per 100 encounters).

Encounters involving a RFE of weakness/tiredness generated very high pathology test ordering rates. There were 2,199 pathology tests (or groups of tests such as FBC) placed at these encounters, a rate of 153 per 100 encounters. This compares with an overall rate of 24.6 orders per 100 encounters. Orders of imaging were only made at a rate of 8.3 per 100 encounters, a similar rate to the average (5.2) and the majority of these orders were for plain X-rays.

7. Problems managed

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

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

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

The relative frequency of problems managed can be described in two ways: as a percentage of all problems managed in the study, or as a rate of problems managed per 100 encounters. Where groups of problems are reported (e.g. circulatory problems) it must be remembered that more than one type of problem (e.g. hypertension and oedema) could have been managed at a single encounter. In considering these results the reader must be mindful that while a rate per 100 encounters for a single ungrouped problem (e.g. asthma, 3.2 per 100 encounters) can be regarded as equivalent to 'asthma is managed at 32% of encounters or at 32 per 1,000 encounters', such a statement cannot be made for grouped concepts.

7.1 All problems

7.1.1 Number of problems managed at encounter

A total of 140,824 problems were managed at the 96,901 patient encounters, at an average rate of 145.3 problems per 100 encounters. For the majority of encounters (66.3%) only one problem was managed, while three or more problems were managed at 10% of encounters (Table 7.1).

Table 7.1: Number of problems managed at an encounter

Number of problems managed at encounter	Number of encounters	Col %	95% LCI	95% UCI
One problem	64,214	66.3	65.1	67.4
Two problems	23,359	24.1	23.4	24.8
Three problems	7,421	7.7	7.3	8.1
Four problems	1,907	2.0	1.6	2.3
Total	**96,901**	**100.0**	. .	. .

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval.

7.1.2 Age–sex specific rates of problems managed

The number of problems managed per encounter varied by both the age and sex of the patient (Figure 7.1).

Overall, slightly more problems were managed per 100 encounters for female patients (141.4) than for male patients (137.1). For patients aged 15 and under, there appeared to be no difference between males and females in the rate of problems managed. However, for patients aged greater that 15 years there was a general trend for females to have a slightly higher rate of problems managed than males. This difference was greatest in the 45–64 years age group.

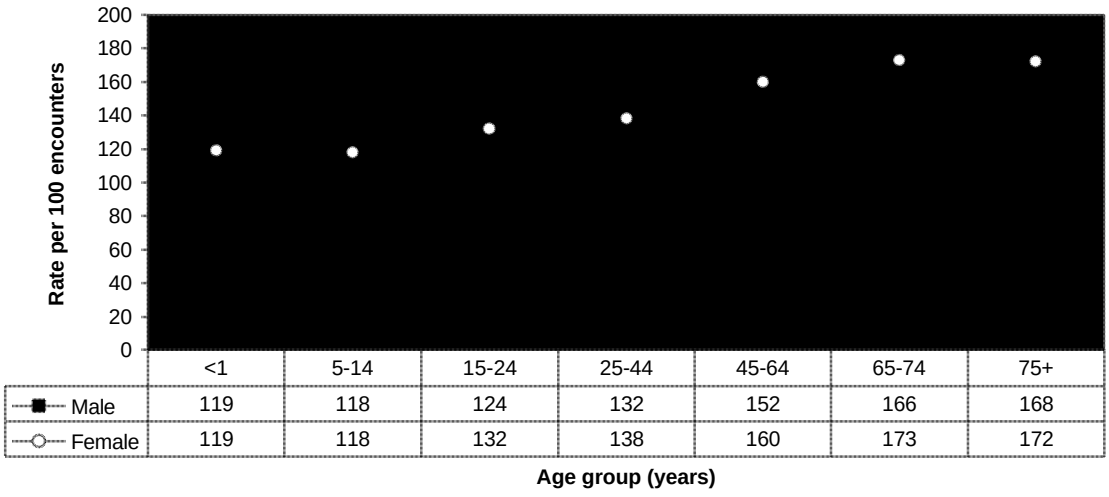


Figure 7.1: Age-sex specific rates per 100 encounters for all problems managed

The number of problems managed increased steadily with age. An average of 170 problems were managed per 100 encounters for patients 65 years and older compared with 118 per 100 encounters for patients aged between 1 and 14 years. The number of problems managed reached a peak of 173 problems per 100 encounters for female patients in the 65–74 age group.

7.1.3 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.

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

Problem managed	Number	% total problems	Rate per 100 encs[(a)]	95% LCI	95% UCI
Respiratory	**23,554**	**16.7**	**24.3**	**23.6**	**25.0**
URTI	6,623	4.7	6.8	6.4	7.3
Acute bronchitis/bronchiolitis	3,185	2.3	3.3	3.0	3.6
Asthma	3,079	2.2	3.2	3.0	3.4
Immunisation/vaccination - respiratory	2,420	1.7	2.5	1.3	3.7
Sinusitis acute/chronic	1,513	1.1	1.6	1.4	1.7
Tonsillitis*	1,422	1.0	1.5	1.3	1.6
Allergic rhinitis	926	0.7	1.0	0.8	1.1
Musculoskeletal	**16,404**	**11.7**	**16.9**	**16.3**	**17.5**
Back complaint*	2,573	1.8	2.7	2.4	2.9
Osteoarthritis*	2,118	1.5	2.2	2.0	2.4
Sprain/strain*	1,790	1.3	1.9	1.6	2.1
Fracture*	1,051	0.8	1.1	0.9	1.2
Skin	**15,976**	**11.3**	**16.5**	**16.0**	**17.0**
Contact dermatitis	1,778	1.3	1.8	1.7	2.0
Solar keratosis/sunburn	963	0.7	1.0	0.8	1.2
Laceration/cut	821	0.6	0.9	0.7	1.0
Malignant skin neoplasm	814	0.6	0.8	0.7	1.0
Circulatory	**15,638**	**11.1**	**16.1**	**15.4**	**16.8**
Hypertension*	8,000	5.7	8.3	7.8	8.7
Cardiac check-up*	1,204	0.9	1.2	0.9	1.6
Ischaemic heart disease without angina	1,054	0.8	1.1	0.9	1.3
Heart failure	846	0.6	0.9	0.7	1.1
General & unspecified	**12,775**	**9.1**	**13.2**	**12.7**	**13.7**
General immunisation/vaccination	2,066	1.5	2.1	1.9	2.4
General check-up*	1,501	1.1	1.6	1.3	1.8
Viral disease NOS	1,284	0.9	1.3	1.1	1.5
Medication request/renew/inject NOS	1,064	0.8	1.1	0.7	1.5

(continued)

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

Problem managed	Number	% total problems	Rate per 100 encs[(a)]	95% LCI	95% UCI
Psychological	**10,142**	**7.2**	**10.5**	**10.0**	**11.0**
Anxiety*	1,639	1.2	1.7	1.5	1.9
Depression*	3,367	2.4	3.5	3.3	3.7
Sleep disturbance	1,579	1.1	1.6	1.5	1.8
Digestive	**9,926**	**7.1**	**10.2**	**9.9**	**10.5**
Oesophageal disease	1,445	1.0	1.5	1.4	1.6
Gastroenteritis, presumed infection	1,047	0.7	1.1	0.9	1.3
Endocrine & metabolic	**8,534**	**6.1**	**8.8**	**8.4**	**9.2**
Diabetes*	2,485	1.8	2.6	2.4	2.7
Lipid disorder	2,392	1.7	2.5	2.3	2.7
Female genital system	**6,073**	**4.3**	**6.3**	**5.9**	**6.6**
Female genital check-up/Pap smear*	1,566	1.1	1.6	1.4	1.9
Menopausal complaint	1,428	1.0	1.5	1.3	1.6
Menstrual problems*	772	0.6	0.8	0.7	0.9
Ear	**4,757**	**3.4**	**4.9**	**4.7**	**5.1**
Acute otitis media/myringitis	1,745	1.2	1.8	1.6	2.0
Otitis externa	838	0.6	0.9	0.7	1.0
Pregnancy & family planning	**3,927**	**2.8**	**4.1**	**3.7**	**4.4**
Pre/post natal check-up*	1,000	0.7	1.0	0.7	1.4
Oral contraception*	946	0.7	1.0	0.8	1.1
Neurological	**3,898**	**2.8**	**4.0**	**3.8**	**4.2**
Migraine	910	0.7	0.9	0.8	1.1
Urology	**2,754**	**2.0**	**2.8**	**2.7**	**3.0**
UTI*	1,569	1.1	1.6	1.5	1.7
Eye	**2,720**	**1.9**	**2.8**	**2.7**	**3.0**
Infectious conjunctivitis	829	0.6	0.9	0.7	1.0
Blood	**1,642**	**1.2**	**1.7**	**1.5**	**1.9**
Male genital system	**1,364**	**1.0**	**1.4**	**1.3**	**1.5**
Social problems	**742**	**0.5**	**0.8**	**0.6**	**0.9**
Total problems	**140,824**	**100.0**	**145.3**	**143.5**	**147.2**

(a) Figures do not total 100% as more than one problem can be managed at each encounter. Only frequencies >0.5 included.

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval,

Overall, half of the problems managed in general practice related to four major body systems—the respiratory, musculoskeletal, skin and circulatory systems. Other common problems were of a psychological nature or related to the digestive, endocrine/metabolic, or female genital systems. Problems least frequently presented related to the blood and blood

forming organs and the male genital system or were of a social nature. Almost 10% of problems managed were not related to a specific body system and were classified in the general and unspecified chapter.

At a chapter level, **respiratory problems** were the most frequently managed at a rate of 24.3 per 100 encounters, accounting for nearly a fifth (16.7%) of all problems managed. The high occurrence of URTI, bronchitis and asthma contributed to this result. Other common respiratory problems included influenza vaccination, sinusitis and tonsillitis.

Problems related to the **musculoskeletal system** were managed at a rate of 16.9 per 100 encounters. Back complaints (including back pain, disc prolapse and degeneration, and other specific back syndromes) were the most frequent (2.7 per 100 encounters). Other common musculoskeletal problems included osteoarthritis and injuries such as sprains/strains and fractures.

The relative rate of **skin problems** (16.5 per 100 encounters) was almost as high as that of musculoskeletal problems. Contact dermatitis (including non-specific dermatitis and eczema) was most common (1.8 per 100 encounters), followed by solar keratosis and injuries to the skin such as lacerations and cuts. Malignant neoplasms were also seen frequently.

Hypertension (8.3 per 100 encounters) constituted over half of all **circulatory problems** (16.1 per 100 encounters) and was the most frequently managed diagnosis, accounting for 5.7% of all problems. Cardiac related check-ups, ischaemic heart disease and heart failure were other circulatory conditions arising at a relatively high frequency.

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 was also common (1.1 per 100 encounters).

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 available. In an ideal world we could therefore predict that problems managed should fall into three components of ICPC-2, namely the diagnosis/disease, symptoms and complaints, and diagnostic and preventive procedures (e.g. check-up). 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. diagnosis was recorded as referral to dermatologist).

The majority of problems (65.2%) were described in terms of a diagnosis or disease (e.g. hypertension, depression, asthma) at an average rate of 94.7 per 100 encounters. Problems described in terms of a symptom or complaint (e.g. febrile) represented almost a quarter of all problems managed and were recorded at a rate of 33.0 per 100 encounters. Diagnostic screening and preventive procedures occurred at a rate of 12.8 per 100 encounters and were most commonly check-ups and vaccinations/immunisations. Problems related to the provision of medication and other treatments where no other diagnostic information was given were recorded at a rate of 2.6 per 100 encounters, while problems described in terms of a referral, test result, or administrative procedure were relatively few (less than 2% of all problems).

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

ICPC-2 component	Number	% of total problems	Rate per 100 encs[(a)]	95% LCI	95% UCI
Diagnosis, disease	91,747	65.2	94.7	93.1	96.3
Symptoms & complaints	32,009	22.7	33.0	32.2	33.9
Diagnostic & preventive procedures	12,432	8.8	12.8	12.2	13.5
Medications, treatments & therapeutics	2,529	1.8	2.6	2.3	2.9
Referral & other RFE	936	0.7	1.0	0.7	1.2
Results	786	0.6	0.8	0.5	1.1
Administrative	385	0.3	0.4	0.2	0.6
Total problems	**140,824**	**100.0**	**145.3**	**143.5**	**147.2**

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

Note: Abbreviations: Encs – encounters, RFE – reason for encounter, UCI – Upper confidence interval, LCI – Lower confidence interval.

Most frequent problems managed

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 flu vaccination (from chapter R) as well as those for childhood immunisation (chapter A), hepatitis immunisation (chapter D) and neurological immunisations such as hibtiter (chapter N).

The 30 most frequently managed problems accounted for almost half of all problems managed. Hypertension was the most common, accounting for almost 6% of all problems managed, at a rate of 8.3 per 100 encounters. This was followed by URTI, which was recorded at a rate of 6.8 per 100 encounters and immunisation/vaccination (5.2 per 100 encounters). Together these top three problems accounted for nearly 15% of all problems managed and their relative frequency was notably higher than that of all other problems managed.

Depression was the fourth most commonly managed problem (3.5 per 100 encounters), followed closely by bronchitis, asthma and back complaint. A number of chronic conditions followed, including diabetes, lipid disorders and osteoarthritis at a rate of 2.6, 2.5 and 2.2 per 100 encounters respectively.

The remaining problems in the top 30 included some problems from body systems that were relatively low in frequency. Although problems involving the ear chapter accounted for only 3.4% of problems overall, otitis media is among the top 30 problems managed. Similarly, urological problems were relatively infrequent overall (only 2.0% of total problems—Table 7.2), however urinary tract infections were among the most frequent 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 systems specific check-ups (female genital, reproductive and circulatory chapters) and medication provision or review.

Table 7.4: Most frequently managed problems

Problem managed	Number	% of total problems	Rate per 100 encs[(a)]	95% LCI	95% UCI
Hypertension*	8,000	5.7	8.3	7.8	8.7
URTI	6,623	4.7	6.8	6.4	7.3
Immunisation/vaccination (all)*	5,025	3.6	5.2	4.7	5.7
Depression*	3,367	2.4	3.5	3.3	3.7
Acute bronchitis/bronchiolitis	3,185	2.3	3.3	3.0	3.6
Asthma	3,079	2.2	3.2	3.0	3.4
Back complaint*	2,573	1.8	2.7	2.4	2.9
Diabetes*	2,485	1.8	2.6	2.4	2.7
Lipid disorder	2,392	1.7	2.5	2.3	2.7
Osteoarthritis*	2,118	1.5	2.2	2.0	2.4
Sprain/strain*	1,790	1.3	1.9	1.6	2.1
Contact dermatitis	1,778	1.3	1.8	1.7	2.0
Acute otitis media/myringitis	1,745	1.2	1.8	1.6	2.0
Anxiety*	1,639	1.2	1.7	1.5	1.9
Sleep disturbance	1,579	1.1	1.6	1.5	1.8
UTI*	1,569	1.1	1.6	1.5	1.7
Female genital check-up/Pap smear*	1,566	1.1	1.6	1.4	1.9
Sinusitis acute/chronic	1,513	1.1	1.6	1.4	1.7
General check-up*	1,501	1.1	1.6	1.3	1.8
Oesophageal disease	1,445	1.0	1.5	1.4	1.6
Menopausal complaint	1,428	1.0	1.5	1.3	1.6
Tonsillitis*	1,422	1.0	1.5	1.3	1.6
Prescription (all)*	1,360	1.0	1.4	1.1	1.7
Viral disease NOS	1,284	0.9	1.3	1.1	1.5
Cardiac check-up*	1,204	0.9	1.2	0.9	1.6
Ischaemic heart disease without angina	1,054	0.8	1.1	0.9	1.3
Fracture*	1,051	0.8	1.1	0.9	1.2
Gastroenteritis, presumed infection	1,047	0.7	1.1	0.9	1.3
Pre/post natal check-up*	1,000	0.7	1.0	0.7	1.4
Solar keratosis/sunburn	963	0.7	1.0	0.8	1.2
Subtotal	*66,786*	*47.4*	. .	. .	. .
Total problems	**140,824**	**100**	**145.3**	**143.5**	**147.2**

(a) Figures do not total 100% as more than one problem can be managed at each encounter. Also only frequencies >0.5% are included.

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence intervals.

7.2 New problems

For each problem managed, a problem status was assigned—new or old. A new problem is defined as the first presentation of a problem to any medical practitioner. This includes new episodes of a recurrent problem and excludes the presentation of a problem first assessed by another provider. Hence, a new problem is the first consultation for a new episode of an acute problem or the first consultation for a new chronic problem. An old problem is defined as a previously assessed problem which requires ongoing (follow-up) care. Missing data (where no problem was status indicated) were eliminated from this analysis.

7.2.1 Age–sex specific rates of new problems managed

Of the 140,824 problems managed, a problem status was nominated for 108,735 (77.2%). Of these, 52,774 (44.4%) were new. The distribution of new problems managed per 100 encounters by age (Figure 7.2) is notably different from that for total problems (Figure 7.1). Although the sex of the patient appeared to have little effect on the rate of new problems managed, as age increased the relative rate of new problems decreased. This trend is consistent with the assumption that new problems presented to the GP tend to be acute, and that older patients are more likely to attend for chronic problems in contrast to acute conditions in younger people.

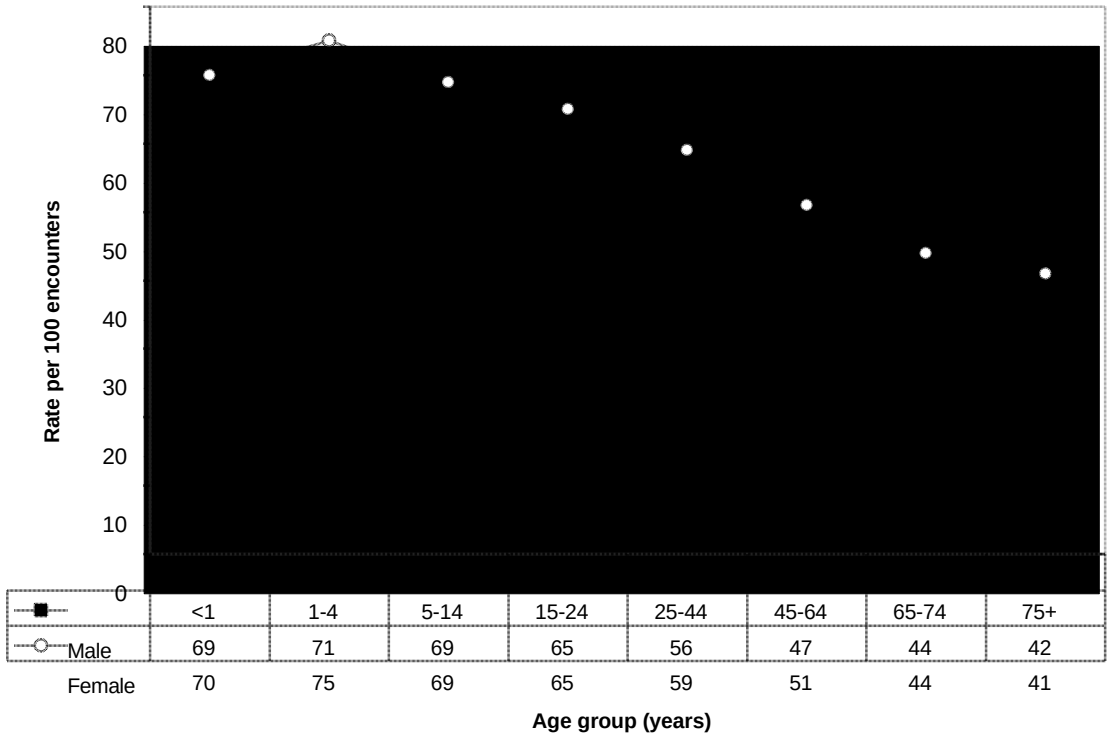


Figure 7.2: Age-sex specific rates per 100 encounters for new problems managed

7.2.2 Most common new problems

Table 7.5: Most frequently managed new problems

New problem managed	Number	% of new problems	New problems as a % of the total for that problem	Problem specific rate per 100 enc[(a)]	95% LCI	95% UCI
URTI	4,868	9.2	93.2	5.0	4.6	5.4
Immunisation/vaccination (all)*	2,853	5.4	81.7	2.9	2.5	3.4
Acute bronchitis/bronchiolitis	2,032	3.9	81.3	2.1	1.8	2.4
Acute otitis media/myringitis	1,136	2.2	82.9	1.2	1.0	1.4
Sprain/strain*	1,013	1.9	68.9	1.1	0.8	1.3
Tonsillitis*	995	1.9	88.0	1.0	0.8	1.2
Sinusitis acute/chronic	925	1.8	77.1	1.0	0.8	1.2
UTI*	905	1.7	71.9	0.9	0.8	1.0
Viral disease NOS	899	1.7	85.5	0.9	0.7	1.1
Contact dermatitis	802	1.5	55.0	0.8	0.7	0.9
Gastroenteritis (presumed infection)	763	1.5	90.8	0.8	0.6	1.0
Depression*	666	1.3	24.9	0.7	0.5	0.8
General check-up*	636	1.2	70.6	0.7	0.4	0.9
Conjunctivitis, infectious	592	1.1	90.0	0.6	0.5	0.7
Female genital check-up*	538	1.0	51.3	0.6	0.3	0.8
Otitis externa	502	1.0	69.8	0.5	0.3	0.7
Back complaint*	494	0.9	24.8	0.5	0.4	0.6
Gastrointestinal infection	458	0.9	90.8	0.5	0.3	0.7
Malignant skin neoplasm	444	0.8	70.2	0.5	0.3	0.6
Laceration/cut	442	0.8	69.1	0.5	0.3	0.6
Asthma	440	0.8	18.8	0.5	0.3	0.6
Solar keratosis/sunburn	437	0.8	59.9	0.5	0.3	0.6
Fracture*	418	0.8	52.0	0.4	0.3	0.6
Hypertension*	415	0.8	6.4	0.4	0.2	0.6
Menstrual problems*	396	0.8	63.5	0.4	0.3	0.6
Skin infection (incl post traumatic)	390	0.7	79.4	0.4	0.2	0.6
Osteoarthritis*	390	0.7	22.3	0.4	0.2	0.6
Excessive ear wax	380	0.7	79.7	0.4	0.2	0.5
Bruise/contusion	363	0.7	85.7	0.4	0.2	0.6
Abdominal pain*	360	0.7	66.8	0.4	0.2	0.5
Subtotal	*25,951*	*49.2*	. .	. .	. .	. .
Total problems	**52,774**	**100**	. .	**54.5**	**53.0**	**56.0**

(a) Figures do not total 100% as more than one problem can be managed at each encounter. Also only new problems >0.5% are included.

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

Note: Abbreviations: Enc – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval, NOS – not otherwise specified

Respiratory problems accounted for almost a quarter (24.4%) of all new problems, followed by those related to the skin (dermatitis, malignant neoplasms, lacerations, solar keratosis), of a general and unspecific nature (fever, unspecified viral illness, weakness/tiredness), or related to the musculoskeletal (sprain/strain, back complaints, fracture) and digestive (gastroenteritis, gastrointestinal infections, abdominal pain) systems. Together these five ICPC-2 chapters represented 69.1% of all new problems (data not presented in tabular form). Table 7.5 lists the most commonly managed new problems in decreasing order of frequency and gives the proportion of all new problems accounted for by each.

There are some notable differences in the frequency distribution of new problems (Table 7.5) when compared to total problems managed (Table 7.2). As expected, most new problems tended to be of an acute (e.g. respiratory or skin infections, musculoskeletal injuries) or preventive nature (e.g. immunisations or check-ups). The most common new problems once again included the respiratory diagnoses of URTI and acute bronchitis which accounted for 9.2% and 3.9% of all new problems respectively. Immunisations, sprains/strains, tonsillitis, sinusitis and UTIs also remained high.

The third numerical column in Table 7.5 describes the number of new problems as a percentage of the total contacts for that problem. Not surprisingly acute problems such as URTI (93.2% new), gastroenteritis (90.8% new) and conjunctivitis (90.0% new) were more likely to present to the GP as a new problem, while contacts related to chronic conditions such as hypertension (6.4% new), asthma (18.8% new), osteoarthritis (22.3% new) and depression (24.9% new) were more likely to be follow-up contacts (i.e. pre-existing conditions).

7.3 The inter-relationship of a problem managed with other variables. Example: Depression

A problem was classified as 'depression' if the GP recorded it in the diagnosis/problem section of the form as either: a complaint, such as 'feeling depressed', which included more specific labels of feeling sad, lonely, unhappy, worried or having low self esteem (ICPC-2 rubric P03); or in diagnostic terms such as a depressive disorder, which included more specific labels of depressive neurosis, postnatal or reactive depression, or anxiety with depression (ICPC-2 rubric P76).

Depression was the fourth most common problem managed in general practice. It presented on 3,367 occasions (at a rate of 3.5 per 100 encounters), accounting for 2.4% of all problems managed. Of these, 666 (19.8%) were new diagnoses of depression (0.7 per 100 encounters). A simple extrapolation based on approximately 103 million Medicare claimed general practice consultations would then suggest there are approximately 3.6 million encounters per year in which GPs manage depression and approximately 709,000 new episodes of depression are diagnosed in general practice in Australia each year.

Figure 7.3 illustrates the relationship of depression with other variables that are collected at the general practice encounter. Depression can be directly linked to patient characteristics such as age and sex, treatments provided, prescriptions written, tests and investigations ordered, and referrals transcribed (solid arrows). Depression can also be indirectly related to patient RFEs (dotted arrow). In addition, other problems that were managed at a 'depression encounter' have been included to give an indication of co-morbidities managed with depression.

Age and sex distribution of patients

Patients managed for depression were more likely to be female (67.9%). The majority of patients (72%) were aged between 25 and 64 years. Comparisons with the age and sex demographics for total encounters (females 58.9%) suggest that female patients were over-represented at depression encounters. Such comparisons also emphasised differences in the age distribution for depression encounters. Young patients of 24 years or less accounted for only 8.3% of those managed for depression compared with 24.4% of all patients. In contrast, patients aged 25 to 44 years were over-represented (39.9%) in this sub-group.

Encounters where a new presentation/diagnosis of depression was managed depicted a similar male to female ratio to that of all patients managed for depression. This suggests that new cases of depression were not influenced by the sex of the patient. Age of the patient, however, appeared to have some impact. Overall, younger patients accounted for a larger proportion of new cases of depression, with patients under 25 years one and a half times more likely to present with a 'new' depressive illness than a previously diagnosed condition. Once again, new episodes of depression were most likely to be managed in patients aged between 25 and 44 years.

Reasons for encounter

At the 3,367 encounters where depression was managed, a total of 5868 patient RFEs were described (174 per 100 depression encounters), somewhat more than in the total dataset (146 per 100 total encounters). For over half of these encounters the patients described their reason for the encounter as depression. Requests for medication (not necessarily for depression) were also a frequent RFE presenting at a rate of 14.1 per 100 depression encounters. Other RFEs included general symptoms such as weakness (4.7 per 100), psychological symptoms and complaints including sleep disturbance (4.6 per 100), anxiety (4.2 per 100) and acute stress (3.8). Miscellaneous preventive procedures such as a general or cardiovascular check-up, back complaints and hypertension were also noted. For encounters where a 'new' depression related problem was managed, the most frequent RFEs returned some dissimilar rates. Medication requests were reduced while symptoms such as weakness, sleep disturbance, anxiety and acute stress reaction were more common than in all depression encounters.

Other problems managed

At each encounter where depression was managed a number of other problems may have arisen. Overall, a total of 3,097 other problems were managed by the GP where a depression contact occurred. The most common co-morbidities managed with depression were similar to those arising in the total dataset. There were, however, some differences in the order they occurred. Most co-morbidities presenting at depression encounters were for a range of chronic conditions such as hypertension (6.7 per 100 depression encounters), back complaints (3.1), menopausal complaints (2.7) and diabetes (2.2). Sleep disturbance (including insomnia), managed at a rate of 2.1 per 100 depression encounters, was the only other common psychological problem managed with depression. Encounters where a 'new' presentation of depression was identified returned similar patterns of co-morbidity.

Prescriptions and other treatments

Counselling was by far the most common form of management, undertaken at a rate of 34.2 per 100 depression encounters and 46.7 per 100 encounters where a new case of depression was identified. Other forms of counselling, advice and reassurance were also common. Note that this compares with an overall use of psychological counselling of only 2.5 per 100 encounters in the total dataset.

Drugs were prescribed for depression at a rate of 78 per 100 depression contacts, a somewhat higher rate than in the total dataset (64.4 per 100 problems). Prescribing rates for new cases of depression were 69.6 per 100 new depression contacts. Of the 2,626 drugs prescribed for depression, 81.1% were for anti-depressants, 7.0% for anti-anxiety drugs and 5.4% for sedative hypnotics (data not presented). At a generic level, selective serotonin uptake inhibitors (SSRIs) such as sertraline, paroxetine, and fluoxetine hcl were the most common drugs prescribed, followed by the more traditional tricyclic anti-depressants (dothiepin).

Tests and investigations

Overall, rates of pathology orders for encounters where depression was managed (8.4 per 100 depression encounters) were far below those for the total dataset (24.6 per 100 total encounters). Chemistry (e.g. urine analysis), haematological (e.g. full blood counts) and microbiological investigations were the most common pathology tests ordered for depression at the relatively low rates of 5.3, 2.4 and 0.3 per 100 depression encounters respectively. New presentations of depression were investigated quite differently from chronic or follow-up depression encounters. Pathology ordering rates for new cases of depression (18.8 per 100 new depression encounters) were more than double the amount ordered for patients with depression that had been previously diagnosed.

Referrals

Overall, referrals for depression (9.1 per 100 depression encounters) were less frequent than those for the total dataset (11.2 per 100 total encounters). Referrals to medical specialists were the most common, occurring at a rate of 5 per 100 depression encounters. This was largely due to the high number of referrals to psychiatrists (4.4 per 100 depression encounters) which was over ten times that seen in the total dataset (0.3 per 100 total problem encounters). Referrals to an allied health service were also common, occurring at a rate of 3.5 per 100 depression encounters. These included referrals to psychologists, counsellors, miscellaneous other health professionals and mental health teams. Referrals to hospitals, or hospital professionals such as clinic psychiatrists, were also noted. As a whole, new cases of depression recorded a higher referral rate (14.1 per 100 new depression encounters) than that for total depression referrals (9.1 per 100).

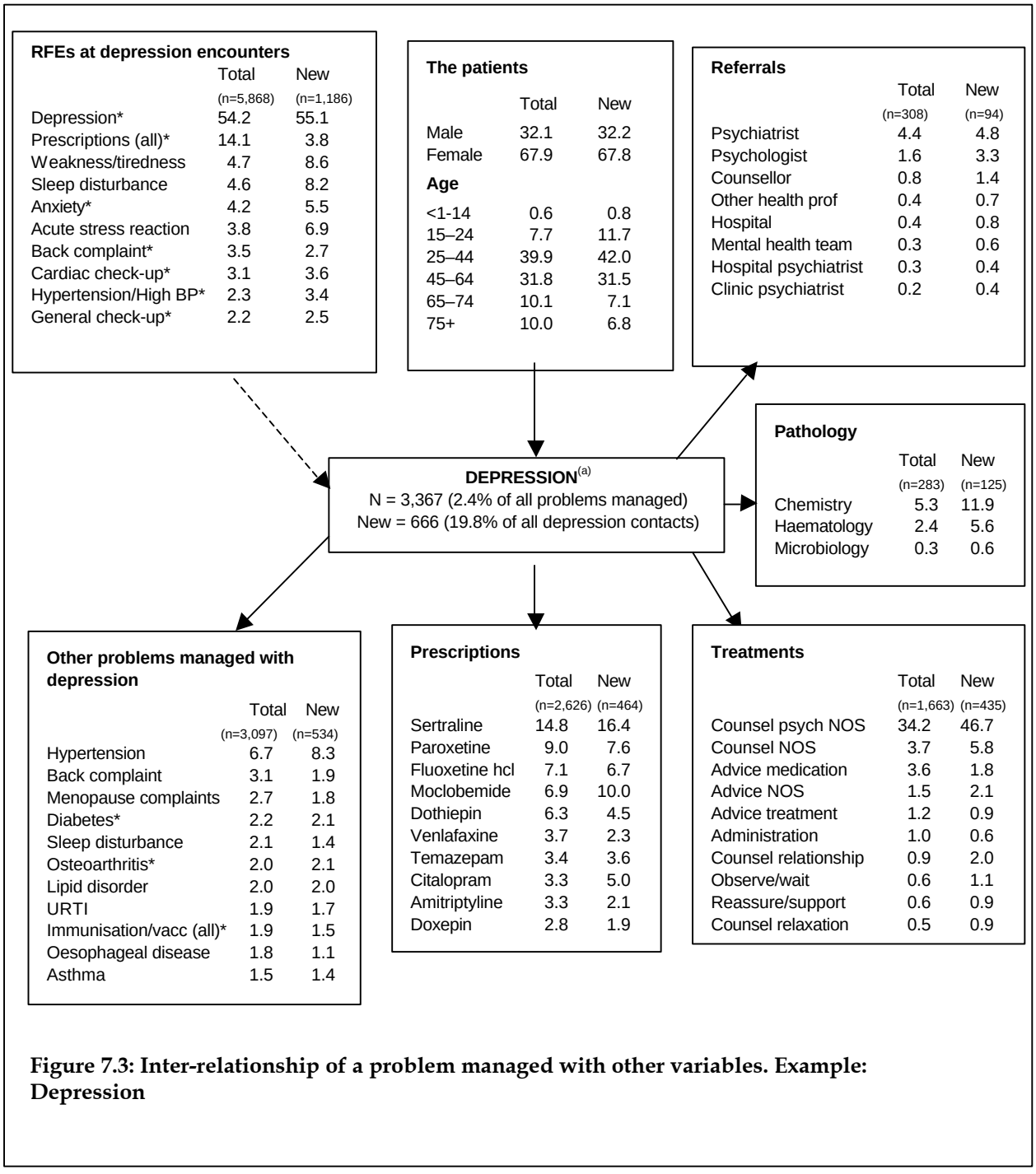


Figure 7.3: Inter-relationship of a problem managed with other variables. Example: Depression

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

(a) Results are presented as rates per 100 encounters at which depression was managed (N=3,367).

8. Management

The BEACH survey form allowed GPs to record several aspects of patient management initiated at each encounter. Pharmaceutical management was recorded in detail and linked to a patient problem. Other modalities such as counselling, procedures and other treatments were recorded briefly in the doctor's own words and were also related to a single problem. Referrals and hospital admissions were similarly related to a single problem. Provision was made on the form for pathology and imaging orders to be related to multiple problems.

8.1 Overview of management

A total of 189,735 management activities were undertaken by GPs at a rate of 196 per 100 encounters and 135 per 100 problems. The most common management activity was medication prescribed, advised or supplied, at a rate of 109.7 per 100 encounters or 75.5 per 100 problems. Other treatments took place at the rate of 43.2 per 100 encounters, referrals at a rate of 11.2, pathology orders at a rate of 24.6 and imaging at a rate of 7.1 per 100 encounters (Table 8.1).

Table 8.1: Summary of management

Management type	Number	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 problems	95% LCI	95% UCI
Medications	106,320	109.7	107.4	112	75.5	74.1	76.9
Prescribed	90,710	93.6	91.2	96.1	64.4	62.9	65.9
Advised OTC	8,538	8.8	8	9.6	6.1	5.5	6.6
GP supplied	7,072	7.3	6.3	8.3	5.0	4.3	5.7
Other treatments	41,839	43.2	41.3	45	29.7	28.5	30.9
Clinical	30,380	31.4	29.7	33	21.6	20.5	22.7
Procedural	11,458	11.8	11.2	12.5	8.1	7.7	8.6
Referrals	10,860	11.2	10.8	11.6	7.71	7.4	8.0
Specialist	7,146	7.4	7.1	7.7	5.1	4.9	5.3
Allied health	2,935	3.0	2.8	3.2	2.1	2.0	2.2
Hospital	717	0.7	0.6	0.9	0.5	0.4	0.6
Emergency Dept	60	0.1	0.0	0.6	0.0	0.0	0.4
Pathology	23,872	24.6	17.0	19.3	12.8	12.0	13.5
Imaging	6,844	7.1	4.8	5.6	3.7	3.4	3.9

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

Another perspective emerges in analysis of the number of encounters or problems managed for which at least one form of management was initiated by the GP. For example, at least one medication was given at more than two-thirds of encounters and for 59.1% of problems. At least one non-pharmacological treatment was given at 34.5% of encounters and for 26.8% of problems. A referral was made in 10,258 encounters (10.6%) and for 7.6% of problems. At least one investigation was ordered at 18.1% of encounters and for 14.2% of problems. These were most commonly pathology orders, which occurred at 13.2% of encounters (10.0% of problems). Imaging orders occurred less frequently at 6.3% of encounters and for 4.5% of problems (Table 8.2).

Table 8.2: Encounters and problems in which treatments occurred

Treatment type	Number of encounters	% total encs[(a)] (N=96,901)	Number of problems	% total probs [(a)] (N= 140,824)
At least one treatment type	**81,025**	**83.6**	**106,812**	**75.8**
At least one medication	**66,610**	**68.7**	**83,282**	**59.1**
At least one prescription	58,136	60.0	72,204	51.3
At least one OTC advised	7,623	7.9	7,779	5.5
At least one GP supplied	5,415	5.6	5,684	4.0
At least one non-pharmacological treatment	**33,411**	**34.5**	**37,692**	**26.8**
At least one clinical treatment	24,758	25.5	27,832	19.8
At least one therapeutic procedure	10,506	10.8	10,805	7.7
At least one referral	**10,258**	**10.6**	**10,640**	**7.6**
At least one referral to a specialist	6,860	7.1	7,084	5.0
At least one referral to allied health	2,850	2.9	2,866	2.0
At least one referral to hospital	708	0.7	717	0.5
At least one referral to emergency dept	60	0.1	60	0.0
At least one investigation	**17,532**	**18.1**	**19,387**	**14.2**
At least one pathology order	12,831	13.2	14,131	10.0
At least one imaging order	6,123	6.3	6,317	4.5

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

8.2 Patterns of pharmacological and non-pharmacological treatment

The common combinations of treatments (pharmacological and non-pharmacological treatment) are illustrated in Table 8.3. Most commonly only a script was given; however, this was combined with a clinical treatment (frequently advice regarding treatment) at 11.2% of encounters and for 6.2% of problems. Other multiple combinations occurred at lower frequencies. No treatment was recorded at 16.4% of encounters and for 24.1% of problems.

Table 8.3: Most frequent treatment combinations

Treatment type					% of total encounters (N=96,901)	% of total problems (N=140,824)
1+ Script	1+ OTC	1+ Supplied	1+ Clinical	1+ Procedure		
✓					40.2	41.7
					16.4	24.1
✓			✓		11.2	6.2
			✓		9.2	11.3
				✓	4.9	5.2
✓				✓	3.2	1.4
	✓				2.9	3.0
		✓			2.7	3.0
✓	✓				2.0	1.0
	✓		✓		1.3	0.9
✓		✓			1.1	0.3
Total					**95.1**	**98.1**

9. Medications

9.1 Source of medications

For each problem managed the survey form allowed the recording of up to four drugs. Each drug 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 drug and to designate if this was a new or continued drug for that patient for this problem. This structure allowed, for the first time, analysis of the drugs advised by GPs for OTC purchase, drugs supplied by the GP and the prescribed daily dose (PDD) of drugs. Generic or brand names could be used and were entered into the database exactly as recorded by the GP. Drugs were classified using the CAPS system developed by the Family Medicine Research Centre from which they were also mapped to the WHO ATC classification (see Methods). While analysis can be conducted at brand name level, the results in this Chapter are reported only at the generic level.

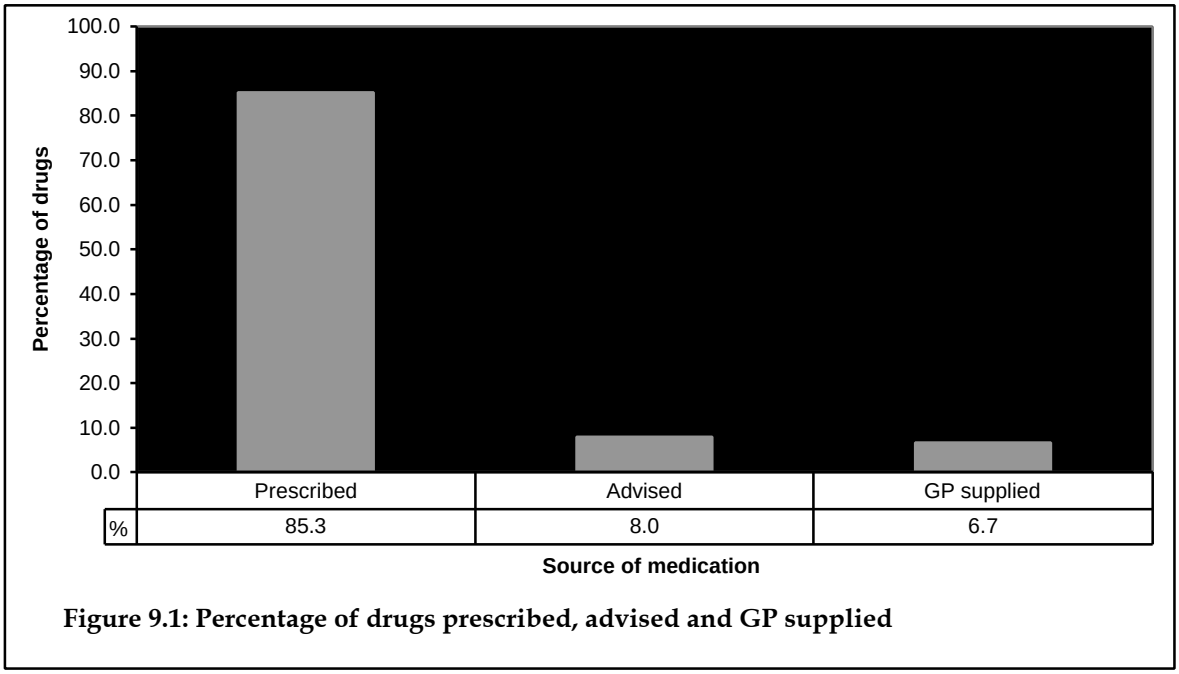


Figure 9.1: Percentage of drugs prescribed, advised and GP supplied

Most medications (85.3%) were prescribed; however, 8.0% of medications were recommended by the GP for OTC purchase. Extrapolated to the whole general practice population, this represents approximately 8 million occasions per annum at which drugs were recommended by GPs to their patients for OTC purchase. On a further 6.7 million occasions at least one drug was supplied by the general practitioner. These areas of drug supply have been largely unexplored in the past (Figure 9.1). Table 9.1 shows the distribution of commonly used medications by method of supply: prescribed, recommended for OTC purchase or supplied by the GP. Simple analgesics and NSAIDs were distributed mainly between prescribed and advised; however, they were also supplied by the GP on a few occasions. Influenza vaccine was two-thirds prescribed and one-third supplied.

