

7 Problems managed

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

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

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

The relative frequency of problems managed can be described in two ways: as a percentage of all problems managed in the study, or as a rate of problems managed per 100 encounters. Where groups of problems are reported (e.g. circulatory problems), it must be remembered that more than one type of problem (e.g. hypertension and oedema) could have been managed at a single encounter. In considering these results, the reader must be mindful that although a rate per 100 encounters for a single ungrouped problem (e.g. asthma, 2.7 per 100 encounters) can be regarded as equivalent to 'asthma is managed at 2.7% of encounters', such a statement cannot be made for grouped concepts.

7.1 Number of problems managed at encounter

A total of 146,336 problems were managed at the 100,987 patient encounters, at an average rate of 144.9 problems per 100 encounters. At two-thirds of encounters (66.9%) only one problem was managed, while three or more problems were managed at 9.7% of encounters (Table 7.1).

Table 7.1: Number of problems managed at an encounter

Number of problems managed at encounter	Number of encounters	Per cent	95% LCL	95% UCL
One problem	67,588	66.9	65.8	68.1
Two problems	23,585	23.4	22.6	24.1
Three problems	7,678	7.6	7.2	8.0
Four problems	2,136	2.1	1.7	2.5
Total	100,987	100.0	—	—

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

7.2 Nature of morbidity

Problems managed by ICPC-2 chapter

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

Overall, half of the problems managed in general practice related to four major body systems – the respiratory, musculoskeletal, skin and circulatory systems. Problems related to the endocrine and metabolic system were commonly managed as were psychological problems and problems relating to the digestive system. Problems least frequently presented related to the blood and blood-forming organs, the male genital system or were of a social nature. Almost 11% of problems managed were not simply related to a single body system and were classified in the general and unspecified chapter.

At the chapter level, respiratory problems were the most frequently managed at a rate of 20.6 per 100 encounters, accounting for 14.2% of all problems managed. The high occurrence of upper respiratory tract infection, asthma and bronchitis contributed to this result. Other common respiratory problems included influenza vaccination, sinusitis, tonsillitis and chronic obstructive pulmonary disease.

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

Skin-related problems were managed at a rate of 16.5 per 100 encounters, contact dermatitis (including non-specific dermatitis and eczema) being most common (1.9 per 100 encounters), followed by solar keratosis, malignant skin neoplasms and injuries to the skin (such as lacerations and cuts).

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

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

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

(continued)

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

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

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

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

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

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

Problems managed by ICPC-2 component

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

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

The majority of problems (64.3%) were described in terms of a diagnosis or disease (e.g. hypertension, depression, asthma) at an average rate of 93.1 per 100 encounters. Problems described in terms of a symptom or complaint (e.g. feeling tired) represented a fifth of all problems managed and were recorded at a rate of 31.4 per 100 encounters. Diagnostic screening and preventive procedures were used as problem labels at a rate of 13.6 per 100 encounters and were most commonly check-ups and vaccinations/immunisations. Problems related to the provision of medication and non-pharmacological treatments where no other diagnostic information was given were recorded at a rate of 3.6 per 100 encounters. There were relatively few problems described in terms of a referral, test result or administrative procedure (2.2% of all problems).

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

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

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

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

Most frequently managed problems

The 30 most commonly recorded problems are listed in descending order of frequency in Table 7.4. In this analysis, the specific chapter to which 'across chapter concepts' (immunisation/vaccination, and prescriptions) apply is ignored and the concept grouped to all other similar concepts. For example, immunisation/vaccination includes influenza vaccinations (from chapter R) as well as those for childhood immunisation (chapter A), hepatitis immunisation (chapter D) and neurological immunisations such as the haemophilus B vaccine (chapter N).

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

Depression was the fourth most commonly managed problem (3.5 per 100 encounters). Lipid disorder, non-gestational diabetes, asthma, back complaint, acute bronchitis and osteoarthritis were all commonly managed at a similar rate (3.0, 2.9, 2.7, 2.6, 2.6 and 2.6 per 100 encounters respectively).

The remaining problems in the top 30 included some problems from body systems that were relatively low in frequency. Although urological problems were relatively infrequent overall (only 1.9% of total problems – Table 7.2), urinary tract infections were among the most frequent individual problems. Similarly, although problems relating to the ear were uncommon (only 2.8% of total problems – Table 7.2), otitis media was among the most frequent individual problems.

