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General practice activity in Australia

2011–12

Family Medicine Research Centre

Helena Britt, Graeme C Miller, Joan Henderson, Janice Charles, Lisa Valenti, Christopher Harrison, Clare Bayram, Carmen Zhang, Allan J Pollack, Julie O'Halloran, Ying Pan

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BEACH
Bettering the Evaluation and Care of Health

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Preface

"We believe that it would be useful for researchers to keep up databases … over several years so that changes over time and their consequences on quality of care can be quantified" *(Norton, Dunn and Soberman, 1994)*

In Australia the general practice profession has a unique opportunity to assess its strengths and weaknesses, and see the changes in its practice over time, through the reports from the BEACH program. This 31st book in the General practice series describes clinical activity at GP–patient encounters in 2011–12 and is accompanied by the 32nd book, *A decade of Australian general practice 2002–03 to 2011–12.*

The General practice series provides timely information to the profession of general practice, professional organisations, researchers, health planners and policy makers. When BEACH began in 1998 as a paper based survey program, many believed it would only last about two years … just until we could organise the secure download of data from GP electronic health records (EHRs). The BEACH program is now in its 15th year.

It took over 20 years of extensive research and development to get to the national BEACH program—testing validity and reliability of each aspect of the methods (funded by small NHMRC grants), followed by 'proof of concept' in 1990–91 in the conduct of the national Australian Morbidity and Treatment Survey (AMTS). The AMTS data provided the basis on which we further developed the standards for GP encounter data—national sample size requirements, data structures, data elements and their definitions, and coding and classification systems. Many used the AMTS data and over the next seven years the need for more up-to-date information became clearly recognised.

So BEACH was born, the only continuous, national, representative study of GP activity in the world that links management actions with morbidity. This linkage is essential for the understanding of what treatments are given for which morbidity, but Medicare and the Pharmaceutical Benefits Scheme do not have such linkages. Governments were not prepared to fund the program in full but were willing to help, so the program has somewhat tenuous research funding from multiple organisations, many of which have changed over time.

BEACH remains a paper based study. The barriers to reliable electronic measurement of GP clinical activity remain large. Most people assumed that with EHRs, there was no need for research and development of the type leading to the BEACH program. As a result, we still have no mandated standards for EHR structure, data elements, definitions, terminologies and classification systems, and no minimum data set required about the patient, their past history, family history and their encounter.

Over the years much of the ground work has been done. For example in the early 90's, as part of the Aus–Read trial, we developed detailed specifications for GP EHRs, and these were regarded as a major achievement by the independent reviewers of the project. However, no-one took up these specifications and Government decided not to proceed with development of standards for computerised data recording and collation. We assume these specifications remain in someone's drawer.

Then in 1997, IBM produced a Functional Requirements Specification for Clinical and Administrative General Practice Computer Systems for the (then) Commonwealth Department of Health and Family Services. In 2000, in collaboration with the profession and the FMRC, Simsion Bowles and Associates developed a comprehensive general practice data

model and core data set, funded by the Department of Health and Ageing through the General Practice Computer Group (GPCG). Later the GPCG did considerably more work in the area of standards for EHRs. In 2003, the International Classification of Primary Care (ICPC–2) was declared the recommended standard for classifying patient reported and GP recorded morbidity data. Sadly, this again failed to become an enforced standard.

In 2005, following the establishment of the National eHealth Transition Authority (NeHTA), government funding for the GPCG ended and it was effectively shut down with the cessation of dedicated government funded GP IT development. NeHTA has subsequently concentrated on developing the Personally Controlled Electronic Health Record (PCEHR). The RACGP is currently reviewing GP EHR standards, but without substantial funding support this work is likely to be protracted.

So while much work has been done, none has resulted in implementation of the necessary GP EHR standards. Currently we have multiple EHR systems with different structures, data elements and terminologies. This lack of adherence to standards has increasingly restricted practice freedom to change EHR systems; it has a negative effect on interoperability, and has ensured that national data collection programs cannot rely on passive data collection from GP desktops to provide a reliable picture of the care provided to the population. Such lack of data standards is amazing in a country with 125 million GP services claimed through Medicare in the 2011–12 financial year, at a cost to government of about $5 billion dollars.

With increasing prevalence of multimorbidity in an ageing population, and growing acceptance of the need for a more holistic approach to an individual's care within the healthcare system, the care given in general practice has become more than that provided by the GPs alone. Since the introduction of Medicare item numbers for selected practice nurse and Aboriginal health worker activities, the work of individual GPs has changed.

It is likely that more and more of the services provided by other health professionals will be conducted independently of the GP–patient encounter. As this occurs, BEACH is likely to show a decrease in some clinical activities by GPs. However, we will not know whether this is due to others in the practice taking over this role, or whether, in fact, there has been a decrease in provision of such care in general practice.

Therefore, until we have standardised GP EHRs that are constantly updated by all healthcare providers within general practices, we need a parallel study of the work undertaken by practice nurses and other health professionals within general practices. These data could be combined with BEACH data to provide a complete picture of the care provided by all clinical staff in the care of their practice population.

Together with the profession and other stakeholders, we have learned an enormous amount about general practice quality and changes over time in the last 14 years as a result of the BEACH program. BEACH has made a significant contribution to the debate and policy change driving primary care reform and professional GP development. How much more could we learn if we were able to collect reliable, valid, representative longitudinal patient based data from GP EHRs and how much more could this contribute to the continuing development of primary care in Australia? Why are we still waiting?

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Summary

This report describes clinical activity at, or associated with, general practitioner (GP) encounters, from April 2011 to March 2012, inclusive. It summarises results from the 14th year of the Bettering the Evaluation and Care of Health (BEACH) program, using a sample of 98,400 patient encounters with 984 randomly selected GPs. After post-stratification weighting, 99,030 encounters were analysed in this report.

BEACH is a continuous cross-sectional national study that began in April 1998. Every year each of about 1,000 randomly selected GPs records details of 100 consecutive encounters on structured paper recording forms, and provides information about themselves and their practice. BEACH is the only continuous randomised study of general practice activity in the world, and the only national program that provides direct linkage of management (such as prescriptions, referrals, investigations) to the problem under management.

The BEACH database now includes information for almost 1.4 million encounters from 13,815 participants representing 9,111 individual GPs.

In subsamples of the BEACH encounters smaller patient-based (rather than encounter-based) studies are conducted. This publication includes results for patient body mass index, smoking status and alcohol consumption, and abstracts (with the research tools) are provided for each of the other substudies conducted in 2011–12.

The companion report highlighting major change over the most recent 10 years of BEACH, *A decade of Australian general practice activity 2002–03 to 2012–12*,[1] is available at <purl.library.usyd.edu.au/sup/9781743320204>.

The general practitioners

Of the 984 participating GPs in 2011–12:

- 59% were male, 41% were aged 55 years and over, 67% had graduated in Australia
- spent an average of 36.9 hours per week (median 38 hours) in direct patient care
- more than 50% were Fellows of the Royal Australian College of General Practitioners (RACGP), and 7% were Fellows of the Australian College of Rural and Remote Medicine (ACRRM)
- 29% bulk-billed Medicare for all patients and 71% bulk-billed for selected patients
- 50% had provided care in a residential aged care facility in the previous month
- 71% practised in Major cities (using Australian Standard Geographical Classification)
- 57% were in practices of fewer than five full-time equivalent (FTE) GPs
- 77% worked in a practice employing practice nursing staff
- nearly two-thirds (62%) had a co-located pathology laboratory or collection centre and almost half (47%) had a psychologist in or within 50 metres of the practice
- 42% worked in a practice that provided their own or cooperative after-hours care
- 63% worked in a practice teaching undergraduates, junior doctors, and or registrars

- 94% of GPs were producing prescriptions electronically, 93% were receiving pathology results online, 81% were producing and printing pathology orders, and 36% were ordering pathology electronically. Almost two-thirds (65%) reported they used electronic medical records exclusively (that is, were paperless).

There were no significant differences in the characteristics of the final sample of BEACH participants and all GPs in the sample frame in terms of sex, age, place of graduation, state, or location by the Australian Standard Geographical Classification.

Participating GPs were slightly less 'busy' than non-participants, with an average 6.8 fewer MBS claims for GP consultation service items per week over the previous year.

The encounters

After weighting the data for non statistically significant minor differences in GP activity and the age–sex distribution of the GP participants, the age–sex distribution of patients at BEACH encounters had an excellent fit (precision ratios 0.91–1.09), with that of patients at all GP services claimed under the Medicare Benefits Schedule (MBS).

- On average, patients gave 155 RFEs, and GPs managed about 154 problems per 100 encounters.
- Chronic problems accounted for 36%, and new problems for 38% of all problems.
- Work-related problems were managed at a rate of 2.6 per 100 encounters.
- Medications were the most common treatment choice, (107 per 100 encounters). Most were prescribed (87 per 100 encounters), rather than supplied by the GP (10 per 100) or advised for over-the-counter (OTC) purchase (11 per 100).
- At an 'average' 100 encounters, problem management involved: 47 pathology tests/batteries of tests; 37 clinical treatments; 17 procedures; 15 referrals [most commonly to medical specialists (9) and to allied health services (5)]; and 10 imaging tests.
- Direct encounters (patient seen) accounted for 98% of encounters at which a payment source was recorded. Of these: 95% were claimable either through the MBS or the DVA; 2% through workers compensation, 1% through other sources.

In a subsample of 33,096 BEACH MBS/DVA-claimable encounters at which start and finish times were recorded, mean consultation length was 15.2 minutes, median 13.0 minutes

Who were the patients?

- Females accounted for 57% of encounters, and the greater proportion of encounters in all adult age groups. Children (aged < 15 years) accounted for 12% of encounters; 15–24 years 9%; 25–44 years 23%, 45–64 years 28%; 65–74 years 13%; and 75 years and over 16%.
- The patient was new to the practice at 8% of encounters, held a Commonwealth concession card at 45%, and was from a non-English-speaking background at 11%.
- At 1.6% of encounters the patient identified themselves as an Aboriginal and/or Torres Strait Islander person.

For every 100 encounters, patients gave 155 reasons for encounter (RFEs): 67 symptom and complaint RFEs, 29 diagnosis/disease RFEs, 59 requests for processes of care (e.g. procedures, referrals).

What problems do GPs manage at patient encounters?

There were 152,286 problems managed, average 154 per 100 encounters: one problem was managed at 62% of encounters, two or three being managed at 35%, and four at 3%. The number managed increased with age group of patients.

Two-thirds (68%) of problems were described as diagnoses or diseases, 18% in terms of symptoms or complaints, and 9% as diagnostic or preventive procedures (e.g. check-ups).

- The most common managed were: respiratory problems (20 per 100 encounters); problems of a general and unspecified nature (19); musculoskeletal problems (17); cardiovascular (17); and skin problems (17 per 100 encounters).
- Individual problems managed most often were hypertension (9.1 per 100 encounters), check-ups (6.4), upper respiratory tract infection (URTI) (6.0), immunisation/vaccination (4.7), and depression (4.4 per 100 encounters).
- At least one chronic problem was managed at 42% of encounters and 56 chronic problems were managed per 100 encounters.
- Almost half of all chronic problems managed were accounted for by the top six chronic problems: non-gestational hypertension (16% of chronic conditions), depressive disorder (8%), non-gestational diabetes (7%), chronic arthritis (7%), lipid disorder (6%), and oesophageal disease (5%). Extrapolation of these results suggests that, across Australia in 2011–12, there were 11.0 million encounters involving hypertension, 5.4 million involving depression and 5.0 million involving diabetes.

An example of the relationship between a problem managed and other data fields is provided for GP management of gastro-oesophageal reflux disease in 2011–12 in Section 7.8.

What management actions were recorded for problems managed?

For an 'average' 100 patient problems, GPs provided 57 prescriptions and 24 clinical treatments, undertook 11 procedures, made 6 referrals to medical specialists and 3 to allied health services, and placed 31 pathology test orders and 7 imaging test orders.

Medications

There were 106,007 medications, 107 per 100 encounters but only 70 per 100 problems managed: 81% were prescribed, 10% supplied by the GP and 11% recommended for OTC purchase.

Extrapolation to the 122.5 million Medicare GP consultation items claimed in 2011–12 suggests GPs wrote about 106 million prescriptions, supplied 11.9 million medications directly to the patient, and advised medications for OTC purchase 12.9 million times.

- At least one medication (most commonly prescribed) was given for 55% of problems managed.
- No repeats were given for 35% of prescriptions, and five repeats were ordered for 36%. The ordering of one repeat was also quite common (16%).
- Medication types most often prescribed were those acting on: the nervous system (22.8% of scripts), particularly opioids (6.8%) and antidepressants (4.7%); and the cardiovascular system (19.3%), particularly antihypertensives and lipid lowering agents. The most commonly prescribed individual medications were: the antibiotics amoxycillin (3.7% of all prescriptions), cephalexin (3.2%) and amoxycillin with potassium clavulanate (2.1%); the analgesics paracetamol (3.4%) and paracetamol/codeine (2.2%); the lipid modifying agent atorvastatin (1.8%); and the opioid oxycodone (1.7%).

- Medications were GP-supplied at a rate of 10 per 100 problems managed and vaccines accounted for the vast majority of these.
- Medications were advised for OTC purchase at a rate of 7 per 100 problems managed. Paracetamol accounted for 27% of these and ibuprofen for 7%.

The pattern of GP prescription or supply of proton pump inhibitors (to whom and for what) is provided as an example of pharmaco-epidemiological analysis in Section 9.5.

Other treatments

At least one other treatment was provided at 41% of encounters and 53,395 other treatments were recorded, 69% being clinical treatments.

Clinical treatments: 36,610 clinical treatments were recorded, 37 per 100 encounters, or 24 per 100 problems managed. General advice and education (16% of clinical treatments), and counselling about the problem being managed (13%) were most common. Preventive counselling/advice about nutrition and weight, exercise, smoking, lifestyle, prevention, and alcohol was also frequently provided by GPs (together at a rate of 7.7 per 100 encounters).

Of all problems for which clinical treatments were provided, the top ten accounted for 29%. The most common were depression (5.5% of problems with clinical treatments), URTI (5.2%), hypertension (3.4%) and diabetes (3.4%).

Procedural treatments: 16,785 procedural treatments were recorded, 17 per 100 encounters, or 11 per 100 problems. The most common were: excisions (2.8 per 100 encounters), dressings (2.5 per 100), local injections (2.2) and rehabilitation (1.4).

Practice nurse (PN)/Aboriginal health worker (AHW) activity

These data are limited to PN/AHW work associated with recorded GP–patient encounters.

- PNs/AHWs were involved in 7% of encounters and in management of 5% of the problems managed. A practice nurse Medicare item number was recorded for 27% of those encounters involving a practice nurse, the most common claims being for immunisation (55% of PN/AHW item number claims) and wound treatment (33%).
- The majority of their activities were procedural (89%) and these procedures represented 35% of all procedures recorded. Clinical treatments accounted for 11% of practice nurse activity, but only 2% of all recorded clinical treatments.
- The most common procedures done by PNs/AHWs were injections (36% of recorded procedures), dressings (20%), check-ups (8%) and INR tests (7%).

Referrals and admissions

There were a total of 14,382 referrals, 15 per 100 encounters or 9 per 100 problems. The most frequent were to medical specialists (9 per 100 encounters, 6 per 100 problems managed), followed by referrals to allied health services (5 per 100 encounters, 3 per 100 problems). Very few patients were referred to hospitals or emergency departments (0.6 per 100 encounters, 0.4 per 100 problems).

Referrals to specialists were most often to surgeons (10% of specialist referrals), orthopaedic surgeons (9%), cardiologists (8%), dermatologists (8%) and ophthalmologists (7%). Diabetes, malignant skin neoplasms, pregnancy and osteoarthritis were the problems most often referred to specialists.

For the first time, this report incorporates information about what problems are referred by GPs to each of the most common medical specialties: surgeons, orthopaedic surgeons,

cardiologists, dermatologists, ophthalmologists, gastroenterologists, ear, nose and throat (ENT) specialists, gynaecologist, urologist, and neurologist. When analysed by individual medical specialty, the top ten problems accounted for 39.9% of all referrals to surgeons (indicative of the broad range of conditions referred to them), and for 74.9% of all referrals to dermatologists, consistent with a more defined range of problems referred.

Referrals to allied health services were most often to physiotherapists (28% of allied health referrals), psychologists (19%), podiatrists (10%) and dietitians/nutritionists (8%). Problems most likely to be referred to allied health services were depression, diabetes and back complaints.

Tests and investigations

Pathology tests ordered: GPs recorded 46,544 orders for pathology tests/batteries, at a rate of 47 per 100 encounters (31 per 100 problems managed). At least one pathology test was recorded at 18% of encounters (for 14% of problems managed).

- Chemistry tests accounted for 59% of pathology test orders, the most common being: lipid tests (2.9 per 100 problems managed); electrolytes, urea and creatinine (2.1); multi-biochemical analysis (1.9); and thyroid function tests (1.7 per 100).
- Haematology tests accounted for 18% of pathology and included full blood count, the most frequently ordered individual test (14% of all pathology), ordered at a rate of 4.3 per 100 problems managed.
- Microbiology accounted for 13% of pathology orders. Urine microscopy, culture and sensitivity was the most frequent test ordered within the group.
- Almost 40% of all pathology tests were generated by orders for ten problems, led by diabetes, hypertension, general check-ups, and lipid disorders.

Imaging ordered: There were 9,978 imaging test orders recorded, 10 per 100 encounters and 7 per 100 problems managed. At least one imaging test was ordered at 9% of encounters (for 6% of problems managed). Diagnostic radiology accounted for 46%, ultrasound 39%, and computerised tomography for 12% of all imaging orders.

Patient risk factors

Overweight and obesity in adults (18 years and over): Of 32,372 adults, 62% (69% of males and 57% of females) were overweight or obese: 35% being overweight and 27% obese.

Overweight and obesity in children (2–17 years): Of 3,093 children, 29% were overweight (18%) or obese (11%). Prevalence and age pattern did not differ between the sexes.

Smoking status (adults 18 years and over): Of 33,086 adults, 15% (18% of men and 13% of women) were daily smokers and this was most prevalent among 25–44 year olds (21.2%).

Alcohol consumption in adults (18 years and over): Of 32,257 adult patients 25% (29% of men and 23% of women) reported drinking at-risk levels of alcohol. It was most prevalence among 18–24 year olds.

Adult risk profile (18 years and over): Of the 31,401 patients for whom all three risk factor data were available: 25% had no risk factors, 52% had one, 19% had two, and 4% had three.

1 Introduction

This publication is the 14th annual report and the 31st 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 2011 to March 2012 inclusive, using details of 98,400 encounters between general practitioners (GPs) and patients (almost a 0.1% sample of all general practice encounters) from a random sample of 958 practising GPs across the country.

Released in parallel with this report is a summary of results from the most recent ten years of the BEACH program, *A decade of Australian general practice activity 2002–03 to 2011–12*,[1] available at <purl.library.usyd.edu.au/sup/9781743320204>. 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).

From 1998 to 2011 the BEACH program was conducted by the Family Medicine Research Centre (FMRC), University of Sydney, in collaboration with the Australian Institute of Health and Welfare (AIHW), under the *AIHW Act*. The collaboration ceased in March 2011. The FMRC continues to conduct the BEACH program.

BEACH is the only continuous randomised study of general practice activity 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 1.4 million encounters from 13,815 participants representing 9,111 individual GPs.

1.1 Background

In June 2011, the population of Australia was estimated to be 22.6 million people.[2] Australia's health expenditure in 2009–10 was $121.4 billion, an average $5,479 per Australian, and accounted for 9.4% of GDP. Governments funded 69.9%, with the remainder (30.1%) being paid by the non-government sector.[3] Government expenditure on general practice services (including those of the practice nurses) was almost $5.6 billion dollars in the 2011–12 financial year.[4]

GPs are usually the first port of call in the Australian healthcare system. Payment for GP visits is largely on a fee-for-service system, there being no compulsory patient lists or registration. People are free to see multiple practitioners and visit multiple practices of their choice. There is a universal medical insurance scheme (managed by Medicare Australia), which covers all or most of an individual's costs for a GP visit.

In 2009 in Australia, there were 25,707 practising primary care practitioners (vocationally recognised GPs and other medical practitioners), making up 24,614 full-time equivalents (based on a 40-hour week), or 112.1 per 100,000 people.[5] While more recent labor force data have been published,[6] the national figures reported do not include data from Queensland and Western Australia, so are not quoted here.

In the April 2011 – March 2012 year, about 83% of the Australian population claimed at least one GP service from Medicare (personal communication, Department of Health and Ageing [DoHA], April 2012). From April 2011 to March 2012, Medicare paid rebates for about

122.5 million claimed general practice service items (excluding practice nurse items),[7] at an average of about 5.36 GP visits per head of population or 6.55 visits per person who visited at least once. This equates to about 2.36 million GP–patient encounters per week.

While Medicare statistics provide information about frequencies and costs 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
- establish 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 15th year. The BEACH database now includes records for 1,381,500 GP–patient encounters from 13,815 participating GPs. Each year we publish an annual report of BEACH results collected in the previous 12 months. This publication reports results from April 2011 to March 2012. A companion publication *A decade of Australian general practice activity 2002–03 to 2011–12*,[1] provides summaries of changes in the most frequent events that have occurred 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, and directly linking management actions to the morbidity under management.
- 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.[8] Our access to a regular random sample of recognised GPs in active practice, through DoHA, ensures that the GP sample is drawn from a very reliable sample frame of currently active GPs.
- There are sufficient details about the characteristics of all GPs in the sample frame to test the representativeness of the final sample, and to apply post-stratification weighting to correct for any under or over-representation in the sample when compared with the

sample frame. 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 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, they are measuring what that group is doing at any one time, or how that group has changed over time, and 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.

- 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. DoHA 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.

- 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. In contrast, systems such as electronic health records rely on the GP to complete fields of interest without guidance.

- BEACH includes all patient encounters and management activities provided at these encounters, not just those encounters and activities funded by Medicare.

- 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 advise 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 link from all management actions (for example, prescribing, ordering tests) to the problem under management 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 use of an internationally standard well-structured classification system (ICPC-2)[9] designed specifically for general practice, together with the use of an extended vocabulary of terms which facilitates reliable classification of the data by trained secondary coders, removes the guesswork often applied in word searches of available records (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 terms of 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 how reliable any estimate might be.
- 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, as this can provide 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 others. This section summarises differences between BEACH and other national sources of data about general practice in Australia.

The Pharmaceutical Benefits Scheme

Prescribed medications paid for under the PBS are recorded by Medicare Australia. The PBS data:
- count the prescription each time it crosses the pharmacist's counter (so that one prescription written by the GP with five repeats in BEACH would be counted by the PBS six times if the patient filled all repeats)
- count only those prescribed medications subsidised by the PBS and costing more than the minimum subsidy (and therefore covered by the PBS for all patients), or medications prescribed for those holding a Commonwealth concession card or for those who have reached the safety net threshold
- 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 cardholders[10]
- have no record of the problem being managed (with the exception of authority prescriptions, which require an indication and account for a small amount of PBS data). The morbidity cannot be reliably assumed on the basis of the prescription type.[11-13]

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 amoxycillin fall under the PBS minimum subsidy level and would not be counted in the PBS data, except where patients received the medication under the PBS because they are Commonwealth concession cardholders or had reached the annual safety net threshold.[10]

Medicare Benefits Schedule

Consultations with GPs that are paid for in part or in full under 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 is made or who pays for them.

- The MBS data reflect the item number charged to Medicare for a service and some patient demographics, but hold no information about the content of the consultation.

- BEACH participants were 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. For example, a study of early uptake of some enhanced primary care items by GPs demonstrated in 2002 that almost half the enhanced primary care items claimed through the MBS came from about 6% of active GPs.[14] 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 over time of the data collection form. 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 data are generated by GP orders.[15]

- Each pathology company can respond differently to a specific test order label recorded by the GP. So the tests completed by a pathologist in response to a GP order for a multibiochemical analysis 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 DoHA 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 medical specialists.

- This means that the MBS pathology data reflect those tests billed to the MBS after interpretation of the order by the pathologist, and after selection of the three most expensive items.

- 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.

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,[16] 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:

- *Are rates of pathology test ordering higher in general practices co-located with pathology collection centres?*[17] 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.*[18]

- *Changes in pathology ordering by general practitioners in Australia 1998–2001.*[19]

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 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.

The National Health Survey

The National Health Survey, conducted by the Australian Bureau of Statistics, provides estimates of population prevalence of specific diseases, and a measure of the problems taken to the GP by people in the two weeks before the survey.

- Prevalence estimates 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.[20]

- Community surveys such as the National Health Survey have 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.

- Self-report has been demonstrated to be susceptible to misclassification because of a lack of clinical corroboration of diagnoses.[21]

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,[22,23] with about 83% of Australians visiting a GP at least once in 2011–12 (personal communication, DoHA, April 2012). Disease management rates are a product of both the prevalence of the disease/health problem in the population, and the frequency with which a patient visits a GP 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.

There was a substudy of disease prevalence among patients seen in general practice (using the Supplementary Analysis of Nominated Data method, see Section 2.6). Those interested in disease prevalence should refer to the following papers: *Estimating prevalence of common chronic morbidities in Australia*,[24] and *Prevalence and patterns of multimorbidity in Australia*.[25]

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/index.php>.

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 2011 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*[26]
- April 1999 to July 2006 were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*[27]
- August 2006 to March 2011 were published in each of the BEACH annual reports[28–32]
- April 2011 to March 2012 are included in Chapter 14 of this report.

Abstracts of results for all SAND substudies are also available on the FMRC website <sydney.edu.au/medicine/fmrc/publications/sand-abstracts/index.php> 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' encounter data are not identifiable even from the original 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/index.php>. The FMRC should be contacted for specific quotations. Contact details are provided at the front of this publication.

Analysis of the BEACH data is a complex task. The FMRC has designed standard reports that cover most aspects of a subject under investigation. Examples of a problem-based standard report (subject: ischaemic heart disease in patients aged 45 years and over), a group report (subject: female patients aged 15–24 years) and a pharmacological-based standard report (subject: allopurinol) for a single year's data are available at <sydney.edu.au/medicine/fmrc/beach/data-reports/for-purchase/index.php>.

Customised data analyses can be done where the specific research question is not adequately answered through standard reports.

2   Methods

In summary:

- each year, BEACH involves a new random sample of about 1,000 GPs
- each GP records details 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 two 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 three-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 three-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 the DoHA updates the sample frame from the Medicare records quarterly from 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 DoHA.

- Over the following ten 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 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 and with targets relating to the National Health Priority Areas 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 six months later.

2.3   Ethics approval and informed patient consent

Ethics approval for this study in 2011–12 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 that 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, postgraduate general practice training status, Fellow of the RACGP status, Fellow of the ACRRM status, usual bulk-billing behaviour, use of computers at work, work undertaken in other clinical settings.

- **Practice characteristics:** postcode and GP Division 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, whether the practice is accredited, whether it is a teaching 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 boxes).

- **Patient data:** date of birth, sex and postcode of residence. Tick boxes (yes/no options) are provided for Commonwealth concession cardholder, holder of a Repatriation health card (from DVA), non-English-speaking background (patient self-report – 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 and whether the problem is considered by the GP to be work-related.

- **Management of** 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).

GP characteristics
- age and sex
- years in general practice
- country of graduation
- direct patient care hours/week
- usual bulk-billing practice
- postgraduate GP qualifications
- FRACGP status (yes/no)
- FACRRM status (yes/no)
- currently a registrar (yes/no)
- clinical use of computers

Practice characteristics
- practice size (no. & FTE GPs)
- practice nurse(s) (no. & FTE)
- after-hours arrangements
- postcode
- teaching practice (yes/no)

The encounter
- date
- direct (face to face)
  - Medicare/DVA item number(s) claimable
  - workers compensation
  - other paid
  - no charge
- indirect (e.g. telephone)

The patient
- age and sex
- practice status (new/old)
- Commonwealth concession card status
- DVA Status
- postcode of residence
- NESB/Indigenous status
- reasons for encounter

Patient substudies (SAND)
- risk factors
  - body mass
  - smoking status
  - alcohol consumption
- other topics

Problems managed
- diagnosis/problem label
- problem status (new/old)
- work-related problem status

Management of each problem

Medications (up to four per problem)
- prescribed
- over-the-counter advised
- provided by GP
  - drug class
  - drug group
  - generic
  - brand name
  - strength
  - regimen
  - number of repeats
  - drug status (new/continued)

Other treatments (up to two per problem)
- procedural treatments
- clinical treatments (e.g. advice, counselling)
- practice nurse involvement

Other management
- referrals (up to two)
  - to specialists
  - to allied health professionals
  - to emergency departments
  - hospital admissions
- pathology tests ordered (up to five)
- imaging ordered (up to three)

Note: FRACGP – Fellow of the Royal Australian College of General practitioners; FACRRM – Fellow of the Australian College of Rural and Remote Medicine; FTE – full-time equivalent; DVA – Department of Veterans' Affairs; NESB – non-English-speaking background; SAND – Supplementary Analysis of Nominated Data.

Figure 2.1: The BEACH relational database

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 ten blocks, each of five 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 is made up of 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 on these encounters are used to calculate the 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 SAND block includes about 3,000 records. Some topics are repeated to increase sample size. Different questions are asked of the patient in each block and these vary throughout the year.

- 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 2012 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*[26]

- from April 1999 to July 2006 were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*[27]

- conducted between August 2006 and March 2011 have been published in each of the general practice activity annual reports[28-32]

- conducted in the 2011–12 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/index.php>.

2.7　Statistical methods

The analysis of the 2011–12 BEACH data was conducted with Statistical Analysis System (SAS) version 9.2,[33] 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%.

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 9.2 were used to calculate the intracluster correlation, and adjust the confidence intervals accordingly.[33]

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 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, but significance of differences in/for rates is judged by non-overlapping confidence intervals of the results being compared. The magnitude of this difference can be described as at least $p < 0.05$. Assessment using non-overlapping CIs is a conservative measure of significance,[34-36] 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 in this and the companion publication we believe a 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), a product of the World Organization of Family Doctors (Wonca):[9]

- 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 World Health Organization (WHO) in the WHO Family of International Classifications,[37] and is the declared national standard in Australia for reporting of health data from general practice and patient self-reported health information.[38]

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 2004[39] 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 Family Medicine Research Centre (FMRC) (then Unit) developed an extended clinical terminology classified according to the ICPC, now called ICPC-2 PLUS.[40] 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),[41] A comparison of country and metropolitan general practice 1990–91 (51,277 encounters),[42] the Morbidity and Therapeutic Index 1992–1998 (a clinical audit tool that was available to GPs) (approximately 400,000 encounters), and BEACH 1998–2011 (about 1.3 million encounters), that together make up about 2.7 million encounter records, involving more than 4 million free text descriptions of problems managed and a further 4 million for patient reasons for encounter. These terms are classified according to ICPC-2 to ensure data are able to 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/index.php>.

When the free-text data are received from the GPs, trained secondary coders (who are undergraduate students), code the data in more specific terms using ICPC-2 PLUS. This ensures high coder reliability and automatic classification of the concept, and provides the ability 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: <purl.library.usyd.edu.au/sup/9781743320181>.

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 six 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 list[43] classified according to ICPC-2 was applied to the BEACH data set. In general reporting, both chronic and non-chronic conditions (for example, diabetes and gestational diabetes) may have been 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 cardiovascular 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 composition and brand name.

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

CAPS is mapped to the Anatomical Therapeutic Chemical (ATC)[44] classification, which is the Australian standard for classifying medications at the generic level.[38] 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.

- When reporting the 2010–11 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). In past years we have reported the results referring to PNs alone. However in 2011–12 a few GPs indicated (of their own accord) that the recorded action was done by an AHW rather than a PN. This information is now included, and now 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 thought that because the question referred specifically to PNs, and recording of work done by AHWs was not specifically requested. These results therefore have the potential to be an underestimate of the work undertaken at GP–patient encounters by PNs and 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.[45] 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,[46] the degree to which GP-reported patient RFEs and problems managed accurately reflect those recalled by the patient,[47] and reliability of secondary coding of RFEs[48] and problems managed.[41] The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work.[49]

However, the question of the extent to which the GP-recorded data are a reliable and valid reflection of the content of the encounter must also be considered. In many primary care consultations, a clear pathophysiological diagnosis is not reached. Bentsen[50] and Barsky[51] suggest that a firm and clear diagnosis is not apparent in about half of GPs' consultations,

and others suggest the proportion may be even greater.[52] Further, studies of general ambulatory medical practice have shown that a large number of patients presenting to a primary care practitioner are without a serious physical disorder.[53,54] As a result, it is often necessary for a practitioner to record a problem in terms of symptoms, signs, patient concerns, or the service that is requested, such as immunisation. For this reason, this report refers to patient 'problems' rather than 'diagnoses'.

A number of studies have demonstrated wide variance in the way a GP perceives the patient's RFE and the manner in which the GP describes the problem under management. Further, in a direct observational study of consultations via a one-way mirror, Bentsen demonstrated that practitioners differ in the way they labelled problems, and suggested that clinical experience may be an important influence on the identification of problems within the consultation.[50] Two other factors that might affect GPs' descriptions of patient RFEs have been identified: although individuals may select the same stimuli, some label each stimulus separately, whereas others cluster them under one label; and individuals differ in the number of stimuli they select (selective perception).[55]

The extent to which therapeutic decisions may influence the diagnostic label selected has also been discussed. Howie[56] and Anderson[53] argue that, while it is assumed that the diagnostic process used in general practice is one of symptom → diagnosis → management, the therapeutic method may well be selected on the basis of the symptom, and the diagnostic label chosen last. They suggest that the selection of the diagnostic label is therefore influenced by the management decision already made.

Alderson contends that to many practitioners 'diagnostic accuracy is only important to the extent that it will assist them in helping the patient'. He further suggests that if major symptoms are readily treatable, some practitioners may feel no need to define the problem in diagnostic terms.[57] Crombie identified 'enormous variability in the rates at which doctors perceive and record illnesses'. He was unable to account statistically for this variation by the effect of geography, age, sex or class differences in the practice populations.[58] Differences in the way male and female GPs label problems also appear to be independent of such influences.[59]

These problems are inherent in the nature of general practice. Knottnerus argues that the GP is confronted with a fundamentally different pattern of problems from the medical specialist, and often has to draw up general diagnostic hypotheses related to probability, severity and consequences.[60] Anderson suggests that morbidity statistics from family practice should be seen as 'a reflection of the physician's diagnostic opinions about the problems that patients bring to them rather than an unarguable statement of the problems managed'.[53]

While these findings regarding limitations in the reliability and validity of practitioner-recorded morbidity should be kept in mind, they apply equally to data drawn from health records, whether paper or electronic, as they do to active data collection methods.[61,62] There is as yet no more reliable method of gaining detailed data about morbidity and its management in general practice. Further, irrespective of the differences between individual GPs in their labelling of the problems, morbidity data collected by GPs in active data collection methods have been shown to provide a reliable overview of the morbidity managed in general practice.[63]

2.11 Extrapolated national estimates

A section at the end of each chapter highlights changes that have occurred over the decade 2002–03 to 2011–12. These sections summarise results published in the companion publication, *A decade of Australian general practice activity 2002–03 to 2011–12*.[1] Where the results demonstrate a significant change over time, the estimated national change across total GP Medicare services from 2002–03 to 2011–12 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 2011–12 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, 122.5 million in 2011–12 (rounded to the nearest 100,000, see Table 2.1), to give the estimated number of the selected event across Australia in 2011–12.

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

- divide the 'rate per 100 encounters' of the selected event for 2002–03 by 100, and then multiply by the total number of GP service items claimed through Medicare in that year, 96.9 million (rounded to the nearest 100,000, see Table 2.1), to give the estimated national number of events in 2002–03.

- repeat the process using data for 2011–12.

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 2002–03 to 2011–12), in the number of general practice contacts for that event (for example, an increase or decrease in the number of GP management contacts with problem X); or an increase or decrease in the number of times a particular medication type was prescribed in Australia in 2011–12, when compared with 2002–03.

Table 2.1 provides the rounded number of GP service items claimed from Medicare in each financial year from 2002–03 to 2011–12.

Table 2.1: Number of general practice professional services claimed from Medicare Australia each financial year, 2002–03 to 2011–12 (million)

	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12[a]
Rounded number of MBS GP items of service claimed	96.9	96.3	98.2	101.1	103.4	109.5	113.0	116.6	118.1	122.5

(a)   Medicare data for the 2011–12 year included data from the April 2011 to March 2012 quarters because the 2011–12 financial year data were not available at the time of preparation of this report.

Source: Medicare statistics[7]

Examples of extrapolation:

1. Number of GP encounters at which hypertension was managed nationally in 2011–12

Hypertension was managed at a rate of 9.1 per 100 GP encounters (95% CI: 8.5 to 9.6) in 2011–12 (shown in Table 7.3). How many times does this suggest that hypertension was managed in GP encounters across Australia in 2011–12?

Our best estimate is: 11.15 million times [(9.1/100) x 122.5 million], but we are 95% confident that the true number lies between 10.4 million [(8.5/100) x 122.5 million] and 11.8 million [(9.6/100) x 122.5 million].

2. National increase in the number of problems managed from 2002–03 to 2011–12

There was a statistically significant increase in the number of problems managed at encounter, from 144.9 per 100 encounters in 2002–03 to 153.8 in 2011–12 (see Table 7.2 in *A decade of Australian general practice activity 2002–03 to 2011–12*.[1] The calculation used to extrapolate the effect of this change across Australia is:

(144.9/100) x 96.9 million = 140.4 million problems managed nationally in 2002–03, and
(153.8/100) x 122.5 million = 188.4 million problems managed nationally in 2011–12.

This suggests there were 48.0 million (188.4 million minus 140.4 million) more problems managed at GP–patient encounters in Australia in 2011–12 than in 2002–03.

This is the result of the compound effect of the increase in the number of problems managed by GPs at encounters **plus** the increased number of visits over the decade across Australia.

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.

Extrapolations are based on the unit of the encounter because the number of national encounters is quantifiable using Medicare claims data. However, the reader should be aware that where an event can occur more than once per encounter, the extrapolation represents the number of occasions at which that event occurs in general practice encounters, rather than the number of encounters where that event occurs.

3 The sample

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

A summary of the BEACH data sets is reported for each year from 2002–03 to 2011–12 in the companion report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1]

3.1 Response rate

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

Contact was attempted with 4,309 GPs but 15.4% could not be contacted. More than one-third of these had moved (and were untraceable), or had retired or died (Table 3.1), although more than half were those with whom contact could not be established after five calls. Younger GPs were harder to contact. Of the GPs approached who were aged less than 35 years, 27.1% were no longer at that practice and could not be traced. These would largely be registrars moving through practices during training. In contrast, 14.3% of GPs aged 35 years and over were not traceable (results not shown).

The final participating sample consisted of 984 practitioners, representing 27.0% of those who were contacted and available, and 22.8% 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 (*n* = 4,309)	Per cent of contacts established (*n* = 3,644)
Letter sent and phone contact attempted	4,309	100.0	—
No contact	665	15.4	—
No phone number	26	0.6	—
Moved/retired/deceased	241	5.6	—
Unavailable (overseas, maternity leave, etc)	48	1.1	—
No contact after five calls	350	8.1	—
Telephone contact established	3,644	84.6	100.0
Declined to participate	2,395	55.6	65.7
Agreed but withdrew	265	6.2	7.3
Agreed and completed	984	22.8	27.0

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 methods 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. DoHA provided the data for all GPs in the sample frame, drawn from Medicare claims data.

Table 3.2 demonstrates that there were no significant differences in GP characteristics between the final sample of BEACH participants and all GPs in the sample frame, in terms of sex, age, place of graduation, state, or practice location as classified by the Australian Standard Geographical Classification.

Occasionally, the random sampling process produces a sample that may be slightly disproportionate to the national sample frame, which can then impact on the final representativeness of the BEACH participants. In 2011–12 the sample provided by DoHA and the final BEACH participant sample were both highly representative of the national sample frame (Table 3.3).

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

Variable	BEACH[a][b] Number	Per cent of GPs (n = 984)	Australia[a][c] Number	Per cent of GPs (n = 20,360)
Sex (χ^2 = 1.2, p = 0.27)				
Males	582	59.2	12,399	60.9
Females	402	40.9	7,961	39.1
Age (χ^2 = 1.96, p = 0.57)				
< 35 years	65	6.6	1,453	7.1
35–44 years	190	19.4	4,027	19.8
45–54 years	322	32.9	6,279	30.8
55+ years	402	41.1	8,601	42.2
Missing	5	—	0	—
Place of graduation (χ^2 = 0.79 p = 0.37)				
Australia	661	67.2	13,409	65.9
Overseas	322	32.8	6,951	34.1
Missing	1	—	0	—
State (χ^2 = 13.3, p = 0.07)				
New South Wales	375	38.3	6,738	33.1
Victoria	220	22.5	5,116	25.1
Queensland	168	17.2	3,966	19.5
South Australia	78	8.0	1,703	8.4
Western Australia	88	9.0	1,861	9.1
Tasmania	28	2.9	528	2.6
Australian Capital Territory	15	1.5	308	1.5
Northern Territory	7	0.7	140	0.7
ASGC (χ^2 = 0.62, p = 0.96)				
Major Cities of Australia	700	71.5	14,553	71.5
Inner Regional Australia	185	18.9	3,843	18.9
Outer Regional Australia	79	8.1	1,596	7.8
Remote Australia	9	0.9	241	1.2
Very Remote Australia	6	0.6	127	0.6

(a)   Missing data removed.

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

(c)   All GPs who claimed at least 375 MBS GP consultation services during the most recent three month Medicare Australia data period. Data provided by the Department of Health and Ageing.

Note: ASGC – Australian Standard Geographical Classification.

Table 3.3: Comparison of all active recognised GPs in Australia (the sample frame), GPs in the sample from Medicare claims data (drawn by DoHA), and BEACH participants 2011–12

Variable	Sample frame (all Australia)[a]		Sample from Medicare claims data[b]		BEACH participants	
	Number	Per cent of GPs	Number	Per cent of GPs	Number	Per cent of GPs
Sex (missing)	(0)		(2)		(0)	
Males	12,399	60.9	2,642	61.3	582	59.2
Females	7,961	39.1	1,665	38.7	402	40.9
Age (missing)	(0)		(3)		(5)	
< 35 years	1,453	7.1	365	8.5	65	6.6
35–44 years	4,027	19.8	899	20.9	190	19.4
45–54 years	6,279	30.8	1,402	32.6	322	32.9
55+ years	8,601	42.2	1,640	38.0	402	41.1
State (missing)	(0)		(1)		(0)	
New South Wales	6,738	33.1	1,506	35.0	375	38.3
Victoria	5,116	25.1	1,064	24.7	220	22.5
Queensland	3,966	19.5	807	18.7	168	17.2
South Australia	1,703	8.4	344	8.0	78	8.0
Western Australia	1,861	9.1	390	9.1	88	9.0
Tasmania	528	2.6	106	2.5	28	2.9
Australian Capital Territory	308	1.5	65	1.5	15	1.5
Northern Territory	140	0.7	26	0.6	7	0.7
Total	**20,360**	**100.0**	**4,309**	**100.0**	**984**	**100.0**

(a)   Sample frame – all recognised (see 'Glossary') GPs in Australia who claimed at least 375 general practice service items in the previous quarter (from Medicare claims data).

(b)   Random sample of GPs from the sample frame, drawn from Medicare claims data and supplied by DoHA to approach for BEACH participation.

GP activity in the previous quarter

Data on the number of MBS general practice service items claimed in the previous quarter were also provided by DoHA 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 GP drawn in the samples, and to compare the activity level of the final participants with that of GPs in the samples who declined to participate.

There were significant differences in the distribution of BEACH participants and non-participants across activity levels. A greater proportion of participants than non-participants were in the low activity group (375–750 services), and a smaller proportion in the high activity group (> 1,500 services). There were similar proportions in the 750–1,500 services group (Table 3.4).

Participants had a significantly ($p < 0.01$) lower mean number of consultation items claimed in the previous quarter (1,311.1) compared with GPs who declined to participate (1,412.6). Comparisons of these groups showed a median difference of 7.7 consultations per week (median difference 7.8 per week) (Table 3.4).

GP activity in the previous year

When comparing GP activity level in the previous 12 months, there was a significant (p = 0.017) difference between the proportions of participating and non-participating GPs in each of the claims categories with the exception of the 3,001–6,000 services category. However, comparison of the median and mean number of claims for each group showed a difference in the median of 6.5 consultations per week (based on a difference of 339 per year), and 6.8 consultations per week in the mean (based on 355 per year) (Table 3.5).

Table 3.4: Quarterly activity level of participating and non-participating GPs

Variable	Participants[a] (n = 984)		Non-participants[a] (n = 2,660)	
	Number of GPs	Per cent	Number of GPs	Per cent
Activity (χ^2 = 6.7, p = 0.0349)				
375–750 services in previous quarter	259	26.3	605	22.7
750–1,500 services in previous quarter	404	41.1	1,088	40.9
> 1,500 services in previous quarter	321	32.6	967	36.4
	Number of claims		Number of claims	
Mean activity level (t = 3.42, p = 0.0006)	1,311.1	—	1,412.6	—
Median activity level	1,130.5	—	1,231.0	—
Standard deviation	770.2	—	805.8	—

(a)   Missing data removed.

Table 3.5: Annual activity level of participating and non-participating GPs

Variable	Participants[a] (n = 984)		Non-participants[a] (n = 2,660)	
	Number of GPs	Per cent	Number of GPs	Per cent
Activity (χ^2 = 10.1, p = 0.0174)				
1–1,500 services in previous year	45	4.6	127	4.8
1,500–3,000 services in previous year	237	24.1	528	19.6
3,001–6,000 services in previous year	394	40.0	1,057	39.7
> 6,000 services in previous year	308	31.3	948	35.6
	Number of claims		Number of claims	
Mean activity level (t = 3.02, p = 0.0025)	5,099.2	—	5,453.8	—
Median activity level	4,459.5	—	4,798.5	—
Standard deviation	3,034.0	—	3,187.3	—

(a)   Missing data removed.

The similarity of the BEACH participants to the national sample frame in terms of age, sex, place of graduation, state and practice location, and the marginal difference in activity level (equating to about one consultation per day), shows a final BEACH participant sample that is highly representative of GPs in the Australian sample frame.

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 Australian sample frame. Occasionally, where participants in a particular age or sex group are over-represented or under-represented, GP age–sex weights are applied to the data sets in post-stratification weighting to achieve comparable estimates and precision. The BEACH participants were representative in all age and sex categories, but because there are always marginal (even if not statistically significant) differences, post-stratification weighting was applied for consistency over recording years.

Activity weights

In BEACH, each GP provides details of 100 consecutive 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. GP activity level was measured as the number of MBS general practice service items claimed by the GP in the previous 12 months (data supplied by DoHA).

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 in the previous 12 months. Table 3.6 shows the precision ratio calculated before and after weighting the encounter data.

3.4 Representativeness of the encounter sample

BEACH aims to gain a representative sample of GP–patient encounters. 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 2011–12 study period (data provided by DoHA).

As shown in Table 3.6, there is an excellent fit of the age–sex distribution of patients at the BEACH (weighted) with that of the MBS claims distribution, with precision ratios all within the 0.91–1.09 range. Even prior to the weightings, the range of raw precision ratios (0.91–1.08) indicates that the BEACH sample is a good representation of Australian GP–patient encounters, as no age–sex category varied by more than 9% from the population distribution.

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 3.6: 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* = 82,465)	Number	Per cent (*n* = 83,395)	Per cent (*n* = 103,753,815)	Raw[a]	Weighted[c]
All							
< 1 year	1,747	2.1	1,617	1.9	2.0	1.07	0.98
1–4 years	4,082	5.0	3,968	4.8	5.2	0.96	0.92
5–14 years	4,649	5.6	4,761	5.7	6.2	0.91	0.92
15–24 years	7,066	8.6	7,135	8.6	8.7	0.98	0.98
25–44 years	18,715	22.7	18,685	22.4	22.9	0.99	0.98
45–64 years	22,613	27.4	23,074	27.7	27.3	1.01	1.01
65–74 years	11,223	13.6	11,483	13.8	13.0	1.05	1.06
75+ years	12,370	15.0	12,672	15.2	14.8	1.01	1.03
Male							
< 1 year	937	1.1	858	1.0	1.1	1.07	0.97
1–4 years	2,174	2.6	2,159	2.6	2.7	0.96	0.94
5–14 years	2,381	2.9	2,466	3.0	3.2	0.91	0.93
15–24 years	2,354	2.9	2,594	3.1	3.2	0.90	0.98
25–44 years	6,365	7.7	7,023	8.4	8.6	0.90	0.98
45–64 years	9,018	10.9	9,995	12.0	11.8	0.93	1.02
65–74 years	4,986	6.1	5,482	6.6	6.0	1.01	1.09
75+ years	4,873	5.9	5,276	6.3	6.1	0.97	1.04
Female							
< 1 year	810	1.0	759	0.9	0.9	1.07	0.99
1–4 years	1,908	2.3	1,809	2.2	2.4	0.95	0.89
5–14 years	2,268	2.8	2,295	2.8	3.0	0.91	0.91
15–24 years	4,712	5.7	4,541	5.5	5.5	1.03	0.98
25–44 years	12,350	15.0	11,662	14.0	14.3	1.05	0.98
45–64 years	13,595	16.5	13,079	15.7	15.5	1.06	1.01
65–74 years	6,237	7.6	6,001	7.2	7.0	1.08	1.03
75+ years	7,497	9.1	7,396	8.9	8.7	1.04	1.02

(a) Unweighted GP consultation Medicare 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) MBS claims data provided by the Australian Government Department of Health and Ageing.