Table 9.1: Distribution of most frequently used medications between the three recorded sources—prescribed, advised and GP supplied

Generic drug	Prescribed			Advised OTCs			GP supplied			Total	
	Number prescribed	Percentage of scripts (n=90,710)	Prescribed as a percentage of N	Number advised	Percentage of advised (n=8,538)	Advised as a percentage of N	Number supplied	Percentage of supplied (n=7,072)	Supplied as a percentage of N	Total of this drug (N)	Percentage of total meds (n=106,320)
Paracetamol	3,802	4.2	61.4	2317	27.2	37.4	76	1.1	1.2	6,196	5.8
Amoxycillin	3,133	3.5	97.6	0	0.0	0.0	78	1.1	2.4	3,212	3.0
Paracetamol/Codeine	2,565	2.8	88.7	224	2.6	7.7	102	1.5	3.5	2,890	2.7
Influenza virus vaccine	1,663	1.8	67.1	0	0.0	0.0	817	11.6	32.9	2,480	2.3
Salbutamol	2,324	2.6	96.3	14	0.2	0.6	76	1.1	3.2	2,414	2.3
Cefaclor monohydrate	2,104	2.3	97.6	0	0.0	0.0	52	0.7	2.4	2,156	2.0
Cephalexin	2,047	2.3	98.0	0	0.0	0.0	43	0.6	2.1	2,090	2.0
Amoxycillin/potass. clavulanate	1,730	1.9	97.2	0	0.0	0.0	49	0.7	2.8	1,779	1.7
Roxithromycin	1,731	1.9	98.5	0	0.0	0.0	27	0.4	1.5	1,758	1.7
Temazepam	1,397	1.5	97.2	0	0.0	0.0	40	0.6	2.8	1,437	1.4
Diclofenac sodium systemic	1,234	1.4	95.8	7	0.1	0.5	48	0.7	3.7	1,288	1.2
Levonorgestrel/ Ethinyloestradiol	1,205	1.3	94.5	0	0.0	0.0	71	1.0	5.6	1,276	1.2
Doxycycline	1,126	1.2	97.0	0	0.0	0.0	34	0.5	3.0	1,161	1.1
Diazepam	1,082	1.2	96.6	0	0.0	0.0	38	0.5	3.4	1,120	1.1
Erythromycin	1,041	1.2	98.6	1	0.0	0.1	15	0.2	1.4	1,056	1.0
Ranitidine	967	1.1	94.6	0	0.0	0.0	55	0.8	5.4	1,022	1.0
Atenolol	953	1.1	98.2	0	0.0	0.0	17	0.3	1.8	970	0.9
Frusemide	929	1.0	98.3	0	0.0	0.0	16	0.2	1.7	945	0.9
Betamethasone topical	915	1.0	97.8	2	0.0	0.2	19	0.3	2.0	935	0.9
Simvastatin	894	1.0	96.9	0	0.0	0.0	29	0.4	3.1	923	0.9

(continued)

Table 9.1 (continued): Distribution of most frequently used medications between the three recorded sources– prescribed, advised and GP supplied

	Prescribed			Advised OTCs			GP suppied			Total	
Generic drug	**Number prescribed**	**Percentage of scripts (n=90,710)**	**Prescribed as a percentage of N**	**Number advised**	**Percentage of advised (n=8,538)**	**Advised as a percentage of N**	**Number supplied**	**Percentage of supplied (n=7,072)**	**Supplied as a percentage of N**	**Total of this drug (N)**	**Percentage of total meds (n=106,320)**
Chloramphenicol eye	878	1.0	95.5	0	0.0	0.0	41	0.6	4.5	919	0.9
Aspirin	712	0.8	79.5	172	2.0	19.2	12	0.2	1.4	896	0.8
Naproxen	842	0.9	97.7	5	0.1	0.6	15	0.2	1.8	862	0.8
Prochlorperazine	720	0.8	88.2	1	0.0	0.1	95	1.4	11.7	816	0.8
Oxazepam	755	0.8	97.6	0	0.0	0.0	19	0.3	2.5	774	0.7
Amlodipine	724	0.8	97.1	0	0.0	0.0	21	0.3	2.9	746	0.7
Enalapril mal	717	0.8	98.1	0	0.0	0.0	14	0.2	1.9	731	0.7
Metoclopramide	595	0.7	81.5	0	0.0	0.0	135	1.9	18.5	730	0.7
Ibuprofen	485	0.5	67.5	209	2.5	29.1	25	0.4	3.4	718	0.7
Piroxicam oral	593	0.7	84.4	4	0.1	0.6	106	1.5	15.1	702	0.7

9.2 The inter-relationship of a medication with other variables. Example: Cephalosporins

Prescribing of cephalosporins by general practitioners has increased considerably since 1990–91, now being used at almost the same rate as broad spectrum penicillins. Figure 9.2 demonstrates the relationship between prescription or supply of cephalosporins by a GP and other variables collected in the survey. This example demonstrates the wealth of information which can be inter-related in studying medications used in general practice. On the chart solid arrows indicate a direct relationship and dotted arrows an indirect.

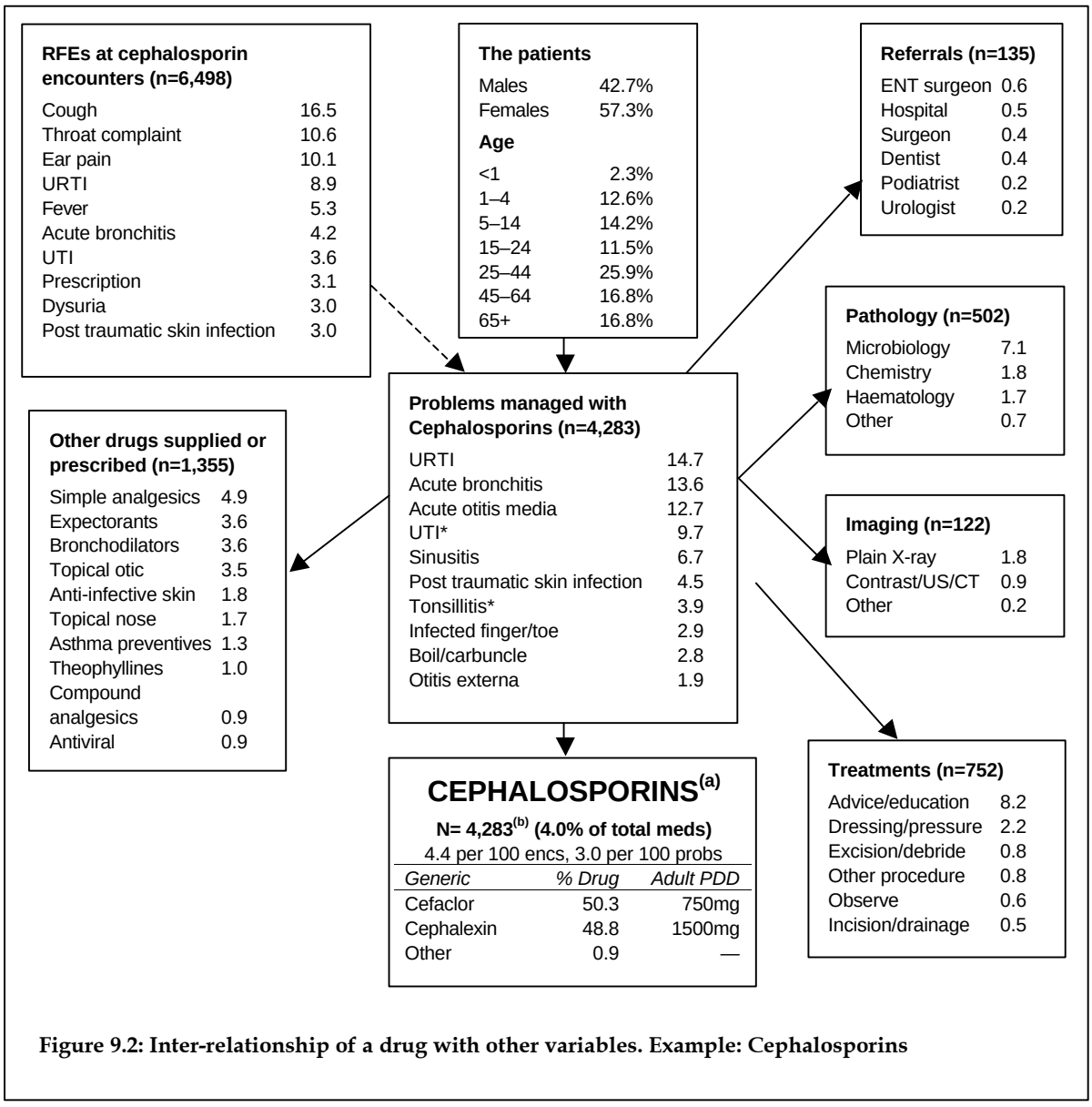


Figure 9.2: Inter-relationship of a drug with other variables. Example: Cephalosporins

* Indicates multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix III).

(a) Except where otherwise specified results are presented as rates per 100 problems for which a cephalosporin was prescribed or supplied.

(b) Problems for which there was at least one prescription or GP supply of cephalosporins (N=4,283).

Note: Abbreviations: Encs –encounters, Probs – problems, Meds – medications prescribed or supplied by the GP.

Rate of supply and source of drug

Cephalosporins were given at a rate of 4.4 per 100 total GP encounters and at a rate of 3.0 per 100 total problems. Their prescribing rate was second only to broad spectrum penicillins amongst the major antibiotic groups (see Section 9.2.). While almost all the drugs were prescribed, 2.2% were supplied by the GP, presumably from sample starter packs. Cefaclor and cephalexin were given with almost identical frequency and together made up 99.1% of cephalosporins.

Prescribed daily dose

Prescribed daily doses (PDD) are reported as medians reflecting the most common prescribing regimes. Cefaclor had a median PDD of 750mg which accords with the recommended usual adult dose (MIMS Australia, 1999). Cephalexin had a median PDD of 1500mg which is 50% above the usual adult dose of 1000mg suggested in MIMS.

Age and sex distribution of patients

Patients between 1 and 24 years of age were over-represented in the population prescribed or supplied cephalosporins and those over 45 under-represented. This probably reflects the age groups in which the infections treated with cephalosporins by GPs occur. The gender distribution of the patients is similar to that of the general GP patient population.

Reasons for encounter

The patients most commonly described their reasons for encounter in terms of respiratory, ENT, urinary or skin infection or as general symptoms of infection such as fever.

Problems managed

Problem labels given by the GP reflected the same spectrum of disorders as the RFEs with 53.5% of common labels being related to respiratory or ENT infections. Urinary and skin infections were also relatively frequent.

Other drugs supplied or prescribed

Other drugs were supplied or prescribed at the same encounter and for the same problem for which cephalosporins were given on 1,355 occasions at a rate of 31.6 per 100 encounters. Their distribution reflects the spectrum of problems under management described above. Simple analgesics were commonly given as were respiratory drugs, particularly anti-asthmatic drugs, although asthma was not frequently the problem under management.

Other treatments

Other treatments were less frequently utilised for problems managed with cephalosporins (17.6 per 100 problems) than in the total dataset (29.7 per 100 problems). They were divided between advice (principally regarding medication), dressings and minor surgery.

Pathology and imaging

Pathology was ordered at a rate of 11.7 per 100 problems managed with cephalosporins and consisted mainly of microbiology tests as might be expected. Imaging occurred much less frequently at a rate of 2.8 per 100 encounters compared with 3.7 for the total data.

Referrals

The patient was referred to other services for these problems infrequently (3.2 per 100 problems) compared with a rate of 7.7 for all problem contacts.

9.3 Prescribed drugs

There were 90,710 prescriptions recorded, at a rate of 93.6 per 100 encounters and 64.4 per 100 problems managed. At least one script was recorded at 60% of encounters and for 51.3% of problems.

The survey form allowed GPs to record up to four medications for each of four problems. A maximum of 16 medications could be recorded at each encounter.

However no drugs were prescribed at 40% of encounters, one drug at 38.5% of encounters, two at 13.8% and three at 4.9%. Four or more drugs were prescribed at only 2.7% of encounters (Figure 9.3).

No prescription was given for almost half (48.7%) of all problems managed, one for 41.1%, two for 7.9% and three or more for only 2.3% (Figure 9.4).

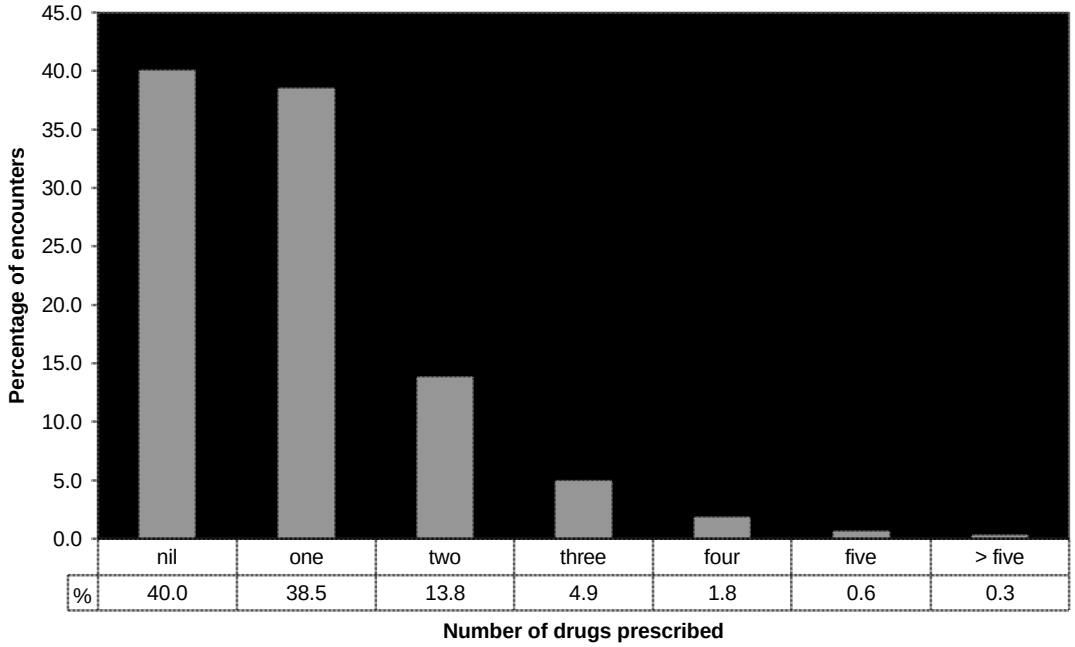


Figure 9.3: Number of drugs prescribed per encounter

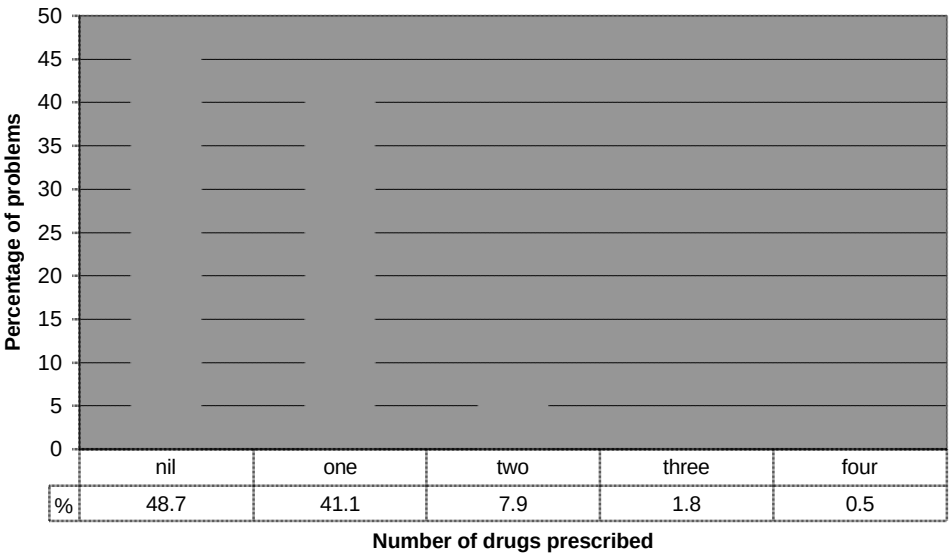


Figure 9.4: Number of drugs prescribed per problem

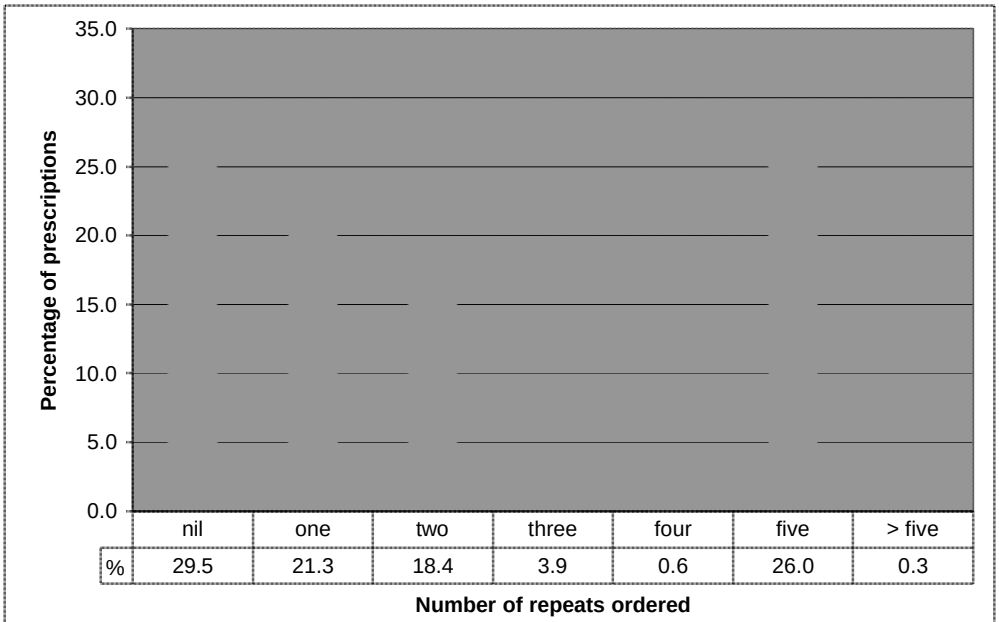


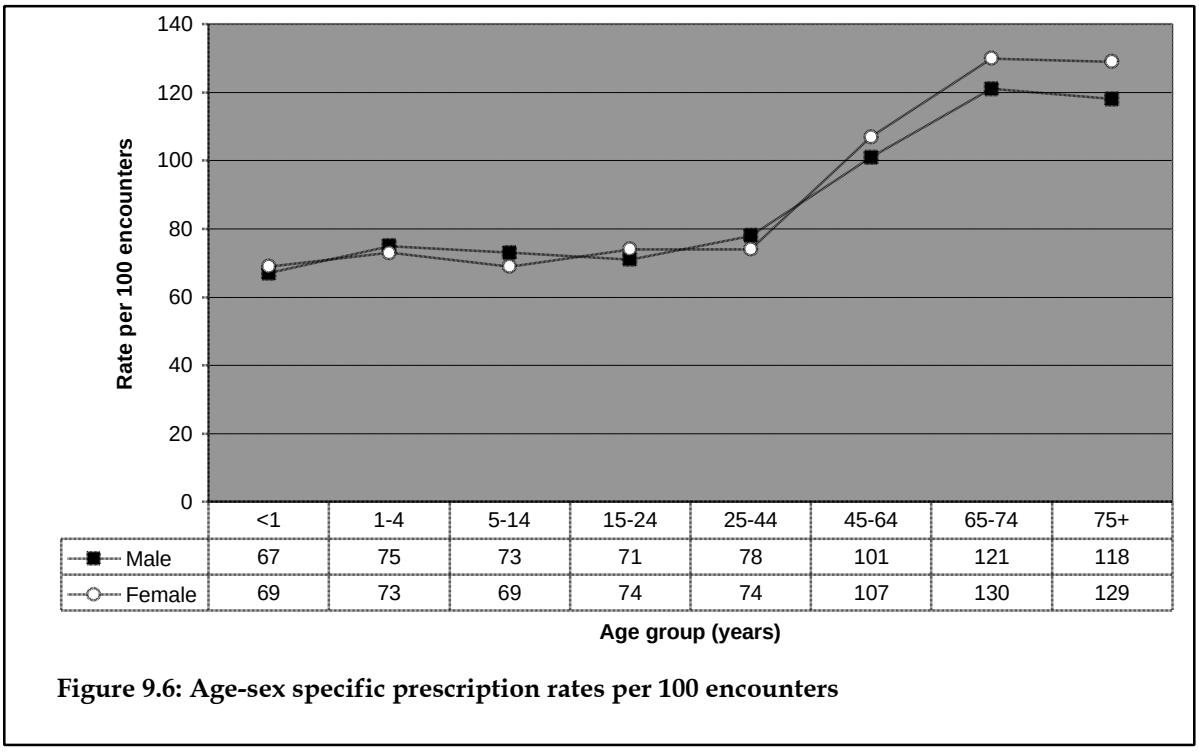
Figure 9.5: Number of repeats ordered per prescription

GPs also recorded the number of repeat prescriptions ordered and these are presented in Figure 9.5 in categories from none to 6+ as a percentage of all prescriptions.

No repeats were ordered in nearly 30% of prescriptions, one or two in a further 40% and five in over a quarter. The total number of original prescriptions plus the repeats ordered amounted to 243,833 for the year. This extrapolates to approximately 244,000,000 orders by recognised GPs for drugs to be dispensed. However, in the 1998 calendar year only 106,532,082 dispensed prescriptions from recognised GPs were recorded in the PBS data (personal communication McManus, DHAC, from HIC data). While it could be expected that some prescriptions are not presented for dispensing, the non-redemption rates for prescriptions in overseas studies have varied between 5.2% in the UK (Beardon et al., 1993) and 13% in a more comparable health system in New Zealand (Gardner et al., 1996). These non-redemption rates are not sufficient to explain the difference. The main cause of this huge discrepancy appears to be the lack of recording in the PBS data of drugs that fall below the subsidy threshold. This suggests that PBS data should not be used alone to monitor significant areas of general practice therapeutic management.

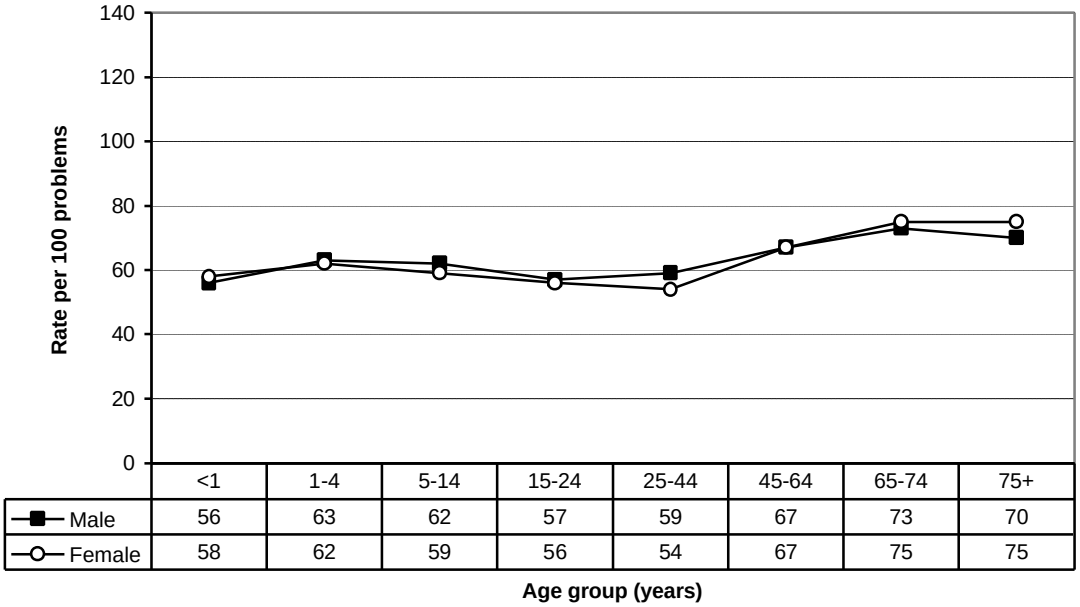
9.3.1 Age–sex specific rates of prescribed drugs

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 9.6 shows the well-described tendency for the number of prescriptions written at each encounter to rise with advancing age. Figure 9.7, 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 to which they are subject.



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	67	75	73	71	78	101	121	118
Female	69	73	69	74	74	107	130	129

Figure 9.6: Age-sex specific prescription rates per 100 encounters



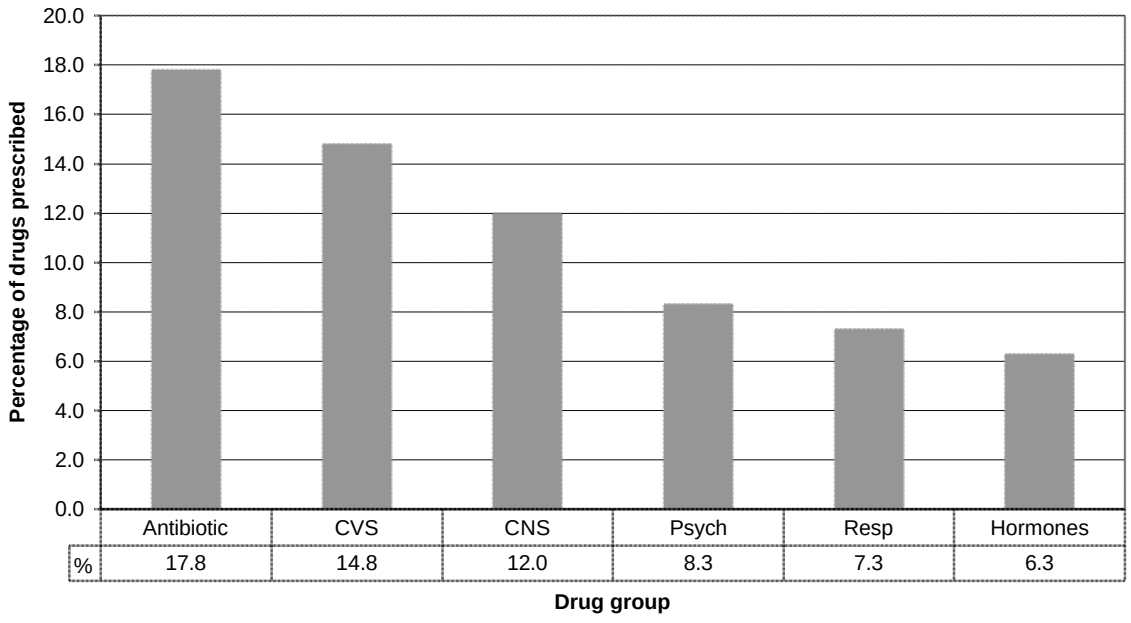
	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	56	63	62	57	59	67	73	70
Female	58	62	59	56	54	67	75	75

Figure 9.7: Age-sex specific prescription rates per 100 problems

9.3.2 Types of drugs prescribed

Drugs prescribed by major groups

The distribution of prescribed drugs by major groups is presented graphically in Figure 9.8.



	Antibiotic	CVS	CNS	Psych	Resp	Hormones
%	17.8	14.8	12.0	8.3	7.3	6.3

Figure 9.8: Distribution of drugs prescribed by major groups

Antibiotics were the most commonly prescribed group, representing 17.8% of all prescriptions. These were followed by **cardiovascular** drugs (14.8%), **CNS** (12.0%), **psychological** (8.3%), **respiratory** drugs (7.3%) and **hormones** (6.9%).

Table 9.2 shows the distribution of drugs commonly prescribed by group, sub-group and generic name in order of frequency. In the **antibiotic** sub-group it is notable that cephalosporins are now being prescribed at a rate of 4.3 per 100 encounters, almost the same rate as broad spectrum penicillins (5.0 per 100). Other antibiotics, including the macrolides, were prescribed at a rate of 3.5 per 100 encounters.

Within **cardiovascular** drugs**,** anti-hypertensives contributed more than half the prescriptions (7.2 per 100 encounters) followed by beta-blockers (1.7 per 100). Other CVS drugs, principally lipid lowering agents, contributed 2.1 prescriptions per 100 encounters.

Prescribed **CNS** drugs were mainly analgesics (9.1 per 100 encounters) and anti-emetics (1.4). Compound analgesics containing codeine continue to be a frequent choice.

Psychological drug prescribing was dominated by benzodiazepines and anti-depressants, while bronchodilators (3.7) and asthma preventives (2.2) made up the majority of **respiratory** drugs prescribed.

In other groups, NSAIDS/anti-rheumatoids were prescribed at a rate of 4.5, vaccines at a rate of 3.9, topical steroids at a rate of 2.8 and anti-ulcerants at a rate of 2.2 per 100 encounters

The wide range of drugs prescribed reflects the extensive variety of problems managed in general practice.

Most frequently prescribed generic drugs

The most frequently prescribed individual generic drugs are listed in Table 9.3. There has been a change in the distribution of the drugs since the AMTS survey in 1990–91 (Bridges-Webb et al. 1992). This is discussed in Chapter 13. Antibiotics were well represented in BEACH, with 6 of the top 10 drugs being from that group. Simple analgesics were very frequently prescribed, probably reflecting their prescription for health care card holders for whom prescription is a cheaper option than over the counter purchase. Influenza vaccine represented 1.8% of all prescriptions, presumably reflecting a patient and GP response to public health campaigns to increase immunisation levels in at-risk groups.

Table 9.2: Distribution of drugs prescribed by group, sub-group, generic drug

Group	Sub-group	Generic	Number	Percentage of scripts	Rate per 100 encs	95% LCI	95% UCI
Antibiotics			**16,799**	**17.8**	**17.3**	**16.7**	**18.0**
	Penicillins		1,431	1.5	1.5	1.3	1.7
	Broad spectrum penicillins		4,871	5.0	5.0	4.7	5.4
		Amoxycillin	3,133	3.2	3.2	2.9	3.5
		Amoxycillin/ clavulanate	1,730	1.8	1.8	1.5	2.0
	Cephalosporins		4,190	4.3	4.3	4.0	4.7
		Cefaclor monohydrate	2,104	2.1	2.2	1.8	2.6
		Cephalexin	2,047	2.2	2.1	1.9	2.4
	Tetracycline		1,386	1.5	1.4	1.2	1.6
		Doxycycline	1,126	1.3	1.2	1.0	1.3
	Sulphonamides	Cotrimoxazole	554	0.6	0.6	0.3	0.9
	Other antibiotics		3,368	3.7	3.5	3.2	3.7
		Roxithromycin	1,731	1.9	1.8	1.5	2.0
		Erythromycin	1,041	1.1	1.1	0.8	1.3
	Antiviral agents		805	1.0	0.8	0.5	1.2
Cardiovascular			**13,253**	**14.8**	**13.7**	**12.9**	**14.5**
	Anti-hypertensives		6,990	7.8	7.2	6.8	7.6
		Amlodipine	724	0.8	0.7	0.6	0.9
		Enalapril mal	717	0.8	0.7	0.6	0.9
		Indapamide	563	0.6	0.6	0.4	0.8
		Perindopril	556	0.6	0.6	0.4	0.7
		Felodipine	529	0.6	0.5	0.4	0.7
		Irbesartan	525	0.5	0.5	0.3	0.8
		Verapamil hydrochloride	502	0.6	0.5	0.4	0.7
		Lisinopril	457	0.5	0.5	0.3	0.7
	Anti-angina		1,421	1.6	1.5	1.3	1.7
		GTN (glyceryl trinitrate)	441	0.5	0.5	0.3	0.6
	Cardiac glycosides		544	0.6	0.6	0.4	0.7
		Digoxin	543	0.6	0.6	0.4	0.7
	Beta-blockers		1,680	1.9	1.7	1.6	1.9
		Atenolol	953	1.1	1.0	0.8	1.1
	Other CVS drugs		2,009	2.2	2.1	1.9	2.3
		Simvastatin	894	1.0	0.9	0.8	1.1
		Atorvastatin	549	0.6	0.6	0.4	0.8

(continued)

Table 9.2 (continued): Distribution of prescribed drugs by group, sub-group, generic drug

Group	Sub-group	Generic	Number	Percentage of scripts	Rate per 100 encs	95% LCI	95% UCI
CNS			**11,011**	**12.0**	**11.4**	**10.8**	**11.9**
	Simple analgesics		4,581	5.0	4.7	4.4	5.1
		Paracetamol	3,802	4.1	3.9	3.6	4.3
		Aspirin	712	0.8	0.7	0.6	0.9
	Narcotic analgesics		1,069	1.2	1.1	0.6	1.6
	Compound analgesics		3,213	3.4	3.3	3.1	3.6
		Paracetamol/Codeine	2,565	2.7	2.6	2.4	2.9
	Anti-convulsants		559	0.6	0.6	0.4	0.8
	Anti-emetic/anti-nausea		1,398	1.5	1.4	1.3	1.6
		Prochlorperazine	720	0.8	0.7	0.6	0.9
		Metoclopramide	595	0.7	0.6	0.4	0.8
Psychological			**7,322**	**8.3**	**7.6**	**7.2**	**7.9**
	Sedative hypnotics		1,902	2.2	2	1.8	2.2
		Temazepam	1,397	1.6	1.4	1.3	1.6
	Anti anxiety		2,025	2.3	2.1	1.9	2.3
		Diazepam	1,082	1.3	1.1	0.9	1.3
		Oxazepam	755	0.9	0.8	0.6	0.9
	Phenothiazines		584	0.7	0.6	0.4	0.8
	Anti-depressants		2,806	3.2	2.9	2.7	3.1
		Sertraline	503	0.6	0.5	0.4	0.7
Respiratory			**6,726**	**7.3**	**6.9**	**6.5**	**7.3**
	Bronchodilators		3,625	3.9	3.7	3.5	4
		Salbutamol	2,324	2.5	2.4	2.2	2.6
		Terbutaline	657	0.7	0.7	0.5	0.9
		Ipratropium inhaled	630	0.7	0.6	0.5	0.8
	Asthma preventives		2,159	2.4	2.2	2.1	2.4
		Budesonide	680	0.8	0.7	0.6	0.8
		Beclomethasone	680	0.7	0.7	0.5	0.9

(continued)

Table 9.2 (continued): Distribution of prescribed drugs by group, sub-group, generic drug

Group	Sub-group	Generic	Number	Percentage of scripts	Rate per 100 encs	95% LCI	95% UCI
Hormones			**5,650**	**6.3**	**5.8**	**5.5**	**6.1**
	Sex hormones		2,150	2.5	2.2	2	2.4
		Medroxyprogesterone	557	0.6	0.6	0.4	0.7
	Corticosteroids		1,206	1.4	1.2	1.1	1.4
		Prednisolone	511	0.6	0.5	0.3	0.7
	Hypoglycaemics		1,736	1.8	1.8	1.5	2.0
		Metformin	670	0.7	0.7	0.5	0.9
	Other hormones		554	0.6	0.6	0.4	0.7
		Thyroxine	451	0.5	0.5	0.3	0.6
Musculoskeletal			**5,485**	**5.9**	**5.7**	**5.4**	**6.0**
	NSAID/anti-rheumatoid		4,349	4.7	4.5	4.2	4.7
		Diclofenac systemic	1,234	1.3	1.3	1.1	1.5
		Naproxen	842	0.9	0.9	0.7	1.1
		Piroxicam oral	593	0.7	0.6	0.4	0.8
		Ibuprofen	485	0.5	0.5	0.2	0.8
	Urosuric agents		483	0.5	0.5	0.3	0.7
Allergy, immune			**4,693**	**5.4**	**4.8**	**4.3**	**5.4**
	Anti-histamines		786	0.8	0.8	0.5	1.1
	Vaccines		3,817	4.5	3.9	3.3	4.6
		Influenza virus vaccine	1,663	2.0	1.7	0.4	3.0
Skin			**4,329**	**4.8**	**4.5**	**4.2**	**4.7**
	Anti-infection skin		946	1.1	1.0	0.8	1.1
	Topical steroids		2,736	3.0	2.8	2.7	3.0
		Betamethasone topical	915	1.0	0.9	0.8	1.1
		Monetasone	560	0.6	0.6	0.4	0.8
		Hydrocortisone topical	468	0.5	0.5	0.3	0.7
	Other skin		624	0.7	0.6	0.5	0.8
Digestive			**4,172**	**4.7**	**4.3**	**4.1**	**4.5**
	Anti-spasmodics		440	0.5	0.5	0.3	0.6
	Anti-ulcerants		2,148	2.4	2.2	2.1	2.4
		Ranitidine	967	1.1	1.0	0.9	1.1
	Anti-diarrhoeals		614	0.7	0.6	0.5	0.8

(continued)

Table 9.2 (continued): Distribution of prescribed drugs by group, sub-group, generic drug

Group	Sub-group	Generic	Number	Percentage of scripts	Rate per 100 encs	95% LCI	95% UCI
Urogenital			**2,133**	**2.5**	**2.2**	**2.0**	**2.4**
	Diuretics		1,639	1.9	1.7	1.5	1.9
		Frusemide (Furosemide)	929	1.1	1.0	0.8	1.1
Ear, nose topical			**2,232**	**2.4**	**2.3**	**2.1**	**2.5**
	Topical otic		991	1.0	1.0	0.8	1.2
		Dexamethas /Framycetin	554	0.6	0.6	0.4	0.8
	Topical nose		1,241	1.4	1.3	1.1	1.4
		Budesonide topical nasal	675	0.7	0.7	0.5	0.9
Contraceptives			**1,611**	**1.8**	**1.7**	**1.5**	**1.8**
	Oral contraception		1,611	1.8	1.7	1.5	1.8
		Levonorgestrel/ Ethinyloestr	1,205	1.3	1.2	1.1	1.4
Blood			**1,530**	**1.7**	**1.6**	**1.4**	**1.8**
	Other blood		716	0.8	0.7	0.6	0.9
		Warfarin sodium	664	0.8	0.7	0.5	0.9
Eye medications			**1,625**	**1.7**	**1.7**	**1.5**	**1.8**
	Anti-infectives		1,064	1.1	1.1	1.0	1.2
		Chloramphenicol eye	878	0.9	0.9	0.8	1.1
Nutrition/ metabolic			**1,179**	**1.4**	**1.2**	**1.1**	**1.4**
	Mineral tonic		634	0.7	0.7	0.5	0.8
Miscellaneous			**448**	**0.5**	**0.5**	**0.0**	**1.2**

Note: Abbreviations: Encs – encounters, Scripts – prescriptions, UCI – Upper confidence interval, LCI – Lower confidence interval

Table 9.3: Most frequently prescribed drugs

Generic drug	Number	Percentage of scripts	Rate per 100 encs	95% LCI	95% UCI
Paracetamol	3,802	4.2	3.9	3.6	4.3
Amoxycillin	3,133	3.5	3.2	2.9	3.5
Paracetamol/Codeine	2,565	2.8	2.7	2.4	2.9
Salbutamol	2,324	2.6	2.4	2.2	2.6
Cefaclor monohydrate	2,104	2.3	2.2	1.8	2.6
Cephalexin	2,047	2.3	2.1	1.9	2.4
Roxithromycin	1,731	1.9	1.8	1.5	2.0
Amoxycillin/potass.clavulanate	1,730	1.9	1.8	1.5	2.0
Influenza virus vaccine	1,663	1.8	1.7	0.4	3.0
Temazepam	1,397	1.5	1.4	1.3	1.6
Diclofenac sodium systemic	1,234	1.4	1.3	1.1	1.5
Levonorgestrel/Ethinyloestradiol	1,205	1.3	1.2	1.1	1.4
Doxycycline hcl	1,126	1.2	1.2	1.0	1.3
Diazepam	1,082	1.2	1.1	0.9	1.3
Erythromycin	1,041	1.2	1.1	0.8	1.3
Ranitidine	967	1.1	1.0	0.9	1.1
Atenolol	953	1.1	1.0	0.8	1.1
Frusemide (Furosemide)	929	1.0	1.0	0.8	1.1
Betamethasone topical	915	1.0	0.9	0.8	1.1
Simvastatin	894	1.0	0.9	0.8	1.1
Chloramphenicol eye	878	1.0	0.9	0.8	1.1
Naproxen	842	0.9	0.9	0.7	1.1
Oxazepam	755	0.8	0.8	0.6	0.9
Amlodipine	724	0.8	0.8	0.6	0.9
Prochlorperazine	720	0.8	0.7	0.6	0.9
Enalapril mal	717	0.8	0.7	0.6	0.9
Aspirin	712	0.8	0.7	0.6	0.9
Budesonide	680	0.8	0.7	0.6	0.8
Beclomethasone	680	0.8	0.7	0.5	0.9
Budesonide topical nasal	675	0.8	0.7	0.5	0.9
Subtotal	*40,226*	*44.4*	. .	. .	. .
Total prescribed	**90,710**	**100**	**93.6**	**91.2**	**96.1**

Note: Abbreviations: Scripts – prescriptions, encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval

9.3.3 Distribution of drugs prescribed by ATC drug group

Table 9.4 shows the distribution of prescribed drugs using the WHO Anatomical, Therapeutic, Chemical classification (ATC) (WHO Collaborating Centre for Drug Statistics Methodology 1998) as an alternative method of grouping. This allows comparison with other data classified in ATC such as that produced by the Health Insurance Commission. With this classification analgesics were the most frequently prescribed group, followed by penicillins and NSAIDs. Other beta-lactam antibacterials, principally cephalosporins, were fourth, followed by ACE inhibitors.

Even when using the same classification, comparison with PBS data is difficult as the PBS records drugs dispensed rather than prescribed and only records those whose price is above the subsidy threshold. For example, the two commonly prescribed cephalosporins discussed earlier fall below the threshold and are not recorded by the PBS for non health care card holders. The threshold for HCC holders is lower and the cephalosporins dispensed for them would be recorded. However the age distribution of the problems for which cephalosporins are used means that the number who are HCC holders is likely to be much less than the general GP patient population. Therefore the number of cephalosporins prescriptions recorded as dispensed in the PBS data is likely to be much lower than actual dispensing. Community pharmacy surveys and sales data may pick up the difference but cannot separate the prescriptions of general practitioners from those of other practitioners.