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

Most common new problems

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

Acute respiratory conditions (URTI and acute bronchitis) were two of the most common new problems managed, together representing 12.3% of all new problems managed. New presentations of URTI were managed at a rate of 5.1 per 100 encounters, and new acute bronchitis at a rate of 1.9 problems per 100 encounters. Immunisation was the second most common new problem (2.9 per 100 encounters). Urinary tract infections, sprains/strains and unspecified viral disease were also frequent new presentations.

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

Table 7.4: Most frequently managed problems

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

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

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

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

Table 7.5: Most frequently managed new problems

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

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

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

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

7.3 Changes from 1998–99 to 2002–03

There has been no significant change in the number of problems managed per 100 encounters between 1998–99 and 2002–03 (Appendix 4, Table A4.2).

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

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

Increased management rates were found for:

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

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

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

8 Overview of management

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

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

Table 8.1: Summary of management

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

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

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

10,696 encounters (10.6%) and for 7.7% of problems. At least one test or investigation was ordered at 20.8% of encounters and for 16.2% of problems. These were most commonly pathology test orders, which were reported at 14.7% of encounters (for 11.4% of problems). Imaging orders were placed less frequently at 7.5% of encounters and for 5.3% of problems (Table 8.2).

Table 8.2: Encounters and problems for which management was recorded

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

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

(b) In General practice activity in Australia 1998–99, 1999–00, and 2000–01, 'Imaging orders' included 'Other investigations'.

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

The combinations of management types related to each problem were then investigated. There were 19,870 problems (13.6%) for which no specific management was recorded by the GP. Check-ups (either partial or full) (10.6%), hypertension (7.9%), upper respiratory tract infections (3.8%) and test results (3.1%) together accounted for one-quarter of these (results not shown). The majority of treatments occurred either as a single component or in combination with one other component. Single component management was provided for 62.8% of problems, and double component for 20.1%. More than two components were provided in the management of less than 5% of problems.

Table 8.3 provides a list of the most common problem management combinations. The most common management choice was medication alone (for 38.7% of problems), followed by clinical treatment alone (9.7%), but the combination of medication and clinical treatment was also relatively frequently recorded (8.0%).

