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# General practice in Australia, health priorities and policies 1998 to 2008

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# Foreword

General practice has always served as the cornerstone of the Australian health care system, and contributes greatly to Australia's high international health and health service rankings. The US-based Commonwealth Fund, in an international study, has shown that when adults have a 'medical home,' their access to necessary care, receipt of effective preventive screening, and management of chronic conditions improve substantially and disparities in access and quality are reduced[1]. The medical home, as provided by general practitioners, contributes to the high approval ratings for the Australian health care system in the Commonwealth Fund survey.

Dependable statistics about process and outcome are essential when making judgements about the quality of the health care system, and this report demonstrates and summarises the substantial contribution to the statistical base in general practice made by the Bettering the Evaluation and Care of Health (BEACH) program.

Over the past decade the BEACH program has provided a unique insight into the clinical encounters between general practitioners and their patients. As the only continuous national study of general practice activity in Australia, indeed in the world, it is an extraordinarily valuable and important resource. The strength of BEACH data lies first in the sheer sample size and second, that it provides a reliable, independent and continuous measure of changes in general practice since 1998.

As this report shows, there have been substantial changes in the activities of general practice in that time, both in numbers of services delivered and the focus of these services. These changes have occurred in parallel with the progressive ageing of our population, a consequent rise in demand by patients for treatment and management of chronic illnesses, changes in the provision of bulk billing, practice and service incentive payments through Medicare, a rising awareness of the need for accountable and evidence-based practice, and a push for greater patient involvement and responsibility in their own health care.

General practice can serve as a platform for preventive care and this has attracted the interest of those determining the Medicare schedule of fees for the provision of general practice services. Likewise the coordinating role that general practitioners may play in the care of patients with chronic illnesses has been reflected in Medicare items to encourage the development of chronic care plans and the better coordination of the range of services that these patients need.

This report provides statistical evidence that general practitioners are doing more check-ups, providing more lifestyle advice and managing more chronic problems than previously. Many of the changes identified can be readily linked to policy changes that have occurred over the time of the study. However, some policies appear to have had little or no impact on general practice patterns of care, and this should raise questions in the minds of policy makers as to their value.

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1 A. C. Beal, M. M. Doty, S. E. Hernandez, K. K. Shea, and K. Davis. Closing the Divide: How Medical Homes Promote Equity in Health Care: Results From The Commonwealth Fund 2006 Health Care Quality Survey, The Commonwealth Fund, June 2007.

Unfortunately a method for linking the measured changes in the process of care to improved health outcomes is yet to be developed and applied in Australia. In the absence of outcome measurements, the data in this report provide a means to assess the impact of past and current policies and programs in general practice, and can be used to help guide the development and implementation of new recommendations and policies.

General practice, alongside hospital care and health services more generally, is currently under review by several government-sponsored commissions and committees. These reviews are necessarily looking at how general practice might contribute to the achievement of a range of preventive and therapeutic health care goals for the future, whether in a suburban setting or as part of the effort to reduce health inequalities in Indigenous communities. Future changes in government policies affecting general practice seem certain.

Regardless of whether these imminent reports recommend revolution or evolution in the way health services are delivered, the new policies and programs that will be implemented to replace or stand alongside current policies and programs will demand evaluation of their costs and benefits, including those in general practice. The current economic environment demands that health care dollars are properly targeted and spent as effectively as possible.

The Australian Government has enunciated its support for evidence-based policy making, and the basis for this is the collection and analysis of data and the public distribution of the findings which can then be used, in a virtuous cycle, to respond to current needs and plan for the future.

This was recognised in 1994 by Canadian researchers who wrote: "*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 and practice patterns can be quantified… Such a model could be used for projecting changes to the system and for planning for the future.*"[2]

BEACH is valuable and important work, an excellent investment that surely should continue into the future. Indeed, necessary health care reforms will make this future work imperative if we are to preserve the honourable place, well deserved, that general practice occupies in health care in Australia.

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2 P.G. Norton, E.V Dun, and L. Soberman, L. Family practice in Ontario: How physician demographics affect practice patterns. Canadian Family Physician, 2004; 40: 249–256

# Contents

# Acknowledgments

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

# Abbreviations

| | |
|---|---|
| ABS | Australian Bureau of Statistics |
| ACCHS | Aboriginal Community Controlled Health Service |
| ACE | angiotensin-converting enzymes |
| AIDS | acquired immune deficiency syndrome |
| AIHW | Australian Institute of Health and Welfare |
| ASGC | Australian Standard Geographical Classification |
| ATC | Anatomical Therapeutic Chemical (classification) |
| AUDIT | Alcohol Use Disorders Identification Test |
| BEACH | Bettering the Evaluation And Care of Health |
| BMI | body mass index |
| BOIMHC | Better Outcomes in Mental Health Care |
| CAPS | Coding Atlas for Pharmaceutical Substances |
| Children's survey | National Children's Nutritional and Physical Activity Survey |
| CI | confidence interval (in this report 95% CI is used) |
| COPD | chronic obstructive pulmonary (airways) disease |
| CT | computerised tomography |
| CVD | cardiovascular disease |
| DVA | Australian Government Department of Veterans' Affairs |
| ED | erectile dysfunction |
| encs | encounters |
| FRACGP | Fellowship of the Royal Australian College of General Practitioners |
| GORD | gastro-oesophageal reflux disease |
| GP | general practitioner |
| H2RA | H2 receptor antagonist |
| HbA1c | haemoglobin, type A1c |
| HIV | human immunodeficiency virus |
| HPV | Human Papillomavirus |
| ICPC | International Classification of Primary Care |
| ICPC-2 | International Classification of Primary Care (Version 2) |
| ICPC-2 PLUS | a terminology classified according to ICPC-2 |
| ICS | inhaled corticosteroids |
| IHD | ischaemic heart disease |
| IMG | international medical graduate |

| | |
|---|---|
| INR | international normalised ratio |
| LABA | long-acting beta-agonist |
| MBS | Medicare Benefits Schedule |
| NHPA | National Health Priority Area |
| NHS | National Health Survey |
| NSAID | non-steroidal anti-inflammatory drug |
| OTC | over-the-counter (that is, medications advised for over-the-counter purchase) |
| OTD | overseas trained doctor |
| PBS | Pharmaceutical Benefits Scheme |
| RACGP | Royal Australian College of General Practitioners |
| RFE | reason for encounter |
| SAND | Supplementary Analysis of Nominated Data |
| SAS | Statistical Analysis System |
| SPANS | New South Wales Schools Physical Activity and Nutrition Survey |
| STI | sexually transmitted infection |
| URTI | upper respiratory tract infection |
| UTI | urinary tract infection |
| WHO | World Health Organization |
| Wonca | World Organization of Family Doctors |

# Symbols

| | |
|---|---|
| **↑**/**↓** | indicates a statistically significant linear change |
| ↑/↓ | indicates a marginally significant linear change |
| § | indicates a non-linear significant or marginal change |
| – | indicates no change |
| < | less than |
| > | more than |
| N/A | not applicable |
| NAv | not available |
| NEC | not elsewhere classified |
| no. | number |
| NOS | not otherwise specified |

# Executive summary

This report looks at changes in the clinical activities of general practice in Australia over the decade 1998 to 2008, in the context of numerous government initiatives, changes in the general practitioner (GP) workforce and changes in the population.

General practice activities are measured by the Bettering the Evaluation and Care of Health (BEACH) program, a continuous national study based on data collected from new samples each year of about 1,000 GPs. Each GP provides details for 100 consecutive GP–patient encounters. BEACH began in April 1998 and this report uses data collected from then to March 2008, covering about 9,900 GP participants and 990,000 GP–patient encounters.

The report focuses on general practice activities for eight health conditions declared as National Health Priority Areas in recent times by the Australian and state and territory governments and two emerging health areas—sexual health and gastro-oesophageal reflux disease. It also summarises care provided to the Aboriginal and Torres Strait Islander population by GPs.

### Australians and their GPs

- Both the Australian population and its GPs are ageing.
- GPs are spending an increasing proportion of their time with older patients and less with children.
- An increasing proportion of GPs are female (almost 4 in 10).
- Most GPs are in group practices; the average GP is working fewer hours.
- Based on the number of doctors and the hours they work, there has been an apparent GP shortage, and recognised geographic maldistribution.
- Over the period of 1998–2008, visits to GPs fell from a peak of 5.5 visits per head of population at the start to a low of 4.9 in 2003–04, then rose towards the earlier level to 5.2 in 2007–08.

### General government measures

- To improve equity of access to GPs, the Australian Government took steps in 2004 and 2005 to increase certain GP payments and reduce patient costs.
- Government also encouraged GP management of chronic diseases, and increased preventive health checks among at-risk groups, by creating payment incentives through the Medicare scheme.
- Responding to the GP shortage, governments have created more training places, encouraged employment of doctors from overseas, and supported use of nurses to help GPs in their clinical work, by providing Medicare rebates for some nurse activities.

### Why patients visit GPs and what GPs are doing

- The number of reasons patients give for seeing the GP have increased over time and changed, with a move towards more requests for services (such as check-ups and prescriptions) and away from descriptions of symptoms.

- GPs are more often doing check-ups and detecting and managing chronic diseases, such as diabetes, hypertension (high blood pressure) and other cardiovascular problems, cholesterol disorders and depression.
- They are increasingly likely to order pathology tests at a visit and to order more tests when they have decided to test.

### Where has disease management improved?

There have been numerous special government initiatives over the decade, and some new clinical guidelines, aiming to help GPs improve their management of a range of priority health problems. The initiatives have mainly been to ensure that GPs are appropriately reimbursed when they adopt what are considered to be best practice methods of clinical care. This is done by devising new items for services that can be claimed under the Medicare scheme. The causal effect of policies is often difficult to assess because of the complexity and breadth of general practice, and because some policies have been in existence longer than others, having less time to have had an effect. However, this report has shown that GP clinical activity generally correlates strongly with health policy initiatives

***Positive developments*** include increased:

- detection and management of Type 2 diabetes
- involvement in detecting and managing cancers of the breast, cervix, skin and prostate, suggesting greater sharing of responsibility with specialists for the care of these problems
- referrals of psychological problems to psychologists but no decrease in GP involvement in management, again suggesting more sharing of care between these professions
- use of asthma maintenance therapy for adults, in line with recent policies and guidelines
- prescribing of the cholesterol-lowering statin drugs and monitoring of patients' cholesterol levels, particularly those at risk through Type 2 diabetes, in line with guidelines for reducing the risk of heart disease and stroke.

So far there has been ***no measurable impact of policies*** on:

- multidisciplinary team management with, and use of, allied health professionals by GPs in the management of priority health areas, except for psychological problems and Type 2 diabetes
- management of arthritis and other musculoskeletal conditions, except osteoporosis
- management of heart disease and stroke, except for cholesterol-lowering activities, though the lack of an increase in the incidence of stroke in an ageing population suggests better preventive care
- how health problems among Aboriginal and Torres Strait Islander patients are managed.

And the study raises ***concerns*** about:

- the cost of the continued rapid growth in the ordering of pathology testing
- an increase in the management rate of adverse medical events in older patients and younger women
- the increasing number of patients who will be diagnosed with complex health needs, the time that will be needed to care for them and the effect this will have on the future GP workforce.

# 1 Overview

This is the 24th report from the Bettering the Evaluation and Care of Health (BEACH) program, described briefly below. This report extensively looks at key changes in the service delivery of general practice in Australia over the decade 1998–2008 in the context of developments in national health priorities and government initiatives, and of a changing GP workforce and workload.

### The BEACH program

The BEACH program is a continuous national study of general practice activity, based on new samples each year of about 1,000 general practitioners (GPs), each of whom provides details for 100 consecutive GP–patient encounters. BEACH began in April 1998, and this report uses data collected between then and March 2008, by 9,874 GP participants for 987,400 GP–patient encounters.

BEACH is conducted by the Australian General Practice Statistics and Classification Centre, a collaborating unit of the Australian Institute of Health and Welfare (AIHW) in the Family Medicine Research Centre at the University of Sydney. BEACH is currently supported financially by the Australian government, government instrumentalities and private industry (see Acknowledgments).

This overview chapter draws together the main features and findings of the report. It begins by providing some general background on the Australian population, the general practice system in Australia, GP workforce and workload, and related government policies and initiatives. It then briefly outlines the report's structure. In a final section it summarises chapters that have examined changes in how GPs have managed eight health conditions since 1998, soon after they were declared as National Health Priority Areas by the Australian and state and territory governments. Another chapter summarised here concerns the care provided in general practice to Aboriginal and Torres Strait Islander peoples, because considerable policy attention has been paid to the health of Indigenous Australians over the period looked at. Finally, this chapter provides summaries of chapters on current general practice management of sexual health issues, and management of gastro-oesophageal reflux disease (GORD), which have not been declared priority areas but have been identified as morbidities of increasing prevalence and cost to society.

## 1.1 Background

### Australians, GPs and general practice

- In June 2008, the estimated population of Australia was 21.4 million people.[1]
- GPs are the first port of call in the Australian health care system.
- In 2006, there were 97 full-time equivalent practising primary care medical practitioners per 100,000 people in Australia.[2]
- Payment is on a fee-for-service system, there being no patient lists or registration.

- Currently people are free to visit multiple practitioners and multiple practices of their choice; however a system of voluntary registration with a practitioner or practice (yet to be decided) has been mooted.
- There is a universal Australian Government-funded medical insurance scheme (the Medicare Benefits Schedule or MBS) which covers all direct costs of most GP visits.
- The Australian Government also contributes to the individual's cost of filling prescribed medications that are accepted on the Pharmaceutical Benefits Scheme (PBS). While everyone receives some government contribution, a larger contribution is provided to disadvantaged people holding a Commonwealth concession card.
- About 88% of the Australian population visited a GP at least once in 2005–06.[3]
- In 2007–08, 109.5 million general practice consultations items of service were paid by Medicare Australia, at an average rate of more than five visits per person per year.[4] GPs provided an estimated additional 5.5 million services, paid for by other funders (such as workers compensation, state government) or not charged for at all.[5] The primary cost to Medicare for claims for GP items of service was over $4.4 billion.[4]
- While data are available from the MBS about the number and cost to government of visits to GPs, and the number and type of medications paid for by the Australian Government through the PBS, BEACH provides some insight into the reasons people attend the GP, the services provided and actions undertaken by the GP within the consultation in the management of each problem, health states, and the relationship these factors have with health service activity.

## National Health Priority Areas

These priority areas began as the National Health Priority Areas (NHPA) initiative, Australia's response to the World Health Organization's global strategy, Health for All by the Year 2000, announced in 1978. The NHPAs were established in 1996, as a process of collaborative activity involving the Australian and state and territory governments. The initiative was a further development of the earlier defined National Health Goals and Targets which included cardiovascular health, cancer control, injury prevention and control, and mental health, with diabetes being added to the priority areas.[6] Since 1996, the following areas have been added: asthma (1999)[7], arthritis and musculoskeletal conditions (2002)[8], and obesity (2008).[9] The initiative also focuses on common health risk factors and health inequalities, such as those in Indigenous communities, as reflected by the priority diseases and conditions.

Conditions selected as priorities were those for which it was thought that a concerted effort could achieve significant gains in the health status of the nation. The initiative was seen as representing a change of focus of accountability in governments with increasing emphasis on measurement of activities and the impact the activities have on the health of the community.[6]

## Government initiatives for general practice

Changes to education and training, the ageing of GPs, and higher numbers of female graduates have had an effect on the workforce and led to an apparent shortage of GPs. Responses to this shortage include increased GP training places, employment of international medical graduates and introduction of practice nurses.

Policy measures, particularly those in the Medicare Benefits Scheme, have driven changes in the GP workload. Remuneration for GP management of chronic disease, and for preventive health checks among at-risk groups have been the focus of recent policies. These have driven changes in diagnostic processes, including pathology ordering.

## 1.2 Report structure and how results are presented

The methods used in this report are fully described in Chapter 2. Other chapters cover:

- changes in the GP workforce, workload and in GP clinical activity (chapters 3 and 4)
- the pathology test ordering behaviour of GPs (Chapter 5), followed by an overview of the care provided by GPs for Aboriginal and Torres Strait Islander patients (Chapter 6)
- the prevalence of overweight and obesity, and of different levels of obesity among patients attending general practice (Chapter 7)
- other priority area morbidities and their management in general practice (chapters 8–14)
- the management of selected morbidities that are not national priority areas but are of importance to public health—sexual health (Chapter 15) and gastro-oesophageal reflux (Chapter 16).

Each chapter contains an overview of the section (including definitions where relevant) and summarises the policies relevant to GP management of the morbidity covered in the chapter. Suggested chapter citations are provided at the end of each chapter, followed by the references pertaining to the chapter.

The term 'management rate' is used frequently. It signifies that the selected problem is managed at an average rate of X times in every 100 GP–patient encounters.

Tabled results include 95% confidence intervals (see Chapter 2) to show statistical significance of differences. In the majority of the figures, error bars are provided representing the 95% confidence interval in each result. Where there are too many variables in a figure for optimum visual reading of the error bars, 95% confidence intervals are provided in the text when significant changes are reported. The national effect of significant change is often estimated by extrapolating the BEACH result to all GP Medicare claimed encounters. The method adopted for extrapolation is described in Chapter 2. The reader can apply this method to any significant change in the data presented, to gain an estimate of the size of the national change in frequency of an event, occurring as a result of the changes in general practice measured by BEACH.

## 1.3 Key findings

### GP workforce and workload

Like the rest of the world, Australia has an ageing population, the median age in 2007 being 37 years. From 1998 to 2007 there was about a 1% decrease in the proportion of the population aged less than 15 years and an extra 1% aged 65 years and over. As life expectancy improves, the median age of the population rises, and a greater part of the GP workload will involve management of older patients.

The highest annual average number of Medicare GP items of service claimed per head of population was in 1998–99, at 5.5 visits per head. Average attendance then steadily decreased to a low of 4.87 visits per head in 2003–04. This decreasing attendance rate raised questions about equity of access, leading the Australian Government to make substantial changes to laws governing Medicare benefits in 2004 and 2005. These measures appear to have had an effect, as attendance rates are now approaching the 1998–99 levels.

Over the decade examined, and increasing proportion of the general practice (GP) workforce became were female, and older (28% now aged 55 years and over). There was a decrease in supply of full-time-equivalent GPs from 101 per 100,000 people in 2002 to 97 per 100,000 in 2006, partially a result of decreased working hours for many. Solo general practice is now relatively rare, the move to larger practices having been encouraged by the Australian Government's GP Links program. More than half the practising GPs now hold postgraduate general practice qualifications in response to changes instituted in the mid-1990s, which required that new GPs be so qualified.

An increasing proportion of the GPs workload is being spent with older patients and a lesser proportion with children. This is associated with the changing population demographics and decreasing child attendance rate, but whether the latter reflects improved overall children's health or reflects access difficulties cannot be determined (see Chapter 3).

## Clinical activity

The reasons patients see a GP have changed, with an increase in the number of reasons given (suggesting an increase in multiple problem management, supported by the results), a move towards more requests for services (for example, check-ups and prescriptions) and away from presentations of symptoms and complaints. The introduction of Medicare item numbers specifically for health assessments of at-risk groups could explain some of the increased requests for check-ups. Publicity campaigns urging skin and cancer checks, and checks for sexually transmitted infections may also have contributed.

In line with the increase in patient requests, GPs are doing more check-ups, and are managing more chronic problems, reflected in higher chronic disease detection rates, which may be the result of more 'well-patient' check-ups for selected groups. There were increases in management rates of many of the commonly managed priority areas, including hypertension, lipid disorders, diabetes and depression. Most chronic diseases, once diagnosed require long-term or life-long ongoing care, so the earlier the disease is detected the more GP services will be used in its management over a lifetime.

A decrease in management rate of infections and in follow-up encounters for non-chronic conditions could be the result of fewer encounters with children, and broad public and GP education campaigns about the self-limiting nature of some acute problems (see Chapter 4).

## Pathology ordering

Between 2000–02 and 2006–08, GPs ordered pathology on an increasing number of occasions, and ordered more tests on average on each occasion. In 2000–02, an estimated 33.6 million tests/batteries were ordered per annum, and by 2006–08, this had increased to 51.3 million per annum. Type 2 diabetes was responsible for 8% of the national increase of 17.7 million tests ordered, due to increased management rate, increased likelihood of ordering pathology, and increased number of tests ordered on those occasions.

Other priority areas that contributed significantly to the increase in pathology ordering was cardiovascular disease (13.1% of the total 17.7 million increase), especially hypertension (7.2%) and lipid disorders (4.5%). Other significant contributors included general check-ups (8.2%), blood tests (4.9%) and female genital check-ups (4.4%).

A number of disease-orientated policies aiming to improve patient care are likely to result in increased GP pathology ordering, because they are in line with evidence-based practice. However, while these policies may increase pathology expenditure, they may also reduce long-term health costs in other areas of the health budget (for example, by reducing avoidable hospital admissions) (see Chapter 5).

### Aboriginal and Torres Strait Islander patients

Aboriginal and Torres Strait Islander patients are a major priority for all governments in Australia and for general practice. They accounted for 1.2% of all BEACH encounters over eight years. Two-thirds were under the age of 45 years, compared with less than half of non-Indigenous patients. Indigenous patients experienced higher management rates of diabetes, asthma and drug abuse, but lower management rates of cardiovascular disease, lipid disorders, oesophageal disease and preventive check-ups (blood pressure checks and immunisations). Infections were managed 36% more often at Indigenous encounters than at non-Indigenous encounters. Of Indigenous patients, 74% resided in Regional/Remote areas. Encounters with the 26% residing in Major Cities more often involved management of drug abuse, upper respiratory tract infection, and psychological problems. Indigenous patients were twice as likely to have all three measured risk factors (daily smoker, at-risk drinker, overweight/obese) than were non-Indigenous patients. The high prevalence of multiple risk factors reinforces the growing need for early intervention. The first hurdle is the inadequate identification of the Indigenous status of patients, as extra preventive services can only be given if Indigenous status is recognised (see Chapter 6).

### Overweight and obesity

The Australian Government has recognised obesity as a major public health problem needing attention, and is allocating resources towards further research and public health campaigns.

Between 1998–00 and 2006–08, there was a steady increase in prevalence of overweight (from 33% to 35%) and obesity (19% to 24%) in adult general practice patients. In 2006–08, 16% of adult GP patients were in Obese Class I (body mass index 30.00–34.99), 5% in Class II (35.00–39.99) and 3% in class III (40.00 and over), the prevalence of each class having increased significantly since 1998–00. The prevalence of overweight/obesity in children (2–17 years) attending general practice did not change between 1998–00 (27.9%) and 2006–08 (28.7%), and this is in line with findings of other recent research (see Chapter 7).

### Respiratory problems

The prevalence of asthma among GP patients remained unchanged, but increased use of maintenance therapy, in accordance with recent policies and guidelines, and a decrease in asthma management rates, suggest better asthma control. The management rate of chronic obstructive airways disease did not change, but there was a significant increase in the detection rate of new cases, reflecting improved GP awareness. Management rates decreased over the decade for acute bronchitis, asthma, sinusitis, tonsillitis, and allergic rhinitis, but remained unchanged for chronic obstructive pulmonary disease (COPD), upper respiratory tract infection (URTI), and influenza.

Antibiotic prescribing decreased significantly for children, probably in response to a range of educational interventions, but remained unchanged for adults. Where URTI was managed, 21% of children and 37% of adults received antibiotics. Further attention to prescribing of antibiotics for adults is warranted (see Chapter 8).

## Cardiovascular problems

Vascular/lipid problems accounted three quarters of all cardiovascular problems managed, and their management rate increased over time for both males and females and for older patients (75 years and over). Increased pathology ordering corresponded with an increase in management of lipid disorders and of diabetes as the most common comorbidity. The management rate of cardiac problems did not change,, but the management rate of ischaemic heart disease and heart failure decreased and the management rate of atrial fibrillation increased. No changes were noted in the management rates of cerebrovascular problems. Common to all problem groups was the increased prescribing rate of statins, probably due to the changed PBS criteria broadening access to statins. Patients managed for cardiovascular problems were less likely to smoke but more likely to be overweight/obese than average. Further, nearly 30% of males and 20% of females already managed for a cardiovascular/lipid problems drink at at-risk levels (see Chapter 9).

## Type 2 diabetes

The prevalence of Type 2 diabetes was estimated to be 5.7% in the GP-attending population and (through extrapolation) 5.0% in the general population. Diabetes patients with one or more additional morbidities constituted 6.1% of the population (1.3 million patients). Over the 10 years, multiple policy initiatives and guideline and regulatory changes have affected the way GPs manage Type 2 diabetes. The management rate of Type 2 diabetes increased by 57%, and the diagnosis rate of new cases doubled. Between 2000–01 and 2007–08 pathology test orders for Type 2 diabetes problems increased by 42% and the HbA1c testing rate by 28%. The rate of referral to allied health doubled in the 10 years. The rate of prescriptions for glucose lowering medications remained constant, but prescription rates for anti-platelet medications, lipid lowering medication and anti-hypertensives increased significantly. Patients with Type 2 diabetes use 50% more GP time per year than average. Changes in GP management of Type 2 diabetes have occurred in line with guideline and policy changes (see Chapter 10).

## Musculoskeletal problems

'Arthritis and musculoskeletal conditions' was added to the national priority areas in 2002. Subsequently, national frameworks for these conditions were designed. However, policies in this area have not greatly affected the management of these conditions in general practice, with the exception of increased management rates of osteoporosis. However, given the ageing population, it may have been reasonable to expect an increase in the management rate of these morbidities. The lack of measurable change in management rates for the majority of these morbidities may suggest a positive effect of policy (see Chapter 11).

## Injuries

The management rate of injuries decreased over the 10 years, with musculoskeletal injuries making up half of all injuries, and skin injuries a further 35%. Adverse effects of a medication (which are internationally regarded in the injury class, but are not in Australia's injury priority area) were the only injury type to increase in frequency. These data suggest that this is an area for future policy consideration. Concerns that arise from this research are the increased use of opioids in GPs' management of physical injuries, and the finding that adverse medical events in older patients are becoming more common (see Chapter 12).

## Cancer

The GP management rates of cancer increased over the 10 years by 25% (from 194.6 to 243.2 per 10,000 encounters), and included increases in management of skin malignancies, and cancer of the breast, prostate and cervix. Rates of preventive check-ups (Pap smears, breast and prostate checks) as well as excisions of skin malignancies all showed significant increases. Rates of pathology test ordering, including prostate specific antigen and faecal occult blood test also increased significantly, perhaps resulting from wide public discussion about prostate cancer, and the National Bowel Cancer Screening program.

Policies that involve a widely publicised campaign or include a patient register appear to increase patient demand for screening tests. GPs are becoming more involved in the cancer detection process and in the coordination of the cancer patient's care (see Chapter 13).

## Mental health

Multiple initiatives introduced between 1998 and 2008 aimed to improve mental health care (particularly depression). General practice played a central role in many of these initiatives.

There was a significant increase in the management of psychological problems overall between 2002–03 and 2007–08, most notably in depression. A significant increase in psychological counselling for anxiety and depression occurred before the Better Outcomes initiative was introduced, and the rate remained steady after its introduction. The rate at which patients with depression and anxiety problems were referred increased significantly, with a shift in referrals for depression, from psychiatrists to psychologists associated with the introduction of the MBS items for psychologist services. The increase in referrals to psychologists was proportionally larger in rural and disadvantaged areas (see Chapter 14).

## Sexual health

While sexual health is not a National Health Priority Area, there have been important Australian Government policy activities in this area. Over the 10 years, the rate of GP sexually transmitted infection (STI) testing and screening increased significantly, and the management rate of diagnosed STIs marginally increased. It is not known whether the increased management of diagnosed STI represents a successful campaign with improved testing for, and recognition and management of, STIs or a failure of safe-sex educational programs resulting in higher prevalence in the population.

In 2004–05, the Australian birth rate rose sharply and there was an increase in pregnancy tests and confirmations in Australian general practice. However, GP management of pregnancy continued to decrease after 2004, suggesting the increased birth rate had no effect on their ongoing move away from obstetrics management (see Chapter 15).

### Gastro-oesophageal reflux disease (GORD)

This problem is not a National Health Priority Area, but has high prevalence in Australia (some estimates suggesting 63%), is frequently managed with other chronic problems, particularly in older patients, and is a significant pharmacological cost to the PBS. The main changes in the guidelines and regulations were about endoscopy and the subsequent removal (in 2001) of the requirement for endoscopy, X-ray or surgery, before proton pump inhibitors could be prescribed on the PBS. Over the 10 years, there was a 47% increase in the management rate and a 46% increase in new cases of GORD being diagnosed. Referrals to specialists for GORD fell by half, and referrals for endoscopy fell by over 90%, coinciding with the regulatory changes in 2001 (see Chapter 16).

## 1.4 Conclusion

This report has shown that GP clinical activity generally correlates strongly with health policy initiatives, and this is particularly apparent in the GP management of Type 2 diabetes. Also, GPs are becoming more involved in the detection and ongoing management of some cancers, suggesting increased sharing of responsibilities with specialists. The introduction of MBS cover for GP-referred psychologist consultations increased referrals dramatically, but did not decrease the GP role in management, suggesting increased multidisciplinary care of psychological problems. In contrast there is no evidence of increased team management with, or use of, allied health professionals in the management of other National Health Priority Areas.

Asthma management rates have decreased, presumably as a result of better asthma control, resulting from the care plan initiatives. In contrast there has been no measurable impact of policies on GP management of: arthritis and other musculoskeletal conditions, with the possible exception of improved detection of osteoporosis; or of cardiovascular disease, though increased lipid monitoring management may be improving secondary prevention, leading to increased quality years of life.

Measurable decreases in rates of injury management may be the result of improved prevention. However, adverse pharmacological events are increasingly being seen in general practice. They may warrant special policy attention, as may sexual health problems and gastro-oesophageal reflux disease, both of which have high social impact.

Initiatives in the area of Indigenous health do not appear to have produced changes in the care received in general practice. Better identification of Indigenous status and concentration on health risk behaviours are the keys to future efforts. Public education initiatives in the area of obesity have begun and policies related to GP care of this problem are currently under development. Measurement of the impact of these policies will be done in the future.

Many policy initiatives rely on increased health checks. A ‘well diagnosed’ ageing population will over time mean increased diagnosed prevalence of multimorbidity, presenting the GP with more patients with complex health needs. The chronic disease item numbers are therefore likely to become more popular with GPs. This has implications for future GP workforce, as chronic disease items of service are on average far longer than other item encounters. It also has implications for the continued exponential growth of pathology test ordering.

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# 2 Methods

## *Helena Britt*

The BEACH program is a continuous national study of general practice activity in Australia. The methods used are described in detail below. In summary it collects details for about 100,000 encounters between GPs and patients (about a 0.1% sample of all general practice encounters) from an ever-changing random sample of about 1,000 recognised practising GPs per year.

A random sample of GPs who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from Medicare Australia data by the Primary and Ambulatory Care Division of the Australian Government Department of Health and Ageing. GPs are approached by letter and followed up by telephone recruitment. Each participating GP completes details for 100 consecutive GP–patient encounters on structured paper encounter forms (Appendix 1). Each also provides information about themselves and their major practice (Appendix 2).

Post-stratification weighting of each individual year's encounter sample adjusts for any variance in the characteristics of the participating GPs from those of the sample frame from which they were drawn, and for the varying 'busyness' of each GP (measured by the number of claims each has made in the previous 12 months from Medicare Australia). The final sample of encounters shows excellent precision when the age–sex distribution of the patients is compared with the distribution in all Medicare-claimed services of this type.[1]

## 2.1 Data elements

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

- **Encounter data:** date of consultation, type of consultation (direct/indirect), up to three Medicare/Department of Veterans' Affairs item numbers (where applicable) and other payment source (where applicable) (tick box and free text).
- **Patient data:** date of birth, sex and postcode of residence. Tick boxes are provided for Commonwealth concession cardholder, holder of a Repatriation health card (from the Department of Veterans' Affairs), 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). At least one ( and up to three) patient reasons for encounter (RFEs) must be recorded and space is provided for up to three.
- The **problems managed** at encounter (at least one and up to four). Tick boxes are provided to denote the status of each problem as a new or continuing problem for the patient (see Glossary).

- **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, number of repeats, and status (new/continuing medication for this problem for this patient)
  - other treatments provided for each problem including counselling, advice and education, and procedures undertaken, and whether the other treatment was provided by practice nurse (tick box)
  - new referrals to medical specialists, allied health professionals and hospital
  - investigations including pathology tests, imaging and other investigations ordered at the encounter.
- **GP characteristics:** age and sex, years in general practice, number of GP sessions worked per week, size of practice, postcode of major practice address, country of graduation, postgraduate general practice training and Fellow of the Royal Australian College of General Practitioners status, after-hours care arrangements, use of computers in the practice, whether the practice is accredited, whether it is a teaching practice, work done in other clinical settings and hours worked in direct patient care.

## 2.2 Statistical methods

The analysis of all BEACH data were done with Statistical Analysis System (SAS) version 9.1.3.[2]

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 9.1.3 are used to calculate the intracluster correlation and adjust the confidence intervals accordingly.[2]

The encounter is the primary unit of inference. Proportions (%) are used when describing the distribution of an event that can arise only once at a consultation (for example, age, sex), or to describe the distribution of events within a class of events (for example, problem A as a percentage of total problems). Rate per 100 encounters is used when an event can occur more than once at the consultation (for example reasons for encounter, problems managed or medications).

Results for events occurring at GP–patient encounters present the rate per 100 encounters and the 95% confidence interval. Rates per 100 selected problems managed are used when a management event can occur more than once per problem.

Changes over time, and comparisons of result for different groups of patients (e.g. males and females) in the frequency of these events are judged to be:

- significant (that is, a real change has occurred) if the two sets of confidence intervals do not overlap. For example, Result A: 11.5 per 100 encounters (95% CI: 11.3–11.7) is significantly less than Result B: 11.9 per 100 encounters (95% CI: 11.8–12.0).
- marginally significant if the two sets of confidence intervals butt together, the difference is regarded as marginal. For example, Result A: 11.5 per 100 encounters (95% CI: 11.3–11.7) is marginally lower than Result B: 11.9 (95% CI: 11.7–12.1).

If the confidence intervals from the two results overlap, no change has occurred, or there is no difference between the groups being compared.

## 2.3 Changes over time

Changes in method or approach have occurred on occasion over the 10 years of the BEACH study. Data presented in this report are comparable for each result across all data years. Where methodological changes have occurred, the data have either:

- been recalculated using the new method (for example, body mass index was recalculated due to a change in the World Health Organization body mass index groupings)
- been regrouped for comparability (where this occurs, it is has been noted in the footnotes of the table)
- been omitted from this report (if recalculation or grouping was not possible). Where data are omitted, this is noted in tables as not applicable (N/A) or not available (NAv), as appropriate.

Readers should be aware that there may be discrepancies between data in this report and data published in earlier BEACH reports.

In measuring changes over time, the 2007–08 results are compared with those from 1998–99 wherever possible. However, as in any long-term research program, changes occur over the years. For example, in response to requests from the Department of Health and Ageing (then the Department of Health and Aged Care), more detailed coding systems for pharmaceuticals, pathology and imaging test orders were developed, and these were applied from year 3 (2000–01) onwards. In these cases, change is measured from 2000–01 because earlier years are not comparable.

The direction and type of change between 1998–99 (or later years, where appropriate) and 2007–08 is indicated for each result in the far right column of some of the tables:

- **↑**/**↓** indicates a statistically significant linear change
- ↑/↓ indicates a marginally significant linear change
- § indicates a non-linear significant or marginal change
- — indicates there was no change.

## 2.4 Extrapolated national estimates

Where the results demonstrate a significant change over time, the effect of this change has sometimes been extrapolated to the total GP Medicare services from 1998–99 (or other years as appropriate) to 2007–08. The method of extrapolation is described below.

- The national estimates are calculated by dividing the rate per 100 encounters of the selected event for 1998–99 by 100, and then multiplying by the total number of GP services claimed through Medicare in that year (rounded to the nearest 100,000, see Table 2.1) to give the estimated annual number of events in 1998–99. The process is then repeated for 2007–08. The difference between the two estimates (to the nearest 10,000) gives the estimated national change in the rate of encounters for that event over the period of interest.
- This is expressed as the estimated increase or decrease over the study period (between 1998–99 and 2007–08), in the number of GP contacts for that event. For example, an increase or decrease in the number of GP management contacts with problem *X* occurring in Australia in 2007–08 compared with 1998–99 (or 2000–01).

- Throughout this report data from different time points have been used, and sometimes data years have been combined. Where data years have been combined, the average, rounded number of GP MBS item number claims have been used for extrapolations.

Table 2.1 provides the total number of general practice professional service items claimed from Medicare in each financial year from 1998–99 to 2007–08. In this report extrapolations are calculated using the number of GP Medicare items claimed rounded to the nearest 100,000. The rounded number is also provided in Table 2.1. Readers can use the method described above to calculate the national effect of any reported significant change in a single result over any two time points.

*Example of extrapolation*

In Chapter 4, the number of problems managed at encounters with GPs steadily increased over the decade, from 145.3 (95% CI: 143.5—147.2) in 1998–99 to 151.3 (95% CI: 149.2—153.4) per 100 encounters in 2007–08.

[(151.4/100) *X* 109.5million] *minus* [(145.3/100) *X* 102.6 million] =
165.8 million *minus* 149.1 million = 16.7 million.

This suggests that nationally, in 1998–99 the GP workforce dealt with 149.1 million problems at encounters with their patients, whereas in 2007–08 they dealt with, 165.8 million problems, an increase of 16.7 million, or 11.2%.