Note: GP consultation Medicare services – see 'Glossary'. Only encounters with a valid age and sex are included in the comparison.
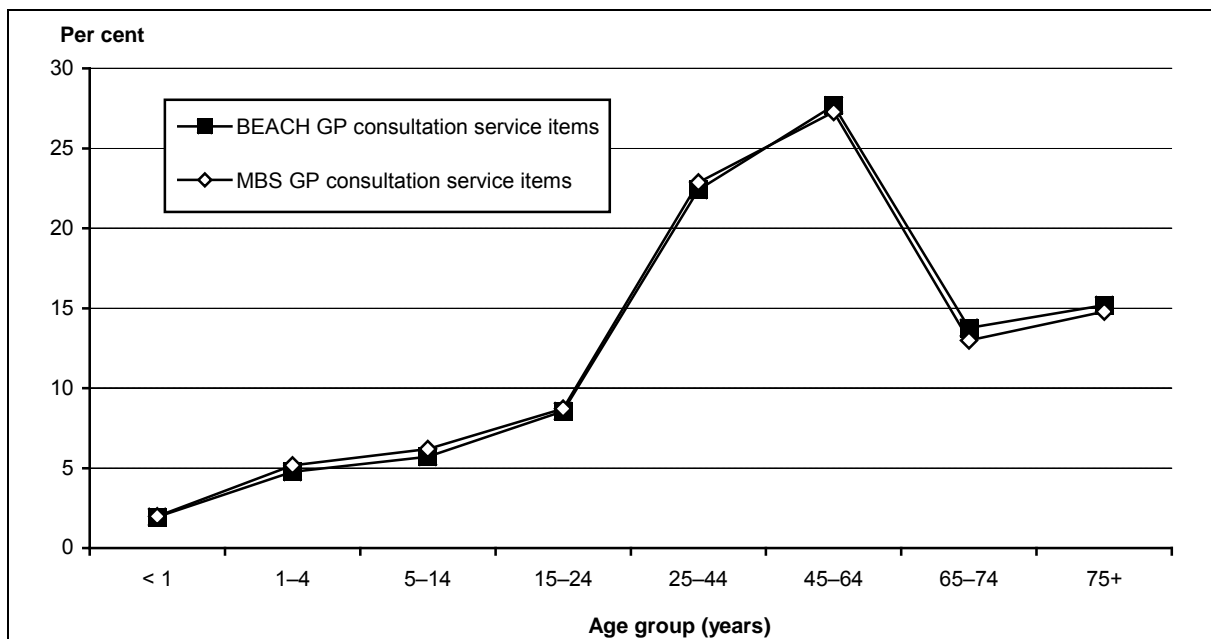
Figure 3.1: Age distribution of all patients at BEACH and MBS GP consultation services 2011–12
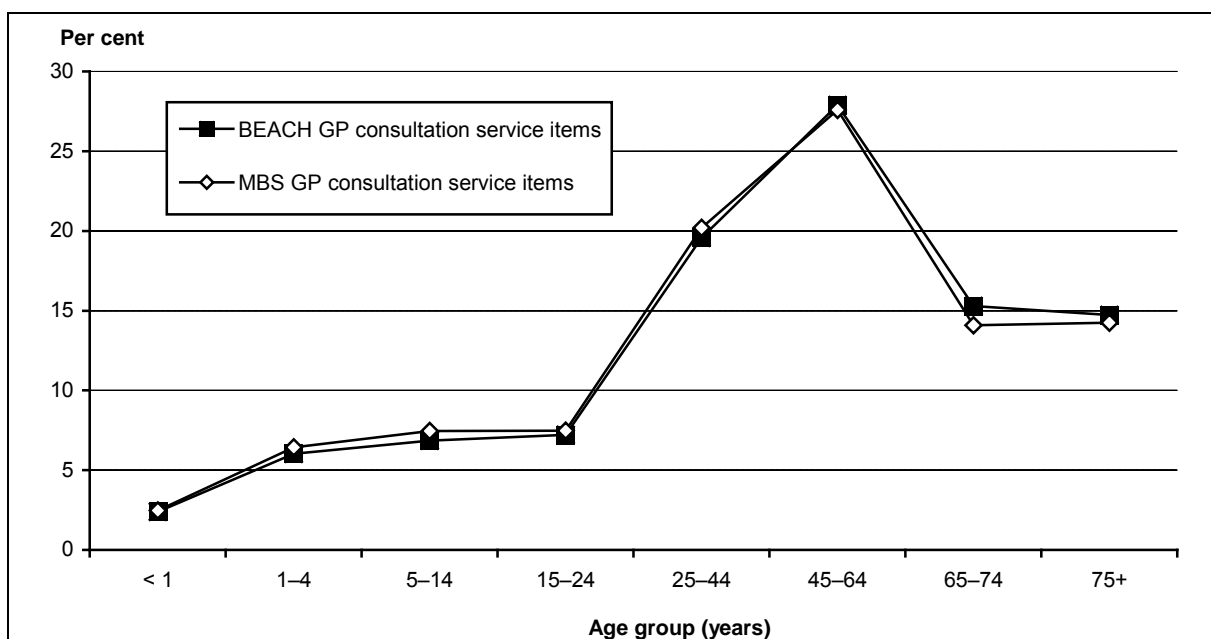
Figure 3.2: Age distribution of male patients at BEACH and MBS GP consultation services 2011–12

Figure 3.3: Age distribution of female patients at BEACH and MBS GP consultation services 2011–12
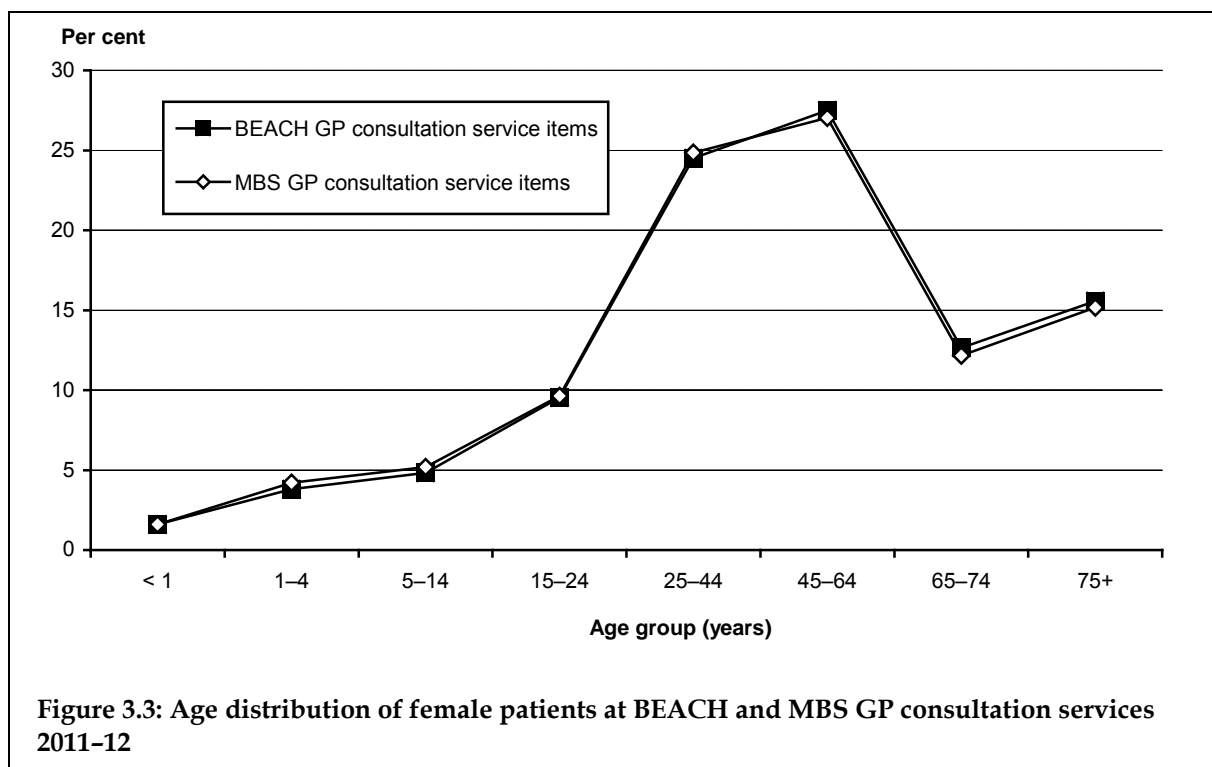
3.5 The weighted data set

The final unweighted data set from the 14th year of collection contained encounters, reasons for encounters, problems and management/treatments. The apparent number of encounters and number of medications increased after weighting, and the number of reasons for encounter, problems managed, other treatments, referrals, imaging and pathology all decreased after weighting. Raw and weighted totals for each data element are shown in Table 3.7. The weighted data set is used for all analyses in the remainder of this report.

Table 3.7: The BEACH data set, 2011–12

Variable	Raw	Weighted
General practitioners	984	984.0
Encounters	98,400	99,030.0
Reasons for encounter	152,696	153,217.8
Problems managed	154,963	152,285.5
Medications	103,320	106,007.4
Other treatments[a]	55,890	53,395.0
Referrals and admissions	15,219	14,382.0
Pathology	50,339	46,544.3
Imaging	10,280	9,978.2
Other investigations	969	896.5

(a) Other treatments excludes injections for immunisations/vaccinations (raw *n* = 3,656, weighted *n* = 3,459) (see Chapter 10).

4 The participating GPs

This chapter reports data collected between April 2011 and March 2012 about the participating GPs and their practices from the 14th year of the BEACH program. Details of GP and practice characteristics are reported for each year from 2002–03 to 2011–12 in the ten-year summary report *A decade of Australian general practice activity 2002–03 to 2011–12.*[1]

4.1 Characteristics of the GP participants

All participants returned a GP profile questionnaire, although some were incomplete. The results are provided in Table 4.1. Of the 984 participants:

- 59% were male, and 41% were aged 55 years and over

- 59% had been in general practice for more than 20 years

- 67% had graduated in Australia

- 34% spent more than 40 hours each week on direct patient care services (mean hours worked was 36.9; median was 38.0 hours)

- 27% conducted some consultations in a language other than English

- more than 50% were Fellows of the RACGP, and 7% were Fellows of the ACRRM

- 29% bulk-billed Medicare for all patients and 71% bulk-billed for selected patients; only 1% did not bulk bill Medicare for any patient consultations

- 50% had provided care in a residential aged care facility in the previous month

- 71% practised in Major cities (using Australian Standard Geographical Classification)[64]

- 37% were in practices of fewer than five individual GPs, and 21% were in practices of ten or more individual GPs

- 57% were in practices of fewer than five full-time equivalent (FTE) GPs

- 77% of the GPs worked in a practice that employed practice nursing staff—for more than a third of these (36.6%) the practice employed less than two full-time equivalents (35–45 hours per week). On average, there were 0.3 FTE practice nurses per FTE GP.

- 89% worked in an accredited practice

- nearly two-thirds (62%) had a co-located pathology laboratory or collection centre and almost half (47%) had a psychologist in or within 50 metres of the practice

- 42% worked in a practice that provided their own or cooperative after-hours care, and 53% in a practice that used a deputising service for after-hours patient care (multiple responses allowed)

- 63% worked in a practice teaching undergraduates, junior doctors, registrars, or all three.

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*.[65] 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*.[66] For more information about the effect of the sex of the GP on clinical practice see Harrison et al. (2011) *Sex of the GP*.[67]

Table 4.1: Characteristics of participating GPs and their practices

GP characteristic	Number[a]	Per cent of GPs[a] (*n* = 984)
Sex (missing = 0)		
Male	582	59.2
Female	402	40.8
Age (missing = 5)		
< 35 years	65	6.6
35–44 years	190	19.4
45–54 years	322	32.9
55+ years	402	41.1
Years in general practice (missing = 5)		
< 2 years	14	1.4
2–5 years	102	10.4
6–10 years	109	11.1
11–19 years	182	18.6
20+ years	572	58.4
Place of graduation (missing = 1)		
Australia	661	67.2
Overseas	322	32.8
Asia	123	12.5
United Kingdom/Ireland	80	8.1
Africa and Middle East	55	5.6
Europe	33	3.4
New Zealand	16	1.6
Other	15	1.5
Direct patient care hours (worked) per week (missing = 13)		
≤ 10 hours	12	1.2
11–20 hours	118	12.2
21–40 hours	515	53.0
41–60 hours	312	32.1
61+ hours	14	1.4
Consult in languages other than English (missing = 3)		
< 25% of consultations	213	21.7
25–50% of consultations	28	2.9
> 50% of consultations	27	2.8
Currently in general practice training program (missing = 9)	38	3.9
Fellow of RACGP (missing = 3)	557	56.8
Fellow of ACRRM (missing = 29)	70	7.3

(continued)

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

GP characteristic	Number[a]	Per cent of GPs[a] (n = 984)
Bulk-billing[b] (missing = 2)		
All patients	282	28.7
Some patients	690	70.3
No patients	10	1.0
Patient care provided in previous month[b]		
In a residential aged care facility (missing = 3)	497	50.1
As a salaried/sessional hospital medical officer (missing = 19)	108	11.2
Practice location by RRMA (missing = 5)		
Capital	649	66.3
Other metropolitan	74	7.6
Large rural	66	6.7
Small rural	69	7.1
Other rural	104	10.6
Remote central	6	0.6
Other remote, offshore	11	1.1
Practice location by ASGC remoteness structure (missing = 5)		
Major cities	700	71.1
Inner regional	185	18.9
Outer regional	79	8.1
Remote	9	0.9
Very remote	6	0.6
Size of practice – number of individual GPs (missing = 16)		
Solo	104	10.7
2–4	257	26.6
5–9	409	42.3
10–14	142	14.7
15+	56	5.8
Size of practice – full-time equivalent GPs (missing = 111)		
< 1	7	0.8
1.0–1.99	113	12.9
2.0–2.99	134	15.3
3.0–3.99	120	13.7
4.0–4.99	127	14.5
5.0–9.99	303	34.7
10.0–14.99	51	5.8
15+	18	2.1

(continued)

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

GP characteristic	Number[a]	Per cent of GPs[a] (n = 984)
Practice nurse at major practice address (missing = 7)	747	76.5
Number of individual practice nurses (missing = 25)		
0	230	24.0
1	148	15.4
2	185	19.3
3	134	14.0
4–5	175	18.2
6+	87	9.1
Number of full-time equivalent practice nurses (missing = 134)		
0	230	27.1
< 1	64	7.5
1.0–1.99	247	29.1
2.0–2.99	157	18.5
3.0–3.99	81	9.5
4.0+	71	8.3
Accredited practice (missing = 11)	862	88.6
Co-located services[c] (missing = 2)		
Pathology laboratory/collection centre	609	62.0
Psychologist	465	47.4
Physiotherapist	336	34.2
Medical specialist	227	23.1
Imaging	154	15.7
After-hours arrangements[b] (missing = 7)		
Practice does own and/or cooperative with other practices	410	42.0
Practice does its own	299	30.6
Cooperative with other practices	122	12.5
Deputising service	518	53.0
Other arrangement	109	11.2
Teaching status of major practice[b] (missing = 4)		
Yes – a teaching practice	620	63.3
For undergraduates	518	52.9
For junior doctors	114	11.6
For registrars	389	39.7

(a)   Missing data removed.

(b)   Multiple responses allowed.

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

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

4.2 Computer use at GP practices

As computers are increasingly being used by GPs in their clinical activity, the GP profile questionnaire was redesigned in 2010–11 so that more comprehensive information could be gained 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 pathology and imaging test ordering and receipt of results, and whether the medical records used were paper only, a mix of paper and electronic medical records, or whether the practice was completely paperless in this regard.

Table 4.2 shows the proportion of individual participating GPs who used computers for each of nine listed activities.

- Only 4.1% of GPs did not use a computer at all for clinical purposes.
- Computers were used mainly for prescribing, receiving pathology results electronically and for internet use.
- 93.9% of GPs were producing prescriptions electronically.
- 92.7% were receiving pathology results online, 81.1% were producing and printing pathology orders, and 35.5% were ordering pathology electronically.
- 74.5% were receiving imaging results online, 73.4% were producing and printing imaging orders, and 20.0% were ordering imaging tests electronically.
- Almost two-thirds (65.0) reported they had electronic medical records exclusively (that is, were paperless).
- Over one-quarter (29.3%) reported maintaining a hybrid record where some patient information is kept electronically and some on paper records.

Table 4.2: Computer applications available/used at major practice address

Computer use	Number	Per cent of GPs (*n* = 984)
Not available	31	3.2
Not used at all	40	4.1
Internet/email only	4	0.4
Prescribing	924	93.9
Internet	832	84.6
Email	655	66.6
Pathology ordering (online)[a]	350	35.5
Produce/print pathology orders[a]	798	81.1
Pathology results receipt (on line)[a]	912	92.7
Imaging ordering (online)[a]	197	20.0
Produce/print imaging orders[a]	722	73.4
Imaging results receipt (on line)[a]	733	74.5
Medical records – complete (paperless)	640	65.0
Partial/hybrid records	288	29.3
Paper records only	54	5.5

(a)   Multiple responses allowed.

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*.[68]

4.3 Changes in characteristics of the GPs over the decade 2002–03 to 2011–12

Changes over the decade 2002–03 to 2011–12 are described in detail in the accompanying report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1] Briefly, the major changes in the characteristics of the participating GPs were:

- the proportion of GP participants who were female increased over time
- the proportion of GPs who were younger than 44 years decreased, whereas the proportion aged 55 years or more increased over the decade
- reflecting the increase in the age of GP participants, the proportion who had worked in general practice for more than 20 years also increased significantly over time
- the proportion of GPs working 21–40 hours per week on direct patient care significantly increased, and the proportion working 41–60 hours, or more than 60 hours, significantly decreased
- the proportion of GPs who graduated from their primary medical degree in Australia decreased over the decade
- the proportion of GPs who provide < 25% of their consultations in a language other than English increased
- 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 more than ten individual GPs almost 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
- computers have become increasingly available at practices, as has their use for clinical activity.

5   The encounters

This chapter describes the content and types of encounters recorded in the 2011–12 BEACH year. Data about the encounters are reported for each year from 2002–03 to 2011–12 in the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12.*[1]

5.1   Content of the encounters

In 2011–12, details of 99,030 encounters (weighted data) were available for 984 GPs. A summary of these encounters is provided as 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 155 RFEs, and GPs managed about 154 problems per 100 encounters.

- Chronic problems accounted for 36.2% of all problems managed, and an average of 55.6 chronic problems were managed per 100 encounters.

- New problems accounted for 38.1% of all problems, and on average 58.6 new problems were managed per 100 encounters.

- Work-related problems were managed at a rate of 2.6 per 100 encounters.

- Medications were the most common treatment choice (107 per 100 encounters), most of these medications were prescribed (86.8 per 100), rather than supplied by the GP (9.7 per 100) or advised for over-the-counter purchase (10.5 per 100).

- For an 'average' 100 GP–patient encounters, GPs provided 107 medications and 37 clinical treatments (such as advice and counselling), undertook 17 procedures, made 9 referrals to medical specialists and 5 to allied health services, and placed 47 pathology test orders and 10 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* = 99,030)	95% LCL	95% UCL	Rate per 100 problems (*n* = 152,286)	95% LCL	95% UCL
General practitioners	984	—	—	—	—	—	—
Encounters	99,030	—	—	—	—	—	—
Reasons for encounter	153,218	154.7	152.8	156.7	—	—	—
Problems managed	152,286	153.8	151.4	156.1	—	—	—
New problems	58,014	58.6	57.1	60.0	38.1	37.1	39.1
Chronic problems	55,080	55.6	53.6	57.7	36.2	35.2	37.2
Work-related	2,559	2.6	2.4	2.8	1.7	1.5	1.8
Medications	106,007	107.0	104.1	110.0	69.6	68.0	71.2
Prescribed	85,980	86.8	84.0	89.7	56.5	54.9	58.1
GP-supplied	9,630	9.7	8.9	10.5	6.3	5.8	6.8
Advised OTC	10,397	10.5	9.7	11.3	6.8	6.3	7.4
Other treatments[(a)]	53,395	53.9	51.2	56.6	35.1	33.5	36.7
Clinical*	36,610	37.0	34.6	39.3	24.0	22.6	25.5
Procedural*	16,785	16.9	16.1	17.8	11.0	10.5	11.5
Referrals	14,382	14.5	13.9	15.1	9.4	9.1	9.8
Medical specialist*	8,488	8.6	8.2	8.9	5.6	5.3	5.8
Allied health services*	4,629	4.7	4.4	5.0	3.0	2.8	3.2
Hospital*	345	0.3	0.3	0.4	0.2	0.2	0.3
Emergency department*	311	0.3	0.3	0.4	0.2	0.2	0.2
Other referrals*	609	0.6	0.5	0.7	0.4	0.3	0.5
Pathology	46,544	47.0	44.9	49.1	30.6	29.3	31.8
Imaging	9,978	10.1	9.6	10.5	6.6	6.3	6.8
Other investigations[(b)]	897	0.9	0.8	1.0	0.6	0.5	0.7

(a)   Other treatments includes treatment given by practice nurses in the context of the GP–patient encounter as well as 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, <purl.library.usyd.edu.au/sup/9781743320181>).

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

5.2   Encounter type

During the first seven years of the BEACH program, where one (or more) MBS/DVA item number was claimable for the encounter, GP participants were asked to record only one item number. Where multiple item numbers (e.g. an A1 item such as 'standard surgery consultation' and a procedural item number) were claimable for an encounter, GPs were instructed to record the lower of the item numbers (usually an A1 item number).

Changes to the BEACH form were made in the 2005–06 BEACH year to capture practice nurse activity associated with GP–patient consultations. One of these changes was to allow GPs to record up to three Medicare item numbers per encounter. For comparability with earlier years, in Tables 5.3, 5.4 and 5.5 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 override incentive item numbers, which override procedural item numbers, which override other Medicare item numbers. Table 5.6 provides a breakdown of all item numbers recorded by the GPs.

Table 5.2 provides an overview of the MBS/DVA item numbers recorded in BEACH in 2011–12. At least one MBS/DVA item number was recorded at 87,323 encounters (88.2% of all BEACH encounters). A single item number was recorded at three-quarters (77.5%) of BEACH encounters said to be claimable from the MBS/DVA.

Table 5.2: Overview of MBS items recorded

Variable	Number	Per cent of MBS/DVA encounters (*n* = 87,323)
Encounters at which one MBS item was recorded	67,704	77.5
Encounters at which two MBS items were recorded	18,501	21.2
Encounters at which three MBS items were recorded	1,118	1.3
Total encounters at which at least one item was recorded	**87,323**	**100.0**

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

In previous years we have reported the breakdown of MBS/DVA services into groups for GPs and practice nurses in Table 5.3. The MBS has continued to expand, with some services provided by Aboriginal health workers and other allied health services (e.g. physiotherapists and speech pathologists) claimable through the MBS/DVA. In addition, some items can be claimed by more than one of these health professionals, for example practice nurses or Aboriginal health workers. To account for these changes, we have modified Table 5.3 to group MBS/DVA items according to whether the service was provided by a GP or an 'other health professional'. The group for other health professionals includes practice nurses, Aboriginal health workers and allied health services.

Of the 87,323 MBS/DVA items of service recorded (counting only one item number per encounter), 94.9% related to GP items of service. Items with other health professionals not accompanied by a GP item of service were recorded at 0.1% of encounters. Direct encounters are defined as those where the patient was physically seen by the GP. At indirect encounters, the patient was not physically seen by the GP (Table 5.3). More detail about item numbers recorded for practice nurse items is given in Chapter 10.

Table 5.3: Breakdown of MBS/DVA items of service according to provider (counting one item number per encounter)

Type of encounter	Number	Per cent of encounters[a] (*n* = 91,956)	95% LCL	95% UCL
MBS/DVA GP item of service	87,243	94.9	94.4	95.3
MBS/DVA item of service with other health professional[b] (no related GP item)	80	0.1	0.0	0.1
Direct encounters	27	0.0	0.0	0.0
Indirect encounters	48	0.1	0.0	0.1
Unspecified as direct or indirect	5	0.0	0.0	0.0
MBS/DVA item of service (all encounters)[c]	**87,323**	**95.0**	**94.5**	**95.4**

(a) Missing data removed from analysis (*n* = 7,074).

(b) 'Other health professional' includes practice nurses, allied health services and Aboriginal health workers.

(c) Includes direct encounters at which either a GP or a practice nurse item was recorded.

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

Table 5.4 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 1.7%, and direct encounters for 98.3% of encounters at which a payment source was recorded.

- The vast majority of all direct encounters (94.9%) were claimable either through Medicare or the DVA.

- Direct encounters where the GP indicated that no charge was made occurred rarely, accounting for 0.5% of encounters.

- Encounters claimable through workers compensation accounted for 2.0% of encounters.

- Encounters claimable through other sources (e.g. hospital-paid encounters) accounted for 0.9% of encounters.

Table 5.4: Type of encounter at which a source of payment was recorded for the encounter (counting one item number per encounter)

Type of encounter	Number	Per cent of encounters[a] (n = 91,956)	95% LCL	95% UCL	Per cent of direct encounters (n = 90,429)
Indirect encounters[b]	1,522	1.7	1.4	1.9	
Direct encounters	90,429	98.3	98.1	98.6	100.0
MBS/DVA items of service (direct encounters only)[c]	87,264	94.9	94.4	95.4	96.5
Workers compensation	1,853	2.0	1.8	2.2	2.0
Other paid (hospital, state, etc)	862	0.9	0.7	1.2	1.0
No charge	450	0.5	0.3	0.7	0.5
Other health professional only items (unspecified as direct or indirect)	5	0.0	0.0	0.0	—
Total	91,956	100.0	—	—	—

(a)   Missing data removed from analysis (n = 7,074).

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

(c)   Includes direct encounters at which either a GP 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 – Department of Veterans' Affairs.

Table 5.5 provides a summary of the MBS items recorded in BEACH, counting one item number per encounter. This provides comparable results about item numbers recorded to those reported in previous years.

- Standard surgery consultations accounted for 81.8% of MBS/DVA-claimable GP consultations, and for 77.6% of all encounters for which a payment source was recorded.

- 8.6% of MBS/DVA claimable encounters were long or prolonged surgery consultations.

- Home or institution visits, and visits at residential aged care facilities were all relatively rare, together accounting for 2.5% of MBS/DVA claimable encounters.

- About 1% of encounters were claimable as GP mental healthcare items, with another 1% claimable as chronic disease management items. Health assessments and case conference items were not recorded often.

Table 5.5: Summary of GP only MBS/DVA items recorded (counting one item number per encounter)

MBS/DVA item	Number	Rate per 100 encounters[a] (*n* = 91,956)	95% LCL	95% UCL	Per cent of MBS/DVA recorded GP items (*n* = 87,243)
Short surgery consultations	1,619	1.8	1.4	2.1	1.9
Standard surgery consultations	71,386	77.6	76.5	78.8	81.8
Long surgery consultations	7,403	8.1	7.5	8.6	8.5
Prolonged surgery consultations	479	0.5	0.4	0.6	0.5
Residential aged care facility (RACF) visits	1,624	1.8	1.1	2.4	1.9
Home or institution visits (excluding RACF)	637	0.7	0.5	0.9	0.7
GP mental health care	1,221	1.3	1.2	1.5	1.4
Chronic disease management items	1,137	1.2	1.1	1.4	1.3
Health assessments	387	0.4	0.3	0.5	0.4
Case conferences	5	0.0	0.0	0.0	0.0
Attendances associated with Practice Incentives Program payments	153	0.2	0.1	0.2	0.2
Other items	1,193	1.3	0.9	1.7	1.4
Therapeutic procedures	339	0.4	0.3	0.5	0.4
Surgical operations	266	0.3	0.2	0.3	0.3
Acupuncture	220	0.2	0.1	0.4	0.3
Other items	368	0.4	0.1	0.7	0.4
Total MBS/DVA items of service (GPs only)	**87,243**	**94.9**	**94.4**	**95.3**	**100.0**

(a)   Encounters with missing payment source were removed from analysis (*n* = 7,074). Denominator used for analysis *n* = 91,956.

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

Table 5.6 provides the distribution of all Medicare 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 108,060 MBS item numbers recorded at 87,323 Medicare/DVA claimable encounters in 2011–12, an average of 1.2 items per encounter claimable through Medicare/DVA.

Surgery consultations (including short, standard, long and prolonged) were the most commonly recorded type of item number, accounting for 75% of all MBS items, one of these items being recorded at 92.6% of MBS claimable encounters.

The second most commonly recorded were items for bulk-billed incentive payments, which accounted for 14.7% of all items recorded. Items for hospital, residential aged care and home visits together accounted for 2% of all MBS items. Items for other practice nurse, Aboriginal health worker and allied health services accounted for 2% of all MBS items, and were recorded at least once at 2.3% of claimable encounters at which at least one MBS item was recorded. A more detailed breakdown of practice nurse item numbers and related data on practice nurse activity, is provided in Section 10.4.

Table 5.6: Distribution of all MBS/DVA item numbers recorded, across item number groups and encounters

Items/encounters	All MBS/DVA items[a] (*n* = 108,060)		Encounters with at least one item recorded[b] (*n* = 87,323)			
	Number	Per cent	Number	Per cent	95% LCL	95% UCL
Surgery consultations	80,887	74.9	80,887	92.6	91.7	93.5
GP bulk-billed incentive payment	15,860	14.7	15,860	18.2	16.1	20.2
Home, institution and residential aged care visits	2,261	2.1	2,261	2.6	1.9	3.3
Chronic disease management items (including case conferences)	2,054	1.9	1,464	1.7	1.5	1.9
Other practice nurse/Aboriginal health worker/allied health worker services	2,031	1.9	1,999	2.3	2.0	2.6
GP mental health care items	1,442	1.3	1,441	1.7	1.5	1.8
Surgical operations	1,023	0.9	992	1.1	1.0	1.3
Diagnostic procedures and investigations	582	0.5	573	0.7	0.6	0.8
Health assessments	458	0.4	457	0.5	0.4	0.6
Therapeutic procedures	417	0.4	416	0.5	0.4	0.6
Acupuncture	226	0.2	226	0.3	0.1	0.4
Pathology services	219	0.2	219	0.3	0.2	0.3
Attendances associated with Practice Incentives Program payments	182	0.2	182	0.2	0.2	0.3
Diagnostic imaging services	7	0.0	7	0.0	0.0	0.0
Other items	411	0.4	411	0.5	0.1	0.8
Total items	**108,060**	**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.

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

5.3 Consultation length

In a subsample of 33,096 BEACH MBS/DVA-claimable encounters at which start and finish times had been recorded by the GP, the mean length of consultation in 2011–12 was 15.2 minutes (95% CI: 15.0–15.5). The median length was 13.0 minutes (results not tabled).

For A1 MBS/DVA-claimable encounters, the mean length of consultation in 2011–12 was 14.9 minutes (95% CI: 14.6–15.1), 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*[69] and Britt et al. (2005) in *Determinants of consultation length in Australian general practice*.[70]

5.4   Changes in the encounters over the decade 2002–03 to 2011–12

The companion report *A decade of Australian general practice activity 2002–03 to 2011–12*,[1] provides an overview of changes in general practice encounters over the last decade. The major changes between 2002–03 and 2011–12 are summarised below.

- There was an increase in the average number of problems managed at encounter, from 145 per 100 encounters in 2002–03 to 154 in 2011–12. This change was reflected in an increase in the number of chronic problems managed per 100 encounters. However these changes did not result in an increase in the average length of GP–patient encounters which remained static over the decade.
- The number of work-related problems managed marginally decreased over the last eight years from 3.1 to 2.6 per 100 encounters.

Of the encounters claimable from Medicare/DVA:

- short surgery consultations as a proportion of all Medicare/DVA claimed consultations increased over the study period
- the proportion designated chronic disease management items or health assessments both increased significantly.

The changes in management actions described below are measured 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 as described in Section 8.1.

- The number of procedures undertaken per 100 encounters rose significantly from 14.6 to 16.9 per 100 encounters.
- There was an increased rate of referrals, which was reflected in referrals to medical specialists, allied health services, emergency departments and 'other' services.
- Pathology test/battery order rates increased by nearly 50%. Orders for imaging tests also increased.

5.5   Discussion

The number of GP encounters with patients, measured by MBS attendance items for both GPs and other medical practitioners claiming primary care attendance items, increased from 96.9 million in 2002–03 to 122.5 million in 2011–12 (see Section 2.11), an increase of 26.4% over the last decade. This is a great deal more than the increase in the Australian population during this period and may be driven by an ageing population with an increased number of chronic diseases requiring more frequent encounters. This is also reflected in the increase in the number of problems managed at encounter, from 145 to 154 for 100 encounters, and the increase in chronic problems managed from 49.1 to 55.6 per 100 encounters between 2002–03 and 2011–12.

A significant decrease in long surgery consultations occurred in 2008–09 and the rate has remained relatively low since. This coincided with concern being expressed by the Medicare Professional Services Review regarding the number of longer GP consultations being claimed from Medicare. A significant rise in chronic disease management items occurred in 2008–09, and may be attributed to an increased use of chronic disease management items (including GP management plans and team care arrangements) and may be a partial substitute for long consultations for this group of patients.

The significant drop in clinical treatments given at GP encounters in 2005–06 coincided with the introduction of the MBS practice nurse items. This may represent a shift of some of this activity from GPs to practice nurses but undertaken by the nurse outside the encounter and therefore not recorded on the BEACH form. The rate of GP clinical treatments has steadily increased since and is now back to 2002–03 levels. The recent removal of practice nurse Medicare items may alter this pattern further in the future.

There was a decrease in home visits in the decade to 2010[71] 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 has been altered from the 2012–13 BEACH data year onwards to ensure we can identify home visits in the future and provide information regarding this important aspect of GP care.

6 The patients

This chapter reports data collected between April 2011 and March 2012 about the characteristics of patients at GP encounters and their reasons for encounter, from the 14th year of the BEACH program. Data on patient characteristics and reasons for encounter are reported for each year from 2002–03 to 2011–12 in the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12.*[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 (56.5%) 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 20.0% of encounters those aged 25–44 years for 22.6%, those aged 45–64 years accounted for 27.7% and those aged 65 years and over for 29.7% of encounters (Table 6.1).

Per cent

	< 1	1–4	5–14	15–24	25–44	45–64	65–74	75+
☐ Female	0.8	2.0	2.6	5.4	13.9	15.5	6.8	9.5
■ Male	0.9	2.4	2.8	3.1	8.7	12.2	6.5	6.9

Age group (years)

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

Figure 6.1: Age–sex distribution of patients at encounter
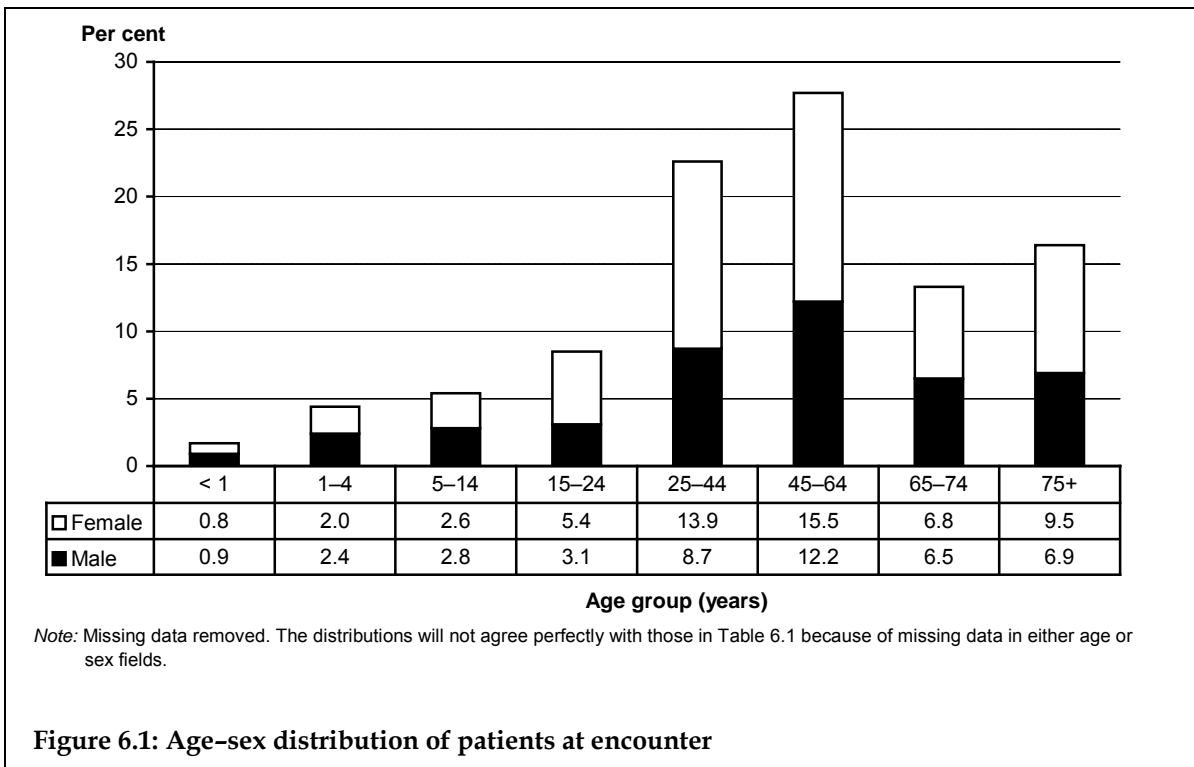
The relationship between patient age, patient general practice attendance rates and the age distribution of the Australian population was reported in *General practice activity in Australia, health priorities and policies 1998 to 2008.*[72]

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 7.9% of encounters
- nearly half of the encounters were with patients who held a Commonwealth concession card (44.7%) and/or a Repatriation health card (2.4%)
- at 11.3% of encounters the patient was from a non-English-speaking background
- at 1.6% 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* = 99,030)	95% LCL	95% UCL
Sex (missing)[a]	(842)	—	—	—
Males	42,737	43.5	42.7	44.3
Females	55,451	56.5	55.7	57.3
Age group (missing)[a]	(793)	—	—	—
< 1 year	1,764	1.8	1.7	1.9
1–4 years	4,342	4.4	4.2	4.7
5–14 years	5,251	5.3	5.1	5.6
15–24 years	8,332	8.5	8.1	8.9
25–44 years	22,179	22.6	21.7	23.4
45–64 years	27,195	27.7	27.1	28.3
65–74 years	13,138	13.4	12.8	13.9
75+ years	16,036	16.3	15.3	17.3
New patient to practice (missing)[a]	(1,713)	—	—	—
New patient to practice	7,715	7.9	7.0	8.8
Patient seen previously	89,602	92.1	91.2	93.0
Commonwealth concession card status (missing)[a]	(8,704)	—	—	—
Has a Commonwealth concession card	41,295	44.7	43.1	46.2
No Commonwealth concession card	51,133	55.3	53.8	56.9
Repatriation health card status (missing)[a]	(10,695)	—	—	—
Has a repatriation health card	2,223	2.4	2.2	2.7
No repatriation health card	88,854	97.6	97.3	97.8
Language status (missing)[a]	(10,783)	—	—	—
Non-English-speaking background[b]	9,978	11.3	9.4	13.2
English-speaking background	78,268	88.7	86.8	90.6
Indigenous status (missing)[a]	(10,707)	—	—	—
Aboriginal and/or Torres Strait Islander[c]	1,394	1.6	1.2	1.9
Non-Indigenous	86,928	98.4	98.1	98.8

(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, which may benefit from intervention on a population level.[73]

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.

Patient RFEs can have a one-to-one, one-to-many, many-to-one or many-to-many relationship to problems managed. That is, the patient may describe a single RFE that relates to a single problem managed at the encounter, one 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 was unrelated to the patient's RFE (e.g. a patient presents about their diabetes but while they are there the GP also provides an immunisation/vaccination and performs a Pap smear).

Number of reasons for encounter

There were 153,218 RFEs recorded at 99,030 encounters in 2011–12. At 57.9% of encounters only one RFE was recorded, at 29.6% two RFEs were recorded and at 12.6% of encounters three RFEs were recorded (Table 6.2). On average patients presented with 154.7 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* = 99,030)	Per cent of encounters	95% LCL	95% UCL
One RFE	57,290	57.9	56.6	59.1
Two RFEs	29,293	29.6	28.9	30.3
Three RFEs	12,447	12.6	11.8	13.3
Total	**99,030**	**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.

More than four out of ten (43.0%) 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 18.9% of RFEs. The remaining 38.1% of RFEs were described in terms of processes of care, such as requests for a health check, requests for prescriptions, referrals, test results or medical certificates.

At an average 100 encounters, patients described 66.6 symptom and complaint RFEs, 29.3 diagnosis/disease RFEs, made 24.6 requests for a procedure and 15.0 requests for treatment.

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

ICPC-2 component	Number	Per cent of total RFEs (n = 153,218)	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL
Symptoms and complaints	65,941	43.0	66.6	64.7	68.5
Diagnosis, diseases	29,028	18.9	29.3	27.8	30.8
Infections	7,220	4.7	7.3	6.8	7.8
Injuries	4,391	2.9	4.4	4.2	4.7
Neoplasms	964	0.6	1.0	0.9	1.1
Congenital anomalies	242	0.2	0.2	0.2	0.3
Other diagnoses, diseases	16,211	10.6	16.4	15.2	17.5
Diagnostic and preventive procedures	24,370	15.9	24.6	23.7	25.6
Medications, treatments and therapeutics	14,870	9.7	15.0	14.2	15.8
Results	8,450	5.5	8.5	8.1	9.0
Referrals and other RFEs	7,658	5.0	7.7	7.3	8.2
Administrative	2,901	1.9	2.9	2.7	3.2
Total RFEs	**153,218**	**100.0**	**154.7**	**152.8**	**156.7**

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 42.2 per 100 encounters, with requests for prescriptions and test results the most frequently recorded of these. RFEs related to the respiratory system arose at a rate of 21.3 per 100 encounters, while those related to the musculoskeletal system were recorded at a rate of 15.8 per 100, and those relating to skin at a rate of 15.1 per 100 encounters (Table 6.4).

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 = 153,218)	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL
General and unspecified	**41,818**	**27.3**	**42.2**	**41.0**	**43.5**
Prescription NOS	8,580	5.6	8.7	8.1	9.2
Results tests/procedures NOS	7,217	4.7	7.3	6.9	7.7
General check-up*	4,438	2.9	4.5	4.2	4.8
Administrative procedure NOS	2,653	1.7	2.7	2.5	2.9
Immunisation/vaccination NOS	2,104	1.4	2.1	2.0	2.3
Fever	1,892	1.2	1.9	1.7	2.1
Weakness/tiredness	1,418	0.9	1.4	1.3	1.5
Blood test NOS	1,198	0.8	1.2	1.0	1.4
Other referrals NEC	1,184	0.8	1.2	1.1	1.3
Observation/health education/advice/diet NOS	981	0.6	1.0	0.9	1.1
Chest pain NOS	910	0.6	0.9	0.8	1.0
Other reason for encounter NEC	908	0.6	0.9	0.7	1.1
Follow-up encounter unspecified	871	0.6	0.9	0.7	1.0
Clarify or discuss patient's RFE	828	0.5	0.8	0.7	0.9
Trauma/injury NOS	770	0.5	0.8	0.7	0.9
Respiratory	**21,083**	**13.8**	**21.3**	**20.3**	**22.2**
Cough	6,602	4.3	6.7	6.2	7.1
Throat symptom/complaint	3,183	2.1	3.2	2.9	3.5
Upper respiratory tract infection	1,904	1.2	1.9	1.7	2.1
Immunisation/vaccination – respiratory	1,870	1.2	1.9	1.5	2.3
Sneezing/nasal congestion	1,462	1.0	1.5	1.3	1.7
Shortness of breath/dyspnoea	808	0.5	0.8	0.7	0.9
Musculoskeletal	**15,648**	**10.2**	**15.8**	**15.3**	**16.3**
Back complaint*	3,105	2.0	3.1	2.9	3.3
Knee symptom/complaint	1,390	0.9	1.4	1.3	1.5
Shoulder symptom/complaint	1,209	0.8	1.2	1.1	1.3
Foot/toe symptom/complaint	1,105	0.7	1.1	1.0	1.2
Leg/thigh symptom/complaint	930	0.6	0.9	0.9	1.0
Neck symptom/complaint	807	0.5	0.8	0.7	0.9
Musculoskeletal injury NOS	774	0.5	0.8	0.7	0.9
Skin	**14,911**	**9.7**	**15.1**	**14.5**	**15.6**
Rash*	2,587	1.7	2.6	2.5	2.8
Skin symptom/complaint, other	1,560	1.0	1.6	1.4	1.7
Skin check-up*	1,156	0.8	1.2	0.9	1.4
Swelling (skin)*	1,058	0.7	1.1	1.0	1.2

(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 = 153,218)	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL
Digestive	**10,134**	**6.6**	**10.2**	**9.9**	**10.6**
Abdominal pain*	1,814	1.2	1.8	1.7	2.0
Diarrhoea	1,350	0.9	1.4	1.2	1.5
Vomiting	890	0.6	0.9	0.8	1.0
Cardiovascular	**10,054**	**6.6**	**10.2**	**9.6**	**10.7**
Cardiovascular check-up*	4,472	2.9	4.5	4.2	4.9
Hypertension/high blood pressure*	1,745	1.1	1.8	1.5	2.0
Prescription – cardiovascular	918	0.6	0.9	0.7	1.1
Psychological	**8,804**	**5.7**	**8.9**	**8.4**	**9.4**
Depression*	2,157	1.4	2.2	2.0	2.3
Anxiety*	1,188	0.8	1.2	1.1	1.3
Sleep disturbance	1,024	0.7	1.0	0.9	1.1
Acute stress reaction	704	0.5	0.7	0.6	0.8
Prescription – psychological	699	0.5	0.7	0.6	0.8
Endocrine and metabolic	**6,218**	**4.1**	**6.3**	**5.9**	**6.6**
Diabetes – (non-gestational)*	1,261	0.8	1.3	1.1	1.4
Prescription – endocrine/metabolic	996	0.7	1.0	0.9	1.1
Female genital system	**4,715**	**3.1**	**4.8**	**4.4**	**5.1**
Female genital check-up/Pap smear*	1,642	1.1	1.7	1.5	1.8
Menstrual problems*	704	0.5	0.7	0.6	0.8
Neurological	**4,503**	**2.9**	**4.5**	**4.3**	**4.8**
Headache	1,504	1.0	1.5	1.4	1.7
Vertigo/dizziness	1,092	0.7	1.1	1.0	1.2
Ear	**3,401**	**2.2**	**3.4**	**3.3**	**3.6**
Ear pain	1,306	0.9	1.3	1.2	1.4
Pregnancy and family planning	**3,306**	**2.2**	**3.3**	**3.1**	**3.6**
Oral contraception*	750	0.5	0.8	0.7	0.8
Urology	**2,557**	**1.7**	**2.6**	**2.4**	**2.7**
Eye	**2,272**	**1.5**	**2.3**	**2.1**	**2.4**
Blood and blood forming organs	**1,650**	**1.1**	**1.7**	**1.5**	**1.8**
Blood test – blood and blood forming organs	1,123	0.7	1.1	1.0	1.3
Male genital system	**1,211**	**0.8**	**1.2**	**1.1**	**1.3**
Social	**932**	**0.6**	**0.9**	**0.8**	**1.0**
Total RFEs	**153,218**	**100.0**	**154.7**	**152.8**	**156.7**

(a)   Only individual RFEs accounting for ≥ 0.5% of total RFEs are included.

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: RFEs – reasons for encounter; LCL – lower confidence limit; UCL – upper confidence limit; 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 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-chapters, irrespective of whether or not the body system was specified.

Table 6.5: Most frequent patient reasons for encounter

Patient reason for encounter	Number	Per cent of total RFEs (*n* = 153,218)	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL
Check-up – all*	13,518	8.8	13.7	13.0	14.3
Prescription – all*	12,481	8.1	12.6	11.9	13.3
Test results*	8,450	5.5	8.5	8.1	9.0
Cough	6,602	4.3	6.7	6.2	7.1
Immunisation/vaccination – all*	4,125	2.7	4.2	3.8	4.6
Throat symptom/complaint	3,183	2.1	3.2	2.9	3.5
Back complaint*	3,105	2.0	3.1	2.9	3.3
Administrative procedure – all*	2,901	1.9	2.9	2.7	3.2
Blood test – all*	2,784	1.8	2.8	2.6	3.1
Rash*	2,587	1.7	2.6	2.5	2.8
Depression*	2,157	1.4	2.2	2.0	2.3
Upper respiratory tract infection	1,904	1.2	1.9	1.7	2.1
Fever	1,892	1.2	1.9	1.7	2.1
Abdominal pain*	1,814	1.2	1.8	1.7	2.0
Hypertension/high blood pressure*	1,745	1.1	1.8	1.5	2.0
Observation/health education/advice/diet – all*	1,595	1.0	1.6	1.5	1.8
Skin symptom/complaint, other	1,560	1.0	1.6	1.4	1.7
Headache	1,504	1.0	1.5	1.4	1.7
Sneezing/nasal congestion	1,462	1.0	1.5	1.3	1.7
Weakness/tiredness	1,418	0.9	1.4	1.3	1.5
Knee symptom/complaint	1,390	0.9	1.4	1.3	1.5
Diarrhoea	1,350	0.9	1.4	1.2	1.5
Ear pain/earache	1,306	0.9	1.3	1.2	1.4
Diabetes – all*	1,268	0.8	1.3	1.1	1.4
Shoulder symptom/complaint	1,209	0.8	1.2	1.1	1.3
Anxiety*	1,188	0.8	1.2	1.1	1.3
Other referrals NEC	1,184	0.8	1.2	1.1	1.3
Foot/toe symptom/complaint	1,105	0.7	1.1	1.0	1.2
Vertigo/dizziness	1,092	0.7	1.1	1.0	1.2
Swelling (skin)*	1,058	0.7	1.1	1.0	1.2
Subtotal	88,940	58.0	—	—	—
Total RFEs	**153,218**	**100.0**	**154.7**	**152.8**	**156.7**

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <purl.library.usyd.edu.au/sup/9781743320181>).

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

The top 30 most common RFEs accounted for 58% of all RFEs recorded. Of the top 30 RFEs, over half were symptom descriptions such as cough, throat complaint, back complaint and rash. However, four of the top five RFEs reflected requests for a process of care (that is, requests for check-up, prescription, test result and immunisation), and together accounted for a quarter of all RFEs (25.1%) (Table 6.5).

6.4 Changes in patients and their reasons for encounter over the decade 2002–03 to 2011–12

An overview of changes in the characteristics of patients at encounters and their reasons for encounter over the decade 2002–03 to 2011–12 can be found in Chapter 6 of the companion report *A decade of Australian general practice activity 2002–03 to 2011–12.*[1]
Major changes are summarised below.

With the ageing of the Australian population, the proportion of the Australian population that was aged 45 years and over increased from 36.1% in 2002 to 38.8% in 2011.[2] Over the same period the proportion of BEACH encounters with patients aged 45 years and over increased from 50.7% to 57.4%. When extrapolated, this change (in combination with the increased number of encounters nationally) means that in 2011–12 there were only about 4.4 million more encounters with younger patients, and about 21.2 million more with older patients nationally compared with 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.[74] This change in the age distribution of patients at GP encounters will effect all aspects of general practice as older patients are more likely to have more problems managed at encounters (see Section 7.1), more chronic conditions managed and are more likely to have multimorbidity.[25]

There was a significant decrease in the proportion of encounters with patients who were new to the practice (from 9.9% in 2002–03 to 7.9% in 2011–12). This may be due to the need for continuity of care for chronic conditions. The proportion of encounters with patients holding a Commonwealth concession card was relatively stable through the decade. The proportion of encounters with patients holding a Repatriation health card decreased by about a third, from 3.7% in 2002–03 to 2.4% in 2011–12. This is probably due to a decline in the number of veterans from World War 2 and their partners.

There was a significant increase in the number of reasons for encounter recorded per 100 encounters across the decade, from 150.9 in 2002–03 to 154.7 in 2011–12, fewer patients giving a single RFE and more giving two RFEs. This increase in RFEs is also probably related to the increasing proportion of encounters with older people, who are more likely to visit for multiple chronic disease management. There was a significant decrease in the rate of RFEs described as symptoms and complaints, and increases in rates of patient presentations for medications, tests and test results. This is also probably due to the increased proportion of encounters that are with older patients and the increase in chronic condition management which requires regular attendance and monitoring. The increase in patients' requests for tests and test results ties in with the increased use of pathology and imaging testing over the decade (see Chapter 12). One increase unrelated to the ageing of the population was a large increase in requests for administrative procedures such as doctor's or sickness certificates. This is probably due to increasing number of policies forcing workers to provide such documentation to claim sick days.