Table 8.3: Most common management combinations

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

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

8.1 Changes from 1998–99 to 2002–03

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

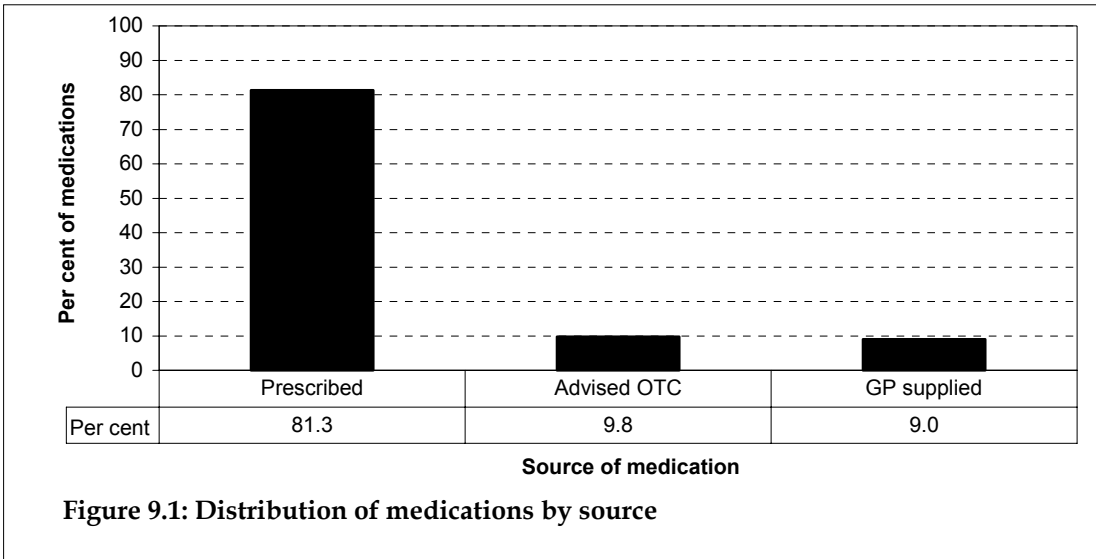
9 Medications

9.1 Source of medications

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

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

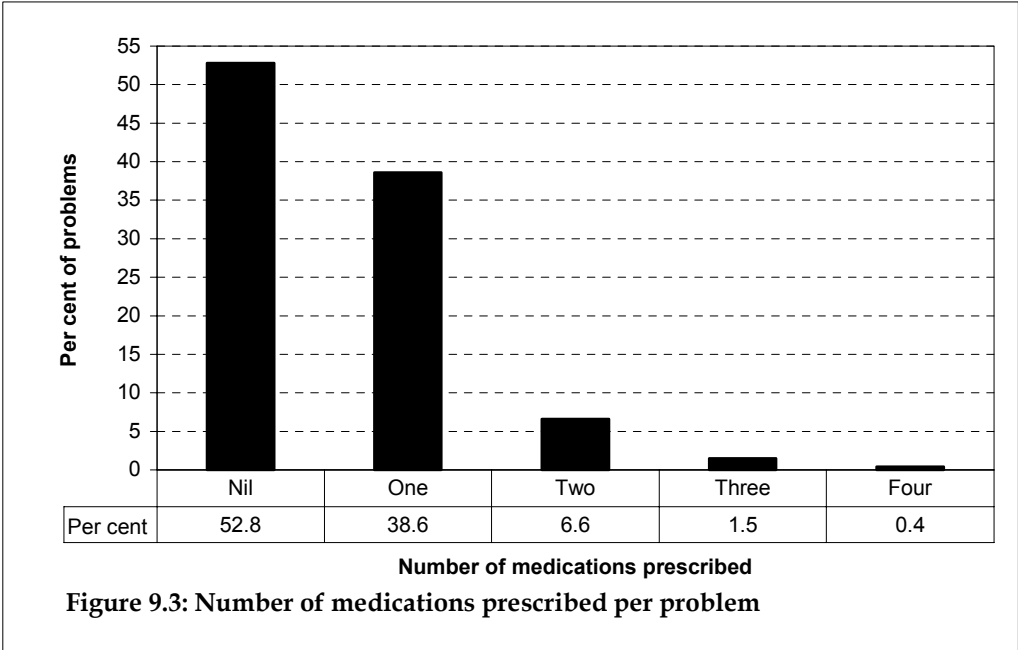
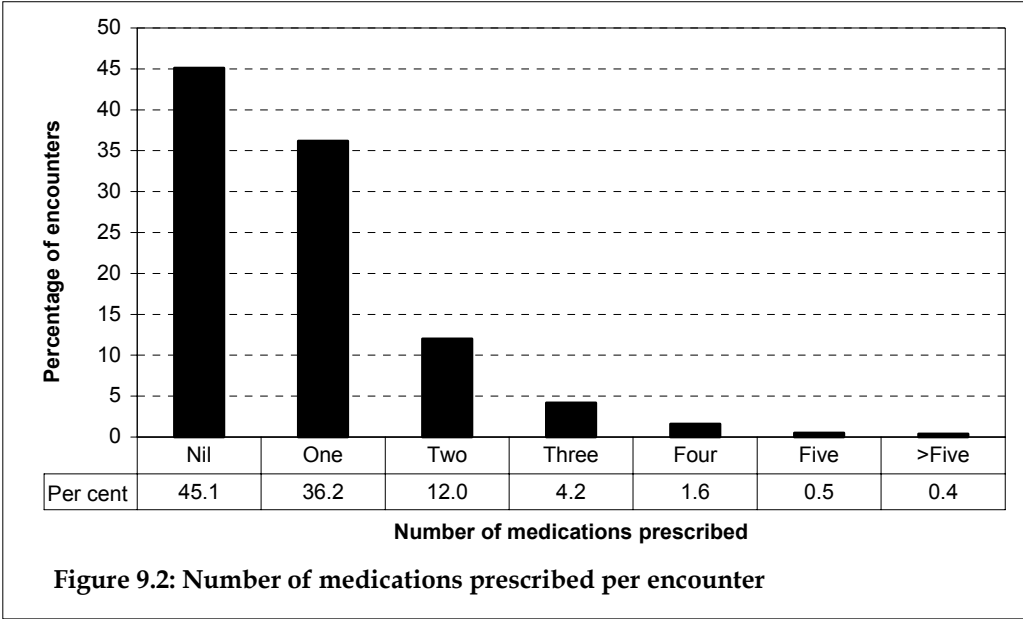
A total of 104,814 medications were recorded at a rate of 104 per 100 encounters and 72 per 100 problems managed. Most medications (81.3%) were prescribed. However, 9.8% of medications were recommended by the GP for OTC purchase, and 9.0% were supplied to the patient by the GP (Figure 9.1). Extrapolated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