**Table 2.1: General practice professional services claimed from Medicare Australia ('000) by financial year, 1998–99 to 2007–08**

| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. of GP MBS items ('000) | 102,552 | 101,517 | 100,645 | 99,921 | 96,919 | 96,330 | 98,180 | 101,095 | 103,433 | 109,518 |
| Rounded no. of GP MBS items ('000) | 102,600 | 101,500 | 100,600 | 99,900 | 96,900 | 96,300 | 98,200 | 101,100 | 103,400 | 109,500 |

*Source:* Medicare statistics, Table B1—Medicare: Number of services ('000) by quarter and financial year of processing by broad type of service. Available from <www6.health.gov.au/internet/main/publishing.nsf/Content/41322B5BFABA25FFCA25744B000334C4/$File/tableb1.xls>.

## Limitations of extrapolations

The extrapolations to the total encounters occurring nationally in any one year are only estimates. It is likely to provide:

- an underestimate of the true GP workload of a condition/treatment because the extrapolations are made to the number of GP Medicare items claimed, not to the total number of GP encounters per year (which include indirect encounters and those paid by sources other than Medicare, such as the Australian Government Department of Veterans' Affairs, state governments, work cover, employers)
- an overestimate of the management rate of a group of conditions (for example, cardiovascular disease) because there is a chance that more than one problem of this type will be managed at a single encounter. In the extrapolations, two cardiovascular problems managed at one encounter will be counted as two encounters.

Further, the base numbers used in the extrapolations are rounded to the nearest 100,000 and the extrapolations are rounded to the nearest 10,000. However, the rounding has been applied to all years, so the effect on measures of change will be very small. The extrapolation therefore still provides an indication of the size of the effect of measured change nationally.

# 2.5 Classification and coding of data

## Reasons for encounter, problems managed and the process of care

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)[3], and the recommended Australian standard for classification of data from general practice or patient self-report[4]:

- patient reasons for encounter
- 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[5], and is the declared national standard in Australia for reporting of health data from general practice and patient self-reported health information.[4]

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 2.1).

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

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

**Figure 2.1: The structure of the International Classification of Primary Care—Version 2 (ICPC-2)**

Chapters are based on body systems, with additional chapters for psychological and social problems. Component 1 includes symptoms and complaints. Component 7 covers diagnoses. These are independent in each chapter and both can be used for patient reasons for encounter or problems managed.

Components 2 to 6 cover the process of care, and are common throughout all chapters. The processes of care, including referrals, other (non-pharmacological) treatments and orders for pathology and imaging, are classified in these process components of ICPC-2. Component 2 (diagnostic, screening and prevention) is also often applied in describing the problem managed (for example, check-up, immunisation).

The ICPC-2 is an excellent epidemiological tool. The diagnostic and symptomatic rubrics have been selected for inclusion on the basis of their relative frequency in primary care settings, or because of their relative importance in describing the health of the community. It has approximately 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 to ensured correct classification of a concept.

## Coding of data

The above data elements are coded in more detail using ICPC-2 PLUS[6], an interface terminology developed by the Family Medicine Research Centre from all the terms used by GPs in studies such as the Australian Morbidity and Treatment Survey 1990–91[7], the Morbidity and Therapeutic Index 1992–1998 (a clinical audit tool that was available to GPs) and BEACH 1998–2008, which together have included about 2 million encounter records. These terms are classified according to ICPC-2 to ensure international reporting standards.

When the free-text data are received, trained secondary coders (who are undergraduate students studying health information management or medical science) code the data in more specific terms using ICPC-2 PLUS. This ensures high coder reliability, and automatic classification of the concept, and gives the ability to 'ungroup' such ICPC-2 rubrics as 'other diseases of the respiratory system' and select a specific disease from the terms within it.

## Presentation of data classified in ICPC-2

Statistical reporting is almost always at the level of the ICPC-2 classification (for example, acute otitis media/myringitis—ICPC-2 code H71). The ICPC-2 code for these individually reported rubrics can be found at: http://www.globalfamilydoctor.com/wicc/pagers.html.[8]

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 3.

### Reporting morbidity with groups of ICPC-2 codes

When recording problems managed, the GP is not always 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 'hypertension, uncomplicated' (code T86). There is another code for 'hypertension, complicated' (T87). In some cases the GP may simply have failed to specify that the patient had complicated hypertension. The research team therefore feels that for national data reporting, it is more reliable to group the two codes K86 and K87 and label this 'Hypertension'. A list of codes included in each of the groups is provided in Appendix 3.

### Reporting morbidity across 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, for example 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 are taken from all the appropriate ICPC-2 codes and grouped. This group is labelled 'Osteoarthritis' but in this case they are PLUS codes rather than ICPC-2 codes. For a list of codes in these groups see Appendix 3.

### Reporting pathology and imaging test orders

All the pathology and imaging tests ordered by the GPs are coded very specifically in ICPC-2 PLUS, but the 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 computerised tomography (CT) scan of the lumbar spine is classified as L41—Diagnostic radiology/imaging of the musculoskeletal system). In Australia, the Medicare Benefits Schedule (MBS) classifies pathology and imaging tests in groups that are relatively well recognised. The team therefore re-grouped pathology and imaging ICPC-2 PLUS codes into MBS standard groups. This allows comparison of data between data sources. Groupings are listed in Appendix 3.

### Chapter specific code groupings

Within each chapter of this report, the data coded using ICPC-2 PLUS may have been analysed using different groupings. These groups include:

- standard ICPC-2 classification—ICPC-2 chapter level and ICPC-2 rubric code groups. These standard classification groups are defined elsewhere and are not listed in this appendix. Further information about the ICPC-2 chapter structure and rubrics can be found at http://www.fmrc.org.au/classifi-i.htm
- standard BEACH grouped codes used in the BEACH annual reports. These groups are listed in Table A3.1 and include ICPC-2 and/or ICPC-2 PLUS codes
- non-standard grouped codes used in chapter-based analysis. Each chapter using non-standard code groups has a table (tables A3.2–A3.12) listing the codes used in these groups. Groups include ICPC-2 and/or ICPC-2 PLUS codes.

Note: if a concept is listed in both Table A3.1 and a chapter-based table (tables A3.2–A3.12) the reader should regard the chapter-based table as correct for that chapter only.

## 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.

Strength and regimen are independent fields that, when combined with the CAPS code, give an opportunity to derive the prescribed daily dose for any prescribed medication or group of medications. CAPS is mapped to the Anatomical Therapeutic Chemical (ATC) classification[9], which is the Australian standard for classifying medications at the generic level.

## 2.6 Changes to data elements

Changes in data elements and reporting methods have occurred on occasion over the 10 years of the BEACH study.

More detailed coding systems for pathology and imaging test orders were developed from the responses recorded for these data elements by GPs participating in the first 2 years of BEACH. The new codes were applied from year 3 (2000–01) onwards. Changes were also made to the coding of referrals to allied health professionals, and the new codes were used for the first time in 2000–01.

This means that data from earlier years, 1998–99 and 1999–00, can be used when counting the proportion of encounters at which at least one pathology test, or imaging tests was ordered, or in the proportion where at least one referral to any health service was made. However, when looking at changes over time in ordering rates of a specific test type, and in comparing referrals to specialists and to allied health services, this report uses measured change from 2000–01 because earlier years data are not comparable.

## 2.7 Understanding BEACH encounter data

Many readers of this report will be familiar with other data produced from MBS and the PBS and it is important that readers are aware of how the BEACH data differ from those drawn from such sources.

- In BEACH, 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. In contrast, the PBS counts the prescription each time it crosses the pharmacist’s counter, so that one prescription with five repeats recorded in BEACH would be counted by the PBS six times if the patient filled all repeats.
- In BEACH, total medications include those prescribed (whether covered by the PBS for all or some patients), those supplied to the patient directly by the GP, and those advised for over-the-counter purchase. The PBS counts 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.
- BEACH includes all consultations, irrespective of who pays for them (if anyone), while the MBS data include those GP services that have been billed to Medicare.

Pathology tests done by pathologists that are charged to Medicare are recorded by Medicare Australia. However, these Medicare data are not comparable with BEACH data.[1]

This report refers to estimates of prevalence of some diseases, drawn from The National Health Survey (NHS) done by the Australian Bureau of Statistics. The NHS provides estimates of population prevalence of specific diseases, and a measure of the problems taken to the GP by people in the 2 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.[10] It also refers to population prevalence estimates from a BEACH substudy which relies on input from both the GP and the attending patient. The methods used in this study are reported elsewhere.[11]

Much of this report relies on management rates of health problems in general practice. Disease management rates reflect GP workload for a health problem, and they depend on the prevalence of the problem in the community, the chronicity of the problem (as chronic problems require long-term care), and the visit frequency required for health maintenance in the individual patient having the morbidity. Those who are older and/or have more chronic disease are likely to visit more often, and have a greater chance of being sampled in the encounter data. Disease management rates therefore reflect GP workload for a health problem rather than prevalence or incidence of disease.

The BEACH program has generated many papers on a wide range of topics in journals and professional magazines. A complete list of publications is also available from the Family Medicine Research Centre's website <www.fmrc.org.au/publications/>.

## 2.8 Supplementary Analysis of Nominated Data

In some chapters of this report references are made to the results of Supplementary Analysis of Nominated Data (SAND) studies. This section describes the methods used in the SAND substudies.

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.

- The year-long data period is divided into 10 blocks, each of 5 weeks with three substudies per block. The aim is 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), alcohol intake and smoking status (patient self-report). The start and finish times collected on these encounters are used to calculate the length of consultation (finish time minus start time in minutes).
- The remaining 60 forms in each pack are divided into two blocks of 30. 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 for all SAND substudies from April 1999 to July 2006 inclusive were published in *Patient-based substudies from BEACH: abstracts and research tools 1999–2006*.[12] Abstracts of results and the research tools used in SAND substudies conducted after August 2006 have been published in the BEACH annual reports in 2007[13] and 2008.[1]. Abstracts of results for all SAND substudies are also available on the Family Medicine Research Centre's website <www.fmrc.org.au/publications/SAND_abstracts.htm>.

### Patient risk factor SAND studies

Several chapters of this report refer to the risk behaviours of the patients. These data are drawn from the patient risk factor SAND substudy, which has been consistently applied through the BEACH program since April 2001. The methods used to measure these risk behaviours are summarised below.

The patient risk factors measured include self-reported height and weight (for calculation of body mass index, BMI), alcohol consumption and smoking status. Patient risk factors are investigated for a subsample of 40 of the 100 patient encounters recorded by each GP. For an example of the encounter form with the patient risk factor SAND questions see Appendix 1.

## Body mass index

Patient BMI was investigated for a subsample of 40 of the 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 (feet and inches, stones and pounds) were provided to the GP.

### Calculations of BMI in adults

The BMI for an adult was calculated by dividing weight (kilograms) by height (metres) squared. The recent WHO recommendations[14] 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
- 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).[15] Encounters with adults whose reported heights were outside the sex-appropriate limits were excluded from the analysis.

### Calculations of BMI in children

The standard BMI cut-offs described above are not appropriate in the case of children. Cole et al. developed a method that calculates the age–sex-specific BMI cut-off levels for overweight and obesity specific to children aged 2–17 years.[16] There are three categories defined for childhood BMI: underweight/normal, 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.[15] Encounters with children whose reported heights were 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). The standard BMI cut-offs have been applied for the adult sample, and the method described by Cole et al. has been used for defining overweight and obesity in children (aged 2–17 years).[17]

### Smoking status

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

- *What best describes your smoking status?*

  Options: smoke daily; smoke occasionally; previous smoker; never smoked

Respondents were limited to adults aged 18 years and over because there are ethical concerns about approaching the younger patient group to ask for information on smoking for survey purposes. In addition, the reliability of this information from patients aged less than 18 years may be compromised if a parent is present at the consultation.

### Alcohol consumption

To measure alcohol consumption, BEACH uses three items from the WHO Alcohol Use Disorders Identification Test (AUDIT)[18], with scoring for an Australian setting.[19] Together, these three questions assess at-risk alcohol consumption. The scores for each question range from zero to four. A total (sum of all three questions) score of five or more for males or four or more for females suggests that the person's drinking level is placing him or her at risk.[19]

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

- *How often do you have a drink containing alcohol?*

  Options: never; monthly or less; once a week/fortnight; 2–3 times a week;
  4+ times a week

- *How many standard drinks do you have on a typical day when you are drinking?*
- *How often do you have six or more standard drinks on one occasion?*

  Options: 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.

Respondents were limited to adults aged 18 years and over because there are ethical concerns about asking younger patients for information on alcohol consumption for survey purposes. In addition, the reliability of this information from patients aged less than 18 years may be compromised if a parent is present at the consultation.

**Suggested chapter citation**

Britt H 2009. Methods. In: Britt H & Miller GC (eds). General practice in Australia, health priorities and policies 1998 to 2008. General practice series no. 24. Cat. no. GEP 24. Canberra: Australian Institute of Health and Welfare.

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# 3 General practice workforce and workload

*Janice Charles, Helena Britt, Christopher Harrison*

## 3.1 General practice workforce

### Background

General practitioners (GPs) are the first port of call in the Australian health care system. In 2007–08, they claimed about 109.5 million items of service through Medicare[1] and provided an estimated additional 5.4 million services that were paid from other sources, such as workers' compensation and state governments, or were not charged for at all.[2] About 88% of the Australian population of about 21 million people visited a GP at least once in 2005–06 (Medicare claims data supplied by Australian Government Department of Health and Ageing). In 2006, there were just under 23,000 primary care practitioners working in Australia, equating to 97 full-time equivalent practising primary care/general practitioners per 100,000 people.[3]

The characteristics of general practitioners have been shown to influence general practice activity.[4] A direct relationship exists between physicians' practice style and their age, the size of their practice and whether they have general practice postgraduate qualifications.[5]

Research in Australia supports the claim that GP age affects manner of practice, for example younger GPs have significantly shorter consultations than older GPs[6], and are significantly more likely to use computers for clinical purposes.[7] Older GPs provide more home and residential aged care facility visits, manage more chronic problems, have higher prescribing rates and lower rates of pathology ordering than young GPs.[8]

There are other ways in which patient population and mode of practice have been found to vary with GP demographics.

- Seventy per cent of encounters with female GPs are with female patients. Female GPs hold longer consultations (15.85 minutes on average compared with 14.3 minutes for male GPs), write more prescriptions, and manage more female-specific conditions and psychosocial problems.[9]
- Patient age mirrors the age of GP—almost two-thirds of patients visiting GPs younger than 35 years are themselves younger than 45 years. GPs in the oldest age group see patients aged 65 years and older at more than double the rate of the youngest GPs. As age of GP increases, the proportion of their workload spent with Commonwealth concession cardholders and non-English-speaking background patients also increases.[8]
- A recent examination of GPs' postgraduate qualifications found that after adjustment for practitioner, practice, patient and morbidity differences, Fellows of the Royal Australian College of General Practitioners (FRACGP) had longer consultations. They also undertook more procedures and prescribed fewer medications than their non-FRACGP counterparts.[10]

- The clinical activity of international medical graduates (IMGs), also known as overseas trained doctors (OTDs), was investigated. When a group of self-selected IMGs was compared with FRACGPs, it was found that IMGs were significantly younger and less experienced, worked more sessions per week and were more likely to be located in Regional and Remote areas. They saw fewer children and elderly patients but significantly more new patients, Commonwealth concession cardholders and Aboriginal and Torres Strait Islander people. They provided more medications and ordered more pathology.[11]

## Overview

Characteristics of GPs and changes that have taken place in the composition of the GP workforce need to be taken into account when attributing causes to changes in morbidity and treatment identified in BEACH data.

A vocational register for GPs was introduced in October 1989 through which qualified and experienced GPs could provide services attracting higher Medicare rebates. A 'grandparent' clause was attached which allowed GPs with more than 5 years' experience to join with no further training. A 5-year period of grace allowed younger GPs to acquire the requisite 5 years' experience to qualify for vocational registration via the grandparent clause.[12] In 1994, legislation was passed to reflect the end of the grandparent period, and to define future eligibility for vocational registration as being GPs who undertook vocational training that resulted in the attainment of Fellowship of the RACGP.[13] The RACGP continued to provide this training until 2000 when the General Practice Education and Training organisation took it on and expanded it as the Australian General Practice Training Program. Only vocationally registered GPs could claim higher Medicare rebates (A1 items) for their consultations, with the proviso they take part in continuing medical education and quality assurance programs.

In 1995, a cap of 400 places was imposed on the GP training program, reducing intake from an average of 670 per year in the early 1990s.[14] At the same time, compulsory vocational registration for GPs made postgraduate training a requisite for new medical graduates to become GPs. Although the cap was raised in subsequent years, the Australian Medical Workforce Advisory Committee calculated that by 2002 there was a shortage of GPs in the range of 800 to 1,300, due to increased demand, uneven distribution, decreased working hours and an ageing GP population.

Measures to tackle the shortage of GPs have included:

- the introduction of Australian and state government programs to attract IMGs to fill general practice positions, particularly in rural and remote areas where there is the greatest need. The Australian Medical Workforce Advisory Committee report of 2005 estimated that IMGs accounted for about 25% of the total medical workforce at that time in Australia[15]
- the GP Links program of 1999, in which the Australian Government offered financial incentives for smaller practices to amalgamate on the assumption that services would be provided more efficiently[16]
- the opening of several new medical schools and the increase in university places for medical students at existing schools. However, since the late 1990s an increasing proportion of medical school places have been dedicated to graduate students, leading to older registrars in GP training who are more likely to have commitments that influence

their choice of practice location and hours of work. Seventy-five additional training places for the 2009 intake to the Australian General Practice Training Program and 100 for 2010 were created, bringing the number of entry places for 2009 to 675 and to 700 for 2010. In previous years, there were fewer applicants than training places, but in 2008 almost all places were filled, and in 2009 it is projected that all places will be filled.[17]

- the introduction of Medicare item numbers that allowed GPs to claim for specified tasks done by a practice nurse under the direction of the GP. By 2007, seven such items could be claimed.

## Characteristics of Australian GPs

The Australian Medical Workforce Advisory Committee reported in 2005 that in 2002 there were about 23,000 GPs in Australia, and more than 80% of the workforce was vocationally registered. Forty per cent of GPs were aged under 45 years and 27.8% were aged 55 years and over. More than one-third (37.0%) was female, and female GPs worked an average 13.6 fewer hours per week than did male GPs.[15]

The Medical Labour Force 2006 report confirmed the age and gender distribution of GPs, and found a decrease in the supply of full-time-equivalent primary care practitioners from 101 per 100,000 head of population in 2002 to 97 per 100,000 in 2006. Also reported was a decrease in the proportion of primary care practitioners who worked 50 hours or more per week from 35.2% in 2002 to 27.9% in 2006.[3]

A study of GP services found there had been an 8% decline in the average number of services provided per GP between 1997–98 and 2003–04: young cohorts of GPs provided fewer services on average than previous young cohorts, and middle-aged GPs, particularly middle-aged male GPs, had reduced the number of services they provide.[18] Other researchers have also found ‘generation X’ GPs are working fewer hours than the ‘baby boomers’ did at the same age.[19] This may reflect an overall trend towards part-time work in the labour force as a consequence of changes in the economy and society. For example, the proportion of employed people aged 24–44 years working part-time increased from 17% to 23% between 1983 and 2003.[20]

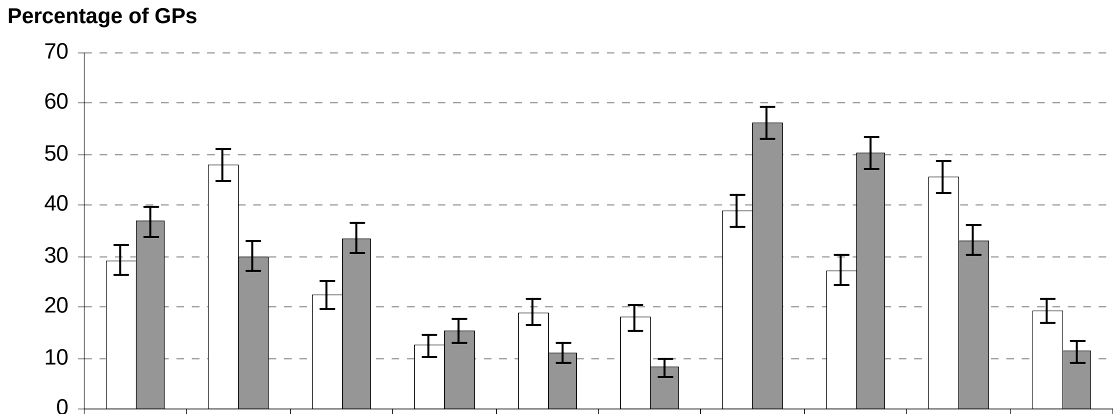
## BEACH participants

An ever-changing sample of about 1,000 GPs per year has taken part in BEACH since 1998 (see Chapter 2). Currently, demographics of BEACH participants are representative of all GPs in the sample frame prepared by the Australian Government Department of Health and Ageing. An earlier difference in the proportion of the youngest cohort of GPs has disappeared, with the sample frame now also showing a decreasing proportion of young doctors.

BEACH also shows that the general practice workforce in Australia is changing in a number of ways (Figure 3.1). Notable changes that have occurred over time are presented here.

- The proportion of female participants increased from 30.0% in 1998–99 to 36.8% in 2007–08[21], in line with the workforce reports mentioned above. This shift is likely to continue in future, as, according to the Medical Training Review Panel, women accounted for 57.3% of all first year medical students in 2004 and 46.6% of advanced vocational trainees in 2007.[22] However, a study of 386 graduates from a Melbourne medical school found a significant decrease in the proportion of new graduates, especially women, choosing to work in general practice. The authors cited reasons such as high workload, less remuneration and heavy administrative burden as some of the reasons for this decline.[23]

- There was a considerable decrease in the proportion of GP participants aged less than 45 years (from42.7% in 1998–99 to 30.0% in 2007–08), and an increase in the proportion aged 55 years or more (from 25.2% in 1998–99 to 33.5% in 2007–08).[21]
- There was an increase in the proportion practising for 20 years or more, from 42.2% to 55.9%.[21]
- The proportion of participants in solo practice halved over the 10-year period. There was an associated significant increase in the proportion of GPs working in practices with five or more practitioners, from 38.9% in 1998–99 to 56.1% in 2006–07 (information not available for 2007–08).[21] This finding reflects the rise in group practices, medical centres and corporatisation which has occurred since BEACH began. Another factor was the GP Links program, which encouraged the formation of larger practices.[16]
- The proportion of GP participants holding Fellowship of the RACGP increased significantly, from 27.3% in 1998–99 to 50.2% in 2007–08. The legislation noted above would have played a large part in this result.




| | Female | <45 years | 55+ years | <6 sessions/ week | >10 sessions/ week | Solo* | 5+ GPs* | FRACGP | Own AHS^ | Co-op AHS^ |
|---|---|---|---|---|---|---|---|---|---|---|
| □ 1998–99 | 29.2 | 48.1 | 22.4 | 12.4 | 19.0 | 17.9 | 38.9 | 27.3 | 45.5 | 19.3 |
| ■ 2007–08 | 36.8 | 30.0 | 33.5 | 15.4 | 10.9 | 8.2 | 56.1 | 50.2 | 33.2 | 11.3 |

GP characteristics

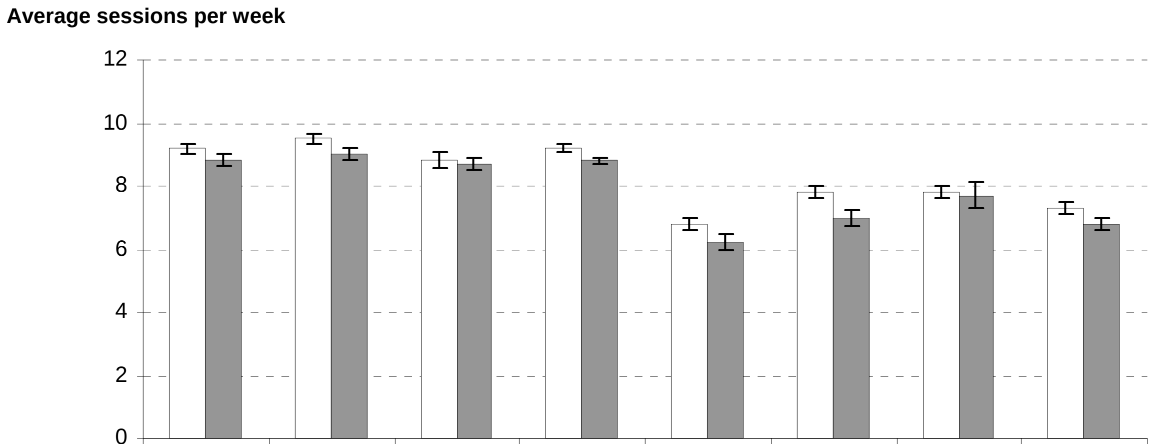
* Results in the bottom row for these two variables are from 2006–07.

^ Data about after-hours services (AHS) were only collected from 2000–01 onward. This figure compares the results from 2000–01 and 2007–08.

*Note*: FRACGP—Fellows of the Royal Australian College of General Practitioners; Own AHS—the practice provides its own after-hours service for their patients; Co-op AHS—the practice provides after-hours services in a cooperative arrangement with other practices.

**Figure 3.1: Changes in characteristics of BEACH GP participants, 1998–99 to 2007–08 (95% CI)**

- Since 2000–01, when a question about computers in the practice was first asked in BEACH, there has been a significant increase in the proportion of GPs with a computer available at their major practice address, for either administrative or clinical use, or both, from 87.4% in 2000–01 to 96.7% in 2007–08.[21] However, availability of computers in the practice was not equalled by use. A study in 2006 found that 11.2% of GPs did not use a computer at all, and of those who used a computer, only 21.7% kept all data electronically and made use of all their computer's clinical functions.[7] A further study found that GPs who were younger, female, Fellows of the RACGP, and those working in larger practices were more likely to use computers for clinical purposes. Additionally, it was demonstrated that the use of computers for clinical purposes had not produced any difference in measurable indicators of quality of patient care.[24]
- In the BEACH program, GP participants have always been asked the number of clinical sessions they work per week. A session was defined as equal to a morning or afternoon consulting period. There has been a significant decrease in the proportion of both male and female GPs working 11 or more sessions per week. The average number of sessions fell significantly from 8.6 per week in 1998–00 to 8.1 in 2006–08.
- Figure 3.2 shows age- and sex-specific rates of sessions worked per week for 2,011 GP participants from 1998–00, and 1,850 from 2006–08. Overall, there were significant decreases in average number of weekly sessions for both male and female GPs. Male GPs worked an average of 9.2 sessions per week in 1998–00 and 8.8 sessions per week in 2006–08. For female GPs the average was 7.3 sessions in 1998–00 and 6.8 in 2006–08. However, this decrease in working hours between the two data periods was not evident for male or female GPs aged 55 years and over. Overall, in both periods females worked significantly fewer sessions per week on average than male GPs.




| | Males <45 | Males 45–54 | Males 55+ | Males All | Females <45 | Females 45–54 | Females 55+ | Females All |
|---|---|---|---|---|---|---|---|---|
| □ 1998–00 | 9.2 | 9.5 | 8.8 | 9.2 | 6.8 | 7.8 | 7.8 | 7.3 |
| ■ 2006–08 | 8.8 | 9.0 | 8.7 | 8.8 | 6.2 | 7.0 | 7.7 | 6.8 |

Age–sex-specific group

**Figure 3.2: Changes in average number of sessions per week by age and sex of GP (95% CI)**

- The geographic distribution of GPs did not appear to undergo any major changes over the 10-year period. Seventy-one per cent of GPs in 1998–99 and 72.2% in 2007–08 worked in Major Cities as defined by the Australian Standard Geographical Classification.[25] There was a slight decrease in the proportions working in Inner and Outer Regional areas and a slight increase (from 0.1% to 0.5%) working in Very Remote areas.[21]
- Practice nurse assistance at consultations was recorded in BEACH from 2005 onwards. The proportion of such consultations increased significantly from 3.9% in 2005–06 to 6.0% in 2007–08. For about 35% of these encounters, practice nurse activities were said to be claimable from Medicare. A comparison of practice nurse item numbers recorded in BEACH with the number shown in Medicare data suggested that about 50% of services claimed for practice nurses have been carried out independently of the recorded consultation, and no data are available on these activities. Non-claimable practice nurse activities that were recorded as part of the BEACH encounter and have been increasing recently were check-up, international normalised ratio (INR) blood test and administrative activities.[21]
- GP referral patterns suggest that there have been changes in workload distribution among GPs, specialists and other professions. Over the 10-year period, there was a significant increase in encounters where a referral was written, and in particular there were higher rates of referral to cardiologists, physiotherapists, psychologists, podiatrists and dietitians.[21]

## 3.2 General practice workload: policy, population and patients

This section summarises changes that occurred over the first 10 years of the BEACH study that are relevant to general practice and have had an impact on the workload of GPs.

### Relevant policy changes since 1998

There have been many changes to the Medicare Benefits Schedule (MBS) over the decade of this study that affect the type of work general practitioners do.

In 1998–99, there were few Medicare items available for GP claims besides the basic A1 and A2 items. These items cover general practitioner attendances and other non-referred attendances to which no other item applies. Other items available at that time were prolonged attendances (A5 items), group therapy (A6), acupuncture (A7) and antenatal care (item number 16500).[26]

New items added to the Medicare schedule provided remuneration for areas of patient care that had not previously been recognised or compensated individually. Relevant items are shown here in the order in which they were introduced.

#### Health assessments and care planning

- In 1999, health assessment items were brought in, providing a Medicare rebate for annual check-ups by GPs of people aged 75 years and over and Aboriginal and Torres Strait Islander peoples aged 55 years and over (A14).[27]

- Also in 1999, multidisciplinary care plans and case conference items (A15) were introduced. The care planning items were withdrawn and replaced in November 2005 with GP management plans, which are applicable to a wider patient population with chronic or terminal medical conditions with or without complex care needs. Patients on these Enhanced Primary Care (EPC) plans are eligible for up to five Medicare-subsidised allied health services on referral from a GP.[28]
- Comprehensive medical assessments of patients in residential aged care facilities were reimbursed by Medicare under a specific item number from May 2004.[29]
- Items to cover health checks specifically for Aboriginal and Torres Strait Islander peoples aged 15–54 years were introduced in May 2004, followed by additional items for check-ups of Indigenous children and refugees, in November 2005.[28]
- A one-off health check item for people aged 45–49 years was introduced in 2006.[30]
- Preschool health checks for all children at or after their 4-year immunisation were given their own item number in 2008 and will therefore not have any impact on the results of this study of changes from 1998–99 to 2007–08.

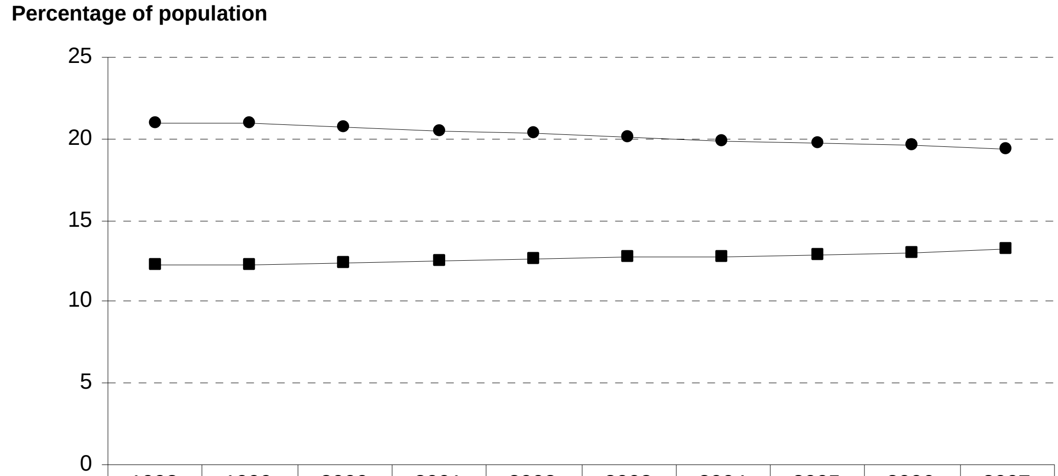
### Other items

- In 2001, MBS items were introduced for medication management reviews (A17), and to the Practice Incentives Program (PIP) (A18 & 19), for completing the diabetes and asthma cycles of care.[31]
- GP mental health care plans (A20), which incorporated a three-step mental health process and focused psychological strategies, were established in 2002 and amended in 2006[32,33] (for more details see Chapter 6).
- Bulk-billing incentive payments came into effect in 2004, and GP after-hours consulting received its own specific item numbers (A22) in the same year.[29]
- Patient care provided by a practice nurse under the supervision of a GP began to be recognised with specific item numbers in 2004 (M2).[29]
- A pregnancy support counselling item began in 2006.[30]
- A Type 2 diabetes risk evaluation item for patients at high risk aged 40–49 years was introduced in 2008.

## The Australian population

Like the rest of the world, Australia has an ageing population, the consequence of large birth cohorts in the 1950s and 1960s, and the subsequent fertility decline combined with increased life expectancy. The median age of the Australian population as of 2007 was 37 years.[34] At present, in just 11 developed countries the median age is more than 40 years, but by 2050, 90 countries will fall into that group, 46 of them in the developing world. The United Nations also reports the beginning of a notable worldwide increase in the number of people aged 80 years or more. In almost all societies, women form the larger proportion of older people.[35]

Figure 3.3 shows changes in the youngest and oldest age groups over the 10-year period.




| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Aged 0–14 | 21.0 | 20.9 | 20.7 | 20.5 | 20.3 | 20.1 | 19.9 | 19.7 | 19.6 | 19.4 |
| Aged 65+ | 12.2 | 12.3 | 12.4 | 12.5 | 12.6 | 12.7 | 12.8 | 12.9 | 13.0 | 13.2 |

Year

*Source*: Australian demographic statistics 2007 (ABS).[36]

**Figure 3.3: Young and older Australians as a proportion of the population by year**

## General practice attendance rates

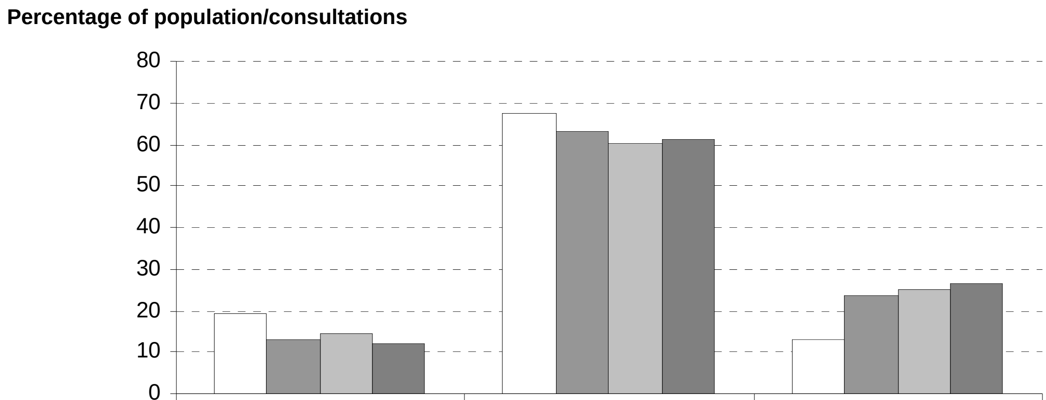
The average number of total Medicare services (including GP services) processed annually per person rose from 10.7 in 1997 to 12.3 in 2007. The proportion of these services used by persons aged 65 years and over rose from 23.6% in 1997 to 29.7% in 2007.[37]

By extrapolation and age standardisation of a population sample of self-reported health, the National Health Survey 2004–05 estimated that 3.9 million persons had consulted a GP in the 2 weeks before the survey. These consultations accounted for almost four-fifths of doctor consultations over that period, the other 20% being with specialists. The closest Census year to the National Health Survey 2004–05 was 2006, and Figure 3.4 compares the proportion of persons in each age group according to the Census[36] with the percentage of GP consultations recorded for each age group from the National Health Survey.[38] Also shown are Medicare claims and BEACH results from the same period.

Children make up a greater proportion of the population (19.3%) than they do the proportion of GP visits (13.0%), while those in young and middle adulthood represent similar proportions of population and GP attendances. In contrast, older people, who represent only 13.0% of the population, account for almost twice the proportion of self-reported GP visits (23.7%), a quarter (25.0%) of Medicare claims for general practice services and 26.5% of BEACH encounters (Figure 3.4).

The average number of Medicare GP items of service claimed per head of population in each financial year since 1998 is shown in Figure 3.5. The highest attendance rate was in the first year, at 5.51 visits per head. Average attendance then steadily decreased to a low of 4.87 visits per head in 2003–04.

The notable decrease in per capita claims coincided with a decline in levels of bulk-billing for GP attendances from a peak of almost 80% in 1996–97 to 69% by the end of 2002. The decline in bulk-billing levels was attributed to a complex interaction of causes, which included level of MBS fee, geographical spread of GPs, and corporatisation.[40]




| | 0–14 | 15–64 | 65+ |
|---|---|---|---|
| Population 2006 | 19.3 | 67.4 | 13.0 |
| GP consults NHS 2004 | 13.0 | 63.3 | 23.7 |
| Medicare claims | 14.3 | 60.4 | 25.0 |
| BEACH encs 2004–05 | 12.0 | 61.4 | 26.5 |

**Age group (years)**

*Note:* Consult—consultations; encs—encounters. Medicare claims data do not include claims for GP services made through the Australian Government Department of Veterans' Affairs; BEACH encounters include some services paid for by organisations other than Medicare, and some for which no charge was made; the NHS does not include residents of aged care facilities or those currently in hospital.

