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Bettering the Evaluation and Care of Health

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Foreword

In any one year, about 85% of the Australian population makes at least one contact with a general practitioner (GP). Mothers, children, the elderly and those with chronic conditions, such as diabetes, asthma and hypertension, have many more contacts than that. As a result of these personal contacts everyone has a view about general practice. Ministers of Health have been known to base their views about general practice on their contact with their own GP. Similarly, specialists with influence on health policy form their views on general practice from the actions of the GPs who, directly or indirectly, refer patients to them. Each of these policy strategists sees a biased sample of the work of general practice. It is obvious that better health care data are needed to inform better health care policy.

One of the pathfinders in the quest for evidence-based policy-making was Dr Kerr White (1917–2014). He was a North American epidemiologist and a champion of primary care medicine. In 1961, he published an important paper on the ecology of medical care in the United States.¹

He showed how short periods of data collection could be used to produce a picture of people's medical needs and their use of health care resources in satisfying them. He found that for any 1000 adults, in any one-month period, 750 reported one or more illnesses or injuries; 250 consulted a primary care physician; 9 were admitted to hospital; 5 were referred to a specialist and only 1 to a tertiary hospital. These figures showed the need for primary medical care services and the chaos and expense in healthcare provision that would occur if they did not exist.

The BEACH program is an Australian extension of Kerr White's philosophies and epidemiological methods. Its genesis began in the 1980s with the work of the Foundation Professor of Community Medicine at Sydney University, Charles Bridges-Webb. The BEACH studies form a considerable extension and refinement of his philosophies and methods.

They are a treasure trove of information for those who wish to be, or should be, better informed about what goes on in general practice before they initiate policies that may cause it, and Australian patients, harm. Those interested in how things have changed in clinical general practice over the last 10 years should read the accompanying publication *A decade of Australian general practice activity 2005–06 to 2014–15*. It shows us that GPs now fit much more in to each consultation than they did a decade ago. This perhaps ties in to the growing complexity of diagnosed patient morbidity, clearly demonstrated in the feature chapter in this report (Chapter 14).

The past year has seen government policy on general practice driven by the desire to reduce Medicare expenditure by placing a patient co-payment on a GP consultation. This was paired with the mantra of improving the quality of general practice by financially discouraging the 'common six-minute GP consultation'. A perusal of the data in this BEACH study will show that the actual mean length of a GP consultation in 2015 is already 4.4 minutes over the 10 minutes consultation advocated by government.

Another often repeated criticism about general practice is that most patients that are seen are referred on to medical specialists. The BEACH studies show that there has been a gradual rise in such referrals between 2005 and 2015 but currently only one in sixteen patient problems are referred. GPs are managing 94% of the problems that are presented to them.

Data from the BEACH studies have many uses. I based my teaching of medical students around its data on the most common encounters, investigations and prescriptions. Knowledge of BEACH content should also be part of the education of general practice registrars as a complement to their training.

The BEACH team is to be complimented on the sophistication of the research methodology and the way in which it is presented. It says much about their recruiting skills, and the altruism of busy GPs, that nearly 1000 general practitioners each year are prepared to record all their activities at 100 consecutive patient encounters. The BEACH study provides the only data available in Australia that gives a comprehensive picture of what goes on in general practice. In the era of 'evidence-based policy making' it is a source of essential data and in future needs and deserves to be better supported.

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1. White KL, Williams TF, Greenberg BG. The Ecology of Medical Care. NEJM, 1961;265:885-92.

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Summary

This report describes clinical activity at, or associated with, general practitioner (GP) encounters, from April 2014 to March 2015, inclusive. It summarises results from the 17th year of the Bettering the Evaluation and Care of Health (BEACH) program, using a nationally representative sample of 99,500 patient encounters with 995 randomly selected GPs, each of whom recorded details of 100 patient encounters. After post-stratification weighting, 98,728 encounters were analysed in this report (see Chapter 2, Methods).

The companion report highlighting major change over the most recent 10 years of BEACH, *A decade of Australian general practice activity 2005–06 to 2014–15*,¹ is available at <purl.library.usyd.edu.au/sup/9781743324547>.

The general practitioners (Chapters 3 and 4)

Of the 995 participating GPs:

- 57% were male, 45% were aged 55 years and over; 67% had graduated in Australia
- 64% were Fellows of the Royal Australian College of General Practitioners (RACGP), and 6% Fellows of the Australian College of Rural and Remote Medicine (ACRRM)
- 71% practised in major cities
- the average hours per week in direct patient care was 37 (median 36 hours)
- the vast majority (84%) worked in a practice employing practice nurses, and 78% in practices with co-located pathology collection services
- less than half (41%) worked in practices that supplied their own or cooperative after-hours care.

The mean number of Medicare Benefits Schedule (MBS) GP service items claimed by participants over the previous year did not differ from the average for all GPs in the sample frame. The BEACH GP sample had slight under-representation of GPs aged less than 45 years, and slight over-representation of GPs aged 55 years or over. Statistical weighting was applied to correct for this. After weighting, the age–sex distribution of patients at BEACH encounters had an excellent fit (precision ratios 0.88–1.10), with that of patients at all GP services claimed through the MBS.

The encounters (Chapter 5)

The patient was seen by the GP (direct encounters) at 99% of all encounters at which a payment source was recorded: 97% of these were claimable through the MBS or the Department of Veterans' Affairs (DVA), of which 79% were designated standard surgery consultations (Item 23). In a subsample of 33,392 MBS/DVA-claimable encounters at which start and finish times were recorded, the mean length of consultation was 14.7 minutes, and the median was 13.0 minutes.

Clinical content of the GP–patient encounters (Chapter 5 and 8)

Chapter 5 shows that at an average 100 encounters, patients gave 154 reasons for encounter (RFEs), and GPs managed 155 problems, including 55 chronic and 59 new problems.

They prescribed 86 medications, supplied a further 8 and advised purchase of 10 over-the-counter medications. They provided 34 clinical treatments, undertook 17 procedures, made 10 referrals to medical specialists and 5 to allied health services, placed 47 pathology test orders and 12 imaging test orders.

Chapter 8 shows that on average for every 100 problems they managed, GPs provided 55 prescriptions and 22 clinical treatments, undertook 11 procedures, made 6 referrals to medical specialists and 3 to allied health services, and placed 30 pathology test orders and 7 imaging test orders.

At least one management action occurred at 91% of encounters, for 85% of problems managed.

When extrapolated to all MBS-claimed GP consultations:

- at least one medication was prescribed, advised for over-the-counter purchase, or supplied at about 86 million GP–patient encounters
- at least one procedure was undertaken at 21 million encounters
- at least one referral to a specialist, allied health professional, hospital or emergency department was provided by GPs at 20 million encounters nationally
- one or more pathology, imaging or other test was ordered at 35 million encounters.

Who were the patients and why did they see the GP? (Chapter 6)

Female patients accounted for 57% of encounters, and the greater proportion of encounters in all adult age groups. Patients aged less than 25 years accounted for 20% of encounters; those aged 25–44 years for 22%; 45–64 years for 27%; and those aged 65 years and over for 31% of encounters.

- The patient was new to the practice at 6% of encounters.
- Nearly half the encounters were with patients who held a Commonwealth concession card (46%) and/or a Repatriation Health Card (2%).
- One in ten encounters was with a patient from a non-English-speaking background.
- At 2% of encounters the patient identified themselves as an Aboriginal and/or Torres Strait Islander person.

At an average 100 encounters, patients presented 154 RFEs including 66 symptoms/complaints, 29 diagnosed diseases, 23 procedural needs and 16 requests for treatment. At 59% of encounters only one RFE was recorded, at 29% two and at 12% three. The most common RFEs were requests for prescriptions, check-ups and test results.

What problems do GPs manage at patient encounters? (Chapter 7)

There were 153,133 problems managed, an average 155 problems per 100 encounters: one problem was managed at 61% of encounters, two at 26%, three at 10%, and four at 3%. The number of problems increased steadily with patient age from young adulthood.

Two-thirds (66%) of problems were described as diagnoses or diseases, but 20% remained undiagnosed symptoms or complaints, and 9% were labelled procedures (for example, check-ups).

- The most commonly managed were those of a general and unspecified nature (20 per 100 encounters), musculoskeletal (19), respiratory (19), skin (17), and circulatory (16) problems.
- Individual problems most often managed were hypertension (8 per 100 encounters), check-ups (7), upper respiratory tract infection (6), depression (5) and diabetes (4).
- At least one chronic problem was managed at 41% of encounters. More than half of all chronic problems managed were accounted for by: non-gestational hypertension (14% of chronic conditions), depressive disorder (8%), non-gestational diabetes (7%), chronic arthritis (7%), lipid disorder (5%), oesophageal disease (5%), and asthma (4%).

Extrapolation of these results suggests that nationally in 2014–15, 11 million encounters involved management of non-gestational hypertension, 6 million involved depression and 5 million involved non-gestational diabetes.

Medications (Chapter 9)

One or more medications were prescribed at 53% of encounters for 44% of the problems managed. There were 84,455 prescriptions recorded, at rates of 86 per 100 encounters or 55 per 100 problems managed. Extrapolated results suggest GPs prescribed at least one medication at 73 million encounters nationally.

GPs recorded 80% of prescribed medications by brand (proprietary) name and 20% by their generic (non-proprietary) name. For 35% of prescriptions, no repeats were prescribed, and for 37% five repeats were ordered. Ordering one repeat was also quite common (15%).

Medications most often prescribed were those acting on the nervous system (accounting for 25% of all prescribed medications), particularly opioids and antidepressants; and the cardiovascular system (18%), particularly anti-hypertensives and lipid lowering agents. However the 10 individual drugs most frequently prescribed (accounting for 23% of all), included three antibiotics, paracetamol and paracetamol/codeine, and oxycodone.

GPs supplied 8 medications direct to the patients per 100 encounters, or 5 per 100 problems managed. The most frequently supplied were largely vaccines.

Over-the-counter medication was advised at 8% of encounters, (paracetamol accounting for 26% of these medications), equivalent to an estimated 11 million encounters nationally in 2014–15.

Other treatments (Chapter 10)

The GP provided other treatments at 39% of encounters, for 29% of all problems managed.

Clinical treatments accounted for two-thirds of all other treatments, and were provided at a rate of 34 per 100 encounters, or 22 per 100 problems managed. General advice and education (18% of clinical treatments) and counselling about the problem being managed (12%) were most common. Preventive counselling/advice about nutrition and weight, exercise, smoking, lifestyle, prevention, and/or alcohol, were together given at a rate of 6 per 100 encounters.

One in five problems was managed with a clinical treatment. Upper respiratory tract infection, depression, diabetes and anxiety represented the largest proportion of problems managed with a clinical treatment.

Procedural treatments were recorded at a rate of 17 per 100 encounters, or 11 per 100 problems. Excision (18% of procedural treatments), dressing (14%) and local injection (14%) accounted for almost half of these. One in ten problems were managed with a procedure. Solar keratosis/sunburn (5%) and laceration/cut (5%) accounted for the largest proportion of problems managed with a procedure.

Practice nurse/Aboriginal health worker activity at recorded GP–patient encounters

A practice nurse (PN) or Aboriginal health worker (AHW) was involved in the management of 4.8% of all problems managed, or 7.2% of encounters. This suggests they were involved in about 10 million GP–patient consultations across Australia. A PN/AHW Medicare item was recorded at only 4% of the encounters in which they were involved.

The vast majority (88%) of PN/AHW recorded activity was procedural. While clinical treatments accounted for 12% of PN/AHW recorded activity, they provided only 3% of all recorded clinical treatments. PN/AHWs did 50% of the recorded immunisation injections.

Referrals and admissions (Chapter 11)

GPs made 16 referrals per 100 encounters, or 10 per 100 problems managed. The most frequent were to medical specialists (10 per 100 encounters, 6 per 100 problems managed), and to allied health services (5 per 100 encounters, 3 per 100 problems). Very few patients were referred to hospitals or emergency departments (0.7 per 100 encounters).

Referrals to specialists were most often to surgeons (9% of specialist referrals), orthopaedic surgeons (9%), cardiologists (8%) and dermatologists (7%). Malignant skin neoplasms, osteoarthritis, diabetes and back complaints were the problems most often referred to medical specialists. The five problems most frequently referred to each of 10 medical specialties are described in Chapter 11.

Referrals to allied health services were most often to physiotherapists (28% of allied health referrals), psychologists (24%), podiatrists/chiropractors (13%) and dietitians/nutritionists (7%). Problems most likely to be referred to allied health services were depression, diabetes and back complaint.

Tests and investigations (Chapter 12)

Pathology tests ordered: GPs recorded 47 orders for pathology tests (or batteries of tests) per 100 encounters (30 per 100 problems managed). At least one pathology test was recorded at 18% of encounters, or 13% of problems managed.

- Chemistry tests accounted for 58% of pathology test orders. Lipid tests, multi-biochemical analysis, thyroid function tests, and electrolytes, urea and creatinine tests were the most common (each ordered at a rate of 2 per 100 problems managed).
- Haematology tests accounted for 18% of pathology tests ordered and included full blood count, the most frequently ordered individual test (14% of all pathology).
- Microbiology accounted for 14% of pathology orders; urine microscopy, culture and sensitivity was the most commonly ordered.
- Almost 40% of all pathology tests ordered were generated in the management of 10 problems. The problems generating the highest volumes of testing were diabetes, hypertension, general check-ups, and weakness/tiredness.

Imaging ordered: 12 imaging tests were ordered per 100 encounters, and 7 per 100 problems managed. At least one was ordered at 10% of encounters (for 7% of problems managed). Ultrasound accounted for 43% and diagnostic radiology for 40%, of all imaging orders.

Patient risk factors (Chapter 13)

Overweight and obesity in adults (18 years and over): Of 32,956 adults, 62% (70% of males and 57% of females) were overweight (34%) or obese (28%). Estimated prevalence in adults who attended general practice at least once in 2014–15 was 34% overweight and 27% obese.

Overweight and obesity in children (2–17 years): Of 3,112 children, 27% were overweight (18%) or obese (9%). Prevalence pattern by age did not differ between the sexes.

Smoking status (adults 18 years and over): Of 33,685 adults, 14% (17% of males and 12% of females) were daily smokers. For the population attending one or more times, an estimated 17% were daily smokers, 3% occasional, 25% previous smokers and 55% had never smoked.

Alcohol consumption in adults (18 years and over): Of 32,835 adult patients, 23% (28% of males, 20% of females) reported at-risk alcohol consumption. Adjusted data suggested 26% of the attending population are consuming at-risk levels of alcohol.

Adult risk profile (18 years and over): Of the 31,952 patients providing all risk factor data: 26% had none, 52% one and 22% two or three risk factors. Adjusted to the attending population, 25% had no risk factors, 50% had one, 21% two and 4% all three risk factors.

Care of older people in general practice (Chapter 14)

This feature chapter explores the care of people aged 65+ in general practice between April 2000 and March 2015 using data from the BEACH study and several of its substudies. We examine GP services provided, the content of the encounters, and the prevalence of chronic problems and multimorbidity. We look at selected issues which affect the health of older patients, including chronic pain, multiple medications/adverse drug events and patient risk factors (smoking, alcohol consumption and overweight).

In light of recent suggestions that voluntary enrolment with a 'medical home' could enhance continuity of care, we also investigate the extent to which patients have a 'regular practice' that they usually visit. This chapter provides valuable information for health policymakers and service providers, to help structure a response to the future challenges of caring for an ageing population.

Supplementary Analysis of Nominated Data (SAND) substudies (Chapter 15)

Abstracts are provided for each of 12 recent SAND substudies which investigated aspects of the health of subsamples of patients at the encounter that are not captured in the encounter data.

Changes in general practice activity over the decade, 2005–06 to 2014–15

The companion publication: *A decade of Australian general practice 2005–06 to 2014–15* reports the results of each of 10 years of BEACH data and identifies changes in practice over the decade based on almost one million GP–patient encounter records, from 9,773 participating GPs. Estimates of the national effect of change in activity are made through extrapolation to total Medicare GP consultation items claimed in the first and last year of the decade.

Over the decade, Australia's population rose by 16% and the proportion aged 65 years and over rose by 35%. About 85% of the population claimed one or more GP services from Medicare in both 2005–06 and 2014–15. However, the number of Medicare-claimed GP consultations grew by 36% from 101 million to 137 million. The average GP visits per head of population rose from 5.0 to 5.8 and for those who saw a GP at least once, from 5.9 to 6.8 visits.

The general practice profession became more feminised, were older, less likely to be Australian graduates, and worked fewer hours per week. Average length of MBS-claimed consultations increased from 13.9 to 14.7 minutes and median length from 12 to 13 minutes. Patients aged 65+ years accounted for an increasing proportion of GPs' workload. Encounters with patients new to the practice decreased by one-third.

In 2014–15, GPs managed 155 problems per 100 encounters, significantly more than a decade earlier (146). This increase and the increased visit rate has had a huge national effect on the complexity of GP services. When the growth in problems managed is combined with increase in actions per 100 problems managed, even larger national growth occurs. The management rate of chronic conditions did not change over the decade, but there were increases in depressive disorder, oesophageal disease, atrial fibrillation/flutter, chronic back pain and unspecified chronic pain. Extrapolation of results to all MBS-claimed GP consultations suggests that nationally GPs managed 65 million more problems, including 23 million more chronic problems in 2014–15 than a decade earlier.

The major changes that occurred from 2005–06 to 2014–15 are summarised below.

- Prescribed medications decreased from 59 to 55 per 100 problems. However, due to the increased problems managed and the higher attendance rate, we estimate 31 million more prescriptions were given in 2014–15 than in 2005–06.
- GP-supplied medications decreased but supplied childhood vaccines increased.
- Clinical treatments were provided at similar rates (20 and 22 per 100 problems managed). However, more problems managed and higher attendance rates meant 17 million more clinical treatments were given nationally.
- Procedural treatments increased significantly, from 10 to 11 per 100 problems, with a national extrapolated effect of about 9 million more procedures in 2014–15.
- Referrals to both medical specialists and allied health services increased. These results suggest 5 million more referrals were made to medical specialists and 4 million more to allied health.
- Orders for pathology tests/batteries increased by 15%, from 26 to 30 per 100 problems, with a national extrapolated effect of about 26 million more tests/batteries ordered by GPs in 2014–15.
- Orders for imaging tests increased significantly from 6 to 7 per 100 problems, suggesting 7 million more tests were ordered nationally in 2014–15 than in 2005–06.

Patient risk factor data are presented for each year from 2007–08 to 2014–15. Prevalence of obesity, smoking and alcohol consumption among the adult patient population who attended general practice at least once in each year showed:

- obesity increased from 23% to 27%
- daily smoking decreased from 19% to 17%
- at-risk alcoholic consumption decreased from 29% to 26%.

1 Introduction

This is the 17th annual report and the 38th book in the General practice series from the BEACH (Bettering the Evaluation and Care of Health) program, a continuous national study of general practice activity in Australia. It provides the annual results for the period April 2014 to March 2015 inclusive, using details of 99,500 encounters between general practitioners (GPs) and patients from a random sample of 995 practising GPs across the country.

Released in parallel with this report is a summary of results from the most recent 10 years of the BEACH program, *A decade of Australian general practice activity 2005–06 to 2014–15*,¹ available at <purl.library.usyd.edu.au/sup/9781743324547>. The major changes that occurred over the decade are summarised at the end of each chapter of this annual report.

The BEACH program began in April 1998 and was the culmination of about 20 years research and development work at the University of Sydney. BEACH is currently supported financially by government and private industry (see Acknowledgments).

BEACH is a continuous national study in which ever-changing random samples of about 1,000 individual general practitioners (GPs) participate each year. Each participating GP records details of 100 consecutive GP–patient encounters with consenting patients.

BEACH is the only study of its kind in the world, and the only national program that provides direct linkage of management actions (such as prescriptions, referrals, investigations) to the problem under management. The BEACH database now includes information for almost 1.7 million encounters from 16,747 participating GPs representing 10,342 individual GPs.

1.1 Background

General practitioners (GPs) are usually the first port of call in the Australian healthcare system, generally receiving payment on a fee-for-service basis. There are no formal patient lists or registration. People are free to see multiple practitioners and visit multiple practices of their choice. A universal medical insurance scheme (managed by Medicare Australia) covers all, or part of a person's costs for a GP visit.

About 85% of the Australian population claimed at least one GP service from Medicare in both 2005–06 and 2014–15 (personal communication, Australian Government Department of Health [DoH]). However, the number of Medicare-claimed GP consultation items (total non-referred attendances excluding practice nurse items) grew by 36% from 101.1 million to 137.4 million.² This equates to about 620,000 more Medicare-claimable GP consultations per week being provided nationally than were provided a decade earlier.

This means that the average number of GP visits per head of population was about 5.0 in 2005–06 and rose to 5.8 in 2014–15. In 2005–06, those who visited at least once claimed an average 5.9 visits, but in 2014–15 this average had risen to 6.8 visits.

Australia's health expenditure in 2013–14 was \$154.6 billion, \$6,639 per head of population, and accounted for 9.8% of gross domestic product (GDP). Governments funded 60.8%, with the remainder (39.2%) being paid by the non-government sector and by individuals.³ In the 2014–15 financial year, government expenditure on general practice services (total non-referred attendances including GP/vocationally recognised GP, Enhanced Primary Care, other, and practice nurse items) was almost \$6.8 billion.⁴

According to reports from the Australian Institute of Health and Welfare (AIHW), in Australia in 2012, there were 25,958 practising GPs (employed medical practitioners self-identifying as GPs), making up 25,063 full-time equivalents (FTE, based on a 40-hour week), or 111.8 FTE GPs per 100,000 people.⁵

In contrast, recent general practice workforce statistics from DoH indicate that in 2013–14 there were 32,401 GPs (defined as GPs or Other Medical Practitioners who provided at least one Medicare claimed GP service during that year), making up 19,365 FTE.⁶

While Medicare statistics provide information about frequency and cost of visits claimed from Medicare for GP service items, they cannot tell us about the content of these visits. The BEACH program fills this gap.

1.2 The BEACH program

In summary, the BEACH program is a continuous national study of general practice activity in Australia. Each year an ever-changing random sample of about 1,000 practising GPs participate, each recording details of 100 patient encounters on structured paper-based recording sheets (Appendix 1). This provides details of about 100,000 GP–patient encounters per year. They also provide information about themselves and their major practice (Appendix 2). The BEACH methods are described in Chapter 2 of this report.

Aims

The three main aims of the BEACH program are to:

- provide a reliable and valid data collection process for general practice that is responsive to the ever-changing needs of information users, and provides insight into the evolving character of GP–patient encounters in Australia
- provide an ongoing database of GP–patient encounter information
- assess patient risk factors and health states, and the relationship these factors have with health service activity.

Current status of BEACH

BEACH began in April 1998 and is now in its 18th year. The BEACH database includes records for almost 1.7 million GP–patient encounters from 16,747 participating GPs. Each year we publish an annual report of BEACH results collected in the previous 12 months. This publication reports results from April 2014 to March 2015. The companion publication *A decade of Australian general practice activity 2005–06 to 2014–15*,¹ provides summaries of changes in the most frequent events over the decade.

The strengths of the BEACH program

- BEACH is the only national study of general practice activity in the world that is continuous, relying on a random ever-changing sample of GPs. The ever-changing nature of the sample (where each GP can participate only once per triennium) ensures reliable representation of what is happening in general practice across the country.
- The sheer size of the GP sample (1,000 per year) and the relatively small cluster of encounters around each GP, provide more reliable estimates than a smaller number of GPs with large clusters of patients and/or encounters.⁷ Our access to a regular random sample of recognised GPs in active practice, through DoH, ensures that the GP sample is drawn from a very reliable sample frame of currently active GPs.
- The sampling methods ensure that new entrants to the profession are available for selection because the sample frame is based on the most recent Medicare data. Where data collection programs use a fixed set of GPs over a long period, measuring what that group is doing at any one time or how that group has changed over time, there may well be a ‘training effect’ inherent in longer-term participation. Such measures cannot be generalised to the whole of general

practice. Further, where GPs in the group have a particular characteristic in common (for example, all belong to a professional organisation to which not all GPs belong; all use a selected software system which is not used by all GPs), the group is biased and cannot represent all GPs.

- We have sufficient details about the characteristics of all GPs in the sample frame to test the representativeness of the final BEACH GP sample, and to apply post-stratification weighting to correct for any under or over-representation in the sample when compared with the sample frame.
- Each GP records for a set number of encounters (100), but there is wide variance among them in the number of patient consultations they conduct in any one year. DoH therefore provides an individual count of activity level (that is, number of Medicare GP service items claimed in the previous period) for all randomly sampled GPs, allowing us to give a weighting to each GP's set of encounters commensurate with his or her contribution to total general practice encounters. This ensures that the final encounters represent encounters with all GPs.
- BEACH includes all patient encounters and management activities provided at these encounters, not just those encounters and activities funded by Medicare.
- The structured paper encounter form leads the GP through each step in the encounter, encouraging entry of data for each element (see Appendix 1), with instructions and an example of a completed form. The structure itself forces linkage of actions to the problem being managed. In contrast, systems such as electronic health records rely on the GP to complete fields of interest without guidance.
- BEACH is the only continuous national study in the world in which management actions at encounter are directly linked by the GP to the problems under management. This provides a measure of the 'quality' of care rather than just a count of the number of times an action has occurred (for example, how often a specific drug has been prescribed).
- The medication data include all prescriptions, rather than being limited to those prescribed medications covered by the Pharmaceutical Benefits Scheme (PBS). BEACH is the only source of information on medications supplied directly to the patient by the GP, and about the medications GPs advised for over-the-counter (OTC) purchase, the patients to whom they provide such advice and the problems managed in this way.
- The inclusion of other (non-pharmacological) treatments such as clinical counselling and procedural treatments, provides a broader view of the interventions used by GPs in the care of their patients than other data sources.
- The use of an internationally standard well-structured classification system (ICPC-2)⁸ designed specifically for general practice, together with the use of a clinical interface terminology, facilitates reliable classification of the data by trained secondary coders, and removes the guesswork often applied in word searches of available records (in free text format) and in classification of a concept.
- The use of the World Health Organization's (WHO) Anatomical Therapeutic Chemical (ATC) classification for pharmaceuticals at the generic level ensures reporting of medications data is in accordance with the international standard.
- The analytical techniques applied to the BEACH data ensure that the clustering inherent in the sampling methods is dealt with. Results are reported with 95% confidence intervals. Users are therefore aware of the level of reliability of any estimate.
- Reliability of the methods is demonstrated by the consistency of results over time where change is not expected, and by the measurement of change when it might be expected.

1.3 Using BEACH data with other national data

Users of the BEACH data might wish to integrate information from multiple national data sources to gain a more comprehensive picture of the health and health care of the Australian community. It is therefore important that readers are aware of how the BEACH data differ from those drawn from other sources. This section summarises differences between BEACH and other national sources of data about general practice in Australia.

The Pharmaceutical Benefits Scheme

Prescribed medications, for which a PBS subsidy has been paid when they are dispensed, are recorded by Medicare Australia.

The PBS data:

- count the prescription each time it crosses the pharmacist's counter (so that one GP prescription written with five repeats in BEACH would be counted by the PBS six times if the patient filled all repeats)
- count only prescribed medications that cost:
 - more than the minimum PBS subsidy for those holding a Commonwealth concession card and/or who have reached the safety net threshold
 - more than the PBS threshold (which is far higher) for non-concession card holders
- will change with each change in the PBS co-payment level for non-Commonwealth concession cardholders – when the co-payment level increases, those medications that then fall under the new level will no longer be counted in the PBS for non-Commonwealth concession cardholders⁹
- hold no record of the problem being managed (with the exception of authority prescriptions, which require an indication and account for a small proportion of PBS data). Morbidity cannot be reliably assumed on the basis of medication prescribed.^{10,11}

In BEACH:

- total medications include those prescribed (whether covered by the PBS or not), those supplied to the patient directly by the GP, and those advised for OTC purchase
- each prescription recorded reflects the GP's intent that the patient receives the prescribed medication, and the specified number of repeats; the prescription, irrespective of the number of repeats ordered, is counted only once
- the medication is directly linked to the problem being managed by the GP
- there is no information on the number of patients who do not present their prescription to be filled (this also applies to the PBS).

These differences have a major impact on the numbers of prescriptions counted and also affect their distribution. For example, the majority of broad spectrum antibiotics such as amoxicillin, fall under the non-concessional card holders' minimum subsidy level and would not be counted in the PBS data. The PBS data only include those filled under the PBS by a Commonwealth concession card holder or by people who had reached the annual safety net threshold.⁹

Medicare Benefits Schedule

Consultations with GPs that are paid for in-part, or in-full, through the Medicare Benefits Schedule (MBS) are recorded by Medicare Australia.

- Publicly available MBS claims data do not include data about patients and encounters funded through the Department of Veterans' Affairs (DVA).
- The MBS data include GP services that have been billed to Medicare. BEACH includes all consultations, irrespective of whether a charge was made or to whom it was charged.
- The MBS data reflect the item number charged to Medicare and include some patient demographics, but hold no information about the content of the consultation.
- BEACH participants are limited to recording three Medicare item numbers for each encounter. In contrast, MBS data include all Medicare item numbers claimed. In the BEACH data set, this may result in a lower number of 'other' Medicare items than would be counted in the Medicare data.
- In activities of relatively low frequency with a skewed distribution across individual GPs, the relative frequency of the event in the BEACH data may not reflect that reported in the MBS data. Where activity is so skewed across the practising population, a national random sample will provide an underestimate of activity because the sample reflects the population rather than the minority.
- One of the advantages of BEACH over the MBS is also the relative consistency of the data collection form over time. BEACH is relatively resilient to changes in MBS payment policies, such as the inclusion or removal of items from the MBS.

Pathology data from the MBS

Pathology tests undertaken by pathologists that are charged to Medicare are recorded by Medicare Australia. However, these Medicare data are not comparable with BEACH data.

- MBS pathology data reflect pathology orders made by GPs and other medical specialists. About 70% of the volume of MBS pathology claims are for pathology ordered by GPs.¹²
- Each pathology company can respond differently to a specific test order label recorded by the GP. For example, the tests completed by a pathologist in response to a GP order for a full blood count may differ between companies.
- The pathology companies can charge through the MBS only for the three most expensive items undertaken, even when more were actually done. This is called 'coning' and is part of the DoH pathology payment system. This means that the tests recorded in the MBS include only those charged for, not all those that were done. Coning applies only to GP pathology orders, not to those generated by other medical specialists.
- Pathology MBS items contain pathology tests that have been grouped on the basis of cost (for example, 'any two of the following ... tests'). Therefore an MBS item often does not give a clear picture of the precise tests performed.
- This means that the MBS data reflect those tests billed to the MBS after interpretation of the order by the pathologist, and after selection of the three most expensive MBS items.

In BEACH, the pathology data:

- include details of pathology tests ordered by the participating GPs; however, the GP is limited to the recording of five tests or battery of tests at each encounter, and as the number of tests/batteries ordered on any single occasion is increasing,¹³ an increasing number of additional tests ordered will be lost
- reflect the terms used by GPs in their orders to pathologists, and for reporting purposes these have been grouped by the MBS pathology groups for comparability.

The distributions of the two data sets will therefore differ, reflecting on the one hand the GP order and on the other the MBS-billed services from the pathologist.

Pathology ordering by GPs is described in Chapter 12 of this report. Those interested in pathology test ordering by GPs should also view the following publications:

- *Evaluation of pathology ordering by general practitioners in Australia* (Doctoral thesis).¹⁴
- *Are rates of pathology test ordering higher in general practices co-located with pathology collection centres?*¹⁵ This publication investigated the independent effect of general practice co-location with pathology collection centres on GP pathology test ordering in Sydney and Melbourne metropolitan areas.
- *Evidence-practice gap in GP pathology test ordering: a comparison of BEACH pathology data and recommended testing.*¹⁶

Imaging data from the MBS

Some of the issues discussed regarding pathology data also apply to imaging data. Although coning is not an issue for imaging, radiologists can decide whether the test ordered by the GP is the most suitable and whether to undertake other or additional tests of their choosing. The MBS data therefore reflect the tests that are actually undertaken by the radiologist, whereas the BEACH data reflect those ordered by the GP. Those interested in GP ordering of imaging tests should also see *Evaluation of imaging ordering by general practitioners in Australia*.¹⁷

The Australian Health Survey

The 2011–13 Australian Health Survey, conducted by the Australian Bureau of Statistics (ABS), includes the National Health Survey, the National Nutrition and Physical Activity Survey and the National Health Measures Survey. The National Health Survey provides estimates of population prevalence of some diseases, and a measure of the problems taken to the GP by people in the two weeks before they were surveyed. The National Health Measures Survey includes biomedical measures related to chronic disease and nutritional biomarkers.¹⁸

- Prevalence estimates from the National Health Survey are based on self-reported morbidity from a representative sample of the Australian population, using a structured interview to elicit health-related information from participants. Prevalence estimates from the National Health Measures Survey are based on biomedical measures of diagnosed and undiagnosed disease.
- The National Health Survey has the advantage of accessing people who do not go to a GP as well as those who do. They can therefore provide an estimate of population prevalence of disease and a point estimate of incidence of disease. However, self-report has been demonstrated to be susceptible to misclassification because of a lack of clinical corroboration of diagnoses.¹⁹
- Prevalence estimates based on biomedical measures have the advantage of measuring diagnosed and undiagnosed disease.

Management rates of health problems in general practice represent GP workload for a health problem. BEACH can be used to estimate the period incidence of diagnosed disease presenting in general practice through the number of new cases of that disease. The management rates of individual health problems and management actions can be extrapolated to national management rates.

The general practice patient population sits between the more clinical hospital-based population and the general population, with about 85.8% of Australians visiting a GP at least once in 2014–15 (personal communication, DoH, July 2015). Disease management rates are a product of both the prevalence of the disease/health problem in the population, and the frequency with which patients visit GPs for the treatment of that problem. Those who are older and/or have more chronic disease are therefore likely to visit more often, and have a greater chance of being sampled in the encounter data.

Prevalence of selected diseases among the patient population seen at least once in general practice can be investigated using the Supplementary Analysis of Nominated Data method (see Section 2.6). Those interested in the prevalence of disease and multimorbidity should refer to the following papers: *Estimating prevalence of common chronic morbidities in Australia*,²⁰ *Prevalence and patterns of multimorbidity in Australia*,²¹ *Prevalence of chronic conditions in Australia*,²² and *Examining different measures of multimorbidity, using a large prospective cross-sectional study in Australian general practice*.²³

1.4 Access to BEACH data

Different bundles of BEACH data are available to the general public, to BEACH participating organisations, and to other organisations and researchers.

Public domain

This annual publication provides a comprehensive view of general practice activity in Australia. The BEACH program has generated many papers on a wide variety of topics in journals and professional magazines. All published material from BEACH is available at sydney.edu.au/medicine/fmrc/publications.

Since April 1998, a section at the bottom of each encounter form has been used to investigate aspects of patient health or healthcare delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data). The SAND methods are described in Section 2.6. Abstracts of results and the research tools used in all SAND substudies from April 1998 to March 2015 have been published. Those from:

- April 1998 to March 1999 were published in *Measures of health and health care delivery in general practice in Australia*²⁴
- April 1999 to July 2006 were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*²⁵
- August 2006 to March 2014 were published in each of the BEACH annual reports²⁶⁻³³
- April 2014 to March 2015 are included in Chapter 14 of this report.

Abstracts of results for all SAND substudies are also available on the Family Medicine Research Centre's (FMRC) website sydney.edu.au/medicine/fmrc/publications/sand-abstracts where you can search by topic.

Participating organisations

Organisations providing funding for the BEACH program receive summary reports of the encounter data quarterly, and standard reports or specifically designed analyses about their subjects of interest. Participating organisations also have direct access to straightforward analyses on any selected problem, medication, pathology or imaging test through an interactive web server. All data made available to participating organisations have been further 'de-identified'. Patients are not identifiable even from the original encounter data forms, but are further stripped of date of birth (replaced with age in years and months) and postcode of residence (replaced with state and area type). GP characteristics data are provided only in the form of grouped output (for example, GPs aged less than 35 years) to any organisation.

External purchasers of reports

Non-contributing organisations may purchase standard reports or other ad hoc analyses. Charges are outlined at sydney.edu.au/medicine/fmrc/beach/data-reports/for-purchase. The FMRC should be contacted for specific quotations. Contact details are provided at the front of this publication.

2 Methods

In summary:

- each year, BEACH involves a new random sample of about 1,000 GPs
- each GP records details of about 100 doctor–patient encounters of all types
- the GP sample is a rolling (ever-changing) sample, with about 20 GPs participating in any one week, 50 weeks a year (with 2 weeks break over Christmas)
- each GP can be selected only once per Quality Improvement & Continuing Professional Development (QI & CPD) Program triennium (that is, once in each 3-year period)
- the encounter information is recorded by the GPs on structured paper encounter forms (Appendix 1)
- GP participants also complete a questionnaire about themselves and their practice (Appendix 2).

2.1 Sampling methods

The source population includes all vocationally registered GPs and all general practice registrars who claimed a minimum of 375 Medicare general practice items of service in the most recently available 3-month Medicare data period (which equates to 1,500 such claims in a year). This ensures inclusion of the majority of part-time GPs, while excluding those who are not in private practice but claim for a few consultations a year.

The Medicare statistics section of DoH updates the sample frame from the Medicare records quarterly, using the Medicare claims data, then removes from the sample frame any GPs already randomly sampled in the current triennium, and draws a new sample from those remaining in the sample frame. This ensures the timely addition of new entries to the profession, and timely exclusion of those GPs who have stopped practising, or have already participated or been approached in the current triennium.

2.2 Recruitment methods

The randomly selected GPs are approached by letter, posted to the address provided by the Australian Government DoH.

- Over the following 10 days, the telephone numbers generated from the Medicare data are checked using the electronic white and yellow pages. This is necessary because many of the telephone numbers provided from the Medicare data are incorrect.
- The GPs are then telephoned in the order they were approached and, referring to the approach letter, asked whether they will participate.
- This initial telephone contact with the practice often indicates that the selected GP has moved elsewhere, but is still in practice. Where a new address and/or telephone number can be obtained, these GPs are followed up at their new address.
- GPs who agree to participate are set an agreed recording date several weeks ahead.
- A research pack is sent to each participant before the planned start date.
- Each GP receives a telephone reminder early in the agreed recording period – this also provides the GP with an opportunity to ask questions about the recording process.
- GPs can use a 'freecall' (1800) number to ring the research team with any questions during their recording period.
- Non-returns are followed up by regular telephone calls for 3 months.

- Participating GPs earn clinical audit points towards their QI & CPD requirements through the Royal Australian College of General Practitioners (RACGP) and/or the Australian College of Rural and Remote Medicine (ACRRM). As part of this QI process, each receives an analysis of his or her results compared with those of nine other de-identified GPs who recorded at about the same time. Comparisons with the national average are also provided. In addition, GPs receive some educational material related to the identification and management of patients who smoke or consume alcohol at hazardous levels. Additional points can be earned if the participant chooses to do a follow-up audit of smoking and alcohol consumption among a sample of patients about 6 months later.

2.3 Ethics approval and informed patient consent

Ethics approval for this study in 2014–15 was obtained from the Human Ethics Committee of the University of Sydney.

Although the data collected by the GPs is not sufficient to identify an individual patient, informed consent for GP recording of the encounter details is required from each patient. GPs are instructed to ensure that all patients presenting during their recording period are provided with a Patient Information Card (Appendix 3), and they ask the patient if they are happy for their data to be included in the study. If the patient refuses, details of the encounter are not recorded. This is in accordance with the ethics requirements for the BEACH program.

2.4 Data elements

BEACH includes three interrelated data collections: GP characteristics, encounter data and patient health status. An example of the form used to collect the encounter data and the data on patient health status is included in Appendix 1. The GP characteristics questionnaire is provided in Appendix 2. The GP characteristics and encounter data collected are summarised below. Patient health status data are described in Section 2.6.

GP profile form (Appendix 2)

- **GP characteristics:** age and sex, years in general practice, number of direct patient care hours worked per week, country of graduation, general practice registrar status, Fellow of the RACGP status, Fellow of the ACRRM status, use of computers at work for clinical purposes, work undertaken in other clinical settings, number of practice locations worked in a regular week.
- **Practice characteristics:** postcode of major practice, number of individual and number of full-time equivalent GPs working in the practice, number of individual and number of full-time equivalent practice nurses working in the practice, usual after-hours care arrangements, other health services located or available at the major practice.

Encounter recording form (Appendix 1)

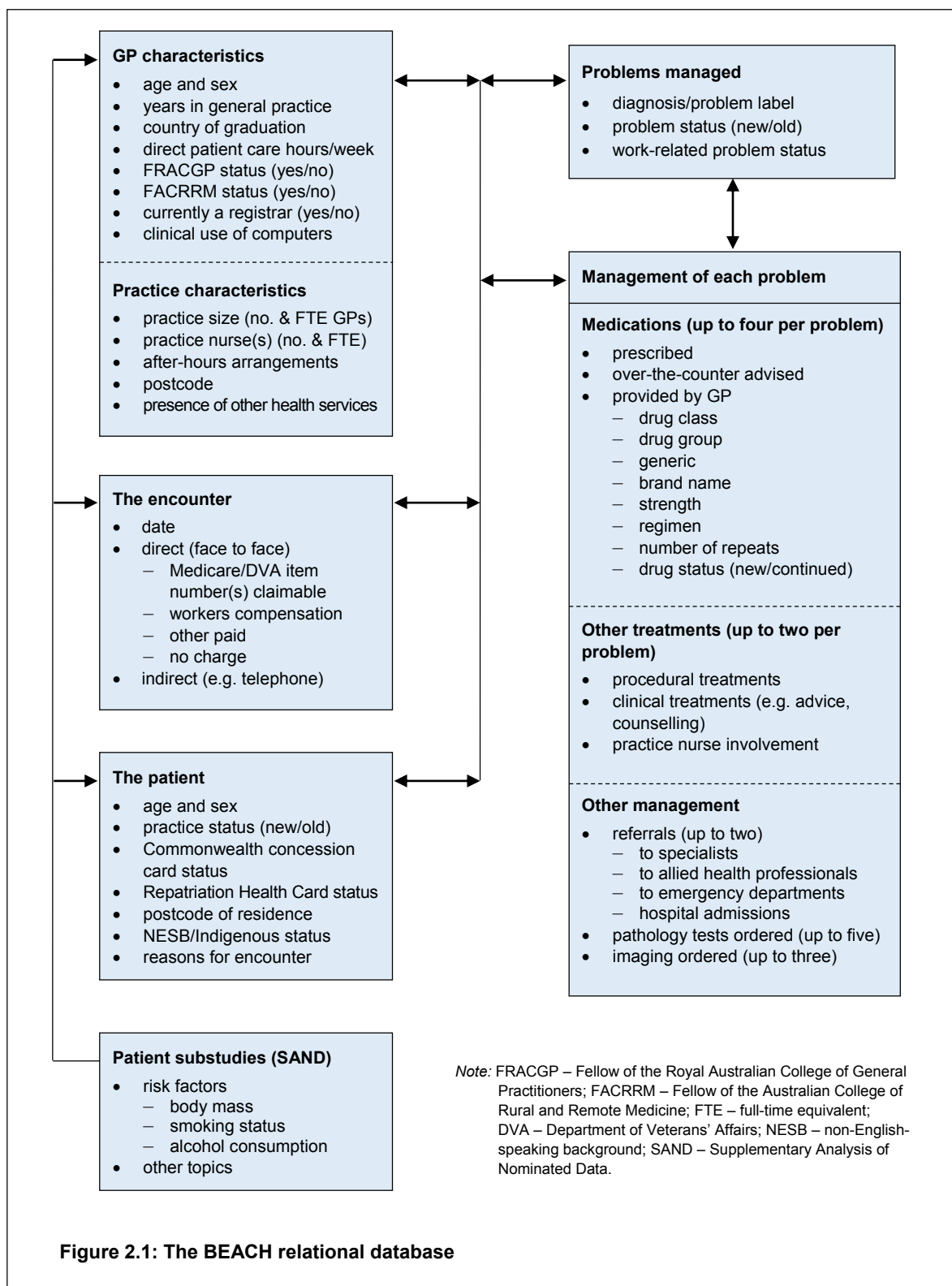
- **Encounter data:** date of consultation, type of consultation (direct/indirect) (tick box options), up to three MBS/DVA item numbers (where applicable), and other payment source (where applicable) (tick box options).
- **Patient data:** date of birth, sex and postcode of residence. Tick boxes (yes/no options) are provided for Commonwealth concession cardholders, holders of a Repatriation Health Card (from DVA), non-English-speaking background (patient reported a language other than English is the primary language at home), Aboriginal person (self-identification), and Torres Strait Islander person (self-identification). Space is provided for up to three patient reasons for encounter (RFEs) (see Glossary).
- **The problems managed** at encounter (at least one and up to four). Tick boxes are provided to denote the status of each problem as new or continuing for the patient (see Glossary).

- **Management actions for each problem**, including:
 - medications prescribed, supplied by the GP and advised for over-the-counter purchase including brand name, form (where required), strength, regimen, status (new or continuing medication for this problem), number of repeats
 - other treatments provided for each problem, including counselling, advice and education, and procedures undertaken, and whether the recorded other treatment was provided by practice nurse (tick box)
 - new referrals to medical specialists, allied health services, emergency departments, and hospital admissions
 - investigations, including pathology tests, imaging and other investigations ordered.

2.5 The BEACH relational database

The BEACH relational database is described diagrammatically in Figure 2.1. Note that:

- all variables can be directly related to the encounter, the GP and the patient characteristics
- all types of management are directly related to the problem being managed
- RFEs have only an indirect relationship with problems managed, as a patient may describe one RFE (such as 'repeat prescriptions') that is related to multiple problems managed, or several RFEs (such as 'runny nose' and 'cough') that relate to a single problem (such as upper respiratory tract infection) managed (see Section 6.3).



2.6 Supplementary Analysis of Nominated Data

A section at the bottom of each recording form investigates aspects of patient health or health care delivery in general practice not covered by the consultation-based data. These additional substudies are referred to as SAND, Supplementary Analysis of Nominated Data.

- Each year the 12-month data period is divided into 10 blocks, each of 5 weeks, with three substudies per block. The research team aims to include data from about 100 GPs in each block.
- Each GP's pack of 100 forms includes 40 forms that ask for the start and finish times of the encounter, and include questions about patient risk factors: patient height and weight (used to calculate body mass index, BMI), alcohol intake and smoking status (patient self-report). The methods and results of topics in the SAND substudies for alcohol consumption, smoking status and BMI are reported in Chapter 13. The start and finish times collected for these encounters are used to calculate length of consultation. The length of consultation for Medicare-claimable encounters is reported in Section 5.3.
- The remaining 60 forms in each pack are divided into two blocks of 30, so each of these other SAND studies includes about 3,000 records (30 x 100 GPs). Different questions are asked of the patient in each block and these vary throughout the year. Some topics are repeated to increase sample size.
- The order of SAND sections is rotated in the GP recording pack, so that 40 patient risk factor forms may appear first, second or third in the pad. Rotation of ordering ensures there was no order effect on the quality of the information collected.

Abstracts of results and the research tools used in all SAND substudies from April 1998 to March 2015 have been published. Those:

- from April 1998 to March 1999 were published in *Measures of health and health care delivery in general practice in Australia*²⁴
- from April 1999 to July 2006 were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*²⁵
- conducted between August 2006 and March 2014 have been published in each of the general practice activity annual reports²⁶⁻³³
- conducted in the 2014–15 BEACH year are provided in Chapter 14 of this publication.

Abstracts of results for all SAND substudies are also available on the FMRC's website <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

2.7 Statistical methods

The analysis of the 2014–15 BEACH data was conducted with Statistical Analysis System (SAS) version 9.3,³⁴ and the encounter is the primary unit of inference. Proportions are used only when describing the distribution of an event that can arise only once at a consultation (for example, patient or GP age and sex), or to describe the distribution of events within a class of events (for example, problem A as a percentage of total problems). Due to rounding, proportions may not always add to exactly 100%.

Calculations are made in SAS using the precise data with multiple decimal points. Therefore, if a reader recalculates the result from the reported rounded numbers presented in tables, their result may differ from that presented by 0.1.

Rates per 100 encounters are used when an event can occur more than once at the consultation (for example, RFEs, problems managed or medications).

Rates per 100 problems are also used when a management event can occur more than once per problem managed. In general, the results present the number of observations (n), the rate per 100 encounters, and (in the case of management actions) the rate per 100 problems managed, and the 95% confidence interval.

BEACH is a single stage cluster sample study design, each 100 encounters forming a cluster around each GP participant. In cluster samples, variance needs to be adjusted to account for the correlation between observations within clusters. Procedures in SAS version 9.3 were used to calculate intraclass correlation, and adjust the confidence intervals accordingly.³⁴

Post-stratification weighting of encounter data adjusts for: any difference in the age–sex distribution of the participating GPs and those GPs in the sample frame from which the samples were drawn; and for the varying activity level of each GP (measured by the number of claims each has made in the previous 12 months from Medicare Australia) (see Chapter 3).

Statistical significance is tested by chi-square statistic for GP characteristics. However, where changes over time are investigated in the companion report, the significance of differences in rates is judged by non-overlapping confidence intervals (CIs) of the results being compared. The magnitude of this difference can be described as at least $p < 0.05$. Assessment using non-overlapping confidence intervals is a conservative measure of significance,³⁵⁻³⁷ particularly when differences are assessed by comparing results from independent random samples, as is the case when changes over time are investigated using BEACH data. Due to the number of comparisons made, we believe this conservative approach is warranted.

2.8 Classification of data

The following data elements are classified according to the International Classification of Primary Care – Version 2 (ICPC-2), of the World Organization of Family Doctors (Wonca).⁸

- patient reasons for encounter (RFEs)
- problems managed
- clinical treatments (for example, counselling, advice)
- procedural treatments
- referrals
- investigations ordered (including pathology, imaging and other investigations).

The ICPC-2 is used in more than 45 countries as the standard for data classification in primary care. It is accepted by the WHO in the WHO Family of International Classifications,³⁸ and is the declared national standard in Australia for reporting of health data from general practice and patient self-reported health information.³⁹

The ICPC-2 has a biaxial structure, with 17 chapters on one axis (each with an alphabetic code) and seven components on the other (numeric codes) (Figure 2.2). Chapters are based on body systems, with additional chapters for psychological and social problems. Component 1 includes symptoms and complaints. Component 7 covers diagnoses – it can also be expanded to provide data about infections, injuries, neoplasms, congenital anomalies and ‘other’ diagnoses.

Component 2 (diagnostic, screening and prevention) is often applied in describing the problem managed (for example, check-up, immunisation). Components 3 to 6 cover other processes of care, including referrals, other (non-pharmacological) treatments and orders for pathology and imaging. The components are standard and independent throughout all chapters. The updated component groupings of ICPC-2 codes, released by the Wonca International Classification Committee in 2004⁴⁰ have been used in this report.

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

In 1995, recognising a need for a coding and classification system for general practice electronic health records, the FMRC (then the Family Medicine Research Unit, FMRU) developed an extended clinical terminology classified according to the ICPC, now called ICPC-2 PLUS.⁴¹ This is an interface terminology, developed from all the terms used by GPs in studies such as *The Australian Morbidity and Treatment Survey 1990–91* (113,468 encounters),⁴² *A comparison of country and metropolitan general practice 1990–91* (51,277 encounters),⁴³ *The Morbidity and Therapeutic Index 1992–1998* (a clinical audit tool that was available to GPs; approximately 400,000 encounters), and *BEACH 1998–2015* (about 1.7 million encounters). Together, these make up about 2.3 million encounter records, involving about 3.4 million free text descriptions of problems managed and a further 3.4 million for patient reasons for encounter. These terms are classified according to ICPC-2 to ensure data can be compared internationally. Readers interested in seeing how coding works can download the ICPC-2 PLUS Demonstrator at sydney.edu.au/medicine/fmrc/icpc-2-plus/demonstrator.

When the free-text data are received from the GPs, trained secondary coders (who are undergraduate students), code the data in specific terms using ICPC-2 PLUS. This ensures high coder reliability and automatic classification of the concept, and allows us to ‘ungroup’ such ICPC-2 rubrics as ‘other diseases of the circulatory system’ and select a specific disease from the terms within it.

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 and unspecified	L	Musculoskeletal	U	Urinary
B	Blood & blood-forming organs	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	Endocrine, nutritional & metabolic		

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

Presentation of data classified in ICPC-2

Statistical reporting is usually at the level of the ICPC-2 classification (for example, acute otitis media/myringitis is ICPC-2 code H71). However, there are some exceptions where data are grouped either above the ICPC-2 level or across the ICPC-2 level. These grouped morbidity, pathology and imaging codes are defined in Appendix 4 available at: <hdl.handle.net/2123/13765>.

Reporting morbidity with groups of ICPC-2 codes

When recording problems managed, GPs may not always be very specific. For example, in recording the management of hypertension, they may simply record the problem as 'hypertension'. In ICPC-2, 'hypertension, unspecified' is classified as 'uncomplicated hypertension' (code K86). There is another code for 'complicated hypertension' (K87). In some cases the GP may simply have failed to specify that the patient had hypertension with complications. The research team therefore feels that for national data reporting, it is more reliable to group the codes K86 and K87 and label this 'Hypertension*' – the asterisk indicating that multiple ICPC-2 codes (as in this example), or ICPC-2 PLUS codes (see below), are included. Appendix 4, Table A4.1 lists the codes included in these groups.

Reporting morbidity with groups of ICPC-2 PLUS codes

In other cases, a concept can be classified within (but be only part of) multiple ICPC-2 codes. For example, osteoarthritis is classified in ICPC-2 in multiple broader codes according to site, such as L92 – shoulder syndrome (includes bursitis, frozen shoulder, osteoarthritis of shoulder, rotator cuff syndrome). When reporting osteoarthritis in this publication, all the more specific osteoarthritis ICPC-2 PLUS terms classified within all the appropriate ICPC-2 codes are grouped. This group is labelled 'Osteoarthritis*' – the asterisk again indicating multiple codes, but in this case they are PLUS codes rather than ICPC-2 codes. Appendix 4, Table A4.1 lists the codes included in these groups.

Reporting chronic morbidity

Chronic conditions are medical conditions characterised by a combination of the following characteristics: duration that has lasted or is expected to last 6 months or more, a pattern of recurrence or deterioration, a poor prognosis, and consequences or sequelae that affect an individual's quality of life.

To identify chronic conditions, a chronic condition list⁴⁴ classified according to ICPC-2 was applied to the BEACH data set. Chronic and non-chronic conditions (for example, diabetes and gestational diabetes) are often grouped together when reporting (for example, diabetes – all*). When reporting chronic morbidity, only problems regarded as chronic have been included in the analysis. Where the group used for the chronic analysis differs from that used in other analyses in this report, they are marked with a double asterisk. Codes included in the chronic groups are provided in Appendix 4, Table A4.2.

Reporting pathology and imaging test orders

All the pathology and imaging tests are coded very specifically in ICPC-2 PLUS, but ICPC-2 classifies pathology and imaging tests very broadly (for example, a test of cardiac enzymes is classified in K34 – Blood test associated with the circulatory system; a CT scan of the lumbar spine is classified as L41 – Diagnostic radiology/imaging of the musculoskeletal system). In Australia, the MBS classifies pathology and imaging tests in groups that are relatively well recognised. The team therefore regrouped all pathology and imaging ICPC-2 PLUS codes into MBS standard groups. This allows comparison of data between data sources.

The groups are marked with an asterisk, and inclusions are provided in Appendix 4, Tables A4.8 and A4.9.

Classification of pharmaceuticals

Pharmaceuticals that are prescribed, provided by the GP or advised for over-the-counter purchase are coded and classified according to an in-house classification, the Coding Atlas for Pharmaceutical Substances (CAPS).

This is a hierarchical structure that facilitates analysis of data at a variety of levels, such as medication class, medication group, generic name/composition, and brand name.

The generic name of a medication is its non-proprietary name, which describes the pharmaceutical substance(s) or active pharmaceutical ingredient(s).

When strength and regimen are combined with the CAPS code, we can derive the prescribed daily dose for any prescribed medication or group of medications.

CAPS is mapped to the Anatomical Therapeutic Chemical (ATC)⁴⁵ classification, which is the Australian standard for classifying medications at the generic level.³⁹ The ATC has a hierarchical structure with five levels. For example:

- Level 1: C – Cardiovascular system
- Level 2: C10 – Serum lipid reducing agents
- Level 3: C10A – Cholesterol and triglyceride reducers
- Level 4: C10AA – HMG CoA reductase inhibitors
- Level 5: C10AA01 – Simvastatin (the generic drug).

Use of the pharmaceutical classifications in reporting

For pharmaceutical data, there is the choice of reporting in terms of the CAPS coding scheme or the ATC. They each have advantages in different circumstances.

In the CAPS system, a new drug enters at the product and generic level, and is immediately allocated a generic code. Therefore, the CAPS classification uses a bottom-up approach.

In the ATC, a new generic may initially enter the classification at any level (1 to 5), not always at the generic level. Reclassification to lower ATC levels may occur later. Therefore, the ATC uses a top-down approach.

When analysing medications across time, a generic medication that is initially classified to a higher ATC level will not be identifiable in that data period and may result in under-enumeration of that drug during earlier data collection periods.

There are some differences in the labels applied to generic medications in the two classifications. For example, the medication combination of paracetamol and codeine is labelled as 'Paracetamol/codeine' in CAPS and as 'Codeine combinations excluding psycholeptics' in the ATC.

- When reporting annual results for pharmaceutical data, the CAPS database is used in tables of the 'most frequent medications' (Tables 9.2 to 9.4).
- When reporting the annual results for pharmaceuticals in terms of the ATC hierarchy (Table 9.1), ATC levels 1, 3, and 5 are used. The reader should be aware that the results reported at the generic level (Level 5) may differ slightly from those reported in the 'most frequent medication' tables for the reasons described above.

Practice nurse and Aboriginal health worker activities associated with the encounter

The BEACH form was changed in 2005–06 to capture 'other treatments' performed by practice nurses (PNs) following the introduction of MBS item numbers for defined PN activities. GPs were asked to tick the 'practice nurse' box if a treatment was provided by the PN. If not ticked, it was assumed that the GP provided the 'other treatment'.

Over the years, new PN item numbers were added to the MBS and some items were broadened to include work done by Aboriginal health workers (AHWs). From 2005–06 to 2010–11, we reported the results referring to PNs alone. As some GPs indicated (of their own accord) that the recorded action was done by an AHW rather than a PN, this information is now included. In this report we refer to work undertaken at encounters by PNs and AHWs in conjunction with the GPs, though the vast majority will have been done by PNs. There is a limitation to this approach. Few GPs specifically indicated that the work was done by an AHW. Others may have considered the question referred specifically to PNs, and therefore did not record work done by AHWs. These results therefore have the potential to be an underestimate of the work undertaken at GP–patient encounters by AHWs.

2.9 Quality assurance

All morbidity and therapeutic data elements were secondarily coded by staff entering key words or word fragments, and selecting the required term or label from a pick list. This was then automatically coded and classified by the computer. To ensure reliability of data entry we use computer-aided error checks ('locks') at the data entry stage, and a physical check of samples of data entered versus those on the original recording form. Further logical data checks are conducted through SAS regularly.

2.10 Validity and reliability

A discussion of the reliability and validity of the BEACH program has been published elsewhere.⁴⁶ This section touches on some aspects of reliability and validity of active data collection from general practice that should be considered by the reader.

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 analysis and reporting of recorded data are described in Section 2.7. Previous work has demonstrated the extent to which a random sample of GPs recording information about a cluster of patients represents all GPs and all patients attending GPs,⁴⁷ the degree to which GP-reported patient RFEs and problems managed accurately reflect those recalled by the patient,⁴⁸ and reliability of secondary coding of RFEs⁴⁹ and problems managed.⁴² The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work.⁵⁰

2.11 Extrapolated national estimates

A section at the end of each chapter highlights changes that have occurred over the decade 2005–06 to 2014–15. These sections summarise results published in the companion publication, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ Where the results demonstrate a significant change over time, the estimated national change across total GP Medicare services from 2005–06 to 2014–15 can be calculated using the method detailed below.

Note that extrapolations are always based on rate per 100 encounters rather than rate per 100 problems because there is no independent measure of the total number of problems managed in Australian general practice. In contrast, the number of national encounters can be drawn from Medicare claims data.

In this report, we also occasionally extrapolate data for the single year 2014–15 to give the reader some feeling of the real size of the issue across Australian general practice.

When extrapolating from a single time point we:

- divide the 'rate per 100 encounters' of the selected event by 100, and then multiply by the total number of GP service items claimed through Medicare in that year, (137.3 million in 2014–15, rounded to the nearest 100,000, see Table 2.1), to give the estimated number of the selected event across Australia in 2014–15.

When extrapolating measured change over the decade to national estimates, we:

- divide the 'rate per 100 encounters' of the selected event for 2005–06 by 100, and then multiply by the total number of GP service items claimed through Medicare in that year, (101.1 million, rounded to the nearest 100,000, see Table 2.1), to give the estimated national number of events in 2005–06
- repeat the process using data for 2014–15.

The difference between the two estimates gives the estimated national change in the frequency of that event over the decade. Estimates are rounded to the nearest 100,000 if more than a million, and to the nearest 10,000 if below a million.

Change is expressed as the estimated increase or decrease over the study period (from 2005–06 to 2014–15), in the number of general practice contacts for that event (for example, an increase or decrease in the number of GP management contacts with a certain problem), or an increase or decrease in the number of times a particular medication type was prescribed in Australia.

Table 2.1 provides the rounded number of GP service items claimed from Medicare in each financial year from 2005–06 to 2014–15.

Table 2.1: Rounded number of general practice professional services claimed from Medicare Australia each financial year, 2005–06 to 2014–15 (million)

	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15 ^(a)
Rounded number of Medicare GP items of service claimed	101.1	103.4	109.5	113.0	116.6	119.2	123.9	126.8	134.2	137.3

(a) Medicare data for the 2014–15 year included data from the April 2014 to March 2015 quarters because the 2014–15 financial year data were not available at the time of preparation of this report.

Source: Medicare Statistics.²

Examples of extrapolation

Example 1: Number of GP encounters at which depression was managed nationally in 2014–15

Depression was managed at a rate of 4.5 per 100 GP encounters (95% CI: 4.2–4.7) in 2014–15 (shown in Table 7.4). How many times does this suggest that depression was managed in GP encounters across Australia in 2014–15?

Our best estimate is:

6.2 million times $[(4.5/100) \times 137.3 \text{ million}]$, but we are 95% confident that the true number lies between 5.8 million $[(4.2/100) \times 137.3 \text{ million}]$ and 6.5 million $[(4.7/100) \times 137.3 \text{ million}]$.

Using the management rate per 100 encounters as the basis for extrapolation works very well when estimating total national GP encounters at which a single concept (symptom/complaint, or diagnosis/disease) is managed. However, if you wish to estimate how many GP–patient encounters involve management of any psychological problem, you need to use a different approach (see example 2 below).

Example 2: Number of GP encounters which involve management of psychological problems

The concept 'psychological problems' includes many different individual concepts (for example, depression, dementia, anorexia nervosa, etc). In BEACH, GPs record at least one and up to four problems managed, per encounter. It is therefore possible that at a single encounter a GP can manage more than one of the many problems classified as 'psychological problems' in the International Classification of Primary Care.

If you use the management rate per 100 encounters to estimate the national number of encounters at which at least one psychological problem was managed in 2014–15, you will overestimate the true number of encounters, because more than one of these problems can be managed at a single encounter.