9.2 Prescribed medications

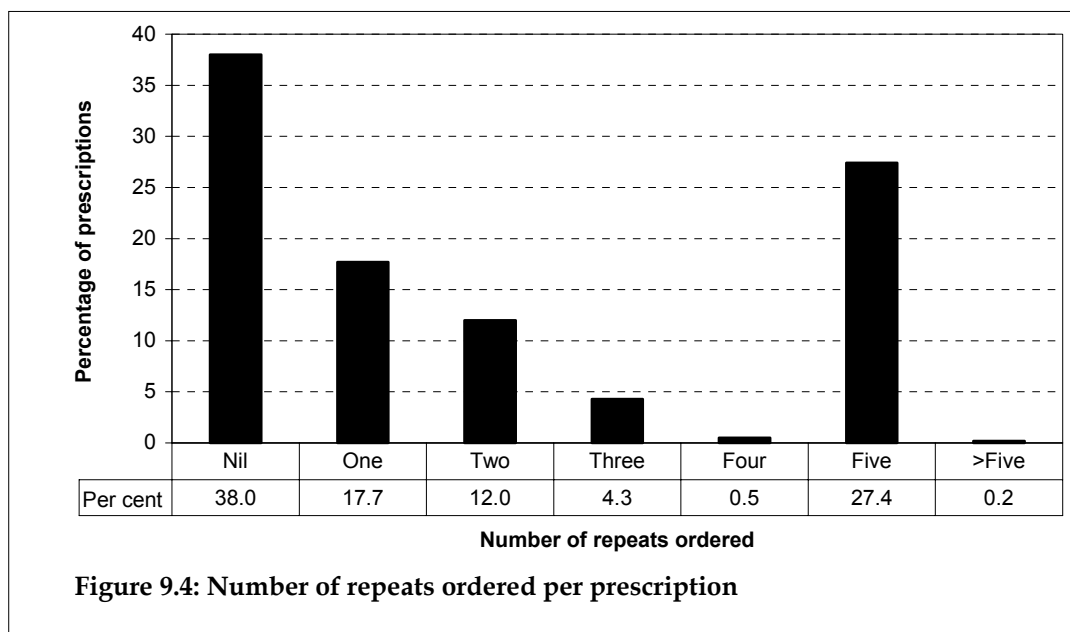
There were 85,162 prescriptions recorded, at a rate of 84.3 per 100 encounters and 58.2 per 100 problems managed. At least one prescription was recorded at 54.9% of encounters and for almost half (47.2%) of the problems managed.