*Sources:* Population 2006: Australian demographic statistics 2007 (ABS)[36]; GP consultations: NHS 2004[38]; Medicare claims: Data supplied by the Australian Government Department of Health and Ageing; BEACH encounters 2004–05.[39]

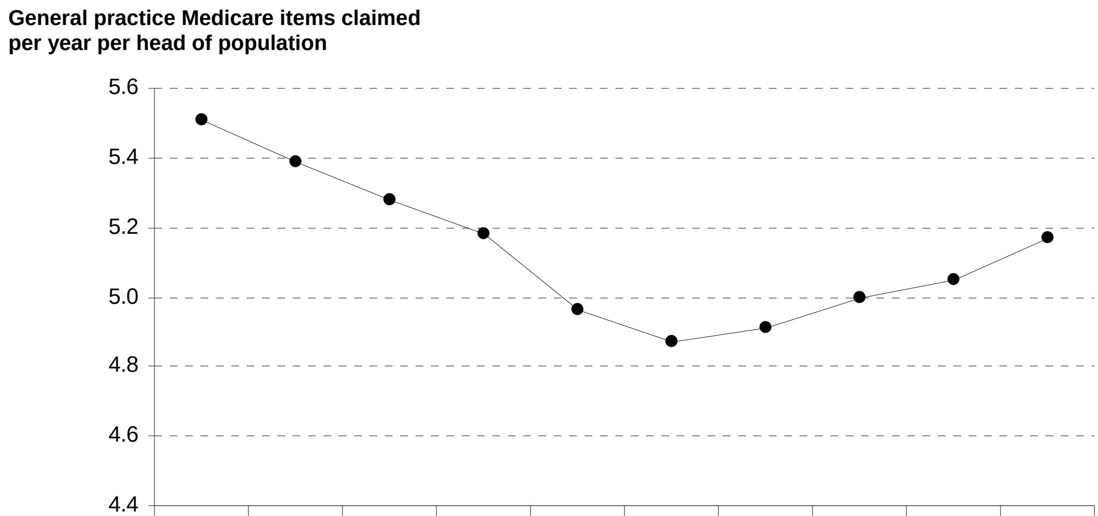
**Figure 3.4: Comparison of age distribution of the population, GP consultations (NHS), Medicare claims, and patients at BEACH encounters**

In light of the decreasing attendance rate, which raised questions about equity of access, the Australian Government made substantial changes to laws governing Medicare benefits in 2004 and 2005.[28,29]

- Each bulk-billed GP service to concession cardholders and children aged less than 16 years attracted an extra incentive payment to the GP. The incentive payment was higher for GPs working in areas outside capital cities and in metropolitan areas with workforce shortage. This measure aimed to tackle the regional disparity in bulk-billing rates.
- The existing safety net, which covered the difference between the Medicare benefit and the schedule fee once an annual threshold was met, was extended to reimburse 80% of out-of-pocket expenses (that is, the difference between the fees charged by the doctor and Medicare benefits paid) when a certain level of spending had been recorded in a calendar year. The out-of-pocket expenses would therefore count towards the threshold, which is currently $555 for concession cardholders and recipients of Family Tax Benefit A, and $1,111 for all other patients.

- From January 2005, the Medicare benefit paid to a GP for almost all services (whether bulk-billed or not) increased from 85% to 100% of the Medicare schedule fee. This measure delivered the extra 15% to the doctor who bulk-billed, or to the patient of a non-bulk-billing doctor and therefore aimed to increase the proportion of consultations that were bulk-billed.

These measures appear to have had an effect, as attendance rates per head of population began to increase from 2004–05 onwards, and are approaching the levels of the 1990s (Figure 3.5). The total number of GP attendances, which had decreased from 102.6 million in 1998–99 to 96.3 million in 2003–04, increased to 109.5 million in 2007–08. Levels of bulk-billing for unreferred GP consultations also rose, reaching 73.9% in June 2008.[1]



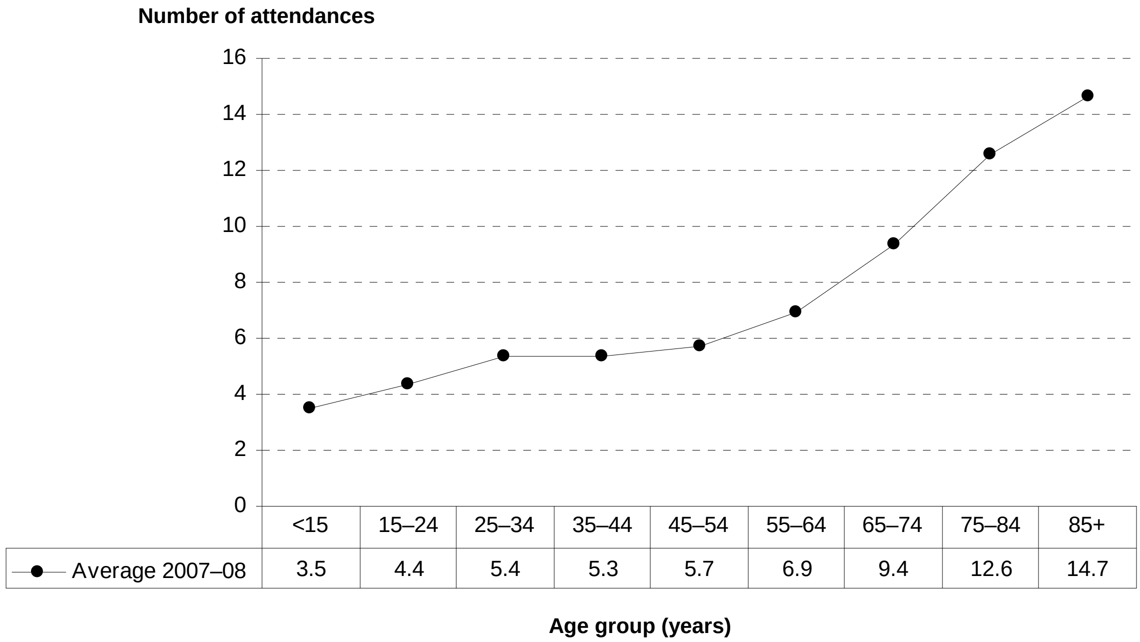

| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Medicare claims | 5.5 | 5.4 | 5.3 | 5.2 | 5.0 | 4.9 | 4.9 | 5.0 | 5.1 | 5.2 |

**Financial year**

*Source:* Australian social trends (ABS).[37]

**Figure 3.5: General practice Medicare items claimed per head of population by financial year, 1998–99 to 2007–08**

Figure 3.6 illustrates the fact that children attend the GP less often than do older people. During 2007–08, children aged less than 15 years attended on average 3.5 times (Medicare claims data supplied by the Australian Government Department of Health and Ageing). Attendance rates increased to 5.4 per year for those aged 25–44 years, and levelled out somewhat until the 55–64 year age group who attended almost 7 times on average. Annual attendance rates then rose steeply with each age group among the older population, to reach an average of almost 15 visits per year among those aged 85 years and over.

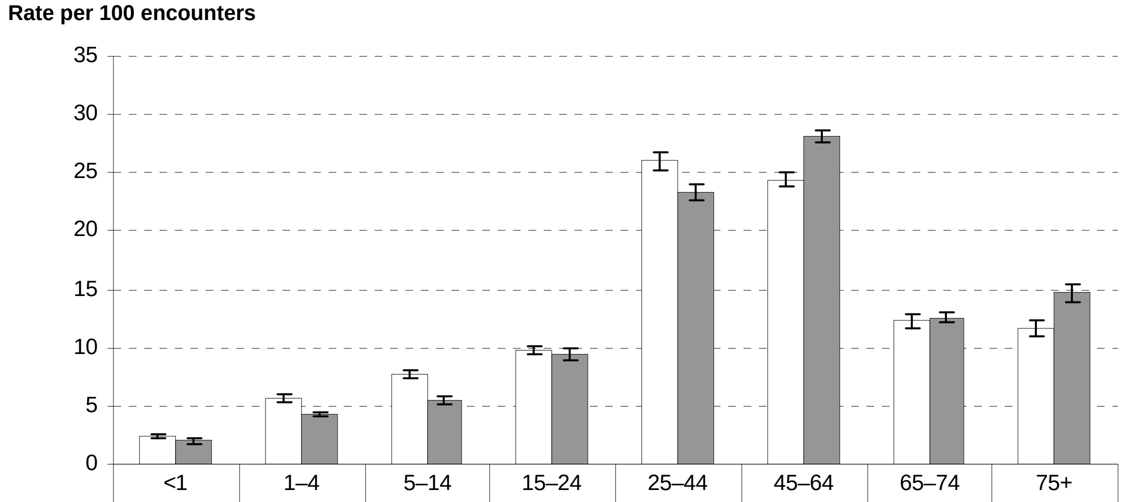



*Source*: Medicare claims data supplied by the Australian Government Department of Health and Ageing.

**Figure 3.6: General practice Medicare claims per head of population by age group, 2007–08**

Another significant change in GP work distribution has been a decrease in the proportion of encounters with patients who hold a Repatriation health card, from 3.4% (95% CI: 3.1–3.6) in 1998–99 to 2.8% (95% CI: 2.5-3.0) in 2007–08. This reflects trends in Veteran numbers published by the Department of Veterans' Affairs.[41] There were no other significant changes in patient characteristics although there have been fluctuations in the proportions of encounters with patients who stated they were of non-English-speaking background and with self-identified Aboriginal/Torres Strait Islander persons. There has also been some non-linear movement in the proportion of encounters with patients who hold a Commonwealth concession card. Initially it decreased from 43.1% in 1998–99 to 36.7% in 2000–01, then increased to 43.2% in 2004–05 before decreasing to the current level of 41.8%. Eligibility for the concession cards changes from time to time, which may affect usage levels. It is probable that an increase will occur in this group as the 'baby-boomer' generation reaches retirement age.

BEACH encounters reflect the changing distribution of attendances by age groups of patients. Over the decade of this study, the proportion of encounters that were with patients aged less than 15 years decreased from 15.8% to 11.8%. Through simple extrapolation to total Medicare claims, this suggests that nationally there were about 3.3 million fewer encounters with children in 2007–08 than in 1998–99. Over the same period, the proportion of encounters with patients aged 45 years and over increased from 48.4% to 55.4%, which equates to 9.6 million encounters more in 2007–08 than a decade earlier. The increasing proportion of the GP workload associated with patients in the 45–64 years and 75 years and older age groups is apparent in Figure 3.7.




| | <1 | 1–4 | 5–14 | 15–24 | 25–44 | 45–64 | 65–74 | 75+ |
|---|---|---|---|---|---|---|---|---|
| □ 1998–99 | 2.4 | 5.7 | 7.7 | 9.8 | 26.0 | 24.4 | 12.3 | 11.7 |
| ■ 2007–08 | 2.0 | 4.3 | 5.5 | 9.5 | 23.4 | 28.1 | 12.6 | 14.7 |

Age group (years)

**Figure 3.7: Age distribution of patients at encounter, 1998–99 to 2007–08 (95% CI)**

Although the population is fairly evenly divided between males and females, it has been shown that women in developed countries consistently attend general practice more often than men, accounting for about 57.0% of patient encounters.[42] BEACH 2006–07 reported a trend towards an increase in the proportion of males at general practice encounters since 1998–99, found to be statistically significant using simple linear regression analysis, and representing an annual increase of 0.17% of encounters with male patients ($t = 3.4$, $p < 0.001$, $df = 8,920$).[43] However, when this measure was repeated, comparing the most recent data from 2007–08 with that from 1998–99, no significant change in the proportion of encounters accounted for by males was apparent.

In late 2008, the Australian Government launched a new men's health initiative, to encourage Australian men to take a greater interest in their health by regularly visiting their GP.[2] It will be interesting in future years to measure the impact of this initiative on men's attendance at the GP, and the problems newly diagnosed as a result. A particularly positive result would be increased attendance by younger men (15–35 years) who have very low attendance rates, are largely managed for acute respiratory problems and injuries,[44] and have high prevalence of at-risk alcohol consumption and daily smoking.[2] Perhaps more regular attendance may lead to earlier detection and management of their behavioural and physical risk factors.

## 3.3 Conclusion

The studies reviewed at the beginning of this chapter looked at GP characteristics and the changing face of the primary care workforce, matters which are fundamental to GPs' practice style. Patient age mirrors age of GP, and the patient population of female GPs is 70% female. Postgraduate qualification (FRACGP) affects the practice style of Australian GPs, and IMGs see a different mix of patients than do GPs who have attained FRACGP.

Changes to education and training, the ageing of GPs and higher numbers of female graduates (who work fewer hours per week on average) have had a considerable effect on the workforce. The decline in weekly hours worked has contributed to an apparent shortage of GPs. Increased GP training places, the employment of international medical graduates in areas of need, and the rise in practice nurse-assisted consultations have been responses to this shortage.

Australian Government initiatives, particularly in regards to the Medicare Benefits Schedule, appear to have led to changes in patient attendance rates and in the pattern of GP clinical activity. Remuneration for GPs managing the particular needs of patients with chronic disease, and conducting preventive health checks for people at risk have been the focus of policy makers in recent years.

As the median age of the population rises and life expectancy improves, a greater part of GPs' workload will involve consultations with older patients. Annual attendance rates increase sharply among patients aged 75 years and over.

All these matters have been considered here, together with changes observed in BEACH GP participants, to provide a context for this report's examination of the content of consultations, management of selected morbidities and use of pathology services that follows.

**Suggested chapter citation**

Charles J, Britt H, Harrison C 2009. General practice workforce and workload. In: Britt H & Miller GC (eds). General practice in Australia, health priorities and policies 1998 to 2008. General practice series no. 24. Cat. no. GEP 24. Canberra: Australian Institute of Health and Welfare.

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# 4 GP clinical activity

*Helena Britt, Christopher Harrison*

This chapter investigates changes between 1998–99 and 2007–08 in the reasons for encounter expressed by patients when they see their GP, the problems managed by GPs in the encounters, the management activities of the GPs for these problems, and the measured time spent in consultations. Note that some concept labels in this chapter include grouped ICPC-2 or ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

## 4.1 Patient reasons for encounter

International interest in reasons for encounter (RFEs) has been developing over the past three decades. 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.[1]

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.

RFEs are classified according to the International Classification of Primary Care—Version 2 (ICPC-2), a product of the World Organization of Family Doctors (Wonca)[2], the structure of which is described briefly below and in detail in Chapter 2

- ICPC-2 has a bi-axial structure, with 17 chapters on one axis and seven components on the other (numeric codes).
- Chapters are based on body systems, with additional chapters for psychological and social problems.
- Component 1 includes symptoms and complaints. Component 7 covers diagnoses/diseases. These are independent in each chapter, and both can be used for patient RFEs or problems managed. Diagnoses can be further divided into infections, neoplasms, injuries, congenital anomalies, and other diagnoses.
- Components 2 to 6 cover the process of care, and are common throughout all chapters. The processes of care, including referrals, other (non-pharmacological) treatments and orders for pathology and imaging are classified in these process components of ICPC-2. Component 2 (diagnostic, screening and prevention) is also often applied in describing the problem managed (for example, check-up, immunisation).

Patient RFEs can have a one-to-one, one-to-many, many-to-one and 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 symptoms or complaints that relate to a single problem managed, or multiple RFEs that relate to multiple problems managed at the encounter.

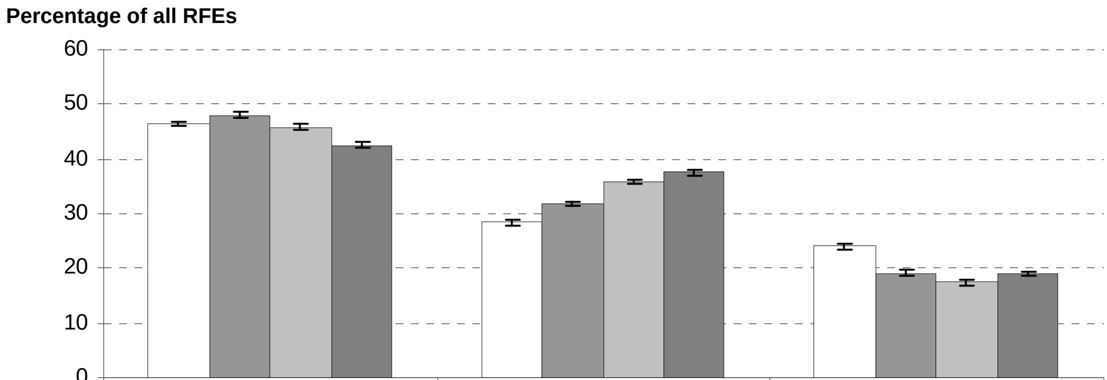
## Number of reasons for encounter 1998–99 to 2007–08

The number of reasons given rose significantly, from 146.3 (95% CI: 144.6–148.0) RFEs per 100 encounters in 1998–99 to 151.0 (95% CI: 149.2–152.8) per 100 in 2000–01. Since then it has remained steady at 151–153 reasons for every 100 encounters. In 1998–99, 26.8% of encounters involved two RFEs and a further 9.7% involved three RFEs. Ten years later, 29.1% involved two and 11.9% involved three RFEs. This suggests that in 2007–08 there were about 7.5 million more encounters nationally with two or three RFEs than a decade earlier.[3]

## Changes in types of reasons for encounter

Figure 4.1 shows the changes in the pattern of patients' reasons for their GP encounters.

- RFEs describing symptom or complaint (for example, 'cough', 'tired', 'rash', 'feeling anxious') remained the most frequent, but since 2000–01 these have taken up a decreasing proportion of all RFEs.
- RFEs described in terms of a diagnosis or disease (for example, 'about my diabetes') decreased in frequency, accounting for a smaller proportion (18.9%) of all the reasons given in 2007–08, than a decade earlier (24.0%).
- However, the major change in the pattern of the demand for care was an increasing emphasis on requests for services ('process requests') from the GP, which made up 28.4% of all RFEs in 1998–99 but rose to 37.6% of all RFEs by 2007–08.




| | Symptoms/complaints | Process RFEs | Diagnoses/diseases |
|---|---|---|---|
| 1998–99 | 46.5 | 28.4 | 24.0 |
| 2001–02 | 48.0 | 31.9 | 19.2 |
| 2004–05 | 45.9 | 35.9 | 17.4 |
| 2007–08 | 42.6 | 37.6 | 18.9 |

**ICPC-2 component**

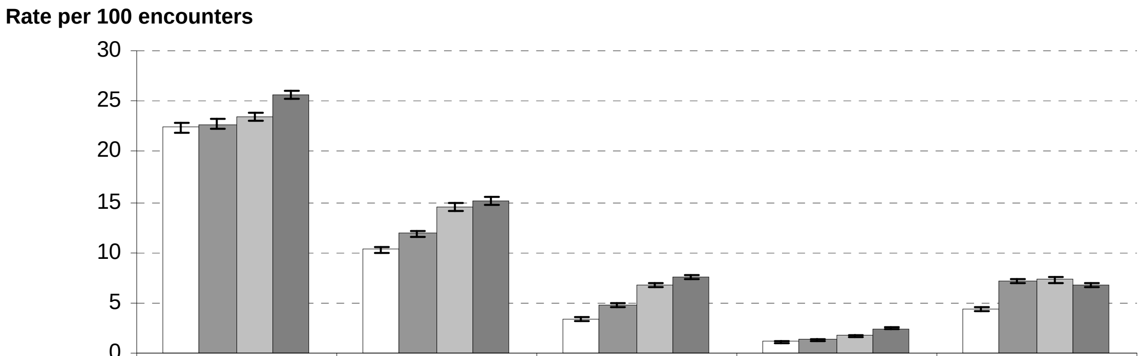
*Note:* These results may not align with those previously published in BEACH reports. This analysis uses updated component groupings of ICPC-2 codes, released by the Wonca International Classification Committee in 2004.[4]

**Figure 4.1: Changes in proportional distribution of RFEs by components, 1998–99 to 2007–08 (95% CI)**

RFEs described as a request for a service or process of care, increased by almost 40% from 41.6 (95% CI: 40.0–43.1) per 100 encounters in 1998–99 to 57.5 (95% CI: 55.8–59.2) per 100 in 2007–08. Rates per 100 encounters for each type of process RFE are shown in Figure 4.2.

The increase in requests for services was apparent in all five process subclasses.

- Requests for diagnostic or preventive procedures were the most common and increased significantly over the study period. The increase was only 14.3% (from 22.4 to 25.6 per 100 encounters), but this equates to about 5 million additional occasions at which these processes were requested nationally in 2007–08 compared with 1998–99. This increase was largely due to increases in requests for general check-ups (not disease or body system specific), female genital check-ups (such as Pap smear) and skin checks. However presentations for unspecified blood tests also increased significantly.
- Requests for medication or for procedural treatments also rose over the study period, by 47%, from 10.3 per 100 encounters in 1998–99 to 15.1 in 2007–08. This was largely due to almost a 50% increase in requests for prescriptions of which there were 8.2 (95% CI: 7.7–8.7) per 100 encounters in 1998–99 and 12.1 (95% CI: 11.4–12.7) per 100 encounters a decade later. This change equates nationally to about 4.8 million more GP–patient encounters at which patients have stated they have come for prescription than in 1998–99.
- Patient requests for the results of tests and investigations more than doubled over the decade, rising from 3.4 per 100 encounters to 7.6 per 100 in 2007–08. This increase suggests that such requests were made on about 4.8 million more occasions nationally in 2007–08 than in 1998–99.




| | Diagnostic/ preventive | Medications/ procedures | Test results | Administrative | Referrals/RFEs |
|---|---|---|---|---|---|
| 1998–99 | 22.4 | 10.3 | 3.4 | 1.1 | 4.4 |
| 2001–02 | 22.7 | 11.9 | 4.7 | 1.3 | 7.2 |
| 2004–05 | 23.4 | 14.5 | 6.8 | 1.7 | 7.3 |
| 2007–08 | 25.6 | 15.1 | 7.6 | 2.4 | 6.8 |

**ICPC-2 component**

*Note:* RFEs—reasons for encounter. These results may not align with those previously published in BEACH reports. This analysis uses updated component groupings of ICPC-2 codes, released by the Wonca International Classification Committee in 2004.[4]

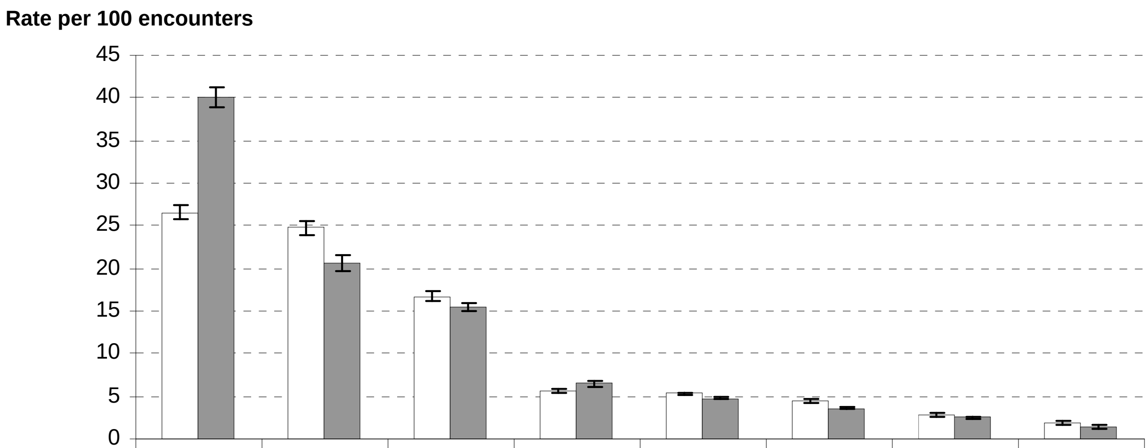
**Figure 4.2: Changes in rates per 100 encounters of process RFEs (components 2-6), 1998–99 to 2007–08 (95% CI)**

- Requests for an administrative procedure (for example, a sickness certificate) also more than doubled, equating to an additional 1.5 million requests nationally in 2007–08 than a decade earlier. This may reflect the increasing requirement of employers to provide a sickness certificate for one day's leave, together with increasing GP responsibility for completion of administrative documents for a range of government departments.
- There was a 55% increase in the frequency of requests for a referral to another service and other RFEs, from 4.4 (95% CI: 4.0–4.7) per 100 encounters in 1998–99 to 6.8 (95% CI: 6.4–7.2) per 100 in 2007–08. The large majority of these were other RFEs (for example, doctor initiated follow-up consultations) and these did not change over the period. However requests for referrals almost doubled from 1.0 (95% CI: 0.9–1.1) per 100 encounters in 2000–01 to 1.9 (95% CI: 1.7–2.0) per 100 in 2007–08.

## Changes in reasons for encounter by ICPC-2 Chapter

Between 1998–99 and 2007–08, there was a large increase in presentations for general and unspecified issues (requesting prescriptions and check-ups in particular) and an increase in RFEs related to the endocrine and metabolic system. There were significant decreases in RFEs associated with the respiratory, musculoskeletal and neurological systems, and in those related to the ear and the eye and the blood/blood forming organs (Figure 4.3).

There was no change in the rate of RFEs associated with the male or female genital systems, the circulatory, digestive and urological systems or those related to the skin, and pregnancy and family planning, or those of a psychological or social nature.




| | General/ unspec | Respir- atory | Musculo- skeletal | Endocrine /metabolic | Neuro- logical | Ear | Eye | Blood/ blood form |
|---|---|---|---|---|---|---|---|---|
| □ 1998–99 | 26.6 | 24.8 | 16.7 | 5.6 | 5.3 | 4.5 | 2.8 | 1.8 |
| ■ 2007–08 | 40.1 | 20.6 | 15.4 | 6.5 | 4.8 | 3.6 | 2.5 | 1.4 |

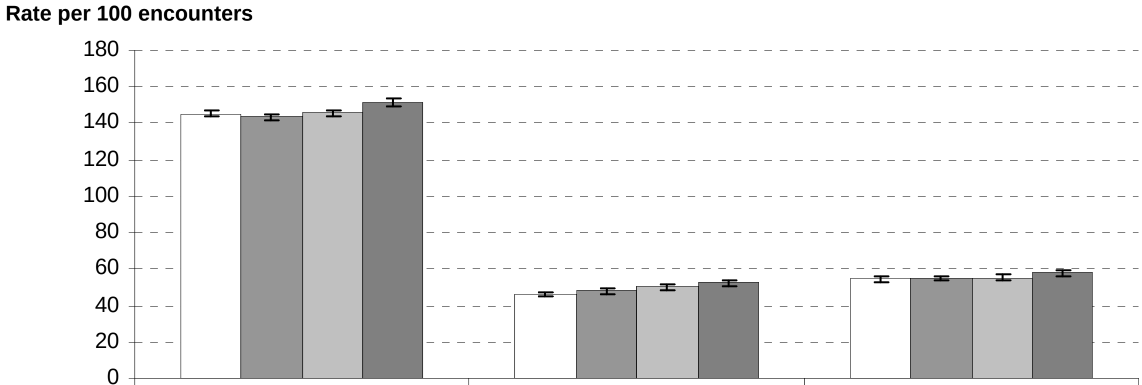
ICPC-2 Chapter

**Figure 4.3: Significant changes in rates of RFEs by ICPC-2 Chapter, 1998–999 and 2007–08 (95% CI)**

# 4.2 Problems managed at GP encounters

The number of problems managed at encounters with GPs steadily increased over the decade, from 145.3 (95% CI: 143.5—147.2) in 1998–99 to 151.3 (95% CI: 149.2—153.4) per 100 encounters in 2007–08. The majority of this increase occurred between 2005–06 and 2007–08. This suggests that nationally, in 1998–99 the GP workforce dealt with 149.1 million problems at encounters with their patients, whereas in 2007–08 they dealt with 165.7 million problems, an increase of 16.6 million, or 11.1%.

This increase was reflected in both the number of new problems managed (that is, first contact with a medical professional for a new problem or for a new episode of an acute or recurrent problem) per 100 encounters, and the number of chronic conditions managed per 100 encounters, both of which increased significantly over the decade (Figure 4.4).




| | Problems managed | Chronic problems | New problems |
|---|---|---|---|
| 1998–99 | 145.3 | 46.1 | 54.5 |
| 2001–02 | 143.4 | 48.0 | 55.1 |
| 2004–05 | 145.5 | 50.4 | 55.2 |
| 2007–08 | 151.3 | 52.3 | 57.7 |

**Problem type**

*Note:* Chronic problems—as defined by O'Halloran et al.[5]

**Figure 4.4: Problems: total, chronic, new, managed per 100 encounters, 1998–99 to 2007–08 (95% CI)**

This led to the investigation of the relationship between new cases and chronic problem management rates. The question was, are GPs increasing their detection rates of chronic conditions, or is this parallel increase coincidental?

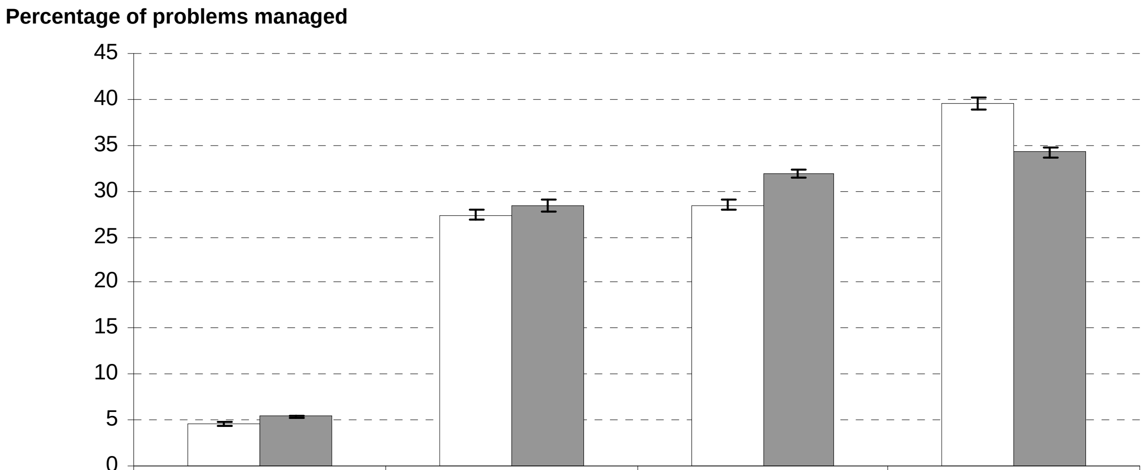
By combining the first 2 years, and the last 2 years of BEACH data for this analysis, statistical power was increased. As shown in Figure 4.5, between 1998–00 and 2006–08 there was a significant increase in the proportion of the problems managed in general practice that were newly diagnosed chronic conditions (as defined by O'Halloran et al. [5]).

This increase may reflect improved detection rates with increased screening associated with the introduction of specific Medicare items for:

- annual health assessments for persons aged 75 years and over (and 55 years and over among Aboriginal and Torres Strait Islander peoples), introduced in 1999
- comprehensive medical assessments in residential aged care facilities (May 2004)
- health checks for those aged 45-49 years (November 2006)
- check-ups for Aboriginal and Torres Strait Islander children and refugees (November 2005).

The new Diabetes Risk Evaluation item (for those aged 40–49 years at high risk of developing Type 2 diabetes), and the Healthy Kids Check for all children aged 4 years[6], introduced in mid-2008, may also influence future detection rates.

In parallel there was a significant reduction in the proportion of the workload spent in follow-ups for previously diagnosed non-chronic conditions. This may be due to the increasing workforce shortage of GPs which may lead to increased use of discretionary follow-up instructions to patients (for example, 'come and see me again if you are no better in *X* days'), and/or more frequent use of advice and counselling on self-management of limiting diseases, leading to fewer return visits for such problems.




| | New chronic problems | F/up chronic problems | New non-chronic probs | F/up non-chronic probs |
|---|---|---|---|---|
| □ 1998–00 | 4.6 | 27.4 | 28.5 | 39.5 |
| ■ 2006–08 | 5.4 | 28.4 | 31.9 | 34.2 |

**Problem type**

*Note*: f/up—follow-up; Chronic problems—as defined by O'Halloran et al.[5]

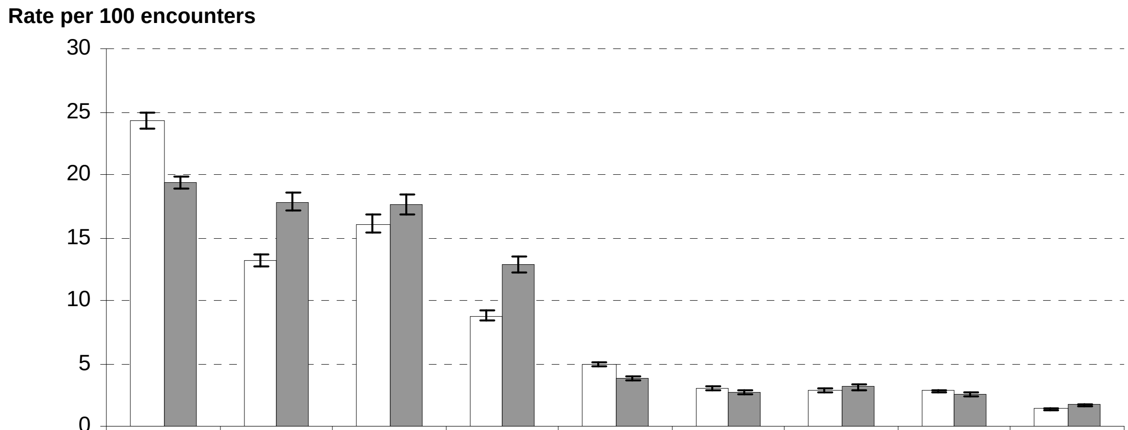
**Figure 4.5: New and chronic problem status, 1998–00 and 2006–08 (95% CI)**

## Problems managed by chapter

The most common problems managed in general practice in 2007–08 were respiratory problems followed by general/unspecified problem, then by problems associated with the skin, the circulatory system and the musculoskeletal system. Together, these five groups accounted for almost 60% of all problems managed.

While respiratory problems remained the problem group most often managed, compared with a decade earlier the management rate of these problems significantly decreased, together with ear problems and neurological problems. There was also a marginal decrease in the management rate of eye problems. Problems related to the respiratory system, the ear and eye are largely acute in nature[1], and perhaps this decline in their management merely reflects the decreasing number of follow-up consultations for non-chronic conditions that was previously noted.

The morbidity groups managed more frequently in 2006–08 than in 1998–00 were general/unspecified problems, those related to the endocrine and metabolic system, and to the male genital system. Marginal increases in management rates were also apparent over the decade in circulatory and urological problems (Figure 4.6).




| | Respira-tory | General/ unspec | Circulatory | Endocrine /metabolic | Ear | Neuro-logical | Urology | Eye | Male genital |
|---|---|---|---|---|---|---|---|---|---|
| □ 1998–99 | 24.3 | 13.2 | 16.1 | 8.8 | 4.9 | 3.0 | 2.8 | 2.8 | 1.4 |
| ■ 2007–08 | 19.4 | 17.8 | 17.6 | 12.9 | 3.8 | 2.7 | 3.1 | 2.6 | 1.7 |

ICPC-2 Chapter

**Figure 4.6: Significant changes in rates of problems managed by ICPC-2 Chapter, 1998–99 and 2007–08 (95% CI)**

The increase in the management rate of:

- general and unspecified problems is largely explained by an increase in the management rate of general check-ups, perhaps stimulated by the increasing number of Medicare items numbers for check-ups and health assessment for patients at different life stages
- endocrine and metabolic problems is heavily influenced by increases in the management of diabetes and lipid disorders (see section below)

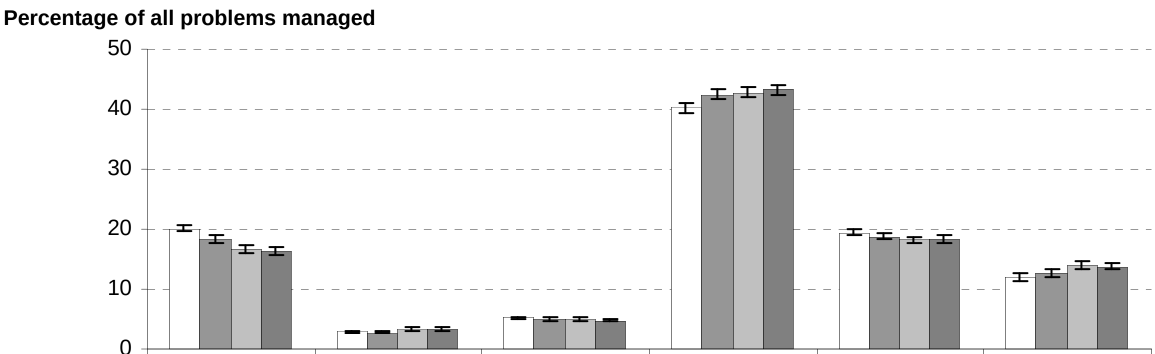
- male genital problems may well be the result of recent wide publicity about the risk of prostate cancer, with the accompanying pressure on males to 'be checked out', combined with a trend toward increasing rates of sexual health checks in younger adult males (see Chapter 15), and the availability and promotion of the health assessment at several adult life stages (see Chapter 3).

There were no changes in the management rates of: problems associated with the skin (managed at a rate of 17.2 per 100 encounters in 2007–08), the musculoskeletal (17.3 per 100), circulatory (17.6 per 100), digestive (10.7 per 100), and female genital systems (5.8 per 100), psychological problems (11.5 per 100), or in those associated with pregnancy and family planning (3.9) or the blood and blood forming organs (1.6 per 100).

## Problems managed by components and sub-components of ICPC-2

In 2007–08, problems labeled by the GP in terms of a symptom or complaint accounted for 18.4% of all problems managed and a further 13.8% were described in terms of a process of care (for example, check-up, immunisation, test results). Problems with diagnostic labels (for example, hypertension, hyperlipidaemia, Type 1 diabetes) accounted for the remaining 67.8% of all problems managed.