To overcome this problem we have a column on the right hand side of Table 6.4 (Patient reasons for encounter by ICPC-2 chapter and most frequent individual reasons for encounter within chapter) and Table 7.3 (Problems managed by ICPC-2 chapter and frequent individual problems within chapter), which gives you the proportion of all BEACH encounters at which at least one problem of each chapter type was managed.

In the examples provided, we use this column to answer the question: *At how many encounters across Australia, did GPs manage at least one psychological problem in 2014–15?*

Using the far right column of Table 7.3, our best estimate is:

17.4 million times (12.7% of 137.3 million), but we are 95% confident that the true number lies between 16.6 million (12.1% of 137.3 million) and 18.1 million (13.2% of 137.3 million).

Example 3: National increase in the number of problems managed from 2005–06 to 2014–15

There was a statistically significant increase in the number of problems managed at GP–patient encounters, from 146.2 per 100 encounters in 2005–06 to 155.1 in 2014–15 (see Table 7.2 in *A decade of Australian general practice activity 2005–06 to 2014–15*).¹ The calculation used to extrapolate the effect of this change across Australia is:

$(146.2/100) \times 101.1 \text{ million} = 147.8 \text{ million}$ problems managed nationally in 2005–06, and
 $(155.1/100) \times 137.3 \text{ million} = 213.0 \text{ million}$ problems managed nationally in 2014–15.

This suggests there were 65 million (213.0 million minus 147.8 million) more problems managed at GP–patient encounters in Australia in 2014–15 than in 2005–06. This is the result of the compound effect of the increase in the number of problems managed by GPs at encounters **plus** the far higher number of number of visits across Australia in 2014–15 than in 2005–06.

Considerations and limitations in extrapolations

The extrapolations to the total events occurring nationally in any one year are only estimates. They may provide:

- an underestimate of the true 'GP workload' of a condition/treatment because the extrapolations are made to GP Medicare items claimed, not to the total number of GP encounters per year – an additional 5% or so of BEACH encounters annually include encounters paid by sources other than Medicare, such as DVA, state governments, workers compensation insurance, and employers, or not charged to anyone.
- an underestimate of activities of relatively low frequency with a skewed distribution across individual GPs. Where activity is so skewed across the practising population, a national random sample will provide an underestimate of activity because the sample reflects the population rather than the minority.

Further, the base numbers used in the extrapolations are rounded to the nearest 100,000, and extrapolation estimates are rounded to the nearest 100,000 if more than a million, and to the nearest 10,000 if below a million, so can only be regarded as approximations. However, the rounding has been applied to all years, so the effect on measures of change will be very small. Therefore, the extrapolation still provides an indication of the size of the effect of measured change nationally.

3 The sample

This chapter describes the GP sample and sampling methods used in the BEACH program. The sampling and recruitment methods are only summarised in this chapter. A more detailed explanation of the BEACH methods is provided in Chapter 2.

A summary of the BEACH data sets is reported for each year from 2005–06 to 2014–15 in the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

3.1 Response rate

A random sample of GPs who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from Medicare claims data by the Australian Government Department of Health (see Chapter 2).

Contact was attempted with 4,437 GPs, but 23.1% could not be contacted. A quarter of these had moved (and were untraceable), or had retired or died (Table 3.1), but more than half (60.9%) were those with whom contact could not be established after five calls. Younger GPs were harder to contact. In previous years these have largely been registrars moving through practices during training, who were no longer at the nominated practice and could not be traced. We were not able to measure the proportion of ‘no contact’ GPs who were registrars as, owing to changes in the privacy requirements in 2013 for data provided by DoH, information relating to any GPs who do not participate in BEACH must be destroyed quarterly, so is not available for comparison.

The fact that one-in-four GPs were not contactable may be a reflection of the uptake of electronic communication between GPs and DoH. Updating practice location may be overlooked, and may result in the contact details being out-of-date at the time the samples are provided.

The final participating sample consisted of 995 practitioners, representing 29.2% of those who were contacted and available, and 22.4% of those with whom contact was attempted (Table 3.1).

Table 3.1: Recruitment and participation rates

Type of contact	Number	Per cent of approached (<i>n</i> = 4,437)	Per cent of contacts established (<i>n</i> = 3,411)
Letter sent and phone contact attempted	4,437	100.0	—
No contact	1,026	23.1	—
No phone number could be established	20	0.5	—
Moved & untraceable/retired/deceased	293	6.6	—
Unavailable (overseas, maternity leave, etc.)	88	1.2	—
No contact after five calls	625	14.0	—
Telephone contact established	3,411	76.9	100.0
Declined to participate	2,162	48.7	63.4
Agreed but withdrew	254	5.7	7.4
Agreed and completed	995	22.4	29.2

3.2 Representativeness of the GP sample

Whenever possible, the study group of GPs should be compared with the population from which the GPs were drawn (the sample frame) to identify and, if necessary, adjust for any sample bias that may affect the findings of the study. Comparisons between characteristics of the final GP sample and those of the GPs in the sample frame are provided below. The method by which weightings are generated as a result of these comparisons and applied to the data are described in Section 3.3.

Statistical comparisons, using the chi-square statistic (χ^2) (significant at the 5% level), were made between BEACH participants and all recognised GPs in the sample frame during the study period (Table 3.2). The GP characteristics data for BEACH participants were drawn from their GP profile questionnaire. DoH provided the grouped data for all GPs in the sample frame, drawn from Medicare claims data.

Table 3.2 demonstrates there were no significant differences in characteristics of GPs in the final sample of BEACH participants and those of all GPs in the sample frame, in terms of sex, State/Territory and practice location as classified by the Australian Standard Geographical Classification (ASGC). In the final BEACH GP sample, there was a slight under-representation of GPs in the <35 year and 35–44 year age groups, and a slight over-representation in the 55+ years age group, compared with GPs in the sample frame. The proportion of GPs who had graduated from their primary medical degree in Australia (place of graduation) was also higher than that in the sample frame.

Table 3.2: Comparison of BEACH participants and all active recognised GPs in Australia who satisfied the selection criteria (the sample frame)

Variable	BEACH ^{(a)(b)}		Australia ^{(a)(c)}	
	Number	Per cent of GPs (n = 995)	Number	Per cent of GPs (n = 23,818)
Sex ($\chi^2 = 0.2, p = 0.68$)				
Males	570	57.3	13,803	58.0
Females	425	42.7	10,015	42.0
Age ($\chi^2 = 16.3, p < 0.001$)				
< 35 years	73	7.4	2,269	9.5
35–44 years	188	19.0	5,411	22.7
45–54 years	279	28.2	6,517	27.4
55+ years	448	45.3	9,621	40.4
Missing	7	—	—	—
Place of graduation ($\chi^2 = 26.0, p < 0.001$)				
Australia	663	67.0	14,014	58.8
Overseas	327	33.0	9,804	41.2
Missing	5	—	—	—
State ($\chi^2 = 9.9, p = 0.19$)				
New South Wales	341	34.3	7,558	31.7
Victoria	237	23.8	5,899	24.8
Queensland	204	20.5	4,930	20.7
South Australia	74	7.4	1,937	8.1
Western Australia	97	9.8	2,317	9.7
Tasmania	15	1.5	631	2.6

(continued)

Table 3.2 (continued): Comparison of BEACH participants and all active recognised GPs in Australia who satisfied the selection criteria (the sample frame)

Variable	BEACH ^{(a)(b)}		Australia ^{(a)(c)}	
	Number	Per cent of GPs (n = 995)	Number	Per cent of GPs (n = 23,818)
Australian Capital Territory	20	2.0	354	1.5
Northern Territory	6	0.6	192	0.8
Missing	1	—	—	—
ASGC ($\chi^2 = 4.1, p = 0.4$)				
Major Cities of Australia	708	71.2	16,625	69.8
Inner Regional Australia	191	19.2	4,634	19.5
Outer Regional Australia	82	8.2	2,090	8.8
Remote Australia	11	1.1	304	1.3
Very Remote Australia	2	0.2	160	0.7
Missing	1	—	—	—

(a) Missing data removed.

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

(c) All GPs who satisfied the sample selection criteria of at least 375 MBS-claimed GP consultation service items during the most recent 3-month Medicare Australia data period prior to their being sampled. Data provided by the Australian Government Department of Health.

Note: ASGC – Australian Standard Geographical Classification.⁵¹

GP activity in the previous year

Data on the number of MBS general practice service items claimed in the previous year were also provided by DoH for each GP in the drawn samples, and for all GPs (as a group) in the sample frame. These data were used to determine the ‘activity level’ of each participating GP, and to compare the activity level of the final participants with that of GPs in the sample frame.

When comparing GP activity level in the previous 12 months, the proportion of GPs in the final participant sample who had claimed fewer than 1,500 services in the previous year was half that of GPs in the sample frame. A slightly larger proportion of participants had claimed 1,501–3,000 services, and 3001–4,500 services, and there was only a very small difference (<2%) in the two most active service claim groups. Comparison of the mean number of claims made by the participating GPs was slightly lower than that of the GP sample frame. Participants conducted on average 143.1 fewer services per year, or 2.8 consultations per week (on a 52-week year, or 3 per week on a 48-week year, assuming 4 weeks leave) (Table 3.3). As the mean number of claims for the sample frame sat within the 95% CIs around the mean for BEACH participants, there was no statistically significant difference in activity levels of the two groups.

This result differs from year to year (the previous report showed small differences in terms of sex, place of graduation, state, and a slight variation in some categories of GP age³³). The effect of random sampling may also influence this measure as, occasionally, the randomly selected recruitment sample can differ slightly from the sample frame in one or more variables, which can affect the ultimate representativeness of the final participant group.

The 2013 changes to privacy requirements regarding data provided by DoH mean that we can no longer examine this possibility.

Table 3.3: Activity level in the previous 12 months of participating GPs and GPs in the sample frame (measured by the number of GP service items claimed)

Variable	Participants (n = 995)		Australia ^(a) (n = 23,848)	
	Number of GPs	Per cent	Number of GPs	Per cent
Activity ($\chi^2 = 38.2, p < 0.0001$)				
1–1,500 services in previous year	42	4.2	1,991	8.7
1,501–3,000 services in previous year	223	22.4	4,410	19.3
3,001–4,500 services in previous year	263	26.4	5,279	23.1
4,501–6,000 services in previous year	190	19.1	3,959	17.3
6,001–10,000 services in previous year	213	21.4	5,406	23.7
> 10,000 services in previous year	64	6.4	1,803	7.9
	Number of claims	95% CI	Number of claims	
Mean activity level	4,909.4	4,736.6–5,082.3	5,052.5	—
Standard deviation	2,779.2	—	—	—
Median activity level	4,358.0	—	—	—

(a) Number of GPs in the sample frame for whom these data were provided.

Note: The 'n' for Australia reported above differs from that of Table 3.2 because activity level is only provided for GPs who were in the sample frame for the entire year. GPs coming into or leaving the sample frame part-way through the year do not have an 'activity level' for the previous year; CI – confidence interval.

3.3 Weighting the data

Age–sex weights

As described in Section 3.2, comparisons are made annually to test how representative BEACH participants are of the GPs in the original Australian sample frame. Where participants in a particular age or sex group are over-represented or under-represented, GP age–sex weights need to be applied to the data sets in post-stratification weighting to achieve comparable estimates and precision. Because there are always slight (even if not statistically significant) differences, even in years where the BEACH participants are representative in all age and sex categories, post-stratification weighting for GP age and sex is applied for consistency over recording years.

Activity weights

In BEACH, each GP provides details of 100 encounters. There is considerable variation among GPs in the number of services each provides in a given year. Encounters were therefore assigned an additional weight directly proportional to the activity level of the recording GP. Please note – GP activity level was measured as the number of MBS general practice service items claimed for services by the GP in the previous 12 months (data supplied by DoH). Because the measure is based on annual activity, estimates could only be provided for GPs who had claimed service items during the whole year. Those entering or leaving the sample frame part way through the year will have met the eligibility criteria for inclusion in the BEACH sample (that is, claiming a minimum of 375 MBS GP consultation services during the most recent 3-month Medicare Australia data period at sampling date) but would not have an annual activity level.

Total weights

The final weighted estimates were calculated by multiplying raw rates by the GP age–sex weight and the GP sampling fraction of services ('activity') in the previous 12 months. Table 3.4 shows the precision ratio calculated before and after weighting the encounter data.

3.4 Representativeness of the encounter sample

In the BEACH program, we aim to gain a representative sample of GP–patient encounters each year. To assess the representativeness of the final weighted sample of encounters, the age–sex distribution of patients at weighted BEACH encounters with GP consultation service items claimed (excluding those with Department of Veterans' Affairs [DVA] patients) was compared with that of patients at all encounters claimed as GP consultation service items through Medicare in the 2014–15 study period (data provided by DoH).

As shown in Table 3.4, there is an excellent fit of the age–sex distribution of patients at the weighted MBS-claimed BEACH encounters with that of the MBS claims distribution, with all precision ratios within the 0.88–1.10 range. This indicates that the BEACH sample is a good representation of Australian GP–patient encounters, as no age–sex category varied by more than 12% from the population distribution, and only one by 12%.

The age–sex distribution of patients at BEACH encounters and for MBS GP consultation service item claims is shown graphically for all patients in Figure 3.1, for males in Figure 3.2, and for females in Figure 3.3.

Table 3.4: Age–sex distribution of patients at BEACH and MBS GP consultation service items

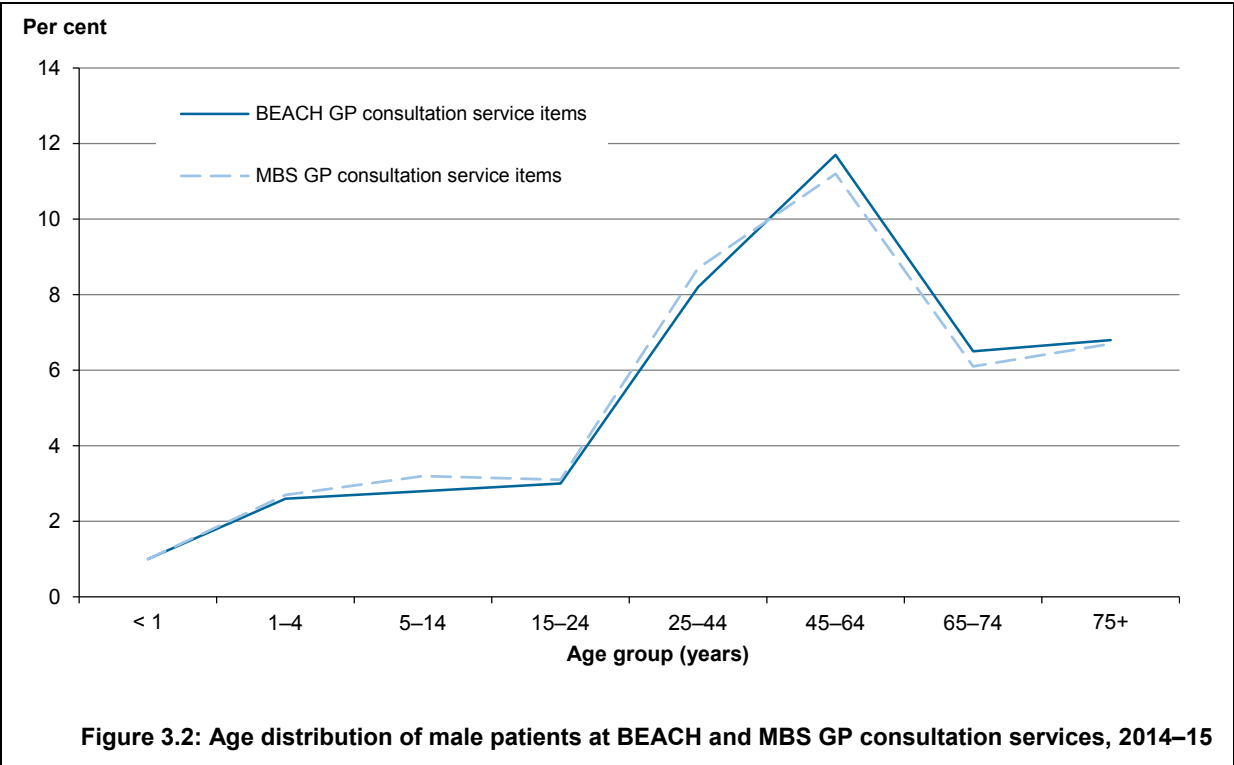
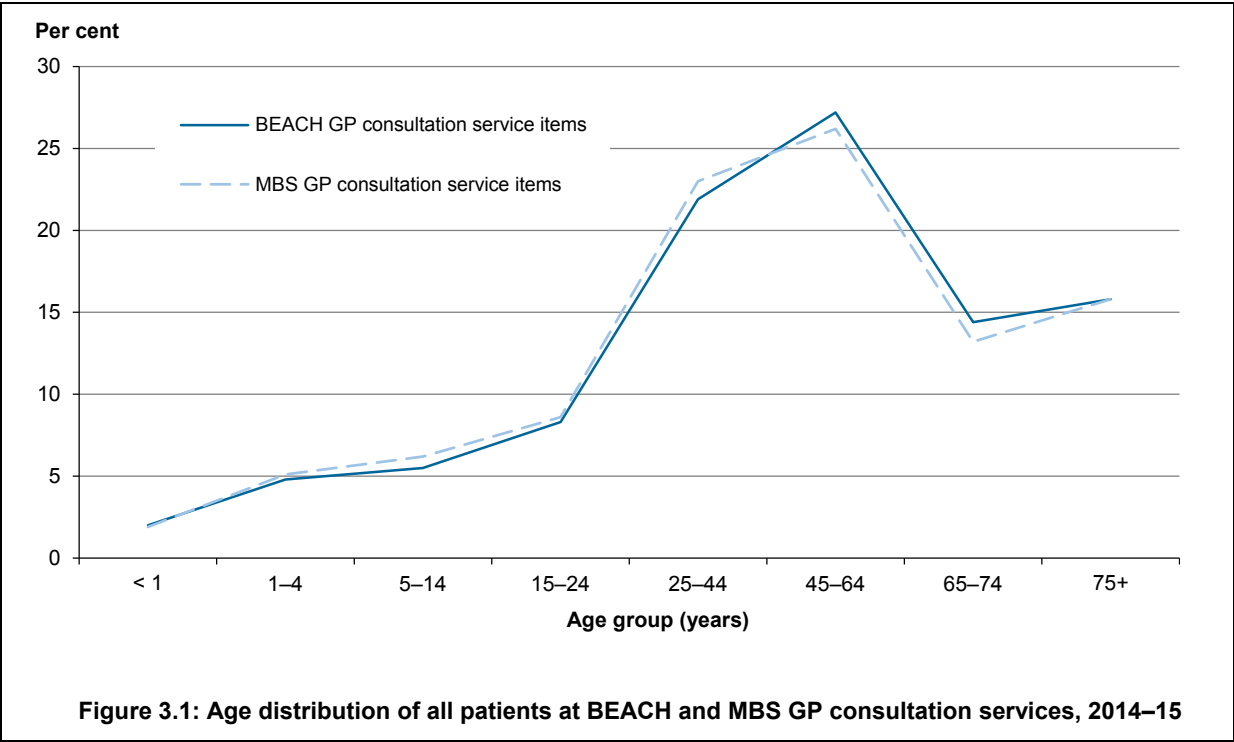
Sex/age	BEACH–raw ^(a)		BEACH–weighted ^(b)		Australia ^(c)	Precision ratios (Australia = 1.00)	
	Number	Per cent (n = 82,865)	Number	Per cent (n = 82,353)	Per cent (n = 116,073,886)	Raw ^(a)	Weighted ^(c)
All							
< 1 year	1,741	2.1	1,640	2.0	1.9	1.11	1.05
1–4 years	3,869	4.7	3,933	4.8	5.1	0.92	0.94
5–14 years	4,511	5.4	4,521	5.5	6.2	0.87	0.89
15–24 years	6,875	8.3	6,866	8.3	8.6	0.97	0.97
25–44 years	18,225	22.0	18,058	21.9	23.0	0.96	0.95
45–64 years	22,562	27.2	22,426	27.2	26.2	1.04	1.04
65–74 years	11,979	14.5	11,866	14.4	13.2	1.10	1.09
75+ years	13,103	15.8	13,044	15.8	15.8	1.00	1.00
Male							
< 1 year	901	1.1	858.4	1.0	1.0	1.07	0.97
1–4 years	2,049	2.5	2,122.6	2.6	2.7	0.93	0.96
5–14 years	2,249	2.7	2,321.4	2.8	3.2	0.84	0.88
15–24 years	2,335	2.8	2,496.6	3.0	3.1	0.89	0.96
25–44 years	6,324	7.6	6,730.3	8.2	8.7	0.88	0.95
45–64 years	9,123	11.0	9,610.7	11.7	11.2	0.98	1.04
65–74 years	5,090	6.1	5,326.0	6.5	6.1	1.00	1.07
75+ years	5,342	6.4	5,588.9	6.8	6.7	0.96	1.02
Female							
< 1 year	840	1.0	781.2	0.9	0.9	1.12	1.01
1–4 years	1,820	2.2	1,810.3	2.2	2.4	0.93	0.93
5–14 years	2,262	2.7	2,199.3	2.7	3.0	0.89	0.89
15–24 years	4,540	5.5	4,369.7	5.3	5.4	1.01	0.97
25–44 years	11,901	14.4	11,327.0	13.8	14.3	1.00	0.96
45–64 years	13,439	16.2	12,815.0	15.6	14.9	1.08	1.04
65–74 years	6,889	8.3	6,539.7	7.9	7.2	1.16	1.10
75+ years	7,761	9.4	7,455.3	9.1	9.1	1.03	1.00

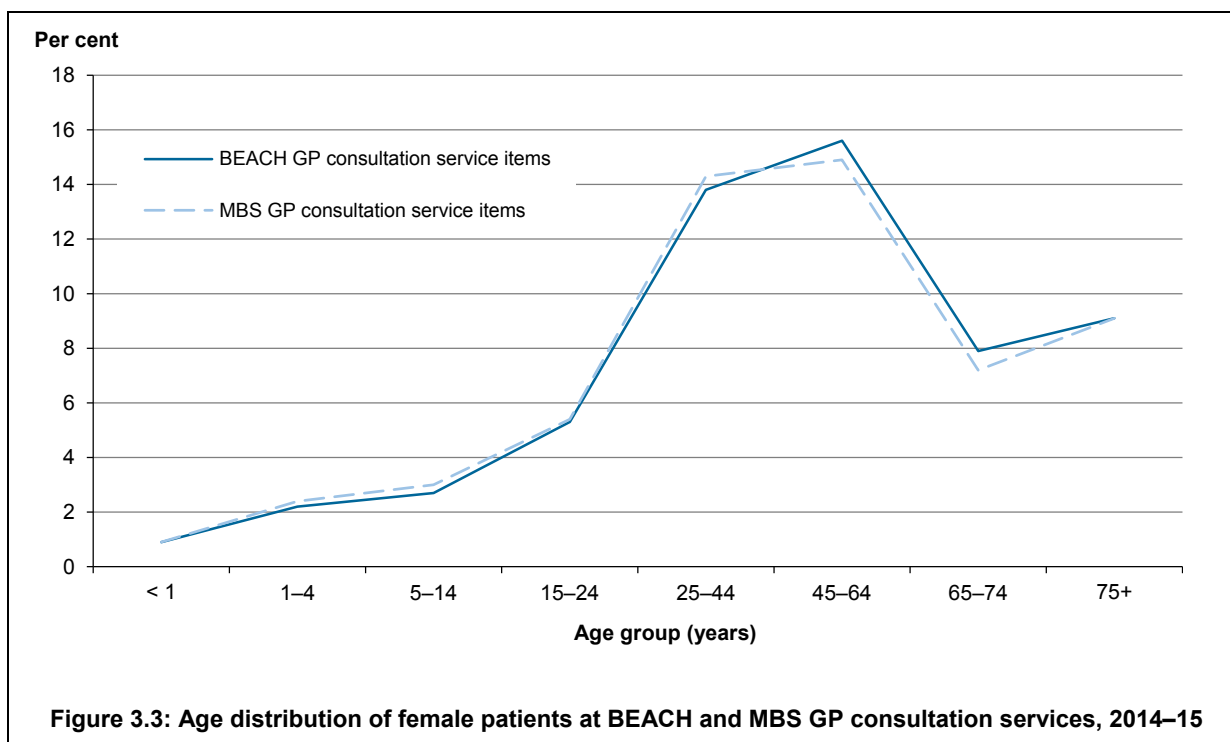
(a) Unweighted Medicare-claimed GP consultation service items only, excluding encounters with patients who hold a DVA Repatriation Health Card.

(b) Calculated from BEACH weighted data, excluding encounters with patients who hold a DVA Repatriation Health Card.

(c) Age–sex distribution of patients at MBS-claimed GP consultation services; data provided by the Australian Government Department of Health.

Note: GP consultation services – see 'Glossary'. Only encounters with valid patient age and sex recorded are included in the comparison.





3.5 The weighted data set

The final unweighted data set from the 17th year of collection contained encounters, reasons for encounters, problems and management/treatments. All variables decreased after weighting. Raw and weighted totals for each data element are shown in Table 3.5. The weighted data set is used for all analyses in the remainder of this report.

Table 3.5: The BEACH data set, 2014–15

Variable	Raw	Weighted
General practitioners	995	995
Encounters	99,500	98,728
Reasons for encounter	153,539	151,636
Problems managed	158,263	153,133
Medications	101,917	101,776
Other treatments ^(a)	53,085	50,204
Referrals and admissions	16,530	15,697
Pathology	50,465	46,435
Imaging	11,405	11,314
Other investigations	819	732

(a) Other treatments excludes injections for immunisations/vaccinations (raw $n = 2,815$, weighted $n = 2,573$) (see Chapter 10).

4 The participating GPs

This chapter reports data collected between April 2014 and March 2015 (the 17th year of the BEACH program) about the participating GPs and their practices. Details of GP and practice characteristics are reported for each year from 2005–06 to 2014–15 in the 10-year summary report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

4.1 Characteristics of the GP participants

All participants returned a GP profile questionnaire, although some were incomplete. The results are provided in Tables 4.1 and 4.2 (median results not tabled). Of the 995 participants:

- 57.3% were male, and 45.3% were aged 55 years and over (mean age 52.4 years; median age 53 years)
- 59.3% had been in general practice for more than 20 years
- 67.0% had graduated in Australia and 13.3% in Asia
- 58.0% spent 21–40 hours on average per week on direct patient care services (mean hours worked was 36.6; median was 36.0 hours)
- 63.8% were Fellows of the RACGP, and 5.9% were Fellows of the ACRRM
- 48.4% had provided care in a residential aged care facility in the previous month
- 90.4% worked in an accredited practice
- 71.2% practised in Major cities (using Australian Standard Geographical Classification⁵¹)
- 76.0% worked at only one practice location in a regular week, and 19.9% worked in two.

At their major practice address:

- 30.8% were in practices of fewer than five individual GPs, and 29.1% were in practices of 10 or more individual GPs. On average, there were 7.5 individual GPs per practice, with a median of 7 per practice
- 48.2% were in practices of fewer than five full-time-equivalent (FTE) GPs. On average, there were 5.4 FTE GPs per practice, with a median of 5 FTE GPs per practice
- 84.0% of the GPs worked in a practice that employed practice nursing staff. Of these practices, more than one-third (36.1%) employed fewer than two FTEs (35–45 hours per week). On average, there were 0.3 FTE practice nurses per FTE GP
- more than three-quarters (78.4%) had a co-located pathology laboratory or collection centre in, or within 50 metres of the practice, and more than half (57.0%) had a co-located psychologist
- 41.4% worked in a practice that provided their own or cooperative after-hours care, and 56.9% in a practice that used a deputising service for after-hours patient care (multiple responses allowed).

Those interested in the clinical activity of overseas trained doctors will find more information in Bayram et al. (2007) *Clinical activity of overseas trained doctors practising in general practice in Australia*.⁵² Readers interested in the effects of GP age on clinical practice will find more information in Charles et al. (2006) *The independent effect of age of general practitioner on clinical practice*.⁵³ For more information about the effect of the sex of the GP on clinical practice see Harrison et al. (2011) *Sex of the GP*.⁵⁴

Table 4.1: Characteristics of participating GPs and their practices

GP characteristic	Number ^(a)	Per cent of GPs ^(a) (<i>n</i> = 995)
Sex (missing <i>n</i> = 0)		
Male	570	57.3
Female	425	42.7
Age (missing <i>n</i> = 7)		
< 35 years	73	7.4
35–44 years	188	19.0
45–54 years	279	28.2
55+ years	448	45.3
Years in general practice (missing <i>n</i> = 13)		
< 2 years	9	0.9
2–5 years	116	11.8
6–10 years	109	11.1
11–19 years	166	16.9
20+ years	582	59.3
Place of graduation (missing <i>n</i> = 5)		
Australia	663	67.0
Overseas	327	33.0
Asia	132	13.3
United Kingdom/Ireland	83	8.4
Africa and Middle East	59	6.0
Europe	31	3.1
New Zealand	13	1.3
Other	9	0.9
Direct patient care hours (worked) per week (missing <i>n</i> = 23)		
≤ 10 hours	12	1.2
11–20 hours	104	10.7
21–40 hours	564	58.0
41–60 hours	276	28.4
61+ hours	16	1.7
GP Registrar (in training)	37	3.8
Fellow of RACGP (missing <i>n</i> = 6)	631	63.8
Fellow of ACRRM (missing <i>n</i> = 38)	56	5.9
Patient care provided in previous month ^(b)		
In a residential aged care facility (missing <i>n</i> = 6)	479	48.4
As a salaried/sessional hospital medical officer (missing <i>n</i> = 6)	113	11.4

(continued)

Table 4.1 (continued): Characteristics of participating GPs and their practices

GP characteristic	Number^(a)	Per cent of GPs^(a) (n = 995)
Accredited practice (missing n = 10)	890	90.4
Practice location by ASGC remoteness structure (missing n = 1)		
Major cities	708	71.2
Inner regional	191	19.2
Outer regional	82	8.3
Remote	11	1.1
Very remote	2	0.2
Number of practice locations worked at in a regular week (missing n = 19)		
1	742	76.0
2	194	19.9
3	32	3.3
4+	8	0.8
Size of practice – number of individual GPs (missing n = 25)		
Solo	93	9.6
2–4	206	21.2
5–9	389	40.1
10–14	193	19.9
15+	89	9.2
Size of practice – full-time equivalent GPs (missing n = 150)		
< 1	3	0.4
1.0– <2	91	10.8
2.0– <3	98	11.6
3.0– <4	100	11.8
4.0– <5	115	13.6
5.0– <10	345	40.8
10.0– <15	68	8.1
15+	25	3.0
Practice nurse at major practice address (missing n = 7)	830	84.0
Number of individual practice nurses (missing n = 25)		
0	158	16.3
1	150	15.5
2	206	21.2
3	171	17.6
4–5	186	19.2
6+	99	10.2

(continued)

Table 4.1 (continued): Characteristics of participating GPs and their practices

GP characteristic	Number ^(a)	Per cent of GPs ^(a) (<i>n</i> = 995)
Number of full-time equivalent practice nurses (missing <i>n</i> = 163)		
0	158	19.0
< 1	63	7.6
1.0– <2	237	28.5
2.0– <3	191	23.0
3.0– <4	104	12.5
4.0+	79	9.5
Co-located services ^(c) (missing <i>n</i> = 27)		
Pathology laboratory/collection centre	759	78.4
Psychologist	552	57.0
Physiotherapist	484	50.0
Medical specialist	270	27.9
Imaging/radiology services	260	26.9
Dietitian	453	46.8
Podiatrist	411	42.5
Other service	169	17.5
None	92	9.5
After-hours arrangements ^(b) (missing <i>n</i> = 5)		
Practice does own and/or cooperative with other practices	410	41.4
Practice does its own	313	31.6
Cooperative with other practices	115	11.6
Deputising service	563	56.9
Other arrangement	82	8.3
None	39	3.9

(a) Missing data removed.

(b) Multiple responses allowed.

(c) Services located/available in the practice, in the same building or within 50 metres, available on a daily or regular basis.

Note: ASGC – Australian Standard Geographical Classification; RACGP – Royal Australian College of General Practitioners; ACRRM – Australian College of Rural and Remote Medicine.

Table 4.2: Means of selected characteristics of participating GPs and their practices

Characteristic	Mean (<i>n</i> = 955)	95% LCL	95% UCL
Mean age of participating GPs (missing <i>n</i> = 7)	52.4	51.7	53.1
Mean hours worked per week on direct patient care (missing <i>n</i> = 23)	36.6	35.8	37.4
Mean number of individual GPs at major practice address (missing <i>n</i> = 25)	7.5	7.2	7.9
Mean number of FTE GPs at major practice address (missing <i>n</i> = 150)	5.4	5.2	5.7
FTE practice nurse: FTE GP (missing <i>n</i> = 214)	0.3	0.3	0.3

Note: LCL – lower confidence limit; UCL – upper confidence limit; FTE – full-time equivalent.

4.2 Computer use at GP practices

As computers are now increasingly used by GPs in their clinical activity, the GP profile questionnaire was redesigned in 2014–15 to gain more comprehensive information about the uses to which computers are put in a general practice clinical environment (see Appendix 2). In particular, more specific information was collected about electronic and other prescribing, and whether the medical records used were paper only, a mix of paper and electronic medical records, or whether the records were completely paperless.

Table 4.3 shows the proportion of individual participating GPs who used computers for each of the listed activities.

- Only 3.6% of GPs did not use a computer at all for clinical purposes.
- 97.8% of GPs were producing prescriptions electronically (either ePrescribing or printing scripts).
- More than two-thirds (70.7%) reported they used electronic medical records exclusively (that is, were paperless).
- One-quarter (25.5%) reported maintaining a hybrid record where some patient information is kept electronically and some on paper records.

Table 4.3: Computer applications available/used at major practice address

Computer use	Number	Per cent of GPs (<i>n</i> = 995) ^(a)
Computer not used for any clinical purposes (missing <i>n</i> = 3)	36	3.6
Not used at all	23	2.3
Internet/email only	13	1.3
Clinical use	956	96.4
Prescribing ^(b) (missing <i>n</i> = 41)		
Electronic (ePrescribing online)	305	32.0
(*Electronic + print scripts)	92	9.6
Print scripts only	628	65.8
Paper only (handwritten)	19	2.0
Both print scripts and handwritten	2	0.2
Internet (missing <i>n</i> = 3)	739	74.5
Email (missing <i>n</i> = 3)	557	56.1
Medical records (missing <i>n</i> = 12)		
Complete (paperless)	695	70.7
Partial/hybrid records	251	25.5
Paper records only	37	3.8

(a) Missing data removed.

(b) Multiple responses allowed.

* Subset of ePrescribing.

Those interested in the effect of computerisation on quality of care in general practice will find more detailed information in Henderson (2007) *The effect of computerisation on the quality of care in Australian general practice*.⁵⁵

4.3 Changes in characteristics of the GPs over the decade 2005–06 to 2014–15

Changes over the decade 2005–06 to 2014–15 are described in detail in Chapter 4 of the accompanying report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ Briefly, the major changes in the characteristics of the participating GPs were:

- the proportion of participants who were female increased over time
- the proportion who were younger than 45 years did not change significantly, whereas the proportion aged 55 years or more increased over the decade
- the proportion of GPs working 21–40 hours per week on direct patient care significantly increased, and the proportion working 41–60 hours, and the proportion working more than 60 hours, significantly decreased
- the mean number of hours spent on direct patient care significantly decreased
- the proportion of participants holding the Fellowship of the RACGP increased over the decade
- the proportion of GPs in solo practice decreased over time, and the proportion in practices with 10 or more individual GPs more than doubled
- fewer practices are providing after-hours care on their own, or in cooperation with other practices, but more practices are using deputising services for after-hours care than a decade ago.

5 The encounters

This chapter describes the content and types of encounters recorded in the 2014–15 BEACH year. Data about the encounters are reported for each year from 2005–06 to 2014–15 in the 10-year report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

5.1 Content of the encounters

In 2014–15, details of 98,728 encounters (weighted data) were available from 995 GPs. A summary of these encounters is provided in Table 5.1. Reasons for encounter (RFEs) and problems managed are expressed as rates per 100 encounters. Each management action is presented in terms of both a rate per 100 encounters and a rate per 100 problems managed, with 95% confidence limits.

- On average, patients gave 154 RFEs, and GPs managed about 155 problems per 100 encounters.
- Chronic problems accounted for 35.5% of all problems managed, and an average of 55.0 chronic problems were managed per 100 encounters.
- New problems accounted for 38.2% of all problems, and on average 59.2 new problems were managed per 100 encounters.
- Medications were the most common treatment choice (103.1 per 100 encounters). Most medications were prescribed (85.5 per 100) rather than supplied by the GP (8.0 per 100) or advised for over-the-counter purchase (9.5 per 100).
- For an 'average' 100 GP–patient encounters, GPs provided 103 medications and 34 clinical treatments (such as advice and counselling), undertook 17 procedures, made 10 referrals to medical specialists and 5 to allied health services, and placed 47 pathology test orders and 12 imaging test orders (Table 5.1).

Table 5.1: Summary of morbidity and management at GP–patient encounters

Variable	Number	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Rate per 100 problems (n = 153,133)	95% LCL	95% UCL
General practitioners	995	—	—	—	—	—	—
Encounters	98,728	—	—	—	—	—	—
Reasons for encounter	151,636	153.6	151.8	155.4	—	—	—
Problems managed	153,133	155.1	153.0	157.2	—	—	—
New problems	58,428	59.2	57.8	60.6	38.2	37.2	39.1
Chronic problems	54,298	55.0	53.0	57.0	35.5	34.5	36.4
Medications	101,776	103.1	100.6	105.6	66.5	65.1	67.8
Prescribed	84,455	85.5	83.1	88.0	55.2	53.8	56.5
GP-supplied	7,923	8.0	7.4	8.6	5.2	4.8	5.5
Advised OTC	9,398	9.5	8.8	10.2	6.1	5.7	6.6
Other treatments ^(a)	50,204	50.9	48.4	53.3	32.8	31.3	34.2
Clinical	33,443	33.9	31.8	36.0	21.8	20.6	23.1
Procedural	16,761	17.0	16.2	17.8	10.9	10.5	11.4
Referrals	15,697	15.9	15.3	16.5	10.3	9.9	10.6
Medical specialist*	9,464	9.6	9.2	10.0	6.2	5.9	6.4
Allied health services*	5,107	5.2	4.9	5.5	3.3	3.1	3.5
Hospital*	355	0.4	0.3	0.4	0.2	0.2	0.3
Emergency department*	305	0.3	0.3	0.4	0.2	0.2	0.2
Other referrals*	466	0.5	0.4	0.5	0.3	0.3	0.4
Pathology	46,435	47.0	45.2	48.9	30.3	29.3	31.4
Imaging	11,314	11.5	11.0	11.9	7.4	7.1	7.7
Other investigations ^(b)	732	0.7	0.7	0.8	0.5	0.4	0.5

(a) Other treatments includes treatment given by practice nurses or Aboriginal health workers in the context of the GP–patient encounter and treatment given by GPs.

(b) Other investigations reported here include only those ordered by the GP. Other investigations in Chapter 12 include those ordered by the GP and those done by the GP or practice staff.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, <hdl.handle.net/2123/13765>).

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

5.2 Encounter type

Of the 89,969 encounters where a payment source was recorded, 95.8% related to MBS/DVA GP items of service. Items with other health professionals, for example, practice nurse item numbers not accompanied by a GP item of service were recorded infrequently.

Table 5.2 reports the breakdown of encounter type by payment source, counting a single Medicare item number per encounter (where applicable).

- Indirect encounters (where the patient was not seen by the GP) accounted for 1.5%, and direct encounters (where the patient was seen by the GP) for 98.5% of encounters at which a payment source was recorded.
- The vast majority of all direct encounters (97.3%) were claimable through Medicare or the DVA.
- Twelve indirect encounters were claimed as chronic disease management or care conference items.

- Direct encounters where the GP indicated that no charge was made were rare, accounting for 0.3% of encounters.
- Encounters claimable through workers compensation accounted for 1.7%.
- Encounters claimable through other sources (for example, hospital-paid encounters) accounted for 0.7%.

Table 5.2: Type of encounter and a source of payment recorded for the encounter

Type of encounter	Number	Per cent of encounters ^(a) (n = 89,969)	95% LCL	95% UCL	Per cent of direct encounters (n = 88,579)
Indirect encounters ^(b) (patient not seen by GP)	1,390	1.5	1.3	1.8	
Direct encounters (patient seen by GP)	88,578	98.5	98.2	98.7	100.0
MBS/DVA items of service (direct encounters only) ^(c)	86,188	95.8	95.5	96.1	97.3
Workers compensation	1,487	1.7	1.5	1.8	1.7
Other paid (hospital, state, etc)	595	0.7	0.5	0.8	0.7
No charge	309	0.3	0.3	0.4	0.3
Total	89,969	100.0	—	—	—

(a) Missing data (no payment source specified) removed from analysis (n = 8,760).

(b) Twelve encounters involving chronic disease management or case conference items were recorded as indirect encounters.

(c) Includes direct encounters at which either a GP item or an item with an other health professional (or both) was recorded.

Note: LCL – lower confidence limit; UCL – upper confidence limit; MBS – Medicare Benefits Schedule; DVA – Australian Government Department of Veterans' Affairs.

Table 5.3 provides an overview of the MBS/DVA item numbers recorded in BEACH in 2014–15. At least one MBS/DVA item number was recorded at 86,202 encounters. A single item number was recorded at 95.8% of BEACH encounters said to be claimable from the MBS/DVA.

Table 5.3: Number of MBS/DVA items recorded

Variable	Number	Per cent of MBS/DVA encounters (n = 86,202) ^(a)
Encounters at which one MBS/DVA item was recorded	82,608	95.8
Encounters at which two MBS/DVA items were recorded	3,173	3.7
Encounters at which three MBS/DVA items were recorded	422	0.5
Total encounters at which at least one item was recorded	86,202	100.0

(a) Total includes 86,188 direct encounters and 14 indirect, including 12 for chronic disease items and 2 practice nurse only items.

Note: MBS – Medicare Benefits Schedule; DVA – Department of Veterans' Affairs.

GPs could record up to three MBS/DVA item numbers per encounter. For comparability with earlier years, in Table 5.4 only one item number per MBS/DVA-claimable encounter has been counted. Selection of one item number was undertaken on a priority basis: consultation item numbers overrode incentive item numbers, which overrode procedural item numbers, which overrode other Medicare item numbers.

- Standard surgery consultations accounted for 78.8% of MBS/DVA-claimable GP consultations, and for 75.5% of all encounters for which a payment source was recorded.
- 11.4% of MBS/DVA-claimable encounters were claimable as long or prolonged surgery consultations.
- Home or institution visits, and visits at residential aged care facilities were all relatively rare, together accounting for 2.6% of MBS/DVA-claimable encounters.

- About 1.5% of encounters were claimable as GP mental health care items, 1.7% as chronic disease management items, and 0.4% as health assessments.
- There was a decrease in home visits in the decade to 2010⁵⁶ and this has important implications for ageing patients wishing to be managed at home rather than in institutional care. The changes to the Medicare schedule in May 2010 mean that it is no longer possible to separate home visits from institutional visits using Medicare item numbers. The BEACH collection form was altered from the 2012–13 BEACH data year onwards to include a tick box to identify home visits. In 2014–15, there were 530 encounters identified as home visits at a rate of 0.6 per 100 encounters (95% CI: 0.4–0.8) (results not tabled). An MBS/DVA GP item was recorded at 525 home visit encounters, or 0.6% (95% CI: 0.4–0.8) of encounters at which an MBS/DVA item was recorded (results not tabled).

Table 5.4: Summary of GP only MBS/DVA items recorded (counting one item per encounter)

MBS/DVA item	Number	Rate per 100 encounters ^(a) (n = 89,969)	95% LCL	95% UCL	Per cent of MBS/DVA GP items (n = 86,198)
Short surgery consultations	1,450	1.6	1.4	1.8	1.7
Standard surgery consultations	67,937	75.5	74.4	76.6	78.8
Long surgery consultations	9,249	10.3	9.6	11.0	10.7
Prolonged surgery consultations	603	0.7	0.5	0.8	0.7
Residential aged care facility (RACF) visits	1,372	1.5	1.0	2.0	1.6
Home or institution visits (excluding RACF)	861	1.0	0.7	1.2	1.0
GP mental health care	1,330	1.5	1.3	1.6	1.5
Chronic disease management items	1,545	1.7	1.5	2.0	1.8
Health assessments	403	0.4	0.4	0.5	0.5
Case conferences	7	0.0 [‡]	0.0 [‡]	0.0 [‡]	0.0 [‡]
Attendances associated with Practice Incentives Program payments	148	0.2	0.1	0.2	0.2
Other items	1,292	1.4	1.2	1.7	1.5
Therapeutic procedures	545	0.6	0.5	0.7	0.6
Surgical operations	326	0.4	0.3	0.4	0.4
Acupuncture	236	0.3	0.1	0.4	0.3
Other items	185	0.2	0.1	0.3	0.2
Total MBS/DVA items of service (GPs only)	86,198	95.8	95.5	96.1	100.0

(a) Encounters with missing payment source were removed from analysis (n = 8,760). Denominator used for analysis n = 89,969.

‡ Rates are reported to one decimal place. This indicates that the rate is less than 0.05 per 100 encounters.

Note: LCL – lower confidence limit; UCL – upper confidence limit; MBS – Medicare Benefits Schedule; DVA – Australian Government Department of Veterans' Affairs; GP – general practitioner; RACF – residential aged care facility.

Table 5.5 provides the distribution of all MBS/DVA item numbers recorded across Medicare item number groups and the number of encounters at which at least one of each type of item number was recorded. Overall, there were 90,217 item numbers recorded at 86,202 MBS/DVA-claimable encounters in 2014–15, an average of 1.0 item per encounter claimable through MBS/DVA.

Surgery consultations (including short, standard, long and prolonged) were the most commonly recorded type of item number, accounting for 87.8% of all MBS items, and at least one of these items was recorded at 91.9% of MBS/DVA claimable encounters.

Items for hospital, residential aged care and home visits together accounted for 2.5% of all MBS items. Items for other practice nurse, Aboriginal health worker and allied health services accounted for 0.3% of all MBS items, and were recorded at 0.3% of claimable encounters at which at least one MBS item was recorded.

Table 5.5: Distribution of MBS/DVA service item numbers recorded, across item number groups and encounters

Items/encounters	All MBS/DVA items ^(a) (n = 90,217)		Encounters with at least one item recorded ^(b) (n = 86,202)			
	Number	Per cent	Number	Per cent	95% LCL	95% UCL
Surgery consultations	79,240	87.8	79,240	91.9	91.2	92.7
Home, institution and residential aged care visits	2,251	2.5	2,251	2.6	2.0	3.2
Chronic disease management items (including case conferences)	2,842	3.2	2,043	2.4	2.0	2.7
Other practice nurse/Aboriginal health worker/allied health worker services	270	0.3	270	0.3	0.2	0.4
GP mental health care items	1,707	1.9	1,707	2.0	1.8	2.2
Surgical operations	1,272	1.4	1,224	1.4	1.2	1.6
Diagnostic procedures and investigations	598	0.7	584	0.7	0.6	0.8
Health assessments	559	0.6	558	0.6	0.5	0.7
Therapeutic procedures	666	0.7	658	0.8	0.6	0.9
Acupuncture	239	0.3	239	0.3	0.1	0.5
Pathology services	128	0.1	124	0.1	0.1	0.2
Diagnostic imaging services	28	0.0 [‡]	27	0.0 [‡]	0.0 [‡]	0.1
Attendances associated with Practice Incentives Program payments	211	0.2	211	0.2	0.2	0.3
Other items	206	0.2	206	0.2	0.1	0.4
Total items	90,217	100.0	—	—	—	—

(a) Up to three MBS/DVA items could be recorded at each encounter.

(b) Identifies encounters where at least one item from the MBS group was recorded.

‡ Rates are reported to one decimal place. This indicates that the rate is less than 0.05 per 100 encounters.

Note: MBS – Medicare Benefits Schedule; DVA – Australian Government Department of Veterans' Affairs; LCL – lower confidence limit; UCL – upper confidence limit.

5.3 Consultation length

In a subsample of 33,392 BEACH MBS/DVA-claimable encounters at which start and finish times were recorded by the GP, the mean length of consultation in 2014–15 was 14.7 minutes (95% CI: 14.4–15.0). The median length was 13.0 minutes (results not tabled).

For A1 MBS/DVA-claimable encounters, the mean length of consultation in 2014–15 was 14.4 minutes (95% CI: 14.1–14.6), and the median length was 13.0 minutes (results not tabled).

Methods describing the substudy from which data on consultation length are collected are described in Section 2.6.

The determinants of consultation length were investigated by Britt et al. (2004) in *Determinants of GP billing in Australia: content and time*⁵⁷ and Britt et al. (2005) in *Determinants of consultation length in Australian general practice*.⁵⁸ Length of GP consultations is also discussed in a 'Byte from BEACH' published on the FMRC website (2014): Britt H, Valenti L, Miller G. *Debunking the myth of general practice as '6 minute medicine'*.⁵⁹

5.4 Changes in the encounters over the decade 2005–06 to 2014–15

Chapter 5 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*,¹ provides an overview of changes in general practice encounters over the past decade.

The major changes between 2005–06 and 2014–15 are summarised below.

- There was an increase in the average number of problems managed at encounter, from 146 per 100 encounters in 2005–06 to 155 in 2014–15.
- The number of clinical treatments provided in general practice increased significantly from 29 per 100 encounters in 2005–06 to 34 per 100 encounters in 2014–15.
- The number of procedures undertaken per 100 encounters rose significantly from 14.4 to 17.0 per 100 encounters.
- There was an increased rate of referrals, which was reflected in referrals to allied health services and to medical specialists.
- Pathology test/battery order rates increased by 22%. Orders for imaging tests also increased.

Of the encounters claimable from MBS/DVA:

- short surgery consultations as a proportion of all MBS/DVA-claimed consultations increased over the study period and standard surgery consultations decreased significantly
- the proportion claimable as chronic disease management items, health assessments and GP mental health care all increased significantly
- the mean length of A1 MBS/DVA-claimable GP–patient encounters in 2014–15 was significantly longer than in 2005–06, increasing from 13.8 to 14.4 minutes. The mean length of all MBS/DVA-claimable encounters increased significantly over the decade from 13.9 minutes to 14.7 minutes. The median length of both groups of MBS/DVA-claimable encounters increased from 12 to 13 minutes from 2012–13 to 2014–15.

The changes in management actions are expressed in terms of rates per 100 encounters. As there was a significant increase in the number of problems managed at encounters, it may be more informative to consider changes in management actions in terms of rates per 100 problems managed. Rates per 100 problems are reported in the individual chapters dealing with these items in the 10-year report.

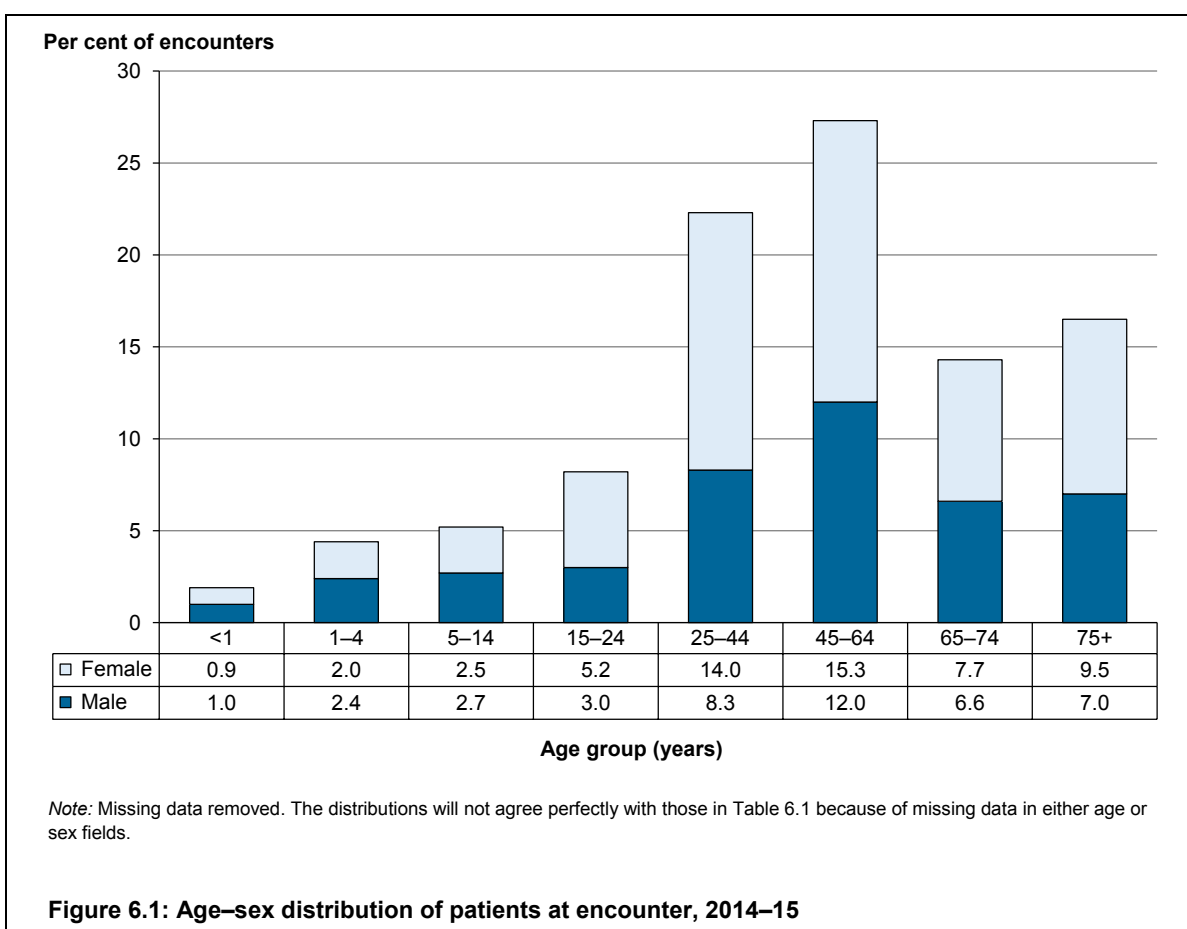
6 The patients

This chapter reports data collected between April 2014 and March 2015 about the characteristics of patients at GP encounters and their reasons for encounter from the 17th year of the BEACH program. Data on patient characteristics and reasons for encounter are reported for each year from 2005–06 to 2014–15 in the 10-year report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

6.1 Age–sex distribution of patients at encounter

The age–sex distribution of patients at encounters is shown in Figure 6.1. Females accounted for the greater proportion (57.1%) of encounters (Table 6.1). This was reflected across all age groups except among children aged less than 15 years (Figure 6.1).

Patients aged less than 25 years accounted for 19.7% of encounters; those aged 25–44 years for 22.3%; those aged 45–64 years accounted for 27.3% and those aged 65 years and over accounted for 30.7% of encounters (Table 6.1). Readers interested in changes in the care of older people in general practice should see Chapter 14.



6.2 Other patient characteristics

Table 6.1 presents other characteristics of the patients at GP encounters. In summary:

- the patient was new to the practice at 6.3% of encounters
- nearly half of the encounters were with patients who held a Commonwealth concession card (46.2%) and/or a Repatriation Health Card (2.1%)
- at 1 in 10 encounters (10.2%) the patient was from a non-English-speaking background
- at 1.7% of encounters the patient identified themselves as an Aboriginal and/or Torres Strait Islander person.

Table 6.1: Characteristics of the patients at encounters

Patient characteristics	Number	Per cent of encounters (n = 98,728)	95% LCL	95% UCL
Sex (missing) ^(a)	(880)			
Males	41,960	42.9	42.0	43.7
Females	55,888	57.1	56.3	58.0
Age group (missing) ^(a)	(855)			
< 1 year	1,847	1.9	1.7	2.0
1–4 years	4,362	4.5	4.2	4.7
5–14 years	5,097	5.2	4.9	5.5
15–24 years	8,014	8.2	7.8	8.6
25–44 years	21,797	22.3	21.4	23.1
45–64 years	26,672	27.3	26.7	27.8
65–74 years	13,941	14.2	13.7	14.8
75+ years	16,144	16.5	15.6	17.4
New patient to practice (missing) ^(a)	(1,192)			
New patient to practice	6,184	6.3	5.8	6.9
Patient seen previously	91,353	93.7	93.1	94.2
Commonwealth concession card status (missing) ^(a)	(6,100)			
Has a Commonwealth concession card	42,826	46.2	44.6	47.9
No Commonwealth concession card	49,803	53.8	52.1	55.4
Repatriation Health Card status (missing) ^(a)	(7,645)			
Has a Repatriation Health Card	1,951	2.1	2.0	2.3
No Repatriation Health Card	89,132	97.9	97.7	98.0
Language status (missing) ^(a)	(7,579)			
Non-English-speaking background ^(b)	9,305	10.2	8.6	11.9
English-speaking background	81,844	89.8	88.1	91.4
Indigenous status (missing) ^(a)	(7,589)			
Aboriginal and/or Torres Strait Islander ^(c)	1,536	1.7	1.3	2.1
Non-Indigenous	89,604	98.3	97.9	98.7

(a) Missing data removed.

(b) Speaks a language other than English as their primary language at home.

(c) Self-identified.

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

6.3 Patient reasons for encounter

Patient reasons for encounter (RFEs) reflect the patient’s demand for care and can provide an indication of service use patterns. Patient demand for care can be influenced by interventions aimed at the general population (for example, health awareness campaigns in popular media and print).

RFEs are those concerns and expectations that patients bring to the GP. Participating GPs were asked to record at least one, and up to three, patient RFEs in words as close as possible to those used by the patient, before the diagnostic or management process had begun. These reflect the patient’s view of their reasons for consulting the GP. RFEs can be expressed in terms of one or more symptoms (for example, ‘itchy eyes’, ‘chest pain’), in diagnostic terms (for example, ‘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.

The patient may describe a single RFE that relates to a single problem managed at the encounter, a single RFE that relates to multiple problems, multiple RFEs that relate to a single problem managed, or multiple RFEs that relate to multiple problems managed at the encounter. GPs may also manage a problem that is unrelated to the patient’s RFE (for example, a patient presents about her diabetes but while she is there the GP also provides a vaccination and performs a Pap smear).

Number of reasons for encounter

There were 151,636 RFEs recorded at 98,728 encounters in 2014–15 (Table 6.3). At 58.5% of encounters only one RFE was recorded, at 29.4% two RFEs were recorded and at 12.1% of encounters three RFEs were recorded (Table 6.2). On average, patients presented with 153.6 RFEs per 100 encounters, or about one-and-a-half RFEs per encounter (Table 6.3).

Table 6.2: Number of patient reasons for encounter

Number of RFEs at encounter	Number of encounters (n = 98,728)	Per cent of encounters	95% LCL	95% UCL
One RFE	57,770	58.5	57.3	59.7
Two RFEs	29,009	29.4	28.6	30.1
Three RFEs	11,949	12.1	11.4	12.8
Total	98,728	100.0	—	—

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

Reasons for encounter by ICPC-2 component

The distribution of patient RFEs by ICPC-2 component is presented in Table 6.3, expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence limits. In the ‘diagnosis, diseases’ group we provide data about infections, injuries, neoplasms, congenital anomalies and ‘other’ diagnoses.

Approximately 4 out of 10 (42.7%) patient RFEs were expressed in terms of a symptom or complaint (for example, ‘tired’, ‘fever’). RFEs described in diagnostic terms (for example, ‘about my diabetes’, ‘for my depression’) accounted for 18.7% of RFEs. The remaining 38.7% of RFEs were described in terms of processes of care, such as requests for a health check, prescriptions, referrals, test results or medical certificates.

On average at 100 encounters, patients described 65.6 ‘symptom or complaint’ RFEs, 28.7 diagnosis/disease RFEs, 23.0 procedural RFEs and made 16.1 requests for treatment.

Table 6.3: Patient reasons for encounter by ICPC-2 component

ICPC-2 component	Number	Per cent of total RFEs (n = 151,636)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL
Symptoms and complaints	64,726	42.7	65.6	63.7	67.4
Diagnosis, diseases	28,288	18.7	28.7	27.3	30
Infections	6,897	4.5	7.0	6.6	7.4
Injuries	4,309	2.8	4.4	4.1	4.6
Neoplasms	987	0.7	1.0	0.9	1.1
Congenital anomalies	212	0.1	0.2	0.2	0.3
Other diagnoses, diseases	15,883	10.5	16.1	15.1	17.1
Diagnostic and preventive procedures	22,716	15.0	23.0	22.2	23.8
Medications, treatments and therapeutics	15,897	10.5	16.1	15.3	16.9
Results	9,342	6.2	9.5	9.0	9.9
Referrals and other RFEs	7,414	4.9	7.5	7.1	7.9
Administrative	3,252	2.1	3.3	3.1	3.5
Total RFEs	151,636	100.0	153.6	151.8	155.4

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

Reasons for encounter by ICPC-2 chapter

The distribution of patient RFEs by ICPC-2 chapter and the most common RFEs within each chapter are presented in Table 6.4. Each chapter and individual RFE is expressed as a percentage of all RFEs and as a rate per 100 encounters with 95% confidence limits.

RFEs of a general and unspecified nature were presented at a rate of 44.9 per 100 encounters, with requests for prescriptions, general check-ups and test results the most frequently recorded of these. RFEs related to the respiratory system occurred at a rate of 19.3 per 100 encounters, those related to the musculoskeletal system at a rate of 15.9 per 100, and those relating to skin at a rate of 15.2 per 100 encounters (Table 6.4).

The far right column of Table 6.4 shows the proportion of patient encounters where there was at least one RFE within an ICPC-2 chapter (representing body systems). Patients may describe multiple RFEs that are classified within the same ICPC-2 chapter (for example, depression and anxiety; or rheumatoid arthritis and osteoporosis), however this column reports only one instance per chapter.

RFEs classified as ‘General and unspecified’ were described at least once at 39.0% of encounters in 2014–15, equating to approximately 53.5 million out of 137.3 million MBS-claimed GP encounters nationally in 2014–15. At least one respiratory RFE was recorded at 16.2% of encounters, while one or more RFEs related to the musculoskeletal system were recorded at 14.7% of encounters.

It is possible to extrapolate the ‘rate per 100 encounters’ and the ‘per cent of encounters’ results to the 137.3 million MBS-claimed GP encounters in 2014–15. This allows calculation of the estimated number of times an RFE was used at GP encounters as well as the number of encounters where an RFE was used. Using respiratory-related RFEs as an example, we estimate that nationally in 2014–15, patients described 26.4 million RFEs related to the respiratory system at 22.2 million GP–patient encounters.