Table 9.4: Distribution of drugs prescribed by ATC drug group

ATC drug group	Number	Percentage of scripts	Rate per 100 encs	95% LCI	95% UCI
Other analgesics & antipyretics	7,417	8.2	7.7	7.2	8.1
Beta-lactam antibacterials penicillins	5,981	6.6	6.2	5.8	6.5
Anti-inflammatory/anti-rheumatic products non-steroids	4,322	4.8	4.5	4.2	4.7
Other beta-lactam antibacterials	4,187	4.6	4.3	4.0	4.7
ACE inhibitors plain	3,309	3.7	3.4	3.2	3.7
Adrenergics inhalants	3,125	3.5	3.2	3.0	3.5
Macrolides & lincosamides	2,851	3.2	2.9	2.7	3.2
Anti-depressants	2,806	3.1	2.9	2.7	3.1
Other anti-asthmatics inhalants	2,683	3.0	2.8	2.6	3.0
Viral vaccines	2,549	2.8	2.6	1.9	3.3
Corticosteroids plain	2,167	2.4	2.2	2.1	2.4
Drugs for treatment of peptic ulcer	2,148	2.4	2.2	2.1	2.4
Anxiolytics	2,030	2.2	2.1	1.9	2.3
Hypnotics & sedatives	1,896	2.1	1.1	1.8	2.2
Cholesterol & triglyceride reducers	1,872	2.1	1.9	1.7	2.1
Beta-blocking agents plain	1,769	2.0	1.8	1.6	2.0
Hormonal contraceptives for systemic use	1,720	1.9	1.8	1.6	1.9
Selective calcium channel blockers with mainly vascular effects	1,707	1.9	1.8	1.6	1.9
Opioids	1,463	1.6	1.5	1.1	1.9
Oral blood glucose lowering drugs	14,278	1.6	1.5	1.2	1.7
Tetracyclines	1,386	1.5	1.4	1.2	1.6
Anti-psychotics	1,305	1.4	1.4	1.2	1.5
Decongestants & other nasal preparations for topical use	1,213	1.3	1.3	1.1	1.4
Anti-infectives	1,205	1.3	1.2	1.1	1.4
Corticosteroids for systemic use plain	1,196	1.3	1.2	1.1	1.4
Oestrogens	1,057	1.2	1.1	1.0	1.2
Anti-histamines for systemic use	986	1.1	1.0	0.8	1.3
High-ceiling diuretics	958	1.1	1.0	0.8	1.2
Selective calcium channel blockers with direct cardiac effects	907	1.0	0.9	0.8	1.1
Sulfonamides & trimethoprim	885	1.0	0.9	0.7	1.1
Subtotal	*68,527*	*75.7*	. .	. .	. .
Total prescribed	**90,710**	**100**	**93.6**	**91.2**	**96.1**

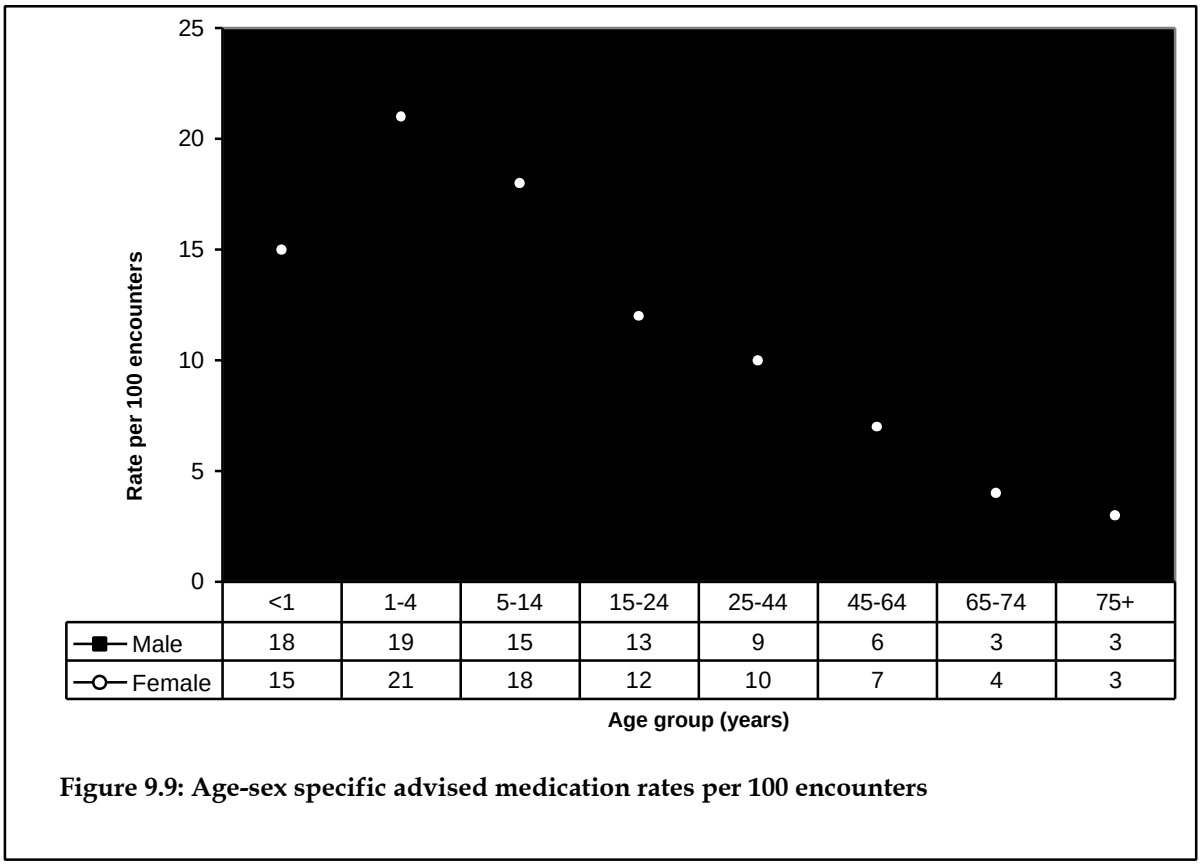
Note: Abbreviations: Encs – encounters, Scripts – prescriptions, UCI – Upper confidence interval, LCI – Lower confidence interval.

9.4 Advised drugs for over the counter purchase

The total number of drugs recorded as recommended by the GP for over the counter purchase was 8,538, at a rate of 8.8 per 100 encounters and 6.1 per 100 problems managed. At least one drug was recorded as advised at 7.9% of encounters and for 5.5% of problems.

9.4.1 Age–sex specific rates of advised drugs

Age–sex specific charts show the advised drug rate per 100 encounters for all the male or female patients respectively in the age group under consideration.



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	18	19	15	13	9	6	3	3
Female	15	21	18	12	10	7	4	3

Figure 9.9: Age-sex specific advised medication rates per 100 encounters

The pattern of age–sex specific rates of advised medications per 100 encounters was almost the reverse of that for prescribed drugs (Figure 9.9). Younger age groups predominate as recipients of advice to purchase OTC drugs. This reflects both the nature of the problems managed and the lower rates of HCC holders in these age groups seen by GPs (see Chapter 6). OTC purchase of drugs by non HCC may be the cheapest option for drugs available without prescription. The age–sex specific rate per 100 problems showed an almost identical distribution (results not presented).

9.4.2 Types of drugs advised

Drugs advised by major groups

CNS drugs predominated in those advised to patients, with almost a third of the drugs advised being in this group (Figure 9.10).

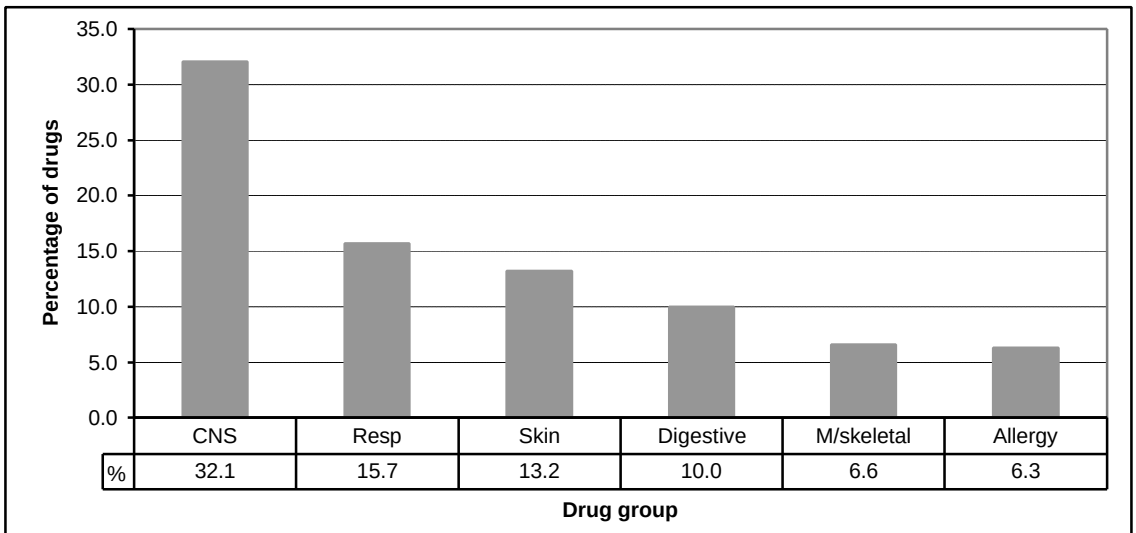


Figure 9.10: Drugs advised by major groups

The distribution of advised OTCs by group, sub-group and individual drugs demonstrated that **CNS** drugs consisted almost entirely of analgesics, with paracetamol predominating (Table 9.5). These results could be expected from the age–sex specific rates described above. **Respiratory** drugs consisted predominantly of compound decongestants/cough suppressants, and **skin** medications were split between anti-infectives and simple creams and lotions.

The distribution of the most frequently advised drugs by generic name shows that paracetamol dominates, accounting for over 25% of all drugs advised, at a rate of 2.4 per 100 encounters (Table 9.6). Other drugs were advised in relatively small numbers; however, the range of drugs was very wide. As stated in Chapter 9.1, general practitioner advice to purchase OTC drugs represents a significant area of therapeutic support for patients and appears particularly important for younger age groups.

Table 9.5: Distribution of OTCs advised by group, sub-group and generic drug

Group	Sub-group	Generic	Number	Percentage of OTCs	Rate per 100 encs	95% LCI	95% UCI
CNS			**2,842**	**32.1**	**2.9**	**2.4**	**3.5**
	Simple analgesics		2,512	28.0	2.6	2.1	3.1
		Paracetamol	2,317	25.2	2.4	1.8	2.9
		Aspirin	172	2.5	0.2	0.0	0.4
	Compound analgesics		320	3.9	0.3	0.0	0.6
		Paracetamol/Codeine	224	2.7	0.2	0.0	0.6
		Paracetamol/Codeine/ Doxylamine	66	0.8	0.1	0.0	0.4
Respiratory			**1,418**	**15.7**	**1.5**	**1.1**	**1.8**
	Expectorants		1,154	12.5	1.2	0.8	1.6
		Chlorpheniramine/ Phenylephrine	313	3.4	0.3	0.0	0.7
		Brompheniramine/ Pseudoephedrine	197	2.1	0.2	0.0	0.9
		Pseudoephedrine	165	1.7	0.2	0.0	0.5
		Pseudoephedrine/ Paracetamol	147	1.7	0.2	0.0	0.6
		Decongest/Expectorant/ Cold relief	98	1.0	0.1	0.0	0.8
		Cough mix/Expectorant	82	0.8	0.1	0.0	0.9
	Antitussives		198	2.5	0.2	0.0	0.6
		Pholcodine	113	1.4	0.1	0.0	0.6
Skin			**1,099**	**13.2**	**1.1**	**1.0**	**1.3**
	Anti-infection skin		558	6.7	0.6	0.4	0.7
		Clotrimazole topical	237	2.9	0.2	0.0	0.4
		Povidone-iodine topical	68	0.8	0.1	0.0	0.4
		Miconazole (cream)	55	0.6	0.1	0.0	0.4
	Other skin		512	6.1	0.5	0.3	0.7
		Sorbolene/Glycerol	96	1.3	0.1	0.0	0.4
		Calamine lotion	67	0.7	0.1	0.0	0.5
		Cream/ointment/lotion	62	0.7	0.1	0.0	0.5

(continued)

Table 9.5 (continued): Distribution of OTCs advised by group, sub-group and generic drug

Group	Sub-group	Generic	Number	Percentage of OTCs	Rate per 100 encs	95% LCI	95% UCI
Digestive			**796**	**10.0**	**0.8**	**0.6**	**1.0**
	Antacids		90	1.2	0.1	0.0	0.4
	Anti-spasmodics		68	0.7	0.1	0.0	0.5
		Hyoscine butylbromide	51	0.5	0.1	0.0	0.6
	Laxatives		206	2.6	0.2	0.0	0.5
		Psyllium mucilloid	72	0.9	0.1	0.0	0.4
	Anti-diarrhoeals		73	0.8	0.1	0.0	0.5
		Loperamide	63	0.7	0.1	0.0	0.6
	Topical rectal		97	1.3	0.1	0.0	0.4
	Mouth, throat topical		246	3.2	0.3	0.0	0.5
		Povidone-iodine gargle	58	0.8	0.1	0.0	0.7
		Benzydamine oropharyngeal	55	0.6	0.1	0.0	0.5
Musculoskeletal			**568**	**6.6**	**0.6**	**0.4**	**0.8**
	NSAID/anti-rheumatoid		240	2.8	0.2	0.0	0.5
		Ibuprofen	209	2.4	0.2	0.0	0.5
	Topical preparations		320	3.8	0.3	0.1	0.6
		Diclofenac diethyl topical	174	2.0	0.2	0.0	0.5
		Meth/salicylate + Menthol	73	0.8	0.1	0.0	0.6
Allergy, immune system	Anti-histamine		**562**	**6.3**	**0.6**	**0.3**	**0.9**
		Loratadine	191	2.3	0.2	0.0	0.5
		Promethazine hchl	86	0.8	0.1	0.0	0.7
		Fexofenadine	77	0.8	0.1	0.0	0.5
Nutrition, metabolism			**354**	**4.7**	**0.4**	**0.0**	**0.7**
	Vitamins		176	2.3	0.2	0.0	0.6
		Vitamin C (ascorbic acid)	46	0.7	0.0	0.0	1.0
	Mineral tonics		173	2.3	0.2	0.0	0.5
		Sodium/Potassium/ Citric/Glucose	97	1.2	0.1	0.0	0.5
Ear, nose topical			**232**	**2.8**	**0.2**	**0.0**	**0.5**
	Topical otic		96	1.1	0.1	0.0	0.4
	Topical nose		136	1.7	0.1	0.0	0.6
		Oxymetazoline	56	0.7	0.1	0.0	0.8

(continued)

Table 9.5 (continued): Distribution of OTCs advised by group, sub-group and generic drug

Group	Sub-group	Generic	Number	Percentage of OTCs	Rate per 100 encs	95% LCI	95% UCI
Urogenital			**193**	**2.5**	**0.2**	**0.0**	**0.4**
	Urinary antiseptic		72	0.9	0.1	0.0	0.4
		Sodium citrotartrate/ Tartaric acid	70	0.9	0.1	0.0	0.4
	Topical vaginal		120	1.6	0.1	0.0	0.3
		Clotrimazole vaginal	94	1.2	0.1	0.0	0.3
Blood			**137**	**1.8**	**0.1**	**0.0**	**0.5**
	Haemopoietics		135	1.7	0.1	0.0	0.5
		Folic acid	59	0.8	0.1	0.0	0.6
Eye medic'ns			**79**	**1.0**	**0.1**	**0.0**	**0.4**
	Other eye medic'ns		76	1.0	0.1	0.0	0.4
Miscellaneous			**190**	**2.3**	**0.2**	**0.0**	**0.6**

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

Table 9.6: Most frequently advised OTC drugs

Generic drug	Number	Percentage of OTCs	Rate per 100 encs	95% LCI	95% UCI
Paracetamol	2,317	25.2	2.4	1.8	2.9
Chlorpheniramine/Phenylephid	313	3.4	0.3	0.0	0.7
Clotrimazole topical	237	2.9	0.2	0.0	0.4
Paracetamol/Codeine	224	2.7	0.2	0.0	0.6
Ibuprofen	209	2.4	0.2	0.0	0.5
Brompheniramine/Pseudoeph	197	2.1	0.2	0.0	0.9
Loratadine	191	2.3	0.2	0.0	0.5
Diclofenac diethyl topical	174	2.0	0.2	0.0	0.5
Aspirin	172	2.5	0.2	0.0	0.4
Pseudoephedrine	165	1.7	0.2	0.0	0.5
Pseudoephedrine/Paracetamol	147	1.7	0.2	0.0	0.6
Pholcodine	113	1.4	0.1	0.0	0.6
Decongest/Expectorant/Cold relief	98	1.0	0.1	0.0	0.8
Sodium/Potassium/Citric/Glucose	97	1.2	0.1	0.0	0.5
Sorbolene/Glycerol/Cetomac	96	1.3	0.1	0.0	0.4
Clotrimazole vaginal	94	1.2	0.1	0.0	0.3
Promethazine hchl	86	0.8	0.1	0.0	0.7
Cough mix/Expectorant nec	82	0.8	0.1	0.0	0.9
Fexofenadine	77	0.8	0.1	0.0	0.5
Methyl salicylate + Menthol	73	0.8	0.1	0.0	0.6
Psyllium hydrophil mucil (Ispaghula)	72	0.9	0.1	0.0	0.4
Sodium citrotartrate/Tartaric acid	70	0.9	0.1	0.0	0.4
Povidone-iodine topical	68	0.8	0.1	0.0	0.4
Calamine lotion	67	0.7	0.1	0.0	0.5
Paracet/Codeine/Doxylamine	66	0.8	0.1	0.0	0.4
Loperamide	63	0.7	0.1	0.0	0.6
Cream/Ointment/Lotion nec	62	0.7	0.1	0.0	0.5
Folic acid	59	0.8	0.1	0.0	0.6
Nicotine	58	0.6	0.1	0.0	0.6
Povidone-iodine gargle	58	0.8	0.1	0.0	0.7
Subtotal	*5,806*	*65.8*	. .	. .	. .
Total	**8,534**	**100.0**	**8.8**	**8.0**	**9.6**

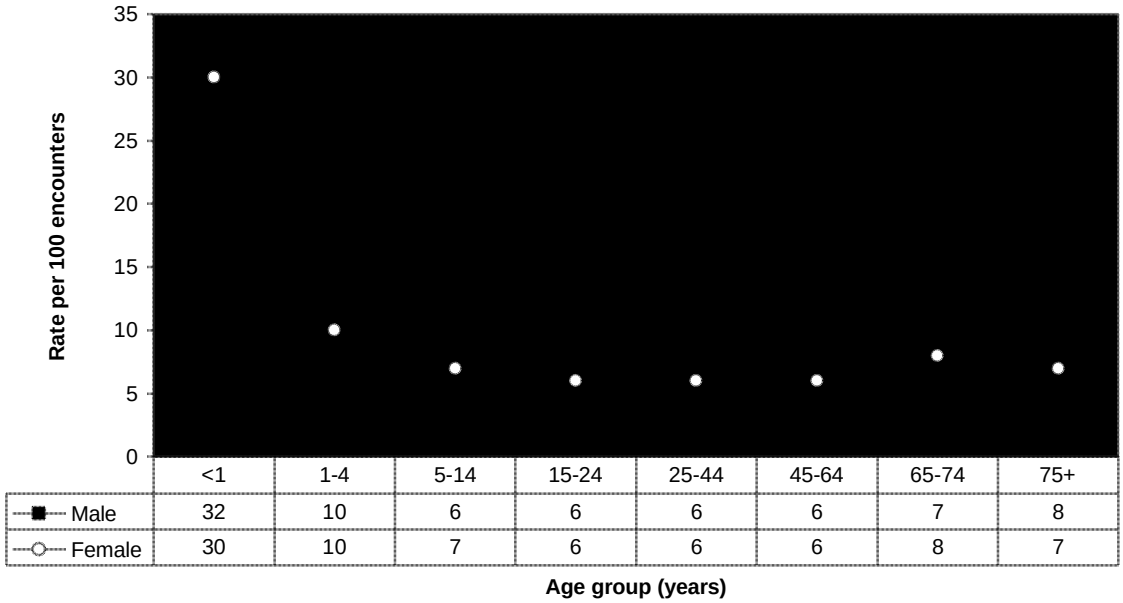
Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

9.5 General practitioner supplied drugs

General practitioners supplied their patients with a total of 7,072 drugs in this study at a rate of 7.3 drugs per 100 encounters and 5.0 per 100 problems. At least one drug was supplied at 5.6% of encounters and for 4.0% of problems.

9.5.1 Age–sex specific rates of GP supplied drugs

The age–sex specific rate is the rate per 100 encounters at which the drugs were supplied to male and female patients respectively in the age group under consideration (Figure 9.11).



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	32	10	6	6	6	6	7	8
Female	30	10	7	6	6	6	8	7

Figure 9.11: Age-sex specific supplied medication rates per 100 encounters

There were only minor differences between these rates for male and female patients of all age groups. Infants aged less than one year had by far the highest rate of receipt of GP supplied drugs (32 and 30 per 100 encounters for male and female patients respectively). Patients aged between one and four years received 10 GP supplied drugs per 100 encounters. The rate for all other age groups was steady at between 6 and 8 per 100 encounters. These results probably reflect the use of a direct GP supply mechanism for childhood vaccines in most parts of Australia.

The age–sex specific rates per 100 problems displayed an almost identical pattern to that per 100 encounters (unreported data).

9.5.2 Types of drugs supplied by GPs

Drugs supplied by GPs by major groups

The distribution of supplied drugs by drug group supported the assumption that direct vaccine supply was responsible for the high supply rate in infants, as allergy/immune drug supply constituted over 40% of drugs supplied. These were followed by CNS and CVS drugs (Figure 9.12).

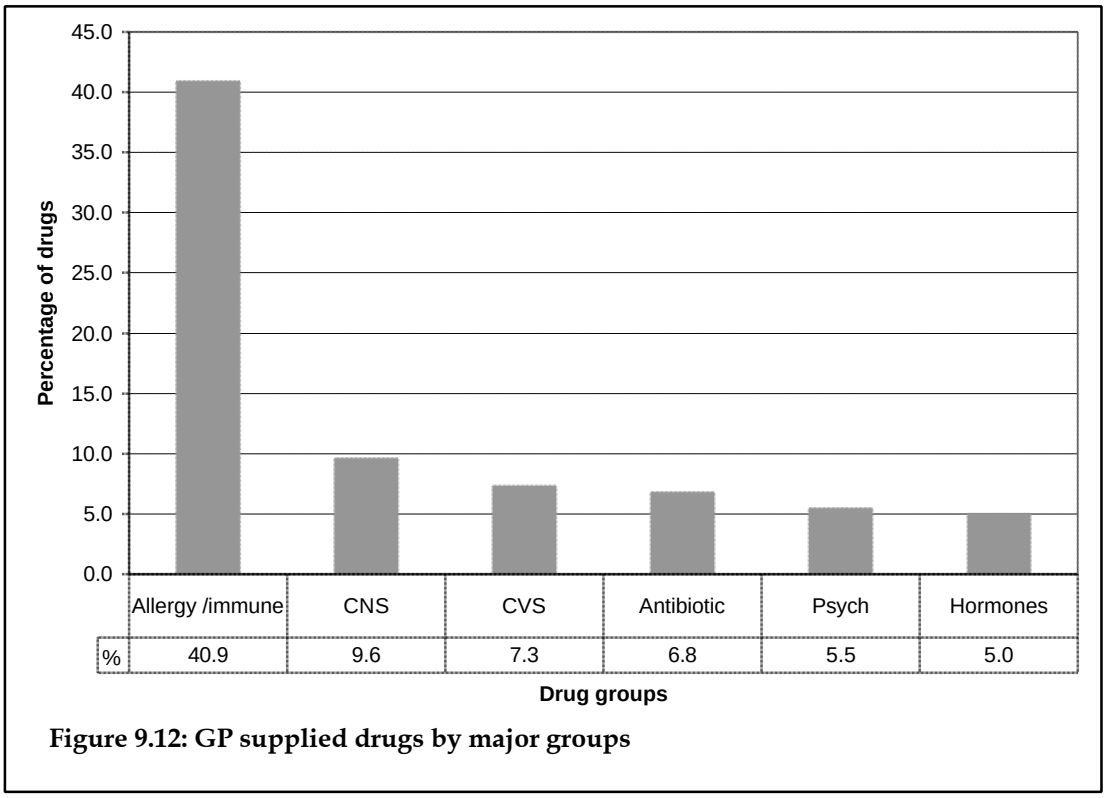


Figure 9.12: GP supplied drugs by major groups

Analysis of the distribution of GP supplied drugs by group, sub-group and commonly supplied individual drug demonstrates that vaccines constitute the major sub-group within the allergy/immune system group (Table 9.7). They were supplied at the rate of 2.9 per 100 encounters and constituted 38.2% of all drugs supplied. Analgesics and anti-emetics, frequently drugs administered by injection, made up almost all of the CNS drugs supplied. There was a wide spread of other drugs supplied, mostly prescription drugs, presumably from manufacturers' sample packs. They reflect a range of drugs which may be needed acutely in a situation (such as out of pharmacy hours) where prescription drugs cannot be obtained from other sources or where cost is an issue.

The distribution of generic drugs frequently supplied by GPs shows that vaccines occupy the first seven places, followed by anti-emetics and analgesics/NSAIDS (Table 9.8). As might be expected, many of the most frequently supplied drugs are injectables and/or only available directly from the GP.

Table 9.7: Distribution of supplied drugs by group, sub-group and generic drug

Group	Sub-group	Generic	Number	Percentage of supplied	Rate per 100 encs	95% LCI	95% UCI
Allergy, immune			**2,967**	**40.9**	**3.1**	**2.5**	**3.7**
	Vaccines		2,795	38.2	2.9	2.2	3.5
		Influenza virus vaccine	817	11.2	0.8	0.0	2.2
		Triple antigen	377	5.0	0.4	0.1	0.7
		Polio sabin oral	347	4.7	0.4	0.1	0.6
		Haemophilus B vaccine	288	4.0	0.3	0.0	0.6
		Mumps/Measles/Rubella	214	3.0	0.2	0.0	0.5
		ADT/CDT (Diph/Tet)	211	2.8	0.2	0.0	0.6
		Hepatitis B vaccine	181	2.3	0.2	0.0	0.6
		Pneumococcal vaccine	101	1.3	0.1	0.0	1.2
		Tetanus toxoid vaccine	77	1.1	0.1	0.0	0.4
		Hepatitis A vaccine	67	1.1	0.1	0.0	0.5
	Anti-histamines		106	1.7	0.1	0.0	0.4
		Promethazine	36	0.6	0.0	0.0	0.5
		Loratadine	34	0.6	0.0	0.0	0.4
	Anti-allergy		65	0.9	0.1	0.0	0.5
		Allergen injection	47	0.7	0.0	0.0	0.6
CNS			**634**	**9.6**	**0.7**	**0.2**	**1.1**
	Simple analgesics		90	1.3	0.1	0.0	0.7
		Paracetamol	76	1.1	0.1	0.0	0.6
	Narcotic analgesics		153	2.4	0.2	0.0	0.6
		Pethidine injection/tablet	100	1.5	0.1	0.0	0.5
	Compound analgesics		131	2.0	0.1	0.0	0.8
		Paracetamol/Codeine	102	1.6	0.1	0.0	0.7
	Ant-iemetic/anti-nausea		236	3.5	0.2	0.0	0.5
		Metoclopramide	135	2.1	0.1	0.0	0.4
		Prochlorperazine	95	1.3	0.1	0.0	0.4
Cardiovascular			**526**	**7.3**	**0.5**	**0.0**	**1.2**
	Anti-hypertensives		290	4.1	0.3	0.0	0.8

(continued)

Table 9.7 (continued): Distribution of supplied drugs by group, sub-group and generic drug

Group	Sub-group	Generic	Number	Percentage of supplied	Rate per 100 encs	95% LCI	95% UCI
Antibiotics			**453**	**6.8**	**0.5**	**0.0**	**1.3**
	Penicillins		92	1.2	0.1	0.0	0.6
	Broad spectrum penicillins		128	1.9	0.1	0.0	1.1
		Amoxycillin	78	1.1	0.1	0.0	0.9
		Amoxycillin/ clavulanate	49	0.8	0.1	0.0	1.0
	Cephalosporins		96	1.4	0.1	0.0	0.8
		Cefaclor monohydrate	52	0.7	0.1	0.0	0.9
		Cephalexin	43	0.7	0.0	0.0	0.8
	Tetracyclines		38	0.6	0.0	0.0	0.9
		Doxycycline	34	0.5	0.0	0.0	0.8
	Other antibiotics		60	1.1	0.1	0.0	0.6
		Roxithromycin	27	0.6	0.0	0.0	0.6
Psychological			**375**	**5.5**	**0.4**	**0.0**	**0.8**
	Sedative hypnotics		67	0.8	0.1	0.0	1.3
	Anti-anxiety		62	1.0	0.1	0.0	0.8
		Diazepam	38	0.6	0.0	0.0	0.7
		Phenothiazine	50	0.8	0.1	0.0	0.4
	Anti-depressants		196	2.9	0.2	0.0	0.5
		Sertraline	67	0.9	0.1	0.0	0.5
		Paroxetine	35	0.6	0.0	0.0	0.5
Hormones			**342**	**5.0**	**0.4**	**0.1**	**0.6**
	Sex hormones		142	2.3	0.1	0.0	0.4
		Medroxyprogesterone	52	0.8	0.1	0.0	0.4
	Cortico steroids		153	2.1	0.2	0.0	0.5
		Methylprednisolone	45	0.5	0.0	0.0	0.5
	Hypoglycaemic		39	0.5	0.0	0.0	1.1
Musculoskeletal			**319**	**4.3**	**0.3**	**0.0**	**0.7**
	NSAID/anti-rheumatoid		260	3.5	0.3	0.0	0.7
		Piroxicam oral	106	1.4	0.1	0.0	0.5
Digestive			**270**	**4.0**	**0.3**	**0.0**	**0.5**
	Anti-spasmodics		32	0.5	0	0.0	0.5
	Anti-ulcerants		177	2.5	0.2	0.0	0.4
		Ranitidine	55	0.7	0.1	0.0	0.5

(continued)

Table 9.7 (continued): Distribution of supplied drugs by group, sub-group and generic drug

Group	Sub-group	Generic	Number	Percentage of supplied	Rate per 100 encs	95% LCI	95% UCI
Respiratory			**269**	**3.8**	**0.3**	**0.0**	**0.6**
	Bronchodilators		128	1.7	0.1	0.0	0.6
		Salbutamol	76	1.0	0.1	0.0	0.5
	Asthma preventives		114	1.6	0.1	0.0	0.4
Skin			**249**	**3.6**	**0.3**	**0.0**	**0.6**
Blood			**131**	**1.8**	**0.1**	**0.0**	**0.5**
Contraceptives			**99**	**1.5**	**0.1**	**0.0**	**0.5**
Eye medications			**88**	**1.2**	**0.1**	**0.0**	**0.6**
Ear/nose topical			**77**	**1.2**	**0.1**	**0.0**	**0.7**
Nutrition/metab			**55**	**0.9**	**0.1**	**0.0**	**0.5**
Urogenital			**46**	**0.7**	**0.0**	**0.0**	**0.9**
Surgical			**55**	**0.7**	**0.1**	**0.0**	**1.7**
Miscellaneous			**39**	**0.9**	**0.0**	**0.0**	**2.6**

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

Table 9.8: Most frequently GP supplied drugs

Generic drug	Number	Percentage of GP supplied	Rate per 100 encs	95% LCI	95% UCI
Influenza virus vaccine	817	11.2	0.8	0.0	2.2
Triple antigen(Diph/Pert/Tet)	377	5.0	0.4	0.1	0.7
Polio sabin oral	347	4.7	0.4	0.1	0.6
Haemophilus B vaccine	288	4.0	0.3	0.0	0.6
Mumps/Measles/Rubella vaccine	214	3.0	0.2	0.0	0.5
ADT/CDT (Diph/Tet) vaccine	211	2.8	0.2	0.0	0.6
Hepatitis B vaccine	181	2.3	0.2	0.0	0.6
Metoclopramide	135	2.1	0.1	0.0	0.4
Piroxicam oral	106	1.4	0.1	0.0	0.5
Paracetamol/Codeine	102	1.6	0.1	0.0	0.7
Pneumococcal vaccine	101	1.3	0.1	0.0	1.2
Pethidine hcl inject/tab	100	1.5	0.1	0.0	0.5
Prochlorperazine	95	1.3	0.1	0.0	0.4
Vitamin B12 (Cyanocobalamin)	85	1.1	0.1	0.0	0.5
Amoxycillin	78	1.1	0.1	0.0	0.9
Tetanus toxoid vaccine	77	1.1	0.1	0.0	0.4
Paracetamol	76	1.1	0.1	0.0	0.6
Salbutamol	76	1.0	0.1	0.0	0.5
Levonorgestrel/Ethinyloestradiol	71	1.0	0.1	0.0	0.6
Hepatitis A vaccine	67	1.1	0.1	0.0	0.5
Sertraline	67	0.9	0.1	0.0	0.5
Ranitidine	55	0.7	0.1	0.0	0.5
Irbesartan	54	0.7	0.1	0.0	0.5
Cefaclor monohydrate	52	0.7	0.1	0.0	0.9
Medroxyprogesterone	52	0.8	0.1	0.0	0.4
Amoxycillin/potass.clavulanate	49	0.8	0.1	0.0	1.0
Monetasone	48	0.7	0.0	0.0	0.5
Diclofenac sodium systemic	48	0.6	0.0	0.0	0.8
Allergen treatment injection	47	0.7	0.0	0.0	0.6
Methylprednisolone	45	0.5	0.0	0.0	0.5
Subtotal	*4,123*	*56.8*	. .	. .	. .
Total	**7,024**	**100.0**	**7.2**	**6.3**	**8.2**

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

10. Non-pharmacological management

For each problem managed, GPs could record up to two non-pharmacological treatments provided. These were divided into two categories: clinical treatments, the majority of which were advice and counselling; and procedural treatments, which encompassed all procedures normally carried out by general practitioners (e.g. removal of sutures, application/removal of plaster). Observations of the patient such as 'blood pressure' measurements, regarded as routine clinical measurements were not included.

At least one non-pharmacological treatment was provided at one-quarter of all encounters. Overall 41,839 non-pharmacological treatments were recorded, a rate of 43 per 100 encounters, and 30 per 100 problems managed. In terms of problem management, at least one non-pharmacological treatment was provided for 20 in every 100 problems managed. Clinical treatments (22 per 100 problems) were more common than procedural treatments (8 per 100 problems) (Table 10.1).

Table 10.1: Non-pharmacological treatments—summary table

	Number	Rate per 100 encs[(a)]	95% LCI	95% UCI	Rate per 100 problems [(b)]	95% LCI	95% UCI
At least one non-pharmacological treatment	33,411	25.4	24.0	26.7	20.1	19.0	21.2
Non-pharmacological treatments	41,839	43.2	41.3	45.0	29.7	28.5	30.9
Clinical treatments	30,380	31.4	29.7	33.0	21.6	20.5	22.7
Procedural treatments	11,458	11.8	11.2	12.5	8.1	7.7	8.6

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

(b) Figures do not total 100% as more than one treatment can be described for each problem.

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

10.1 Clinical treatments

10.1.1 Number of clinical treatments at encounter

There were 30,380 clinical treatments provided, at a rate of 31.4 per 100 encounters (Table 10.1). At three-quarters of consultations (74.5%), and for the vast majority of problems (80.2%), the GP recorded no clinical treatments. At 20.6% of encounters one clinical treatment was provided, while relatively few had two or more (Table 10.2).

Table 10.2: Number of clinical treatments provided

Number of clinical treatments	Number of encounters	% of encounters	Number of problems	% of problems
Nil	72,143	74.5	112,991	80.2
One	19,973	20.6	25,285	18.0
Two	4,074	4.2	2,548	1.8
Three	589	0.6	—	—
Four or more	121	0.1	—	—
Total*	**96,900**	**100.0**	**140,824**	**100.0**

* Totals may not equal N due to rounding of weighted encounters.

10.1.2 Age–sex specific rates of clinical treatments

There were few differences between males and females in the age–sex specific rates of treatments provided. This is interesting as these treatments include much of the psychosocial counselling provided by GPs, and some might have expected that these would be provided relatively more often to females than to males.

Rates of counselling and advice were understandably lower in childhood (ranging between 24 and 26 per 100 encounters), and peaked for females in young adulthood, declining gradually through the older age groups (Figure 10.1).

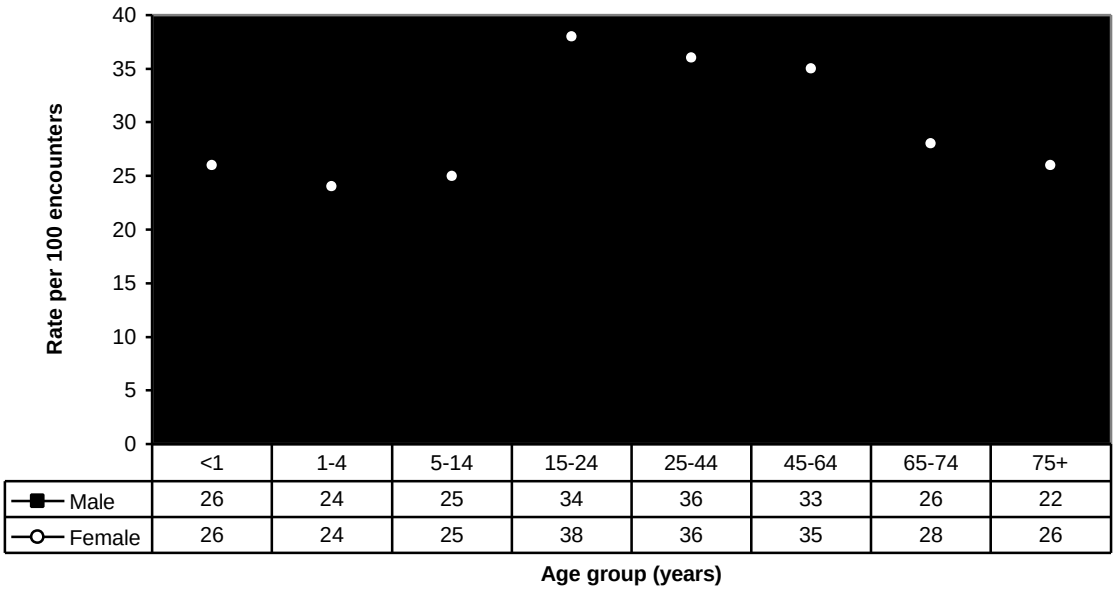


Figure 10.1: Age-sex specific rates - clinical treatments

10.1.3 Most frequent clinical treatments

The most frequent clinical treatments were advice or education about self-management of the problem (e.g. take fluids and rest) which accounted for 14.4% of all non-pharmacological treatments and occurred at a rate of 6.2 per 100 encounters. Advice about weight or nutrition (including advice about diet and weight management) was provided at a rate of 3.8 per 100 encounters. GPs also provided a range of counselling and advice about other aspects of health such as drug and alcohol use, smoking, exercise, life-style and relationship issues, although these were relatively infrequent (Table 10.3).

General or unspecified advice or education was given at a rate of 3.5 per 100 encounters. Counselling about the problem being managed (2.9 per 100 encounters) and counselling of a psychological nature (2.5 per 100 encounters) also occurred frequently. The role of the GP in dealing with the psychosocial aspects of the patient's health are quantified to some extent by these figures.

Table 10.3: Most frequent clinical treatments

Treatment*	Number	% of non-pharmacological treatments	Rate per 100 encs[(a)] (N=96,901)	95% LCI	95% UCI
Advice/education—treatment	6,006	14.4	6.2	5.5	6.8
Counsel/advice—nutrition/weight	3,636	8.7	3.8	3.4	4.1
Advice/education	3,394	8.1	3.5	2.7	4.3
Counselling—problem	2,832	6.8	2.9	2.4	3.5
Counselling—psychological	2,409	5.8	2.5	2.2	2.8
Advice/education—medication	2,321	5.6	2.4	2.1	2.7
Reassurance, support	1,588	3.8	1.6	1.3	2.0
Counsel/advice—exercise	1,318	3.2	1.4	0.9	1.8
Observe/wait	991	2.4	1.0	0.5	1.5
Other admin/document	849	2.0	0.9	0.7	1.1
Counsel/advice—health/body	792	1.9	0.8	0.3	1.4
Sickness certificate	708	1.7	0.7	0.3	1.1
Counsel/advice—smoking	603	1.4	0.6	0.4	0.8
Counsel/advice—relationship	389	0.9	0.4	0.2	0.6
Counsel/advice—prevention	376	0.9	0.4	0.1	0.7
Counsel/advice—relaxation	351	0.8	0.4	0.1	0.6
Counsel/advice—alcohol	341	0.8	0.4	0.1	0.6
Counsel/advice—life-style	295	0.7	0.3	0.0	0.8
Family planning	282	0.7	0.3	0.0	0.6
Counsel/advice—other	174	0.4	0.2	0.0	0.4
Counsel/advice—drug abuse	163	0.4	0.2	0.0	0.9
Counsel/advice—pregnancy	122	0.3	0.1	0.0	0.5
Counsel/advice—STDs	119	0.3	0.1	0.0	0.6
Counsel/advice—occupational	94	0.2	0.1	0.0	0.4
Advice/education—mothercare	94	0.2	0.1	0.0	0.6
Advice—care of other person	89	0.2	0.1	0.0	0.5
Subtotal: most frequent clinical treatments	*30,334*	*72.5*	*. .*	*. .*	*. .*
Total non-pharmacological treatments	**41,839**	**100.0**	**43.2**	**41.3**	**45.0**

(a) Figures do not total 100% as more than one non-pharmacological treatment can be managed at each encounter. Also only percentages >=0.2% included.

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

10.1.4 Problems managed with clinical treatments

Table 10.4: Top 30 problems managed with a clinical treatment

Problem managed	Number	% probs managed with a clinical treatment	Rate per 100 encs[(a)] (N=96,901)	95% LCI	95% UCI
Depression*	1,565	5.6	1.6	1.4	1.8
URTI	1,192	4.3	1.2	0.9	1.6
Hypertension*	913	3.3	0.9	0.7	1.1
Anxiety*	726	2.6	0.8	0.6	0.9
Lipid disorder	704	2.5	0.7	0.5	0.9
Diabetes*	659	2.4	0.7	0.5	0.9
Gastroenteritis, presumed infection	545	2.0	0.6	0.3	0.8
Asthma	535	1.9	0.6	0.3	0.8
Back complaint*	525	1.9	0.5	0.3	0.8
Sprain/strain*	495	1.8	0.5	0.3	0.7
Acute stress reaction	439	1.6	0.5	0.2	0.7
Viral disease NOS	427	1.5	0.4	0.2	0.7
Obesity (BMI> 30)	338	1.2	0.4	0.1	0.6
Acute bronchitis/bronchiolitis	321	1.2	0.3	0.1	0.6
Osteoarthritis*	301	1.1	0.3	0.1	0.5
Gastrointestinal infection	299	1.1	0.3	0.0	0.6
Immunisation/vaccination (all)*	281	1.0	0.3	0.0	0.6
Contact dermatitis	278	1.0	0.3	0.1	0.5
Sleep disturbance	271	1.0	0.3	0.1	0.5
UTI*	228	0.8	0.2	0.0	0.4
Menopausal complaint	228	0.8	0.2	0.0	0.5
Menstrual problems*	203	0.7	0.2	0.0	0.4
Constipation	200	0.7	0.2	0.0	0.4
Weakness/tiredness general	198	0.7	0.2	0.0	0.4
General check-up*	197	0.7	0.2	0.0	0.5
Tobacco abuse	188	0.7	0.2	0.0	0.5
Drug abuse	187	0.7	0.2	0.0	0.9
Oesophageal disease	179	0.6	0.2	0.0	0.4
Pregnancy*	177	0.6	0.2	0.0	0.5
Bruise/contusion	175	0.6	0.2	0.0	0.4
Subtotal:top 30 problems managed with clinical treatment	*12,973*	*46.6*	*. .*	*. .*	*. .*
Total problems managed with clinical treatment	**27,832**	**100.0**	**28.7**	**27.3**	**30.2**

(a) Figures do not total 100% as more than one treatment can be described at each encounter. Also only treatments >=0.5% included.

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

Note: Abbreviations: Probs – problems, Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

A total of 27,832 problems included a clinical treatment as part of their management. The top 30 (Table 10.4) accounted for almost half (47.0%) of all problems for which a clinical treatment was used. The problem most frequently managed was depression (5.6% of problems managed with a clinical treatment), followed by URTI (4.3%), hypertension (3.3%) and anxiety (2.6%).