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. As GPs were instructed to record each problem at the most specific level possible from the information available, 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 in general practice are included in this section, including those that involved management by a practice nurse at the recorded encounter. Problems that included management by a practice nurse are reported specifically in Chapter 10.

There are two ways to describe the relative 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, cardiovascular 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. In considering these results, the reader must be mindful that although a rate per 100 encounters for a single ungrouped problem, for example, 'asthma, 2.0 per 100 encounters', can be regarded as equivalent to 'asthma is managed at 2.0% of encounters', such a statement cannot be made for grouped concepts (ICPC-2 chapters and those marked with asterisks in the tables).

Data on problems managed in Australian general practice from the BEACH study are reported for each year from 2002–03 to 2011–12 in the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1]

7.1   Number of problems managed at encounter

There were 152,286 problems managed, at a rate of 153.8 per 100 encounters in 2011–12 (Table 5.1 and total row Table 7.2). Table 7.1 shows the number of problems managed at each encounter. Only one problem was managed at 62.1% of encounters, two problems were managed at 25.5% of encounters, and 9.1% involved the management of three problems. The management of four problems at an encounter was less common (3.4% 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	61,470	62.1	60.8	63.4
Two problems	25,212	25.5	24.7	26.2
Three problems	9,000	9.1	8.6	9.6
Four problems	3,348	3.4	3.0	3.8
Total	**99,030**	**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 onward.

Significantly more problems were managed overall at encounters with female patients (156.0 per 100 encounters, 95% CI: 153.6–158.5) than at those with male patients (151.0 per 100 encounters, 95% CI: 148.5–153.5) (results not tabled). Figure 7.1 demonstrates that this difference was particularly evident in the 15–24 year age group.

Rate per 100 encounters

Age group (years)	<1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	120.6	114.6	116.5	123.6	135.8	161.2	173.3	174.1
Female	122.9	114.4	116.0	134.1	143.0	165.3	179.0	178.6

Note: Missing data removed.

Figure 7.1: Age–sex-specific rates of problems managed per 100 encounters with 95% CI
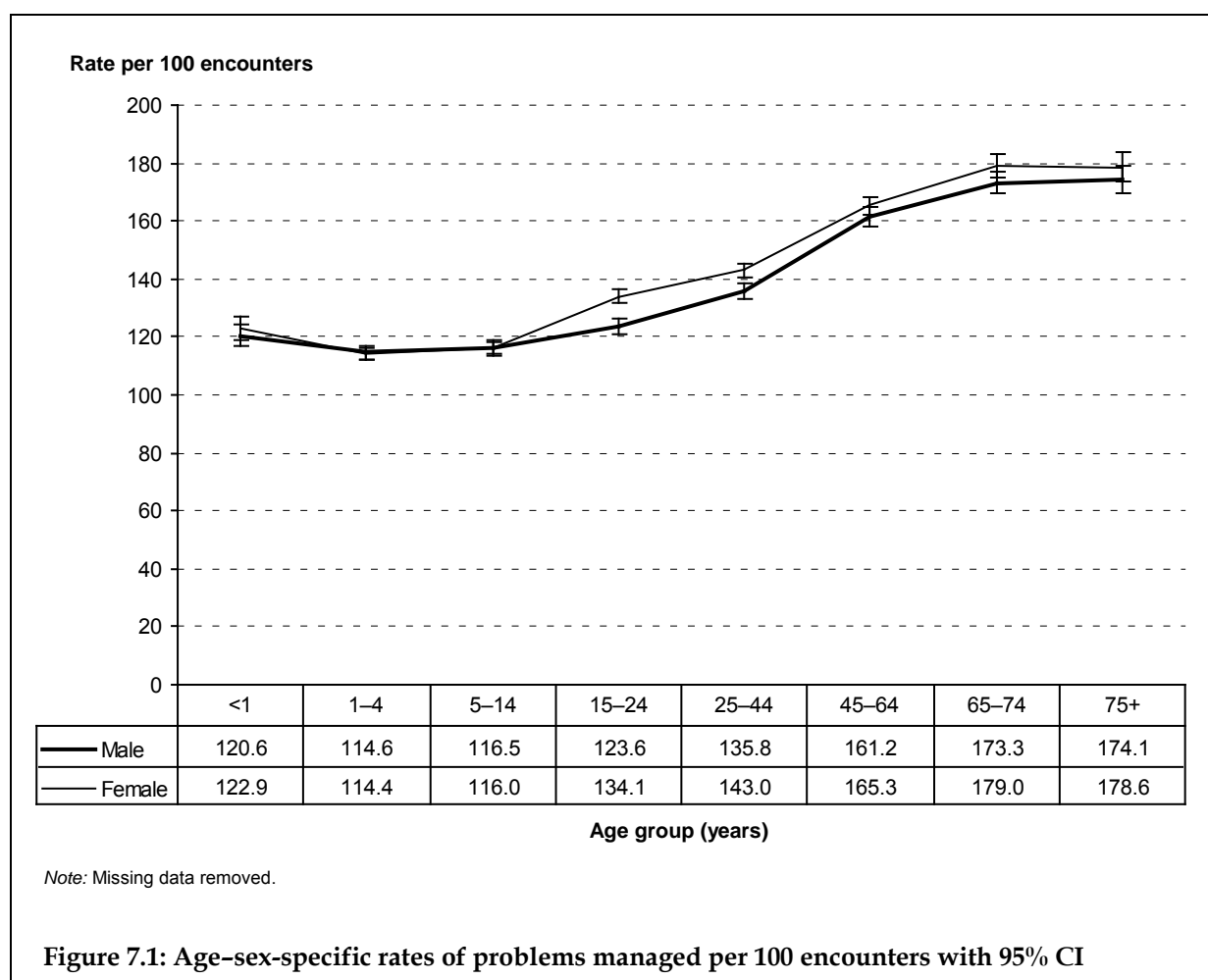
7.2 Problems managed by ICPC-2 component

Problems managed in general practice may also be examined using the components of the ICPC-2 classification to provide a broader view of the types of problems managed during general practice encounters. Table 7.2 lists the distribution of problems managed by ICPC-2 component.

Two-thirds (67.7%) of problems were expressed as diagnoses or diseases. The majority of other problems were described as symptoms or complaints (18.1%), or as diagnostic or preventive procedures (9.1%) such as check-ups. However, in some situations, rather than providing clinical details about the problem under management, other processes were recorded: that is, the problem was described in such terms as a prescription, test result, referral, or an administrative procedure.

At an 'average' 100 encounters GPs managed 104 diagnoses/diseases: 25 infections; 8 injuries; and 4 neoplasms. They also managed 28 symptoms and complaints, and conducted 14 diagnostic and preventive procedures.

Table 7.2: Problems managed by ICPC-2 component

ICPC-2 component	Number	Per cent of total problems (n = 152,286)	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL
Diagnosis, diseases	103,101	67.7	104.1	102.1	106.1
Infections	24,465	16.1	24.7	24.0	25.5
Injuries	7,514	4.9	7.6	7.3	7.9
Neoplasms	4,143	2.7	4.2	3.9	4.5
Congenital anomalies	681	0.5	0.7	0.6	0.8
Other diagnoses	66,298	43.5	66.9	64.9	69.0
Symptoms and complaints	27,636	18.1	27.9	27.0	28.8
Diagnostic and preventive procedures	13,832	9.1	14.0	13.3	14.7
Medications, treatments and therapeutics	3,356	2.2	3.4	3.1	3.7
Results	1,812	1.2	1.8	1.6	2.0
Referrals and other RFEs	1,275	0.8	1.3	1.1	1.5
Administrative	1,274	0.8	1.3	1.1	1.4
Total problems	**152,286**	**100.0**	**153.8**	**151.4**	**156.1**

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, by ICPC-2 chapter, are presented in Table 7.3. 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. Only those individual problems accounting for at least 0.5% of all problems managed are listed in the table, in decreasing order of frequency.

The most common problems managed were:

- those classified to the respiratory system (20.0 per 100 encounters), in particular upper respiratory tract infection, acute bronchitis, respiratory immunisations and asthma

- problems of a general and unspecified nature (18.5 per 100 encounters), such as general check-ups, general immunisations and unspecified test results

- musculoskeletal problems (17.4 per 100 encounters), particularly arthritis and back complaints

- cardiovascular problems (17.2 per 100 encounters), led by hypertension and atrial fibrillation

- skin problems (16.7 per 100 encounters), contact dermatitis and malignant neoplasms being the most common (Table 7.3).

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

Problem managed	Number	Per cent total problems (n = 152,286)	Rate per 100 encounters[a] (n = 99,030)	95% LCL	95% UCL
Respiratory	**19,811**	**13.0**	**20.0**	**19.3**	**20.7**
Upper respiratory tract infection	5,902	3.9	6.0	5.5	6.4
Acute bronchitis/bronchiolitis	2,494	1.6	2.5	2.3	2.7
Immunisation/vaccination – respiratory	2,304	1.5	2.3	1.9	2.7
Asthma	1,972	1.3	2.0	1.9	2.1
Sinusitis	1,211	0.8	1.2	1.1	1.3
Chronic obstructive pulmonary disease	919	0.6	0.9	0.8	1.0
Tonsillitis*	900	0.6	0.9	0.8	1.0
Allergic rhinitis	721	0.5	0.7	0.6	0.8
General and unspecified	**18,345**	**12.1**	**18.5**	**17.8**	**19.2**
General check-up*	2,757	1.8	2.8	2.6	3.0
Immunisation/vaccination NOS	2,068	1.4	2.1	1.9	2.2
Results tests/procedures NOS	1,359	0.9	1.4	1.2	1.5
Prescription NOS	1,326	0.9	1.3	1.2	1.5
Viral disease, other/NOS	1,196	0.8	1.2	1.0	1.4
Administrative procedure NOS	1,170	0.8	1.2	1.0	1.3
Abnormal result/investigation NOS	970	0.6	1.0	0.9	1.1
Musculoskeletal	**17,245**	**11.3**	**17.4**	**16.9**	**17.9**
Arthritis – all*	3,401	2.2	3.4	3.2	3.6
Osteoarthritis*	2,924	1.9	3.0	2.8	3.2
Back complaint*	2,756	1.8	2.8	2.6	3.0
Sprain/strain*	1,409	0.9	1.4	1.3	1.6
Bursitis/tendonitis/synovitis NOS	1,128	0.7	1.1	1.1	1.2
Fracture*	908	0.6	0.9	0.8	1.0
Injury musculoskeletal NOS	905	0.6	0.9	0.8	1.0
Osteoporosis	800	0.5	0.8	0.7	0.9

(continued)

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

Problem managed	Number	Per cent total problems (*n* = 152,286)	Rate per 100 encounters[a] (*n* = 99,030)	95% LCL	95% UCL
Cardiovascular	**17,006**	**11.2**	**17.2**	**16.4**	**18.0**
Hypertension*	8,971	5.9	9.1	8.5	9.6
Atrial fibrillation/flutter	1,375	0.9	1.4	1.2	1.5
Ischaemic heart disease*	1,042	0.7	1.1	0.9	1.2
Cardiovascular check-up*	1,019	0.7	1.0	0.9	1.2
Skin	**16,503**	**10.8**	**16.7**	**16.1**	**17.2**
Contact dermatitis	1,804	1.2	1.8	1.7	1.9
Malignant neoplasm skin	1,055	0.7	1.1	0.9	1.2
Solar keratosis/sunburn	1,046	0.7	1.1	0.9	1.2
Laceration/cut	958	0.6	1.0	0.9	1.1
Skin disease, other	779	0.5	0.8	0.7	0.9
Endocrine and metabolic	**13,407**	**8.8**	**13.5**	**13.0**	**14.1**
Diabetes – non-gestational*	4,097	2.7	4.1	3.9	4.4
Lipid disorder	3,463	2.3	3.5	3.3	3.7
Vitamin/nutritional deficiency	1,335	0.9	1.3	1.2	1.5
Hypothyroidism/myxoedema	788	0.5	0.8	0.7	0.9
Psychological	**12,831**	**8.4**	**13.0**	**12.3**	**13.6**
Depression*	4,361	2.9	4.4	4.1	4.7
Anxiety*	1,892	1.2	1.9	1.8	2.1
Sleep disturbance	1,504	1.0	1.5	1.4	1.6
Acute stress reaction	727	0.5	0.7	0.6	0.8
Tobacco abuse	721	0.5	0.7	0.7	0.8
Digestive	**11,003**	**7.2**	**11.1**	**10.8**	**11.4**
Oesophageal disease	2,629	1.7	2.7	2.5	2.8
Gastroenteritis*	1,500	1.0	1.5	1.4	1.6
Female genital system	**5,406**	**3.6**	**5.5**	**5.1**	**5.8**
Female genital check-up/Pap smear*	1,661	1.1	1.7	1.5	1.9
Menopausal complaint	715	0.5	0.7	0.6	0.8
Pregnancy and family planning	**3,810**	**2.5**	**3.9**	**3.6**	**4.1**
Pregnancy*	1,287	0.8	1.3	1.2	1.4
Oral contraception*	1,186	0.8	1.2	1.1	1.3
Ear	**3,627**	**2.4**	**3.7**	**3.5**	**3.8**
Acute otitis media/myringitis	1,016	0.7	1.0	0.9	1.1
Excessive ear wax	750	0.5	0.8	0.7	0.8
Neurological	**3,553**	**2.3**	**3.6**	**3.4**	**3.8**
Urology	**3,148**	**2.1**	**3.2**	**3.0**	**3.3**
Urinary tract infection*	1,686	1.1	1.7	1.6	1.8

(continued)

Problem managed	Number	Per cent total problems (*n* = 152,286)	Rate per 100 encounters[a] (*n* = 99,030)	95% LCL	95% UCL
Eye	**2,421**	**1.6**	**2.5**	**2.3**	**2.6**
Male genital system	**1,810**	**1.2**	**1.8**	**1.7**	**2.0**
Blood and blood forming organs	**1,637**	**1.1**	**1.7**	**1.5**	**1.8**
Social	**724**	**0.5**	**0.7**	**0.6**	**0.8**
Total problems	**152,286**	**100.0**	**153.8**	**151.4**	**156.1**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; 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 30 problems accounted for 57.2% of all problems managed, and the top ten problems accounted for 30.9%.

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.

The most common problems managed were hypertension (9.1 per 100 encounters), check-ups (6.4 per 100), upper respiratory tract infection (URTI) (6.0 per 100), immunisation/vaccination (4.7 per 100), and depression (4.4 per 100) (Table 7.4).

The far right-hand column in Table 7.4 lists the percentage of each problem that was new to the patient. The problem is considered new if it is a new problem or a new episode of a recurrent problem, and the patient has not been treated for that problem or episode by any medical practitioner before. This can provide a measure of general practice incidence. For example, only 4.6% of all contacts with diabetes were new diagnoses. In contrast, 78% of URTI problems were new to the patient, suggesting that the majority of people attend the GP for URTI only once per episode.

Table 7.4: Most frequently managed problems

Problem managed	Number	Per cent of total problems (n = 152,286)	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL	New as per cent of all problems[a]
Hypertension*	8,971	5.9	9.1	8.5	9.6	5.3
Check-up – all*	6,351	4.2	6.4	6.0	6.8	44.9
Upper respiratory tract infection	5,902	3.9	6.0	5.5	6.4	77.6
Immunisation/vaccination – all*	4,623	3.0	4.7	4.2	5.1	55.8
Depression*	4,361	2.9	4.4	4.1	4.7	15.9
Diabetes – all*	4,123	2.7	4.2	3.9	4.4	4.6
Arthritis – all*	3,875	2.5	3.9	3.7	4.1	18.6
Lipid disorder	3,463	2.3	3.5	3.3	3.7	10.3
Back complaint*	2,756	1.8	2.8	2.6	3.0	23.9
Oesophageal disease	2,629	1.7	2.7	2.5	2.8	15.9
Acute bronchitis/bronchiolitis	2,494	1.6	2.5	2.3	2.7	71.5
Prescription – all*	2,357	1.5	2.4	2.1	2.7	6.8
Asthma	1,972	1.3	2.0	1.9	2.1	20.0
Anxiety*	1,892	1.2	1.9	1.8	2.1	19.8
Test results*	1,812	1.2	1.8	1.6	2.0	31.5
Contact dermatitis	1,804	1.2	1.8	1.7	1.9	45.1
Urinary tract infection*	1,686	1.1	1.7	1.6	1.8	64.1
Sleep disturbance	1,504	1.0	1.5	1.4	1.6	21.7
Gastroenteritis*	1,500	1.0	1.5	1.4	1.6	76.0
Sprain/strain*	1,409	0.9	1.4	1.3	1.6	62.1
Atrial fibrillation/flutter	1,375	0.9	1.4	1.2	1.5	6.4
Vitamin/nutritional deficiency	1,335	0.9	1.3	1.2	1.5	36.1
Pregnancy*	1,287	0.8	1.3	1.2	1.4	41.4
Administrative procedure – all*	1,274	0.8	1.3	1.1	1.4	44.0
Sinusitis acute/chronic	1,211	0.8	1.2	1.1	1.3	65.6
Viral disease, other/NOS	1,196	0.8	1.2	1.0	1.4	73.9
Oral contraception*	1,186	0.8	1.2	1.1	1.3	18.0
Abnormal test results*	1,171	0.8	1.2	1.1	1.3	46.7
Bursitis/tendonitis/synovitis NOS	1,128	0.7	1.1	1.1	1.2	59.2
Malignant neoplasm skin	1,055	0.7	1.1	0.9	1.2	52.5
Subtotal	*87,033*	*57.2*	—	—	—	—
Total problems	**152,286**	**100.0**	**153.8**	**151.4**	**156.1**	**38.1**

(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 <purl.library.usyd.edu.au/sup/9781743320181>).

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, 58,014 problems (38.1% of all problems) were specified as being new, being managed at a rate of 58.6 per 100 encounters.

The most common new problems managed were largely acute or preventive, and included upper respiratory tract infection (4.6 per 100 encounters), check-up (2.9 per 100), immunisation/vaccination (2.6 per 100), acute bronchitis (1.8 per 100) and gastroenteritis (1.2 per 100) (Table 7.5).

The far right-hand column of this table shows the new cases of this problem as a proportion of total contacts with this problem. This provides an idea of the incidence of each problem. For example, the 694 new cases of depression represented only 16% of all GP contacts with diagnosed depression, suggesting that by far the majority of contacts for depression were for ongoing management. In contrast, 70% of acute otitis media contacts were first consultations to a medical practitioner for this episode, the balance (30%) being 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 otitis media.

Table 7.5: Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (*n* = 58,014)	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	New as per cent of all problems[a]
Upper respiratory tract infection	4,578	7.9	4.6	4.3	5.0	77.6
Check-up – all*	2,853	4.9	2.9	2.6	3.1	44.9
Immunisation/vaccination – all*	2,582	4.5	2.6	2.3	2.9	55.8
Acute bronchitis/bronchiolitis	1,783	3.1	1.8	1.6	2.0	71.5
Gastroenteritis*	1,140	2.0	1.2	1.0	1.3	76.0
Urinary tract infection*	1,081	1.9	1.1	1.0	1.2	64.1
Viral disease, other/NOS	883	1.5	0.9	0.7	1.1	73.9
Sprain/strain*	876	1.5	0.9	0.8	1.0	62.1
Contact dermatitis	814	1.4	0.8	0.7	0.9	45.1
Sinusitis acute/chronic	794	1.4	0.8	0.7	0.9	65.6
Arthritis – all*	722	1.2	0.7	0.7	0.8	18.6
Acute otitis media/myringitis	711	1.2	0.7	0.6	0.8	69.9
Depression*	694	1.2	0.7	0.6	0.8	15.9
Bursitis/tendonitis/synovitis NOS	668	1.2	0.7	0.6	0.7	59.2
Back complaint*	659	1.1	0.7	0.6	0.7	23.9
Tonsillitis*	659	1.1	0.7	0.6	0.7	73.2
Test results*	572	1.0	0.6	0.5	0.7	31.5
Administrative procedure – all*	561	1.0	0.6	0.5	0.6	44.0
Malignant neoplasm skin	554	1.0	0.6	0.5	0.6	52.5

(continued)

Table 7.5 (continued): Most frequently managed new problems

New problem managed	Number	Per cent of total new problems (n = 58,014)	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL	New as per cent of all problems[a]
Abnormal test results*	547	0.9	0.6	0.5	0.6	46.7
Pregnancy*	533	0.9	0.5	0.5	0.6	41.4
Solar keratosis/sunburn	511	0.9	0.5	0.4	0.6	48.8
Conjunctivitis, infectious	497	0.9	0.5	0.4	0.6	78.8
Vitamin/nutritional deficiency	482	0.8	0.5	0.4	0.6	36.1
Hypertension*	477	0.8	0.5	0.4	0.5	5.3
Excessive ear wax	464	0.8	0.5	0.4	0.5	61.9
Observation/health education/ advice/diet – all*	439	0.8	0.4	0.4	0.5	53.8
Skin disease, other	437	0.8	0.4	0.4	0.5	56.1
Injury musculoskeletal NOS	436	0.8	0.4	0.4	0.5	48.1
Laceration/cut	433	0.7	0.4	0.4	0.5	45.1
Subtotal	*35,732*	*61.6*	—	—	—	—
Total new problems	**58,014**	**100.0**	**58.6**	**57.1**	**60.0**	—

(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 <purl.library.usyd.edu.au/sup/9781743320181>).

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 2004[43] and regularly updated by O'Halloran (see 'Chronic conditions' grouper G84 <sydney.edu.au/medicine/fmrc/icpc-2-plus/ demonstrator/index.php>), was applied to the BEACH data set. More than one-third (36.2%) of the problems managed in general practice were chronic. At least one chronic problem was managed at 41.6% of encounters (95% CI: 40.5–42.7) (Table 5.1), and chronic problems were managed at an average rate of 55.6 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, they are marked with a double asterisk (for example, Diabetes [non-gestational]**). Codes included can be found in Appendix 4, Table A4.2.

Table 7.6 shows the most frequently managed chronic problems in decreasing order of frequency. These 30 chronic problems together accounted for 79.9% of all chronic problems managed, and for 28.9% of all problems managed. Almost half (49.7%) of all chronic problems managed were accounted for by the top six chronic problems: non-gestational hypertension (16.3% of chronic conditions), depressive disorder (7.8%), non-gestational diabetes (7.4%), chronic arthritis (7.1%), lipid disorder (6.3%), and oesophageal disease (4.8%) (Table 7.6).

Extrapolation of these results suggests that, across Australia in 2011–12, there were 11.0 million encounters involving hypertension, 5.4 million involving depression and 5.0 million involving diabetes.

Table 7.6: Most frequently managed chronic problems

Chronic problem managed	Number	Per cent of total chronic problems (*n* = 55,080)	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL
Hypertension (non-gestational)**	8,955	16.3	9.0	8.5	9.6
Depressive disorder**	4,318	7.8	4.4	4.1	4.6
Diabetes (non-gestational)**	4,097	7.4	4.1	3.9	4.4
Chronic arthritis**	3,910	7.1	3.9	3.7	4.2
Lipid disorder	3,463	6.3	3.5	3.3	3.7
Oesophageal disease	2,629	4.8	2.7	2.5	2.8
Asthma	1,972	3.6	2.0	1.9	2.1
Atrial fibrillation/flutter	1,375	2.5	1.4	1.2	1.5
Malignant neoplasm of skin	1,055	1.9	1.1	0.9	1.2
Ischaemic heart disease**	1,042	1.9	1.1	0.9	1.2
Back syndrome with radiating pain**	922	1.7	0.9	0.8	1.0
Chronic obstructive pulmonary disease	919	1.7	0.9	0.8	1.0
Osteoporosis	800	1.5	0.8	0.7	0.9
Hypothyroidism/myxoedema	788	1.4	0.8	0.7	0.9
Chronic skin ulcer	655	1.2	0.7	0.6	0.7
Obesity (BMI > 30)	629	1.1	0.6	0.5	0.7
Migraine	628	1.1	0.6	0.6	0.7
Dementia (including senile, Alzheimer's)	611	1.1	0.6	0.5	0.8
Gout	607	1.1	0.6	0.5	0.7
Heart failure	569	1.0	0.6	0.5	0.6
Shoulder syndrome (excluding arthritis)**	525	1.0	0.5	0.5	0.6
Anxiety disorder**	515	0.9	0.5	0.4	0.6
Schizophrenia	486	0.9	0.5	0.4	0.6
Back syndrome without radiating pain (excluding arthritis, sprains and strains)**	405	0.7	0.4	0.3	0.5
Chronic acne**	398	0.7	0.4	0.4	0.5
Chronic back pain**	365	0.7	0.4	0.3	0.4
Chronic kidney disease**	364	0.7	0.4	0.3	0.4
Chronic pain NOS	351	0.6	0.4	0.3	0.4
Vertiginous syndrome	345	0.6	0.3	0.3	0.4
Malignant neoplasm prostate	338	0.6	0.3	0.3	0.4
Subtotal	*44,036*	*79.9*	—	—	—
Total chronic problems	**55,080**	**100.0**	**55.6**	**53.6**	**57.7**

** Includes multiple ICPC-2 or ICPC-2 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 <purl.library.usyd.edu.au/sup/9781743320181>).

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

7.7 Work-related problems managed

The work-related status of a problem under management was determined by the GP, and is defined as any problem that is (in the GP's view) likely to have resulted from work-related activity or workplace exposure, or that has been significantly exacerbated by work activity or workplace exposure. Work-related problems accounted for 1.7% of problems and were managed at a rate of 2.6 per 100 encounters in 2011–12 (Table 7.7). This suggests that there were 3.2 million problems managed in general practice nationally that were likely to be work related.

Table 7.7: Work-related problems, by type and most frequently managed individual problems

Work-related problem managed	Number	Per cent of total WR problems (*n* = 2,559)	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	WR as per cent of all problems[(a)]
Musculoskeletal problems	**1,520**	**59.4**	**1.5**	**1.4**	**1.7**	**8.8**
Back complaint*	379	14.8	0.4	0.3	0.4	13.8
Sprain/strain*	268	10.5	0.3	0.2	0.3	19.0
Injury musculoskeletal NOS	230	9.0	0.2	0.2	0.3	25.4
Bursitis/tendonitis/synovitis NOS	83	3.3	0.1	0.1	0.1	7.4
Shoulder syndrome	67	2.6	0.1	0.0	0.1	12.8
Acute internal knee damage	60	2.4	0.1	0.0	0.1	19.2
Fracture*	59	2.3	0.1	0.0	0.1	6.5
Tennis elbow	54	2.1	0.1	0.0	0.1	25.1
Arthritis – all*	43	1.7	0.0	0.0	0.1	1.1
Psychological problems	**281**	**11.0**	**0.3**	**0.2**	**0.3**	**2.2**
Depression*	95	3.7	0.1	0.1	0.1	2.2
Acute stress reaction	85	3.3	0.1	0.1	0.1	11.7
Post traumatic stress disorder	41	1.6	0.0	0.0	0.1	29.7
Anxiety*	36	1.4	0.0	0.0	0.1	1.9
Other work-related problems	**759**	**29.7**	**0.8**	**0.7**	**0.9**	**0.6**
Administrative procedure – all*	75	2.9	0.1	0.0	0.1	5.9
General check-up*	73	2.8	0.1	0.0	0.1	1.1
Injury skin, other	71	2.8	0.1	0.0	0.1	12.9
Laceration/cut	57	2.2	0.1	0.0	0.1	5.9
Total work-related problems	**2,559**	**100.0**	**2.6**	**2.4**	**2.8**	**—**

(a)   The proportion of total contacts with this problem that was accounted for by work-related problems.

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: WR – work-related; LCL – lower confidence limit; UCL – upper confidence limit; NOS – not otherwise specified. Only the most frequent individual work-related problems accounting for ≥ 1.4% of total work-related problems are reported.

The most common work-related problems were musculoskeletal problems, accounting for 59.4% of work-related problems and managed at a rate of 1.5 per 100 general practice encounters. Almost one in ten 10 (8.8%) of musculoskeletal problems managed in general practice were work related. The most common musculoskeletal work-related problems were back complaint (14.8% of work-related problems), sprain and strain (10.5%), unspecified musculoskeletal injury (9.0%) and unspecified bursitis/tendonitis/synovitis (3.3%).

Work-related psychological problems accounted for 11.0% of total work-related problems, and were managed at a rate of 0.3 per 100 encounters. The most common were depression (3.7% of work-related problems), acute stress reaction (3.3%), post-traumatic stress disorder (1.6%) and anxiety (1.4%). Psychological work-related problems accounted for only 2.2% of total psychological problems managed in general practice.

7.8 Management of gastro-oesophageal reflux disease in 2011–12

Each year in the annual report we select one morbidity with which to demonstrate how BEACH data pertaining to a selected problem can be analysed and viewed. This section uses the example of the management of gastro-oesophageal reflux disease (GORD).

Although GORD is not a National Health Priority Area, it causes a well-documented high disease burden on the Australian community, and large health expenditures for both health services and pharmaceuticals.

- Knox et al. (2008) estimated the prevalence of GP-diagnosed GORD in Australia to be 10.4% (95% CI: 9.3–11.5) of patients attending GPs and 9.2% (95% CI: 8.2–10.1) of the Australian population.[24] The prevalence of GORD in the Australian community is similar to that of osteoarthritis, asthma or depression.[24]

- In 1992, proton pump inhibitor (PPI) pharmaceuticals were introduced onto the Pharmaceutical Benefits Scheme (PBS) for the treatment of oesophagitis due to GORD.

- In 2010–11, the cost to the PBS of prescribed drugs for acid related disorders was more than $417 million, and the cost of the most frequently prescribed drug in this group (esomeprazole) was approximately $169 million.[75]

Results are summarised in Figure 7.2.

Results

GORD (defined as ICPC-2 PLUS codes D84004, D84008 and D84011) is commonly managed in general practice, with 2,557 recorded contacts with the problem, a management rate of 2.6 per 100 encounters with patients in 2011–12 (Figure 7.2). This represents about 3.2 million encounters at which a GORD was managed in general practice across Australia in that year.

Patient age, sex and reasons for encounter

There was no difference in the rate of GORD management between the sexes: 2.6 per 100 male encounters compared with 2.5 per 100 female encounters. Patients aged 65–74 years were most likely to have GORD managed (4.0 per 100 encounters with patients in this age group), followed by those aged 75 years and over (3.7) and 45–64 years (3.6). The rate among infants aged less than one year (2.1, 95% CI: 1.3–2.9) was significantly higher than the rate for 1–4 year-olds (0.1, 95% CI: 0.0–0.2).

The most common reasons for encounter given by patients were: need for a prescription (45.7 per 100 GORD encounters), oesophageal disease (20.6), test result (7.4) or a cardiovascular check-up (6.2).

Other problems managed

Hypertension was the co-morbidity most often managed with GORD (22.6 per 100 GORD encounters), followed by lipid disorder (9.9), depression (7.1), diabetes (6.1) and osteoarthritis (5.8). The high management rates of these co-morbidities with the management of GORD is not surprising considering about 45% of patients at these encounters were aged 65 or more years.

Medications and other treatments

Medications were prescribed, supplied by the GP, or advised for over-the-counter purchase in the management of GORD (96.1 per 100 GORD problems, 95% CI: 94.3–97.9) significantly more often than the average for all problems (69.6 per 100 problems, 95% CI: 68.0–71.2) in the 2011–12 BEACH year (Table 5.1).

The medications most often prescribed, supplied or advised for GORD were esomeprazole (41.6 per 100 GORD problems), pantoprazole (20.0), rabeprazole (12.4), omeprazole (10.0), and ranitidine (3.9).

Other treatments were provided at a rate of 16.4 per 100 GORD problems. The vast majority (93%) of these were clinical treatments (15.2 per 100 GORD problems), the most common being counselling and advice about nutrition and weight (5.6), unspecified advice and education (2.3), and advice and education about medication (2.0). Procedural treatments were provided at a rate of 1.1 per 100 GORD problems.

Referrals

Referrals were provided at a rate of 4.9 per 100 GORD problems. Referrals to medical specialists (4.5 per 100 GORD problems, 95% CI: 3.4–5.5) were significantly more frequent than referrals to allied health services (0.3, 95% CI: 0.0–0.6).

Tests and investigations

Imaging was rarely ordered in the management of GORD (2.0 per 100 GORD problems). Pathology was ordered in the management of GORD (14.0 per 100 problems, 95% CI: 10.6–17.3) significantly less often than the average for all problems (30.6) in the 2011–12 BEACH year. The pathology tests ordered most often were full blood count (2.5 per 100 GORD problems), H pylori (2.2), electrolytes, urea and creatinine (1.5), and liver function tests (1.1) (Table 5.1).

Changes in GORD management since 2006–08

Data about the management of GORD in general practice in 2006–08 are reported in Chapter 16 of *General practice activity in Australia, health priorities and policies 1998 to 2008*.[72]

There has been a significant increase in the management rate of GORD in general practice, from 2.2 per 100 encounters in 2006–08 (95% CI: 2.1–2.3)[72] to 2.6 per 100 encounters in 2011–12 (95% CI: 2.4–2.8). This represents an increase in the estimated national annual number of encounters at which GORD is managed in general practice from 2.3 million to 3.2 million between 2006–08 and 2011–12.

The age and sex distributions of patients were similar in 2011–12 to those of 2006–08, and further analysis demonstrated that the sex specific rate of GORD per 100 encounters in females was marginally higher in 2011–12 (2.5 per 100 encounters, 95% CI: 2.3–2.7) than in 2006–08, (2.2 per 100 encounters, 95% CI: 2.0–2.3); and the age specific rate of GORD per 100

encounters with 45–64 year-olds was marginally higher in 2011–12 (3.6 per 100 encounters, 95% CI: 3.2–3.9) than in 2006–08, (3.0 per 100 encounters, 95% CI: 2.8–3.2).

Patient reasons for encounter were recorded at a rate of 188.7 per 100 GORD encounters in 2011–12 and 187.4 in 2006–08, the two most common being request for prescription (45.7 and 38.2 per 100 GORD encounters) and oesophageal disease (20.6 and 19.5 respectively).

There were 145.9 other problems managed per 100 GORD encounters in 2011–12 and 141.3 in 2006–08, the two most common being hypertension (22.6 per 100 GORD encounters and 19.8 respectively) and lipid disorder (9.9 and 8.9 respectively).

Medications were prescribed, supplied or advised at a rate of 96.1 per 100 GORD problems in 2011–12 and 94.5 in 2006–08, the two most common being esomeprazole (41.6 per 100 GORD problems and 33.4 respectively) and pantoprazole (20.0 and 16.0 respectively).

There were 4.5 specialist referrals per 100 GORD problems in 2011–12 and 4.2 per 100 in 2006–08, the most common being to a gastroenterologist (2.8 per 100 GORD problems and 3.2 respectively).

There was no significant difference in the total pathology orders for GORD: 14.0 (95% CI: 10.6–17.3) per 100 GORD problems in 2011–12 and 10.6 (95% CI: 8.7–12.5) in 2006–08. The two most commonly ordered tests were full blood count (2.5 per 100 GORD problems in 2011–12 and 2.0 in 2006–08) and H pylori (2.2 per 100 GORD problems, 95% CI: 1.5–2.9 in 2011–12 and 1.8 per 100 GORD problems, 95% CI: 1.3–2.2 in 2006–08). The H pylori testing rate was significantly higher in the management of new cases of GORD (which accounted for 15.4% of all GORD problems managed in 2011–12) than for all GORD: 7.8 per 100 new GORD problems (95% CI: 4.4–11.3) in 2011–12 and 4.3 (95% CI: 2.8–5.8) in 2006–08.

Imaging occurred at a rate of 2.0 per 100 GORD problems in 2011–12 and 2.1 in 2006–08, the most commonly ordered test being abdominal ultrasound.

Clinical treatments were provided at a rate of 15.2 per 100 GORD problems in 2011–12 and 13.4 in 2006–08, the most common being 'counselling/advice – nutrition/weight' (5.6 per 100 GORD problems and 4.7 respectively).

The patients

Sex	Per cent	Rate[b]
Males	44.3	2.6
Females	55.8	2.5

Age group	Per cent	Rate[b]
<1 years	1.4	2.1
1–4 years	0.2	0.1
5–14 years	0.3	0.1
15–24 years	2.6	0.8
25–44 years	12.9	1.5
45–64 years	38.1	3.6
65–74 years	20.9	4.0
75+ years	23.6	3.7

Medications
n = 2,457 (96.1 per 100 GORD problems)

	Rate per 100 problems[d]
Esomeprazole	41.6
Pantoprazole	20.0
Rabeprazole	12.4
Omeprazole	10.0
Ranitidine	3.9
Lansoprazole	1.6
Domperidone	1.4
Simethicone/Magnesium/Al hydroxide	1.0

GORD[a]

n = 2,557 (2.6 per 100 encounters)
New cases *n* = 395 (15.4% of all GORD cases)

Reasons for encounter
n = 4,826 (188.7 per 100 GORD encounters)

	Rate per 100 encounters[c]
Prescription – all*	45.7
Oesophageal disease	20.6
Test results*	7.4
Cardiovascular check-up*	6.2
Abdominal pain*	5.6
General check-up*	5.5
Heartburn	4.3
Cough	3.9
Pain, abdominal epigastric	3.9
Dyspepsia/indigestion	3.7

Other treatments
n = 418 (16.4 per 100 GORD problems)

	Rate per 100 problems[d]
Clinical treatments	15.2
Counsel/advice – nutrition/weight*	5.6
Advice/education NEC*	2.3
Advice/education – medication*	2.0
Counselling – problem*	1.9
Counsel/advice – lifestyle*	1.0
Procedural treatments	1.1

Other problems managed
n = 3730 (145.9 per 100 GORD encounters)

	Rate per 100 encounters[c]
Hypertension*	22.6
Lipid disorder	9.9
Depression*	7.1
Diabetes – all*	6.1
Osteoarthritis*	5.8
Immunisation/vaccination – all*	4.0
Back complaint *	2.9
Asthma	2.6
Ischaemic heart disease*	2.5
Sleep disturbance	2.4

Referrals
n = 126 (4.9 per 100 GORD problems)

	Rate per 100 problems[d]
Medical specialists*	4.5
Gastroenterologist	2.8
Allied health services*	0.3

Pathology
n = 357 (14.0 per 100 GORD problems)

	Rate per 100 problems[d]
Full blood count*	2.5
H pylori*	2.2
Electrolytes, urea and creatinine*	1.5
Liver function*	1.1
Lipids*	0.9

Imaging
n = 50 (2.0 per 100 GORD problems)

	Rate per 100 problems[d]
Ultrasound; abdomen	0.7

(a) GORD includes the ICPC-2 PLUS codes D84004, D84008 and D84011.

(b) Age and sex-specific rate per 100 encounters in each age/sex group.

(c) Expressed as a rate per 100 encounters at which GORD problems were managed.

(d) Expressed as a rate per 100 GORD problems managed.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, <purl.library.usyd.edu.au/sup/9781743320181>).

Note: GORD – Gastro-oesophageal reflux disease; NEC – not elsewhere classified.

Figure 7.2: Management of GORD in general practice 2011–12

7.9   Changes in problems managed over the decade 2002–03 to 2011–12

Data about the problems managed in general practice from each of the past ten years of the BEACH study, 2002–03 to 2011–12 are reported in the companion report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1] Major changes that have occurred over the decade are summarised below.

There was a significant increase in the average number of problems managed at encounter, from 144.9 per 100 encounters in 2002–03 to 153.8 in 2011–12 (Table 7.2). When this change is extrapolated to estimate the national it combines with the increase in GP attendances over the decade (see Methods) and suggests there were an additional 48.0 million problems managed at GP encounters in Australia in 2011–12 than in 2002–03. This was reflected in a significant increase in the management rate of chronic conditions (49.0 rising to 55.6 per 100 encounters) over the decade.

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

- The management rate of depression increased from 3.5 per 100 encounters in 2002–03 to 4.4 in 2011–12, an estimated national increase of 2.0 million occasions of depression management in 2011–12 since 2002–03.

- The management rate of diabetes increased significantly from 2.9 per 100 encounters in 2002–03 to 4.2 in 2011–12, suggesting about 2.3 million more occasions of diabetes management in 2011–12 than in 2002–03.

- The management rate of general check-up increased from 1.9 per 100 encounters in 2002–03 to 2.8 in 2011–12. This represents an estimated national increase of 1.6 million occasions where a general check-up was managed in 2011–12 since 2002–03. This increase possibly reflects the many MBS items for health assessments including the annual assessment of patients aged 75 years and over, the health assessment for 45–49 year olds at risk of developing chronic disease and the assessment of 40–49 year olds at risk of Type 2 diabetes.[76]

- The management rate of immunisation/vaccinations did not change between 2002–03 (4.6 per 100 encounters) and 2011–12 (4.7). However there was a significant spike in the management rate in 2009–10 (7.3 per 100) that coincided with the concern about H1N1 influenza.

- The management rate of lipid disorder increased significantly from 3.0 per 100 encounters in 2002–03 to 3.5 in 2011–12, an estimated national increase of 1.4 million occasions of lipid disorder management in 2011–12 since 2002–03.

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 2002–03 to 2011–12 is reported for each year in the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1]

At the 99,030 encounters, GPs undertook 231,203 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, GPs provided 57 prescriptions and 24 clinical treatments, undertook 11 procedures, made 6 referrals to medical specialists and 3 to allied health services, and placed 31 pathology test orders and 7 imaging test orders.

Table 8.1: Summary of management

Management type	Number	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 problems (*n* = 152,286)	95% LCL	95% UCL
Medications	106,007	107.0	104.1	110.0	69.6	68.0	71.2
Prescribed	85,980	86.8	84.0	89.7	56.5	54.9	58.1
GP-supplied	9,630	9.7	8.9	10.5	6.3	5.8	6.8
Advised OTC	10,397	10.5	9.7	11.3	6.8	6.3	7.4
Other treatments	53,395	53.9	51.2	56.6	35.1	33.5	36.7
Clinical*	36,610	37.0	34.6	39.3	24.0	22.6	25.5
Procedural*	16,785	16.9	16.1	17.8	11.0	10.5	11.5
Referrals and admissions	14,382	14.5	13.9	15.1	9.4	9.1	9.8
Medical specialist*	8,488	8.6	8.2	8.9	5.6	5.3	5.8
Allied health services*	4,629	4.7	4.4	5.0	3.0	2.8	3.2
Hospital*	345	0.3	0.3	0.4	0.2	0.2	0.3
Emergency department*	311	0.3	0.3	0.4	0.2	0.2	0.2
Other referrals*	609	0.6	0.5	0.7	0.4	0.3	0.5
Pathology	46,544	47.0	44.9	49.1	30.6	29.3	31.8
Imaging	9,978	10.1	9.6	10.5	6.6	6.3	6.8
Other investigations[(a)]	897	0.9	0.8	1.0	0.6	0.5	0.7
Total management activities	**231,203**	**233.5**	—	—	**151.8**	—	—

(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, <purl.library.usyd.edu.au/sup/9781743320181>).

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

Analysing 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 91.9% of encounters, for 86.8% of problems managed.

- At least one medication or other treatment was given for nearly three-quarters (73.4%) of the problems managed.
- At least one medication (most commonly prescribed) was prescribed, supplied or advised for more than half (54.8%) of the problems managed.
- At least one other treatment (most commonly clinical) was provided for nearly one-third (30.7%) of problems managed.
- At least one referral (most commonly to a medical specialist) was made for 9.3% of problems managed.
- At least one investigation (most commonly pathology) was requested for 18.6% of problems managed (Table 8.2).

Table 8.2: Encounters and problems for which management was recorded

Management type	Number of encounters	Per cent of all encounters (n = 99,030)	Number of problems	Per cent of all problems (n = 152,286)
At least one management type	90,983	91.9	132,169	86.8
At least one medication or other treatment	81,127	81.9	111,828	73.4
At least one medication	64,464	65.1	83,426	54.8
At least one prescription	53,996	54.5	69,096	45.4
At least one GP-supplied	7,348	7.4	7,672	5.0
At least one OTC advised	9,175	9.3	9,445	6.2
At least one other treatment	40,086	40.5	46,729	30.7
At least one clinical treatment	28,199	28.5	32,556	21.4
At least one procedural treatment	15,034	15.2	15,664	10.3
At least one referral or admission	13,219	13.3	14,228	9.3
At least one referral to a medical specialist	8,126	8.2	8,584	5.6
At least one referral to allied health services	4,291	4.3	4,587	3.0
At least one referral to hospital	345	0.3	354	0.2
At least one referral to emergency department	311	0.3	316	0.2
At least one other referral	609	0.6	636	0.4
At least one investigation	24,467	24.7	28,378	18.6
At least one pathology order	17,894	18.1	20,702	13.6
At least one imaging order	8,562	8.6	8,888	5.8
At least one other investigation[a]	861	0.9	888	0.6

(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: OTC – over-the-counter.

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

- as a single component for almost two-thirds (61.8%) of the problems managed
- as a double component for 19.6% of problems managed
- rarely with more than two components (results not tabled).

Table 8.3 lists the most common management combinations. 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 the 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 = 152,286)	Per cent of total encounters (n = 99,030)
No recorded management						**13.2**	**8.1**
1+ management recorded						**86.8**	**91.9**
✓						36.4	30.1
	✓					9.5	6.6
✓	✓					6.7	10.7
					✓	5.0	3.1
			✓			4.6	3.5
		✓				4.1	3.5
✓					✓	3.1	4.7
✓		✓				2.7	4.3
				✓		2.2	1.7
✓			✓			1.4	2.9
	✓				✓	1.2	1.3
		✓			✓	1.2	1.1
✓				✓		1.1	1.9
	✓		✓			1.0	1.2
✓	✓				✓	0.6	1.8
				✓	✓	0.5	0.6
✓	✓		✓			0.4	1.3
	✓	✓				0.4	0.7
✓	✓	✓				0.4	1.2
✓		✓			✓	0.3	1.0
			✓		✓	0.3	0.4

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

8.1   Changes in management over the decade 2002–03 to 2011–12

Changes over the decade 2002–03 to 2011–12 are described in detail in the accompanying report *A decade of Australian general practice activity 2002–03 to 2011–12*.[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 ten years to 2011–12 are summarised below.

- There was a marginal increase in the rate at which procedural treatments were undertaken, from 10.1 per 100 problems managed in 2002–03 to 11.0 per 100 problems in 2011–12.

- There was significant decrease in the rate of clinical treatments given by GPs from a peak in 2004–05 to a low point of 19.9 per 100 problems managed in 2006–07. This is likely to be related to the introduction of MBS item numbers for practice nurse activity in 2005–06. However since then, the rate of GP-provided clinical treatments gradually increased again such that there was no significant difference between the start and end of the decade. The original impact of practice nurses on this area of GP workload was no longer observed, suggesting that by 2011–12 GPs were again performing clinical treatments at a similar rate to that prior to the introduction of practice nurse item numbers.

- The rate of referrals to other health providers significantly increased, from 7.7 to 9.4 per 100 problems between 2002–03 and 2011–12, influenced by referrals to allied health services, which almost doubled over the period (1.7 to 3.0 per 100 problems managed). It was further influenced by a significant increase in referrals to emergency departments (0.1 to 0.2), and in 'other referrals' (0.2 to 0.4 per 100 problems managed). Conversely, the rate of referrals to hospital halved between 2002–03 and 2011–12.

- The rate at which pathology tests/batteries of tests were ordered significantly increased by 35%, from 22.7 tests/batteries of tests per 100 problems managed in 2002–03 to 30.6 in 2011–12.

- The rate at which imaging was ordered increased significantly, from 5.9 imaging orders per 100 problems managed in 2002–03 to 6.6 per 100 in 2011–12.

Between 2002–03 and 2011–12, there was no significant change in total (including prescribed, GP–supplied, and advised for over-the-counter purchase) medication rates per 100 problems managed or per 100 encounters. However the increasing number of GP encounters over the decade, led to an extrapolated national effect of 24.6 million more prescriptions given nationally by GPs in 2011–12 than a decade earlier.

There were some significant increases in GP prescribing rate per 100 problems managed for a specific drug groups including: agents acting on the renin-angiotensin system, psychoanaleptic, and lipid modifying agents.

There were also some significant decreases in the prescribing rate per 100 problems managed of some medications including: drugs for obstructive airway disease, anti-inflammatory and antirheumatic products, sex hormones and modulators of the genital system, and diuretics.

9 Medications

GPs could record up to four medications for each of four problems – 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.

- 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 in 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) which is able to capture details of products at the brand and generic level. Every medication in the CAPS coding system is mapped to the international Anatomical Therapeutic Chemical (ATC) classification.[77]
- 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 (the equivalent of ATC level 5) because ATC does not include many 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 2002–03 to 2011–12 in the 10-year summary report, *A decade of Australian general practice activity 2002–03 to 2011–12*.[1]

Readers interested in adverse drug events will find more detailed information from the BEACH program in Miller et al. (2006) *Adverse drug events in general practice patients in Australia*.[78]

9.1 Source of medications

As reported in Chapter 8, a total of 106,007 medications were recorded, at rates of 107 per 100 encounters and 70 per 100 problems managed. We can derive from Table 8.1 that:

- four out of five medications (81.1%) were prescribed
- less than one in ten (9.1%) medications was supplied to the patient by the GP
- 9.8% of medications recommended by the GP for over-the-counter purchase.

When medication rates per 100 encounter are extrapolated to the 122.5 million general practice Medicare-claimed encounters in Australia April 2011 – March 2012, we estimated that GPs in Australia:

- wrote a prescription (with/without repeats) for more than 106.3 million medications
- supplied 11.9 million medications directly to the patient
- recommended medications for OTC purchase 12.9 million times.

9.2   Prescribed medications

There were 85,980 prescriptions recorded, at rates of 87 per 100 encounters and
57 per 100 problems managed (Table 8.1). GPs recorded 83.0% of prescribed medications by
brand (proprietary) name and 17.0% by their generic (non-proprietary) name. Some of the
medications most likely to be recorded as a generic were warfarin, prednisolone and
thyroxine (results not tabled).

On a per problem basis:

- no prescription was given for 54.6% of all problems managed
- one prescription was given for 37.0% of problems managed
- two prescriptions were given for 6.3% of problems managed
- three or four prescriptions were given for 2.1% of problems managed (Figure 9.1).