Table 6.4: Patient reasons for encounter by ICPC-2 chapter and most frequent individual reasons for encounter within chapter

Reasons for encounter	Number	Per cent of total RFEs ^(a) (n = 151,636)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of encounters ^(b) (n = 98,728) (95% CI)
General and unspecified	44,283	29.2	44.9	43.7	46.0	39.0 (38.1–39.9)
Prescription NOS	9,858	6.5	10.0	9.4	10.6	—
General check-up*	4,539	3.0	4.6	4.3	4.9	—
Results tests/procedures NOS	7,959	5.2	8.1	7.6	8.5	—
Administrative procedure NOS	2,851	1.9	2.9	2.7	3.1	—
Immunisation/vaccination NOS	2,016	1.3	2.0	1.9	2.2	—
Fever	1,826	1.2	1.8	1.7	2.0	—
Weakness/tiredness	1,464	1.0	1.5	1.4	1.6	—
Other referrals NEC	1,458	1.0	1.5	1.4	1.6	—
Blood test NOS	973	0.6	1.0	0.8	1.1	—
Observation/health education/advice/ diet NOS	925	0.6	0.9	0.8	1.0	—
Follow-up encounter unspecified	906	0.6	0.9	0.8	1.0	—
Chest pain NOS	859	0.6	0.9	0.8	0.9	—
Trauma/injury NOS	780	0.5	0.8	0.7	0.9	—
Clarify or discuss patient's RFE	777	0.5	0.8	0.7	0.9	—
Other reason for encounter NEC	724	0.5	0.7	0.6	0.9	—
Respiratory	19,007	12.5	19.3	18.4	20.1	16.2 (15.6–16.8)
Cough	6,187	4.1	6.3	5.8	6.7	—
Throat symptom/complaint	2,836	1.9	2.9	2.6	3.1	—
Upper respiratory tract infection	2,077	1.4	2.1	1.8	2.4	—
Sneezing/nasal congestion	1,281	0.8	1.3	1.1	1.5	—
Immunisation/vaccination – respiratory	1,175	0.8	1.2	1.0	1.4	—
Shortness of breath/dyspnoea	843	0.6	0.9	0.8	0.9	—
Musculoskeletal	15,747	10.4	15.9	15.5	16.4	14.7 (14.3–15.1)
Back complaint*	3,347	2.2	3.4	3.2	3.6	—
Knee symptom/complaint	1,505	1.0	1.5	1.4	1.6	—
Shoulder symptom/complaint	1,259	0.8	1.3	1.2	1.4	—
Foot/toe symptom/complaint	1,058	0.7	1.1	1.0	1.2	—
Leg/thigh symptom/complaint	951	0.6	1.0	0.9	1.0	—
Neck symptom/complaint	811	0.5	0.8	0.7	0.9	—
Musculoskeletal injury NOS	712	0.5	0.7	0.6	0.8	—

(continued)

Table 6.4 (continued): Patient reasons for encounter by ICPC-2 chapter and most frequent individual reasons for encounter within chapter

Reasons for encounter	Number	Per cent of total RFEs ^(a) (n = 151,636)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of encounters ^(b) (n = 98,728) (95% CI)
Skin	15,050	9.9	15.2	14.7	15.8	14.4 (13.9–14.9)
Rash*	2,678	1.8	2.7	2.5	2.9	—
Skin symptom/complaint, other	1,577	1.0	1.6	1.5	1.7	—
Skin check-up*	1,376	0.9	1.4	1.2	1.6	—
Swelling (skin)*	994	0.7	1.0	0.9	1.1	—
Laceration/cut	786	0.5	0.8	0.7	0.9	—
Digestive	9,703	6.4	9.8	9.5	10.2	8.7 (8.4–9.0)
Abdominal pain*	2,101	1.4	2.1	2.0	2.3	—
Diarrhoea	1,238	0.8	1.3	1.2	1.4	—
Vomiting	730	0.5	0.7	0.7	0.8	—
Psychological	9,366	6.2	9.5	9.0	10.0	8.4 (8.0–8.8)
Depression*	2,224	1.5	2.3	2.1	2.4	—
Anxiety*	1,465	1.0	1.5	1.3	1.6	—
Sleep disturbance	1,162	0.8	1.2	1.1	1.3	—
Circulatory	8,644	5.7	8.8	8.3	9.2	8.4 (7.9–8.8)
Cardiovascular check-up*	3,493	2.3	3.5	3.3	3.8	—
Hypertension/high blood pressure*	1,505	1.0	1.5	1.3	1.7	—
Endocrine and metabolic	5,734	3.8	5.8	5.5	6.1	5.5 (5.2–5.8)
Diabetes (non-gestational)*	1,239	0.8	1.3	1.1	1.4	—
Prescription – endocrine/metabolic	854	0.6	0.9	0.8	1.0	—
Female genital system	4,549	3.0	4.6	4.2	5.0	4.2 (3.9–4.5)
Female genital check-up/Pap smear*	1,611	1.1	1.6	1.5	1.8	—
Neurological	4,452	2.9	4.5	4.3	4.7	4.3 (4.1–4.5)
Headache*	1,635	1.1	1.7	1.5	1.8	—
Vertigo/dizziness	1,086	0.7	1.1	1.0	1.2	—
Pregnancy and family planning	3,421	2.3	3.5	3.2	3.8	3.4 (3.1–3.7)
Prenatal/postnatal check-up*	932	0.6	0.9	0.8	1.1	—
Ear	3,333	2.2	3.4	3.2	3.5	3.3 (3.1–3.4)
Ear pain/earache	1,220	0.8	1.2	1.1	1.3	—

(continued)

Table 6.4 (continued): Patient reasons for encounter by ICPC-2 chapter and most frequent individual reasons for encounter within chapter

Reasons for encounter	Number	Per cent of total RFEs ^(a) (n = 151,636)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of encounters ^(b) (n = 98,728) (95% CI)
Urology	2,618	1.7	2.7	2.5	2.8	2.5 (2.4–2.6)
Eye	2,077	1.4	2.1	2.0	2.2	2.0 (1.9–2.1)
Blood and blood-forming organs	1,486	1.0	1.5	1.3	1.7	1.5 (1.3–1.7)
Blood test – blood and blood forming organs	909	0.6	0.9	0.8	1.1	—
Male genital system	1,135	0.7	1.1	1.0	1.3	1.1 (1.0–1.2)
Social	1,028	0.7	1.0	0.9	1.1	1.0 (0.9–1.1)
Total RFEs	151,636	100.0	153.6	151.8	155.4	—

(a) Only individual RFEs accounting for $\geq 0.5\%$ of total RFEs are included.

(b) The proportion of all encounters at which the patient described at least one reason for encounter that was classified in the chapter.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <hdl.handle.net/2123/13765>).

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

Most frequent patient reasons for encounter

The 30 most commonly recorded RFEs (Table 6.5), accounted for more than half (58.9%) of all RFEs. In this analysis, the specific ICPC-2 chapter to which an across-chapter concept belongs is disregarded, so that, for example, ‘check-up – all’ includes all check-ups from all ICPC-2 chapters, irrespective of whether or not the body system was specified.

Of the top 30 RFEs (Table 6.5), most were either symptom or disease descriptions such as cough, back complaint, throat complaint or rash. However, the top three RFEs reflected requests for a process of care (that is, requests for prescription, check-up and test results), and together accounted for nearly one-quarter of all RFEs (23.4%).

Table 6.5: Thirty most frequent patient reasons for encounter

Patient reason for encounter	Number	Per cent of total RFEs ^(a) (n = 151,636)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL
Prescription – all*	13,131	8.7	13.3	12.6	14.0
Check-up – all*	13,015	8.6	13.2	12.6	13.8
Test results*	9,342	6.2	9.5	9.0	9.9
Cough	6,187	4.1	6.3	5.8	6.7
Back complaint*	3,347	2.2	3.4	3.2	3.6
Immunisation/vaccination – all*	3,324	2.2	3.4	3.1	3.6
Administrative procedure – all*	3,252	2.1	3.3	3.1	3.5
Throat symptom/complaint	2,836	1.9	2.9	2.6	3.1
Rash*	2,678	1.8	2.7	2.5	2.9
Blood test – all*	2,283	1.5	2.3	2.1	2.5
Depression*	2,224	1.5	2.3	2.1	2.4
Abdominal pain*	2,101	1.4	2.1	2.0	2.3
Upper respiratory tract infection	2,077	1.4	2.1	1.8	2.4
Fever	1,826	1.2	1.8	1.7	2.0
Headache*	1,635	1.1	1.7	1.5	1.8
Skin symptom/complaint, other	1,577	1.0	1.6	1.5	1.7
Hypertension/high blood pressure*	1,505	1.0	1.5	1.3	1.7
Knee symptom/complaint	1,505	1.0	1.5	1.4	1.6
Observation/health education/advice/diet – all*	1,499	1.0	1.5	1.4	1.7
Anxiety*	1,465	1.0	1.5	1.3	1.6
Weakness/tiredness	1,464	1.0	1.5	1.4	1.6
Other referrals NEC	1,458	1.0	1.5	1.4	1.6
Sneezing/nasal congestion	1,281	0.8	1.3	1.1	1.5
Shoulder symptom/complaint	1,259	0.8	1.3	1.2	1.4
Diabetes – all*	1,251	0.8	1.3	1.1	1.4
Diarrhoea	1,238	0.8	1.3	1.2	1.4
Ear pain/earache	1,220	0.8	1.2	1.1	1.3
Sleep disturbance	1,162	0.8	1.2	1.1	1.3
Vertigo/dizziness	1,086	0.7	1.1	1.0	1.2
Foot/toe symptom/complaint	1,058	0.7	1.1	1.0	1.2
<i>Subtotal</i>	<i>89,287</i>	<i>58.9</i>	<i>—</i>	<i>—</i>	<i>—</i>
Total RFEs	151,636	100.0	153.6	151.8	155.4

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <hdl.handle.net/2123/13765>).

Note: RFEs – reasons for encounter; LCL – lower confidence limit; UCL – upper confidence limit; NEC – not elsewhere classified.

6.4 Changes in patients and their reasons for encounter over the decade 2005–06 to 2014–15

An overview of changes in the characteristics of patients at encounters and their reasons for encounter over the decade 2005–06 to 2014–15, can be found in Chapter 6 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ Major changes are summarised below.

With the ageing of the Australian population, the proportion of the population that was aged 65 years and over increased from 12.9% in 2005 to 14.7% in 2014.⁶⁰ Over the same period, the proportion of BEACH encounters with patients aged 65 years and over increased from 26.7% to 30.7%. When extrapolated, this change (in combination with the increased number of encounters nationally) means that in 2014–15 there were 15.2 million more encounters with older patients nationally than a decade earlier.

The increase in the proportion of encounters with older patients was greater than the population increase in this age group, because older patients attend general practice more often than do younger patients.⁶¹ This change in the age distribution of patients at GP encounters will affect all aspects of general practice as older patients are more likely to have more problems managed at encounters, more chronic conditions managed and are more likely to have multimorbidity.²³

There was a significant decrease in the proportion of encounters with patients who were new to the practice (from 9.1% in 2005–06 to 6.3% in 2014–15). This may be due to the need for continuity of care for chronic conditions. The proportion of patients holding a Repatriation Health Card decreased by one-third, from 3.4% in 2005–06 to 2.1% in 2014–15. This is probably due to a decline in the number of World War 2 veterans and their partners.

Over the decade, there was no significant change in the number of reasons for encounter recorded per 100 encounters, from 150.3 in 2005–06 to 153.6 in 2014–15. However, there was a marginal decrease in the proportion of patients providing a single RFE and a significant increase in the proportion providing two RFEs. There was a significant increase in the rate of RFEs describing processes of care, particularly requests for 'medications, treatments and therapeutics' and for test results.

There was a large increase in requests for administrative procedures such as sickness certificates. This is probably due to an increasing number of policies forcing workers to provide such documentation to claim sick days and children to stay at home from school.

The rate of RFEs describing an infection decreased across the decade. This continues a trend that has been seen particularly among children at GP encounters.⁶² Psychological RFEs increased significantly over the decade. This may be due to the introduction of both the Better Outcomes and Better Access general practice mental health care initiatives.⁶³

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, and can be described in terms of a disease, symptom or complaint, social problem or ill-defined condition managed at the encounter. GPs were instructed to record each problem at the most specific level possible from the information available. As a result, the problem managed may at times be limited to the level of a presenting symptom.

At each patient encounter, up to four problems could be recorded by the GP. A minimum of one problem was compulsory. The status of each problem to the patient – new (first presentation to a medical practitioner) or old (follow-up of previous problem) – was also indicated. The concept of a principal diagnosis, which is often used in hospital statistics, is not adopted in studies of general practice where multiple problem management is the norm rather than the exception. Further, the range of problems managed at the encounter often crosses multiple body systems and may include undiagnosed symptoms, psychosocial problems or chronic disease, which makes the designation of a principal diagnosis difficult. Thus, the order in which the problems were recorded by the GP is not significant. All problems managed include those that involved some management by a practice nurse at the recorded encounter, which are also reported separately in Section 10.4.

There are two ways to describe the frequency of problems managed: as a percentage of all problems managed in the study or as a rate at which problems are managed per 100 encounters. Where groups of problems are reported (for example, circulatory problems) it must be remembered that more than one of that type of problem (such as hypertension and heart failure) may have been managed at a single encounter. We therefore report these data in a variety of ways to aid interpretation and reporting.

For a single ungrouped problem that can only be managed once per encounter, the rate per 100 encounters can also be regarded as equivalent to the percentage of encounters at which that problem was managed. For example, 'asthma was managed at 2.1 per 100 encounters', can also be regarded as 'asthma was managed at 2.1% of encounters'. The reader must be mindful that such a statement cannot be made for grouped concepts (ICPC-2 chapters and those marked with asterisks in the tables), as more than problem within that group could have been managed at a single encounter.

The last column in Table 7.3 describes the proportion of encounters during which at least one problem within each ICPC-2 chapter was managed. This allows users to make the following types of statements: 'at least one psychological problem was managed at 12.8% of encounters'; or (using the extrapolation methods described in Chapter 2) 'at least one digestive problem was managed at 14.3 million general practice encounters in 2014–15.'

Changes in the problems managed in Australian general practice from the BEACH study are reported for each year from 2005–06 to 2014–15 in the 10-year report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

7.1 Number of problems managed at encounter

In 2014–15, there were 153,133 problems managed, at a rate of 155.1 per 100 encounters (Table 7.2). Table 7.1 shows that one problem was managed at 61.0% of encounters and two problems were managed at 26.2% of encounters. Approximately 10% of encounters involved the management of three problems (9.6%), and four problems were managed at 3.2% of encounters.

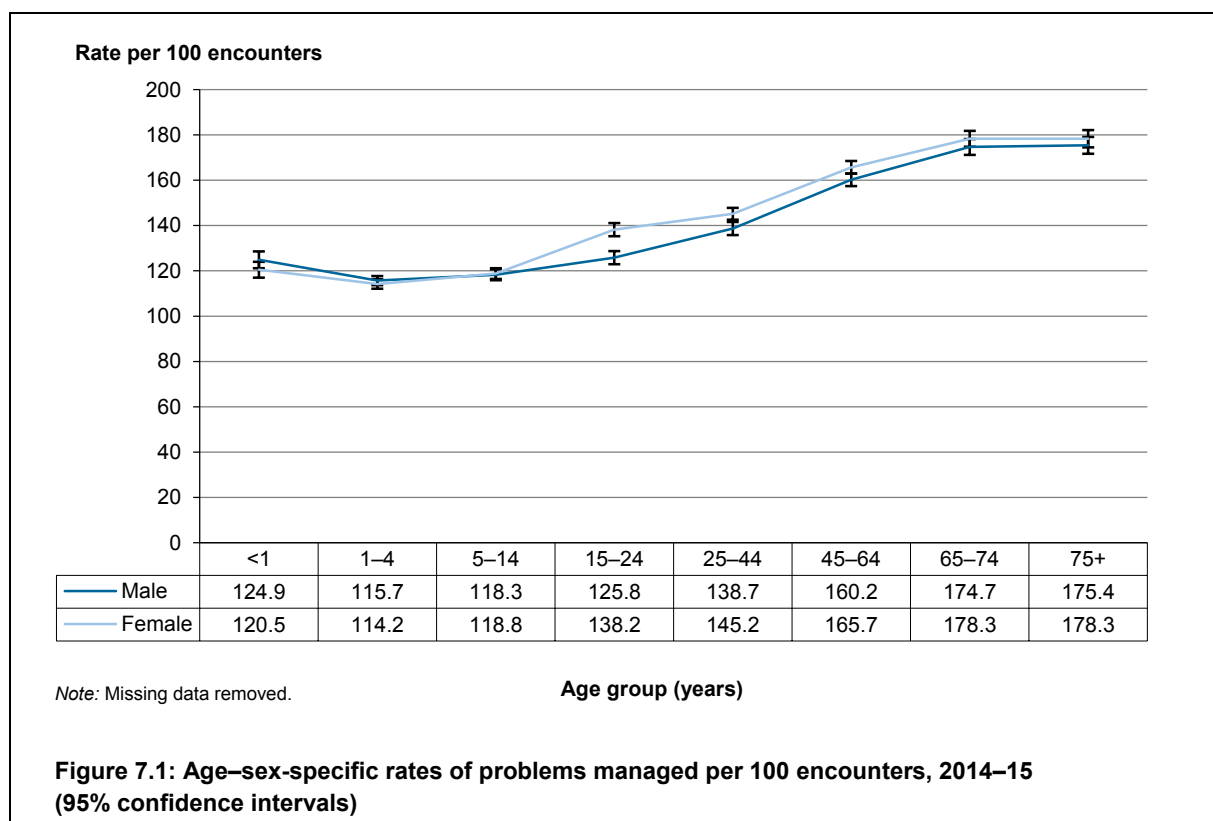
Table 7.1: Number of problems managed at an encounter

Number of problems managed at encounter	Number of encounters	Per cent	95% LCL	95% UCL
One problem	60,192	61.0	59.7	62.2
Two problems	25,851	26.2	25.5	26.9
Three problems	9,503	9.6	9.1	10.1
Four problems	3,183	3.2	2.9	3.5
Total	98,728	100.0	—	—

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

Figure 7.1 shows the age–sex-specific rates of problems managed. The number of problems managed at encounter increased steadily with the age of the patient from young adulthood up to those aged 65–74 years.

Significantly more problems were managed overall at encounters with female patients (157.3 per 100 encounters, 95% CI: 155.0–159.5) than at those with male patients (152.4 per 100 encounters, 95% CI: 150.2–154.7) (results not tabled). Figure 7.1 demonstrates that this difference was evident in the 15–24, 25–44 and 45–64 year age groups. There was no difference in the average number of problems managed between males and females for those aged 65–74 and 75 years and over. For both sexes, the number of problems managed at encounters significantly increased with each step in adult age up to those aged 45–64.



7.2 Problems managed by ICPC-2 component

A broad view of the types of problems managed in general practice can be seen by examining problems managed from the perspective of the component structure of the ICPC-2 classification (as described in Section 2.8). Table 7.2 lists the distribution of problems managed by ICPC-2 component.

Nearly two-thirds (65.7%) of problems were described as diagnoses or diseases. Of these, the majority were 'other diagnoses' (accounting for 42.8% of all problems managed), followed by infections (14.9%), injuries (4.6%) and neoplasms (3.0%).

Nearly 1 in 5 problems (19.7%) were expressed as a symptom or complaint. In some situations, rather than providing clinical descriptions of the problem under management, processes of care were recorded. The processes recorded most often were diagnostic and preventive procedures (for example, check-ups), accounting for 8.7% of problems managed.

At an 'average' 100 encounters GPs managed 102 diagnoses/diseases: 23 infections; 7 injuries; and 5 neoplasms. They also managed an average 31 symptoms and complaints, and 13 problems described as a diagnostic and preventive procedure.

Table 7.2: Problems managed by ICPC-2 component

ICPC-2 component	Number	Per cent of total problems (n = 153,133)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL
Diagnosis, diseases	100,577	65.7	101.9	99.9	103.8
Infections	22,807	14.9	23.1	22.4	23.8
Injuries	7,007	4.6	7.1	6.8	7.4
Neoplasms	4,585	3.0	4.6	4.3	5.0
Congenital anomalies	614	0.4	0.6	0.6	0.7
Other diagnoses	65,563	42.8	66.4	64.4	68.4
Symptoms and complaints	30,166	19.7	30.6	29.7	31.4
Diagnostic and preventive procedures	13,252	8.7	13.4	12.8	14.0
Medications, treatments and therapeutics	4,200	2.7	4.3	3.9	4.6
Results	2,154	1.4	2.2	2.0	2.4
Administrative	1,455	1.0	1.5	1.3	1.6
Referrals and other RFEs	1,329	0.9	1.3	1.2	1.5
Total problems	153,133	100.0	155.1	153.0	157.2

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

7.3 Problems managed by ICPC-2 chapter

The frequency and the distribution of problems managed are presented in Table 7.3 by ICPC-2 chapter (equivalent to body systems, as described in Chapter 2). Rates per 100 encounters and the proportion of total problems are provided at the ICPC-2 chapter level, and for frequent individual problems within each chapter. Individual problems accounting for at least 0.5% of all problems managed are listed in the table, in decreasing order of frequency within chapter.

The most common problems managed were:

- problems of a general and unspecified nature (19.9 per 100 encounters and 12.8% of all problems), particularly general check-ups, prescriptions and general immunisations (usually multisystem childhood immunisations)
- those classified to the musculoskeletal system (18.5 per 100 encounters), such as arthritis and back complaints
- respiratory problems (18.5 per 100 encounters), in particular upper respiratory tract infections, acute bronchitis/bronchiolitis, asthma and respiratory immunisations
- skin problems (17.1 per 100 encounters), with contact dermatitis and solar keratosis/sunburn the most common
- circulatory problems (15.9 per 100), led by hypertension and atrial fibrillation/flutter
- psychological problems (13.6 per 100), with depression and anxiety the most common.

The last column in Table 7.3 describes the proportion of encounters at which at least one problem within an ICPC-2 chapter was managed. GPs may manage more than one problem within an ICPC-2 chapter (for example, depression and anxiety; rheumatoid arthritis and osteoporosis), but this column reports only one instance per chapter.

At least one general and unspecified problem was managed at 18.4% of encounters in 2014–15, equating to approximately 27.3 million encounters at which at least one general and unspecified problem was managed in 2014–15. At least one musculoskeletal problem was managed at 17.5% of encounters, which extrapolates to 24.0 million encounters at which at least one musculoskeletal problem was managed nationally in 2014–15 (Table 7.3).

Table 7.3: Problems managed by ICPC-2 chapter and most frequent individual problems within chapter

Problem managed	Number	Per cent total problems ^(a) (n = 153,133)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of encounters ^(b) (n = 98,728) (95% CI)
General and unspecified	19,642	12.8	19.9	19.1	20.7	18.4 (17.7–19.0)
General check-up*	2,987	2.0	3.0	2.8	3.2	—
Prescription NOS	1,983	1.3	2.0	1.7	2.3	—
Immunisation/vaccination NOS	1,931	1.3	2.0	1.8	2.1	—
Results tests/procedures NOS	1,584	1.0	1.6	1.4	1.8	—
Administrative procedure NOS	1,293	0.8	1.3	1.2	1.5	—
Viral disease, other/NOS	1,054	0.7	1.1	0.9	1.2	—
Abnormal result/investigation NOS	1,000	0.7	1.0	0.9	1.1	—
Weakness/tiredness, general	785	0.5	0.8	0.7	0.9	—
Musculoskeletal	18,278	11.9	18.5	18.0	19.0	17.5 (17.0–17.9)
Arthritis – all*	3,709	2.4	3.8	3.5	4.0	—

(continued)

Table 7.3 (continued): Problems managed by ICPC-2 chapter and frequent individual problems within chapter

Problem managed	Number	Per cent total problems^(a) (n = 153,133)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of encounters^(b) (n = 98,728) (95% CI)
Osteoarthritis*	2,855	1.9	2.9	2.7	3.1	—
Back complaint*	3,297	2.2	3.3	3.2	3.5	—
Sprain/strain*	1,149	0.8	1.2	1.1	1.3	—
Bursitis/tendonitis/synovitis NOS	1,159	0.8	1.2	1.1	1.3	—
Fracture*	942	0.6	1.0	0.9	1.0	—
Injury musculoskeletal NOS	917	0.6	0.9	0.8	1.0	—
Osteoporosis	846	0.6	0.9	0.8	1.0	—
Respiratory	18,226	11.9	18.5	17.8	19.1	17.8 (17.2–18.4)
Upper respiratory tract infection	5,726	3.7	5.8	5.4	6.2	—
Acute bronchitis/bronchiolitis	2,146	1.4	2.2	2.0	2.4	—
Asthma	2,061	1.3	2.1	1.9	2.2	—
Immunisation/vaccination – respiratory	1,361	0.9	1.4	1.2	1.6	—
Sinusitis acute/chronic	1,157	0.8	1.2	1.1	1.3	—
Chronic obstructive pulmonary disease	927	0.6	0.9	0.8	1.0	—
Tonsillitis*	797	0.5	0.8	0.7	0.9	—
Skin	16,931	11.1	17.1	16.6	17.7	16.2 (15.7–16.7)
Contact dermatitis	1,775	1.2	1.8	1.7	1.9	—
Solar keratosis/sunburn	1,227	0.8	1.2	1.1	1.4	—
Malignant neoplasm, skin	1,200	0.8	1.2	1.1	1.4	—
Laceration/cut	1,019	0.7	1.0	0.9	1.1	—
Skin disease, other	1,002	0.7	1.0	0.9	1.1	—
Skin symptom/complaint, other	709	0.5	0.7	0.6	0.8	—
Circulatory	15,666	10.2	15.9	15.1	16.6	14.6 (14.0–15.3)
Hypertension*	7,778	5.1	7.9	7.4	8.3	—
Atrial fibrillation/flutter	1,272	0.8	1.3	1.2	1.4	—
Ischaemic heart disease*	1,124	0.7	1.1	1.0	1.3	—
Cardiovascular check-up*	915	0.6	0.9	0.8	1.1	—
Psychological	13,432	8.8	13.6	12.9	14.3	12.7 (12.1–13.2)
Depression*	4,410	2.9	4.5	4.2	4.7	—
Anxiety*	2,220	1.4	2.2	2.1	2.4	—
Sleep disturbance	1,632	1.1	1.7	1.5	1.8	—
Acute stress reaction	692	0.5	0.7	0.6	0.8	—

(continued)

Table 7.3 (continued): Problems managed by ICPC-2 chapter and frequent individual problems within chapter

Problem managed	Number	Per cent total problems^(a) (n = 153,133)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of encounters^(b) (n = 98,728) (95% CI)
Endocrine and metabolic	12,850	8.4	13.0	12.5	13.6	11.8 (11.3–12.2)
Diabetes (non-gestational)*	3,919	2.6	4.0	3.7	4.2	—
Lipid disorder	2,952	1.9	3.0	2.8	3.2	—
Vitamin/nutritional deficiency	1,337	0.9	1.4	1.2	1.5	—
Hypothyroidism/myxoedema	799	0.5	0.8	0.7	0.9	—
Digestive	11,201	7.3	11.3	11.0	11.7	10.9 (10.6–11.2)
Gastro-oesophageal reflux disease*	2,762	1.8	2.8	2.6	3.0	—
Gastroenteritis*	1,285	0.8	1.3	1.2	1.4	—
Abdominal pain*	767	0.5	0.8	0.7	0.9	—
Female genital system	5,308	3.5	5.4	5.0	5.7	5.0 (4.7–5.3)
Female genital check-up/Pap smear*	1,528	1.0	1.5	1.4	1.7	—
Neurological	4,063	2.7	4.1	3.9	4.3	4.0 (3.9–4.2)
Headache*	1,137	0.7	1.2	1.1	1.2	—
Pregnancy and family planning	3,932	2.6	4.0	3.7	4.3	3.9 (3.6–4.2)
Pregnancy*	1,206	0.8	1.2	1.0	1.4	—
Oral contraception*	999	0.7	1.0	0.9	1.1	—
Ear	3,583	2.3	3.6	3.5	3.8	3.6 (3.4–3.7)
Acute otitis media/myringitis	919	0.6	0.9	0.8	1.0	—
Excessive ear wax	817	0.5	0.8	0.8	0.9	—
Urology	3,429	2.2	3.5	3.3	3.6	3.4 (3.3–3.6)
Urinary tract infection*	1,688	1.1	1.7	1.6	1.8	—
Eye	2,299	1.5	2.3	2.2	2.5	2.3 (2.2–2.4)
Male genital system	1,815	1.2	1.8	1.7	2.0	1.8 (1.7–1.9)
Blood and blood-forming organs	1,611	1.1	1.6	1.5	1.8	1.6 (1.5–1.8)
Social	864	0.6	0.9	0.8	1.0	0.9 (0.8–1.0)
Total problems	153,133	100.0	155.1	153.0	157.2	—

(a) Only those individual problems accounting for $\geq 0.5\%$ of total problems are included in the table.

(b) The proportion of all encounters at which at least one problem classified in this chapter was managed.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <hdl.handle.net/2123/13765>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; CI – confidence interval; NOS – not otherwise specified.

7.4 Most frequently managed problems

Table 7.4 shows the most frequently managed individual problems in general practice, in decreasing order of frequency. These 35 problems accounted for 53.5% of all problems managed, and the top 10 problems accounted for 29.4%.

In this analysis, the specific chapter to which 'across chapter concepts' (for example, check-ups, immunisation/vaccination and prescriptions) apply is ignored, and the concept is grouped with all similar concepts regardless of body system. For example, immunisation/vaccination includes vaccinations for influenza, childhood diseases, hepatitis and many others.

Hypertension was the most common problem managed (7.9 per 100 encounters), followed by check-ups (6.9 per 100), upper respiratory tract infection (URTI) (5.8 per 100), depression (4.5 per 100) and diabetes (4.0 per 100) (Table 7.4).

The percentage of each problem that was 'new' is listed in the far right column in Table 7.4. If a problem was a new chronic problem to the patient, or a new episode of a recurrent problem and the patient had not been treated for that problem or episode by any medical practitioner before the encounter, it was considered a new problem. This can provide a measure of general practice incidence. For example, only 5.5% of all contacts with hypertension were new diagnoses. In contrast, 76.4% of URTI problems were new to the patient, suggesting that the majority of people with URTIs who attend the GP, do so only once per episode.

Table 7.4: Most frequently managed problems

Problem managed	Number	Per cent of total problems (n = 153,133)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	New as per cent of all problems ^(a)
Hypertension*	7,778	5.1	7.9	7.4	8.3	5.5
Check-up – all*	6,778	4.4	6.9	6.5	7.2	44.7
Upper respiratory tract infection	5,726	3.7	5.8	5.4	6.2	76.4
Depression*	4,410	2.9	4.5	4.2	4.7	13.0
Diabetes – all*	3,960	2.6	4.0	3.8	4.3	4.8
Arthritis – all*	3,755	2.5	3.8	3.6	4.0	16.9
Immunisation/vaccination – all*	3,531	2.3	3.6	3.3	3.9	65.9
Back complaint*	3,297	2.2	3.3	3.2	3.5	24.6
Lipid disorder	2,952	1.9	3.0	2.8	3.2	10.9
Prescription – all*	2,865	1.9	2.9	2.6	3.3	6.6
Gastro-oesophageal reflux disease*	2,762	1.8	2.8	2.6	3.0	14.8
Anxiety*	2,220	1.4	2.2	2.1	2.4	16.7
Test results*	2,154	1.4	2.2	2.0	2.4	37.4
Acute bronchitis/bronchiolitis	2,146	1.4	2.2	2.0	2.4	75.9
Asthma	2,061	1.3	2.1	1.9	2.2	22.0
Contact dermatitis	1,775	1.2	1.8	1.7	1.9	45.5
Urinary tract infection*	1,688	1.1	1.7	1.6	1.8	63.9
Sleep disturbance	1,632	1.1	1.7	1.5	1.8	20.1
Administrative procedure – all*	1,455	1.0	1.5	1.3	1.6	37.6
Vitamin/nutritional deficiency	1,337	0.9	1.4	1.2	1.5	32.8
Gastroenteritis*	1,285	0.8	1.3	1.2	1.4	78.7
Atrial fibrillation/flutter	1,272	0.8	1.3	1.2	1.4	5.6
Abnormal test results*	1,235	0.8	1.3	1.1	1.4	47.3
Solar keratosis/sunburn	1,227	0.8	1.2	1.1	1.4	50.1
Pregnancy*	1,206	0.8	1.2	1.0	1.4	35.4
Malignant neoplasm, skin	1,200	0.8	1.2	1.1	1.4	58.6
Bursitis/tendonitis/synovitis NOS	1,159	0.8	1.2	1.1	1.3	56.7
Sinusitis acute/chronic	1,157	0.8	1.2	1.1	1.3	68.7
Sprain/strain*	1,149	0.8	1.2	1.1	1.3	60.9
Headache*	1,137	0.7	1.2	1.1	1.2	36.2
Ischaemic heart disease*	1,124	0.7	1.1	1.0	1.3	9.8
Viral disease, other/NOS	1,054	0.7	1.1	0.9	1.2	74.6
Laceration/cut	1,019	0.7	1.0	0.9	1.1	45.0
Skin disease, other	1,002	0.7	1.0	0.9	1.1	59.7
Oral contraception*	999	0.7	1.0	0.9	1.1	19.0
<i>Subtotal</i>	<i>81,507</i>	<i>53.5</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>
Total problems	153,133	100.0	155.1	153.0	157.2	38.2

(a) The proportion of total contacts with this problem that were accounted for by new problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <hdl.handle.net/2123/13765>).

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

7.5 Most common new problems

For each problem managed, participating GPs are asked to indicate whether the problem under management was a new problem for the patient (see definition in Section 7.4). Table 7.5 lists the most common new problems managed in general practice, in decreasing order of frequency. Overall, 58,428 problems (38.2% of all problems) were specified as new, and were managed at a rate of 59.2 per 100 encounters.

New problems were often acute in nature, such as URTI (4.4 per 100 encounters), acute bronchitis/bronchiolitis (1.6 per 100) and urinary tract infection (1.1 per 100). Preventive activities were also frequently recorded, including check-ups (3.1 per 100) and immunisation/vaccination (2.4 per 100 encounters) (Table 7.5).

The far right column of this table shows the new cases of this problem as a proportion of total contacts with this problem. This provides an indication of the incidence of each problem. For example, the 635 new cases of arthritis represented only 17% of all GP contacts with diagnosed arthritis, suggesting that by far the majority of contacts for arthritis were for ongoing management. In contrast, 76% of acute bronchitis/bronchiolitis contacts were first consultations with a medical practitioner for this episode, indicating that the balance (24%) were follow-up consultations for this episode. This indicates that most patients only require one visit to a GP for the management of an episode of acute bronchitis/bronchiolitis.

Table 7.5: Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (n = 58,428)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	New as per cent of all problems ^(a)
Upper respiratory tract infection	4,374	7.5	4.4	4.1	4.8	76.4
Check-up – all*	3,033	5.2	3.1	2.9	3.3	44.7
Immunisation/vaccination – all*	2,327	4.0	2.4	2.1	2.6	65.9
Acute bronchitis/bronchiolitis	1,628	2.8	1.6	1.5	1.8	75.9
Urinary tract infection*	1,079	1.8	1.1	1.0	1.2	63.9
Gastroenteritis*	1,011	1.7	1.0	0.9	1.1	78.7
Back complaint*	810	1.4	0.8	0.7	0.9	24.6
Contact dermatitis	807	1.4	0.8	0.7	0.9	45.5
Test results*	806	1.4	0.8	0.7	0.9	37.4
Sinusitis acute/chronic	795	1.4	0.8	0.7	0.9	68.7
Viral disease, other/NOS	786	1.3	0.8	0.6	1.0	74.6
Malignant neoplasm, skin	703	1.2	0.7	0.6	0.8	58.6
Acute otitis media/myringitis	702	1.2	0.7	0.6	0.8	76.4
Sprain/strain*	700	1.2	0.7	0.6	0.8	60.9
Bursitis/tendonitis/synovitis NOS	657	1.1	0.7	0.6	0.7	56.7
Arthritis – all*	635	1.1	0.6	0.6	0.7	16.9
Solar keratosis/sunburn	615	1.1	0.6	0.5	0.7	50.1
Skin disease, other	599	1.0	0.6	0.5	0.7	59.7
Tonsillitis*	587	1.0	0.6	0.5	0.7	73.6
Abnormal test results*	584	1.0	0.6	0.5	0.7	47.3
Depression*	572	1.0	0.6	0.5	0.6	13.0

(continued)

Table 7.5 (continued): Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (n = 58,428)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	New as per cent of all problems ^(a)
Administrative procedure – all*	547	0.9	0.6	0.5	0.6	37.6
Observation/health education/advice/diet – all*	499	0.9	0.5	0.4	0.6	58.3
Excessive ear wax	499	0.9	0.5	0.4	0.6	61.0
Musculoskeletal injury NOS	488	0.8	0.5	0.4	0.6	53.2
Fracture*	465	0.8	0.5	0.4	0.5	49.4
Laceration/cut	458	0.8	0.5	0.4	0.5	45.0
Asthma	454	0.8	0.5	0.4	0.5	22.0
Vitamin/nutritional deficiency	438	0.7	0.4	0.4	0.5	32.8
Abdominal pain*	436	0.7	0.4	0.4	0.5	56.9
<i>Subtotal</i>	<i>28,094</i>	<i>48.1</i>	—	—	—	—
Total new problems	58,428	100.0	59.2	57.8	60.6	—

(a) The proportion of total contacts with this problem that were accounted for by new problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <hdl.handle.net/2123/13765>).

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

7.6 Most frequently managed chronic problems

To identify chronic conditions, a list classified according to ICPC-2, based on work undertaken by O’Halloran et al. in 2004⁴⁴ and regularly updated (see ‘Chronic conditions’ grouper G84 in the ‘Analysis and reporting’ section of the ICPC-2 PLUS Demonstrator⁶⁴), was applied to the BEACH data set. More than one-third (35.5%) of the problems managed in general practice were chronic. At least one chronic problem was managed at 41.0% of encounters (95% CI: 39.9–42.2) (results not tabled), and chronic problems were managed at an average rate of 55.0 per 100 encounters (Table 7.6).

In other parts of this chapter, both chronic and non-chronic conditions (for example, diabetes and gestational diabetes) may have been grouped together when reporting (for example, diabetes – all*, Table 7.4). In this section, only problems regarded as chronic have been included in the analysis. For this reason, the condition labels and figures in this analysis may differ from those in Table 7.4. Where the group used for the chronic analysis differs from that used in other analyses in this report, the labels are marked with a double asterisk (for example, Diabetes [non-gestational]**). Codes included in asterisked concepts are presented in Appendix 4, Table A4.2.

Table 7.6 shows the most frequently managed chronic problems. Together, these 30 chronic problems accounted for 78.9% of all chronic problems managed, and for 28.0% of all problems managed. Half of all chronic problems managed (50.9%) were accounted for by the top seven chronic problems: non-gestational hypertension (14.3% of chronic conditions), depressive disorder (8.1%), non-gestational diabetes (7.2%), chronic arthritis (6.9%), lipid disorder (5.4%), oesophageal disease (5.2%) and asthma (3.8%) (Table 7.6).

A new column added to Table 7.6 this year shows the proportion of each chronic problem that was new to the patient (as defined in Section 7.4). Overall, 15.8% of chronic problems managed were new diagnoses, though just 4.3% of non-gestational diabetes problems were new, and 58.6% of malignant skin neoplasms managed were new problems.

Table 7.6: Most frequently managed chronic problems

Chronic problem managed	Number	Per cent of total chronic problems (n = 54,298)	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	New as per cent of all chronic problems
Hypertension (non-gestational)**	7,759	14.3	7.9	7.4	8.3	5.5
Depressive disorder**	4,374	8.1	4.4	4.2	4.7	12.9
Diabetes (non-gestational)**	3,919	7.2	4.0	3.7	4.2	4.3
Chronic arthritis**	3,745	6.9	3.8	3.6	4.0	16.8
Lipid disorder	2,952	5.4	3.0	2.8	3.2	10.9
Oesophageal disease	2,807	5.2	2.8	2.7	3.0	15.2
Asthma	2,061	3.8	2.1	1.9	2.2	22.0
Atrial fibrillation/flutter	1,272	2.3	1.3	1.2	1.4	5.6
Malignant neoplasm, skin	1,200	2.2	1.2	1.1	1.4	58.6
Ischaemic heart disease**	1,124	2.1	1.1	1.0	1.3	9.8
Back syndrome with radiating pain**	1,011	1.9	1.0	0.9	1.1	23.9
Chronic obstructive pulmonary disease	927	1.7	0.9	0.8	1.0	14.5
Osteoporosis	846	1.6	0.9	0.8	1.0	17.3
Hypothyroidism/myxoedema	799	1.5	0.8	0.7	0.9	8.7
Shoulder syndrome (excluding arthritis)**	658	1.2	0.7	0.6	0.7	44.7
Obesity (BMI > 30)	649	1.2	0.7	0.6	0.7	10.7
Migraine	626	1.2	0.6	0.6	0.7	21.3
Heart failure	619	1.1	0.6	0.5	0.7	11.6
Chronic back pain**	591	1.1	0.6	0.5	0.7	2.3
Chronic skin ulcer (including varicose ulcer)	580	1.1	0.6	0.5	0.7	20.0
Chronic pain NOS	518	1.0	0.5	0.4	0.6	0.7
Gout	512	0.9	0.5	0.5	0.6	18.5
Schizophrenia	496	0.9	0.5	0.4	0.6	3.1
Anxiety disorder**	482	0.9	0.5	0.4	0.6	15.2
Dementia (including senile, Alzheimer's)	470	0.9	0.5	0.4	0.6	9.6
Chronic acne**	421	0.8	0.4	0.4	0.5	33.0
Back syndrome without radiating pain (excluding arthritis, sprains and strains)**	389	0.7	0.4	0.3	0.5	14.4
Chronic kidney disease**	386	0.7	0.4	0.3	0.4	11.4
Affective psychosis	330	0.6	0.3	0.3	0.4	7.3
Vertiginous syndrome	320	0.6	0.3	0.3	0.4	54.0
<i>Subtotal</i>	<i>42,843</i>	<i>78.9</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>
Total chronic problems	54,298	100.0	55.0	53.0	57.0	15.8

** Includes multiple ICD-10 or ICD-10 PLUS codes and indicates that this group differs from that used for analysis in other sections of this chapter, as only chronic conditions have been included in this analysis (see Appendix 4, Table A4.2 <hdl.handle.net/2123/13765>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; BMI – body mass index; NOS – not otherwise specified.

7.7 Changes in problems managed over the decade 2005–06 to 2014–15

Data about the problems managed in general practice from each of the past 10 years of the BEACH study, 2005–06 to 2014–15 are reported in Chapter 7 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ Major changes that occurred over the decade are summarised below.

Overall, the number of problems managed at general practice encounters increased from 146.2 per 100 encounters in 2005–06, to 155.1 per 100 encounters in 2014–15. When this result is extrapolated to estimate national figures, this represents 65.1 million more problems managed at general practice encounters in 2014–15 than in 2005–06. A rise in GP attendances over the decade also contributed to this increase. This was reflected in a significant increase over the decade in the management of new problems (56.9 to 59.2 per 100 encounters).

Changes in some of the most common individual problems managed in general practice are summarised below.

- The management rate of hypertension decreased from 9.4 per 100 encounters in 2005–06 to 7.9 per 100 in 2014–15. Of the most frequently managed problems, hypertension was the only chronic problem with a decreased management rate. However, due to the overall increase in the number of general practice encounters nationally, there was still an additional 1.3 million encounters at which hypertension was managed in 2014–15 than in 2005–06.
- General check-ups were managed more often in 2014–15 than in 2005–06, increasing from 2.1 to 3.0 per 100 encounters. This represents 2.0 million more occasions where general check-ups were managed in 2014–15 than in 2005–06.
- The management rate of depression increased from 3.6 per 100 encounters to 4.5 per 100 between 2005–06 and 2014–15, suggesting about 2.5 million more occasions where depression was managed in 2014–15 than in 2005–06.
- Immunisation/vaccination was managed at a significantly lower rate in 2014–15 than in 2005–06 (from 5.0 per 100 encounters to 3.6 per 100). This equated to 110,000 fewer occasions at which immunisation/vaccination was managed in 2014–15 than in 2005–06. This is probably due to a delay in the supply of influenza vaccine for the 2015 flu season, which was not available until after this BEACH year was completed.

The management rate of chronic conditions did not differ in 2014–15 (55.0 per 100 encounters) from that of 2005–06 (52.1 per 100 encounters). However, due to the increase in the number of GP visits nationally, we estimate that GPs managed 23 million more chronic problems in 2014–15 than they did a decade earlier.

8 Overview of management

The BEACH survey form allows GPs to record several aspects of patient management for each problem managed at each encounter. Pharmaceutical management is recorded in detail. Other modes of treatment, including clinical treatments (for example, counselling) and procedures, recorded briefly in the GP's own words, are also related to a single problem. The form allows for referrals, hospital admissions, pathology and imaging test orders to be related to a single problem or to multiple problems (see Appendix 1).

A summary of management at general practice encounters from 2005–06 to 2014–15 is reported for each year in the 10-year report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

At the 98,728 encounters, GPs undertook 226,158 management activities in total. The most common management form was medication, either prescribed, GP-supplied, or advised for over-the-counter purchase. 'Other treatments' were the second most common management activity, with clinical treatments more frequent than procedural treatments (Table 8.1).

For an 'average' 100 patient problems managed, GPs provided 55 prescriptions and 22 clinical treatments, undertook 11 procedures, made 6 referrals to medical specialists and 3 to allied health services, and placed 30 pathology test/battery orders and 7 imaging test orders.

Table 8.1: Summary of management

Management type	Number	Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Rate per 100 problems (n = 153,133)	95% LCL	95% UCL
Medications	101,776	103.1	100.6	105.6	66.5	65.1	67.8
Prescribed	84,455	85.5	83.1	88.0	55.2	53.8	56.5
GP-supplied	7,923	8.0	7.4	8.6	5.2	4.8	5.5
Advised OTC	9,398	9.5	8.8	10.2	6.1	5.7	6.6
Other treatments	50,204	50.9	48.4	53.3	32.8	31.3	34.2
Clinical	33,443	33.9	31.8	36.0	21.8	20.6	23.1
Procedural	16,761	17.0	16.2	17.8	10.9	10.5	11.4
Referrals and admissions	15,697	15.9	15.3	16.5	10.3	9.9	10.6
Medical specialist*	9,464	9.6	9.2	10.0	6.2	5.9	6.4
Allied health services*	5,107	5.2	4.9	5.5	3.3	3.1	3.5
Hospital*	355	0.4	0.3	0.4	0.2	0.2	0.3
Emergency department*	305	0.3	0.3	0.4	0.2	0.2	0.2
Other referrals*	466	0.5	0.4	0.5	0.3	0.3	0.4
Pathology	46,435	47.0	45.2	48.9	30.3	29.3	31.4
Imaging	11,314	11.5	11.0	11.9	7.4	7.1	7.7
Other investigations ^(a)	732	0.7	0.7	0.8	0.5	0.4	0.5
Total management activities	226,158	229.1	—	—	147.8	—	—

(a) Other investigations reported here include only those ordered by the GP. Other investigations in Chapter 12 include those ordered by the GP and those done by the GP or practice staff.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, <hdl.handle.net/2123/13765>).

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

The number of encounters or problems for which at least one form of management was recorded by the GPs gives us another perspective (Table 8.2). At least one management action was recorded at 90.8% of encounters, for 85.0% of problems managed.

- At least one medication or other treatment was given for 70.5% of the problems managed.
- At least one medication (most commonly prescribed) was prescribed, supplied or advised for more than half (51.8%) of the problems managed.
- At least one other treatment (most commonly clinical) was provided for nearly one-third (29.4%) of problems managed.
- At least one referral (most commonly to a medical specialist) was made for 10.2% of problems managed.
- At least one investigation (most commonly pathology) was requested for 19.0% of problems managed (Table 8.2).

When extrapolated nationally based on the total number of MBS claims for GP consultation items of service (see Section 2.11), which in 2014–15 was 137.3 million:

- at least one medication was prescribed, advised for over-the-counter purchase, or supplied by the GP at approximately 85.5 million (95% CI: 84.3–86.9 million) GP–patient encounters across the country in 2014–15
- at least one procedure was undertaken at 21.1 million (95% CI: 20.2–22.0 million) encounters nationally
- at least one referral to a specialist, allied health professional, hospital or emergency department was provided by GPs at 19.9 million (95% CI: 19.2–20.7 million) encounters nationally
- at least one pathology, imaging or other investigation was ordered at 34.9 million (95% CI: 33.9–35.8 million) encounters across Australia in 2014–15.

Table 8.2: Encounters and problems for which management was recorded

Management type	Number of encounters	Per cent of all encounters (n = 98,728)	95% LCL	95% UCL	Number of problems	Per cent of all problems (n = 153,133)	95% LCL	95% UCL
At least one management type	89,648	90.8	90.2	91.4	130,224	85.0	84.4	85.7
At least one medication or other treatment	78,786	79.8	78.9	80.7	107,935	70.5	69.6	71.4
At least one medication	61,555	62.3	61.4	63.3	79,383	51.8	50.9	52.8
At least one prescription	52,405	53.1	52.1	54.0	67,082	43.8	42.8	44.8
At least one GP-supplied	6,065	6.1	5.7	6.6	6,234	4.1	3.8	4.4
At least one OTC advised	8,212	8.3	7.7	8.9	8,434	5.5	5.1	5.9
At least one other treatment	38,908	39.4	37.8	41.0	45,089	29.4	28.2	30.6
At least one clinical treatment	26,543	26.9	25.4	28.3	30,484	19.9	18.8	21.0
At least one procedural treatment	15,170	15.4	14.7	16.0	15,840	10.3	9.9	10.8
At least one referral or admission	14,360	14.5	14.0	15.1	15,553	10.2	9.8	10.5
At least one referral to a medical specialist	8,996	9.1	8.7	9.5	9,574	6.3	6.0	6.5
At least one referral to allied health services	4,777	4.8	4.5	5.1	5,060	3.3	3.1	3.5
At least one referral to hospital	355	0.4	0.3	0.4	377	0.2	0.2	0.3
At least one referral to emergency department	305	0.3	0.3	0.4	316	0.2	0.2	0.2
At least one other referral	466	0.5	0.4	0.5	488	0.3	0.3	0.4
At least one investigation	25,114	25.4	24.7	26.1	29,040	19.0	18.5	19.5
At least one pathology order	17,875	18.1	17.5	18.7	20,544	13.4	13.0	13.8
At least one imaging order	9,641	9.8	9.4	10.1	10,058	6.6	6.3	6.8
At least one other investigation ^(a)	699	0.7	0.6	0.8	713	0.5	0.4	0.5

(a) Other investigations reported here only include those ordered by the GP. Other investigations in Chapter 12 include those ordered by the GP and those done by the GP or practice staff.
 Note: LCL – lower confidence limit; UCL – upper confidence limit; OTC – over-the-counter.

The combinations of management types related to each problem were investigated. The majority of treatments occurred as a single component, or in combination with one other component. Management was provided:

- as a single component for almost two-thirds (61.3%) of the problems managed (Table 8.3)
- as a double component for 19.1% of problems managed
- less often (3.6%) with more than two components (results not tabled).

Table 8.3 lists the most common management combinations, where management action(s) was recorded. Medication alone was the most common management, followed by a clinical treatment alone, and the combination of a medication and a clinical treatment. When a problem was referred it was most likely that no other treatments were given for that problem at the encounter.

Table 8.3: Most common management combinations

1+ medication	1+ clinical treatment	1+ procedural treatment	1+ referral	1+ imaging order	1+ pathology order	Per cent of total problems (n = 153,133)	Per cent of total encounters (n = 98,728)
No recorded management						15.0	9.2
1+ management recorded							
✓						34.6	28.5
	✓					9.4	6.8
✓	✓					5.9	9.5
			✓			5.2	3.9
					✓	5.1	3.0
		✓				4.3	3.7
✓					✓	3.0	4.5
				✓		2.7	2.0
✓		✓				2.6	4.2
✓			✓			1.5	3.2
		✓			✓	1.3	1.4
✓				✓		1.2	2.2
	✓				✓	1.1	1.2
	✓		✓			1.0	1.3
				✓	✓	0.6	0.8
✓	✓			✓		0.5	0.5
✓	✓		✓			0.4	1.3
			✓		✓	0.3	0.5
		✓	✓			0.3	0.4
	✓	✓				0.3	0.6

Note: 1+ – at least one specified management type.

8.1 Changes in management over the decade 2005–06 to 2014–15

Changes in management over the decade 2005–06 to 2014–15 are described in detail in Chapter 8 of the accompanying report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ In that publication, changes over time are largely reported in terms of changes in management actions as a rate per 100 problems. This reflects change in how GPs are managing problems after accounting for the significant increase in the number of problems managed per encounter over the decade.

The major changes over the 10 years to 2014–15 are summarised below.

- There was a significant decrease in the rate of medications prescribed, supplied by the GP or advised for over-the-counter purchase, from 71.4 per 100 problems managed in 2005–06 to 66.5 per 100 problems managed in 2014–15.
- The major contributor to the above change was a significant decrease in the rate of prescribed medications over the time period, from 58.7 to 55.2 per 100 problems, and in GP-supplied medications, from 6.0 to 5.2 per 100 problems.
- The rate of other treatments increased significantly, from 29.9 to 32.8 per 100 problems, influenced by the significant increase in procedural treatments, from 9.9 to 10.9 per 100 problems over the decade.
- The rate of referrals to other health providers significantly increased, from 8.2 to 10.3 per 100 problems managed between 2005–06 and 2014–15, influenced by an 11% increase in referrals to medical specialists (from 5.6 to 6.2 per 100 problems managed) and a 65% increase in referrals to allied health services over the period (from 2.0 to 3.3 per 100 problems managed). It was further influenced by a marginal increase in referrals to emergency departments (from 0.1 to 0.2 per 100 problems managed).
- The rate at which pathology tests/batteries were ordered significantly increased by 15%, from 26.4 tests/batteries per 100 problems managed in 2005–06 to 30.3 in 2014–15.
- The rate at which imaging was ordered increased significantly, from 6.0 imaging orders per 100 problems managed in 2005–06 to 7.4 per 100 in 2014–15, an increase of 23%.

9 Medications

GPs could record up to four medications for each of four problems managed – a maximum of 16 medications per encounter. Each medication could be recorded as prescribed (the default), supplied by the GP, or recommended for over-the-counter (OTC) purchase. The generic name of a medication is its non-proprietary name, which describes the pharmaceutical substance(s) or active pharmaceutical ingredient(s).

- GPs were asked to:
 - record the generic or brand name, the strength, regimen and number of repeats ordered for each medication
 - designate this as a new or continued medication for this patient for this problem.
- Generic or brand names were entered into the database in the manner recorded by the GP.
- Medications were coded using the Coding Atlas of Pharmaceutical Substances (CAPS) system developed by the FMRC, a hierarchical classification system which captures details of products down to the generic and brand level. Every medication in the CAPS coding system is mapped to the international Anatomical Therapeutic Chemical (ATC) classification index.⁴⁵
- The reporting of results at drug group, subgroup and generic level uses ATC levels 1, 3 and 5. The most frequently prescribed, supplied or advised individual medications are reported at the CAPS generic level (equivalent to ATC level 5) because ATC does not include many of the over-the-counter medications that arise in BEACH. Further, some ATC level 5 labels are not sufficiently specific for clarity.

Data on medications are reported for each year from 2005–06 to 2014–15 in the 10-year summary report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

Readers interested in adverse drug events will find more detailed information from the BEACH program in *Drugs causing adverse events in patients aged 45 or older: a randomised survey of general practice patients*.⁶⁵

9.1 Source of medications

As reported in Chapter 8, a total of 101,776 medications were recorded, at rates of 103.1 per 100 encounters and 66.5 per 100 problems managed. We can derive from Table 8.1 that:

- approximately 4 out of 5 medications (83.0%) were prescribed
- 7.8% of medications were supplied to the patient by the GP
- 9.2% of medications were recommended by the GP for OTC purchase.

When medication rates per 100 encounters are extrapolated to the 137.3 million general practice Medicare-claimed encounters in Australia from April 2014 to March 2015, we estimate that GPs in Australia:

- prescribed, supplied or advised at least one medication at 85.5 million encounters (62.3% of encounters, Table 8.2)
- wrote a prescription (with/without repeats) for more than 117.4 million medications
- supplied 11 million medications directly to the patient
- recommended 13 million medications for OTC purchase (Table 8.1).

9.2 Prescribed medications

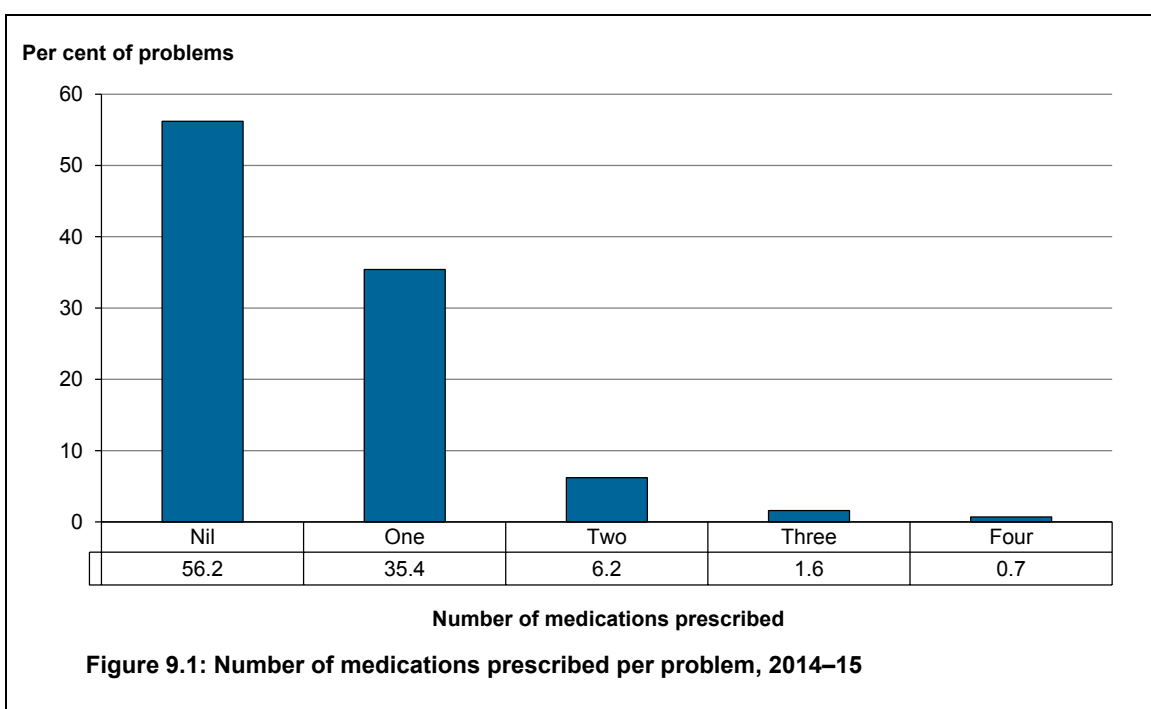
Prescribed medications accounted for 83.0% of all medications. There were 84,455 prescriptions recorded, at rates of 85.5 per 100 encounters and 55.2 per 100 problems managed (Table 8.1).

GPs recorded 79.6% of prescribed medications by brand (proprietary) name and 20.4% by their generic (non-proprietary) name. Medications most likely to be recorded by generic name were paracetamol, amoxicillin, and prednisolone (results not tabled).

As shown in Table 8.2, at least one prescription was given at 53.1% of encounters. Extrapolated to the 137.3 million general practice Medicare-claimed encounters, we estimate that GPs prescribed at least one medication at 72.9 million encounters.

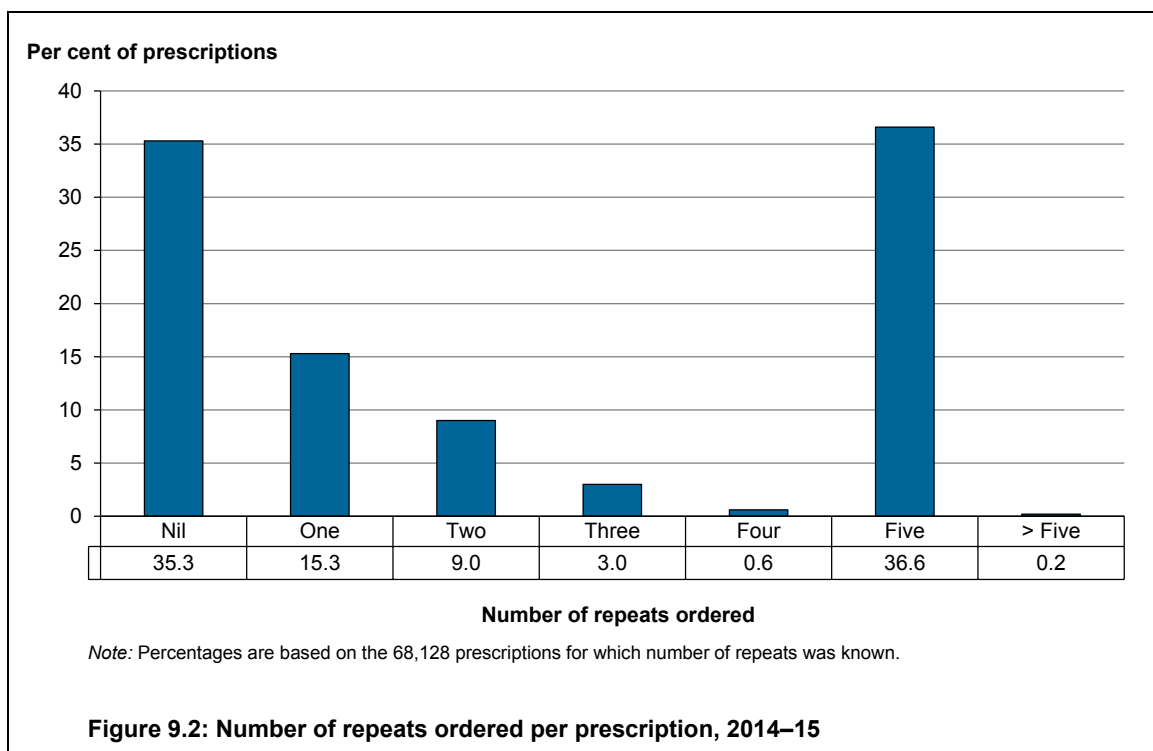
At least one prescription was given for 43.8% of problems managed.

- No prescription was given for 56.2% of problems managed.
- One prescription was given for 35.4% of problems managed.
- Two prescriptions were given for 6.2% of problems managed.
- Three or four prescriptions were given for 2.3% of problems managed (Figure 9.1).



Number of repeats

For 68,128 prescriptions (80.7% of all prescriptions), the GPs recorded 'number of repeats'. The distribution of the specified number of repeats (from nil to more than five) is provided in Figure 9.2. For 35.3% of these prescriptions, the GP specified that no repeats had been prescribed, and for 36.6% 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 repeat was also quite common (15.3%).



Age–sex-specific rates of prescribed medications

Age–sex-specific analysis showed similar prescription rates for male (87 per 100 encounters) and female patients (85 per 100), and the well-described tendency for the number of prescriptions written at each encounter to rise with the advancing age of the patient.

The rate of prescribing almost doubled from 55 per 100 encounters for patients aged less than 25 years to 108 per 100 encounters for patients aged 65 years and over (results not tabled).