10.1.5 The inter-relationship of a clinical treatment with other variables. Example: Counselling and advice for weight/nutrition

A clinical treatment of counselling/advice for weight or nutrition was assigned when the GP provided counselling, advice or education about diet, nutrition or weight management. This group was the second most frequent clinical treatment provided, accounting for 8.7% of all clinical treatments across 3,457 encounters. This treatment was given for 3,571 problems managed at these encounters. The majority of patients were female (57.7%), aged 25–64 years. Comparisons to the total dataset indicate that the proportion of patients who were female is normal; however, the age distribution for patients receiving weight/nutrition counselling is not ,with patients in the 25–64 age group being over-represented.

Rates for RFEs are presented as a rate per 100 encounters where counselling/advice for weight/nutrition occurred, while problems managed, prescriptions, other treatments, pathology and imaging, and referrals are presented as rates per 100 problems managed.

Reasons for encounter

A total of 6,029 reasons for encounter were described at a rate of 174.4 per 100 encounters by patients who received weight/nutrition counselling. This is notably higher than that of the total dataset (146.3). Similarly, the number of problems managed at these encounters was higher in this group than across all encounters.

Patients within this sub-group most commonly presented to the GP for test results (12.6 per 100 encounters where counselling and advice for weight/nutrition was given), cardiac check-ups, abdominal pain and diarrhoea.

Problems managed

Counselling for weight/nutrition was given for problems and disorders where weight and diet are important in the treatment of the condition. Some of the problems reflect the growing incidence of life-style related health problems, while others, such as gastrointestinal problems, may have been either caused or managed by dietary factors.

Problems most commonly managed when weight/nutrition counselling was provided were lipid disorders (14.8), diabetes (9.7) and hypertension (7.4). The weight of the patient was itself considered the problem for both obese (8.7) and overweight (4.3) patients. Gastrointestinal problems managed included gastroenteritis (5.9) and gastrointestinal infections (3.8) as well as constipation (3.4).

Prescriptions

Pharmacological treatments given together with the counselling and advice were varied, reflecting the range of problems under management. Overall, prescribing rates for problems concurrently managed with weight/nutrition counselling were less (48.4) than those for all problems managed. Medications classified as other CVS drugs (including lipid-lowering agents) were most frequently prescribed (5.0 per 100 problems managed), anti-hypertensives (4.5) and hypoglycaemic medications (3.9). Various digestive treatments such

as anti-diarrhoeals (2.7) and laxatives (2.3) appeared in the most frequent medications, with a small number of anti-obesity drugs (1.6). Herbal remedies and dietary agents were classified as 'miscellaneous' and these were prescribedat a rate of 2.5 per 100 problems treated with weight/nutrition advice.

Other treatments

As well as advice about their weight/diet, some patients at these encounters were advised about exercise (16.1), general treatment (3.4), life-style (1.7) and alcohol (1.3).

Referrals, tests and investigations

Referrals for patients receiving counselling for weight/nutrition (4.7) were less frequent than average. Most common referrals included those to dietitians (1.2) and gastroenterologists (0.6).

Pathology was ordered at a rate of 28.3 per 100 problems managed with weight/nutrition counselling. This was higher than pathology rates for all problems (17.0 per 100 problems). This high rate is somewhat explained by the relative frequency of the management of problems that are often monitored by pathology (e.g. lipid disorder). Blood tests were ordered relatively often at these encounters, chemistry tests being most common (20.0 per 100 problems managed).

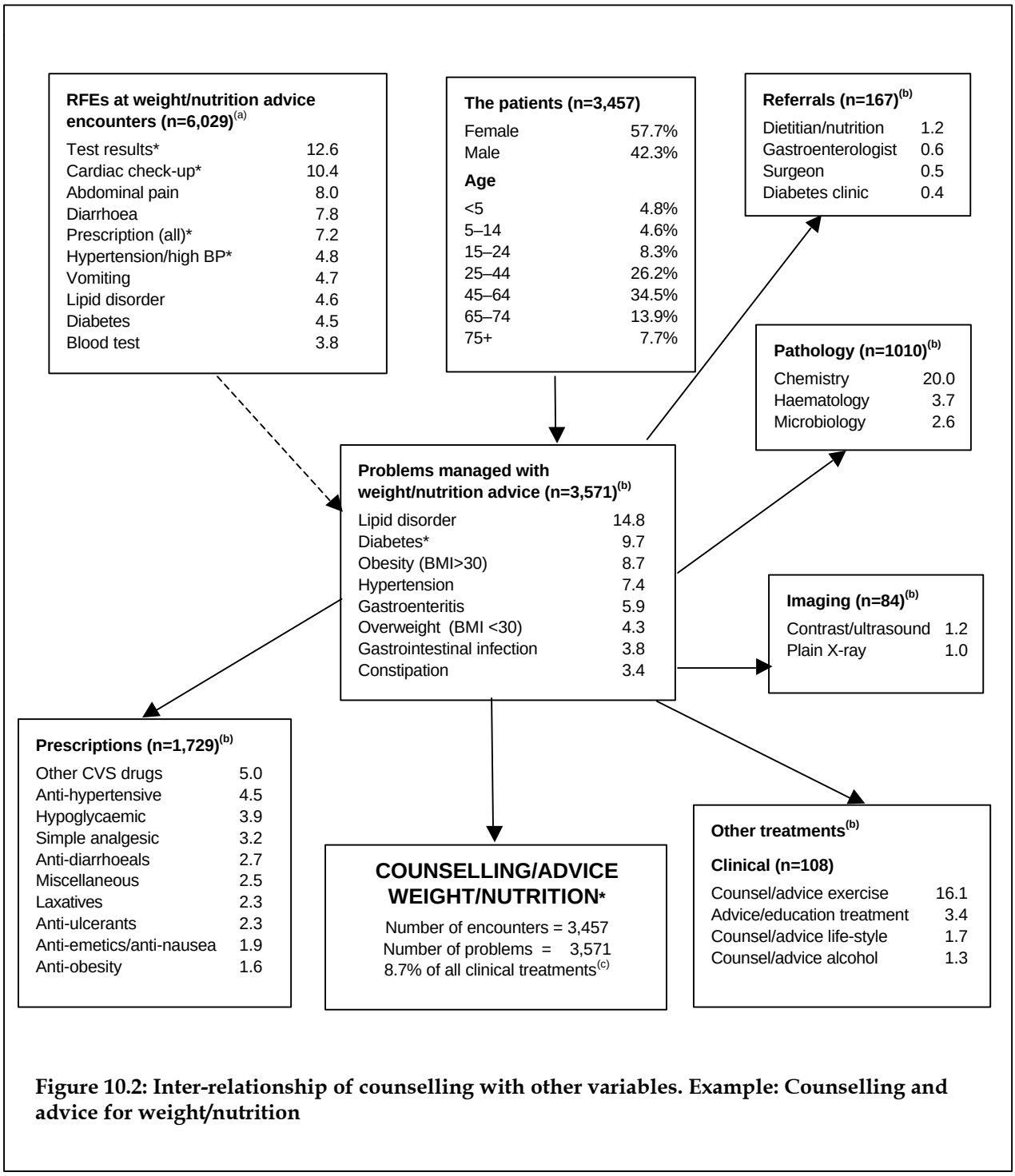


Figure 10.2: Inter-relationship of counselling with other variables. Example: Counselling and advice for weight/nutrition

10.2 Procedural treatments

10.2.1 Number of procedures at encounter

Procedural treatments included therapeutic actions undertaken by the GP, with some diagnostic procedures also described in this Chapter. ICPC-2 level codes were grouped across chapters for this analysis due to small numbers within each chapter. There were 11,458 procedural treatments, provided at a rate of 11.8 per 100 encounters (Table 10.1). These occurred relatively rarely across consultations, with at least one procedural treatment recorded at 10.8% of encounters. More than one procedural treatment at an encounter was relatively infrequent (0.9% of encounters). Similarly for problems managed, only 7.2% included one procedural treatment in their management, while 92.3% had no procedural treatments (Table 10.5).

Table 10.5: Number of procedural treatments provided

Number of procedural treatments	Number of encs	% of encs	Number of probs	% of probs
Nil	86,399	89.2	130,020	92.3
One	9,607	9.9	10,149	7.2
Two	849	0.9	655	0.5
Three	31	<0.1	—	—
Four or more	15	<0.1	—	—
Total	**96,901**	**100.0**	**140,824**	**100.0**

Note: Abbreviations: Encs – encounters, Probs – problems managed.

10.2.2 Age–sex specific rates of procedures

For all age groups except infants, males received relatively more procedural treatments than females. This difference was especially marked in young adults 15–24 years and may reflect higher injury rates for males in this age group (Figure 10.3). Overall, the rate of procedural treatments increased with age, in contrast to clinical treatments which were less frequent in the older age groups.

10.2.3 Most frequent procedures

The most common procedural treatment was excision or removal of tissue, (including destruction, debridement or cauterisation). It accounted for 6.5% of all non-pharmacological treatments and occurred at a rate of 2.8 per 100 encounters (see Table 10.6). This was followed by dressing, compressing or applying pressure (2.0 per 100 encounters). Physical medicine or rehabilitation (including physiotherapy, massage and therapeutic exercises) occurred at a rate of 1.8 per 100 encounters, and accounted for 4.2% of all procedures. Other therapeutic procedures included applying, removing and repairing casts or prosthetic devices (1.0 per 100 encounters) anddraining of fluids(1.0 per 100 encounters).

Diagnostic procedures undertaken included taking of Pap smears, glucose tests, physical function tests such as peak flow readings and a small number of endoscopies and electrocardiograms undertaken by GPs themselves. (Note that the majority of diagnostic tests were ordered and are described in Chapter 12—Investigations.)

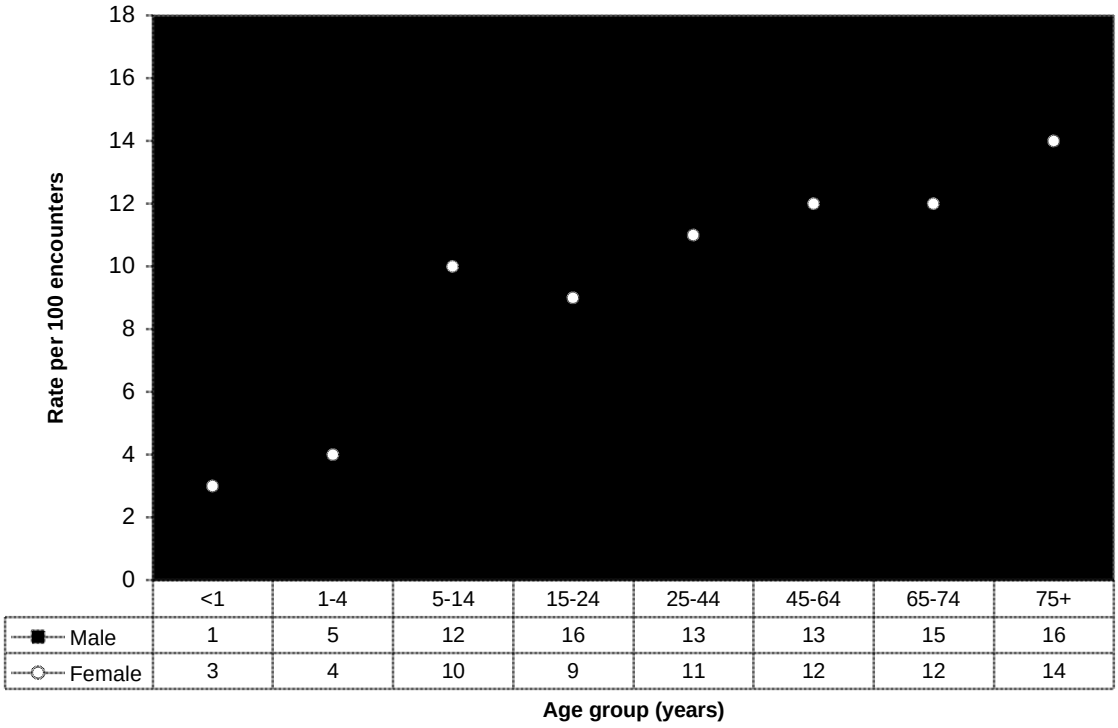


Figure 10.3: Age-sex specific rates - procedural treatments

10.2.4 Problems managed with a procedural treatments

A total of 10,804 problems involved a procedural treatment in their management. The top 30 problems accounted for 64.7% of all problems for which a procedure was used. These problems were commonly associated with skin complaints, injuries of various types, musculoskeletal problems and some chronic complaints such as osteoarthritis, diabetes and asthma (Table 10.7).

The problems most frequently managed with a procedural treatment were solar keratosis/ sunburn (6.2% of problems managed by a procedural treatment), followed by lacerations and cuts (5.9%), sprains and strains (4.9%), ear wax (4.4%) and warts (4.2%). It appears that the types of procedures that GPs undertake are of a relatively minor nature. While GPs in rural areas may undertake more complex procedural treatments, most appear to undertake major procedures rarely (Table 10.6).

1.1

Table 10.6: Most frequent procedural treatments

Treatment	Number	% of non-pharm treatments	Rate per 100 encs[(a)] (N=96,901)	95% LCI	95% UCI
Excision/removal tissue/biopsy/destruction/ debridement/cauterisation	2,712	6.5	2.8	2.6	3.0
Dressing/pressure/compression/tamponade	1,941	4.6	2.0	1.8	2.2
Physical medicine/rehabilitation	1,758	4.2	1.8	1.3	2.4
Repair/fixation-suture/cast/prosthetic device (apply/remove)	978	2.3	1.0	0.9	1.2
Incision/drainage/flushing/aspiration/removal body fluid	965	2.3	1.0	0.9	1.1
Other therapeutic procedures/surgery NEC	839	2.0	0.9	0.2	1.6
Pap smear	553	1.3	0.6	0.3	0.9
Electrical tracings	385	0.9	0.4	0.2	0.6
Local injection/infiltration	291	0.7	0.3	0.0	1.6
Test; glucose	276	0.7	0.3	0.0	0.6
Physical function test	276	0.7	0.3	0.0	0.6
Pregnancy test	159	0.4	0.2	0.0	0.4
Urine test	137	0.3	0.1	0.0	0.7
Diagnostic endoscopy	69	0.2	0.1	0.0	0.9
Other diagnostic procedures	34	0.1	0.0	0.0	0.8
Instrumentation/catheterisation/intubation/ dilation	30	0.1	0.0	0.0	0.5
Subtotal: most frequent procedural treatments	*11,403*	*27.3*	*. .*	*. .*	*. .*
Total non-pharmacological treatments	**41,839**	**100.0**	**43.1**	**41.3**	**45**

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

Note: Abbreviations: Non-pharm – non-pharmacological, Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

Table 10.7: Top 30 problems managed by a procedural treatment

Problem managed	Number	% of probs managed by a procedural treatment	Rate per 100 encs[(a)] (N=96,901)	95% LCI	95% UCI
Solar keratosis/sunburn	671	6.2	0.7	0.5	0.9
Laceration/cut	640	5.9	0.7	0.5	0.8
Sprain/strain*	528	4.9	0.5	0.1	1.0
Excessive ear wax	476	4.4	0.5	0.4	0.6
Warts	455	4.2	0.5	0.3	0.6
Chronic ulcer skin (incl varicose ulcer)	449	4.2	0.5	0.2	0.7
Back complaint*	422	3.9	0.4	0.0	1.1
Malignant neoplasm skin	348	3.2	0.4	0.2	0.6
Female genital check-up/Pap smear*	307	2.8	0.3	0.0	0.7
Fracture*	243	2.3	0.3	0.0	0.5
Diabetes*	214	2.0	0.2	0.0	0.6
Osteoarthritis*	181	1.7	0.2	0.0	0.6
Other skin disease	160	1.5	0.2	0.0	0.5
Benign/uncertain neoplasm skin	159	1.5	0.2	0.0	0.4
Skin infection, post traumatic	134	1.2	0.1	0.0	0.5
Injury musculoskeletal	131	1.2	0.1	0.0	0.4
Neck complaint	130	1.2	0.1	0.0	0.9
Skin complaint	126	1.2	0.1	0.0	0.4
Asthma	124	1.2	0.1	0.0	0.5
Shoulder syndrome	113	1.0	0.1	0.0	0.5
Injury skin	110	1.0	0.1	0.0	0.5
General check-up*	104	1.0	0.1	0.0	0.5
Naevus/mole	101	0.9	0.1	0.0	0.4
Bursitis/tendonitis/synovitis NOS	100	0.9	0.1	0.0	0.4
Boil/carbuncle	99	0.9	0.1	0.0	0.4
Otitis externa	98	0.9	0.1	0.0	0.4
Muscle pain	95	0.9	0.1	0.0	0.5
Neck syndrome	94	0.9	0.1	0.0	0.6
Burns/scalds	91	0.8	0.1	0.0	0.4
Bruise/contusion	91	0.8	0.1	0.0	0.4
Subtotal: top 30 problems managed – procedural treatments	*6,994*	*64.7*	*. .*	*. .*	*. .*
Total problems managed with a procedural treatment	**10,804**	**100.0**	**11.2**	**10.6**	**11.7**

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

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

Note: Abbreviations: Probs – problems, Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

11. Referrals and admissions

A referral is defined as the process by which the responsibility for part or all of the care of a patient is temporarily transferred to another health care provider. Only new referrals arising at the encounter were included (i.e. continuations were not recorded). For every 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 accident and emergency department. Referrals to hospital outpatient clinics were classified as specialist referrals. Referrals for certain clinical assessments such as endoscopies and ECGs without nomination of the provider, were also included in this Chapter. (Note that orders for imaging and pathology are described in Chapter 12—Investigations).

11.1 Number of referrals and admissions

At least one referral was given at 7.8% encounters. There were 10,860 referrals made at a rate of 11.2 per 100 encounters. The most frequent were referrals to a medical specialist (7.4 per 100 encounters), followed by referrals to allied health services (3.0). Very few patients were referred to hospital for admission (0.7 per 100 encounters) or to the emergency department of a hospital (0.06 per 100). For every 100 problems managed, a referral to a specialist was made for 5.1, while a referral to an allied health professional was given for 2.1 (Table 11.1). A very small number of encounters (0.6%) resulted in two referrals.

Table 11.1: Referrals and admissions—summary table

	Number	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 problems	95% LCI	95% UCI
At least one referral	10,258	7.8	7.4	8.2	5.7	5.4	6.0
Referrals	10,860	11.2	10.8	11.6	7.7	7.4	8.0
Specialist	7,147	7.4	7.1	7.7	5.1	4.9	5.3
Allied health service	2,935	3.0	2.8	3.2	2.1	2.0	2.2
Hospital	717	0.7	0.6	0.9	0.5	0.4	0.6
Emergency department	61	0.06	0.0	0.6	0.04	0.0	0.4

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

11.2 Age–sex specific rates of referrals

Relative rates of referrals to both medical specialists (Figure 11.1) and allied health services (Figure 11.2) increased with age. The rate of new referrals to specialists showed a slight decline in women over 65 year old patients, but this could reflect the fact that many women of this age have already been referred to specialists appropriate to their needs. The referral rate was slightly higher for males than for females in these older age groups. Referral rates to allied health services did not show any consistent trend. Males aged 25–64 years, and females aged 75 years or more, had the highest rate of referral to allied health services.

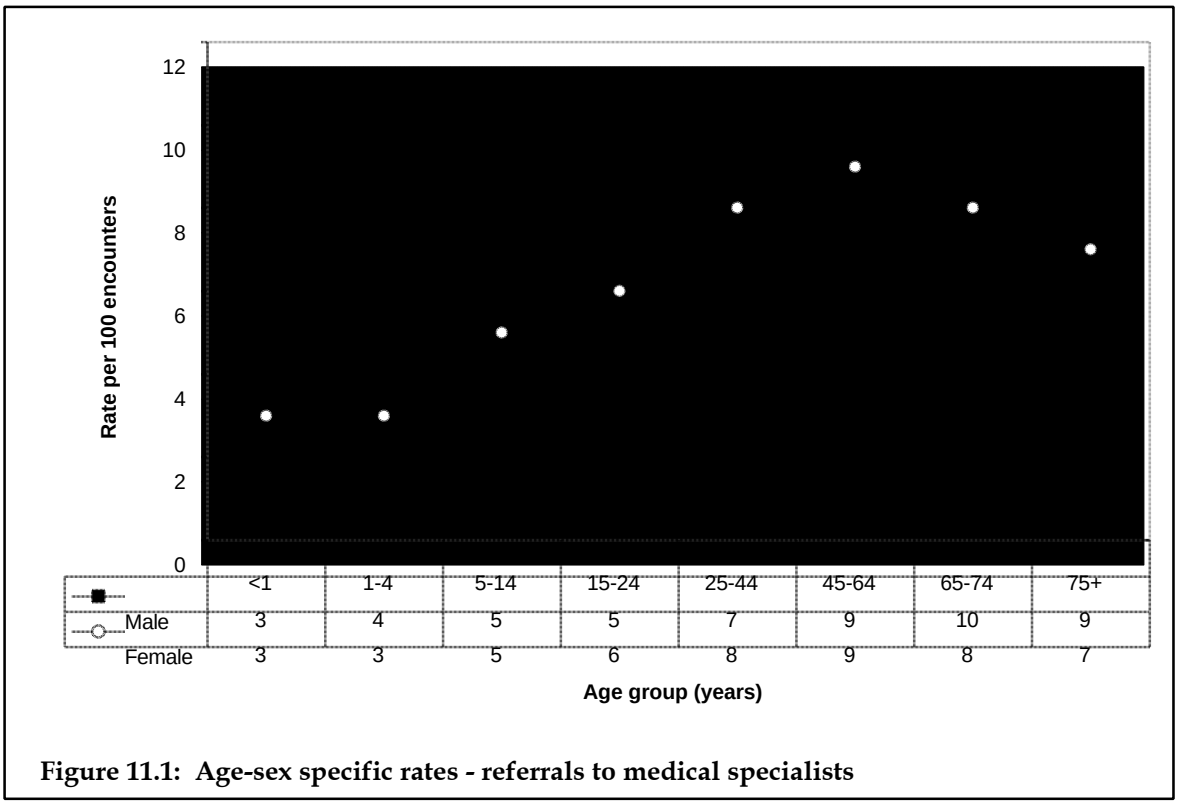
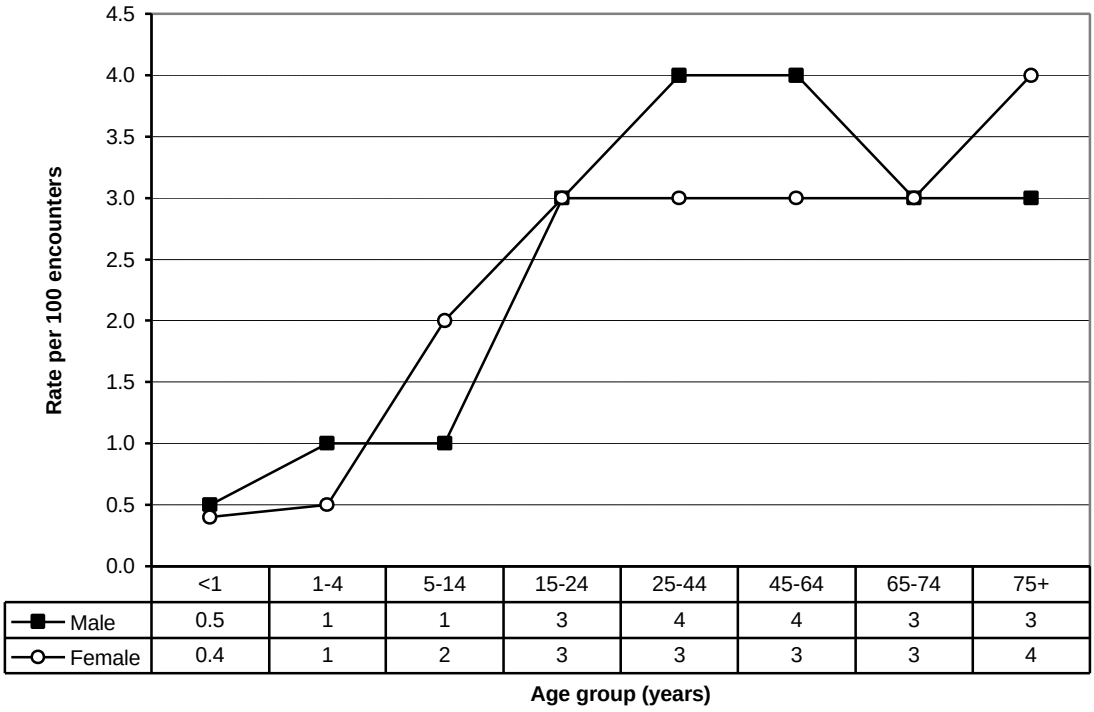


Figure 11.1: Age-sex specific rates - referrals to medical specialists



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	0.5	1	1	3	4	4	3	3
Female	0.4	1	2	3	3	3	3	4

Figure 11.2: Age-sex specific rates - referrals to allied health services

11.3 Most frequent referrals

Of the 10,860 referrals, 93% (n=10,082) were referrals to specialists or allied health services. The top ten provider types in each category accounted for 69.5% of all referrals to medical specialists and 59.8% of those to allied health services respectively (Table 11.2—Note that this table does not show referrals where the GP did not specify the type of provider—e.g. referral to specialist).

The most frequent referrals made to specialist medical practitioners were to surgeons (11.2% of all referrals to medical specialists), ophthalmologists (9.8%), orthopaedic surgeons (8.1%) and gynaecologists (7.5%).

The majority of referrals to allied health services were to physiotherapists, and these accounted for 30.7% of all referrals of this type, and 8.3% of all referrals. Referrals to podiatrists and chiropodists (1.4% of all referrals), dentists (1.3%) and psychologists (1.3%) followed (Table 11.2).

Table 11.2: Most frequent referrals to specialists and allied health professionals

Professional to whom patient referred	Number	% of all referrals	% of referral group	Rate per 100 encs (N=96,901)	95% LCI	95% UCI
Medical specialist	**7,147**	**70.8**	**100.0**	**7.4**	**7.1**	**7.7**
Surgeon	804	7.4	11.2	0.8	0.7	0.9
Ophthalmologist	701	6.5	9.8	0.7	0.6	0.8
Orthopaedic surgeon	582	5.4	8.1	0.6	0.5	0.7
Gynaecologist	539	5.0	7.5	0.6	0.4	0.7
Ear, nose and throat specialist	514	4.7	7.2	0.5	0.4	0.7
Dermatologist	504	4.6	7.1	0.5	0.4	0.7
Gastroenterologist	396	3.7	5.5	0.4	0.3	0.6
Cardiologist	355	3.3	5.0	0.4	0.2	0.5
Urologist	305	2.8	4.3	0.3	0.2	0.5
Psychiatrist	270	2.5	3.8	0.3	0.1	0.4
Subtotal: top 10 specialist referrals	*4,970*	*49.3*	*69.5*	. .	. .	. .
Allied health professional	**2,935**	**29.1**	**100.0**	**3.0**	**2.8**	**3.2**
Physiotherapy	902	8.3	30.7	0.9	0.8	1.1
Podiatrist/chiropodist	147	1.4	5.0	0.2	0.0	0.4
Dentist	142	1.3	4.8	0.2	0.0	0.4
Psychologist	141	1.3	4.8	0.2	0.0	0.4
Dietician/nutrition	114	1.1	3.9	0.1	0.0	0.4
Acoustic testing	111	1.0	3.8	0.1	0.0	0.5
Drug & alcohol	70	0.7	2.4	0.1	0.0	0.5
Counsellor	50	0.5	1.7	0.1	0.0	0.5
Optometrist	44	0.4	1.5	0.1	0.0	0.4
Aged care assessment	34	0.3	1.2	0.0	0.0	0.5
Subtotal : top 10 allied health services	*1,755*	*17.4*	*59.8*	. .	. .	. .
Total specialist and allied health referrals	**10,082**	**100.0**	. .	. .	. .	. .

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

11.4 Problems that were referred

A referral to a specialist was provided for a total of 7,084 problems managed. The 30 problems most commonly associated with a referral to a specialist accounted for a third of all problems associated with specialist referrals. The problems most frequently being managed with these referrals were malignant neoplasms of the skin (2.6% of problems managed), depression (2.4%), oesophageal disease (1.7%), pregnancy (1.7%) and diabetes (1.6%) (Table 11.3).

Referrals to allied health services were fewer in number (n=2,935), possibly because formal referrals to such services are not always required. There were 2,894 problems associated with a referral to an allied health professional or service. Table 11.4 shows the 30 most frequent problems associated with allied health referrals and these accounted for more than half of all problems referred to allied health services.

Back complaints were most frequently referred to allied health services (7.6% of problems managed), followed by sprains and strains (5.9%). Musculoskeletal injuries (2.4%), osteoarthritis and shoulder syndromes also featured in the top 30 problems managed. These problems are those that would be likely to be referred to physiotherapists. It is interesting to note that depression, one of the most common problems managed by GPs, was referred relatively frequently to both allied health professionals (4.0%) and medical specialists (2.4%).

Of the 717 referrals to hospital, the associated problems under management were often acute in nature. These included fractures (3.7% of problems managed), pneumonia (3.0%), appendicitis (2.8%) and asthma (2.5%). Acute cardiovascular problems such as heart failure, chest pain and strokes were also referred to hospital. Referrals to psychiatric units/hospitals were also included in this category and these would appear to be largely accounted for by depression (3.0%) (Table 11.5).

Table 11.3: Top 30 problems associated with a specialist referral

Problem managed	Number	% of problems managed	Rate per 100 encs (N=96,901)	95% LCI	95% UCI
Malignant neoplasm skin	182	2.6	0.2	0.0	0.4
Depression*	167	2.4	0.2	0.0	0.4
Oesophageal disease	123	1.7	0.1	0.0	0.4
Pregnancy*	123	1.7	0.1	0.0	0.4
Diabetes*	111	1.6	0.1	0.0	0.3
Osteoarthritis*	106	1.5	0.1	0.0	0.3
Menstrual problems*	92	1.3	0.1	0.0	0.4
Cataract	92	1.3	0.1	0.0	0.4
Back complaint*	87	1.2	0.1	0.0	0.3
Abdominal pain*	79	1.1	0.1	0.0	0.4
Skin complaint	78	1.1	0.1	0.0	0.4
Abnormal test results*	71	1.0	0.1	0.0	0.4
Naevus/mole	70	1.0	0.1	0.0	0.4
Haemorrhoids	70	1.0	0.1	0.0	0.4
Eye/adnexa disease, other	66	0.9	0.1	0.0	0.4
Solar keratosis/sunburn	66	0.9	0.1	0.0	0.4
Visual disturbance, other	64	0.9	0.1	0.0	0.3
Acute internal damage knee	63	0.9	0.1	0.0	0.4
Cardiovascular disease	63	0.9	0.1	0.0	0.4
Ischaemic heart disease without angina	63	0.9	0.1	0.0	0.4
Inguinal hernia	61	0.9	0.1	0.0	0.3
Fracture*	60	0.9	0.1	0.0	0.4
Carpal tunnel syndrome	60	0.8	0.1	0.0	0.4
Contact dermatitis	58	0.8	0.1	0.0	0.3
Bursitis/tendonitis/synovitis NOS	57	0.8	0.1	0.0	0.4
Refractive error	53	0.8	0.1	0.0	0.4
Musculoskeletal disease	51	0.7	0.1	0.0	0.4
Pre/post natal check-up*	51	0.7	0.1	0.0	0.4
Cholecystitis, cholelithiasis	51	0.7	0.1	0.0	0.4
Hypertension*	50	0.7	0.1	0.0	0.4
Subtotal: top 30 problems referred to specialistl	*2,388*	*33.7*	*. .*	*. .*	*. .*
Total problems managed with a specialist referral	**7,084**	**100.0**	**7.3**	**7.0**	**7.6**

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

Table 11.4: Top 30 problems associated with a referral to allied health services

Problem managed	Number	% of problems managed	Rate per 100 encs (N=96,901)	95% LCI	95% UCI
Back complaint*	219	7.6	0.2	0.0	0.4
Sprain/strain*	171	5.9	0.2	0.0	0.4
Depression*	116	4.0	0.1	0.0	0.4
Teeth/gum disease	73	2.5	0.1	0.0	0.4
Injury musculoskeletal	69	2.4	0.1	0.0	0.4
Osteoarthritis*	68	2.3	0.1	0.0	0.3
Pain, chest NOS	64	2.2	0.1	0.0	0.5
Diabetes*	62	2.1	0.1	0.0	0.4
Drug abuse	52	1.8	0.1	0.0	0.5
Anxiety*	52	1.8	0.1	0.0	0.4
Shoulder syndrome	51	1.8	0.1	0.0	0.4
Bursitis/tendonitis/synovitis NOS	47	1.6	0.1	0.0	0.3
Neck syndrome	44	1.5	0.1	0.0	0.4
Musculoskeletal disease	44	1.5	0.1	0.0	0.5
Fracture*	44	1.5	0.1	0.0	0.8
Neck complaint	40	1.4	0.0	0.0	0.5
Hearing complaint	39	1.3	0.0	0.0	0.5
Obesity (BMI>30)	38	1.3	0.0	0.0	0.5
Hypertension*	38	1.3	0.0	0.0	0.4
Injury skin	37	1.3	0.0	0.0	0.4
Acute stress reaction	35	1.2	0.0	0.0	0.5
Teeth/gum complaint	32	1.1	0.0	0.0	0.5
Sleep disturbance	28	1.0	0.0	0.0	0.5
Ischaemic heart disease with angina	28	1.0	0.0	0.0	0.4
Deafness	27	0.9	0.0	0.0	0.6
General check-up*	25	0.9	0.0	0.0	0.5
Acute internal damage knee	24	0.8	0.0	0.0	0.5
Dementia (incl senile, Alzheimer)	24	0.8	0.0	0.0	0.5
Muscle pain	23	0.8	0.0	0.0	0.5
Back syndrome without radiating pain	23	0.8	0.0	0.0	0.5
Subtotal: top 30 problems referred to allied health services	*1,636*	*56.5*	*. .*	*. .*	*. .*
Total problems	**2,894**	**100.0**	**3.0**	**2.8**	**3.2**

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval

Table 11.5: Top 30 problems associated with a referral to hospital

Problem managed	Number	% of problems managed	Rate per 100 encs (N=96,901)	95% LCI	95% UCI
Fracture*	26	3.7	0.03	0.0	0.5
Depression*	22	3.0	0.02	0.0	0.6
Pneumonia	22	3.0	0.02	0.0	0.5
Appendicitis	20	2.8	0.02	0.0	0.5
Asthma	18	2.5	0.02	0.0	0.6
Heart failure	14	1.9	0.01	0.0	0.6
Hypertension*	14	1.9	0.01	0.0	1.1
Diabetes*	13	1.9	0.01	0.0	1.0
Pain, chest NOS	12	1.7	0.01	0.0	0.7
Abdominal pain*	12	1.7	0.01	0.0	0.7
Pregnancy*	12	1.7	0.01	0.0	0.6
Stroke/cerebrovascular accident	10	1.4	0.01	0.0	1.2
Pre/post natal check-up*	10	1.4	0.01	0.0	0.9
UTI*	9	1.3	0.01	0.0	0.7
Malignant neoplasm skin	9	1.2	0.01	0.0	0.8
Tonsillitis*	9	1.2	0.01	0.0	0.8
Acute myocardial infarction	8	1.2	0.01	0.0	0.7
Disease digestive system, other	8	1.1	0.01	0.0	0.7
Viral disease	8	1.1	0.01	0.0	0.8
Concussion	8	1.1	0.01	0.0	5.2
Ischaemic heart disease without angina	8	1.1	0.01	0.0	0.8
Acute bronchitis/bronchiolitis	8	1.1	0.01	0.0	0.7
Diverticular disease	8	1.1	0.01	0.0	0.9
Malignant neoplasm bronchus, lung	7	1.0	0.01	0.0	1.0
Complication of treatment	7	1.0	0.01	0.0	0.9
Phlebitis and thrombophlebitis	7	1.0	0.01	0.0	0.7
Cholecystitis, cholelithiasis	7	1.0	0.01	0.0	0.9
Genital disease (female)	7	0.9	0.01	0.0	1.1
Foreign body in eye	7	0.9	0.01	0.0	1.7
Skin infection	6	0.9	0.01	0.0	0.8
Subtotal: top 30 problems referred to hopital	*335*	*46.8*	*. .*	*. .*	*. .*
Total problems	**717**	**100.0**	**0.7**	**0.6**	**0.9**

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

11.5 The inter-relationship of referrals with other variables

11.5.1 Example 1: Referrals to a psychiatrist

Referrals can be directly linked (solid lines in Figures 11.3 and 11.4) to all other encounter variables apart from RFEs (shown as dotted lines). There were 295 referrals to psychiatrists, including hospital clinics and psychiatric wards, and these constituted 2.5% of all referrals. The proportions of males and females referred to psychiatrists exactly matched the overall distribution, with 58% female. Patients aged 25–44 years were over-represented in this sub-group (49.9% compared with approximately 25% in the total dataset); those aged 15–24 years were under-represented (15.5%).

Reasons for encounter

Patients receiving a referral to a psychiatrist presented to the GP with a range of psychological RFEs including depression (37.2 per 100 encounters at which there was a psychiatry referral), and anxiety (9.7). The patient actually requested a referral at 12.8 per 100 of these encounters, and a prescription was requested at 2.7 per 100 of these encounters. Acute stress (4.9), sleep disturbances (2.7), and suicidal ideation or attempts (2.6) were also described in the top ten RFEs.

Problems managed

Depression (55.7 per 100 problems referred to a psychiatrist) and anxiety (9.3) were the labels most frequently used by GPs to describe the problem being managed, while psychotic disorders were also diagnosed. Hyperkinetic disorder (mostly accounted for by the relatively new diagnosis of attention deficit hyperactivity disorder) was relatively frequent, (3.3 per 100 problems referred to a psychiatrist), while stress disorders and drug abuse also appeared.

Prescriptions and other treatments

Overall, the management of problems that were referred to a psychiatrist differed from those seen across all problems. Prescription rates for these problems were notably less (49.5 per 100 problems) than those provided for all problems (64.4), while non-pharmacological treatments were used more frequently (36.6 per 100 problems) than those in the total dataset (29.7).

Concurrent drug prescriptions were most frequently for anti-depressants (30.8 per 100 problems referred to a psychiatrist). Anti-psychotic drugs (phenothiazines—6.6 per 100 problems), anti-anxiolytics (5.2) and sedative hypnotics (2.3) were also prescribed. GPs also provided psychological or problem-related counselling (27.5 per 100 problems associated with a psychiatry referral), and advice about relaxation (1.6) and of a general nature (1.5).

Other referrals, tests and investigations

Only a few other referrals (n=6) and pathology orders (n=22) were recorded for problems where a referral to a psychiatrist was made. The pathology ordering rate was half (7.5) that seen in the total dataset (17.0). This can be explained by the nature of problems presented at these encounters.

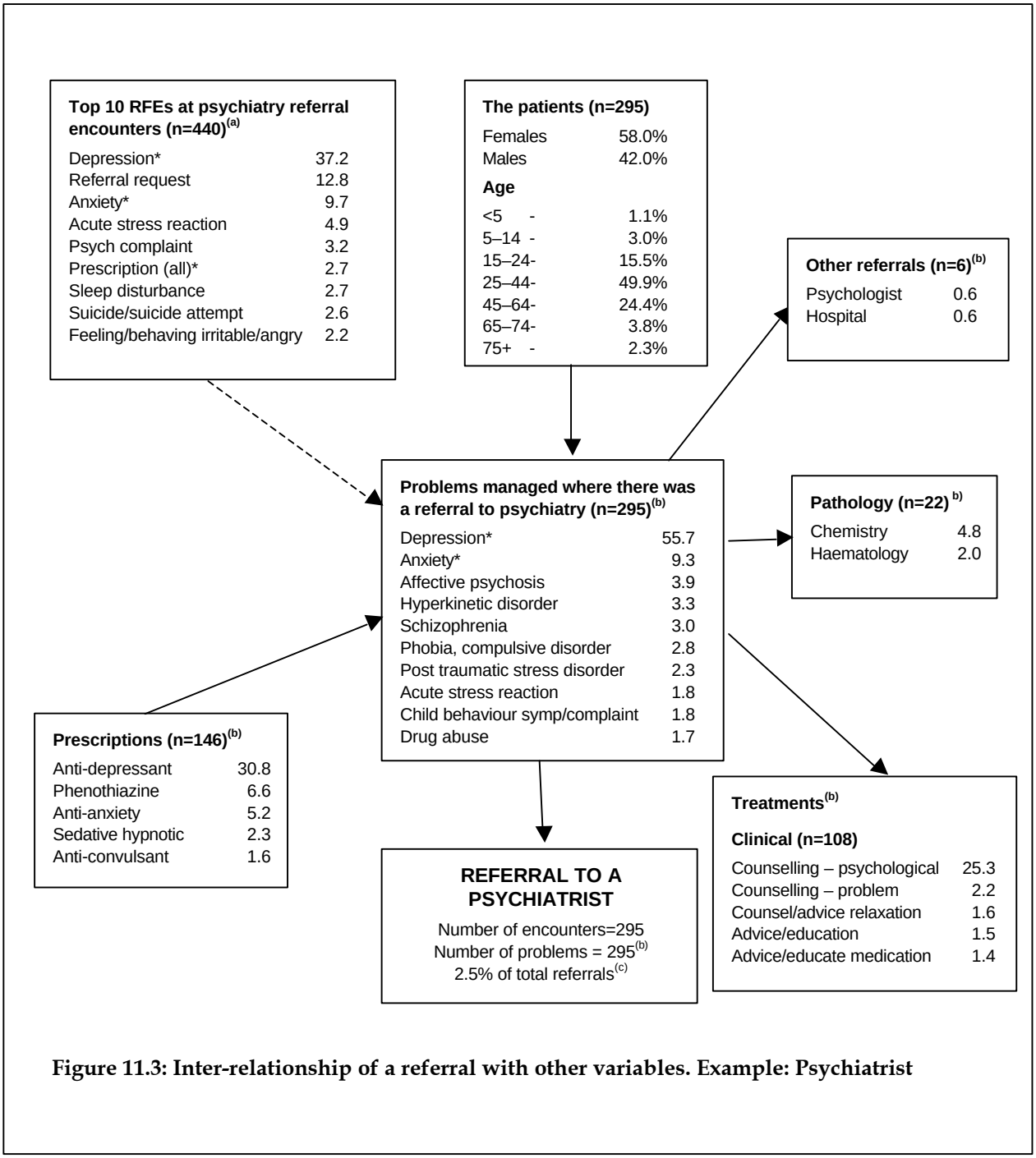


Figure 11.3: Inter-relationship of a referral with other variables. Example: Psychiatrist

* Indicates multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix V)

(a) Results are presented as rates per 100 encounters at which this referral was given (N=295).

(b) Results are presented as rates per 100 problems at which this referral was given (N=295).