Per cent of problems

Nil	One	Two	Three	Four
54.6	37	6.3	1.5	0.6

Number of medications prescribed
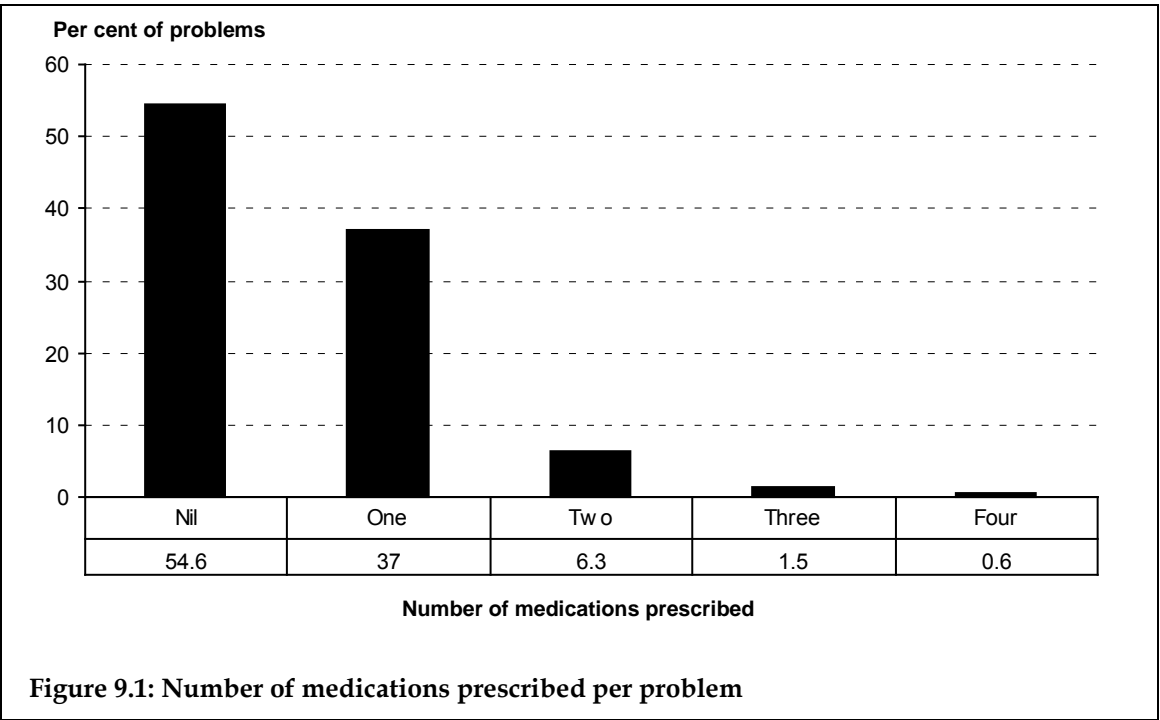
Figure 9.1: Number of medications prescribed per problem

Number of repeats

For 66,626 prescriptions (77.5% 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 34.7% of these prescriptions, the GP specified that no repeats had been
prescribed, and for 35.5% five repeats were ordered. The latter proportion reflects the PBS
provision of one month's supply and five repeats for many medications used for chronic
conditions such as hypertension. The ordering of one repeat was also quite common (16.2%).

Per cent of prescriptions

	Nil	One	Two	Three	Four	Five	> Five
	34.7	16.2	9.6	3	0.8	35.5	0.2

Number of repeats ordered

Figure 9.2: Number of repeats ordered per prescription
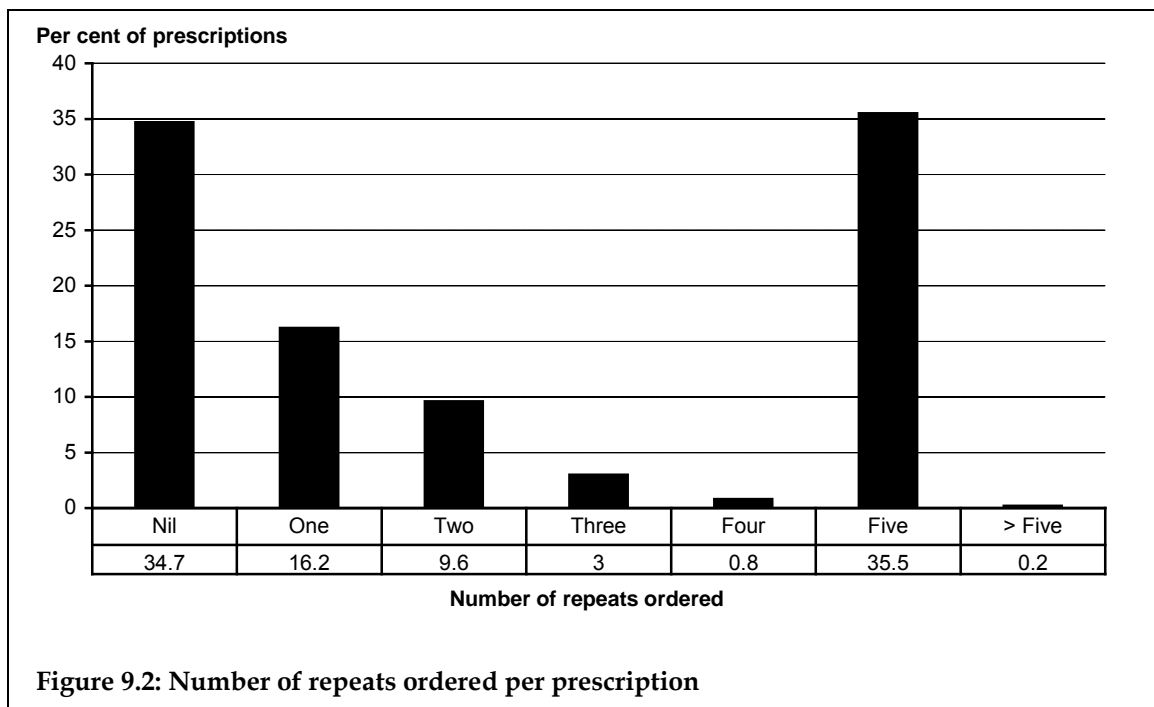
Age–sex-specific rates of prescribed medications

Age–sex-specific analysis found similar prescription rates for male (88 per 100 encounters) and female patients (86 per 100). It also showed the well-described tendency for the number of prescriptions written at each encounter to rise with the advancing age of the patient, with the rate of 57 per 100 encounters with patients aged less than 25 years almost doubling to 111 per 100 encounters for patients aged 65 years and over (results not tabled).

Rate per 100 problems

	< 1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Male	31.9	45.3	50.2	50.0	54.6	62.0	63.8	62.3
Female	30.2	45.1	50.6	48.3	46.4	56.3	63.5	62.9

Age group (years)

Figure 9.3: Age–sex-specific prescription rates per 100 problems managed
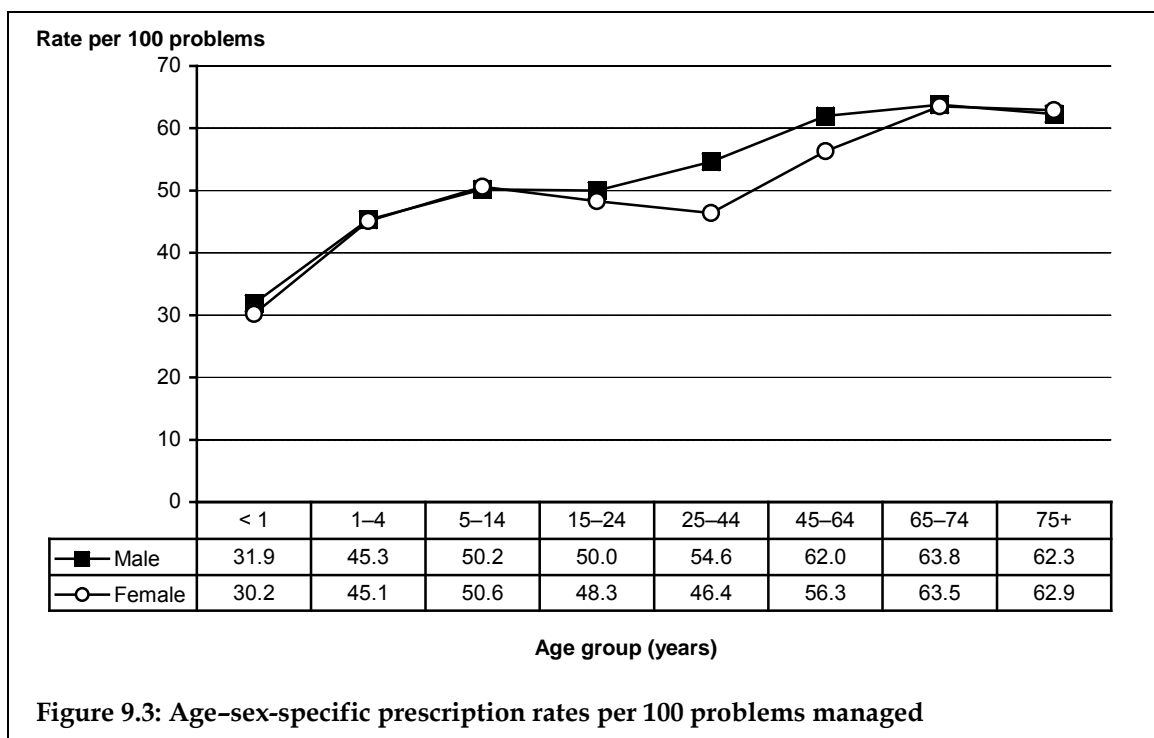
However, Figure 9.3 demonstrates that this age-based increase lessens if the prescription rate is considered in terms of the number of problems being managed in each age group. This suggests that a substantial part of the higher prescription rate for older patients is due to the increased number of health 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, which are more likely to be chronic at encounters with older patients.

Types of medications prescribed

Table 9.1 shows the distribution of prescribed medications using the WHO ATC classification.[77] This allows comparison with other data sources such as those produced by Medicare Australia for PBS data. The table lists medications in frequency order within ATC levels 1, 3 and 5. Prescriptions are presented as a percentage of total prescriptions, as a rate per 100 encounters, and as a rate per 100 problems managed, with 95% confidence intervals.

The high number of opioids shown in this table (compared with BEACH data published before 2010) is due to our re-classification of some medications in 2010. We decided to recode codeine combinations which contained 30 mg of codeine as opioids in the ATC Index, whereas pre-2010 they were coded as 'other analgesics and antipyretics'. In the ATC classification, either grouping is correct. We took the decision to place high-dose codeine products in the opioid group in accordance with MIMS grouping[79] and following the Poisons Regulations of the Therapeutic Goods Administration,[80] which stipulates that high-dose codeine combinations are Schedule 4 (prescription only) medications. However, a few combination analgesics containing less than 30 mg of codeine but classified as Schedule 4 may be missed because there are other criteria which form part of the scheduling of prescription-only codeine. One of these is pack-size, which is not recorded in BEACH.

Similarly, before 2010 all aspirin (acetylsalicylic acid) was classified in the analgesic group of neurological medications. In 2010 we split aspirin into two different codes depending on dosage. We reclassified low-dose (100 mg) plain aspirin as an antithrombotic medication in the blood medications group, while higher doses and combinations with other analgesic/antipyretics remain in the neurological group.

If readers are making comparisons with previous BEACH publications, they should note that this change has caused the opioid and antithrombotic groups to increase, and 'other analgesics and antipyretics' to decrease. In the companion report to this publication, *A decade of Australian general practice activity 2002–03 to 2011–12*,[1] medications have been re-analysed across all ten years to incorporate the adjustment.

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

ATC Classification level 1 3 5	Number	Per cent of prescribed medications (n = 85,980)	Rate per 100 encounters (95% CI) (n = 99,030)	Rate per 100 problems (95% CI) (n = 152,286)
Nervous system	**19,617**	**22.8**	**19.8 (18.9–20.7)**	**12.9 (12.3–13.4)**
Opioids	5,813	6.8	5.9 (5.5–6.2)	3.8 (3.6–4.0)
Codeine, combinations excluding psycholeptics	1,918	2.2	1.9 (1.8–2.1)	1.3 (1.1–1.4)
Oxycodone	1,488	1.7	1.5 (1.4–1.6)	1.0 (0.9–1.1)
Tramadol	913	1.1	0.9 (0.8–1.0)	0.6 (0.5–0.7)
Buprenorphine	559	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
Antidepressants	4,050	4.7	4.1 (3.8–4.3)	2.7 (2.5–2.8)
Escitalopram	551	0.6	0.6 (0.5–0.6)	0.4 (0.3–0.4)
Sertraline	522	0.6	0.5 (0.5–0.6)	0.3 (0.3–0.4)
Other analgesics and antipyretics	3,061	3.6	3.1 (2.8–3.4)	2.0 (1.8–2.2)
Paracetamol [plain]	2,917	3.4	2.9 (2.7–3.2)	1.9 (1.7–2.1)
Anxiolytics	1,894	2.2	1.9 (1.7–2.1)	1.2 (1.1–1.4)
Diazepam	1,094	1.3	1.1 (1.0–1.2)	0.7 (0.6–0.8)
Hypnotics and sedatives	1,473	1.7	1.5 (1.4–1.6)	1.0 (0.9–1.0)
Temazepam	969	1.1	1.0 (0.9–1.1)	0.6 (0.6–0.7)
Antipsychotics	1,191	1.4	1.2 (1.1–1.3)	0.8 (0.7–0.9)
Drugs used in addictive disorders	773	0.9	0.8 (0.6–0.9)	0.5 (0.4–0.6)
Antiepileptics	681	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
Cardiovascular system	**16,556**	**19.3**	**16.7 (15.7–17.7)**	**10.9 10.3–11.5)**
Lipid modifying agents, plain	3,669	4.3	3.7 (3.4–4.0)	2.4 (2.3–2.6)
Atorvastatin	1,568	1.8	1.6 (1.5–1.7)	1.0 (1.0–1.1)
Rosuvastatin	1,086	1.3	1.1 (1.0–1.2)	0.7 (0.6–0.8)
Simvastatin	576	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
Angiotensin II antagonists, plain	2,371	2.8	2.4 (2.2–2.6)	1.6 (1.4–1.7)
Irbesartan	941	1.1	1.0 (0.9–1.0)	0.6 (0.6–0.7)
Candesartan	618	0.7	0.6 (0.6–0.7)	0.4 (0.4–0.5)
Telmisartan	583	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
ACE inhibitors, plain	2,151	2.5	2.2 (2.0–2.3)	1.4 (1.3–1.5)
Perindopril	1,174	1.4	1.2 (1.1–1.3)	0.8 (0.7–0.8)
Ramipril	614	0.7	0.6 (0.5–0.7)	0.4 (0.4–0.5)
Beta blocking agents	1,711	2.0	1.7 (1.6–1.9)	1.1 (1.0–1.2)
Atenolol	727	0.8	0.7 (0.7–0.8)	0.5 (0.4–0.5)
Metoprolol	528	0.6	0.5 (0.5–0.6)	0.3 (0.3–0.4)
Angiotensin II antagonists, combinations	1,579	1.8	1.6 (1.5–1.7)	1.0 (0.9–1.1)
Irbesartan and diuretics	666	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)

(continued)

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

ATC Classification level			Number	Per cent of prescribed medications (n = 85,980)	Rate per 100 encounters (95% CI) (n = 99,030)	Rate per 100 problems (95% CI) (n = 152,286)
1	3	5				
	Selective calcium channel blockers with mainly vascular effects		1,345	1.6	1.4 (1.2–1.5)	0.9 (0.8–1.0)
		Amlodipine	637	0.7	0.6 (0.6–0.7)	0.4 (0.4–0.5)
	ACE inhibitors, combinations		709	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
	High-ceiling diuretics		623	0.7	0.6 (0.5–0.7)	0.4 (0.4–0.5)
		Frusemide	621	0.7	0.6 (0.5–0.7)	0.4 (0.4–0.5)
Anti-infective for systemic use			**15,829**	**18.4**	**16.0 (15.4–16.6)**	**10.4 (9.9–10.8)**
	Beta-lactam antibacterials, penicillins		6,051	7.0	6.1 (5.8–6.4)	4.0 (3.7–4.2)
		Amoxycillin	3,205	3.7	3.2 (3.0–3.5)	2.1(1.9–2.3)
		Amoxycillin and enzyme inhibitor	1,840	2.1	1.9 (1.7–2.0)	1.2 (1.1–1.3)
	Other beta-lactam antibacterials		3,321	3.9	3.4 (3.1–3.6)	2.2 (2.0–2.3)
		Cephalexin	2,755	3.2	2.8 (2.6–3.0)	1.8 (1.7–1.9)
	Macrolides, lincosamides and streptogramins		2,606	3.0	2.6 (2.4–2.9)	1.7 (1.6–1.9)
		Roxithromycin	1,115	1.3	1.1 (1.0–1.3)	0.7 (0.6–0.8)
		Clarithromycin	667	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
		Erythromycin	603	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.5)
	Sulfonamides and trimethoprim		698	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
	Viral vaccines		692	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
	Tetracyclines		690	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
		Doxycycline	616	0.7	0.6 (0.6–0.7)	0.4 (0.4–0.5)
Alimentary tract and metabolism			**8,860**	**10.3**	**8.9 (8.5–9.4)**	**5.8 (5.5–6.1)**
	Drugs for peptic ulcer and gastro-oesophageal reflux		3,314	3.9	3.3 (3.1–3.6)	2.2 (2.1–2.3)
		Esomeprazole	1,472	1.7	1.5 (1.4–1.6)	1.0 (0.9–1.0)
		Pantoprazole	742	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)
	Blood glucose lowering drugs, excluding insulins		2,307	2.7	2.3 (2.1–2.5)	1.5 (1.4–1.7)
		Metformin	1,293	1.5	1.3 (1.2–1.4)	0.8 (0.8–0.9)
		Gliclazide	538	0.6	0.5 (0.5–0.6)	0.4 (0.3–0.4)
	Propulsives		616	0.7	0.6 (0.5–0.7)	0.4 (0.4–0.5)
		Metoclopramide	519	0.6	0.5 (0.5–0.6)	0.3 (0.3–0.4)
		Insulins and analogues	566	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4(
Respiratory system			**5,335**	**6.2**	**5.4 (5.0–5.8)**	**3.5 (3.3–3.7)**
	Adrenergics, inhalants		2,740	3.2	2.8 (2.6–3.0)	1.8 (1.7–1.9)
		Salbutamol	1,288	1.5	1.3 (1.2–1.4)	0.8 (0.8–0.9)
		Salmeterol and other drugs for obstructive airways disease	842	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
	Decongestants and other nasal preparations for topical use		901	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.7)

(continued)

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

ATC Classification level 1 3 5	Number	Per cent of prescribed medications (*n* = 85,980)	Rate per 100 encounters (95% CI) (*n* = 99,030)	Rate per 100 problems (95% CI) (*n* = 152,286)
Other drugs for obstructive airway diseases, inhalants	794	0.9	0.8 (0.7–0.9)	0.5 (0.5–0.6)
Musculoskeletal system	**4,248**	**4.9**	**4.3 (4.0–4.5)**	**2.8 (2.6–3.0)**
Anti-inflammatory and antirheumatic products, non-steroid	3,002	3.5	3.0 (2.8–3.2)	2.0 (1.8–2.1)
Meloxicam	826	1.0	0.8 (0.7–0.9)	0.5 (0.5–0.6)
Diclofenac	588	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
Celecoxib	526	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
Antigout preparations	522	0.6	0.5 (0.5–0.6)	0.3 (0.3–0.4)
Drugs affecting bone structure and mineralization	516	0.6	0.5 (0.4–0.6)	0.3 (0.3–0.4)
Dermatologicals	**3,790**	**4.4**	**3.8 (3.6–4.0)**	**2.5 (2.4–2.6)**
Corticosteroids, plain	2,268	2.6	2.3 (2.1–2.4)	1.5 (1.4–1.6)
Betamethasone	844	1.0	0.9 (0.8–0.9)	0.6 (0.5–0.6)
Mometasone	584	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
Genitourinary system and sex hormones	**3,202**	**3.7**	**3.2 (3.0–3.4)**	**2.1 (2.0–2.2)**
Hormonal contraceptives for systemic use	1,380	1.6	1.4 (1.3–1.5)	0.9 (0.8–1.0)
Blood and blood forming organs	**3,032**	**3.5**	**3.1 (2.8–3.3)**	**2.0 (1.8–2.1)**
Antithrombotic agents	2,443	2.8	2.5 (2.2–2.7)	1.6 (1.5–1.7)
Warfarin	1.398	1.6	1.4 (1.3–1.6)	0.9 (0.8–1.0)
Systemic hormonal preparations, excluding sex hormones	**2,382**	**2.8**	**2.4 (2.2–2.6)**	**1.6 (1.5–1.7)**
Corticosteroids for systemic use, plain	1,439	1.7	1.5 (1.3–1.6)	0.9 (0.9–1.0)
Prednisolone	877	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
Thyroid preparations	722	0.8	0.7 (0.7–0.8)	0.5 (0.4–0.5)
Levothyroxine sodium	713	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
Sensory organs	**2,247**	**2.6**	**2.3 (2.1–2.4)**	**1.5 (1.4–1.6)**
Anti-infectives ophthalmological	849	1.0	0.9 (0.8–0.9)	0.6 (0.5–0.6)
Chloramphenicol ophthalmological	782	0.9	0.8 (0.7–0.9)	0.5 (0.5–0.6)
Corticosteroids and anti-infective in combination otological	594	0.7	0.6 (0.5–0.7)	0.4 (0.3–0.4)
Antineoplastic and immunomodulating agents	**423**	**0.5**	**0.4 (0.4–0.5)**	**0.3 (0.2–0.3)**
Various	**256**	**0.3**	**0.3 (0.2–0.3)**	**0.2 (0.1–0.2)**
Antiparasitic products, insecticides and repellent	**203**	**0.2**	**0.2 (0.2–0.2)**	**0.1 (0.1–0.2)**
Total prescribed medications	**85,980**	**100.0**	**86.8 (84.0–89.7)**	**56.5 (54.9–58.1)**

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 43.4% of all prescribed medications.

Table 9.2: Most frequently prescribed medications

Generic medication	Number	Per cent of prescribed medications (*n* = 85,980)	Rate per 100 encounters (95% CI) (*n* = 99,030)	Rate per 100 problems (95% CI) (*n* = 152,286)
Amoxycillin	3,205	3.7	3.2 (3.0–3.5)	2.1 (1.9–2.3)
Paracetamol	2,917	3.4	2.9 (2.7–3.2)	1.9 (1.7–2.1)
Cephalexin	2,755	3.2	2.8 (2.6–3.0)	1.8 (1.7–1.9)
Paracetamol/Codeine	1,912	2.2	1.9 (1.8–2.1)	1.3 (1.1–1.4)
Amoxycillin/potassium clavulanate	1,840	2.1	1.9 (1.7–2.0)	1.2 (1.1–1.3)
Atorvastatin	1,568	1.8	1.6 (1.5–1.7)	1.0 (1.0–1.1)
Oxycodone	1,488	1.7	1.5 (1.4–1.6)	1.0 (0.9–1.1)
Esomeprazole	1,472	1.7	1.5 (1.4–1.6)	1.0 (0.9–1.0)
Warfarin sodium	1,398	1.6	1.4 (1.3–1.6)	0.9 (0.8–1.0)
Salbutamol	1,319	1.5	1.3 (1.2–1.5)	0.9 (0.8–0.9)
Metformin	1,293	1.5	1.3 (1.2–1.4)	0.8 (0.8–0.9)
Perindopril	1,174	1.4	1.2 1.1–1.3)	0.8 (0.7–0.8)
Roxithromycin	1,115	1.3	1.1 (1.0–1.3)	0.7 (0.6–0.8)
Diazepam	1,094	1.3	1.1 (1.0–1.2)	0.7 (0.6–0.8)
Rosuvastatin	1,086	1.3	1.1 (1.0–1.2)	0.7 (0.6–0.8)
Temazepam	969	1.1	1.0 (0.9–1.1)	0.6 (0.6–0.7)
Irbesartan	941	1.1	1.0 (0.9–1.0)	0.6 (0.6–0.7)
Tramadol	913	1.1	0.9 (0.8–1.0)	0.6 (0.5–0.7)
Betamethasone topical	844	1.0	0.9 (0.8–0.9)	0.6 (0.5–0.6)
Fluticasone/Salmeterol	842	1.0	0.9 (0.8–1.0)	0.6 (0.5–0.6)
Meloxicam	826	1.0	0.8 (0.7–0.9)	0.5 (0.5–0.6)
Levonorgestrel/Ethinyloestradiol	823	1.0	0.8 (0.8–0.9)	0.5 (0.5–0.6)
Chloramphenicol eye	782	0.9	0.8 (0.7–0.9)	0.5 (0.5–0.6)
Pantoprazole	742	0.9	0.7 (0.7–0.8)	0.5 (0.4–0.5)
Atenolol	727	0.8	0.7 (0.7–0.8)	0.5 (0.4–0.5)
Thyroxine	713	0.8	0.7 (0.6–0.8)	0.5 (0.4–0.5)
Clarithromycin	667	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
Irbesartan/Hydrochlorothiazide	666	0.8	0.7 (0.6–0.8)	0.4 (0.4–0.5)
Amlodipine	637	0.7	0.6 (0.6–0.7)	0.4 (0.4–0.5)
Frusemide	621	0.7	0.6 (0.5–0.7)	0.4 (0.4–0.5)
Subtotal	*37,349*	*43.4*	—	—
Total prescribed medications	**85,980**	**100.0**	**86.8 (84.0–89.7)**	**56.5 (54.9–58.1)**

Note: CI – confidence interval.

9.3 Medications supplied by GPs

GPs supplied patients with 9,630 medications in 2011–12, at a rate of 9.7 medications per 100 encounters. At least one medication was supplied at 7.4% of encounters for 5.0% of problems. Table 9.3 shows the medications supplied most often at CAPS generic level (ATC level 5 equivalent), with vaccines accounting for over half the supplied medications.

Table 9.3: Medications most frequently supplied by GPs

Generic medication	Number	Per cent of GP supplied medications (*n* = 9,630)	Rate per 100 encounters (95% CI) (*n* = 99,030)	Rate per 100 problems (95% CI) (*n* = 152,286)
Influenza virus vaccine	1,931	20.1	1.9 (1.6–2.3)	1.3 (1.0–1.5)
Pneumococcal vaccine	635	6.6	0.6 (0.6–0.7)	0.4 (0.4–0.5)
Diphtheria/pertussis/tetanus/hepatitis B/polio/Hib vaccine	419	4.4	0.4 (0.4–0.5)	0.3 (0.2–0.3)
Vitamin B12 (Cobalamin)	376	3.9	0.4 (0.3–0.4)	0.2 (0.2–0.3)
Triple antigen (diphtheria/pertussis/tetanus)	351	3.6	0.4 (0.3–0.4)	0.2 (0.2–0.3)
Mumps/measles/rubella vaccine	322	3.3	0.3 (0.3–0.4)	0.2 (0.2–0.2)
Rotavirus vaccine	265	2.8	0.3 (0.2–0.3)	0.2 (0.1–0.2)
ADT/CDT (diphtheria/tetanus) vaccine	178	1.8	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Meningitis vaccine	164	1.7	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Haemophilus B vaccine	156	1.6	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Chickenpox (Varicella zoster) vaccine	147	1.5	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Typhoid vaccine (*Salmonella typhi*)	121	1.3	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Hepatitis A vaccine	116	1.2	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Hepatitis B vaccine	112	1.2	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Diphtheria/pertussis/tetanus/polio vaccine	112	1.2	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Allergen treatment	101	1.0	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Esomeprazole	90	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Salbutamol	88	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Medroxyprogesterone	88	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Immunisation	86	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Hepatitis A/Typhoid vaccine (*Salmonella typhi*)	83	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Methylprednisolone	82	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Celecoxib	72	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Amoxycillin	70	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Hepatitis A and B vaccine	69	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Local anaesthetic injection	69	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Metoclopramide	68	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Meloxicam	65	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Paracetamol	61	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Dabigatran etexilate	58	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Subtotal	*6,555*	*68.1*	—	—
Total supplied medications	**9,630**	**100.0**	**9.7**	**6.3**

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

9.4 Medications advised for over-the-counter purchase

The GPs recorded 10,397 medications as recommended for OTC purchase, at rates of 10.5 per 100 encounters and 6.8 per 100 problems managed. At least one OTC medication was advised at 9.3% of encounters and for 6.2% of problems. Table 9.4 shows the top 30 advised medications at the CAPS generic level (ATC level 5 equivalent). A wide range of medications was recorded in this group, the most common being paracetamol, which accounted for 27.2% of these medications. The re-classification of aspirin described in Section 9.2 also affected rates of advised OTC medications so higher-dose analgesic aspirin and low-dose aspirin for antithrombotic purposes are presented separately here.

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

Generic medication	Number	Per cent of OTC medications (*n* = 10,397)	Rate per 100 encounters (95% CI) (*n* = 99,030)	Rate per 100 problems (95% CI) (*n* = 152,286)
Paracetamol (plain)	2,826	27.2	2.9 (2.5–3.2)	1.9 (1.6–2.1)
Ibuprofen	693	6.7	0.7 (0.6–0.8)	0.5 (0.4–0.5)
Saline bath/solution/gargle	251	2.4	0.3 (0.2–0.3)	0.2 (0.1–0.2)
Sodium/potassium/citric/glucose	245	2.4	0.2 (0.2–0.3)	0.2 (0.1–0.2)
Simple analgesics NEC	235	2.3	0.2 (0.1–0.3)	0.2 (0.1–0.2)
Sodium chloride topical nasal	223	2.1	0.2 (0.2–0.3)	0.1 (0.1–0.2)
Ergocalciferol (Vitamin D analogue)	186	1.8	0.2 (0.1–0.2)	0.1 (0.1–0.2)
Diclofenac topical	162	1.6	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Loratadine	157	1.5	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Cetirizine	155	1.5	0.2 (0.1–0.2)	0.1 (0.1–0.1)
Cream/ointment/lotion NEC	148	1.4	0.1 (0.1–0.2)	0.1 (0.1–0.1)
Paracetamol/codeine (all)	116	1.1	0.1 (0.0–0.2)	0.1 (0.0–0.1)
Hydrocortisone/clotrimazole	114	1.1	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Clotrimazole topical	107	1.0	0.1 (0.1–0.1)	0.1 (0.1–0.1)
Fexofenadine	99	1.0	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Fish oil	90	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Clotrimazole vaginal	90	0.9	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Bromhexine	85	0.8	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Vitamin D	85	0.8	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Hyoscine butylbromide	84	0.8	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Aspirin cardiovascular	79	0.8	0.1 (0.1–0.1)	0.1 (0.0–0.1)
Cold and Flu medication NEC	76	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Cholecalciferol	73	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Loperamide	72	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Docusate otic	70	0.7	0.1 (0.1–0.1)	0.0 (0.0–0.1)
Folic acid	68	0.7	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Hydrocortisone topical	65	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.1)

(continued)

Generic medication	Number	Per cent of OTC medications (*n* = 10,397)	Rate per 100 encounters (95% CI) (*n* = 99,030)	Rate per 100 problems (95% CI) (*n* = 152,286)
Aspirin (analgesic)	66	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Sorbolene/glycerol/cetomacrogol	63	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Multivitamins with minerals	63	0.6	0.1 (0.0–0.1)	0.0 (0.0–0.1)
Subtotal	6,848	65.9	—	—
Total advised medications	**10,397**	**100.0**	**10.5**	**6.8**

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

9.5   Proton pump inhibitors prescribed or supplied in 2011–12

In our examination of the management of gastro-oesophageal reflux (GORD) in general practice (Section 7.8) we demonstrated that medications most often prescribed for GORD were proton pump inhibitors (PPIs).

This section examines PPIs as classified in ATC group A02BC. The relationships between patients, their reasons for encounter and the problems managed with PPIs are presented in Figure 9.4.

PPIs were prescribed or supplied by GPs at a rate of 3.2 per 100 total encounters, and 2.1 per 100 problems managed, and they accounted for 3.0% of all medications recorded. For every 100 problems managed with a PPI, 94 PPIs were prescribed and 6 were supplied by the GP.

An extrapolation of the above results to estimate the number of these medications prescribed or supplied nationally suggested that almost 4 million PPIs were prescribed or supplied by GPs to patients in 2011–12. The ten-year summary report, *A decade of Australian general practice activity 2002–03 to 2011–12,*[1] details significant increases over the decade in prescribing rates of drugs for acid related disorders and the most common PPI, esomeprazole. The extrapolated national effect was 1.7 million more prescriptions for drugs for acid related disorders (which included 1.5 million more prescriptions for esomeprazole) given by GPs in 2011–12 than in 2002–03.

Patient age and sex, and reasons for encounter

At encounters with infants aged less than one year, 0.3 PPI were prescribed per 100 encounters, while among 1–4 year olds the rate was 0.1 and for 5–14 year old children it was 0.2 per 100 encounters. Patients aged less than 45 years were significantly less likely to receive a PPI than those aged 45 years and over, with the rate more than doubling for the older age groups. Patients aged 65–74 years were the most likely to be prescribed or supplied a PPI (5.2 per 100 encounters). There was no difference between male and female patients in the rate of prescription/supply of PPIs.
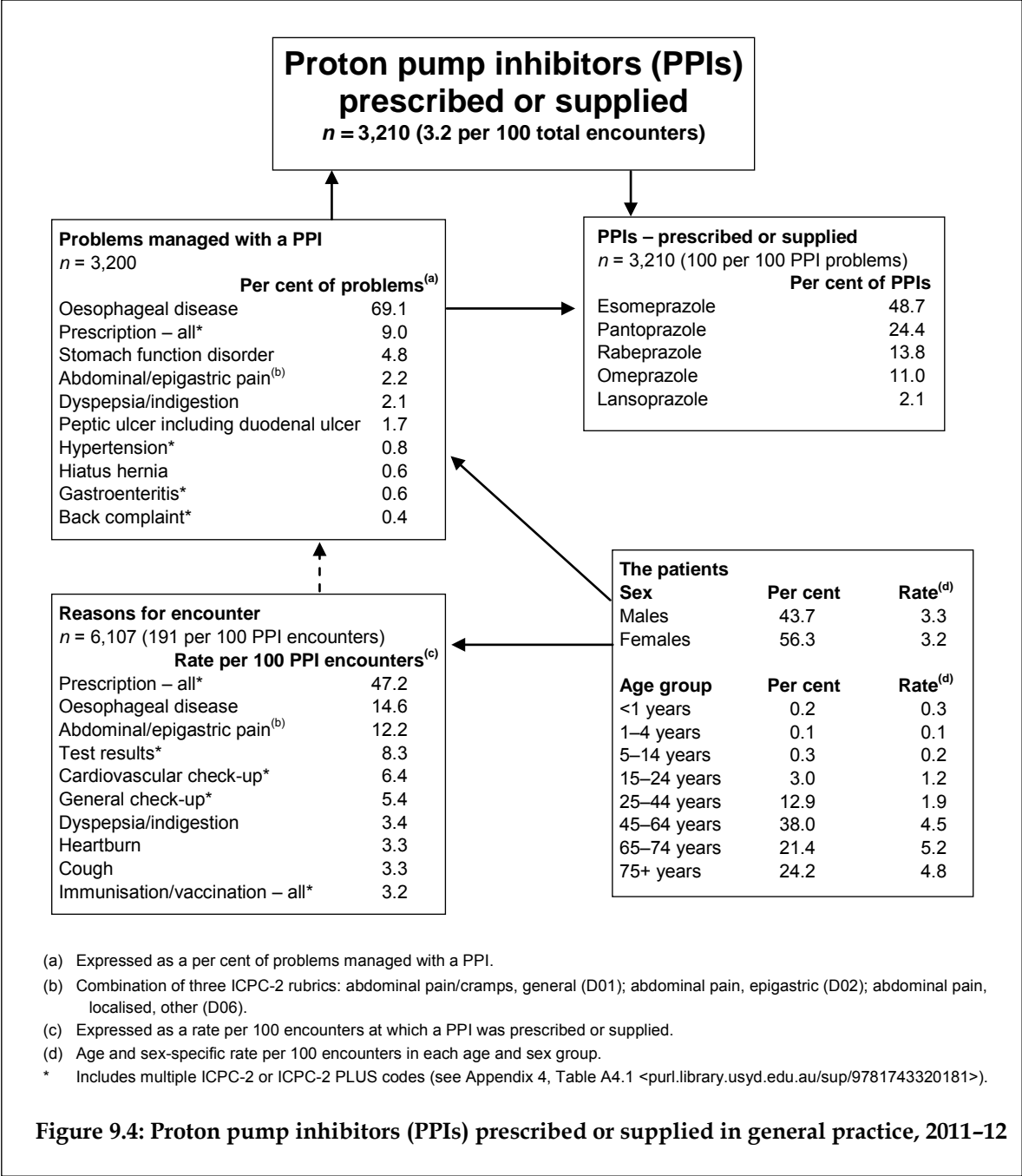
The reason for encounter most often given by patients at encounters where a PPI was prescribed or supplied was a prescription request (47.2 per 100 PPI encounters). Other common reasons were for oesophageal disease (14.6 per 100) and test results (8.3 per 100).

Problems managed with a PPI

Oesophageal disease accounted for almost 7 out of 10 problems managed with a PPI, while the GP labelled the problem under management as prescription request for 9.0%. Stomach function disorder (almost exclusively gastritis) accounted for 4.8% of problems managed with a PPI, abdominal/epigastric pain 2.2%, and dyspepsia/indigestion 2.1%.

Individual PPIs prescribed or supplied

There are five generic types of PPIs available in Australia. Esomeprazole accounted for 48.7% of prescribed or supplied PPIs. The most common esomeprazole product was the 40 mg tablet. Pantoprazole accounted for one-quarter of PPIs, rabeprazole made up 13.8%, and lansoprazole made up 2.1% of these medications.

Proton pump inhibitors (PPIs) prescribed or supplied
n = 3,210 (3.2 per 100 total encounters)

Problems managed with a PPI
n = 3,200

	Per cent of problems[a]
Oesophageal disease	69.1
Prescription – all*	9.0
Stomach function disorder	4.8
Abdominal/epigastric pain[b]	2.2
Dyspepsia/indigestion	2.1
Peptic ulcer including duodenal ulcer	1.7
Hypertension*	0.8
Hiatus hernia	0.6
Gastroenteritis*	0.6
Back complaint*	0.4

PPIs – prescribed or supplied
n = 3,210 (100 per 100 PPI problems)

	Per cent of PPIs
Esomeprazole	48.7
Pantoprazole	24.4
Rabeprazole	13.8
Omeprazole	11.0
Lansoprazole	2.1

Reasons for encounter
n = 6,107 (191 per 100 PPI encounters)

	Rate per 100 PPI encounters[c]
Prescription – all*	47.2
Oesophageal disease	14.6
Abdominal/epigastric pain[b]	12.2
Test results*	8.3
Cardiovascular check-up*	6.4
General check-up*	5.4
Dyspepsia/indigestion	3.4
Heartburn	3.3
Cough	3.3
Immunisation/vaccination – all*	3.2

The patients

Sex	Per cent	Rate[d]
Males	43.7	3.3
Females	56.3	3.2

Age group	Per cent	Rate[d]
<1 years	0.2	0.3
1–4 years	0.1	0.1
5–14 years	0.3	0.2
15–24 years	3.0	1.2
25–44 years	12.9	1.9
45–64 years	38.0	4.5
65–74 years	21.4	5.2
75+ years	24.2	4.8

(a) Expressed as a per cent of problems managed with a PPI.

(b) Combination of three ICPC-2 rubrics: abdominal pain/cramps, general (D01); abdominal pain, epigastric (D02); abdominal pain, localised, other (D06).

(c) Expressed as a rate per 100 encounters at which a PPI was prescribed or supplied.

(d) Age and sex-specific rate per 100 encounters in each age and sex group.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Figure 9.4: Proton pump inhibitors (PPIs) prescribed or supplied in general practice, 2011–12

9.6 Changes in medications over the decade 2002–03 to 2011–12

Data on medications are reported for each year from 2002–03 to 2011–12 in Chapter 9 of the companion report entitled *A decade of Australian general practice activity 2002–03 to 2011–12*.[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 2011–12 (see Section 7.9).

The rate at which medications were prescribed did not change significantly from 2002–03 (58.2 per 100 problems) to 2011–12 (56.5 per 100). Among the prescribed drug groups that increased significantly were agents acting on the renin-angiotensin system, psychoanaleptics, lipid modifying agents, antithrombotic agents and thyroid therapy. At the same time, prescribing rates of several drug groups decreased, including drugs for obstructive airways disease, systemic anti-inflammatory medications and sex hormones.

At the individual generic level, significant increases were found in the prescribing rates of a number of medications. Among them were cephalexin, atorvastatin, oxycodone, esomeprazole, warfarin, metformin and perindopril. On the other hand, salbutamol, levonorgestrel/ethinyloestradiol, and simvastatin were among the medications for which significant decreases in prescribing rates occurred over time.

Other changes that occurred over the ten-year period were a steady rise in the proportion of prescriptions for which five repeats were recorded, and a corresponding decrease in those for which two, three or four repeats were recorded. There was a significant increase in the rate of vaccines supplied to the patient by GPs, and an increase in the rate of unspecified unspecified simple analgesics and in vitamin D advised for over-the-counter purchase.

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. 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 included if they were undertaken by the GP. However GPs were instructed to record and indicate clinical measurements or observations if these were undertaken by the practice nurse (PN) or Aboriginal health worker (AHW) in conjunction with the GP at the encounter.

In 2004, four Medicare item numbers were introduced into the MBS that allowed GPs to claim for specified tasks done by a PN under the direction of the GP.[81] In 2005–06 the BEACH recording form was amended to capture this information.

- GPs were allowed to record multiple (up to three) Medicare item numbers where appropriate, rather than be limited to one item number as had been the case in the past.
- 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.

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

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

Routine clinical measurements or observations, such as measurements of blood pressure and physical examinations, were not included between 2002–03 and 2004–05. With the inclusion of PN activities in BEACH since 2005–06, clinical observations have been recorded, but only when done by the PN.

Data on other treatments are reported for each year from 2002–03 to 2011–12 in the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1]

10.1   Number of other treatments

In 2011–12, a total of 53,395 other treatments were recorded, at a rate of 53.9 per 100 encounters (Table 5.1). More than two-thirds (68.6%) of these were clinical treatments. At least one other treatment was provided at 40.5% of all encounters, for 30.7% of all problems managed. For every 100 problems managed, GPs provided 24.0 clinical treatments and 11.0 procedures (Table 10.1).

Table 10.1: Summary of other treatments

Variable	Number	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 problems (*n* = 152,286)	95% LCL	95% UCL
At least one other treatment	40,086	40.5	38.9	42.1	30.7	29.4	31.9
Other treatments	53,395	53.9	51.2	56.6	35.1	33.5	36.7
Clinical treatments	36,610	37.0	34.6	39.3	24.0	22.6	25.5
Procedural treatments	16,785	16.9	16.1	17.8	11.0	10.5	11.5

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.

- In 60.8% of the problems that were managed with an 'other treatment', no concurrent pharmacological treatment was provided.
- At least one clinical treatment was provided in the management of 21.4% of problems. For 60.0% of these problems, no medication was prescribed/supplied or advised for that problem at that encounter.
- At least one procedural treatment was undertaken in the management of 10.3% of problems, with no pharmacological management given for 61.8% 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* = 152,286)	95% LCL	95% UCL
At least one other treatment	46,729	100.0	30.7	29.4	31.9
Without pharmacological treatment	28,401	60.8	18.7	17.9	19.4
At least one clinical treatment	32,556	100.0	21.4	20.2	22.6
Without pharmacological treatment	19,520	60.0	12.8	12.1	13.5
At least one procedural treatment	15,664	100.0	10.3	9.8	10.7
Without pharmacological treatment	9,680	61.8	6.4	6.1	6.7

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 2011–12, there were 36,610 clinical treatments recorded, at a rate of 37.0 per 100 encounters, or 24.0 per 100 problems managed (Table 10.1).

Most frequent clinical treatments

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

General advice and education was the most frequently recorded clinical treatment in 2011–12 (5.9 per 100 encounters), accounting for 16.0% of all clinical treatments. This was followed by counselling about the problem under management (4.6 per 100 encounters),

counselling and advice about nutrition and weight (4.0 per 100), and advice and education about treatment (3.9 per 100). Psychological counselling was provided at a rate of 3.3 per 100 encounters, and advice and education about medication at a rate of 3.2 per 100 encounters (Table 10.3).

Several recorded clinical treatments related to preventive activities. The most common was counselling and advice about nutrition and weight, followed by counselling/advice for: exercise, smoking, life style, prevention, and alcohol. Together, these preventive treatments accounted for 20.8% of clinical treatments, provided at a rate of 7.7 per 100 encounters (Table 10.3).

Table 10.3: Most frequent clinical treatments

Clinical treatment	Number	Per cent of clinical treatments (*n* = 36,610)	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 problems (*n* = 152,286)	95% LCL	95% UCL
Advice/education NEC*	5,855	16.0	5.9	5.2	6.6	3.8	3.4	4.3
Counselling – problem*	4,565	12.5	4.6	3.8	5.4	3.0	2.5	3.5
Counselling/advice – nutrition/weight*	3,951	10.8	4.0	3.6	4.4	2.6	2.3	2.9
Advice/education – treatment*	3,849	10.5	3.9	3.5	4.3	2.5	2.3	2.8
Counselling – psychological*	3,287	9.0	3.3	3.0	3.6	2.2	2.0	2.3
Advice/education – medication*	3,189	8.7	3.2	2.9	3.5	2.1	1.9	2.3
Other administrative procedure/ document (excl. sickness certificate)*	2,148	5.9	2.2	2.0	2.4	1.4	1.3	1.5
Sickness certificate*	1,741	4.8	1.8	1.5	2.0	1.1	1.0	1.3
Reassurance, support*	1,525	4.2	1.5	1.3	1.8	1.0	0.9	1.1
Counselling/advice – exercise*	1,248	3.4	1.3	1.1	1.5	0.8	0.7	0.9
Counselling/advice – smoking*	758	2.1	0.8	0.7	0.9	0.5	0.4	0.6
Counselling/advice – lifestyle*	755	2.1	0.8	0.6	0.9	0.5	0.4	0.6
Counselling/advice – prevention*	547	1.5	0.6	0.4	0.7	0.4	0.3	0.4
Counselling/advice – health/body*	430	1.2	0.4	0.3	0.5	0.3	0.2	0.3
Observe/wait*	387	1.1	0.4	0.3	0.5	0.3	0.2	0.3
Counselling/advice – alcohol*	359	1.0	0.4	0.3	0.4	0.2	0.2	0.3
Family planning*	328	0.9	0.3	0.3	0.4	0.2	0.2	0.3
Subtotal	*34,922*	*95.4*	—	—	—	—	—	—
Total clinical treatments	**36,610**	**100.0**	**37.0**	**34.6**	**39.3**	**24.0**	**22.6**	**25.5**

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.4 <purl.library.usyd.edu.au/sup/9781743320181>).

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 ten 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 individual problems at that encounter.

- A total of 32,556 problems (21.4% of all problems) involved one or more clinical treatments in their management (Table 8.2).

- There was a very broad range of problems managed with clinical treatments, the top ten problems accounting for 29.4% of all problems for which clinical treatments were provided.

- Depression represented the largest proportion of problems managed with a clinical treatment (5.5%), followed by upper respiratory tract infection (representing 5.2%), hypertension (3.4%) and diabetes (3.4%).

- A clinical treatment was provided at 40.8% of depression contacts. Almost half (49.0%) of these did not involve medication for that problem at that encounter.

- However, of the top ten problems acute stress reaction was the one most likely to be managed with a clinical treatment (at 73.7% of contacts). Of the contacts with acute stress reaction where a clinical treatment was provided, 88.3% did not result in concurrent medication prescribed/supplied or advised for that problem.

- Two-thirds (66.5%) of lipid disorder contacts managed with a clinical treatment had no concurrent pharmacological treatment provided for that problem.

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

Problem managed	Number	Per cent of problems with clinical treatment	Rate per 100 encounters[a] (*n* = 99,030)	95% LCL	95% UCL	Per cent of this problem[b]	Per cent of treated problems no medications[c]
Depression*	1,779	5.5	1.8	1.6	2.0	40.8	49.0
Upper respiratory tract infection	1,696	5.2	1.7	1.5	1.9	28.7	54.4
Hypertension*	1,123	3.4	1.1	1.0	1.3	12.5	41.6
Diabetes – all*	1,114	3.4	1.1	1.0	1.2	27.0	61.7
Lipid disorder	828	2.5	0.8	0.7	0.9	23.9	66.5
Anxiety*	811	2.5	0.8	0.7	0.9	42.9	65.4
Gastroenteritis*	651	2.0	0.7	0.6	0.7	43.4	52.9
Acute stress reaction	536	1.6	0.5	0.5	0.6	73.7	88.3
Test results*	534	1.6	0.5	0.4	0.6	29.5	89.9
Back complaint*	516	1.6	0.5	0.5	0.6	18.7	43.5
Subtotal	*9,587*	*29.4*	—	—	—	—	—
Total problems with clinical treatments	**32,556**	**100.0**	**32.9**	**30.9**	**34.9**	—	—

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

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

(c)   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, <purl.library.usyd.edu.au/sup/9781743320181>).

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 ($n = 3,359$) are not counted here as these have been counted as medications (see Chapter 9). There were 16,785 other procedures recorded, 16.9 per 100 encounters, 11.0 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 procedural treatments, as a rate per 100 encounters and as a rate per 100 problems, both with 95% confidence limits. Some of the procedures (for example INR test, electrical tracings, physical function test) are investigations undertaken at the encounter. These results 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 Table 12.6.

The most frequently recorded group of procedures was excision/removal tissue/biopsy/ destruction/debridement/cauterisation (2.8 per 100 encounters), accounting for 16.5% of recorded procedures, followed by dressing/pressure/compression/tamponade (2.5 per 100), local injection/infiltration (excluding local injection/infiltrations performed for immunisations) (2.2) and physical medicine/rehabilitation (1.4 per 100) (Table 10.5).

Table 10.5: Most frequent procedural treatments

Procedural treatment	Number	Per cent of procedural treatments ($n = 16,785$)	Rate per 100 encounters ($n = 99,030$)	95% LCL	95% UCL	Rate per 100 problems ($n = 152,286$)	95% LCL	95% UCL
Excision/removal tissue/biopsy/destruction/ debridement/cauterisation	2,774	16.5	2.8	2.6	3.0	1.8	1.7	2.0
Dressing/pressure/compression/tamponade*	2,523	15.0	2.5	2.3	2.7	1.7	1.5	1.8
Local injection/infiltration*(a)	2,163	12.9	2.2	2.0	2.4	1.4	1.3	1.5
Physical medicine/rehabilitation – all*	1,374	8.2	1.4	1.2	1.6	0.9	0.8	1.0
Incision/drainage/flushing/aspiration/ removal body fluid*	1,140	6.8	1.2	1.0	1.3	0.7	0.7	0.8
Repair/fixation – suture/cast/prosthetic device (apply/remove)*	881	5.2	0.9	0.8	1.0	0.6	0.5	0.6
Pap smear*	860	5.1	0.9	0.8	1.0	0.6	0.5	0.6
Other therapeutic procedures/minor surgery*	791	4.7	0.8	0.6	1.0	0.5	0.4	0.6
INR test*	683	4.1	0.7	0.6	0.8	0.4	0.4	0.5
Electrical tracings*	648	3.9	0.7	0.6	0.7	0.4	0.4	0.5
Check-up – PN/AHW*	585	3.5	0.6	0.4	0.7	0.4	0.3	0.5
Physical function test*	557	3.3	0.6	0.4	0.7	0.4	0.3	0.4
Other preventive procedures/high-risk medication*	516	3.1	0.5	0.4	0.6	0.3	0.3	0.4
Subtotal	*15,495*	*92.3*	—	—	—	—	—	—
Total procedural treatments	**16,785**	**100.0**	**16.9**	**16.1**	**17.8**	**11.0**	**10.5**	**11.5**

(a)   Excludes all local injection/infiltrations performed for immunisations/vaccinations.
*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Tables A4.5 and A4.6, <purl.library.usyd.edu.au/sup/9781743320181>).
Note: LCL – lower confidence limit; UCL – upper confidence limit; NEC – not elsewhere classified; INR – international normalised ratio; PN/AHW – practice nurse/Aboriginal health worker.