However, Figure 9.3 demonstrates that this age-based increase lessens if the prescription rate is considered in terms of the number of problems managed in each age group. This suggests that a substantial part of the higher prescription rate for older patients is due to the increased number of health problems they have managed at an encounter. The remaining increase in prescription rate associated with patient age is probably a reflection of the problems under management, as the rate of chronic problem management increases with patient age.⁶⁶

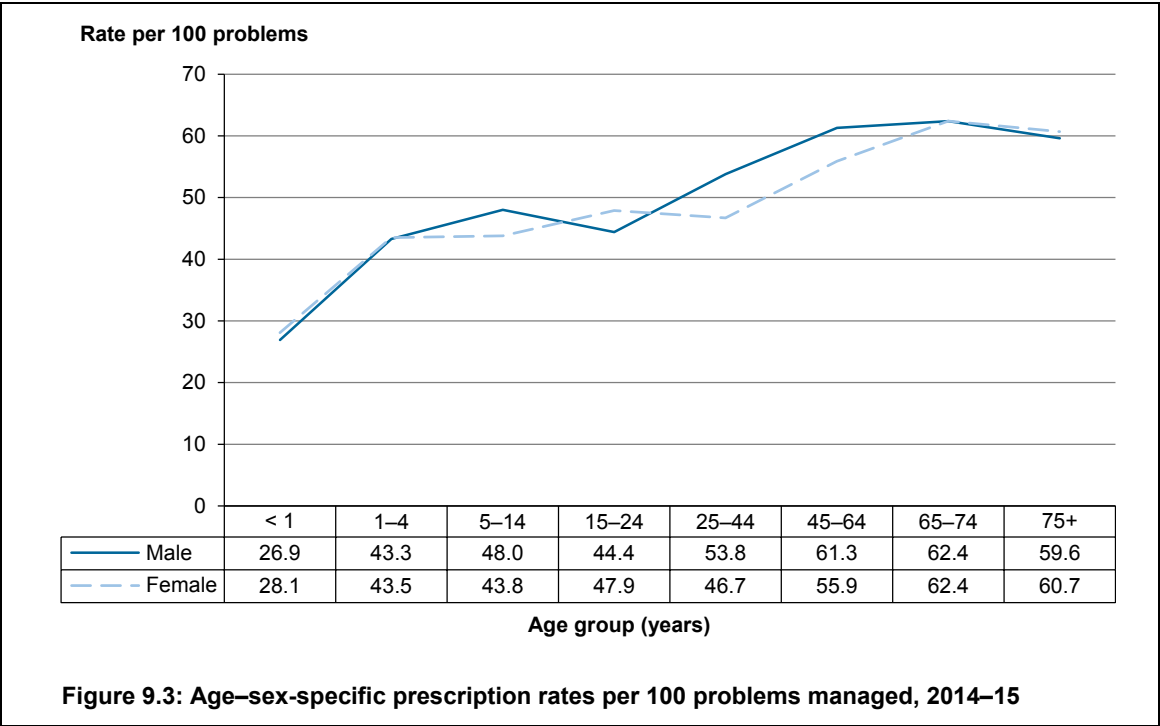


Figure 9.3: Age–sex-specific prescription rates per 100 problems managed, 2014–15

Types of medications prescribed

Table 9.1 shows the distribution of prescribed medications using the WHO ATC classification.⁴⁵ This allows comparison with other data sources such as those produced from PBS data. The table lists medications in frequency order within ATC levels 1, 3 and 5, which are drug category (mainly anatomical), subgroup, and non-proprietary drug name. Prescriptions are presented as a percentage of total prescriptions, as a rate per 100 encounters, and as a rate per 100 problems managed, each with 95% confidence intervals.

Drugs acting on the nervous system accounted for one-quarter (24.9%) of all medications. Most common were the opioids (7.6% of all medications), which include analgesics containing high-dose (30 mg) codeine. The inclusion of analgesic combinations with 30 mg of codeine aligns with the Poisons Regulations of the Therapeutic Goods Administration,⁶⁷ which stipulates that high-dose codeine combinations are Schedule 4 (prescription only) medications. Oxycodone was prescribed at a similar rate to the codeine combinations. Antidepressants were also common nervous system medications, as were other analgesics, in particular, plain paracetamol.

Cardiovascular system medications made up 18.0% of medications, and lipid-modifying agents were the most common of these. Anti-infectives for systemic use, a group including antibiotics and antivirals, accounted for 17.6% of medications.

Table 9.1: Prescribed medications by ATC levels 1, 3 and 5

ATC Classification level			Number	Per cent of prescribed medications (n = 84,455) ^(a)	Rate per 100 encounters (95% CI) (n = 98,728)	Rate per 100 problems (95% CI) (n = 153,133)
1	3	5				
Nervous system			21,004	24.9	21.3 (20.3–22.2)	13.7 (13.1–14.3)
	Opioids		6,397	7.6	6.5 (6.1–6.9)	4.2 (3.9–4.4)
	Codeine, combinations excl. psycholeptics		1,794	2.1	1.8 (1.7–2.0)	1.2 (1.1–1.3)
	Oxycodone		1,637	1.9	1.7 (1.5–1.8)	1.1 (1.0–1.2)
	Tramadol		881	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
	Oxycodone, combinations		659	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
	Buprenorphine		618	0.7	0.6 (0.5–0.7)	0.4 (0.4–0.5)
	Antidepressants		4,502	5.3	4.6 (4.3–4.8)	2.9 (2.8–3.1)
	Sertraline		634	0.8	0.6 (0.6–0.7)	0.4 (0.4–0.5)
	Escitalopram		603	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
	Amitriptyline		566	0.7	0.6 (0.5–0.6)	0.4 (0.3–0.4)
	Venlafaxine		513	0.6	0.5 (0.5–0.6)	0.3 (0.3–0.4)
	Mirtazepine		428	0.5	0.4 (0.4–0.5)	0.3 (0.2–0.3)
	Other analgesics and antipyretics		2,551	3.0	2.6 (2.3–2.8)	1.7 (1.5–1.8)
	Paracetamol, plain		2,411	2.9	2.4 (2.2–2.7)	1.6 (1.4–1.7)
	Anxiolytics		1,894	2.2	1.9 (1.7–2.1)	1.2 (1.1–1.4)
	Diazepam		1,267	1.5	1.3 (1.1–1.4)	0.8 (0.7–0.9)
	Oxazepam		454	0.5	0.5 (0.4–0.5)	0.3 (0.3–0.3)
	Hypnotics and sedatives		1,526	1.8	1.5 (1.4–1.7)	1.0 (0.9–1.1)
	Temazepam		947	1.1	1.0 (0.9–1.1)	0.6 (0.6–0.7)
	Antipsychotics		1,344	1.6	1.4 (1.2–1.5)	0.9 (0.8–1.0)
	Prochlorperazine		519	0.6	0.5 (0.5–0.6)	0.3 (0.3–0.4)
	Antiepileptics		1,316	1.6	1.3 (1.2–1.4)	0.9 (0.8–0.9)
	Pregabalin		729	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)
	Drugs used in addictive disorders		727	0.9	0.7 (0.5–0.9)	0.5 (0.4–0.6)
Cardiovascular system			15,232	18.0	15.4 (14.6–16.2)	9.9 (9.5–10.4)
	Lipid modifying agents, plain		3,586	4.2	3.6 (3.4–3.9)	2.3 (2.2–2.5)
	Atorvastatin		1,352	1.6	1.4 (1.3–1.5)	0.9 (0.8–1.0)
	Rosuvastatin		1,351	1.6	1.4 (1.2–1.5)	0.9 (0.8–1.0)
	Simvastatin		433	0.5	0.4 (0.4–0.5)	0.3 (0.3–0.3)
	Angiotensin II antagonists, plain		2,135	2.5	2.2 (2.0–2.3)	1.4 (1.3–1.5)
	Irbesartan		713	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
	Telmisartan		613	0.7	0.6 (0.6–0.7)	0.4 (0.4–0.4)
	Candesartan		589	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
	ACE inhibitors, plain		1,881	2.2	1.9 (1.8–2.1)	1.2 (1.1–1.3)
	Perindopril		1,082	1.3	1.1 (1.0–1.2)	0.7 (0.6–0.8)
	Ramipril		542	0.6	0.5 (0.5–0.6)	0.4 (0.3–0.4)

(continued)

Table 9.1 (continued): Prescribed medications by ATC levels 1, 3 and 5

ATC Classification level			Number	Per cent of prescribed medications (<i>n</i> = 84,455) ^(a)	Rate per 100 encounters (95% CI) (<i>n</i> = 98,728)	Rate per 100 problems (95% CI) (<i>n</i> = 153,133)
1	3	5				
		Beta blocking agents	1,617	1.9	1.6 (1.5–1.8)	1.1 (1.0–1.1)
		Atenolol	659	0.8	0.7 (0.6–0.7)	0.4 (0.4–0.5)
		Metoprolol	505	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
		Angiotensin II antagonists, combinations	1,474	1.7	1.5 (1.4–1.6)	1.0 (0.9–1.0)
		Irbesartan and diuretics	445	0.5	0.5 (0.4–0.5)	0.3 (0.3–0.3)
		Selective calcium channel blockers with mainly vascular effects	1,138	1.3	1.2 (1.0–1.3)	0.7 (0.7–0.8)
		Amlodipine	527	0.6	0.5 (0.5–0.6)	0.3 (0.3–0.4)
		Lercanidipine	392	0.5	0.4 (0.3–0.5)	0.3 (0.2–0.3)
		High-ceiling diuretics	663	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
		Frusemide	654	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
		ACE inhibitors, combinations	635	0.8	0.6 (0.6–0.7)	0.4 (0.4–0.5)
		Anti-infective for systemic use	14,876	17.6	15.1 (14.5–15.6)	9.7 (9.3–10.1)
		Beta-lactam antibacterials, penicillins	5,964	7.1	6.0 (5.7–6.4)	3.9 (3.7–4.1)
		Amoxicillin	3,007	3.6	3.0 (2.8–3.3)	2.0 (1.8–2.1)
		Amoxicillin and enzyme inhibitor	2,052	2.4	2.1 (1.9–2.3)	1.3 (1.2–1.5)
		Flucloxacillin	394	0.5	0.4 (0.3–0.5)	0.3 (0.2–0.3)
		Other beta-lactam antibacterials	3,157	3.7	3.2 (3.0–3.4)	2.1 (1.9–2.2)
		Cephalexin	2,744	3.2	2.8 (2.6–2.8)	1.8 (1.7–1.9)
		Macrolides, lincosamides and streptogramins	1,990	2.4	2.0 (1.9–2.2)	1.3 (1.2–1.4)
		Roxithromycin	858	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
		Clarithromycin	525	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
		Tetracyclines	804	1.0	0.8 (0.7–0.9)	0.5 (0.5–0.6)
		Doxycycline	732	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)
		Sulfonamides and trimethoprim	672	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
		Trimethoprim	462	0.5	0.5 (0.4–0.5)	0.3 (0.3–0.3)
		Other antibacterials	491	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
		Viral vaccines	474	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
		Direct acting antivirals	431	0.5	0.4 (0.3–0.6)	0.3 (0.2–0.4)
		Alimentary tract and metabolism	8,956	10.6	9.1 (8.6–9.5)	5.8 (5.6–6.1)
		Drugs for peptic ulcer and gastro-oesophageal reflux	3,716	4.4	3.8 (3.6–4.0)	2.4 (2.3–2.5)
		Esomeprazole	1,749	2.1	1.8 (1.7–1.9)	1.1 (1.1–1.2)
		Pantoprazole	836	1.0	0.8 (0.8–0.9)	0.5 (0.5–0.6)
		Rabeprazole	428	0.5	0.4 (0.4–0.5)	0.3 (0.2–0.3)
		Blood glucose lowering drugs, excluding insulins	2,154	2.6	2.2 (2.0–2.4)	1.4 (1.3–1.5)
		Metformin	1,269	1.5	1.3 (1.2–1.4)	0.8 (0.7–0.9)
		Propulsives	579	0.7	0.6 (0.5–0.6)	0.4 (0.3–0.5)
		Metoclopramide	448	0.5	0.5 (0.4–0.5)	0.3 (0.3–0.3)

(continued)

Table 9.1 (continued): Prescribed medications by ATC levels 1, 3 and 5

ATC Classification level			Number	Per cent of prescribed medications (n = 84,455) ^(a)	Rate per 100 encounters (95% CI) (n = 98,728)	Rate per 100 problems (95% CI) (n = 153,133)
1	3	5				
		Insulins and analogues	556	0.7	0.6 (0.5–0.6)	0.4 (0.3–0.4)
		Drugs for constipation	444	0.5	0.4 (0.4–0.5)	0.3 (0.3–0.3)
		Respiratory system	4,988	5.9	5.1 (4.7–5.4)	3.3 (3.1–3.5)
		Adrenergics, inhalants	2,662	3.2	2.7 (2.5–2.9)	1.7 (1.6–1.9)
		Salbutamol	1,265	1.5	1.3 (1.2–1.4)	0.8 (0.8–0.9)
		Salmeterol and fluticasone	750	0.9	0.8 (0.7–0.8)	0.5 (0.4–0.5)
		Formoterol and budesonide	515	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
		Decongestants and other nasal preparations	850	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
		Other drugs for obstructive airway diseases, inhalants	811	1.0	0.8 (0.7–0.9)	0.5 (0.5–0.6)
		Musculoskeletal system	4,150	4.9	4.2 (4.0–4.4)	2.7 (2.6–2.9)
		Anti-inflammatory and antirheumatic products, non-steroid	2,981	3.5	3.0 (2.8–3.2)	1.9 (1.8–2.1)
		Meloxicam	893	1.1	0.9 (0.8–1.0)	0.6 (0.5–0.7)
		Diclofenac	582	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
		Celecoxib	552	0.7	0.6 (0.5–0.6)	0.4 (0.3–0.4)
		Drugs affecting bone structure and mineralization	468	0.6	0.5 (0.4–0.5)	0.3 (0.3–0.3)
		Antigout preparations	465	0.6	0.5 (0.4–0.5)	0.3 (0.3–0.3)
		Dermatologicals	3,759	4.5	3.8 (3.6–4.0)	2.5 (2.3–2.6)
		Corticosteroids, plain	2,198	2.6	2.2 (2.1–2.4)	1.4 (1.3–1.5)
		Betamethasone	740	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)
		Mometasone	604	0.7	0.6 (0.5–0.7)	0.4 (0.4–0.4)
		Genitourinary system and sex hormones	3,175	3.8	3.2 (3.0–3.4)	2.1 (2.0–2.2)
		Hormonal contraceptives for systemic use	1,312	1.6	1.3 (1.2–1.4)	0.9 (0.8–0.9)
		Estrogens	495	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
		Urologicals	458	0.5	0.5 (0.4–0.5)	0.3 (0.3–0.3)
		Blood and blood-forming organs	2,684	3.2	2.7 (2.5–2.9)	1.8 (1.6–1.9)
		Antithrombotic agents	2,043	2.4	2.1 (1.9–2.3)	1.3 (1.2–1.4)
		Warfarin	917	1.1	0.9 (0.8–1.0)	0.6 (0.5–0.7)
		Systemic hormonal preparations, excluding sex hormones	2,697	3.2	2.7 (2.6–2.9)	1.8 (1.7–1.9)
		Corticosteroids for systemic use, plain	1,548	1.8	1.6 (1.4–1.7)	1.0 (0.9–1.1)
		Prednisolone	1,001	1.2	1.0 (0.9–1.1)	0.7 (0.6–0.7)
		Thyroid preparations	873	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
		Levothyroxine sodium	856	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
		Sensory organs	2,125	2.5	2.2 (2.0–2.3)	1.4 (1.3–1.5)
		Anti-infectives ophthalmological	692	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
		Chloramphenicol ophthalmological	592	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
		Corticosteroids and anti-infective in combination otological	580	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)

(continued)

Table 9.1 (continued): Prescribed medications by ATC levels 1, 3 and 5

ATC Classification level			Number	Per cent of prescribed medications (<i>n</i> = 84,455) ^(a)	Rate per 100 encounters (95% CI) (<i>n</i> = 98,728)	Rate per 100 problems (95% CI) (<i>n</i> = 153,133)
1	3	5				
Antineoplastic and immunomodulating agents			430	0.5	0.4 (0.4–0.5)	0.3 (0.2–0.3)
Antiparasitic products, insecticides and repellent			215	0.3	0.2 (0.2–0.3)	0.1 (0.1–0.2)
Various			165	0.2	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Total prescribed medications			84,455	100.0	85.5 (83.1–88.0)	55.2 (53.8–56.5)

(a) Only those individual medications accounting for ≥ 0.5% of total prescribed medications are included in the table.

Note: ATC – Anatomical Therapeutic Chemical classification; CI – confidence interval; ACE – angiotensin-converting enzyme.

Most frequently prescribed medications

The most frequently prescribed individual medications are reported at the CAPS generic level (ATC level 5 equivalent) in Table 9.2. Together these 30 medications made up 42.9% of all prescribed medications.

Table 9.2: Most frequently prescribed medications

Generic medication	Number	Per cent of prescribed medications (<i>n</i> = 84,455)	Rate per 100 encounters (95% CI) (<i>n</i> = 98,728)	Rate per 100 problems (95% CI) (<i>n</i> = 153,133)
Amoxicillin	3,007	3.6	3.0 (2.8–3.3)	2.0 (1.8–2.1)
Cephalexin	2,744	3.2	2.8 (2.6–3.0)	1.8 (1.7–1.9)
Paracetamol [plain]	2,411	2.9	2.4 (2.2–2.7)	1.6 (1.4–1.7)
Amoxicillin/potassium clavulanate	2,052	2.4	2.1 (1.9–2.3)	1.3 (1.2–1.5)
Paracetamol/codeine	1,759	2.1	1.8 (1.6–1.9)	1.1 (1.1–1.2)
Esomeprazole	1,749	2.1	1.8 (1.7–1.9)	1.1 (1.1–1.2)
Oxycodone	1,637	1.9	1.7 (1.5–1.8)	1.1 (1.0–1.2)
Atorvastatin	1,352	1.6	1.4 (1.3–1.5)	0.9 (0.8–1.0)
Rosuvastatin	1,351	1.6	1.4 (1.2–1.5)	0.9 (0.8–1.0)
Salbutamol	1,269	1.5	1.3 (1.2–1.4)	0.8 (0.8–0.9)
Metformin	1,269	1.5	1.3 (1.2–1.4)	0.8 (0.7–0.9)
Diazepam	1,267	1.5	1.3 (1.1–1.4)	0.8 (0.7–0.9)
Perindopril	1,082	1.3	1.1 (1.0–1.2)	0.7 (0.6–0.8)
Temazepam	947	1.1	1.0 (0.9–1.1)	0.6 (0.6–0.7)
Warfarin sodium	917	1.1	0.9 (0.8–1.0)	0.6 (0.5–0.7)
Meloxicam	893	1.1	0.9 (0.8–1.0)	0.6 (0.5–0.7)
Tramadol	881	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
Roxithromycin	858	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
Thyroxine	856	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
Pantoprazole	836	1.0	0.8 (0.8–0.9)	0.5 (0.5–0.6)
Levonorgestrel/ethinylloestradiol	798	0.9	0.8 (0.7–0.9)	0.5 (0.5–0.6)
Fluticasone/salmeterol	750	0.9	0.8 (0.7–0.9)	0.5 (0.4–0.5)
Betamethasone topical	740	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)

(continued)

Table 9.2 (continued): Most frequently prescribed medications

Generic medication	Number	Per cent of prescribed medications (n = 84,455)	Rate per 100 encounters (95% CI) (n = 98,728)	Rate per 100 problems (95% CI) (n = 153,133)
Doxycycline	732	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)
Pregabalin	729	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)
Irbesartan	713	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
Prednisolone	679	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
Oxycodone/naloxone	659	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
Atenolol	659	0.8	0.7 (0.6–0.7)	0.4 (0.4–0.5)
Frusemide	654	0.8	0.7 (0.6–0.7)	0.4 (0.4–0.5)
<i>Subtotal</i>	36,250	42.9	—	—
Total prescribed medications	84,455	100.0	85.5 (83.1–88.0)	55.2 (53.8–56.5)

Note: CI – confidence interval.

9.3 Medications supplied by GPs

GPs supplied 7,923 medications in 2014–15, at a rate of 8.0 medications per 100 encounters, and 5.2 per 100 problems managed. At least one medication was supplied for 4.1% of all problems managed, and at 6.1% of encounters, an estimated 8.4 million encounters nationally. The most frequently supplied medications are listed in Table 9.3.

Table 9.3: Medications most frequently supplied by GPs

Generic medication	Number	Per cent of supplied medications (n = 7,923)	Rate per 100 encounters (95% CI) (n = 98,728)	Rate per 100 problems (95% CI) (n = 153,133)
Influenza virus vaccine	1,232	15.5	1.2 (1.0–1.5)	0.8 (0.7–0.9)
Pneumococcal vaccine	622	7.8	0.6 (0.5–0.7)	0.4 (0.4–0.5)
Vitamin B12 (cobalamin)	492	6.2	0.5 (0.4–0.6)	0.3 (0.3–0.4)
Diphtheria/pertussis/tetanus/hepatitis B/polio/ Haemophilus influenzae B vaccine	441	5.6	0.4 (0.4–0.5)	0.3 (0.3–0.3)
Rotavirus vaccine	379	4.8	0.4 (0.3–0.4)	0.2 (0.2–0.3)
Measles/mumps/rubella vaccine	336	4.2	0.3 (0.3–0.4)	0.2 (0.2–0.3)
Triple antigen (diphtheria/pertussis/tetanus)	191	2.4	0.2 (0.2–0.2)	0.1 (0.1–0.1)
Diphtheria/tetanus vaccine	144	1.8	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Haemophilus B/Meningococcus C vaccine	141	1.8	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Measles/mumps/rubella/varicella zoster vaccine	125	1.6	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Hepatitis B vaccine	117	1.5	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Denosumab	117	1.5	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Diphtheria/pertussis/tetanus/polio vaccine	114	1.4	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Hepatitis A vaccine	106	1.3	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Allergen treatment	104	1.3	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Typhoid vaccine (<i>Salmonella typhi</i>)	103	1.3	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Hepatitis A/typhoid (<i>Salmonella typhi</i>) vaccine	102	1.3	0.1 (0.1–0.1)	0.1 (0.0–0.1)

(continued)

Table 9.3 (continued): Medications most frequently supplied by GPs

Generic medication	Number	Per cent of supplied medications (n = 7,923)	Rate per 100 encounters (95% CI) (n = 98,728)	Rate per 100 problems (95% CI) (n = 153,133)
Medroxyprogesterone	85	1.1	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Celecoxib	72	0.9	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Salbutamol	61	0.8	0.1 (0.1–0.1)	0.0 (0.0–0.1)
Etonogestrel	60	0.8	0.1 (0.1–0.1)	0.0 (0.0–0.1)
Metoclopramide	57	0.7	0.1 (0.1–0.1)	0.0 (0.0–0.0)
Immunisation NEC	55	0.7	0.1 (0.1–0.1)	0.0 (0.0–0.0)
Testosterone	54	0.7	0.1 (0.1–0.1)	0.0 (0.0–0.0)
Meloxicam	52	0.7	0.1 (0.1–0.1)	0.0 (0.0–0.0)
Mometasone nasal	51	0.6	0.1 (0.1–0.1)	0.0 (0.0–0.0)
Steroid injection NEC	48	0.6	0.0 (0.0–0.1)	0.0 (0.0–0.0)
Betamethasone systemic	45	0.6	0.0 (0.0–0.1)	0.0 (0.0–0.0)
Meningitis vaccine	45	0.6	0.0 (0.0–0.1)	0.0 (0.0–0.0)
Pregabalin	43	0.5	0.0 (0.0–0.1)	0.0 (0.0–0.0)
<i>Subtotal</i>	<i>5,594</i>	<i>70.6</i>	—	—
Total supplied medications	7,923	100.0	8.0 (7.4–8.6)	5.2 (4.8–5.5)

Note: CI – confidence interval; NEC – not elsewhere classified.

9.4 Medications advised for over-the-counter purchase

The GPs recorded 9,398 medications as recommended for OTC purchase, at rates of 9.5 per 100 encounters and 6.1 per 100 problems managed. At least one OTC medication was advised at 8.3% of encounters, equivalent to an estimated 11.4 million encounters nationally where GPs recommended at least one OTC medication. At least one OTC medication was advised for 5.5% of problems (Table 8.2). Table 9.4 shows the top 30 advised medications at the CAPS generic level (ATC level 5 equivalent). Advised medications covered a wide range, and the most common was paracetamol, which accounted for 26.2% of these medications.

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

Generic medication	Number	Per cent of OTC medications (n = 9,398)	Rate per 100 encounters (95% CI) (n = 98,728)	Rate per 100 problems (95% CI) (n = 153,133)
Paracetamol [plain]	2,465	26.2	2.5 (2.2–2.8)	1.6 (1.4–1.8)
Ibuprofen	683	7.3	0.7 (0.6–0.8)	0.4 (0.4–0.5)
Sodium chloride topical nasal	226	2.4	0.2 (0.1–0.3)	0.1 (0.1–0.2)
Vitamin D3 (cholecalciferol)	205	2.2	0.2 (0.1–0.2)	0.1 (0.1–0.2)
Sodium/potassium/citric acid/glucose	184	2.0	0.2 (0.1–0.2)	0.1 (0.1–0.2)
Loratadine	176	1.9	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Diclofenac topical	158	1.7	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Fexofenadine	150	1.6	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Cetirizine	147	1.6	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Simple analgesics	144	1.5	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Saline bath/solution/gargle	134	1.4	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Hydrocortisone/clotrimazole	115	1.2	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Paracetamol/codeine	108	1.2	0.1 (0.1–0.2)	0.1 (0.0–0.1)
Cream/ointment/lotion NEC	96	1.0	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Clotrimazole vaginal	91	1.0	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Clotrimazole topical	89	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Hyoscine butylbromide	87	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Multivitamins with minerals	87	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Docusate otic	84	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Ferrous sulfate/sodium ascorbate	82	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Vitamin D NEC	81	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Bromhexine	77	0.8	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Sodium chloride/potassium chloride/sodium bicarbonate	77	0.8	0.1 (0.1–0.1)	0.0 (0.0–0.1)
Hydrocortisone topical	72	0.8	0.1 (0.1–0.1)	0.0 (0.0–0.1)
Mometasone nasal	66	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Loperamide	63	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Aspirin cardiovascular	62	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Cold and flu medication NEC	62	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Fish oil	60	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Cinchocaine/hydrocortisone topical rectal	56	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.0)
<i>Subtotal</i>	<i>6,186</i>	<i>65.8</i>	<i>—</i>	<i>—</i>
Total advised medications	9,398	100.0	9.5 (8.8–10.2)	6.1 (5.7–6.6)

Note: OTC – over-the-counter; CI – confidence interval; NEC – not elsewhere classified.

9.5 Changes in medications over the decade 2005–06 to 2014–15

Data on medications are reported for each year from 2005–06 to 2014–15 in Chapter 9 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ In that report, changes over time are measured as change in the management of problems (that is, as a rate per 100 problems). This reflects change in how GPs are managing problems, and takes into account the significant increase in the number of problems managed per encounter over the decade to 2014–15.

The rate at which medications were prescribed decreased significantly from 2005–06 (58.7 per 100 problems, 95% CI: 57.2–60.3) to 2014–15 (55.2 per 100 problems, 95% CI: 53.8–56.5). Among the prescribed drug groups that decreased significantly were antibacterials for systemic use, systemic anti-inflammatory medications and sex hormones. At the same time, prescribing rates of several drug groups increased significantly, including psychoanaleptics, digestive drugs for acid-related disorders and antiepileptic drugs.

At the individual generic level, significant increases were found in the prescribing rates of a number of medications. Among them were esomeprazole, oxycodone, rosuvastatin, pantoprazole, and pregabalin. On the other hand, amoxicillin, plain paracetamol and paracetamol/codeine combination products, atorvastatin and roxithromycin were among the medications for which significant decreases in prescribing rates occurred over time.

Other changes that occurred over the 10-year period were a significant decrease in GP-supplied medications, in particular the influenza virus vaccine after peaks in previous years. There were increases in the supply of vitamin B12 and a number of combination childhood vaccines. Among medications advised for over-the-counter purchase, there was a significant rise in vitamin D3 but overall the rate of OTC medications did not change. There was a steady rise in the proportion of prescriptions for which five repeats were recorded, and a corresponding decrease in those for which one repeat was recorded.

10 Other treatments

The BEACH survey form allows GPs to record up to two other (non-pharmacological) treatments for each problem managed at the encounter, and to indicate if each of these was done by a practice nurse (PN) or Aboriginal health worker (AHW). Other treatments include all clinical and procedural treatments provided. These groups are defined in Appendix 4, Tables A4.4 and A4.5.

Routine clinical measurements or observations, such as measurements of blood pressure and physical examinations, were not recorded if they were undertaken by the GP. However GPs were instructed to record clinical measurements or observations if these were undertaken by a PN or AHW in conjunction with the GP at the encounter.

In Sections 10.1–10.3 inclusive, ‘other treatments’ have been counted irrespective of whether they were done by the GP or by the PN/AHW. That is, the non-pharmacological management provided at general practice patient encounters is described, rather than management provided specifically by the GP. In the analysis of procedural treatments, injections given in the provision of vaccines were removed, as this action has already been counted and reported in Section 9.3.

In Section 10.4, treatments provided by the PN/AHW (including injections given for vaccination) are reported separately to provide a picture of the work they undertake in association with GP–patient encounters.

Data on other treatments are reported for each year from 2005–06 to 2014–15 in the 10-year report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

10.1 Number of other treatments

In 2014–15, 50,204 other treatments were recorded, at a rate of 50.9 per 100 encounters. Two-thirds (66.6%) of these were clinical treatments. At least one other treatment was provided at 39.4% of all encounters, and for 29.4% of all problems managed. For every 100 problems managed, 22 clinical treatments and 11 procedures were performed by a GP or PN/AHW (Table 10.1).

Table 10.1: Summary of other treatments

Variable	Number	Rate per 100 encounters (<i>n</i> = 98,728)	95% LCL	95% UCL	Rate per 100 problems (<i>n</i> = 153,133)	95% LCL	95% UCL
At least one other treatment	38,908	39.4	37.8	41.0	—	—	—
Other treatments	50,204	50.9	48.4	53.3	32.8	31.3	34.2
Clinical treatments	33,443	33.9	31.8	36.0	21.8	20.6	23.1
Procedural treatments ^(a)	16,761	17.0	16.2	17.8	10.9	10.5	11.4

(a) Excludes all local injection/infiltrations performed for immunisations/vaccinations (*n* = 2,573).

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

Table 10.2 shows the relationship between other treatments and pharmacological treatments given for problems managed.

- For 63.3% of the problems that were managed with an ‘other treatment’, no medication was prescribed, supplied or advised for that problem at that encounter.
- Around 1 in 5 problems (19.9%) were managed with at least one clinical treatment. For 62.6% of these problems, no concurrent pharmacological treatment was provided.
- About 1 in 10 problems (10.3%) were managed with at least one procedural treatment, with no pharmacological management given for 64.0% of these problems.

Table 10.2: Relationship between other treatments and pharmacological treatments

Co-management of problems with other treatments	Number of problems	Per cent within class	Per cent of problems (n = 153,133)	95% LCL	95% UCL
At least one other treatment	45,089	100.0	29.4	28.2	30.6
Without pharmacological treatment	28,551	63.3	18.6	17.9	19.4
At least one clinical treatment	30,484	100.0	19.9	18.8	21.0
Without pharmacological treatment	19,072	62.6	12.5	11.8	13.1
At least one procedural treatment	15,840	100.0	10.3	9.9	10.8
Without pharmacological treatment	10,137	64.0	6.6	6.3	6.9

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

10.2 Clinical treatments

Clinical treatments include general and specific advice, counselling or education, and administrative processes. During 2014–15, there were 33,443 clinical treatments recorded, at a rate of 33.9 per 100 encounters, and 21.8 per 100 problems managed (Table 10.1).

Most frequent clinical treatments

Table 10.3 lists the 20 most common clinical treatments provided. Each clinical treatment is expressed as a percentage of all clinical treatments, as a rate per 100 encounters and as a rate per 100 problems managed, with 95% confidence limits.

The top 10 most frequently provided clinical treatments accounted for 84.8% of all clinical treatments. General advice and education was the most frequently recorded (6.1 per 100 encounters), accounting for 18.1% of all clinical treatments, followed by counselling about the problem under management (4.2 per 100 encounters).

Several groups of clinical treatments related to preventive activities. The most common was counselling and advice about nutrition and weight (3.0 per 100 encounters), followed by counselling and advice for lifestyle, exercise, smoking, alcohol and prevention. Together, these preventive treatments accounted for 17.9% of clinical treatments, provided at a rate of 6.1 per 100 encounters.

Table 10.3: Most frequent clinical treatments

Clinical treatment	Number	Per cent of clinical treatments (n = 33,443)	Rate per 100 encounters (n = 98,728)			Rate per 100 problems (n = 153,133)		
			95% LCL	95% UCL	95% LCL	95% UCL	95% LCL	95% UCL
Advice/education NEC*	6,037	18.1	6.1	5.3	6.9	3.9	3.4	4.5
Counselling – problem*	4,127	12.3	4.2	3.6	4.8	2.7	2.3	3.1
Advice/education – treatment*	3,284	9.8	3.3	2.9	3.7	2.1	1.9	2.4
Counselling – psychological*	3,020	9.0	3.1	2.8	3.3	2.0	1.8	2.1
Counselling/advice – nutrition/weight*	2,977	8.9	3.0	2.7	3.4	1.9	1.7	2.2
Advice/education – medication*	2,801	8.4	2.8	2.6	3.1	1.8	1.7	2.0
Other administrative procedure/document (excluding sickness certificate)*	2,260	6.8	2.3	2.1	2.5	1.5	1.4	1.6
Sickness certificate*	1,549	4.6	1.6	1.3	1.8	1.0	0.9	1.2
Reassurance, support*	1,428	4.3	1.4	1.2	1.7	0.9	0.8	1.1
Counselling/advice – lifestyle*	862	2.6	0.9	0.7	1.0	0.6	0.5	0.7
Counselling/advice – exercise*	830	2.5	0.8	0.7	1.0	0.5	0.5	0.6
Counselling/advice – smoking*	610	1.8	0.6	0.5	0.7	0.4	0.3	0.5
Counselling/advice – alcohol*	374	1.1	0.4	0.3	0.4	0.2	0.2	0.3
Counselling/advice – health/body*	355	1.1	0.4	0.3	0.4	0.2	0.2	0.3
Observe/wait*	353	1.1	0.4	0.3	0.4	0.2	0.2	0.3
Counselling/advice – prevention*	344	1.0	0.3	0.3	0.4	0.2	0.2	0.3
Counselling/advice – other*	289	0.9	0.3	0.2	0.4	0.2	0.1	0.2
Family planning*	283	0.8	0.3	0.2	0.3	0.2	0.2	0.2
Consultation with primary care provider*	269	0.8	0.3	0.2	0.3	0.2	0.1	0.2
Counselling/advice – pregnancy*	243	0.7	0.2	0.2	0.3	0.2	0.1	0.2
<i>Subtotal</i>	32,296	96.6	—	—	—	—	—	—
Total clinical treatments	33,443	100.0	33.9	31.8	36.0	21.8	20.6	23.1

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.4 <hdl.handle.net/2123/13765>).

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

Problems managed with a clinical treatment

Table 10.4 lists the top 10 problems managed with a clinical treatment. It also shows the extent to which clinical treatments were used for each problem, and the relationship between the use of a clinical treatment and the provision of medication for that problem at that encounter.

- A total of 30,484 problems (19.9% of all problems) involved one or more clinical treatments in their management (Table 10.2).
- There was a very broad range of problems managed with clinical treatments. However, the 10 most common accounted for 30% of all problems for which clinical treatments were provided.
- Upper respiratory tract infection (URTI) represented the largest proportion of problems managed with a clinical treatment (5.9%), followed by depression (5.4%).
- URTI was managed with a clinical treatment at a rate of 1.8 per 100 encounters. This means that for every 100 GP–patient encounters in 2014–15, URTI was managed with at least one clinical treatment on about two occasions. Extrapolation of this result suggests that across Australia in 2014–15, there were 2.5 million occasions where URTI was managed with a clinical treatment.

- A clinical treatment was provided at 31.5% of contacts with URTI, with no concurrent pharmacological treatment provided for 60.8% of these contacts where a clinical treatment was provided.
- Of the top 10 problems, acute stress reaction was the problem most likely to be managed with a clinical treatment (at 68.8% of contacts). Of the contacts with acute stress reaction where a clinical treatment was provided, 88.8% did not result in concurrent medication prescribed, supplied or advised for that problem.

Table 10.4: The 10 most common problems managed with a clinical treatment

Problem managed	Number ^(a)	Per cent of problems with clinical treatment (n = 30,484)	Rate per 100 encounters ^(b) (n = 98,728)			Per cent of this problem ^(c)	Per cent of treated problems no medications ^(d)
			95% LCL	95% UCL			
Upper respiratory tract infection	1,804	5.9	1.8	1.6	2.1	31.5	60.8
Depression*	1,653	5.4	1.7	1.5	1.8	37.5	47.5
Diabetes – all*	998	3.3	1.0	0.9	1.1	25.2	65.3
Anxiety*	901	3.0	0.9	0.8	1.0	40.6	65.7
Hypertension*	861	2.8	0.9	0.7	1.0	11.1	46.3
Lipid disorder	694	2.3	0.7	0.6	0.8	23.5	67.0
Gastroenteritis*	602	2.0	0.6	0.5	0.7	46.9	55.8
Back complaint*	584	1.9	0.6	0.5	0.7	17.7	51.8
Acute stress reaction	476	1.6	0.5	0.4	0.5	68.8	88.8
Test results*	472	1.5	0.5	0.4	0.6	21.9	94.4
<i>Subtotal</i>	<i>9,045</i>	<i>29.7</i>	—	—	—	—	—
Total problems with clinical treatments	30,484	100.0	30.9	29	32.7	—	—

(a) Number of contacts with this problem that generated at least one clinical treatment.

(b) Rate at which a selected problem was managed with one or more clinical treatments, per 100 encounters.

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

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

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <hdl.handle.net/2123/13765>).

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

10.3 Procedural treatments

Procedural treatments include therapeutic actions and diagnostic procedures undertaken at the encounter. Injections for immunisations/vaccinations (n = 2,573) are not counted here as these were already counted as a GP-supplied medication in Section 9.3. There were 16,761 procedures recorded at a rate of 17.0 per 100 encounters, and 10.9 per 100 problems managed (Table 10.1).

Most frequent procedures

Table 10.5 lists the most common procedural treatments recorded. Each procedural treatment is expressed as a percentage of all procedures, as a rate per 100 encounters and as a rate per 100 problems, with 95% confidence limits. Some of the procedures (for example, international normalised ratio [INR] tests, electrical tracings, physical function tests) are investigations undertaken at the encounter. Results presented in Table 10.5 do not include investigations that were ordered by the GP to be performed by an external provider. A summary of all investigations (both undertaken and ordered) is provided in Chapter 12 (Table 12.6).

The top 10 most frequently performed procedural treatments accounted for 82.5% of all procedures. The most frequent group of procedures was excision/removal tissue/biopsy/destruction/debridement/cauterisation (3.0 per 100 encounters), accounting for 17.6% of procedural treatments recorded.

Table 10.5: Most frequent procedural treatments

Procedural treatment	Number	Per cent of procedural treatments (n = 16,761)	Rate per 100 encounters (n = 98,728)			Rate per 100 problems (n = 153,133)		
			95% LCL	95% UCL	95% LCL	95% UCL		
Excision/removal tissue/biopsy/destruction/debridement/cauterisation*	2,942	17.6	3.0	2.7	3.2	1.9	1.7	2.1
Dressing/pressure/compression/tamponade*	2,421	14.4	2.5	2.3	2.6	1.6	1.5	1.7
Local injection/infiltration ^(a)	2,320	13.8	2.3	2.2	2.5	1.5	1.4	1.6
Physical medicine/rehabilitation – all*	1,215	7.3	1.2	1.1	1.4	0.8	0.7	0.9
Incision/drainage/flushing/aspiration/removal body fluid*	1,072	6.4	1.1	1.0	1.2	0.7	0.6	0.8
Pap smear*	848	5.1	0.9	0.8	1.0	0.6	0.5	0.6
Repair/fixation – suture/cast/prosthetic device (apply/remove)*	818	4.9	0.8	0.7	0.9	0.5	0.5	0.6
Other therapeutic procedures/minor surgery*	818	4.9	0.8	0.6	1.0	0.5	0.4	0.7
INR test*	722	4.3	0.7	0.6	0.9	0.5	0.4	0.5
Check-up – PN/AHW*	656	3.9	0.7	0.5	0.8	0.4	0.3	0.5
Electrical tracings*	651	3.9	0.7	0.6	0.7	0.4	0.4	0.5
Other preventive procedures/high-risk medication*	646	3.9	0.7	0.6	0.7	0.4	0.4	0.5
Physical function test*	479	2.9	0.5	0.4	0.6	0.3	0.3	0.4
Other diagnostic procedures*	308	1.8	0.3	0.2	0.4	0.2	0.2	0.2
Urine test*	208	1.2	0.2	0.2	0.3	0.1	0.1	0.2
Hormone implant*	162	1.0	0.2	0.1	0.2	0.1	0.1	0.1
Glucose test*	156	0.9	0.2	0.1	0.2	0.1	0.1	0.1
Pregnancy test*	129	0.8	0.1	0.1	0.2	0.1	0.1	0.1
<i>Subtotal</i>	<i>16,572</i>	<i>98.9</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>—</i>
Total procedural treatments	16,761	100.0	17.0	16.2	17.8	10.9	10.5	11.4

(a) Excludes all local injection/infiltrations performed for immunisations/vaccinations (n = 2,573).

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Tables A4.5 and A4.6, <hdl.handle.net/2123/13765>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; INR – international normalised ratio; PN – practice nurse; AHW – Aboriginal health worker.

Problems managed with a procedural treatment

Table 10.6 lists the top 10 problems managed with a procedural treatment. It also shows the proportion of contacts with each problem that were managed with a procedure, and the proportion of these contacts where medication was not given concurrently.

- One or more procedural treatments were provided in the management of 15,840 problems (10.3% of all problems) (Table 10.2).
- The top 10 problems accounted for more than one-third (35.4%) of all problems managed with a procedural treatment.
- Solar keratosis/sunburn accounted for the largest proportion of problems managed with a procedure (5.3%), followed by laceration/cut (5.1%).
- Solar keratosis/sunburn was managed with a procedure at 68.1% of contacts with this problem, at a rate of 0.8 per 100 encounters. Extrapolation of this result suggests that across Australia in 2014–15, there were about 1.1 million occasions where solar keratosis/sunburn was managed with a procedure.
- Of the top 10 problems, laceration/cut was the problem most likely to be managed with a procedure, undertaken at 4 out of 5 (79.7%) contacts with this problem. Of those contacts where laceration/cut was managed with a procedural treatment, no medication was prescribed, supplied or advised for that problem at 80.4% of contacts.

Table 10.6: The 10 most common problems managed with a procedural treatment

Problem managed	Number ^(a)	Per cent of problems with procedure (<i>n</i> = 15,840)	Rate per 100 encounters ^(b) (<i>n</i> = 98,728)	95% LCL	95% UCL	Per cent of this problem ^(c)	Per cent of treated problems no medications ^(d)
Solar keratosis/sunburn	835	5.3	0.8	0.7	1.0	68.1	96.9
Laceration/cut	812	5.1	0.8	0.7	0.9	79.7	80.4
Female genital check-up/ Pap smear*	709	4.5	0.7	0.6	0.8	46.4	97.0
Excessive ear wax	577	3.6	0.6	0.5	0.6	70.6	92.8
Malignant neoplasm, skin	565	3.6	0.6	0.5	0.7	47.1	96.0
General check-up*	503	3.2	0.5	0.4	0.6	16.8	73.6
Warts	438	2.8	0.4	0.4	0.5	77.9	94.3
Chronic ulcer skin (including varicose ulcer)	415	2.6	0.4	0.4	0.5	71.5	76.5
Atrial fibrillation/flutter	403	2.5	0.4	0.3	0.5	31.7	64.9
Vitamin/nutritional deficiency	349	2.2	0.4	0.3	0.4	26.1	0.2
<i>Subtotal</i>	<i>5,607</i>	<i>35.4</i>	—	—	—	—	—
Total problems with procedural treatments	15,840	100.0	16.0	15.3	16.8	—	—

(a) Number of contacts with this problem that generated at least one procedural treatment.

(b) Rate at which a selected problem was managed with one or more procedural treatments, per 100 encounters.

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

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

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <hdl.handle.net/2123/13765>).

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

10.4 Practice nurse/Aboriginal health worker activity

This section describes the activities of practice nurses (PNs) and Aboriginal health workers (AHWs) recorded in association with the GP–patient encounters detailed by the BEACH GP participants.

The survey form allows GPs to record up to two other treatments for each problem managed at the encounter (up to eight per encounter). Other treatments include all clinical and procedural treatments provided at the encounters. These groups are defined in Appendix 4, Tables A4.4 and A4.5.

As a result of the introduction of new item numbers in the MBS that allowed GPs to claim for specific PN clinical activities⁶⁸, the BEACH recording form was amended in 2005–06 to allow GPs to record information about the actions PNs undertook in association with the GP–patient encounter. In the ‘other treatments’ section for each problem managed, GPs were asked to tick the ‘practice nurse’ box if the treatment recorded was provided by the PN rather than by the GP. If the box was not ticked it was assumed the GP gave the treatment.

Over time, new PN item numbers were added to the MBS, and some items were broadened, to cover work done by AHWs. In January 2012, the Australian Government significantly altered the payment structure for PN and AHW activities in general practice, such that the range of claimable MBS item numbers was reduced and the Practice Nurse Incentive Program (PNIP) introduced.

The following section investigates: the proportion of encounters involving PNs/AHWs; the proportion of these claimable with a Medicare item number; treatments provided by PNs/AHWs in association with the GP–patient encounters; and the problems for which these treatments were provided.

Remember that these results will not include PN/AHW activities undertaken during the GP’s BEACH recording period that were not associated with the recorded encounter. Such activities could include Medicare-claimable activities (for example, chronic disease management) provided under instruction from the GP but not at the time of the encounter recorded in BEACH, or provision of other services not claimable from Medicare.

Practice nurse/Aboriginal health worker Medicare claims

There were 7,075 GP–patient encounters (7.2% of all encounters) at which at least one PN/AHW activity was recorded. However, for 58 of these, their activity was not described. At the remaining encounters, a PN/AHW was involved in the management of 7,324 problems (4.8% of all problems managed at all encounters) (Table 10.7). Extrapolation of these results suggests that during 2014–15 practice nurses were involved in about 9.9 million GP–patient consultations across Australia.

A PN/AHW Medicare item was recorded at only 270 encounters, or 3.8% of the 7,075 encounters involving a PN/AHW (Table 10.7).

Table 10.7: Summary of PN or AHW involvement at encounters

Variable	Number
Total encounters	98,728
Encounters involving PN/AHW	7,075
Encounters at which PN/AHW activity described	7,018
Encounters with PN/AHW item number(s) recorded but activity not described	58
Encounters at which one or more MBS PN/AHW item numbers were recorded as claimable	270
Total problems managed	153,133
Problems managed with PN/AHW-involvement	7,324
	Per cent (95% CI)
Encounters involving the PN/AHW as a proportion of total encounters	7.2 (6.6–7.7)
PN/AHW-claimable encounters as a proportion of total encounters	0.3 (0.2–0.4)
Proportion of PN/AHW-involved encounters for which one or more PN/AHW item numbers were claimed from Medicare	3.8 (2.7–5.0)
Problems involving the PN/AHW as a proportion of total problems (95% CI)	4.8 (4.4–5.2)

Note: PN/AHW – practice nurse/Aboriginal health worker; MBS – Medicare Benefits Schedule; CI – confidence interval.

Treatments provided by practice nurses or Aboriginal health workers at GP–patient encounters

As shown in Section 10.1, GPs reported 50,204 other treatments. A further 1,289 local injections in administration of vaccine were given by a PN/AHW and 1,283 by the recording GP (these were not reported in Section 10.2). Of the 52,776 other treatments recorded, PN/AHWs accounted for 7,797 of these, representing 14.8% of all other treatments recorded (Table 10.8), at a rate of 7.9 per 100 recorded encounters (result not tabled).

The vast majority (87.6%) of the PN/AHW recorded activity was procedural, and these procedures represented 35.3% of all procedures recorded. In contrast, clinical treatments accounted for 12.4% of PN/AHW recorded activity at encounters, but PN/AHWs provided only 2.9% of all recorded clinical treatments. PN/AHWs did 50.1% of the recorded immunisation injections at GP–patient encounters (Table 10.8).

Table 10.8: Summary of treatments given by GPs, and by PN or AHW at GP–patient encounters

Treatment	Performed/assisted by PN/AHW		Performed by the GP		Total number recorded ^(a)
	Number	Row per cent of total	Number	Row per cent of total	
Procedures ^(a)	6,829	35.3	12,505	64.7	19,333
(Immunisation injections)	(1,289)	(50.1)	(1,283)	(49.9)	(2,573)
Clinical treatments	968	2.9	32,475	97.1	33,443
All other treatments	7,797	14.8	44,979	85.2	52,776

(a) Procedural treatments here include all injections given by a PN/AHW or the GP for immunisations/vaccinations ($n = 2,573$). These are not included in the summary of the content of encounter in Table 5.1, summary of management in Table 8.1 or in the analyses of other treatments in Chapter 10, because the immunisation/vaccination is already counted as a prescription or GP-supplied medication.

Note: PN/AHW – practice nurse/Aboriginal health worker; columns and rows may not add to total due to rounding.

Of the 6,829 procedures performed by a PN/AHW, 2,170 (31.8%) were injections (Table 10.9), of which 1,289 (59.4%) were for immunisations (Table 10.8). A further 20.3% of the recorded procedures were dressing/pressure/compression/tamponade. Together, these accounted for more than half (52.1%) of all procedures undertaken by PNs/AHWs. Check-ups made up 9.6%, followed by INR tests (7.4%) (Table 10.9).

Other administrative procedure (including administrative/documentation work but excluding provision of sickness certificates) was the most frequently recorded clinical activity, accounting for 33.8% of the 968 clinical treatments provided by PNs/AHWs, followed by advice/education (not elsewhere classified) (9.6%), advice/education about treatment (9.4%), counselling about a health problem (7.9%), counselling/advice about nutrition/weight (7.5%), and advice/education about medication (5.4%) (Table 10.9).

Table 10.9: Most frequent activities done by a PN or AHW at GP encounters

Activity	Number	Per cent of group ^(a)	Rate per 100 encs where PN/AHW activity described ^(a) (n = 7,018)	95% LCL	95% UCL
Procedural treatments	6,829	100.0	97.3	95.2	99.5
Local injection/infiltration*	2,170	31.8	30.9	28.4	33.4
Dressing/pressure/compression/tamponade*	1,385	20.3	19.7	17.9	21.6
Check-up – PN/AHW*	653	9.6	9.3	7.0	11.6
INR test*	508	7.4	7.2	6.1	8.4
Incision/drainage/flushing/aspiration/removal body fluid*	412	6.0	5.9	4.9	6.8
Electrical tracings*	364	5.3	5.2	4.4	6.0
Excision/removal tissue/biopsy/destruction/debridement/cauterisation*	335	4.9	4.8	3.7	5.8
Repair/fixation – suture/cast/prosthetic device(apply/remove)*	327	4.8	4.7	4.0	5.3
Physical function test*	209	3.1	3.0	2.2	3.7
Other therapeutic procedures/minor surgery*	92	1.4	1.3	0.9	1.7
Urine test*	87	1.3	1.2	0.9	1.6
Other diagnostic procedures*	73	1.1	1.0	0.7	1.4
Glucose test*	57	0.8	0.8	0.5	1.2
Pap smear*	39	0.6	0.6	0.3	0.8
Clinical treatments	968	100.0	13.8	11.8	15.8
Other administrative procedure/document (excluding sickness certificate)*	327	33.8	4.7	3.7	5.6
Advice/education NEC*	93	9.6	1.3	0.8	1.9
Advice/education – treatment*	91	9.4	1.3	0.9	1.7
Counselling – problem*	76	7.9	1.1	0.6	1.6
Counselling/advice – nutrition/weight*	73	7.5	1.0	0.4	1.7
Advice/education – medication*	52	5.4	0.7	0.4	1.0
Consultation with primary care provider*	46	4.8	0.7	0.4	0.9

(a) Only the most common individual treatments provided by practice nurses/Aboriginal health workers are included in this table.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Tables A4.4–A4.6 <hdl.handle.net/2123/13765>).

Note: Encs – encounters; PN/AHW – practice nurse/Aboriginal health worker; LCL – lower confidence limit; UCL – upper confidence limit; INR – international normalised ratio; NEC – not elsewhere classified.

Problems managed with practice nurse or Aboriginal health workers involvement at encounter

PNs and AHWs were involved in the management of a wide range of problems in association with GP–patient encounters. The problems they managed most often were immunisation/vaccination (18.1% of all problems managed with the involvement of a PN or AHW), check-ups (6.9%), laceration/cut (6.7%), diabetes (4.4%), chronic skin ulcer (4.2%), and atrial fibrillation (3.7%). Other common problems for which PNs/AHWs were involved are listed in Table 10.10. These top 20 problems accounted for two-thirds (65.9%) of all encounters which involved a PN/AHW.

Table 10.10: The 20 most common problems managed with involvement of PNs or AHWs at GP–patient encounters

Problem managed	Number	Per cent of problems involving PN/AHW (n = 7,324)	Rate per 100 encounters with recorded PN/AHW activity ^(a) (n = 7,018)	95% LCL	95% UCL
Immunisation/vaccination – all*	1,322	18.1	18.8	16.8	20.9
Check-up – all*	508	6.9	7.2	6.3	8.2
Laceration/cut	494	6.7	7.0	6.1	8.0
Diabetes – all*	320	4.4	4.6	3.7	5.4
Chronic ulcer skin (including varicose ulcer)	309	4.2	4.4	3.7	5.1
Atrial fibrillation/flutter	268	3.7	3.8	3.0	4.6
Excessive ear wax	236	3.2	3.4	2.8	3.9
Malignant neoplasm, skin	199	2.7	2.8	2.1	3.5
Vitamin/nutritional deficiency	156	2.1	2.2	1.7	2.7
Administrative procedure – all*	118	1.6	1.7	1.1	2.3
Asthma	110	1.5	1.6	1.2	1.9
Repair/fixation – suture/cast/prosthetic device (apply/remove)*	109	1.5	1.6	1.2	1.9
Hypertension*	108	1.5	1.5	1.1	2.0
Skin infection, other	100	1.4	1.4	1.0	1.8
Blood test – all*	94	1.3	1.3	0.8	1.9
Prescription – all*	84	1.2	1.2	0.7	1.7
Skin symptom/complaint, other	79	1.1	1.1	0.8	1.5
Other preventive procedures/high risk medication*	73	1.0	1.0	0.7	1.4
Excision/removal tissue/biopsy/destruction/debridement/cauterisation*	72	1.0	1.0	0.6	1.4
Contraception female, other	71	1.0	1.0	0.7	1.3
<i>Subtotal</i>	4,830	65.9	—	—	—
Total problems involving practice nurse	7,324	100.0	104.4	103.6	105.1

(a) Rate at which a PN/AHW provided a treatment in the management of the selected problem (as a rate per 100 PN/AHW encounters).

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, A4.3 <hdl.handle.net/2123/13765>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; PN/AHW – practice nurse/Aboriginal health worker.

10.5 Changes in other treatments over the decade 2005–06 to 2014–15

An overview of changes in other treatments provided in general practice over the decade can be found in Chapter 10 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ A summary of the results is provided below.

Clinical treatments

Between 2006–07 and 2007–08, there was a significant increase in the rate at which clinical treatments were provided by the GP or the PN/AHW at GP–patient encounters, from 19.9 to 22.9 per 100 problems managed. The rate then remained relatively steady, but in 2014–15 clinical treatments were provided at a rate that did not significantly differ from that of 10 years earlier, at a rate of 21.8 clinical treatments per 100 problems.

Although there was no significant change over the decade in the rate at which clinical treatments were provided per 100 problems, there was a significant increase in the rate per 100 encounters, from 29.3 per 100 encounters in 2005–06 to 33.9 per 100 in 2014–15. This was due to the increased number of problems managed per encounter over the decade. There was also a massive increase in the number of encounters claimed through Medicare due to the increased visit rate. The combination of increased number of problems managed at encounters and the increased attendance rate over the study period affects the number of clinical treatments provided nationally. We estimate that as a result, 16.9 million more clinical treatments were provided at GP–patient encounters nationally in 2014–15 than in 2005–06.

There was a significant increase in the likelihood that one or more clinical treatments were provided in the management of an individual problem, from 26.7 problems for every 100 GP–patient encounters in 2005–06 to 30.9 per 100 in 2014–15.

Procedural treatments

There was a significant increase in the rate at which procedures were performed from 9.8 per 100 problems in 2005–06 to 10.9 per 100 in 2014–15. The extrapolated effect of this change, from 14.4 procedures per 100 encounters in 2005–06 to 17.0 per 100 in 2014–15, is that nationally in 2014–15, there were an estimated 8.8 million more procedures undertaken at GP–patient encounters than a decade earlier.

For every 100 GP–patient encounters in 2005–06, one or more procedures were used in the management of 13.5 problems. The rate significantly increased over time, reaching 16.0 problems per 100 encounters in 2014–15. This increase was reflected in significant increases in the rate at which one or more procedures were undertaken for the management of general check-up and atrial fibrillation/flutter.

Practice nurse/Aboriginal health worker activity

Section 10.5 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*,¹ provides an overview of changes in general practice encounters over the past decade. The major changes between 2005–06 and 2014–15 are summarised below.

Encounters involving a PN/AHW as a proportion of all encounters more than doubled from 4.2% in 2005–06 to peak at 9.0% in 2009–10. Since then, PN/AHW involvement in GP–patient encounters has significantly decreased, with only 7.2% of encounters in 2014–15 involving a PN/AHW.

Similarly, the proportion of problems managed with PN/AHW involvement at GP–patient encounters increased significantly from 2.8% in 2005–06 to 6.1% in 2009–10, and then gradually decreased to reach a significant change by 2014–15 at 4.8%.

In 2005–06, GPs recorded one or more PN/AHW MBS item numbers at 39.2% of encounters with recorded PN/AHW activity. By 2009–10, this proportion had risen to 45.5%. In 2011–12, which included 3 months of the new 2012 PNIP, GPs recorded a PN/AHW item at only 27.4% of encounters involving a PN/AHW.

In 2014–15, PN/AHW activities were claimable from Medicare at only 3.8% of encounters with which they were associated. When this result is considered in terms of the total GP–patient encounters recorded in BEACH, a PN/AHW Medicare item number was claimable at 4.1% of all GP encounters in 2009–10 but only 0.3% in 2014–15.

Clearly, PN/AHW involvement with patient care in association with GP–patient consultations is decreasing. While it is likely that PNs/AHWs are increasingly working with patients independent of GP–patient encounters, this is not measured in the BEACH program.

The rate at which procedures (including injections and tests) were undertaken by PNs/AHWs in association with the recorded GP–patient encounters more than doubled from 4.0 per 100 encounters in 2005–06 to 9.2 per 100 in 2009–10. The rate then decreased in 2011–12 to 7.2 per 100 encounters, with no further significant change in the ensuing years.

While their provision of clinical treatments (such as advice and health education) remained infrequent at GP–patient encounters, there was a steady increase over the study period, from 0.2 clinical treatments per 100 encounters in 2005–06 to 1.1 per 100 in 2012–13 and then remaining steady through to 2014–15.

Changes in the problems for which PNs/AHWs were involved in management largely reflect the changes in the activities undertaken. Their assistance in management of immunisation/vaccination at GP encounters significantly decreased from 30.9 per 100 PN/AHW involved encounters in 2005–06 to 18.8 per 100 in 2014–15. This parallels the overall decrease in the management rate of immunisations/vaccinations in the total data set in 2014–15, perhaps reflecting the delay in availability of influenza vaccines in 2015. There were significant increases in the rate at which PNs/AHWs were involved in the management of check-ups, diabetes, atrial fibrillation/flutter, and vitamin/nutritional deficiency.

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. GPs were instructed only to record new referrals at the encounter (that is, to not record continuations). For each encounter, GPs could record up to two referrals, and each referral was linked by the GP to the problem(s) for which the patient was referred. Referrals included those to medical specialists, allied health services, hospitals for admission, emergency departments, and those to other services (including outpatient clinics and to other GPs).

Data on referrals and admissions are reported for each of the most recent BEACH years from 2005–06 to 2014–15, in the 10-year report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

11.1 Number of referrals and admissions

Table 11.1 provides a summary of referrals and admissions, and the rates per 100 encounters and per 100 problems managed. The patient was given at least one referral at 14.5% of all encounters, for 10.2% of all problems managed.

There were 15,697 referrals made at a rate of 15.9 per 100 encounters, most often to medical specialists (9.6 per 100 encounters, 6.2 per 100 problems managed), followed by referrals to allied health services (5.2 per 100 encounters, 3.3 per 100 problems). Relatively few patients were referred/admitted to hospital, or referred to the emergency department.

Table 11.1: Summary of referrals and admissions

Variable	Number	Rate per 100 encounters (<i>n</i> = 98,728)	95% LCL	95% UCL	Rate per 100 problems (<i>n</i> = 153,133)	95% LCL	95% UCL
At least one referral ^(a)	14,360	14.5	14.0	15.1	10.2	9.8	10.5
Referrals	15,697	15.9	15.3	16.5	10.3	9.9	10.6
Medical specialist*	9,464	9.6	9.2	10.0	6.2	5.9	6.4
Allied health services*	5,107	5.2	4.9	5.5	3.3	3.1	3.5
Hospital*	355	0.4	0.3	0.4	0.2	0.2	0.3
Emergency department*	305	0.3	0.3	0.4	0.2	0.2	0.2
Other referrals*	466	0.5	0.4	0.5	0.3	0.3	0.4

(a) At least one referral was given in the management of 15,553 problems at the 14,360 encounters.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.7, <hdl.handle.net/2123/13765>).

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

11.2 Most frequent referrals

Table 11.2 shows the medical specialists and allied health service groups to whom GPs most often referred patients. Referrals to medical specialists were most often to surgeons (8.8% of specialist referrals), orthopaedic surgeons (8.5%), and cardiologists (8.0%). The top 10 specialists accounted for 63.7% of specialist referrals and for 41.3% of the 14,571 referrals to specialists and allied health services combined.

Referrals to allied health services were most often to physiotherapists (27.8% of allied health services referrals), psychologists (24.3%), podiatrists/chiropractors (12.6%), dietitians/nutritionists (7.2%) and dentists (2.9%). The top 10 allied health services accounted for 84.1% of allied health referrals and 29.5% of the 14,571 referrals to specialists and allied health services combined.