(c) All instances of referral to psychiatrist as a proportion of all referrals

11.5.2 Example 2: Referrals to a physiotherapist

There were 902 problems (at 894 encounters) for which a referral to a physiotherapist was made, accounting for 8.3% of total referrals and occurring at a rate of 0.9 per 100 encounters. Of the 894 patients referred to a physiotherapist, 54.6% were female. Young adults were over-represented in this sub-group, representing 37.1% of patients referred to a physiotherapist, compared with 25% in the overall sample. The elderly were slightly less likely to receive a referral to a physiotherapist, with 21% of these patients aged 65 and over, compared with 24% in the overall sample.

Reasons for encounter

Not surprisingly, the majority of patient RFEs were musculoskeletal in nature, with undifferentiated back (25 per 100 problems referred to a physiotherapist), neck (10.7), shoulder (10.4), and knee complaints accounting for 34% of all RFEs associated with a physiotherapy referral.

Problems managed

The diagnoses, or problem labels assigned by GPs where a physiotherapy referral was provided were most commonly for back complaints (18.1 per 100 problems referred to a physiotherapist), sprain/strain (17.6) and musculoskeletal injuries (6.1). Overall the rate of problems managed for this group was notably less (100.9) than that recorded across the total dataset (145.3).

Prescriptions and other treatments

While prescribing rates for problems with a physiotherapy referral were similar to those seen across the entire dataset, less non-pharmacological treatments were provided for these problems. Advice and counselling were more common than procedural treatments in the management of these referred problems. However, some GPs administered some physical medicine (3.7 per 100 problems referred to a physiotherapist), dressed the injury (1.4) or repaired a suture or cast (1.2). Advice about the treatment (5.4) including advice to exercise (3.4) was also given.

More than a quarter (29.6%) of these referred problems were also managed with a prescription for NSAIDS while compound (11.9) and simple analgesics (9.5) were also prescribed relatively often.

Other referrals, tests and investigations

There were few concurrent referrals, with those made to orthopaedic surgeons (1.2 per 100) and hydrotherapy (0.4) the most frequent. As expected, the high frequency of musculoskeletal problems associated with a physiotherapy referral generated a high rate of imaging orders (16.3 compared to 4.9 in the total dataset), and low rates of pathology orders.

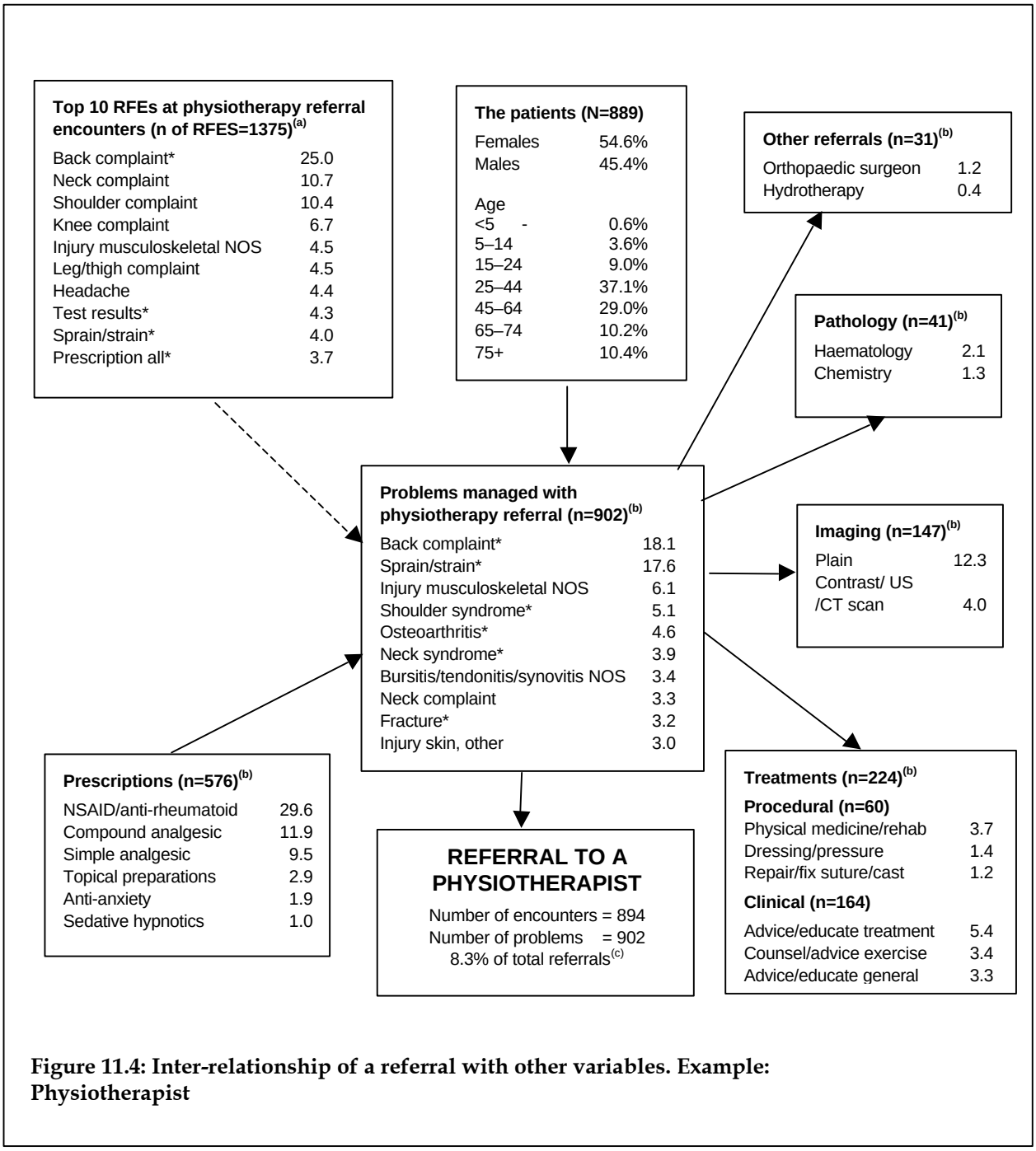


Figure 11.4: Inter-relationship of a referral with other variables. Example: Physiotherapist

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

(a) Results are presented as rates per 100 encounters at which this referral was given (N=894).

(b) Results are presented as rates per 100 problems at which this referral was given (N=902).

(c) All instances of referral to physiotherapist as a proportion of all referrals

12. Investigations

The GPs participating in the study were asked to record (in free text) any pathology or imaging ordered or undertaken at the encounter and to nominate the problem(s) associated with each order placed. This allows the linkage of test orders to single or multiple problems. Up to five orders for pathology and three for imaging 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 (81.9%) of encounters. There were 30,716 tests (23,872 pathology and 6,844 imaging) ordered or undertaken. At least one pathology order was recorded at 13.2% of encounters (for 10.0% of problems managed) and an imaging test was ordered at 6.3% of encounters (for 4.5% of problems managed) (Table 12.1).

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

	Number of encs[(a)]	% of encs	95% LCI	95% UCI	Number of probs[(a)]	% of probs	95% LCI	95% UCI
Pathology and imaging ordered	1,424	1.5	1.3	1.6	1,063	0.8	0.6	0.9
Pathology only ordered	11,408	11.8	11.4	12.2	13,069	9.3	9.0	9.6
Imaging only ordered	4,700	4.8	4.6	5.1	5,255	3.7	3.6	3.9
No tests ordered	79,370	81.9	81.3	82.5	121,438	86.2	85.8	86.6
Total	**96901**	**100.0**	. .	. .	**140,824**	**100.0**	. .	. .
Pathology ordered	12,831	13.2	12.8	13.7	14,132	10.0	9.7	10.4
Imaging ordered	6,123	6.3	6.0	6.6	6,317	4.5	4.3	4.7

(a) Columns may not add to total due to rounding after post stratification weighting.

Note: Abbreviations: Encs – encounters, Probs – problems, UCI – Upper confidence interval, LCI – Lower confidence interval

12.1 Pathology ordering

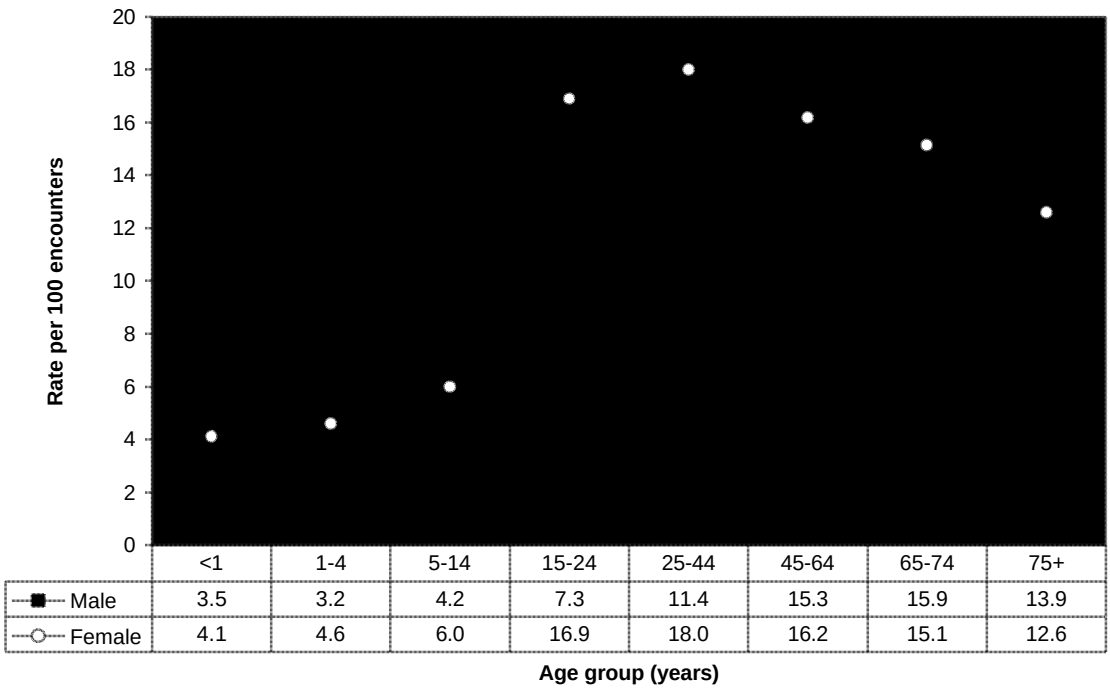
12.1.1 Number of pathology orders at encounter

There were 23,872 orders for a pathology test (or battery of tests) and these were made at a rate of 24.6 per 100 encounters. At least one pathology test was ordered at 13.2% of encounters and for 10.0% of problems.

12.1.2 Age–sex specific rates of encounters where at least one pathology test was ordered

At least one pathology test (or battery of tests such as FBC) was ordered at 14.7% of encounters with females, compared with 11.4% of those with males. Pathology tests were ordered for a higher proportion of encounters with females in all age groups up to 65 years. In contrast a slightly higher proportion of encounters with males in the two oldest age groups, 65–74 and 75+, generated at least one order for pathology. The percentage of encounters at which a pathology test was ordered peaked for females aged 25–44 and males aged 65–74 (Figure 12.1).

The differences between males and females in the distributions of age-specific pathology rates are largely attributable to pregnancy tests and Pap smears among females. However, a difference of 5% remained among patients aged 15–24 after these two groups of tests were removed from the count of pathology tests.



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	3.5	3.2	4.2	7.3	11.4	15.3	15.9	13.9
Female	4.1	4.6	6.0	16.9	18.0	16.2	15.1	12.6

Figure 12.1: Age-specific rates of encounters with at least one pathology order, per 100 encounters

12.1.3 Nature of the pathology orders

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 VI. The main pathology groups reflect those used in previous analyses of pathology tests recorded by the HIC.

Table 12.2: Distribution of pathology orders across pathology groups and most frequent individual test orders within groups

Pathology test ordered	Number	% of all pathology orders [(a)]	% of group	Rate per 100 encs (N=96,901)	95% LCI	95% UCI
Chemistry	**10,929**	**45.8**	**100.0**	**11.3**	**10.6**	**11.9**
Lipids	2,248	9.4	20.6	2.3	2.1	2.6
Liver function	1,914	8.0	17.5	2.0	1.7	2.2
EUC	1,447	6.1	13.2	1.5	1.3	1.7
Glucose/tolerance	1,367	5.7	12.5	1.4	1.2	1.6
Thyroid function	1,142	4.8	10.5	1.2	1.1	1.3
Ferritin	423	1.8	3.9	0.4	0.3	0.6
HbA1c	409	1.7	3.8	0.4	0.2	0.6
Multibiochemical analysis	405	1.7	3.7	0.4	0.0	1.0
Prostate specific antigen	340	1.4	3.1	0.4	0.2	0.5
Hormone assay	308	1.3	2.8	0.3	0.1	0.5
Haematology	**4,942**	**20.7**	**100.0**	**5.1**	**4.8**	**5.4**
Full blood count	3,422	14.3	69.2	3.5	3.3	3.8
ESR	673	2.8	13.6	0.7	0.5	0.9
Coagulation	634	2.7	12.8	0.7	0.5	0.9
Microbiology	**3,953**	**16.6**	**100.0**	**4.1**	**3.8**	**4.4**
Urine MC&S	1,425	6.0	36.1	1.5	1.3	1.6
Hepatitis serology	515	2.2	13.0	0.5	0.2	0.8
Faeces MC&S	279	1.2	7.1	0.3	0.0	0.6
Vaginal swab and C&S	266	1.1	6.7	0.3	0.1	0.5
HIV	203	0.9	5.1	0.2	0.0	0.5
Skin swab C&S	197	0.8	5.0	0.2	0.0	0.4
Monospot	162	0.7	4.1	0.2	0.0	0.4
Cytology	**1,520**	**6.4**	**100.0**	**1.6**	**1.3**	**1.8**
Pap smear	1,451	6.1	95.5	1.5	1.3	1.7
Other NEC	**1,224**	**5.1**	**100.0**	**1.3**	**0.9**	**1.7**
Other NEC	615	2.6	50.2	0.6	0.0	1.3
Other blood test NEC	375	1.6	30.6	0.4	0.0	0.7
Infertility/pregnancy	**449**	**1.9**	**100.0**	**0.5**	**0.3**	**0.6**
Histopathology	**427**	**1.8**	**100.0**	**0.4**	**0.3**	**0.6**
Histology; skin	339	1.4	79.4	0.4	0.1	0.6
Immunology	**392**	**1.6**	**100.0**	**0.4**	**0.1**	**0.7**
Immunology; other	141	0.6	36.0	0.2	0.0	0.7
Simple test; other	**35**	**0.2**	**100.0**	**0.0**	**0.0**	**0.4**
Total pathology tests	**23,872**	**100.0**	**100.0**	**24.6**	**23.6**	**25.7**

(a) This column does not sum to 100% as only those groups which accounted for greater than 0.5% of all pathology tests were included.

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval, NEC – not elsewhere classified.

The top four pathology test groups were **Chemistry**, **Haematology**, **Microbiology** and **Cytology** and together these accounted for almost 90% of all pathology test orders. The fifth largest group was **Other NEC** (other pathology test orders that could not be classified elsewhere), which made up 5.1% of all pathology test orders. The relatively large size of this group is in part due to the non-specificity of the pathology orders recorded by some GPs (e.g. blood test) and in part to a lack of specificity available in ICPC-2 PLUS for the classification of some pathology items.

The largest of the groups, **Chemistry**, accounted for 45.8% of all tests and was recorded at a rate of 11.3 per 100 encounters. Within this group the most frequently ordered test was lipids (20.6%), followed by liver function (17.5%). Full blood count (69.2%) was the largest group within **Haematology** and urine MC&S (36.1%) was the largest in **Microbiology**.

The most frequently ordered test types were full blood count, lipids, liver function, Pap smear and EUC tests. Full blood counts accounted for 14.3% of tests and were ordered at a rate of 3.5 per 100 encounters. Pap smears accounted for 6.1% of all tests and made up the greater proportion of the **Cytology** group (95.5%). Lipid tests were ordered at a rate of 2.3 per 100 encounters (Table 12.2).

12.1.4 Problems associated with pathology tests

Table 12.3 describes the most common problems under management when pathology was ordered. They are presented in decreasing order of frequency.

There were 14,132 problems to which pathology tests were linked. The three problems accounting for the highest number of pathology tests ordered were lipid disorder (5.2% of problems managed with a pathology order), diabetes (4.8%) and female genital check-up/Pap smear (4.6%). This is not surprising given the distribution of pathology tests described in the previous table. However, the last two columns of the table provide some interesting contrasts. The second-last column shows the percentage of contacts (with the selected problem) that resulted in an order for pathology. The last column (right) shows the number of test orders placed when contact with the selected problem resulted in pathology tests.

Hypertension was the fifth most common problem managed in general practice and there were 8,000 hypertension problems recorded in the dataset (5.7% of problems). Female genital check-ups (1.1% of problems) occurred far less frequently. However, female genital check-ups accounted for more pathology tests than did hypertension. There were 1,120 tests orders (4.6%) associated with female genital check-up and 958 test orders (3.9%) associated with hypertension. This is explained by the fact that 67.2% of female genital check-ups resulted in a pathology test, compared to 5.9% of contacts with hypertension.

Weakness/tiredness was not a problem label which ranked in the top 30 problems managed in general practice, yet it ranked fourth highest in the problems associated with pathology ordering. This is because the decision to order a pathology test for weakness/tiredness was relatively frequent (51% of contacts generating an order) and where such a decision was made, multiple pathology tests were likely (averaging 300 test orders per 100 problems). A similar rate of multiple tests was apparent for depression, where 294 tests were ordered for every 100 contacts that led to a pathology test order. The problem label of female genital check-up/Pap smear, and the associated pathology test Pap smear, provide a useful contrast as multiple tests were rarely ordered.

Table 12.3: The 30 most common problems for which a pathology test was ordered

Problem managed	Number of problems	Number of prob/path combinations [a]	% of prob/path combinations	Percentage of problems with test [b]	Rate of path orders per 100 problems with path [c]
Lipid disorder	2,392	1,276	5.2	30.7	173.9
Diabetes*	2,485	1,182	4.8	24.6	193.5
Fem genital check-up/Pap smear*	1,566	1,120	4.6	67.2	106.5
Weakness/tiredness general	724	1,105	4.5	51.0	299.4
Hypertension*	8,000	958	3.9	5.9	204.5
UTI*	1,569	850	3.5	48.4	112.0
General check-up*	1,501	758	3.1	22.0	230.0
Pre/post natal check-up*	1,000	382	1.6	23.3	163.7
Pregnancy*	708	370	1.5	31.8	164.2
Viral disease NOS	1,284	364	1.5	12.5	227.2
Anaemia*	634	340	1.4	28.7	187.1
Blood test endocrine/metabolic	281	313	1.3	71.9	155.2
Abdominal pain*	712	309	1.3	21.7	199.8
Abnormal test results*	505	308	1.3	39.6	154.1
Menstrual problems*	772	305	1.3	24.8	159.3
Depression*	3,367	290	1.2	2.9	294.5
Menopausal complaints	1,428	279	1.1	11.7	166.9
Atrial fibrillation/flutter	554	258	1.1	35.5	131.0
Hypothyroidism/myxoedema	472	257	1.1	40.0	136.5
Rheumatoid arthritis*	461	253	1.0	22.3	246.7
Blood test NOS	140	251	1.0	81.0	220.9
IHD without angina	1,054	249	1.0	11.4	207.8
Heart failure	846	238	1.0	15.0	187.2
Musculoskeletal disease	664	194	0.8	12.4	235.5
Arthritis*	743	188	0.8	9.0	280.7
Vertigo/dizziness	371	187	0.8	18.1	279.0
Endocrine/metab/nutrit'l disease	429	186	0.8	25.6	170.0
Gout	608	178	0.7	15.6	188.0
Gastroenteritis, presume infection	1,047	177	0.7	12.3	137.3
Risk factor NOS	211	174	0.7	43.2	191.0
Subtotal	*36,528*	*13,299*	*54.4*	. .	. .
Total	**140,824**	**24,458**	**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 23,872 pathology test orders and 24,458 problem/pathology combinations.

(b) The percentage of contacts with the problem which 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 III).

Note: Abbreviations: Path – pathology order, prob – problem managed.

12.1.5 The inter-relationship between pathology ordered and other variables. Example: Full blood count

Full blood count (FBC) was the most common pathology test ordered in general practice, accounting for 14.3% of all pathology orders. Overall 3,422 FBCs were ordered at a rate of 3.5 per 100 encounters.

Figure 12.2 illustrates the relationship between the ordering of an FBC and other variables that are collected at the general practice encounter. An order for pathology is directly linked to one or more problems under management. Through these problems managed, the pathology order can be linked to the other variables collected at the encounter, such as drugs supplied and imaging ordered.

Age and sex distribution of patients

Sixty per cent of patients for whom an FBC was ordered were female, which is similar to the proportion for general practice as a whole. There were relatively few patients aged under 5 years who had an FBC, compared to the general practice population.

Reasons for encounter

There were 5,876 reasons for encounter recorded at the 3,422 encounters at which an FBC was ordered. The most common reasons for encounter for patients with an FBC were weakness/tiredness (15.5 per 100 encounters), general check-up (7.2), prescription all (5.3) and abdominal pain (5.2).

Problems managed

There were 3,531 problems associated with an order for an FBC. Weakness/tiredness was the most common of these problems, followed by anaemia and hypertension. Four of the top ten problems managed with an order for an FBC do not appear in the top 30 problems managed in general practice and these were weakness/tiredness, anaemia, rheumatoid arthritis and abdominal pain.

Prescriptions and other treatments

Drugs supplied or prescribed for problems managed with an order for an FBC numbered 1,782. The most common drug groups were anti-hypertensives (4.3 per 100 problems managed), simple analgesics (3.9) and NSAID/anti-rheumatoids (3.6).

Other treatments were carried out for problems managed with an FBC at a rate of 21.3 per 100 problems. The majority of these other treatments were in the form of advice or counselling.

Referrals, tests and investigations

A referral for an ECG was the most common referral for problems managed by an FBC. An order for imaging was recorded at 15.7 of every 100 problems managed by an FBC. Plain X-rays were the most common type of imaging ordered. Almost 200 other pathology tests were ordered for every 100 problems managed with and order for FBC. Pathology tests categorised as Chemistry made up 70% of these tests.

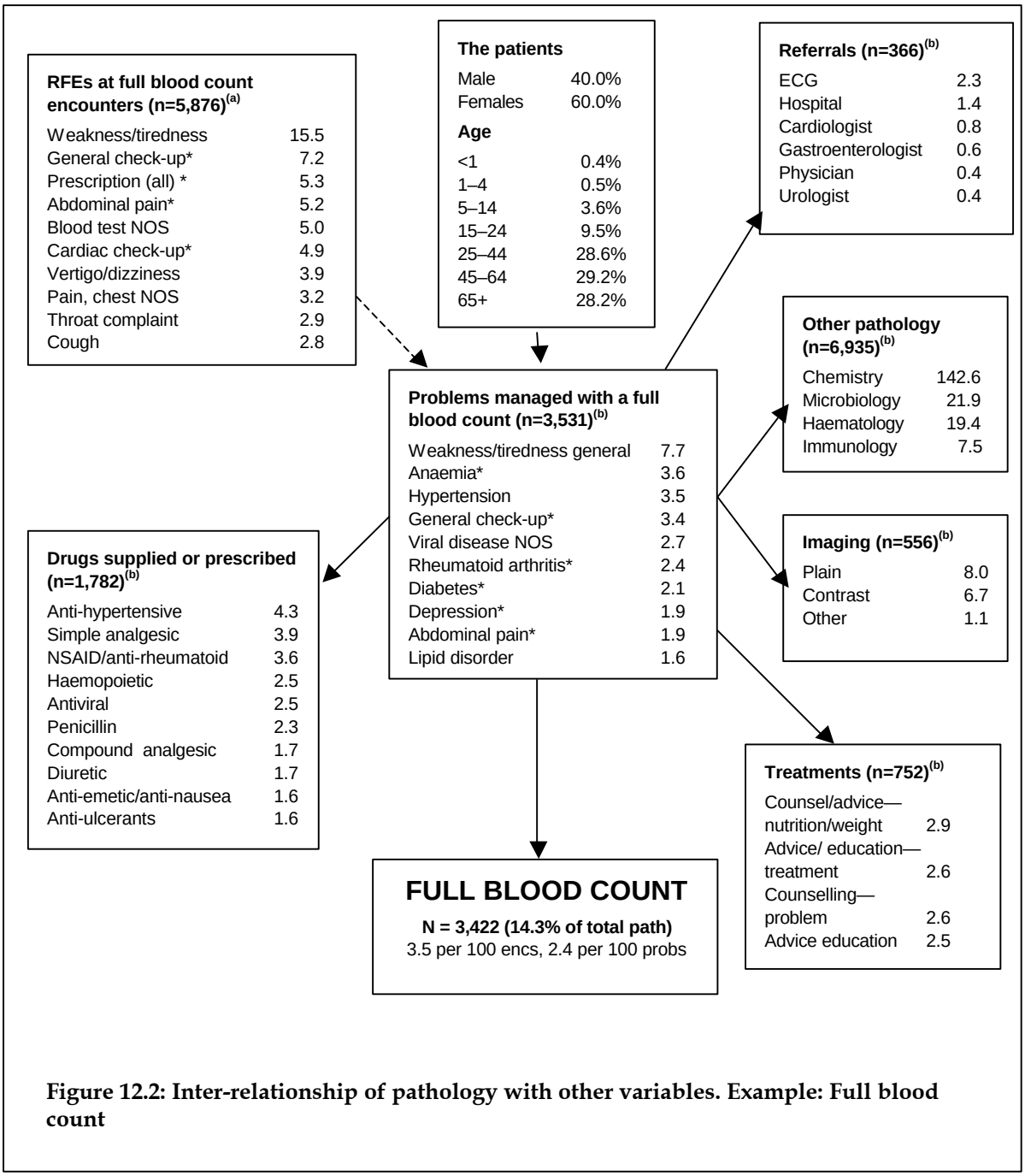


Figure 12.2: Inter-relationship of pathology with other variables. Example: Full blood count

(a) Results are presented as rates per 100 encounters at which this pathology was ordered (N=3,422).

(b) Results are presented as rates per 100 problems for which this pathology was ordered (N=3,351).

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

12.2 Imaging ordering

12.2.1 Number of imaging orders at encounter

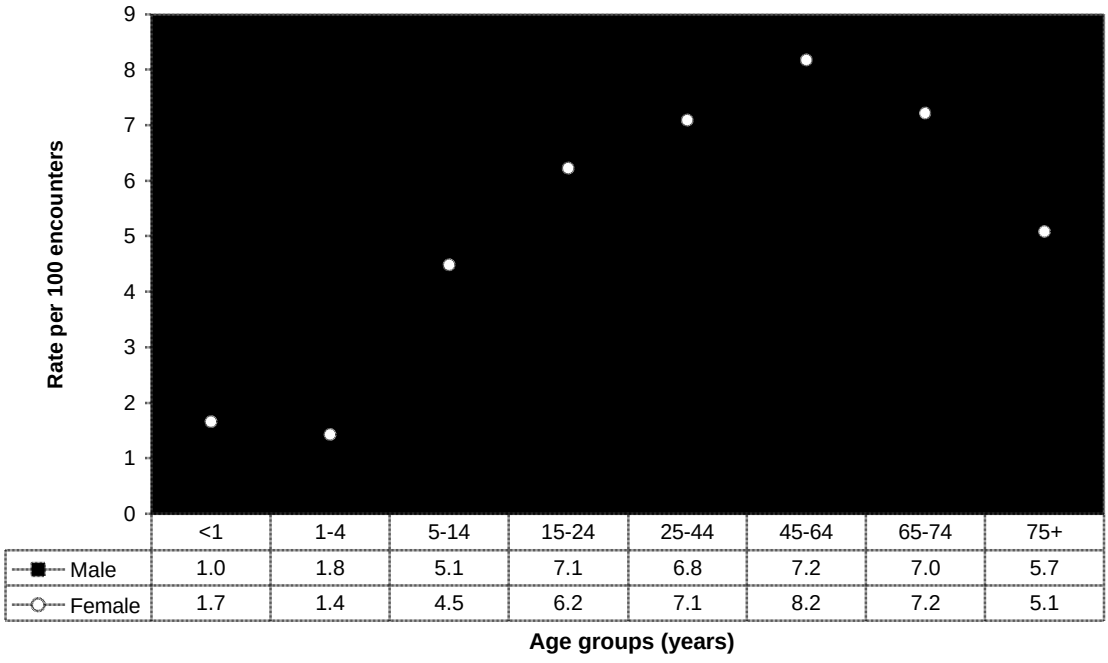
There were 6,844 orders for imaging and these were made at a rate of 7.1 per 100 encounters. At least one imaging was ordered at 6.3% of encounters and for 4.5% of problems managed.

12.2.2 Age–sex specific rates of encounters where at least one imaging test was ordered

One or more imaging tests were ordered at 6.2% of encounters with males and 6.4% of encounters with females. Although the overall rate and the age-specific distribution of rates were similar for both males and females, the small differences that did arise may reflect differences in the ordering of certain types of imaging tests for males and females. The two age groups where the largest differences occurred were the 15–24 years and the 45–64 years (Figure 12.3).

Males aged 15–24 were more likely to have an imaging test ordered than females of this age group. This may be due to the higher proportion of young males with fractures and other injuries.

Females aged 45–64 were more likely to have an imaging test than males of this age group. Females over 50 are encouraged to have a mammography every two years in order to detect breast cancer and this may explain the difference. However, more specific analyses would be required to define this difference.



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	1.0	1.8	5.1	7.1	6.8	7.2	7.0	5.7
Female	1.7	1.4	4.5	6.2	7.1	8.2	7.2	5.1

Figure 12.3: Age-sex specific rates of encounters with at least one imaging order, per 100 encounters

12.2.3 Nature of imaging orders

The imaging tests recorded were grouped into one of three categories—**Plain**, **Contrast/US/CT** and **Other** imaging (see Appendix VII). **Plain** X-rays made up almost two-thirds (60.7%) of all imaging tests, **Contrast/US/CT** accounted for 35.0% and **Other** imaging only 4.3% (Table 12.4).

Chest X-rays were by far the most common **Plain** X-ray (22.8%) while mammography (8.9%) and X-ray of the knee (8.8%) followed. **Contrast** X-rays were usually of the abdomen (16.2%), the pelvis (12.2%) or of an unspecified site (9.0%). Bone scans (32.8%), unspecified imaging (30.6%) and Doppler tests (15.3%) were the most common in the **Other** group (Table 12.4).

Overall the most frequently ordered imaging test was a chest X-ray, which accounted for 13.8% of all imaging and was ordered at a rate of 1.0 per 100 encounters. All other imaging tests were ordered at a rate of less than 1 per 100 encounters. Contrast X-rays of the abdomen, the second most frequently ordered, accounted for 5.7% of all imaging tests and were ordered at a rate of 0.4 per 100 encounters.

Table 12.4: Most frequent imaging tests ordered

Imaging test ordered	Number	% of tests [(a)]	% of group	Rate per 100 encs	95% LCI	95% UCI
Plain	**4,155**	**60.7**	**100.0**	**4.3**	**4.0**	**4.5**
X-ray;chest	947	13.8	22.8	1.0	0.8	1.1
Mammography;F	369	5.4	8.9	0.4	0.2	0.6
X-ray;knee	365	5.3	8.8	0.4	0.2	0.5
X-ray;foot/feet	279	4.1	6.7	0.3	0.1	0.5
X-ray;spinal	269	3.9	6.5	0.3	0.1	0.4
X-ray;lumbosacral	231	3.4	5.6	0.2	0.0	0.5
X-ray;hand	230	3.4	5.5	0.2	0.1	0.4
X-ray;shoulder	191	2.8	4.6	0.2	0.0	0.4
X-ray;ankle	176	2.6	4.2	0.2	0.0	0.4
X-ray;hip	174	2.5	4.2	0.2	0.0	0.4
X-ray;wrist	138	2.0	3.3	0.1	0.0	0.4
X-ray;cervical	110	1.6	2.6	0.1	0.0	0.4
X-ray;abdomen	97	1.4	2.3	0.1	0.0	0.4
Plain X-ray;bone(s)	80	1.2	1.9	0.1	0.0	0.5
X-ray;elbow	77	1.1	1.8	0.1	0.0	0.4
X-ray;face	60	0.9	1.4	0.1	0.0	0.4
X-ray;pelvis	51	0.7	1.2	0.1	0.0	0.5
X-ray;leg	42	0.6	1.0	0.0	0.0	0.5
X-ray;ribs	41	0.6	1.0	0.0	0.0	0.4

(continued)

Table 12.4 (continued): Most frequent imaging tests ordered

Imaging test ordered	Number	% of tests [(a)]	% of group	Rate per 100 encs	95% LCI	95% UCI
Contrast / US / CT	**2,397**	**35.0**	**100.0**	**2.5**	**2.3**	**2.6**
Test;US/CT/contrast;abdomen	387	5.7	16.2	0.4	0.3	0.5
Test;US/CT/contrast;pelvis	293	4.3	12.2	0.3	0.1	0.5
Test;US/CT/contrast	215	3.1	9.0	0.2	0.0	0.4
Test;US/CT/contrast;spine	172	2.5	7.2	0.2	0.0	0.4
Test;US/CT/contrast;breast;F	150	2.2	6.3	0.2	0.0	0.4
Test;US/CT/contrast;obstetric	149	2.2	6.2	0.2	0.0	0.5
Test;US/CT/contrast;shoulder	121	1.8	5.0	0.1	0.0	0.4
Test;US/CT/contrast;head	117	1.7	4.9	0.1	0.0	0.4
Test;US/CT/contrast;urin tract	109	1.6	4.6	0.1	0.0	0.3
Test;US/CT/contrast;brain	84	1.2	3.5	0.1	0.0	0.4
Pyelogram;intravenous	63	0.9	2.6	0.1	0.0	0.3
Test;US/CT/contrast;stom/duod	62	0.9	2.6	0.1	0.0	0.4
Test;US/CT/contrast;musculosk	60	0.9	2.5	0.1	0.0	0.4
Test;US/CT/contrast;chest	56	0.8	2.3	0.1	0.0	0.5
Test;US/CT/contrast;colon	51	0.7	2.1	0.1	0.0	0.4
Test;US/CT/contrast;neck	47	0.7	2.0	0.1	0.0	0.4
Test;US/CT/contrast;extremity	38	0.6	1.6	0.0	0.0	0.4
Other	**292**	**4.3**	**100.0**	**0.3**	**0.1**	**0.5**
Scan;bone(s)	96	1.4	32.8	0.1	0.0	0.4
Imaging other	89	1.3	30.6	0.1	0	0.4
Test;Doppler	45	0.7	15.3	0.1	0.0	0.4
Echocardiography	41	0.6	14.1	0.0	0.0	0.5
Total imaging tests	**6,844**	**100.0**	**100.0**	**7.1**	**6.7**	**7.4**

(a) This column does not sum to 100% as only those groups which accounted for greater than 0.5% of all imaging tests were included.

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

12.2.4 Problems associated with orders for imaging

Table 12.5 describes the problems most commonly under management when imaging was ordered. They are presented in decreasing order of frequency.

There were 6,318 problems to which imaging tests were linked. Thirteen (including the top four) of the 30 most common problems were related to the musculoskeletal system. The remaining problems were related to a range of body systems including the genital, skin and respiratory systems.

Fractures, the most common problem for which imaging was ordered, accounted for 6% of all imaging. Over one-third (37.3%) of contacts with this problem resulted in an order for imaging. Back complaints accounted for the same proportion of imaging orders but only 14% of contacts with a back complaint resulted in an imaging order.

The ordering of multiple imaging for a single problem was less common than the ordering of multiple pathology. All problems associated with imaging resulted in less than 1.5 imaging orders per problem. Shoulder syndrome had the highest rate of multiple test orders, 142.4 tests being ordered for every 100 contacts.

Table 12.5: The 30 most frequent problems managed for which imaging test ordered

Problem managed	Number of probs	Number of prob/imaging combinations[(a)]	% of prob/imaging combinations	% of problems with test [(b)]	Rate of image orders per 100 problems with imaging [(c)]
Fracture*	1,051	411	6.0	37.3	104.8
Back complaint*	2,573	407	6.0	13.9	114.0
Sprain/strain*	1,790	306	4.5	15.2	112.7
Osteoarthritis*	2,118	294	4.3	12.6	110.1
Abdominal pain*	712	201	2.9	25.7	109.5
Injury musculoskeletal NOS	720	155	2.3	19.1	112.9
Breast lump/mass (female)	178	141	2.1	57.3	138.4
Shoulder syndrome	480	139	2.0	20.3	142.4
Injury skin, other	524	136	2.0	22.5	115.3
Acute bronchitis/bronchiolitis	3,185	131	1.9	4.1	100.0
Female genital check-up*	1,566	107	1.6	5.9	116.1
Bursitis/tendonitis/synovitis NOS	670	100	1.5	13.7	108.4
Pneumonia	295	98	1.4	32.3	103.2
Pre/post natal check-up*	1,000	90	1.3	9.0	100.0
Bruise/contusion	536	88	1.3	14.9	110.6
Arthritis*	743	84	1.2	10.3	109.5
Pain, chest NOS	348	81	1.2	22.1	105.7
Acute internal damage knee	255	75	1.1	29.1	101.5
Cholecystitis, cholelithiasis	185	75	1.1	39.0	103.5
Cough	618	71	1.0	11.4	100.9
Menstrual problems*	772	71	1.0	8.7	106.0
Knee symptom/complaint	238	68	1.0	26.1	110.3
UTI*	1,569	66	1.0	4.0	104.6
Musculoskeletal disease, other	664	65	1.0	9.2	107.5
Headache	495	65	1.0	13.0	101.7

(continued)

Table 12.5 (continued): The 30 most frequent problems managed for which imaging test ordered

Problem managed	Number of probs	Number of prob/imaging combinations[(a)]	% of prob/imaging combinations	% of problems with test [(b)]	Rate of image orders per 100 problems with imaging [(c)]
Hip symptom/complaint	126	62	0.9	44.0	113.1
Sinusitis acute/chronic	1,513	62	0.9	3.8	108.9
Shoulder symptom/complaint	198	61	0.9	23.8	128.9
Heart failure	846	60	0.9	6.5	108.2
Asthma	3,079	59	0.9	1.9	100.0
Subtotal	*29,074*	*3,830*	*55.3*	. .	. .
Total	. **140,824**	**6,922**	**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 6,844 imaging test orders and 6,922 problem/imaging combinations.

(b) The percentage of contacts with the problem which 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 III).

Note: Abbreviations: Probs – problems managed, NOS –Not otherwise specified.

12.2.5 The inter-relationship between imaging ordered and other variables: Example: Chest X-ray

The most common imaging ordered was a chest X-ray. The 947 orders accounted for 13.8% of all imaging and occurred at a rate of 1.0 per 100 encounters.

Figure 12.4 illustrates the relationship between the ordering of a chest X-ray and other variables that are collected at the general practice encounter. An order for imaging is directly linked to one or more problems under management. Through these problems managed, the imaging can be linked to other variables collected such as referrals and treatments carried out.

Age and sex distribution of patients

Just over 50%of patients who had a chest X-ray were male which is slightly higher than the overall percentage of males seen in general practice. Older patients (aged 65 and over) were also over-represented.

Reasons for encounter

There were 1,533 reasons for encounter recorded at encounters where a chest X-ray was ordered. Cough and chest pain were the most common RFEs recorded.

Problems managed

Acute bronchitis was the most common problem managed of the 971 problems managed with a chest X-ray. As well as problems related to the respiratory system and of problems of unspecified nature, problems related to the cardiovascular system featured in the ten most common problems.

Prescriptions and other treatments

There were 771 drugs prescribed or supplied for problems managed with a chest X-ray. The most common were broad spectrum penicillins (10.9), followed by bronchodilators (10.6) and other antibiotics (8.1).

Other treatments were carried out at a rate of 20.4 per 100 problem contacts. Electrical tracings was the most common other treatment carried out for these problems.

Referrals, tests and investigations

One hundred and thirty-seven referrals were recorded for problems managed with a chest X-ray. A referral for an ECG was recorded for 4.2 of every 100 problem contacts, a hospital referral for 3.2 and a referral to a cardiologist for 1.6.

A pathology test order was recorded at 67 per 100 problem contacts. The majority of these tests were either chemistry or haematology tests.

Only 89 other imaging tests were ordered for the same problem contact as those with a chest X-ray. Less than 10 per 100 problems had an imaging test ordered concurrently with a chest X-ray.

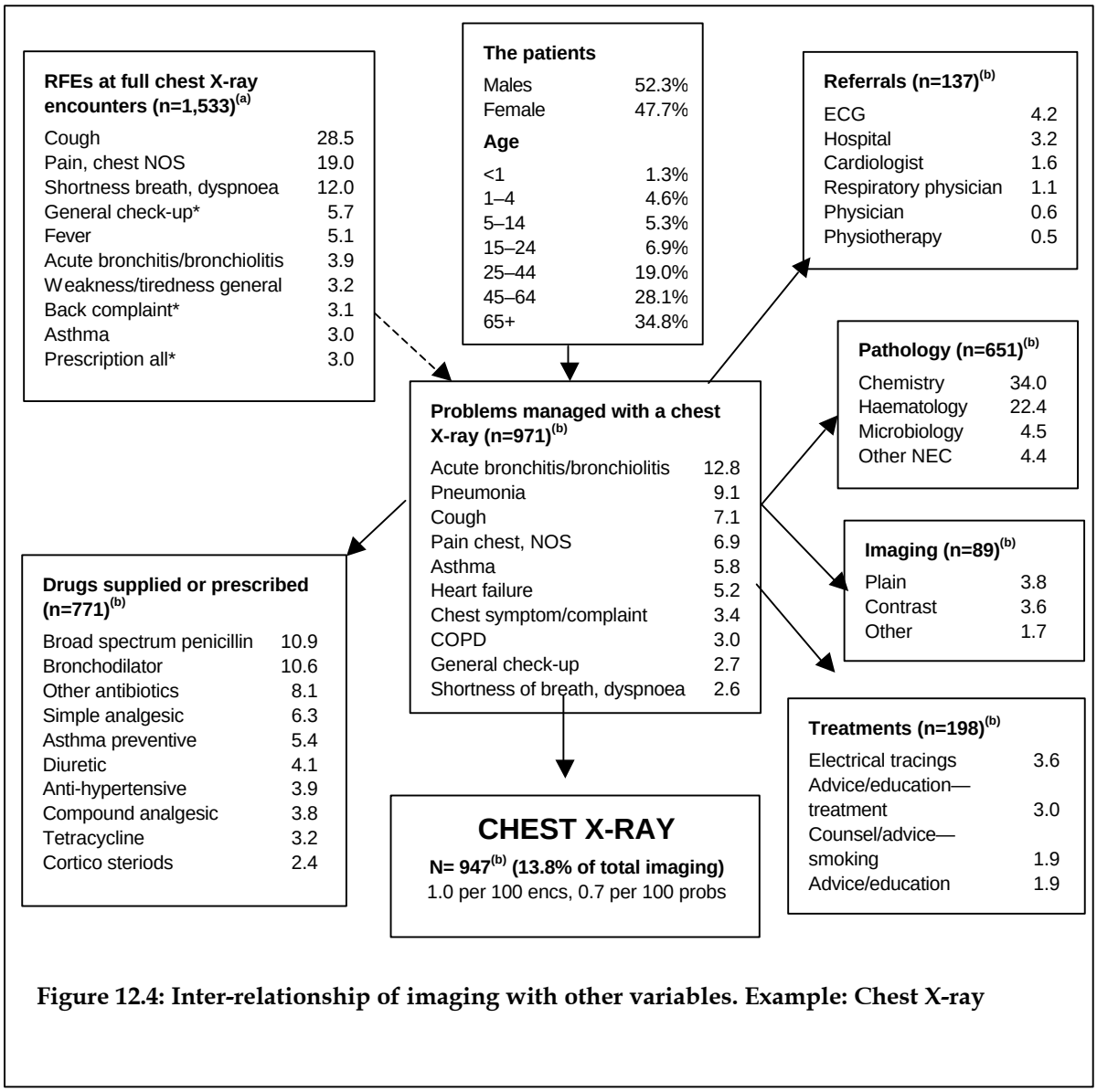


Figure 12.4: Inter-relationship of imaging with other variables. Example: Chest X-ray

(a) Results are presented as rates per 100 encounters at which this imaging was ordered (N=947).