This overall pattern of problems managed by GPs had changed slightly since 1998–99 with a small move away from both symptom descriptions and diagnosed problems, towards process problem labels (such as 'check-up', 'immunisation', 'test results').




| | Infections | Neoplasms | Injuries | Other diagnoses | Symptoms | Processes |
|---|---|---|---|---|---|---|
| □ 1998–99 | 20.2 | 2.9 | 5.2 | 40.2 | 19.4 | 12.1 |
| ■ 2001–02 | 18.3 | 2.8 | 5.0 | 42.4 | 18.8 | 12.7 |
| ■ 2004–05 | 16.7 | 3.4 | 5.0 | 42.8 | 18.2 | 13.9 |
| ■ 2007–08 | 16.3 | 3.4 | 4.8 | 43.2 | 18.4 | 13.8 |

**ICPC-2 component**

*Note:* Congenital anomalies form another subclass of diagnostic labels, but are not included here as they accounted for less than 0.2% of all problems managed in all years. These results may not align with those previously published in BEACH reports. This analysis uses updated component groupings of ICPC-2 codes, released by the Wonca International Classification Committee in 2004.[4]

**Figure 4.7: Changes in management rates of types of problems managed, as a proportion of all problems managed, 1998–99 to 2007–08 (95% CI)**

Diagnosed problems can be further divided into subgroups. Between 1998–99 and 2007–08, as a proportion of all problems managed:

- infections decreased significantly (20.2% in 1998–99 and 16.3% in 2007–08)
- injuries accounted for a marginally smaller proportion (from 5.2% in 1998–99 to 4.8% in 2007–08). Injuries are investigated in Chapter 12
- congenital anomalies remained constant, accounting for less than 0.2% of all problems managed (see note in Figure 4.7)
- neoplasms increased (from 2.9% in 1998–99 to 3.4% in 2007–08). Malignant neoplasms are studied in further detail in Chapter 13
- 'other diagnoses' (that is, those that were not in the above subgroups) increased markedly from 40.2% of all problems managed in 1998–99 to 43.2% in 2007–08. These are largely chronic diseases, reflecting the increased rate of chronic problem management described earlier (Figure 4.7).

As both infections and injuries seen in general practice are largely acute in nature, the decrease in both reflects the decreasing proportion of the GP workload spent with non-chronic conditions, discussed earlier.

## Management rates of individual problems

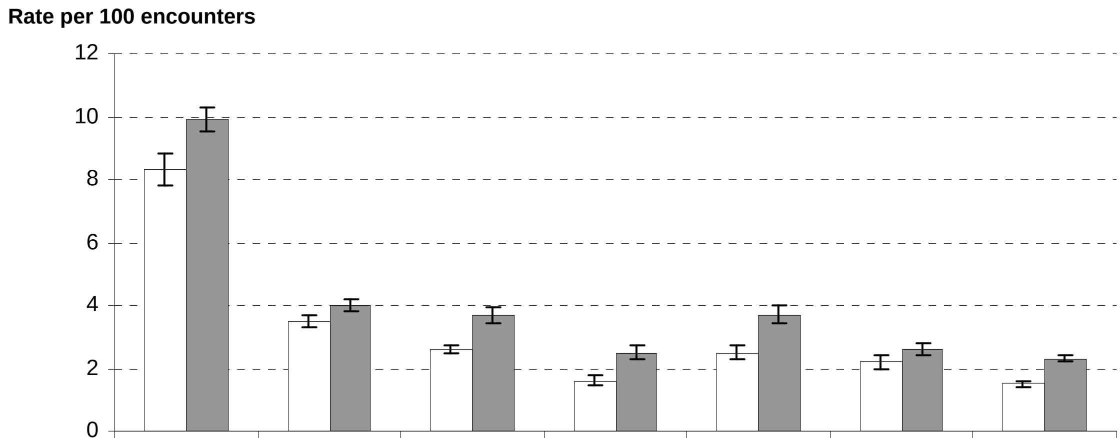
There were many changes in management rates of individual problems over the decade of this study, and these are tabled in *General practice activity in Australia: 10 year data tables*.[3] This chapter merely highlights changes in the most commonly managed problems, many of which are investigated in more details in later chapters of this report.

Between 1998–99 and 2007–08, there were significant increases in the management rate of hypertension, depression, diabetes, lipid disorders (for example, high cholesterol), osteoarthritis, and oesophageal disease (Figure 4.8). These are all chronic diseases and the first three fall into the National Health Priority Areas. As such, they are investigated in more depth in later chapters of this publication. Oesophageal disease is not a National Health Priority Area, but is an emerging chronic problem in the community and is investigated in Chapter 16.

Other problems which GPs managed more often in 2007–08 than a decade earlier that are not presented in Figure 4.8 included:

- solar keratosis (a marginal increased from 1.0 in 1998–99 to 1.4 per 100 in 2007–08)
- malignant skin neoplasms (a significant increase from 0.8 to 1.3 per 100 encounters) (see Chapter 13)
- atrial fibrillation/flutter (almost doubling from 0.6 per 100 encounters to 1.1 per 100 in 2007–08[3]
- 'test results', which more than doubled from 0.8 per 100 encounters in 1998–99 to 1.8 per 100 in 2007–08, supporting our earlier hypothesis that patients are being called back more often to receive and/or discuss their test results with the GP
- 'abnormal test results', which doubled as a problem managed between 1998–99 (0.5 per 100 encounters) and 2007–08 (1.0 per 100). This issue is further discussed in Chapter 5.

The management rate of upper respiratory tract infections significantly decreased between 1998–99 (6.8 per 100 encounters) and 2003–04 (5.5 per 100), but then increased to almost its earlier level by 2007–08 (6.2 per 100 encounters).[3]




| | Hypertension | Depression | Diabetes | General check-up | Lipids | Osteoarthritis | Oesophageal disease |
|---|---|---|---|---|---|---|---|
| □ 1998–99 | 8.3 | 3.5 | 2.6 | 1.6 | 2.5 | 2.2 | 1.5 |
| ■ 2007–08 | 9.9 | 4 | 3.7 | 2.5 | 3.7 | 2.6 | 2.3 |

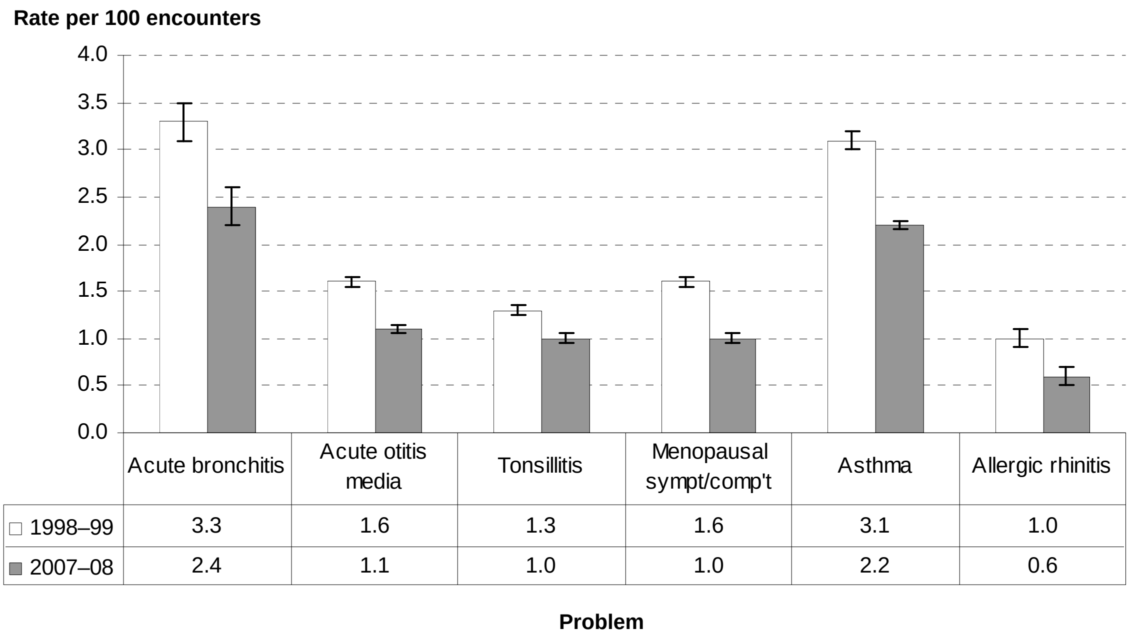
Problem

**Figure 4.8: Significant increases in frequently managed problems in general practice, 1998–99 and 2007–08 (95% CI)**

Some problems commonly managed in 1998–99 were less frequently managed in 2007–08. The most common of these are shown in Figure 4.9 which demonstrates significant decreases in management rates of acute bronchitis, acute otitis media, tonsillitis and allergic rhinitis.

Menopausal symptoms/complaints were also managed less often in 2007–08 than 10 years earlier (Figure 4.9), but the large decrease occurred in 2004–05 and then remained through to 2007–08. This may be due to the wide publicity in 2002 surrounding the finding of a link between hormone replacement therapy and increased risk of breast cancer.[7] If women are choosing not to take hormone replacement therapy for this problem, and therefore not needing repeat prescriptions, they may be less likely to discuss their menopausal symptoms with their GP.[8]

The only commonly managed chronic problem which demonstrated a decrease in management frequency was asthma. Changes in management of respiratory and related problems are investigated in more detail in Chapter 8.




| | Acute bronchitis | Acute otitis media | Tonsillitis | Menopausal sympt/comp't | Asthma | Allergic rhinitis |
|---|---|---|---|---|---|---|
| □ 1998–99 | 3.3 | 1.6 | 1.3 | 1.6 | 3.1 | 1.0 |
| ■ 2007–08 | 2.4 | 1.1 | 1.0 | 1.0 | 2.2 | 0.6 |

*Note:* sympt—symptom; comp't—complaint.

**Figure 4.9: Significant decreases in frequently managed problems in general practice, 1998–99 and 2007–08 (95% CI)**

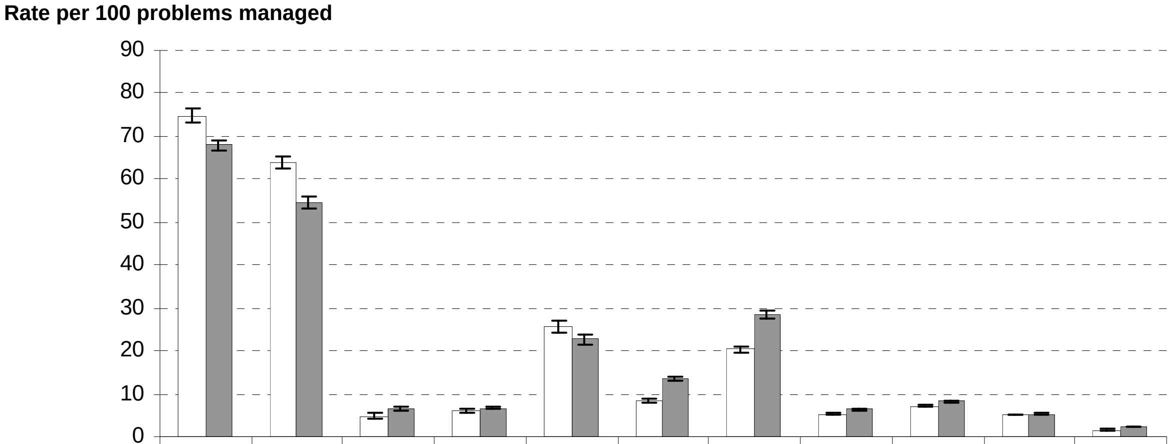
# 4.3 Management actions at encounter

In BEACH all recorded management actions are directly related to the problem being managed by the GP. As problem types change (such as the increase in the number of chronic problems managed) it would be expected that the pattern of interventions would also change.

This section compares the management actions of 2007–08 with those of 2000–01, because in 2000 more specific coding was introduced for pathology and imaging tests ordered, referrals and medications, rendering earlier data not comparable to that of later years.

Many changes are apparent when comparing the management actions taken in 2007–08 with those taken in 2000–01 for every 100 problems managed (Figure 4.10). In 2007–08:

- GPs prescribed/supplied or advised significantly fewer medications per 100 problems managed (from 74.8 to 67.9 per 100 problems managed).
  - They prescribed significantly fewer medications (54.5 compared with 63.9 per 100 problems managed in 2000–01).
  - They supplied medications (mainly vaccines) directly to their patients significantly more often (6.7 per 100 problems) than 10 years earlier (4.8 per 100).
  - There was no change in the rate of advised purchase of over-the-counter medications.




| | All meds | Presc meds | GP-sup meds | Advised OTC | Clinical tx's | Proced-ural tx's | Patho-logy | Imaging | All refs | Spec't refs | AHP refs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| □ 2000–01 | 74.8 | 63.9 | 4.8 | 6.2 | 25.8 | 8.4 | 20.4 | 5.3 | 7.2 | 5.1 | 1.6 |
| ■ 2007–08 | 67.9 | 54.5 | 6.7 | 6.7 | 22.8 | 13.5 | 28.5 | 6.3 | 8.3 | 5.3 | 2.3 |

**Management action**

*Note:* Meds—medications; presc—prescribed; GP-sup—GP-supplied; advised OTC— medications advised for over-the-counter purchase; clinical—clinical treatments given (such as advice and counselling); tx's—treatments; pathology—pathology tests/batteries of test ordered; imaging—imaging orders; refs—referrals; spec't—medical specialist; AHP—allied health professional

**Figure 4.10: Management actions per 100 problems managed, 2000–01 and 2007–08 (95% CI)**

The increase in supplied medications, and parallel decrease in prescribed medications, led to the investigation of whether one counteracted the other. Combining the two forms of provision led to the finding that in 2000–01, GPs prescribed or supplied medications at a rate of 68.6 (95% CI: 67.2–70.0) per 100 problems managed, and in 2007–08, they prescribed or supplied them at a rate of 61.2 (95% CI: 59.8–62.4). This means the decrease in rate of prescribed medications can only be partially explained by the increase in GP-supplied medications.

- GPs provided clinical treatments (advice, counselling and education) at a significantly lower rate in 2007–08 than in 2000–01.
- GPs undertook more procedures, and this change represents annual gradual increases, rather than a change at a single point in time.[3]
- GPs ordered more pathology tests, again representing a gradual annual increase over that period[1], and ordered more imaging.
- Overall, GPs referred their patients at the same rate in 2007–08 as they did in 2000–01, and this was reflected in an unchanged referral rate of problems to medical specialists.
- However, there was a significant increase in the rate of referral to allied health professionals, from 1.6 per 100 problems managed in 2000–01 to 2.3 per 100 problems in 2007–08 (Figure 4.10)

- The increases since 2000–01 have particularly been in referrals to:
  - psychologists: which steady at about 2 per 1,000 encounters from 2000–01 to 2005–06 then doubled in 2006–07 (4 per 1,000 encounters) and rose again to 7 per 1,000 encounters in 2007–08. The rise in 2006–08 coincided with the 2006 introduction of the GP Mental Health Care Plans[9], which aimed (among other things) to improve patient access to psychologists as well as to GPs and psychiatrists (see Chapter 14).
  - physiotherapists: rising from 10 per 1,000 encounters in 2000–01 to 12 per 1,000 in 2007–08
  - podiatrists: tripled from 1 per 1,000 encounters to 3 per 1,000
  - dietitians/nutritionists: doubling from 1 per 1,000 encounters to 2 per 1,000.[3]

The increases in referrals to physiotherapists, podiatrists and dietitians coincided with the introduction of MBS item numbers for management plans and team care arrangements in the care of patients with chronic disease[10], which enabled such patients to access specified types of allied health professionals five times per year subsidised by the MBS.

## 4.4 Length of consultation

In each year of BEACH there has been a subsample study of 35,000–40,000 encounters in which the GP recorded their encounter start and finishing times. Length of consultation was calculated as finish time minus start time (in minutes).

The mean and median consultation length of general practice A1 items of service were first compared for 1998–99 and 2007–08, and no change in consultation length was apparent, the mean length remaining at 14.8 minutes (95% CI: 14.6–15.1), with a median of 13.0 minutes and a range of about 1 to 110 minutes.[3]

However, between these two data points, Medicare introduced a number of new item numbers that sit outside the A1 set of items. These include chronic disease, care plans and health assessment items. Between April 2005 and March 2008, there were 1,306 BEACH face-to-face consultations at which one of these new item numbers were recorded, representing 1.3% of the 101,134 Medicare/Department of Veterans' Affairs consultations at which start and finish times were recorded. The mean length of these consultations was 25.6 (95% CI: 25.3—26.0) minutes, significantly longer than the A1 items reported above.

Considering the changing age distribution of patients at GP encounters, the relationship between patient age and consultation length was investigated (Figure 4.11).

- Consultations with children aged less than 15 years were shorter on average, at 12.2 minutes.
- Consultations with young adults (15–24 years) averaged a little over 14 minutes.
- Those with 25–44 year olds increased to an average 15.6 minutes.
- The longest were with patients aged 45–64 years (15.9 minutes).
- The average consultation length for older patients (65 years and over) was 15.2 to 15.3 minutes.

This suggests that as the older adults take up a growing proportion of GPs' workload, there will be a subtle but significant effect on total GP time required to provide the same number of services.

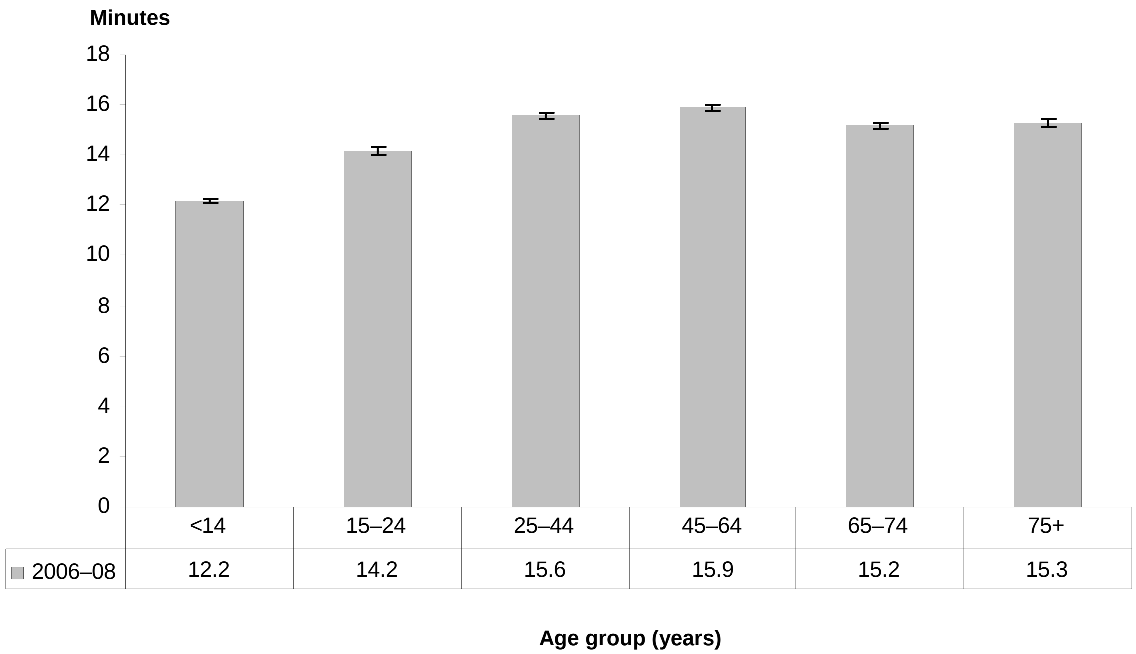
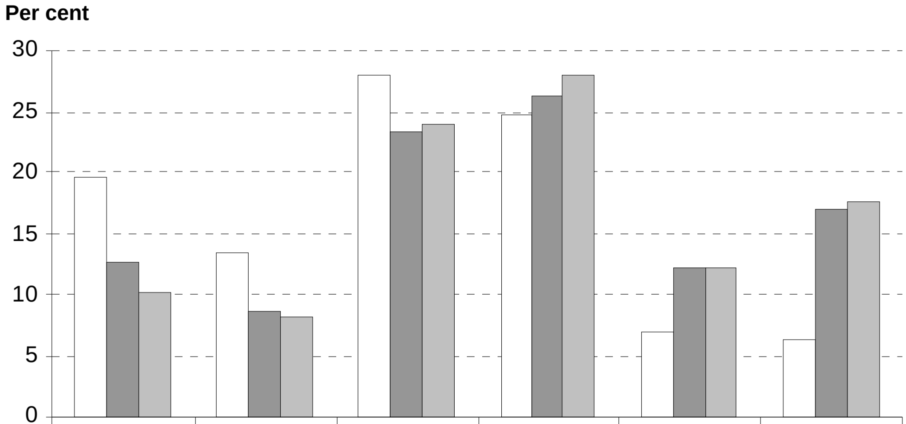



**Figure 4.11: Age group-specific mean length (in minutes) of Medicare claimable GP encounters, BEACH 2006–08 (95% CI) (*n* = 66,923)**

If these mean consultation lengths for each age group are applied to the total number of Medicare-claimed encounters, the proportion of the total general practice face-to-face patient time likely to have been spent with each age group in 2007–08 can be measured.

In Figure 4.12, the expected distribution of workload according to time spent multiplied by the number of visits for each age group are compared with the population age distribution and the distribution of Medicare attendances by age group. It demonstrates that:

- children account for a smaller proportion of Medicare attendances than they do the population, and since their average consultations are shorter than those with older age groups, they account for an even lesser proportion of the GP clinical face-to-face time.
- in young people aged 15–24 years there is a similar pattern though it is far less pronounced than in children.
- in the 25–44 years age group there is a far closer relationship between proportion of population, proportion of attendances and proportion of face-to-face time spent with GPs. However this group still represents a greater proportion of the population than they do visits or GP clinical time.
- in the middle age group of 45–64 years the patients start to account for a greater proportion of the Medicare attendances, and an even greater proportion of GP clinical time, than they represent in the population as a whole.
- in the older age groups this pattern continues and strengthens, to grow to an extreme in the 75+ age group who represents only 6.3% of the population but account for 17.1% of all Medicare attendances and 17.5% of GP clinical time spent in direct patient care.




| | <15 | 15–24 | 25–44 | 45–64 | 65–74 | 75+ |
|---|---|---|---|---|---|---|
| Percentage of pop'n | 19.6 | 13.5 | 28.0 | 24.7 | 6.9 | 6.3 |
| Medicare attends | 12.6 | 8.7 | 23.2 | 26.3 | 12.1 | 17.1 |
| 2006–08 BEACH | 10.2 | 8.2 | 23.9 | 28.0 | 12.2 | 17.5 |

**Age group (years)**

*Note*: Pop'n—population. BEACH: (Timed mean length of consultation in minutes for age group x total number of Medicare GP attendances) as a proportion of total calculated clinical face-to-face time spent for all Medicare GP attendances.

*Sources*: Population data, ABS 2008.[11] Medicare attendances: 2007 Medicare attendance data supplied by the Australian Department of Health and Ageing

**Figure 4.12: Estimated proportion of total face-to-face clinical time spent by general practitioners with each patient age group, compared with the proportion of total population and with total Medicare claimed attendances.**

Patient age is only one of many factors shown (through BEACH) to have an independent effect on consultation length. Others include: GP characteristics such as age, sex and general practice training status; geographic location of the practice; the sex and socioeconomic status of the patient; the complexity of the consultation; and the types of problems managed.[12] All of these factors must be considered in modelling future general practice workforce needs.

# 4.5 Discussion

The clinical activities of GPs have changed over the decade to 2007–08. As shown in Chapter 3, an increasing proportion of GPs' workload is being spent with older patients (particularly those aged 45–64 years and 75 years and over) and a lesser proportion with children. This is associated with the decreasing proportion of children in the Australian population, and their decreasing attendance rate. Whether their decreasing attendance rate reflects improved overall health of the child population, or a decreased likelihood to attend for minor ailments cannot be determined from this study.

## Patient reasons for encounter

The changing age distribution of patients at encounters with GPs in itself affects the reasons people give for attending, and the content of the encounters. Patient reasons for encounter changed over the decade, with an increase in the number of reasons given (suggesting an increase in multiple problem management, which was supported by the results), and a move towards more requests for services (for example, check-ups and prescriptions), with a parallel decrease in presentations of symptoms and complaints.

Where the patient presents for follow-up care of a previously diagnosed chronic disease, a request for a check-up and a request for prescription may often be interchangeable because most patients accept they need to be checked before being given their repeat prescriptions. However, the introduction of Medicare item numbers specifically for annual health assessments of older people, and the one-off health assessment of those aged 45–49 years, could also explain a proportion of the increase in the frequency of patient requests for check-ups. Publicity campaigns urging people to have their skin checked (discussed in Chapter 13), and warning of sexually transmitted infections (see Chapter 15) may also have contributed to patient presentations for check-ups.

The increase in patient requests for results of tests and investigations (as RFEs) may suggest a move away from provision of results over the phone, and towards patient attendance to receive them. The privacy legislation released at the end of 2001[13] may have influenced the likelihood of patient callback for test results. The increasing emphasis on the quality of chronic disease management, through the introduction of specific chronic disease-based Medicare item numbers (see Chapter 3) also may have led to more frequent callbacks for face-to-face discussion of the results with the patient.

## Problems managed

In line with the increase in patient requests, there has been an increase in the GP management rate of general check-ups. However, an increasing proportion of the GP workload is also being spent in the management of chronic problems. This has been reflected in higher chronic disease detection rates (that is, more new chronic problems diagnosed), which may have also improved as a result of the program to encourage 'well-patient' check-ups, as noted above.

There has also been an increasing number of follow-up consultations for previously diagnosed chronic diseases. Most chronic diseases, once diagnosed require long term or life-long ongoing care, so the earlier the disease is detected the more GP services will be used in its management over a lifetime.

A well-diagnosed ageing population will over time result in increased prevalence of multimorbidity[14], providing the GP with more patients with complex health needs. As a result, the chronic disease item numbers more recently introduced to the MBS are likely to become far more popular with GPs. This has implications for the future GP workforce, as this chapter has demonstrated that non-A1 GP items of service (such as chronic disease item numbers) are on average about 10 minutes longer than the average A1 items of service.

The decrease in management rate of infections, and in the proportion of the GP workload spent in follow-up care for non-chronic conditions could be the result of fewer encounters with children, and broad public and GP education campaigns about the self-limiting nature of some acute problems (particularly upper respiratory tract infection). It may also indicate improved empowerment of the patient for self-care of non-chronic problems.

There were increased management rates over the decade for many of the commonly managed National Health Priority Areas, including hypertension, lipid disorders, diabetes and depression. Each of these are discussed in the chapters that follow.

### Management

The decrease in the number of prescriptions given by GPs was only partially explained by the increase in medications supplied directly to the patient by the GP, and there was no change in the rate at which over-the-counter drugs were advised. The medications supplied by GPs are largely vaccines[3], so the increase in supply frequency is not surprising in light of the growing number of vaccines provided free as part of Australian Government policies. Other factors which may have influenced the GP prescribing rate include:

- an increasing number of products being made available for over-the-counter purchase, and an increased availability of combination products, where two types of medication are combined (for example, the combination of an ACE inhibitor with a diuretic). Where they are combined, only one prescription is written for the combined product, rather than one for each individual product
- the increase in the average number of repeats ordered for a prescribed medication: the proportion of prescriptions being provided with the maximum number (five) repeats significantly increased over the study period, and the proportion with no repeats, one repeat or two repeats significantly decreased.[3] When more repeats are provided with the prescription another prescription for the drug will be required less often, influencing the overall GP prescribing rate and possibly the patient attendance rate
- the increased co-contribution required of Commonwealth concession cardholders for medications provided under the PBS, in parallel with the growth of discount pharmacies, may have made it cheaper for people to buy over-the-counter medications than fill a prescription under the PBS. This would result in a decrease in prescriptions for some medications. For example, there was a significant decrease in prescribing rates of paracetamol, and paracetamol+codeine over the decade of this study.[3]

Changes in patterns of prescribing for specific morbidities are discussed in many of the following chapters.

This chapter has shown that between 2000–01 and 2007–08, there was a decrease in the rate of clinical treatments such as advice, education and counselling. However this decline was not linear over the period. Their frequency peaked in 2004–05, and then declined in 2005–06. The 2006–07 result remained consistent with the 2005–06 period, and then in 2007–08 the rate again increased significantly.[3] The fact that this pattern was only apparent in rates of advice and education, and not in provision of psychological counselling, suggests the decrease in 2004–05 was related to increased use of practice nurses, after introduction of the Medicare practice nurse item numbers.[15] The gradual increase since that time may indicate a settling in period occurred, where the roles of GPs and practice nurses in provision of advice and education became better defined.

Pathology test order rates steadily increased between 2000–01 and 2007–08, and there has been no indication of a slowing in this growth. Ongoing care of chronic disease often requires regular pathology tests, to assess for disease progression, to ensure compliance, measure effectiveness of treatment, and monitor possible side or adverse effects of treatment. So it is not surprising that pathology order rates have steadily increased, and would be expected to continue to do so as the Australian population ages, chronic problems are newly diagnosed, and ongoing medical care established. Increased medico-legal concerns among

GPs (and doctors at large) may also prompt additional testing. Pathology test ordering for selected problems is reported in more detail in Chapter 5.

While orders for imaging also increased over the same period, the increase was far smaller, and could well represent increased use in the diagnostic process. For example, Chapter 11 reports increased imaging ordered in the management of unspecific arthritis, an increase in management rate of osteoarthritis, and increased imaging for osteoporosis. Such increases may reflect a greater need to have evidence of such diseases to ensure correct classification of the problem as a chronic disease.

While GP rates of referral to specialists did not change between 2000–01 and 2007–08, staying steady at about 5 to 6 per 100 problems managed, referrals to allied health professionals increased by about 50%. The BEACH 10 year data report[3] shows that this increase built steadily in each year, but that the increase was largest in the final 2 years (2006–07 and 2007–08). This was most apparent in referrals to physiotherapists, psychologists, podiatrists and dietitians. This suggests that the introduction of MBS coverage for patients referred to such professionals in the management of chronic disease has had a positive effect on patient access to these services, and may have improved the team management of some patients in line with the enhanced primary care item number objectives (see Chapter 3).

## 4.6 Conclusion

The findings in this chapter suggest that Australian Government initiatives, together with changes in population need may be influencing the care provided to the community by general practice. The chapter provides an overview against which the reader can consider general practice management of specific problems, particularly those included as National Health Priority Areas, in the following chapters.

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# 5 GP pathology ordering

## *Clare Bayram, Lisa Valenti*

This chapter investigates changes in pathology ordering by general practitioners for the morbidities in the National Health Priority Areas, and other selected problems that commonly involve pathology ordering in their management.

Changes in pathology ordering behaviour are considered using two data points April 2000–March 2002 and April 2006–March 2008. While BEACH began in April 1998, pathology data from the first 2 years are not comparable because the pathology codes were expanded to incorporate greater specificity from April 2000 onward.

This chapter explores the relationship between changes in pathology ordering for the selected problems and: the management rate of the problem; the likelihood of pathology being ordered in the management of the problem; the number of pathology tests/batteries of tests being ordered.

The types of pathology tests by Medicare Benefits Schedule (MBS) group and individual pathology tests/batteries of tests ordered in Australian general practice are not investigated in this chapter but have been published elsewhere.[1]

## 5.1 Background

Pathology plays a critical role in more than 70% of clinical diagnoses and in many of the decisions around the optimal treatment for patients.[2]

Pathology services in Australia are provided by laboratories in both public and private sectors. Public laboratories are primarily based in public hospitals and are state-run. Private laboratories are predominately community based, and their eligible testing services are charged to the Australian Government-funded MBS.

General practice is community based, and therefore pathology tests requested by GPs are primarily MBS funded. MBS services and expenditure statistics reflect both specialist and GP requests. In 2007–08, pathology tests requested by GPs accounted for 70% of MBS pathology services and generated 67% of the pathology costs to Medicare.[5]

There are a number of MBS claim and payment rules that mean the MBS data are not an exact reflection of pathology requests. In particular:

- episode coning restricts the number of MBS pathology item numbers that can be claimed per episode of care for pathology tests requested by GPs in non-hospitalised patients, to a maximum of three items. Some MBS pathology item numbers are exempt from the coning rule (for example, Pap smear items).[3]
- each MBS pathology item number can represent multiple pathology tests (a group of tests) or a single analyte.[3]

These rules have not significantly changed over the period of this study.

In 1996, recognising the growth in pathology costs the Australian Government introduced a Memorandum of Understanding *(*a risk-sharing agreement*)* with the pathology industry and profession, which aimed to cap the growth in Medicare expenditure for pathology to an agreed amount. The current Memorandum of Understanding is the third, covering 1 July 2004 to 30 June 2009, and it includes cost outlays, the quality and safety of pathology ordering and workforce training.[6]

A number of adjustments (up and down) have been made to the funding arrangements since the MoUs were first introduced. The most recent were made to selected MBS pathology items in the 2008–09 budget (outside the Memorandum of Understanding).

- The maximum number of tests funded per sample was reduced from six to five producing an estimated saving of $21.6 million in 2008–09, with estimated cumulative savings of $95.8 million over 4 years.
- Pathology collection fees were also reduced, producing a one-off forecast saving of $17 million in 2008–09.[7]

Over the 8-year period investigated in this chapter, 2000–01 to 2007–08, the cost and number of MBS pathology items claimed in Australia increased significantly.

- In the 2000–01 financial year, the cost of pathology services to the MBS was $1.2 billion (15.8% of total MBS benefits paid), and in 2007–08, the cost was $1.9 billion, (14.4% of MBS benefits paid). From 2000–01 to 2007–08, the total cost increased by 62.2%, and the per capita cost increased by 47.5%.[4]
- In 2000–01, there were 62 million pathology services claimed (3.2 per capita) and in 2007–08, there were 96 million (4.5 per capita). Representing a 54.1% increase in the number of claimed services and a 40.6% increase in the number of services per capita.[4]

From 2000–01 to 2007–08, the number of GP encounters paid through the MBS in Australia increased. In the 2000–01 financial year, there were 100.6 million GP encounters, and in 2007–08, there were 109.5 million encounters.[4]

In general practice, total pathology ordering can be influenced by a number of factors:

- a change in the number of GP encounters nationally (increased volume of encounters without a change in the distribution of GPs' workload)
- a change in the management rate of a problem
- a change in GPs' pathology ordering behaviour in the management of the problem. This is measurable as a change in the rate of pathology orders, caused by a change in the likelihood of pathology ordering for the problem (more or fewer episodes of testing) and/or a change in the number of pathology tests ordered per tested problem (more or fewer tests per episode).

The drivers of change in these factors are a complex combination of GP characteristics (for example, years of experience, size and location of practice), patient characteristics (for example, age, morbidity), and environment factors (for example, ageing population, increased survival time and long-term monitoring, new technologies and new tests, change in disease incidence or prevalence).

## 5.2 Method

Pathology tests ordered at the GP encounter are recorded in free text on the BEACH form. Each test or battery of tests is linked by the GP to the related problem or problems under management at the encounter (see Appendix 1). Each pathology test can be linked to up to four problems managed (the maximum number of problems recorded per encounter). Some problem labels in this chapter include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

Pathology tests can either be recorded as a single test (for example, fasting glucose test) or as a battery of tests (such as full blood count), and each of these counts as one order. All BEACH data are secondarily coded. The pathology tests are coded using the terminology ICPC-2 PLUS (see Chapter 2).

BEACH data report the pathology test(s) requested by the GP (to a maximum of five tests/batteries of tests per encounter). In contrast, data from pathology laboratories list the organisation's interpretation of the GP's order. The MBS data report the number of MBS pathology items claimed by pathologists. As noted above, for GP-requested tests, pathologists can only claim the three most expensive items due to episode coning.

## Limitations

When a GP places an order for pathology at the encounter, each test may relate to more than one problem being managed. Therefore, it is possible for a single pathology order to be linked to more than one problem. This chapter uses a problem base, and consequently it looks at the linkages of pathology tests to the problem. A single pathology test will be counted more than once if it is linked to more than one problem.

- In 2000–02, there were 2.7% more links than tests (66,429 pathology–problem links and 64,643 pathology tests/batteries of tests)
- In 2006–08, there were 3.8% more links than tests (90,753 pathology–problem links and 87,444 pathology tests/batteries of tests).

It is likely that a single pathology test/battery of tests could be counted more than once in the large morbidity groups (for example, cardiovascular disease, psychological disease and musculoskeletal problems). Therefore, the number of tests/batteries for the large morbidity groups and total problems is likely to be a small overestimation. However, it is very unlikely that a single pathology test would be counted twice within an individual morbidity group (for example, hypertension, Type 2 diabetes).

There is space for up to five individual tests or batteries of tests to be recorded per encounter. If more than five tests/batteries of tests are recorded, the five tests that represent the breadth of testing ordered by the GP are coded, with priority given to batteries of tests over single tests. The pathology data are coded at the same level of specificity that the GP records whenever possible. However, on occasions where GPs specify all the analytes from a battery of tests, these have been coded as the battery of tests to allow space for any other tests recorded by the GP to be coded. This coding decision would also contribute to an underestimation of the number of tests ordered by GPs. However, this underestimation applies to all data years investigated.

Over time there was a significant increase in the number of encounters where five pathology tests were recorded. In 2000–02, 11.5% of encounters (95% CI: 10.9–12.1) that involved at least one pathology test had five pathology tests recorded by the GP, and in 2006–08, this had increased significantly to 19.0% (95% CI: 18.2–19.8). This increase suggests that BEACH data are likely to underestimate the number of pathology tests/batteries ordered by GPs, and more so in 2006–08 than in 2000–02.

## Extrapolations

The method used to extrapolate BEACH data are described in Chapter 2. The numbers of GP encounters used in the extrapolations in this chapter are different from those described in Chapter 2 because two data years are combined. The numbers used are the average for the two years in each time point: 100.3 million in 2000–02 and 106.5 million in 2006–08.[4]

Extrapolations are based on the problem–pathology links for the selected problem(s) rather than the number of pathology tests/batteries of tests. The extrapolated numbers for each data point are average annual estimates. For example, the number of encounters at which hypertension is managed by GPs is estimated to be 10.1 million encounters per annum in 2006–08. Extrapolation estimates are rounded to the nearest 100,000 if more than a million and to the nearest 10,000 if less than a million.