Table 11.2: Most frequent referrals to medical specialists and allied health services

Professional/organisation	Number	Per cent of referrals to spec/AHS	Per cent of referral group	Rate per 100 encounters (n = 98,728)	Rate per 100		Rate per 100		Rate per 100	
					95% LCL	95% UCL	problems (n = 153,133)	95% LCL	95% UCL	
Medical specialist*	9,464	65.0	100.0	9.6	9.2	10.0	6.2	5.9	6.4	
Surgeon	835	5.7	8.8	0.8	0.8	0.9	0.5	0.5	0.6	
Orthopaedic surgeon	808	5.5	8.5	0.8	0.7	0.9	0.5	0.5	0.6	
Cardiologist	760	5.2	8.0	0.8	0.7	0.9	0.5	0.4	0.6	
Dermatologist	654	4.5	6.9	0.7	0.6	0.7	0.4	0.4	0.5	
Gastroenterologist	652	4.5	6.9	0.7	0.6	0.7	0.4	0.4	0.5	
Ophthalmologist	639	4.4	6.7	0.6	0.6	0.7	0.4	0.4	0.5	
Gynaecologist	545	3.7	5.8	0.6	0.5	0.6	0.4	0.3	0.4	
Ear, nose and throat	489	3.4	5.2	0.5	0.4	0.5	0.3	0.3	0.4	
Urologist	343	2.4	3.6	0.3	0.3	0.4	0.2	0.2	0.3	
Neurologist	300	2.1	3.2	0.3	0.3	0.4	0.2	0.2	0.2	
<i>Subtotal: top 10 medical specialist referrals</i>	<i>6,025</i>	<i>41.3</i>	<i>63.7</i>	—	—	—	—	—	—	
Allied health services*	5,107	35.0	100.0	5.2	4.9	5.5	3.3	3.1	3.5	
Physiotherapist	1,418	9.7	27.8	1.4	1.3	1.6	0.9	0.8	1.0	
Psychologist	1,243	8.5	24.3	1.3	1.1	1.4	0.8	0.7	0.9	
Podiatrist/chiropractist	641	4.4	12.6	0.6	0.6	0.7	0.4	0.4	0.5	
Dietitian/nutritionist	369	2.5	7.2	0.4	0.3	0.4	0.2	0.2	0.3	
Dentist	149	1.0	2.9	0.2	0.1	0.2	0.1	0.1	0.1	
Optometrist	124	0.8	2.4	0.1	0.1	0.1	0.1	0.1	0.1	
Exercise physiologist	106	0.7	2.1	0.1	0.1	0.1	0.1	0.1	0.1	
Audiologist	88	0.6	1.7	0.1	0.1	0.1	0.1	0.0	0.1	
Chiropractor	81	0.6	1.6	0.1	0.1	0.1	0.1	0.0	0.1	
Diabetes educator	74	0.5	1.4	0.1	0.1	0.1	0.0 [†]	0.0	0.1	
<i>Subtotal: top 10 allied health referrals</i>	<i>4,293</i>	<i>29.5</i>	<i>84.1</i>	—	—	—	—	—	—	
Total allied health and medical specialist referrals	14,571	100.0	—	14.8	14.1	15.4	9.5	9.1	9.9	

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.7, <hdl.handle.net/2123/13765>).

† Rates are reported to one decimal place. This indicates that the rate is less than 0.05 per 100 encounters.

Note: LCL – lower confidence limit; UCL – upper confidence limit; spec/AHS – specialists and allied health services combined.

11.3 Problems most frequently referred to a specialist

The GP could link a single referral to multiple problems that were managed at the encounter. Therefore, there are more problem–referral links than referrals. Table 11.3 shows the most common problems referred to a medical specialist, in decreasing frequency order of problem-referral links.

The 9,464 referrals to a medical specialist were provided in the management of 9,710 problems. The 10 problems most often referred to a specialist accounted for only 18.1% of all problem–referral links, reflecting the breadth of problems referred to specialists. Malignant skin neoplasm accounted for 2.5% of problem-referral links, followed by osteoarthritis (2.3%), diabetes (1.9%) and back complaint (1.9%) (Table 11.3). The ranking of problems most often referred reflects not only the need for referral but how frequently that problem is managed at GP encounters. For example, osteoarthritis, commonly managed at GP encounters, is ranked highly, even though referrals were made (far right column) at only 7.9% of GP contacts with this problem. Malignant skin neoplasm resulted in a specialist referral at 1 in 5 (20.1%) GP contacts with this problem. This was followed by ischaemic heart disease (15.7%) and pregnancy (11.8%). The likelihood of referral depends not only on the need for referral, but on other factors such as the acuity/chronicity of the condition. For example, at only 3.2% of GP contacts at which depression is managed is this problem referred, partly due to the relatively high number of GP encounters that may be required in any recurrent or chronic condition.

Table 11.3: The 10 problems most frequently referred to a medical specialist

Problem managed	Problem–referral links		Rate per 100 encounters (<i>n</i> = 98,728)	95% LCL	95% UCL	Per cent of contacts with this problem ^(a)
	Number	Per cent				
Malignant neoplasm, skin	242	2.5	0.2	0.2	0.3	20.1
Osteoarthritis*	226	2.3	0.2	0.2	0.3	7.9
Diabetes – all*	187	1.9	0.2	0.2	0.2	4.7
Back complaint*	186	1.9	0.2	0.2	0.2	5.6
Ischaemic heart disease*	177	1.8	0.2	0.1	0.2	15.7
Sleep disturbance	165	1.7	0.2	0.1	0.2	10.1
Gastro-oesophageal reflux disease*	149	1.5	0.2	0.1	0.2	5.4
Pregnancy*	142	1.5	0.1	0.1	0.2	11.8
Abnormal test results*	142	1.5	0.1	0.1	0.2	11.5
Depression*	139	1.4	0.1	0.1	0.2	3.2
<i>Subtotal: top 10 problems referred to a medical specialist</i>	<i>1,755</i>	<i>18.1</i>	—	—	—	—
Total problems referred to medical specialist	9,710	100.0	9.8	9.4	10.3	—

(a) The proportion of GP contacts with this problem that was referred to a medical specialist.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <hdl.handle.net/2123/13765>).

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

Table 11.4 shows the five problems accounting for the greatest proportion of referrals to each of the 10 most common medical specialty types. The top five problems may represent a small or large proportion of all problems referred to a particular specialty. For example, the top five problems accounted for 30.4% of all referrals to ear, nose and throat (ENT) specialists (indicative of the broad range of conditions referred to them), but for 55.7% of all referrals to orthopaedic surgeons, consistent with a more defined range of clinical work.

Surgeon: The two problems accounting for the most referrals were inguinal hernia (6.1% of general/unspecified surgeon referrals) and malignant neoplasm of skin (5.4% of referrals). Of the five problems most frequently referred to a general/unspecified surgeon, those most likely to be referred at each GP contact with that problem were inguinal hernia (referred at 39.0% of contacts) and other (not inguinal or diaphragmatic) abdominal hernia (32.3%).

Orthopaedic surgeon: The two problems accounting for the most referrals were osteoarthritis (21.7% of referrals) and acute internal knee damage (13.0%). Of the five problems most frequently referred, those most likely to be referred were acute internal knee damage (referred at 28.1% of GP contacts) and musculoskeletal injury (not otherwise specified) (7.2%).

Cardiologist: The two problems accounting for the most referrals were ischaemic heart disease (20.8% of referrals) and atrial fibrillation/flutter (9.0%). Of the five problems most frequently referred, those most likely to be referred were ischaemic heart disease (referred at 14.8% of GP contacts) and chest pain (not otherwise specified) (14.6%).

Dermatologist: The two problems accounting for the most referrals were malignant neoplasm of skin (12.6% of referrals) and other skin disease (9.4%). Of the five problems most frequently referred to a dermatologist, those most likely to be referred were skin check-up (referred at 9.5% of GP contacts) and other skin symptom/complaint (8.1%).

Gastroenterologist: The two problems accounting for the most referrals were gastro-oesophageal reflux disease (11.4% of referrals) and digestive neoplasm (benign or uncertain) (7.9%). Of the five problems most frequently referred to a gastroenterologist, those most likely to be referred were benign/uncertain digestive neoplasm (referred at 26.3% of GP contacts) and rectal bleeding (26.1%).

Ophthalmologist: The two problems accounting for the most referrals were cataract (12.8%) and diabetes (10.5%). Of the five problems most frequently referred to an ophthalmologist, those most likely to be referred were other visual disturbance (referred at 60.2% of GP contacts) and cataract (59.7%).

Gynaecologist: The two problems accounting for the most referrals were menstrual problems (14.0% of referrals) and other female genital disease (13.7%). Of the five problems most frequently referred to a gynaecologist, those most likely to be referred were uterovaginal prolapse (referred at 45.6% of GP contacts) and other female genital disease (31.3%).

Ear, nose and throat: The two problems accounting for the most referrals were acute/chronic sinusitis (11.4% of referrals to an ENT specialist) and tonsillitis (6.1%). Of the five problems most frequently referred to an ENT specialist, those most likely to be referred were throat symptom/complaint (referred at 12.1% of GP contacts) and other respiratory disease (9.0%).

Urologist: The two problems accounting for the most referrals were benign prostatic hypertrophy (16.1% of referrals) and abnormal test results (7.8%). Of the five problems most frequently referred, those most likely to be referred were benign prostatic hypertrophy (referred at 19.9% of GP contacts) and urinary calculus (16.5%).

Neurologist: The two problems accounting for the most referrals were headache (11.4% of referrals) and epilepsy (11.2%). Of the five problems most frequently referred to a neurologist, those most likely to be referred at each GP contact with that problem were Parkinsonism (referred at 12.9% of GP contacts) and epilepsy (12.2%) (Table 11.4).

Table 11.4: The top problems most frequently referred, by type of medical specialist

Specialist	Problem managed	Number	Per cent of problems referred to each specialist	Per cent of contacts with this problem ^(a)
Surgeon	Total	856	100.0	—
	Inguinal hernia	52	6.1	39.0
	Malignant neoplasm, skin	46	5.4	3.9
	Abdominal hernia, other	45	5.2	32.3
	Cholecystitis/cholelithiasis	42	4.9	26.6
	Haemorrhoids	32	3.8	12.1
	<i>Subtotal: top five problems</i>	217	25.4	—
Orthopaedic surgeon	Total	826	100.0	—
	Osteoarthritis*	179	21.7	6.3
	Acute internal knee damage	107	13.0	28.1
	Injury musculoskeletal NOS	66	8.0	7.2
	Bursitis/tendonitis/synovitis NOS	58	7.0	5.0
	Fracture*	50	6.0	5.3
	<i>Subtotal: top five problems</i>	460	55.7	—
Cardiologist	Total	801	100.0	—
	Ischaemic heart disease*	167	20.8	14.8
	Atrial fibrillation/flutter	72	9.0	5.7
	Hypertension*	69	8.6	0.9
	Heart failure	49	6.1	7.8
	Chest pain NOS	48	6.0	14.6
	<i>Subtotal: top five problems</i>	405	50.5	—
Dermatologist	Total	661	100.0	—
	Malignant neoplasm, skin	83	12.6	6.9
	Skin disease, other	62	9.4	6.2
	Skin symptom/complaint, other	58	8.7	8.1
	Skin check-up*	57	8.7	9.5
	Solar keratosis/sunburn	57	8.7	4.7
	<i>Subtotal: top five problems</i>	318	48.1	—
Gastroenterologist	Total	672	100.0	—
	Gastro-oesophageal reflux disease*	76	11.4	2.8
	Benign/uncertain neoplasm digestive	53	7.9	26.3
	Abdominal pain*	50	7.5	6.6
	Rectal bleeding	39	5.9	26.1
	Disease digestive system, other	29	4.3	9.3
	<i>Subtotal: top five problems</i>	248	36.9	—

(continued)

Table 11.4 (continued): The top problems most frequently referred, by type of medical specialist

Specialist	Problem managed	Number	Per cent of problems referred to each specialist	Per cent of contacts with this problem ^(a)
Ophthalmologist	Total	653	100.0	—
	Cataract	84	12.8	59.7
	Diabetes – all*	69	10.5	1.7
	Glaucoma	67	10.2	32.1
	Eye/adnexa disease, other	60	9.1	28.7
	Visual disturbance, other	34	5.2	60.2
	<i>Subtotal: top five problems</i>	<i>312</i>	<i>47.9</i>	<i>—</i>
Gynaecologist	Total	558	100.0	—
	Menstrual problems*	78	14.0	11.4
	Genital disease, other (female)	76	13.7	31.3
	Abnormal test results*	38	6.8	3.1
	Uterovaginal prolapse	36	6.4	45.6
	Contraception, intrauterine	26	4.6	17.6
	<i>Subtotal: top five problems</i>	<i>254</i>	<i>45.6</i>	<i>—</i>
Ear, nose and throat	Total	494	100.0	—
	Sinusitis acute/chronic	56	11.4	4.9
	Tonsillitis*	30	6.1	3.8
	Acute otitis media/myringitis	22	4.5	2.4
	Throat symptom/complaint	21	4.3	12.1
	Respiratory disease, other	20	4.0	9.0
	<i>Subtotal: top five problems</i>	<i>150</i>	<i>30.4</i>	<i>—</i>
Urologist	Total	353	100.0	—
	Benign prostatic hypertrophy	57	16.1	19.9
	Abnormal test results*	27	7.8	2.2
	Malignant neoplasm, prostate	27	7.8	8.9
	Haematuria	20	5.6	12.1
	Urinary calculus	17	4.9	16.5
	<i>Subtotal: top five problems</i>	<i>149</i>	<i>42.2</i>	<i>—</i>
Neurologist	Total	305	100.0	—
	Headache*	35	11.4	3.0
	Epilepsy	34	11.2	12.2
	Parkinsonism	24	8.0	12.9
	Neurological disease, other	16	5.4	3.1
	Carpal tunnel syndrome	16	5.4	8.6
	<i>Subtotal: top five problems</i>	<i>126</i>	<i>41.4</i>	<i>—</i>

(a) The proportion of GP contacts with this problem that was referred to each type of medical specialist.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <hdl.handle.net/2123/13765>).

Note: NOS – not otherwise specified.

11.4 Problems most frequently referred to allied health services and hospitals

The 5,107 referrals to an allied health service were provided in the management of 5,325 problems. The 10 most commonly referred problems accounted for 47.9% of all problem–referral links. Depression was the problem accounting for the largest proportion of allied health referrals (12.2%), followed by diabetes (7.4%), back complaints (7.2%) and anxiety (6.0%). However, of the 10 most commonly referred problems, the most likely to be referred to an allied health service was acute stress reaction, referred at 16.7% of all GP contacts with this problem (Table 11.5).

Table 11.5: The 10 problems most frequently referred to allied health services

Problem managed	Problem–referral links		Rate per 100 encounters (<i>n</i> = 98,728)	95% LCL	95% UCL	Per cent of contacts with this problem ^(a)
	Number	Per cent				
Depression*	647	12.2	0.7	0.6	0.7	14.7
Diabetes – all*	394	7.4	0.4	0.3	0.5	10.0
Back complaint*	386	7.2	0.4	0.3	0.5	11.7
Anxiety*	317	6.0	0.3	0.3	0.4	14.3
Osteoarthritis*	189	3.5	0.2	0.2	0.2	6.6
Sprain/strain*	152	2.9	0.2	0.1	0.2	13.2
Administrative procedure NOS	143	2.7	0.1	0.1	0.2	11.0
Bursitis/tendonitis/synovitis NOS	116	2.2	0.1	0.1	0.1	10.0
Acute stress reaction	116	2.2	0.1	0.1	0.1	16.7
Obesity (BMI > 30)	93	1.7	0.1	0.1	0.1	14.3
<i>Subtotal: top 10 problems referred to AHS</i>	<i>2,552</i>	<i>47.9</i>	—	—	—	—
Total problems referred to AHS	5,325	100.0	5.4	5.1	5.7	—

(a) The proportion of GP contacts with this problem that was referred to allied health services.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <hdl.handle.net/2123/13765>).

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

The 355 referrals to a hospital were provided in the management of 377 problems. The 10 problems most frequently referred to a hospital are shown in Table 11.6. Pregnancy accounted for the highest proportion (5.8%) of these referrals, but pneumonia was the problem most likely to be referred (4.2% of GP contacts).

The 305 referrals to an emergency department were associated with the management of 316 problems. The 10 problems most frequently referred to an emergency department are shown in Table 11.7. Appendicitis accounted for the highest proportion (7.0%) of these referrals, and was the most likely to be referred (62.3% of GP contacts).

Table 11.6: The 10 problems most frequently referred to hospital

Problem managed	Problem-referral links		Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of contacts with this problem ^(a)
	Number	Per cent				
Pregnancy*	22	5.8	0.02	0.01	0.03	1.8
Fracture*	20	5.2	0.02	0.01	0.03	2.1
Pneumonia	13	3.5	0.01	0.01	0.02	4.2
Anaemia*	10	2.7	0.01	0.00	0.02	1.8
Heart failure	10	2.6	0.01	0.00	0.02	1.6
Chest pain NOS	9	2.3	0.01	0.00	0.02	2.6
Chronic obstructive pulmonary disease	8	2.2	0.01	0.00	0.02	0.9
Urinary tract infection*	8	2.1	0.01	0.00	0.02	0.5
Skin infection, other	7	1.9	0.01	0.00	0.01	1.3
Ischaemic heart disease*	7	1.8	0.01	0.00	0.01	0.6
<i>Subtotal: top 10 problems referred for admission</i>	<i>113</i>	<i>30.0</i>	—	—	—	—
Total problems referred to hospital	377	100.0	0.38	0.31	0.45	—

(a) The proportion of GP contacts with this problem that was referred to hospital.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <hdl.handle.net/2123/13765>).

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

Table 11.7: The 10 problems most frequently referred to an emergency department

Problem managed	Problem-referral links		Rate per 100 encounters (n = 98,728)	95% LCL	95% UCL	Per cent of contacts with this problem ^(a)
	Number	Per cent				
Appendicitis	22	7.0	0.02	0.01	0.04	62.3
Abdominal pain*	16	5.1	0.02	0.00	0.03	2.1
Chest pain NOS	14	4.4	0.01	0.01	0.02	4.2
Fracture*	14	4.3	0.01	0.01	0.02	1.4
Pneumonia	12	3.8	0.01	0.00	0.02	3.9
Skin infection, other	11	3.4	0.01	0.00	0.02	2.0
Injury musculoskeletal NOS	6	2.0	0.01	0.00	0.01	0.7
Ischaemic heart disease*	6	2.0	0.01	0.00	0.01	0.6
Urinary tract infection*	6	2.0	0.01	0.00	0.01	0.4
Pleurisy/pleural effusion	6	1.9	0.01	0.00	0.01	10.7
<i>Subtotal: top 10 problems referred to emergency department</i>	<i>114</i>	<i>36.0</i>	—	—	—	—
Total problems referred to emergency department	316	100.0	0.32	0.27	0.38	—

(a) The proportion of GP contacts with this problem that was referred to an emergency department.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <hdl.handle.net/2123/13765>).

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

11.5 Changes in referrals over the decade 2005–06 to 2014–15

An overview of changes in referrals over the decade can be found in Chapter 11 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ In that report, changes over time are discussed in terms of change in the management of problems (that is, as a rate per 100 problems managed). This reflects change in how GPs are managing problems, and accounts for the significant increase in the number of problems managed per encounter over the decade.

In summary, over the 10 years there was a significant increase in the proportion of problems that were referred: in 2005–06 at least one referral was made in the management of 8.2% of problems and this increased to 10.2% of problems managed in 2014–15.

The overall rate of referral per 100 problems managed increased from 8.2 in 2005–06 to 10.3 in 2014–15, and per 100 encounters from 12.0 to 15.9. This suggests that there were 9.7 million more referrals made by GPs nationally in 2014–15 than a decade earlier.

Referrals to medical specialists increased from 5.6 per 100 problems managed in 2005–06, to 6.2 in 2014–15. There were no changes in the rate of referrals to the most frequent medical specialists, except for a marginally significant decrease in referrals to ophthalmologists.

Referrals to allied health services increased from 2.0 per 100 problems managed in 2005–06 to 3.3 in 2014–15. This was reflected in significant increases in referral rates per 100 problems to psychologists and podiatrists/chiropractors.

12 Investigations

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

A pathology test order may be for a single test (for example, Pap smear, HbA1c) or for a battery of tests (for example, lipids, full blood count). Where a battery of tests was ordered, the battery name was recorded rather than each individual test within the battery. GPs also recorded the body site for any imaging ordered (for example, x-ray chest, CT head).

Data on investigations are reported for each year from 2005–06 to 2014–15 in the 10-year report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

12.1 Number of investigations

Table 12.1 shows the number of encounters and problems at which a pathology or imaging test was ordered. There were no pathology or imaging tests recorded at three-quarters (74.9%) of encounters.

At least one pathology test order was recorded at 18.1% of encounters (and for 13.4% of problems managed), and at least one imaging test was ordered at 9.8% of encounters (and for 6.6% of problems managed).

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

Pathology/imaging test ordered	Number of encounters	Per cent of encounters (n = 98,728)	95% LCL	95% UCL	Number of problems	Per cent of problems (n = 153,133)	95% LCL	95% UCL
Pathology and imaging ordered	2,730	2.8	2.6	2.9	1,984	1.3	1.2	1.4
Pathology only ordered	15,146	15.3	14.8	15.8	18,560	12.1	11.7	12.5
Imaging only ordered	6,911	7.0	6.7	7.3	8,074	5.3	5.1	5.5
No pathology or imaging tests ordered	73,942	74.9	74.2	75.6	124,515	81.3	80.8	81.8
At least one pathology ordered	17,875	18.1	17.5	18.7	20,544	13.4	13.0	13.8
At least one imaging ordered	9,641	9.8	9.4	10.1	10,058	6.6	6.3	6.8
At least one other investigation ordered	699	0.7	0.6	0.8	713	0.5	0.4	0.5
At least one other investigation performed in the practice	1,380	1.4	1.3	1.5	1,391	0.9	0.8	1.0
At least one other investigation ordered or performed	2,019	2.0	1.9	2.2	2,048	1.3	1.2	1.4

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

12.2 Pathology ordering

A report on changes in pathology ordering by GPs from 1998 to 2001 was produced in 2003.⁶⁹ A review of GP pathology orders in the National Health Priority Areas and other selected problems between 2000 and 2008 was reported in *General practice in Australia, health priorities and policies 1998 to 2008*.¹³ A report *Evidence-practice gap in pathology test ordering: a comparison of BEACH pathology data and recommended testing* was produced by the FMRC for the Australian Government Quality Use of Pathology Program in June 2009.¹⁶ A PhD thesis *Evaluation of pathology ordering by general practitioners in Australia* was completed in 2013.¹⁴ Readers may wish to consider those publications in conjunction with the information presented below.

Nature of pathology orders at encounter

The GPs recorded 46,435 orders for pathology tests (or batteries of tests), at a rate of 47.0 per 100 encounters or 30.3 per 100 problems managed (Table 12.2). The pathology tests recorded were grouped according to the categories set out in Appendix 4, Table A4.8. The main pathology groups reflect those used in the Medicare Benefits Schedule (MBS).⁷⁰

The distribution of pathology tests by MBS group, and the most common tests within each group are presented in Table 12.2. Each group and individual test is expressed as a proportion of all pathology tests, as a proportion of the group, as a rate per 100 encounters and as a rate per 100 problems managed with 95% confidence limits.

Tests classed as chemistry accounted for more than half (58.1%) of the pathology test orders, the most common being: lipid tests, for which there were 3.8 orders per 100 encounters and 2.4 per 100 problems; multi-biochemical analysis (3.4; 2.2); thyroid function tests (3.1; 2.0); and electrolytes, urea and creatinine (2.8; 1.8). Haematology tests accounted for 17.8% of all pathology including the most frequently ordered individual pathology test, full blood count (FBC). FBC tests accounted for 14.3% of all pathology, there being 6.7 FBC orders per 100 encounters and 4.3 per 100 problems managed. Microbiology accounted for 13.5% of pathology orders, with urine microscopy, culture and sensitivity being the most frequent test type in the group at 2.0 orders per 100 encounters and 1.3 per 100 problems managed.

Table 12.2: Most frequent pathology tests ordered within each MBS pathology group

Pathology test ordered	Number	Per cent		Rate per 100 encounters (n = 98,728)			Rate per 100 problems (n = 153,133)		
		of all pathology	Per cent of group	95% LCL	95% UCL	95% LCL	95% UCL		
Chemistry*	26,977	58.1	100.0	27.3	26.1	28.6	17.6	16.9	18.4
Lipids*	3,734	8.0	13.8	3.8	3.5	4.0	2.4	2.3	2.6
Multi-biochemical analysis*	3,372	7.3	12.5	3.4	3.1	3.7	2.2	2.0	2.4
Thyroid function*	3,012	6.5	11.2	3.1	2.9	3.2	2.0	1.8	2.1
Electrolytes, urea and creatinine*	2,793	6.0	10.4	2.8	2.6	3.1	1.8	1.7	2.0
Glucose/glucose tolerance*	2,294	4.9	8.5	2.3	2.1	2.5	1.5	1.4	1.6
Liver function*	2,235	4.8	8.3	2.3	2.1	2.5	1.5	1.3	1.6
Ferritin*	1,717	3.7	6.4	1.7	1.6	1.9	1.1	1.0	1.2
HbA1c*	1,279	2.8	4.7	1.3	1.2	1.4	0.8	0.8	0.9
Chemistry; other*	1,131	2.4	4.2	1.1	1.0	1.3	0.7	0.7	0.8
C reactive protein	1,029	2.2	3.8	1.0	0.9	1.2	0.7	0.6	0.7
Hormone assay*	815	1.8	3.0	0.8	0.7	0.9	0.5	0.5	0.6

(continued)

Table 12.2 (continued): Most frequent pathology tests ordered within each MBS pathology group

Pathology test ordered	Number	Per cent of all pathology	Per cent of group	Rate per 100 encounters (n = 98,728)			Rate per 100 problems (n = 153,133)		
				95% LCL	95% UCL	95% LCL	95% UCL		
Prostate specific antigen*	779	1.7	2.9	0.8	0.7	0.9	0.5	0.5	0.6
Vitamin B12	621	1.3	2.3	0.6	0.5	0.7	0.4	0.4	0.5
Vitamin D	559	1.2	2.1	0.6	0.5	0.6	0.4	0.3	0.4
Albumin/creatinine, urine*	524	1.1	1.9	0.5	0.4	0.6	0.3	0.3	0.4
Calcium/phosphate/magnesium*	323	0.7	1.2	0.3	0.3	0.4	0.2	0.2	0.2
Haematology*	8,257	17.8	100.0	8.4	7.9	8.8	5.4	5.1	5.6
Full blood count	6,653	14.3	80.6	6.7	6.4	7.1	4.3	4.1	4.6
ESR	869	1.9	10.5	0.9	0.8	1.0	0.6	0.5	0.6
Coagulation*	548	1.2	6.6	0.6	0.5	0.6	0.4	0.3	0.4
Microbiology*	6,273	13.5	100.0	6.4	6.0	6.7	4.1	3.9	4.3
Urine M,C&S*	1,930	4.2	30.8	2.0	1.8	2.1	1.3	1.2	1.3
Microbiology; other*	922	2.0	14.7	0.9	0.8	1.0	0.6	0.5	0.7
Faeces M,C&S*	517	1.1	8.2	0.5	0.5	0.6	0.3	0.3	0.4
Hepatitis serology*	438	0.9	7.0	0.4	0.4	0.5	0.3	0.2	0.3
Venereal disease*	380	0.8	6.1	0.4	0.3	0.5	0.2	0.2	0.3
Vaginal swab M,C&S*	339	0.7	5.4	0.3	0.3	0.4	0.2	0.2	0.3
Chlamydia*	322	0.7	5.1	0.3	0.3	0.4	0.2	0.2	0.2
Skin swab M,C&S*	223	0.5	3.6	0.2	0.2	0.3	0.1	0.1	0.2
Cytopathology*	1,507	3.2	100.0	1.5	1.4	1.7	1.0	0.9	1.1
Pap smear*	1,455	3.1	96.5	1.5	1.3	1.6	1.0	0.9	1.0
Immunology*	1,061	2.3	100.0	1.1	1.0	1.2	0.7	0.6	0.8
Immunology, other*	602	1.3	56.7	0.6	0.5	0.7	0.4	0.3	0.4
Tissue pathology*	951	2.0	100.0	1.0	0.8	1.1	0.6	0.5	0.7
Histology; skin	874	1.9	91.9	0.9	0.8	1.0	0.6	0.5	0.7
Other NEC*	955	2.1	100.0	1.0	0.8	1.1	0.6	0.5	0.7
Blood test	515	1.1	53.9	0.5	0.4	0.7	0.3	0.3	0.4
Other test NEC*	251	0.5	26.3	0.3	0.2	0.3	0.2	0.1	0.2
Simple tests*	232	0.5	100.0	0.2	0.2	0.3	0.2	0.1	0.2
Infertility/pregnancy*	222	0.5	100.0	0.2	0.2	0.3	0.1	0.1	0.2
Total pathology tests	46,435	100.0	—	47.0	45.2	48.9	30.3	29.3	31.4

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.8, <hdl.handle.net/2123/13765>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; ESR – erythrocyte sedimentation rate; M,C&S – microscopy, culture and sensitivity; NEC – not elsewhere classified.

Problems for which pathology tests were ordered

Table 12.3 describes the problems for which pathology was commonly ordered, in decreasing frequency order of problem–pathology combinations. Diabetes (accounting for 7.0% of all problem–pathology combinations), hypertension, general check-up, and weakness/tiredness were the most common problems for which pathology tests were ordered.

The two columns on the far right show the proportion of each problem that resulted in a pathology order, and the rate of pathology tests/batteries of tests per 100 specified problems when at least one test was ordered. For example, 68.1% of contacts with weakness/tiredness resulted in pathology orders, and when pathology was ordered for weakness/tiredness, the GPs ordered an average of 394 tests/batteries of tests per 100 ‘tested’ weakness/tiredness contacts. In contrast, only 12.0% of contacts with hypertension problems resulted in a pathology test, but the resulting test orders accounted for more tests (5.8%) than those ordered for weakness/tiredness (4.4%). This is because in general practice, hypertension is managed far more frequently (7.9 per 100 encounters) than weakness/tiredness (0.8 per 100 encounters) (see Section 7.3).

Table 12.3: The 10 problems for which pathology was most frequently ordered

Problem managed	Number of problems	Number of problem–pathology combinations ^(a)	Per cent of problem–pathology combinations ^(a)	Per cent of problems with test ^(b)	Rate of pathology orders per 100 problems with pathology ^(c)
Diabetes – all*	3,960	3,376	7.0	30.8	276.8
Hypertension*	7,778	2,789	5.8	12.0	298.3
General check-up*	2,987	2,720	5.6	26.6	342.6
Weakness/tiredness	785	2,105	4.4	68.1	394.1
Lipid disorder	2,952	1,713	3.5	25.0	232.5
Female genital check-up/ Pap smear*	1,528	1,400	2.9	75.6	121.1
Blood test NOS	366	1,188	2.5	88.1	368.6
Abnormal test results*	1,235	1,107	2.3	50.9	176.2
Urinary tract infection*	1,688	1,079	2.2	55.1	116.1
Pregnancy*	1,206	876	1.8	35.6	203.8
<i>Subtotal</i>	<i>24,485</i>	<i>18,352</i>	<i>38.0</i>	<i>—</i>	<i>—</i>
Total problems	153,133	48,250	100.0	13.4	234.9

(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 46,435 pathology test orders and 48,250 problem–pathology combinations.

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

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

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <hdl.handle.net/2123/13765>).

Note: NOS – not otherwise specified.

12.3 Imaging ordering

Readers wanting a more detailed study of imaging orders should consult the comprehensive report on imaging orders by GPs in Australia in 1999–00, by the FMRC using BEACH data, and published by the Australian Institute of Health and Welfare and the University of Sydney in 2001.⁷¹ A 2014 report, *Evaluation of imaging ordering by general practitioners in Australia 2002–03 to 2011–12*, described changes in GPs' imaging ordering over time and evaluated the alignment between guidelines and GP test ordering for selected problems.¹⁷ This recent report was funded by a grant from the Diagnostic Imaging Quality Program, through the Australian Government Department of Health. Readers may wish to consider those reports in conjunction with the information presented below.

Nature of imaging orders at encounter

There were 11,314 imaging test orders recorded, at a rate of 11.5 per 100 encounters and 7.4 per 100 problems managed. The distribution of imaging tests by MBS group and the most common tests within each group are presented in Table 12.4. Each group and individual test is expressed as a percentage of all imaging tests, as a percentage of the group, as a rate per 100 encounters, and as a rate per 100 problems with 95% confidence limits. Ultrasound accounted for 42.5% of all imaging test orders, and diagnostic radiology accounted for 39.5%. This is the first time that ultrasound orders have outnumbered diagnostic radiology orders since BEACH began in April 1998.

Table 12.4: Most frequent imaging tests ordered within each MBS imaging group

Imaging test ordered	Number	Per cent of all imaging	Per cent of group	Rate per 100 encounters (n = 98,728)			Rate per 100 problems (n = 153,133)		
				95% LCL	95% UCL	95% LCL	95% UCL		
Ultrasound*	4,811	42.5	100.0	4.9	4.6	5.1	3.1	3.0	3.3
Ultrasound; pelvis	701	6.2	14.6	0.7	0.6	0.8	0.5	0.4	0.5
Ultrasound; shoulder	562	5.0	11.7	0.6	0.5	0.6	0.4	0.3	0.4
Ultrasound; abdomen	476	4.2	9.9	0.5	0.4	0.5	0.3	0.3	0.3
Ultrasound; breast; female	348	3.1	7.2	0.4	0.3	0.4	0.2	0.2	0.3
Ultrasound; obstetric	319	2.8	6.6	0.3	0.3	0.4	0.2	0.2	0.2
Echocardiography	181	1.6	3.8	0.2	0.1	0.2	0.1	0.1	0.1
Ultrasound; hip	172	1.5	3.6	0.2	0.1	0.2	0.1	0.1	0.1
Test; Doppler	149	1.3	3.1	0.2	0.1	0.2	0.1	0.1	0.1
Ultrasound; foot/toe(s)	141	1.2	2.9	0.1	0.1	0.2	0.1	0.1	0.1
Ultrasound; kidney	139	1.2	2.9	0.1	0.1	0.2	0.1	0.1	0.1
Ultrasound; kidney/ureter/bladder	133	1.2	2.8	0.1	0.1	0.2	0.1	0.1	0.1
Ultrasound; thyroid	123	1.1	2.6	0.1	0.1	0.2	0.1	0.1	0.1
Ultrasound; leg	114	1.0	2.4	0.1	0.1	0.1	0.1	0.1	0.1
Ultrasound; knee	98	0.9	2.0	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; scrotum	94	0.8	2.0	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; groin	89	0.8	1.8	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; wrist	85	0.8	1.8	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; hand/finger(s)	83	0.7	1.7	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; elbow	79	0.7	1.6	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; neck	72	0.6	1.5	0.1	0.1	0.1	0.0	0.0	0.1

(continued)

Table 12.4 (continued): Most frequent imaging tests ordered within each MBS imaging group

Imaging test ordered	Number	Per cent of all imaging	Per cent of group	Rate per 100 encounters (n = 98,728)			Rate per 100 problems (n = 153,133)		
				95% LCL	95% UCL	95% LCL	95% UCL	95% UCL	
Ultrasound; abdomen upper	63	0.6	1.3	0.1	0.0	0.1	0.0	0.0	0.1
Ultrasound; liver	55	0.5	1.1	0.1	0.0	0.1	0.0	0.0	0.0
Test; doppler carotid	51	0.5	1.1	0.1	0.0	0.1	0.0	0.0	0.0
Diagnostic radiology*	4,465	39.5	100.0	4.5	4.3	4.8	2.9	2.8	3.1
X-ray; chest	986	8.7	22.1	1.0	0.9	1.1	0.6	0.6	0.7
X-ray; knee	485	4.3	10.9	0.5	0.4	0.6	0.3	0.3	0.4
Test; densitometry	292	2.6	6.5	0.3	0.2	0.3	0.2	0.2	0.2
Mammography; female	287	2.5	6.4	0.3	0.2	0.3	0.2	0.2	0.2
X-ray; foot/feet	281	2.5	6.3	0.3	0.2	0.3	0.2	0.2	0.2
X-ray; hip	255	2.3	5.7	0.3	0.2	0.3	0.2	0.1	0.2
X-ray; shoulder	254	2.2	5.7	0.3	0.2	0.3	0.2	0.1	0.2
X-ray; hand	187	1.7	4.2	0.2	0.2	0.2	0.1	0.1	0.1
X-ray; ankle	159	1.4	3.6	0.2	0.1	0.2	0.1	0.1	0.1
X-ray; wrist	140	1.2	3.1	0.1	0.1	0.2	0.1	0.1	0.1
X-ray; spine; lumbar	114	1.0	2.6	0.1	0.1	0.1	0.1	0.1	0.1
X-ray; abdomen	109	1.0	2.4	0.1	0.1	0.1	0.1	0.1	0.1
X-ray; finger(s)/thumb	95	0.8	2.1	0.1	0.1	0.1	0.1	0.0	0.1
X-ray; spine; lumbosacral	78	0.7	1.7	0.1	0.1	0.1	0.1	0.0	0.1
X-ray; spine; cervical	71	0.6	1.6	0.1	0.1	0.1	0.0	0.0	0.1
X-ray; spine; thoracic	59	0.5	1.3	0.1	0.0	0.1	0.0	0.0	0.1
X-ray; ribs	52	0.5	1.2	0.1	0.0	0.1	0.0	0.0	0.0
Computerised tomography*	1,441	12.7	100.0	1.5	1.3	1.6	0.9	0.9	1.0
CT scan; spine; lumbar	215	1.9	14.9	0.2	0.2	0.3	0.1	0.1	0.2
CT scan; abdomen	211	1.9	14.6	0.2	0.2	0.2	0.1	0.1	0.2
CT scan; brain	162	1.4	11.2	0.2	0.1	0.2	0.1	0.1	0.1
CT scan; head	113	1.0	7.8	0.1	0.1	0.1	0.1	0.1	0.1
CT scan; chest	103	0.9	7.1	0.1	0.1	0.1	0.1	0.1	0.1
CT scan; sinus	85	0.7	5.9	0.1	0.1	0.1	0.1	0.0	0.1
CT scan; spine; lumbosacral	83	0.7	5.8	0.1	0.1	0.1	0.1	0.0	0.1
CT scan; pelvis	62	0.6	4.3	0.1	0.0	0.1	0.0	0.0	0.1
CT scan; neck	59	0.5	4.1	0.1	0.0	0.1	0.0	0.0	0.1
CT scan; spine; cervical	55	0.5	3.8	0.1	0.0	0.1	0.0	0.0	0.0
Magnetic resonance imaging*	503	4.4	100.0	0.5	0.4	0.6	0.3	0.3	0.4
MRI; knee	190	1.7	37.8	0.2	0.2	0.2	0.1	0.1	0.1
MRI; brain	77	0.7	15.3	0.1	0.1	0.1	0.1	0.0	0.1
Nuclear medicine*	93	0.8	100.0	0.1	0.1	0.1	0.1	0.0	0.1
Total imaging tests	11,314	100.0	—	11.5	11.0	11.9	7.4	7.1	7.7

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.9 <hdl.handle.net/2123/13765>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; CT – computerised tomography; MRI – magnetic resonance imaging.

Problems for which imaging tests were ordered

Table 12.5 lists the problems for which imaging was commonly ordered, in decreasing frequency order of problem–imaging combinations. Back complaints accounted for 5.1% of all orders, followed by osteoarthritis (4.6%), bursitis/tendonitis/synovitis (3.8%) and shoulder syndrome (3.3%).

The two columns on the far right show the proportion of each problem that resulted in an imaging test, and the rate of imaging tests per 100 specified problems when at least one test was ordered. For example, 15.7% of contacts with back complaints resulted in an imaging test, and 113.4 tests were ordered per 100 ‘tested’ back complaint contacts. Note that shoulder syndrome and knee symptom/complaint were the problems most likely to be tested (46.0% and 44.4% respectively).

Table 12.5: The 10 problems for which an imaging test was most frequently ordered

Problem managed	Number of problems	Number of problem–imaging combinations ^(a)	Per cent of problem–imaging combinations ^(a)	Per cent of problems with test ^(b)	Rate of imaging orders per 100 problems with imaging ^(c)
Back complaint*	3,297	588	5.1	15.7	113.4
Osteoarthritis*	2,855	521	4.6	15.6	117.2
Bursitis/tendonitis/synovitis NOS	1,159	438	3.8	31.5	119.7
Shoulder syndrome	658	378	3.3	46.0	124.8
Fracture*	942	369	3.2	36.5	107.2
Injury musculoskeletal NOS	917	366	3.2	33.9	117.8
Pregnancy*	1,206	354	3.1	29.0	101.3
Sprain/strain*	1,149	322	2.8	22.9	122.1
Abdominal pain*	767	316	2.8	36.1	114.0
Knee symptom/complaint	384	196	1.7	44.4	115.1
<i>Subtotal</i>	<i>13,334</i>	<i>3,847</i>	<i>33.7</i>	<i>—</i>	<i>—</i>
Total problems	153,133	11,433	100.0	6.6	113.7

(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 11,314 imaging test orders and 11,433 problem–imaging combinations.

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

(c) The rate of imaging orders placed per 100 tested problem contacts with at least one order for imaging.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <hdl.handle.net/2123/13765>).

Note: NOS – not otherwise specified.

12.4 Other investigations

Other investigations include diagnostic procedures ordered by the GP, or undertaken by the GP or practice staff at the encounter. GPs ordered 732 other investigations during the study year, and GPs or practice staff undertook a further 1,439. There were, in total, 2,171 other investigations either ordered or undertaken (Table 12.6).

The first section of Table 12.6 lists the other investigations ordered by GPs. The second lists the other investigations undertaken in the practice by GPs or practice staff. The third section lists the total other investigations (either ordered or undertaken in the practice). Each investigation is expressed as a percentage of total other investigations ordered or undertaken, as a rate per 100 encounters, and as a rate per 100 problems, each with 95% confidence limits. Electrical tracings were the most common group of other investigations ordered or undertaken, making up 48.4% of other investigations, followed by physical function test (29.0%).

The results also demonstrate the majority of electrical tracings were undertaken in the practice (62.0%). In contrast, the majority (92.7%) of diagnostic endoscopies were ordered to be done by external providers (Table 12.6).

Table 12.6: Other investigations ordered by GPs or performed in the practice

Investigation	Investigations ordered by the GP			
	Number	Per cent	Rate per 100 encounters (95% CI) (n = 98,728)	Rate per 100 problems (95% CI) (n = 153,133)
Investigations ordered by the GP	732	100.0	0.7 (0.7–0.8)	0.5 (0.4–0.5)
Electrical tracings*	399	54.5	0.4 (0.4–0.5)	0.3 (0.2–0.3)
Diagnostic endoscopy*	179	24.5	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Physical function test*	150	20.5	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Other diagnostic procedures*	4	0.5	0.0 (0.0–0.0)	0.0 (0.0–0.0)
Investigations undertaken in the practice	1,439	100.0	1.5 (1.3–1.6)	0.9 (0.8–1.0)
Electrical tracings*	651	45.3	0.7 (0.6–0.7)	0.4 (0.4–0.5)
Diagnostic endoscopy*	13	0.9	0.0 (0.0–0.0)	0.0 (0.0–0.0)
Physical function test*	479	33.3	0.5 (0.4–0.6)	0.3 (0.3–0.4)
Other diagnostic procedures*	295	20.5	0.3 (0.2–0.4)	0.2 (0.1–0.2)
All investigations (ordered or undertaken)	2,171	100.0	2.2 (2.0–2.4)	1.4 (1.3–1.5)
Electrical tracings*	1,050	48.4	1.1 (1.0–1.2)	0.7 (0.6–0.8)
Diagnostic endoscopy*	193	8.9	0.2 (0.2–0.2)	0.1 (0.1–0.2)
Physical function test*	630	29.0	0.6 (0.6–0.7)	0.4 (0.4–0.5)
Other diagnostic procedures*	298	13.7	0.3 (0.2–0.4)	0.2 (0.2–0.2)

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.6 <hdl.handle.net/2123/13765>).

Note: CI – confidence interval.

12.5 Changes in investigations over the decade 2005–06 to 2014–15

Data on investigations are reported for each year from 2005–06 to 2014–15 in Chapter 12 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹ In that report, changes over time are measured as change in the management of problems (that is, as a rate per 100 problems). This reflects change in how GPs are managing problems, and adjusts for the significant increase in the number of problems managed per encounter over the decade. The major changes are highlighted below.

- There was no change in the proportion of problems where at least one pathology test was ordered (12.7% of problems managed in 2005–06 and 13.4% in 2014–15). However, the number of pathology tests ordered increased over the decade from 26.4 tests (or batteries of tests) per 100 problems managed in 2005–06 to 30.3 in 2014–15. This increased rate of ordering (per 100 problems) was due to GPs ordering more tests per problem once the decision to order pathology had been made, not to any change in the likelihood of pathology being ordered in the management of problems. The largest increase was in orders for chemical pathology, which increased from 14.8 per 100 problems managed in 2005–06 to 17.6 per 100 in 2014–15.
- There was an increase in the proportion of encounters involving at least one pathology test from 16.4% of encounters in 2005–06 to 18.1% in 2014–15, equating to approximately 8.3 million more encounters at which pathology was ordered nationally in 2014–15 than 10 years earlier. This national increase was driven by a rise in the number of problems managed at encounter (increasing from 146.2 to 155.1 per 100 encounters over the decade, see Chapter 5) and the increased GP attendance rate in Australia.²
- The rate of pathology tests ordered per 100 encounters increased from 38.6 per 100 encounters in 2005–06 to 47.0 in 2014–15, which extrapolates to approximately 25.5 million more tests (or batteries of tests) ordered nationally in 2014–15 than a decade earlier. The largest increase was in the order rate of ultrasound imaging, which increased by 55.0% over the decade, from 2.0 tests per 100 problems in 2005–06 to 3.1 per 100 in 2014–15.
- At least one imaging test was ordered for 5.5% of all problems managed in 2005–06, rising to 6.6% of all problems in 2014–15. The proportion of encounters generating imaging orders increased from 7.8% in 2005–06 to 9.8% in 2014–15. This resulted in an estimated 5.6 million more encounters nationally at which imaging was ordered by GPs in 2014–15 than in 2005–06.
- The number of imaging tests ordered increased from 6.0 tests per 100 problems managed in 2005–06 to 7.4 per 100 problems in 2014–15. Total imaging orders per 100 encounters increased significantly from 8.8 per 100 encounters in 2005–06 to 11.5 in 2014–15, suggesting that nationally there were 6.9 million more imaging tests ordered by GPs in 2014–15 than in 2005–06.
- There were changes in the types of imaging tests ordered, with a move away from diagnostic radiology toward ultrasound imaging. Ultrasounds were the most commonly ordered imaging test, and GPs' ordering increased from 2.9 to 4.9 per 100 encounters, a national increase of about 3.8 million ultrasound orders over the decade period. The rates of computerised tomography and magnetic resonance imaging, while accounting for a smaller proportion of orders, also increased over the decade.

13 Patient risk factors

General practice is a useful intervention point for health promotion because the majority of the population visit a GP at least once per year. In 2014–15, 85.8% of Australians visited a GP at least once (personal communication, DoH, June 2015). GPs have substantial knowledge of population health, screening programs and other interventions. They are therefore in an ideal position to advise patients about the benefits of health screening, and to counsel individuals about their lifestyle choices.

Since the beginning of the BEACH program (1998), a section at the bottom of each encounter form has been used to investigate aspects of patient health or healthcare delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data). The SAND methods are described in Section 2.6.

The patient risk factors collected in BEACH include body mass index (BMI) (calculated using self-reported height and weight), self-reported alcohol consumption and self-reported smoking status. These patient risk factors are recorded for a subsample of 40 of the 100 patient encounters recorded by each GP. An example of the encounter form with the patient risk factor SAND questions is included as Appendix 1. The methods used in the risk factor substudies reported in this chapter are described in each section below.

Unweighted (sample) data on patient risk factors measured in SAND are reported for each of the 10 most recent years, and risk factor prevalence after adjustment for general practice attendance patterns by age–sex for each of the eight most recent years are reported in the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

Abstracts of results and the research tools used in other SAND substudies from April 1998 to March 2014 have been published. Those conducted:

- from April 1998 to March 1999 were published in *Measures of health and health care delivery in general practice in Australia*²⁴
- from April 1999 to July 2006 were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*²⁵
- since August 2006 have been published in each of the general practice annual reports^{26–33}
- in the 2014–15 BEACH year are provided in Chapter 14 of this publication.

13.1 Body mass index

From the most recent publicly available Australian data, high body mass (BMI) was the third highest contributor to the total burden of disease in Australia in 2003, accounting for 7.5% of the total burden,⁷² an increase from 4.3% of the total burden and sixth rank in 1996.⁷³ The Global Burden of Disease 2010 study compared burden of disease and injury attributable to 67 risk factors in 21 regions. In Australasia (which includes Australia) ‘high body mass index’ was the leading risk factor for disease burden. This Australasian ranking compares unfavourably with the global risk factor ranking, in which ‘high body mass index’ ranks sixth.⁷⁴

In 2015, the Organisation for Economic Co-operation and Development (OECD) reported that Australia’s adult obesity rates (based on measured data) in 1989, 1995, 2007 and 2011 were among the highest in the world (10.8%, 19.8%, 24.6% and 28.3% of adults respectively), with Australia’s adult obesity rate fifth globally, behind the United States, Mexico and New Zealand and on par with Hungary (28.5%).⁷⁵

In 2007 (or nearest year), Australia was fourth, with obesity rates two percentage points below that of New Zealand, and in 2013 (or nearest year), Australia was fifth with obesity rates still around two percentage points below New Zealand. The obesity rates of both nations increased by about four

percentage points (from 24.6% to 28.3% and 26.5% to 30.6% respectively). In a similar 6-year period, obesity rates in the United States increased by about one percentage point to 35.3%, and those in Mexico increased by two percentage points to 32.4%.⁷⁵

Australia's obesity rate of 28.3% in 2011 is much higher than the average for the 16 OECD countries with recent measured data (22.9%). It has been suggested that the growing prevalence of obesity in Australia foreshadows increases in related health problems (such as diabetes and cardiovascular diseases) and escalating health care costs in future.⁷⁶

The Australian Health Survey (2011–12), using trained interviewer measured data, estimated that 35% of Australians aged 18 years and over were overweight (BMI 25–<30) and 28% were obese (BMI 30 or more). Men were more likely to be overweight (42%) than women (28%), but obesity rates did not differ between the sexes (28% among both men and women).⁷⁷

The Australian Health Survey also reported that 25% of children aged 2–17 years were classified as overweight or obese (18% overweight, 7% obese).⁷⁷

The Australian government has recognised the epidemic of overweight and obesity, and the likely impact on future health costs and negative health outcomes. New guidelines about the clinical management of overweight and obesity were released by the National Health and Medical Research Council (NHMRC) in May 2013.⁷⁸

Method

Patient BMI was investigated for a subsample of 40 of each GP's 100 patient encounters. Each GP was instructed to ask the patient (or their carer in the case of children):

- What is your height in centimetres (without shoes)?
- What is your weight in kilograms (unclothed)?

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

The BMI for an individual was calculated by dividing weight (kilograms) by height (metres) squared. The WHO recommendations⁷⁹ for BMI groups were used. They specify that an adult (18 years and over) with a BMI:

- less than 18.5 is underweight
- greater than or equal to 18.5 and less than 25 is normal weight
- greater than or equal to 25 and less than 30 is overweight
- of 30 or more is obese.

The reported height for adult patients was checked against sex-appropriate upper and lower height limits from the ABS.⁸⁰ Adults whose self-reported height was outside the sex-appropriate limits were excluded from the analysis.

The standard BMI cut-offs described above are not appropriate in the case of children. Cole et al. (2000 & 2007) developed a method to calculate the age–sex-specific BMI cut-off levels for underweight, overweight and obesity specific to children aged 2–17 years.^{81,82} There are four categories defined for childhood BMI: underweight, normal weight, overweight and obese. This method, based on international data from developed Western cultures, is applicable in the Australian setting.

The reported height of children was checked against age–sex-appropriate upper and lower height limits from the ABS and Centres for Disease Control.^{80,83} Children whose self-reported height was outside the age–sex-appropriate limits were excluded from the analysis.

The BEACH data on BMI are presented separately for adults (aged 18 years and over) and children (aged 2–17 years).

Results

Body mass index of adults

The sample size was 32,956 patients aged 18 years and over at encounters with 992 GPs.

- Over half (62.1%) of these adults were overweight (34.1%) or obese (28.0%) (Table 13.1).
- Just over one-third (35.5%) of adult patients had a BMI in the normal range, and 2.4% of were underweight. Underweight was more prevalent among females than males.
- Males were more likely to be overweight or obese (69.5%, 95% CI: 68.5–70.5) than females (57.3%, 95% CI: 56.2–58.3) (results not tabled).
- Overweight/obesity was most prevalent among male patients aged 45–64 years (77.0%) and 65–74 years (76.0%) (Figure 13.1).
- In female patients overweight/obesity was most prevalent in those aged 65–74 years (69.5%) and 45–64 years (63.8%) (Figure 13.1).
- Underweight was most prevalent among patients aged 18–24 years (6.9%, 95% CI: 5.8–8.0) (results not tabled).
- Of young adults (aged 18–24 years), 8.6% of females and 3.3% of males were underweight, and among those aged 75 years and over, 4.2% of females and 1.5% of males were underweight (Figure 13.2).

Our overall and sex-specific prevalence estimates of overweight/obesity among patients at general practice encounters (62% of adults, 70% of males and 57% of females are remarkably consistent with the ABS 2011–12 figures from the Australian Health Survey (based on measured BMI data), which reported that 63% of adults aged 18 years and over (70% of males and 56% of females) were overweight or obese.¹⁸

Readers interested in the prevalence of the three WHO-defined levels of obesity will find more information and discussion in Chapter 7 of *General practice in Australia, health priorities and policies 1998 to 2008*.⁸⁴

Estimation of body mass index for the adult general practice patient population

The BEACH study provides data about patient BMI from a sample of the patients attending general practice. As older people attend a GP more often than young adults, and females attend more often than males, they have a greater chance of being selected in the subsample. This leads to a greater proportion of older and female patients in the BEACH sample than in the total population who attend a GP at least once in a year. The 2014–15 BEACH sample was weighted to estimate the BMI of the GP–patient attending population (that is, the 15.8 million adult patients who attended a GP at least once in 2014–15 (personal communication, DoH, June 2015), using the method described by Knox et al. (2008).²⁰ This statistical adjustment had little effect on the resulting proportions.

The estimates for the adult population who attended general practice at least once (after adjusting for age–sex general practice attendance patterns) suggest that 27.2% of the adult patient population were obese, 33.9% were overweight, 36.6% were normal weight and 2.3% were underweight (Table 13.1).

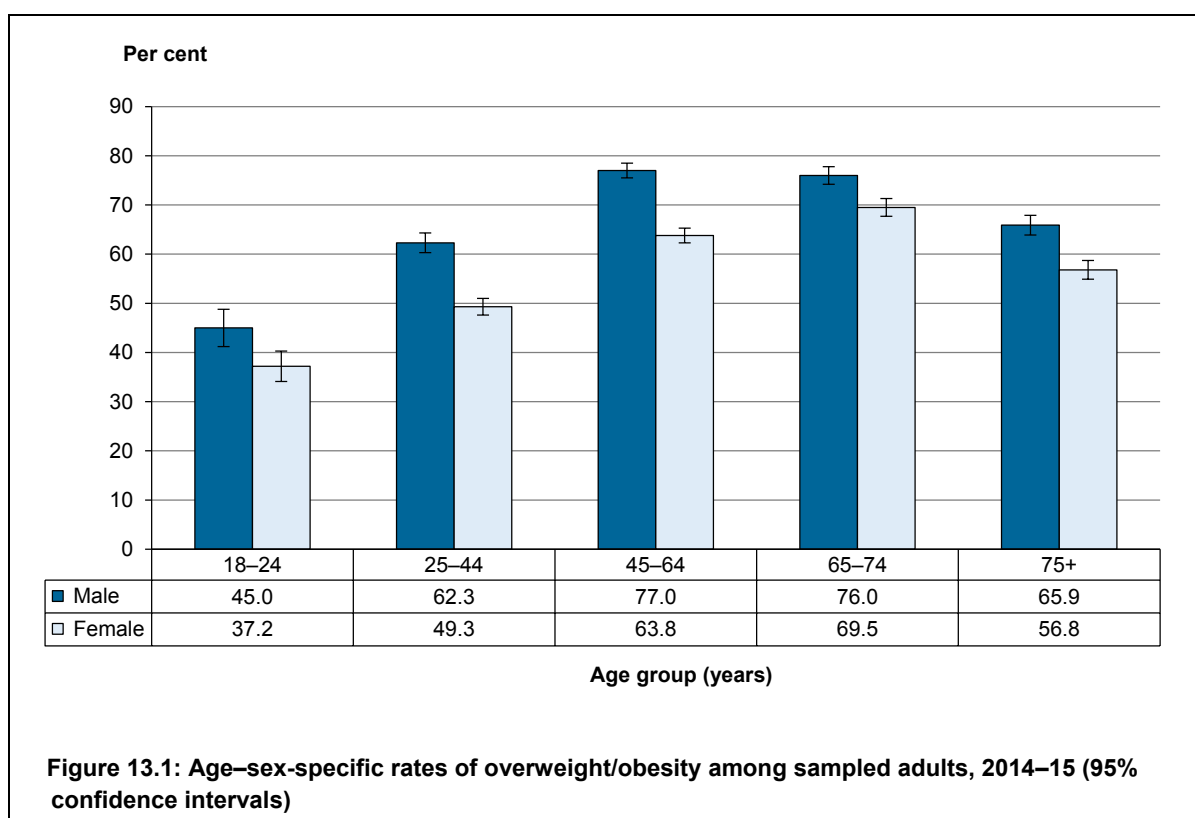
Table 13.1: Patient body mass index (aged 18 years and over)

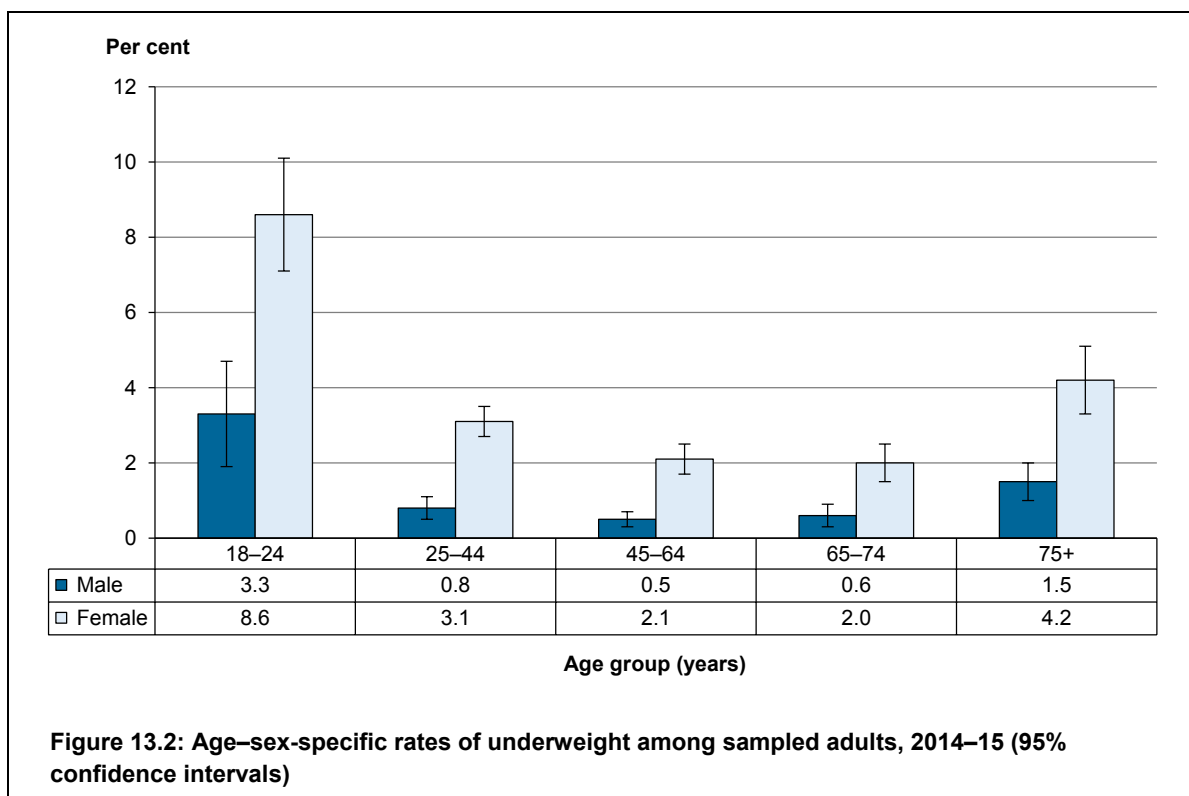
BMI class	Male ^(a)		Female ^(a)		Total respondents	
	Per cent in BEACH sample (95% CI) (n = 12,947)	Per cent in patient population (95% CI) ^(b)	Per cent in BEACH sample (95% CI) (n = 19,765)	Per cent in patient population (95% CI) ^(b)	Per cent in BEACH sample (95% CI) (n = 32,956)	Per cent in patient population (95% CI) ^(b)
Obese	28.1 (27.1–29.0)	27.1 (26.0–28.1)	27.9 (27.0–28.8)	27.4 (26.4–28.3)	28.0 (27.3–28.8)	27.2 (26.4–28.0)
Overweight	41.4 (40.5–42.4)	40.2 (39.2–41.3)	29.3 (28.6–30.1)	28.5 (27.7–29.2)	34.1 (33.5–34.7)	33.9 (33.3–34.6)
Normal	29.6 (28.5–30.6)	31.7 (30.5–32.9)	39.5 (38.4–40.5)	40.8 (39.7–41.9)	35.5 (34.7–36.3)	36.6 (35.7–37.5)
Underweight	0.9 (0.8–1.1)	1.0 (0.8–1.2)	3.3 (3.0–3.6)	3.4 (3.1–3.6)	2.4 (2.2–2.6)	2.3 (2.1–2.5)

(a) Patient sex was not recorded for 244 respondents.

(b) Estimation of BMI among the total adult general practice patient population (that is, patients aged 18 years and over who attended a GP at least once in 2014–15).

Note: BMI – body mass index; CI – confidence interval.