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



Number of repeats

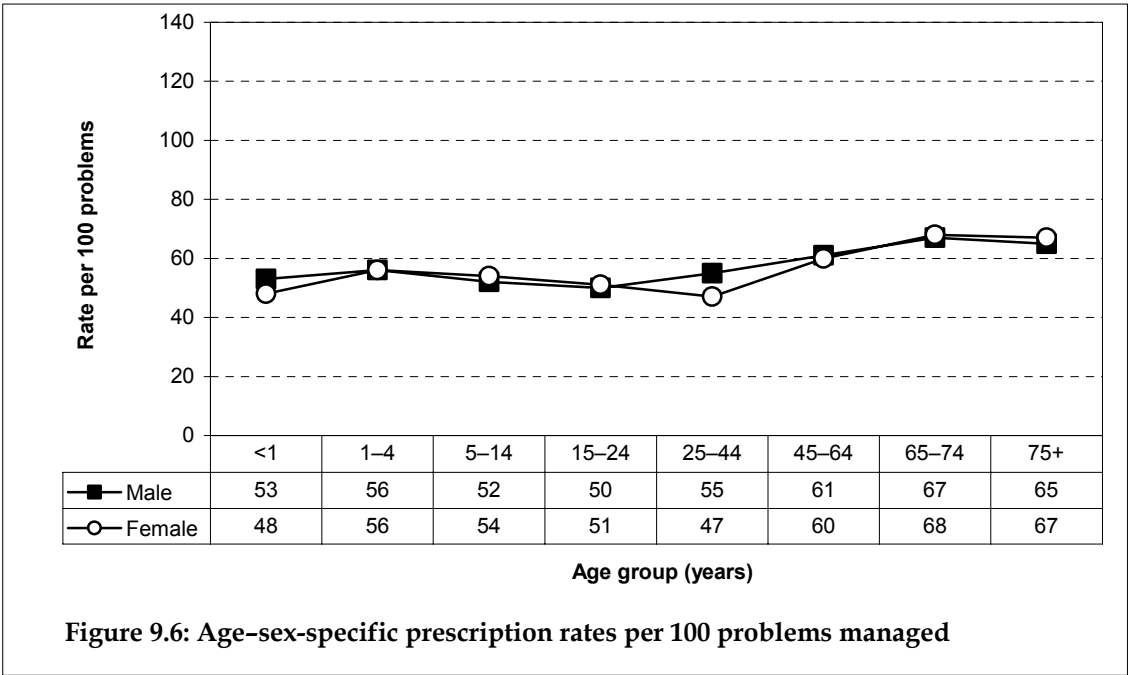
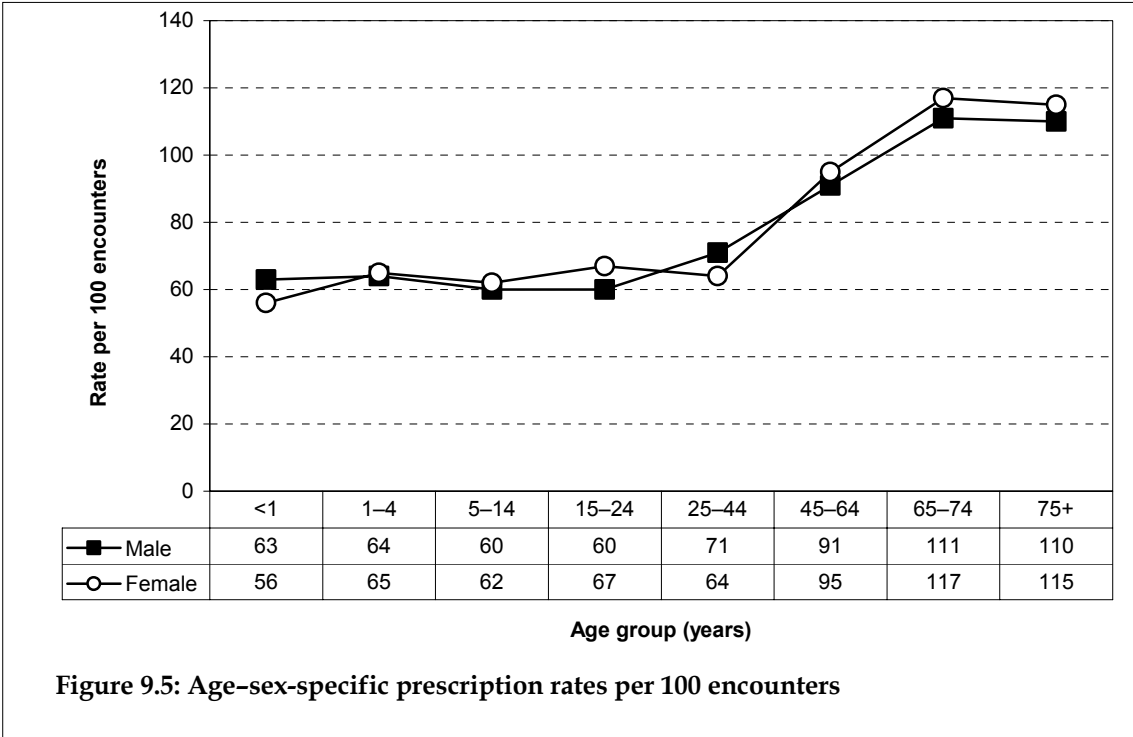
GPs were also asked to record the number of repeat prescriptions ordered for each prescribed medication. In previous BEACH years, there was a very high level of missing data in this field (up to 50.0%). However, with an improved instruction sheet, which asked participating GPs to indicate with a zero or dash if there were no repeats, the missing rate dropped to 30.1%. For the 59,557 prescriptions for which data were available, the distribution of the specified number of repeats (from specified zero to 6+) is provided in Figure 9.4. For 38.0% of these prescriptions, the GP specified that no repeats had been prescribed and for 27.4%, five repeats were ordered. The latter proportion reflects the Pharmaceutical Benefits Scheme (PBS) provision of one month's supply and five repeats for many medications used for chronic conditions such as hypertension. The ordering of one or two repeats (17.7% and 12.0%) was also not unusual.



Age–sex-specific rates of prescribed medications

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

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



Types of medications prescribed

Medications prescribed by major groups

The distribution of prescribed medications by major groups is presented graphically in Figure 9.7. Antibiotics were the most commonly prescribed group, representing 16.4% of all prescriptions. These were followed by cardiovascular (15.5%), central nervous system (12.5%), psychological (8.3%), musculoskeletal (6.8%) and respiratory (6.3%) medications.