The extrapolated changes reported throughout this chapter are calculated as the difference between the average annual estimates in each 2-year time point.

# 5.3 Changes in pathology ordering 2000–02 to 2006–08

In 2000–02, there were 198,200 encounters recorded by 1,982 GPs, and in 2006–08, there were 188,300 encounters recorded by 1,883 GPs. During this time, there was a significant increase in the number of problems managed per GP encounter, from 147.3 per 100 encounters (95% CI: 146.1–148.4) to 153.3 per 100 (95% CI: 151.9–154.7).

Pathology test ordering of GPs has increased significantly.

- The rate of pathology tests/batteries of tests increased from 32.6 per 100 encounters in 2000–02 to 46.4 per 100 in 2006–08. This was due to significant increases in:
  - the likelihood of at least one pathology test/battery being ordered at encounters (14.9% of encounters in 2000–02 and 18.7% in 2006–08)
  - the number of pathology tests ordered per encounter once the decision to order was made (217.8 per 100 tested encounters in 2000–02 and 247.8 in 2006–08) (Table 5.1).
- The rate of pathology tests/batteries ordered per 100 problems managed increased from 22.2 per 100 in 2000–02 to 30.3 in 2006–08. This was due to a significant increases in:
  - the likelihood of at least one pathology test/battery being ordered in the management of problems (11.4% of problems in 2000–02 and 14.2% in 2006–08)
  - the number of pathology tests ordered per problem once the decision to order was made (200.1 per 100 tested problems in 2000–02 and 221.3 in 2006–08) (Table 5.1).

When these pathology ordering data are extrapolated to the GP encounters claimed through Medicare (100.3 million per year in 2000–02 and 106.5 million per year in 2006–08), these data suggest that in 2006–08 there were:

- 6.4 million additional problems for which the GP ordered at least one pathology test/battery of tests (23.2 million per year in 2006–08 compared with 16.8 million per year in 2000–02)
- 17.7 million additional tests/batteries of tests ordered by GPs (51.3 million per year in 2006–08 compared with 33.6 million per year in 2000–02).

For interested readers, the pathology ordering rates for each year measured in BEACH from 2000–01 to 2007–08 have been published in *General practice in Australia 1998–99 to 2007–08: 10 year data tables*, available from <www.aihw.gov.au/publications/index.cfm/title/10661>.

**Table 5.1: Summary of pathology ordering, 2000–02 and 2006–08**

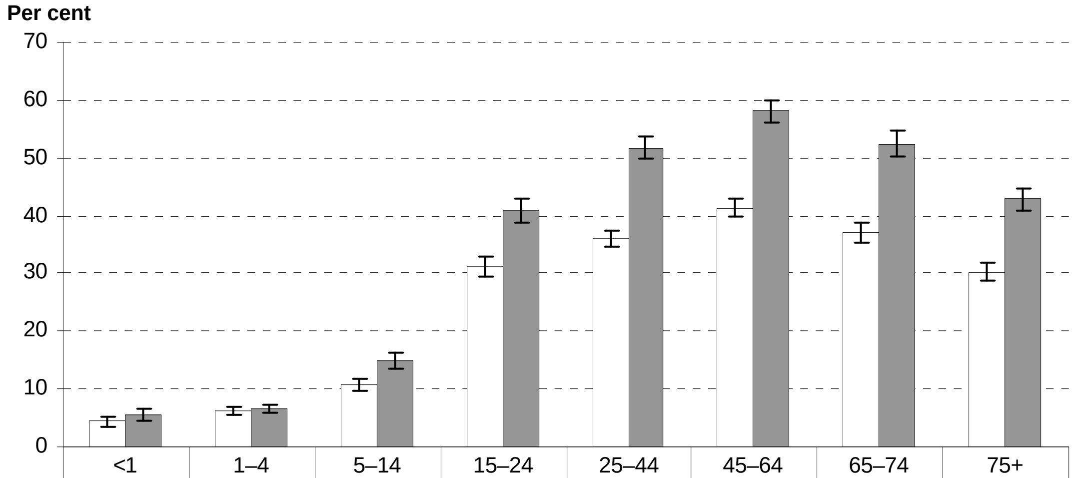
| | 2000–02 (*n* = 198,200) | | 2006–08 (*n* = 188,300) | |
|---|---|---|---|---|
| **Pathology ordering** | **Number** | **Rate/per cent (95% CI)** | **Number** | **Rate/per cent (95% CI)** |
| Pathology order rate per 100 encounters[(a)] | 64,389 | 32.6 (31.7–33.5) | 87,444 | 46.4 (45.2–47.7) |
| At least one pathology order per encounter (percentage of all encounters) | 29,559 | 14.9 (14.6–15.3) | 35,284 | 18.7 (18.3–19.2) |
| Test order rate per 100 tested encounters | . . | 217.8 (214.9–220.6) | . . | 247.8 (244.6–251.1) |
| Pathology test rate per 100 problems managed[(b)] | 64,389 | 22.2 (21.6–22.7) | 87,444 | 30.3 (29.6–31.0) |
| At least one pathology order per problem (percentage of total problems managed) | 33,196 | 11.4 (11.1–11.6) | 41,019 | 14.2 (13.9–14.5) |
| Number of tests ordered per 100 tested problems (rate) | . . | 200.1 (197.6–202.6) | . . | 221.3 (218.5–224.0) |

(a) This is a rate of pathology test/batteries ordered per 100 encounters based on the number of pathology tests/batteries over the number of encounters rather than the number of problem–pathology links.

(b) This is a rate of pathology test/batteries ordered per 100 problems managed (in 2000–02, *n* = 291,890 and in 2006–08, *n* = 288,610) based on the number of pathology tests/batteries over the number of problems rather than the number of problem–pathology links. There are more links than tests because each test can be linked to more than one problem under management (see Section 5.2).

*Note:*CI—confidence interval.

The age-specific rate of pathology ordering is shown in Figure 5.1. In 2006–08, the rate of testing was highest at encounters with patients aged 45–64 years (58.1 pathology tests/batteries per 100 encounters), followed by those with patients aged 65–74 years (52.5 per 100) and 25–44 years (51.8 per 100).




| | <1 | 1–4 | 5–14 | 15–24 | 25–44 | 45–64 | 65–74 | 75+ |
|---|---|---|---|---|---|---|---|---|
| □ 2000–02 | 4.4 | 6.2 | 10.7 | 31.2 | 36.0 | 41.3 | 37.0 | 30.3 |
| ■ 2006–08 | 5.6 | 6.6 | 14.8 | 40.8 | 51.8 | 58.1 | 52.5 | 42.9 |

Age group (years)

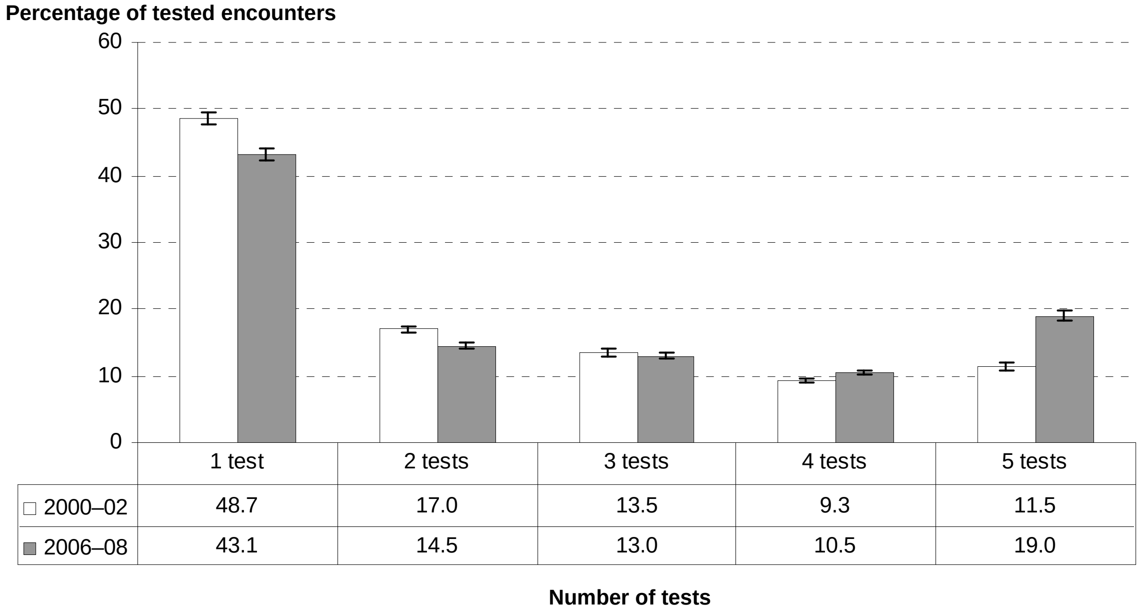
**Figure 5.1: Age-specific rate of pathology ordering per 100 encounters, 2000–02 to 2006–08 (95% CI)**

Between 2000–02 and 2006–08, there were significant increases in the age-specific rates of pathology ordering at encounters with all patient age groups except in those with children aged less than 5 years. Patients with the highest age-specific rates of pathology testing (45–64, 65–74 and 25–44 years) showed the largest age-specific increases in pathology ordering rates from 2000–02 to 2006–08 (Figure 5.1). The age groups accounting for the highest volume of pathology tests/batteries ordered were the 45–64 year age group (34.9% of tests/batteries) and the 25–44 year age group (26.5%) (results not shown).

There was a significant increase in the number of pathology tests/batteries ordered per encounter where at least one test/battery was ordered (tested encounter), and per tested problem in 2006–08 compared with 2000–02 (figures 5.2 and 5.3).

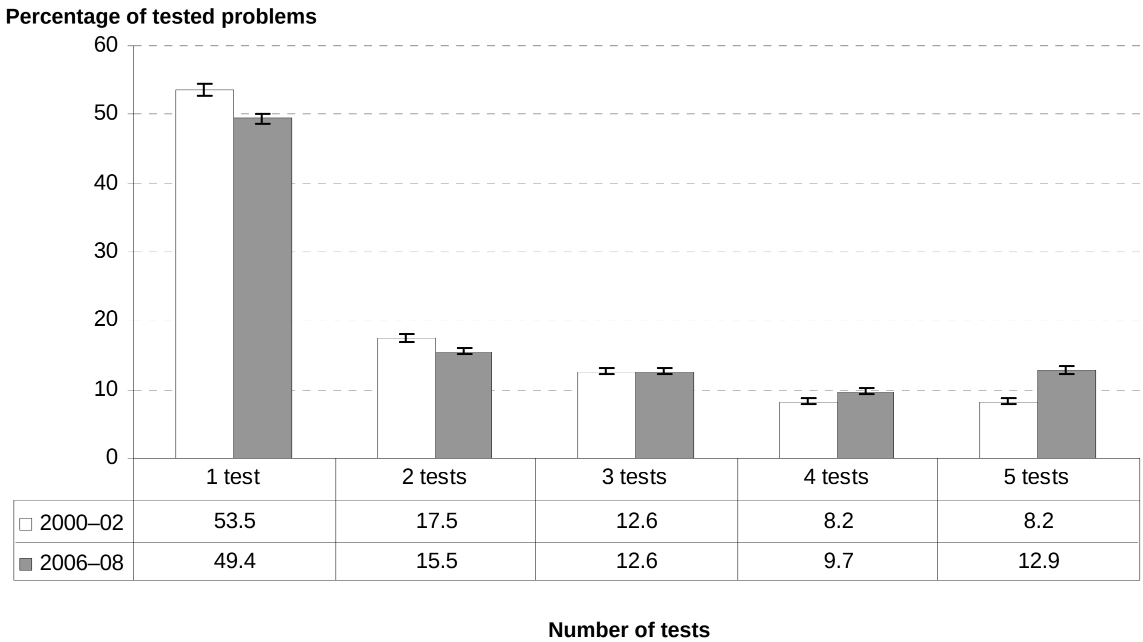
There was a significant decrease in the proportion of tested encounters with one or two tests/batteries ordered, in 2000–02, 48.7% of tested encounters had one test and 17.0% had two compared with 43.1% (one test) and 14.5% (two tests) in 2006–08. Simultaneously, there was a significant increase in the proportion with four or five tests/batteries ordered (Figure 5.2).

The distribution of number of tests per tested problem shows the same pattern of change. In 2006–08 compared with 2000–02, there was a significant decrease in the proportion of tested problems where one or two tests/batteries were ordered and a significant increase in the proportion where four or five tests/batteries were ordered (Figure 5.3). The proportions are smaller per tested problem, as more than one problem involving pathology tests can be managed per encounter.




| | 1 test | 2 tests | 3 tests | 4 tests | 5 tests |
|---|---|---|---|---|---|
| 2000–02 | 48.7 | 17.0 | 13.5 | 9.3 | 11.5 |
| 2006–08 | 43.1 | 14.5 | 13.0 | 10.5 | 19.0 |

**Figure 5.2: Number of pathology tests ordered per encounter when at least one test is ordered, 2000–02 to 2006–08 (95% CI)**




| | 1 test | 2 tests | 3 tests | 4 tests | 5 tests |
|---|---|---|---|---|---|
| 2000–02 | 53.5 | 17.5 | 12.6 | 8.2 | 8.2 |
| 2006–08 | 49.4 | 15.5 | 12.6 | 9.7 | 12.9 |

**Figure 5.3: Number of pathology tests ordered per problem when at least one test is ordered, 2000–02 to 2006–08 (95% CI)**

# 5.4 National Health Priority Areas

## Type 2 diabetes

GP pathology ordering behaviour in the management of Type 2 diabetes is looked at from 2000–02 to 2006–08 in this section. Changes in the management of Type 2 diabetes over the last decade (1998–99 to 2007–08) are looked at in detail in Chapter 10. The management rate of all diabetes (including types 1 and 2) increased significantly from 2.6 per 100 encounters in 1998–99 to 3.9 per 100 in 2007–08[8], primarily due to the significant increase in the management of Type 2 diabetes (see Chapter 10).

The management rate of Type 2 diabetes increased significantly from 2.6 per 100 encounters in 2000–02 to 3.3 per 100 in 2006–08 (Table 5.2). There was no change in the diagnosis or detection rate of new cases of Type 2 diabetes during this time. Pathology tests/batteries ordered for Type 2 diabetes accounted for 4.9% of all pathology orders in 2000–02 and 6.0% in 2006–08 (results not shown).

The rate of pathology ordering increased significantly from 63.6 tests/batteries of tests ordered in 2000–02 per 100 contacts with Type 2 diabetes to 88.4 per 100 in 2006–08. This was due to significant increases in both the likelihood of pathology testing being ordered for Type 2 diabetes (27.3% in 2000–02 to 31.6% in 2006–08 of diabetes problems), and the number of tests ordered once the decision to order tests was made (232.9 per 100 tested Type 2 diabetes contacts in 2000–02 and 280.2 in 2006–08) (Table 5.2).

When these data are extrapolated to the number of GP encounters claimed through Medicare nationally, it is estimated there were about:

- 850,000 more encounters involving the management of Type 2 diabetes in 2006–08 (3.5 million per year) than in 2000–02 (2.6 million per year)
- 380,000 additional Type 2 diabetes contacts that involved the ordering of at least one pathology test/battery of tests (tested contacts) in 2006–08 (1.1 million per year) compared with 2000–02 (720,000 per year)
- 1.4 million additional pathology tests/batteries of tests ordered for Type 2 diabetes in 2006–08 (3.1 million per year) than in 2000–02 (1.7 million per year). Type 2 diabetes accounted for 8% of the increase in pathology ordering that occurred between 2000–02 and 2006–08 (Table 5.2) (results not shown).

**Summary of findings**

There was a 50% increase in the volume of GP requests for pathology tests/batteries attributable to Type 2 diabetes. Due to a combination of factors:

- the increase in the total number of GP encounters
- the increased management rate of Type 2 diabetes
- changes in GP pathology ordering behaviour for Type 2 diabetes, that is:
  - increased likelihood of pathology being ordered for Type 2 diabetes
  - increased number of tests ordered once the decision to order was made.

There are likely to be many contributors to the increase in the encounters involving the management of Type 2 diabetes, and to the pathology ordering behaviour of GPs. As discussed in Chapter 10, the diagnosed prevalence of Type 2 diabetes is increasing in

Australia. In recognition of the growing burden/risks associated with diabetes, it was made a National Health Priority Area in 1996.

A number of national initiatives (such as the MBS Diabetes annual cycle of care MBS items, chronic disease MBS item numbers, Australian Primary Care Collaboratives) and state-based policies have been developed to improve the management of diabetes (see Chapter 10 for more details). The annual cycle of care MBS item introduced in November 2001 requires 'at least' annual testing of HbA1c, cholesterol, high-density lipoprotein, triglycerides and testing for microalbuminuria. The promotion of management guidelines that include testing, consumer education and the initiatives above have contributed to the increase in pathology ordering for diabetes.

## Overweight/obesity

The overweight/obesity analysis in this section includes problems managed that were labelled by the GP as obesity or overweight for patients aged 18 years and over. This does not represent all encounters with overweight/obese patients, only those who were being actively managed for overweight or obesity at the encounter. It also does not include GP management of overweight/obesity when it occurs in the management of other morbidity (for example, weight management advice to a hypertensive patient).

GP pathology ordering behaviour for overweight/obesity among adult patients is looked at from 2000–02 to 2006–08 in this section. During this time, there was no significant change in the management rate of overweight/obesity, remaining at 1.2 per 100 adult encounters (Table 5.2). However, there was a significant increase in the management of obesity (alone) from 1998–99 to 2007–08.[8] In Chapter 7, the prevalence of overweight and obesity among patients at GP encounters is investigated, and related policies are discussed.

Pathology tests/batteries of tests attributed to overweight/obesity accounted for 1% of all pathology at both time-points, 2000–02 and 2006–08 (results not shown). The rate of pathology tests orders in the management of overweight/obesity among adult patients increased between 2000–02 and 2006–08 by more than 50% (30.7 to 47.1 per 100 overweight/obesity contacts). This increase was due to an increased likelihood that at least one test/battery of tests was ordered (11.7% of contacts for overweight/obesity in 2000–02 and 16.5% in 2006–08). The number of tests ordered per tested problem did not change significantly (262.3 per 100 tested contacts in 2000–02 and 285.9 per 100 in 2006–08) (Table 5.2).

When these results are extrapolated to national GP encounters it is estimated that, compared with 2000–02, in 2006–08 there were about:

- 90,000 more encounters involving the management of overweight/obesity (1 million per year in 2000–02 and 1.1 million per year in 2006–08)
- 60,000 additional tested overweight/obesity contacts (120,000 per year in 2000–02 and 180,000 per year in 2006–08)
- 210,000 additional tests/batteries requested for overweight/obesity (310,000 per year in 2000–02 and 520,000 per year in 2006–08) (results not shown).

**Summary of findings**

Of the total increase in pathology, 1.2% was attributable to pathology ordering in the management of overweight/obesity. The increase in pathology ordering for overweight/obesity problems in general practice is due solely to an increase in the likelihood of pathology tests being ordered for overweight/obesity problems. There was no corresponding significant change in the number of tests/batteries ordered per tested overweight/obesity problem.

Also affecting the increase in the estimated extrapolated number of tests/batteries for overweight/obesity is the national increase in the number of GP encounters (100.3 million per year in 2000–02 and 106.5 million per year in 2006–08). There was no contributing change in the management rate of overweight/obesity problems.

The prevalence of overweight and obesity among adult patients at GP encounters in 2006–08 was 58.8% (see Chapter 7). There is a large gap between the prevalence and the management rate. For each occasion of management of overweight/obesity by GPs (as a separate clinical problem), there have been 49 GP encounters with overweight/obese adult patients. If the management rate of overweight/obesity increases in the future there will be a corresponding increase in pathology ordering for overweight/obesity based on the current pattern.

## Cardiovascular disease

GP pathology ordering behaviour for cardiovascular (CVD) problems is looked at from 2000–02 to 2006–08 in this section. The management of CVD problems in general practice from 1998–99 to 2007–08 is investigated in detail in Chapter 9. BEACH data show that there was a marginally significant increase in the management of CVD problems over the decade.[8] CVD was responsible for 18% of the total burden of disease and injury in Australia in 2003.[9]

There was no significant change in the management rate of CVD problems between 2000–02 (16.7 per 100 encounters) and 2006–08 (17.3 per 100) (Table 5.2). However, new CVD problems increased by 21%, the increase in diagnosis/detection rate being from 1.86 per 100 encounters (95% CI: 1.78–1.93) in 2000–02 to 2.24 (95% CI: 2.15–2.33) in 2006–08.

Pathology ordering for CVD problems accounted for 12.7% of the pathology tests/batteries ordered by GPs in BEACH in 2000–02 and 12.8% in 2006–08 (results not shown). There was a significant increase in the ordering of pathology tests/batteries of tests for CVD problems from 25.4 per 100 contacts with CVD problems in 2000–02 to 35.6 per 100 contacts in 2006–08. This increase was due to significant increases in:

- the proportion of CVD problems involving at least one pathology order (12.1% of CVD problems in 2000–02 to 15.0% in 2006–08)
- the number of tests/batteries of tests per tested CVD problem (210.3 per 100 tested CVD problems in 2000–02 to 238.3 per 100 in 2006–08) (Table 5.2).

When these results are extrapolated to national GP encounters, it is estimated that, compared with 2000–02, in 2006–08 there were about:

- 1.7 million additional encounters involving the management of CVD problems (15.5 million encounters per year in 2000–02 and 17.2 million per year in 2006–08). This increase does not reflect a significant change in the proportion of GP encounters that are for CVD problems; rather it reflects the increase in the number of GP encounters claimed through Medicare
- 740,000 more CVD problems managed for which pathology was ordered
- 2.4 million additional tests ordered for CVD problems. This indicates that more than one-tenth (13.1%) of the total 17.7 million (estimated) additional tests ordering by GPs in 2006–08, compared with 2000–02, was attributable to CVD (results not shown).

**Summary of findings**

The increase in pathology ordering in the management of CVD problems in 2006–08 compared with 2000–02 was due to increases in the total number of GP encounters, and to two changes in GP pathology ordering behaviour—an increase in the likelihood of pathology ordering, and an increase in the number of pathology tests ordered per tested problem.

Pathology ordering behaviour is examined below for three specific CVD problems that each account for more than 1% of pathology tests/batteries of tests ordered by GPs (in either 2000–02 or 2006–08): hypertension, ischaemic heart disease and atrial fibrillation. Pathology ordering for these three conditions together accounted for two-thirds of all pathology ordered for CVD.

## Hypertension

Hypertension is the most commonly managed individual problem in general practice in Australia. BEACH data show that there was a significant increase in the management of hypertension from 1998–99 to 2007–08.[8] High blood pressure was responsible for 7.6% of the total burden of disease and injury in Australia in 2003.[9]

Pathology ordering for non-gestational hypertension is considered between 2000–02 and 2006–08. During this time, there was no significant change in the management rate of hypertension (9.1 per 100 encounters in 2000–02 and 9.5 per 100 in 2006–08) (Table 5.2). However, the management rate of new hypertension problems increased by 24%, indicating an increase in the diagnosis or detection rate, from 0.48 per 100 encounters (95% CI: 0.44–0.52) in 2000–02 to 0.60 (95% CI: 0.56–0.64) in 2006–08.

Pathology ordering for hypertension accounted for 5.9% of the pathology ordered in 2000–02 and 6.3% in 2006–08 (results not shown). The rate of pathology ordering per 100 hypertension contacts increased significantly, from 21.6 per 100 contracts in 2000–02 to 32.3 per 100 in 2006–08. This increase was due to significant increases in:

- the likelihood of pathology being ordered in the management of hypertension (8.7% of hypertension contacts in 2000–02 compared with 11.9% in 2006–08)
- the number of pathology tests ordered per tested hypertension problem (248.2 per 100 tested contacts in 2000–02 compared with 270.4 per 100 in 2006–08) (Table 5.2).

When these results are extrapolated to national GP encounters, it is estimated that, in 2006–08, compared with 2000–02 there were about:

- 950,000 more encounters involving the management of hypertension problems
- 410,000 more hypertension contacts involving at least one pathology request
- 1.3 million more tests/batteries of tests ordered for hypertension problems (7.2% of the total increase in pathology tests) (results not shown).

**Summary of findings**

The increase in pathology ordering in the management of hypertension was due to increases in the total number of GP encounters, and to two changes in GP pathology ordering behaviour for hypertension problems—an increase in the likelihood of pathology ordering, and an increase in the number of pathology tests ordered per tested problem.

## Ischaemic heart disease

Pathology ordering for ischaemic heart disease (IHD) is looked at between 2000–02 and 2006–08. During this time, there was a marginal decrease in the management rate from 1.4 per 100 encounters to 1.2 per 100 (Table 5.2). There was no change in the management rate of new IHD problems.

Pathology ordering for IHD accounted for 1.4% of tests in 2000–02 and 1.2% in 2006–08 (results not tabled). The rate of pathology per 100 contacts with IHD increased significantly, from 33.3 per 100 IHD contacts in 2000–02 to 46.7 per 100 in 2006–08. This was due to a significant increase in the number of tests/batteries ordered for IHD problems once the decision to order had been made (231.3 tests/batteries per 100 tested IHD problems in 2000–02 compared with 272.6 tests per 100 in 2006–08). However, there was no change in the likelihood of pathology ordering being involved in the management of IHD problems (Table 5.2).

When these results are extrapolated to national GP encounters, it is estimated that in 2006–08, compared with 2000–02, there were about:

- 90,000 fewer encounters involving the management of IHD problems
- 20,000 more encounters with IHD problems for which pathology was requested
- 140,000 more tests/batteries ordered for IHD problems (0.8% of the total increase in pathology tests) (results not shown).

**Summary of findings**

The increase in pathology ordering attributable to IHD was due to an increase in the total number of GP encounters, and to an increase in the number of pathology tests ordered per tested IHD problem. This increase in number of pathology tests ordered for IHD outweighed the effect of the decrease in the management rate of IHD, even with the likelihood of pathology being ordered for IHD remaining constant.

## Atrial fibrillation

Pathology ordering for atrial fibrillation is looked at between 2000–02 and 2006–08. During this time, there was a significant increase in the management rate of atrial fibrillation, from 0.7 per 100 encounters to 1.0 per 100 (Table 5.2). There was no change in the management rate of new atrial fibrillation problems.

Pathology ordering for atrial fibrillation accounted for 1% of total pathology tests in both 2000–02 and 2006–08 (results not shown). There was no change in the pathology ordering behaviour for atrial fibrillation—the likelihood of pathology ordering and number of pathology tests/batteries of tests ordered per tested atrial fibrillation problem remained constant (Table 5.2).

When these data are extrapolated to national GP Medicare encounters, it is estimated that in 2006–08, compared with 2000–02, there were about:

- 360,000 more encounters involving atrial fibrillation
- 130,000 more encounters with atrial fibrillation problems for which pathology was requested
- 180,000 more tests/batteries of tests ordered for atrial fibrillation (1% of the total increase in pathology tests/batteries of tests) (results not shown).

**Summary of findings**

The increase in the number of pathology orders for atrial fibrillation nationally was due to a small increase in the management rate of atrial fibrillation, and to the increase in the number of total national GP encounters between 2000–02 and 2006–08, not to any change in the pathology ordering behaviour of GPs in the management of atrial fibrillation.

## Lipid disorders

Lipid disorders are one of the National Health Priority Area risk factors. It is a risk factor for cardiovascular disease, particularly in patients with diabetes and obesity. High blood cholesterol was responsible for 6.2% of the total burden of disease and injury in Australia in 2003.[9] Changes in the management of lipid disorders between 1998–99 and 2007–08 are looked at in the cardiovascular chapter (see Chapter 9).

Pathology ordering for lipid disorders is investigated from 2000–02 to 2006–08 in this section. During this time, there was a significant increase in the management rate of lipid disorders, from 2.9 per 100 encounters to 3.5 per 100 (Table 5.2). The management rate of new lipid disorders also increased—a 37 increase in diagnosis/detection rate, from 0.35 per 100 encounters (95% CI: 0.32–0.38) in 2000–02 to 0.48 (95% CI: 0.44–0.52) in 2006–08.

Pathology ordering for lipid disorders accounted for 5.1% of pathology orders in 2000–02 and 4.9% in 2006–08 (results not shown). The rate of pathology ordering increased from 58.2 per 100 contacts with lipid disorders in 2000–02 to 66.5 per 100 in 2006–08. This increase was due to a significant increase in the number of tests ordered per tested lipid problem (191.4 tests/ batteries per 100 tested contacts in 2000–02 compared with 219.4 per 100 in 2006–08). There was no change in the likelihood of pathology tests being ordered in management of lipid disorders (30.4% of lipid disorder contacts in 2000–02 and 30.3% in 2006–08) (Table 5.2).

When these data are extrapolated to national GP Medicare encounters, it is estimated that, compared with 2000–02, in 2006–08 there were about:

- 820,000 more encounters involving lipid disorders, and 250,000 more lipid disorder problems for which pathology was requested
- 790,000 more tests/batteries ordered for lipid disorders (4.5% of the total increase in pathology tests/batteries of tests) (results not shown).

**Summary of findings**

The national increase in pathology ordering in the management of lipid problems in 2006–08, compared with 2000–02, was due to the increase in the management rate of lipid disorders, the increase in number of total GP encounters, and an increase in the number of pathology tests/batteries ordered per tested lipid problem.

## Musculoskeletal conditions

Pathology ordering for all musculoskeletal problems (in particular arthritis) is investigated from 2000–02 to 2006–08 in this section. The management of musculoskeletal problems in general practice from 1998–99 to 2007–08 is investigated in detail in Chapter 11.

The management rate of musculoskeletal problems did not change between 2000–02 (17.5 per 100 encounters) and 2006–08 (17.1 per 100) (Table 5.2). However, the rate of new musculoskeletal problems increased by 7%, indicating an increase in the diagnosis or detection rate, from 5.6 per 100 encounters (95% CI: 5.4–5.7) in 2000–02 to 6.0 (95% CI: 5.8–6.2) in 2006–08.

Pathology ordering for musculoskeletal conditions accounted for 5.4% of all pathology tests/batteries of tests in 2000–02 and 5.1% in 2006–08 (results not shown). The ordering rate of pathology for musculoskeletal problems increased significantly, from 10.3 per 100 contacts in 2000–02 to 14.4 per 100 in 2006–08. This was due to significant increases:

- in the likelihood of pathology tests/batteries of tests being ordered for musculoskeletal conditions (from 3.8% of musculoskeletal problems in 2000–02 to 4.9% in 2006–08)
- in the number of tests/batteries of tests ordered per tested musculoskeletal problem (274.3 per 100 tested contacts in 2000–02 to 294.0 per 100 in 2006–08) (Table 5.2).

When these results are extrapolated to national GP encounters, it is estimated that in 2006–08, compared with 2000–02, there were about:

- 620,000 more encounters involving the management of musculoskeletal problems
- 230,000 more musculoskeletal problems involving at least one pathology request
- 810,000 more tests/batteries of tests ordered for musculoskeletal problems (4.6% of the total increase in pathology tests) (results not shown).

**Summary of findings**

The national increase in pathology ordering in the management of musculoskeletal problems in 2006–08, compared with 2000–02, was due to the increase in the total number of GP encounters, and to two changes in pathology ordering behaviour of the GPs—the increase in the likelihood of ordering and the number of pathology tests ordered per tested problem.

## Arthritis

The management rate of arthritis per 100 encounters decreased significantly between 2000–02 (3.9 per 100 encounters) and 2006–08 (3.6 per 100) (Table 5.2). There was no change in the rate at which arthritis problems were diagnosed.

Pathology ordering for arthritis accounted for 1.9% of pathology orders in 2000–02 and 1.5% in 2006–08 (results not shown). GP pathology ordering behaviour in the management of arthritis (rate of pathology per 100 arthritis problems, likelihood of pathology orders and numbers of tests per tested arthritis problem) did not change between 2000–02 and 2006–08 (Table 5.2).

When these results are extrapolated to the national GP encounters, it is estimated that in 2006–08, compared with 2000–02, there were about:

- 140,000 fewer encounters involving the management of arthritis
- 30,000 more arthritis problems involving at least one pathology request
- 110,000 more tests/batteries of tests ordered for arthritis (0.6% of the total increase in pathology tests) (results not shown).

**Summary of findings**

The national increase in pathology ordering in the management of arthritis problems in 2006–08, compared with 2000–02, was due solely to the increase in the number of GP encounters. The pathology ordering behaviour of GPs in the management of arthritis did not change.

## Mental health

Pathology ordering for psychological problems (referred to as mental health problems) (in particular depression) is looked at between 2000–02 and 2006–08 in this section. Chapter 14 investigates GP management of mental health problems from 1998–99 to 2007–08.

The management rate of mental health problems did not change (11.5 per 100 encounters in 2000–02 and 12.0 per 100 in 2006–08) (Table 5.2). There was no change in the diagnosis or detection rate of new cases of mental health problems during this time.

Pathology ordering for mental health conditions accounted for 3.8% of all pathology tests/batteries of tests in 2000–02 and 3.7% in 2006–08 (results not shown). There was a significant increase in the ordering rate of pathology for mental health problems, from 11.0 contacts with mental health problems in 2000–02 to 15.0 in 2006–08. This increase was due to a significant increase in the likelihood of pathology being ordered (from 4.0% of mental health problems in 2000–02 to 5.1% in 2006–08). There was no change in the number of tests/batteries ordered per problem once the decision to order had been made (Table 5.2).

When these results are extrapolated to the national GP encounters, it is estimated that in 2006–08, compared with 2000–02, there were about:

- 1.1 million more encounters involving the management of mental health problems
- 190,000 more mental health problems involving at least one pathology request
- 640,000 more tests/batteries of tests ordered for mental health problems (3.6% of the total increase in pathology tests) (results not shown).

**Summary of findings**

The national increase in GP pathology ordering attributable to mental health problems was due to the increase in the number of national GP encounters, and an increased likelihood of pathology being ordered in the management of mental health.

### Depression

The management rate of depression increased marginally between 2000–02 (3.9 per 100 encounters) and 2006–08 (4.2 per 100) (Table 5.2). There was no change in the diagnosis or detection rate of new cases of depression during this time.

GP pathology ordering in management of depression accounted for 1.1% of all pathology tests/batteries ordered in 2000–02 and 1.3% in 2006–08 (results not shown). There was a significant increase in the ordering of pathology tests for depression, from 9.8 per 100 contacts with depression in 2000–02 to 14.7 per 100 in 2006–08. This was due to a significant increase in the likelihood of pathology tests/batteries being ordered for depression problems (from 3.3% of depression problems in 2000–02 to 4.6% in 2006–08). There was no change in the number of tests/batteries ordered per tested depression problem (299.6 per 100 tested depression problems in 2000–02 and 322.4 per 100 in 2006–08) (Table 5.2).

When these results are extrapolated to the national GP encounters, it is estimated that in 2006–08, compared with 2000–02, there were about:

- 590,000 more encounters involving the management of depression problems
- 80,000 more depression problems involving at least one pathology request
- 280,000 more tests/batteries of tests ordered for depression problems (1.6% of the total increase in pathology tests) (results not shown).

**Summary of findings**

The national increase in pathology ordering in the management of depression problems from 2000–02 to 2006–08 was due to the increase in the number of total GP encounters, the increase in the management rate of depression, and an increase in the likelihood of GPs ordering pathology for depression problems.

## Cancer

Pathology ordering for all malignant neoplasm problems (referred to as cancer problems) (in particular skin cancer) is looked at between 2000–02 and 2006–08 in this section. Chapter 13 investigates the management of cancer in general practice from 1998–99 to 2007–08.

The management rate of cancer problems increased significantly, from 1.9 per 100 encounters in 2000–02 to 2.4 per 100 in 2006–08 (Table 5.2). The rate at which new cancer problems were diagnosed increased by 38%, from 0.58 new cases per 100 encounters (95% CI: 0.52–0.64) in 2000–02 to 0.80 (95% CI: 0.72–0.87) in 2006–08.

Pathology ordering for cancer accounted for 1.6% of total pathology tests in 2000–02 and 1.5% in 2006–08 (results not shown). There was no change in the pathology ordering behaviour for cancer; that is, there was no change in the likelihood of pathology ordering or in the number of pathology tests/batteries ordered per tested cancer problem (Table 5.2).

When these results are extrapolated to the national GP Medicare encounters, it is estimated that, compared with 2000–02, in 2006–08 there were about:

- 660,000 more encounters involving the management of cancer
- 170,000 more cancer problems involving at least one pathology request
- 230,000 more tests/batteries of tests ordered for cancer problems (1.3% of the total increase in pathology tests/batteries of tests) (results not shown).

**Summary of findings**

The increase in pathology tests/batteries was due to an increase in the management rate of cancer, and the increase in the number of GP encounters between 2000–02 and 2006–08, not to any change in the pathology ordering behaviour of GPs in the management of cancer.

### Skin cancer

The management rate of skin cancer increased significantly from 0.9 per 100 encounters in 2000–02 to 1.2 per 100 in 2006–08 (Table 5.2). The management rate of new skin cancer problems also increased—a 38% increase in diagnosis/detection rate, from 0.46 per 100 encounters (95% CI: 0.40–0.51) in 2000–02 to 0.63 (95% CI: 0.56–0.69) in 2006–08.

Pathology ordering for skin cancer accounted for 0.6% of total pathology tests in 2000–02 and 0.7% in 2006–08 (results not shown). There was no change in GP pathology ordering behaviour for skin cancer; that is, the likelihood of pathology ordering and number of pathology tests/batteries of tests ordered per tested skin cancer problem did not change (Table 5.2).