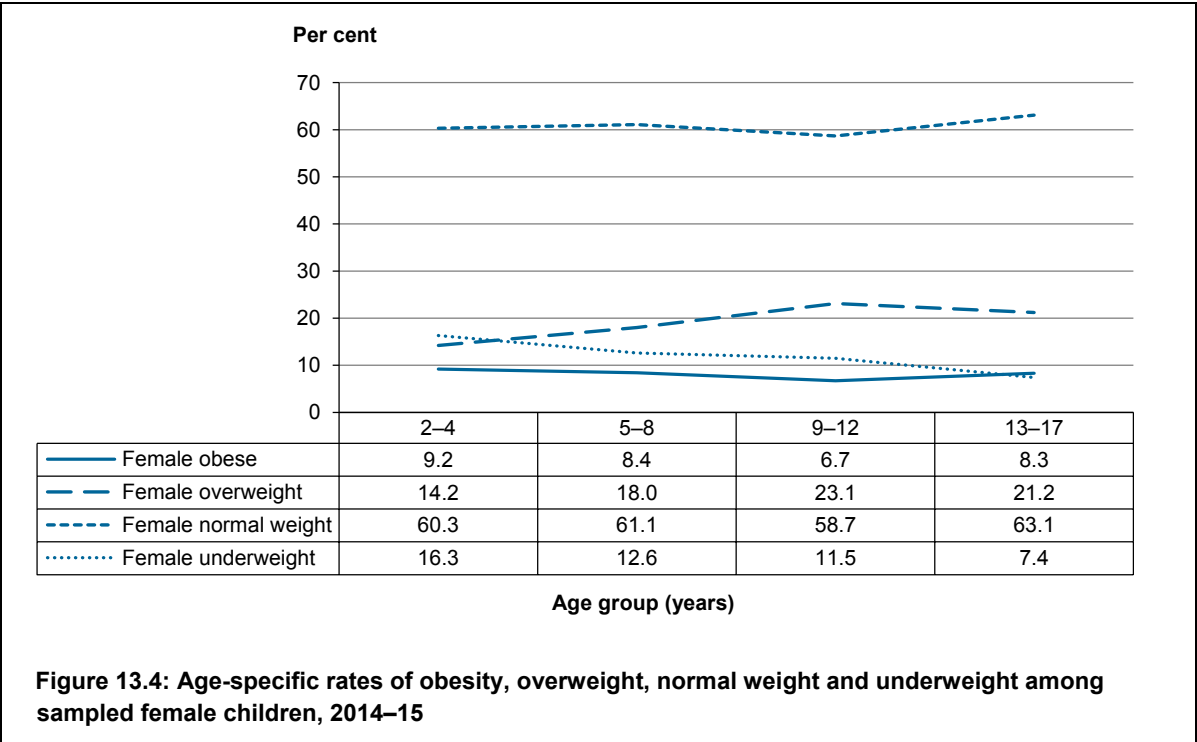
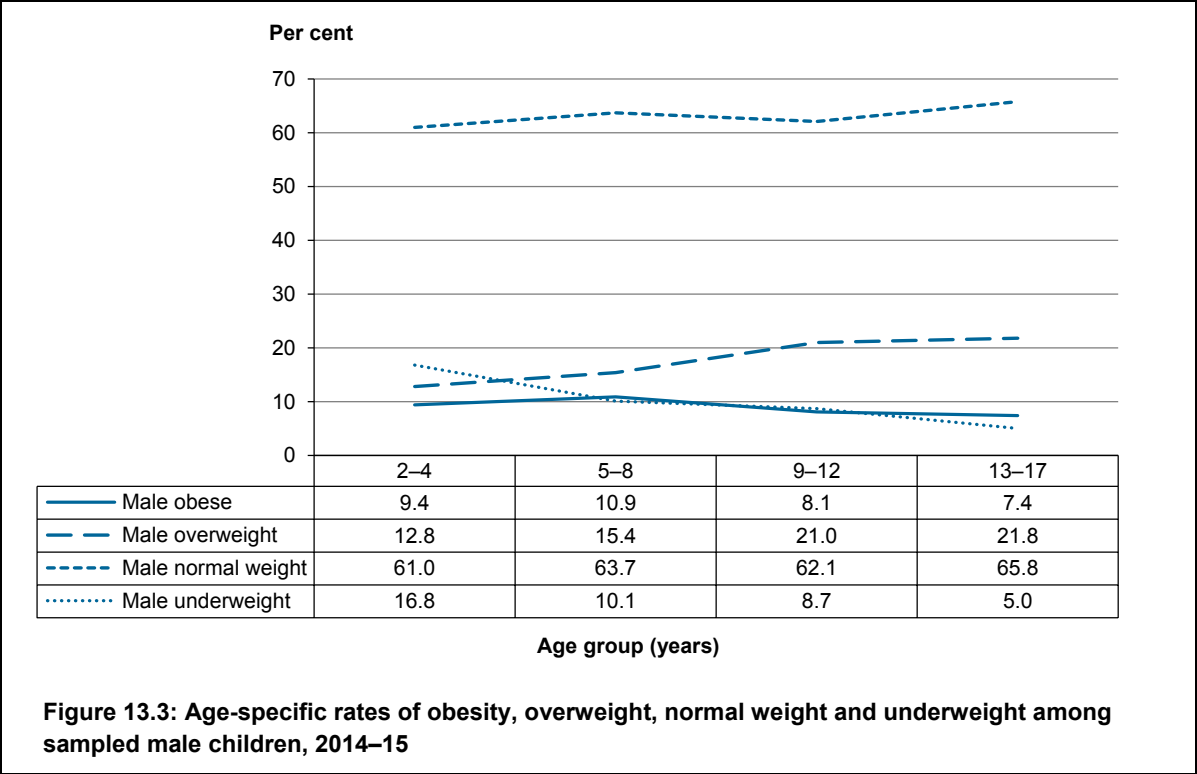


Body mass index of children

BMI was calculated for 3,112 patients aged 2–17 years at encounters with 901 GPs.

- Just over one-quarter of children (27.0%, 95% CI: 25.2–28.8) were classed as overweight or obese, including 8.6% (95% CI: 7.5–9.7) obese and 18.4% (95% CI: 17.0–19.9) overweight (results not tabled).
- There was no difference in the prevalence of overweight/obesity among male (26.6%, 95% CI: 24.2–28.9) and female children (27.5%, 95% CI: 25.1–29.8) (results not tabled).
- The age-specific rates of obesity followed similar patterns for both sexes (Figures 13.3 and 13.4).

Readers interested in further detail and discussion about overweight and obesity in children attending general practice will find more information in Cretikos et al. (2008) *General practice management of overweight and obesity in children and adolescents in Australia*.⁸⁵



13.2 Smoking (patients aged 18 years and over)

Tobacco smoking is the leading cause of ill health, drug-related death and hospital separations in Australia.⁸⁶ It is a major risk factor for coronary heart disease, stroke, peripheral vascular disease, several cancers, respiratory disorders and other diseases.⁸⁷ The most recent publicly available Australian data identified smoking as the risk factor associated with the greatest disease burden, accounting for 7.8% of the total burden of disease in Australia in 2003,⁷² a decrease from 9.7% of total burden in 1996.⁷³

The Global Burden of Disease 2010 study has compared burden of disease and injury attributable to 67 risk factors in 21 regions. In Australasia (which includes Australia), 'tobacco smoking, including second-hand smoke' was ranked as the second most important risk factor for disease burden. These Australasian rankings are on par with the global risk factor rankings, with 'tobacco smoking, including second-hand smoke' also second globally.⁷⁴

In 2015, the OECD reported that Australia has been remarkably successful in reducing tobacco consumption by more than half, from 30.6% of adults in 1986 to 12.8% in 2013, now one of the lowest smoking rates in OECD countries.⁷⁵ The 2014 summary suggested "much of this decline can be attributed to policies aimed at reducing tobacco consumption through public awareness campaigns, advertising bans and increased taxation". In December 2012, Australia became the first (and currently only) country to require tobacco products to be sold in plain packaging.⁷⁶ In March 2015, Britain's parliament approved legislation to ban branding on cigarette packs. The plain packaging legislation is expected to come into force in May 2016.⁸⁸

According to the 2010 National Drug Strategy Household Survey (NDSHS), 15.1% of Australians aged 14 years and over smoked daily: 16.4% of males and 13.9% of females.⁸⁹ The 2011–12 Australian Health Survey reported that 16.1% of Australians aged 18 years and over were daily smokers: 18.1% of males and 14.1% of females.⁷⁷

Method

GPs were instructed to ask adult patients (18 years and over):

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

Results

The smoking status of 33,685 adult patients was established at encounters with 993 GPs. Table 13.2 shows that:

- 14.1% of sampled adult patients were daily smokers
- significantly more male (17.4%) than female patients (11.9%) were daily smokers (Table 13.2)
- only 2.2% of sampled adult patients were occasional smokers
- more than one-quarter of sampled adults (27.8%) were previous smokers.

Estimation of smoking in the adult general practice patient population

The BEACH study provides data about patient smoking habits from a sample of the patients attending general practice. As older people attend a GP more often than young adults, and females attend more often than males, they have a greater chance of being selected in the subsample. This leads to a greater proportion of older and female patients in the BEACH sample than in the total population who attend a GP at least once in a year. The 2014–15 BEACH sample was weighted to estimate the

smoking status of the GP–patient attending population (that is, the 15.8 million adult patients who attended a GP at least once in 2014–15 [personal communication, DoH, June 2015]), using the method described by Knox et al. (2008).²⁰

After adjusting for age–sex general practice attendance patterns, we estimated that 16.5% of the patient population aged 18 or more were daily smokers, 2.8% were occasional smokers, 25.1% were previous smokers and 55.5% had never smoked. Male patients in the total general practice population were significantly more likely to be daily (20.5%), occasional (3.5%) and previous smokers (29.5%), than female patients (13.1%, 2.3% and 21.3%, respectively) (Table 13.2).

Table 13.2: Patient smoking status (aged 18 years and over)

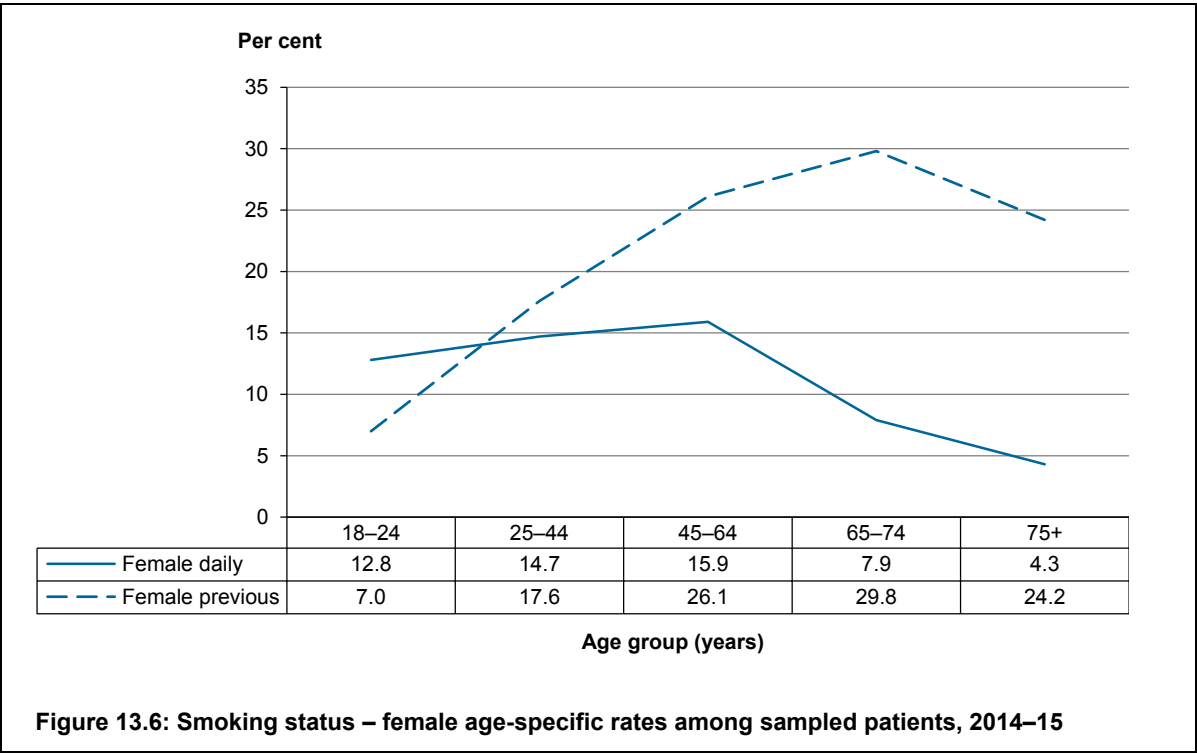
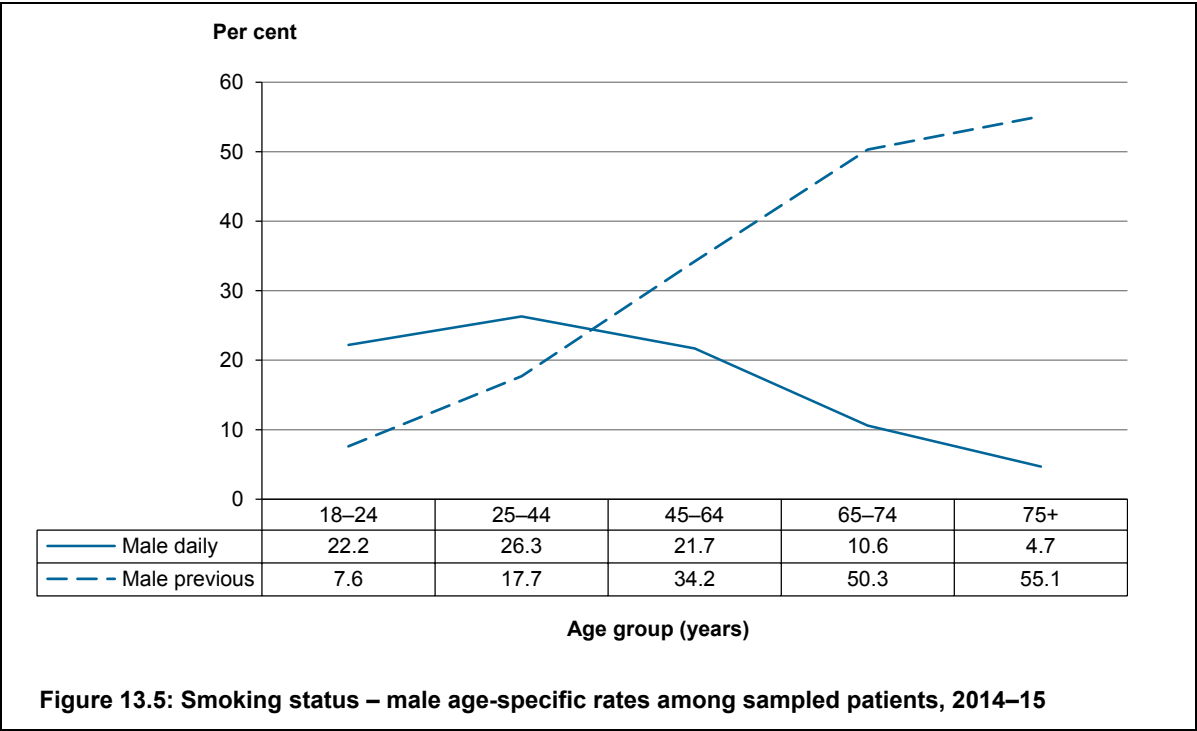
Smoking status	Male ^(a)		Female ^(a)		Total respondents	
	Per cent in BEACH sample (95% CI) (n = 13,180)	Per cent in patient population (95% CI) ^(b)	Per cent in BEACH sample (95% CI) (n = 20,252)	Per cent in patient population (95% CI) ^(b)	Per cent in BEACH sample (95% CI) (n = 33,685)	Per cent in patient population (95% CI) ^(b)
Daily	17.4 (16.5–18.4)	20.5 (19.4–21.7)	11.9 (11.3–12.6)	13.1 (12.4–13.8)	14.1 (13.4–14.7)	16.5 (15.7–17.3)
Occasional	2.6 (2.3–2.9)	3.5 (3.1–3.9)	2.0 (1.7–2.2)	2.3 (2.0–2.6)	2.2 (2.0–2.4)	2.8 (2.6–3.1)
Previous	36.0 (34.8–37.2)	29.5 (28.3–30.6)	22.4 (21.6–23.3)	21.3 (20.5–22.1)	27.8 (27.0–28.6)	25.1 (24.3–25.9)
Never	44.0 (42.8–45.2)	46.5 (45.2–47.8)	63.7 (62.6–64.8)	63.3 (62.2–64.5)	55.9 (54.9–56.9)	55.5 (54.5–56.6)

(a) Patient sex was not recorded for 253 respondents.

(b) Estimation of smoking status among the total adult general practice patient population (that is, patients aged 18 years and over who attended a GP at least once in 2014–15).

Note: CI – confidence interval.

Daily smoking was least prevalent among older adults aged 65–74 and 75 years or more (9.1% and 4.4% respectively), and most prevalent among adult patients aged 25–44 years (18.8%) (results not tabled). Over half (55.1%) of the male and 24.2% of the female patients aged 75 years and over were previous smokers, but only 4.7% of males and 4.3% of females in this age group were daily smokers (Figures 13.5 and 13.6).



13.3 Alcohol consumption (patients aged 18 years and over)

Among people aged 65 years and over, low to moderate consumption of alcohol has been found to have a preventive effect against selected causes of morbidity.⁹⁰ Following a review of the evidence, the NHMRC stated that at low levels of consumption, alcohol has some cardiovascular health benefits in certain age groups (middle-aged and older males, and women after menopause). Low levels of alcohol consumption raise high-density lipoprotein cholesterol and reduce plaque accumulations in arteries. Alcohol can also have a mild anti-coagulating effect. However, the authors of the review noted that the extent of cardiovascular risk reduction is uncertain, and the potential cardiovascular benefits can be gained from other means, such as exercise or diet modification.⁹¹ From the most recent publicly available Australian data, in 2003, alcohol consumption accounted for 3.3% of the total burden of disease in Australia; however, after taking into account the benefit derived from low to moderate alcohol consumption, this fell to 2.3%.⁷²

The Global Burden of Disease 2010 study compared burden of disease and injury attributable to 67 risk factors in 21 regions. In Australasia (which includes Australia) 'alcohol use' was ranked as the ninth risk factor for disease burden, a lower ranking than in the global risk factor rankings, where 'alcohol use' ranked fifth.⁷⁴

The Australian Health Survey classified alcohol use for those aged 18 years or more based on the estimated average daily consumption of alcohol during the previous week. The results indicated that 11.7% drank at levels considered to be risky (13.4% of males and 10.1% of females), based on the 2001 NHMRC guidelines.¹⁸ Based on the NHMRC 2009 guidelines, 19.5% of adults drank at levels exceeding the guidelines (29.1% of males and 10.1% of females).¹⁸

The 2010 NDSHS found that 20.1% of people aged 14 years and over (29.0% of males and 11.3% of females) drank at levels considered to put them at risk of harm from alcohol-related disease or injury over their lifetime. The NDSHS also found that 28.4% of people aged 14 years or more (38.2% of males and 18.9% of females) drank (at least once in the previous month) in a pattern that placed them at risk of an alcohol-related injury from a single drinking occasion.⁸⁹ These alcohol consumption risk levels were based on the NHMRC 2009 guidelines.⁹¹

For consistency over time, this report uses the definitions of alcohol-related risk developed by WHO (see 'Method' below).⁹² This differs from the definition in the NHMRC guidelines.

Method

To measure alcohol consumption, BEACH uses AUDIT-C,⁹³ which is the first three items from the WHO Alcohol Use Disorders Identification Test (AUDIT),⁹² with scoring for an Australian setting.⁹⁴ The AUDIT-C tool has demonstrated validity and internal consistency and performs as well as the full AUDIT tool.⁹⁵ The three AUDIT-C questions are practical and valid in a primary care setting to assess 'at-risk' alcohol consumption (heavy drinking and/or active alcohol dependence).⁹³ The scores for each question range from zero to four. A total (sum of all three questions) score of five or more for males, or four or more for females, suggests that the person's drinking level is placing him or her at risk.⁹⁴

GPs were instructed to ask adult patients (18 years and over):

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

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

Results

Patient self-reported alcohol consumption was recorded for 32,835 adult patients (18 years and over) at encounters with 993 GPs.

- Just under one-quarter of sampled adults reported drinking alcohol at at-risk levels (23.3%) (Table 13.3).
- At-risk drinking was more prevalent among male (28.2%) than female patients (20.1%) (Table 13.3).
- At-risk drinking was most prevalent in those aged 18–24 years, particularly among males. In this age group over a third of males (37.9%) and over a quarter of females (28.8%) reported at-risk alcohol consumption (Figure 13.7).
- The proportion of patients who were at-risk drinkers decreased with age among both males and females (Figure 13.7).

Estimation of alcohol consumption levels in the adult general practice patient population

The BEACH study provides data about patient alcohol consumption from a sample of the patients attending general practice. As older people attend a GP more often than young adults, and females attend more often than males, they have a greater chance of being selected in the subsample. This leads to a greater proportion of older and female patients in the BEACH sample than in the total population who attend a GP at least once in a year. The 2014–15 BEACH sample was weighted to estimate the prevalence of at-risk alcohol consumption among the GP–patient attending population (that is, the 15.8 million adult patients who attended a GP at least once in 2014–15 (personal communication, DoH, June 2015), using the method described by Knox et al. (2008).²⁰

After adjusting for age–sex general practice attendance patterns, we estimated that 26.1% of the patient population were at-risk drinkers, 43.0% were responsible drinkers and 30.8% were non-drinkers. Males in the general practice attending population were significantly more likely to be at-risk drinkers (31.7%) than females (21.3%) (Table 13.3).

Table 13.3: Patient alcohol consumption (aged 18 years and over)

Alcohol consumption	Male		Female		Total respondents	
	Per cent in BEACH sample (95% CI) (n = 12,969)	Per cent in patient population (95% CI) ^(a)	Per cent in BEACH sample (95% CI) (n = 19,866)	Per cent in patient population (95% CI) ^(a)	Per cent in BEACH sample (95% CI) (n = 32,835)	Per cent in patient population (95% CI) ^(a)
At-risk drinker	28.2 (27.1–29.4)	31.7 (30.3–33.0)	20.1 (19.2–21.0)	21.3 (20.3–22.3)	23.3 (22.5–24.2)	26.1 (25.2–27.1)
Responsible drinker	47.0 (45.9–48.2)	45.3 (44.2–46.5)	40.2 (39.2–41.3)	41.0 (40.0–42.1)	42.9 (42.0–43.8)	43.0 (42.1–43.9)
Non-drinker	24.7 (23.5–25.9)	23.0 (21.8–24.2)	39.7 (38.3–41.0)	37.6 (36.3–39.0)	33.8 (32.7–34.9)	30.8 (29.7–31.9)

(a) Estimation of alcohol consumption among the total adult general practice patient population (that is, patients aged 18 years and over who attended a GP at least once in 2014–15).

Note: CI – confidence interval.

These estimates are not directly comparable with the results from the 2011–12 Australian Health Survey¹⁸ or the 2010 NDSHS.⁸⁹ They all use different definitions for risky levels of alcohol consumption, and different adult populations (patients aged 18 years or more for BEACH, persons aged 15 or 18 years or more for the Australian Health Survey, and persons aged 14 years or more for the NDSHS).

Readers interested in the relationship between morbidities managed and alcohol consumption will find more information in Proude et al. (2006) *The relationship between self-reported alcohol intake and the morbidities managed by GPs in Australia*.⁹⁶

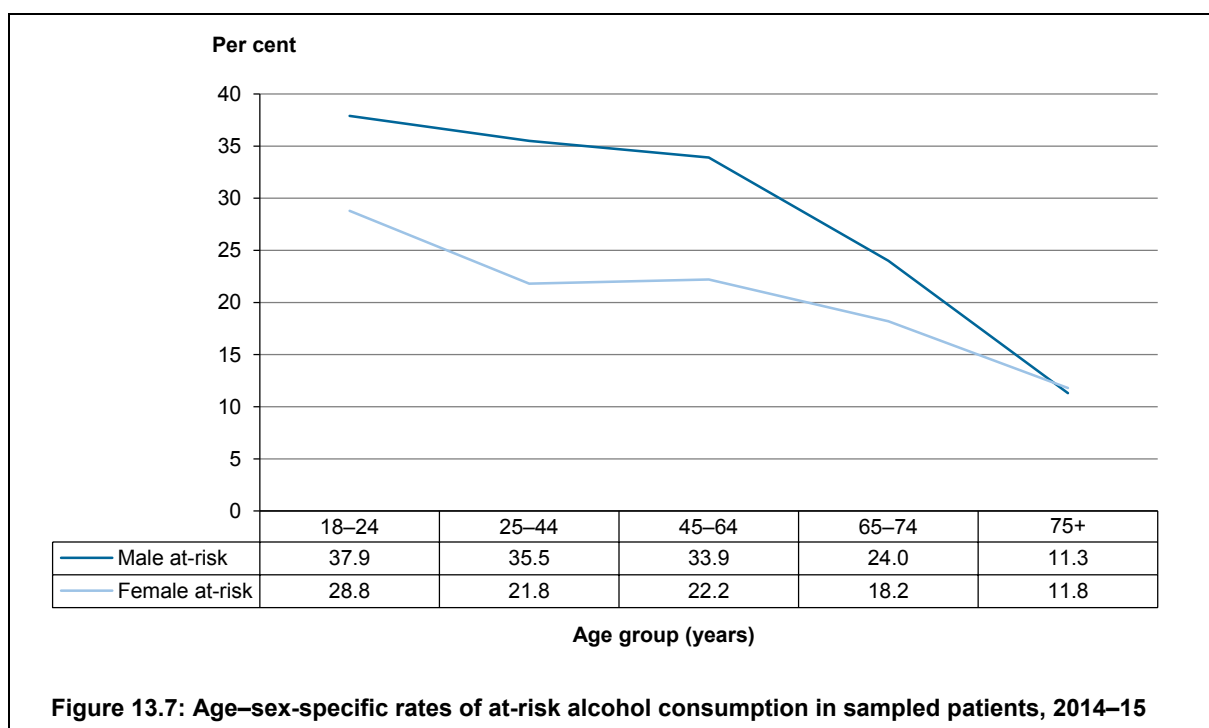


Figure 13.7: Age–sex-specific rates of at-risk alcohol consumption in sampled patients, 2014–15

13.4 Risk factor profile of adult patients

All patient risk factor questions (BMI, smoking and alcohol consumption) were asked of the same subsample of patients. This allows us to build a risk profile of this sample. For the purposes of this analysis, being overweight or obese, a daily smoker or an at-risk drinker was considered a risk factor. A risk factor profile was prepared for the 31,952 adult patients from 992 GPs, for whom data were available in all three elements (Table 13.4).

- About half (52.2%) the sampled adult respondents had one risk factor. The most common was overweight (23.1% of adults) followed by obesity (19.2%).
- Almost 1 in 5 patients (19.0%) had two risk factors. The most common combinations were:
 - overweight and at-risk alcohol consumption – 6.5% of patients
 - obesity and at-risk alcohol consumption – 4.8% of patients
 - overweight and daily smoking – 2.7% of patients.
- A small group of patients (3.2%) had all three risk factors.

Table 13.5 shows the number of risk factors by patient sex.

- Females were significantly more likely to have no risk factors (29.8%) than males (19.2%).
- Females were significantly less likely to have two or three risk factors (14.9% and 2.2% respectively) than males (25.1% and 4.7%).

Estimation of the risk profile of the adult general practice patient population

The 2014–15 BEACH sample was weighted to estimate the risk profile of the GP–patient attending population; that is, the 15.8 million adult patients who attended a GP at least once in 2014–15.

After adjusting for age–sex general practice attendance patterns we estimated that:

- one-quarter of all attending adult patients had no risk factors (24.9%)
- half of the adult patients had one risk factor (50.1%), with the most common being overweight (21.4% of adults) followed by obesity (17.7%)
- 1 in 5 patients had two risk factors (21.0%), with the most common combinations being overweight and at-risk alcohol consumption (7.1%), followed by obesity and at-risk alcohol consumption (5.1%)
- 3.9% of patients who attend general practice had three risk factors (Table 13.4)
- significantly more female than male patients had no risk factors (30.1% and 18.8% respectively). Male patients were also more likely to have two and three risk factors (27.4% and 5.6%) than females (15.5% and 2.5%) (Table 13.5).

Table 13.4: Risk factor profile of patients (aged 18 years and over)

Number of risk factors	Number	Per cent in BEACH sample (n = 31,952)			Per cent in patient population ^(a)		
		95% LCL	95% UCL	95% LCL	95% UCL	95% LCL	95% UCL
No risk factors	8,180	25.6	24.8	26.4	24.9	24.1	25.8
One risk factor	16,690	52.2	51.5	53.0	50.1	49.4	50.9
Overweight only	7,366	23.1	22.5	23.6	21.4	20.8	22.0
Obese only	6,133	19.2	18.6	19.8	17.7	17.0	18.3
At-risk alcohol level only	2,134	6.7	6.3	7.1	7.3	6.8	7.8
Current daily smoker only	1,057	3.3	3.1	3.6	3.7	3.4	4.0
Two risk factors	6,059	19.0	18.3	19.6	21.0	20.3	21.7
Overweight and at-risk alcohol level	2,089	6.5	6.2	6.9	7.1	6.7	7.5
Obese and at-risk alcohol level	1,544	4.8	4.5	5.1	5.1	4.8	5.4
Overweight and current daily smoker	876	2.7	2.5	3.0	3.1	2.9	3.4
Obese and current daily smoker	833	2.6	2.4	2.8	2.8	2.6	3.1
Daily smoker and at-risk alcohol level	717	2.2	2.0	2.5	2.9	2.6	3.2
Three risk factors	1,023	3.2	3.0	3.4	3.9	3.6	4.2
Overweight and current daily smoker and at-risk alcohol level	588	1.8	1.7	2.0	2.3	2.1	2.5
Obese and current daily smoker and at-risk alcohol level	435	1.4	1.2	1.5	1.6	1.5	1.8

(a) Estimation of risk factor profile among the total adult general practice patient population (that is, patients aged 18 years and over who attended a GP at least once in 2014–15).

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

Table 13.5: Number of risk factors by patient sex

Number of risk factors	Male		Female	
	Per cent in BEACH sample (95% CI) (n = 12,665)	Per cent in patient population (95% CI) ^(a)	Per cent in BEACH sample (95% CI) (n = 19,287)	Per cent in patient population (95% CI) ^(a)
No risk factors	19.2 (18.3–20.1)	18.8 (17.8–19.8)	29.8 (28.8–30.8)	30.1 (29.1–31.2)
One risk factor	51.0 (49.9–52.0)	48.1 (47.0–49.3)	53.1 (52.2–53.9)	51.8 (50.9–52.7)
Two risk factors	25.1 (24.2–26.1)	27.4 (26.4–28.5)	14.9 (14.3–15.6)	15.5 (14.9–16.2)
Three risk factors	4.7 (4.3–5.1)	5.6 (5.1–6.1)	2.2 (2.0–2.4)	2.5 (2.2–2.8)

(a) Estimation of risk factor profile among the total adult general practice patient population (that is, patients aged 18 years and over who attended a GP at least once in 2014–15).

Note: CI – confidence interval.

13.5 Changes in patient risk factors over the decade 2005–06 to 2014–15

To investigate changes over time in prevalence of these patient risk factors (overweight and obesity, smoking, at-risk alcohol consumption), results are reported from the BEACH sample data for each year from 2005–06 to 2014–15 in Chapter 13 of the companion report, *A decade of Australian general practice activity 2005–06 to 2014–15*.¹

The major changes between 2005–06 and 2014–15 are summarised below.

- The prevalence of obesity in adults attending general practice increased significantly, from 22.2% to 28.0%, an increase apparent in both male and female patients. In parallel, the prevalence of normal weight in adults attending general practice decreased significantly, from 40.5% to 35.5%.
- The prevalence of overweight and obesity among sampled children aged 2–17 years remained static for 7 years from 2005–06 to 2011–12 (around 18% and 10% respectively), but then obesity dropped to around 9% in 2012–13 to 2014–15, however the drop in obesity was only marginally significant compared with 2005–06. Similar patterns were noted for both male and female children, however there were no significant differences over the decade.
- There was a significant decrease in the prevalence of current daily smoking and occasional smoking among sampled adults aged 18 years and over, from 17.1% and 3.6% respectively in 2005–06, to 14.1% and 2.2% in 2014–15. These decreases were apparent among both male and female patients.
- Prevalence of at-risk levels of alcohol consumption among sampled adults declined from about 26% in 2005–06 to 23% in 2014–15. A corresponding increase in non-drinkers from about 29% in 2005–06 to 34% in 2014–15 was apparent. The significant decrease in at-risk levels of alcohol consumption and increase in non-drinkers was apparent among both male and female patients.
- There was a significant increase in the proportion of sampled adults with one risk factor from 49.2% in 2005–06, to 52.2% in 2014–15, and the increase applied to both male and female patients. About 1 in 5 adults had two risk factors in all reported years. There was a significant decrease in the proportion of patients with three risk factors, from 3.9% to 3.2%.

14 Care of older people in general practice

14.1 Background

Like other OECD countries, Australia's population is ageing. The proportion aged 65 years or older (65+) increased from 12.4% in June 2000 to 14.7% in June 2014,⁶⁰ and the Australian Bureau of Statistics (ABS) expects the proportion to reach 18.6% by 2030.⁹⁷

The two main drivers for this increase are lower fertility rates and increased life expectancy.

Lower fertility rates

Since the mid 1970s, Australia's fertility rate has been lower than that required to replace both the mother and her partner in the population (2.1 children per woman is considered to be the replacement rate).⁹⁸ In 2013, the total fertility rate was approximately 1.88 children per woman,⁹⁸ so the proportion of the population who are children is decreasing, and the proportion who are older is increasing.

Increasing life expectancy

People are living longer than they did in previous generations. Since 1947, life expectancy in Australia has increased by approximately 12 years and is currently one of the highest in the world.⁹⁹

Importantly, it is not only the total number of years that has increased, but also the years without disability from illness.¹⁰⁰ The increase in life expectancy has increased the number of older Australians, which in turn increases the average age of the population.

While Australians enjoy one of the longest life expectancies in the world, what we pay for health care is comparable to countries with lower life expectancies. Box 14.1 shows World Health Organization (WHO) data from 2013 for five selected developed countries. Of the group, Australia had the highest life expectancy (4 years more than the average American). In terms of total (public and private) health expenditure as a proportion of gross domestic product, Australia and the United Kingdom spent the least at 9%, while the United States spent 17%. In terms of total health expenditure per person in US dollars, the UK spent the least at \$3,311 per person, the United States spent the most at \$9,146 per person, and Australia was mid-range at \$4,191 per person.

Box 14.1: Life expectancy at birth and total health expenditure for selected countries (2013)

	Australia	New Zealand	United Kingdom	Canada	United States of America
Life expectancy	83 years	82 years	81 years	82 years	79 years
Total health expenditure (GDP)	9%	10%	9%	11%	17%
Total health expenditure (PPP USD\$ per capita)	\$4,191	\$3,405	\$3,311	\$4,759	\$9,146

Note: PPP – Purchasing Power Parity; GDP – Gross Domestic Product; USD – United States Dollars.

Sources: WHO Global Health Expenditure Database¹⁰¹; WHO Global Health Observatory Data Repository, Life expectancy data by country.¹⁰²

However Indigenous Australians do not enjoy the same level of life expectancy. It is estimated male Indigenous Australians born in 2010–12 will live 10.6 fewer years on average, and Indigenous females 9.5 fewer years than the average for the non-Indigenous Australian population.¹⁰³

The ageing of the population places additional demands on health and other resources because increased age is associated with increased prevalence of diagnosed chronic conditions. While the proportion of the population made up by people aged 65+ increased by 18% from June 2000 to June 2014,⁶⁰ Medicare data show that the proportion of GP encounters that were with patients aged 65+ increased by 22% over the same period. Nearly all people aged 65+ (98.5%) had at least one Medicare-claimed GP visit in 2014–15, and some of the remaining 1.5% may have also visited, with the visits being covered by the Department of Veterans' Affairs. The average number of GP visits per person aged 65+ in a given year increased from 9.6 in 2000–01 to 10.4 in 2014–15.

This chapter explores the care of people aged 65+ in general practice over the 15 years, from April 2000 to March 2015, using data from the BEACH study and several of its substudies. We examine GP services provided, the content of the encounters, continuity of care, and the prevalence of chronic problems and multimorbidity. Finally, we look at risk factors which affect the health of patients in older age groups.

We investigated:

- chronic pain, which is associated with many chronic problems, as pain management adds to the increasing number of medications being taken by older patients
- adverse drug events, a growing risk because of the increasing number of medications required to manage the multiple chronic conditions often prevalent in older patients
- smoking, alcohol consumption and overweight in patients aged 65+, as these are modifiable risk factors that exacerbate many chronic respiratory, circulatory, metabolic and musculoskeletal conditions experienced by older patients.

These results will provide valuable information for health policy makers and service providers, to help structure a response to the challenges of caring for an ageing population.

14.2 Results

The increase in people aged 65+ and the flow on increases in general practice use

Over the period 2000–01 to 2014–15, the proportion of:

- GP-patient encounters accounted for by people aged 65+ increased from 22.8% to 27.8%, a 22% relative increase
- GP face-to-face clinical consulting time that was spent managing patients aged 65+ increased from 23.9% to 28.7%, a 20% relative increase
- problems managed in general practice that were with patients aged 65+ increased from 26.9% to 35.0%, a 30% relative increase
- all medications prescribed, supplied or advised for over-the-counter purchase in general practice that were for patients aged 65+ increased from 28.2% to 35.8%, a 27% relative increase
- all pathology and imaging tests ordered that were for patients aged 65+ increased from 24.9% to 30.8%, a 24% relative increase
- referrals made in general practice that were for patients aged 65+ increased from 24.2% to 32.2%, a 33% relative increase.

All the relative increases were far larger than the 18% relative increase in the proportion of the population aged 65+. This is because patients aged 65+ attended more often than average, and more problems were managed at these encounters. This results in more clinical actions per encounter with people in this age group than at encounters with younger people.

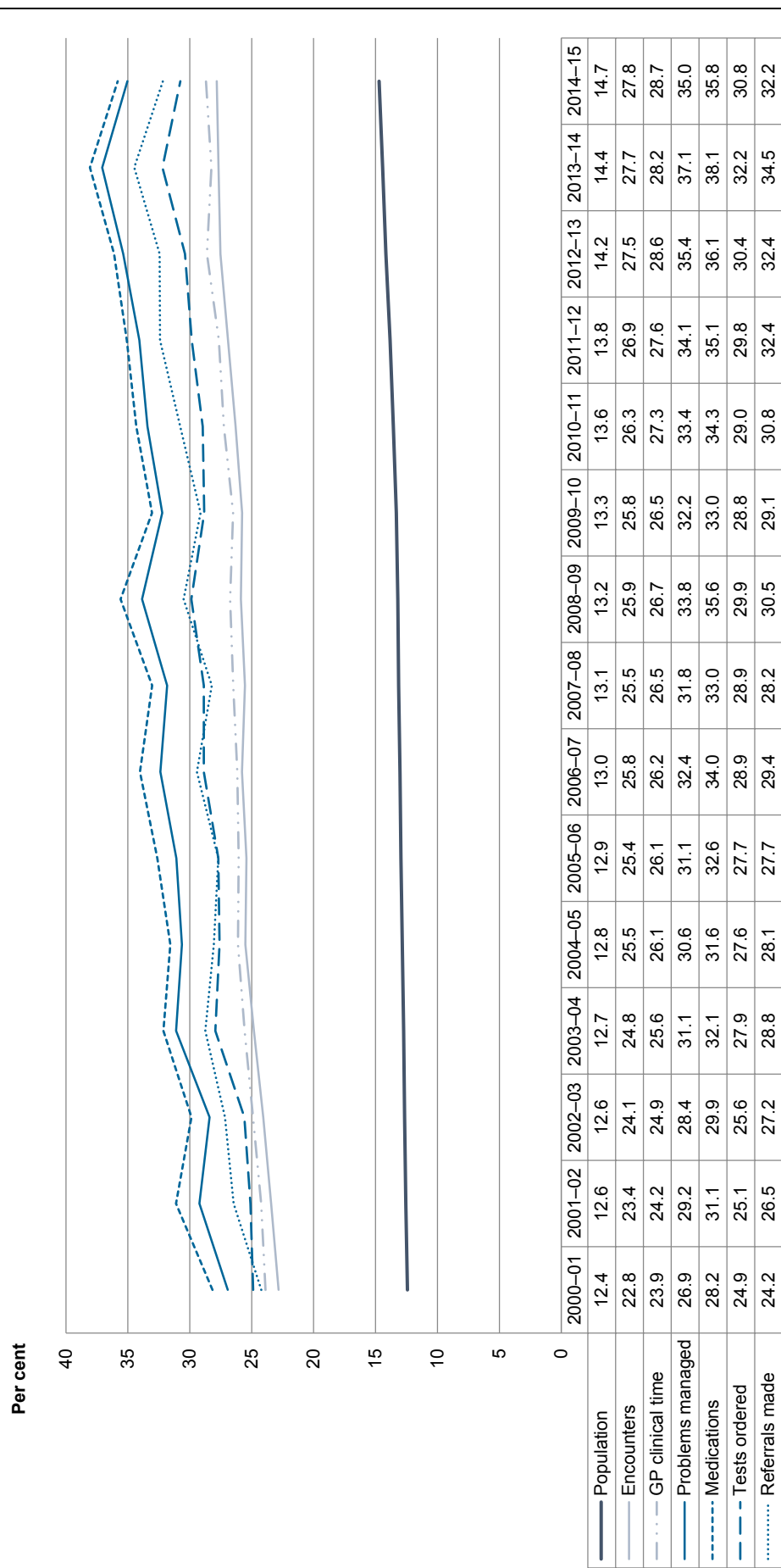
Figure 14.1 facilitates relative comparisons between the proportion of management actions accounted for by patients aged 65+ and the proportion they account for in the population. For example, in 2014–15, patients aged 65+ accounted for 35.8% of all medication emanating from general practice while they only accounted for 14.7% of the population. By dividing the 35.8% by 14.7%, we find that people aged 65+ on average use 2.4 times as many medications as the average Australian. Applying the same approach, in 2014–15, compared with the average Australian, people aged 65+ had:

- 1.9 times more GP encounters
- 2.0 times more clinical face-to-face time with GPs
- 2.4 times more problems managed
- 2.1 times more tests ordered
- 2.2 times more referrals made.

There was no significant change in the average length of consultations with this age group, ranging from 14.1 to 15.1 minutes across the study (results not tabled).

Figure 14.2 gives an idea of the content of GP encounters with patients aged 65+ from 2000–01 to 2014–15. Over this period, on average for every 100 encounters with patients aged 65+:

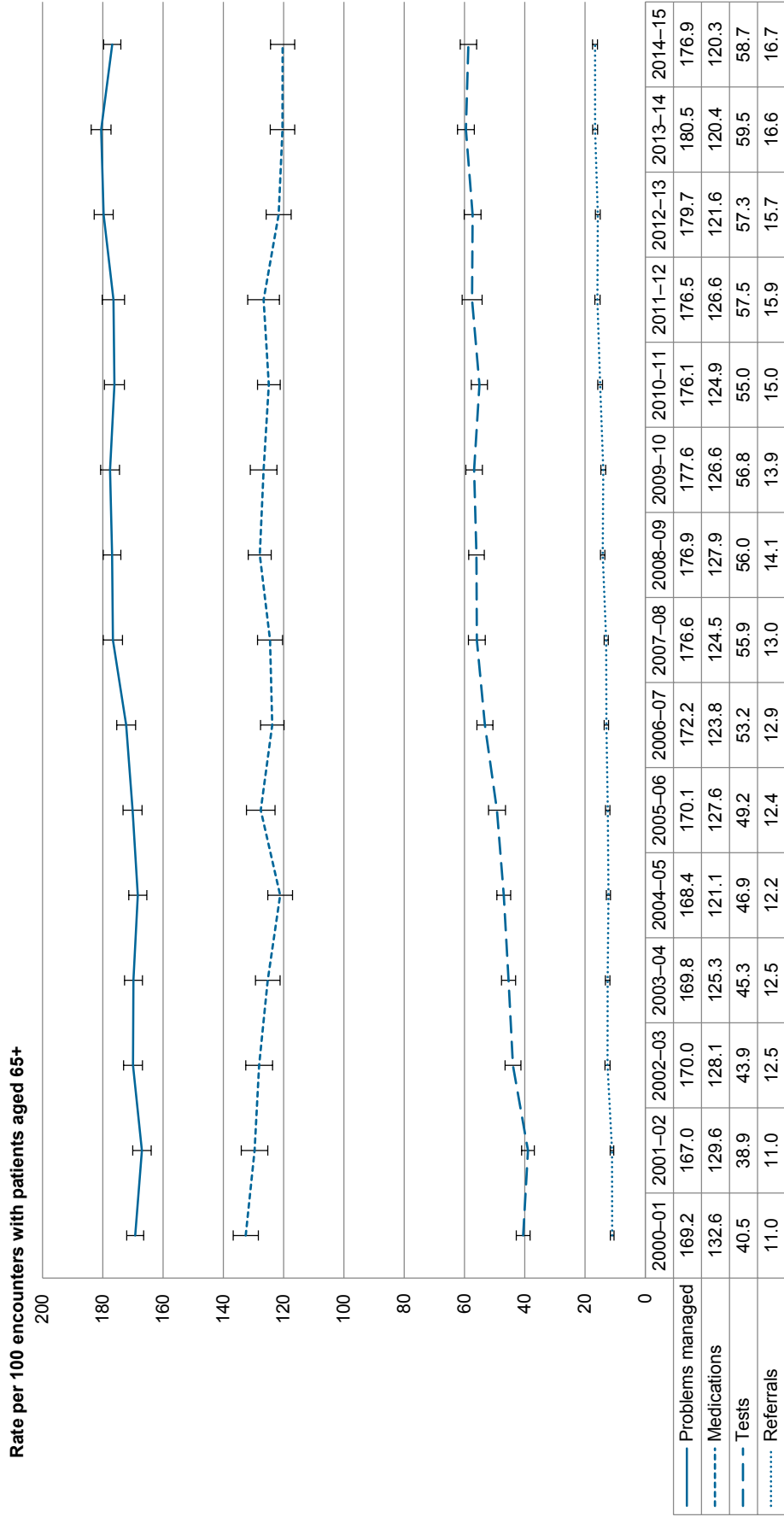
- the number of problems managed increased by 5% (from 169.2 per 100 encounters to 176.9)
- the number of tests ordered increased from 40.5 to 58.7, a 45% increase
- the number of referrals to specialists or allied health professionals, emergency departments or hospitals rose from 11.0 to 16.7, a 52% increase
- the number of medications prescribed, supplied to the patient or advised for over-the counter purchase decreased from 132.6 to 120.3, a decrease of 9%. This decrease may be due to the increasing number of combination medication products available (which now require a single prescription, when previously GPs had to prescribe the two products separately) and due to the increasing numbers of medications that used to be prescription-only, but are now available for over-the-counter purchase (so that patients can now acquire them without seeing a GP).



BEACH data years

Source: Population data: ABS 3101.0 Australian Demographic Statistics, Table 59.⁵⁰ Number of GP encounters: personal communication, Department of Health, June 2015. Length of consultation: BEACH SAND data. Notes: Medications include GP-prescribed, GP-supplied direct to the patient, and those advised for patient over-the-counter purchase. Tests include pathology, imaging, and other tests ordered or undertaken at the encounter. Referrals include all referrals made at the encounter (e.g. to medical specialists, allied health services, hospitals, clinics).

Figure 14.1 Proportion of population, GP encounters and management actions accounted for by people aged 65+ (2000-01 to 2014-15)

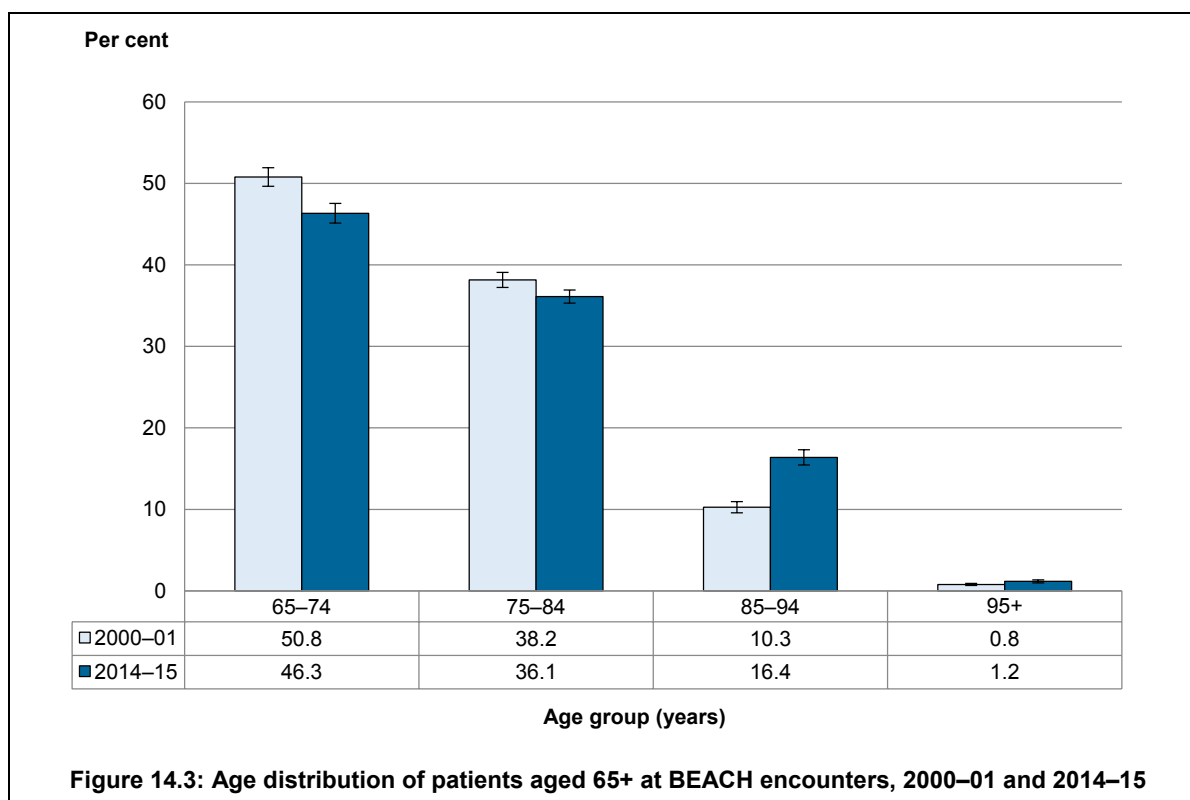


Notes: Medications include GP-prescribed, GP-supplied direct to the patient, and those advised for patient over-the-counter purchase. Tests include pathology, imaging, and other tests ordered or undertaken at the encounter. Referrals include all referrals made at the encounter (e.g. to medical specialists, allied health services, hospitals, clinics).

Figure 14.2: Rate of problems managed and clinical actions used in treatment per 100 encounters with patients aged 65+ (2000-01 to 2014-15)

Age distribution of patients aged 65+ at encounters

Over the study period, the average age of patients aged 65+ increased from 75.7 (95% CI: 75.5–75.9) in 2000–01 to 76.7 (95% CI: 76.4–76.9) in 2014–15. Figure 14.3 shows the age distribution of patients aged 65+ at BEACH encounters in 2000–01 and 2014–15. It is apparent that in 2014–15, older patients at GP encounters were less likely to be aged 65–84 years and more likely to be aged 85 years or more than in 2000–01. This means that proportionally, GP encounters with patients of 85 years or more have increased. This may explain some of the increase in use of services by patients aged 65+ years (reported earlier), above and beyond their increase as a proportion of the population.



Number of chronic conditions in people aged 65+

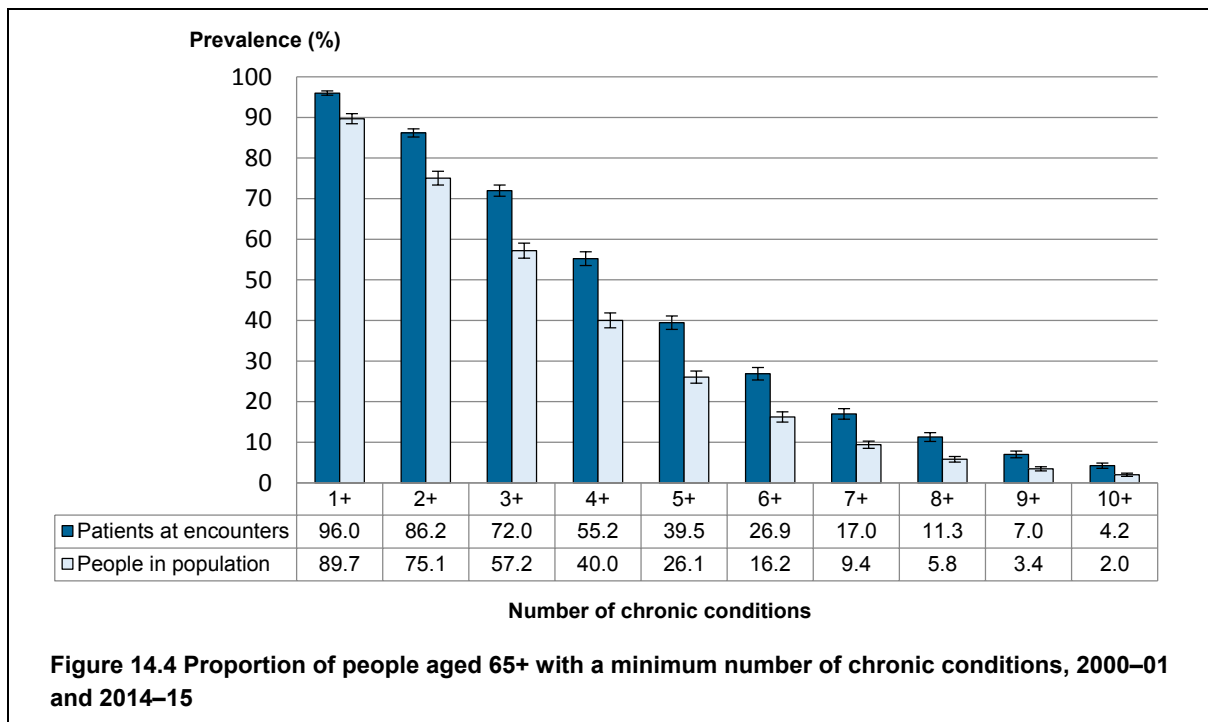
Between December 2012 and February 2015, we conducted a series of SAND substudies (see Section 2.6 for SAND methods) that examined the prevalence of diagnosed chronic conditions and multimorbidity among patients at general practice encounters. In total, information was collected from 35,162 patients, making it one of the largest, nationally representative, multimorbidity studies in the world. There were 11,181 patients in the sample aged 65+. The tools used in this study are described in more detail in SAND abstract 231 (Chapter 15).

Figure 14.4 shows that among those aged 65+:

- nearly all had one or more chronic conditions (96.0% of patients at encounters and 89.7% of people in the population). This means that only 4.0% of patients at encounters and 10.3% of people in the population aged 65+ had no diagnosed chronic conditions
- the majority had three or more diagnosed chronic conditions (72.0% of patients at encounters and 57.2% of people in the population)
- about a quarter of patients at encounters and 16.2% of people in the population had six or more diagnosed chronic conditions

- 4.2 % of patients at encounters and 2.0% of older people in the population had 10 or more diagnosed chronic conditions. Although this appears to be a small proportion it does suggest about 70,000 older people have 10 or more diagnosed chronic conditions.

Three or more diagnosed chronic conditions is often used as the definition of multimorbidity.²³ Multimorbidity is an important health indicator as it is associated with increased health care resource use,¹⁰⁴ complexity of care,¹⁰⁵ severity of illness,¹⁰⁵ polypharmacy¹⁰⁶ and adverse events.¹⁰⁶ Of the 11,181 patients aged 65+ in our sample, the average number of diagnosed chronic conditions among them was 4.2 (median = 4) and ranged from 0 to 21.



Prevalence and management of chronic conditions

Table 14.1 shows the prevalence and management rates of common chronic conditions among patients aged 65+. The pattern differs markedly for individual chronic conditions.

Example 1: diagnosed hypertension

- was present in 55.8% of patients aged 65+ at GP–patient encounters
- was managed at 15.5% of encounters with patients aged 65+, therefore was managed at 27.8% of encounters with patients with diagnosed hypertension.

Patients aged 65+ with diagnosed hypertension visited an average 8.7 times a year. Therefore we can conclude that among patients with diagnosed hypertension, this condition was managed at 2.4 of their 8.7 visits a year on average.

The prevalence of diagnosed hypertension among people aged 65+ in the population was 48.3%. Of those people with hypertension, 78.5% had two or more other chronic conditions (that is, they had three or more diagnosed chronic conditions in total).

Example 2: diagnosed type 2 diabetes

- was present in 19.4% of patients aged 65+ at encounters
- was managed at only 6.9% of encounters with patients aged 65+
- was managed at about 35.8% of GP encounters with a patient with diagnosed type 2 diabetes.

Patients aged 65+ with diagnosed type 2 diabetes visited 9.3 times a year on average (a little more often than patients with hypertension). This means that for these patients, their type 2 diabetes was managed 3.3 times a year on average.

The prevalence of type 2 diabetes among people aged 65+ in the population was 16.0%, and 83.8% of these people had two or more other diagnosed chronic conditions.

Example 3: diagnosed congestive heart failure (CHF)

- was managed at only 1.9% of encounters with patients aged 65+
- was present in 7.2% of patients aged 65+ at encounters
- was therefore managed at 26.0% of GP visits made by a patient with diagnosed CHF.

Patients aged 65+ with CHF visited 12.6 times a year on average (nearly 50% more often than patients with hypertension). We conclude that in these patients, CHF was managed 3.3 times a year on average (35% more often than hypertension).

The prevalence of CHF among people aged 65+ in the population was 4.2% and nearly all of these people (95.4%) had two or more other chronic conditions.

Example 4: diagnosed dementia (including Alzheimers)

- was managed at only 1.5% of encounters with patients aged 65+
- was present in 6.7% of patients aged 65+ at encounters
- was therefore managed at about 22.6% of GP visits by patients with diagnosed dementia.

Patients aged 65+ with dementia visited 10.3 times a year on average. This means that in these patients, dementia was managed 2.3 times a year on average.

The prevalence of dementia among people aged 65+ in the population was 4.7% and nearly all of these people (84.0%) had two or more other chronic conditions.

Patterns of multimorbidity

We examined the specific patterns of multimorbidity, and found the most common 'pair' of chronic conditions diagnosed among patients aged 65+ was hypertension and osteoarthritis:

- 32.4% (95% CI: 31.1–33.7) of patients surveyed at encounter having both
- 24.1% (22.8–25.5) of people in the population having both.

Of patients with both these conditions who were surveyed at encounter, 69.9% (95% CI: 68.4–71.4) had three or more other chronic conditions (i.e. five or more in total).

Hypertension and hyperlipidaemia was the second of most prevalent pair, both being diagnosed in:

- 24.2% (95% CI: 22.9–25.3) of patients surveyed at encounter
- 20.0% (95% CI: 18.8–21.3) of people in the population.

Hyperlipidaemia and osteoarthritis were the third most common pair:

- 19.3% (95% CI: 18.1–20.5) of patients at encounters having both
- 14.3% (95% CI: 13.2–15.4) of people in the population having both.

It is therefore not surprising that the most prevalent "trio" of diagnosed chronic conditions was hypertension, hyperlipidaemia and osteoarthritis, all three conditions being diagnosed in

- 14.7% (95% CI: 13.7–15.8) of patients at encounters
- 10.6% (95% CI: 9.7–11.5) of people in the population

Of those patients at encounters with these three conditions, 83.9% (95% CI: 82.1–85.7) had at least two or more other conditions (5 or more in diagnosed chronic conditions in total).

Table 14.1: Prevalence and management of chronic conditions among people aged 65 years and older

Diagnosed condition	Prevalence at encounters (95% CI)	Proportion of encounters where this problem managed (95% CI)	Management Ratio	Number of GP visits in previous year (95% CI)	Number of times this problem managed in general practice per year	Prevalence in the Australian population (95% CI)	Proportion of those with this condition, who had 2 or more other chronic conditions (95% CI)
Hypertension	55.8% (54.5–57.0)	15.5% (14.7–16.4)	27.8%	8.7 (8.4–9.0)	2.4	48.3% (46.7–49.9)	78.5% (76.6–80.4)
Osteoarthritis	51.6% (50.1–53.2)	7.0% (6.6–7.5)	13.6%	9.3 (9.0–9.7)	1.3	41.5% (39.7–43.2)	81.5% (79.7–83.4)
Hyperlipidaemia	33.2% (31.7–34.6)	4.7% (4.3–5.2)	14.3%	8.7 (8.4–9.0)	1.2	28.9% (27.3–30.5)	85.9% (84.0–87.7)
Gastro-oesophageal reflux disease	21.5% (20.3–22.7)	4.4% (4.1–4.8)	20.7%	10.2 (9.8–10.7)	2.1	15.8% (14.7–16.9)	89.8% (87.8–91.8)
Type 2 diabetes	19.4% (18.5–20.2)	6.9% (6.5–7.4)	35.8%	9.3 (8.9–9.7)	3.3	16.0% (15.0–17.0)	83.8% (81.1–86.6)
Ischaemic heart disease	19.4% (18.5–20.3)	2.7% (2.4–3.0)	14.1%	10.5 (10.0–11.0)	1.5	14.1% (13.3–15.0)	91.7% (89.9–93.5)
Depression	17.9% (16.9–18.9)	2.9% (2.6–3.1)	16.1%	10.5 (9.9–11.0)	1.7	12.8% (11.9–13.8)	91.1% (89.3–93.0)
Osteoporosis	15.7% (14.7–16.7)	2.2% (2.0–2.5)	14.1%	10.3 (9.7–10.8)	1.4	11.1% (10.3–12.0)	87.8% (85.2–90.5)
Chronic back pain	15.4% (14.3–16.5)	1.8% (1.6–2.0)	11.9%	10.7 (10.1–11.2)	1.3	10.8% (9.9–11.8)	91.7% (89.8–93.6)
Malignant neoplasm	13.4% (12.6–14.2)	4.9% (4.5–5.3)	36.4%	9.0 (8.5–9.5)	3.3	11.4% (10.5–12.2)	73.4% (69.7–77.0)
Anxiety	13.2% (12.3–14.2)	1.6% (1.4–1.8)	12.2%	10.8 (10.2–11.4)	1.3	9.1% (8.3–10.0)	91.1% (88.9–93.3)
Atrial fibrillation	11.6% (10.9–12.3)	3.7% (3.3–4.0)	31.6%	11.7 (11.0–12.5)	3.7	7.5% (6.8–8.1)	90.5% (88.1–92.9)
Chronic obstructive airways disease	10.2% (9.5–10.9)	2.2% (2.0–2.4)	21.8%	10.6 (10.0–11.3)	2.3	7.4% (6.7–8.1)	87.4% (84.2–90.7)

(continued)

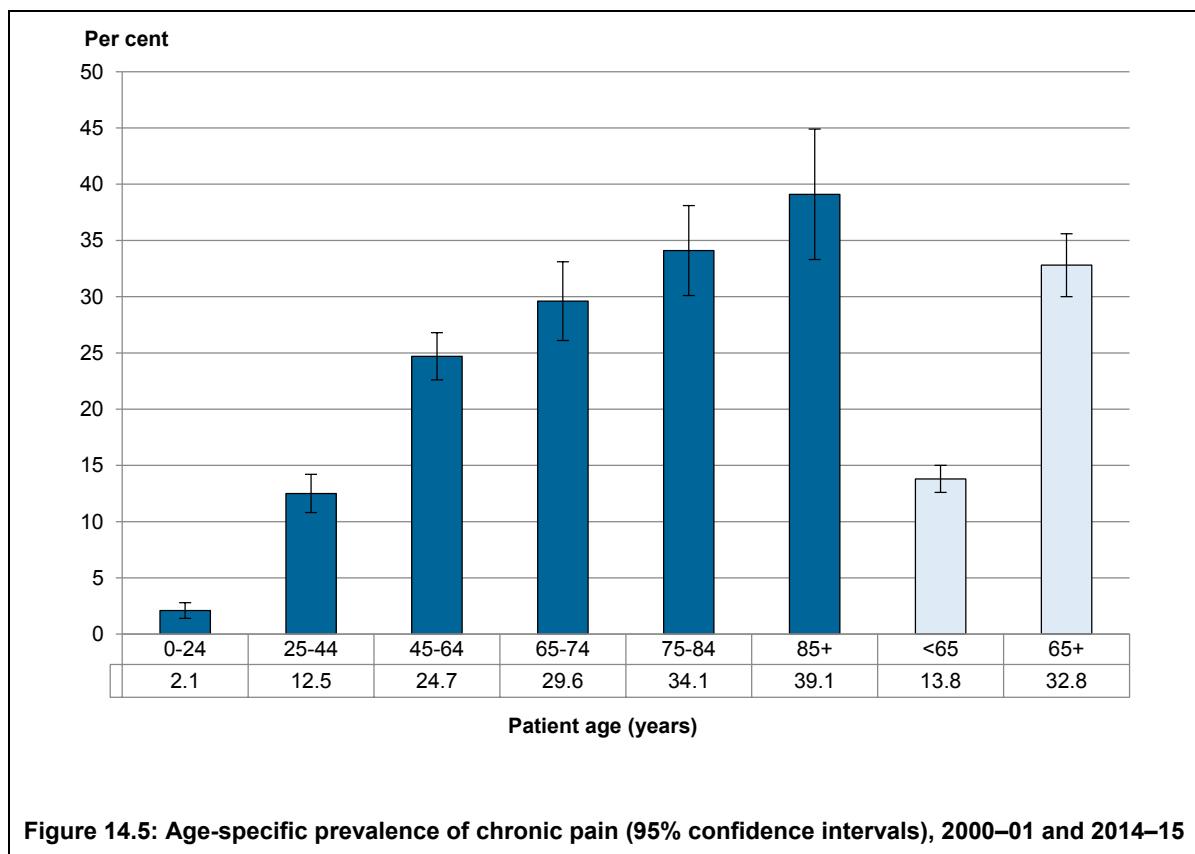
Table 14.1 (continued): Prevalence and management of chronic conditions among people aged 65 years and older

Diagnosed condition	Prevalence at encounters (95% CI)	Proportion of encounters where this problem managed (95% CI)	Management Ratio	Number of GP visits in previous year (95% CI)	Number of times this problem managed in general practice per year	Prevalence in the Australian population (95% CI)	Proportion of those with this condition, who had 2 or more other chronic conditions (95% CI)
Hypothyroidism	7.5% (6.9–8.0)	1.0% (0.9–1.2)	13.7%	9.1 (8.5–9.7)	1.2	6.1% (5.4–6.7)	81.9% (77.5–86.2)
Asthma	8.7% (8.1–9.3)	1.5% (1.3–1.6)	16.7%	9.6 (8.9–10.2)	1.6	6.8% (6.2–7.5)	82.5% (78.5–86.5)
Congestive heart failure	7.2% (6.5–7.8)	1.9% (1.7–2.1)	26.0%	12.6 (11.8–13.5)	3.3	4.2% (3.8–4.7)	95.4% (93.4–97.5)
Dementia (including Alzheimer's disease)	6.7% (5.8–7.5)	1.5% (1.3–1.7)	22.6%	10.3 (9.1–11.4)	2.3	4.7% (4.0–5.4)	84.0% (79.4–88.6)
Chronic renal failure	6.6% (6.0–7.2)	1.1% (0.9–1.2)	16.2%	11.9 (10.9–12.9)	1.9	4.2% (3.6–4.7)	91.3% (84.8–97.8)
Stroke/cerebrovascular accident	6.3% (5.8–6.9)	0.9% (0.8–1.0)	13.9%	10.5 (9.6–11.3)	1.4	4.6% (4.0–5.1)	92.4% (89.6–95.3)
Insomnia	5.8% (5.2–6.4)	2.0% (1.7–2.2)	33.7%	11.6 (10.7–12.4)	3.9	3.8% (3.2–4.3)	92.9% (88.8–96.9)
Peripheral vascular disease	4.5% (4.1–5.0)	0.5% (0.4–0.6)	12.1%	12.8 (11.9–13.7)	1.5	2.7% (2.4–3.0)	92.4% (88.8–96.1)
Glaucoma	4.0% (3.6–4.4)	0.6% (0.5–0.7)	13.8%	9.4 (8.6–10.2)	1.3	3.2% (2.8–3.6)	82.5% (76.5–88.5)
Sleep apnoea	3.1% (2.7–3.5)	0.2% (0.2–0.3)	7.7%	10.3 (9.4–11.2)	0.8	2.4% (2.0–2.7)	93.9% (90.2–97.5)
Other arthritis	3.0% (2.6–3.4)	0.1% (0.1–0.1)	3.5%	8.7 (7.6–9.8)	0.3	2.7% (2.2–3.1)	84.4% (77.0–91.9)
Rheumatoid arthritis	2.5% (2.2–2.8)	0.6% (0.5–0.7)	23.0%	10.2 (8.8–11.5)	2.3	1.8% (1.5–2.1)	75.1% (66.3–83.9)
Type 1 diabetes	1.1% (0.9–1.3)	0.3% (0.2–0.4)	27.6%	9.4 (7.6–11.3)	2.6	0.9% (0.6–1.1)	88.0% (80.2–95.9)
Hyperthyroidism	1.0% (0.8–1.2)	0.3% (0.2–0.3)	25.4%	10.5 (8.9–12.0)	2.7	0.7% (0.5–0.9)	81.0% (71.1–91.0)

Notes: CI: confidence intervals. Sources and calculation methods for results presented in Table 14.1 are provided in Appendix 5.