Problems managed with a procedural treatment

Table 10.6 lists the top ten problems managed with a procedural treatment. It also shows the proportion of contacts with each problem that was managed with a procedure, and the proportion of problems managed with a procedure without medication given concurrently.

- One or more procedural treatments were provided in the management of 15,664 problems (10.3% of all problems) (Table 8.2).

- The top ten problems accounted for more than a third (34.4%) of all problems for which a procedure was used.

- Laceration/cut accounted for 4.9% of all problems managed with procedures, followed by female genital check-up/pap smear (4.8%), solar keratosis/sunburn (4.4%), and excessive ear wax (3.5%).

- Of the top ten problems, laceration/cut was the problem most likely to be managed with a procedural treatment with a procedure being undertaken at four-out-of-five (79.9%) contacts. Of these contacts with a laceration/cut where a procedural treatment was provided, 80.4% were not prescribed/supplied or advised a medication for that problem at that encounter.

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

Problem managed	Number	Per cent of problems with procedure	Rate per 100 encounters[a] (n = 99,030)	95% LCL	95% UCL	Per cent of this problem[b]	Per cent of treated problems no medications[c]
Laceration/cut	765	4.9	0.8	0.7	0.9	79.9	80.4
Female genital check-up/ Pap smear*	747	4.8	0.8	0.7	0.9	45.0	98.3
Solar keratosis/sunburn	697	4.4	0.7	0.6	0.8	66.6	97.8
Excessive ear wax	546	3.5	0.6	0.5	0.6	72.8	92.0
Chronic ulcer skin (including varicose ulcer)	496	3.2	0.5	0.4	0.6	75.7	74.7
Warts	487	3.1	0.5	0.4	0.6	77.2	95.0
Malignant neoplasm of skin	482	3.1	0.5	0.4	0.6	45.7	94.3
General check-up*	474	3.0	0.5	0.4	0.6	17.2	77.3
Atrial fibrillation/flutter	382	2.4	0.4	0.3	0.5	27.8	55.4
Back complaint*	317	2.0	0.3	0.3	0.4	11.5	33.1
Subtotal	*5,393*	*34.4*	—	—	—	—	—
Total problems with procedural treatments	**15,664**	**100.0**	**15.8**	**15.1**	**16.5**	—	—

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

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

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1, <purl.library.usyd.edu.au/sup/9781743320181>).

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

10.4 Practice nurse/Aboriginal health worker activity

This section describes the activities of PNs recorded in association with the GP–patient encounters recorded by the GP BEACH participants.

In February 2004, two Medicare item numbers were introduced into the MBS that allowed GPs to claim for specified tasks undertaken by a PN under the direction of the GP. The BEACH recording form (see Appendix 1) was amended to allow the capture of this information from April 2005 onwards.

- GPs were allowed to record multiple (up to three) Medicare item numbers where appropriate, rather than be limited to one item number.

- 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 that the GP provided the 'other treatment'.

The survey form allows GPs to record up to two other treatments for each problem managed at the encounter (i.e. 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.

Over the years new PN item numbers were added to the MBS and some items were broadened to include work done by AHWs. In past years we have reported the results referring to PNs alone. However in 2011–12 a few GPs indicated (of their own accord) that the recorded action was done by an AHW rather than a PN. We have included this information in this section, which now refers 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 thought that because the question referred specifically to PNs, and recording of work done by AHWs was not specifically requested. These results therefore have the potential to be an underestimate of the work undertaken at GP–patient encounters by PNs and AHWs.

In January 2012 the Australian Government significantly altered the payment structure for practice nurse and AHW activities in general practice such that the range of claimable MBS item numbers was diminished and the Practice Nurse Incentive Program (PNIP) introduced. The PNIP "provides incentive payments to practices…by consolidating funding arrangements under the Practice Incentive Program (PIP) Practice Nurse Incentive". Six of the Medicare Benefits Schedule (MBS) practice nurse items covering MBS immunisation, cervical smears and treatments of a person's wound were removed and the funds redirected into a single payment to eligible general practices.[82]

This means that Medicare claims for PN/AHW items recorded in BEACH from January 2012 onwards were limited to a far smaller range of claimable items.[83] This means that the 2011–12 data presented here includes a period of nine months (April – December 2011) of the old payment system and three months of the new. Likewise the distribution of PN/AHW claims in BEACH and in the MBS claims data reflect this mix.

This change in payment systems as of 1 January 2012 must be remembered in the following section, which investigates:

- the proportion of encounters involving the practice nurse
- the proportion of these recorded as claimable under a Medicare item number
- the distribution of the practice nurse items recorded; treatments provided by practice nurses in association with the GP-recorded encounters
- the problems for which practice nurses provided treatments (in direct association with the GP-recorded encounters).

When viewing these results, it must be remembered that these practice nurse data will not include activities undertaken by practice nurses during the GP's BEACH recording period that were outside (not associated with) the recorded encounter. Such activities could include Medicare-claimable activities (for example, immunisations/vaccinations) provided under instruction from the GP but not provided at the time of the encounter recorded in BEACH, or provision of other services not currently claimable from Medicare (for example, dietary advice on a one-to-one basis, or in a group situation).

Practice nurse/Aboriginal health worker Medicare claims

There were 7,293 (GP–patient encounters 7.4% of all encounters) for which at least one practice nurse item and/or nurse activity was recorded. However, for 82 of these their activity was not described. At the remaining 7,210 encounters a practice nurse was involved in the management of 7,554 problems (5.0% of all problems managed at all encounters). Simple extrapolation of these results suggests that during 2011–12 practice nurses were involved in about 9 million GP–patient consultations across Australia.

A PN/AHW Medicare item was recorded at only 1,997 encounters: 2.3% of the 87,323 with one or more MBS item number(s) (Table 5.2) and 27.4% of the 7,293 encounters involving a PN/AHW (Table 10.7), and 2,028 PN/AHW item numbers were recorded (Table 10.8).

Table 10.7: Summary of PN or AHW involvement at encounters

Variable	Number
Total encounters	99,030
Encounters involving PN/AHW	7,293
Encounters at which PN/AHW activity described	7,210
Encounters with MBS PN/AHW item number(s) recorded but activity not described	82
Encounters at which one or more MBS PN/AHW item numbers were recorded as claimable	1,997
Total problems managed	152,286
Problems managed with PN/AHW involvement	7,554
	Per cent (95% CI)
Encounters involving PN/AHW as a proportion of total encounters	7.4 (7.6–8.0)
Problems involving PN/AHW as a proportion of total problems	5.0 (4.5–5.4)
PN/AHW claimable encounters as a proportion of total encounters with at least one MBS item recorded	2.0 (1.7–2.3)
Proportion of encounters involving PNs/AHWs for which one or more MBS practice nurse item numbers were recorded as claimable	27.4 (24.3–30.4)

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

Distribution of practice nurse/Aboriginal health worker items claimed

A total of 2,028 PN/AHW item numbers were recorded at 1,997 encounters. More than half (55.1%) of these were for immunisations and a further 33.3% were for wound treatments. Items recorded for practice nurse services to a person with chronic disease accounted for 10.0%. There were few PN/AHW items claimed for cervical smears (with or without preventive checks) and for health assessments of a four year old, each accounting for 0.6% of all PN/AHW items claimed (Table 10.8).

Comparison of the distribution of recorded practice nurse item numbers and the distribution of the approximately 4.7 million claims made for such items from Medicare in the same data period demonstrated a relatively good fit (Table 10.8). These results suggest that PNs/AHWs conduct of cervical smears were more likely to occur separately from the GP encounter, while their immunisations, wound treatments and services provided to people with a chronic disease were likely to be done in association with a GP encounter.

Table 10.8: Distribution of PM/AHW worker item numbers recorded

Medicare item number	Short descriptor	Number[a]	Per cent of total	Per cent of Medicare PN/AHW item claims[b] (*n* = 4.7 million)
10993	Immunisation by PN	1,117	55.1 (50.2–59.9)	55.7
10996	Wound treatment (other than normal aftercare) by PN	676	33.3 (29.1–37.5)	30.0
10997	Service provided to a person with a chronic disease by a PN or registered AHW	211	10.4% (6.6–14.2)	10.0
10994	Cervical smear and preventive checks by PN	7	0.3 (0.0–0.7)	1.6
10995	Cervical smear and preventive checks – women aged 20–69 years, no smear in previous 4 years	0	0	0.1
10998	Cervical smear by PN	2	0.1 (0.0–0.3)	0.2
10999	Cervical smear – women 20–69 years, no smear in past four years	4	0.2 (0.0–0.5)	0.02
10986	Health assessment of four year old who has had /is having 4 year old immunisation, by PN or AHW	7	0.3 (0.0–0.7)	0.6
82210	Professional attendance by a participating nurse practitioner[c]	2	0.1 (0.0–0.3)	—[c]
16400	Antenatal service provided by a midwife, PN or AHW	1	0.0 (0.0–0.3) Ŧ	1.1
Total[b]	**All Medicare practice nurse item numbers**	**2,028**	**100.0**	100.0

(a) Three of the 2,031 PN/AHW/allied health worker item numbers (Table 5.6) were allied health worker item numbers and are excluded here as we have no data on their activity at the encounters.

(b) Total Medicare PN claims (Source: Medicare health statistics, March 2011 – April 2012 <www.medicareaustralia.gov.au>).

(c) Only two nurse practitioner item numbers were recorded in BEACH and we assume that by far the majority of these item numbers are being claimed by nurse practitioners working outside a general practitioner's practice, so we have not included these items in the Medicare claims summary denominator.

Note: There were no recordings of items: 10950, 10983, 10984, 10987, 10988, 10989 and 81300, which together accounted for less than 0.5% of claims for PN/AHW MBS item numbers between 1 April 2011 and 31 March 2012 (Source: Medicare health statistics, March 2011 – April 2012 <www.medicareaustralia.gov.au>).

Treatments provided by practice nurses or Aboriginal health worker at GP-patient encounters

As shown in Section 10.1 GPs reported 53,395 other treatments at encounters. A further 1,823 local injections in administration of immunisations were given by a PN/AHW and 1,636 by the recording GP (these were not reported in Section 10.2). So, in total 56,854 other treatments were recorded, PNs/AHWs accounting for 8,040 of these (representing 14.1% of all other treatments recorded at BEACH encounters) at a rate of 8.2 per 100 recorded encounters. The majority (89.0%) of the PN/AHW activity was procedural, and these procedures represented 35.4% of all procedures recorded. In contrast, clinical treatments accounted for 11.0% of PN/AHW activity at encounters, but PNs/AHWs provided only 2.4% of all recorded clinical treatments. PNs/AHWs did just over half of the immunisation injections (52.7%) at GPs encounters (Table 10.9).

Table 10.9: 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]	7,158	35.4	13,086	64.6	20,244
(Immunisation injections)	(1,823)	(52.7)	(1,636)	(47.3)	(3,459)
Clinical treatments	882	2.4	35,728	97.6	36,610
All other treatments	**8,040**	**14.1**	**48,814**	**85.9**	**56,854**

(a)   Procedural treatments here include all injections given by a PN/AHW or the GP for immunisations/vaccinations (*n* = 3,459). 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.

Of the 7,158 procedures performed by a PN/AHW, 35.8% were injections (71.2% of which were for immunisations), and a further 20.1% were dressing/pressure/compression/tamponade. Together these accounted for 55.9% of all procedures undertaken by PNs/AHWs in association with the recorded GP-patient encounters. Check-ups made up 8.0% of procedures undertaken by a PN/AHW followed by INR tests (6.7%), and incision/drainage/aspirations (5.5%). PNs/AHWs also undertook a wide range of other procedural activities in association with the GP-patient encounters. The most common are listed in Table 10.10.

Other administrative procedure (which includes administrative/documentation work but excludes provision of sickness certificates) was the most frequently recorded clinical activity, accounting for 29.3% of the 882 clinical treatments provided by PNs/AHWs, followed by counselling the patient about their health problem (14.5%), general advice/education (9.2%), and counselling about a psychological problem (6.0%) (Table 10.10).

Table 10.10: Most frequent activities done by a PN or AHW at GP encounters

Activity	Number	Per cent of group[a]	Rate per 100 encounters where PN/AHW activity described[a] (n = 7,210)	95% LCL	95% UCL
Procedural treatments	**7,158**	**100.0**	**99.3**	**96.5**	**102.0**
Local injection/infiltration*	2,561	35.8	35.5	32.4	38.6
Dressing/pressure/compression/tamponade*	1,441	20.1	20.0	18.2	21.8
Check-up – PN/AHW*	575	8.0	8.0	6.1	9.8
INR test*	477	6.7	6.6	5.4	7.8
Incision/drainage/flushing/aspiration/removal body fluid*	395	5.5	5.5	4.2	6.7
Electrical tracings*	377	5.3	5.2	4.5	6.0
Repair/fixation-suture/cast/prosthetic device (apply/remove)*	286	4.0	4.0	3.3	4.6
Excision/removal tissue/biopsy/destruction/ debridement/cauterisation*	263	3.7	3.7	2.8	4.5
Physical function test*	203	2.8	2.8	2.1	3.5
Urine test*	155	2.2	2.1	1.5	2.8
Glucose test*	88	1.2	1.2	0.8	1.7
Other diagnostic procedures*	59	0.8	0.8	0.4	1.2
Pregnancy test*	47	0.7	0.7	0.4	0.9
Pap smear*	45	0.6	0.6	0.3	0.9
Clinical treatments	**882**	**100.0**	**12.2**	**9.6**	**14.8**
Other administrative procedure/document (excluding sickness certificate)*	258	29.3	3.6	2.8	4.4
Counselling – problem*	128	14.5	1.8	0.1	3.4
Advice/education NEC*	81	9.2	1.1	0.7	1.5
Counselling – psychological	53	6.0	0.7	0.2	1.3
Advice/education – medication*	52	5.9	0.7	0.4	1.1
Consultation with primary care provider*	42	5.4	0.7	0.1	1.2
Counselling/advice – nutrition/weight*	32	3.6	0.4	0.1	0.7

(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 purl.library.usyd.edu.au/sup/9781743320181>).

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

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

PNs and AHWs were involved in management of a wide range of problems in association with the GP encounters. The problems managed most often were immunisation/vaccination (24.3% of all problems managed with the involvement of a PN or AHW), laceration/cut and check-ups (5.6% in both cases), chronic skin ulcer (4.6%) and diabetes (3.8%). Other common problems for which PNs or AHWs were involved at the GP-patient consultations are listed in Table 10.11.

Table 10.11: The most common problems managed with involvement of PNs or AHWs at GP-patient encounters

Problem managed	Number	Per cent of problems involving PN/AHW[a] (n = 7,554)	Rate per 100 encounters with recorded PN/AHW activity[b] (n = 7,210)	95% LCL	95% UCL
Immunisation/vaccination – all*	1,839	24.3	25.5	22.7	28.3
Laceration/cut	427	5.6	5.9	5.1	6.7
Check-up – all*	422	5.6	5.8	4.9	6.8
Chronic ulcer skin (including varicose ulcer)	351	4.6	4.9	4.1	5.6
Diabetes – all*	284	3.8	3.9	3.2	4.7
Atrial fibrillation/flutter	259	3.4	3.6	2.5	4.6
Hypertension*	165	2.2	2.3	1.4	3.1
Excessive ear wax	164	2.2	2.3	1.8	2.7
Malignant neoplasm skin	161	2.1	2.2	1.7	2.8
Blood test – all*	135	1.8	1.9	1.3	2.4
Skin infection – post traumatic	125	1.6	1.7	1.3	2.1
Vitamin/nutritional deficiency	117	1.5	1.6	1.2	2.0
Administrative procedure – all*	92	1.2	1.3	0.7	1.8
Asthma	82	1.1	1.1	0.8	1.5
Other preventive procedures/high risk medication*	69	0.9	1.0	0.6	1.3
Contraception, other	68	0.9	0.9	0.7	1.2
Repair/fixation-suture/cast/prosthetic device (apply/remove)*	68	0.9	0.9	0.7	1.2
Urinary tract infection*	64	0.8	0.9	0.5	1.3
Skin symptom/complaint – NOS/NEC	60	0.8	0.8	0.6	1.1
Boil/carbuncle	60	0.8	0.8	0.5	1.1
Burns/scalds	58	0.8	0.8	0.5	1.1
Pregnancy*	56	0.7	0.8	0.4	1.1
Observation/health education/advice/diet – all*	55	0.7	0.8	0.4	1.1
Prescription – all*	52	0.7	0.7	0.5	1.0
Abrasion/scratch/blister	52	0.7	0.7	0.5	1.0
Dressing/pressure/compression/tamponade*	46	0.6	0.6	0.3	0.9
Arthritis – all*	45	0.6	0.6	0.4	0.8
Anaemia*	45	0.6	0.6	0.4	0.8
Complication of medical treatment	44	0.6	0.6	0.4	0.9
Chest pain NOS	44	0.6	0.6	0.4	0.8

(a)   Only those problems accounting for >0.5% of all problems managed at GP-patient encounters with involvement of a PN or AHW are included in this table.

(b)   Rate of nurse provision of treatment at encounter for selected problem per 100 total encounters in which a practice nurse or Aboriginal health worker was involved.

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.3, <purl.library.usyd.edu.au/sup/9781743320181>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; NEC – not elsewhere classified; NOS – not otherwise stated; PN/AHW – practice nurse/Aboriginal health worker.

10.5 Changes in other treatments over the decade 2002–03 to 2011–12

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 2002–03 to 2011–12*.[1] A summary of the results is provided below.

Clinical treatments

The rate of clinical treatments provided in the management of patient problems did not differ in 2002–03 and 2011–12 but there were major changes within the decade.

The rate of provision of clinical treatments remained steady from 2002–03 to 2004–05. Following the introduction of PN and AHW Medicare item numbers in 2004, there was a sudden and significant decrease in the rate in 2005–06. From 2006–07 onwards, the rate slowly increased to reach 24.0 clinical treatments per 100 problems in 2011–12, returning to the level provided ten years earlier.

The rate at which counselling/advice about nutrition/weight and counselling/advice about exercise was provided significantly decreased in 2005–06 then remained steady at a significantly lower rate in 2011–12 than ten years earlier. We estimate 140,000 fewer occasions of counselling/advice about nutrition and weight, and 86,000 fewer occasions of counselling/advice about exercise in 2011–12 than in 2002–03. These changes are discussed in Section 10.4 of the accompanying report.

Overall, there was no significant change in the proportion of problems managed with clinical treatments over the decade. However, the rate of clinical treatments provided for diabetes increased significantly, from 0.8 per 100 encounters in 2002–03 to 1.1 in 2011–12.

Procedural treatments

The rate at which procedures were recorded per 100 encounters increased significantly from 14.6 per 100 encounters in 2002–03 to 16.9 per 100 in 2011–12. The extrapolated effect of this change is that nationally in 2011–12 there were an estimated 6.6 million more procedures undertaken than a decade earlier.

There was an overall increase in the proportion of problems managed with procedural treatment(s) from 13.6% in 2002–03 to 15.8% in 2011–12 but there was no change in the rate at which procedures were performed per 100 problems managed. There were significant changes in rates of some specific types of procedures within this period.

- The provision of local injections/infiltration (excluding immunisations) significantly increased over the decade. When extrapolated, the increase suggests provision of 1.2 million more local injections/infiltrations nationally in 2011–12 than in 2002–03.

- In contrast, there was a significant decrease in the rate of physical medicine/rehabilitation, Pap smear and other therapeutic procedures/surgery NEC.

- There was a significant increase in the procedural rate in management of atrial fibrillation from 2002–03 to 2011–12. The coincided with a significant increase in the prescribing rate of warfarin sodium over the decade (see Chapter 9). INR testing is used to monitor patients on warfarin therapy and the provision of INR testing at the encounter significantly increased from one INR test per 1,000 encounters in 2006–07 to seven per 1,000 encounters in 2011–12.

Practice nurse/Aboriginal health worker activity

A comparison of PN/AHW activity from 2005–06 to 2011–12 is provided in Chapter 10 of the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1] Changes are summarised below.

As a proportion of all encounters, those involving a PN/AHW almost doubled from 4.2% in 2005–06 to peak at 9.0% in 2009–10 then significantly decreased to 7.4% in 2011–12. The proportion of problems managed with a PN/AHW involvement also increased from 2.8% in 2005–06 to peak to 6.1% in 2009–10 with no significant change by 2011–12 (5.0%).

In 2005–06 GPs recorded at least one PN/AHW Medicare item number at 39% of encounters with recorded PN/AHW activity. This increased to 46% by 2009–10, and then decreased to 40% in 2010–11. In 2011–12, which includes three months of data recorded after the change in practice nurse funding structure, the proportion decreased to 27%.

There were two significant changes in between 2005–06 and 2011–12 in the distribution of practice nurse item numbers claimed for work associated with the BEACH encounters: in 2011–12 PN/AHW services to a person with a chronic disease (first introduced in 2007–08), made up a significantly greater proportion of recorded items (3.6%) than in 2007–08; the proportion of claims accounted for by immunisations was significantly lower in 2011–12 (55.1%) than in 2005–06 (69.5%).

The rate at which procedures (including tests) were undertaken by PNs/AHWs at GP–patient encounters more than doubled from 4.0 per 100 encounters in 2005–06 to 9.2 per 100 in 2009–10, but decreased in 2011–12 to 7.2 per 100 encounters. PNs/AHWs also took over an increasing proportion of the procedural work, increasing from 23% in 2005–06 to 38% in 2010–11, with no statistical change in 2011–12.

While their provision of clinical treatments (such as advice and health education) remained infrequent at GP–patient encounters, there was a significant increase over the study period, from 0.2 clinical treatments per 100 encounters in 2005–06 to 0.9 per 100 in 2011–12. Overall in 2011–12 PNs/AHWs provided 14.1% of all 'other treatments' recorded at the encounters, a significantly greater proportion than in 2005–06 (9.0%).

Last year local injections/infiltrations had reverted to the 2005–06 level of about 41 per 100 practice nurse involved encounters. In 2011–12 the rate decreased further to 36 per 100. This may be linked to the removal of the Medicare item number for immunisations in January 2012. Check-ups by PNs/AHWs at GP-patient encounters doubled over the study period. International normalised ratio (INR) blood testing frequency more than tripled.

In clinical treatments, PNs/AHWs carried out administrative procedures (excluding sickness certificates) at an ever increasing rate, rising from 0.7 per 100 PN/AHW-involved encounters in 2005–06, to 3.6 per 100 in 2011–12. Their provision of advice/education about medication also increased.

There were significant increases in the rate at which PNs/AHWs were involved in management of check-ups, diabetes, atrial fibrillation/flutter and urinary tract infections. Some of these increases may well have been stimulated by the introduction of MBS item 10997 for services provided to a person with a chronic disease, in 2007–08.

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, not to 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 those to outpatient clinics and to other GPs).

Data on referrals and admissions are reported for each of the most recent BEACH years from 2002–03 to 2011–12 in the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12.*[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 13.3% of all encounters, and for 9.3% of all problems managed.

There were 14,382 referrals made at a rate of 14.5 per 100 encounters, most often to medical specialists (8.6 per 100 encounters, 5.6 per 100 problems managed), followed by referrals to allied health services (4.7 per 100 encounters, 3.0 per 100 problems). Few patients were referred/admitted to hospital, or the emergency department.

Table 11.1: Summary of referrals and admissions

Variable	Number	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 problems (*n* = 152,286)	95% LCL	95% UCL
At least one referral[a]	13,219	13.3	12.8	13.8	9.3	9.0	9.7
Referrals	14,382	14.5	13.9	15.1	9.4	9.1	9.8
Medical specialist*	8,488	8.6	8.2	8.9	5.6	5.3	5.8
Allied health services*	4,629	4.7	4.4	5.0	3.0	2.8	3.2
Hospital*	345	0.3	0.3	0.4	0.2	0.2	0.3
Emergency department*	311	0.3	0.3	0.4	0.2	0.2	0.2
Other referrals*	609	0.6	0.5	0.7	0.4	0.3	0.5
Total referrals	**14,382**	**14.5**	**13.9**	**15.1**	**9.4**	**9.1**	**9.8**

(a)   At least one referral was given in the management of 14,228 problems at the 13,219 encounters.

*   Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.7, <purl.library.usyd.edu.au/sup/9781743320181>).

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 (9.8% of specialist referrals), orthopaedic surgeons (8.9%), and cardiologists (8.0%). The top ten specialists accounted for 65.3% of specialist referrals and for 42.3% of all referrals.

Referrals to allied health services were most often to physiotherapists (28.2%), psychologists (19.2%), podiatrists/chiropodists (9.8%), dietitians/nutritionists (7.8%) and dentists (7.8%). The top ten allied health services accounted for 82.1% of allied health referrals and for 29.0% of all referrals.

Table 11.2: Most frequent referrals, by type

Professional/organisation	Number	Per cent of all referrals	Per cent of referral group	Rate per 100 encounters ($n = 99,030$)	95% LCL	95% UCL	Rate per 100 problems ($n = 152,286$)	95% LCL	95% UCL
Medical specialist*	**8,488**	**64.7**	**100.0**	**8.6**	**8.2**	**8.9**	**5.6**	**5.3**	**5.8**
Surgeon	832	6.3	9.8	0.8	0.8	0.9	0.5	0.5	0.6
Orthopaedic surgeon	756	5.8	8.9	0.8	0.7	0.8	0.5	0.4	0.5
Cardiologist	675	5.1	8.0	0.7	0.6	0.8	0.4	0.4	0.5
Dermatologist	665	5.1	7.8	0.7	0.6	0.7	0.4	0.4	0.5
Ophthalmologist	622	4.7	7.3	0.6	0.6	0.7	0.4	0.4	0.5
Gastroenterologist	522	4.0	6.2	0.5	0.5	0.6	0.3	0.3	0.4
Ear, nose and throat	462	3.5	5.4	0.5	0.4	0.5	0.3	0.3	0.3
Gynaecologist	453	3.5	5.3	0.5	0.4	0.5	0.3	0.3	0.3
Urologist	315	2.4	3.7	0.3	0.3	0.4	0.2	0.2	0.2
Neurologist	242	1.8	2.9	0.2	0.2	0.3	0.2	0.1	0.2
Subtotal: top ten medical specialist referrals	*5,545*	*42.3*	*65.3*	—	—	—	—	—	—
Allied health services*	**4,629**	**35.3**	**100.0**	**4.7**	**4.4**	**5.0**	**3.0**	**2.8**	**3.2**
Physiotherapy	1,304	9.9	28.2	1.3	1.2	1.4	0.9	0.8	0.9
Psychologist	889	6.8	19.2	0.9	0.8	1.0	0.6	0.5	0.6
Podiatrist/chiropodist	454	3.5	9.8	0.5	0.4	0.5	0.3	0.3	0.3
Dietitian/nutritionist	360	2.7	7.8	0.4	0.3	0.4	0.2	0.2	0.3
Dentist	360	2.7	7.8	0.4	0.3	0.4	0.2	0.2	0.3
Optometrist	113	0.9	2.4	0.1	0.1	0.1	0.1	0.1	0.1
Exercise physiologist	90	0.7	2.0	0.1	0.1	0.1	0.1	0.0	0.1
Audiologist	84	0.6	1.8	0.1	0.1	0.1	0.1	0.0	0.1
Diabetes education	74	0.6	1.6	0.1	0.1	0.1	0.0	0.0	0.1
Counsellor	74	0.6	1.6	0.1	0.0	0.1	0.0	0.0	0.1
Subtotal: top ten allied health referrals	*3,801*	*29.0*	*82.1*	—	—	—	—	—	—
Subtotal: all referrals listed	*9,347*	*71.3*	—	—	—	—	—	—	—
Total allied health and medical specialist referrals	**13,117**	**100.0**	—	**13.2**	**12.7**	**13.8**	**8.6**	**8.3**	**8.9**

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.7, <purl.library.usyd.edu.au/sup/9781743320181>).

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

11.3 Problems most frequently referred to a specialist

The GP could link a single referral to multiple problems being 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 8,488 referrals to a medical specialist were provided in management of 8,686 problems. The ten problems most often referred to a specialist accounted for only 20.0% of all problem–referral links, reflecting the breadth of problems referred to specialists. Diabetes accounted for 2.9% of problem-referral links, malignant skin neoplasm (2.6%), pregnancy (2.5%), and osteoarthritis (2.2%) (Table 11.3). The far right hand column of Table 11.3 shows the likelihood of referral to a medical specialist when each problem is managed. Malignant skin neoplasm resulted in a specialist referral at one in five (21.2%) GP contacts with this problem. This was followed by pregnancy (17.1%) and ischaemic heart disease (13.0%).

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

Problem managed	Number	Per cent of problem–referral links	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 contacts with this problem[a]
Diabetes – all*	251	2.9	0.3	0.2	0.3	6.1
Malignant neoplasm skin	223	2.6	0.2	0.2	0.3	21.2
Pregnancy*	221	2.5	0.2	0.2	0.3	17.1
Osteoarthritis*	194	2.2	0.2	0.2	0.2	6.6
Back complaint*	167	1.9	0.2	0.1	0.2	6.1
Sleep disturbance	158	1.8	0.2	0.1	0.2	10.5
Oesophageal disease	137	1.6	0.1	0.1	0.2	5.2
Ischaemic heart disease*	136	1.6	0.1	0.1	0.2	13.0
Abnormal test results*	131	1.5	0.1	0.1	0.2	11.2
Depression*	117	1.3	0.1	0.1	0.1	2.7
Subtotal: top ten problems referred to a medical specialist	*1,735*	*20.0*	—	—	—	—
Total problems referred to medical specialist	**8,686**	**100.0**	**8.8**	**8.4**	**9.1**	—

(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 <purl.library.usyd.edu.au/sup/9781743320181>).

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

At a meeting of senior academic researchers at the 2011 North American Primary Care Research Group meeting in Canada, we identified an international paucity of information about what problems are referred by GPs to particular types of specialists. The following analyses goes some way to regressing this deficiency.

When analysed by individual medical specialty, the top ten problems accounted for 39.9% of all referrals to surgeons (indicative of the broad range of conditions referred to them), and for 74.9% of all referrals to dermatologists, consistent with a more defined range (Tables 11.3.1 to 11.3.10).

The two most common problems referred to a surgeon were inguinal hernia and haemorrhoids. Of the ten problems most commonly referred to a surgeon, the most likely to be referred at each GP contact with that problem were: inguinal hernia, cholecystitis and other abdominal hernia (Table 11.3.1).

Table 11.3.1: The ten problems most frequently referred to a surgeon

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Inguinal hernia	56	6.7	38.5
Haemorrhoids	56	6.6	20.0
Malignant neoplasm skin	43	5.1	4.1
Cholecystitis/cholelithiasis	41	4.9	24.4
Abdominal hernia, other	33	3.9	22.8
Rectal bleeding	30	3.6	18.5
Malignant neoplasm breast (female)	27	3.2	11.7
Carpal tunnel syndrome	17	2.1	8.8
Oesophageal disease	17	2.0	0.6
Obesity (BMI > 30)	16	1.9	2.5
Subtotal: top ten problems referred to a surgeon	*337*	*39.9*	*—*
Total problems referred to a surgeon	**844**	**100.0**	**—**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: BMI – body mass index.

The two most common problems referred to an orthopaedic surgeon were osteoarthritis and acute internal damage of the knee. Of the 10 problems most commonly referred to an orthopaedic surgeon, the most likely to be referred at each GP contact with that problem were: acute internal damage of the knee and knee symptom/complaint (Table 11.3.2).

Table 11.3.2: The ten problems most frequently referred to an orthopaedic surgeon

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Osteoarthritis*	165	21.6	5.6
Acute internal damage knee	86	11.3	27.6
Injury musculoskeletal NOS	63	8.2	6.9
Fracture*	48	6.3	5.3
Sprain/strain*	39	5.2	2.8
Bursitis/tendonitis/synovitis NOS	39	5.1	3.5
Knee symptom/complaint	36	4.7	12.6
Back complaint*	35	4.6	1.3
Shoulder syndrome	31	4.1	5.9
Musculoskeletal disease, other	17	2.2	3.7
Subtotal: top ten problems referred to an orthopaedic surgeon	*559*	*73.3*	*—*
Total problems referred to an orthopaedic surgeon	**763**	**100.0**	**—**

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: NOS – not otherwise specified.

The two most common problems referred to a cardiologist were ischaemic heart disease and atrial fibrillation/flutter. Of the 10 problems most commonly referred, the most likely to be referred at each GP contact with that problem were: palpitations and heart disease (not otherwise specified), (apart from GP contact specifically for referral) (Table 11.3.3).

Table 11.3.3: The ten problems most frequently referred to a cardiologist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Ischaemic heart disease*	133	18.8	12.8
Atrial fibrillation/flutter	72	10.1	5.2
Hypertension*	57	8.1	0.6
Chest pain NOS	42	5.9	16.5
Heart failure	41	5.8	7.3
Palpitations/awareness of heart	40	5.6	19.3
Heart disease, other	38	5.4	18.4
Refer physician/specialist/clinic/hospital cardiovascular	26	3.6	63.4
Cardiac arrhythmia NOS	19	2.7	17.7
Heart valve disease NOS	17	2.3	16.8
Subtotal: top ten problems referred to a cardiologist	*485*	*68.4*	—
Total problems referred to a cardiologist	**709**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: NOS – not otherwise specified.

The two most common problems referred to a dermatologist were malignant neoplasm of skin and contact/allergic dermatitis. Of the 10 problems most commonly referred to a dermatologist, the most likely to be referred at each GP contact with that problem were: skin check-up, rash and malignant neoplasm of skin (Table 11.3.4).

Table 11.3.4: The ten problems most frequently referred to a dermatologist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Malignant neoplasm skin	102	15.1	9.7
Dermatitis, contact/allergic	71	10.5	3.9
Solar keratosis/sunburn	68	10.2	6.5
Skin symptom/complaint, other	57	8.4	9.0
Skin check-up*	46	6.9	9.9
Skin disease, other	37	5.5	4.8
Acne	36	5.4	8.7
Naevus/mole	35	5.1	8.8
Rash*	26	3.9	9.8
Psoriasis	26	3.9	9.6
Subtotal: top ten problems referred to a dermatologist	*504*	*74.9*	—
Total problems referred to a dermatologist	**673**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

The two most common problems referred to an ophthalmologist were diabetes and cataract. Of the ten problems most commonly referred to an ophthalmologist, the most likely to be referred at each GP contact with that problem were: visual disturbance (not otherwise specified), cataract, refractive error and macular degeneration (apart from GP contact specifically for referral) (Table 11.3.5).

Table 11.3.5: The ten problems most frequently referred to an ophthalmologist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Diabetes – all*	98	15.5	2.4
Cataract	81	12.8	54.0
Glaucoma	53	8.3	28.3
Visual disturbance, other	48	7.6	54.2
Eye/adnexa disease, other	31	4.9	15.6
Macular degeneration	28	4.4	49.9
Blepharitis/stye/chalazion	26	4.1	10.6
Refractive error	21	3.4	52.3
Refer physician/specialist/clinic/hospital, eye	18	2.8	70.8
Conjunctivitis, infectious	17	2.7	2.7
Subtotal: top 10 problems referred to an ophthalmologist	*420*	*66.3*	—
Total problems referred to an ophthalmologist	**633**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

The two most common problems referred to a gastroenterologist were oesophageal disease and rectal bleeding. Of the ten problems most commonly referred to a gastroenterologist, the most likely to be referred at each GP contact with that problem were: rectal bleeding and digestive neoplasm (benign or uncertain) (Table 11.3.6).

Table 11.3.6: The ten problems most frequently referred to a gastroenterologist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Oesophageal disease	88	16.4	3.3
Rectal bleeding	40	7.6	24.8
Irritable bowel syndrome	26	4.8	9.1
Benign/uncertain neoplasm digestive	26	4.8	23.5
Abdominal pain*	23	4.2	3.7
Viral hepatitis	21	4.0	13.6
Risk factor NOS	20	3.8	5.1
Chronic enteritis/ulcerative colitis	19	3.6	12.9
Diarrhoea	18	3.4	6.3
Disease digestive system, other	17	3.2	6.5
Subtotal: top ten problems referred to a gastroenterologist	*298*	*55.8*	—
Total problems referred to a gastroenterologist	**535**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: NOS – not otherwise specified.

The two most common problems referred to an ear, nose, and throat (ENT) specialist were sinusitis and tonsillitis. Of the ten problems most commonly referred to an ENT specialist, the most likely to be referred at each GP contact with that problem were: tinnitus and nose bleed (Table 11.3.7).

Table 11.3.7: The ten problems most frequently referred to an ear, nose, and throat (ENT) specialist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Sinusitis	33	7.1	2.8
Tonsillitis*	33	7.1	3.7
Nose bleed/epistaxis	27	5.8	24.5
Otitis externa	21	4.5	3.7
Upper respiratory infection	20	4.4	0.3
Throat symptom/complaint	20	4.2	14.1
Tinnitus, ringing/buzzing ear	20	4.2	25.7
Acute otitis media/myringitis	19	4.1	1.9
Respiratory disease, other	15	3.2	7.7
Hearing complaint NEC	14	3.0	15.4
Subtotal: top 10 problems referred to an ENT specialist	*223*	*47.7*	—
Total problems referred to an ENT specialist	**467**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: NEC – not elsewhere classified; ENT – ear, nose and throat.

The two most common problems referred to a gynaecologist were menstrual problems and female genital disease (not otherwise specified). Of the 10 problems most commonly referred to a gynaecologist, the most likely to be referred at each GP contact with that problem were: postmenopausal bleeding and uterovaginal prolapse (Table 11.3.8).

Table 11.3.8: The problems most frequently referred to a gynaecologist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Menstrual problems*	64	13.8	9.6
Female genital disease, other	50	10.8	25.0
Abnormal test results*	35	7.6	3.0
Uterovaginal prolapse	27	5.8	38.9
Female genital check-up*	18	3.8	1.1
Female genital symptom/complaint, other	18	3.8	20.6
Menopausal symptom/complaint	16	3.5	2.3
Female infertility/subfertility	16	3.4	18.6
Postmenopausal bleeding	15	3.2	39.1
Endocrine/metabolic/nutritional disease, other	13	2.8	2.3
Subtotal: top ten problems referred to a gynaecologist	*272*	*58.4*	—
Total problems referred to a gynaecologist	**465**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

The two problems most commonly referred to a urologist were benign prostatic hypertrophy and haematuria. Of the ten problems most often referred, those most likely to be referred at each GP contact with that problem were: malignant neoplasm of the bladder, haematuria, urinary calculus and benign prostatic hypertrophy (Table 11.3.9).

Table 11.3.9: The ten problems most frequently referred to an urologist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Benign prostatic hypertrophy	47	14.5	18.7
Haematuria	31	9.7	21.7
Abnormal test results*	30	9.3	2.6
Malignant neoplasm prostate	28	8.6	8.2
Urinary calculus	16	4.9	19.9
Malignant neoplasm bladder	14	4.3	40.5
Urinary frequency/urgency	12	3.7	9.7
Urinary tract infection*	10	3.0	0.6
Prostate symptom/complaint	9	2.9	11.2
Urinary disease, other	9	2.7	11.7
Subtotal: top 10 problems referred to a urologist	*205*	*63.5*	—
Total problems referred to a urologist	**323**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

The two problems most commonly referred to a neurologist were epilepsy and carpal tunnel syndrome. Of the 10 problems most commonly referred to a neurologist, the most likely to be referred at each GP contact with that problem were: convulsions/seizures and tingling of fingers/toes (Table 11.3.10).

Table 11.3.10: The ten problems most frequently referred to a neurologist

Problem managed	Number	Per cent of problems referred	Rate per 100 contacts with this problem[a]
Epilepsy	25	10.1	8.6
Carpal tunnel syndrome	21	8.5	10.5
Migraine	16	6.5	2.5
Vertigo/dizziness	16	6.4	4.4
Parkinsonism	12	4.8	7.3
Neurological disease, other	10	4.2	4.0
Peripheral neuritis/neuropathy	10	3.9	3.1
Convulsions/seizures	9	3.8	20.3
Tingling fingers/feet/toes	8	3.2	16.1
Headache	8	3.2	2.7
Subtotal: top 10 problems referred to a neurologist	*134*	*54.6*	—
Total problems referred to a neurologist	**245**	**100.0**	—

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

*   Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.1 <purl.library.usyd.edu.au/sup/9781743320181>).

11.4 Problems most frequently referred to allied health services and hospitals

The 4,629 referrals to an allied health service were provided in the management of 4,853 problems. The ten most common referred problems accounted for 46.0% of all problem–referral links. Depression was the problem accounting for the largest proportion of allied health referrals (10.6%), followed by diabetes (7.1%), back complaints (6.4%) and anxiety (4.2%). However, of the ten most common problems, the most likely to be referred to an allied health service was teeth/gum disease, referred at 27.8% all GP contacts with this problem (Table 11.4).

Table 11.4: The ten problems most frequently referred to allied health services

Problem managed	Number	Per cent of problem–referral links	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 contacts with this problem[a]
Depression*	515	10.6	0.5	0.5	0.6	11.8
Diabetes – all*	342	7.1	0.3	0.3	0.4	8.3
Back complaint*	310	6.4	0.3	0.3	0.4	11.3
Anxiety*	205	4.2	0.2	0.2	0.2	10.8
Sprain/strain*	199	4.1	0.2	0.2	0.2	14.1
Osteoarthritis*	171	3.5	0.2	0.1	0.2	5.8
Administrative procedure NOS	153	3.2	0.2	0.1	0.2	13.1
Teeth/gum disease	138	2.8	0.1	0.1	0.2	27.8
Bursitis/tendonitis/synovitis NOS	117	2.4	0.1	0.1	0.1	10.4
Acute stress reaction	82	1.7	0.1	0.1	0.1	11.2
Subtotal: top ten problems referred to AHS	*2,234*	*46.0*	—	—	—	—
Total problems referred to AHS	**4,853**	**100.0**	**4.9**	**4.6**	**5.2**	—

(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, <purl.library.usyd.edu.au/sup/9781743320181>).

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

The 345 referrals to a hospital were provided in the management of 354 problems. The ten problems most frequently referred to hospital are shown in Table 11.5. Pregnancy accounted for the highest proportion (6.5%) of these referrals, but appendicitis was the problem most likely to be referred (20.8%).

The 311 referrals to an emergency department were provided in the management of 316 problems. The ten problems most frequently referred to an emergency department are shown in Table 11.6. Fracture accounted for the highest proportion (8.4%) of these referrals, but appendicitis was the problem most likely to be referred (23.6%).

Table 11.5: The ten problems most frequently referred to hospital

Problem managed	Number	Per cent of problems referred	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 contacts with this problem[a]
Pregnancy*	23	6.5	0.02	0.01	0.04	1.8
Fracture*	15	4.3	0.02	0.01	0.03	1.7
Appendicitis	10	3.0	0.01	0.00	0.02	20.8
Atrial fibrillation/flutter	8	2.3	0.01	0.00	0.02	0.6
Depression*	8	2.3	0.01	0.00	0.01	0.2
Ischaemic heart disease*	8	2.2	0.01	0.00	0.01	0.7
Anaemia*	8	2.1	0.01	0.00	0.01	1.4
Skin infection, other	7	2.0	0.01	0.00	0.01	2.2
Chest pain NOS	6	1.8	0.01	0.00	0.01	2.5
Gastroenteritis*	6	1.7	0.01	0.00	0.01	0.4
Subtotal: top ten problems referred for admission	*100*	*28.1*	—	—	—	—
Total problems referred to hospital	**354**	**100.0**	**0.36**	**0.29**	**0.42**	—

(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, <purl.library.usyd.edu.au/sup/9781743320181>).

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

Table 11.6: The ten problems most frequently referred to an emergency department

Problem managed	Number	Per cent of problems referred	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 contacts with this problem[a]
Fracture*	26	8.4	0.03	0.01	0.04	2.9
Chest pain NOS	12	3.9	0.01	0.00	0.02	4.9
Appendicitis	12	3.8	0.01	0.00	0.02	23.6
Pneumonia	12	3.8	0.01	0.01	0.02	4.3
Ischaemic heart disease*	10	3.0	0.01	0.00	0.02	0.9
Acute bronchitis/bronchiolitis	9	3.0	0.01	0.00	0.02	0.4
Boil/carbuncle	8	2.6	0.01	0.00	0.02	1.5
Abdominal pain*	8	2.4	0.01	0.00	0.01	1.2
Dehydration	6	2.0	0.01	0.00	0.01	14.8
Foreign body in skin	5	1.7	0.01	0.00	0.01	6.4
Subtotal: top ten problems referred to emergency department	*109*	*34.5*	—	—	—	—
Total problems referred to emergency department	**316**	**100.0**	**0.32**	**0.27**	**0.37**	—

(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, <purl.library.usyd.edu.au/sup/9781743320181>).

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

11.5 Changes in referrals over the decade 2002–03 to 2011–12

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 2002–03 to 2011–12*.[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 (see Section 7.9).

In summary, over the ten years there was a significant increase in the proportion of problems that were referred to other health providers: in 2002–03 at least one referral was made in the management of 7.7% of problems and this increased to 9.3% of problems managed in 2011–12.

Referrals to medical specialists remained almost stable at 5.3 and 5.6 per 100 problems managed, with a small but significant increase in referrals to cardiologists, and a significant decrease in referrals to gynaecologists. However, referrals to allied health services almost doubled, from 1.7 to 3.0 per 100 problems managed. This was reflected in significant increases in referral rates per 100 problems, to psychologists, podiatrists or chiropodists, dietitians or nutritionists, and dentists.

12 Investigations

The GPs 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 test orders to a single problem or multiple problems. Up to five orders for pathology, and two for imaging and other tests could be recorded at each encounter. A single test may have been ordered for the management of multiple problems, and multiple tests may have been used in the management of a single problem.

A pathology test order may be for a single test (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. 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 2002–03 to 2011–12 in the ten-year report *A decade of Australian general practice activity 2002–03 to 2011–12*.[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 tests recorded at three-quarters (75.7%) of encounters.

At least one pathology test order was recorded at 18.1% of encounters (for 13.6% of problems managed), and at least one imaging test was ordered at 8.6% of encounters (for 5.8% 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* = 99,030)	95% LCL	95% UCL	Number of problems	Per cent of problems (*n* = 152,286)	95% LCL	95% UCL
Pathology and imaging ordered	2,430	2.5	2.3	2.6	1,772	1.2	1.1	1.3
Pathology only ordered	15,464	15.6	15.1	16.2	18,930	12.4	12.0	12.9
Imaging only ordered	6,132	6.2	5.9	6.4	7,116	4.7	4.5	4.9
No pathology or imaging tests ordered	75,004	75.7	75.0	76.5	124,467	81.7	81.2	82.3
At least one pathology ordered	17,894	18.1	17.4	18.7	20,702	13.6	13.1	14.1
At least one imaging ordered	8,562	8.6	8.3	9.0	8,888	5.8	5.6	6.1
At least one other investigation ordered	861	0.9	0.8	1.0	888	0.6	0.5	0.6
At least one other investigation performed in the practice	1,455	1.5	1.3	1.6	1,465	1.0	0.9	1.1
At least one other investigation ordered or performed	2,263	2.3	2.1	2.5	2,302	1.5	1.4	1.6

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.[19] A review of GP pathology orders in the National Health Priority Areas and other selected problems between 2000 and 2008 is reported in *General practice in Australia, health priorities and policies 1998 to 2008*.[16] 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.[18] Readers may wish to consider those reports in conjunction with the information presented below.

Nature of pathology orders at encounter

The GPs recorded 46,544 orders for pathology tests/batteries of tests, at a rate of 47.0 per 100 encounters or 30.6 per 100 problems managed. 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).[84]

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.

Test orders classed as chemistry accounted for more than half the pathology test orders, the most common being: lipid tests, for which there were 4.4 orders per 100 encounters and 2.9 per 100 problems; electrolytes, urea and creatinine (3.2; 2.1); multibiochemical analysis (2.9; 1.9); and thyroid function tests (2.7; 1.7). Haematology tests accounted for 18.0% of all pathology including the most frequently ordered individual pathology test, full blood count, at 14.1% of all pathology and 6.6 orders per 100 encounters and 4.3 per 100 problems managed. Microbiology accounted for 13.2% of pathology orders, with urine microscopy, culture and sensitivity being the most frequent in the group at 1.9 tests per 100 encounters and 1.3 per 100 problems managed.