(b) Results are presented as rates per 100 problems for which this imaging was ordered (N=971).

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

13. Changes since 1991

This chapter compares findings from BEACH 1998 with those from the Australian Morbidity and Treatment Survey 1990–91 (AMTS), the most recent national survey of general practice (Bridges-Webb et al. 1992). The purpose in examining these findings from the two in-depth studies of morbidity managed and treatment provided in general practice is to ascertain whether changes have occurred during the eight year period 1990–91 to 1998–99. Documenting change provides an understanding of the trends that are taking place in general practice activity.

The AMTS, a paper-based random survey of doctor–patient encounters, was the culmination of a number of studies undertaken by a group of researchers from the University of Sydney exploring and testing the methodology of research into general practice. These same methods have formed the basis of the BEACH 1998 method.

In the AMTS, a random, stratified (by State) sample of 495 general practitioners recorded all consultations that took place in the surgery or in the patient's home for two periods of one week, six months apart. The data were weighted to adjust for an over-representation from the smaller States and Territories, which had been over-sampled to allow for individual State analysis. The weighted dataset contained 98,796 encounters, which were analysed in terms of patient reasons for encounter, problems managed and their treatments, type of consultation, tests, referrals and follow-up. A total of 145,799 problems were managed and 98,563 drugs were prescribed or provided.

In BEACH 1998, a random sample of 984 participants each recorded details of 100 consecutive encounters, providing a database of 98,400 records. These data were then weighted to correct for GP activity level and for a slight under-representation of young GPs (see Methods). The AMTS included only direct encounters, that is, those at which the patient was seen, either in the surgery or at home visits. Therefore, to ensure comparability, only the direct encounters in the surgery or home were extracted from the BEACH dataset and analysed for the results shown in this chapter. The weighted data from these BEACH 1998 encounters, comprising 92,758 consultations, form the basis of the following comparisons.

Both the AMTS and BEACH 1998 relied on GPs actively recording details about consecutive consultations on paper encounter forms. The forms used for each consultation in BEACH 1998 contained all but one of the features of the original AMTS form. The elimination of the question on 'follow-up' was the only change made to the 'core' of the data-gathering instrument. The morbidity and treatment section remained essentially comparable with the 1990–91 AMTS. Additions to the BEACH 1998 recording form, the 'SAND' section, provide a rich data source but have no comparable elements in the AMTS. The additions of more specific pharmaceutical data and expanded patient demographic data are other data elements of BEACH that cannot be compared with results from the earlier study.

The GP profile questionnaire, which gathered demographic data on the GP participants, has remained almost the same since the AMTS, thus enabling comparison of the characteristics of participants in the two studies.

Statistical methods for the measurement of difference were applied incorporating the single stage cluster sampling design used in both studies. In most cases, statistical difference was determined on the basis of non-overlapping confidence intervals (CI) where specific comparisons were made between two estimates. Chi-square tests at the 5% level were used to measure differences between the characteristics of GP participants in both studies. Only

those differences that were proven to be statistically significant can be regarded with any certainty.

13.1 Characteristics of participating GPs

The GP profile questionnaire was completed by 95.5% of the AMTS GPs and 100% of BEACH participants. Results are shown in Table 13.1.

There was a statistically significant increase in the proportion of participating GPs who were female, reflecting the increased number of women practising as GPs. There was no significant change in the age group distribution of participants. The proportion of GPs who worked in solo practice decreased from 25.9% in 1991 to 16.4% in 1998 but no statistically significant difference was found.

There were changes in the percentage of participants who had graduated in Australia in the 1998 study and the proportion of participants who had graduated overseas, particularly Asia and Europe. GPs in BEACH 1998 were also much more likely than participants in the AMTS 1990–91 to report conducting more than 50% of consultations with patients who spoke a language other than English at home. However, chi-square tests found no significant differences in any of these results.

Fellows of the Royal Australian College of General Practitioners comprised a significantly higher proportion of participants in BEACH, rising from 12.9% in 1991 to 32.3% in 1998. The proportion of GPs who had completed the RACGP training program also showed a statistically significant increase from 1991 when the program had only recently been introduced. It rose from 4% in the AMTS to 35.1% in 1998, reflecting a cumulative total of GPs who had gone through the training program during the past seven years.

Table 13.1: Comparison of GP participants 1991––1998

	AMTS 1990–91(a)	BEACH 1998–99(a)
GP characteristic	**%**	**%**
Sex (c^2=4.08, p=0.04)	. .	. .
Male	80.5	68.0
Female	19.5	32.0
Age (c^2=0.66, p=0.71)	. .	. .
<35 years	14.2	15.7
35–54 years	67.9	62.5
>54 years	18.0	21.8
Size of practice (c^2=2.70, p=0.10)	. .	. .
Solo	25.9	16.4
Place of graduation (c^2=0.36, p=0.54)	. .	. .
Australia	80.0	76.5
United Kingdom	9.7	9.0
Asia	6.2	8.6
Europe	1.3	2.4
Africa	1.1	1.5
New Zealand / Pacific	0.2	1.3
Other	1.5	0.6
Consult in language other than English (c^2=2.68, p=0.10)	. .	. .
>50% consultations	4.9	11.2
Medical post-graduate qualifications	. .	. .
Fellow of RACGP (χ^2=10.75, p<0.01)	12.9	32.3
RACGP training program (χ^2=30.74, p<0.01)	4.0	35.1

(a) Missing data removed.

13.2 Distribution of services

Doctors in both studies were instructed to record only one Medicare item number per encounter. If an encounter included more than one item, for example a standard consultation plus a procedure (e.g. acupuncture or excision), they were told to record the standard item number because the procedure would be recorded elsewhere on the form.

Of all encounters recorded by AMTS GPs, 89.1% took place in the doctor's surgery and 4.3% were home visits. Medicare paid standard surgery consultations made up 81.1% of all encounters. A third category 'Other' incorporated all item numbers for specific procedures, miscellaneous work such as insurance or workers' compensation and pre-employment check-ups which are not covered by Medicare, plus encounters at which no item number was recorded. These made up 6.6% of the total.

Surgery consultations in BEACH 1998 accounted for 84.2% of the total direct encounters, while home visits showed a statistically significant relative decrease at just 1.7%. Medicare

paid standard surgery consultations made up 75.5% of all encounters, a significant decrease from the earlier study. There was a statistically significant relative decrease in the percentage of short consultations in the BEACH 1998 and a significant increase in the proportion of long surgery consultations. This could reflect an increasing complexity of doctor–patient encounters in general practice. Factors related to this change could include the age distribution of patients (in an aging population) and possibly the trend towards earlier discharge of patients from hospitals.

In BEACH 1998 14.1% of encounters met the same criteria for inclusion in the grouped 'Other' category. This is more than double the AMTS finding and may be partially attributed to the more structured arrangement of this section of the BEACH encounter form, which encouraged more specificity from participants. This difference may also have contributed to the significant changes in patterns of practice noted above.

A comparison of the distribution of items of service is shown in Table 13.2.

Table 13.2: Distribution of items of service

	AMTS 1990–91				BEACH 1998–99			
Items of service	**Number**	**% (a)**	**95% LCI**	**95% UCI**	**Number**	**% (a)**	**95% LCI**	**95% UCI**
Short surgery	2,938	3.0	2.5	3.4	1,241	1.3	0.9	1.8
Standard surgery	80,089	81.1	80.1	82.0	70,024	75.5	74.3	76.7
Long surgery	4,612	4.7	4.0	5.3	6,378	6.9	6.3	7.5
Prolonged surgery	416	0.4	0.0	1.1	473	0.5	0.0	1.5
Home visit	4,249	4.3	4.7	4.9	1,604	1.7	1.3	2.4
Other (includes missing item no.)	6,491	6.6	5.6	7.5	13,037	14.1	12.9	15.2

(a) Percentage of all direct encounters.

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval.

13.3 Age and sex of patient

13.3.1 Age of patient

There was a similar pattern of distribution across most age groups of patients at AMTS and BEACH encounters. However, significant differences were found in the 15–24 age group where there was a lower proportion of patients, and in the 45–64 age group where there was a higher proportion of patients in BEACH than in the AMTS (Table 13.3).

13.3.2 Sex of patient

There was no significant difference in the patient gender distribution in the two studies. There were more encounters with female than with male patients in the AMTS (58.1% compared with 42.1% male). BEACH 1998 data presented a similar finding: encounters with female patients made up 58.6% of the total while 41.4% of encounters were with males.

Table 13.3: Age distribution of patients in AMTS and BEACH

	AMTS 1990–91				BEACH 1998–99			
Age group of patients	Number	% (a)	95% LCI	95% UCI	Number	% (a)	95% LCI	95% UCI
<1 year	2,264	2.3	2.1	2.5	2,210	2.4	2.2	2.6
1–4 years	5,458	5.5	5.2	5.9	4,994	5.4	5.1	5.7
5–14 years	7,934	8.0	7.6	8.4	6,843	7.4	7.1	7.7
15–24 years	10,713	10.8	10.4	11.3	9,249	10.0	9.6	10.3
25–44 years	25,268	25.6	24.7	26.4	24,301	26.2	25.5	26.9
45–64 years	21,920	22.2	21.5	22.8	22,711	24.5	24.0	25.0
65–74 years	13,249	13.4	12.7	14.1	11,619	12.5	12.0	13.0
75+ years	10,907	11.0	10.3	11.8	10,869	11.7	11.0	12.3

(a) Percentage of all patients at direct encounters (missing data excluded)

Note: Abbreviations: UCI – Upper confidence interval, LCI – Lower confidence interval

13.4 Comparison of problems managed

The following description of problems managed applies to both studies. A problem was defined as any disease, complaint, social problem or ill-defined condition managed at the encounter. GPs were instructed to record at least one and up to four problems at the most specific level possible from the information available. The order in which problems were recorded was unimportant as all problems managed were of interest.

There was no statistically significant difference between the rates of problems managed in the two studies. In the AMTS, GPs managed a total of 145,799 problems at 98,796 patient encounters, an average rate of 148 problems per 100 encounters. A total of 135,672 problems were recorded in BEACH 1998 at 92,758 direct patient encounters, an average of 146 per 100 encounters.

13.4.1 Most common problems managed

The 30 most frequently managed problems are compared in Table 13.4. The problems are listed in order of decreasing frequency as they appeared in the BEACH 1998 data.

A considerable amount of change in the relative management rates of the most common problems can be seen. Although hypertension remained the most commonly managed problem, the relative rate per 100 encounters decreased significantly from 9.5 to 8.4.

Immunisation/vaccination rose from the sixth to the third most frequently managed problem and a statistically significant increase was found in its rate of management. In 1991 immunisation/vaccination showed a rate of 3.2 per 100 encounters, whereas in 1998 the rate was 5.3 per 100 encounters. A number of developments in the 1990s may have contributed to this finding. The General Practice Immunisation Incentive (GPII) introduced by the Federal Government to increase vaccination in general practice, and the downgrading of the Local Government Immunisation Program, would have had some effect. The introduction of new vaccines may also have been a factor. The increasingly wide-spread use of influenza vaccine for at-risk and elderly patients, as demonstrated by the relatively high frequency of

influenza vaccine as a prescribed medication (see Chapter 13.5 below), would also have affected the result.

A statistically significant increase in the management rate of depression was found. From a rate of 2.1 in 1991 when depression was the tenth most frequently managed, it rose to a rate of 3.5 per 100 encounters in 1998, becoming the fourth most commonly managed problem in general practice.

It is possible that a real increase in the rate of depression in the community has occurred and that this was reflected in problems managed in 1998 by general practitioners, the most accessible members of the health care workforce. The status of depression as a new problem for the patient is an indication of a real rise in the incidence of depression in general practice. The rate of new depression presentations per 100 encounters rose significantly between the two studies, from 0.5 per 100 encounters in 1991 to 0.7 in 1998.

A number of other factors may have some bearing on the increase in total depression problems. A significant decrease was found in the frequency of recorded cases of anxiety as a problem managed. This might indicate that some patients were diagnosed with depression in the later study where previously a diagnosis of anxiety might have been recorded. A growing acceptability of depression may have led to less hesitancy on the part of the GP to record this diagnosis.

A more open attitude to depression has evolved in the 1990s, led by media exposure. These changing attitudes may have encouraged patients to go to their GP seeking new and effective management methods of which they have heard. A concomitant rise in overall prescribing for depression did occur. Prescriptions were written at 62.7% of contacts with depression in 1991 and 68.6% in 1998, a statistically significant increase. In line with the increased relative frequency of depression, the prescription rate for anti-depressants has also risen by more than 50%, from 1.8 to 2.9 per 100 encounters.

A number of other problems managed showed statistically significant increases in rate per 100 encounters between the two studies. They were back complaint, diabetes, lipid disorder, oesophageal disease and prescription requests. The increase in back complaint and diabetes in general practice points to an increase in these problems in the population of Australia, or an increase in rates of identification of the problems. A more thorough investigation of these two diagnoses than is possible here would help to clarify this point.

Lipid disorder (usually hypercholesterolaemia) could be an example of a condition which has received a lot of attention during the 1990s, raising GP and public awareness of the need to control cholesterol level and leading to an increase in the relative frequency of its management. Media reports and vigorous marketing strategies by the pharmaceutical industry may have influenced patients to visit a GP for this 'at-risk' cardiovascular condition. GPs may also be testing cholesterol levels in their patients more often, leading to an increase in the identification of lipid disorder. The fact that the most common hypolipidaemic drug, simvastatin, was recorded at the significantly higher rate of 0.9 in the 1998 study, compared to 0.4 per 100 encounters in 1991, supports these assumptions (see Table 13.6 below).

Oesophageal disease, a rubric that covers a group of diseases associated with the oesophagus such as reflux, spasm, achalasia, ulcerative and other oesophagitis, showed a significant increase between the two studies. A major factor in this increase would be the advent of new drugs onto the market to treat this disease (see Chapter 13.5.1 below).

Table 13.4: Comparison of most frequently managed problems

Problem managed	AMTS 1990–91				BEACH 1998–99			
	Number	Rate per 100 encs(a)	95% LCI	95% UCI	Number	Rate per 100 encs(a)	95% LCI	95% UCI
Hypertension*	9,356	9.5	8.9	10.0	7,779	8.4	8.0	8.8
URTI	7,017	7.1	6.7	7.5	6,585	7.1	6.6	7.6
Immunisation/vaccination all*	3,195	3.2	3.0	3.5	4,922	5.3	4.8	5.8
Depression*	2,053	2.1	1.9	2.2	3,229	3.5	3.3	3.7
Acute bronchitis/bronchiolitis	3,484	3.5	3.3	3.8	3,137	3.4	3.1	3.7
Asthma	3,692	3.7	3.5	4.0	2,972	3.2	3.0	3.4
Back complaint*	2,062	2.1	1.9	2.2	2,476	2.7	2.4	3
Diabetes*	1,908	1.9	1.8	2.1	2,388	2.6	2.4	2.8
Lipid disorder	1,744	1.8	1.6	1.9	2,312	2.5	2.3	2.7
Osteoarthritis*	3,601	3.6	3.4	3.9	2,028	2.2	2.0	2.4
Sprain/strain*	2,146	2.2	2.0	2.3	1,779	1.9	1.6	2.2
Contact dermatitis	2,040	2.1	2.0	2.2	1,739	1.9	1.7	2.1
Acute otitis media/myringitis	1,921	1.9	1.8	2.1	1,737	1.9	1.7	2
Female genital check-up/Pap smear*	1,508	1.5	1.3	1.7	1,558	1.7	1.4	1.9
Anxiety*	2,475	2.5	2.3	2.7	1,549	1.7	1.5	1.8
Sinusitis acute/chronic	1,659	1.7	1.5	1.8	1,502	1.6	1.4	1.8
Sleep disturbance	1,543	1.6	1.4	1.7	1,469	1.6	1.4	1.7
UTI*	1,635	1.7	1.6	1.7	1,446	1.6	1.4	1.7
General check-up*	1,450	1.5	1.3	1.6	1,429	1.5	1.3	1.7
Tonsillitis*	1,715	1.7	1.6	1.9	1,413	1.5	1.3	1.7
Oesophageal disease	682	0.7	0.6	0.8	1,374	1.5	1.3	1.6
Menopausal complaint	1,291	1.3	1.1	1.5	1,372	1.5	1.3	1.6
Viral disease NOS	1,438	1.5	1.3	1.6	1,267	1.4	1.1	1.6
Cardiac check-up*	780	0.8	0.7	1.0	1,200	1.3	0.9	1.7
Prescription all*	527	0.4	0.3	0.7	1,140	1.2	0.9	1.6
Gastroenteritis, presumed infection	1,370	1.4	1.3	1.5	1,039	1.1	0.9	1.3
IHD without angina	1,347	1.4	1.2	1.5	999	1.1	0.8	1.3
Fracture*	1,001	1.0	0.9	1.1	997	1.1	0.7	1.4
Pre/post natal check-up*	963	1.0	0.7	1.3	987	1.1	0.9	1.2
Solar keratosis/sunburn[b]	n.a.	n.a.	n.a.	n.a.	952	1.0	0.8	1.2
Subtotal	*70,338*	. .	. .	. .	*64,775*	. .	. .	. .
Total problems	**145,799**	**147.6**	**143.2**	**152.0**	**135,672**	**146.3**	**144.3**	**148.2**

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

(b). Rubric was not seperable in the 1990–91 study.

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

– *Note:* Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval, n.a. – not available

No comparison can be made of the rate of management of solar keratosis/sunburn because of classification changes in the revision of ICPC, which has rendered the codes and their rubrics incomparable in the two studies.

Asthma was the most common problem that showed a statistically significant relative decrease in management rates. The management rate in the 1991 study was 3.7, compared to 3.2 per 100 encounters in 1998. One possible explanation for the decrease in asthma is the availability of salbutamol from the pharmacy without need for a prescription. This is borne out by overall prescription results, which show a significant decrease in salbutamol from 3.1 to 2.4 per 100 encounters (see Table 13.6 below). However, even with the advent of 'over the counter' salbutamol, it remains the fourth most commonly prescribed medication in BEACH 1998, leading to the conclusion that salbutamol is not the only influence here. There has been a greater emphasis on education of asthma sufferers and their families over the last few years. With more information to guide them regarding asthma preventive drugs, and encouragement from their doctors, patients may be more able to apply self-management methods.

Two other problems, anxiety and osteoarthritis, showed a significantly lower relative rate per 100 encounters in the later study. Anxiety as a problem managed decreased significantly from a rate of 2.5 per 100 encounters to 1.7 in 1998. The rise in the diagnosis of depression discussed earlier may have been a factor in this finding.

The management of osteoarthritis also showed a significantly lower relative management rate. One factor which could have contributed to this result is the recent availability 'over the counter' of some brands of the NSAID, ibuprofen. However, total NSAIDs have dropped slightly in frequency between the two studies, pointing to a diversification of treatments, such as acupuncture and herbal remedies, for this condition. It is possible that patients are turning to health providers other than general practitioners for treatment of osteoarthritis.

13.4.2 Comparison of problems by ICPC-2 chapter

Problems managed, grouped within ICPC-2 chapters, can also be compared between the two studies. This comparison is shown in Table 13.5.

Statistically significant increases were found in the relative management rate of general and unspecified problems, in endocrine and metabolic problems and in problems of the male genital system between the 1991 and 1998 studies. Problems associated with the skin, the circulatory system, the eye and those of a social nature all demonstrated a statistically significant relative decrease in BEACH 1998 when compared to the AMTS 1991.

Table 13.5: Comparison of problems managed across ICPC-2 chapter

ICPC chapter	AMTS 1990–91				BEACH 1998–99			
	Number	Rate per 100 encs(a)	95% LCI	95% UCI	Number	Rate per 100 encs(a)	95% LCI	95% UCI
Respiratory	24,283	24.6	23.7	25.5	23,053	24.9	24.1	25.6
Musculoskeletal	17,533	17.8	17.0	18.5	15,915	17.2	16.5	17.8
Skin	18.100	18.3	17.7	19.0	15,652	16.9	16.4	17.4
Circulatory	18,203	18.4	17.5	19.4	14,905	16.1	15.4	16.8
General & unspecified	9,652	9.8	9.3	10.2	11,951	12.9	12.4	13.4
Digestive	10,396	10.5	10.1	10.9	9,574	10.3	10	10.6
Psychological	9,664	9.8	9.2	10.3	9,506	10.3	9.8	10.7
Endocrine & metabolic	7,197	7.3	6.9	7.7	8,218	8.9	8.4	9.3
Female genital system	7,141	7.2	6.7	7.7	5,893	6.4	6	6.7
Ear	5,294	5.4	5.1	5.6	4,714	5.1	4.8	5.3
Pregnancy & family planning	4,140	4.2	3.8	4.5	3,827	4.1	3.8	4.4
Neurological	3,911	4.0	3.8	4.1	3,721	4.0	3.8	4.2
Eye	3,310	3.4	3.2	3.5	2,628	2.8	2.7	3
Urology	2,852	2.9	2.7	3.0	2,541	2.7	2.6	2.9
Blood	1,848	1.9	1.7	2.0	1,536	1.7	1.4	1.9
Male genital system	1,066	1.1	1.0	1.2	1,320	1.4	1.3	1.5
Social problems	1,208	1.2	1.1	1.4	713	0.8	0.6	0.9
Total	***145,799***	***147.6***	***143.2***	***152.0***	**135,672**	**146.3**	**144.3**	**148.2**

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

13.5 Comparison of medications prescribed

In the AMTS, only medications prescribed or provided from the GP's own supply were recorded. This comparison, therefore, does not include the 'over the counter' drugs recorded by BEACH participants.

The total number of prescriptions recorded during the AMTS was 98,563, a rate of 100per 100 encounters. This does not mean that a prescription was recorded at 99 out of every 100 encounters, because multiple prescriptions were often written at one encounter. For every 100 problems managed, 67.7 prescriptions were recorded.

There were 87,381 prescriptions recorded during BEACH 1998 at a rate of 94.2 per 100 encounters. Per 100 problems managed, the rate was 64.4.

Overall rates of medication prescribing declined significantly between the two studies both as a rate per 100 encounters and as a rate per 100 problems. As there have been few changes between 1991 and 1998 in the number of repeats allowable, this decline cannot be due to an effect of legislation. However, some widely used medications such as salbutamol can now be obtained without prescription and this could have affected the results.

13.5.1 Individual drugs prescribed

The 30 most frequently prescribed medications in BEACH, with their corresponding results from the AMTS, are shown in Table 13.6.

There was a statistically significant relative increase in the rate per 100 encounters of the most commonly prescribed drug, paracetamol, and of the third and fifth most common drugs in BEACH, paracetamol/codeine and cefaclor monohydrate.

Amoxycillin, erythromycin and doxycycline, three of the most frequently prescribed drugs in the AMTS all decreased significantly in BEACH. Cotrimoxazole and flucloxacillin dropped out of the top 30 drugs in BEACH after having been among the most common in the AMTS. Conversely, roxithromycin was not recorded in the AMTS as it was not available in 1990, but became the seventh most commonly prescribed drug in the 1998 study. These results suggest that the reason for the most notable changes in prescribing habits between 1991 and 1998 was the availability of new drugs on the market. The two antibiotics, cefaclor and roxithromycin, recent additions to the market, became the fifth and seventh most commonly prescribed drugs in the 1998 study, probably due to their efficacy and lack of side effects. The significant decreases in BEACH of many of the other anti-infective medications could be directly linked to this result.

As would be expected, there was a significant decrease in prescribed salbutamol, from a rate of 3.1 to 2.4 per 100 encounters. Beclomethasone also decreased significantly from a rate of 1.5 per 100 encounters in 1991 to 0.7 in 1998. On the other hand, budesonide topical nasal spray was not recorded in 1990 but in 1998 it became one of the top 30 most frequently prescribed. This was despite the drop in allergic rhinitis, which was among the Top 30 most common problems in 1990 but not in 1998, and may indicate a trend in managing asthma-related conditions.

The only skin preparation to appear in the top 30 was the topical corticosteroid, betamethasone, and it showed a statistically significant decrease in prescription rate between the two studies. The anti-anxiety agent, oxazepam, also declined significantly in rate from 1991 to 1998, in line with the decrease in anxiety as a problem managed.

The relative rate of prescribing the influenza virus vaccine rose from 1.0 to 1.7 per 100 encounters. However, the drug tended to cluster around certain GPs, causing the cluster effect to prevent any statistical significance being found.

The combined oral contraceptive levonorgestrel/ethinyloestradiol was high on the list of most frequent drugs in 1998, having increased significantly since 1991. The rate of prescribing of drugs such as levonorgestrel/ethinyloestradiol and the compound analgesic, paracetamol/codeine could be examples of changing prescribing habits led by changing preferences among doctors and their patients.

The digestive system drug, ranitidine, was a fairly new medication in 1991 and rose significantly in rate of prescribing by 1998. In BEACH it was prescribed at a rate of 1.0 per 100 encounters making it one of the most common drugs in the study. This coincided with the significant rise in the rate per 100 encounters of oesophageal disease as a problem managed, which was mentioned previously. It could be assumed that more patients attended in 1998 to receive this new and effective pharmaceutical treatment for the problem.

Table 13.6: Comparison of top 30 most frequent medications

Medications	AMTS 1990–91				BEACH 1998–99			
	Number	Rate per 100 encs(a)	95% LCI	95% UCI	Number	Rate per 100 encs(a)	95% LCI	95% UCI
Paracetamol	3,086	3.1	2.8	3.5	3,681	4.0	3.6	4.3
Amoxycillin	5,313	5.4	5.0	5.7	3,109	3.4	3.0	3.7
Paracetamol/Codeine	1,325	1.3	1.1	1.5	2,451	2.6	2.4	2.9
Salbutamol	3,051	3.1	2.9	3.3	2,238	2.4	2.2	2.6
Cefaclor monohydrate	371	0.4	0.1	0.6	2,093	2.3	1.9	2.7
Cephalexin	1,737	1.8	1.5	2.0	1,975	2.1	1.9	2.4
Roxithromycin(b)	—	—	—	—	1,710	1.8	1.6	2.1
Amoxycillin/potass.clavulanate	1,327	1.3	1.1	1.6	1,706	1.8	1.6	2.1
Influenza virus vaccine	974	1.0	0.7	1.3	1,598	1.7	0.4	3.1
Temazepam	1,234	1.3	1.1	1.4	1,277	1.4	1.2	1.5
Diclofenac sodium systemic	1,424	1.4	1.3	1.6	1,213	1.3	1.1	1.5
Levonorgestrel/Ethinyloestradiol	459	0.5	0.4	0.6	1,162	1.3	1.1	1.4
Doxycycline hcl	1,908	1.9	1.8	2.1	1,097	1.2	1.0	1.4
Erythromycin	2,068	2.1	1.9	2.3	1,028	1.1	0.8	1.4
Diazepam	916	0.9	0.8	1.0	1,022	1.1	0.9	1.3
Ranitidine	561	0.6	0.5	0.6	921	1.0	0.9	1.1
Atenolol	1,052	1.1	0.9	1.2	920	1.0	0.8	1.2
Betamethasone topical	1,576	1.6	1.5	1.7	895	1.0	0.8	1.1
Simvastatin	397	0.4	0.3	0.5	863	0.9	0.8	1.1
Chloramphenicol eye	909	0.9	0.8	1.0	861	0.9	0.8	1.1
Frusemide (Furosemide)	1,198	1.2	1.1	1.4	826	0.9	0.7	1.1
Naproxen	1,034	1.1	0.9	1.2	816	0.9	0.7	1.1
Amlodipine(b)	—	—	—	—	703	0.8	0.6	0.9
Oxazepam	1,120	1.1	1.0	1.3	698	0.8	0.6	0.9
Prochlorperazine	1,048	1.1	0.9	1.2	685	0.7	0.6	0.9
Enalapril mal	760	0.8	0.7	0.9	680	0.7	0.6	0.9
Aspirin	855	0.9	0.8	1.0	675	0.7	0.5	0.9
Budesonide topical nasal(b)	—	—	—	—	662	0.7	0.5	0.9
Beclomethasone	1,505	1.5	1.4	1.7	657	0.7	0.5	0.9
Metformin	191	0.2	0.1	0.3	651	0.7	0.5	0.9
Subtotal	*43,243*	*. .*	*. .*	*. .*	*38,874*	*. .*	*. .*	*. .*
Total	**98,563**	**99.9**	**97.2**	**102.6**	**87,381**	**94.2**	**91.7**	**96.7**

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

(b) Drug was not available or not prescribed during the 1990–91 study.

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

The relative prescribing rate of simvastatin increased significantly in 1998. As mentioned earlier, this finding is presumably linked to the rise in management of lipid disorder. Amlodipine, a relatively new anti-hypertensive, was not recorded in the AMTS but became one of the most frequently prescribed drugs in 1998. Metformin showed a statistically significant increase in prescribing rate consistent with the rise in diabetes as a problem managed.

13.6 Conclusion

The AMTS provided a monitoring method, which was used as a basis for the ongoing BEACH study. Detailed information from BEACH on the doctor–patient encounter can be measured in terms of various research questions, a major one being the assessment of changes that have taken place over time.

This chapter has summarised some of the most significant changes that have taken place in general practice during the 1990s. More specific analysis similar to that shown in the flow charts of earlier Chapters of this report could explore causal factors for those changes. Other problems managed, medications prescribed, or other aspects of the encounter could be analysed in a similar manner as long as the particular topic of interest occurred at sufficient frequency to present a meaningful result.

This comparative analysis has demonstrated that changes did take place between 1991 and 1998 and that measurement of change over time in general practice is a viable and useful endeavour.

14. Selected topics

This Chapter provides a brief summary of results for some specific areas of interest:

- encounters with Indigenous persons,
- indirect encounters,
- comparison of encounters with male and female GPs,
- State/Territory of home residence of patients attending participating GPs.

14.1 Encounters with Indigenous people

GPs were instructed to ask each patient whether or not they identified as an Aboriginal and/or Torres Strait Islander person. This is the first time this question has been asked in a national general practice activity study.

14.1.1 Number of encounters

At 1,162 encounters (1.2%) the patient responded positively to one or both questions. The vast majority (87.0%) stated they were Aboriginal persons, while 9.9% stated they were Torres Strait Islanders and 3.1% said they were both.

In terms of the total dataset 1.2% is not large. However, a simple extrapolation to the (approximately) 103 million General Practice Medicare item numbers claimed per year in Australia suggests that there are about 1.1 million GP consultations with Indigenous people, an even greater number than is conducted by Aboriginal Medical Services (AMS). It was thought that some of the participating GPs may have recorded activity conducted in Aboriginal Medical Services claimed through Medicare. If that was the case this number of consultations with private general practitioners by the Indigenous people could be an over-estimate. An investigation of the distribution of these encounters across individual GPs was therefore warranted.

Over one-third of participating GPs saw at least one Indigenous person during their 100 recorded encounters. The relative number of encounters with Indigenous people was calculated for each GP and Figure 14.1 demonstrates the distribution of these encounters across the 326 practitioners involved. The range was 1 to 63 consultations with Indigenous persons, the median being 2 and the mean 3.5, with a standard deviation of 6.2.

By far the majority of these GPs saw less than ten Indigenous persons during their 100 recorded encounters and only five GPs saw 20 or more. If it was assumed that these five GPs worked either full- or part-time in an AMS and that these consultations were undertaken in an AMS, their recorded encounters with Indigenous persons should be removed prior to extrapolation from BEACH to the annual Medicare data. The number of consultations with Indigenous persons in the non-AMS private general practice environment after removal of these encounters was estimated to be approximately 1 million per annum.

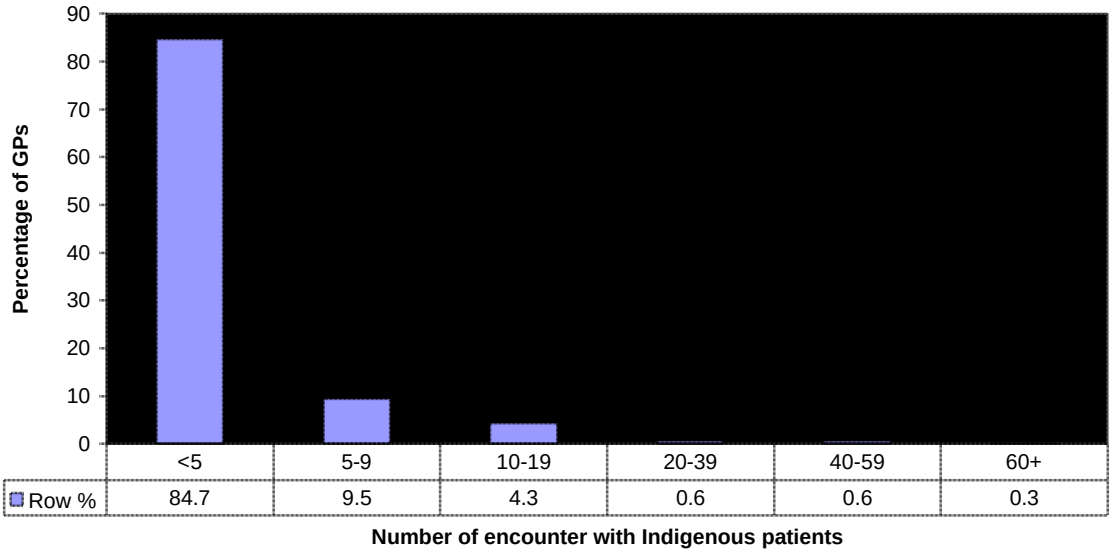


Figure 14.1: Distribution of Indigenous encounters by GP

14.1.2 Age–sex distribution of Indigenous persons at encounter

The age–sex distribution of these patients is presented in Figure 14.2. While the patient was male at 43.7% of encounters, paralleling the result for the total dataset (42.3%, Table 6.1), the age distribution of these patients differed markedly from that of all patients at encounter.

Overall, Indigenous patients were younger, almost 30% being children aged less than 15 years (compared with 15.8% in the total dataset, Figure 6.1). While the proportion of persons aged 15–24 years was also greater than in the total database, the major differences were the very high proportion of Indigenous men and women aged 25–44 years (34.1% compared with 26.0% in the total dataset), the lesser proportion in the 45–64 years age group (17.8% compared with 24.4%) and the very small proportion of older persons (5.4%) aged 65 years or more (compared with 24.0%).

14.1.3 Other patient characteristics

Other characteristics of this group also differed from those of all patients. Over 80% held a health care card (compared with 47.3% in the total sample), less than 1% held a Department of Veterans' Affairs card (compared with 3.4% in the total data) and 15.2% were new to the practice (compared with 9.2% of all encounters). (Results not presented.)

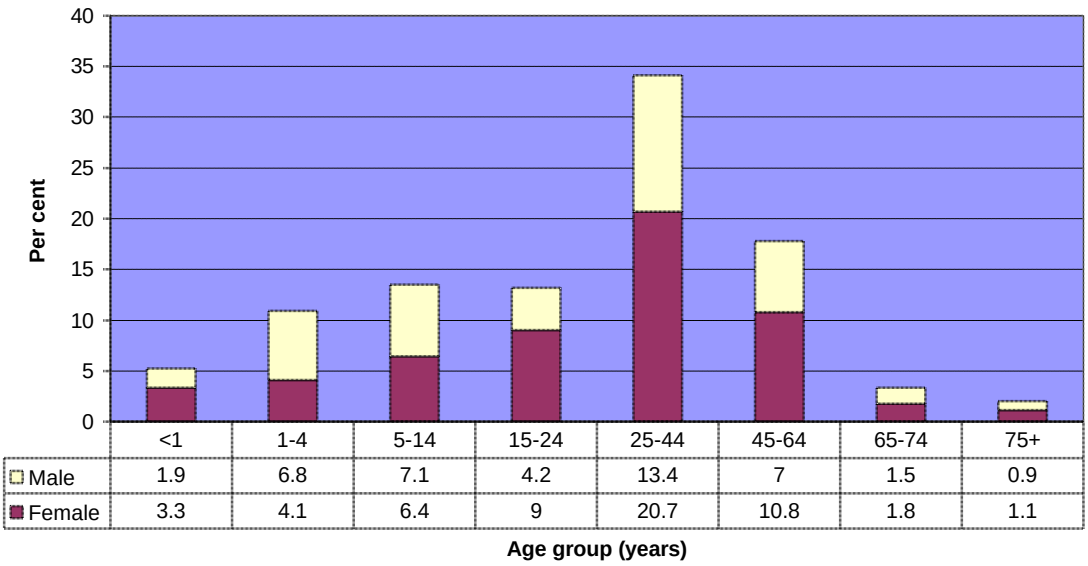


Figure 14.2: Age-sex distribution of Indigenous patients seen by GPs

14.1.4 Geographic location

The GPs were asked to record the postcode of the patient's home residence at each encounter. After missing data were removed (n=38) the postcodes were classified according to State and by the Rural, Remote and Metropolitan Area (RRMA) classification.

Distribution by State/Territory

The distribution of Indigenous patient residence by State is presented in Figure 14.3 and compared with the distribution of residence for non-Indigenous persons. One-third of the Indigenous patients resided in Queensland and almost as many resided in New South Wales (28.5%). Over 10% lived in each of South and Western Australia and there was only a small proportion living in each of the other States and Territories. The comparative data for non-Indigenous people demonstrate that the relative proportion of Indigenous patients seen by GPs in Queensland, South Australia, Western Australia and the Northern Territory was high, while the relative proportion seen in Victoria was very low.

Distribution by RRMA

In Figure 14.4, RRMA distribution of the patient postcode of residence for the Indigenous persons consulting GPs in this study is compared with the RRMA distribution for non-Indigenous persons. Over 40% of these Indigenous patients lived in capital cities, a lesser proportion than for non-Indigenous patients (67.7%). Indigenous persons were more likely than non-Indigenous persons to reside in small, large and other rural areas and about one in ten lived in remote centres, other remote areas or offshore. Non-Indigenous persons living in remote areas represented only 1.2% of all non-Indigenous patients consulting participating GPs.

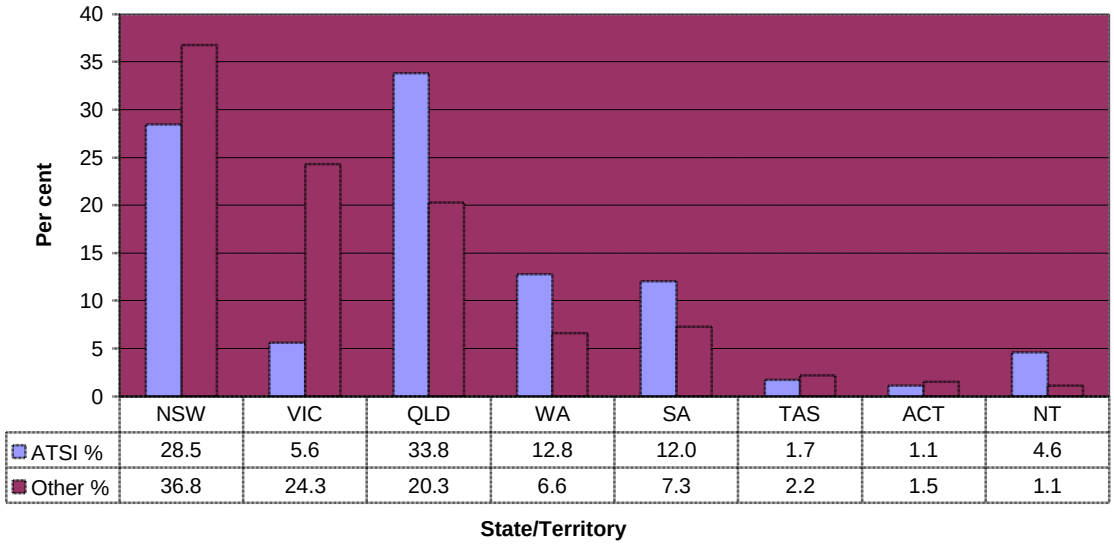


Figure 14.3: Geographic location of indigenous and non-Indigenous patients by State/Territory

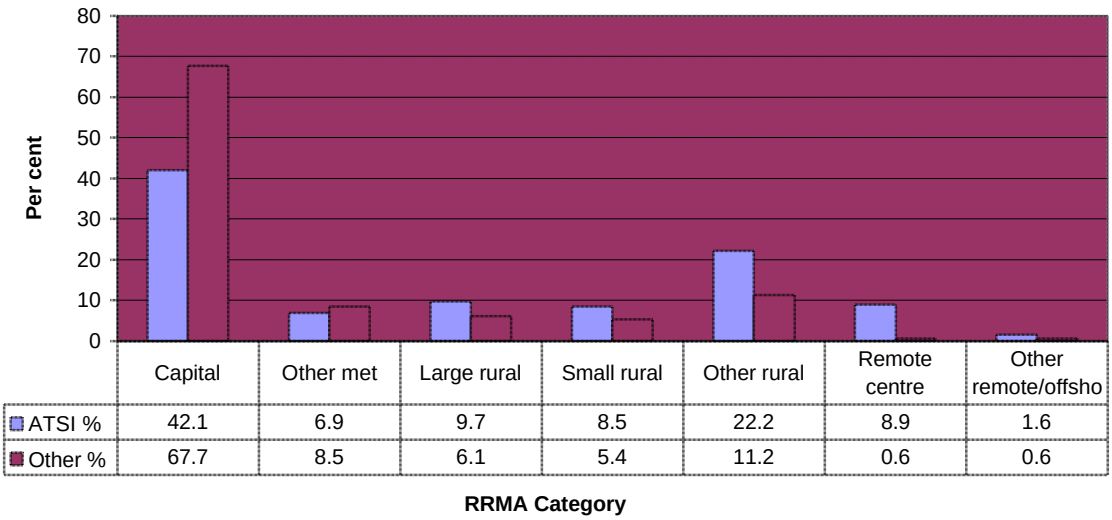


Figure 14.4: Geographic location of Indigenous and non-Indigenous patients by RRMA category

14.1.5 Nature of morbidity managed

Problems managed by ICPC-2 chapter

The distribution of the problems managed in encounters with Indigenous people is presented in terms of ICPC-2 chapters and compared with the distributions for all encounters in Table 14.1. Due to the relatively small sample size the confidence intervals around the results for Indigenous people are broad and in most cases this rendered any differences in the two distributions of no statistical significance. The exception was the relative rate of management of problems associated with the circulatory system which arose at a rate of 10.0 per 100 encounters, a significantly lower rate than in the total dataset (16.1 per 100). Other differences of interest (although not statistically significant) included the high relative rate of management of problems related to pregnancy and family planning (7.4 per 100 encounters compared with 4.9). In contrast the relative frequency of problems associated with the eye, and with the female and the male genital systems was somewhat lower than that of the total BEACH population (Table 14.1).