Patients aged 65+ years with chronic pain

Our earlier research found that chronic pain affects 1 in 5 patients attending general practice.¹⁰⁷ (Chronic pain was defined as pain experienced every day for 3 months in the 6 months prior to this consultation¹⁰⁸) A subsequent analysis of SAND substudies¹⁰⁹⁻¹¹¹ showed the prevalence increased with patient age (Figure 14.5). Of 2,217 patients aged 65 years or older, 1 in 3 (32.8%) had chronic pain.



There are many conditions that cause chronic pain, and most are musculoskeletal in nature. Patients and GPs were able to nominate multiple causal conditions for the pain. Among the patients aged 65+ years with chronic pain:

- 69.4% elected osteoarthritis as a cause
- 21.2% nominated back problems as a cause of the chronic pain.

The vast majority (93.4%) of patients in this age group who experienced chronic pain managed their pain with at least one medication. Some patients were on two or more different types of medications.

- For 33.7%, chronic pain management included opioids (including low dose combination products)
- For 20.7%, chronic pain management included non-steroidal anti-inflammatory drugs.

Risk factors and chronic problems can both affect chronic pain. Collectively, two-thirds of the patients aged 65+ were overweight or obese (Figure 14.6). Most importantly, the proportion of patients who were obese increased by 55% over the 15 years between 2000–01 and 2014–15. Obesity has a strong influence on the cause and progression of osteoarthritis,^{112,113} and osteoarthritis was the leading cause of chronic pain in the SAND patient samples. Chronic pain can limit physical activity, restricting the patient's capacity to manage their weight through exercise, which can detrimentally affect other chronic problems such as type 2 diabetes and cardiovascular problems.

Chronic pain has been found to be independently associated with multiple chronic conditions^{114,115} and Figure 14.4 shows that 72.0% of patients at encounters aged 65+ have three or more co-existing chronic conditions.

The fact that 93.4% of patients with chronic pain use one or more medications for pain management also adds to their risk of polypharmacy-related adverse events, as discussed below.

Multiple medications and adverse drug events in patients 65+

The combination of increased multimorbidity, cardiovascular risk factors and secondary symptomatic problems such as chronic pain, described above, result in many patients aged 65+ with multiple medications. The occurrence of adverse drug events in this age group is directly related to this increased medication load.

A series of SAND studies undertaken in 2014–15 ($n = 11,477$) (see Chapter 15 in this publication) indicate that the proportion of surveyed patients taking at least one continuing medication was:

- 86.4% (95% CI: 83.6–89.3) of those aged 65+
- 84.6% (95% CI: 81.5–87.7) of those aged 65–74
- 87.9% (95% CI: 84.7–91.1) of those aged 75+.

The average number of medications taken by patients aged 65+ was 5.6 (95% CI: 5.3–5.9) and within this age group the number increased in a linear fashion with age, with:

- patients aged 65–74 taking an average of 4.9 (95% CI: 4.6–5.2)
- patients aged 75+ taking an average of 6.1 (95% CI: 5.7–6.5).

The proportion of patients aged 65+ suffering an adverse drug event (ADE) in the preceding 6 months increased in a linear fashion with the number of continuing medications taken:

- from 7.8% (95% CI: 4.6–11.0) of patients on one continuing medication
- to 18.5% (95% CI: 14.9–22.1) of those on 10 or more.

One or more ADEs were reported for 13.0% (95% CI: 11.5–14.5) of patients aged 65+ who were taking at least one medication. As a result of the increasing medication rate with age, one or more ADEs were reported for:

- 11.1% (95% CI: 9.1–13.1) of patients aged 65–74 years taking at least one medication
- 14.4% (95% CI: 12.3–16.6) of patients aged 75+ taking at least one medication.

Among patients of all ages in the sample who had an ADE, hospital care (ED attendance or hospital admission) for the most recent ADE also increased in a linear fashion with the number of medications taken. Hospitalisation rate for ADEs increased from 4.7% (95% CI: 0.2–9.1) of those patients on one medication to 20.1% (95% CI: 12.9–27.4) of those on 10 or more.

Our previous research demonstrated that the vast majority of ADEs are manifestations of known side effects of commonly prescribed medications.⁶⁵

As a result of multimorbidity and associated use of multiple medications, patients aged 65 and older are at a significant risk of suffering an adverse drug event and consequent hospital care.

Lifestyle risk factors in patients aged 65+

While age is an important contributing factor for many chronic conditions, lifestyle risk factors are also important. Patient weight, smoking status and their level of alcohol consumption, are all studied in SAND subsamples every year. The SAND methods are described in Section 2.6.

Body Mass Index

For samples from each year 2000–01 to 2014–15, the number of patients aged 65+ for whom BMI could be calculated ranged from 8,394 to 11,638.

Using the WHO definitions of BMI,⁷⁹ Figure 14.6 shows that between 2000–01 and 2014–15, the proportion of sampled patients aged 65+ who were:

- underweight decreased significantly. This is a positive outcome as being underweight as an older patient is a health concern¹¹⁶
- classed as 'normal' weight decreased from 40.0% to 31.1%
- considered 'overweight' did not significantly change
- classed as 'obese' increased by over 50% from 18.5% to 28.6%
- classed as 'Class III obesity' or 'morbidly obese' more than doubled from 1.2% to 2.7%.

This increase in the proportion of patients considered to be morbidly obese is a concern as it is expected to increase the prevalence of related health problems (such as diabetes and cardiovascular diseases) and escalate health care costs in future.⁷⁶ Interestingly, for patients aged 65+, being overweight is actually a protective factor against mortality. Patients aged 65+ classified as Class I obesity (BMI 30–34.99) have a similar risk of mortality as those who are normal weight (BMI 20.0–24.9).¹¹⁷ This means the significant increase in the proportion of patients aged 65+ considered to be obese is not as concerning as the rise of obesity in younger adults.

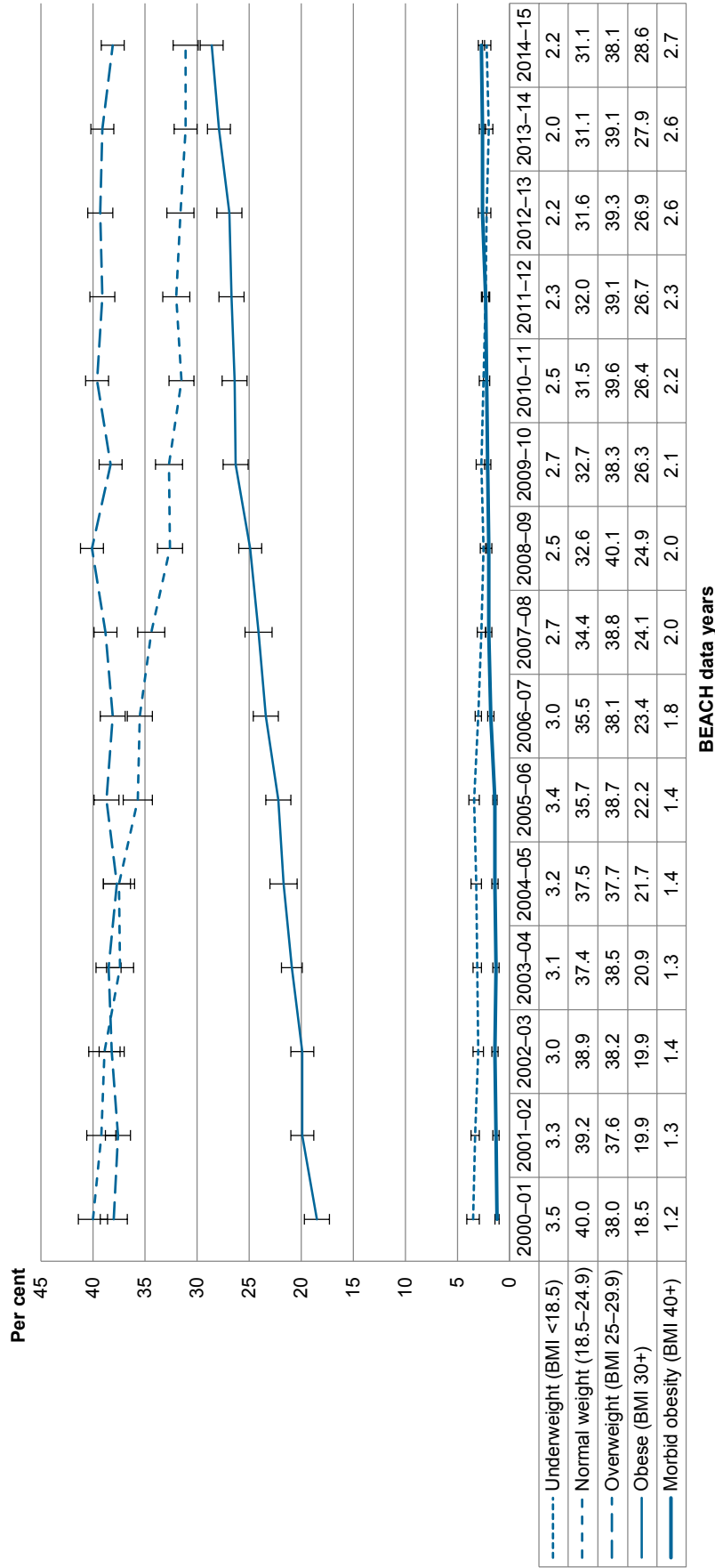
Smoking status

As discussed in Chapter 13, tobacco smoking is the leading cause of ill health, drug-related death and hospital separations in Australia.¹¹⁸

We found that there was no significant change in the proportion of patients aged 65+ who had never smoked (range: 52.8%–56.1% over the years 2000–01 to 2014–15), were previous smokers (range: 37.0%–38.9%), or were daily smokers (range: 6.0%–8.3%). However, we did find a decrease in the proportion of patients who reported they were 'occasional' smokers (from 1.5% in 2000–01 to 0.7% in 2014–15). The prevalence of previous smokers was far higher than that of all adult patients and the prevalence of current daily smokers was lower (Chapter 13).

Alcohol consumption

Over the 15 years, there was no significant change in the proportion of patients aged 65+ who were non-drinkers (range: 39.0–43.0%), responsible drinkers (range: 41.6%–44.9%) and at-risk drinkers of alcohol (range: 15.1%–17.1%). Once again, while there was no change for these measures across the study period, the proportion of patients aged 65+ who were non-drinkers was consistently higher than the proportion among all surveyed adults (see Chapter 13). These older patients were significantly less likely to be at-risk drinkers.



Note: BMI – body mass index. Columns will not total to 100% as the obesity category includes morbid obesity.

Figure 14.6: Proportion of patients at encounters aged 65+ in each body mass index group (2000-01 to 2014-15)

Continuity of general practice care for patients aged 65+

As early as 2009, the National Primary Health Care Strategy¹¹⁹ suggested voluntary enrolment with a 'health care home' in general practice could enhance continuity of care in Australia. The American Association of Family Physicians notes that:

*patient-centered medical homes integrate patients as active participants in their own health and well-being. Patients are cared for by a physician who leads the medical team that coordinates all aspects of preventive, acute and chronic needs of patients using the best available evidence and appropriate technology. These relationships offer patients comfort, convenience, and optimal health throughout their lifetimes.*¹²⁰

Adoption of 'patient-centred medical homes' has been raised repeatedly as a possible way forward for Australia. The most recent have been the McKinsey Report, which provided a summary of 'consumer enrolment systems' adopted in other countries – some voluntary and some mandatory,¹²¹ and a subsequent discussion paper, *Better outcomes for people with chronic and complex health conditions*, recently released by the Primary Care Advisory Group. It also puts forward 'capitated payments' as one of a number of payment mechanisms that may support 'a better primary health care system', particularly for the delivery of 'ongoing care to people with chronic and complex health conditions'.¹²²

Considering the very high prevalence of one or more chronic conditions among patients aged 65 years and over described earlier in this chapter, we wondered how difficult it may be to introduce voluntary registration among older people in Australia.

In a SAND substudy,¹²³ we investigated the extent to which patients have a 'practice they usually visit' and the extent to which they used multiple practices, even when they did have a 'regular' practice.

Of the 7,799 patients surveyed at encounters with 269 randomly selected GPs, 2,645 were aged 65 years or over. Of this age group, the mean number of GP visits over the previous 12 months was 12.3, median 10, with a range of 1 to 110. At least one diagnosed chronic condition was present in 96.1% of these patients, but the proportion was significantly higher among those aged 75 years and over (98.6%, 95% CI: 97.9–99.3) than among 65–74 year olds (93.1%, 95% CI: 91.4–94.8). Almost all the older patients (98.6%, 95% CI: 97.9–99.3) said that they did have a practice they usually visited and the proportion did not differ between the 65–74 and 75+ age groups. After adjustment for the attendance rate (methods described in Appendix 5), we estimated that of all patients in this age group who attended general practice at least once in the year, 97.8% (95% CI: 96.2–99.4) have a practice they usually visit.

Presence of chronic condition(s) had little impact: 98.7% of those with one or more chronic conditions and 95.1% of the 102 without any diagnosed chronic conditions had a regular practice.

Of the 2,603 surveyed patients with a regular practice, 367 (14.1%) had visited another practice during the previous 12 months, most often because (multiple responses allowed):

- they were unable to get an appointment at their regular practice (24.1% of respondents)
- travelling (19.9%)
- convenience of location (16.8%)
- emergency (13.6%)
- they use another practice for specific health problems (9.1%).

Visits to seek a second opinion were rare (2.1% of respondents).

These results suggest that only 1.4% of older patients surveyed while seeing a GP did not have a regular practice, 82% had a regular practice and did not attend any other practice, and 17% had a regular practice but had, for one reason or another, visited another practice in the 12 months prior to being surveyed. This suggests that if voluntary registration to a practice was introduced it may well be taken up by the vast majority of older people. However, some means by which a visit to an 'other' practice could be covered by payment systems would be required for the 1 in 7 who visit another practice, for reasons such as those listed above.

14.3 Discussion

Our results have highlighted some of the challenges facing general practice as a result of the ageing of the population. Since the beginning of the study period (2000–01) patients aged 65+ have consistently used a greater share of GP service resources than the proportion they accounted for in the population. Further, over the last 15 years this share has increased by more than their relative increase as a proportion of the general population.

Patients aged 65+ use more health resources than the average Australian (ranging from 1.9 times as many GP encounters, to using 2.4 times as many medications). When they visit a GP now, they are about 50% more likely to be referred and about 45% more likely to have tests ordered than in 2000–01.

Nearly all patients aged 65+ at a GP consultation have one or more diagnosed chronic conditions. In the Australian population, 90% of this older group have at least one chronic condition, the majority (57%) have three or more (multimorbidity), and almost 10% have seven or more diagnosed chronic conditions. For example, both hypertension and osteoarthritis have already been diagnosed in more than 50% of older patients sitting in front of a GP. It is therefore not surprising that older people are more likely than younger people to have chronic pain and be taking multiple medications, and so have a greater chance of experiencing an adverse drug event.

These results demonstrate the level of management complexity of these patients. When GPs manage a single chronic condition in an older patient, they almost always have to consider the implications of the presence of multiple other diagnosed chronic morbidities and the average 5.6 medications being taken for these conditions.

Considered collectively, these findings suggest we have some challenges ahead of us, but most are merely a by-product of the success of our health system, for example, the ageing population is partly a product of our increased longevity. We are better able to keep people alive, with increased years without disability than in the past. This allows them to extend their years as productive members of the workforce or the community. Medical advances have changed many once life-threatening health events (for example, acute coronary syndrome) into ones for which intervention (for example, stents) can solve (but not cure) the problem, though the patient still has to have ongoing (for example, cardiovascular) management for the rest of their lives.

The overall effect is that we have more people acquiring and being diagnosed with more conditions, and each condition is being managed for a longer period of time. The resulting exponential increase in chronic condition management must generate a similar growth in the number of GP visits and the number of management actions, such as prescriptions and test orders. The increased use of GP services has no doubt contributed to our increased life expectancy, and is provided at a per-person cost in line with, or less than, that of other countries.

Policy changes such as the introduction to Medicare of health assessment items, chronic disease management items, some disease-specific service items payments (SIP) and practice incentive payments (PIP),⁷⁰ represent efforts to improve primary and secondary health prevention, and facilitate early diagnosis and management of chronic disease. Early diagnosis means that over time, more and more chronic conditions may be managed for an individual, and these chronic conditions will be managed for a longer period because of Australia's increased life expectancy. For example, a patient diagnosed with diabetes at 45 years of age during a 45–49 years MBS-claimed Health Assessment potentially has 40 more years of life in which management of that problem is required.

Many chronic problems presenting to general practice result from modifiable risk factors. At-risk levels of alcohol consumption and daily tobacco smoking, though lower than adult community averages, may well have contributed to the health problems currently co-existing in older patients. The increasing prevalence of morbid obesity among older patients, more than doubling over the study period, is a growing problem. However the significant decrease in the prevalence of underweight in this age group is a positive result, as being underweight is a significant risk factor for mortality in older people.

Australia's health system is largely structured on single diseases. The vast majority of specialists work within a single body system, and often sub-specialise within that system. Patients can be referred to multiple specialists, possibly one for each of their diagnosed diseases. Further, guidelines for care are based on a single/disease type; clinical trials and medical research (and its funding) are largely single disease/disease type focused. More broadly, a single disease/disease type focus is the basis of organisations such as Diabetes Australia, the Heart Foundation and Kidney Health Australia, and this flows through to the patient information/education material such groups distribute. Yet, we have shown that in this age group, 84–92% of people with one of these conditions have two or more other diagnosed conditions – multimorbidity is the rule, rather than the exception.

As stated by Barbara Starfield, "*Those who ... (are) focusing on diseases resist understanding that health is a pattern. Without grasping the pattern, management is at best an approximation of adequate care*".¹²⁴ This suggests that the patient is more than just a sum of their individual diseases and needs a 'whole patient' approach to management rather than a 'problem'-based approach.

As discussed earlier, the possibility of patient enrolment with a GP or practice has been raised repeatedly in Australia over the last 5 years. There is good evidence that continuity of care, especially in a 'patient-centred medical home' can result in improved quality of care and patient experiences, and decreased hospital and emergency department use. A recent review from the United States found some patient-centred medical home initiatives have resulted in improved quality of care and patient experiences and have reduced emergency department visits and hospitalisations, providing savings in health expenditure for the patients involved.^{125,126}

Our study has shown that the vast majority of patients aged 65+ have already voluntarily attached themselves to a single practice. Much of the ground work has already been done if Australia wanted to formally encourage the use of 'patient-centred medical homes'. However, medical homes should not be considered in isolation, but as one key part of an integrated health care system.

In the future, care of those with complex chronic problems will require better integration of services and coordination of the care given by multiple providers including hospitals, specialists, allied health professionals, and community services. General practices are in a prime position to act as the coordinators of care and help to lower the chance of 'fragmented care'. In turn, this may help reduce presentations to emergency departments and primary care preventable hospitalisations. Every extra hospitalisation avoided reduces unnecessary testing, extra prescribing and the risk of fragmented care through poor communication. It is likely that any extra resources spent in primary care would be countered by savings through reduced use of more expensive services.

Integration requires effective communication of core health information between different health sectors and different health professionals. Ideally there would be one record for one patient, a record all health providers could access when caring for that patient with structured standardised format for additions to the record made by each provider. Improvements to other forms of communication are also required if we are to move to a more patient-centred approach with shared decision-making between practitioners and the patient.

Possible remuneration systems for the care of patients enrolled in a medical home have not been widely discussed. The level of multimorbidity present in a patient has been shown to be a good indicator of health care resource use,¹⁰⁴ complexity of care,¹⁰⁵ severity of illness,¹⁰⁵ polypharmacy¹⁰⁶ and adverse events.¹⁰⁶ From the BEACH data we can estimate general practice health resource utilisation (and its cost) for individuals with different numbers of diagnosed chronic conditions, and different combinations of conditions. Remuneration of the medical home for the annual care of an individual patient could be based on the level of their multimorbidity.

As always, this is not as simple as it sounds, since a patient with two diagnosed conditions of uncomplicated hypertension and hyperlipidaemia utilises fewer services and needs less co-ordination of care than an individual patient with insulin-treated type 2 diabetes plus severe osteoarthritis in multiple sites. However, it would be a much more efficient starting point than merely paying for co-ordination of the care of each individual chronic condition, which must inevitably result in multiple payments for multiple diseases for the vast majority of older people.

14.4 Conclusion

We have demonstrated here the high chronic disease load and the resulting high service utilisation, (and therefore the cost to the health care budget) of people aged 65 years and over. Much more can be done with these data to assist in the planning of Australia's future primary health care system. For example, identifying the most common multimorbidity patterns of disease among this high health care needs population would provide useful evidence of services that would benefit from better co-ordination and integration. In thinking about our future health care system, the next step is to repeat this study for people aged 45–64 years, many of whom already have multiple diagnosed chronic conditions. For many of those who do not, there is still time for further preventive activities.

The Australian Government is aiming for a '*strong and sustainable Medicare*'.¹²⁷ Perhaps what we should be aiming for is a system for sustainable health of the population. Clearly there will be challenges for quality care provision to older patients over the coming decades but with a strong primary care system Australia is well-placed to take up this challenge.

This chapter contains unpublished methods that form part of Christopher Harrison's thesis for his candidature for Doctor of Philosophy in Medicine.

15 SAND abstracts and research tools

Since BEACH began in April 1998, a section on the bottom of each encounter form has been used to investigate aspects of patient health or healthcare delivery not covered by general practice consultation-based information. These additional substudies are referred to as SAND (Supplementary Analysis of Nominated Data). The SAND methods are described in Section 2.6. All substudies were approved by the Human Ethics Committee of the University of Sydney.

The Family Medicine Research Centre (FMRC) and most of the organisations supporting the BEACH program select topics for investigation in the SAND studies. In each BEACH year, up to 20 substudies can be conducted in addition to the study of patient risk behaviours (see Chapter 13). Topics can be repeated to increase the sample size and its statistical power.

This chapter includes the abstracts and research tools for SAND substudies, most of which were conducted from April 2014 to March 2015. The subjects covered in the abstracts in this chapter are listed in Table 14.1, with the sample size for each topic.

Table 15.1: SAND abstracts for 2014–15 and sample size for each

Abstract number	Subject	Number of respondents	Number of GPs
223	Pneumococcal vaccination in general practice patients 2014 ^(a)	2,718	103
224	Cardiovascular disease risk in general practice patients	1,649	95
225	Patients with diabetes and practice-based continuity of care	2,755	95
226	Asthma management and asthma control in general practice patients 2014	2,870	97
227	Care of patients with chronic heart failure	2,909	98
228	Prevalence and management of hepatitis C virus in general practice	5,855	198
229	Pharmacological management of type 2 diabetes among general practice patients	3,104	104
230	Patient use of generic medication substitution	2,824	96
231	Prevalence of chronic conditions and multimorbidity, health services utilisation	35,162	1,171
232	Polypharmacy and adverse drug events in general practice patients	11,477	390
233	Type 2 diabetes management and referrals among general practice patients	2,620	90
234	Chronic musculoskeletal/nerve pain in general practice patients	2,848	97

(a) Substudy limited to patients aged 15 years and over.

SAND abstract 223: Pneumococcal vaccination in general practice patients 2014

Organisation collaborating for this study: bioCSL (Australia) Pty Ltd.

Issues: The proportion of general practice patients with risk factors for pneumococcal vaccination and the type of risk factors they had; the proportion of patients who received a pneumococcal vaccine; reasons for not vaccinating against pneumococcal.

Sample: 2,718 patients aged 15+ years from 103 GPs; data collection period: 06/05/2014 – 09/06/2014.

Method: Detailed in the paper entitled *SAND Method 2013–14* on this website: sydney.edu.au/medicine/fmrc/publications/sand-abstracts/.

Summary of results

The age and sex distributions of the 2,718 respondents aged 15 years and over did not differ from the age and sex distributions of patients at all 2013–14 BEACH encounters.

Of 2,718 respondents, over half had at least one risk factor for pneumococcal disease (52.1%) and there was no significant difference between males and females in this proportion. More than one-third (36.1%) of all respondents were at risk due to age (65+ years), 13.8% had chronic heart disease, 11.7% had diabetes, 9.9% had chronic lung disease, 8.5% were tobacco smokers, 3.4% had chronic renal failure, 2.7% had immune deficiency and 2.0% had chronic liver disease.

Patients are eligible for a free dose of the pneumococcal vaccine under the National Immunisation Program (NIP) when they turn 65 years old. Recent changes to the NIP mean that patients aged 70 years and over need an additional risk factor (other than age) to be eligible for a second free dose of the vaccine. In this study, 62.8% of patients aged 70 years and over had an additional risk factor.

Of 2,673 respondents, 739 (27.6%) had been vaccinated against pneumococcal infection in the previous five years, 68.1% had not, and 4.3% did not know whether they had been vaccinated. Of 1,408 respondents who had at least one risk factor for pneumococcal infection, 51.4% were currently vaccinated and 44.3% were not. Of the patients aged 65–69 years, 49.2% had been vaccinated, 48.5% had not and 2.3% did not know. For patients aged 70 years or more, 70.3% were currently vaccinated, 26.1% were not, and 3.6% did not know. For patients aged 70 and over with at least one additional risk factor, 75.1% had been vaccinated, 21.1% had not, and 3.8% did not know.

Among the 1,819 patients who had not been vaccinated against pneumococcal infection in the previous five years, 1,703 responded to the question on why they were not vaccinated: 72.9% were assessed by the GP as not at risk of pneumococcal infection, 9.2% of patients objected to the vaccination, 3.5% of patients cited cost as the reason, and 2.8% of patients disagreed with the risk assessment. There were 254 patients (14.9%) who indicated other reasons, including: patient had not been assessed; patient was unaware of the vaccine; patient had been vaccinated twice already; and some patients were to receive the vaccine at the current encounter or would soon be vaccinated.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **PNEUMOCOCCAL VACCINATION**. You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

The following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen.

For any patients aged less than 15 years, please leave the questions in the bottom section blank.

For patients aged 15+ years

Risk factors for pneumococcal infection

Please use the tick boxes to indicate whether the patient has any of the listed **risk factors** or **indications** for pneumococcal vaccination.

Please tick as many as apply.

If the patient **does not** have any of the listed risk factors/indications please tick the box labelled '**none of the above**'.

Patients who WERE vaccinated

For patients who received a pneumococcal vaccination please indicate whether it was:

- **supplied free of charge** to the patient (i.e. under the Government's Immunise Australia Program),
- **subsidised by PBS** or
- **fully privately paid** (e.g. by the patient, employer).

Patients who were NOT vaccinated

For patients who **did not** receive the pneumococcal vaccination please indicate the **reason/s** that the vaccine was not given.

Please tick all options that apply.

If the reason/s for not vaccinating is one **other** than those listed, please **write the reason/s in the space provided**.

Consumer disease awareness campaign

Please indicate whether, in the past 12 months, the patient has seen a **consumer awareness campaign** about pneumococcal disease.

If 'yes', please indicate:

- whether this campaign prompted the patient to **ask a GP about vaccination**
- the **medium/media** in which the patient **saw the campaign**. Please tick all options that apply.

Vaccination status

Please use the tick boxes to indicate whether the patient is **currently vaccinated for pneumococcal** (i.e. within the past 5 years).

If 15+ years, does the patient have:

- (tick all that apply)
- Chronic heart disease
 - Chronic lung disease
 - Diabetes
 - Chronic renal failure
 - Chronic liver disease
 - Impaired immunity (e.g. HIV)
 - Tobacco smoker
 - None of the above**

Is the patient currently vaccinated for pneumococcal (i.e. in past 5 yrs)?

- Yes
- No
- Don't know

If patient IS VACCINATED, how was the vaccine(s) supplied?

- (i.e. Govt supplied)
- Free to patient
 - PBS subsidised
 - Fully privately funded

If patient IS NOT VACCINATED, the reason(s) was:

- (tick all that apply)
- GP assessed patient as not at risk
 - Patient objection
 - Cost to patient
 - Patient disagrees with risk assessment
 - Other reason: _____

In the past 12 months, has the patient seen a consumer awareness campaign about pneumococcal disease?

- Yes
- No

If 'YES' ... (a) did it prompt the patient to ask a GP about vaccination?

- Yes
- No

(b) in what medium was the campaign seen?

- Radio
- Newspaper
- TV
- Poster (in waiting room)
- Seniors Card
- Other

SAND abstract 224: Cardiovascular disease risk in general practice patients

Organisation collaborating for this study: Family Medicine Research Centre.

Issues: Cardiovascular disease risk profile of general practice patients aged 45 years and over.

Sample: 1,649 patients from 95 GPs; data collection period: 24/09/2013 – 28/10/2013.

Method: Detailed in the paper entitled *SAND Method 2013–14* on this website: [<sydney.edu.au/medicine/fmrc/publications/sand-abstracts/>](http://sydney.edu.au/medicine/fmrc/publications/sand-abstracts/).

Methods for this substudy: Cardiovascular disease risk assessment was based on guidelines from the National Vascular Disease Prevention Alliance (NVDPA) [<www.cvdcheck.org.au/index.php?option=com_content&view=article&id=47&Itemid=27>](http://www.cvdcheck.org.au/index.php?option=com_content&view=article&id=47&Itemid=27). The Heart Foundation classification of blood pressure (BP) levels in adults was used to define hypertension [<www.heartfoundation.org.au/SiteCollectionDocuments/Hypertension_slideshow_.pdf>](http://www.heartfoundation.org.au/SiteCollectionDocuments/Hypertension_slideshow_.pdf).

Summary of results

There were 1,649 patients aged 45 years and over who responded to the questions about cardiovascular disease risk. The age and sex distributions of patients in this SAND did not significantly differ from that of patients at all 2012–13 BEACH encounters.

Current or previous conditions or risk factors were recorded for the 1,649 patients aged 45+ years: 18.1% had diabetes, 50.0% had hypertension, 12.7% had ischaemic heart disease, 2.9% had left ventricular hypertrophy, 9.3% had familial hypercholesterolaemia, 25.1% had other dyslipidaemia, 11.9% had an 'other cardiovascular disease or event', 8.6% were current smokers, 3.2% had microalbuminuria, 4.7% had moderate or severe chronic kidney disease, and 4.8% had a family history of premature heart disease.

Cardiovascular disease risk was assessed using a three-step process. At Step 1, patients were assessed against a list of known high risk groups. Of all sampled patients, 618 (37.5%) had at least one of seven high risk conditions, placing them in the 'Known High Risk' category: 21.3% had known cardiovascular disease, 13.5% had diabetes and were aged over 60 years, 2.3% had diabetes and microalbuminuria, 4.7% had moderate/severe chronic kidney disease, 9.3% had familial hypercholesterolaemia, 1.3% had high blood pressure (systolic BP \geq 180 mmHg, or diastolic BP \geq 110 mmHg), and 1.6% had high total cholesterol (>7.5 mmol/L).

At Step 2, the Framingham equation established absolute risk of a cardiovascular event over the next 5 years for 965 respondents from the 1,031 patients who were not classified as 'Known High Risk' at Step 1. There were 777 patients (80.5%) who were at low risk ($<10\%$ absolute risk of cardiovascular event in the next 5 years), 130 (13.5%) at moderate risk (10–15% risk) and 58 (6.0%) at high risk ($>15\%$ risk).

Step 3 calculations showed that of 1,583 respondents, 528 (33.4%) had at least one of the other factors for cardiovascular disease risk. The three steps were combined to give a final assessment of cardiovascular disease risk level for 1,583 patients. There were 34.4% of patients assessed as being at low risk, 20.6% at moderate risk, and 45.0% at high risk.

The proportion of patients taking at least one of the selected types of medications rose significantly through level of cardiovascular disease risk, from 38.2% of low risk patients to 83.7% of high risk patients. The average number of types of medication taken also rose significantly through level of cardiovascular disease risk from 0.6 medications for low risk to 2.1 for high cardiovascular disease risk patients.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **CARDIOVASCULAR DISEASE RISK**. You may tear out this page as a guide to completing the following set of forms.

INSTRUCTIONS

These questions investigate the absolute cardiovascular risk for patients aged 45 years or more. For the next 30 PATIENTS, ask every adult patient aged 45 years or older the following questions. If the patient is less than 45 years of age leave the questions blank. Please **DO NOT** select patients to suit the topic being investigated.

For patients aged 45 years or older Height/weight

Please ask patients aged 45+ years:

What is their height (without shoes)?*

What is their weight (unclothed)?*

Conversion tables from stone/pounds to kilograms and feet/inches to centimetres are provided.

*You are NOT REQUIRED to weigh or measure the patient, but if the patient is unsure, you may either do so or take information from the medical records.

Current or previous conditions or risks

Please use the tick boxes to advise whether the patient also has, or has a history of, any of the listed conditions or risk factors.

Notes:

LV hypertrophy = left ventricular hypertrophy

Microalbuminuria: defined as > 20 mcg/min or urinary albumin:creatinine ratio >2.5 mg/mmol for males, >3.5 mg/mmol for females

Moderate/severe chronic kidney disease: defined as persistent proteinuria or estimated glomerular filtration rate < 45 mL/min/1.73 m²

Family history of premature heart disease: a mother or sister younger than 55 years, or a father or brother younger than 65 years when diagnosed with heart disease.

Current medication use

Please indicate whether the patient is currently taking any lipid-lowering medication, antihypertensive medication or antiplatelet therapy.

(Note: ACE inhibitor = angiotensin-converting enzyme inhibitor).

Clinical measurements

Please write the patient's most recent results of blood pressure, total cholesterol, and HDL and LDL cholesterol. If these levels were measured in the past 12 months please tick the box labelled 'Tested in past 12 mths'.

If the patient has never been tested, or you/the patient don't know the results of the previous test please tick the box labelled 'Don't know / never tested' for that measure.

For patients aged 45 years or older

Patient reported:

Height: [] cm

Weight: [] kg

Does the patient have/ have history of:

- Diabetes
- Hypertension
- Ischaemic heart disease
- LV hypertrophy
- Familial hypercholesterolaemia
- Other dyslipidaemia
- Other cardiovascular disease/event

Does the patient have/ have history of:

- Current smoker
- Microalbuminuria
- Mod/severe chronic kidney disease
- Family Hx of premature heart disease

Is the patient currently taking:

- Statin
- Other lipid-lowering medication
- Antiplatelet therapy
- ACE inhibitor
- Angiotensin receptor blocker
- Calcium channel blocker
- Other antihypertensive

What are the most recent levels of:

- Blood pressure: ____ / ____ mmHg Tested in past 12 mths Don't know / never tested
- Total cholesterol: ____ mmol/L
- HDL cholesterol: ____ mmol/L
- LDL cholesterol: ____ mmol/L

BL156B

SAND abstract 225: Patients with diabetes and practice-based continuity of care

Organisation conducting this study: Family Medicine Research Centre.

Issues: Prevalence of type 1 and type 2 diabetes in general practice patients. For patients with type 2 diabetes: BMI; smoking status; number of GP visits in previous 12 months; proportion of patients with comorbidities, and types of comorbidities; proportion of patients with a regular general practice and number of years the regular practice has been visited; number of general practices the patient has visited in the previous 12 months.

Sample: 2,755 patients from 95 GPs; data collection: 24/09/2013 – 28/10/2013.

Method: Detailed in the paper entitled *SAND Method 2013–14* on this website: [<sydney.edu.au/medicine/fmrc/publications/sand-abstracts/>](http://sydney.edu.au/medicine/fmrc/publications/sand-abstracts/).

Summary of results

Of the 2,755 respondents, 29 patients (1.1%, 95% CI: 0.7–1.5) had type 1 diabetes, and 307 patients (11.1%, 95% CI: 9.5–12.8) had type 2 diabetes, including one patient who had both types, giving a total of 335 patients (12.2%, 95% CI: 10.5–13.8) with diabetes.

The age-specific rate of type 2 diabetes was 2.7% (95% CI: 1.3–4.2) for respondents aged 25–44 years, 13.4% (95% CI: 10.7–16.1) for those aged 45–64, 24.8% (95% CI: 19.7–30.0) for 65–74 year olds and 18.8% (95% CI: 14.6–23.1) for those 75 years and over. There was no significant difference between the sexes, with 13.1% of males and 9.7% of females having the condition.

The following results refer to the 307 patients with type 2 diabetes.

Of the 307 patients, 295 provided height and weight information, and the median body mass index (BMI) was 30.8 kg/m². Of these, 87.8% were overweight or obese, including: 31.5% overweight, 30.5% obese, and 25.8% morbidly obese. Among the 301 adult (18+) respondents, 21 (7.0%, 95% CI: 3.8–10.2) were current smokers, a significantly lower prevalence than among adult BEACH subsample respondents 2012–13 (14.4%, 95% CI: 13.7–15.1).

At least one of the comorbidities listed on the survey form was present in 94.5% of respondents, and 61.9% of respondents had three or more. Hypertension was the most common (75.9% of patients), followed by dyslipidaemia (68.7%).

Of 281 respondents to the question on number of GP visits in the previous year, 4.3% had made 1–3 visits, 18.9% 4–6 visits, 16.7% 7–9 visits, 29.2% 10–12 visits, 10.0% 13–15 visits, and 21.0% 16 or more visits. There was a positive association between the number of comorbidities and number of GP visits. The number of comorbidities did not appear to be associated with the length of consultation, with most visits lasting about 15 minutes.

Of 302 respondents with type 2 diabetes, 292 (96.7%) indicated that the current encounter was at their regular general practice, and eight patients (2.6%) had another regular general practice. Only two patients had no regular general practice. Of 282 respondents who provided length of attendance, the majority (77.0%) had been attending that practice for more than 5 years. Most patients (83.9%) had not attended any but their regular general practice in the previous year.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **PATIENTS WITH DIABETES AND PRACTICE-BASED CONTINUITY OF CARE**. You may tear out this page as a guide to completing the following set of forms.

START Time [] : [] AM / PM (please circle)	Start time Record the time the consultation STARTED in hours and minutes and circle whether the time was AM or PM. For example: [9] : [10] (AM) PM (please circle)	INSTRUCTIONS Please answer the following questions for ALL of the next 30 PATIENTS in the order in which the patients are seen. Please DO NOT select patients to suit the topic being investigated. Please use your own knowledge, patient knowledge and medical records as you see fit, in order to answer these questions.	Finish time Record the time the consultation FINISHED in hours and minutes and circle whether the time was AM or PM. For example: [9] : [28] (AM) PM (please circle)
Diabetes Please advise whether this patient has been diagnosed with either Type 1 or Type 2 diabetes . If the patient does not have diabetes please end the questions here for this patient .	Comorbidities/risk factors Please use the tick boxes to advise whether the patient has also been diagnosed with any of the listed comorbidities or risk factors . Tick as many as apply. Note: IHD=ischæmic heart disease, COPD=chronic obstructive pulmonary disease, GORD=gastro-oesophageal reflux disease, CKD=chronic kidney disease.	Regular general practice Please ask the patient whether they have a regular general practice that they usually visit . If 'yes', please indicate: <ul style="list-style-type: none"> whether the patient regards the practice they are visiting today as their regular general practice. for how long the patient has been attending their regular general practice A general practice is defined as a group of primary care practitioners who share medical records.	General practices visited Please ask the patient how many general practices other than their 'regular' practice they have visited in the past 12 months . Do not include deputising services. If the patient only visited their regular practice please tick the box labelled ' none - only regular practice '.
Height/weight Ask the patient: What is their height (without shoes)?* What is their weight (unclothed)?* Conversion tables from stone/pounds to kilograms and feet/inches to centimetres are provided. * You are NOT REQUIRED to weigh or measure the patient, but if the patient is unsure, you may either do so or take information from the medical records.	Frequency of GP visits Please ask the patient approximately how many times (including today's visit) they have seen any GP (at any practice) for any reason in the past 12 months . If the patient cannot recall, use your notes or knowledge, to give the best estimate.	Do you have a regular general practice* you usually visit? <input type="checkbox"/> Yes - this one <input type="checkbox"/> Yes - another one <input type="checkbox"/> No <small>(*a practice is a group of primary care practitioners who share medical records)</small>	How many general practices** other than the regular one have you visited in the past 12 months? <small>(**Do not include deputising services)</small> <input type="checkbox"/> None - only regular practice
Does this patient have diabetes? <input type="checkbox"/> Yes - Type 1 <input type="checkbox"/> Yes - Type 2 <input type="checkbox"/> No → End questions	Patient reported Height: [] cm Weight: [] kg	Does this patient have: <input type="checkbox"/> Hypertension <input type="checkbox"/> IHD <input type="checkbox"/> Dyslipidaemia <input type="checkbox"/> Depression <input type="checkbox"/> Anxiety <input type="checkbox"/> Osteoarthritis <input type="checkbox"/> Chronic back pain	Ask the patient: Approx. how many times have you seen any GP in the past 12 months (including today)? <input type="checkbox"/> Don't know
If 'yes', how long have you attended the regular practice? <input type="checkbox"/> < 12 months <input type="checkbox"/> 1-2 years <input type="checkbox"/> 3-5 years <input type="checkbox"/> > 5 years	Do you have a regular general practice* you usually visit? <input type="checkbox"/> Yes - this one <input type="checkbox"/> Yes - another one <input type="checkbox"/> No <small>(*a practice is a group of primary care practitioners who share medical records)</small>	FINISH Time [] : [] AM / PM (please circle)	FINISH Time [] : [] AM / PM (please circle)

SAND abstract 226: Asthma management and asthma control in general practice patients 2014

Organisation collaborating for this study: Family Medicine Research Centre.

Issues: The proportion of patients at general practice encounters with diagnosed asthma; time since diagnosis; medication management; intended duration of current inhaled corticosteroid (ICS) or combination inhaled corticosteroid/long-acting beta agonists (ICS/LABA) management; relationship between level of asthma control and medication use.

Sample: 2,870 patients from 97 GPs; data collection period: 15/07/2014 – 18/08/2014.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: [<sydney.edu.au/medicine/fmrc/publications/sand-abstracts/>](http://sydney.edu.au/medicine/fmrc/publications/sand-abstracts/).

Methods for this substudy: GINA guidelines (Global Initiative for Asthma, 2014) were used to classify asthma control: 0 symptoms = well-controlled; 1–2 = partly controlled; 3–4 = uncontrolled.

Summary of results

Though the sex distribution of the 2,870 respondents did not differ from that of patients at all 2013–14 BEACH encounters, a significantly smaller proportion of patients were aged 75 years and over.

Of the 2,870 respondents, 14.7% (95% CI: 12.8–16.7) had diagnosed asthma. There was no significant difference in the sex-specific rates of asthma (13.1% males; 15.9% females), however the age-specific rates showed some differences – diagnosed prevalence among 5–14 year-olds (23.8%) was significantly higher than among those aged <5 years (8.7%) and those 75+ years (13.3%), but not different from prevalence in other age groups.

In the majority of patients (81.0% of 406 respondents with diagnosed asthma), asthma had been diagnosed more than 5 years prior to the recorded consultation. For 1 in 10 patients (9.6%) asthma had been diagnosed 1–3 years previously.

Of 408 respondents with asthma, 339 (83.1%) were taking at least one medication for its management: 39.5% were taking one medication; 35.5% were taking two; and 6.9% were taking three. One patient was currently taking four asthma medications.

A total of 555 asthma medications were recorded. Almost half (49.7%; $n = 276$) were short-acting beta agonists (SABA), and one-third (33.9%, $n = 188$) were ICS/LABA. ICS as single therapy accounted for 7.2% of asthma medications, anticholinergics for 5.8%, and oral systemic steroids for 1.1%. Of 226 patients taking ICS or ICS/LABA, 220 responded to the question about intended duration of medication use. The intended duration was >6 months for 78.6% of patients on these medications.

More than half (55.2%, $n = 233$) the patients with asthma had not experienced any symptoms in the previous 4 weeks (well controlled); 26.1% ($n = 110$) had 1–2 symptoms (partly controlled) and 18.7% ($n = 79$) had 3–4 symptoms (uncontrolled). Of 223 patients with well-controlled asthma, 38.1% were taking ICS or ICS/LABA. Of 108 patients with partly controlled asthma, 69.4% were taking ICS or ICS/LABA. Of 77 patients with uncontrolled asthma, 85.7% were taking ICS or ICS/LABA.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **MANAGEMENT OF ASTHMA**. You may tear out this page as a guide to completing the following set of forms.

INSTRUCTIONS

Please answer the following questions for **EACH** of the **next 30 PATIENTS** in the order in which the patients are seen. Please **DO NOT** select patients to suit the topic being investigated. Please use your own knowledge, patient knowledge and medical records as you see fit, in order to answer these questions.

Diagnosed asthma

Please use the tick boxes to indicate whether the patient has been **diagnosed with asthma**, either today or at a previous consultation, by you or by another doctor.
If the patient **does not** have diagnosed asthma please **end the questions** here for this patient.

Time since diagnosis

Please use the tick boxes to advise the **approximate length of time** since the patient's asthma was diagnosed.

Current asthma medications

Please write the **name, form and regimen (dose and frequency)** of any medication(s) currently taken to manage this patient's asthma.
If the patient is **not taking any medication** for the treatment of asthma please tick the box labelled '**no current asthma medication**'.

Use of ICS and ICS/LABA medication

For patients currently taking an **inhaled corticosteroid (ICS)** or an **ICS/long-acting beta agonist (LABA) combination product**, please use the tick boxes to indicate the **intended duration of ICS or ICS/LABA treatment**.

Asthma severity

Please advise which of the **severity levels** best describes the patient's **asthma**, based on your clinical opinion.

Asthma symptoms

Please **ask the patient** whether they have experienced **any of the listed symptoms due to asthma** in the **past 4 weeks**.
Please tick all that apply.

Does this patient have diagnosed asthma?
 Yes
 No
 End questions ←

How long ago was asthma diagnosed?
 <12 months
 1-3 years
 4-5 years
 >5 years

Current asthma medication/s taken:
 Name & Form Strength Dose Freq

 No current asthma medication BL15/4C

For patients taking an ICS or ICS/LABA, the intended duration of treatment is:
 < 1 month
 1 - 3 months
 4 - 6 months
 > 6 months

In your clinical opinion, how severe is the patient's asthma?
 Mild
 Moderate
 Severe
 Refractory

In the past 4 weeks, has the patient had:
(Tick all that apply)
 Daytime asthma symptoms more than twice/week
 Used reliever medication more than twice/week
 Any night waking due to asthma
 Any limitation of activities due to asthma

SAND abstract 227: Care of patients with chronic heart failure

Organisation conducting this study: Novartis Pharmaceuticals Australia Pty Ltd.

Issues: Prevalence of chronic heart failure (CHF) in general practice patients. For those with CHF: current medications for CHF and initiator of medications; hospitalisation for acute heart failure; discharge to community-based management program; and distance to nearest hospital.

Sample: 2,909 patients from 98 GPs; data collection: 01/04/2014 – 05/05/2014.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: sydney.edu.au/medicine/fmrc/publications/sand-abstracts/

Summary of results

There was a greater proportion of patients aged <5 years and a smaller proportion aged 65 years or more in this sample than at all BEACH encounters in 2013–14. Of the 2,909 respondents, 87 (3.0%, 95% CI: 2.0–4.0) had CHF. There was no significant difference in CHF prevalence among males (4.4%, 95% CI: 2.5–6.3) and females (2.0%, 95% CI: 1.3–2.8). No patients aged <45 years had CHF. A significantly greater proportion of patients aged 75+ years (12.2%, 95% CI: 8.3–16.1) had CHF than of those aged 45–64 (1.9%, 95% CI: 0.8–3.0). CHF prevalence in those aged 65–74 was 7.1%.

After adjusting (by age–sex) for the rates of attendance to GPs, the prevalence of CHF among patients who attend general practice at least once in a year was estimated to be 2.0% (95% CI: 1.3–2.8). Extrapolation to the Australian population gave an estimated population prevalence of 1.7% (95% CI: 1.1–2.4).

Medication status was known for 84 of 87 patients with CHF. Two patients (2.4%, 95% CI: 0.0–5.7) were taking no medication for CHF, 19 (22.6%, 95% CI: 11.4–33.8) were taking one medication, 34 (40.5%, 95% CI: 28.0–53.0) two, and 29 (34.5%, 95% CI: 23.5–45.5) three, a total of 174 medications. Frusemide (25.9%) was the most common individual medication, followed by ACE inhibitor perindopril (9.2%) and beta blocker bisoprolol (8.6%). Of the 174 medications, 33.3% were diuretics, and 28.2% were beta blockers.

Initiation source was specified for 161 medications. Of those, 64.0% (95% CI: 53.3–74.7) were initiated by specialists, significantly more than the proportion initiated by GPs, 36.0% (95% CI: 25.3–46.7). Specialists were significantly more likely than GPs to have initiated anti-angina medications, beta blockers and calcium channel blockers.

Of 84 respondents to questions on the most recent admission, 37 (44.0%) had been hospitalised for an acute episode of heart failure. For the most recent admission of 36 patients, 18 (50.0%) were admitted through the emergency department, 15 (41.7%) from a GP referral, and four (11.1%) through a cardiac outpatient clinic. For the most recent admission of 35 patients, the average length of stay was 6.5 days (95% CI: 4.4–8.7).

Of 37 patients hospitalised for heart failure, nine were discharged under a community-based heart failure management program, 20 were not, and eight did not know. Of the 37 patients, nine lived <5 km by road from the nearest hospital, 12 lived 5–9 km away, and a further 12 lived 10–19 km away.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **CHRONIC HEART FAILURE (CHF)**. You may tear out this page as a guide to completing the following set of forms.

INSTRUCTIONS

The following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen.

Please **DO NOT** select patients to suit the topic being investigated.

Chronic heart failure (CHF)

Please use the tick boxes to indicate whether the patient has been diagnosed with chronic heart failure (CHF).

If the patient **does not** have CHF please tick the box labelled 'no' and **END the questions** here for this patient.

Current management

If 'yes' please write the name and regimen of any medications currently used by the patient for CHF management. For each medication please circle an option to indicate whether the medication was initiated by a GP or a specialist.

Hospitalisation for CHF

Please advise whether the patient has ever been hospitalised for treatment of an acute exacerbation of their CHF condition (i.e. principal diagnosis). If the patient has not been hospitalised for CHF treatment please tick the box labelled 'no' and **END the questions** here for this patient.

Length of stay

In the space provided, please write the number of days the patient was in hospital during their most recent admission for CHF.

Circumstance of admission

If 'yes' please advise the avenue of the admission e.g., admitted from GP or outpatient clinic referral, through A&E etc.

Community-based management program

Please advise whether the patient was discharged under a community-based heart failure management program. If neither you, nor the patient, know this information, please tick the box labelled 'Don't know'.

Distance from hospital service

Please use the tick boxes to advise the approximate distance (by road) between the patient's residence and the nearest hospital facility.

Does this patient have chronic heart failure (CHF)?
 Yes
 No → End questions

If 'yes' current medication/s for CHF are:
 Name & Form Strength Dose Freq Initiated by
 _____ _____ _____ _____ GP / Spec
 _____ _____ _____ _____ GP / Spec
 _____ _____ _____ _____ GP / Spec
 (please circle one)
 No CHF medication

Has the patient ever been hospitalised for treatment of an acute episode of heart failure?
 Yes
 No → End questions

If 'yes' how did their most recent admission occur?
 GP referral
 Cardiac outpatient clinic
 Emergency dept
 Other
 (please specify) _____

What was the length of stay for their most recent admission?
 _____ (days)

Was the patient discharged under a community-based heart failure management program?
 Yes
 No
 Don't know

What is the approximate distance from the patient's home to the nearest hospital?
 < 5 kms
 5 - < 10 kms
 10 - < 20 kms
 20 - < 50 kms
 50 - < 100 kms
 100+ kms

SAND abstract 228: Prevalence and management of hepatitis C virus in general practice

Organisation collaborating for this study: AbbVie Pty Ltd.

Issues: The prevalence of hepatitis C virus (HCV) infection in general practice patients; for those with HCV, the approximate duration of their HCV positive status; the proportion who have diagnosed liver fibrosis or cirrhosis and the stage of fibrosis; the cause of the HCV infection; specialist referral for HCV care; current medications for HCV; chronic comorbidities present with HCV (tick boxes and free text).

Sample: 5,855 patients from 198 GPs; data collection periods: 01/04/14 – 05/05/14 and 28/10/14 – 01/12/14.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: sydney.edu.au/medicine/fmrc/publications/sand-abstracts/.

Methods for this substudy: The stages of fibrosis were defined using the Metavir Fibrosis Score Card. (Source: Poynard T, Dedossa P, Opolon P. Natural history of liver fibrosis progression in patients with chronic hepatitis C. *Lancet* 1997; Vol. 349, Issue 9055: 825–832).

Summary of results

The sex distributions of the 5,855 patients who gave their hepatitis C virus (HCV) status did not differ from all patients at 2013–14 BEACH encounters. There was a difference in the age distribution, with fewer patients aged 75 years and over in this sample.

There were 61 patients (1.0%, 95% CI: 0.7–1.4) who had a diagnosed HCV infection, with a significantly greater likelihood among male respondents ($n = 39$, 1.7%, 95% CI: 1.0–2.3) than among female respondents ($n = 21$, 0.6%, 95% CI 0.3–0.9). The prevalence among patients aged 45–64 years (2.3%, 95% CI: 1.5–3.2) was significantly higher than among patients aged 65–74 years (0.3%, 95% CI: 0.0–0.6) or 75+ years (0.5%, 95% CI: 0.0–0.9). Of 45 patients who knew the duration of their HCV, 20.0% had diagnosed HCV for less than one year, 37.8% between 1 and 10 years, 33.3% had diagnosed HCV for 11–20 years, and 8.9% for more than 20 years.

Of 53 patients, 10 (18.9%) had been diagnosed with liver fibrosis/cirrhosis, and of these, five had Stage F4 (cirrhosis), one had Stage F1 (portal fibrosis without septa), and a stage was not known for the remaining four.

Thirty-three (62.3%) of 53 respondents contracted HCV through intravenous drug use, six patients through sexual encounter, four through body modification, three through needle stick injury, and two from blood/organ donation.

Thirty-eight of 54 respondents (70.4%) had been referred to a specialist for HCV management. Of these, 29 (76.3%) had been referred only to a hepatologist, three had been referred to a hepatologist and a gastroenterologist, and one to a hepatologist and a hospital. Four patients had been referred only to a gastroenterologist.

Current HCV medication status was known for 50 patients. Only four of them were on medication for HCV, using eight medications: all four patients were taking peginterferon/ribavirin combinations, two were also taking interferon, one was also taking teleprevir, and one was also taking boceprevir.

Thirty-one (58.5%) of 53 respondents had at least one chronic comorbidity. Depressive disorder was the most common of the comorbidities, followed by diabetes, hypertension and chronic obstructive pulmonary disease.

The following pages contain the recording form and instructions with which the data in this substudy were collected.

Metavir fibrosis score¹

The stages of liver fibrosis are defined as:

F0 = no fibrosis

F1 = portal fibrosis without septa

F2 = portal fibrosis with few septa

F3 = numerous septa without cirrhosis

F4 = cirrhosis

1. Poynare T, Bedossa P, Opolon P. Natural history of liver fibrosis progression in patients with chronic hepatitis C. *Lancet* 1997; 349:825-3

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **PREVALENCE AND MANAGEMENT OF HEPATITIS C VIRUS (HCV)**. You may tear out this page as a guide to completing the following set of forms.

INSTRUCTIONS

The following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen.

Please **DO NOT** select patients to suit the topic being investigated.

HCV management

Please use the tick boxes to advise any **medications** currently used by the patient for **HCV management**. Tick as many as apply. If **no medications** are used, please tick the box labelled 'no HCV medication'.

If **other management** is used, please write this in the space provided.

Hepatitis C Virus (HCV) infection

Please use the tick boxes to indicate whether the patient has been **diagnosed with Hepatitis C** viral infection.

If the patient **does not** have HCV please tick the box labelled 'no' and **END** the questions here for this patient.

Cause of infection

Please advise **how the patient's HCV infection occurred**.

It is important to understand how diseases such as HCV are acquired. However, even though the patient cannot be identified, if you feel that this intrudes on your relationship with the patient, or if the patient objects, please tick the box labelled 'withheld' and go to the next question.

Specialist referrals

Please advise whether the patient has been **referred to a specialist(s)** for HCV management, prior to today's visit.

If 'yes', please use the tick boxes and spaces provided to advise the **type of specialist(s)** to whom the patient was referred. Tick as many as apply.

If **no referrals**, please tick the 'No' box.

Chronic comorbidities

Please advise whether the patient also has any of the **listed comorbidities**. If the patient has a comorbidity **other than** those listed, please **write this/these** in the space provided. Tick all that apply.

If the patient has **no other chronic conditions**, please tick the box labelled 'No current comorbidities'.

Fibrosis/cirrhosis and stage

Please advise whether the patient has diagnosed liver fibrosis or cirrhosis. If 'yes', please use the tick boxes to indicate the **stage of liver fibrosis** (using the Metavir fibrosis score - defined here, and on the card in your research kit).

F0 = no fibrosis
 F1 = portal fibrosis without septa
 F2 = portal fibrosis with few septa
 F3 = numerous septa without cirrhosis
 F4 = cirrhosis.

Duration

If 'yes' please advise the **duration of their HCV+ status**, by writing the approximate number of years in the space provided.

If neither you nor the patient know, tick the box labelled 'don't know'.

<p>Does this patient have diagnosed Hepatitis C viral infection (HCV)?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No → End questions</p>	<p>If 'yes', approximately how long ago were they diagnosed?</p> <p><input type="checkbox"/> <1 yr <input type="checkbox"/> ___ yrs <input type="checkbox"/> Don't know</p>	<p>Does the patient have diagnosed liver fibrosis/cirrhosis?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know</p>	<p>If 'yes', fibrosis stage is: <small>(See card for definition)</small></p> <p><input type="checkbox"/> F0 <input type="checkbox"/> F1 <input type="checkbox"/> F2 <input type="checkbox"/> F3 <input type="checkbox"/> F4 <input type="checkbox"/> Unknown</p>	<p>How was HCV contracted?</p> <p><input type="checkbox"/> IV drug use <input type="checkbox"/> Sexual transmission <input type="checkbox"/> Blood/organ donation <input type="checkbox"/> Needle stick injury <input type="checkbox"/> Body modification <input type="checkbox"/> Vertical transmission <input type="checkbox"/> Unknown <input type="checkbox"/> Withheld</p>	<p>Has the patient been referred to a specialist for HCV care?</p> <p><input type="checkbox"/> Yes - Hepatologist <input type="checkbox"/> Yes - other specialist/s <small>(please specify)</small> <input type="checkbox"/> No</p>	<p>Current medications for HCV are: <small>(tick all that apply)</small></p> <p><input type="checkbox"/> Teleprevir <input type="checkbox"/> Bocoprevir <input type="checkbox"/> Peg interferon alpha + ribavirin <input type="checkbox"/> Peg interferon + ribavirin <input type="checkbox"/> Interferon <input type="checkbox"/> Other _____ <small>(please specify)</small> <input type="checkbox"/> No HCV medication <small>BL161C</small></p>	<p>Does the patient have any current chronic comorbidities?</p> <p><input type="checkbox"/> Coronary artery disease <input type="checkbox"/> Diabetes <input type="checkbox"/> Chronic kidney disease <input type="checkbox"/> HIV <input type="checkbox"/> Other chronic disease: _____ <small>(please specify)</small> <input type="checkbox"/> No current comorbidities</p>
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SAND abstract 229: Pharmacological management of type 2 diabetes among general practice patients

Organisation collaborating for this study: Novartis Pharmaceuticals Australia Pty Ltd.