Table 12.2: Pathology orders by MBS pathology groups and most frequent individual test orders within group

Pathology test ordered	Number	Per cent of all pathology	Per cent of group	Rate per 100 encounters (*n* = 99,030)	95% LCL	95% UCL	Rate per 100 problems (*n* = 152,286)	95% LCL	95% UCL
Chemistry*	**27,348**	**58.8**	**100.0**	**27.6**	**26.1**	**29.1**	**18.0**	**17.1**	**18.8**
Lipids*	4,341	9.3	15.9	4.4	4.0	4.7	2.9	2.6	3.1
Electrolytes, urea and creatinine*	3,170	6.8	11.6	3.2	2.9	3.5	2.1	1.9	2.3
Multi-biochemical analysis*	2,861	6.1	10.5	2.9	2.6	3.2	1.9	1.7	2.1
Thyroid function*	2,632	5.7	9.6	2.7	2.5	2.8	1.7	1.6	1.8
Liver function*	2,615	5.6	9.6	2.6	2.4	2.9	1.7	1.6	1.9
Glucose/glucose tolerance*	2,578	5.5	9.4	2.6	2.4	2.8	1.7	1.6	1.8
Chemistry; other*	1,547	3.3	5.7	1.6	1.4	1.7	1.0	0.9	1.1
HbA1c*	1,368	2.9	5.0	1.4	1.2	1.5	0.9	0.8	1.0
Ferritin*	1,278	2.7	4.7	1.3	1.2	1.4	0.8	0.8	0.9
Prostate specific antigen*	946	2.0	3.5	1.0	0.9	1.1	0.6	0.6	0.7

(continued)

Table 12.2 (continued): Pathology orders by MBS pathology groups and most frequent individual test orders within group

Pathology test ordered	Number	Per cent of all pathology	Per cent of group	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL	Rate per 100 problems (n = 152,286)	95% LCL	95% UCL
C reactive protein	911	2.0	3.3	0.9	0.8	1.0	0.6	0.5	0.7
Calcium/phosphate/magnesium*	880	1.9	3.2	0.9	0.8	1.0	0.6	0.5	0.6
Haematology*	**8,385**	**18.0**	**100.0**	**8.5**	**8.0**	**8.9**	**5.5**	**5.2**	**5.8**
Full blood count*	6,578	14.1	78.4	6.6	6.3	7.0	4.3	4.1	4.6
Coagulation*	797	1.7	9.5	0.8	0.7	0.9	0.5	0.4	0.6
ESR	794	1.7	9.5	0.8	0.7	0.9	0.5	0.5	0.6
Microbiology*	**6,148**	**13.2**	**100.0**	**6.2**	**5.9**	**6.6**	**4.0**	**3.8**	**4.3**
Urine M,C&S*	1,913	4.1	31.1	1.9	1.8	2.1	1.3	1.2	1.3
Microbiology; other*	938	2.0	15.3	0.9	0.9	1.0	0.6	0.6	0.7
Hepatitis serology*	440	0.9	7.2	0.4	0.4	0.5	0.3	0.2	0.3
Faeces M,C&S*	407	0.9	6.6	0.4	0.4	0.5	0.3	0.2	0.3
Chlamydia*	340	0.7	5.5	0.3	0.3	0.4	0.2	0.2	0.3
Vaginal swab M,C&S*	336	0.7	5.5	0.3	0.3	0.4	0.2	0.2	0.3
Venereal disease*	275	0.6	4.5	0.3	0.2	0.3	0.2	0.1	0.2
H Pylori*	232	0.5	3.8	0.2	0.2	0.3	0.2	0.1	0.2
Cytopathology*	**1,699**	**3.7**	**100.0**	**1.7**	**1.5**	**1.9**	**1.1**	**1.0**	**1.2**
Pap smear*	1,662	3.6	97.8	1.7	1.5	1.9	1.1	1.0	1.2
Other NEC*	**909**	**2.0**	**100.0**	**0.9**	**0.7**	**1.1**	**0.6**	**0.5**	**0.7**
Blood test	444	1.0	48.8	0.4	0.3	0.6	0.3	0.2	0.4
Other test NEC	256	0.6	28.2	0.3	0.2	0.3	0.2	0.1	0.2
Tissue pathology*	**781**	**1.7**	**100.0**	**0.8**	**0.7**	**0.9**	**0.5**	**0.4**	**0.6**
Histology; skin	699	1.5	89.5	0.7	0.6	0.8	0.5	0.4	0.5
Immunology*	**790**	**1.7**	**100.0**	**0.8**	**0.7**	**0.9**	**0.5**	**0.5**	**0.6**
Immunology, other*	433	0.9	54.8	0.4	0.4	0.5	0.3	0.2	0.3
Anti-nuclear antibodies	139	0.3	17.6	0.1	0.1	0.2	0.1	0.1	0.1
Rheumatoid factor	112	0.2	14.2	0.1	0.1	0.1	0.1	0.1	0.1
Simple tests*	**252**	**0.5**	**100.0**	**0.3**	**0.2**	**0.3**	**0.2**	**0.1**	**0.2**
Infertility/pregnancy*	**234**	**0.5**	**100.0**	**0.2**	**0.2**	**0.3**	**0.2**	**0.1**	**0.2**
Total pathology tests	**46,544**	**100.0**	**—**	**47.0**	**44.9**	**49.1**	**30.6**	**29.3**	**31.8**

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.8, <purl.library.usyd.edu.au/sup/9781743320181>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; ESR – Erythrocyte sedimentation rate; M,C&S – microscopy, culture and sensitivity; H Pylori – test for Helicobacter pylori infection; 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 8.3% of all problem–pathology combinations, followed by hypertension, general check-ups and lipid disorder were the most common problems for which pathology tests were ordered. The two right-hand columns 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 is ordered. For example, 32.7% of contacts with diabetes resulted in pathology orders, and when pathology was ordered for diabetes, 300 tests/batteries of tests were ordered per 100 diabetes contacts that resulted in a pathology test order. In contrast, only 12.0% of contacts with hypertension problems resulted in a pathology test, but the resulting test orders accounted for almost as many tests (6.5%) as did diabetes (8.3%).

Table 12.3: The ten 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*	4,123	4,038	8.3	32.7	299.7
Hypertension*	8,971	3,173	6.5	12.0	295.4
General check-up*	2,757	2,684	5.5	27.9	349.4
Lipid disorder	3,463	2,234	4.6	26.7	241.7
Female genital check-up/ Pap smear*	1,661	1,630	3.3	79.8	122.9
Weakness/tiredness	599	1,532	3.1	64.2	398.2
Urinary tract infection*	1,686	1,079	2.2	54.3	117.8
Abnormal test results*	1,171	1,044	2.1	51.6	172.9
Pregnancy*	1,287	1,029	2.1	36.8	217.2
Blood test NOS	314	877	1.8	80.7	345.9
Subtotal	*26,032*	*19,320*	*39.6*	—	—
Total problems	**152,286**	**48,795**	**100.0**	**13.6**	**235.7**

(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 46,544 pathology test orders and 48,795 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, <purl.library.usyd.edu.au/sup/9781743320181>).

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 AIHW and the University of Sydney in 2001.[85]

Nature of imaging orders at encounter

There were 9,978 imaging test orders recorded, at a rate of 10.1 per 100 encounters and 6.6 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. Diagnostic radiology accounted for almost half (45.6%) of all imaging test orders, and ultrasound accounted for 39.4%.

Table 12.4: Imaging orders by MBS imaging groups and the most frequent imaging tests ordered within group

Imaging test ordered	Number	Per cent of all imaging	Per cent of group	Rate per 100 encounters ($n = 99,030$)	95% LCL	95% UCL	Rate per 100 problems ($n = 152,286$)	95% LCL	95% UCL
Diagnostic radiology*	**4,547**	**45.6**	**100.0**	**4.6**	**4.3**	**4.9**	**3.0**	**2.8**	**3.2**
X-ray; chest	959	9.6	21.1	1.0	0.9	1.1	0.6	0.6	0.7
X-ray; knee	489	4.9	10.8	0.5	0.4	0.5	0.3	0.3	0.4
Mammography; female	284	2.9	6.2	0.3	0.2	0.3	0.2	0.2	0.2
X-ray; hip	272	2.7	6.0	0.3	0.2	0.3	0.2	0.2	0.2
Test; densitometry	266	2.7	5.9	0.3	0.2	0.3	0.2	0.1	0.2
X-ray; shoulder	252	2.5	5.5	0.3	0.2	0.3	0.2	0.1	0.2
X-ray; foot/feet	246	2.5	5.4	0.2	0.2	0.3	0.2	0.1	0.2
X-ray; ankle	169	1.7	3.7	0.2	0.1	0.2	0.1	0.1	0.1
X-ray; wrist	163	1.6	3.6	0.2	0.1	0.2	0.1	0.1	0.1
X-ray; spine; lumbar	144	1.4	3.2	0.1	0.1	0.2	0.1	0.1	0.1
X-ray; hand	124	1.2	2.7	0.1	0.1	0.2	0.1	0.1	0.1
X-ray; finger(s)/thumb	108	1.1	2.4	0.1	0.1	0.1	0.1	0.1	0.1
X-ray; abdomen	104	1.0	2.3	0.1	0.1	0.1	0.1	0.0	0.1
X-ray; spine; cervical	85	0.9	1.9	0.1	0.1	0.1	0.1	0.0	0.1
X-ray; spine; lumbosacral	84	0.8	1.8	0.1	0.1	0.1	0.1	0.0	0.1
X-ray; ribs	69	0.7	1.5	0.1	0.0	0.1	0.0	0.0	0.1
Ultrasound*	**3,936**	**39.4**	**100.0**	**4.0**	**3.8**	**4.2**	**2.6**	**2.5**	**2.7**
Ultrasound; pelvis	646	6.5	16.4	0.7	0.6	0.7	0.4	0.4	0.5
Ultrasound; shoulder	462	4.6	11.7	0.5	0.4	0.5	0.3	0.3	0.3
Ultrasound; abdomen	388	3.9	9.9	0.4	0.3	0.4	0.3	0.2	0.3
Ultrasound; breast; female	265	2.7	6.7	0.3	0.2	0.3	0.2	0.1	0.2
Ultrasound; obstetric	258	2.6	6.6	0.3	0.2	0.3	0.2	0.1	0.2

(continued)

Table 12.4 (continued): Imaging orders by MBS imaging groups and the most frequent imaging tests ordered within group

Imaging test ordered	Number	Per cent of all imaging	Per cent of group	Rate per 100 encounters (n = 99,030)	95% LCL	95% UCL	Rate per 100 problems (n = 152,286)	95% LCL	95% UCL
Echocardiography	153	1.5	3.9	0.2	0.1	0.2	0.1	0.1	0.1
Ultrasound; leg	134	1.3	3.4	0.1	0.1	0.2	0.1	0.1	0.1
Test; Doppler	133	1.3	3.4	0.1	0.1	0.2	0.1	0.1	0.1
Ultrasound; kidney	127	1.3	3.2	0.1	0.1	0.2	0.1	0.1	0.1
Ultrasound; hip	94	0.9	2.4	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; scrotum	90	0.9	2.3	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; thyroid	89	0.9	2.3	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; abdomen; upper	85	0.9	2.2	0.1	0.1	0.1	0.1	0.0	0.1
Ultrasound; foot/toe(s)	82	0.8	2.1	0.1	0.1	0.1	0.1	0.0	0.1
Computerised tomography*	**1,163**	**11.7**	**100.0**	**1.2**	**1.1**	**1.3**	**0.8**	**0.7**	**0.8**
CT scan; brain	180	1.8	15.5	0.2	0.1	0.2	0.1	0.1	0.1
CT scan; abdomen	168	1.7	14.4	0.2	0.1	0.2	0.1	0.1	0.1
CT scan; spine; lumbar	135	1.4	11.6	0.1	0.1	0.2	0.1	0.1	0.1
CT scan; head	94	0.9	8.1	0.1	0.1	0.1	0.1	0.0	0.1
CT scan; chest	89	0.9	7.7	0.1	0.1	0.1	0.1	0.0	0.1
CT scan; spine; lumbosacral	78	0.8	6.7	0.1	0.1	0.1	0.1	0.0	0.1
CT scan; sinus	59	0.6	5.1	0.1	0.0	0.1	0.0	0.0	0.1
Magnetic resonance imaging*	**228**	**2.3**	**100.0**	**0.2**	**0.2**	**0.3**	**0.1**	**0.1**	**0.2**
Nuclear medicine*	**105**	**1.0**	**100.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total imaging tests	**9,978**	**100.0**	**—**	**10.1**	**9.6**	**10.5**	**6.6**	**6.3**	**6.8**

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, Table A4.9 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: LCL – lower confidence limit; UCL – upper confidence limit; CT – computerised tomography.

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. Osteoarthritis accounted for 5.3% of all orders, this was followed by back complaint (4.8%), and musculoskeletal injury (3.6%). The two right-hand columns 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, 35.6% of contacts with fractures resulted in an imaging test, and 106.6 tests were ordered per 100 fracture contacts when at least one test had been ordered.

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

Problem managed	Number of problems	Number of problem–imaging combinations[a]	Per cent of problem–imaging combinations	Per cent of problems with test[b]	Rate of imaging orders per 100 problems with imaging[c]
Osteoarthritis*	2,924	531	5.3	15.4	118.0
Back complaint*	2,756	480	4.8	15.3	113.9
Injury musculoskeletal NOS	905	364	3.6	34.5	116.8
Sprain/strain*	1,409	363	3.6	20.9	123.6
Bursitis/tendonitis/synovitis NOS	1,128	351	3.5	26.6	116.6
Fracture*	908	345	3.4	35.6	106.6
Pregnancy*	1,287	329	3.3	24.9	102.5
Abdominal pain*	614	307	3.0	42.4	118.0
Shoulder syndrome	525	255	2.5	37.9	128.2
Breast lump/mass (female)	150	170	1.7	75.4	149.6
Subtotal	*12,606*	*3,495*	*34.7*	—	—
Total problems	**152,286**	**10,076**	**100.0**	**5.8**	**113.4**

(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 9,978 imaging test orders and 10,076 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 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: NOS – not otherwise specified.

12.4   Other investigations

Other investigations include diagnostic procedures ordered by the GP at the encounter or undertaken by the GP or practice staff. GPs ordered 897 other investigations during the study year, and GPs or practice staff undertook 1,548 other investigations. There were, in total, 2,445 other investigations either ordered or undertaken in the practice (Table 12.6).

The first part of Table 12.6 lists the other investigations ordered by GPs. The second part lists the other investigations undertaken in the practice by GPs or practice staff. The third part lists the total of 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 44.1% of other investigations, followed by physical function test (29.9%).

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

Investigation ordered	Investigations ordered by the GP				Investigations undertaken in the practice				All investigation (ordered or undertaken)			
	Number	Per cent	Rate per 100 encounters (95% CI) (n = 99,030)	Rate per 100 problems (95% CI) (n = 152,286)	Number	Per cent	Rate per 100 encounters (95% CI) (n = 99,030)	Rate per 100 problems (95% CI) (n = 152,286)	Number	Per cent	Rate per 100 encounters (95% CI) (n = 99,030)	Rate per 100 problems (95% CI) (n = 152,286)
Electrical tracings*	431	48.0	0.43 (0.37–0.50)	0.28 (0.24–0.33)	648	41.8	0.65 (0.57–0.74)	0.43 (0.37–0.48)	1,079	44.1	1.09 (0.98–1.20)	0.71 (0.64–0.78)
Diagnostic endoscopy*	262	29.2	0.26 (0.22–0.31)	0.17 (0.14–0.20)	39	2.5	0.04 (0.01–0.07)	0.03 (0.01–0.04)	300	12.3	0.30 (0.25–0.36)	0.20 (0.16–0.23)
Physical function test*	173	19.3	0.17 (0.14–0.21)	0.11 (0.09–0.14)	557	36.0	0.56 (0.44–0.69)	0.37 (0.28–0.45)	730	29.9	0.74 (0.61–0.87)	0.48 (0.39–0.57)
Other diagnostic procedures*	31	3.5	0.03 (0.01–0.05)	0.02 (0.01–0.03)	304	19.7	0.31 (0.23–0.39)	0.20 (0.15–0.25)	336	13.7	0.34 (0.26–0.42)	0.22 (0.17–0.27)
Total other investigations ordered	**897**	**100.0**	**0.91 (0.80–1.01)**	**0.59 (0.52–0.65)**	**1,548**	**100.0**	**1.56 (1.37–1.76)**	**1.02 (0.89–1.14)**	**2,445**	**100.0**	**2.47 (2.24–2.70)**	**1.61 (1.46–1.75)**

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, Table A4.6 <purl.library.usyd.edu.au/sup/9781743320181>).

Note: CI – confidence interval.

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12.5 Changes in investigations over the decade 2002–03 to 2011–12

Data on investigations are reported for each year from 2002–03 to 2011–12 in Chapter 12 of the companion report *A decade of Australian general practice activity 2002–03 to 2011–12.*[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 accounts for the significant increase in the number of problems managed per encounter over the decade (see Section 7.9). The major changes are highlighted below.

- At least one pathology test was ordered for 11.4% of problems managed in 2002–03 rising to 13.6% of problems in 2011–12. The largest increase was in orders for chemical pathology, which increased from 12.2 per 100 problems in 2002–03 to 18.0 per 100 problems in 2011–12. Haematology increased at a slower rate, from 4.3 per 100 problems in 2002–03 to 5.5 in 2011–12. Microbiology test orders increased from 3.5 per 100 problems in 2002–03 to 4.0 in 2011–12.

- Between 2002–03 and 2011–12 the number of problems managed per 100 encounters rose from 144.9 to 153.8 (Table 5.1). Both the rise in the number of tested problems and the rise in the number of problems managed at encounter contributed to an overall increase in the proportion of encounters involving a pathology test. These rose from 14.7% of encounters in 2002–03 to 18.1% in 2011–12, which suggests that in 2011–12 pathology was ordered at about 8 million more encounters nationally than in 2002–03.

- The number of pathology tests ordered increased from 22.7 tests (or battery of tests) per 100 problems managed in 2002–03 to 30.6 per 100 problems in 2011–12. The rate of pathology orders per 100 encounters increased from 32.9 per 100 encounters in 2002–03 to 47.0 in 2011–12, which extrapolates to approximately 25.7 million more tests (or batteries of tests) ordered in 2011–12.

- At least one imaging test was ordered for 5.3% of all problems managed in 2002–03, rising to 5.8% of all problems in 2011–12. The proportion of encounters generating imaging orders increased from 7.5% in 2002–03 to 8.6% in 2011–12, resulting in an estimated 3.3 million more encounters nationally at which imaging was ordered in 2011–12.

- The number of imaging tests ordered increased from 5.9 tests per 100 problems managed in 2002–03 to 6.6 per 100 problems in 2011–12. Total imaging orders per 100 encounters also increased significantly from 8.6 per 100 encounters in 2002–03 to 10.1 in 2011–12, suggesting there were 4 million more imaging orders in 2011–12 than in 2002–03.

12.6   Discussion

Pathology testing underpins both the diagnostic and chronic disease monitoring processes of Australian general practice. It is thus a tool integral to the function of general practice and the management of patients.

The volume of pathology ordering by general practitioners in Australia (which constitutes about 70% of all pathology orders claimed from Medicare[16]) has increased in every year since the inception of the BEACH program in 1998. This rising volume has resulted from an increase in the number of services delivered by GPs and an increase in the number of patient problems managed at encounters as well as an increase in the number of pathology tests or batteries of tests ordered on each occasion in the management of some problems.[16]

There continue to be some problematic areas of pathology ordering which were reported in previous FMRC publications and continue in the present BEACH reporting year.[16,19] Examples include the ordering of full blood counts and ESR which have little support in guidelines for most of the indications for which they are ordered. FBC orders increased from 4.3 per 100 encounters in 2002–03 to 6.6 per 100 encounters in 2011–12, an increase of almost 4 million encounters in 2011–12 at which FBCs were ordered.[86]

The largest rise in pathology orders has been in chemical pathology tests, led by tests for lipid levels which have increased from 3.3 per 100 encounters in 2002–03 to 4.4 per 100 encounters in 2011–12.[86] This extrapolates to an increase over the decade of approximately 2.2 million more encounters where lipid tests were ordered, accounting for about 13% of the total increase in chemical pathology orders. This appears to have been driven by the changes in guidelines resulting from increasing evidence regarding the role of blood lipids in the genesis and prevention of cardiovascular disease.

Prostate specific antigen (PSA) testing has become a very contentious issue with conflicting views as to its benefit in terms of patient outcomes. Conflicting guidelines for PSA tests make it difficult for GPs to decide when it is appropriate and limit the ability to measure the quality of GP ordering of PSA testing. Research conducted by the FMRC for the Quality Use of Pathology Program of the Department of Health and Ageing raised significant concerns regarding the quality of guidelines for pathology ordering.[18]

While there was a significant increase in imaging orders overall, there was no increase in diagnostic radiology per 100 encounters and a significant decrease per 100 problems managed. The major change was in ultrasound orders which increased by the equivalent of 2.4 million encounters at which ultrasound was ordered in 2011–12 compared with 2002–03.[1] Of greater concern was CT scan orders which increased by the equivalent of 690,000 CT scan encounters over the decade.[1] There is a growing concern regarding the safety of CT scans,[87,88] particularly in children, which has led to changes in Medicare Schedules rules to allow rebates for MRI scans ordered by general practitioners in the future.[89] BEACH will monitor the effect of this policy change on the ordering of imaging tests in the future.

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 2011–12, 83% of Australians visited a GP at least once (personal communication, DoHA, April 2012). GPs, through ongoing professional education, 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 patients individually about their lifestyle choices.

Since the beginning of the BEACH program (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.

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 investigated 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.

Data on patient risk factors measured in SAND are reported for each of the ten most recent years in the companion report *A decade of Australian general practice activity 2002–03 to 2011–12*.[1]

Abstracts of results and the research tools used in other SAND substudies from April 1998 to March 2012 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*[26]

- from April 1999 to July 2006 were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*[27]

- since August 2006 have been published in each general practice annual reports[28–32]

- in the 2011–12 BEACH year are provided in Chapter 14 of this publication.

13.1 Body mass index

From the most recent publicly available data, high body mass was the third highest contributor to the total burden of disease in Australia in 2003, accounting for 7.5% of the total burden,[90] an increase from 4.3% of total burden and sixth rank in 1996.[91] In 2010, the AIHW reported that based on OECD data, Australia's obesity rates in 1987 and 2006 were among the highest in the world (10.8% and 25.6% of adults respectively).[92] These figures rank Australia firmly in the worst third of OECD countries.[92]

From the 2007–08 National Health Survey (NHS) it was estimated that, based on trained interviewer measured data 37% of Australians aged 18 years and over were overweight (BMI 25–<30) and 25% were obese (BMI 30 or more). Men were more likely to be overweight (42%) than women (31%), but obesity rates were similar (26% in men, 24% in women).[20]

The 2007–08 NHS also reported that 25% of children aged 5–17 years were classified as overweight or obese, with boys and girls having similar rates of overweight/obesity (26% and 24% respectively).[20]

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 recommendations[93] for BMI groups were used, which 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 Australian Bureau of Statistics (ABS).[94] 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 that calculates the age–sex-specific BMI cut-off levels for underweight, overweight and obesity specific to children aged 2–17 years.[95,96] 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 (CDC).[94,97] 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 32,372 patients aged 18 years and over at encounters with 984 GPs.

- Over half (61.6%) of the patients were overweight (35.0%) or obese (26.6%) (Table 13.1).
- Just over one-third (36.2%) of adult patients had a BMI in the normal range, 2.3% of adults were underweight (Table 13.1). Underweight was more prevalent among females than males.
- Males were more likely to be overweight or obese (68.9%, 95% CI: 67.8–70.0) than females (56.9%, 95% CI: 56.9–57.9) (results not tabled).

- Overweight/obesity was most prevalent among male patients aged 65–74 years (76.8%) and 45–64 years (76.0%) (Figure 13.1).
- Among female patients, overweight/obesity was most prevalent in those aged 65–74 years (67.7%) and 45–64 years (64.5%) (Figure 13.1).
- Underweight was most prevalent among patients aged 18–24 years (5.2%, 95% CI: 4.2–6.2) (results not tabled).
- Of young adults (18–24 years), 6.2% of females and 2.8% of males were underweight, and among those aged 75 years and over, 3.8% of females and 1.8% 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, 69% of males and 57% of females) are consistent with the ABS 2007–08 figures from the National Health Survey (based on measured BMI data), which reported that 62% of adults aged 18 and over (68% of men and 55% of females) were overweight or obese.[20]

Readers interested in 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*.[98]

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

The BEACH study reports 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 sample than in the total population who attend a GP at least once in a year. The 2011–12 BEACH sample was weighted to estimate the BMI of the GP–patient attending population (that is, the 14.8 million adult patients who attended a GP at least once in 2011–12 (personal communication, DoHA, April 2012), using the method described by Knox et al. (2008).[24] This statistical adjustment had little effect on the result.

The estimates for the adult GP–patient attending population (after adjusting for age–sex attendance patterns) suggest that 26.1% of the adult patient population were obese, 34.9% were overweight, 36.9% were normal weight and 2.2% 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 = 12,531)	Per cent in patient population (95% CI)[b]	Per cent in BEACH sample (95% CI) (n = 19,605	Per cent in patient population (95% CI)[b]	Per cent in BEACH sample (95% CI) (n = 32,372)	Per cent in patient population (95% CI)[b]
Obese	26.4 (25.4–27.4)	25.7 (24.6–26.8)	26.7 (25.8–27.5)	26.4 (25.5–27.3)	26.6 (25.8–27.3)	26.1 (25.3–26.9)
Overweight	42.5 (41.5–43.5)	41.5 (40.4–42.5)	30.2 (29.5–30.9)	29.3 (28.5–30.0)	35.0 (34.4–35.6)	34.9 (34.2–35.5)
Normal	29.9 (28.8–30.9)	31.5 (30.4–32.7)	40.2 (39.3–41.2)	41.5 (40.4–42.5)	36.2 (35.3–37.0)	36.9 (36.0–37.8)
Underweight	1.3 (1.1–1.5)	1.3 (1.1–1.5)	2.9 (2.6–3.1)	2.9 (2.6–3.2)	2.3 (2.1–2.4)	2.2 (2.0–2.3)

(a) Patient sex was not recorded for 236 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 2011–12) (n = 14.8 million, source: unpublished Medicare data, personal communication, DoHA, April 2012).

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

	18–24	25–44	45–64	65–74	75+
■ Male	40.8	64.6	76.0	76.8	62.9
□ Female	34.1	50.4	64.5	67.7	56.9

Age group (years)
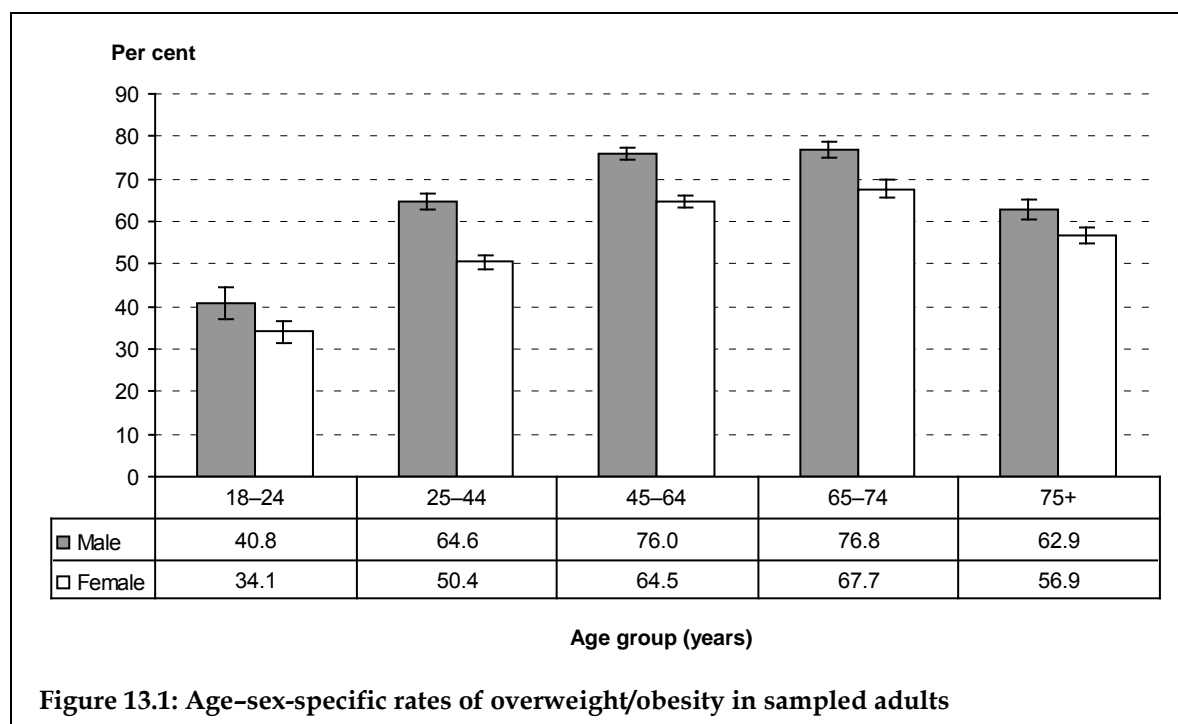
Figure 13.1: Age–sex-specific rates of overweight/obesity in sampled adults

Figure 13.2: Age–sex-specific rates of underweight in sampled adults
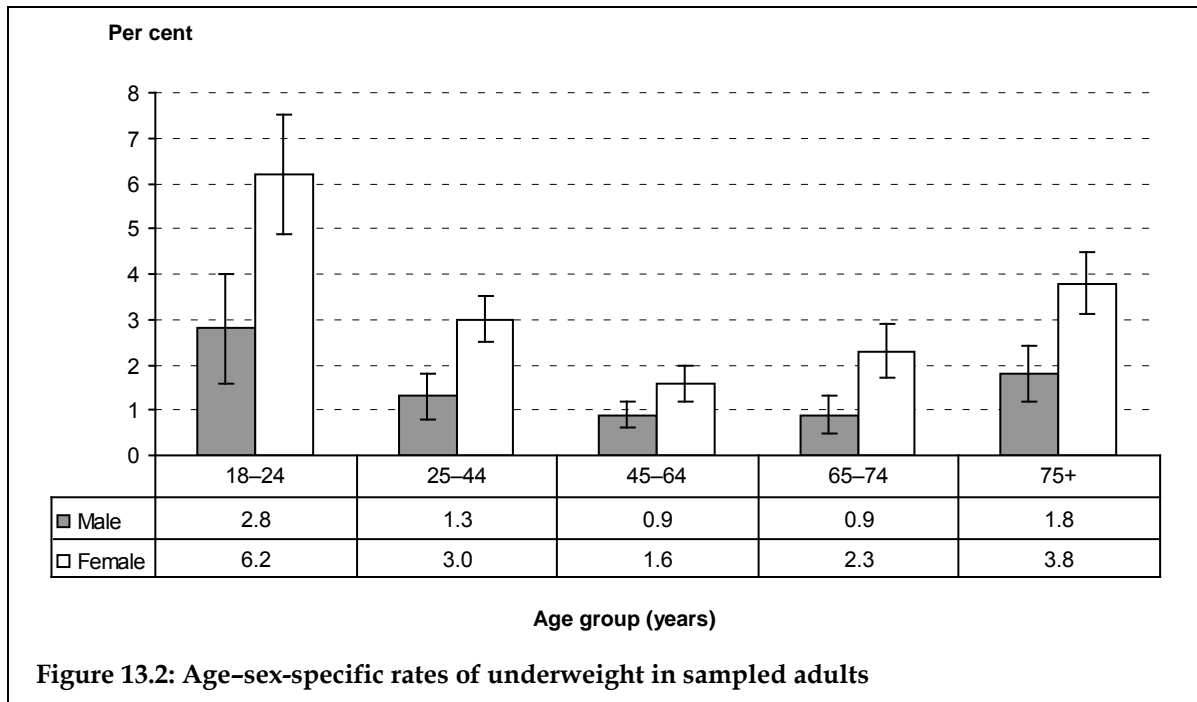
Body mass index of children

BMI was calculated for 3,093 patients aged 2–17 years at encounters with 818 GPs.

- Just over one-quarter of children (28.7%, 95% CI: 26.8–30.6) were classed as overweight or obese – 11.1% (95% CI: 9.8–12.5) obese and 17.6% (95% CI: 16.2–19.0) overweight (results not tabled).

- There was no difference in the prevalence of overweight/obesity among male (29.6%, 95% CI: 26.9–32.3) and female children (27.9%, 95% CI: 25.5–30.3) (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*.[99]

Per cent

	2–4	5–8	9–12	13–17
■ Male obese	11.6	14.6	12.7	9.4
● Male overweight	16.6	12.5	22.1	19.6
✕ Male normal weight	56.7	59.7	57.7	65.2
△ Male underweight	15.1	13.1	7.5	5.8

Age group (years)

Figure 13.3: Age-specific rates of obesity, overweight, normal weight and underweight in sampled male children

Per cent

	2–4	5–8	9–12	13–17
■ Female obese	12.9	14.0	8.7	8.0
● Female overweight	13.2	16.2	18.1	20.3
✕ Female normal weight	56.7	59.7	60.5	63.3
△ Female underweight	17.2	10.1	12.6	8.4

Age group (years)

Figure 13.4: Age-specific rates of obesity, overweight, normal weight and underweight in sampled female children

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.[100] It is a major risk factor for coronary heart disease, stroke, peripheral vascular disease, several cancers, respiratory disorders ad other diseases.[101] It has been identified as the risk factor associated with the greatest disease burden, accounting for 7.8% of the total burden of disease in Australia in 2003,[90] a decrease from 9.7% of total burden in 1996.[91] In 2010, the AIHW cited OECD data that showed Australia's tobacco smoking rates steadily decreased between 1987 and 2006 (from 30.6% to 16.6% of daily smokers aged 15 years and over), with the ranking improving from middle third to best third when compared with other OECD nations.[92] 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.[102]

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 33,086 adult patients was established at encounters with 984 GPs. Table 13.2 shows that:

* 14.7% of sampled adult patients were daily smokers
* significantly more male (18.0%) than female patients (12.6%) were daily smokers
* only 2.5% of sampled adult patients were occasional smokers
* more than a quarter of sampled adults (27.9%) were previous smokers.

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* = 12,777)	Per cent in patient population (95% CI)[b]	Per cent in BEACH sample (95% CI) (*n* = 20,060)	Per cent in patient population (95% CI)[b]	Per cent in BEACH sample (95% CI) (*n* = 33,086)	Per cent in patient population (95% CI)[b]
Daily	18.0 (17.1–19.0)	21.4 (20.3–22.5)	12.6 (11.8–13.3)	14.1 (13.3–14.9)	14.7 (14.0–15.3)	17.4 (16.6–18.2)
Occasional	2.9 (2.6–3.3)	3.8 (3.3–4.2)	2.2 (2.0–2.4)	2.6 (2.3–2.9)	2.5 (2.3–2.7)	3.2 (2.9–3.5)
Previous	36.3 (35.1–37.4)	30.4 (29.3–31.5)	22.6 (21.8–23.5)	21.7 (20.8–22.5)	27.9 (27.2–28.7)	25.7 (24.9–26.4)
Never	42.8 (41.6–44.1)	44.4 (43.2–45.7)	62.6 (61.6–63.7)	61.7 (60.6–62.8)	54.9 (53.9–55.8)	53.8 (52.8–54.8)

(a)   Patient sex was not recorded for 249 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 2011–12) (*n* = 14.8 million, source: unpublished Medicare data, personal communication, DoHA, April 2012).

Note: CI – confidence interval.

Daily smoking was least prevalent in older adults aged 65– 74 and 75 or more (8.9% and 4.1% respectively) and most prevalent among adult patients aged 25–44 years (21.2%) (results not tabled). Over half (54%) of the male and 25% of the female patients aged 75 years and over were previous smokers, but only 5.7% of males and 3.1% of females in this age group were daily smokers (Figures 13.5 and 13.6).

	18–24	25–44	45–64	65–74	75+
Male daily	21.4	28.7	20.9	10.4	5.7
Male previous	9.2	21.3	34.9	49.0	54.1

Age group (years)

Figure 13.5: Smoking status – male age-specific rates of sampled patients

	18–24	25–44	45–64	65–74	75+
Female daily	15.3	17.3	15.3	7.6	3.1
Female previous	9.1	19.5	24.7	29.3	25.4

Age group (years)

Figure 13.6: Smoking status – female age-specific rates of sampled patients
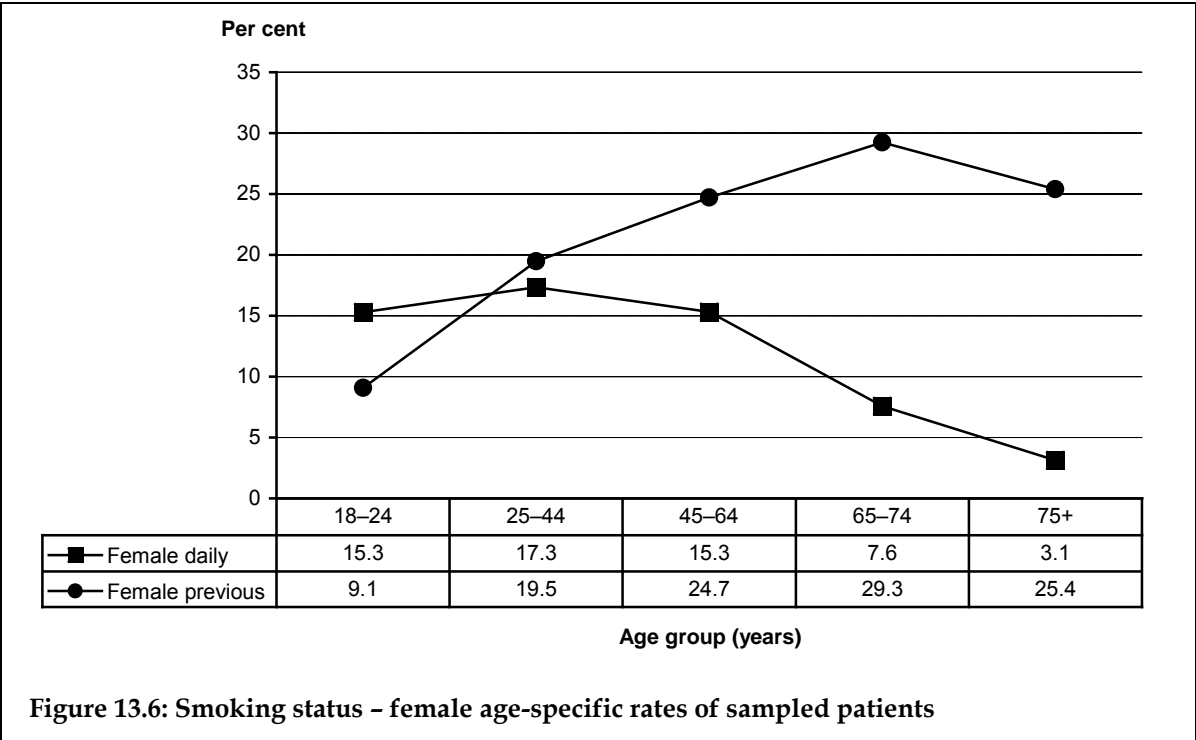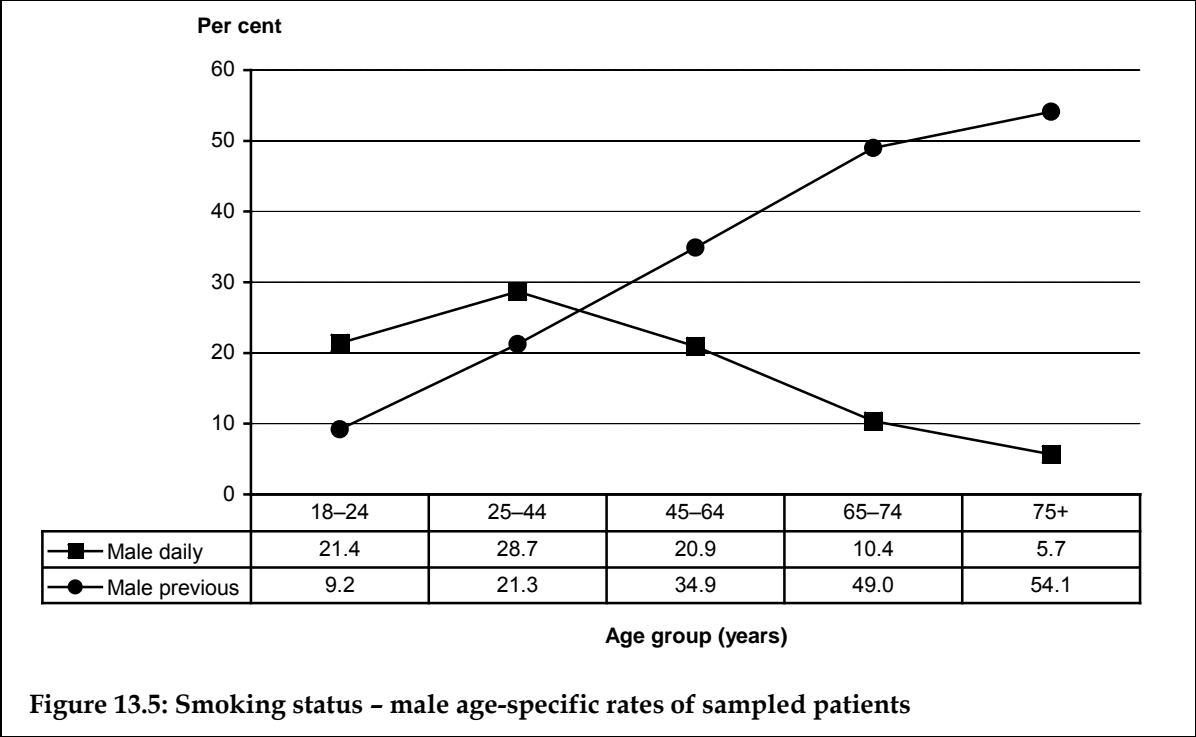
Estimation of smoking in the adult general practice patient population

The BEACH study reports data about patient smoking habits from a sample of 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 subsample than in the total population who attend a GP at least once in a year. We weighted the 2011–12 BEACH smoking substudy to estimate smoking status of the GP–patient attending population (that is, the 14.8 million adult patients who attended a GP at least once in 2011–12 [personal communication, DoHA, April 2012]), using the method described by Knox et al. (2008).[24]

After adjusting for age–sex attendance patterns we estimated that 17.4% of the patient population were daily smokers, 3.2% were occasional smokers, 25.7% were previous smokers and 53.8% had never smoked. Male patients in the total general practice population were significantly more likely to be daily (21.4%), occasional (3.8%) and previous smokers (30.4%) than females patients (13.1%, 2.6% and 21.7%, respectively) (Table 13.2).

13.3   Alcohol consumption (patients aged 18 years and over)

In 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[103] (in particular ischaemic heart disease).[104] In a review of the evidence, the National Health and Medical Research Council (NHMRC) concluded that in young women there was no evidence of any cardiovascular mortality benefit from alcohol consumption, and in young men any benefit was outweighed by other alcohol-related causes of death.[104] 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%.[90]

The 2007–08 NHS classified alcohol use of those aged 15 years or more based on the estimated average daily consumption of alcohol during the previous week. They found that 12.6% drank at levels considered to be risky (14.4% of males and 10.8% of females).[20]

The 2010 National Drug Strategy Household Survey (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 older (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.[102] These alcohol consumption risk levels were based on the NHMRC 2009 guidelines.[105]

For consistency over time, this report uses the definitions of alcohol-related risk developed by WHO (see 'Method' below).[106] This differs from the definition in the NHMRC guidelines.

Method

To measure alcohol consumption, BEACH uses AUDIT-C[107] which is the first three items from the WHO Alcohol Use Disorders Identification Test (AUDIT),[106] with scoring for an Australian setting.[108] The AUDIT-C has demonstrated validity and internal consistency and performs as well as the full AUDIT tool.[109] The three AUDIT-C tool is practical and valid in a primary care setting to assess 'at-risk' alcohol consumption (heavy drinking and/or active alcohol dependence).[107] 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.[108]

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 at 32,257 adult patient (18 years and over) encounters with 984 GPs.

- About one-quarter of sampled adults reported drinking alcohol at at-risk levels (24.5%) (Table 13.3).

- At-risk drinking was more prevalent among male (29.3%) than female patients (21.5%) (Table 13.3).

- At-risk drinking was most prevalent in those aged 18–24 years, particularly among men. In this age group almost half the males and one in three females reported at-risk alcohol consumption (Figure 13.7).

- The proportion of patients who were at-risk drinkers decreased with age for both males and females (Figure 13.7).

These estimates are not comparable with the 2007–08 NHS[20] or the 2010 NDSHS[102] as they all use different concepts for defining alcohol consumption and risk, and different adult populations (patients aged 18 years or more for BEACH, persons aged 15 years or more for the NHS, and persons aged 14 years or more for the NDSHS).

Readers interested in the relationship between morbidity 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*.[110]

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* = 12,572)	Per cent in patient population (95% CI)[a]	Per cent in BEACH sample (95% CI) (*n* = 19,685)	Per cent in patient population (95% CI)[a]	Per cent in BEACH sample (95% CI) (*n* = 32,257)	Per cent in patient population (95% CI)[a]
At-risk drinker	29.3 (28.1–30.5)	33.3 (32.0–34.7)	21.5 (20.6–22.5)	23.2 (22.2–24.2)	24.5 (23.7–25.4)	27.9 (26.9–28.9)
Responsible drinker	46.7 (45.5–48.0)	44.3 (43.1–45.6)	41.8 (40.8–42.8)	42.6 (41.5–43.6)	43.7 (42.9–44.6)	43.4 (42.5–44.3)
Non-drinker	24.0 (22.8–25.2)	22.3 (21.1–23.6)	36.7 (35.3–38.0)	34.2 (32.9–35.6)	31.7 (30.6–32.8)	28.7 (27.6–29.9)

(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 2011–12) (n = 14.8 million, Source: personal communication, DoHA, April 2012).

Note: CI – confidence interval.

	18–24	25–44	45–64	65–74	75+
Male at-risk	44.9	38.3	33.1	23.0	12.3
Female at-risk	35.9	24.7	22.1	18.2	11.7

Age group (years)
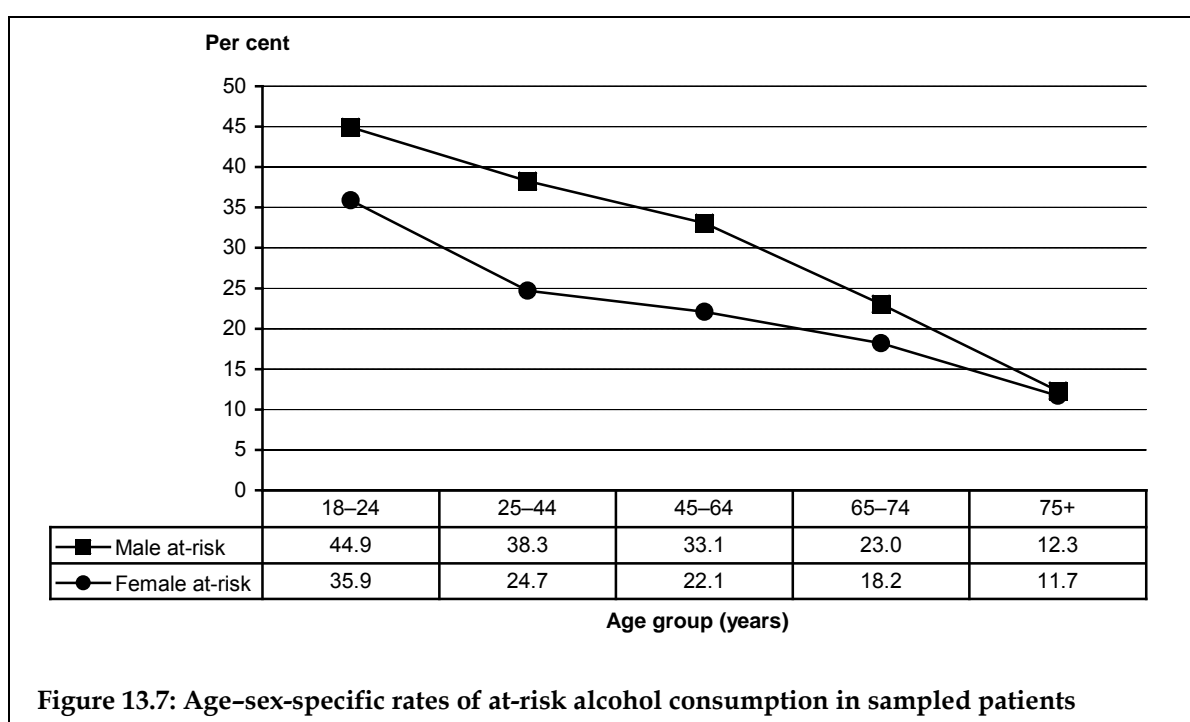
Figure 13.7: Age–sex-specific rates of at-risk alcohol consumption in sampled patients

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

The BEACH study reports 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 sample than in the total population who attend a GP at least once in a year.

We weighted the 2011–12 BEACH sample to estimate alcohol consumption levels among the GP–patient attending population (that is, the 14.8 million adult patients who attended a GP at least once in 2011–12 [personal communication, DoHA, April 2012]), using the method described by Knox et al. (2008).[24] After adjusting for age–sex attendance patterns we estimated that 27.9% of the patient population were at-risk drinkers, 43.4% were responsible drinkers and 28.7% were non-drinkers. Males in the general practice population were significantly more likely to be at-risk drinkers (33.3%) than females (23.2%) (Table 13.3).

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 were considered risk factors. A risk factor profile was prepared for the 31,401 adult patients for whom data were available in all three elements, with 981 GPs. (Table 13.4).

- About half (52.1%) the sampled adult respondents had one risk factor. The most common was overweight (23.4% of adults) followed by obesity (18.3%).
- Almost one in five patients (18.9%) had two risk factors, the most common combinations being:
  - overweight and at-risk alcohol consumption – 6.8% of patients
  - obesity and at-risk alcohol consumption – 4.5% of patients
  - daily smoking and at-risk alcohol consumption – 2.7% of patients.
- A small group of patients (3.6%) 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 (29.5%) than males (18.9%).
- Females were significantly less likely to have two or three risk factors (15.5% and 2.5% respectively) than males (24.3% and 5.4%).

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

The 2011–12 BEACH sample was weighted to estimate the risk profile of the GP–patient attending population (that is, the 14.8 million adult patients who attended a GP at least once in 2011–12 (personal communication, DoHA, April 2012), using the method described by Knox et al. (2008).[24]

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

- one-quarter of patients had no risk factors (24.1%)
- half of the adult patients had one risk factor (50.2%), the most common being overweight (21.7% of adults) followed by obesity (16.9%)
- one in five patients had two risk factors (21.2%), the most common combinations being overweight and at-risk alcohol consumption (7.5%), followed by obesity and at-risk alcohol consumption (4.8%)
- 4.5% of patients who attend general practice had three risk factors (Table 13.4)
- significantly more female than male patients had no risk factors (29.3% and 17.9% respectively). Male patients were also more likely to have one, two and three risk factors (48.8%, 26.7% and 6.5%) than females (51.4%, 16.4% and 2.8%) (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* = 31,401)	95% LCL	95% UCL	Per cent in patient population[a]	95% LCL	95% UCL
No risk factors	**7,967**	**25.4**	**24.6**	**26.2**	**24.1**	**23.3**	**24.9**
One risk factor	**16,365**	**52.1**	**51.4**	**52.8**	**50.2**	**49.5**	**50.9**
Overweight only	7,360	23.4	22.8	24.1	21.7	21.0	22.3
Obese only	5,733	18.3	17.7	18.9	16.9	16.2	17.5
At-risk alcohol level only	2,225	7.1	6.6	7.5	7.8	7.3	8.3
Current daily smoker only	1,047	3.3	3.1	3.6	3.9	3.6	4.2
Two risk factors	**5,936**	**18.9**	**18.3**	**19.5**	**21.2**	**20.5**	**21.9**
Overweight and at-risk alcohol level	2,136	6.8	6.4	7.2	7.5	7.1	7.9
Obese and at-risk alcohol level	1,405	4.5	4.2	4.8	4.8	4.5	5.1
Daily smoker and at-risk alcohol level	839	2.7	2.5	2.9	3.3	3.1	3.6
Overweight and current daily smoker	811	2.6	2.4	2.8	2.9	2.7	3.2
Obese and current daily smoker	745	2.4	2.2	2.6	2.6	2.4	2.9
Three risk factors	**1,133**	**3.6**	**3.3**	**3.9**	**4.5**	**4.2**	**4.9**
Overweight and current daily smoker and at-risk alcohol level	697	2.2	2.0	2.4	2.9	2.6	3.1
Obese and current daily smoker and at-risk alcohol level	436	1.4	1.2	1.5	1.7	1.5	1.9

(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 2011–12) (*n* = 14.8 million).