When these results are extrapolated to the national GP Medicare encounters, it is estimated that, compared with 2000–02, in 2006–08 there were about:

- 370,000 more encounters involving the management of skin cancer
- 120,000 more skin cancer problems involving at least one pathology request
- 120,000 more tests/batteries of tests ordered for skin cancer problems (0.7% of the total increase in pathology tests/batteries of tests) (results not shown).

**Summary of findings**

The increase in pathology tests/batteries was due to an increase in the management rate of skin cancer, and the increase in the number of GP encounters between 2000–02 and 2006–08, not to any change in the pathology ordering behaviour of GPs in the management of skin cancer.

## Respiratory problems

GP pathology ordering in the management of respiratory problems (in particular asthma) is looked at between 2000–02 and 2006–08 in this section. The management of respiratory problems in general practice from 1998–99 to 2007–08 is investigated in detail in Chapter 8.

The management rate of respiratory problems decreased significantly from 21.2 per 100 encounters in 2000–02 to 18.9 per 100 in 2006–08 (Table 5.2). There was no change in the diagnosis or detection rate of new cases of respiratory problems during this time.

Pathology ordering for respiratory problems accounted for 3.0% of total pathology tests in 2000–02 and 2.9% in 2006–08 (results not shown). The pathology ordering rate per 100 respiratory problem contacts increased significantly (4.8 per 100 contacts in 2000–02 compared with 7.3 per 100 in 2006–08). This was due to significant increases in:

- the likelihood of pathology being ordered in the management of respiratory problems (2.3% of contacts in 2000–02 compared with 3.2% in 2006–08)
- the number of pathology tests/batteries ordered per 100 tested respiratory problems (205.9 per 100 in 2000–02 compared with 230.6 per 100 in 2006–08) (Table 5.2).

When these results are extrapolated to the national GP encounters, it is estimated that in 2006–08, compared with 2000–02, there were about:

- 890,000 fewer encounters involving the management of respiratory problems
- 140,000 more respiratory problems involving at least one pathology request
- 440,000 more tests/batteries of tests ordered for respiratory problems (2.5% of the total increase in pathology tests) (results not shown).

**Summary of findings**

The national increase in pathology ordering in the management of respiratory problems from 2000–02 to 2006–08 was due to the increase in the number of total GP encounters, and to two changes in GP pathology ordering behaviour for respiratory problems—increases in the likelihood of pathology ordering and in the number of tests ordered per tested problem. These changes in GP pathology ordering behaviour outweighed the effect of the decrease in the management rate of respiratory problems.

### Asthma

The management rate of asthma decreased significantly from 2.8 per 100 encounters in 2000–02 to 2.2 per 100 in 2006–08. There was no change in the diagnosis or detection rate of new cases of asthma during this time.

Pathology ordering for asthma problems accounted for 0.2% of total pathology tests in both 2000–02 and 2006–08 (results not shown). There was a significant increase in the rate of pathology ordering per 100 asthma contacts, from 2.0 per 100 in 2000–02 to 4.4 per 100 in 2006–08. This was due to a significant increase in the likelihood of pathology being ordered in the management of asthma problems (1.1% of asthma contacts in 2000–02 compared with 1.9% in 2006–08). There was no change in the number of pathology tests/batteries of tests ordered for asthma once the decision to test had been made (Table 5.2).

When these results are extrapolated to the national GP encounters, it is estimated that, compared with 2000–02, in 2006–08 there were about:

- 430,000 fewer encounters involving the management of asthma problems
- 10,000 more asthma problems involving at least one pathology request
- 50,000 more tests/batteries of tests ordered for asthma problems (0.3% of the total increase in pathology tests).

**Summary of findings**

The national increase in pathology ordering in the management of asthma problems was due to the increase in the number of total GP encounters, and the increase in the likelihood of GPs ordering pathology tests/batteries in the management of asthma. These increases outweighed the effect of the decrease in the management rate of asthma, even with the number of pathology ordered per tested encounter remaining constant.

## Table 5.2: Pathology ordering for management of problems classed as National Health Priority Areas, 2000–02 and 2006–08

| Problem | 2000–02 | | | | 2006–08 | | | | Change from 2000–02 to 2006–08[(a)] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rate per 100 encs (95% CI)[(b)] | Path per 100 probs (95% CI)[(c)] | % at least 1 path (95% CI)[(d)] | Path per 100 tested probs (95% CI) | Rate per 100 encs (95% CI)[(b)] | Path per 100 probs (95% CI)[(c)] | % at least 1 path (95% CI)[(c)] | Path per 100 tested probs (95% CI) | Rate per 100 encs | Path per 100 probs | Per cent at least 1 path | Path per 100 tested probs | Per cent of national change[(e)] |
| Cardiovascular problems | 16.7 (16.2–17.2) | 25.4 (24.1–26.7) | 12.1 (11.5–12.6) | 210.3 (204.7–216.0) | 17.3 (16.8–17.8) | 35.6 (34.1–37.2) | 15.0 (14.4–15.5) | 238.3 (232.6–243.9) | — | ↑ | ↑ | ↑ | 13.1 |
| Hypertension (excl gestational) | 9.1 (8.8–9.4) | 21.6 (20.0–23.2) | 8.7 (8.1–9.3) | 248.2 (239.5–257.0) | 9.5 (9.1–9.8) | 32.3 (30.3–34.2) | 11.9 (11.3–12.6) | 270.4 (262.5–278.4) | — | ↑ | ↑ | ↑ | 7.2 |
| Ischaemic Heart disease | 1.4 (1.3–1.5) | 33.3 (29.2–37.5) | 14.4 (12.9–15.9) | 231.3 (216.3–246.3) | 1.2 (1.1–1.3) | 46.7 (41.3–52.1) | 17.1 (15.4–18.8) | 272.6 (257.5–287.8) | ↓ | ↑ | — | ↑ | 0.8 |
| Atrial fibrillation | 0.7 (0.6–0.7) | 48.5 (43.9–53.1) | 37.4 (34.4–40.5) | 129.7 (121.8–137.6) | 1.0 (0.9–1.0) | 49.6 (45.3–54.0) | 37.4 (34.6–40.2) | 132.7 (125.6–139.9) | ↑ | — | — | — | 1.0 |
| Lipid disorders | 2.9 (2.8–3.0) | 58.2 (54.7–61.7) | 30.4 (28.9–31.9) | 191.4 (184.6–198.2) | 3.5 (3.4–3.7) | 66.5 (62.5–70.6) | 30.3 (28.9–31.8) | 219.4 (211.6–227.3) | ↑ | ↑ | — | ↑ | 4.5 |
| Type 2 diabetes | 2.6 (2.5–2.8) | 63.6 (59.6–67.6) | 27.3 (25.8–28.8) | 232.9 (224.8–241.0) | 3.3 (3.1–3.4) | 88.4 (83.7–93.2) | 31.6 (30.1–33.0) | 280.2 (272.4–288.1) | ↑ | ↑ | ↑ | ↑ | 8.0 |
| Musculoskeletal problems | 17.5 (17.1–17.9) | 10.3 (9.6–11.1) | 3.8 (3.5–4.0) | 274.3 (265.9–282.7) | 17.1 (16.7–17.5) | 14.4 (13.5–15.3) | 4.9 (4.6–5.2) | 294.0 (285.5–302.4) | — | ↑ | ↑ | ↑ | 4.6 |
| Arthritis all | 3.9 (3.8–4.1) | 16.4 (14.6–18.2) | 5.5 (5.0–6.1) | 296.3 (283.7–308.9) | 3.6 (3.4–3.7) | 20.1 (18.0–22.1) | 6.5 (5.9–7.1) | 308.5 (294.2–322.8) | ↓ | — | — | — | 0.6 |
| Mental health problems | 11.5 (11.1–11.9) | 11.0 (10.1–11.9) | 4.0 (3.8–4.3) | 272.3 (261.5–283.2) | 12.0 (11.6–12.4) | 15.0 (13.8–16.1) | 5.1 (4.8–5.5) | 292.4 (280.8–304.0) | — | ↑ | ↑ | — | 3.6 |
| Depression | 3.9 (3.7–4.0) | 9.8 (8.4–11.2) | 3.3 (2.8–3.7) | 299.6 (280.2–319.0) | 4.2 (4.0–4.4) | 14.7 (12.8–16.7) | 4.6 (3.9–5.2) | 322.4 (300.6–344.3) | ↑ | ↑ | ↑ | — | 1.6 |
| Cancer | 1.9 (1.8–2.0) | 28.4 (25.6–31.3) | 19.6 (17.5–21.7) | 145.3 (136.8–153.8) | 2.4 (2.3–2.6) | 30.1 (27.6–32.6) | 21.0 (19.2–22.9) | 143.2 (135.5–150.9) | ↑ | — | — | — | 1.3 |
| Skin cancer | 0.9 (0.8–1.0) | 23.6 (19.7–27.5) | 23.0 (19.3–26.7) | 102.7 (100.5–104.8) | 1.2 (1.1–1.3) | 26.0 (22.9–29.1) | 25.5 (22.4–28.6) | 102.1 (100.4–103.7) | ↑ | — | — | — | 0.7 |
| Overweight/obesity (adults) | 1.2 (1.1–1.3) | 30.7 (24.6–36.8) | 11.7 (9.7–13.7) | 262.3 (241.4–283.3) | 1.2 (1.1–1.3) | 47.1 (39.9–54.4) | 16.5 (14.1–18.9) | 285.9 (268.2–303.6) | — | ↑ | ↑ | — | 1.2 |

*(continued)*

## Table 5.2 (continued): Pathology ordering for management of problems classed as National Health Priority Areas, 2000–02 and 2006–08

| Problem | 2000–02 Rate per 100 encs (95% CI)[b] | 2000–02 Path per 100 probs (95% CI)[c] | 2000–02 % at least 1 path (95% CI)[d] | 2000–02 Path per 100 tested probs (95% CI) | 2006–08 Rate per 100 encs (95% CI)[b] | 2006–08 Path per 100 probs (95% CI)[c] | 2006–08 % at least 1 path (95% CI)[d] | 2006–08 Path per 100 tested probs (95% CI) | Change from 2000–02 to 2006–08[a] Rate per 100 encs | Change Path per 100 probs | Change Per cent at least 1 path | Change Path per 100 tested probs | Per cent of national change[e] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Respiratory | 21.2 (20.8–21.6) | 4.8 (4.4–5.2) | 2.3 (2.2–2.5) | 205.9 (197.4–214.4) | 18.9 (18.5–19.3) | 7.3 (6.7–7.9) | 3.2 (2.9–3.4) | 230.6 (221.3–239.9) | ↓ | ↑ | ↑ | ↑ | 2.5 |
| Asthma | 2.8 (2.7–2.9) | 2.0 (1.4–2.6) | 1.1 (0.8–1.4) | 181.7 (155.3–208.0) | 2.2 (2.1–2.3) | 4.4 (3.1–5.6) | 1.9 (1.5–2.4) | 230.4 (197.5–263.2) | ↓ | ↑ | ↑ | — | 0.3 |
| **Total problems** | **147.3 (146.1–148.4)** | **22.8 (22.2–23.4)** | **11.4 (11.1–11.6)** | **200.1 (197.6–202.6)** | **153.3 (151.9–154.7)** | **31.4 (30.7–32.2)** | **14.2 (13.9–14.5)** | **221.3 (218.5–224.0)** | ↑ | ↑ | ↑ | ↑ | **100.0** |

(a) The direction and type of change is indicated for each measure between 2000–02 and 2006–08: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates no change.

(b) Management rate of the problem, expressed as a rate per 100 encounters. In 2000–02, the total number of encounters was 198,200. In 2006–08 the total number of encounters was 188,300.

(c) In 2000–02 there were 66,429 pathology tests/batteries of tests linked to problems, and in 2006–08 there were 90,753.

(d) Proportion of each problem with at least one pathology test/battery of tests ordered.

(e) The proportion of the total national increase in pathology tests/batteries ($n$ = 17.7 million) that was attributable to each problem.

*Note:* %—percentage; Encs—encounters; CI—confidence interval; path—pathology; probs—problems.

## Table 5.3: Changes in pathology ordering for selected problems, 2000–02 and 2006–08

| Problem | 2000–02 Rate per 100 encs (95% CI)[ba] | 2000–02 Path per 100 probs (95% CI)[c] | 2000–02 % at least 1 path (95% CI)[d] | 2000–02 Path per 100 tested probs (95% CI) | 2006–08 Rate per 100 encs (95% CI)[b] | 2006–08 Path per 100 probs (95% CI)[c] | 2006–08 % at least 1 path (95% CI)[d] | 2006–08 Path per 100 tested probs (95% CI) | Change from 2000–02 to 2006–08[a] Rate per 100 encs | Change Rate of new cases | Change Path per 100 probs | Change Per cent at least 1 path | Change Path per 100 tested probs | Per cent of national change[e] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General check-up | 1.9 (1.8–2.0) | 70.8 (63.6–78.1) | 28.5 (25.9–31.0) | 248.9 (234.9–262.9) | 2.7 (2.5–2.9) | 98.1 (90.2–106.0) | 31.1 (28.8–33.3) | 315.8 (303.2–328.3) | ↑ | ↑ | ↑ | — | ↑ | 8.2 |
| Female genital check-up | 2.0 (1.8–2.1) | 79.1 (76.4–81.8) | 70.1 (62.2–72.0) | 112.9 (110.7–115.1) | 2.4 (2.2–2.6) | 93.1 (90.2–96.0) | 77.9 (76.2–79.7) | 119.5 (116.7–122.2) | ↑ | ↑ | ↑ | ↑ | ↑ | 4.4 |
| Weakness/ tiredness | 0.8 (0.7–0.8) | 177.9 (164.0–191.8) | 50.3 (46.7–53.9) | 353.6 (343.2–364.0) | 0.7 (0.7–0.8) | 233.0 (217.3–248.7) | 62.2 (58.5–65.9) | 374.6 (363.5–385.7) | — | — | ↑ | ↑ | — | 2.5 |

*(continued)*

## Table 5.3 (continued): Changes in pathology ordering for selected problems, 2000–02 and 2006–08

| | 2000–02 | | | | 2006–08 | | | | Change from 2000–02 to 2006–08[a] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Problem | Rate per 100 encs (95% CI)[b] | Path per 100 probs (95% CI)[c] | % at least 1 path (95% CI)[d] | Path per 100 tested probs (95% CI) | Rate per 100 encs (95% CI)[b] | Path per 100 probs (95% CI)[c] | % at least 1 path (95% CI)[d] | Path per 100 tested probs (95% CI) | Rate per 100 encs | Rate of new cases | Path per 100 probs | Per cent at least 1 path | Path per 100 tested probs | Per cent of national change[e] |
| Blood test—all | 0.6 (0.5–0.6) | 147.6 (136.3–159.0) | 68.8 (65.7–71.8) | 214.7 (201.6–227.8) | 0.8 (0.7–0.9) | 199.1 (186.4–211.8) | 75.0 (72.2–77.8) | 265.4 (253.1–277.8) | ↑ | ↑ | ↑ | ↑ | ↑ | 4.9 |
| STI | 0.6 (0.5–0.6) | 105.0 (95.3–115.7) | 42.6 (39.3–45.9) | 246.5 (231.4–261.6) | 1.0 (0.8–1.1) | 125.2 (115.3–135.2) | 46.6 (43.9–49.3) | 268.7 (251.2–286.2) | ↑ | ↑ | — | — | — | 3.9 |
| UTI | 1.6 (1.6–1.7) | 61.6 (58.9–64.3) | 53.4 (51.4–55.4) | 115.3 (112.5–118.0) | 1.7 (1.6–1.7) | 64.3 (61.4–67.1) | 55.7 (53.7–57.7) | 115.4 (112.6–118.2) | — | ↑ | — | — | — | 0.7 |
| Pregnancy | 0.9 (0.8–1.0) | 66.5 (60.5–72.6) | 34.5 (31.9–37.1) | 192.8 (180.6–240.9) | 1.5 (1.3–1.6) | 74.1 (68.6–79.6) | 35.0 (33.0–37.0) | 211.7 (200.8–222.6) | ↑ | ↑ | — | — | — | 3.0 |
| Abnormal test result | 0.7 (0.7–0.8) | 68.6 (62.7–74.5) | 42.3 (39.4–45.1) | 162.9 (154.1–171.7) | 1.1 (1.0–1.1) | 88.5 (83.2–93.9) | 52.5 (50.2–54.9) | 168.6 (161.6–175.6) | ↑ | ↑ | ↑ | ↑ | — | 3.0 |
| Menstrual problems | 0.8 (0.7–0.8) | 60.6 (54.3–66.9) | 28.9 (26.5–31.4) | 209.3 (196.1–222.4) | 0.8 (0.7–0.8) | 80.2 (72.2–88.2) | 31.8 (29.1–34.5) | 252.3 (238.4–266.2) | — | — | ↑ | — | ↑ | 1.1 |
| Anaemia | 0.6 (0.6–0.7) | 79.2 (71.8–86.6) | 34.9 (32.2–37.7) | 226.8 (215.4–238.2) | 0.6 (0.6–0.7) | 90.7 (82.3–99.0) | 37.3 (34.4–40.2) | 243.1 (230.4–255.8) | — | — | — | — | — | 0.6 |
| Hypothyroidism | 0.5 (0.5–0.6) | 68.9 (62.3–75.5) | 43.0 (39.7–46.2) | 160.4 (150.7–170.1) | 0.7 (0.7–0.8) | 74.2 (68.2–80.1) | 44.4 (41.5–47.2) | 167.1 (158.2–176.0) | ↑ | — | — | — | — | 1.2 |
| Abdominal pain | 0.6 (0.6–0.7) | 57.5 (50.8–64.3) | 25.6 (23.0–28.2) | 224.8 (210.0–239.6) | 0.6 (0.6–0.7) | 79.1 (70.4–87.8) | 27.9 (25.3–30.6) | 283.1 (265.7–300.5) | — | ↑ | ↑ | — | ↑ | 1.0 |
| Menopausal complaint | 1.6 (1.5–1.7) | 33.0 (28.9–37.0) | 13.4 (12.0–14.7) | 247.0 (231.4–262.5) | 1.0 (0.9–1.1) | 44.5 (37.9–51.1) | 19.6 (15.2–23.9) | 227.7 (191.1–264.2) | ↓ | — | ↑ | ↑ | — | –0.2 |
| Viral illness | 1.4 (1.3–1.5) | 26.7 (22.8–30.6) | 10.6 (9.3–12.0) | 250.8 (232.9–268.8) | 1.1 (1.0–1.2) | 37.4 (32.0–42.7) | 13.4 (11.7–15.1) | 279.6 (261.2–298.0) | ↓ | — | ↑ | — | — | 0.3 |

(a) The direction and type of change is indicated for each measure between 2000–02 and 2006–08: ↑/↓ indicates a statistically significant change, and — indicates no change.

(b) Management rate of the problem, expressed as a rate per 100 encounters. In 2000–02, the total number of encounters was 198,200. In 2006–08 the total number of encounters was 188,300.

(c) In 2000–02 there were 66,429 pathology tests/batteries of tests linked to problems, and in 2006–08 there were 90,753.

(d) Proportion of the problem with at least one pathology test/battery of tests ordered.

(e) The proportion of the total national increase in pathology tests/batteries ($n$ = 17.7 million) that was attributable to each problem.

*Note:* %—percentage; Encs—encounters; CI—confidence interval; path—pathology; probs—problems; STI—sexually transmitted infection; UTI—urinary tract infection. Problems that account for more than 1% of problem–pathology links in either 2000–02 or 2006–08 have been included in this table.

## 5.5 Other problems with high rates of pathology ordering

This section investigates pathology ordering for 14 other selected problems that each accounted for 1% or more of pathology orders recorded in BEACH in 2000–02 or 2006–08. It explores the relationship between changes in pathology ordering for the selected problems and:

- the management rate of the problem per 100 GP encounters
- the pathology ordering behaviour of GPs for the problem (Table 5.3).

The increase in the total number of Medicare-claimed GP encounters in Australia from 100.3 million per annum in 2000–02 to 106.5 million per annum in 2006–08 is an independent contributing factor to the increase in the estimated number of pathology tests.

### General check-ups

Pathology ordering for general check-ups accounted for 4.0% of tests/batteries of tests in 2000–02 and 5.5% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to general check-ups was 8% (results not shown). This increase was due to significant increases in:

- the management rate of general check-ups per 100 encounters (the rate of new general check-ups also significantly increased, doubling from 0.6 to 1.3 per 100 encounters)
- pathology ordering for general check-up problems, due to an increased likelihood of pathology tests being ordered, and an increased number of tests being ordered once the decision to order had been made (Table 5.3).

### Female genital check-ups

Pathology ordering for female genital check-ups accounted for 4.7% of tests/batteries of tests in 2000–02 and 4.6% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to female genital check-ups was 4.4% (results not shown). This increase was due to significant increases in:

- the management rate of female genital check-ups per 100 encounters (the rate of new cases of female genital check-ups also significantly increased, doubling from 0.1 to 0.2 per 100 encounters)
- pathology ordering for female genital check-ups, due to an increased likelihood of pathology tests being ordered, and an increased number of tests being ordered once the decision to order had been made (Table 5.3).

## Weakness and tiredness

Pathology ordering for weakness/tiredness problems accounted for 4.0% of tests/batteries of tests in 2000–02 and 3.5% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to weakness/tiredness was 2.5% (results not shown). This increase was due to a significant increase in the rate of pathology ordering for weakness/tiredness, due to increased likelihood of pathology tests being ordered (Table 5.3). The data also showed a trend toward increased numbers of tests ordered per tested weakness/tiredness problem, but this did not reach statistical significance. There was no change in the management rate of weakness/tiredness or presentation rate of new cases.

## Blood test problems

Pathology ordering for problems labelled as blood test accounted for 2.5% of tests/batteries of tests in 2000–02 and 3.3% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to blood test problems was 4.9% (results not shown). This increase was due to significant increases in:

- the management rate of blood tests per 100 encounters (the rate of new blood test problems significantly increased, doubling from 0.1 to 0.2 per 100 encounters)
- the rate of pathology tests/batteries for blood test problems, due to increased likelihood of pathology tests being ordered, and increased numbers of tests ordered per tested problem (Table 5.3).

## Abnormal test result problems

Pathology ordering for problems labelled as abnormal tests result accounted for 1.4% of tests/batteries of tests in 2000–02 and 2.0% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to abnormal test result problems was 3.0% (results not shown). This increase was due to significant increases in:

- the management rate of abnormal test results (0.7 per 100 encounters in 2000–02 and 1.1 per 100 in 2006–08) (the rate of new abnormal result problems increased significantly from 0.3 to 0.5 per 100 encounters)
- the rate of pathology tests/batteries of tests for abnormal test result problems, due to an increased likelihood of pathology tests being ordered (Table 5.3).

Implications of the increase in abnormal test result problems are discussed in Section 5.6.

## Menstrual problems

Pathology ordering for menstrual problems accounted for 1.4% of tests/batteries of tests in 2000–02 and 1.3% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to menstrual problems was 1.1% (results not shown). This increase was due to a significant increase in the rate of pathology for menstrual problems, due to increased numbers of tests ordered per tested problem (Table 5.3).

## Abdominal pain

Pathology ordering in the management of abdominal pain accounted for 1.1% of tests/batteries of tests in 2000–02 and 1.0% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to abdominal pain was 1.0% (results not shown). This increase was due to a significant increase in the rate of pathology tests/batteries of tests for abdominal pain, due to increased numbers of tests ordered per tested problem (Table 5.3). While there was no change in the management rate of abdominal pain, there was a significant increase in the rate of new cases from 0.28 to 0.34 per 100 encounters.

## Viral illness

Pathology ordering for viral illness problems accounted for 1.1% of tests/batteries of tests in 2000–02 and 0.9% in 2006–08. The proportion of the national increase in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to viral illness was 0.3% (results not shown). This increase was due to:

- a significant decrease in the management rate of viral illness per 100 encounters
- a significant increase in the rate of pathology tests/batteries of tests for viral illness (Table 5.3). The data also showed a trend toward increased likelihood of tests being ordered for viral illness, but this did not reach statistical significance.

The increase in pathology ordering outweighed the effect of the decrease in the management rate, creating a net increase in pathology ordering attributable to viral illness.

## Menopausal complaint

Pathology ordering for menopausal complaints accounted for 1.5% of tests/batteries of tests in 2000–02 and 0.9% in 2006–08. The proportion of the national change in pathology tests/batteries of tests ordered by GPs in 2006–08, compared with 2000–02, attributable to menopausal complaints was –0.2% (results not shown). This decrease was due to:

- a significant decrease in the management rate of menopausal complaints per 100 encounters
- a significant increase in the rate of pathology tests/batteries for menopausal complaints, due to increased likelihood of pathology tests being ordered (Table 5.3).

The decrease in management rate outweighed the effect of the increased pathology ordering by GPs, creating a net decrease in pathology ordering attributable to menopausal complaints.

## Problems for which there was no change in GP pathology ordering

Problems for which GP pathology ordering behaviour did not change are listed below. The proportion of pathology tests accounted for by each problem, and the proportion of the 17.7 million additional tests ordered nationally between 2000–02 and 2006–08 attributable to the problem and the management rate are noted for each problem (results not shown). Any national change was due to the increase in the total number of GP encounters with or without a simultaneous change in the management rate of the problem between 2000–02 and 2006–08.

- **Sexually transmitted infections (STIs)**—pathology for STIs accounted for 1.8% of tests in 2000–02 and 2.5% in 2006–08; 3.9% of the national increase was attributable to STIs. There were significant increases in the management rate and rate of new cases of STIs.
- **Urinary tract infection (UTI)**—pathology tests for UTIs accounted for 3.0% of tests in 2000–02 and 2.2% in 2006–08; 0.7% of the national increase was attributable to UTIs. There was no change in the management rate of UTIs. However, there was a 15% increase in the rate of new UTI problems from 0.9 to 1.0 per 100 encounters.
- **Pregnancy**—pathology for pregnancy accounted for 1.8% of tests in both 2000–02 and 2006–08; 3.0% of the national increase was attributable to pregnancy. There were significant increases in the management rate and rate of new cases of pregnancy.
- **Anaemia**—pathology tests for anaemia accounted for 1.5% of tests in 2000–02 and 1.2% in 2006–08; 0.6% of the national increase was attributable to anaemia. There was no change in the management rate of anaemia.
- **Hypothyroidism**—pathology tests for hypothyroidism accounted for 1.1% of tests in both 2000–02 and 2006–08; 1.2% of the national increase was attributable to hypothyroidism. There was a significant increase in the management rate of hypothyroidism.

## 5.6 Implications of high volume of tests

The volume of pathology items paid through the MBS increased by 54.1% from 2000–01 to 2007–08. However, this does not accurately reflect changes in GP pathology ordering behaviour, as only 70% of the pathology MBS items are generated by GPs.[5] In addition, only three pathology item numbers can be claimed per episode of care (due to episode coning), and multiple tests may be included in each MBS item.[3]

The BEACH data reflect actual GP requests. These data suggest that in 2006–08, compared with 2000–02, there was a national increase of approximately 17.7 million tests/batteries of tests ordered by GPs, an increase of 34.5%. However, it is likely that BEACH data underestimate the true number of pathology tests/batteries of tests ordered by GPs, as there is only space for up to five tests to be recorded per encounter. There was a significant increase in the proportion of tested encounters with five pathology tests recorded, from 11.5% of encounters in 2000–02 to 19.0% in 2006–08 (Figure 5.2).

The increasing volume of pathology tests/batteries of tests ordered by general practitioners is caused by many factors. Some of these factors are beyond the control of the GPs (for example, increasing management rates of conditions caused by changes in disease incidence or prevalence). Others are due to 'good' (for example, in response to new evidence) and 'bad' changes (for example, inappropriate test choice) in the pathology ordering behaviour of GPs.

GP motivation for ordering tests is not just limited to clinical applications.[11-14] Van der Weijden et al. (2002) investigated GP motivation for ordering pathology tests in diagnostic uncertainty in The Netherlands.[12] They found that (among other factors) time pressure was a cause for ordering tests, as requesting a laboratory test was a quick non-verbal way of signalling the end of the consultation.[12] An Australian study investigating motives for pathology testing in GP encounters found that GP-related factors (including time pressures) accounted for 3.2% of reasons for ordering tests.[11] Given that the GP workforce in Australia is experiencing shortages, pressures on GPs' time are likely to increase. While this may be a small factor influencing GP pathology ordering behaviour it should be acknowledged.

Regardless of the cause of the increase, the implications of the increase are the same. These include:

- the increased cost to the health system
- the strain of increased workload to the pathology workforce, which currently has workforce shortages
- the increased likelihood of false positive test results.

## Cost to the health system

Over the 8 years from 2000–01 to 2007–08, the total cost of pathology services claimed through the MBS increased by 62.2%, and the per capita cost increased by 47.5%.[4] These data reflect the total cost of pathology to the MBS, but two-thirds (67%) of this cost is generated by GP orders.[5]

This cost is not a reflection of the true cost of pathology ordering as the Memorandum of Understanding between the Australian Government and the pathology industry and pathology profession limits the total pathology expenditure, and the number of MBS pathology items claimable per GP-requested episode of care is limited to the three most expensive items.

## Pathology workforce shortages

The increasing volume of tests being ordered by both GPs and specialists[5] places an increasing workload on the pathology industry.[10] The pathology workforce in Australia is currently experiencing shortages.[2] The increase in pathology workload coupled with workforce shortages has the potential to cause a significant impact on service quality and timeliness, with serious consequences for safety and efficiency in the whole health system.[2]

## Increased likelihood of false positive results

A false positive result, also referred to as type 1 error, is caused when a test result incorrectly shows an 'abnormal' test result; that is, the result is outside the reference range (too high or too low).

Each test has a reference range of results that is incorporated in reports by pathology laboratories and used to show whether the tested sample is normal or abnormal. Reference ranges are established by testing healthy individuals to determine the range of results that are considered 'normal'. In most cases, a 95% population reference range is used; this means that 95% of non-diseased persons are expected to have a pathology result within this range. The effect is that 5% of normal patients have a result that is outside this reference range (2.5% above and 2.5% below).[15-17] For each test on a normal sample there is a 95% chance that the result will be normal and a 5% chance that the result will be inappropriately reported as abnormal (a false positive result).

For each additional independent test (referred to as an analyte) that is performed the probability that any abnormal result will be incorrectly detected by chance increases.[15-17] For example, if 10 analytes are tested using the 95% reference range, the chance of at least one false positive result occurring by chance is 40%, if 15 analytes are tested the chance is 54%.[15]

There has been some debate about changing the reference range from a 95% reference range to a 99.9% reference range, thereby reducing the proportion of normal patients outside the reference range from 5% to 0.1%. Jorgensen et al. (2004) suggest using the 99.9% reference range while testing well patients, and when the pretest probability of disease is low, to reduce the likelihood of false positive results.[15] However, Smellie argues that increasing the reference range to 99.9% would increase the number of false negative results (that is, type 2 error, where the result is incorrectly reported as normal), increasing the risk of failing to diagnose clinical disease.[17] Another reason that use of the 99.9% reference range is not feasible is that clinical significance for some tests includes results that lie between the 95% and 99.9% reference interval.[17] Smellie suggests using a graphic indicator (already used by some laboratories) to display how far outside the reference range a result is, to differentiate between tests results that are likely (and those unlikely) to be occurring by chance.[17] Most general practitioners do this intuitively—that is, they are likely to automatically (and even subconsciously) ignore an abnormal result that lies just outside the reference range.

Each pathology test or battery of tests recorded in BEACH is not equivalent to a single analyte; batteries of tests have multiple analytes (for example, a full blood count often includes five analytes: haemoglobin, haematocrit, red blood cell count, white blood cell count, and platelet count[18]). The most common batteries of tests ordered by GPs in BEACH (full blood count, lipid profile, liver function test, multibiochemical analysis, hormone assay) accounted for 41.8% of total pathology tests/batteries of tests ordered by GPs in 2006–08 and 41.2% in 2000–02 (results not shown).

An increase in the number of tests being ordered per encounter by GPs will increase the likelihood of false positive results. The significant increase in the management rate and pathology order rate for general check-ups may also contribute to the likelihood of false positive results. Patients having a general check-up are likely to be well patients with a low pretest probability of disease. High rates of pathology testing in well patients increases the likelihood of false positives.

These factors may contribute to the significant increase in the management rate of abnormal test results seen in the BEACH data. GP pathology ordering for abnormal test result problems increased significantly, due to a higher likelihood of at least one pathology test being ordered in the management of abnormal test results, but there was no change in the number of pathology tests ordered per tested encounter.

There is varied opinion on whether GPs should explain the likelihood of an abnormal result being created by a statistical anomaly, and whether patients would accept this explanation. Phillips (2003)[16] and Smellie (2006)[17] both suggest that this should be discussed with the patient to reassure them that a one-off abnormal result is unlikely to be clinically relevant. Winkens and Dinant (2002)[13] also suggest patient education to inform patients that not all results are reliable. Phillips (2003)[16] suggests doing this before the tests are ordered to avoid creating 'worried well' patients. However, Jorgensen et al. (2004)[15] contends that most patients are unfamiliar with the concept that an abnormal result may be caused by statistical chance, and this leads those patients with a clinically insignificant abnormal finding to return for retesting to 'renew their status of wellness'.[15]

A small qualitative study by van Bokhoven et al. (2006)[19] investigating patient beliefs in blood tests in The Netherlands found that patients believed blood tests to be extremely reliable, with false positive or negative results being rare or non-existent. Patients also felt that if a test result was abnormal (even if their symptoms were unrelated to the result) this needed to be further investigated to determine the cause. This supports the comments made by Jorgensen et al. (2004)[15] that patients are unfamiliar with the concept of statistical outliers and want to be further investigated after an abnormal test result.

Given that one of the reasons GPs request pathology tests[11,12] and that patients desire tests[19] is to reassure the patient that there is no serious disease present, it seems counterintuitive to continue to request increasing numbers of tests at encounters, hence increasing the likelihood of false positive results that potentially create patient anxiety associated with an abnormal result.[15-17]

The BEACH data show the increasing management rate of abnormal test results and the increase in pathology ordering behaviour of GPs in the management of abnormal test result problems. It is likely that the increasing volume of tests ordered per encounter, and increased testing as part of check-ups (in presumably well patients) have contributed to this change. Perhaps, as suggested by others[13,16,17], further attempts should be made to educate GPs and patients (such as the patient information about reference ranges available on the 'lab tests online' website[18]) about the statistical likelihood of abnormal test results being obtained by chance when ordering high numbers of tests per patient, to reduce additional unnecessary investigations.

# 5.7 Conclusion

BEACH data demonstrate the rate of pathology ordering by GPs increased significantly from 2000–02 to 2006–08. In 2000–02, there were an estimated 33.6 million tests/batteries of tests ordered per year, and by 2006–08, this had increased to 51.3 million per year, a national increase of approximately 17.7 million tests/batteries of tests ordered by GPs, or 34.5%. This is likely to be an underestimation of the total GP-pathology ordering rate, as there has been a significant increase in the proportion of BEACH encounters with the maximum allowed number of pathology tests recorded (five tests/batteries of tests).

The National Health Priority Areas that are significant contributors to the increase include: cardiovascular disease (13.1% of the total 17.7 million increase), especially hypertension (7.2%); Type 2 diabetes (8.0%), and lipid disorders (4.5%). Other problems that are significant contributors include general check-ups (8.2% of the total 17.7 million increase), blood tests (4.9%) and female genital check-ups (4.4%).

In general practice, pathology ordering can be influenced by a number of factors: a change in the number of GP encounters nationally; a change in the management rate of a problem; and a change in GPs' pathology ordering behaviour in the management of the problem. This is measurable as a change in the rate of pathology orders, caused by a change in the likelihood of pathology ordering for the problem and/or a change in the number of pathology tests ordered per tested problem.

The drivers of change in these factors are due to a complex combination of GP, patient, and environment factors. The implications of the increase in pathology ordering include: the increased cost to the health system; the strain of increased workload on the pathology workforce, which currently has workforce shortages; and the increased likelihood of false positive test results.

To date, national policies aiming to limit growth in pathology expenditure have involved the pathology industry and profession; they have not directly been aimed at the health professionals who order the tests. National policy has not focused on GPs, to limit or reduce their pathology ordering behaviours. In contrast, a number of the disease-orientated policies aiming to improve patient care may have served to increase GP-pathology ordering in line with evidence-based best practice. For example, the Practice Incentives Program includes incentive payments to GPs for completing the requirements of an annual diabetes cycle of care, which includes (at least) annual testing of HbA1c and lipids, and testing for microalbuminuria, for patients with Type 2 diabetes. It is possible that these evidence-based policies may reduce long-term health costs in other areas of the health budget (for example, through avoidable hospital admissions) while increasing pathology expenditure in the short term. However, the current increasing volume of pathology testing and the testing done as part of general check-ups (in well patients) are likely to increase false positive results. In turn, this will increase the workload of general practitioners in follow-up consultations, and pathology workload in further investigations. On the other hand, if any future policies were to focus on GPs directly to reduce pathology ordering, there would be a risk of jeopardising quality health care unless the reductions were only in inappropriate testing.