Issues: Prevalence of diagnosed type 2 diabetes among patients attending general practice; use of metformin medication in the management of type 2 diabetes; concomitant use of selected glucose-lowering medications (sulfonylurea and dipeptidyl peptidase-4 [DPP-4] inhibitor [known as gliptin]) with the metformin.

Sample: 3,104 patients from 104 GPs; data collection period: 10/06/2014 – 14/07/2014.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: sydney.edu.au/medicine/fmrc/publications/sand-abstracts/.

Summary of results

The age of the patient was recorded at 3,096 encounters. The age distribution of patients in this sample did not differ from those of patients at all BEACH encounters in 2013–14. Patient sex was known for 3,084 respondents of whom 45.3% (95% CI: 42.3–48.3) were male, a significantly larger proportion than among those at all BEACH encounters in 2013–14, where 40.1% (95% CI: 39.2–41.0) were male.

Of the 3,104 sampled patients, 344 (11.1%, 95% CI: 9.5–12.7) had diagnosed type 2 diabetes. After statistical adjustment to reflect patients attending general practice at least once in the year, prevalence of diagnosed type 2 diabetes among the attending population was 7.1% (95% CI: 5.7–8.4). Assuming those who did not attend did not have diagnosed type 2 diabetes, population prevalence was estimated as 6.1% (95% CI: 4.9–7.3).

There was a significant step-wise increase in prevalence of diagnosed type 2 diabetes with patient age group, from 3.3% (95% CI: 1.9–4.7) of patients aged 25–44 years, to 21.7% (95% CI: 17.3–26.1) of those aged 65–74 years. The rate then remained steady among those aged 75 years or more with 19.8% (95% CI: 16.1–23.4) having the condition. Prevalence did not significantly differ between the sexes, with 13.2% of males and 9.4% of females having type 2 diabetes. Of 331 respondents with diagnosed type 2 diabetes, 65.3% ($n = 216$) were currently taking metformin. The question about concomitant sulfonylurea and/or gliptin use was answered for 211 of these patients, most of whom (63.5%) did not take either medication. Metformin and sulfonylurea were being taken by 45 patients, metformin and gliptin were taken by 28 patients, and 4 patients took all three medications.

Of the 45 patients taking metformin and a sulfonylurea only, reasons for taking a sulfonylurea rather than a gliptin were given for 43. The most common reasons were efficacy of sulfonylurea ($n = 23$), and 'other' (non-listed) reasons (18 patients). Most of the latter group indicated satisfactory long-term use of a sulfonylurea.

Reasons for use of gliptin rather than sulfonylurea were provided for the 28 patients taking metformin and a gliptin only. The most common reasons given were concern about an adverse event associated with a sulfonylurea ($n = 13$), and efficacy of gliptin ($n = 10$).

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **TYPE 2 DIABETES MANAGEMENT**. You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

The following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen. Please **DO NOT** select patients to suit the topic being investigated.

Type 2 diabetes

Please advise whether this patient has been diagnosed with **Type 2 diabetes**. If the patient does not have Type 2 diabetes please end the questions here for this patient.

Sulfonylurea and Gliptin use

For patients taking metformin, please indicate whether they were also taking a sulfonylurea or a dipeptidyl peptidase-4 (DPP-4) inhibitor (i.e. a Gliptin) in dual therapy. These medications may be taken separately or as a combination product. If the patient is not taking metformin in combination with sulfonylurea or gliptin, please end the questions here for this patient.

Reasons for metformin + sulfonylurea use

For patients taking metformin in combination with sulfonylurea, please indicate the reason/s that the sulfonylurea was chosen in preference to a gliptin.
 Note: Efficacy includes glycaemic control. Please tick all options that apply. If the reason/s is not listed, please write the reason/s in the space provided.

Metformin use

Please use the tick boxes to indicate whether the patient is currently taking metformin for the management of Type 2 diabetes. If 'no', please end the questions here for this patient.

Reasons for metformin + gliptin use

For patients taking metformin in combination with gliptin, please indicate the reason/s that the gliptin was chosen in preference to a sulfonylurea.
 Note: Efficacy includes glycaemic control. If the reason/s is not listed, please write the reason/s in the space provided.

Does the patient have Type 2 diabetes?
 Yes
 No → End questions

Is the patient currently taking metformin?
 Yes
 No → End questions

Is the patient also taking (either as a separate agent or in a combination product):
 Sulfonylurea
 DPP-4 inhibitor (Gliptin)
 None of the above → End questions

For patients taking metformin + sulfonylurea, why was sulfonylurea chosen, rather than gliptin?
 Efficacy of sulfonylurea
 Adverse event with gliptin use
 Concern for adverse event associated with gliptin
 Gliptin contraindicated
 Other (please specify): _____
 Don't know

For patients taking metformin + gliptin, why was gliptin chosen, rather than sulfonylurea?
 Efficacy of gliptin
 Adverse event with sulfonylurea use
 Concern for adverse event associated with sulfonylurea
 Sulfonylurea contraindicated
 Other (please specify): _____
 Don't know

SAND abstract 230: Patient use of generic medication substitution

Organisation collaborating for this study: AstraZeneca Pty Ltd (Australia).

Issues: The proportion of general practice patients who had been offered generic medication substitution when filling a prescription in the previous 12 months; patterns of purchase for those offered generic substitution; factors influencing the decision to purchase generic medications; medical conditions for which patients did not purchase generic medications.

Sample: 2,824 patients from 96 GPs; data collection period: 15/07/2014 – 18/08/2014.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: [<sydney.edu.au/medicine/fmrc/publications/sand-abstracts/>](http://sydney.edu.au/medicine/fmrc/publications/sand-abstracts/).

Methods for this substudy: An information card was supplied to patients providing response options about factors influencing the decision to purchase or reject generic medication.

Summary of results

The sex distribution of this patient sample did not differ from that of patients at all 2013–14 BEACH encounters. However, a significantly larger proportion of the 2,806 patients in this sample for whom age was recorded were aged 1–4 years (5.9%, 95% CI: 4.7–7.0 compared with 4.2%, 95% CI: 3.9–4.4), and a smaller proportion aged 75+ years (14.3%, 95% CI: 11.7–16.8 compared with 18.0%, 95% CI: 17.2–18.9) than at all 2013–14 BEACH encounters.

Over two-thirds of the 2,824 patients (67.3%, 95% CI: 62.7–72.0) had been offered generic substitution when filling a prescription in the previous 12 months, while 21.8% had not, and 10.9% of patients did not know whether generic substitution had been offered.

There were 1,893 patients offered a generic substitution who responded to the question about whether they purchased the substitution when offered. Of these, 45.9% said they always accepted generic substitution when offered, 35.4% sometimes accepted, and 18.6% never accepted. Three-quarters (75.0%) of 669 respondents who sometimes accepted substitution purchased at least one generic medication on the most recent occasion substitution was offered.

Of 1,366 respondents who accepted a generic medication substitution the most recent time it was offered, factors influencing this decision included cost saving for self (70.6% of patients), pharmacy encouragement (42.2%), information provided by the pharmacy (15.3%), original brand not in stock (11.1%) and cost saving for government (6.7%). Multiple responses were allowed.

Of 520 respondents who rejected a generic substitution the most recent time offered, 507 provided reasons for their decision, including: concerns about effectiveness of the generic (64.3%), concern about adverse events (22.7%), possible confusion with medications (16.6%) and substitution not allowed by doctor (11.2%).

There were 448 conditions listed for which medications were prescribed for the 520 patients who rejected generic substitution the most recent time it was offered. One condition was recorded for 301 patients, two conditions for 48 patients and three for 17 patients. No condition was listed for 154 patients. Classified to ICPC-2, the most common condition listed was uncomplicated hypertension, followed by depressive disorder, type 2 diabetes, lipid disorder, oesophageal disease and asthma.

The following page contains the recording form and instructions with which the data in this substudy were collected.

A For patients who purchased a generic medication

This question aims to determine what factors influenced your choice to purchase generic medication/s.

Thinking of the most recent occasion you purchased a generic medication, please indicate which of the listed factors influenced this choice. If other (unlisted) factors influenced your choice, please let your GP know what these other factors were.

- Original brand not in stock
- Pharmacy encouragement
- Information provided by the pharmacy
- Cost saving for the government
- Cost saving for yourself
- Other - *please let your GP know what other factor/s influenced your decision*

B For patients who DID NOT purchase a generic medication

This question aims to determine what factors influenced your choice **not** to purchase generic medication/s.

Please indicate which of the listed factors influenced your choice not to purchase generic medication. Please answer referring to the most recent occasion you were offered a generic medication. If the factor is not listed please let your GP know what other factor or factors influenced your choice.

- Concern about effectiveness of medication
- Substitution not allowed by doctor
- Possible confusion with medications
- Concern about adverse event
- Other - *please let your GP know what other factor/s influenced your decision*

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **PATIENT USE OF GENERIC MEDICATION SUBSTITUTION**. You may tear out this page as a guide to completing the following set of forms.

INSTRUCTIONS

The following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen.

Please **DO NOT** select patients to suit the topic being investigated.

The purpose of this exploratory study is to investigate the extent to which patients chose to/not to take generic medications when they are offered at the pharmacy, and the reasons for making their decision.

Offer of generic substitution

Ask the patient
Please ask the patient whether they have been offered a generic substitution when filling a prescription in the past 12 months. If the patient has not been offered a generic substitution please end questions here for this patient.

Use of generic medication

Please ask the patient, whether they usually purchase generic medication when it is offered at the pharmacy.
For those patients that **ALWAYS** purchase a generic (when offered), tick the box labelled 'Yes-always' and go to question A on the form.
For patients that sometimes purchase a generic, tick the box labelled 'Yes - sometimes'.
Please ask these patients to think of the last time a generic was offered, and indicate whether they purchased one (or more) generic medication/s. Go to question A or B based on the patient's response. **Note** for questions A and B please ask these patients to answer referring to the most recent time generic substitution was offered.
For those patients that **NEVER** purchase a generic, tick the box labelled 'No - never' and go to question B on the form.

A Patients who purchased generic medication

For patients who chose to purchase a generic medication on the most recent occasion it was offered, please ask the patient what factors influenced this choice.
Please tick all options that apply.
This question is provided on a card in the research pack. You can show this card to the patient to assist when filling out the form.
If the reason/s is not listed, please write the reason/s in the space provided.

B Patients who did not purchase generic medication

For patients who chose **NOT** to purchase any generic medication on the most recent occasion it was offered, please ask the patient:
What factors influenced this choice. Please tick all options that apply.
If the reason/s is not listed, please write the reason/s in the space provided.
This question is provided on a card in the research pack. You can show this card to the patient to assist when filling out the form.
The condition/s for which the original medication/s was/were prescribed. Please write these in the space provided. Conditions may be recorded as a defined disease (e.g. diabetes) or an other indication (e.g. pain management).

Please ask the patient:
Have you been offered a generic substitution when filling a prescription in the past 12 months?
 Yes
 No
 Don't know

When offered a generic medication do you usually accept?
 Yes - always → go to A
 Yes - sometimes → go to B
 No - never → go to B

Thinking of the last time you were offered a generic, did you purchase one (or more) generic medication/s?
 Yes → go to A
 No → go to B

A If YES, what factors influenced your choice? (tick all that apply)
 Original brand not in stock
 Pharmacy encouragement
 Information provided by the pharmacy
 Cost saving for the government
 Cost saving for yourself
 Other (please specify):

B If NO:
What factors influenced your choice?
 Concern about effectiveness of medication
 Substitution not allowed by doctor
 Possible confusion with medications
 Concern about adverse event (tick all that apply)
 Other (please specify):

For which condition/s was/were the original medication/s prescribed?

SAND abstract 231: Prevalence of chronic conditions and multimorbidity, health services utilisation

Organisation collaborating for this study: Family Medicine Research Centre and the National Health Performance Authority.

Issues: The number of visits to a GP in the previous 12 months. Prevalence of diagnosed individual chronic conditions, of multimorbidity (2+ chronic conditions); and of complex multimorbidity (1+ chronic condition in each of 3 or more body systems),^(a) among the sampled patients, the population attending a GP in a year, and in the Australian population. In a subsample, for people with 1+ chronic conditions: number of different individual GPs; different specialists and different allied health professionals seen in the previous 12 months.

Sample: 35,162 patients from 1,171 GPs; subsample was 14,462 patients from 482 GPs; data collection periods: 27/11/2012 – 14/01/2013; 19/02/2013 – 25/03/2013; 01/05/2013 – 06/06/2013; 21/01/2014 – 31/03/2014; 06/05/2014 – 14/07/2014.

Method: Detailed in the paper entitled SAND Method 2014–15 on this website: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. **Methods for this study:** Statistical adjustment methods for estimates among attending population and Australian population are described elsewhere.^(b) Body systems were defined as chapters of ICPC-2.^(c)

Summary of results

The age and sex distributions of the sampled patients and of the subsample did not significantly differ from those of patients at all 2013–14 BEACH encounters.

The average number of visits to any GP in previous 12 months was 9.4, higher than the average of 6.8 attendances of all those who see a GP, because frequent attenders have a greater chance of being sampled.

Hypertension was the most prevalent chronic condition, diagnosed in 25.9% (95% CI: 25.0–26.8) of the sample, 15.0% (14.3–15.7) of the attending population and 11.8% (11.2–12.3) of the Australian population. This was followed by: osteoarthritis (22.8 [21.8–23.8]; 12.1 [11.4–12.8]; 9.3 [8.8–9.9]); hyperlipidaemia (16.5 [15.8–17.3], 10.0 [9.5–10.6], 8.0 [7.5–8.4]); depression; anxiety; gastro-oesophageal reflux disorder; and chronic back pain.

One-third (32.1%) of patients had 1+ musculoskeletal conditions; 31.8% 1+ circulatory; 30.4% 1+ endocrine/nutritional/metabolic; 26.4% 1+ psychological problems. Adjusted population estimates: 1+ endocrine/nutritional/metabolic 15.4% (14.7–16.1); 1+ circulatory 14.3% (13.6–15.0); 1+ musculoskeletal 14.2% (13.5–14.9); 1+ psychological 13.2% (12.6–13.8). Half (51.1%) the sampled patients had multimorbidity and 36.9% had 3+ diagnosed chronic conditions. Adjusted population estimates suggested 24.9% (95% CI: 23.9–26.0) had multimorbidity, and 15.2% (14.4–16.0) had 3+ chronic conditions. Complex multimorbidity was present in 30.1% (28.9–31.2) of the sample and 11.5% (10.9–12.2) of the Australian population.

Of the 14,462 patients in the subsample, 9,795 had 1+ diagnosed chronic conditions. For 8,996 of these, the average number of different GPs visited was 2.2 GPs (median 2). For 8,564, the average number of different specialists seen was 1.5 (median 1). For 7,709 patients, the average number of different allied health providers seen was 1.0 (median 1.0), in the previous 12 months.

(a) Harrison C, Britt H, Miller G, Henderson J. Examining different measures of multimorbidity, using a large prospective cross-sectional study in Australian general practice. *BMJ Open*. 2014 Jul 11;4(7):e004694.

(b) Harrison C, Britt H, Miller G, Henderson J. Prevalence of chronic conditions in Australia. *PLoS ONE* 2013;8(7):e67494. Epub 2013 Jul 23.

(c) Classification Committee of the World Organization of Family Doctors. ICPC-2: International Classification of Primary Care. 2nd ed. Oxford: Oxford University Press; 1998.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about the **PATIENT'S CHRONIC CONDITIONS / PROBLEMS**. Please complete these questions in addition to information about the encounter. *You may tear out this page as a guide to completing the shaded section of the following forms.*

INSTRUCTIONS

Answer the questions in the shaded section for **EACH** of the **next 30 PATIENTS** in the order in which the patients are seen.

Please **DO NOT** select patients to suit the topic being investigated.

Use your own knowledge, patient knowledge and your records as you see fit, in order to answer these questions.

Frequency of GP visits - ASK THE PATIENT

Using patient recall, and your notes and knowledge, please write the approximate number of times (including today's visit) the patient has seen **any GP** for any reason in the past 12 months.

Patient's diagnosed chronic conditions/problems

The aim of these questions is to estimate the prevalence and patterns of multimorbidity in general practice patients. With an ageing population, the prevalence of multimorbidity is expected to increase and much of the care will fall on general practice. This study will highlight the complexity of multimorbidity and assist in planning for future health service needs.

If the patient has **NO diagnosed chronic problems** please tick the box labelled '**NO**', and end the questions here for this patient.

If the patient **DOES** have diagnosed chronic conditions or problems, please use the tick boxes to indicate which ones (irrespective of whether you have managed them today). Tick as many as apply.

If the patient has a malignant neoplasm(s) please specify the primary site of the neoplasm.

If the patient has any other diagnosed chronic problems or conditions that are not listed please specify these in the 'Other chronic problems not listed' section.

Abbreviations

BMI = body mass index
IHD = ischaemic heart disease
CHF = congestive heart failure
CVA = cerebrovascular accident
COPD = chronic obstructive pulmonary disease (including emphysema)
GORD = gastro-oesophageal reflux disease

Co-ordination of care

This question aims to assess the complexity of co-ordinating the care of each patient who has at least one chronic condition.

Please advise how many individual health care providers have provided patient care over the previous 12 months. This may have included care provided by:

- any GP either in your practice or at another practice (ask the patient), for **any** problem
- any medical or surgical specialists (either private or hospital-based) who has provided healthcare to the patient for **any** problem (i.e. the deciding carer - not their registrar)
- any allied health professional (either private or hospital-based) who has/have provided healthcare to the patient for **any** problem

For example, if the patient has seen you and a partner at your practice, a cardiologist, a diabetes educator, and a physiotherapist, your response would be:

GPs 2
Medical specialists 1
Allied Health Profs 2

Approx. how many times has this patient seen **any GP** in the past 12 months? (including today)

Does the patient have any chronic conditions/problems?
Yes →
No →

End questions

If 'yes' please tick all that apply:

Musculoskeletal
 Osteoarthritis
 Rheumatoid arthritis
 Other arthritis
 Osteoporosis
 Chronic back pain

Psychological
 Depression
 Anxiety
 Insomnia
 Dementia (including Alzheimer's)

Endocrine / nutritional
 Hyperlipidaemia
 Diabetes Type 1
 Diabetes Type 2
 Obesity (BMI ≥30)
 Hypothyroidism
 Hypertthyroidism

Cardiovascular
 Hypertension
 IHD
 CHF
 Peripheral Vascular Disease
 CVA/stroke
 Atrial fibrillation

Other:
 Asthma
 COPD
 Sleep apnoea
 GORD
 Chronic renal failure
 Glaucoma
 Malignant neoplasm → Site: _____

Other chronic problems not listed: (please specify)

Ask the patient - How many different GPs, Specialists or Allied Health professionals have you seen in the past 12 months?
GPs _____
Medical specialists _____
Allied Health Profs _____

SAND abstract 232: Polypharmacy and adverse drug events in general practice patients

Organisation collaborating for this study: National Health Performance Authority.

Issues: The proportion of general practice patients on continual medications, the number of medications and the number of prescribers; the proportion who had a medication review; the proportion who had an adverse drug event (ADE); the severity and rate of hospitalisation for adverse drug events.

Sample: 11,477 patients from 390 GPs; data collection periods: 19/08/14 – 22/09/14, 23/09/14 – 27/10/14, 20/01/15 – 23/02/15 and 24/02/15 – 30/03/15.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

Summary of results

There was no significant difference in the sex distribution of respondents in this sample and those of patients at all 2013–14 encounters. There were marginally more patients aged 15–24 years in this sample than at all BEACH encounters in 2013–14.

Of the 11,477 patients in this sample, two-thirds (66.0%, 95% CI: 63.6–68.4) had been prescribed or advised at least one medication for continual use in the previous 6 months. On average, patients took 3.1 continual medications. Polypharmacy (defined as a patient taking five or more continual medications) was present in 26.7% of the patients in this sample.

Of 7,411 respondents who were taking at least one continual medication, 23.5% reported that no doctor had prescribed or advised any new medication in the previous 6 months, 45.3% reported that one doctor had prescribed or advised a new continual medication in the previous 6 months, and 21.8% reported that two doctors had done so. For those on continual medications, on average, 1.2 doctors had prescribed or advised new continual medications.

Medication reviews had been performed for 74.7% of 7,010 respondents taking continual medication for which medication review status was known. GPs were involved (either alone or in conjunction with a pharmacist or nurse) in 97.0% of medication reviews. Patients with polypharmacy were more likely to have a medication review (81.9%, 95% CI: 78.9–84.8) than those who did not have polypharmacy (69.9%, 95% CI: 66.4–73.4).

Of 7,426 respondents taking at least one continual medication, 11.3% ($n = 837$) had experienced an ADE in the previous 6 months. Significantly more patients who had polypharmacy had experienced an ADE in the previous 6 months (15.6%, 95% CI: 13.9–17.3) than those who were taking one to four continual medications (8.3%, 95% CI: 7.3–9.3).

For 819 patients who had experienced an ADE and where information was provided about the severity of the most recent event, 62.4% had experienced an ADE regarded as 'mild' in the GP's clinical opinion, 28.3% had experienced a 'moderate' ADE, and 9.3% had experienced a 'severe' event.

Of 798 patients who had an ADE and information was provided about hospitalisation, 5.9% reported a hospital admission as a result of their most recent ADE and 4.3% reported attendance at an emergency department without admission to hospital.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **THE ASSOCIATION BETWEEN POLYPHARMACY AND ADVERSE DRUG EVENTS (ADE)**. Please complete these questions in addition to information about the encounter. *Tear out this page as a guide to completing the shaded section of the following forms.*

INSTRUCTIONS

The shaded section of the following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen. **If you see the same patient twice in this set of 30 forms please only survey them once. Leave the shaded section blank if the patient attends a second time.** Please **DO NOT** select patients to suit the topic being investigated. Previous research shows that **1 in 10 patients have had an ADE in the previous 12 months** (Miller G et al. Drugs causing adverse events in patients aged 45 or older: a randomised survey of Australian general practice patients *BMJ Open*, 2013 Oct 10;3(10):e003701. doi: 10.1136/bmjopen-2013-003701)

Continuing medication use

This question refers to any **prescribed or advised (over-the-counter) medications INTENDED to be taken continually** (i.e. for 4 months or more) by the patient, including any that have since **stopped**.

This includes e.g. a course of monthly injections, a bronchodilator PRN, a daily prescribed statin, an advised NSAID or low-dose aspirin, etc.

Please **write the number** of each in the spaces provided.

If **no continuing medications** were prescribed or advised, please **end the questions here** for this patient.

Number of prescribers- ASK the PATIENT

If 'yes' please write the **number of different prescribers** (include hospitals, and private specialists) for any **new** medication in the **space provided**.

Please **do not** include doctors writing a repeat prescription for a medication already initiated by another clinician.

Medication review - ASK the PATIENT

Please ask the patient whether, over the past 6 months (i.e. other than today), **any of the listed health professionals have reviewed all the medications** they are taking?

ASK THE PATIENT - if they have experienced an **Adverse Drug Event (ADE)** from the use of **any medication** in the **past six months**.

An adverse event is an unintended event which could have harmed or did harm the patient. 'Harm' includes physical, psychological or emotional suffering. If **no ADEs** were experienced, please **end the questions here** for this patient.

Hospitalisation

As a result of the **most recent ADE**, please indicate whether the patient was treated at a **hospital emergency department** or was **admitted to hospital**?

Severity of the most recent ADE

Please indicate the **severity of the most recent ADE** in terms of harm to the patient (in your clinical opinion)

Mild - a reaction of limited duration not requiring further treatment; minimum impact on daily activities

Moderate - a reaction of longer duration or which required further treatment; limited impact on daily activities.

Severe - a reaction of any duration which results in long term limitation of daily activities.

In the past 6 months, how many **different** medications were prescribed and/or advised for **continual use** by the patient?
Prescribed _____
Advised OTC _____
 None → **End questions**

Ask the patient - If 'yes', how many **doctors** have prescribed/advised any **new** medication for the patient in the past 6 months?

(please specify)

Ask the patient - In the past 6 months (not including today), have any of the following reviewed all the medications you are taking? (Tick all that apply)

- GP
 Practice nurse
 Pharmacist
 Don't know
 None of the above

Ask the patient - In the past 6 months, has the patient experienced an **adverse drug event (ADE)**?

- Yes
 No → **End questions**

In your clinical opinion, how severe was the **most recent ADE**?

- Mild
 Moderate
 Severe

Was the patient hospitalised as a result of the **most recent ADE**?

- Emergency Department
 Yes No
Hospital Admission
 Yes No

BL170C

SAND abstract 233: Type 2 diabetes management and referrals among general practice patients

Organisation collaborating for this study: AstraZeneca Pty Ltd.

Issues: The diagnosed prevalence of type 2 diabetes among general practice patients; for those with type 2 diabetes, referrals for diabetes; diabetes medication; diabetes control; test results and patient body mass index (BMI).

Sample: 2,620 patients from 90 GPs; data collection period: 02/12/2014 – 19/01/2015.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: sydney.edu.au/medicine/fmrc/publications/sand-abstracts.

Summary of results

The sex distribution of this patient sample (46.4% male) did not differ from that of patients at all 2013–14 BEACH encounters. However, a significantly smaller proportion of this sample were aged 5–14 years (3.6%, 95% CI: 2.8–4.5) than at all 2013–14 BEACH encounters (4.9%, 95% CI: 4.6–5.2).

Type 2 diabetes had been diagnosed in 262 patients (10.0%, 95% CI: 8.1–11.9). There was no significant difference in the prevalence among males (12.2%) and females (8.7%), and the highest prevalence was in patients aged 65–74 years (21.4%).

Of the 262 patients diagnosed with type 2 diabetes, 33 (12.6%, 95% CI: 7.7–17.5) had not been referred to a health professional for their diabetes in the previous 12 months, 22.1% were referred to one, 25.2% to two and 40.1% to three or more health professionals. So 229 (87.4%, 95% CI: 82.5–92.3) had been referred to at least one health professional. Referrals to podiatrist were the most common (62.6% of patients with type 2 diabetes), followed by ophthalmologist (51.5%), diabetes educator (31.7%), dietitian (29.0%), endocrinologist (26.7%), and other health professionals (16.4%).

Current diabetes medication was recorded for 258 patients, and most were currently taking medication ($n = 219$, 84.9%, 95% CI: 78.0–91.8). There were 360 individual medications recorded: at the generic level, metformin was the most common (41.9% of medications), followed by gliclazide (15.8%), and insulin glargine (11.1%). In terms of medication groups, metformin (41.9%), sulfonamides (16.9%), and basal insulin (13.3%) were recorded most commonly. Of the 258 respondents, 72 (27.9%) were currently taking insulin, including 26 patients on two types of insulin. Almost half (48.5%) of the insulins recorded were basal, 26.3% were rapid acting, and 23.2% were premix insulin.

The GP's clinical opinion of the patient's level of diabetes control was recorded for 247 patients with type 2 diabetes, of whom over half ($n = 142$, 57.5%) had well controlled, 28.3% had partly controlled, and 14.2% had poorly controlled type 2 diabetes.

Most recent HbA1c level was recorded for 251 type 2 diabetes patients. The mean HbA1c level was 55.3 mmol/mol, and the median was 50.8. The RACGP and Diabetes Australia target is HbA1c ≤ 53 mmol/mol for patients with diabetes. The majority ($n = 148$, 59.0%, 95% CI: 51.5–66.5) of patients had reached that target.

Most recent eGFR (estimated glomerular filtration rate) was recorded for 246 type 2 diabetes patients: 184 (74.8%) had an abnormal GFR (<90) and 62 (25.2%) had a normal GFR (≥ 90). The most common category was slightly decreased GFR, with 60–89 recorded for 113 (45.9%) patients.

Of 248 type 2 diabetes patients with recorded height and weight, 133 (53.6%) were obese, and 78 patients (31.5%) were overweight.

The following page contains the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **TYPE 2 DIABETES MANAGEMENT**. You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

The following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen.

Please **DO NOT** select patients to suit the topic being investigated.

Type 2 diabetes

Please advise whether this patient has been diagnosed with **Type 2 diabetes**. If the patient **does not have** Type 2 diabetes please **end the questions here for this patient**.

Referrals to health professionals

Please use the tick boxes to advise whether the patient has been referred for the management of diabetes or diabetes-related conditions in the past 12 months. For a referral to a health professional not listed (e.g. cardiologist, nephrologist), please tick the box labelled 'other' and specify in the space provided. Please tick as many as apply.

Reason(s) for referrals

Please use the tick boxes to indicate the reason(s) the patient was referred to each health professional.

- **Assessment/check** - where the purpose of the referral was to have a specialised assessment or check-up performed (e.g. for feet check).
- **Poor glycaemic control** - this may include referrals to investigate the cause of the poor control or for patient education about the disease
- **Comorbidity/complication** e.g. management of comorbidities or complications associated with diabetes.
- **Management advice** e.g. changes of treatment regime.
- **Continuing management** of the patient's diabetes.

Please tick all that apply. If multiple referrals were made to the same type of health professional please indicate the reason(s) for the most recent referral.

HbA1c level, estimated glomerular filtration rate (eGFR), patient height and weight

Please advise, at the most recent testing, the patient's:

- HbA1c level.
- estimated glomerular filtration rate (eGFR)

Ask the patient: What is their height (without shoes)* and their weight (unclothed)?* Conversion tables from stone/pounds to kilograms and feet/inches to centimetres are provided.

*You are NOT REQUIRED to weigh or measure the patient, but if the patient is unsure, you may either do so or take information from the medical records.

Diabetes medication

Please write the name of the medication(s) currently taken for management of diabetes. Please include both oral medications and injected medications.

If the patient is **not currently taking a medication** for diabetes management please tick the box labelled 'NONE'.

Diabetes control

Please advise whether, in your clinical opinion, the patient's diabetes is well controlled, partly controlled or poorly controlled.

Does the patient have Type 2 diabetes?
 Yes
 No → End questions

Referral(s) made for diabetes in past 12 months:
(Tick all that apply)

- Diabetes educator
- Endocrinologist
- Dietitian
- Ophthalmologist
- Podiatrist
- Other: _____

Reason(s) for referral:
(Tick all that apply)

- | Assessment/ check | Poor glycaemic control | Comorbidity/ complication | Management advice | Continuing management |
|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
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| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Current diabetes medication(s):

- _____
- _____
- _____
- NONE

In your clinical opinion, how controlled is the patient's diabetes?

- Well controlled
- Partly controlled
- Poorly controlled

What were the most recent levels of:

- HbA1c: _____ mmol/mol
- eGFR: _____ mL/min/1.73m²
- ...and the current:
 height: _____ cm
 weight: _____ kg

SAND abstract 234: Chronic musculoskeletal/nerve pain in general practice patients

Organisation collaborating for this study: bioCSL Pty Ltd.

Issues: The proportion of patients at general practice encounters with chronic musculoskeletal and/or nerve pain; causes of this chronic pain; management of pain (current and previous); pain level and functioning.

Sample: 2,848 patients from 97 GPs; data collection period: 24/02/2015 – 30/03/2015.

Method: Detailed in the paper entitled *SAND Method 2014–15* on this website: sydney.edu.au/medicine/fmrc/publications/sand-abstracts/.

Methods for this substudy: 'Live better with pain log' (American Chronic Pain Association© 2005) was used to classify pain levels.

Summary of results

Age and sex distributions of respondents did not differ from those of patients at all 2013–14 BEACH encounters.

Of the 2,848 respondents, 25.4% (95% CI: 22.1–28.6, $n = 722$) had chronic musculoskeletal and/or nerve pain: 20.2% ($n = 575$) had chronic musculoskeletal pain only; 1.8% ($n = 50$) had chronic nerve pain only; and 3.4% ($n = 97$) had both. There was no significant difference in the sex-specific rates of chronic musculoskeletal and/or nerve pain (21.8% males; 27.7% females). No patients under 15 years of age had chronic musculoskeletal and/or nerve pain. The age-specific rates significantly increased with patient age, from 3.4% among 15–24 year-olds to 47.8% among patients aged 75+ years.

Of 672 patients with chronic musculoskeletal pain, reported cause(s) (multiple responses allowed) were: osteoarthritis (58.9%); lower back problem (34.8%); and cancer (1.2%). Of 147 patients with chronic nerve pain, reported cause(s) were: lower back problem (50.3%); osteoarthritis (18.4%); and cancer (2.0%).

Of 711 respondents, 60.6% managed pain with medication only, 25.6% used medication plus other management, 5.5% used non-medication management only, and 8.3% were using no pain management. Over half (51.3% of the 711 patients who responded about chronic pain management) were taking paracetamol, 8.2% were taking pregabalin, 7.7% were taking a paracetamol/codeine 30mg product, and 6.6% were taking oxycodone. Of 224 patients using non-pharmacological treatments, 12.0% used physiotherapy, 5.3% used exercise programs and 3.1% used heat therapy.

For three-quarters of patients (75.1%), management had not changed in the previous 6 months. Of 166 respondents for whom a change had occurred, changes reported were: switch medication (31.3%); initiate medication (where none previously taken) (30.7%); add medication (16.9%); increase dose (6.6%); cease all pain medication (5.4%); stop (one) medication (4.8%); and decrease dose (4.2%). The most common reasons given for management change (136 respondents) were to improve musculoskeletal pain (39%) and nerve pain (16.9%), and because of side effects (13.2%) such as drowsiness, nausea or constipation.

Reported pain level was significantly greater for patients with nerve pain (mean 6.3) than musculoskeletal pain (5.2), as was the impact of pain on activity (5.4 compared with 4.5), sleep (5.5 compared with 4.3) and mood (5.3 compared with 4.1).

The following page contains the recording form and instructions with which the data in this substudy were collected.

Definitions:

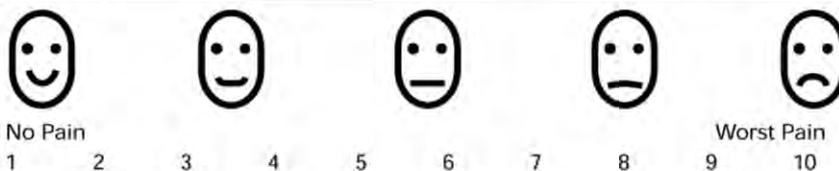
Chronic Pain = 'pain experienced every day for three months in the six months prior to this consultation'¹

Musculoskeletal (nociceptive) pain = caused by damage to body tissue (by painful stimuli e.g. heat, cold, mechanical force or chemical irritants) and usually described as a sharp, aching, or throbbing pain.^{2,3,4}

Nerve (neuropathic) pain = caused by actual nerve damage, often described as a burning, electric shock, shooting, numbness, itching or pins & needles.^{2,3,4}

Live Better with Pain Log

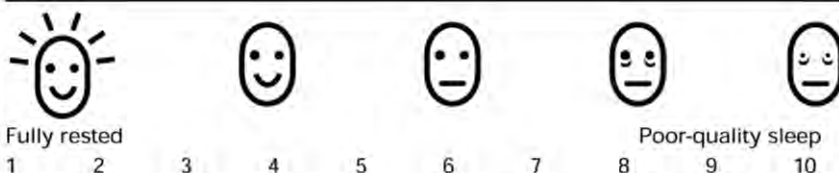
Pain Level



Activity



Sleep



Mood



Adapted from: Live Better with Pain Log; © Copyright: 2005
Reproduced with kind permission of the American Chronic Pain Association
<http://www.theacpa.org/painlog/>

1. Blythe FM et al. 2001. *Pain* 89(2-3);127-134
2. Fong A & Schug S. 2014 PRSJ 143:8S-14S
3. Boreau F et al. 1990. *Pain* 42(1990); 145-152.
4. Richeimer S. 2000. Richeimer Pain Medical Group <http://www.helpforpain.com/arch2000dec.htm>

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **CHRONIC MUSCULOSKELETAL (nociceptive) and/or NERVE (neuropathic) PAIN**. You may tear out this page as a guide to completing the following set of forms.

INSTRUCTIONS

The following 30 forms relate to the **next 30 PATIENTS** in the order in which the patients are seen.

Please **DO NOT** select patients to suit the topic being investigated.

Chronic musculoskeletal and/or nerve pain

Please use the tick boxes to indicate whether the patient suffers from **chronic^a musculoskeletal (nociceptive)^b and/or nerve (neuropathic)^c pain**. Please also indicate the **condition/s** involved using the tick boxes, or by **writing** the condition/s in the space/s provided.

If the patient **does not** have chronic musculoskeletal and/or nerve pain please tick the box labelled **'Neither'** and **END** the questions here for this patient:

- a - chronic pain defined as pain experienced every day for three months in the six months prior to this consultation!*
b - nociceptive e.g. sharp, aching or throbbing pain^{2,3,4}
c - neuropathic e.g. burning, electric, shooting, numbness, itching, or pins and needles^{2,3,4} (See card in pack)

1. Blyth FM et al. 2001. Pain 89(2-3): 127-134
2. Fong A & Schug S. 2014. PKSF 143:85-145
3. Boreau et al. 1990. Pain 42(1990): 145-152
4. Reichner S. 2000. Reichner Pain Medical Group. Available from: <http://www.helpforpain.com/areh2000dec.htm>; Accessed 19th Nov 2014.

Previous pain management

If the patient's pain management has not changed in the past 6 months, please tick the box labelled **'Same as current'** and go to the last question.

If the pain management has changed in the past 6 months, please **write** the details of any **medications or other managements** previously used by the patient for pain management.

Chronic musculoskeletal or nerve pain management

Please advise how the patient's pain is **currently** being managed. Use the spaces provided to **write** the details of any **medications or other managements** currently being used by the patient for pain management.

If the patient's pain is **not currently being managed** please tick the box labelled **'NO management'**.

Reasons for management changes

If the patient's pain management did change in the past 6 months, please use the tick boxes and spaces provided to indicate the **reasons** for the change/s.

NB: Please note that any adverse events disclosed by the patient should be reported to the sponsor of the product or Therapeutic Goods Administration (TGA).

Ask the patient

Pain level and functioning
 Referring to the 'Live better with pain log' tool (see card) please ask the patient to indicate their level of pain, and its impact on an activity, sleep and mood, when they are in pain and write the corresponding number in the space provided.

<p>Does this patient have (either or both) - (see card)</p> <p>1. Chronic musculoskeletal 2. Chronic nerve pain</p> <p>due to:</p> <p><input type="checkbox"/> Cancer <input type="checkbox"/> Osteoarthritis</p> <p><input type="checkbox"/> Lower back problem <input type="checkbox"/> Lower back problem</p> <p><input type="checkbox"/> Other (please specify) _____</p> <p><input type="checkbox"/> NEITHER → End questions (please specify) _____</p> <p style="text-align: right;">BL170B</p>	<p>If 'yes' current pain management/s are:</p> <p><input type="checkbox"/> Medication (please specify)</p> <p>Name & Form Strength Dose Freq</p> <p>Other management (please specify) _____</p> <p>No pain management</p>	<p>Six mths ago the pain management was:</p> <p><input type="checkbox"/> Same as current - go to last question</p> <p>OR</p> <p>Name & Form Strength Dose Freq</p> <p>Other management (please specify) _____</p> <p>No pain management</p>	<p>If management was changed in past 6 mths, why?</p> <p><input type="checkbox"/> Side effects (please specify) _____</p> <p><input type="checkbox"/> Improve mgt of nerve pain</p> <p><input type="checkbox"/> Improve mgt of musc. pain</p> <p><input type="checkbox"/> Drug interactions</p> <p><input type="checkbox"/> Other (please specify) _____</p>	<p>Ask the patient to rate their pain and its impact on the following functions when in pain: (see card)</p> <p>Pain _____</p> <p>Activity _____</p> <p>Sleep _____</p> <p>Mood _____</p>
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Abbreviations

ABS	Australian Bureau of Statistics
ACE	angiotensin-converting enzyme
ACRRM	Australian College of Rural and Remote Medicine
ADE	adverse drug event
AHS	allied health service
AHW	Aboriginal health worker
AIHW	Australian Institute of Health and Welfare
ASGC	Australian Standard Geographical Classification
ATC	Anatomical Therapeutic Chemical (classification)
BEACH	Bettering the Evaluation and Care of Health
BMI	body mass index
BP	blood pressure
CAPS	Coding Atlas for Pharmaceutical Substances
CHF	chronic heart failure
CHF	congestive heart failure
CI	confidence interval (in this report 95% CI is used)
CT	computerised tomography
DoH	Australian Government Department of Health
DVA	Australian Government Department of Veterans' Affairs
eGFR	estimated glomerular filtration rate
ENT	ear, nose and throat
HCV	hepatitis C virus
FMRC	Family Medicine Research Centre
FTE	full-time equivalent
GDP	gross domestic product
GP	general practitioner
HbA1c	haemoglobin, type A1c
ICPC	International Classification of Primary Care
ICPC-2	International Classification of Primary Care – Version 2
ICPC-2 PLUS	a terminology classified according to ICPC-2
ICS	inhaled corticosteroid

INR	international normalised ratio
LABA	long-acting beta agonist
LCL	lower confidence limit
MBS	Medicare Benefits Schedule
M,C&S	microscopy, culture and sensitivity
NDSHS	National Drug Strategy Household Survey
NEC	not elsewhere classified
NESB	non-English-speaking background
NHMRC	National Health and Medical Research Council
NOS	not otherwise specified
OECD	Organisation for Economic Co-operation and Development
OTC	over-the-counter (medications advised for over-the-counter purchase)
PBS	Pharmaceutical Benefits Scheme
PIP	practice incentive payments
PN	practice nurse
PPP	purchasing power parity
RACF	residential aged care facility
RACGP	Royal Australian College of General Practitioners
RFE	reason for encounter
SABA	short-acting beta agonist
SAND	Supplementary Analysis of Nominated Data
SAS	Statistical Analysis System
SIP	service incentive payments
UCL	upper confidence limit
URTI	upper respiratory tract infection
USD	United States Dollars
WHO	World Health Organization
Wonca	World Organization of Family Doctors

Symbols

χ^2	chi-square
—	not applicable
<	less than
>	more than
n	number
F	rate is less than 0.05 per 100 encounters

Glossary

A1 Medicare items: See *MBS/DVA items: A1 Medicare items*.

Aboriginal: The patient identifies himself or herself as an Aboriginal person.

Activity level: The number of general practice A1 Medicare items claimed during the previous 3 months by a participating GP.

Allied health services: Clinical and other specialised health services provided in the management of patients by allied and other health professionals including physiotherapists, occupational therapists, dietitians, dentists and pharmacists.

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

Chronic problem: See *Diagnosis/problem: Chronic problem*.

Commonwealth concession card: An entitlement card provided by the Australian Government, which entitles the holder to reduced-cost medicines under the Pharmaceutical Benefits Scheme and some other concessions from state and local government authorities.

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

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

Co-located health service: A health service (for example, physiotherapist, psychologist, etc) located in the practice building or within 50 metres of the practice building, available on a daily or regular basis.

Co-operative after-hours arrangements: The normal after-hours arrangements for patient care provision is undertaken in co-operation with another practice(s).

Consultation: See *Encounter*.

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

- *New problem:* The first presentation of a problem, including the first presentation of a recurrence of a previously resolved problem, but excluding the presentation of a problem first assessed by another provider.
- *Old problem:* A previously assessed problem that requires ongoing care, including follow-up for a problem or an initial presentation of a problem previously assessed by another provider.
- *Chronic problem:* A medical condition characterised by a combination of the following characteristics: duration that has lasted or is expected to last 6 months or more, a pattern of recurrence or deterioration, a poor prognosis, and consequences or sequelae that impact on an individual's quality of life. (Source: O'Halloran J, Miller GC, Britt H 2004. *Defining chronic conditions for primary care with ICPC-2*. *Fam Pract* 21(4):381–86).
- *Work-related problem:* Irrespective of the source of payment for the encounter, it is likely in the GP's view that the problem has resulted from work-related activity or workplace exposure, or that a pre-existing condition has been significantly exacerbated by work activity or workplace exposure.

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

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

Direct encounters can be further divided into:

- *MBS/DVA-claimable*: Encounters for which GPs have recorded at least one MBS item number as claimable, where the conditions of use of the item require that the patient be present at the encounter.
- *Workers compensation*: Encounters paid by workers compensation insurance.
- *Other paid*: Encounters paid from another source (for example, state).

Full-time equivalent (FTE): A GP working 35–45 hours per week.

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

Generic medication: See *Medication: Generic*

GP consultation service items: See *MBS/DVA items: GP consultation service items*.

MBS/DVA items: MBS item numbers recorded as claimable for activities undertaken by GPs and staff under the supervision of GPs. In BEACH, an MBS item number may be funded by Medicare or by the Department of Veterans' Affairs (DVA).

- *A1 Medicare items*: Medicare item numbers 1, 2, 3, 4, 13, 19, 20, 23, 24, 25, 33, 35, 36, 37, 38, 40, 43, 44, 47, 48, 50, 51, 601, 602.
- *GP consultation service items*: Includes GP services provided under the MBS professional services category including MBS items classed as A1, A2, A5, A6, A7, A14, A17, A18, A19, A20, A22, A23, A27, A30 and selected items provided by GPs classified in A11 and A15.
- *MBS/DVA item categories*: (Note: item numbers recorded in BEACH in earlier years which are no longer valid are mapped to the current MBS groups)
 - *Surgery consultations*: Identified by any of the following item numbers: short 3, 52, 5000, 5200; standard 23, 53, 5020, 5203; long 36, 54, 2143, 5040; prolonged 44, 57, 2195, 5060, 5208.
 - *Residential aged care facility*: Identified by any of the following item numbers: 20, 35, 43, 51, 92, 93, 95, 96, 5010, 5028, 5049, 5067, 5260, 5263, 5265, 5267.
 - *Home or institution visits (excluding residential aged care facilities)*: Identified by any of the following item numbers: 4, 19, 24, 33, 37, 40, 47, 50, 58, 59, 60, 65, 87, 89, 90, 91, 503, 507, 5003, 5023, 5043, 5063, 5220, 5223, 5227, 5228.
 - *GP mental health care*: Identified by any of the following item numbers: 2700, 2701, 2702, 2704, 2705, 2710, 2712, 2713, 2715, 2717, 2721, 2723, 2725.
 - *Chronic disease management items*: Identified by any of the following item numbers: 720, 721, 722, 723, 724, 725, 726, 727, 729, 730, 731, 732.
 - *Health assessments*: Identified by any of the following item numbers: 700, 702, 703, 704, 705, 706, 707, 708, 709, 710, 712, 713, 714, 715, 717, 718, 719.
 - *Case conferences*: Identified by any of the following item numbers: 139, 734, 735, 736, 738, 739, 740, 742, 743, 744, 747, 750, 762, 765, 771, 773, 775, 778.
 - *Attendances associated with Practice Incentives Program payments*: Identified by any of the following item numbers: 2497, 2501, 2503, 2504, 2506, 2507, 2509, 2517, 2518, 2521, 2522, 2525, 2526, 2546, 2547, 2552, 2553, 2558, 2559, 2574, 2575, 2577, 2598, 2600, 2603, 2606, 2610, 2613, 2616, 2620, 2622, 2624, 2631, 2633, 2635, 2664, 2666, 2668, 2673, 2675, 2677, 2704, 2705.

- *Practice nurse/Aboriginal health worker/allied health worker services*: Identified by any of the following item numbers: 711, 10950, 10951, 10960, 10966, 10970, 10986, 10987, 10988, 10989, 10993, 10994, 10995, 10996, 10997, 10998, 10999, 16400, 82210.
- *Acupuncture*: Identified by any of the following item numbers: 173, 193, 195, 197, 199.
- *Diagnostic procedures and investigations*: Identified by item numbers: 11000–12533.
- *Therapeutic procedures*: Identified by item numbers: 13206–23042 (excluding 16400).
- *Surgical operations*: Identified by item numbers: 30001–52036.
- *Diagnostic imaging services*: Identified by item numbers: 55037–63000.
- *Pathology services*: Identified by item numbers: 65120–74991.

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

- *Generic*: The generic name of a medication is its non-proprietary name, which describes the pharmaceutical substance(s) or active pharmaceutical ingredient(s).
- *GP-supplied*: The medication is provided directly to the patient by the GP at the encounter.
- *Over-the-counter (OTC)*: Medication that the GP advises the patient to purchase OTC (a prescription is not required for the patient to obtain an OTC medication).
- *Prescribed*: Medications that are prescribed by the GP (that is, does not include medications that were GP-supplied or advised for over-the-counter purchase).

Medication status:

- *New*: The medication prescribed/provided at the encounter/advised is being used for the management of the problem for the first time.
- *Continued*: The medication prescribed/provided at the encounter/advised is a continuation or repeat of previous therapy for this problem.
- *Old*: See *Continued*.

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

Non-English speaking background: The patient reported that the primary language spoken at home was not English.

Patient status: The status of the patient to the practice.

- *New patient*: The patient has not been seen before in the practice.
- *Patient seen previously*: The patient has attended the practice before.

Problem managed: See *Diagnosis/problem*.

Provider: A person to whom a patient has access when contacting the healthcare system.

Reasons for encounter (RFEs): The subjective reasons given by the patient for seeing or contacting the general practitioner. These can be expressed in terms of symptoms, diagnoses or the need for a service.

Recognised GP: A medical practitioner who is:

- vocationally recognised under Section 3F of the *Health Insurance Act*, or
- a holder of the Fellowship of the Royal Australian College of General Practitioners who participates in, and meets the requirements for, quality assurance and continuing medical education as defined in the Royal Australian College of General Practitioners (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. (*Source:* Commonwealth Department of Health and Aged Care 2001. *Medicare Benefits Schedule book*. Canberra: DHAC).

Referral: The process by which the responsibility for part, or all, of the care of a patient is temporarily transferred to another health care provider. Only new referrals to specialists and allied health services, and for hospital and residential aged care facility admissions arising at a recorded encounter, are included. Continuation referrals are not included. Multiple referrals can be recorded at any one encounter.

Repatriation Health Card: An entitlement card provided by the Department of Veterans' Affairs that entitles the holder to access a range of repatriation health care benefits, including access to prescription and other medications under the Pharmaceutical Benefits Scheme.

Rubric: The title of an individual code in ICPC-2.

Significant: This term is used to refer to a statistically significant result. Statistical significance is measured at the 95% confidence level in this report.

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

Work-related problem: See *Diagnosis/problem*.

Appendices

Appendix 1: Example of a 2014–15 recording form

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

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DOC ID

Encounter Number	Date of encounter	Date of Birth	Sex	Patient Postcode	Yes / No New Patient <input type="checkbox"/> <input type="checkbox"/> Health Care/Benefits Card <input type="checkbox"/> <input type="checkbox"/> Veterans Affairs Card <input type="checkbox"/> <input type="checkbox"/> NESA <input type="checkbox"/> <input type="checkbox"/> Aboriginal <input type="checkbox"/> <input type="checkbox"/> Torres Strait Islander <input type="checkbox"/> <input type="checkbox"/>	PATIENT NOT SEEN BY GP <input type="checkbox"/> PATIENT NOT SEEN BY GP <input type="checkbox"/> Medicare Item Nos: (if applicable) Home visit (not RACF) <input type="checkbox"/> 1. <input type="checkbox"/> Workers comp paid <input type="checkbox"/> 2. <input type="checkbox"/> Other paid <input type="checkbox"/> 3. <input type="checkbox"/> No charge <input type="checkbox"/>
START Time	1. Patient Reasons for Encounter	2.	3.			
AM / PM (please circle)						
Diagnosis/ Problem ①: Problem Status New <input type="checkbox"/> Old <input type="checkbox"/> Drug Name AND Form for this problem: Drug Name AND Form for this problem						
1.	Strength of product	Dose	Frequency	No. of Rpts	OTC	
2.						
3.						
4.						
Procedures, other treatments, counselling this consult for this problem						
1.	Prac Nurse? <input type="checkbox"/>	2.	Prac Nurse? <input type="checkbox"/>		Prac Nurse? <input type="checkbox"/>	
Diagnosis/ Problem ③: Problem Status New <input type="checkbox"/> Old <input type="checkbox"/>						
1.	Strength of product	Dose	Frequency	No. of Rpts	OTC	
2.						
3.						
4.						
Procedures, other treatments, counselling this consult for this problem						
1.	Prac Nurse? <input type="checkbox"/>	2.	Prac Nurse? <input type="checkbox"/>		Prac Nurse? <input type="checkbox"/>	
Diagnosis/ Problem ④: Problem Status New <input type="checkbox"/> Old <input type="checkbox"/>						
1.	Strength of product	Dose	Frequency	No. of Rpts	OTC	
2.						
3.						
4.						
Procedures, other treatments, counselling this consult for this problem						
1.	Prac Nurse? <input type="checkbox"/>	2.	Prac Nurse? <input type="checkbox"/>		Prac Nurse? <input type="checkbox"/>	
NEW REFERRALS, ADMISSIONS Problem(s)						
1.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
2.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
IMAGING/Other tests Body site						
1.						
2.						
3.						
PATHOLOGY Problem(s)						
1.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
2.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
3.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
PATHOLOGY (cont) Problem(s)						
1.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
2.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
3.	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
To the patient if 18+:						
How often do you have a drink containing alcohol?						
Never <input type="checkbox"/> Monthly or less <input type="checkbox"/> Once a week/fortnight <input type="checkbox"/> 2-3 times a week <input type="checkbox"/> 4+ times a week <input type="checkbox"/>						
How many 'standard' drinks do you have on a typical day when you are drinking?						
Never <input type="checkbox"/> Less than monthly <input type="checkbox"/> Monthly <input type="checkbox"/> Weekly <input type="checkbox"/> Daily or almost daily <input type="checkbox"/>						
How often do you have 6 or more standard drinks on one occasion?						
Never <input type="checkbox"/> Less than monthly <input type="checkbox"/> Monthly <input type="checkbox"/> Weekly <input type="checkbox"/> Daily or almost daily <input type="checkbox"/>						
FINISH Time						
AM / PM (please circle)						
BA17						

Appendix 2: GP characteristics questionnaire, 2014–15



THE UNIVERSITY OF SYDNEY

GP profile

Family Medicine Research Centre



Doctor Identification Number

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Please answer the following: a) ABOUT YOU

- Sex Male / Female (Please circle)
- Age
- How many years have you spent in general practice?
- Country of graduation (primary medical degree):
 Australia Other: (specify) _____
- How many direct patient care hours do you work per week?
(Include hours of direct patient care, instructions, counselling etc and other services such as referrals, prescriptions, phone calls etc.)
- Are you a GP Registrar (i.e. in training)? Yes / No
- Do you hold FRACGP? Yes / No
- Do you hold FACRRM? Yes / No
- Do YOU use the computer at your major practice? Yes / No
 If 'yes', which clinical software is used? (specify) _____
Please tick to indicate which functions of the computer/clinical software you use
Active medical records: Completely paperless
 Combination of computer and paper
 Paper only
Prescribing: Electronic prescribing (ePrescribing online)
 Print scripts
 Paper only (handwritten)
Other: Internet
 Email
- Over the past four weeks have you provided any patient care...
 (a) in a residential aged care facility? Yes / No
 (b) as a salaried/sessional hospital medical officer? Yes / No
- At how many practice locations do you usually work, in a regular week.....
- Did any of your BEACH consultations take place in an Aboriginal Community Controlled Health Service?
(Circle one option)
 No..... 1
 Yes - all 2
 Yes - some (which dates) 3

b) ABOUT YOUR MAJOR PRACTICE

- Postcode?
 - Which Medicare Local? _____
 - Is the practice accredited?..... Yes / No
 - How many individuals (ie. headcount) and how many full-time equivalents (FTE*) for each type of professional listed below?
**Each FTE is defined as working 35-45 hours per week e.g. 2 GPs each working 20 hours/wk is recorded as 2 individual GPs and 1 FTE; 1 practice nurse working 20 hours/wk is recorded as 1 individual and 0.5 FTE.*
- | | No. individuals | No. FTEs |
|-----------------------------------|----------------------|----------------------|
| (a) GPs (including yourself) | <input type="text"/> | <input type="text"/> |
| (b) Practice nurses | <input type="text"/> | <input type="text"/> |
| (c) Nurse practitioners | <input type="text"/> | <input type="text"/> |
| (d) Aboriginal health workers ... | <input type="text"/> | <input type="text"/> |
- Health services located or available (on a daily or regular basis) at the practice site?
(Tick all that apply)
- | | In the practice | In the building or within 50 metres |
|-----------------------------------|--------------------------|-------------------------------------|
| Physiotherapist | <input type="checkbox"/> | <input type="checkbox"/> |
| Psychologist | <input type="checkbox"/> | <input type="checkbox"/> |
| Dietitian..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Podiatrist | <input type="checkbox"/> | <input type="checkbox"/> |
| Pathology collection centre/lab.. | <input type="checkbox"/> | <input type="checkbox"/> |
| Imaging | <input type="checkbox"/> | <input type="checkbox"/> |
| Specialist(s)
(specify): _____ | <input type="checkbox"/> | <input type="checkbox"/> |
| Other
(specify): _____ | <input type="checkbox"/> | <input type="checkbox"/> |
| NONE | <input type="checkbox"/> | <input type="checkbox"/> |
- Normal after-hours arrangements?
(Circle all that apply)
 Practice does its own..... 1
 Co-operative with other practices 2
 Deputising service..... 3
 Other (specify) 4
 None 5

Thank you for participating in the **BEACH PROGRAM**.
 Please return this form with the completed BEACH pad.

Appendix 3: Patient information card, 2014–15



Family Medicine Research Centre



INFORMATION FOR PATIENTS

The *BEACH*® Project

Today your doctor is taking part in a National Survey of general practice called *BEACH*® (*Bettering the Evaluation and Care of Health*). This study is being done by the Family Medicine Research Centre, University of Sydney.

Your Doctor will be recording information about each patient he/she sees (age, gender etc), the problems that you see the Doctor about and the treatments given to you. **There are no names on the forms so you cannot be identified.** The information about today's visit to the doctor will be one record in a set of 100,000 records collected in general practices across Australia every year.

This information will be used by researchers to describe what happens in general practice and to look at different aspects of health care; by government departments to help them plan for our future health; and by pharmaceutical companies to gain a picture of the problems being treated with the drugs they produce.

Remember: your name will not be on the form and no information will ever be released which could possibly let anyone know who you are. However, if you do not wish your doctor to record any unidentified information about you or your visit **please tell your Doctor as soon as you go in.** Such a decision will not affect the consultation with your doctor in any way.

SEE OVER FOR PROJECT DETAILS

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BEACH[®] Program Details

This program has been approved by the Ethics Committee of the University of Sydney. The data are being collected in accordance with the Privacy Act 1988 as amended.

Organisations contributing financially to the conduct of this study in 2014–2015 are:

- ✦ The Australian Government Department of Health
- ✦ AstraZeneca Pty Ltd (Australia)
- ✦ CSL Biotherapies Pty Ltd
- ✦ Novartis Pharmaceuticals Australia Pty Ltd
- ✦ AbbVie Pty Ltd

BEACH is endorsed
by
the Royal Australian College
of General Practitioners



BEACH is endorsed
by
the Australian Medical Association



FURTHER INFORMATION:

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Fax: (02) 9845 8155
Email: clare.bayram@sydney.edu.au
Web: <http://sydney.edu.au/medicine/fmrc/>

Any person with concerns or complaints about the conduct of this research study can contact The Manager, Research Integrity and Ethics Administration, University of Sydney on +61 2 8627 8176 (Telephone); +61 2 8627 8177 (Facsimile); ro.humanethics@sydney.edu.au (Email).

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Appendix 4: Code groups from ICPC-2 and ICPC-2 PLUS

Available at: <hdl.handle.net/2123/13765>.

Table A4.1: Code groups from ICPC-2 and ICPC-2 PLUS – reasons for encounter and problems managed

Table A4.2: Code groups from ICPC-2 and ICPC-2 PLUS – chronic problems

Table A4.3: Code groups from ICPC-2 and ICPC-2 PLUS – problems managed by practice nurses

Table A4.4: Code groups from ICPC-2 and ICPC-2 PLUS – clinical treatments

Table A4.5: Code groups from ICPC-2 and ICPC-2 PLUS – procedures

Table A4.6: Code groups from ICPC-2 and ICPC-2 PLUS – clinical measurements

Table A4.7: Code groups from ICPC-2 and ICPC-2 PLUS – referrals

Table A4.8: Code groups from ICPC-2 and ICPC-2 PLUS – pathology test orders (MBS groups)

Table A4.9: Code groups from ICPC-2 and ICPC-2 PLUS – imaging test orders (MBS groups)

Appendix 5: Calculation methods for Table 14.1

Attending population weight

On the SAND recording form (see Appendix 1), there was a question asking the number of times the patient had seen a GP in the previous 12 months (including the current visit). An attending population weight was created by weighting each surveyed patient by their chance of being in our sample. The chance of being in our sample is based on how many times they had visited a GP in the previous year. A weight of $X/(\text{number of GP visits})$ was applied to each patient.

Management ratios

The management ratio was calculated by dividing the proportion of encounters at which the chronic condition was managed, by the prevalence of the condition among patients at general practice encounters.

Number of GP visits in previous 12 months

The average number of times patients aged 65+ with a certain chronic condition had seen a GP in the previous year was calculated using the attending population weight (described above).

Number of times condition was managed in general practice

The number of times a condition was managed in general practice was calculated by multiplying the management ratio by the average number of times patients with the selected chronic condition had visited a GP in previous 12 months.

Population prevalence

Population prevalence was calculated by first applying the attending population weight to the data. A second weight was created so that when applied to the attending population weight, the proportion of surveyed patients in each age–sex group matched the proportion represented by that age–sex group in the Australian population.

The numerator of whether a patient had a specific chronic condition (1 = patient has chronic condition, 0 = patient does not have condition) was weighted by the proportion of people in that age–sex group that saw a GP at least once in the previous year. This adjusted the data for those who did not see a GP, whom we assumed had not been diagnosed with that chronic condition.

Proportion of patients with a selected condition, who had 2 or more other chronic conditions

The proportion of people aged 65+ with a selected condition who had two or more other diagnosed chronic conditions was calculated using the attending population weight. This means that the results are representative of people in the population who have the selected diagnosed condition.

This book provides a summary of results from the 17th year of the University of Sydney's BEACH program, a continuous national study of general practice activity in Australia.

From April 2014 to March 2015, 995 general practitioners (GPs) recorded details of 99,500 GP-patient encounters, at which patients presented 151,636 reasons for encounter and 153,133 problems were managed. For an 'average' 100 problems managed, GPs recorded 66 medications (including 55 prescribed, 5 supplied to the patient and 6 advised for over-the-counter purchase), 11 procedures, 22 clinical treatments (advice and counselling), 6 referrals to specialists and 3 to allied health services, 30 orders for pathology tests and 7 for imaging tests.

A subsample study of measured risk factors in more than 31,000 patients suggests that in the adult (18 years and over) population who attended general practice at least once in 2014–15 the prevalence of obesity was 27%, overweight was 34%, daily smoking was 17%, and at-risk alcohol consumption was 26%. One in four people in the attending population had at least two of these risk factors.

This book also contains a feature chapter examining changes in the care of older people (aged 65 years or more) in general practice over the 15 years 2000–01 to 2014–15.



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