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

Table 13.5: Number of risk factors, by patient sex

Number of risk factors	Male Per cent in BEACH sample (95% CI) (*n* = 12,252)	Male Per cent in patient population (95% CI)[a]	Female Per cent in BEACH sample (95% CI) (*n* = 19,149)	Female Per cent in patient population (95% CI)[a]
No risk factors	18.9 (18.0–19.8)	17.9 (17.0–18.9)	29.5 (28.6–30.5)	29.3 (28.3–30.3)
One risk factor	51.5 (50.4–52.5)	48.8 (47.7–49.9)	52.5 (51.7–53.4)	51.4 (50.5–52.3)
Two risk factors	24.3 (23.3–25.2)	26.7 (25.7–27.8)	15.5 (14.8–16.1)	16.4 (15.7–17.1)
Three risk factors	5.4 (4.9–5.8)	6.5 (5.9–7.1)	2.5 (2.2–2.8)	2.8 (2.5–3.1)

(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 2011–12) (*n* = 14.8 million, source: personal communication, DoHA, April 2012).

Note: CI – confidence interval.

13.5   Changes in patient risk factors over the decade 2002–03 to 2011–12

To investigate changes over time in these patient risk factors, results are reported from the BEACH sample data for each year from 2002–03 to 2011–12 in the companion report *A decade of Australian general practice activity 2002–03 to 2011–12.*[1]

The major changes between 2002–03 and 2011–12 are summarised below.

- The prevalence of obesity in adults attending general practice increased significantly, from 20.9% to 26.6%, an increase apparent in both male and female patients. In parallel the prevalence of normal weight and underweight in adults attending general practice decreased significantly, from 42.4% and 2.9% to 36.2% and 2.3%.

- The prevalence of overweight and obesity in children aged 2–17 years remained stable, with about 11–12% of children being obese and about 18% overweight.

- Prevalence of daily and occasional smoking decreased significantly in adults aged 18 years and over, from 17.2% and 4.1%, respectively, to 14.7% and 2.5%.

- The prevalence of at-risk alcohol consumption among adults aged 18 years and over attending general practice remained stable at about 25–26%.

- The number of adults aged 18 years and over with one risk factor (overweight/obesity, at-risk drinking, daily smoker) increased significantly from 48.1% to 52.1% and the number with zero risk factors decreased significantly from 28.6% to 25.4% between 2002–03 and 2011–12.

14 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 size of the sample and its statistical power.

This chapter includes the abstracts and research tools for SAND substudies conducted from April 2011 to March 2012. The subjects covered in the abstracts in this chapter are listed in Table 14.1, with the sample size for each topic.

Table 14.1: SAND abstracts for 2011–12 and sample size for each

Abstract number	Subject	Number of respondents	Number of GPs
180	Polypharmacy and adverse drug events in general practice patients aged 50 years and over	4,468	293
181	Influenza and pneumococcal infection risk and vaccination status among adult general practice patients	2,437	99
182	Chronic obstructive pulmonary disease (COPD) in general practice patients (2)	2,869	100
183	Cardiovascular disease, risk factors, antiplatelet use and gastrointestinal side effects among general practice patients	2,743	92
184	CKD and dyslipidaemia among general practice patients	5,674	192
185	Diabetes management and self-monitoring in general practice patients	5,730	194
186	Hepatitis B and travel vaccinations	2,826	95
187	General practice patient behaviour in seeking help for depression	2,971	101
188	Acute coronary syndrome among general practice patients	2,957	100
189	Menopause symptoms among female general practice patients aged 40–69 years	673	100
190	Benign prostatic hyperplasia (BPH) and symptoms among male general practice patients aged 40 years or older	708	93
191	NSAID use, gastrointestinal and cardiovascular risk in general practice patients with arthritis	5,429	186
192	Influenza risk, vaccination and diagnosis among general practice patients	2,737	93
193	Diabetes, macular oedema and dyslipidaemia among general practice patients	2,825	97
194	Adult general practice patients' cardiovascular risk and lipid medication use	2,531	100

SAND abstract number 180: Polypharmacy and adverse drug events in general practice patients aged 50 years and over

Organisation conducting this study: Family Medicine Research Centre

Issues: Proportion of general practice patients aged 50 years or older on regular medication and the type and number of medications. Proportion of patients with an adverse drug event (ADE) in the preceding six months, type of medication causing the adverse event and the severity of the event.

Sample: 4,468 patients aged 50 yrs or more from 293 GPs; data collection period: 22/02/2011 – 28/03/2011 and 29/11/2011 – 20/02/2012.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. Drugs were classified using the WHO Anatomical Therapeutic Chemical (ATC) classification.

Summary of results

The sex distribution or patients in this sample did not differ from that of patients aged 50 years or older at all BEACH encounters 2010–11.

The number of regular medications recorded for each patient aged 50 years and over varied from none in 12.9%, one in 12.6%, five in 9.7% to ten or more in 8.9%, for an average number of medications of 4.4. There was no difference in the average number of medications per patient between male and female patients. The average number of medications per patient increased from 2.3 among those aged 50–54 years to 6.0 in patients aged 75 years and older.

Of 17,878 medications for which details were recorded 32.2% were cardiovascular drugs and alimentary tract and metabolism medications made up 17.9% at ATC level 1. At ATC Level 4, statins were the most common (7.7%), followed by proton pump inhibitors (6.3%).

Of 3,994 respondents to the ADE question, 449 (11.2%, 95% CI: 9.8–12.7) reported an ADE in the preceding six months. In the patients who recorded an ADE there was no difference in sex, location or Health Care Card status. Patients 75 years and older were more likely to have had ADEs (13.9%, 95% CI: 11.5–16.3) than those of 55–64 years (8.7%, 95% CI: 6.9–10.4). Likelihood of adverse events increased in a linear fashion with total number of medications taken, from 6.2% of those taking 1–2, to 23.8% of those taking 10 or more medications.

For 449 ADE patients, GPs implicated a medication in 435; one medication was listed for 384 (88.3%), and 44 (10.1%) listed two, a total of 493 implicated medications. Cardiovascular and nervous system drugs each accounted for about one-third of ADEs. There were significant differences between prescribing rates and rates of ADEs for some drug groups. At ATC level 1, nervous system drugs accounted for 17.3% of all medications but 29.0% of medications implicated in the most recent ADE. At ATC level 2, analgesics accounted for 7.5% of all medications and 13.2% of implicated medications; lipid modifying agents accounted for 9.2% of medications but only 6.5% of implicated medications. At the more specific ATC level 3, opioids accounted for 2.6% of all medications listed and 11.8% of implicated medications.

Of the 449 ADE respondents, 443 reported on severity of the event. Of these, 47.4% had a mild event, 41.5% had a moderate event and 11.1% a severe adverse drug event.

The following pages contain the recording form and instructions with which the data in this substudy were collected.

PLEASE READ CAREFULLY

The shaded section of the following forms investigates **THE ASSOCIATION BETWEEN POLYPHARMACY AND ADVERSE PHARMACOLOGICAL EVENTS IN OLDER GENERAL PRACTICE PATIENTS.**

You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

For the **next 30 PATIENTS**, ask all who are **aged 50 years and over** the following questions. If the patient is aged less than 50 years please leave the questions blank.

Please **DO NOT select patients** to suit the topic being investigated.

Severity of the event

Please indicate the **severity of the event** 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 requires further treatment; limits daily activities.

Severe – a reaction of any duration which results in hospitilisation and/or long term limitation of daily activities.

ASK THE PATIENT

Adverse medication event

Please ask the patient if they have **experienced an adverse event 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** adverse events were experienced, **end the questions here.**

Medication involved in the event

Please **list the drug (or drugs in the case of interactions) that you suspect were the cause of the most recent adverse event.**

The drug(s) may be listed using the **generic** or **brand** name.

Routine medication use

This question refers to any **prescribed or doctor-advised medications routinely taken** by patients aged 50 years and older.

For example, if the patient is currently undertaking a course of monthly injections, uses a bronchodilator when required, or a daily statin, you should answer '**yes**'.

You **do not** need to duplicate the medications you have **recorded at today's consultation.**

Medications routinely taken

Please **list the names of prescribed or doctor-advised medications routinely taken** by the patient (other than those prescribed or advised today).

List up to 8 medications. If there are more than 8, please indicate how many more by writing a number in the space provided.

For patients aged 50+ years:

Is the patient currently taking any routine medications other than those you prescribed or advised today?

☐ Yes
☐ No

BL130C

If 'yes', please name these medications:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

If more than 8, how many more? _____

In the past six months has this patient experienced an adverse event in response to use of medication:

☐ Yes
☐ No → **End questions**

Please list the drug(s) you suspect caused the most recent event:

_____
_____

Was the event -

☐ Mild
☐ Moderate
☐ Severe
☐ Don't know

SAND abstract number 181: Influenza and pneumococcal infection risk and vaccination status among adult general practice patients

Organisation collaborating for this study: CSL Biotherapies Pty Ltd

Issues: The proportion of adult general practice patients who had: risk factors for influenza or pneumococcal infection; discussed influenza or pneumococcal vaccination with a health professional, and who initiated the discussion(s). Influenza and pneumococcal vaccination status, source of vaccine supply, and reason(s) for not vaccinating unvaccinated patients.

Sample: 2,437 adult patients (aged 18 years and over) from 99 GPs; data collection period: 29/03/2011 – 02/05/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. Drugs were classified using the WHO Anatomical Therapeutic Chemical (ATC) classification.
Methods for this study: Risk factors for influenza and pneumococcal infection were adapted from those in the Australian Immunisation Handbook (9th Edition, 2008, National Health and Medical Research Council) and were supplied to participating GPs on a card.

Summary of results

The age and sex distributions of patients in this SAND sample did not differ significantly from all patients at 2010–11 BEACH encounters.

Prevalence of at least one risk factor for influenza and/or pneumococcal infection was 53.0% (95% CI: 48.3–57.7) adult patients. Most risk factors were common to both influenza and pneumococcal, and the most common were: age 65 years and over (33.2%), chronic heart disease (8.9%), diabetes (8.5%), chronic lung disease (8.3%) and other chronic diseases (6.8%).

Influenza vaccination: Of 2,340 adult respondents, 1,269 (54.2%) had discussed influenza vaccination with a health care professional in the previous 12 months. Of the 1,266 respondents with at least one risk factor for influenza, 79.7% had discussed vaccination in the past year, and most were GP-initiated (79.2% of 1,260 respondents). Of 2,363 patients for whom vaccination status was given, 1,082 (45.8%) were vaccinated, 1,124 (47.6%) were not, and status was not known for 157 patients. Of 1,061 vaccinated respondents, 80.5% were supplied the vaccine free of charge (i.e. government supplied), for 3.4% the vaccine was PBS subsidised, and for 16.1% it was fully privately funded. There were 1,093 reasons for not being vaccinated given by 1,087 unvaccinated patients: 55.5% of patients were considered 'not at risk', and 14.5% gave 'patient objection' as the reason.

Pneumococcal vaccination: Of 2,265 adult respondents, 798 (35.2%) had discussed pneumococcal vaccination with a health care professional in the previous 5 years. Of the 1,149 respondents with at least one risk factor for pneumococcal infection, 64.8% had discussed vaccination in the previous 5 years. GPs initiated the discussion in most cases (85.5% of 764 respondents). Of 2,193 patients with recorded vaccination status, 687 (31.3%) were vaccinated, 1,303 (59.4%) were not, and status was not known for 203 patients. Of 650 vaccinated respondents, 94.5% were supplied the vaccine free of charge (i.e. government supplied), for 3.2% the vaccine was PBS subsidised, and for 2.3% it was fully privately funded. There were 1,202 reasons for not being vaccinated given by 1,198 unvaccinated patients: 66.5% of patients were considered 'not at risk', and 122 (10.2%) gave 'patient objection' as the reason.

The following pages contain the recording form and instructions with which the data in this substudy were collected.

Risk factors for influenza and pneumococcal infection

This card lists the risk factors and indications for influenza and/or pneumococcal vaccination.

Please circle the numbers on the recording form to indicate whether this patient has any of the listed risk factors or indications.

1. ≥65 years of age

2. ≥50 years of age and Aboriginal and/or Torres Strait Islander

3. Childhood immunisation schedule

4. Chronic heart disease

5. Chronic lung disease (including emphysema, severe asthma)

6. Diabetes

7. Other chronic disease(s) e.g. chronic renal failure

8. Immune deficiency (e.g. HIV, malignancy)

9. Tobacco smoker

10. Pregnancy

11. Residents of nursing home or other long-term facilities

12. People in contact with high risk patients (e.g. staff of nursing homes)

13. Cerebrospinal fluid leak

14. Asplenia (functional or anatomical)

15. Aboriginal and/or Torres Strait Islander 15-49 years with conditions placing them at increased risk of pneumococcal infection

Source: adapted from the National Health and Medical Research Council (NHMRC) Australian Immunisation Handbook 9th Edition 2008

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **INFLUENZA AND PNEUMOCOCCAL VACCINATION.**
You may tear out this page as a guide to completing the following section of forms.

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.

Risk factors for influenza and pneumococcal infection

Please **circle the numbers** to indicate whether this patient has any of the listed risk factors or indications for **influenza** and/or **pneumococcal** vaccination.

1. ≥65 years of age
2. ≥50 years of age and ATSI (Aboriginal and/or Torres Strait Islander)
3. Childhood immunisation schedule
4. Chronic heart disease
5. Chronic lung disease (e.g. emphysema, severe asthma)
6. Diabetes
7. Other chronic disease(s) e.g. chronic renal failure
8. Immune deficiency (e.g. HIV, malignancy)
9. Tobacco smoker
10. Pregnancy
11. Residents of nursing home or other long-term facilities
12. People in contact with high risk patients (e.g. staff of nursing homes)
13. Cerebrospinal fluid leak
14. Asplenia (functional or anatomical)
15. ATSI 15-49 years with conditions placing them at increased risk of pneumococcal infection

The **risk factors/indications** listed above are also on a **card** in your research pack.

Influenza and pneumococcal vaccination

Please indicate whether, prior to today's visit, **vaccination** has been **discussed with the patient** for:
1. **influenza** in the **past 12 months**; and/or
2. **pneumococcal** in the **past 5 years**.
This question refers to discussion with **a health professional** irrespective of whether the vaccination was given.

Patients who WERE vaccinated

For patients who **received an influenza and/or pneumococcal vaccination** please indicate for each vaccine whether it was/were **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 **influenza and/or pneumococcal vaccination** please indicate the **reasons that the vaccine(s) was/were not given.**

Vaccination status

Please use the tick boxes to indicate whether the patient is **currently vaccinated for influenza** (i.e. within the past 12 months) and/or **pneumococcal** (i.e. within the past 5 years).

Initiation of discussion

For each type of vaccination, influenza (Influ) and pneumococcal (Pneum), please inidicate **who initiated the discussion.**

Please circle number(s) to indicate whether the patient has indications or risk factors for influenza or pneumococcal infection:

See key list on card, circle as many as apply

1.	2.	3.	4.	5.
6.	7.	8.	9.	10.
11.	12.	13.	14.	15.

□ **None of the above**

BL131B

Prior to today's visit, has vaccination been discussed with the patient for:

1. Influenza in the past 12 months? □ Yes □ No
2. Pneumococcal in the past 5 years? □ Yes □ No

If 'yes' who initiated the discussion(s)?

	Influ	Pneum
GP	□	□
Patient	□	□
Other health professional	□	□
Don't know	□	□

Is the patient currently vaccinated?

	Influ	Pneum
Yes	□	□
No	□	□
Don't know	□	□

If patient IS VACCINATED, how was the vaccine(s) supplied?

	Influ	Pneum
Free to patient *(i.e. Govt supplied)*	□	□
PBS subsidised	□	□
Fully privately funded	□	□

If patient IS NOT VACCINATED, the reason(s) was:

	Influ	Pneum
Patient not at risk	□	□
Patient objection	□	□
Cost to patient	□	□
Patient does not agree with risk assessment	□	□
Other reason	□	□

SAND abstract number 182: Chronic obstructive pulmonary disease (COPD) in general practice patients (2)

Organisation collaborating for this study: Novartis Pharmaceuticals Australia Pty Ltd

Issues: Prevalence of diagnosed chronic obstructive pulmonary disease (COPD) with or without asthma among patients attending general practice; severity of COPD; factors (listed with tick boxes) contributing to diagnosis of COPD; proportion with asthma diagnosed before COPD; medications taken for management of COPD/COPD with asthma; proportion who had medication changes at the current encounter, and the reasons for these changes.

Sample: 2,869 patients from 100 GPs; data collection period: 29/03/2011 – 2/05/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. Drugs were classified using the WHO Anatomical Therapeutic Chemical (ATC) classification.
Methods for this study: GOLD COPD guidelines were used to categorise severity of COPD <www.goldcopd.com/>.

Summary of results

The age and sex distributions of the sampled patients did not significantly differ from those of patients at all BEACH encounters in 2009–10.

Of the 2,869 respondents, 244 patients (8.5%, 95% CI: 6.9–10.1) currently had diagnosed asthma without COPD, 89 (3.1%, 95% CI: 2.3–4.0) had COPD without asthma, 63 (2.2%, 95% CI: 1.5–2.9) had both COPD and asthma, and 2,473 (86.2%, 95% CI: 84.4–88.0) had neither. The highest prevalence of COPD (with or without asthma) was among patients aged 75+ years. There was no significant difference in the prevalence of COPD between males and females.

Of the 152 patients with COPD, severity was reported for 146: 43.2% had mild COPD; 34.9% had moderate COPD; 16.4% had severe COPD; and 5.5% had very severe COPD.

Factors contributing to the diagnosis were reported for 150 patients with COPD (98.7%). Some were health states/risk factors, and some were diagnostic factors. Each section of this question had a different number of respondents: among 126 patients, 'clinical history/symptoms' was selected as a contributing factor for 125 (99.2%); among 71 patients, 'non-response to bronchodilator' was selected for 30 (42.3%); among 123 patients, 'smoking history' was nominated for 115 (93.5%); among 52 patients, 'environmental irritants' was selected for 13 (25.0%); among 105 patients, spirometry testing was nominated for 93 (88.6%); and among 99 patients, chest x-ray was selected for 82 (82.8%).

Of the 63 patients with both COPD and asthma, 41 of 57 respondents (71.9%) had been diagnosed with asthma before being diagnosed with COPD.

Medication use questions were answered by 142 of the 152 patients with COPD, and 114 of these (80.3%) were taking at least one. These 114 patients reported a total of 221 medications, the most common being tiotropium (31.2% of 221 medications) and salbutamol (28.5%). For seven patients (6.2% of 113 respondents) medication was changed at the current encounter. For three patients, lack of efficacy was the reason for the change, and one patient had medication changed due to progression of disease.

The following pages contain the recording form and instructions with which the data in this substudy were collected.

Severity of Chronic Obstructive Pulmonary Disease (COPD) reference card

Severity	Measure	Symptoms
Mild	**FEV_1/FVC < 0.7** **$FEV_1 \geq 80\%$ predicted**	**Characterised by mild airflow limitation.** **Symptoms of chronic cough and sputum production may be present.**
Moderate	**FEV_1/FVC < 0.7** **$FEV_1 \geq 50$ and <80% predicted**	**Characterised by worsening airflow limitation.** **Shortness of breath typically developing on exertion, chronic cough and sputum production may also be present.**
Severe	**FEV_1/FVC < 0.7** **$FEV_1 \geq 30$ and <50% predicted**	**Characterised by further worsening of airflow limitation.** **Greater shortness of breath, reduced exercise capacity, fatigue, and repeated exacerbations that almost always have an impact on patients' quality of life.**
Very severe	**FEV_1/FVC < 0.7** **FEV_1 <30% predicted or FEV_1 <50% predicted plus chronic respiratory failure[a]**	**Characterised by severe airflow limitation.** **Quality of life is very appreciably impaired and exacerbations may be life threatening.**

(a) Respiratory failure is defined as arterial pressure of oxygen (Pa_{O2}) <8.0 kPa (60 mm Hg) with or without arterial partial pressure of CO_2 (Pa_{CO2})>6.7 kPa (50 mm Hg) while breathing at sea level.

Note: FEV_1 – post bronchodilator forced expiratory volume in one second; FVC – forced vital capacity (maximal inspiration); FEV_1/FVC – ratio of forced expiratory volume to forced vital capacity.

Source: Rabe KF, Hurd S, Anzueto A, Barnes PJ, Buist SA, Calverley P et al. 2007. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive summary. Am J Respir Crit Care Med 176(6):532–555

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **MANAGEMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE.**
You may tear out this page as a guide to completing the following section of forms.

Chronic Obstructive Pulmonary Disease (COPD) and asthma

Please use the tick boxes to indicate whether this patient has been diagnosed with **COPD (without asthma), COPD with asthma or asthma (without COPD)**.

If the patient has been diagnosed with COPD (with or without asthma) please continue with the questions on this form.

If the patient has **not been diagnosed with COPD** please **end questions here** for this patient.

Factors contributing to COPD diagnosis

Please use the tick boxes to indicate the **factors** that played a role in the **diagnosis of COPD** in this patient.

COPD with asthma

For patients with <u>both</u> COPD and asthma please indicate if the **asthma was diagnosed prior to the COPD.**

Current medications

For patients with COPD (with or without asthma) please write the **name, form** and regimen (**dose and frequency**) of the COPD/asthma medication(s) **currently used.**

If the patient is **not taking any medication** for the treatment of COPD/asthma please tick the box labelled '**no medication**'.

Medication change

Please use the tick boxes to advise whether the patient's **COPD or asthma medication** was **changed** as a result of **today's encounter.** This includes, for example, changes in the dosage of existing medications, starting or stopping medications.

Reasons for medication change

If the medication was changed at today's encounter please indicate the **reason(s) that it was changed.**

Has this patient been diagnosed with:

COPD with Asthma ☐
COPD without Asthma ☐
Asthma without COPD ☐
None of the above ☐   **End questions**

BL131C

How severe is the patient's COPD?	
According to the GOLD guidelines (see card)	
☐ Mild	
☐ Moderate	
☐ Severe	
☐ Very Severe	

Severity of COPD

Referring to the **COPD severity scale** on the **laminated card** in your research pack, please indicate the **severity of the patient's COPD.**

Which factors contributed to the COPD diagnosis?	Yes	No
Clinical history/symptoms	☐	☐
Non-response to bronchodilator	☐	☐
Smoking history	☐	☐
Environmental irritants	☐	☐
Spirometry	☐	☐
Chest X-ray	☐	☐
Other: _____		

If the patient has <u>both COPD and asthma,</u> was the asthma diagnosed prior to the COPD?
☐ Yes
☐ No

Current COPD/asthma+COPD medication/s:

Name & Form	Strength	Dose	Frequency
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

☐ NO MEDICATION

Was the COPD/asthma medication changed today (e.g. change in dose or type of medication)?
☐ Yes
☐ No

If 'yes', for what reason(s) was it changed?
☐ Lack of efficacy
☐ Patient request
☐ Progression of disease
☐ Side effect(s)
☐ Other: *(please specify)* _____

SAND abstract number 183: Cardiovascular disease, risk factors, antiplatelet use and gastrointestinal side effects among general practice patients

Organisation collaborating for this study: AstraZeneca Pty Limited

Issues: Among patients attending general practice: prevalence of listed cardiovascular disease (CVD) or CVD risk factors (as listed in results); proportion taking antiplatelet medication (APM); type, dose and duration of APM; and prevalence and management of gastrointestinal side effects (GI SEs) (present or at risk) due to APM.

Sample: 2,743 patients from 92 GPs; data collection period: 03/05/2011 – 06/06/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. Drugs were classified using the WHO Anatomical Therapeutic Chemical (ATC) classification.

Summary of results

Responses to either or both the CVD and APM questions were given for 2,743 patients; (2,693 answered both, 30 the CVD question alone and 20 the APM question alone). When these respondents were compared with patients at all BEACH encounters in 2010–11, the sex distribution did not differ, but minor differences in age distribution were noted, with more 1–4 and 25–44 year-olds and fewer 75 years and over.

Among 2,723 respondents, prevalence of at least one CVD/risk factor was 59.8% (95% CI: 55.9–63.6): 9.5% had diabetes; 26.4% hypertension; 18.7% high total cholesterol; 4.4% familial dyslipidaemia; 8.3% were current smokers; 2.4% had moderate or severe CKD; 9.0% existing CVD; 15.1% had a family history of CVD; 38.2% were aged 45–74 years; and 1.4% were Aboriginal or Torres Strait Island persons aged 35 years or more.

Of 2,713 respondents, 12.1% were currently taking APM, 81.7% of these for more than one year. The proportion taking APM rose significantly with age: 12.4% of 45–64 year olds, 30.2% of 65–74 year-olds, and 47.2% of those 75 years or more.

Of 2,712 respondents to the APM questions, 10.0% were taking aspirin, 1.8% clopidogrel, nine (0.3%) aspirin/dipyridamole, eight (0.3%) aspirin/clopidogrel, and one other; (total 339 medications). This equates to 10.6% taking aspirin (including combinations) and 2.1% clopidogrel (including combinations), with 21 patients in both groups.

Of 1,607 respondents with at least one CV condition/risk factor, 20.2% were taking APM, 81.8% of these for more than one year; 17.7% were taking aspirin (including combinations) and 3.6% taking clopidogrel (including combinations), including 21 patients taking both.

Of 318 respondents on APM, 65 (20.4%) had had GI SEs, and a further 113 (37.5%) of 301 of these responding were at risk of GI SEs. All of the 65 with GI SEs were being managed for these: 90.8% with medication, 38.5% being monitored and 15.4% having investigations/tests. Of 58 detailed medication responses, 98.3% were using a proton pump inhibitor: 34.5% esomeprazole and 27.6% pantoprazole.

The following pages contain 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 **ANTIPLATELET MEDICATIONS AND GASTROINTESTINAL SIDE EFFECTS.**

You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

Ask **ALL** of the next 30 PATIENTS the following questions **in the order in which the patients are seen.**

Please **DO NOT select patients** to suit the topic being investigated.

Cardiovascular risk factors and disease

Please use the tick boxes to indicate whether this patient has any of the listed **risk factors** for cardiovascular disease and/or **established cardiovascular disease.**

Note: CKD=Chronic kidney disease, Hx=history.

Antiplatelet medication use

Please ask the patient whether they currently take **antiplatelet medication** (e.g. **aspirin, clopidogrel**).

If '**yes**' please indicate the **duration** that the patient has used antiplatelet medications.

Note: these questions relate to antiplatelet medication use. They do not refer to other anticoagulant medications (e.g. warfarin).

If '**No**', please end questions here for this patient.

Antiplatelet medication

In the space provided please write the **name** and **form** of the **antiplatelet medication,** and the regimen (i.e. **strength, dose and frequency**) of the medication(s) the patient is currently taking.

Please include any aspirin combination medications if taken for antiplatelet purposes.

Gastrointestinal (GI) side effects

Please use the tick boxes to advise whether this patient has experienced **any GI side effects due to antiplatelet use,** OR is **at risk of GI side effects due to antiplatelet use.**

Gastrointestinal risk and side effects

Please use the tick boxes to indicate how **gastrointestinal (GI) risks and side effects** associated with **antiplatelet** medication use **are managed** in this patient. Please tick all that apply

If the patient uses a **medication** to manage these risks/side effects please specify the medication **name** in the space provided.

Does this patient have any of the following conditions/risk factors:

- ☐ Diabetes
- ☐ Hypertension
- ☐ High total cholesterol
- ☐ Familial dyslipidaemia
- ☐ Current smoker
- ☐ Moderate or severe CKD (GFR: <45mL/min/1.73m²)
- ☐ Existing cardiovascular disease
- ☐ Family Hx of cardiovascular disease
- ☐ None of the above   BL132B

Does this patient currently take antiplatelet medication?

- ☐ Yes (duration <1yr)
- ☐ Yes (duration >1yr)
- ☐ No → **End Questions**

Current antiplatelet medication(s):

Name & Form	Strength	Dose	Frequency

(Please include aspirin combinations if taken as an antiplatelet)

Due to antiplatelet use has this patient...

a) had gastrointestinal (GI) side effect(s)?
- ☐ Yes
- ☐ No

b) at risk of GI side effect(s)?
- ☐ Yes
- ☐ No

How do you manage GI risks OR side effects associated with antiplatelet use for this patient?

(Tick all that apply)

- ☐ Medications: *(please specify)*
- ☐ Monitoring
- ☐ Investigations/testing
- ☐ No management

_____

_____

SAND abstract number 184: CKD and dyslipidaemia among general practice patients

Organisation collaborating for this study: Merck Sharp and Dohme (Australia) Pty Ltd

Issues: The proportion of general practice patients who: had their kidney function assessed in the previous 12 months; had conditions or risk factors associated with chronic kidney disease (CKD); had diagnosed CKD and the stage of disease; were currently on dialysis. Recent lipid level results and current use of lipid-lowering medication.

Sample: 5,674 patients from 192 GPs; data collection period: 3/05/2011 – 11/07/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. Drugs were classified using the WHO Anatomical Therapeutic Chemical (ATC) classification

Summary of results

Patient age was provided at 5,643 encounters. A significantly greater proportion of patients in the sample were aged 25–44 years and a smaller proportion were 45–74 years than the patients at all BEACH encounters 2010–11. The sex of the patient was provided at 5,640 encounters and distribution did not differ from that at all BEACH encounters.

Among 5,659 respondents to the question on kidney function testing, 53.5% had had at least one kidney function test in the previous 12 months: 42.5% had had a serum creatinine test, 1.0% had had a proteinuria/microalbuminuria test, and 9.9% had had both tests.

Of 5,534 respondents to the question about CKD, 387 (7.0%, 95% CI: 5.7–8.3) had diagnosed CKD. Four out of five of these patients were diagnosed by a GP. Prevalence rose with age from 4.5% of patients aged 45–64 years to 29.0% of those aged 75 years or older. There was no difference between male and female patients in the prevalence of CKD.

The stage of CKD was known for 385 patients: 17.7% were at stage 1, 24.7% were at stage 2, 42.6% were at stage 3, 7.3% were at stage 4 and 1.8% were at stage 5. Among 308 patients for whom dialysis status was known, 1.0% were currently receiving dialysis.

Test status was available for 386 CKD patients: 96.6% had had at least one kidney function test in the previous 12 months: 92.7% of patients with stage 1 CKD, 99.0% of those in stage 2, 96.9% of those at stage 3, and all patients at stage 4 and 5.

Of 5,588 patients who gave information on associated conditions or risk factors, 26.2% had hypertension, 18.7% had dyslipidaemia, 9.1% were current smokers and 8.9% had diabetes. Among 382 CKD patients, 79.8% had hypertension, 50.5% had dyslipidaemia, 35.1% had diabetes, and 5.0% were current smokers.

Total cholesterol level was known for 338 CKD patients, and the average level was 4.6. The average LDL cholesterol level was 2.5 for 297 CKD respondents, and average HDL was 1.3 for 302 CKD patients. Average triglyceride level for 327 patients was 1.7.

Among 370 patients with CKD, 46.0% were not taking any lipid medication. Just over half (51.6%) were currently taking one lipid medication, and nine patients (2.4%)were taking two. A total of 200 CKD patients were taking 209 lipid-lowering medications. Atorvastatin accounted for 40.2% and simvastatin made up 22.0% of these medications.

The following pages contain 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 KIDNEY DISEASE AND DYSLIPIDAEMIA.**
You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

Ask **ALL** of the **next 30 PATIENTS** the following questions **in the order in which the patients are seen.**

Please **DO NOT select patients** to suit the topic being investigated.

Assessment of renal function

Please use the tick boxes to advise whether this patient has had their **kidney function** tested in the past 12 months, and with **what test/s.**

Please tick as many as apply.

Risk factors and comorbidities

Please advise whether the patient has any of the **listed risk factors** or **conditions.** Tick as many as apply.

If the patient has **none of the** listed risk factors or conditions please tick the box labelled '**none of the above**'.

CKD diagnosis

Please advise whether the patient has been **diagnosed with Chronic Kidney Disease (CKD)**, either today or prior to today's consultation. Also advise whether the diagnosis was made **by you or another GP**, or **by a specialist.**

If the patient has never been diagnosed with CKD **please end the questions here.**

Stage of disease*

If the patient has been diagnosed with CKD, please advise what **stage of the disease** currently applies to this patient.

If you **do not know** (e.g if test results are not available) please tick the box labelled 'don't know'.

Dialysis: please indicate whether this patient is **currently on dialysis.**

Stage*	Description	GFR (mL/min/1.73m₂)
1	**Kidney damage with normal or ↑ GFR**	**>= 90**
2	**Kidney damage with mild ↓ GFR**	**60 - 89**
3	Moderate ↓ GFR	**30 - 59**
4	Severe ↓ GFR	**15 - 29**
5	Kidney failure	**<15 (or dialysis)**

*Stages classified as per National Kidney Foundation Guidelines. Part 4 - 'Definition and Stages of Chronic Kidney Disease'.

Test levels

Please advise the patient's **levels** at the **most recent testing** of: **Total cholesterol, HDL cholesterol, LDL cholesterol, and Triglycerides.**

If you **do not know** one of these levels, or if the patient has **never had** one or more of these **levels measured**, please tick the box labelled '**don't know / never tested**'.

Lipid lowering medication

Please write the **name** and **form** of the **current lipid lowering medication/s** taken by the patient, including the regimen (i.e. **strength, dose and frequency**) of the medication.

If **no** lipid medication is currently taken, please tick the box labelled '**no current lipid medication**'.

In the past 12 mths has kidney function / damage been assessed? *(tick all that apply)*

☐ Yes - serum creatinine level
☐ Yes - urine test for proteinuria/ microalbuminuria
☐ No
☐ Don't know   BL133B

Does the patient have: *(tick all that apply)*

☐ Diabetes
☐ Hypertension
☐ Proteinuria/microalb'uria
☐ Dyslipidaemia
☐ Hyperparathyroidism
☐ Anaemia
☐ Current smoker
☐ None of the above

Has the patient been diagnosed with Chronic Kidney Disease (CKD)?

☐ Yes - by you or another GP

☐ Yes - by a specialist

☐ No → **End Qs**

If 'yes' what is their Stage* of disease? *(see definitions on green sheet)*

☐ Stage 1   ☐ Stage 4
☐ Stage 2   ☐ Stage 5
☐ Stage 3   ☐ Don't know

Is the patient on dialysis?

☐ Yes
☐ No

What are the patient's most recent levels of...

		Don't know/ never tested
Total chol	_____ mmol/L	☐
LDL-C	_____ mmol/L	☐
HDL-C	_____ mmol/L	☐
Triglycerides	_____ mmol/L	☐

The patient's current lipid med'n is:

Name & Form	Strength	Dose	Freq

☐ No current lipid medication

SAND abstract number 185: Diabetes management and self-monitoring in general practice patients

Organisation collaborating for this study: Sanofi-Aventis Australia Pty Ltd.

Issues: Proportion of sampled patients with diagnosed type 1 or type 2 diabetes; HbA1c measures; patient BMI; self-measurement of blood glucose (BG) (fasting and post-prandial); medication management; changes in medication at encounter and reasons for change.

Sample: 5,730 patients from 194 GPs; data collection period: 07/06/2011 – 15/08/2012.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. Drugs were classified using the WHO Anatomical Therapeutic Chemical (ATC) classification

Summary of results

The age and sex distributions of respondents differed slightly from all patients at 2010–11 BEACH encounters, with a greater proportion of males (42.9% c.f. 39.5), and a smaller proportion aged 65–74 years (11.2% c.f. 13.3%). Of the 5,730 respondents, 507 (8.8%, 95% CI: 7.8–9.9) had either type 1 (0.8%; n = 43) or type 2 (8.1%; n = 464) diabetes.

Prevalence of any diabetes was significantly higher among males (11.1%, 95% CI: 9.4–12.8) than females (7.3%, 95% CI: 6.2–8.4), and increased with patient age, peaking at 21.7% in those aged 65–74 years and 19.1% in those aged 75 years or older.

The most recent HbA1c level was known for 469 patients, and of these, 49.7% had HbA1c of <7%. The mean result was 7.3%. Of 486 respondents with diabetes, 38.5% (n = 187) reported measuring fasting BG daily, while 27.2% (n = 132) measured fasting BG weekly. Fasting BG was tested daily by 63.4% of patients with type 1 diabetes, and by 36.2% of those with type 2 diabetes. Of 451 respondents with diabetes, 29.3% (n = 132) measured post-prandial BG daily, and 25.7% (n = 116) measured weekly. Post-prandial BG was tested daily by 62.5% of patients with type 1 diabetes, and by 26.0% of patients with type 2 diabetes.

Of 474 patients for whom height and weight were reported (using WHO categories of BMI status in adults), 0.8% were underweight; 19.4% were in the normal weight range; 33.3% were overweight and 46.4% were obese.

Responses about medication management were recorded for 501 patients with diabetes: 75.4% were currently taking medication for BG management and 24.6% were not; 55.3% were currently taking oral medication only, 9.6% were taking only insulin, and 10.6% were taking insulin and an oral medication. Of the 378 patients currently taking BG medication, 70.6% were taking metformin; 40.5% were taking a sulfonamide, and 26.7% were on insulin. More than half (53.4%) of the 378 patients taking BG medication were on mono therapy and 39.2% on dual therapy. Metformin taken as mono therapy was the most common, taken by 30.7%, followed by dual therapy of metformin plus a sulfonamide (21.7%).

Of 504 respondents with diabetes, 8.5% had medication changed at the recorded encounter. Four patients with type 1 (9.3% of those with type 1 diabetes) and 39 patients with type 2 (8.5% of those with type 2 diabetes) had medication changed, and the most common reason for change was poor HbA1c (69.8%, n = 43) followed by poor fasting control (30.2%, n = 43).

The following pages contain 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 **DIABETES MANAGEMENT**.
You may tear out this page as a guide to completing the following section of forms.

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.

HbA1c level, patient height and weight

Please advise the patient's **HbA1c level** at the **most recent testing**. If you do **not know** the most recent result, please tick the box labelled '**don't know**'.

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

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.**

Post prandial and fasting glucose

Please indicate **how often** the patient currently **tests** their **post prandial glucose and fasting glucose levels.**

Glucose-lowering medication

Please write the **name, form and regimen** (i.e. **strength, dose and frequency**) of the **medication(s)** currently (i.e. taken prior to today's visit) for **management of blood glucose levels.** Please include both oral medications and injected medications.

If the patient is **not currently taking a medication** for blood glucose management please tick the box labelled '**NONE**'.

Changes to glucose-lowering medication

Please advise whether the patient's glucose medication **will change as a result of today's visit.**

- **No change:** If the medication(s) and regimen will remain unchanged you should **END the questions here.**

- **Cease medication:** If a medication is to be **stopped**, please **circle a number** to indicate which medication(s) (from those listed in Q.4) will cease.

- **Change to medication or regimen** includes: **adding another** medication to those currently being taken; **changing** a medication **for a different one**; changing the **dosage** of a current medication, either by an **increase** or **decrease.**

If medication(s) or regimen is changing please **write the new medication(s) or regimen** in the space provided. Only include the **additions/changes made today.**

Reasons for change(s) to glucose-lowering medication

Please use the tick boxes to advise **why this patient's medication was changed at** today's encounter. Please tick all that apply.

Does this patient have diabetes?	What was the most recent HbA1c result:	HbA1c level, patient height and weight

☐ Yes - Type 1
☐ Yes - Type 2
☐ No → **End questions**

BL133C

_____ % ☐ Don't know
...and the current:
height: _____ cm
weight: _____ kg

How often does the patient measure glucose:

Fasting:
☐ Daily
☐ Weekly: _____ no. per week
☐ <1 per wk
☐ Never

Post prandial:
☐ Daily: _____ no. per day
☐ Weekly: _____ no. per week
☐ <1 per wk
☐ Never

Current blood glucose medication (i.e. taken prior to this visit): ☐ **NONE**

Name & Form	Strength	Dose	Freq
1.			
2.			
3.			
4.			

From today's visit, the patient's glucose-lowering med'n changed as follows: ☐ NO CHANGE → **End Qs**

☐ Cease medication - *Please circle to indicate which med (No.s correspond to previous Q):* ← **1 2 3 4**

☐ Add/change med'n or regimen - *Please specify:*

Name & Form	Strength	Dose	Freq
_____			

Why was the medication changed?

☐ Hypoglycaemia
☐ Poor HbA1c
☐ Poor post prandial control
☐ Poor fasting gluc. control
☐ Weight gain
☐ Other:_____ *(please specify)*

SAND abstract number 186: Hepatitis B and travel vaccinations

Organisation collaborating for this study: GlaxoSmithKline Australia Pty Ltd

Issues: Proportion of surveyed patients who had been vaccinated for hepatitis B; reason(s) for vaccination; proportion who had travelled overseas in the previous 12 months; countries and regions visited; proportion who sought travel advice prior to travel; vaccines and prophylaxis medication(s) given; proportion who stayed in areas for which hepatitis B vaccination and/or malaria prophylaxis was recommended.

Sample: 2,826 patients from 95 GPs; data collection period: 12/07/2011 – 15/08/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>. **Methods for this substudy:** Destinations were coded using the Australian Bureau of Statistics (ABS) Standard Australian Classification of Countries. Information on hepatitis B and malaria risk was drawn from the Centres for Disease Control and Prevention website: <www.cdc.gov/travel>

Summary of results

The age and sex distributions of the 2,826 patients in this sample did not significantly differ from those of all patients at 2010–11 BEACH encounters.

Of 2,823 respondents, 976 (34.6%, 95% CI: 31.0–38.2) had received hepatitis B vaccination and were immune, 96 (3.4%, 95% CI: 2.3–4.5) had started a course of hepatitis vaccination; making a total of 1,072 patients (38.0%) either fully or partial vaccinated. There were 1,266 patients (44.8%) not vaccinated, and 485 (17.2%) did not know if they had been vaccinated.

The 1,072 patients who were fully or partially vaccinated gave 1,061 reasons for hepatitis B vaccination. The most common reasons were because it was part of the Immunisation Schedule (53.5% of reasons), for overseas travel (20.9%), and for employment (20.1%).

Among 2,750 respondents, 387 (14.1%) had travelled overseas in the previous year. Of 515 destinations recorded by 382 travellers, the most frequently visited individual countries were the United States of America (10.5%) and New Zealand (8.5%). The most frequently visited regions were South-East Asia (25.5% of 462 regions) and Oceania/Antarctica (15.8%). Overnight rural stays were most common in New Zealand and South Africa.

Among 380 respondents who had travelled overseas, 145 (38.2%) had sought travel advice: 132 sought advice from a GP, nine from a travel clinic, and four from another health professional. Of 141 respondents who sought travel advice, the majority (60.3%) had sought advice one to six months before their trip.

Travel vaccination status was provided for 234 respondents who travelled overseas: 77 (32.9%) had been given a vaccine and/or prophylaxis medication prior to travel and 157 (67.1%) had not. The 77 patients received 157 prophylaxis medications, the most common being typhoid vaccine (23.6%), hepatitis A vaccine (16.6%) and influenza vaccine (13.4%).

Of 233 respondents who specified they visited a country for which hepatitis B vaccination was recommended, 139 (59.7%) were fully or partially immunised against hepatitis B. Of 43 respondents who specified that they had travelled to a country where malaria prophylaxis was recommended, four (9.3%) were given prophylaxis medication prior to their trip.

The following pages contain 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 **HEPATITIS B VACCINATION AND TRAVEL VACCINATIONS.**
You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

Ask **ALL** of the **next 30 PATIENTS** the following questions **in the order in which the patients are seen.**

Please **DO NOT select patients** to suit the topic being investigated.

The remaining questions on this form relate to the patient's most recent overseas trip. Patients who have made multiple overseas trips in the past 12 months should answer the questions pertaining to the most recent trip.

Vaccinations/prophylaxis medication

Please specify which vaccines **and/or prophylaxis medications were given** to the patient for the most recent trip.

If **no** vaccines or prophylaxis medications were given please tick '**none**'.

Country/region visited and rurality

Please **specify** the country/countries visited during the patients <u>most recent</u> overseas trip. If more than four countries were visited in the most recent trip please summarise by indicating the **region(s)** that were visited (instead of specifying the countries) e.g. South-East Asia, Western Europe.

For **each** country/region please use the tick box to indicate whether the patient **stayed overnight in a rural area.**

Vaccination/prophylaxis not given

When a **vaccination(s)** and/ or prophylaxis medication(s) was **indicated** for a travel destination but **not given to the patient** please use the tick boxes to indicate **why** it/they were not given.

Travel advice

Prior to the most recent trip please indicate whether the patient **sought travel advice** from a **health care professional.**

If '**yes**' please indicate **how long before the trip** advice was **first sought**. Note: this question aims to determine whether the patient allowed sufficient time for vaccination to be administered before travel. Some vaccinations require multiple injections over time (e.g. weeks or months).

Hepatitis B immunisation

Please indicate whether this patient has received the **Hepatitis B vaccination.**

If '**no**' you can end questions **here for this patient.**

Overseas travel

Please advise whether this patient has **travelled overseas** in the past 12 months.

Number of trips

Please specify **how many times** this patient has **travelled overseas** in the past 12 months.

Visiting friends and relatives

Please indicate whether the patient visited friends or relatives in their country of birth or a close relative's country of birth (e.g. parent or partner) during any of these overseas trips.

Reason for immunisation

For patients who are partially or fully vaccinated for Hepatitis B please use the tick boxes to indicate **why the patient was immunised.**

Is the patient vaccinated for Hepatitis B?	If 'yes' why was vaccine given?	Has the patient travelled overseas in the past 12 months?	If 'yes', how many trips: _____	*The remaining Qs relate to the most recent overseas trip*		Prior to trip was a health prof. seen for travel advice?	If 'yes' how long before trip was advice first sought?	Travel vaccines/ prophylaxis given:	If a vaccine or med'n advised for the destination wasn't given, why not?
☐ Yes - immune ☐ Yes - started vaccination ☐ No ☐ Don't know	☐ Immunisation Schedule ☐ Overseas travel ☐ Employment ☐ Other: _____ *(please specify)*	☐ Yes ☐ No→**End questions**	Did the patient visit friends or relatives in their or their parents/ partners country of birth? ☐ Yes ☐ No	Country (or region/s) visited: _____ _____ _____	<u>Staved overnight in rural area?</u> ☐ ☐ ☐ ☐	☐ Yes - GP ☐ Yes - travel clinic ☐ Yes - other ☐ No	☐ <1 week ☐ 1 to <4 wks ☐ 1 mth to <6 mths ☐ ≥6 mths	_____ _____ _____ ☐ None	☐ Not enough time prior to travel ☐ Already immune ☐ Other: *(please specify)*

BL134C

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SAND abstract number 187: General practice patient behaviour in seeking help for depression

Organisation collaborating for this study: Pfizer Australia Pty Ltd

Issues: The proportion of general practice patients who have ever been diagnosed with depression. The proportion with a current depression diagnosis; duration of the current episode and percentage of patients for whom it was a first episode; treatments tried for depression symptoms before diagnosis (tick boxes, see form for list of treatments); length of time symptoms were present before consulting a healthcare professional; reasons for seeking treatment; reasons for delay in seeking treatment.

Sample: 2,971 patients from 101 GPs; data collection period: 16/08/2011 – 19/09/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

Summary of results

The age and sex distributions of the 2,971 patients who responded to the question on diagnosed depression did not differ from those of all patients at 2010–11 BEACH encounters. Of the 2,971 patients, 422 (14.2%, 95% CI: 11.8–16.6) were currently diagnosed with depression and 337 (11.3%, 95% CI: 9.6–13.1) had previously been diagnosed, giving a total of 759 patients (25.6%, 95% CI: 22.6–28.5) who at some stage had been diagnosed with depression. The proportion of patients ever diagnosed with depression rose significantly from those aged 15–24 years (16.2%, 95% CI: 10.0–22.3) to patients aged 25–44 years (34.3%, 95% CI: 29.1–39.4) then remained steady until it decreased significantly for those aged 65–74 years (24.1%, 95% CI: 19.7–28.6) and remained steady for those aged 75 years and over. A marginally greater proportion of female patients (28.4%, 95% CI: 24.8–31.9) than male patients (21.5%, 95% CI: 18.2–24.8) had been diagnosed with depression at some stage.

Almost three-quarters (72.3%) of 418 respondents with current depression had been diagnosed more than 12 months earlier. For 140 patients (36.9% of 379 respondents) this was their first episode of depression.

Among 404 respondents with current depression, over half (56.4%) had used none of the listed treatments prior to diagnosis, 29.2% had used relaxation techniques and 22.6% diet and exercise.

Of 406 respondents with current depression, 39.9% sought help from a health professional less than three months after the first symptom was experienced, 26.4% waited 3–5 months, and 33.7% waited six months or longer. Reasons for seeking professional help were provided by 412 patients with current depression. 'Not coping' was the most common issue (given by 14.8%). Low mood/feeling depressed, insomnia, problems with work or school were other common reasons for seeking professional care for depression.

Of the 137 patients who delayed seeking treatment by six months or more, 127 responded to the question on reason for delay. "Didn't realise they had depression" was the most common reason for delay, described for 26.8% of respondents. "Hoping they would get through it by themselves" was also a common reason (22.8%).

The following pages contain 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 **PATIENT BEHAVIOUR IN SEEKING HELP FOR DEPRESSION.**
You may tear out this page as a guide to completing the following section of forms.

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.

Depression

Please use the tick boxes to indicate whether this patient has **ever been diagnosed with depression.**

If the patient **does not** have a current diagnosis of **depression** please **end questions here** for this patient.

Current depression diagnosis

Please use the tick boxes to advise **how long ago the current episode of depression was diagnosed.**

Please also indicate if this is the patient's **first episode** of diagnosed depression.

Treatments tried prior to diagnosis

Please use the tick boxes to indicate the treatments the patient tried for **treatment of depression symptoms prior to diagnosis of depression.**

Seeking treatment from a health care professional

Please ask the patient to estimate **how long after the first symptoms** of depression they waited **before seeing a health care professional** for treatment.

Reason for seeking treatment

Please ask the patient to nominate the **main reason** they **sought treatment** for their depression symptoms from a health care professional.

Delay in seeking treatment

If the patient **waited 6 months or more** after onset of depression symptoms to see a health care professional please ask the patient to nominate the **main reason** they **delayed seeking treatment.**

Has this patient ever been diagnosed with depression?	How long ago was the current depression diagnosed?	Prior to diagnosis of depression, did the patient try any of the following to treat the symptoms of depression:	Seeking treatment from a health care professional — How long after first symptoms of depression did the patient take to see a health care professional?	What was the main reason that the patient sought treatment for their depression symptoms:	If the patient did not see a health care professional for ≥6 months following onset of depression symptoms what was the main reason for delay:
☐ Yes - current ☐ Yes - previous ☐ No - never **End questions**	☐ <3 months ☐ 6 to 12 mths ☐ 3 to <6 mths ☐ >12 mths **Is this the first episode of diagnosed depression?** ☐ Yes ☐ No BL135B	☐ Diet and exercise ☐ Other OTC ☐ Relaxation medication technique(s) ☐ Acupuncture ☐ Support group ☐ Hypnotherapy ☐ St John's Wort ☐ None of the above	☐ <3 months ☐ 3 to <6 months ☐ 6 to 12 months ☐ 1 to <2 years ☐ ≥2 years		

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SAND abstract number 188: Acute coronary syndrome among general practice patients

Organisation collaborating for this study: AstraZeneca Pty Ltd

Issues: The proportion of general practice patients who had an acute coronary syndrome (ACS) event in the previous three years; types of ACS events experienced; length of time since an ACS event; treatments used for ACS; details of clopidogrel use in patients who experienced an ACS event, including duration of present use and reasons for cessation.