Table 14.1: Distribution of problems managed by ICPC-2 chapter

	Indigenous encounters			All encounters		
Problems Managed	**Rate per 100 encs (N=1,163)[(a)]**	**95% LCI**	**95% UCI**	**Rate per 100 encs (N=140,824)[(a)]**	**95% LCI**	**95% UCI**
Respiratory	28.0	22.8	33.1	24.3	23.6	25.0
Skin	16.5	10.2	19.2	16.5	16.0	17.0
Musculoskeletal	13.0	9.4	16.6	16.9	16.3	17.5
General & unspecified	11.7	7.3	16.2	13.2	12.7	13.7
Digestive	11.2	7.3	15.1	10.2	9.9	10.5
Psychological	10.6	5.7	15.5	10.5	10.0	11.0
Circulatory	10.0	5.8	14.1	16.1	15.4	16.8
Endocrine & metabolic	9.0	4.9	13.2	8.8	8.4	9.2
Pregnancy & family planning	7.4	2.2	12.6	4.1	3.7	4.4
Ear	7.0	2.0	12.0	4.9	4.7	5.1
Neurological	4.4	0.0	10.0	4.0	3.8	4.2
Female genital system	4.0	0.7	7.4	6.3	5.9	6.6
Urology	2.7	0.0	6.6	2.8	2.7	3.0
Eye	1.9	0.0	7.1	2.8	2.7	3.0
Blood	1.6	0.0	5.9	1.7	1.5	1.9
Social problems	1.0	0.0	21.0	0.8	0.6	0.9
Male genital system	0.8	0.0	14.6	1.4	1.3	1.5
Total problems	138.8	132.9	144.8	145.3	143.5	147.2

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval

The most frequent individual problems managed

The ten most frequently managed problems at encounters with Indigenous people are listed in decreasing order of frequency in Table 14.2 with comparative results for the total dataset. Although the wide confidence intervals generated by the small sample size rendered none of the differences statistically significant, some interesting patterns emerged. The relative rate of respiratory problems as a whole was earlier demonstrated to be slightly higher at encounters with Indigenous people (28 per 100 encounters compared with 24 in the total dataset). However the differences in relative rates for the more frequent individual respiratory problems were very large. For example, URTI was managed at a rate of 9 per 100 encounters in this sub-group compared with 6.8 in the total dataset. The rate of acute bronchitis was also high (5.1 compared with 3.3) as was asthma (4.5 compared with 3.2) and tonsillitis. Diabetes was managed at almost double the overall rate (5.1 compared with 2.6). In contrast hypertension was far less frequently managed (4.3 compared with 8.3 per 100 encounters) as were immunisation/vaccination and depression.

Table 14.2: Most frequent individual problems managed

Problem managed	Indigenous encounters			All encounters		
	Rate per 100 encs[(a)] (N=1,614)	95% LCI	95% UCI	Rate per 100 encs[(a)] (N=140,824)	95% LCI	95% UCI
URTI	9.0	2.5	15.4	6.8	6.4	7.3
Acute bronchitis/bronchiolitis	5.1	0.0	10.4	3.3	3.0	3.6
Diabetes*	5.1	0.2	9.9	2.6	2.4	2.7
Acute otitis media/myringitis	4.6	0.0	9.4	1.8	1.6	2.0
Asthma	4.5	0.5	8.6	3.2	3.0	3.4
Hypertension*	4.3	0.0	9.9	8.3	7.8	8.7
Pre/post natal check-up*	4.0	0.0	10.8	1.0	0.7	1.4
Immunisation all*	3.2	0.0	9.6	5.2	4.7	5.7
Depression*	2.7	0.0	7.3	3.5	3.3	3.7
Tonsillitis*	2.6	0.0	9.3	1.5	1.3	1.6

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

Note: Abbreviations: Encs - encounters, UCI - Upper confidence interval, LCI – Lower confidence interval, NOS – Not otherwise specified

14.1.6 Conclusion

This brief summary of the characteristics of Indigenous people who visited GPs participating in BEACH and the outline of the morbidity managed provides an indication of the health services provided to the Indigenous population by private general practitioners. The AIHW recently published a report about the health of this community but these results were not available at the time(ABS 1999). The estimates of the total number of private general practice consultations with Indigenous people in Australia suggest that, outside the Aboriginal Medical Services, GPs have an important role in the care of the Indigenous population. In any assessment of the health of the Indigenous population these services must be considered.

14.2 Indirect encounters

This is the first time data about indirect GP–patient encounters have been collected in a national general practice activity survey. Indirect services are those which occur when GPs take a telephone call from a patient (e.g. asking for advice) or receive a call or message requesting a service such as a repeat prescription. As they have not seen the patient they do not receive any government benefits for these services.

14.2.1 Services provided at indirect encounters

There were 3,024 indirect encounters, representing 3.1% of all encounters. At least one indirect encounter was recorded by more than two-thirds (n=636) of participating GPs. More than one service type could be provided at these encounters (e.g. a prescription and a referral) but at most only one service was involved, 3,096 services being provided at a rate of 102 per 100 indirect encounters (Table 14.3).

The most common clinical service resulting from these encounters was a prescription (55.2 per 100 indirect encounters). Services other than prescriptions, referrals and certificates ('Other') were also provided relatively frequently (29.8 per 100 encounters) and these would include advice about treatment of a problem. Referrals were provided at a rate of 13.5 and certificates at a rate of 3.8 per 100 indirect contacts recorded.

Table 14.3: Services provided at indirect encounters

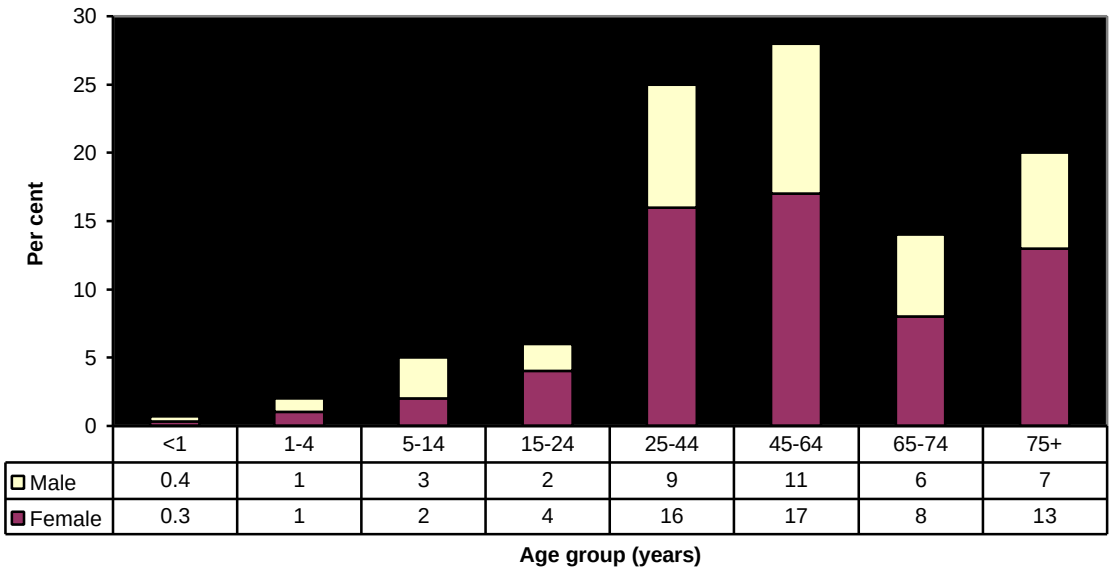
Service provided	Number of encs	Rate per 100 indirect encs[(a)]	95% LCI	95% UCI
Prescription	1,670	55.2	51.8	58.6
Referral	409	13.5	11.5	15.6
Certificate	115	3.8	0.9	6.7
Other	902	29.8	26.3	33.3
Total	**3,024**	**114.8**	. .	. .

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

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval

14.2.2 Age–sex distribution of patients

The age–sex distribution of patients involved in indirect encounters is graphically presented in Figure 14.5. Women were slightly over-represented at these encounters, 61.3% being female compared with 57.7% at all encounters. Young people were least likely to have indirect encounters and the proportion of patients aged between 25 and 44 years was not different to that of all encounters. However, women aged between 45 and 64 years were over-represented in indirect encounters (17% compared with 14% at all encounters), as were elderly women (13% compared with 7%).



	<1	1-4	5-14	15-24	25-44	45-64	65-74	75+
Male	0.4	1	3	2	9	11	6	7
Female	0.3	1	2	4	16	17	8	13

Age group (years)

Figure 14.5: Age-sex distribution of patients at indirect encounters

14.2.3 Problems managed at indirect encounters

For the majority of indirect encounters only one problem was managed. There were 3,474 problems managed a rate of 115 per 100 encounters, significantly less than average (145 per 100). Of those problems for which the status was specified (n=2,099), 18% were said to be new to the patient (compared with 38% of all problems). These new cases may well be those associated with 'other ' services such as advice about self-management of an acute problem.

The ten problems most often managed at indirect encounters are listed in order of frequency in Table 14.4 and their relative frequency is compared with that in the total dataset.

As with the earlier analysis of encounters with Indigenous persons the relatively small sample size for indirect encounters resulted in wide confidence intervals even for the more frequent events and this rendered the majority of differences between morbidity managed at indirect encounters and that managed at all encounters statistically insignificant. The exception was the relative frequency of 'prescription', the most common label used by GPs to describe the problem under management at indirect encounters (6.1 per 100 encounters compared with 1.4 per 100 total encounters). With the exception of immunisation/vaccination which would logically be associated with a need for a prescription to be filled prior to presenting for its administration, the other frequently managed problems were chronic in nature. They included hypertension, asthma, osteoarthritis, depression, sleep disturbance, and anxiety.

Table 14.4: Most frequent problems managed (top 10) at indirect encounters

Problem managed	Indirect encounters					All encounters		
	Number	% total problems	Rate per 100 encs[(a)] (N=3,025)	95% LCI	95% UCI	Rate per 100 encs[(a)] (N=140,824)	95% LCI	95% UCI
Prescription all*	210	6.1	7.0	2.5	11.4	1.4	1.1	1.7
Hypertension*	168	4.9	5.6	2.7	8.4	8.3	7.8	8.7
Depression*	100	2.9	3.3	0.8	5.8	3.5	3.3	3.7
Sleep disturbance	96	2.8	3.2	0.0	6.3	1.6	1.5	1.8
Asthma	89	2.6	3.0	0.0	5.9	3.2	3.0	3.4
Lipid disorder	80	2.3	2.6	0.0	6.2	2.5	2.3	2.7
Anxiety*	79	2.3	2.6	0.0	6.4	1.7	1.5	1.9
Back complaint*	78	2.2	2.6	0.0	5.4	2.7	2.4	2.9
Osteoarthritis*	69	2.0	2.3	0.0	5.1	2.2	2.0	2.4
Immunisation all*	66	1.9	2.2	0.0	9.2	5.2	4.7	5.7
Subtotal	*1,035*	*29.8*	. .	. .	. .	. .	. .	. .
Total problems	**3,474**	**100.0**	**146.3**	**144.6**	**148.0**	**145.3**	**143.5**	**147.2**

(a) Figures do not total 100 as more than one problem can be managed at each encounter. Also only the top 10 problems included

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

Note: Abbreviations: Encs - encounters, UCI - Upper confidence interval, LCI – Lower confidence interval, NOS – Not otherwise specified.

Table 14.5: Drugs most frequently prescribed (top 10) at indirect encounters

Generic drug	Number	Rate per 100 encs (N=3,024)	95% LCI	95% UCI
Temazepam	100	3.3	0.0	6.6
Paracetamol & codeine	82	2.7	0.0	5.6
Paracetamol	58	1.9	0.0	5.4
Influenza virus vaccine	53	1.8	0.0	9.7
Oxazepam	52	1.8	0.0	4.7
Diazepam	51	1.7	0.0	4.7
Salbutamol	46	1.5	0.0	5.7
Frusemide (Furosemide)	44	1.4	0.0	6.6
Levonorgestrel/Ethinyloestradiol	42	1.4	0.0	5.1
Warfarin sodium	42	1.4	0.0	7.3
Subtotal	*570*	. .	. .	. .
Total prescriptions	**2192**	**72.5**	**64.7**	**80.2**

Note: Abbreviations: Encs-encounters, UCI- Upper confidence interval, LCI – Lower confidence interval,

14.2.4 Drugs most frequently prescribed at indirect encounters

The ten drugs most often prescribed at indirect encounters are presented in decreasing order of frequently in Table 14.5. Temazepam was most frequently prescribed (3.3 per 100 indirect encounters), while oxazepam and diazepam were also in the list of commonly prescribed drugs. Second was paracetamol and codeine, followed by paracetamol. Reflecting the inclusion of asthma in the more frequently managed problems, salbutamol was also relatively frequently prescribed at these indirect encounters.

14.3 The gender of the GP

14.3.1 Age distribution of male and female GPs

Of the 984 GPs who participated, 689 (70%) were male and 285 female (30%). Women GPs tended to be younger, less than 10% (compared with 28% of male GPs) being aged over 55 years (Figure 14.6). This aligns with the increasing number of women entering medical schools and the RACGP training program.

	<35	35-44	45-54	55+
Female	22.9	40.8	26.9	9.4
Male	12.3	30.3	29.7	27.7

Figure 14.6: Age-sex distribution of male and female GP participants

14.3.2 Geographic distribution of male and female GPs by RRMA

The postcode of practice served to locate each participating GP in a RRMA category. Figure 14.7 shows that the vast majority of both male and female participating GPs practise in capital cities. However, a lesser proportion of females practiced outside capital cities (18.5%) than did males (24.1%) and this applied in all rural and remote RRMA categories except 'other remote/offshore'.

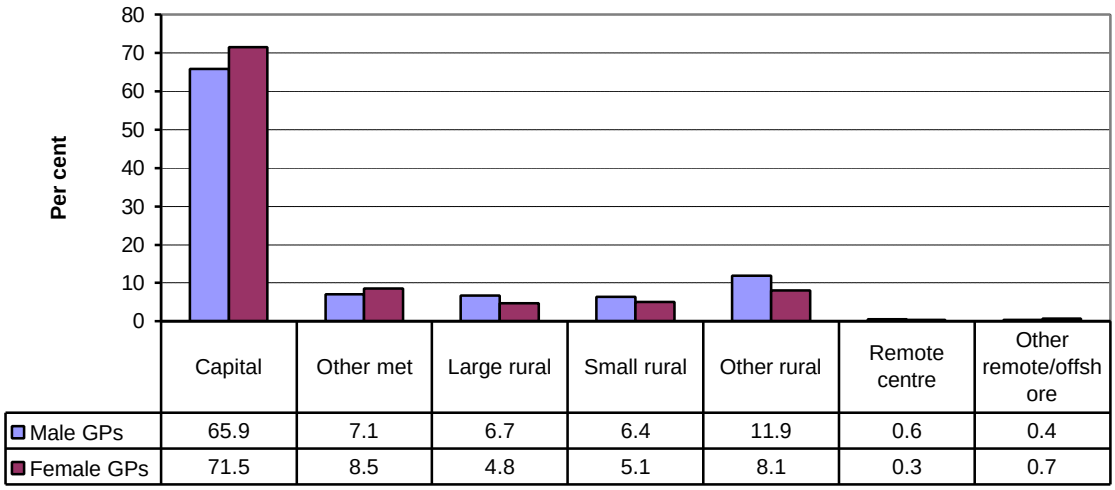


Figure 14.7: Geographic location of practice for male and female GPs by RRMA category

14.3.3 Age and sex distribution of patients

The patients seen by female GPs tended to be younger than those seen by male GPs. Patients aged less than 25 years made up 29% of female GPs' practice compared with 25% of male GPs' practice and women saw fewer older patients, 19% being 65 years or older compared with 25% of patients seeing male GPs (Figure 14.8).

The gender distribution of patients seen by male and female GPS differed markedly. More than two-thirds of patients (69.6%) seeing women GPs were female, while female patients made up only half (52.8%) the male GPs' patient population (Table 14.6).

14.3.4 Other patient characteristics

There was only one other significant difference in the characteristics of patients seen by male GPs compared with those of women GPs. Patients of male GPs were significantly more likely to hold a Veterans' Affairs Gold card than patients of women GPs (Table 14.6). This may reflect the difference in the age distribution of male and female GPs reported earlier.

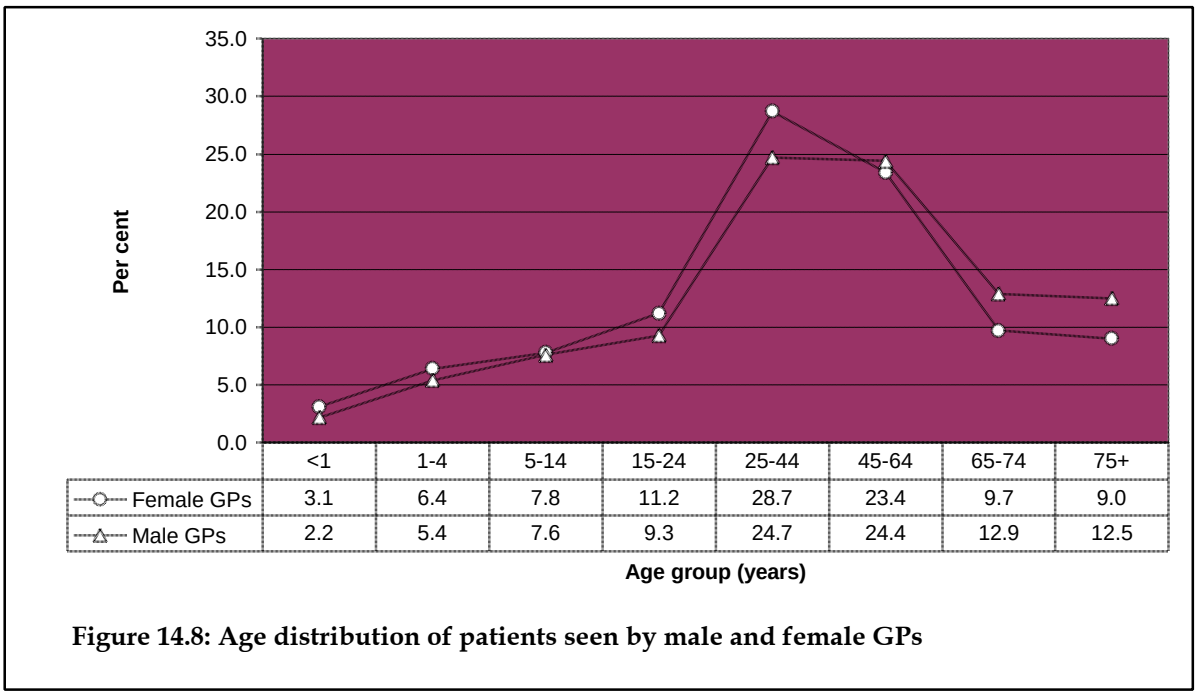


Figure 14.8: Age distribution of patients seen by male and female GPs

Table 14.6: Characteristics of patients seen by male and female GPs

Patient characteristic	Male GPs			Female GPs		
	Rate per 100 encs (N=73,538)	95% LCI	95% LCI	Rate per 100 encs (N=23,363)	95% LCI	95% LCI
Female	52.8	52.2	53.3	69.6	68.3	70.8
New to practice	9.3	8.5	10.0	8.6	7.8	9.4
Health care card	44.2	42.4	45.9	39.7	36.8	42.6
VA gold card	3.4	3.0	3.7	1.9	1.5	2.2
VA white card	0.4	0.2	0.6	0.4	0.0	0.8
NESB	14.7	12.5	17.0	13.7	10.7	16.6
Aboriginal	1.0	0.2	1.9	1.2	0.0	3.0
Torres Strait Islander	0.1	0.0	0.6	0.1	0.0	0.7
Aboriginal & Torres Strait Islander	*	0.0	0.5	0.1	0.0	3.4

* Less than 0.1 per 100 encounters.

Note: Abbreviations: Encs– encounters, UCI –Upper confidence interval, LCI – Lower confidence interval.

14.3.5 The type and content of encounters

Type of encounters

The proportion of direct and indirect encounters, the proportion of encounters charged to Medicare and the relative rate of home visits did not differ between male and female GPs. While the relative rate of short, standard and prolonged surgery consultations also did not differ, women GPs recorded long surgery consultations at a significantly higher rate (9.2 per 100 encounters) than male GPs (6.2). Male GPs recorded significantly higher rates of encounters under the workers' compensation system (2.1 per 100 encounters) than did their female counterparts (1.3 per 100) (Table 14.7).

Content of encounters

There were marked differences in the content of encounters with male and female GPs. While there was no significant difference in the rate of patient reasons for encounter (demonstrated by the overlapping confidence intervals), women GPs managed a significantly higher number of problems (153.5 per 100 encounter) than did male GPs (142.7 per 100). Women GPs saw relatively higher numbers of new problems (92.3 per 100 encounters) than did male GPs (86.1 per 100) but this was due to the higher overall rate of problem management by women. New problems as a proportion of all problems managed did not differ between female (60.1, 95% CIs 58.4–61.9) and male GPs (60.3, 95% CIs 59.1–61.5).

There was no significant difference in the overall medication rate nor in the prescribing rate per 100 encounters for male and female GPs. However when the higher problem rate at encounters with women GPs was considered and rates compared per 100 problems managed, women GPs had lower overall medication rates (55.7 per 100 problems managed, 95% CIs 54.1–57.3) than did male GPs (60.3 per 100, 95% CIs 59.3–61.4). Women GPs also prescribed fewer drugs per problem (58.5 per 100 encounters, 95% CIs 55.9–61.1) than did their male counterparts (66.4 per 100, 95% CIs 64.6–68.3). While women GPs advised purchase of OTC drugs relatively more frequently per 100 encounters this difference disappeared when rates were considered in terms of the number of problems managed.

Clinical treatments were provided by women GPs relatively more often than by male GPs both in terms of rates per 100 encounters and rates per 100 problems managed. In contrast, male GPs recorded procedural treatments relatively more often than their female counterparts in terms of both number per 100 encounters and per 100 problems managed.

The patient was referred to another provider relatively more often by female GPs (13.3 per 100 encounters) than by male GPs (10.6 per 100 encounters) and this difference was not explained by the higher numbers of problems managed at encounters with women GPs, the difference remaining when tested in terms of rate per 100 problems managed.

Orders for imaging were also more frequently made by women GPs but this difference disappeared when considered in terms of the number of problems managed. In contrast, the rates of ordering for pathology differed markedly between male and female GPs. Females placed a pathology order at a rate of 32.8 test orders per 100 encounters compared with 22.1 per 100 encounters for male GPs. This difference was not explained by the higher rates of problem management by women GPs who placed 21.4 pathology test orders per 100 problems managed (95% CIs 20.0–22.7). Male GPs recorded 15.5 test orders for pathology per 100 problems managed (95% CIs 14.7–16.2). (Note that rates per 100 problems managed are not presented) (Table 14.7).

Table 14.7: The type and content of encounters

Variable	Male GPs (N= 689)			Female GPs (N=285)		
	Rate per 100 encs (N=73,538)	95% LCI	95% LCI	Rate per 100 encs (N=23,363)	95% LCI	95% LCI
Type of encounters	. .	. .	. .	. .	. .	. .
Direct consultations	96.9	96.6	97.3	96.0	95.3	96.8
No charge	1.5	1.1	1.8	1.7	0.1	3.3
Medicare paid	90.2	89.1	91.4	90.5	88.9	92.2
Short surgery consultations	1.4	0.9	1.9	1.3	0.4	2.3
Standard surgery consultations	76.9	75.5	78.3	74.6	72.5	76.7
Long surgery consultations	6.2	5.5	6.9	9.2	8.1	10.3
Prolonged surgery consultation	0.4	0.0	1.4	0.9	0.0	3.1
Home visits	1.8	1.3	2.4	1.5	0.2	2.8
Worker's compensation	2.1	1.8	2.4	1.3	0.9	1.6
Indirect consultations	3.1	2.5	3.6	4.0	3.0	5.0
Content of encounters	. .	. .	. .	. .	. .	. .
Reasons for encounter	144.3	137.7	151.0	152.5	142.5	162.4
Problems managed	142.7	140.6	144.9	153.5	150.0	157.0
New problems	86.1	84.4	87.8	92.3	89.9	94.7
Medications (all)	110.1	107.3	112.8	108.7	104.4	112.9
Prescribed	94.8	91.9	97.8	89.8	85.5	94.1
Advised OTC	8.3	7.4	9.3	10.4	9.7	11.3
Supplied	6.9	5.7	8.1	8.5	6.9	10.1
Other clinical treatments	29.4	27.5	31.4	37.4	34.0	40.7
Procedural treatments	12.3	11.5	13.0	10.5	9.7	11.3
Referrals	10.6	10.1	11.0	13.3	12.4	14.1
Pathology	22.1	20.9	23.2	32.8	30.5	35.0
Imaging	6.8	6.3	7.2	8.0	7.4	8.6

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

14.3.6 Nature of morbidity

The types of morbidity managed by male and female GPs differed markedly. Table 14.8 provides a comparison for male and female GPs of the relative rates of management of problems in each of the ICPC-2 chapters and for the more frequent specific types of morbidity. The order in which the chapters are presented is that emerging from the total data.

Male GPs dealt with significantly higher rates of musculoskeletal problems (17.7 per 100 encounters compared with 14.3 per 100 for female GPs). Reflecting the higher proportion of male patients seen by male GPs they also managed male genital problems at a significantly higher rate (1.6 per 100 encounters) than did their female counterparts (0.9).

In contrast, women GPs managed relatively more general/unspecified problems (16.2 compared with 12.2 per 100 encounters) and those associated with the urological system (3.2 compared with 2.4 per 100 encounters). The very high management rate of problems associated with the female genital system (12.6 compared with 4.3 per 100 encounters) and pregnancy and family planning (6.6 compared with 3.2 per 100 encounters with male GPs) reflects, at least to some degree, the high proportion of females in the patient population attending women GPs. In particular, women GPs undertook Pap smears at a significantly higher rate than did male GPs and the difference was very large (4.3 compared with 0.8 per 100 encounters). Other specific problems managed at significantly higher rates by women GPs included pre/post natal check, oral contraception and menopausal complaints. While there was no significant difference in the relative rate of management of psychological problems overall, women did manage depression relatively more often than male GPs.

14.3.7 Conclusion

This descriptive comparison of male and female GPs has served to demonstrate that they have very different patient populations and deal with a different pattern of morbidity. Their management patterns have also been shown to differ. However, whether the differences in morbidity managed are purely a result of differences in patient populations and whether differences in management patterns are a result only of the morbidity managed must be considered. Earlier research based on the AMTS (1990–91) demonstrated similar differences in the characteristics of male and female GPs, the morbidity managed and treatments provided. (Britt et al. 1996a) When the morbidity patterns were adjusted for differences in GP characteristics other than gender, for the characteristics of their patients and for patient selectivity in the problems brought to GPs of different gender (reflected through patient RFEs), some of these differences disappeared. However, others remained, some differences became greater and new differences emerged.

The above comparisons from the BEACH data are purely descriptive. While differences have again been demonstrated in the patterns of practice of male and female GPs, a more detailed analysis which adjusts for differences in other GP and patients characteristics would be required in order to measure any change that has occurred in male and female GP practice over the intervening years.

Table 14.8: Distribution of problems managed across ICPC-2 chapters and most frequent individual problems within chapter

Problems managed	Male GPs			Female GPs		
	Rate per 100 encs[(a)]	95% LCI	95% LCI	Rate per 100 encs[(a)]	95% LCI	95% LCI
Respiratory	**24.6**	**23.7**	**25.4**	**23.4**	**22.4**	**24.7**
URTI	6.9	6.4	7.5	6.5	5.8	7.2
Acute bronchitis/bronchiolitis	3.4	3.0	3.7	3.1	2.6	3.6
Asthma	3.2	2.9	3.4	3.2	2.9	3.5
Musculoskeletal	**17.7**	**17.0**	**18.5**	**14.3**	**13.4**	**15.3**
Back complaint*	2.8	2.4	3.1	2.3	1.9	2.8
Osteoarthritis*	2.3	2.1	2.6	1.8	1.5	2.2
Skin	**16.7**	**16.1**	**17.3**	**15.9**	**15.0**	**16.7**
Contact dermatitis	1.9	1.7	2.0	1.9	1.6	2.1
Circulatory	**16.6**	**15.7**	**17.4**	**14.9**	**13.8**	**15.9**
Hypertension*	8.4	7.9	8.9	7.9	7.1	8.7
General & unspecified	**12.2**	**11.7**	**12.8**	**16.2**	**15.2**	**17.1**
General check-up*	1.5	1.3	1.8	1.6	1.3	1.9
Psychological	**10.1**	**9.5**	**10.7**	**11.7**	**10.7**	**12.6**
Depression*	3.2	3.0	3.5	4.2	3.8	4.6
Anxiety*	1.7	1.5	1.8	1.8	1.4	2.2
Sleep disturbance	1.6	1.4	1.8	1.6	1.3	1.9
Digestive	**10.2**	**9.9**	**10.6**	**10.3**	**9.7**	**10.9**
Oesophageal disease	1.6	1.4	1.7	1.3	1.0	1.5
Endocrine & metabolic	**8.9**	**8.4**	**9.4**	**8.6**	**7.9**	**9.2**
Diabetes*	2.7	2.5	3.0	2.0	1.7	2.3
Lipid disorder	2.5	2.2	2.7	2,4	2.1	2.8
Female genital system	**4.3**	**4.0**	**4.5**	**12.6**	**11.8**	**13.4**
Female genital check-up/Pap smear*	0.8	0.6	0.9	4.3	3.8	4.7
Menopausal complaint	1.2	1.0	1.3	2.5	2.2	2.7
Ear	**4.9**	**4.6**	**5.2**	**5.0**	**4.6**	**5.4**
Acute otitis media/myringitis	1.7	1.4	1.9	2.1	1.8	2.5
Pregnancy & family planning	**3.2**	**2.9**	**3.6**	**6.6**	**5.9**	**7.3**
Pre/post natal check-up*	0.6	0.5	1.2	1.6	0.9	2.3
Oral contraception*	0.8	0.6	1.0	1.5	1.2	1.8
Neurological	**4.0**	**3.8**	**4.2**	**4.0**	**3.7**	**4.3**
Urology	**2.4**	**2.2**	**2.6**	**3.2**	**2.9**	**3.4**
UTI*	1.6	1.4	1.7	1.9	1.7	2.1

(continued)

Table 14.8 (continued): Distribution of problems managed across ICPC-2 chapters and most frequent individual problems within chapter

Problems managed	Male GPs			Female GPs		
	Rate per 100 encs[(a)]	95% LCI	95% LCI	Rate per 100 encs[(a)]	95% LCI	95% LCI
Eye	**2.8**	**2.7**	**3.0**	**2.7**	**2.5**	**3.0**
Blood	**1.6**	**1.4**	**1.7**	**2.1**	**1.3**	**2.9**
Male genital system	**1.6**	**1.4**	**1.7**	**0.9**	**0.6**	**1.1**
Social problems	**0.7**	**0.4**	**0.9**	**1.1**	**0.9**	**1.4**

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

* Indicates multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix III).

Note: Abbreviations: Encs – encounters, UCI – Upper confidence interval, LCI – Lower confidence interval.

14.4 State/Territory data based on patient residence

14.4.1 Summary of data for States and Territories

Participating GPs recorded the postcode of residence for each of the patients encountered, allowing identification of the distribution of patient encounters by State and Territory. While GP practice postcode could also be used to classify State, the patients seeing the GP may well be interstate at the time. The size of the raw datasets for each State or Territory is described in Table 14.9. Though State health departments are not responsible for the costs associated with general practice consultations, they are responsible for other medical services such as those in hospital and are therefore interested in the health of their population.

In a study aiming to represent Australian general practice encounters, the number of encounters reflects the patient and GP population in each State/Territory. It would not be expected that all of the States/territories would have a sufficient sample size to describe specific patterns of care

In the first row of Table 14.9 the number of encounters with patients resident in each of the States is provided. The percentage distribution after removal of missing data (n=310) is presented in the second row. As anticipated the majority of patients (79.5%) resided in New South Wales, Victoria or Queensland. The size of each of these three State datasets is sufficient for individual State based analysis.

Approximately 7,000 encounters were recorded with patients residing in Western Australia, and similar numbers were recorded for residents of South Australia. These sample sizes would allow these two States to gain a broad overview of the more frequent events occurring. However, for less common morbidities or for selected patient groups (such as children or the elderly), reliability may be questionable. Over-sampling of these two States in future years would provide more reliable State results.

The sample sizes for Tasmania, the Northern Territory and the Australian Capital Territory were insufficient for any State/Territory description of general practice activity. Again over-sampling of GPs in these States in future years would provide a valuable data source about the health of the community in each.

Table 14.9: Raw data size by State/Territory (unweighted data)

	NSW	Vic	Qld	WA	SA	Tas[a]	ACT[a]	NT[a]
Encounters [b] (n)	35,768	23,208	18,108	7,204	7,188	2,195	1,682	1,238
Row % (N= 98,400)	37.0	24.0	18.7	7.5	7.4	2.3	1.7	1.3
New patients	3,259	2,020	2,035	661	580	. .	. .	. .
Reasons for encounter	54,158	33,874	25,151	10,728	10,580	. .	. .	. .
Problems managed	53,226	34,614	26,165	10,875	10,431	. .	. .	. .
Prescriptions	35,437	21,440	15,697	6,624	6,327	. .	. .	. .
Other treatments	15,261	10,465	8,746	3,503	3,015	. .	. .	. .
Pathology	9,424	5,873	4,756	1,914	2,016	. .	. .	. .
Imaging	2,683	1,671	1,382	573	490	. .	. .	. .
Referrals	4,419	2,772	1,887	830	902	. .	. .	. .

(a) Sample size insufficient for analysis

(b) Missing data removed

14.4.2 Age and sex of patients by State

The gender distribution of patients resident in each State was relatively constant around the national average of 59% female. The age distributions also tended to the national average of 25% in each age group: <25 years, 25–44 years, 45–64 years and 65+, though there was some variance, with a greater proportion of elderly patients in New South Wales (27.0%) and Western Australia (26.7%) and a lesser proportion in Queensland (23.1%) (Table 14.10).

Table 14.10: Encounter based data

	NSW	Vic	Qld	WA	SA
Sex of patient (%)	. .	. .	. .	. .	. .
Male	41.2	39.8	41.7	41.5	42.0
Female	58.8	60.2	58.3	58.5	58.0
Age of patient (%)	. .	. .	. .	. .	. .
<1 year	2.3	2.1	2.8	1.6	2.1
1–4 years	5.2	4.8	5.8	4.5	5.4
5–14 years	7.1	6.6	8.1	6.0	7.5
15–24 years	9.0	9.7	10.6	9.3	10.3
25–44 years	24.8	26.7	25.4	26.8	26.5
45–64 years	24.7	23.7	24.3	25.1	23.5
65–74 years	13.4	13.0	11.6	13.5	12.0
75+ years	13.6	13.4	11.5	13.2	12.7
Other patient characteristics	. .	. .	. .	. .	. .
New to practice	9.2	8.8	11.4	9.3	8.2
Aboriginal/Torres Strait Islander	0.9	0.2	1.5	2.1	1.6
NESB	16.5	16.5	6.8	13.6	11.0
Health care card	44.0	47.1	47.9	49.6	48.3

The relative frequency of new patient presentations varied between 8.2 per 100 encounters in South Australia and 11.4 per 100 in Queensland. The number of Indigenous persons seen differed between States even more. In Queensland these patients were seen at a rate of 1.5 per 100 encounters, while in Victoria only 0.2% of encounters were with Indigenous persons. Patients with a non-English speaking background were most commonly residents of New South Wales, Victoria (16.5% NESB in each), Western Australia (13.6%) and South Australia (11.0%). The relative number of NESB patients in Queensland was far less.

14.4.3 Nature of morbidity managed

The relative frequencies of the most common problems managed (drawn from the national BEACH dataset) are provided for each of the States in Table 14.11. Note that the National result (column 1) is based on the weighted total dataset while the State results are unweighted. There was some variance between states in the relative rates of management of many of the listed problems, the relative order of the top ten problems remained almost the same.

Table 14.11: Relative frequencies of the national top 20 problems managed by State[(a)]

Most frequent problems managed (rate per 100 encounters)	National (N=96,901)	NSW (N=35,768)	Vic (N=23,208)	Qld (N=18,108)	WA (N=7,204)	SA (N=7,188)
Hypertension*	8.3	9.5	8.3	7.3	8.0	8.3
URTI*	6.8	6.7	6.2	5.9	5.6	6.0
Immunisation/vaccination (all)*	5.2	5.3	5.1	5.2	7.9	5.1
Depression*	3.5	3.4	4.2	3.7	3.6	3.2
Acute bronchitis/bronchiolitis	3.3	3.0	3.6	3.3	2.2	3.0
Asthma	3.2	3.0	3.3	3.1	2.8	3.1
Back complaint*	2.7	2.5	2.7	3.1	3.0	2.5
Diabetes*	2.6	2.5	2.8	2.1	2.5	2.9
Lipid disorder	2.5	2.9	2.3	1.8	2.9	2.1
Osteoarthritis*	2.2	2.4	2.0	1.8	2.4	2.4
Sprain/strain*	1.9	1.5	1.7	1.8	2.0	2.2
Contact dermatitis	1.8	1.8	2.0	1.5	1.6	2.0
Acute otitis media/myringitis	1.8	1.6	1.5	1.9	1.6	1.6
Anxiety*	1.7	1.7	2.0	1.5	1.5	2.1
Sleep disturbance	1.6	1.8	1.6	1.7	1.8	1.6
UTI*	1.6	1.8	1.7	1.5	1.9	1.6
Female genital check-up/Pap smear*	1.6	2.0	2.1	1.6	2.2	2.1
Sinusitis acute/chronic	1.6	1.5	1.4	1.6	1.2	1.5
General check-up*	1.6	1.5	1.6	2.0	1.6	1.9
Oesophageal disease	1.5	1.7	1.2	1.5	1.5	1.4

(a) Results are only provided for States with sufficient sample size

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

14.4.4 Conclusion

This overview of State based data has served to provide each State with an indication of the BEACH data available to them from the 1998–99 data collection period. More detailed analyses could be conducted for the larger States. Such data could be combined with hospital separation data, ABS National Health Survey data and other health information to provide each State and Territory with a more complete picture of the health of their community. In smaller States and Territories over-sampling would be required in future BEACH years to ensure sufficient reliability.

15. Conclusion

This report has served to provide an overview of general practice activity in Australia in 1998-99, the first for almost a decade. Gray suggests that if it is to improve, any profession 'must be able to analyse itself, so it may develop its strengths and diminish its weaknesses.' (Gray 1984). BEACH provides the profession of general practice with such an opportunity. Further, this report describes the normative behaviour of almost one thousand general practitioners who together have more than 10,000 years of clinical experience in this role. Such normative data may well be the best place to start in the development of guidelines of care.

Some significant changes in rates of management of specific morbidities and in some management practices since 1990–91 have been demonstrated. This first years BEACH data can now act as a new baseline against which future changes can be measured—changes occurring in response to public education campaigns, educational interventions or changes in the health care system. The continuing nature of the program will facilitate tracking of these changes over time.

The revised encounter form and newly applied methods of coding, classification and data entry have proved effective. However, the BEACH process is not static. It will evolve with the changing data needs of those organisations supporting the program and with the increased adoption of computer technology in general practice. It will be some time before the standards required for reliable collection of data via computer will be in place. There is still a need for longitudinal de-identified data which would allow assessment of medium and long-term outcomes of care. The General Practice Statistics and Classification Unit continues to work on the development of the analytical techniques to be applied to such data in readiness for its availability.

A number of other publications in the General Practice series are planned for the future. These will include a report of the sixteen topics investigated in the SAND section of the forms during the 1998–99 data year and detailed reports of GP activity related to the National Health Priority Areas.

The potential of this rich database is also immense for others interested in health services research, population health, health economics or quality of health care. The number of research questions that can be applied to the database are innumerable. The examples of analyses of the relational database pertaining to specific areas of interest may help others better understand the manner in which they could utilise the data. The ongoing nature of BEACH will ensure an ever-increasing sample size so that the reliability of the data in describing even relatively rare events will constantly improve.

15.1 Access to the BEACH data

15.1.1 Public domain

In line with standard Australian Institute of Health and Welfare practice, an annual publication will provide a comprehensive view of general practice activity in Australia.

15.1.2 Participating organisations

Organisations providing funding for the BEACH program receive quarterly summary reports of the encounter data and standard reports about their subjects of interest. Analysis of the data is a complex task. The General Practice Statistics and Classification Unit has therefore designed standard report formats that cover most aspects of the subject under investigation.

Standard reports have multiple possible entry points. For example:

- Population-based (e.g. the elderly; non-English speaking background patients),
- encounter type (e.g. long consultations),
- GP type (e.g. rural practitioners),
- test ordering (e.g. pathology of any sort; a specific pathology test),
- referral (e.g. those patients and problems for which a referral to a specialist was made),
- drug-based analyses for individual drugs (brand or generic), drug sub-groups or drug groups,
- diagnostically based analyses for individual ICPC-2 PLUS codes (e.g. hypertension), ICPC individual code (e.g. hypertension; nephropathy), ICPC grouper (e.g. all hypertension), ICPC chapter-component level (e.g. digestive symptoms), or ICPC chapters (e.g. all cardiovascular problems).

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

15.1.3 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.