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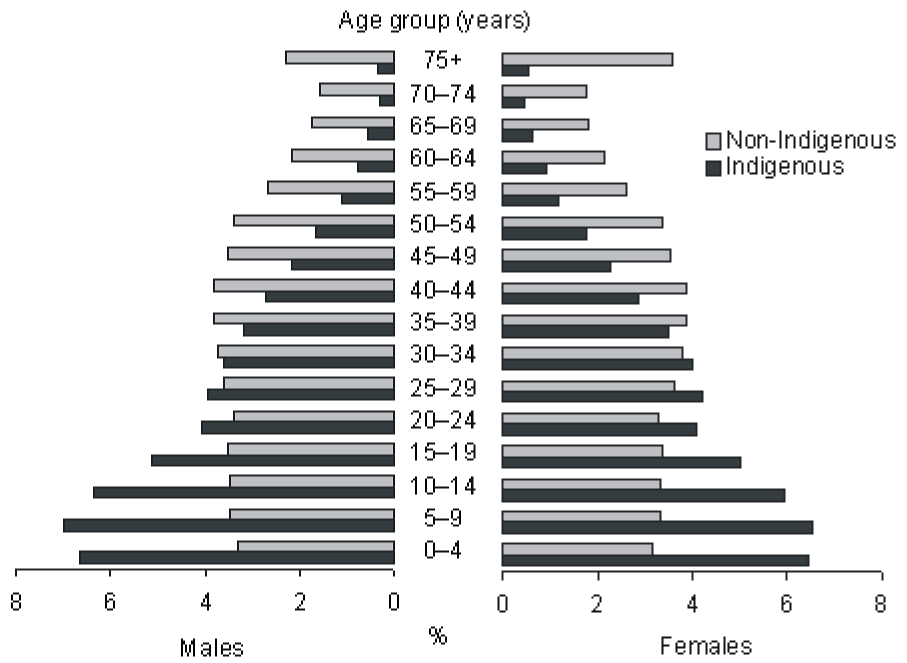
# 6 Aboriginal and Torres Strait Islander patients

*Salma Fahridin, Helena Britt*

## 6.1 The Indigenous population

In this chapter the term 'Indigenous' is used often to refer to people who identify themselves as Aboriginal and/or Torres Strait Islander. The health of the Indigenous population of Australia is of significant concern due to disparities in life expectancy, access issues and other barriers to receiving adequate and appropriate health services. The National Aboriginal and Torres Strait Islander Healthy Survey 2004–05, found that almost two-thirds of Indigenous Australians surveyed, and 97% of those aged 55 years and over, reported at least one long-term health condition. Conditions that contribute most to disparities in morbidity and mortality among the Indigenous population include asthma, diabetes, cardiovascular diseases, kidney disease, as well as drug and alcohol use-related problems.[1]

The 2006 Australian Census found that Aboriginal and Torres Strait Islander peoples made up 2.5% of the total Australian population.[2] Figure 6.1 shows a pyramidal age distribution of the Indigenous population, depicting a population much younger than the non-Indigenous population, with far fewer people in the older age groups as a proportion of the total population. The sex distribution is similar in the Indigenous and non-Indigenous population.




*Source:* Australian Bureau of Statistics 2006.[1]

**Figure 6.1: Age-sex distribution of Indigenous and non-Indigenous populations, 2004–05**

## 6.2 Policies and initiatives

There have been many policies and initiatives directed at the Indigenous population of Australia, with the aim of eliminating life expectancy disparities and improving health outcomes. Often, the policy initiatives focus on primary care as the centre of service provision. Some effects of the following policies have the potential to be measured through BEACH data.

- Section 100 of the *National Health Act 1953* was amended in 1999 to allow Aboriginal and Torres Strait Islander peoples special access arrangements where pharmaceutical benefits cannot be conveniently accessed.[3]
- Items for Aboriginal and Torres Strait Islander health assessments for children, adults and older people, have been progressively introduced into the Medicare Benefits Schedule since 1999.[4]
- The National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan 2000–2010 provides a framework for improving the nutritional status of Aboriginal and Torres Strait Islander peoples, and recognises the effect of poor diet on preventable illness.[5]
- The Aboriginal and Torres Strait Islander Health Performance Framework, designed to inform policy analysis, planning and program implementation, contains a number of measures across three domains: Health status and outcomes; Determinants of health including socioeconomic and behavioural factors; and Health system performance. Reports against the measures in the framework are delivered biennially.[6]
- The Practice Incentives Program (PIP) practice nurse incentives were first introduced for rural practices in 2001 and were extended to urban areas with workforce shortages in 2003 to support general practices to employ a practice nurse and/or Aboriginal Health Worker.[7]
- The National Indigenous Pneumococcal and Influenza Immunisation Program began in 1999, and provides free influenza and pneumococcal vaccinations to Aboriginal and Torres Strait Islander peoples aged over 50 years, or to those aged 15 to 49 years considered 'high risk'. Hepatitis A vaccines are also free to children aged under 5 years living in certain states of Australia.[8]
- The National Strategic Framework for Aboriginal and Torres Strait Islander Peoples' Mental Health and Social and Emotional Well Being 2004–2009 is a 5-year plan to guide government and non-government agencies that are working towards improving the mental health and social and emotional wellbeing of Aboriginal and Torres Strait Islander peoples.[9]
- The National Aboriginal and Torres Strait Islander Sexual Health and Blood Borne Virus Strategy 2005–2008, a continuation of the National Indigenous Australians' Sexual Health Strategy 1996–97 to 2003–04 aimed to prevent the spread of HIV, other sexually transmitted infections and blood-borne viruses in Aboriginal and Torres Strait Islander communities.[10]
- The Australia 2020 Summit facilitated debate and drafted proposals led by Aboriginal and Torres Strait Islander representatives for the future of Aboriginal and Torres Strait Islander peoples.[11]

- 'Close the Gap, National Indigenous Health Equality Targets' (2008) identifies health and primary care targets designed to reduce or eliminate disparities in health outcomes. An overarching goal of the campaign is to increase access to culturally appropriate comprehensive primary health care services.[12]
- In October 2008, the Council of Australian Governments signed the Indigenous Early Childhood Development National Partnership providing $564 million over six years (2008-09 to 2013-14) to address the needs of Indigenous children in their early years, with an initial focus from birth to three years. The national partnership has three priority areas: integration of early childhood services through the establishment of thirty five children and family centres; increased access to antenatal, reproductive and sexual health care; and increased access and use of maternal and child health services.

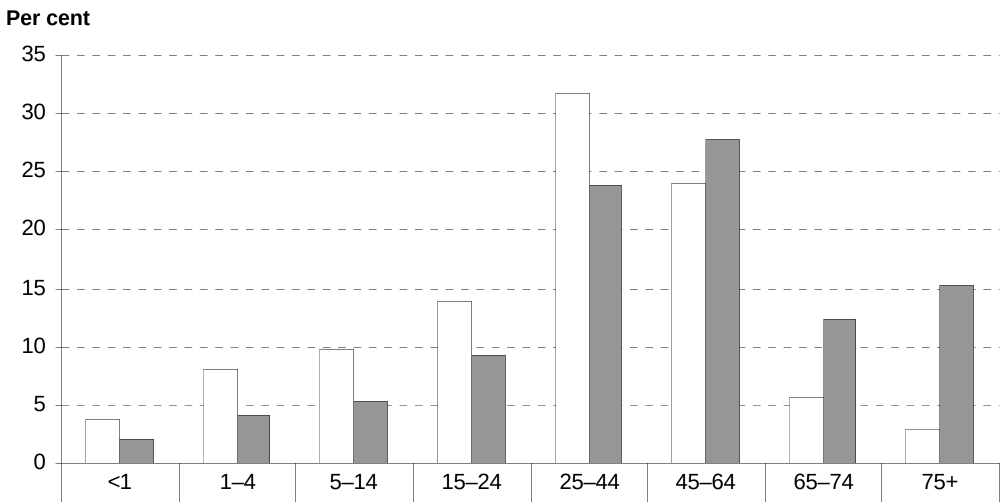
## 6.3 BEACH encounters with Indigenous patients

Identification of Aboriginal and/or Torres Strait Islander status in the BEACH program is self-reported. GPs participating in the BEACH program are instructed to ask each patient whether he/she is of Aboriginal and/or Torres Strait Islander origin. Over 8 years of BEACH data (April 2000 to March 2008), of the 1.4% of patients who were recorded as being Aboriginal and/or Torres Strait Islander, 88.4% stated they were Aboriginal only, 9.0% reported being Torres Strait Islander only, and 2.6% reported being both Aboriginal and Torres Strait Islander.

A previous BEACH report[13] showed that Aboriginal and Torres Strait Islander peoples at general practice encounters were more likely to be younger and live in the regional areas of Australia. They were more likely to hold a Commonwealth concession card, and to suffer from vaccine preventable infections. Some of these issues will be considered in this chapter with reference to policies and their effect on general practice encounters with Indigenous Australians.

### Age distribution

Between April 2003 and March 2008, there were 485,300 encounters recorded in BEACH, 7,292 (1.5%) of which were with Indigenous patients. Of these, 35.5% were with patients under the age of 25 years, and 67.3% were with patients under the age of 45 years (Figure 6.2). This vastly differs from encounters with non-Indigenous patients, where 20.8% of the patients were aged less than 25 years, and 44.7% were aged less than 45 years. In contrast, patients aged 45 years and over accounted for 32.7% of Indigenous encounters, but 55.4% of non-Indigenous encounters (Figure 6.2).




| | <1 | 1–4 | 5–14 | 15–24 | 25–44 | 45–64 | 65–74 | 75+ |
|---|---|---|---|---|---|---|---|---|
| Indigenous | 3.8 | 8.1 | 9.7 | 13.9 | 31.8 | 24.1 | 5.7 | 2.9 |
| Non-Indigenous | 2.0 | 4.2 | 5.4 | 9.2 | 23.9 | 27.8 | 12.4 | 15.2 |

Age group (years)

**Figure 6.2: Age distribution of Indigenous and non-Indigenous patients at encounters, 2003–2008**

## Sex distribution

The sex distribution of Indigenous patients (41% males; 59% females) was similar to ABS population data (Figure 6.1) and was not significantly different from the sex distribution of patients at all BEACH encounters.[14]

## Problems managed

There was no significant difference in the average number of problems managed at encounters with Indigenous and non-Indigenous patients. Table 6.1 compares the management rates of selected problems at encounters with Indigenous and non-Indigenous patients. Some problem and concept labels include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3. The problems presented are a combination of frequently managed problems, and problems that stand out as having a marked difference between the two population groups.

Table 6.1 shows that among the largest differences were the:

- higher management rates of diabetes, asthma and drug use at Indigenous encounters
- lower management rates of cardiovascular diseases, particularly hypertension, as well as lipid disorders and oesophageal disease at Indigenous encounters
- lower rates of preventive measures such as immunisations/vaccinations and cardiac check-ups (mainly blood pressure checks) at encounters with Indigenous patients.

Some of the problems listed with significantly higher management rates at Indigenous patient encounters have also been recognised as having a higher prevalence among Aboriginal and Torres Strait Islander patients in the *Burden of disease and injury in Aboriginal and Torres Strait Islander peoples* report.[15]

When compared with non-Indigenous encounters, at Indigenous encounters:

- renal failure was managed at almost 5 times the rate
- drug use problems were managed at 4 times the rate
- teeth/gum disease was managed 3.5 times more often
- schizophrenia was managed more than twice as often
- cardiomyopathy, (which is not mentioned in the *Burden of disease* report, but is mentioned elsewhere[16]), was managed at 3 times the rate.

Despite the severity of the problems managed at encounters with Indigenous patients, their encounters involved the management of fewer chronic problems (as defined by O'Halloran et al.[17]) (46.8 per 100 encounters, 95% CI: 43.7–49.8), when compared with the non-Indigenous population (51.6 per 100 encounters, 95% CI: 50.9–52.3).

**Table 6.1: Management rates of selected problems at encounters with Indigenous and non-Indigenous patients, 2003–2008**

| | Indigenous patients (*n* = 7,292) | | Non-Indigenous patients (*n* = 478,008) | | |
|---|---|---|---|---|---|
| **Problem** | **Number** | **Rate per 100 encounters (95% CI)** | **Number** | **Rate per 100 encounters (95% CI)** | **Change[(a)]** |
| Cardiovascular problems | 927 | 12.71 (11.6–13.8) | 81,705 | 17.09 (16.8–17.4) | **↓** |
| Hypertension | 439 | 6.02 (5.3–6.8) | 44,756 | 9.36 (9.2–9.6) | **↓** |
| Cardiac check-up | 51 | 0.70 (0.5–0.9) | 5,587 | 1.17 (1.1–1.2) | **↓** |
| Cardiomyopathy | 19 | 0.26 (0.10–0.40) | 412 | 0.09 (0.08–0.10) | ↑ |
| Diabetes, non-gestational | 574 | 7.87 (6.8–8.9) | 15,778 | 3.30 (3.2–3.4) | **↑** |
| Depression | 262 | 3.59 (3.0–4.2) | 19,483 | 4.08 (4.0–4.2) | — |
| Asthma | 225 | 3.09 (2.6–3.5) | 10,995 | 2.30 (2.2–2.4) | **↑** |
| Immunisation/vaccination—all | 226 | 3.10 (2.4–3.8) | 24,574 | 5.14 (4.9–5.3) | **↓** |
| Pregnancy | 166 | 2.28 (1.8–2.8) | 5,211 | 1.09 (1.2–1.1) | **↑** |
| Lipid disorders | 145 | 1.99 (1.6–2.4) | 16,294 | 3.41 (3.3–3.5) | **↓** |
| Drug use[(b)] | 135 | 1.85 (1.0–2.7) | 2,221 | 0.46 (0.38–0.55) | **↑** |
| Fracture | 124 | 1.70 (1.3–2.1) | 4,794 | 1.00 (0.97–1.04) | **↑** |
| Oesophageal disease | 109 | 1.49 (1.2–1.8) | 10,586 | 2.21 (2.2–2.3) | **↓** |
| Teeth/gum disease | 94 | 1.29 (1.0–1.6) | 1,702 | 0.36 (0.34–0.37) | **↑** |
| Pre/postnatal check-up | 73 | 1.00 (0.7–1.3) | 2,686 | 0.56 (0.51–0.61) | **↑** |
| Schizophrenia | 72 | 0.99 (0.6–1.3) | 2,220 | 0.46 (0.43–0.50) | **↑** |
| Renal failure (acute/chronic/NOS) | 66 | 0.91 (0.58–1.23) | 1,022 | 0.21 (0.20–0.23) | **↑** |
| Chronic alcohol use[(c)] | 58 | 0.80 (0.5–1.0) | 1,248 | 0.26 (0.24–0.28) | **↑** |
| Housing/neighbourhood problems | 13 | 0.18 (0.01–0.34) | 91 | 0.02 (0.01–0.02) | — |
| *Subtotal (n, percentage of total)* | *2,835* | *25.87* | *168,849* | *23.38* | . . |
| **Total problems** | **10,960** | **150.3 (146.2–154.4)** | **722,067** | **151.1 (150.2–151.9)** | — |

(a) The change in management rates are indicated for each result: **↑**/**↓** indicates significantly higher/lower management rate at encounters with Indigenous patients, ↑/↓ indicates a marginal difference, and — indicates there was no difference.

(b) Drug use—as classified in ICPC-2 as drug abuse (code P19).

(c) Chronic alcohol use—as classified in ICPC–2 as chronic alcohol abuse (code P15).

*Note*: NOS—not otherwise specified; CI—confidence interval. Some rates and/or 95% confidence intervals are presented to two decimal places where required to show statistical significance.

Infectious and parasitic diseases are responsible for 4% of the total disease burden in Indigenous Australians[15] and are therefore presented separately in Table 6.2, using the ICPC-2[18] definition of infections, and using 8 years of data to increase statistical power.

**Table 6.2: Management rates of infections at encounters with Indigenous and non-Indigenous patients, 2000–2008**

| | Indigenous patients (*n* = 10,701) | | Non-Indigenous patients (*n* = 773,599) | | |
|---|---|---|---|---|---|
| **Infection** | **Number** | **Rate per 100 encounters (95% CI)** | **Number** | **Rate per 100 encounters (95% CI)** | **Change[(a)]** |
| Upper respiratory infection, acute | 574 | 5.36 (4.72–6.00) | 42,799 | 5.53 (5.42–5.65) | — |
| Acute bronchitis/bronchiolitis | 369 | 3.45 (2.93–3.96) | 18,597 | 2.4 (2.35–2.46) | **↑** |
| Acute otitis media/myringitis | 244 | 2.28 (1.94–2.62) | 9,209 | 1.19 (1.16–1.23) | **↑** |
| Urinary tract infection | 211 | 1.97 (1.69–2.25) | 13,072 | 1.69 (1.66–1.72) | — |
| Gastroenteritis | 202 | 1.89 (1.55–2.23) | 11,628 | 1.50 (1.47–1.54) | **↑** |
| Boil/carbuncle | 181 | 1.69 (1.41–1.98) | 3,640 | 0.47 (0.45–0.49) | **↑** |
| Impetigo | 145 | 1.36 (1.03–1.68) | 1,508 | 0.19 (0.18–0.21) | **↑** |
| Tonsillitis | 129 | 1.21 (0.97–1.44) | 7,584 | 0.98 (0.95–1.01) | **↑** |
| Dermatophytosis | 126 | 1.18 (0.93–1.43) | 4,592 | 0.59 (0.57–0.61) | **↑** |
| Conjunctivitis, infectious | 109 | 1.02 (0.79–1.25) | 5,504 | 0.71 (0.69–0.73) | **↑** |
| Skin infection, post-traumatic | 108 | 1.01 (0.79–1.23) | 4,112 | 0.53 (0.51–0.55) | **↑** |
| Sinusitis acute/chronic | 101 | 0.94 (0.74–1.15) | 10,376 | 1.34 (1.31–1.38) | **↓** |
| Otitis externa | 97 | 0.91 (0.70–1.11) | 5,112 | 0.66 (0.64–0.68) | **↑** |
| Infectious disease, other/NOS | 95 | 0.89 (0.70–1.07) | 3,087 | 0.40 (0.38–0.42) | **↑** |
| Viral disease, other/NOS | 88 | 0.82 (0.63–1.01) | 9,726 | 1.26 (1.21–1.30) | **↓** |
| Scabies/other acariasis | 88 | 0.82 (0.60–1.04) | 358 | 0.05 (0.04–0.05) | **↑** |
| Respiratory infection, other | 78 | 0.73 (0.42–1.04) | 3,579 | 0.46 (0.43–0.50) | **↓** |
| Pneumonia | 77 | 0.72 (0.46–0.98) | 2,424 | 0.31 (0.30–0.33) | **↓** |
| Skin infection, other | 59 | 0.55 (0.36–0.74) | 2,158 | 0.28 (0.27–0.29) | **↑** |
| Influenza | 39 | 0.36 (0.22–0.51) | 2,561 | 0.33 (0.30–0.36) | — |
| Rheumatic fever/heart disease | 38 | 0.36 (0.22–0.49) | 48 | 0.01 (0.00–0.01) | **↑** |
| Warts | 34 | 0.32 (0.20–0.43) | 5,139 | 0.66 (0.64–0.69) | **↓** |
| Genital candidiasis (female) | 31 | 0.29 (0.18–0.40) | 1,997 | 0.26 (0.24–0.27) | — |
| Viral hepatitis | 30 | 0.28 (0.16–0.40) | 1,167 | 0.15 (0.14–0.16) | ↑ |
| Chronic otitis media | 30 | 0.28 (0.16–0.40) | 640 | 0.08 (0.07–0.09) | **↑** |
| Serous otitis media | 25 | 0.23 (0.13–0.34) | 957 | 0.12 (0.11–0.13) | **↑** |
| Pelvic inflammatory disease | 21 | 0.20 (0.10–0.29) | 405 | 0.05 (0.05–0.06) | **↑** |
| *Subtotal (n, percentage of total)* | *3,329* | *91.66* | *171,979* | *89.44* | . . |
| **Total Infectious problems** | **3,632** | **33.9 (32.4–35.5)** | **192,293** | **24.9 (24.6–25.1)** | **↑** |

(a) The change in management rates are indicated for each result: **↑**/**↓** indicates significantly higher/lower management rate at encounters with Indigenous patients, ↑/↓ indicates a marginal difference, and — indicates there was no difference.

*Note*: NOS—not otherwise specified; CI—confidence interval. Rates and 95% confidence intervals are presented to two decimal places to ensure identification of statistically significant differences

Indigenous patients had 33.9 infections managed per 100 encounters, far more often than non-Indigenous patients who had infections managed at a rate of 24.9 per 100 encounters.

When compared with non-Indigenous encounters, at Indigenous encounters, the management rate of:

- acute otitis media/myringitis, and serous otitis media were twice as high, while chronic otitis media was 3 times higher
- pneumonia, dermatophytosis and post-traumatic skin infection (including localised skin infection and wound infection) were twice as high
- boil/carbuncle was almost 4 times higher
- impetigo was 7 times higher
- other infectious diseases (not otherwise specified) were more than twice as high
- scabies/other acariasis were 16 times higher
- rheumatic fever/heart disease were 36 times higher
- pelvic inflammatory disease was 4 times higher.

## Medications

The overall rate of medications prescribed/supplied or advised was significantly higher at encounters with Aboriginal and Torres Strait Islander patients, but this was due to the vast difference in the rates of GP-supplied medications, which were 3 times higher at Indigenous encounters. Rates of prescribed medications showed no significant difference, and medications advised for over-the-counter purchase were significantly lower at Indigenous encounters (Table 6.3). Rates of GP-supplied medications by Australian Standard Geographical Classification areas[19] are discussed in Section 6.4.

Specifically, vaccines were prescribed/supplied at a rate of 6.4 (95% CI: 5.2–7.6) per 100 encounters with Indigenous patients, compared with 7.5 (95% CI: 7.2–7.7) per 100 encounters with non-Indigenous patients. The policy that provided Indigenous patients with free pneumococcal and influenza vaccines at younger ages than in the non-Indigenous population[8] did not appear to have a significant effect on the overall rate of these vaccines at encounters with Indigenous patients from the time it was introduced in 2004.

## Treatments

There was no difference in the overall rate at which clinical treatments (advice/education and counselling) were given at encounters with Indigenous and non-Indigenous patients (Table 6.3). However, advice about smoking was provided more often and other administrative procedures/documentations were more frequently recorded at Indigenous encounters, while advice about exercise was provided less often than at non-Indigenous encounters.

While the rate at which procedures were undertaken by the GP did not differ, excision/removal tissue/biopsy/destruction/debridement/cauterisation occurred more than 3 times as often at encounters with non-Indigenous patients. This is likely to be due to the lower management rate of skin lesions at Indigenous encounters (0.2 per 100 encounters, 95% CI: 0.1–0.3 compared with 1.4 per 100 encounters, 95% CI: 1.3–1.4).

Dressings were undertaken more frequently at encounters with Indigenous patients, and this is due to a higher rate of injury management at Indigenous encounters (9.9 per 100 encounters, 95% CI: 9.0–10.7 compared with 8.1 per 100 encounters, 95% CI: 7.3–8.3). Glucose tests, performed by the GP, were also significantly more frequent among Indigenous patients than at encounters with non-Indigenous patients.

**Table 6.3: Management actions at encounters with Indigenous and non-Indigenous patients, 2003–08**

| | Indigenous patients (*n* = 7,292) | Non-Indigenous patients (*n* = 478,008) | |
|---|---|---|---|
| **Type of management** | **Rate per 100 encounters (95% CI)** | **Rate per 100 encounters (95% CI)** | **Change[(a)]** |
| **Medications (prescribed/supplied or advised)** | **122.8 (115.8–129.7)** | **101.6 (100.6–102.5)** | ↑ |
| Prescribed | 88.3 (80.4–96.3) | 82.4 (81.5–83.4) | — |
| GP-supplied | 27.3 (19.6–34.9) | 9.4 (9.0–9.7) | ↑ |
| Advised for over-the-counter purchase | 7.2 (5.9–8.4) | 9.7 (9.5–10.0) | ↓ |
| **Clinical treatments** | **39.3 (34.6–44.0)** | **35.5 (34.6–36.3)** | — |
| Advice/education—smoking | 1.8 (1.4–2.3) | 0.6 (0.58–0.65) | ↑ |
| Other admin procedures/documentation | 2.6 (2.0–3.1) | 1.5 (1.4–1.6) | ↑ |
| Advice/education—exercise | 0.1 (0.0–0.2) | 1.4 (1.3–1.5) | ↓ |
| **Procedural treatments** | **18.6 (18.2–19.0)** | **19.1 (16.2–22.1)** | — |
| Excision/removal tissue/biopsy/destruction/ debridement/cauterisation | 1.0 (0.7–1.2) | 3.4 (3.2–3.6) | ↓ |
| Dressing/pressure/compression/tamponade | 2.8 (2.3–3.4) | 2.0 (2.0–2.1) | ↑ |
| Glucose test | 0.7 (0.3–1.2) | 0.2 (0.16–0.20) | ↑ |
| **Referrals** | **16.2 (14.0–18.5)** | **12.2 (11.6–12.7)** | ↑ |
| Hospital | 1.9 (1.1–2.7) | 0.5 (0.4–0.5) | ↑ |
| **Pathology** | **57.1 (49.4–64.8)** | **46.4 (44.3–48.5)** | ↑ |
| Electrolytes, urea and creatinine | 10.5 (9.3–11.6) | 7.0 (6.7–7.2) | ↑ |
| Liver function test | 8.3 (7.4–9.2) | 6.6 (6.4–6.8) | ↑ |
| Pap smear | 2.3 (1.6–3.0) | 5.3 (5.1–5.6) | ↓ |

(a) The change in management rates is indicated for each result: ↑/↓ indicates significantly higher/lower management rate at encounters with Indigenous patients, and — indicates there was no difference.

*Note*: CI—confidence interval.

## Referrals

Total referrals (to all service types) were significantly more frequent at Indigenous encounters. However, this was not reflected in significantly higher rates of referrals to either specialists or allied health professionals.

Aboriginal and Torres Strait Islander patients were referred to other health services significantly more often than non-Indigenous patients. Specifically, referrals to hospitals were almost 4 times higher at encounters with Indigenous patients.

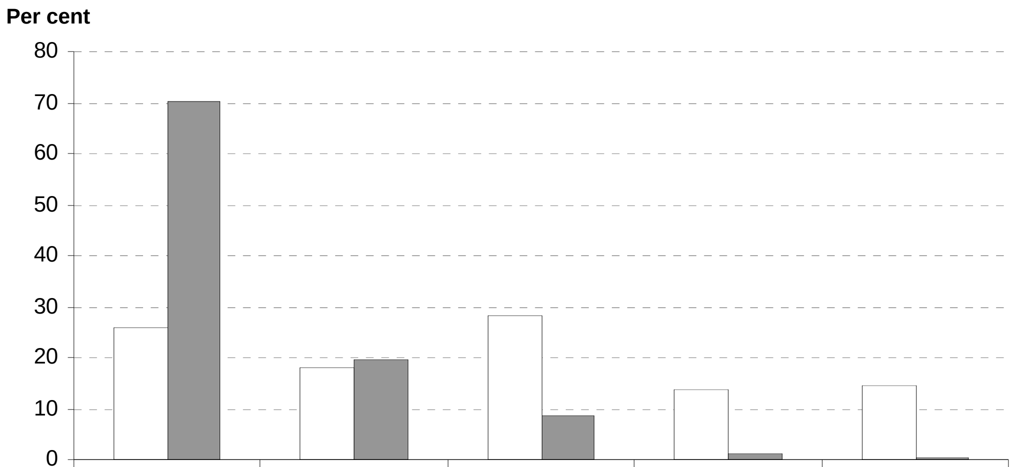
## Pathology and imaging

GPs ordered significantly more pathology tests at Indigenous patient encounters than at non-Indigenous encounters. The largest differences were higher rates for electrolyte/urea/creatinine tests and liver function tests. In contrast, there were significantly fewer Pap smears ordered at encounters with Indigenous patients than at non-Indigenous encounters.

No significant differences were apparent in the overall rate of imaging orders, however chest X-rays were ordered more often at encounters with Indigenous patients (1.7 per 100 encounters, 95% CI: 1.3–2.1) than at those with non-Indigenous patients (1.1 per 100 encounters, 95% CI: 1.0–1.1), which may reflect more frequent investigations for suspected pneumonia and a higher management rate of diagnosed pneumonia (Table 6.2).

# 6.4 Encounters by patient residential location

Patient postcode, rather than the practice postcode, was used to classify the patient's area of residence using the Australian Standard Geographic Classes (ASGC)[19]. The geographic location of residence of Indigenous and non-Indigenous patients differed substantially (Figure 6.3). Of the 7,292 Indigenous patients encountered between April 2003 and March 2008 inclusive, residential postcode was provided for 7,035. Of these, 1,815 (25.8%) resided in Major Cities, 1,258 (17.9%) resided in Inner Regional areas, 1,976 (28.1%) were from Outer Regional areas, 963 (13.7%) were from Remote areas and 1,023 (14.5%) were from Very Remote areas. Together, those from Outer Regional, Remote or Very Remote areas accounted for 56.3% (*n* = 3,962) of the total Indigenous encounter sample, compared with 10.4% of non-Indigenous patients encountered.




| | Major Cities | Inner Regional | Outer Regional | Remote | Very Remote |
|---|---|---|---|---|---|
| Indigenous | 25.8 | 17.9 | 28.1 | 13.7 | 14.5 |
| Non-Indigenous | 70.2 | 19.5 | 8.8 | 1.2 | 0.4 |

ASGC area

*Note:* ASGC—Australian Standard Geographical Classification.[19]

**Figure 6.3: Geographic distribution (by patient residential postcode) of Indigenous patients and non-Indigenous patients by ASGC, 2003–2008**

While BEACH has reported the content of Indigenous encounters in the past[13,20], comparisons of encounters with Aboriginal and Torres Strait Islander patients of different geographic locations have not been previously investigated. Many differences were found among these patients, and some of the main findings are presented in Table 6.4.

- A Commonwealth concession card was held by a greater proportion of Indigenous patients seen from the Inner Regions of Australia than those from Major City and Outer Regional/Remote/Very Remote Regions.
- Non-English-speaking background is patient self-reported. A higher percentage of Indigenous patients from Outer Regional/Remote/Very Remote areas spoke an Indigenous language as their first language when compared with encounters with Indigenous patients residing in Inner Regional areas. There was no significant difference in the proportion of Indigenous patients who primarily spoke a language other than English at home from Outer Regional/Remote/Very Remote areas than among those from Major Cities.
- Overall, Indigenous patients from Inner Regional areas had significantly more problems managed at an encounter than those from Major Cities and from Outer Regional/Remote/Very Remote areas.

**Table 6.4: Indigenous patients and their encounters by ASGC area, 2003–2008**

| | Major Cities (*n* = 1,788) | Inner Regional (*n* = 1,153) | Outer Regional/Remote/Very Remote (*n* = 4,098) |
|---|---|---|---|
| | Rate per 100 encounters (95% CI) | Rate per 100 encounters (95% CI) | Rate per 100 encounters (95% CI) |
| **Commonwealth concession cardholders** | **65.1 (60.7–69.5)** | **76.4 (70.6–82.2)** | **61.6 (54.2–69.0)** |
| **Non-English-speaking background** | **6.3 (4.2–8.3)** | **1.0 (0.3–1.8)** | **15.3 (7.0–23.7)** |
| **Problems managed** | **147.8 (142.2–153.3)** | **166.2 (156.4–176.0)** | **147.3 (141.6–153.0)** |
| Psychological | 20.3 (16.6–23.9) | 19.5 (15.6–23.4) | 10.7 (8.9–12.5) |
| Diabetes, non-gestational | 5.4 (4.1–6.6) | 7.5 (5.7–9.2) | 8.9 (7.3–10.4) |
| Upper respiratory infection, acute | 7.8 (5.9–9.6) | 4.8 (3.0–6.6) | 4.8 (3.8–5.8) |
| Immunisation/vaccination—all | 4.4 (3.3–5.5) | 4.6 (2.7–6.5) | 2.1 (1.3–2.9) |
| Drug use[(a)] | 4.5 (1.9–7.1) | 1.8 (0.7–3.0) | 0.7 (0.3–1.1) |
| **Medications (presc/advised/supplied)** | **114.1 (107.6–120.5)** | **121.0 (109.8–132.2)** | **125.7 (115.0–136.5)** |
| GP-supplied | 14.0 (8.6–19.4) | 13.8 (9.3–18.3) | 36.4 (23.8–48.9) |
| **Pathology** | **37.6 (29.9–45.4)** | **53.5 (45.9–61.1)** | **57.3 (49.3–65.3)** |
| **Imaging** | **6.3 (4.9–7.7)** | **9.9 (6.9–12.8)** | **9.9 (8.2–11.6)** |
| X-ray—chest | 0.9 (0.4–1.3) | 1.7 (1.0–2.5) | 2.1 (1.4–2.8) |

(a) Drug use—as classified in ICPC-2 as drug abuse (code P19).

*Note*: CI—confidence interval; presc—prescribed. ASGC—Australian Standard Geographical Classification.[19] Shading indicates statistical significance between areas. Missing data removed—postcode was missing for 253 patients.

- Encounters with Indigenous patients who reside in a Major City or an Inner Regional area of Australia had almost twice the management rate of psychological problems, upper respiratory tract infection, diabetes and immunisations/vaccinations than Outer Regional/Remote/Very Remote Indigenous patients.
- Encounters with Indigenous patients from Major Cities had drug use managed at 6 times the rate of Indigenous patients from Outer Regional/Remote/Very Remote areas, and twice the rate of those from Inner Regional areas.
- The rate of prescribed/supplied or advised medications increased with remoteness, with medications supplied by the GP at Outer Regional/Remote/Very Remote encounters being 2.5 times higher than at Major City Indigenous encounters.
- Pathology and imaging ordering rates increased with remoteness.

# 6.5 Aboriginal Community Controlled Health Services

From 2004, GPs who participated in the BEACH program were asked if any or all of their encounters took place in an Aboriginal Community Controlled Health Service (ACCHS). Of the 485,300 encounters recorded by 4,853 GPs between 2004 and 2008, there were 4,926 encounters from 61 participating GPs that took place in an ACCHS, representing 1% of encounters recorded during the 4-year period. Of these encounters, 59% were with an Aboriginal and/or Torres Strait Islander patient.

The age and sex distribution of these Indigenous patients encountered was similar to that of all Indigenous encounters. More than half the ACCHS encounters took place in Outer Regional/Remote/Very Remote areas (59.2%), 27.0% took place in Inner Regional areas and 13.8% took place in Major Cities. Therefore, since most of the ACCHS encounters were in regional areas, the differences found were similar to those seen earlier between all regional and Major City Indigenous patients.

# 6.6 Patient risk factors

Data about patient risk factors (body mass index, smoking status and alcohol consumption) are requested on 40 out of the 100 encounter forms provided to each GP participant, in a section of the form referred to as SAND (Supplementary Analysis of Nominated Data). The SAND methods are detailed in Chapter 2 of this report.

Information for all three risk factors was available for 213,389 patients encountered in general practice between 2001 and 2008, and 1,900 (0.9%) of these respondents were Aboriginal and Torres Strait Islander peoples. These data allow a comparison of the prevalence of multiple risk factors in the Indigenous subsample and in the total subsample. As shown in Table 6.5, Indigenous patients were almost 4 times as likely to have all three risk factors (overweight/obesity, daily smoking, and at-risk alcohol consumption), when compared with all respondents (including Indigenous patients).

**Table 6.5: Risk factor profile of adult Indigenous respondents and all adult respondents**

| | Indigenous respondents ($n$ = 1,900)[a] | | All respondents ($n$ = 213,389)[a] | |
|---|---|---|---|---|
| **Number of risk factors** | **Per cent** | **95% CI** | **Per cent** | **95% CI** |
| None | 11.1 | 9.4–12.7 | 27.2 | 26.9–27.5 |
| One | 42.3 | 39.8–44.7 | 49.1 | 48.8–49.4 |
| Two | 32.3 | 29.7–34.8 | 19.9 | 19.6–20.1 |
| Three | 14.4 | 12.6–16.2 | 3.9 | 3.7–4.0 |

(a) Missing data removed—data for at least one risk factor was missing for 282 of 2,182 Indigenous respondents and for 17,812 of the 231,201 patients in the total sample who were asked questions about all 3 risk factors. (body mass, smoking, and alcohol consultion).

*Note:* CI—confidence interval.

Patients are classed as obese, overweight, normal or underweight by body mass index (BMI) categories. Adult BMI cut-offs are classified according to the World Health Organization guidelines.[21] For more detail, refer to Chapter 7.

Overweight/obesity was more prevalent in the adult Indigenous population (65.7%, 95% CI: 62.9–68.6) than in the total sample of adults (56.7%, 95% CI: 56.4–57.1). However, Indigenous patients were more likely to be obese and less likely to be overweight than the total patient sample. Obesity was more prevalent among Indigenous women than men, but Indigenous men were more likely to be overweight than Indigenous women (Table 6.6).

**Table 6.6: Body mass index of Indigenous adult respondents (18+ years) and all adult respondents**

| | Indigenous adult respondents[a] | | | | | | All adult respondents | |
|---|---|---|---|---|---|---|---|---|
| | Male ($n$ = 755) | | Female ($n$ = 1,245) | | Total ($n$ = 2,012) | | Total ($n$ = 223,019) | |
| **BMI** | **Per cent** | **95% CI** | **Per cent** | **95% CI** | **Per cent** | **95% CI** | **Per cent** | **95% CI** |
| Obese | 28.1 | 24.4–31.8 | 43.6 | 39.5–47.8 | 37.6 | 34.3–40.9 | 22.3 | 22.0–22.6 |
| Overweight | 33.8 | 30.2–37.4 | 24.7 | 21.8–27.6 | 28.1 | 25.8–30.5 | 34.4 | 34.2–34.7 |
| Normal | 33.9 | 29.5–38.3 | 28.7 | 25.6–31.8 | 30.7 | 28.1–33.4 | 40.5 | 40.2–40.9 |
| Underweight | 4.2 | 2.3–5.9 | 3.1 | 2.0–4.1 | 3.5 | 2.6–4.5 | 2.7 | 2.7–2.8 |

(a) Missing data removed—patient sex was not recorded for 12 Indigenous respondents.

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

Adult Indigenous patients were almost 3 times as likely to be daily smokers (46.6%) than were those in the total adult sample (17.3%). The distribution of smoking status among male and female Indigenous patients was similar, except that females were more likely to have never smoked (Table 6.7).