Sample: 2,957 patients from 100 GPs; data collection period: 16/08/2011 – 19/09/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

Summary of results

The age and sex distributions of the 2,957 patients who responded to the initial question about ACS did not differ from those of patients at all BEACH encounters in 2010–11.

Of the 2,957 respondents, 106 (3.6%, 95% CI: 2.7–4.5) had experienced at least one ACS event in the previous three years. Two of these patients were aged less than 45 years (0.3% of patients aged 25–44 years). An ACS event was reported by 3.7% of patients aged 45–64 years, 8.0% of those aged 65–74 years and 7.3% of those aged 75 years and over.

There were 112 ACS events reported by the 106 patients who reported at least one event. The ACS event reported most often was unstable angina (46.2% of patients with ACS), followed by an unspecified ACS event (22.6%), non-ST-elevated myocardial infarction (21.7%) and ST-elevated myocardial infarction (15.1%).

One-third of 102 ACS patients reported that their most recent ACS event was 2–3 years ago (32.4%), and 26.5% of patients had their most recent ACS event more than one, but less than two years ago. For 15 patients (14.7%), their most recent event was less than three months ago.

There were 103 respondents to the question on treatments for ACS. Of these, 54.4% stated they had been treated with at least one of the specified ACS treatments: 35.9% with percutaneous coronary intervention (i.e. a stent); 17.5% with coronary artery bypass and 4.9% with fibrinolytic reperfusion.

Reporting clopidogrel use (*n* = 104), 43.3% of patients had not used clopidogrel after their most recent ACS event. Nearly two-fifths of patients (38.5%) were currently using clopidogrel, and 14.4% had ceased using clopidogrel. Four patients did not know whether they had used clopidogrel.

Of the 35 patients who were currently taking clopidogrel and reported on duration of use, nearly three-quarters (74.3%) had been taking clopidogrel for more than one year.

Of those who had ceased taking clopidogrel since their most recent ACS event (*n* = 14), 50.0% had used it for more than one year. The decision to cease use of clopidogrel was made by a cardiologist for 10 of the 14 patients (71.4%). The reason(s) for ceasing clopidogrel were reported for 13 patients. Guideline recommendation was the most common reason (61.5%), followed by side-effects (30.8%).

The following pages contain 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 **ACUTE CORONARY SYNDROME.**
You may tear out this page as a guide to completing the following section of forms.

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.

Acute coronary syndrome

Please use the tick boxes to advise whether this patient has had any **Acute coronary syndrome (ACS) events** in the past 3 years.

Please tick as many as apply.

If the patient has not had an ACS event please **end questions here** for this patient.

In the past 3 years, has the patient had an acute coronary syndrome (ACS) event/s:
- ☐ ST-elevated myocardial infarction
- ☐ Non-ST-elevated myocardial infarct'n
- ☐ Unstable angina
- ☐ Other ACS event
- ☐ None of the above → **End questions**

Time since last ACS event

Please advise **how long ago** the most recent **ACS event occurred.**

How long since the most recent ACS event?
- ☐ <3 months
- ☐ 3 to <6 mths
- ☐ 6 to <12 mths
- ☐ 1 to <2 yrs
- ☐ 2 to 3 yrs   BL135C

Treatments for ACS

Please advise whether the patient received any of the listed **treatments** following the most recent ACS event.

Tick as many as apply.

After the most recent ACS did the patient have:
- ☐ Percutaneous coronary intervention (i.e. stent)
- ☐ Fibrinolytic reperfusion
- ☐ Coronary artery bypass
- ☐ None of the above

Clopidogrel therapy

Please use the tick boxes to advise whether **clopidogrel was used at any time** in the management of the most recent ACS event.

Following the ACS event was/is clopidogrel taken?
- ☐ Yes - currently
- ☐ Yes - now ceased
- ☐ No
- ☐ Don't know — **End questions**

Duration of current clopidogrel use

For patients currently **taking clopidogrel,** please use the tick boxes to advise the **duration of use.**

What is the duration of current clopidogrel use?
- ☐ <3 months
- ☐ 3 to <6 mths
- ☐ 6 to 12 mths
- ☐ >1 year

Cessation of clopidogrel

For patients who have ceased clopidogrel please indicate:

- the **duration** of (most recent) **past use**
- **who decided to cease** the clopidogrel
- **why** it was ceased.

If clopidogrel is no longer taken please advise:

Duration of (most recent) **past use:**	Who decided to cease it:	Why was it ceased:
☐ <3 months	☐ GP	☐ Guideline recommendation
☐ 3 to <6 mths	☐ Cardiologist	☐ Side effect: *(please specify)*
☐ 6 to 12 mths	☐ Other clinician	☐ Other: *(please specify)*
☐ >1 year	☐ Patient	☐ Don't know

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SAND abstract number 189: Menopause symptoms among female general practice patients aged 40–69 years

Organisation collaborating for this study: Pfizer Australia Pty Ltd

Issues: The proportion of female general practice patients aged 40–69 years who are: pre-menopausal; peri-menopausal; post-menopausal; oophorectomy-induced menopausal. Their frequency of hot flushes/sweating episodes; vaginal dryness; irregular bleeding/spotting; depressive mood. For each symptom: time since onset; current treatment; patient satisfaction with their symptom management.

Sample: 673 female patients aged 40–69 years from 100 GPs.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.
Methods for this substudy: A card listing treatment options for menopausal symptoms was supplied to participating GPs for reference.

Summary of results

There were 673 female patients aged 40–69 years who responded to the initial question. The age distribution of this sample differed significantly from that of patients at all 2010–11 BEACH encounters with female patients aged 40–69 years including a smaller proportion of 61–64 year olds (14.4%, 95% CI: 11.6–17.2) compared with (18.1%, 95% CI: 17.5–18.7).

Of the 673 respondents, 181 (26.9%) were considered by the GP to be pre-menopausal, 101 (15.0%) were peri-menopausal, 378 (56.2%) were post-menopausal, and 13 being oophorectomy-induced menopausal. At least one menopausal symptom was experienced by 407 women (62.3% of 653 respondents).

Of 643 patients, 246 (38.3%) said they had hot flushes/sweating episodes some or all of the time. Of 235 respondents, almost half (49.4%) had experienced hot flushes for more than two years. Of 228 respondents with hot flushes, 140 (61.4%) were not currently receiving treatment and 31 (13.6%) were taking hormone replacement therapy (HRT). Of 31 respondents on HRT, 21 were satisfied or very satisfied with their symptom management.

Among 636 respondents, 230 (36.2%) had vaginal dryness some or all of the time. Of 216 respondents, more than half (55.1%) had experienced vaginal dryness for more than two years. Of 214 respondents, more than half (51.9%) were not having treatment, 43 (20.1%) were taking HRT, 25 (11.7%) were using OTC products, and 23 (10.7%) were using other prescription medication for vaginal dryness. Of 60 respondents using any prescribed medication for vaginal dryness, 41 (68.3%) were satisfied or very satisfied with the treatment.

Of 636 respondents, 81 (12.7%) had experienced irregular bleeding/spotting some or all of the time, and 555 (87.3%) did not. Among 633 respondents, 223 (35.2%) had depressive mood some or all of the time. Of 216 respondents, 63.4% had experienced depressive mood for more than two years. Of 214 respondents, 73 (34.1%) were using no treatment, 18 (8.4%) were taking HRT, and 83 (38.8%) were using other prescribed medications. Of 98 respondents using any prescribed medication for depressive mood, 58 (59.2%) were satisfied or very satisfied with the treatment.

The following pages contain the recording form and instructions with which the data in this substudy were collected.

Treatment options for menopausal symptoms:

a = no treatment

b = vitamins / nutritional supplements

c = other over-the-counter medicines/products

d = hormone replacement therapy (HRT)

e = other prescribed medications

f = any other therapies or treatments (such as yoga, counselling, exercise, acupuncture etc)

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **MENOPAUSAL SYMPTOMS.**
You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

Although the bottom section of the following forms relate to female patients aged 40 - 69 years only, please continue to complete the forms for **ALL** of the **next 30 PATIENTS in the order in which the patients are seen**, and complete the bottom section for females who are in the nominated age group.

Please **DO NOT select patients** to suit the topic being investigated. If the patient is **NOT** a female aged 40 -69 years, please leave the questions in the bottom section **BLANK.**

Part 4: Satisfaction with treatment

For each symptom, please ask the patient **how satisfied** they are with **symptom management**.

Rate their answers on a scale of 1 to 5, where **1 = 'very dissatisfied'** and **5 = 'very satisfied'.**

(If more than one management is used for a symptom, give an overall rating).

Part 2: Duration of symptoms

For symptoms answered 2-5, please **circle an option** to best describe **how long** the patient has been experiencing **each** of the symptoms.

Part 3: Symptom management

For each symptom, please **circle the letters that correspond to the treatment options** listed below.

a = *no treatment*

b = *vitamins / nutritional supplements*

c = *other over-the-counter medicines/products*

d = *hormone replacement therapy (HRT)*

e = *other prescribed medications*

f = *any other therapies or treatments (for mind and/or body such as yoga, couselling, exercise, acupuncture etc)*

e.g: if 'irregular bleeding' is managed with HRT, circle **'d'** on that symptom line. If the HRT is also for another symptom, circle **'d'** on that symptom line also.

This list is **also printed on the card** in your research kit.

Menopausal symptoms

There are **4 parts** to this question, each relating to the **symptoms** listed below:

Part 1: Frequency of symptoms

Please ask the patient **how often** they currently experience any of the **listed symptoms.**

Rate their answers on a scale of 1 to 5, where **1 = 'never'** and **5 = 'all the time'.**

If '**1**' (i.e. '*never*') is circled for all symptoms please **end the questions here** for this patient.

Menopausal status

These questions are for **female patients aged 40 - 69 years only.**

Please **use the tick boxes** to advise which of the **listed categories** best describes the patient, based on **your clinical opinion.**

(For females 40-69 yrs): BL136B
In your clinical opinion, is this patient:

☐ Pre-menopausal

☐ Peri-menopausal

☐ Post-menopausal

☐ Oophorectomy - induced menopausal

Ask the patient …						
1. How often do you experience these symptoms? *(Please circle, rating as 1 = 'never' and 5 = 'all the time' for each symptom)* *If '1' for all symptoms please end the questions here.*					*If '2' - '5' for any part of previous Question...* **2. How long have you been experiencing each symptom?**	**3. Current treatment for each symptom is:** *(circle all that apply)* *(letters correspond with treatment options on green sheet or card)*	**4. How satisfied are you with current treatments?** *(where 1 = 'very dissatisfied' and 5 = 'very satisfied')*
Hot flushes/sweating episodes	1	2	3	4	5	<1 yr / 1-2 yrs / >2 yrs	a b c d e f	1 2 3 4 5
Vaginal dryness	1	2	3	4	5	<1 yr / 1-2 yrs / >2 yrs	a b c d e f	1 2 3 4 5
Irregular bleeding/spotting	1	2	3	4	5	<1 yr / 1-2 yrs / >2 yrs	a b c d e f	1 2 3 4 5
Depressive mood	1	2	3	4	5	<1 yr / 1-2 yrs / >2 yrs	a b c d e f	1 2 3 4 5

SAND abstract number 190: Benign prostatic hyperplasia (BPH) and symptoms among male general practice patients aged 40 years or older

Organisation collaborating for this study: CSL Biotherapies Pty Ltd

Issues: Among male general practice patients aged 40+ years: prevalence of BPH; urinary symptoms experienced (dribbling post-urination, urinary retention, incontinence, nocturia, hesitancy, urgency, pain/bleeding with urination, frequency, weak stream, straining to urinate or none); duration of symptoms prior to seeking treatment for BPH or symptoms; prompt for the initial consultation; managements used for symptoms; duration of use, initiator and side-effects (if any) for each medication used.

Sample: 708 male patients aged 40 years or older from 93 GPs; data collection period: 20/09/2011 – 24/10/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

Summary of results

The age distribution of these 708 patients did not significantly differ from that of the same age–sex cohort at all encounters during the April 2010 – March 2011 BEACH year.

Of 707 respondents, 150 (21.2%, 95% CI: 17.3–25.1) had been diagnosed with BPH. There was a significant stepwise increase in prevalence with age from 0% in the 40–49 year age group, to 6.5% (95% CI: 2.3–10.7) among 50–59 year olds, 17.5% (95% CI: 10.8–24.3) among 60–69 year olds, and 35.3% (95% CI: 27.6–43.0) among 70–79 year olds. Prevalence remained high among 80–89 year olds, (49.5%, 95% CI: 40.1–58.9) and those of 90 years or more, (53.3%, 95% CI: 29.6–77.0).

At least one of the listed symptoms of BPH was reported by 247 (40.9%, 95% CI: 35.1–46.7) of 604 respondents to this question. The most common symptoms were: nocturia, 25.7%; post-urination dribbling, 19.0%; weak stream, 16.9%; and frequency, 14.6%. At least one symptom was present in 14.1% of 40–49 year age group, 40.5% of 60–69 and 66.7% of those 80 years and older. Of 232 symptomatic patients, 46.1% had waited more than two years before seeking treatment. Discussion about symptoms had been initiated by the GP for 53.4% and by the patient for 39.1% of 238 symptomatic respondents.

Of 243 symptomatic respondents, 109 (44.9%) were currently being treated for BPH or symptoms, of whom 45 (41.3%) were taking 45 medications, the most common being tamsulosin (40.0%) and prazosin (28.9%). For 40 respondents, the average duration on medication was 13 months. Medication had been initiated by the GP for 53.5% and by the specialist for 44.2% of 43 respondents. Only one side-effect was reported (postural hypotension from tamsulosin) from 27 respondents.

Non-pharmacological management had been used for BPH or symptoms by 21 (8.6%) of 243 respondents, the most common (*n* = 12) being transurethral resection of the prostate (TURP). Of 243 symptomatic patients, 72 (29.6%) had been referred to an urologist.

The following pages contain 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 **BENIGN PROSTATIC HYPERPLASIA (BPH)**
You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

Although the bottom section of the following forms relate to male patients aged 40 years or older, please continue to complete the forms for **ALL** of the **next 30 PATIENTS in the order in which the patients are seen**, and complete the bottom section for patients who are in the nominated age group.

Please **DO NOT select patients** to suit the topic being investigated. If the patient is **NOT** male and aged 40+ years, please leave the questions in the bottom section **BLANK**.

Initiation of treatment

For patients who are on medication for BPH/symptoms, please advise for each

- **the approximate duration of use**
- **who initiated the medication**
- **what side effects are experienced, if any.**

Management of BPH / symptoms

Please advise **what medications or other treatments** are **currently being used** by the patient for BPH or symptom management.

Please write the **name** of up to **two medications** used. **Other treatments** may include medical devices, advice/ counselling etc. **Other referrals** may include other specialists, allied health professionals etc.

Initial consultation

Please advise what prompted the initial conversation about these symptoms.

Duration of symptoms

Please use the tick boxes to advise (approximately) **how long the patient had experienced these symptoms prior to seeking treatment.**

BPH symptoms

Please use the tick boxes to advise **what symptoms the patient has experienced.**

Benign prostatic hyperplasia (BPH)

Please use the tick boxes to advise whether this patient has been **diagnosed with BPH.**

Medication 1: - taken for? _____ yrs _____ mths
- initiated by? ☐ GP ☐ Specialist ☐ Don't know
- please specify ☐ None
any side effects _____

Medication 2: - taken for? _____ yrs _____ mths
- initiated by? ☐ GP ☐ Specialist ☐ Don't know
- please specify ☐ None
any side effects _____

Current management is:
☐ No treatment
☐ Medication - *(Please specify)*
1. _____
2. _____
☐ Other _____ *(Please specify)*
☐ Referral - urologist
☐ Referral - other _____
(Please specify)

GP/patient discussion of symptoms resulted from?
☐ Patient initiation
☐ GP asked about symptoms
☐ Prompt from patient's spouse/partner
☐ Pharmacist's advice
☐ Other _____

How long were symptoms experienced before the patient sought treatment?
☐ <6 months
☐ 6 to <12 mths
☐ 1 to <2 yrs
☐ >2 yrs   BL136C

What symptoms is/was the patient experiencing?
☐ dribbling post urination
☐ urinary retention
☐ incontinence
☐ nocturia
☐ hesitancy
☐ urgency
☐ pain/bleeding with urination
☐ frequency
☐ weak stream
☐ straining to urinate
☐ NONE → **End questions**

(For males 40+yrs):
Has this patient been diagnosed with BPH?
☐ Yes
☐ No

SAND abstract number 191: NSAID use, gastrointestinal and cardiovascular risk in general practice patients with arthritis

Organisation collaborating for this study: AstraZeneca Pty Ltd (Australia)

Issues: Prevalence of arthritis in general practice patients and use of non-steroidal anti-inflammatory drugs (NSAIDs); gastrointestinal (GI) and cardiovascular (CV) risk profile of patients with arthritis; use of NSAIDs by patients with different risk profiles.

Sample: 5,429 patients from 186 GPs; data collection period: 25/10/2011 – 16/01/2012.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.
Methods for this substudy: GI risk was defined using the Gastroenterology Society of Australia (GESA) guideline "NSAIDs and the gastrointestinal tract", 2008. CV risk was calculated using "Guidelines for the assessment of absolute cardiovascular disease risk", National Vascular Disease Prevention Alliance, 2009.

Summary of results

The age and sex distributions of patients in this SAND sample did not differ significantly from that of patients at all 2010–11 BEACH encounters.

Almost one-third (32.3%, 95% CI: 29.8–34.9) of the surveyed patients had arthritis. Prevalence increased significantly with age from 3.3% (95% CI: 1.6–5.1) of patients aged 15–24 years to 74.6% (95% CI: 70.5–78.6) in patients aged 75 years and over. Osteoarthritis was the most common type of arthritis (29.8%, 95% CI: 27.3–32.3), followed by rheumatoid arthritis (1.3%, 95% CI: 0.9–1.7), gout (0.8%, 95% CI: 0.5–1.0) and other types of arthritis (1.5%, 95% CI: 1.0–1.9) (multiple types of arthritis could be recorded).

Of the 1,755 patients with arthritis, 1,682 provided details of NSAID and aspirin use and 43.3% (95% CI: 40.2–46.3) of these were currently taking aspirin and/or NSAID. NSAIDs were taken by 21.2% (95% CI: 18.2–24.3) of patients with arthritis, and 12.8% of patients with arthritis had taken a NSAID continuously for more than three months. Aspirin was taken by 24.6% (95% CI: 21.9–27.3) of patients with arthritis. Most of these patients used aspirin as an antiplatelet medication, the mean and median daily dose being 110.2mg and 100.0mg respectively, and 97.3% of patients using aspirin had taken it continuously for more than three months.

GI risk was calculated for 1,596 arthritis patients: 40.1% had high risk, 49.1% moderate and 10.8% low GI risk. There were 1,579 patients for whom details of NSAID use and GI risk were provided. Of the 336 arthritis patients taking a NSAID: 58.0% had high risk, 36.6% moderate, and 5.4% were at low GI risk. Use of GI protection medication (e.g. proton pump inhibitors) was recorded for 1,556 patients: 19.1% of patients with low GI risk took GI protection medication (most of these patients had GORD); 38.2% of patients with moderate GI risk, and 50.5% of patients with high GI risk took GI protection medication.

CV risk was calculated for 1,299 arthritis patients: 65.4% had high CV risk, 9.0% moderate and 25.6% low CV risk. There were 1,250 patients who provided details of NSAID use and CV risk. Of the 244 arthritis patients taking a NSAID: 54.9% were at high risk, 10.2% moderate, and 34.8% were at low CV risk.

The following pages contain 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 **ARTHRITIS, CARDIOVASCULAR RISK AND GASTROINTESTINAL RISK.**
You may tear out this page as a guide to completing the following section of forms.

INSTRUCTIONS

Please answer the following questions for **ALL** of the <u>next 30 PATIENTS</u> in the order in which **the patients are seen.**

Please **DO NOT select patients** to suit the topic being investigated.

Arthritis

Please use the tick boxes to advise whether this patient has been diagnosed with:

- **osteoarthritis**

- **rheumatoid arthritis (RA)**—please tick the box if the **RA is severely disabling**

- **other types of arthritis** (e.g. lupus (SLE) or psoriatic arthritis, ankylosing spondylitis, gout).

Please **tick as many as apply.**

If the patient does **not** have arthritis please **end the questions here for this patient.**

Other 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: GORD = gastro-oesophgeal reflux disease.

Moderate/severe renal impairment: 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 aspirin and/or NSAID use

If the patient is currently taking either **aspirin and/or non-steroidal anti-inflammatory medication (NSAID)** please write the **name and regimen** of the medication/s in the space provided. NSAIDs includes traditonal NSAIDs, COX-II inhibitors, and oxicams.

Beside each medication, please advise whether or not the **patient has taken the product continuously for more than 3 months.**

If **neither** medication is taken, please tick the box labelled **'Not taking aspirin or NSAID'**

Other medications

Please use the tick boxes to advise whether the patient is **also taking any of the listed medications.** (Note: SSRI = Selective serotonin reuptake inhibitor)

If the patient **is not taking** any of the listed medications please tick the box labelled **'None of above'.**

Clinical measurements

Please write in the patient's most recent results of **blood pressure, total cholesterol, and HDL cholesterol, if tested in the past 12 months.**

If any level is **unknown**, or the patient was **not tested in the past 12 months,** please tick the box labelled **'Don't know/not tested'** for that measure.

Please advise whether or not the patient is a **current smoker.**

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.

Does the patient have:

☐ Osteoarthritis
☐ Rheumatoid arthritis
  ↳☐ severely disabling?
☐ Other arthritis:
_____
  (please specify)
☐ No arthritis → **End Qs**

Does the patient have/ have history of:
☐ Diabetes   ☐ GORD/dyspepsia
☐ Hypertension   ☐ Hepatic impairment
☐ Microalbuminuria
☐ Mod/severe renal impairment
☐ Peptic ulcer/ulcer bleed
☐ Familial hypercholesterolaemia
☐ Other cardiovascular disease/event
☐ Family Hx of premature heart disease

Current aspirin and/or NSAID (including COX-II inhibitors, oxicams) medication(s) are:

Name & Form	Strength	Dose	Frequency	Continuous use >3 mths? Yes	No
				☐	☐
				☐	☐

☐ **Not taking aspirin or NSAID**

Is the patient currently regularly taking:
☐ Proton pump inhibitor
☐ Other acid suppressant
☐ Anti-platelet *(excl. aspirin)*
☐ Anticoagulant
☐ Oral corticosteroid
☐ SSRI
☐ None of the above

BL137B

Patient reported...
Weight: _____ kg

Height: _____ cm

If measured in the past 12 months, please specify (most recent) levels of: Don't know/ not tested

Blood pressure: _____ / _____ mmHg ☐

Total chol: _____ mmol/L ☐

HDL-C: _____ mmol/L ☐

Current smoker? ☐ Yes ☐ No

SAND abstract number 192: Influenza risk, vaccination and diagnosis among general practice patients

Organisation collaborating for this study: GlaxoSmithKline Australia Pty Ltd

Issues: The proportion of general practice patients who were 'at risk' of influenza (had one or more risk factors – see attached card for risk factors); proportion of at risk patients aware they were eligible for a free influenza vaccine; proportion of at risk patients vaccinated; reasons why at risk patients were not vaccinated; proportion of patients diagnosed with influenza in previous year and any complications or hospitalisations due to influenza.

Sample: 2,737 patients from 93 GPs; data collection period: 25/10/2011 – 28/11/2011.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

Summary of results

There was no significant difference between the sex distribution of patients in this SAND and patients at all 2010–11 BEACH encounters. There was a significantly greater proportion of patients in the 75+ age group in this SAND (21.2%, 95% CI: 17.6–24.8) than at all 2010–11 BEACH encounters (16.3%, 95% CI: 15.5–17.1).

Among the 2,737 respondents, 1,317 (48.1%) had one or more influenza risk factor: one-third (33.0%) were aged 65+ years; 10.9% had cardiac disease; 9.6% had diabetes; 8.0% had chronic respiratory disease; 1.8% had impaired immunity; 1.7% were Indigenous aged 15 years and older; and 0.7% had a neurological condition impacting respiratory function. There was no difference between male and female patients in the proportion that were at risk.

Of 1,298 at risk respondents, 980 (75.5%) had been vaccinated in 2011, while 291 (22.4%) had not. Of 1,255 at risk respondents, 1,150 (91.6%) were aware that influenza vaccination was available free to them through the Immunise Australia Program. Four out of five patients (79.8%) who were aware that influenza vaccination was available free had been vaccinated compared with only 26.2% of those who were not aware of this.

Of the 291 at risk patients who were not vaccinated in 2011, 284 gave 296 reasons for not being vaccinated. The most common of the listed reason was patient objection (27.8% of the 284 patients), followed by patients considering themselves not at risk (25.4%), patient belief they could get the flu from the vaccination (9.5%), cost (1.4%) and 40.1% gave other reasons.

Among 1,278 respondents, 50 (3.9%) had been diagnosed with influenza in the previous year. Of 950 at risk patients who had been vaccinated in 2011, 36 (3.8%) had been diagnosed with influenza in the previous year, while among 290 patients not vaccinated, 13 (4.5%) had been diagnosed with influenza in the previous year. Of 49 respondents diagnosed with influenza, 28 (57.1%) had at least one complication, the most common being bronchitis (*n* = 23, 46.9%) followed by pneumonia (*n* = 6, 12.2%). Of the 36 patients vaccinated in 2011 who had influenza in the previous year, 20 (55.6%) had had complications from it, while among 12 patients who were not vaccinated, 7 (58.3%) had had complications. Of 44 respondents with influenza, 8 (18.2%) had been hospitalised for influenza or its complications in the previous year. Among 31 vaccinated respondents, 6 (19.4%) had been hospitalised, while among 12 respondents who were not vaccinated, 1 (8.3%) had been hospitalised.

The following pages contain the recording form and instructions with which the data in this substudy were collected.

Risk factors for influenza infection

This card lists the risk factors for influenza infection.

Please circle the numbers on the recording form to indicate whether this patient has any of the listed risk factors or indications.

1. ≥65 years of age

2. Aboriginal and/or Torres Strait Islander aged ≥15 years

3. Cardiac disease

4. Diabetes

5. Chronic respiratory disease (e.g. emphysema, severe asthma)

6. Other chronic disease requiring regular follow-up or hospitalisation in the previous year (e.g. chronic renal failure)

7. Neurological conditions that impact respiratory function

8. Impaired immunity (e.g. HIV, malignancy)

9. Children (aged 6 months to 10 years) on long term aspirin therapy

Source: adapted from the National Health and Medical Research Council (NHMRC) Australian Immunisation Handbook 9th Edition 2008

PLEASE READ CAREFULLY

The shaded section of the following forms asks questions about **INFLUENZA RISK FACTORS AND VACCINATION.**

You may tear out this page as a guide to completing the following section of forms.

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.

Risk factors for influenza infection

Please **circle the numbers** to indicate whether this patient has any of the listed **risk factors** for **influenza** infection. These **risk factors** are also listed on a **card** in the research pack.

1. ≥65 years of age
2. Aboriginal and/or Torres Strait Islander aged ≥15 year
3. Cardiac disease
4. Diabetes
5. Chronic respiratory disease
6. Other chronic disease requiring regular follow-up or hospitalisation in the previous year
7. Neurological conditions that impact respiratory function
8. Impaired immunity (e.g. HIV, malignancy)
9. Children (aged 6 months to 10 years) on long term aspirin therapy

If the patient has **none** of the risk factors please **end questions here.**

Immunise Australia Program

For patients who have **at least one of the listed risk factors** please ask whether (prior to today's visit) they were aware that **free influenza vaccine** is available through the **Immunise Australia Program.**

Patients who were **NOT** vaccinated

For patients who **did not** receive the **influenza** vaccination for the **2011 season,** please indicate the **reasons that the vaccine was not given.**

Influenza vaccination status

Please use the tick boxes to indicate whether this patient **received the influenza vaccine** for (or during) the **2009, 2010 and 2011** flu seasons.

Please **exclude** separate **vaccinations given for monovalent pandemic influenza A,** subtype H1N1 (commonly referred to as 'swine flu') in 2009 and 2010.

Influenza diagnosis

Please indicate whether the patient was **diagnosed** (either laboratory confirmed or clinical diagnosis) **with influenza** in the **past 12 months.**

Influenza complications

Please use the tick boxes to indicate whether the patient experienced any **complications as a result of influenza infection.**

If the patient did **not** experience any complications please tick the box labelled '**NONE**'.

Hospitalisation

For patients who were diagnosed with influenza in the past 12 months, please indicate whether **influenza or its complications** required **a hospital admission.**

Please **circle** the number(s) to indicate whether the patient has current influenza infection risk factor(s):	If 'yes', was the patient aware (prior to today's visit) that influenza vaccination is freely available through the Immunise Australia Program?	Did the patient receive influenza vaccination** for/during the:				If **not** vaccinated in 2011, the reason(s) was:	Was the patient diagnosed* with influenza in the past 12 months?	Any influenza complications?	Was the patient admitted to hospital due to influenza illness or its complications?
See key list on card, circle as many as apply 1. 2. 3. 4. 5. 6. 7. 8. 9.	☐ Yes ☐ No		Yes	No	Don't know	☐ Cost to patient	(*either laboratory confirmed or clinical diagnosis)	☐ Bronchitis	
		2009** flu season	☐	☐	☐	☐ Patient objection	☐ Yes	☐ Pneumonia	☐ Yes
		2010** flu season	☐	☐	☐	☐ Patient considers themselves low risk	☐ No	☐ Other:	☐ No
		2011 flu season	☐	☐	☐	☐ Patient believes they may get flu from vaccine	☐ Don't know	_____ (please specify)	
☐ None → End questions		**Please exclude monovalent pandemic influenza A (H1N1) vaccination when given as a separate vaccine				☐ Other reason		☐ NONE	

BL137C

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SAND abstract number 193: Diabetes, macular oedema and dyslipidaemia among general practice patients

Organisation collaborating for this study: Novartis Pharmaceuticals Australia Pty Ltd

Issues: The proportion of general practice patients who have diagnosed type 1 and 2 diabetes; the length of time since diabetes was diagnosed; most recent HbA1c result; current medications used to manage diabetes; proportion of patients with diabetes that also have diagnosed macular oedema and its current management; proportion of patients with diabetes and macular oedema that also have dyslipidaemia and its current management.

Sample: 2,825 patients from 97 GPs; data collection period: 17/01/2012 – 20/02/2012.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

Summary of results

The age distribution of patients in this sample did not differ from that of patients at all 2010–11 BEACH encounters, however, in this sample there was a significantly higher proportion of females (61.5%, 95% CI: 58.2–64.7% c.f. 57.1%, 95% CI: 56.3–58.0).

Of the 2,825 respondents, 308 had diabetes (10.9%, 95% CI: 9.3–12.6): 29 (1.0%) had type 1 diabetes only; 276 (9.8%) had type 2 diabetes only; and 3 patients had both type 1 and type 2 diabetes. The age-specific prevalence of diabetes were highest among patients aged 65–74 years (23.9%) followed by patients aged 75 years and older (16.4%) and those aged 45–64 years (11.9%). Sex-specific prevalence of diabetes was significantly higher among males (14.7%, 95% CI: 12.1–17.3) than females (8.5%, 95% CI: 6.8–10.3). Time since diagnosis was known for 297 patients: two-thirds (66.0%) had been diagnosed more than 5 years earlier, and 26.6% between one and five years earlier.

Most recent HbA1c test results were reported for 265 diabetes patients. The mean HbA1c level was 7.4% and the median was 6.9%. Among 289 respondents with diabetes, 233 (80.6%) were using 386 medication to manage their diabetes. Metformin accounted for 42.5% of these. The various types of insulin together made up over one-quarter of medications.

Among 303 respondents with diabetes, 25 (8.3%) had macular oedema, 218 (71.9%) had been tested and did not have macular oedema, while 60 patients (19.8%) did not know or had never been tested. Of the 23 patients with macular oedema who responded, the majority (65.2%) reported no visual impairment and the macular oedema was not actively managed, 3 patients had impairment but no management, 3 had received laser treatment, and 2 were on medication.

Over two-thirds of patients with diabetes (72.8%) were known to have dyslipidaemia. Information about dyslipidaemia status was given for 24 of the 25 diabetes patients with macular oedema. Twenty (83.3%) of these patients had dyslipidaemia, and 4 had been tested and did not have dyslipidaemia. Of the 20 patients with all three conditions, dyslipidaemia was managed with: medication only for 14 patients; a combination of diet, exercise and medication for 3; diet and exercise for 2 patients and no management recorded for 1 patient.

The following pages contain 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 **MACULAR OEDEMA and HYPER/DYSLIPIDAEMIA in DIABETES.**
You may tear out this page as a guide to completing the following section of forms.

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.

Diagnosed diabetes

Please use the tick boxes to advise whether this patient has been **diagnosed with diabetes** (either Type 1 or Type 2).

If the patient **does not have** diagnosed diabetes please **end the questions here.**

Time since diabetes diagnosis

If 'yes' please use the tick boxes to advise the **approximate length of time** since the patient's diabetes was diagnosed.

Most recent HbA1c

Please write the result of the patient's **most recent HbA1c test** in the space provided.
(% will be converted to mmol/mol at analysis).

Diabetes medication

Please write the **name** of any **medication/s** currently being taken by the patient for **diabetes management.**

If **no medication** is currently used to manage diabetes please tick the box labelled '**No medication**'.

Macular Oedema

Please use the tick boxes to advise whether the patient has diagnosed **macular oedema.**

(When) diagnosed ...If 'yes' please also advise whether the macular oedema was diagnosed **prior to the** diabetes diagnosis, or if **afterward,** approximately how long.

Current management ... please use the tick boxes to advise what **management** (if any) is currently being used for the macular oedema.

Hyper/dyslipidaemia

Please use the tick boxes to advise whether the patient has diagnosed **hyper/dyslipidaemia.**

(When) diagnosed ...If 'yes' please also advise whether the hyper/dyslipidaemia was diagnosed **prior to the** diabetes diagnosis, or if **afterward,** approximately how long.

Current management ... please use the tick boxes to advise what **management** (if any) is currently being used for the hyper/dyslipidaemia.

Does the patient have diagnosed diabetes?	If yes, how long since diabetes was diagnosed?	Most recent HbA1c was: _____ %	Does the patient have diagnosed macular oedema?	Current management is: *(tick all that apply)*	Does the patient have diagnosed hyper/dyslipidaemia?	Current management is: *(tick all that apply)*
☐ Yes - Type 1	☐ <3 months	Current diabetes medication is:	☐ Yes → *diagnosed ....*	☐ No visual impairment - not actively managed	☐ Yes → *diagnosed ....*	☐ Not treated
☐ Yes - Type 2	☐ 3 - 12 months	1._____	☐ Tested - No ☐ prior to diabetes	☐ Has visual impairment - not actively managed	☐ Tested - No ☐ prior to diabetes	☐ Diet and exercise
☐ No → End	☐ >1 - 5 years	2._____	☐ Don't ☐ <1 yr after diabetes	☐ Laser treatment	☐ Don't ☐ <1 yr after diabetes	☐ Medication -
Questions	☐ > 5 years	3._____	know / ☐ 1 - 2 yrs after diabetes	☐ Medication -	know / ☐ 1 - 2 yrs after diabetes	1._____
		☐ No medication	Never ☐ >2 - 5 yrs after diabetes	_____	Never ☐ >2 - 5 yrs after diabetes	2._____
			tested ☐ >5 yrs after diabetes	*(please specify)*	tested ☐ >5 yrs after diabetes	*(please specify)*

BL139C

SAND abstract number 194: Adult general practice patients' cardiovascular risk and lipid medication use

Organisation collaborating for this study: AstraZeneca Pty Ltd (Australia)

Issues: The proportion of adults attending general practice who: have at least one listed cardiovascular disease/risk factor; are classed as low, medium, and high cardiovascular risk; are using lipid lowering agents.

Sample: 2,531 adult (18+ years) patient from 100 GPs; data collection period: 21/02/2012 – 26/03/2012.

Method: Detailed in the paper titled *SAND Method 2011–12* available at: <sydney.edu.au/medicine/fmrc/publications/sand-abstracts>.

Methods for this substudy: Cardiovascular risk was defined as per the 'Guidelines for the assessment of absolute cardiovascular disease risk' (National Vascular Disease Prevention Alliance, 2009).

Step 1: The patient is assessed as automatic high risk if they have any of: cardiovascular disease (CVD) including ischaemic heart disease, angina, previous MI, previous stroke, other CVD/event; diabetes and are 60 years of older; diabetes and microalbuminuria; moderate/severe chronic kidney disease (CKD); total cholesterol >7.5 mmol/L.

Step 2: For those not high risk in step 1, CV risk calculated with Framingham equation.

Step 3: For those still not assessed as high risk, 5% added (New Zealand cardiovascular guidelines handbook, 2009) to calculated risk score if one or more factors for consideration present, including: family history of premature heart disease; obesity (calculated using BMI from reported height and weight); age 35+ for Indigenous patients.

Summary of results

The age and sex distribution of sampled adults did not differ from that of adults at all BEACH encounters in 2010–11.

Of 2,525 patients the prevalence of one or more CVD and/or risk factors for CVD was 67.2% (95% CI: 63.9–70.6), and 34.4% (*n* = 868) were automatically classed as high CVD risk (Step 1).

At Step 2 Framingham could only be calculated for 1,464 patients (58.0%) of the sample because the equation requires complete data in all variables surveyed. Calculation was made for 653 (75.2%) of the 868 patients already identified as at high risk and 811 (48.9%) of the 1,658 not classed as high risk in Step 1. Of the 811 patients not classed as at high risk in Step 1: 84.2% were classed as at low risk, 11.3% at moderate risk, and 4.4% at high risk.

When 5% was added to the Framingham result for each individual with one or more of the listed additional factors (Step 3), 25 moved from moderate to high risk, and 90 moved from low to moderate risk class. So at the end of Step 3, of the 1677 patients whose risk level could be measured: 929 (55.4%) were at high risk; 9.4% at moderate risk, and 35.2% at low risk.

Lipid-lowering medication(s) were used by 33.8% of 2,382 respondents to this question, by 24.3% of low CVD risk patients; 44.7% of moderate risk, and 62.3% of high risk patients. There were 841 patients not taking lipid medications for whom CVD risk could be calculated. Of these, 50.3% were at low risk, 10.0% at moderate, and 39.7% were at high risk.

The following pages contain 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 **LIPID MEDICATION USE in PATIENTS AT CARDIOVASCULAR RISK.**

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 18 years, please leave the questions in the bottom section blank.

Test levels

Please advise the patient's **levels** at the **most recent testing**, of **blood pressure, Total cholesterol, HDL cholesterol, LDL cholesterol, and Triglycerides.**

If you **do not know** one of these levels, or if the patient has **never had** one or more of these **levels measured**, please tick the box labelled **'don't know / not tested'**.

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.

Lipid lowering medication

Please write the **name** and **form** of the **current lipid lowering medication/s** taken by the patient, including the regimen (i.e. **strength, dose and frequency**) of the medication.

If **no** lipid medication is currently taken, please tick the box labelled **'not taking lipid medication'**.

For patients 18+ years

Cardiovascular disease (CVD) and risk factors for CVD

For all **adult patients** (aged 18+ years), please use the tick boxes to advise whether the patient has any of the listed **cardiovascular diseases, risk factors**, behaviours or history. Please tick all that apply.

If the patient has **none** of these diseases or risk factors, please tick the box labelled **'none of the above'**.

Notes:

Moderate/severe chronic kidney disease: defined as persistent proteinuria or estimated glomerular filtration rate < 45 mL/min/1.73 m2

MI = myocardial infarction.

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.

If aged 18+ years, does the patient have: *(tick all that apply)*

- ☐ Diabetes
- ☐ Angina
- ☐ Previous MI
- ☐ Hypertension
- ☐ Previous stroke
- ☐ Dyslipidaemia
- ☐ Other cardiovascular disease (CVD)/event
- ☐ Ischaemic heart disease
- ☐ Microalbuminuria
- ☐ None of the above
- ☐ Moderate/severe chronic kidney disease

Does the patient have any of the following CVD risk factors:

- ☐ Current smoker
- ☐ Familial hypercholesterolaemia
- ☐ Family Hx of premature heart disease
- ☐ Other CVD risk
- ☐ None of the above

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Current lipid medication(s) are:

Name & Form	Strength	Dose	Frequency

☐ Not taking lipid medication

What are the patient's most recent levels of...

		Don't know/ not tested
Blood pressure: _____ / _____ mmHg		☐
Total chol: _____ mmol/L		☐
LDL-C: _____ mmol/L		☐
HDL-C: _____ mmol/L		☐
Triglycerides: _____ mmol/L		☐

Patient reported

Height: _____ (in cm)

Weight: _____ (in **kg**)

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Abbreviations

ABS	Australian Bureau of Statistics
ACE	angiotensin-converting enzyme
ACRRM	Australian College of Rural and Remote Medicine
ACS	acute coronary syndrome
ADE	adverse drug event
AHS	allied health service
AHW	Aboriginal health worker
AIHW	Australian Institute of Health and Welfare
APM	antiplatelet medication
ASGC	Australian Standard Geographical Classification
ATC	Anatomical Therapeutic Chemical (classification)
BEACH	Bettering the Evaluation and Care of Health
BMI	body mass index
BG	blood glucose
BPH	Benign prostatic hyperplasia
CAPS	Coding Atlas for Pharmaceutical Substances
CI	confidence interval (in this report 95% CI is used)
CKD	chronic kidney disease
COPD	chronic obstructive pulmonary disease
CT	computerised tomography
CV	cardiovascular
CVD	cardiovascular disease
DoHA	Australian Government Department of Health and Ageing
DVA	Australian Government Department of Veterans' Affairs
ENT	Ear, nose and throat
FMRC	Family Medicine Research Centre
FTE	full-time equivalent
GI	gastrointestinal
GI SE	gastrointestinal side effect
GP	general practitioner
HbA1c	haemoglobin, type A1c
HRT	hormone replacement therapy
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
INR	international normalised ratio
LCL	lower confidence limit
MBS	Medicare Benefits Schedule
M,C&S	microscopy, culture and sensitivity
NDSHS	National Drug Strategy Household Survey
NESB	non-English-speaking background
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
NSAIDs	non-steroidal anti-inflammatory drugs
OTC	over-the-counter (medications advised for over-the-counter purchase)
PBS	Pharmaceutical Benefits Scheme
PN	Practice nurse
RACGP	Royal Australian College of General Practitioners
RFE	reason for encounter
RRMA	Rural, Remote and Metropolitan Area classification
SAND	Supplementary Analysis of Nominated Data
SAS	Statistical Analysis System
UCL	upper confidence limit
URTI	upper respiratory tract infection
WHO	World Health Organization
Wonca	World Organization of Family Doctors

Symbols

—	not applicable
<	less than
>	more than
NEC	not elsewhere classified
n	number
NOS	not otherwise specified

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.

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):381–6).

- *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).

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

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 and selected items provided by GPs classified in A11, A15 and A27.

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 a 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 and selected items provided by GPs classified in A11, A15 and A27.

- *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, 52003; standard 23, 53, 5020, 5203; long 36, 54, 5040; prolonged 44, 57, 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: 734, 735, 736, 738, 739, 740, 742, 743, 744, 750, 762, 765, 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, 2667, 2668, 2673, 2675, 2677, 2704, 2705.
- *GP bulk-billed incentive payment:* identified by any of the following item numbers: 10990,10991,10992,74990,74991.
- *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, 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: 13015–25205 (excluding 16400).
- *Surgical operations:* identified by item numbers: 30001–53706.
- *Diagnostic imaging services:* identified by item numbers: 55028–64991.
- *Pathology services:* identified by item numbers: 65060–74999.

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

Medication rates: The rate of use of all medications, including medications that were prescribed, supplied by the GP and 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.

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.

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

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 2011–12 recording form

BEACH (Bettering the Evaluation And Care of Health) - Morbidity and Treatment Survey - National © BEACH The University of Sydney 1996

Encounter Number

DOC ID

START Time

:

AM / PM
(please circle)

Date of encounter ___/___/___

Date of Birth ___/___/___

Patient Reasons for Encounter	1.
	2.
	3.

Sex M ☐ F ☐

Patient Postcode

PATIENT SEEN BY GP .... ☐
PATIENT NOT SEEN BY GP .... ☐

Medicare
Item Nos:
(if applicable)
1. _____
2. _____
3. _____

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

Workers comp paid ...... ☐
State Govt/Other paid ... ☐
No charge ...... ☐

Diagnosis/ Problem ① :

Problem Status New ☐ Old ☐ Work related ☐

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

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

Prac Nurse? ☐ 2.

Diagnosis/ Problem ③ :

Problem Status New ☐ Old ☐ Work related ☐

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

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

Prac Nurse? ☐ 2.

Diagnosis/ Problem ② :

Problem Status New ☐ Old ☐ Work related ☐

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

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

Prac Nurse? ☐ 2.

Diagnosis/ Problem ④ :

Problem Status New ☐ Old ☐ Work related ☐

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

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

Prac Nurse? ☐ 2.

NEW REFERRALS, ADMISSIONS

Problem(s)

1. _____ 1 2 3 4
2. _____ 1 2 3 4

IMAGING/Other tests Body site Problem(s)

1. _____ - _____ 1 2 3 4
2. _____ - _____ 1 2 3 4
3. _____ - _____ 1 2 3 4

PATHOLOGY

Problem(s)

1. _____ 1 2 3 4
2. _____ 1 2 3 4
3. _____ 1 2 3 4

PATHOLOGY (cont) Problem(s)

4. _____ 1 2 3 4
5. _____ 1 2 3 4

Patient reported

Height: ☐ cm

Weight: ☐ kg

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

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

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

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

FINISH Time
:
AM / PM
(please circle)

BA14

Appendix 2: GP characteristics questionnaire, 2011–12

THE UNIVERSITY OF SYDNEY

GP profile

Family Medicine Research Centre

© BEACH The University of Sydney 1996

Doctor Identification Number ☐ ☐ ☐ ☐ ☐

Please fill in boxes or circle answers

1. Sex .... **Male / Female** (Please circle)

2. Age .... ☐

3. How many years have you spent in general practice? .... ☐

4. Country of graduation (primary medical degree):
   ☐ Australia   ☐ Other: (specify) _____

5. 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.) .... ☐

6. Do you conduct any of your consultations in a language other than English?
   ☐ No   ☐ Yes 25–50%
   ☐ Yes <25%   ☐ Yes >50%

7. Are you a GP registrar (i.e. in training)?..... **Yes / No**

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

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

10. Do you bulk bill patients?......... **All / Some / None**

11. Is a computer available at your major practice? .... **Yes / No**
    If '**yes**', which clinical software is used? (specify) _____

12. Do **YOU** use the computer at your major practice? .... **Yes / No**
    If '**yes**', please tick to indicate which functions of the computer/clinical software you use

    ☐ Prescribing
    ☐ Internet
    ☐ Email

    Active medical records:
    ☐ Completely paperless
    ☐ Combination of computer and paper
    ☐ Paper only

    Pathology:
    ☐ Electronic ordering (online)
    ☐ Print/produce orders
    ☐ Receive results electronically

    Imaging:
    ☐ Electronic ordering (online)
    ☐ Print/produce orders
    ☐ Receive results electronically

13. Did any of your BEACH consultations take place in an Aboriginal Community Controlled Health Service?
    No...1
    Yes - all 2
    Yes - some (which dates) _____ 3

14. 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**

15. Postcode of major practice address...... ☐

16. For your major practice, please specify the number of individuals (ie. headcount) and number of full time equivalents (FTE*) for each type of professional:
    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 enrolled nurse working 20 hours/wk is recorded as 1 individual and 0.5 FTE.

	No. individuals	No. FTEs
(a) GPs (including yourself)	☐	☐
(b) Enrolled nurses	☐	☐
(c) Registered nurses...............	☐	☐
(d) Nurse practitioners.............	☐	☐
(e) Midwives............................	☐	☐
(f) Aboriginal health workers	☐	☐

17. Is your major practice accredited?......... **Yes / No**

18. Are any of the following health services located or available at your major practice?
    (includes services in the same building or within 50 metres, available on a daily or regular basis) (Circle all that apply)
    Physiotherapist.. 1
    Psychologist 2
    Pathology lab/collection centre......................... 3
    Imaging 4
    Specialist 5
    Other (specify) _____ 6
    None... 7

19. What are the normal after-hours arrangements for your major practice? (Circle all that apply):
    Practice does its own.. 1
    Co-operative with other practices 2
    Deputising service... 3
    Other 4
    None 5

20. Is your major practice a teaching practice?
    (Circle all that apply):
    For undergraduates... 1
    For junior doctors.. 2
    For GP registrars 3
    No 4

Thank you for participating in the BEACH PROGRAM.
Please return this form with the completed BEACH pad.

GP14(V1)   Ph: 02 9845 8151   fax: 02 9845 8155   FMRC, PO Box 533, Westmead Hospital, Wentworthville, 2145.   email: jan.charles@sydney.edu.au   Web: www.fmrc.org.au

Appendix 3: Patient information card, 2011–12

THE UNIVERSITY OF SYDNEY

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 over the 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 people who use their drugs and 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 care your doctor is providing in any way.

SEE OVER FOR PROJECT DETAILS

(page 1 / 2)

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.

BEACH is endorsed
by
the Royal Australian College
of General Practitioners

BEACH is endorsed
by
the Australian Medical Association

AMA

FURTHER INFORMATION:

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The University of Sydney
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Phone: (02) 9845 8151
Fax: (02) 9845 8155
Email: jan.charles@sydney.edu.au
Web: www.fmrc.org.au

Any person with concerns or complaints about the conduct of this research study can contact The Manager, Human Ethics Administration, University of Sydney on +61 2 8627 8176 (Telephone); +61 2 8627 8177 (Facsimile); ro.humanethics@sydney.edu.au (Email).   (page 2/2)

Appendix 4: Code groups from ICPC-2 and ICPC-2 PLUS

Available at: <purl.library.usyd.edu.au/sup/9781743320181>, see 'Electronic editions and downloads'.

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)

The book provides a summary of results from the 14th year of the BEACH program, a continuing national study of general practice activity in Australia.

From April 2011 to March 2012, 984 general practitioners recorded details about 98,400 GP–patient encounters, at which patients presented 153,218 reasons for encounter and 152,286 problems were managed. For an 'average' 100 problems managed, GPs recorded: 70 medications (including 57 prescribed, six supplied to the patient and seven advised for over-the-counter purchase); 11 procedures; 24 clinical treatments (advice and counselling); six referrals to specialists and three to allied health services; orders for 31 pathology tests and seven imaging tests.

A subsample study of more than 31,000 patients suggests prevalence of the following measured risk factors in the attending adult (18 years and over) patient population: obesity—27%; overweight—35%; daily smoking—15%; at-risk alcohol consumption—25%. One in four people in the attending population had at least two of these risk factors.