Appendices

Appendix I. Example of a recording form

Appendix II. GP characteristics questionnaire

The University of Sydney
at Westmead Hospital

General Practice Statistics and Classification Unit
Family Medicine Research Unit
Department of General Practice

A collaborating unit of the
Australian Institute of Health and Welfare

Please fill in boxes or circle answers where appropriate

1. Doctor Identification Number: [ ][ ][ ][ ]

2. Sex: Male / Female 3. Age [ ]

4. How many years have you spent in general practice? [ ]

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

6. How many **full-time** (>5 sessions per week) general practitioners work with you at this practice? (Practice= shared medical records) [ ]

7. How many **part-time** (<6 sessions per week) general practitioners work with you at this practice? (Practice= shared medical records) [ ]

8. Do you conduct more than **50%** of consultations in a language other than English? Yes / No

9. What is the postcode of your major practice address? [ ][ ][ ][ ]

10. Country of graduation: Aust NZ Asia UK Other: _____

11. General Practice training status (CSCT or RACGP training program)? Presently training / Completed training / Not applicable

12. Do you hold FRACGP? Yes / No

13. Are you a member of any of the following organisations? AMA RACGP RDAA

14. How do you routinely instruct pharmacists on the substitution of generic drugs? No substitute allowed / Some substitute allowed

15. Special interests: *(up to three)*

1. Acupuncture	7. Dermatology	13. Paediatrics
2. Anaesthetics	8. Diabetes	14. Preventive medicine
3. Asthma	9. Geriatrics/aged care	15. Psychiatry
4. Cardiology	10. Nutrition	16. Sports medicine
5. Computers	11. Obstetrics/antenatal	17. Surgery
6. Counselling	12. Occup./indust. med.	18. Women's Health

Other _____

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Appendix III. Reasons for encounter and problems managed—code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
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
		L84023	Arthritis spine thoracic
		L84024	Arthritis spine lumbar
		L84025	Arthritis lumbosacral
		L84026	Arthritis sacroiliac
		L89004	Arthritis hip
		L90004	Arthritis knee
		L91009	Arthritis
		L91010	Arthritis acute
		L91011	Arthritis allergic
		L91012	Polyarthritis
		L92006	Arthritis shoulder
		L91002	Arthritis psoriatic
		T99063	Arthritis crystal (excl. gout)

(continued)

Appendix III. (continued): Reasons for encounter and problems managed—code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
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
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	T89		Diabetes, insulin dependent
	T90		Diabetes, non-insulin dependent
	W85		Gestational diabetes
Fracture	L72		Fracture: radius/ulna
	L73		Fracture: tibia/fibula
	L74		Fracture: carpal/metacarpal/tarsal /metatarsal/phalanges

(continued)

Appendix III. (continued): Reasons for encounter and problems managed—code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
	L75		Fracture: femur
	L76		Fracture: other
Hypertension/High BP (for RFEs)	K85		Elevated blood pressure without hypertension
	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
	W81003		Hypertension in pregnancy
Hypertension (for problems)	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
	W81003		Hypertension in pregnancy
Immunisation	A44		Preventive immunisation/medication – general/unspecified
	D44		Preventive immunisation/medication – hepatitis
	N44		Preventive immunisation/medication – tetanus
	R44		Preventive immunisation/medication – influenza
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
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

(continued)

Appendix III. (continued): Reasons for encounter and problems managed—code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
		L91001	Osteoarthritis degenerative
		L91003	Osteoarthritis
		L92007	Osteoarthritis shoulder
Oral contraception	W10		Contraception, postcoital
	W11		Oral contraceptive
	W50		Medication (reproductive system)
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 of skin
Rheumatoid arthritis	L88		Rheumatoid arthritis
Sprain/strain		L19014	Strain muscle(s)
	L77		Sprains and strains of ankle(s)
	L78		Sprains and strains of knee(s)
	L79		Sprains and strains of other joint
		L83023	Sprain neck
		L83024	Strain neck
		L84020	Strain back
		L84021	Sprain back
Swelling	S04		Localised swelling/papules/ lump/mass/skin/subcutaneous tissue
	S05		Generalised swelling/papules/ lumps/mass/skin/subcutaneous tissue

(continued)

Appendix III. (continued): Reasons for encounter and problems managed—code groups from ICPC-2 and ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Test results	-60		Results test/procedures
	-61		Results examinations/test/record/letter from other provider
Tonsillitis	R76		Tonsillitis – acute
	R90		Hypertrophy tonsils/adenoids
Urinary tract infection (UTI)	U70		Pyelonephritis/pyelitis, acute
	U71		Cystitis/other urinary infection, non-venereal

Appendix IV. Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical	Advice – care of other person	A45022	Advice;care of sick 3rd person
		A45023	Advice;care of well 3rd person
		A58001	Counselling;terminal care
	Advice/education	A45002	Advice/education
		B45002	Advice/education;blood
		D45002	Advice/education;digestive
		F45002	Advice/education;eye
		H45002	Advice/education;ear
		K45002	Advice/education;cardiovascular
		L45002	Advice/education;musculoskeletal
		N45002	Advice/education;neurological
		P45001	Advice/education;psychological
		R45002	Advice/education;respiratory
		S45002	Advice/education;skin
		T45002	Advice/education;endocrine/metabolic
		U45002	Advice/education;urology
		W45004	Advice/education;reproductive
		X45002	Advice/education;genital;Female
		Y45002	Advice/education;genital;Male
		Z45002	Advice/education;social
	Advice/education – legal/other	A45017	Advice/education;compensation
		Z45009	Advice/education;legal
	Advice/education – medication	A45015	Advice/education;medication
		A48003	Review;medication
		A48005	Increased;drug dosage
		A48006	Decreased;drug dosage
		A48007	Change (in);drug dosage
		A48008	Stop medication
		A48009	Recommend medication (not new)
		A48010	Change (in);medication
	Advice/education – mothercare	A45024	Advice;mothercare
	Advice/education – treatment	A45016	Advice/education;treatment
		A45019	Advice;time off work
		A45020	Advice;order rest/RIB

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		A45021	Advice;naturopathic treatment
		A48004	Review;treatment
		S45004	Advice/education;RICE
		T45004	Advice/education;diabetes
	Consultation with primary care provider	A46001	Consult;other GP/AHP
		A46002	Consult;nursing
		B46001	Consult;other GP/AHP;blood/blood forming
		K46001	Consult;other GP/AHP;cardiovascular
		L46001	Consult;other GP/AHP;musculoskeletal
		P46001	Consult;other GP/AHP;psychological
		U46001	Consult;other GP/AHP;urology
		Z46001	Consult;other GP/AHP;social
	Consultation with specialist	A47001	Consult;specialist
		F47002	Consult;ophthalmologist
		K47002	Consult;cardiologist
		L47002	Consult;orthopaedic surgeon
		L47003	Consult;rheumatologist
		N47002	Consult;neurologist
		P47003	Consult;psychiatrist
		S47002	Consult;dermatologist
		T47002	Consult;endocrinologist
		U47001	Consult;specialist;urology
		W47002	Consult;obstetrician/gynaecologist
	Counsel/advice – STDs	A45012	Advice/education;STD
		A58008	Counselling;STDs
		X58004	Counselling;STDs;Female
		Y58004	Counselling;STDs;Male
	Counsel/advice – alcohol	P45005	Advice/education;alcohol
		P58009	Counselling;alcohol
	Counsel/advice – drug abuse	P45006	Advice/education;illicit drugs
		P58010	Counselling;drug abuse
	Counsel/advice – exercise	A45004	Advice/education;exercise
		A58005	Counselling;exercise
	Counsel/advice – health/body	A45005	Advice/education;health
		A45010	Information;health
		A45018	Advice/education;body
		A58006	Counselling;health

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Counsel/advice – life style	P45008	Advice/education;life style
		P58012	Counselling;life style
	Counsel/advice – nutrition/weight	A45006	Advice/education;diet
		T45005	Advice/education;nutritional
		T45007	Advice/education;weight mgt
		T58002	Counselling;weight management
	Counsel/advice – occupational	Z45004	Advice/education;occupation
		Z45010	Advice/education;work practice
		Z58004	Counselling;occupational
	Counsel/advice – other	A45014	Advice/education;travel
		P45009	Advice/education;sexuality
		P45010	Advice/education;life stage
		P58016	Counselling;life stage
		Z58005	Counselling;environment
	Counsel/advice – pregnancy	W58004	Counselling;prenatal
		W58006	Counselling;problem;pregnancy
	Counsel/advice – prevention	A45025	Advice/education;immunisation
		A58007	Counselling;prevention
		X45004	Advice/educat;breast self exam
		Z45005	Advice/education;environment
	Counsel/advice – relationship	Z45006	Advice/education;parenting
		Z45007	Advice/education;mothering
		Z58001	Counselling;conjugal(partner)
		Z58003	Counselling;marriage/rship
		Z58006	Counselling;parenting
		Z58007	Counselling;mothering
		Z58009	Counselling;family
	Counsel/advice – relaxation	P45007	Advice/education;relaxation
		P58011	Counselling;relaxation
		P58017	Counselling;stress management
	Counsel/advice – smoking	P45004	Advice/education;smoking
		P58008	Counselling;smoking

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Counselling – problem	A58002	Counselling;problem
		A58003	Counselling;individual
		B58001	Counselling;problem;blood/blood forming
		D58001	Counselling;problem;digestive
		F58001	Counselling;problem;eye
		H58001	Counselling;problem;ear
		K58001	Counselling;problem;cardiovascular
		L58001	Counselling;problem;musculoskeletal
		N58001	Counselling;problem;neurological
		R58001	Counselling;problem;respiratory
		S58001	Counselling;problem;skin
		T58001	Counselling;problem;endocrine/metabolic
		U58001	Counselling;problem;urology
		W58003	Counselling;problem;reproductive
		X58001	Counselling;problem;genital;Female
		X58003	Counselling;sexual;physical;Female
		Y58001	Counselling;problem;genital;Male
		Y58003	Counselling;sexual;physical;Male
		Z58002	Counselling;problem;social
	Counselling – psychological	P58001	Counselling;psychiatric
		P58002	Psychotherapy
		P58004	Counselling;psychological
		P58005	Counselling;sexual;psychological
		P58006	Counselling;individual;psychological
		P58007	Counselling;bereavement
		P58013	Counselling;anger
		P58014	Counselling;self esteem
		P58015	Counselling;assertiveness
	Family planning	W14015	Counselling;genetic;Female
		W45006	Advice/education;preconceptual
		W45007	Advice/education;contraception
		W45008	Advice/education;family plan;Female
		W58001	Counselling;abortion
		W58005	Counselling;terminat pregnancy
		W58007	Counselling;preconceptual
		W58012	Counselling;sterilisation;Female

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		W58013	Counselling;family planning;Female
		Y14006	Counselling;genetic;Male
		Y58005	Counselling;sterilisation;Male
		Y58006	Counselling;family planning;Male
	Observe/wait	A45001	Observe/wait
		B45001	Observe/wait;blood/blood forming organs
		D45001	Observe/wait;digestive
		F45001	Observe/wait;eye
		H45001	Observe/wait;ear
		K45001	Observe/wait;cardiovascular
		L45001	Observe/wait;musculoskeletal
		N45001	Observe/wait;neurological
		P45002	Observe/wait;psychological
		R45001	Observe/wait;respiratory
		S45001	Observe/wait;skin
		T45001	Observe/wait;endocrine/metabolic
		U45001	Observe/wait;urology
		W45003	Observe/wait;reproductive
		X45001	Observe/wait;genital;Female
		Y45001	Observe/wait;genital;Male
		Z45001	Observe/wait;social
	Other admin/document	A62001	Administrative
		A62002	Admin;certificate
		A62003	Admin;document
		A62004	Admin;application
		A62005	Admin;legal report
		A62006	Admin;workers compensation report
		A62007	Admin;certificate;death
		A62009	Admin;travel
		H62001	Administrative;ear
		L62001	Administrative;musculoskeletal
		L62002	Order/supply;physical aids
		P62001	Administrative;psychological
		R62001	Administrative;respiratory
		S62001	Administrative;skin
		T62001	Administrative;endocrine/metabolic
		W62001	Administrative;reproductive

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		Z62001	Administrative;social
		Z62002	Certificate(s);social
		Z62003	Admin;social security
	Other treatment code NEC	R48002	Discuss;pt RFE;respiratory
	Reassurance support	A58010	Reassurance/support
	Sickness certificate	A62008	Admin;certificate;sickness
Procedural	Assist at operation	A69006	Assist at operation
		D69002	Assist at operation;digestive
		L69002	Assist at operation;musculoske
		S69002	Assist at operation;skin
		U69002	Assist at operation;urological
		Y69002	Assist at operation;genital;Male
	Contraceptive device fit/supply/remove	W12005	IUCD;removal
	Diagnostic endoscopy	A40001	Endoscopy
		A40002	Laparoscopy
		D40001	Gastroscopy
		D40002	Proctoscopy
		D40003	Rectoscopy
		D40004	Colonoscopy
		D40007	Sigmoidoscopy
		D40009	Endoscopy;diagnostic;digestive
		L40006	Arthroscopy;knee
		R40001	Bronchoscopy
		R40002	Laryngoscopy;direct
		R40005	Laryngoscopy;indirect
		X40001	Colposcopy
	Diagnostic radiology/imaging	K41001	Echocardiography
	Dressing/pressure/compression/tamponade	A56001	Dressing
		A56002	Compression
		B56002	Compression;blood
		F56002	Compression;eye
		H56001	Packing;ear
		K56001	Reduction (of);haemorrhoids
		K56002	Reduction (of);piles
		K56003	Support;varicose veins
		K56004	Jobst stockings;varicose vein
		K56005	Jobst stockings;lymphadena

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		K56007	Compression;cardiovascular
		L56002	Compression;musculoskeletal
		L56003	Bandage/strap
		R56007	Nasal packing (for) epistaxis
		S56001	Dressing;skin
		S56003	Dressing;burn
		S56004	Dressing;wound
		S56005	Ice pack
		U56003	Incontinence pads
	Electrical tracings	K42002	Electrocardiogram
		K42004	Electrocardiogram;exercise
		K42005	Holter monitor
		K42009	Vectocardiogram
		K42010	Electrocardiogram;stress test
		N42001	Electroencephalogram
		W42001	Monitoring;foetal
	Excision/removal tissue/biopsy/ destruction/debridement/ cauterisation	A52001	Excision
		A52002	Remove
		A52004	Cauterise
		A52007	Removal;foreign body
		B52001	Excision;blood
		B52002	Remove;blood
		B52004	Cauterise;blood
		D52001	Excision;digestive
		D52002	Remove;digestive
		D52005	Cholecystectomy
		D52013	Whipples procedure
		D52015	Appendicectomy
		D52017	Removal;foreign body;mouth
		F52001	Excision;eye
		F52002	Remove;eye
		F52009	Removal;foreign body;eye
		H52001	Excision;ear
		H52002	Remove;ear
		H52006	Removal;foreign body;ear
		K52001	Excision;cardiovascular

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		K52007	Stripping;varicose vein
		L52001	Excision;musculoskeletal
		L52008	Excision;neoplasm;soft tissue
		N52001	Excision;neurological
		R52002	Remove;respiratory
		R52005	Lobectomy
		R52007	Cauterise;nasal
		R52009	Removal;foreign body;nasal
		S52002	Excision;scar tissue
		S52003	Removal;wart
		S52004	Excision;lesions;superficial
		S52006	Debridement;wound
		S52007	Removal;foreign body;skin
		S52008	Excision;skin
		S52009	Remove;skin
		S52011	Cauterise;skin
		S52012	Excision;neoplasm/cyst;benign
		S52013	Debridement;burn
		S52014	Cryotherapy
		S52015	Electrocautery/diathermy
		S52017	Laser treatment
		S52018	Excision;neoplasm;malignant
		S52019	Excision;mole
		S52020	Excision/debride;plantar wart
		S52022	Resection;ingrown toenail(s)
		S52023	Cautery;chemical
		S52024	Removal;foreign body;nail
		S52025	Biopsy;skin
		S52026	Removal;toenail(s)
		S52027	Removal;fingernail(s)
		S52028	Resection;ingrown fingernail(s
		S52029	Curettage;skin/wound
		S52030	Excision;cyst;skin
		W52010	Dilatation and curettage
		X52001	Biopsy;endometrial
		X52002	Excision;genital;Female
		X52005	Cauterise;genital;Female

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		X52008	Polypectomy;cervical
		X52017	Oophorectomy;unilateral
		X52021	Removal;foreign body;vagina
		Y52001	Procedure;circumcision;Male
		Y52006	Excision;cyst;epididymal
		Y52007	Vasectomy
	Incise/drainage/flushing/aspiration/removal body fluid	A51001	Incise;body fluids
		A51002	Drain;body fluids
		A51003	Aspirate;body fluids
		A51005	Venesection
		B51001	Incise;body fluids;blood
		B51002	Drain;body fluids;blood
		D51003	Drain;body fluids;digestive
		D51004	Aspirate;body fluids;digestive
		F51001	Eye;washing
		F51003	Incise;body fluids;eye
		F51004	Drain;body fluids;eye
		H51001	Clean ear
		H51002	Removal;wax;ear
		H51004	Syringe ear;for wax
		H51007	Drain;body fluids;ear
		H51009	Syringe ear
		K51002	Incise;haemorrhoid
		L51001	Aspiration;bursa
		L51002	Aspiration;joint(s)
		L51006	Incise;body fluids;musculoskeletal
		L51007	Drain;body fluids;musculoskeletal
		L51008	Aspirate;body fluids;musculoskeletal
		L51009	Aspiration;cyst;musculoskeletal
		N51002	Lumbar puncture
		R51003	Drain;body fluids;respiratory
		S51001	Incise;haematoma;skin
		S51003	Incise/drain;abscess;skin
		S51004	Aspiration;abscess;skin
		S51007	Incise;body fluids;skin
		S51008	Drain;body fluids;skin

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		S51009	Aspirate;body fluids;skin
		S51010	Incise/drain;cyst;skin
		T51001	Implant;oestrogen
		T51006	Implant;testosterone
		X51004	Aspiration;cyst;breast
		D53002	Dilate;digestive
		D53003	Enema
		H53004	Drainage tube(s);middle ear
		K53007	Stent(s);carotid
		U53001	Dilate;urethral
		U53002	Insertion;catheter;urinary
		U53006	Removal;catheter;urinary
		U53007	Catheterise;urology
		U53009	Insertion;catheter;suprapubic
		U53010	Removal;catheter;suprapubic
		U53012	Care (of);catheter
		Y53001	Catheterise;genital;Male
	Local injection/infiltration	A55001	Infiltrate
		A55002	Local anaesthetic
		K55001	Injection;varicose vein
		L55001	Injection;bursa
		L55002	Injection;joint(s)
		L55003	Injection;tendon(s)
		L55008	Injection;trigger point;muscul
		L55011	Injection;intra-articular
		N55001	Block;nerve
		N55002	Injection;nerve(s)
		N55003	Injection;trigger point;neurological
		N55004	Injection;local;CNS
		S55001	Injection;lesions/cysts;skin
		S55002	Infiltrate;skin
		T55002	IV fluids/infusion
	Other diagnostic procedures	B43001	Procedures;diagnostic;blood
		D43002	Procedures;diagnostic;digestive
		F43001	Procedures;diagnostic;eye
		H43001	Procedures;diagnostic;ear
		K43003	Test;Doppler

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		L43002	Procedures;diagnostic;musculoskeletal
		L43003	Test;bone marrow density
		P43001	Test;psychological
		S43001	Procedures;diagnostic;skin
		U43002	Procedures;diagnostic;urology
		X43001	Procedures;diagnostic;genital;Female
	Other preventive procedures/high risk medication condition	A49004	Preventive procedure
		L49001	Preventive procedure;musculoskeletal
		N49001	Preventive procedure;neurolog
		S49001	Preventive procedure;skin
		U49001	Preventive procedure;urology
	Other therapeutic procedures/surgery NEC	A59001	Therapeutic proced
		A59002	Acupuncture
		A59003	Personal care
		A59004	Oxygen
		B59002	Blood transfusion
		D59002	Therapeutic proced;digestive
		D59009	Care (of);colostomy
		F59001	Therapeutic proced;eye
		H59001	Piercing;ear
		H59002	Therapeutic proced;ear
		L59001	Therapeutic proced;musculo
		L59002	Carpal tunnel release
		P59003	Hypnosis/hypnotherapy
		P59005	Therapy;relaxation
		R59001	Therapeutic proced;respiratory
		R59003	Steam inhalation
		S59001	Therapeutic proced;skin
		S59002	Podiatry
		T59001	Therapeutic proced;endo/metab
		U59001	Dialysis;kidney (renal)
		U59003	Therapeutic proced;urology
		X59001	Therapeutic proced;genital;Female
		Y59001	Therapeutic proced;genital;Male

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Other treatment code NEC	D33008	Test;faeces MC&S
		R69002	Assist at operation;respirator
		T34006	Test;cholesterol
		U41001	Pyelogram;intravenous
		W14010	Contraception;diaphragm
		W69002	Assist at operation;reproduct
		X41001	Mammography;Female
	Pap smear	X37001	Pap smear
	Physical function test	A39001	Test;physical function
		F39003	Schiotz tonometry
		F39005	Test;vision
		F39006	Test;visual field
		F39013	Test;physical function;eye
		H39001	Test;audiometry
		H39003	Test;hearing
		H39007	Test;tympanometry
		H39008	Test;physical function;ear
		N39001	Test;physical function;neuro
		R39002	Test;peak flow
		R39003	Test;pulmonary function
		R39004	Test;spirometry
		R39005	Test;lung function
		R39007	Test;physical function;respira
	Physical medicine/rehabilitation	A57001	Rehab;physical
		A57002	Radiotherapy
		A57003	Therapy;physical
		A57004	Massage
		A57005	Home assessment
		K57001	Rehab;physical;cardiovascular
		L57001	Joint;manipulation
		L57002	Rehab;physical;musculo
		L57003	Therapy;ultrasound;musculoskeletal
		L57004	Therapy;short wave;musculoskeletal
		L57005	Physiotherapy
		L57006	Therapy;heat
		L57007	Hydrotherapy
		L57008	Therapy;microwave;musculoskeletal

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Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		L57009	Electrical stimulation
		L57010	Therapeutic exercises
		R57001	Therapy;respiratory
		X57001	Rehab;physical;genital;Female
		Y57001	Massage;prostatic
	Pregnancy test	W33001	Test;urine;pregnancy
		W33002	Test;pregnancy
	Repair/fixation-suture/cast/prosthetic device (apply/remove)	D54002	Hernia;support truss
		D54007	Surgery/extraction;dental
		D54010	Repair;hernia;inguinal
		F54001	Fitting (of);glasses
		F54002	Fitting (of);contact lens
		H54001	Adjusting;hearing aid
		K54009	Repair/replace;valve;mitral
		L54001	Adjusting;brace;back
		L54004	Cast (for);fracture
		L54005	Cast (for);removal
		L54009	Application;support;neck
		L54011	Application;collar;cervical
		L54014	Plaster (for);fracture
		L54017	Splint/immobilise;joint(s)
		L54018	Fixation/support;tendon(s)
		L54019	Strapping;sprains/strains
		L54022	Fitting (of);brace;back
		L54023	Fitting (of);brace;leg
		L54033	Replace;joint;hip
		L54034	Sling
		L54038	Osteotomy
		L54039	Adjusting;brace;leg
		L54040	Plaster;removal (of)
		L54041	Plaster;repair (of)
		L54042	Cast (for);repair/alter
		L54043	Plaster (for);sprain
		L54044	Plaster (for);strain
		L54045	Splint/immobilise;fracture
		L54046	Splint/immobilise;removal

(continued)

Appendix IV (continued): Non-pharmacological treatment code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		L54047	Splint/immobilise;repair (of)
		L54048	Splint/immobilise;sprain
		L54049	Splint/immobilise;strain
		L54060	Treat;fract/disloc;humerus
		L54070	Treat;fract/disloc;pelvis
		L54072	Treat;fract/disloc;radioulnar
		L54073	Treat;fract/disloc;radius
		L54077	Treat;fract/disloc;shoulder
		L54089	Replace;joint;shoulder
		L54097	Treat;fract/disloc
		N54006	Clipping;aneurysm;intracranial
		S54001	Repair;laceration;skin
		S54002	Suture;laceration;skin
		S54004	Repair;skin
		S54006	Removal;suture(s)
		S54008	Repair;wound;skin
		W54010	Episiotomy;repair
		X54001	Insertion;pessary
		Y54002	Fixate;genital;Male
	Sensitivity test	A32001	Test;sensitivity
	Sensitivity test	D32001	Test;sensitivity;digestive
	Sensitivity test	R32001	Test;Mantoux
		S32001	Test;sensitivity;skin
	Test; glucose	T34005	Test;glucose
	Urine test	A35001	Test;urine
		A35002	Urinalysis
		B35001	Test;urine;blood
		T35001	Test;urine;endocrine/metabolic
		W35001	Test;urine;reproductive

Appendix V. Referrals—code groups from ICPC-2 and ICPC-2 PLUS

Referral group	ICPC-2 PLUS code	ICPC-2 PLUS label
Allied health services	all component '66'	Referral to other provider/nurse/therapist/social worker
	component '68', excluding A68009	Other referrals NEC
	Z67002	Referral; respite care
Specialist	component '67', excluding A67011, A67010, P67005 and Z67002	Referral to physician/specialist/clinic/hospital
	A68009	Referral; oncologist
Emergency department	A67011	Referral;A&E
Hospital	A67010	Referral;hospital
	P67005	Referral;hospital;psychiatrist

Appendix VI. Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
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
	Cardiac enzymes	D34005	Test;asparate aminotransferase
		K34003	Test;cardiac enzymes
		K34004	Test;creatine kinase
	Chemistry; other	A34015	Test;protein
		A34018	Vitamin assay
		B34023	Test;transferrin
		D34002	Test;alanine aminotransferase
		K34001	Test;blood;digitalis
		N34001	Test;blood;phenylhydantoin
		P34003	Test;methadone
	Digoxin	A34002	Drug assay
		K34005	Test;digoxin
		N34003	Test;phenytoin
		P34002	Test;lithium
	Drug screen	A35003	Drug screen
	EUC	A34007	Test;chloride
		A34008	Test;electrolytes
		A34010	Test;EUC
		A34014	Test;potassium
		A34017	Test;sodium
		U34002	Test;creatinine
		U34003	Test;urea
	Ferritin	B34016	Test;ferritin
		B34019	Tests;iron studies
	Folic acid	B34017	Test;folic acid
	Glucose tolerance	T34005	Test;glucose
		T34009	Test;glucose tolerance
	HbA1c	T34010	Test;HbA1c

(continued)

Appendix VI (continued): Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Hormone assay	A34003	Hormone assay
		T34007	Test;cortisol
	Lipids	T34001	Check-up;cholesterol
		T34004	Test;lipids profile
		T34006	Test;cholesterol
		T34011	Test;cholesterol HDL
		T34013	Test;cholesterol LDL
		T34016	Test;triglycerides
	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;mult biochemical analysis
	Prostate specific antigen	Y34002	Test;acid phosphatase
		Y34003	Test;prostate specific antigen
	Thyroid function	T34015	Test;thyroid function
	Urate/uric acid	U34004	Test;urate/uric acid
Cytopathology	Cytology; other	A37002	Test;cytology
		B37003	Test;cytology;blood
		D37002	Test;cytology;digestive
		F37002	Test;cytology;eye
		H37002	Test;cytology;ear
		K37002	Test;cytology;cardiovascular
		L37002	Test;cytology;musculoskeletal
		N37002	Test;cytology;neurological
		R37002	Test;cytology;respiratory
		R37003	Test;sputum cytology
		S37002	Test;cytology;skin
		T37002	Test;cytology;endocr/metabol
		U37002	Test;cytology;urology
		W37002	Test;cytology;reproduction
		Y37002	Test;cytology;genital;Male
	Pap smear	X37001	Pap smear
		X37003	Test;cytology;genital;Female
Haematology	Blood grouping & typing	B33001	Test;Coombs

(continued)

Appendix VI (continued): Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
		B33002	Test;blood grouping & typing
	Blood; other	B33003	RH;antibody titer
		B34005	Test;blood;platelets
		B34007	Test;blood;sickle cell
		B34021	Test;reticulocyte count
		B37001	Exam;bone marrow
	Coagulation	B34002	Test;blood;coagulation/bleed
		B34003	Test;blood;coagulation time
		B34006	Test;part thromboplastin time
		B34008	Test;bleeding/coagulation time
		B34009	Test;prothrombin time
		B34014	Test;APTT
		B34022	Test;thrombin time
	ESR	A34009	Test;ESR
	Full blood count	A34011	Test;full blood count
	Haemoglobin	B34018	Test;haemoglobin
Histopathology	Histology; other	A37001	Test;histology
		B37002	Test;histology;blood
		D37001	Test;histology;digestive
		F37001	Test;histology;eye
		H37001	Test;histology;ear
		K37001	Test;histology;cardiovascular
		L37001	Test;histology;musculoskeletal
		N37001	Test;histology;neurological
		R37001	Test;histology;respiratory
		T37001	Test;histology;endoc/metabol
		U37001	Test;histology;urology
		W37001	Test;histology;reproductive
		X37002	Test;histology;genital;Female
		Y37001	Test;histology;genital;Male
	Histology; skin	S37001	Test;histology;skin
Immunology	Anti nuclear antibodies	L33004	Test;anti nuclear antibodies
	Immunology; other	A32001	Test;sensitivity
		A33005	Test;immunology
		B33005	Test;immunology;blood

(continued)

Appendix VI (continued): Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
		B33007	Test;immunoglobulins
		D32001	Test;sensitivity;digestive
		D33004	Test;immunology;digestive
		H33002	Test;immunology;ear
		K33002	Test;immunology;cardiovascular
		L33003	Test;immunology;musculoskeletal
		L34001	Test;lupus erythemat;cell prep
		N33002	Test;immunology;neurological
		R32004	Test;sensitivity;respiratory
		R33004	Test;immunology;respiratory
		S32001	Test;sensitivity;skin
		S33002	Test;immunology;skin
		S33004	Test;skin patch
		T33002	Test;immunology;endocrine/metabolic
		U33003	Test;immunology;urology
		W33007	Test;immunology;reproductive
		X33002	Test;immunology;genital;Female
		Y33002	Test;immunology;genital;Male
	RAST	A34016	Test;RAST
	Rheumatoid factor	L33001	Test;rheumatoid factor
Infertiliity/pregnancy test	Infertility/pregnancy	W33001	Test;urine;pregnancy
		W33002	Test;pregnancy
		W34002	Test;blood;pregnancy
		W34003	Test;antenatal
		Y38002	Test;sperm count
Microbiology	Antibody	A33003	Test;antibody
	Cervical swab	X33004	Test;cervical swab
	Chlamydia	A33006	Test;chlamydia
		X33006	Test;viral culture;genital;Female
	Ear swab and C&S	H33003	Test;ear swab and C&S
	Faeces MC&S	D33002	Stool(s);culture
		D33008	Test;faeces MC&S
		D36001	Test;faeces;cyst/ova/parasite
	Fungal ID/sensitivity	A33008	Test;fungal ID/sensitivity

(continued)

Appendix VI (continued): Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
	H pylori	D33009	Test;H Pylori
		D33005	Test;hepatitis A serology
		D33006	Test;hepatitis B serology
		D33007	Test;hepatitis C serology
		D33013	Test;hepatitis serology
	HIV	B33006	Test;HIV
	Microbiology; other	A33004	Test;microbiology
		A33007	Test;culture and sensitivity
		B33004	Test;microbiology;blood
		D33003	Test;microbiology;digestive
		D33010	Test;hepatitis D serology
		D33011	Test;hepatitis E serology
		D33012	Test;rotavirus
		F33001	Test;microbiology;eye
		H33001	Test;microbiology;ear
		K33001	Test;microbiology;cardiovascular
		L33002	Test;microbiology;musculoskeletal
		N33001	Test;microbiology;neurological
		R33001	Culture;tuberculosis
		R33002	Culture;throat
		R33003	Test;microbiology;respiratory
		S33001	Test;microbiology;skin
		T33001	Test;microbiology;endoc/metabolic
		U33002	Test;microbiology;urology
		W33006	Test;microbiology;reproductive
		X33001	Test;microbiology;genital;Female
		X33003	Culture;gonococcal;Female
		Y33001	Test;microbiology;genital;Male
		Y33003	Culture;gonococcal;Male
		Y33004	Test;viral culture;genital;Male
		Y33005	Test;urethral/penile swab
	Monospot	A33002	Test;monospot
	Nose swab C&S	R33008	Test;nose swab C&S
	Pertussis	R33007	Test;pertussis
	Ross River fever	A33009	Test;Ross River fever
	Rubella	A33001	Test;rubella

(continued)

Appendix VI (continued): Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Skin swab C&S	S33003	Test;skin swab C&S
	Sputum C&S	R33005	Test;sputum MC&S
	Throat swab C&S	R33006	Test;throat swab C&S
	Urine MC&S	U33001	Test;culture;urine
		U33004	Test;urine MC&S
	Vaginal swab and C&S	X33005	Test;vaginal swab and C&S
	Venereal disease	A33010	Test;venereal disease
Other NEC	Blood test	A34001	Test;blood
	Other test NEC	A38001	Test;other lab
	Faeces test	A36001	Test;faeces
		A38002	Pathology
		B38001	Test;other lab;blood
		D34001	Test;blood;digestive
		D35001	Test;urine;digestive
		D36002	Test;faeces;digestive
		D38001	Test;other lab;digestive
		F34001	Test;blood;eye
		F38001	Test;other lab;eye
		H34001	Test;blood;ear
		H38001	Test;other lab;ear
		K34002	Test;blood;cardiovascular
		K38001	Test;other lab;cardiovascular
		L34003	Test;blood;musculoskeletal
		L38001	Test;other lab;musculoskeletal
		N34002	Test;blood;neurological
		N38001	Test;other lab;neurological
		P34001	Test;blood;psychological
		P35001	Test;urine;psychological
		P38001	Test;other lab;psychological
		R34001	Test;blood;respiratory
		R38001	Test;other lab;respiratory
		S34001	Test;blood;skin
		S38001	Test;other lab;skin
		T34002	Test;blood;endocr/metabolic
		T35001	Test;urine;endocrine/metabolic

(continued)

Appendix VI (continued): Pathology test orders—code groups from ICPC-2 and ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
		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;Female
		X35001	Test;urine;genital;Female
		X38001	Test;other lab;genital;Female
		Y34001	Test;blood;genital;Male
		Y35001	Test;urine;genital;Male
		Y38001	Test;other lab;genital;Male
		Z38001	Test;other lab;social
	Urinalysis	A35002	Urinalysis
	Urine test	A35001	Test;urine
	Simple test; other	B35001	Test;urine;blood
	Simple test; other	D36003	Test;occult blood
	Simple test; other	R32001	Test;Mantoux
	Simple test; other	R32002	Test;tuberculin

Appendix VII. Imaging test orders—code groups from ICPC-2 and ICPC-2 PLUS

Imaging group	ICPC-2 PLUS code	ICPC-2 PLUS label
Plain	A41002	X-ray;chest
	A41006	X-ray;abdomen
	D41006	X-ray;oesophagus
	D41008	X-ray;digestive tract
	D41009	X-ray;mouth
	F41002	X-ray;eye
	H41002	X-ray;ear
	L41003	X-ray;bone(s)
	L41004	Plain X-ray;bone(s)
	L41013	X-ray;elbow
	L41014	X-ray;hand
	L41015	X-ray;wrist
	L41016	X-ray;knee
	L41017	X-ray;hip
	L41018	X-ray;neck
	L41019	X-ray;pelvis
	L41020	X-ray;shoulder
	L41021	X-ray;lumbosacral
	L41022	X-ray;cervical
	L41023	X-ray;thoracic
	L41024	X-ray;spinal
	L41025	X-ray;joint(s)
	L41026	X-ray;foot/feet
	L41027	X-ray;ankle
	L41028	X-ray;leg
	L41029	X-ray;ribs
	L41030	X-ray;face
	L41032	X-ray;arm
	N41004	X-ray;skull
	R41002	X-ray;sinus
	U41007	X-ray;urinary tract
	W41003	X-ray;uterus
	X41001	Mammography;Female
	X41002	Mammography;request;Female

(continued)

Appendix VII (continued): Imaging test orders—code groups from ICPC-2 and ICPC-2 PLUS

Imaging group	ICPC-2 PLUS code	ICPC-2 PLUS label
	X41007	X-ray;breast;Female
Contrast/ultrasound/CT scan	A41003	Test;US/CT/contrast
	A41004	Test;US/CT/contrast;abdomen
	A41005	Test;US/CT/contrast;chest
	A41008	MRI
	D41002	Test;US/CT/contrast;gallbladder
	D41004	Test;US/CT/contrast;oesophagus
	D41010	Test;US/CT/contrast;stomach/duodenum
	D41011	Test;US/CT/contrast;colon
	K41005	Angiography;coronary
	K41007	Angiography;cerebral
	K41008	Test;US/CT/contrast;vascular
	K41009	Test;US/CT/contrast;cardiac
	K41010	Test;US/CT/contrast;heart
	L41001	Arthrogram
	L41006	Test;US/CT/contrast;pelvis
	L41007	Test;US/CT/contrast;musculosk
	L41008	Test;US/CT/contrast;neck
	L41009	Test;US/CT/contrast;spine
	L41010	Test;US/CT/contrast;joint
	L41011	Test;US/CT/contrast;face
	L41012	Test;US/CT/contrast;extremity
	L41031	Test;US/CT/contrast;shoulder
	N41002	Test;US/CT/contrast;brain
	N41003	Test;US/CT/contrast;head
	T41002	Test;US/CT/contrast;endo/metab
	U41006	Test;US/CT/contrast;urin tract
	W41001	Test;US/CT/contrast;obstetric
	X41006	Test;US/CT/contrast;breast;Female
	X41008	Test;US/CT/contrast;genital;Female
	Y41002	Test;US/CT/contrast;prostate
	Y41003	Test;US/CT/contrast;scrotum
	Y41004	Test;US/CT/contrast;genital;Male

(continued)

Appendix VII (continued): Imaging test orders—code groups from ICPC-2 and ICPC-2 PLUS

Imaging group	ICPC-2 PLUS code	ICPC-2 PLUS label
Other	A41007	Imaging other
	A41009	Nuclear medicine
	A41010	Radiology
	A41011	Isotope scan
	K41001	Echocardiography
	K41003	Cardiogram
	K42002	Electrocardiogram
	K42005	Holter monitor
	K43003	Test;Doppler
	L40006	Arthroscopy;knee
	L41002	Scan;bone(s)
	L43003	Test;bone marrow density
	N41001	Radiology;diagnostic;neurolog
	U41001	Pyelogram;intravenous

Glossary

Aboriginal	The patient identifies himself or herself as an Aboriginal person.
Activity level	Number of general practice Medicare items claimed during the previous twelve months by a participating general practitioner.
Allied health professionals	Those who provide clinical and other specialised services in the management of patients, including physiotherapists, occupational therapists, dietitians and pharmacists.
Chapters	The main divisions within ICPC-2 PLUS: there are 17 chapters primarily representing the body systems.
Complaint	A symptom or disorder expressed by the patient when seeking care.
Component	In ICPC-PLUS 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 which requires ongoing care. Includes follow-up for a problem or an initial presentation of a problem previously assessed by another provider.
Drug	See Medication
Drug status	
• **new**	The drug prescribed/advised/provided at the encounter is being used for the management of the problem for the first time.
• **continuation**	The drug prescribed/advised/provided at the encounter is a continuation or repeat of previous therapy for this problem.

Encounter (enc)	Any professional interchange between a patient and a general practitioner:
• **indirect**	Encounter where there is no face-to-face meeting between the patient and the general practitioner but a service is provided (eg: prescription, referral).
• **direct**	Encounter where there is a face-to-face meeting of the patient and the general practitioner. Direct encounters can be further divided into encounters covered by,
♦ **Medicare**	
– surgery consultations	encounters identified by any one of MBS item numbers 3; 23; 36; 44
– home visits	encounters identified by any one of MBS item numbers 4; 24; 37; 47
– hospital encounter	encounters identified by any one of MBS item numbers 19; 33; 40; 50
– nursing home visits	encounters identified by any one of MBS item numbers 20; 35; 43; 51
– other institutional visits	encounters identified by any one of MBS item numbers 13; 25; 38; 40
– other MBS encounters	encounters identified by an MBS item number which does not identify place of encounter
♦ **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 which is prescribed, advised for over the counter purchase or provided by the GP at the encounter.
MIMS	A widely distributed bi-monthly index of drugs in medicine.
Morbidity	Any departure, subjective or objective, from a state of physiological well-being. In this sense, sickness, illness and morbid conditions are synonymous.
Patient status	
• **new**	The patient has not been seen before in the practice.
• **old**	The patient has attended the practice before.
Problem managed	See Diagnosis
Provider	A person to whom a patient has access when contacting the health care system.

Reasons for encounter (RFEs)	The subjective reasons given by the patient for seeing or contacting the general practitioner. These can be expressed in terms of symptoms, diagnoses or the need for a service.
Recognised GP	A medical practitioner who is vocationally recognised under Section 3F of the Health Insurance Act, ***or*** a holder of the Fellowship of the Royal Australian College of General Practitioners who participates in, and meets the requirements for, quality assurance and continuing medical education as defined in the RACGP Quality Assurance and Continuing Medical Education Program, ***or*** undertaking an approved placement in general practice as part of a training program for general practice leading to the award of the Fellowship of the Royal Australian College of General Practitioners or undertaking an approved placement in general practice as part of some other training program recognised by the RACGP as being of equivalent standard. (Medicare Benefits Schedule book, 1 November 1998)
Referral	The process by which the responsibility for part or all of the care of a patient is temporarily transferred to another health care provider. Only new referrals to specialist, allied health professionals, and for hospital and nursing home admissions arising at a recorded encounter are included. Continuation referrals are not included. Multiple referrals can be recorded at any one encounter.
Rubric	An individual code in ICPC-2 PLUS.
Torres Strait Islander	The patient identifies himself or herself as a Torres Strait Islander.
Veterans' Affairs Gold	A person who holds a Gold Card from the Department of Veterans' Affairs.
Veterans' Affairs White	A person who holds a White Card from the Department of Veterans' Affairs.
Work related problem	Irrespective of the source of payment for the consultation, it is likely in the GP's view that the problem has resulted from work-related activity or workplace exposures or that a pre-existing condition has been significantly exacerbated by work activity or workplace exposure.

Abbreviations

ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
AMA	Australian Medical Association
AMS	Aboriginal Medical Service
AMTS	Australian Morbidity and Treatment Survey 1990–91
ATC	Anatomical Therapeutic Chemical (classification)
ATSI	Aboriginal and/or Torres Strait Islander
BEACH	Bettering the Evaluation And Care of Health
BMI	Body mass index
BP	Blood pressure
CAPS	Coding Atlas for Pharmaceutical Substances
CI	Confidence interval (in this report 95% Cis are used)
CNS	Central nervous system
CT	Computed tomography
CVS	Cardiovascular system
DHAC	Commonwealth Department of Health and Aged Care
ECG	Electrocardiogram
Enc	Encounter
ENT	Ear, nose and throat
ESR	Erythrocyte sedimentation rate
EUC	Electrolytes, urea, creatinine
FBC	Full blood count
FMRU	Family Medicine Research Unit, Department of General Practice, the University of Sydney (now the Family Medicine Research Centre)
GP	General practitioner
GPII	General Practice Immunisation Incentives
GPSCU	General Practice Statistics and Classification Unit, University of Sydney, a collaborating unit of the Australian Institute of Health and Welfare
HBA1C	Glycohaemoglobin whole blood test
HCC	Health care card
HIC	Health Insurance Commission
HIV	Human immunodeficiency virus
ICHPPC	International Classification of Health Problems in Primary Care
ICPC	International Classification of Primary Care
ICPC-2	International Classification of Primary Care (Version 2)
ICPC-2 PLUS	An extended vocabulary of terms classified according to ICPC-2

IHD	Ischaemic heart disease
LCI	Lower confidence interval
MBS	Medicare Benefits Schedule
MC&S	Microscopy culture and sensitivity
NEC	Not elsewhere classified
NESB	The patient reports coming from a non-English speaking background i.e. a language other than English is spoken at home.
NHMRC	National Health and Medical Research Council
NOS	Not otherwise specified
NSAID	Nonsteroidal anti-inflammatory drugs
NSW	New South Wales
NT	Northern Territory
OA	Osteoarthritis
OTCs	Drugs advised for over the counter purchase
PBS	Pharmaceutical Benefits Scheme
PDD	Prescribed daily dose
Qld	Queensland
RACGP	Royal Australian College of General Practitioners
RFE	Reason for encounter (see Glossary)
RRMA	Rural, remote and metropolitan area classification
RSE	Relative standard error
SA	South Australia
SAND	Supplementary analysis of nominated data
Tas	Tasmania
UCI	Upper confidence interval
URTI	Upper respiratory tract infection
UTI	Urinary tract infection
VA	Veterans' Affairs
Vic	Victoria
WA	Western Australia
WHO	World Health Organisation
WONCA	World Organisation of Family Doctors

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