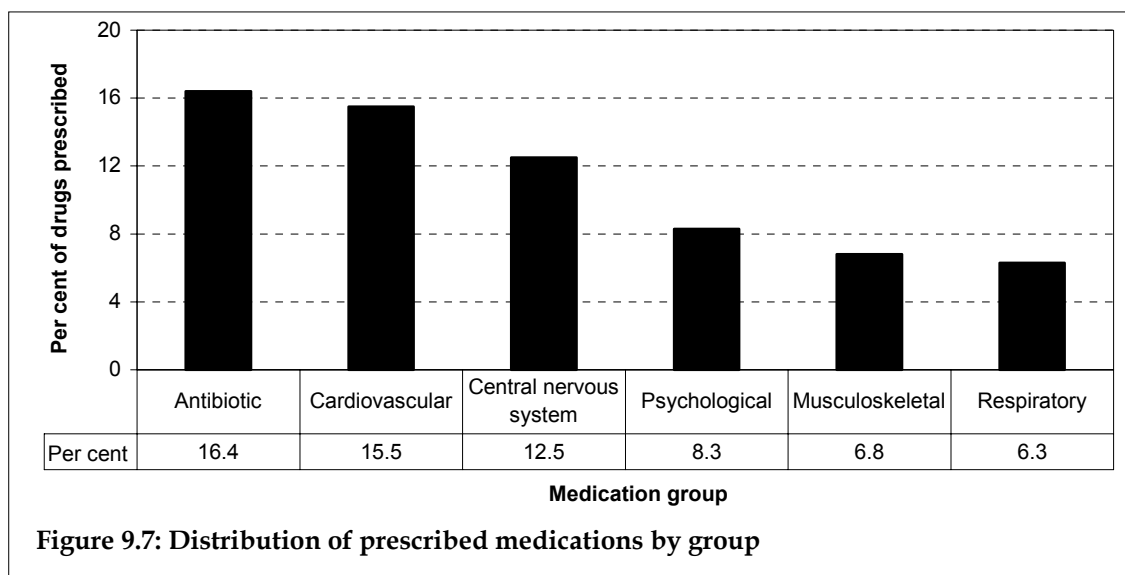


Table 9.1 shows the distribution of medications commonly prescribed by group, subgroup and generic name in order of medication group frequency. In the antibiotic group, broad-spectrum penicillins were prescribed at a rate of 4.7 per 100 encounters. Amoxicillin and amoxicillin + potassium clavulanate were the most frequently prescribed generic drugs in that subgroup. Cephalosporins were also prescribed often, at 3.0 per 100 encounters.

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

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

Hormones were also commonly prescribed, with hypoglycaemics the most frequent, followed by sex hormones and anabolic agents. In other groups, medications for the control or prevention of asthma were the most common in the respiratory group. Immunisation accounted for most of the allergy/immune system group, with influenza vaccine prescribed at a rate of 1.4 per 100 encounters. The wide range of medications prescribed reflects the extensive variety of problems managed in general practice.

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

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

(continued)

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

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

(continued)

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

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

(continued)

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

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

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

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

Most frequently prescribed medications

The most frequently prescribed individual medications are listed in Table 9.2. Together, these accounted for more than half (52.5%) of all prescribed medications. Antibiotics accounted for four of the top ten medications, and analgesics were also frequently prescribed.

Distribution of medications prescribed by ATC group

Table 9.3 shows the distribution of prescribed medications using the WHO ATC classification¹³ as an alternative method of grouping. This allows comparison with other data classified in ATC such as those produced by the HIC.

With this classification 'other analgesics and anti-pyretics', which includes paracetamol and aspirin, was the most frequently prescribed group. This was followed by penicillins, then non-steroid anti-inflammatory drugs. Inhaled adrenergics, other beta-lactam anti-bacterials (principally cephalosporins) and anti-depressants were also common.

Table 9.2: Most frequently prescribed medications

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

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

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

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

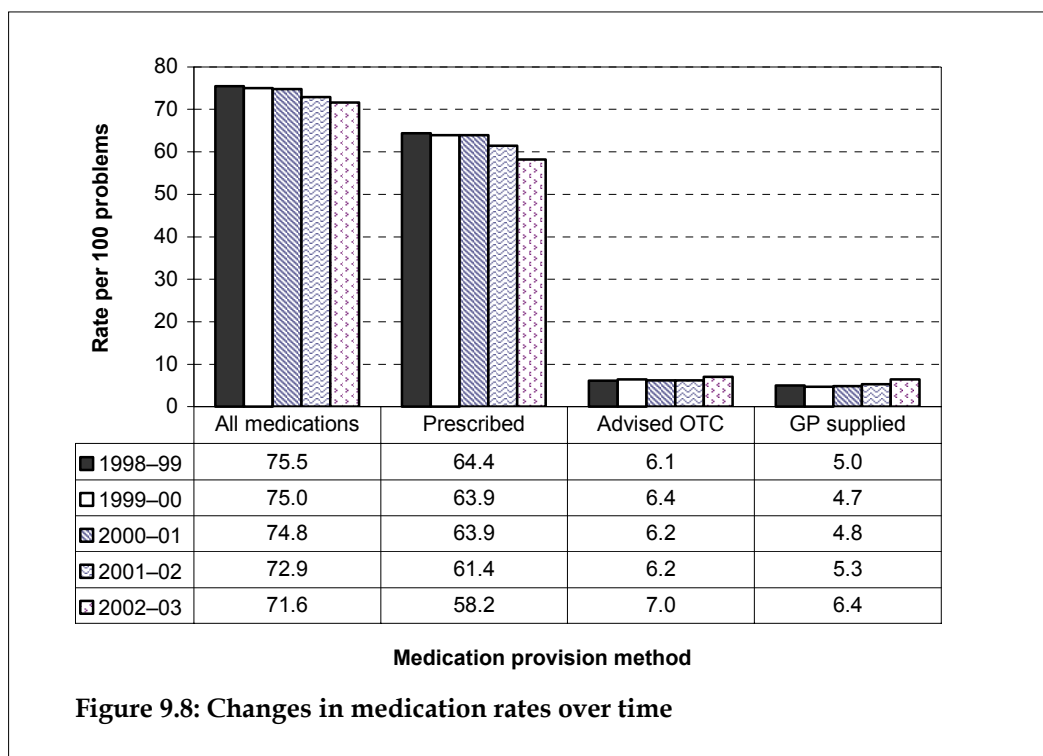
Generic medication	Number	Per cent of scripts (n=85,161)	Rate per 100 encs^(a) (n=100,987)	95% LCL	95% UCL
Other analgesics and anti-pyretics	6,028	7.1	6.0	5.5	6.5
Beta-lactam anti-bacterials, penicillins	5,938	7.0	5.9	5.5	6.3
Anti-inflammatory/anti-rheumatic non-steroid	4,819	5.7	4.8	4.5	5.0
Adrenergics,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

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

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

Significant changes from 1998–99 to 2002–03

Since 1998–99 there has been a significant decrease in overall medication rates, from 109.7 per 100 encounters (95% CI: 107.4–112.0) in 1998–99 to 103.8 (95% CI: 101.4–106.2) in 2002–03. The decrease in total medications was reflected particularly in the rates of prescribed medications which fell steadily from 93.6 (95% CI: 91.2–96.1) per 100 encounters in 1998–99 to 84.3 (95% CI: 81.8–86.9) in 2002–03. The rate of advised OTC medications and those supplied by the GP showed no significant changes or trends over this period (Appendix 4, Table A4.2). Figure 9.8 provides a graphic view of the changes in medication rates per 100 problems managed over time. The graph demonstrates that decreased prescribing rates are not due to any decrease in total problem management rates.



Changes in prescribed medications (classified in CAPS)

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

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

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

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

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

Changes in prescription rates of individual generic medications

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

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

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

- atorvastatin
- omeprazole
- tramadol.

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

Medications which increased significantly over the more recent years were:

- rofecoxib
- fluticasone/salmeterol.

Changes in prescribed medications (classified in ATC)

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

Significant decreases were apparent in prescribing rates of:

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

Significant increases were apparent in the rate of prescribing of:

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

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

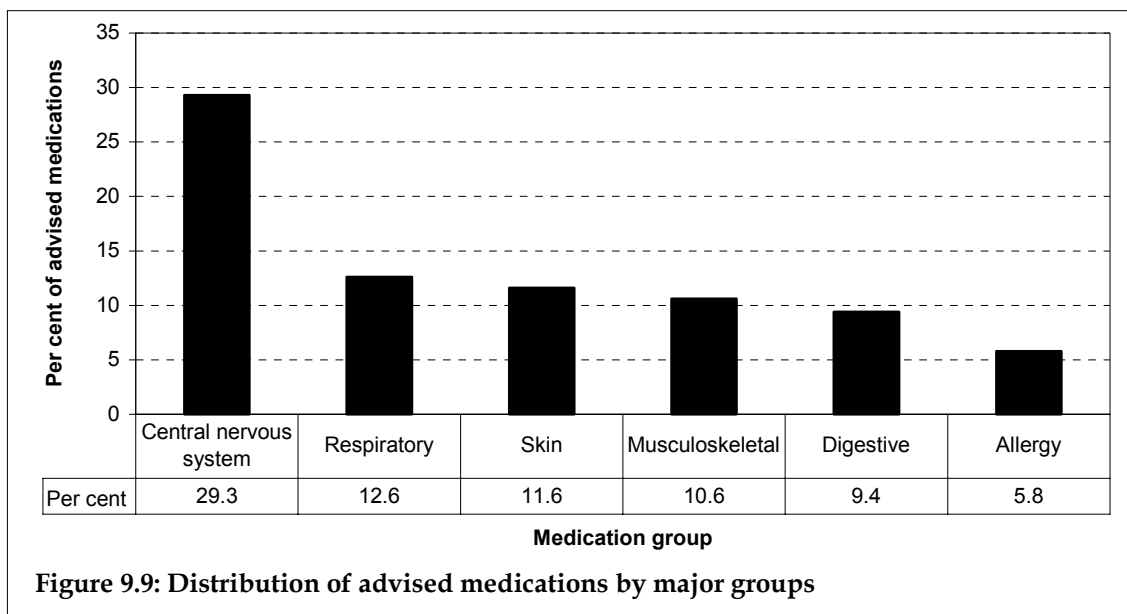
9.3 Medications advised for over-the-counter purchase

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

Types of medications advised

Medications advised by major groups

Central nervous system medications predominated in those advised to patients, with almost one-third of the advised medications being in this group. They were followed by medications acting on the respiratory system (Figure 9.9).



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

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

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

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

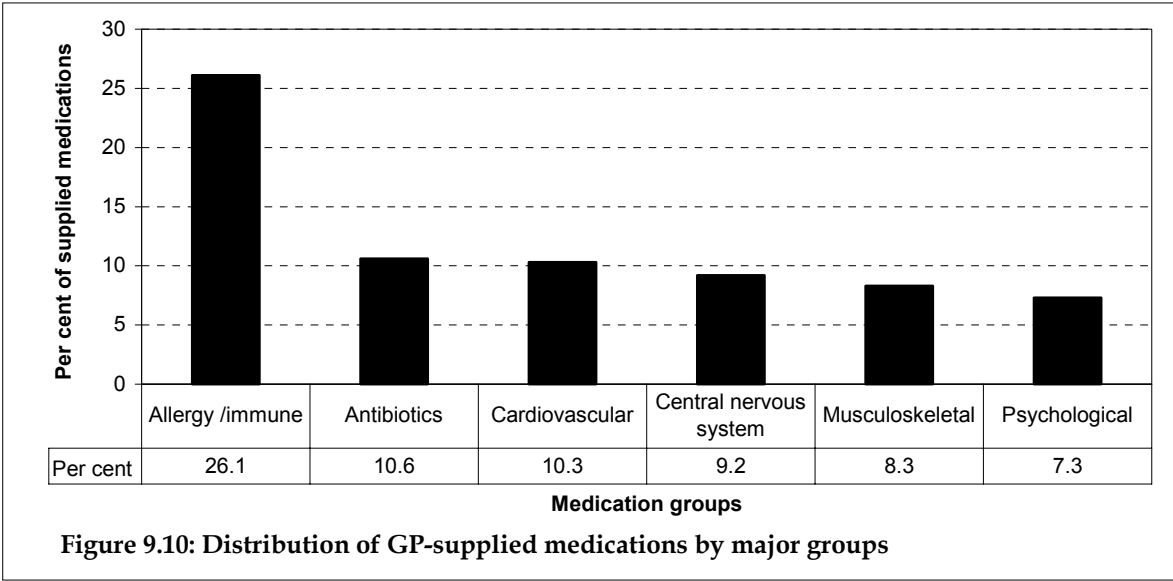
Note: OTCs—over-the-counter medications; encs—encounters; LCL—lower confidence limit; UCL—upper confidence limit.

9.4 Medications supplied by GPs

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

Types of medications supplied by GPs

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



Of the ten most common medications supplied by the GP, seven were vaccines, principally influenza virus vaccine, which accounted for 7.5% of GP-supplied medications (Table 9.5). There was a wide spread of other medications supplied, mostly prescription medications, presumably from manufacturers’ sample packs. They reflect a range of medications that are often supplied by the GP (e.g. vaccines). Others may be needed urgently, or samples may be supplied to test efficacy for a particular patient, or where cost is an issue. The most common of these were the NSAID rofecoxib and the antibiotic amoxicillin, accounting for 2.6% and 2.4% respectively of all medications supplied.

9.5 Changes from 1998–99 to 2002–03

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

Table 9.5: Medications most frequently supplied by GPs

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

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

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