**Table 6.7: Smoking status of Indigenous adult respondents (18+ years) and all adult respondents**

| | Indigenous adult respondents[(a)] | | | | | | All adult respondents | |
|---|---|---|---|---|---|---|---|---|
| | Male (*n* = 776) | | Female (*n* = 1,276) | | Total (*n* = 2,064) | | Total (*n* = 225,016) | |
| Smoking status | Per cent | 95% CI | Per cent | 95% CI | Per cent | 95% CI | Per cent | 95% CI |
| Daily | 49.5 | 45.3–53.6 | 44.9 | 41.8–48.0 | 46.6 | 43.9–49.3 | 17.3 | 17.0–17.5 |
| Occasional | 6.3 | 4.2–8.4 | 5.4 | 4.1–6.7 | 5.8 | 4.6–7.0 | 3.7 | 3.6–3.8 |
| Previous | 21.5 | 18.2–24.8 | 18.7 | 16.2–21.1 | 19.7 | 17.6–21.7 | 27.8 | 27.5–28.1 |
| Never | 22.7 | 19.3–26.1 | 31.0 | 27.8–34.3 | 28.0 | 25.5–30.5 | 51.2 | 50.8–51.6 |

(a) Missing data removed— patient sex was not recorded for 12 Indigenous respondents.

*Note:* CI—confidence interval.

Alcohol consumption was measured using the World Health Organization's Alcohol Use Disorders Identification Test (AUDIT)[22] with scoring for an Australian setting.[23] The methods for calculating at-risk and responsible drinkers have been described elsewhere.[14] At-risk drinking was more prevalent among Indigenous adult patients than among all adults sampled. Indigenous men were more likely to be at-risk drinkers than Indigenous women, who were more likely to be non-drinkers (Table 6.8). Indigenous patients were half as likely to be responsible drinkers when compared with the total sample, but were also more likely to be non-drinkers.

**Table 6.8: Alcohol consumption among Indigenous adult respondents (18+ years) and all adult respondents**

| | Indigenous respondents[(a)] | | | | | | All respondents | |
|---|---|---|---|---|---|---|---|---|
| | Male (*n* = 756) | | Female (*n* = 1,239) | | Total (*n* = 1,995) | | Total (*n* = 219,730) | |
| Alcohol consumption | Per cent | 95% CI | Per cent | 95% CI | Per cent | 95% CI | Per cent | 95% CI |
| At-risk drinker | 47.4 | 43.1–51.6 | 33.7 | 30.2–37.1 | 38.8 | 35.8–41.9 | 26.3 | 26.0–26.7 |
| Responsible drinker | 22.1 | 18.3–25.9 | 23.1 | 20.2–26.0 | 22.7 | 20.2–25.2 | 44.6 | 44.3–44.9 |
| Non-drinker | 30.6 | 26.4–34.7 | 43.3 | 39.6–46.9 | 37.4 | 35.5–41.4 | 29.1 | 28.7–29.5 |

(a) Missing data removed— patient sex was not recorded for 12 Indigenous respondents.

*Note:* CI—confidence interval.

# 6.7 Discussion

The age distribution of the Indigenous patients encountered in BEACH was very different from that of the non-Indigenous patient sample. Indigenous patients were far more likely to be in the younger age groups and less likely to be aged 65 years and over, reflecting shorter life expectancy. The majority (75%) of Indigenous patients lived in Regional/Remote areas, the reverse of non-Indigenous patients, 70% of whom lived in Major Cities.

The average number of problems managed at encounters with Indigenous and non-Indigenous patients did not differ, but there were large differences in the types of problems managed. Encounters with Indigenous patients included higher management rates of diabetes, asthma, pregnancy, drug use, chronic alcohol use and renal failure, yet lower management rates of cardiovascular diseases including hypertension. Infections were also more commonly managed, particularly those related to the skin and to the ears (mainly otitis media). Previous literature demonstrated that despite Indigenous children being 5 times more likely to be diagnosed with severe otitis media than non-Indigenous children, the management was not different, and was inconsistent with the national guidelines.[24]

Given the greater burden of illness and higher mortality rates for Indigenous patients, it could have been expected that chronic disease management rates would equate with, or be higher than the management rates at non-Indigenous encounters. However, chronic conditions were managed less often at encounters with Indigenous patients. This may be due partially to the younger age of the Indigenous population, specifically those attending general practice. One of the aims of the Indigenous-specific health assessment MBS item numbers is to provide opportunities for early diagnosis of chronic disease, particularly asthma, diabetes, kidney disease and cardiovascular disease. The first three of these were more frequently managed at encounters with Indigenous patients, possibly indicating high detection rates through screening and preventive care; however, cardiovascular diseases were less frequently managed, which may reflect a low detection rate caused by lower rates of preventive care, such as blood pressure check-ups. It should also be noted that whatever improvements may have occurred in the general practice care of Aboriginal and Torres Strait Islander peoples, and whatever benefits this may have brought, Indigenous Australians still have at least a 12–14 year lesser life expectancy than do other Australians.[25]

The high rate at which medications were supplied directly by the GP to patients from Outer Regional/Remote/Very Remote areas relates to the amendment made to the *National Health Act 1953* in 1999, allowing pharmaceuticals to be directly received at the point of consultation where pharmaceuticals cannot be conveniently accessed through other means.[3] These results provide support to those who suggest that the amendment led to improved access to prescribed pharmaceuticals for about 36% of Indigenous people.[26]

With the MBS item number for health assessments available to younger age groups, and the broader funded availability of some vaccines, it could also have been anticipated that Indigenous patients would have a higher management frequency of cardiovascular check-ups and immunisations/vaccinations than non-Indigenous patients. However, this is not the case as both cardiovascular check-ups and immunisations/vaccinations were less often provided at Indigenous encounters than at non-Indigenous encounters.

The lower levels of these preventive activities may be the result of:

- limited access to services in rural areas where 75% of the Indigenous patients reside, leading to poor continuity of care, and less opportunities for GP intervention
- an unwillingness of 'well' people to attend for preventive services
- time and workforce constraints. The funded health assessments are comprehensive and require a considerable amount of time. Since the introduction of the Indigenous health assessment item numbers, less than 10% of eligible adults have participated[4], and to date, there has not been a single BEACH encounter for which any one of these item numbers were recorded.

Reasons for low uptake have been investigated and some of the surprising findings were that GPs did not know about the Indigenous health assessments; furthermore, some felt it unnecessary to apply special treatment to Indigenous patients when many cultural groups require this attention, although they did acknowledge that Indigenous status is relevant to health care delivery.[4]

However, to provide preventive care specifically aimed at the known health risk of Indigenous Australians, and in line with RACGP guidelines[27], one must first be aware that the patient is an Indigenous Australian. Lack of knowledge of Indigenous status has been recognised by others as a contributing factor to the low uptake of Indigenous-specific health checks, with reasons for not knowing including not wanting to discriminate, being unfamiliar with who qualifies as Indigenous, and procedural barriers, where general practice software does not provide for routine identification.[4]

The findings of a BEACH substudy confirmed this suspected under-identification. In the data period reported here, 1.4% of patients encountered identified themselves as Indigenous. In contrast, in a BEACH substudy that asked 9,245 patients a complete set of questions about their cultural background (including Indigenous status) 2.2% (95% CI: 1.6–2.9) of respondents identified themselves as Indigenous.[28] This rate is similar to the ABS estimates of Indigenous Australians as a proportion of the total population.[1]

However, the BEACH substudy included Indigenous Australians seen at Community Controlled Health Services funded through Medicare claims, and the estimate of 2.2% could have been an overestimate for the proportion of encounters that are with Indigenous patients in general practice as a whole. Deeble et al. (2008) conducted further investigations on this data and estimated that the BEACH encounter identification was an underestimate of about 10%, and that a more reliable estimate of the Indigenous population would be about 1.6% of all encounters.[29]

The findings of these studies are that some GPs are not routinely asking patients at the encounter about their Indigenous status, even when this is a variable specifically collected for each patient encountered, as it is in BEACH encounter data.

Unpublished work on the relationship between measured Indigenous proportions in rural and metropolitan practice compared the 'expected' proportions in each area (from the substudy mentioned above) with the 'observed' proportions from the encounter data, and found that the vast majority of the under-identification is occurring in Major Cities, and not in rural areas.

This may suggest that there are still some social barriers to asking the question, and that this is largely in Major City practice. The risk of offending the patient has been mentioned as a reason for low identification in a study done in a Major City area.[4] Perhaps wide public education (beyond the Indigenous population) about the importance of identifying people's Indigenous status is necessary before changes to the health of the Indigenous population can occur. This is of particular importance to mainstream services. The inclusion of a question on Indigenous status as a matter of course on all forms requiring completion for government, hospitals, general practice, and other health services, may then be better understood by health professionals and patients alike.

Other findings included the higher rate of dressings/pressure/compressions provided at Indigenous patient encounters, which might reflect the high management rate of skin infections seen earlier in this chapter. Glucose tests, also recorded at Indigenous encounters more often, may be a reflection of the higher management rate of diabetes (double that at non-Indigenous encounters), but may also be included as part of a routine check-up.

Pathology tests for electrolytes, urea and creatinine and liver function test, which were ordered more frequently at Indigenous encounters, would partially reflect the higher management rate of chronic alcohol use, and perhaps reflects acknowledgement of the prevalence of alcohol-related problems in some Indigenous communities and the subsequent testing for related kidney and liver problems.

Additionally, the higher rate at which Indigenous patients were referred to a hospital is likely to reflect reduced access to primary care and specialist services in many rural, regional and remote areas.

For the first time, differences between the content of encounters with Indigenous patients from different regions of Australia are presented in this chapter. Some of the interesting differences to emerge were that:

- psychological problems were managed far more often at encounters with Indigenous Australians from Major Cities and Inner Regional areas than at those with patients from Outer Regional/Remote/Very Remote areas
- the management of drug use was 4 times higher at encounters with Major City Indigenous Australians that at encounters with those from Outer Regional/Remote/Very Remote areas
- patients from Outer Regional/Remote/Very Remote areas had the highest management rates for diabetes.

Factors that are also considered as contributing to the increased risk of disease in Indigenous patients are higher rates of overweight/obesity, smoking and dangerous levels of alcohol consumption. The BEACH substudy that has measured the prevalence of these three risk factors in a sample of more than 200,000 patients to date, of whom 1,900 were Indigenous Australians, demonstrated that only 1 in 10 had none of the measured risk factors, and almost half had all three risk factors, double the proportion found in non-Indigenous patients. Though Indigenous patients were more likely to be obese than overweight, this was particularly so among women. However, it has been suggested that BMI is not as good an indicator, as measurement of central obesity is among the Indigenous population, particularly in Indigenous women.[30] Unfortunately BEACH relies on patient reported height and weight to measure BMI, as asking the GP to measure the patient would add further time to the consultation.

# 6.8 Conclusion

The inequalities experienced by the Indigenous population of Australia have long been a recognised problem. The high prevalence of multiple risk factors in the Indigenous population supports other findings[20], and reinforces the growing need of early intervention through educational programs that cover healthy choices about food, tobacco and alcohol. Tackling their health issues through general practitioner intervention is one approach, however the first hurdle to be overcome is the inadequate identification of the Indigenous status of patients, particularly those in Major Cities. Progressive early detection seems to be affecting the management of some diseases, but not those of the cardiovascular system. Attention to extra preventive services, early diagnosis and ongoing management—all encouraged by current health policies—can only be given if the patient is known to be of Aboriginal or Torres Strait Islander descent. GP use of a routine question to each attending patient on one occasion, and careful recording of Aboriginal and/or Torres Straight Islander descent in the health record, would ensure that GP-mediated specific health interventions (health assessments, immunisation, and PBS listings) are offered. This, together with broad educational programs delivered at an early age, may help in reducing the health disparities evident in Australia's Indigenous population.

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# 7 Overweight and obesity

## *Lisa Valenti*

General practice is a useful intervention point for health care and health promotion activities because general practice is usually the first contact point into the Australian health care system. In 2005–06, 88% of the Australian population visited a GP at least once.[1] GPs are therefore in an ideal position to interact one-on-one to individually counsel and advise the patient about their lifestyle choices and how these affect health and wellbeing.

This chapter focuses on prevalence of overweight and obesity in patients attending general practice, and the prevalence of different levels of obesity. It also investigates changes that have occurred over time in both adults aged 18 years and over and children aged 2 to 17 years. The length of consultation by patient body mass index (BMI) is investigated in both adults and children attending general practice.

Pathology ordered by GPs in the management of overweight/obesity is reported in Chapter 5.

## 7.1 Background

Overweight and obesity in the general population are increasing problems not only in Australia, but globally in the developed and developing world. The World Health Organization (WHO) has labelled the dramatic worldwide increase in obesity as a global epidemic[2], presenting a serious public health challenge for the 21st century. Much recent research effort has been aimed at overweight and obesity, with the National Health and Medical Research Council investing $68.9 million between 2000 and 2007.[3]

It is estimated that overweight and obesity were responsible for 7.5% of the total burden of disease in Australia in 2003, ranking a close third after tobacco and high blood pressure.[4] This contribution has increased from 4.3% in 1996 when overweight and obesity ranked fourth in total burden of disease after tobacco, physical inactivity and high blood pressure.[5]

Access Economics estimates the financial cost of obesity in Australia in 2008 as $8.3 billion, mainly comprised of productivity loss (44%), health system (24%) and carer costs (23%)—up from $3.8 billion in 2005, and growing exponentially.[6]

### Specific policies and initiatives

- In April 2008 Australian health ministers agreed to make obesity a National Health Priority Area. At the same time, the Minister appointed the Preventative Health Taskforce and tasked them with developing the National Preventative Health Strategy. The Strategy, to be provided to Government in June 2009, will provide advice on options for addressing obesity.[7]

- To facilitate consultation in the development of the Strategy, the Taskforce released a discussion paper in October 2008 titled 'Australia: The Healthiest Country by 2020' and a technical paper focussing on obesity titled *Obesity in Australia: a need for urgent action*.[8] The technical paper details a number of recommended initiatives, including regulating the marketing of unhealthy foods and beverages directed at children, reshaping the food supply towards lower risk products (for example, by increasing taxes on unhealthy energy dense foods), and encouraging physical activity (for example, by increasing tax breaks on recreation and fitness-related products). Other initiatives include improving public health and information, reshaping urban environments to encourage healthy options, and strengthening, upskilling and supporting primary healthcare workers to encourage healthier choices in the population.
- In October 2008, the Australian Government launched a national campaign called 'Measure Up' which it regards as an important element in the fight against obesity. The campaign encourages Australian adults to measure their waist to identify whether or not they are at risk of developing some lifestyle related chronic diseases. The campaign states that for women, a waist measurement of over 80 centimetres (cm) indicates an increased risk of developing a chronic disease, and for a waist measurement of over 88 cm the risk greatly increases. For men, waist measurements over 94 cm and 102 cm indicate increased and greatly increased risk of developing a chronic disease.[9]
- In December 2008, the Australian Government announced fast-tracked funding of $580 million from the Higher Education Endowment Fund towards 11 selected projects to build Australian infrastructure and strengthen research facilities in Australian universities. The largest of these successful projects, pledging $95 million, was a Sydney University initiative to establish The Centre for Obesity, Diabetes and Cardiovascular Disease.[10] The centre aims to conduct internationally significant collaborative research with other prestigious international universities, and attract world-class clinicians and researchers to Sydney. The centre will be one of the world's first to do thematic research on the connectivity between obesity, diabetes and cardiovascular disease.[11]

## Overweight and obesity in adults

Apart from the BEACH program, two recent national studies have estimated the prevalence of overweight and obesity in Australian adults. The 2004–05 National Health Survey (NHS) used self-reported height and weight to calculate BMI, and reported 62% of adult males and 45% of adult females aged 18 years or more were overweight or obese (excluding those adults for whom BMI could not be derived as height and/or weight were not stated)—an increase from 58% of males and 42% of females in the 2001 NHS, and 52% of males and 37% of females in the 1995 NHS.[12]

The Australian Diabetes, Obesity and Lifestyle Study (AusDiab) in 1999–00 used measured height and weight to calculate BMI in adults aged 25 years and over. AusDiab estimated 68% of males and 52% of females were overweight or obese.[13] The AusDiab estimates suggest that a higher prevalence of overweight and obesity is identified with measured rather than self-reported (NHS) data, which is supported by other Australian research suggesting self-report of height and weight may underestimate BMI.[14]

The 2007–08 NHS collected both self-reported and measured height and weight as well as measured waist circumference from all participants. Initial summary results published in May 2009 indicated that 62% of adults were overweight or obese based on measured data, compared with 56% based on self-reported data.[15]

### Overweight and obesity in children

Overweight and obesity are also problems in childhood and adolescence, and are a particular focus of the Australian Government preventative health initiatives. At present, about one in four children in the United Kingdom[16] and Australia[17,18], and one in three children in the United States[19] are overweight or obese. Recently published BEACH data for the period April 2002 to March 2008 estimate that 29.6% of all children aged 2 to 17 years who present to general practice are overweight or obese: 30.6% of male children and 28.7% of female children.[20] The New South Wales Schools Physical Activity and Nutrition Survey (SPANS), carried out in 2004, studied children aged 5-16 years in New South Wales schools, and found that 25% of boys and 23.3% of girls were either overweight or obese.[21] The 2007 Australian National Children's Nutritional and Physical Activity Survey (Children's Survey) reported that 23% of children aged 2-16 years were either overweight (17%) or obese (6%), based on interviewer-measured height and weight data; however confidence intervals are not provided for the prevalence reported. This study also reports the mean waist girth for boys and girls by age group. In 2007, on average, about one in six children has a waist to girth greater than the recommended ratio.[22] Initial results from the 2007–08 NHS suggested that based on measured height and weight, 25% of children aged 5–17 years were classified as overweight (17%) or obese (7.8%). The proportions of male (26%) and female (24%) children classified as overweight/obese were similar.[15]

The BEACH program is a valuable research tool, as it can provide updated current prevalence estimates of overweight/obesity in a sample of adults and children attending general practice on a yearly basis in the published annual reports.

## 7.2 Method

Since April 1998, a section on the bottom of the BEACH encounter form has been used to investigate aspects of patient health or health care delivery not included in the general practice consultation-based information. These substudies are referred to as SAND (Supplementary Analysis of Nominated Data). SAND methods are described in Chapter 2.

Self- or carer-reported patient risk factors are recorded for a subsample of 40 of the 100 GP–patient encounters. The risk factors used in this chapter are height (centimetre, without shoes) and weight (kilograms, unclothed), from which BMI is calculated as weight (kilograms)/height$^2$ (metres). Encounter start time and end time, for calculation of consultation length, have also been collected with these patient risk factors from 2000–01 onwards. Consultation length was calculated in minutes, as end time minus start time for data collected from 2000–01 onwards.

Adult BMI cut-offs are classified according to the World Health Organization guidelines which indicate a BMI of less than 18.50 is underweight, 18.50–24.99 is normal weight, 25.00–29.99 is overweight and equal to or more than 30.00 obese. Obesity is further grouped into Obese Class I (BMI 30.00–34.99), Obese Class II (BMI 35.00–39.99) and Obese Class III (BMI >=40.00).[23]

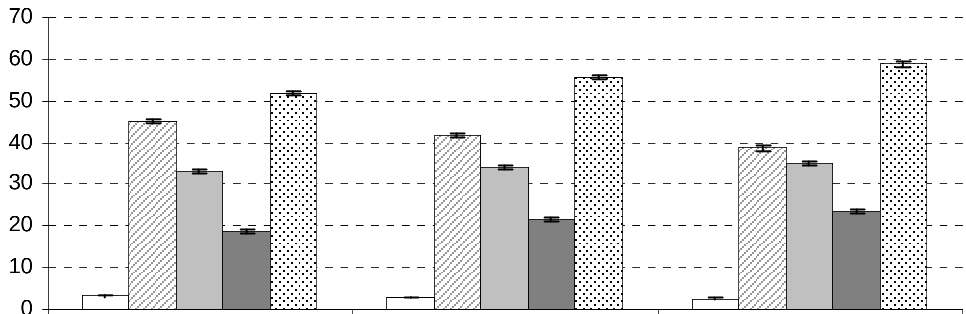
The standard BMI cut-offs described above are not appropriate in the case of children. Cole et al. developed a method that calculates the age–sex-specific BMI cut-off levels for overweight and obesity in children aged 2–17 years; at age 18 years it equates to the adult definitions.[24] This method categorises childhood BMI into three groups: underweight/normal, overweight and obese.[25]

To investigate changes in prevalence in adults aged 18 years and over, and in children aged 2–17 years, three 2-year time periods are compared: April 1998–March 2000, April 2002–March 2004 and April 2006–March 2008 (subsequently labelled 1998–00, 2002–04 and 2006–08). The age distribution of children did not differ across these three time periods, so age standardisation was not necessary. The age distribution of adults differed across these three time periods, so age standardisation was done. The age-standardised results did not differ significantly from the crude rates, so crude rates are presented.

# 7.3 BEACH prevalence of overweight/obesity in adults

The substudies included responses for 63,401 adults in 1998–00, 64,235 in 2002–04 and 63,396 in 2006–08.

The prevalence of overweight/obesity in adult patients seen at general practice encounters increased steadily between 1998–00 and 2006–08 from 51.8% (95% CI: 51.2–52.4) to 58.8% (95% CI: 58.2–59.5). Split into the individual components, the prevalence of overweight significantly increased from 33.0% (95% CI: 32.6–33.5) to 35.2% (95% CI: 34.8–35.6), as did the prevalence of obesity from 18.8% (95% CI: 18.3–19.2) to 23.7% (95% CI: 23.2–24.2) (Figure 7.1). These increases are statistically significant and clinically important as overweight and obesity are major risk factors for a number chronic conditions, including Type 2 diabetes, cardiovascular disease and cancer.[2]

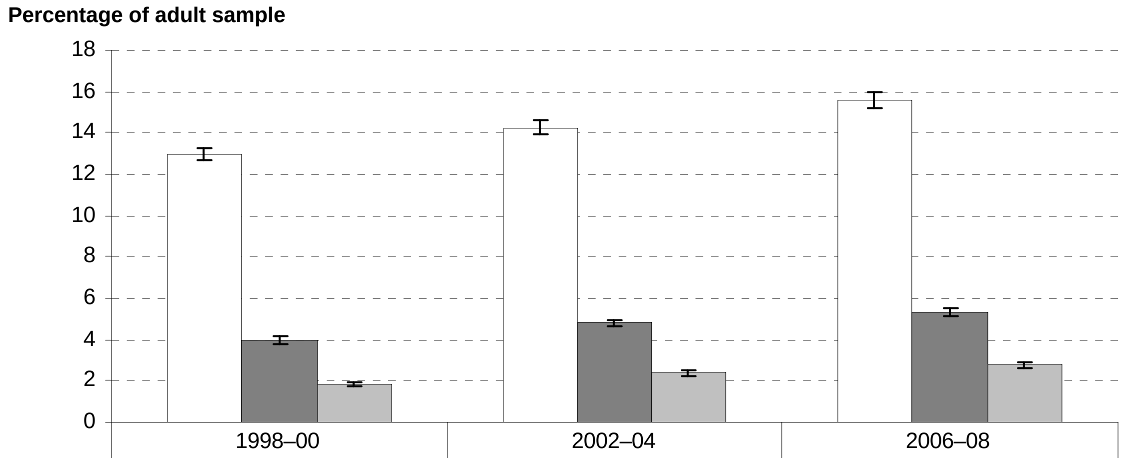



| | 1998–00 | 2002–04 | 2006–08 |
|---|---|---|---|
| Underweight | 3.3 | 2.8 | 2.5 |
| Normal | 45.0 | 41.6 | 38.6 |
| Overweight | 33.0 | 34.1 | 35.2 |
| Obese | 18.8 | 21.4 | 23.7 |
| Overweight+obese | 51.8 | 55.6 | 58.8 |

**Data period**

*Note*: Overweight + obese may differ from the sum of the individual values for overweight and obese by 0.1 due to rounding.

**Figure 7.1: BMI distribution of adult patients, 1998–00, 2002–04 and 2006–08 (95% CI)**




| | 1998–00 | 2002–04 | 2006–08 |
|---|---|---|---|
| Obese I | 13.0 | 14.3 | 15.6 |
| Obese II | 3.9 | 4.8 | 5.3 |
| Obese III | 1.9 | 2.4 | 2.8 |

Data period

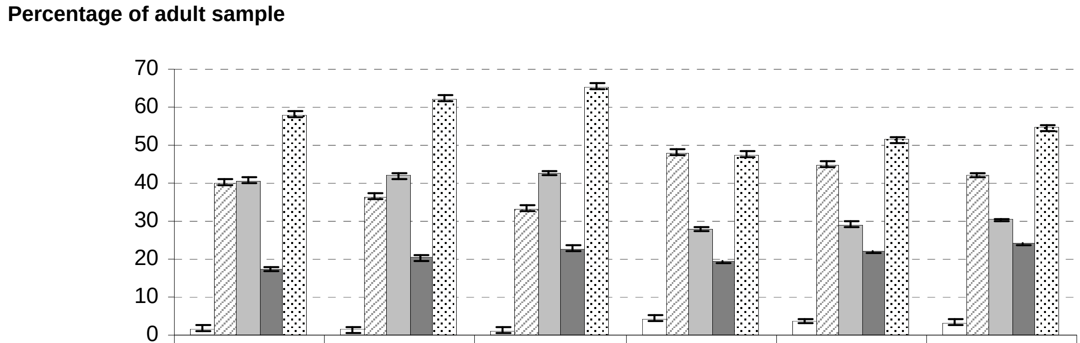
**Figure 7.2: Obesity class distribution of adult patients, 1998–00, 2002–04 and 2006–08 (95% CI)**

Taking this one step further and providing Australian data on levels of obesity not published elsewhere, obese adults were divided into three subgroups: WHO defined Obesity Class I, II and III.[23] This division provides further insight into the levels of obesity in the general practice population and the changes in these levels over this 10-year period (April 1998–March 2008).

The prevalence of all three obesity subgroups (Obese Class I, II and III) increased significantly between 1998–00 and 2006–08 from 13.0%, 3.9% and 1.9%, respectively, in 1998–00 to 15.6%, 5.3% and 2.8% in 2006–08 (Figure 7.2).

The prevalence of overweight/obesity among male adults increased from 58.1% in 1998–00 to 65.4% in 2006–08, and in female adults from 47.5% in 1998–00 to 54.5% in 2006–08 (Figure 7.3).

The increase in level of obesity by WHO defined subgroups (Obese Class I, II and III) can be seen among both male and female adults (Figure 7.4). Clearly, any public health messages need to be put to both the male and female population, as they are both facing the great health challenges presented by increasing levels of obesity over this 10-year period.

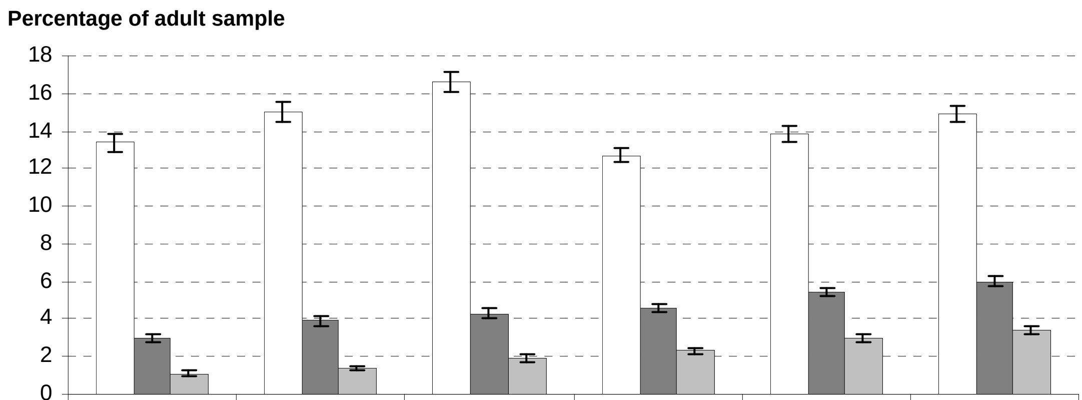



| | 1998–00 Male | 2002–04 Male | 2006–08 Male | 1998–00 Female | 2002–04 Female | 2006–08 Female |
|---|---|---|---|---|---|---|
| Underweight | 1.7 | 1.4 | 1.2 | 4.4 | 3.7 | 3.4 |
| Normal | 40.2 | 36.4 | 33.4 | 48.1 | 44.9 | 42.1 |
| Overweight | 40.7 | 41.9 | 42.7 | 28.0 | 29.2 | 30.3 |
| Obese | 17.5 | 20.3 | 22.8 | 19.6 | 22.2 | 24.3 |
| Overweight+obese | 58.1 | 62.2 | 65.4 | 47.5 | 51.4 | 54.5 |

**Data period by patient sex**

*Note*: Overweight + obese may differ from the sum of the individual values for overweight and obese by 0.1 due to rounding.

**Figure 7.3: Sex-specific BMI distribution of adult patients, 1998–00, 2002–04 and 2006–08 (95% CI)**




| | 1998–00 Male | 2002–04 Male | 2006–08 Male | 1998–00 Female | 2002–04 Female | 2006–08 Female |
|---|---|---|---|---|---|---|
| Obese I | 13.4 | 15.0 | 16.6 | 12.7 | 13.8 | 14.9 |
| Obese II | 3.0 | 3.9 | 4.3 | 4.6 | 5.4 | 6.0 |
| Obese III | 1.1 | 1.4 | 1.9 | 2.3 | 3.0 | 3.4 |

**Data period by patient sex**

**Figure 7.4: Sex-specific obesity class distribution of adult patients, 1998–00, 2002–04 and 2006–08 (95% CI)**

## Current prevalence in adults who attend general practice

Prevalence estimates based on 2006–08 BEACH data indicate that 58.8% of adults at general practice in Australia were overweight or obese (Figure 7.1). Sex-specific prevalence rates in adults were significantly different, with more male adults being overweight/obese (65.4%, 95% CI: 64.6–66.3) than females (54.5%, 95% CI: 53.8–55.3) (Figure 7.3).However, when divided into the individual components of overweight and obesity, female adult patients were significantly more likely to be obese than their male counterparts (24.3%, 95% CI: 23.7–24.9 compared with 22.8%, 95% CI: 22.1–23.4, respectively) (Figure 7.3).

Taking this one step further, the levels of severe obesity (that is, Obese Class II and III) in patients were investigated by sex. In 2006–08, adult female patients were significantly more likely to be severely obese (6.0% and 3.4%, Obese Class II and III) than male patients (4.3% and 1.9%). Therefore, adult males were significantly more likely to be overweight, while adult females were significantly more likely to be severely obese (Class II or III) (Figure 7.4).

In an unpublished study of the prevalence of overweight and obesity in an adult subsample of BEACH data, the crude prevalence rates was adjusted to account for varying age–sex attendance rates (that is, varying chance of patients being sampled based on their age and sex). The resulting adjusted prevalence (prevalence among all patients who attended a GP at least once in a year) did not differ from the crude rates.[26] Therefore, it seems reasonable to extrapolate these crude encounter rates to estimate prevalence among the adult general practice attending population (that is, all adults attending general practice at least once in a year). The Medicare Benefits Schedule (MBS) data show that in April 2007–March 2008, there were 7.1 million adult female patients who attended general practice at least once, and 5.8 million male adult patients (MBS general practice claims data April 2007–March 2008 supplied by the Australian Government Department of Health and Ageing).

Extrapolation of the 2006–08 BEACH prevalence estimates for adults suggest there were:

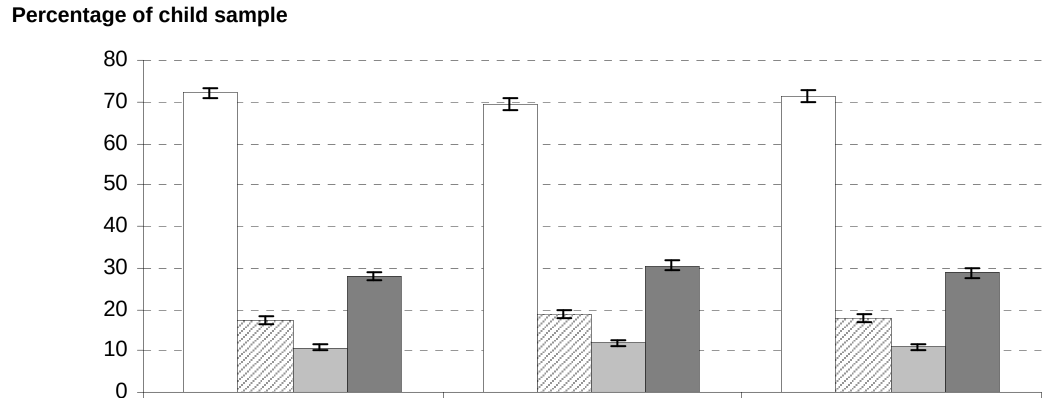
- about 1.71 million obese adult females who attended general practice, made up of: 1.05 million Obese Class I; 0.42 million Obese Class II; 0.24 million Obese Class III.
- about 1.32 million obese adult males who attended general practice, made up of: 0.96 million Obese Class I; 0.25 million Obese Class II; 0.11 million Obese Class III.

These results cannot be further extrapolated to the total Australian adult population, as any assumptions about the weight status of the 12% of the population who do not attend general practice cannot be made.

# 7.4 BEACH prevalence of overweight/obesity in children aged 2–17 years

Responses were received for 8,072 children aged 2–17 years in 1998–00, for 6,569 in 2002–04, and for 6,133 in 2006–08.

Over the 10-ear period April 1998–March 2008, there was no change in the prevalence of overweight and obesity in children aged 2–17 years attending general practice. In 1998–00, 27.9% were classified as overweight or obese compared with 28.7% in 2006–08. During the intervening years, however, there was a significantly different peak when prevalence reached 30.6% (Figure 7.5).




| | 1998–00 | 2002–04 | 2006–08 |
|---|---|---|---|
| Underweight/normal | 72.1 | 69.4 | 71.3 |
| Overweight | 17.3 | 18.7 | 17.9 |
| Obese | 10.7 | 11.8 | 10.9 |
| Overweight+obese | 27.9 | 30.6 | 28.7 |

**Data period**

*Note*: Overweight + obese may differ from the sum of the individual values for overweight and obese by 0.1 due to rounding.

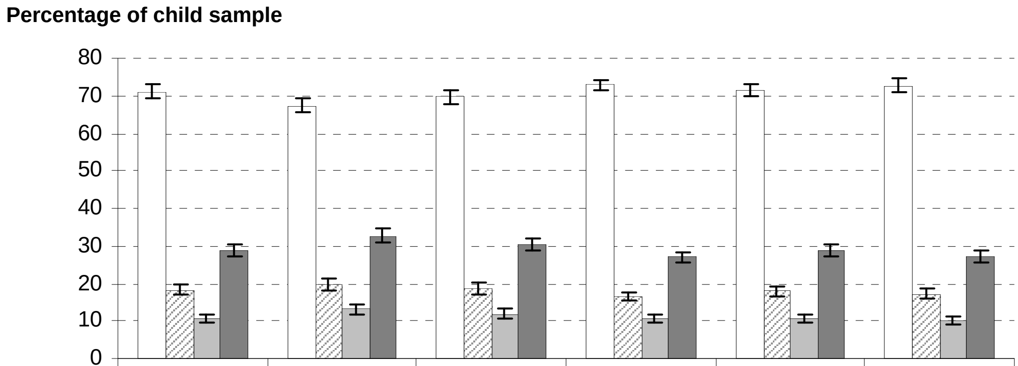
**Figure 7.5: BMI distribution of children, 1998–00, 2002–02 and 2006–08 (95% CI)**

There was no significant change in the prevalence of overweight/obesity among both male and female children between 1998–00 and 2006–08 (28.8% to 30.3% in males and 27.1% to 27.2% in females) (Figure 7.6).

Recent, high levels of media attention on 'increasing levels of childhood obesity in Australia' are not supported by national BEACH data over the 10 years. The initial SPANS data reported, based on school children aged 5–16 years in NSW only, shows an increase of childhood overweight and obesity from 20% in 1995 to 25% in 2004, but does not supply *p* values or confidence intervals to indicate whether this change is statistically significant.[21] More recent published data on the SPANS study provides odds ratios and 95% confidence intervals allowing statistical testing.[27] This indicates that over the period 1985 to 1997, the prevalence of overweight and obesity increased significantly among younger boys (grades 2, 4, 6) and older boys (grades 8, 10) and younger girls (grades 2, 4, 6). Over the period 1997 to 2004, the prevalence of overweight/obesity combined increased significantly among younger and older boys but not among girls.[27] It is very important to recognise that based on all recent Australian data, the levels of overweight/obesity in children are unacceptably high, and present a major public health problem that needs to be tackled. The increased media attention highlights this problem, spurring on much-welcomed debate and attention by government and policy makers.

## Current prevalence in children who attend general practice

Prevalence estimates based on 2006–08 BEACH data indicate that 28.7% of children aged 2–17 years at encounters in general practice were overweight (17.9%) or obese (10.9%) (Figure 7.5). Sex-specific prevalence rates in children in 2006–08 were not significantly different, with 30.3% of male children being overweight/obese compared with 27.2% of female children (Figure 7.6).




| | 1998–00 Male | 2002–04 Male | 2006–08 Male | 1998–00 Female | 2002–04 Female | 2006–08 Female |
|---|---|---|---|---|---|---|
| □ Underw eight/normal | 71.2 | 67.3 | 69.7 | 72.9 | 71.3 | 72.8 |
| ▨ Overw eight | 18.2 | 19.6 | 18.6 | 16.4 | 18.0 | 17.1 |
| ■ Obese | 10.6 | 13.1 | 11.8 | 10.7 | 10.7 | 10.0 |
| ■ Overw eight+obese | 28.8 | 32.7 | 30.3 | 27.1 | 28.7 | 27.2 |

**Data period by patient sex**

*Note*: Overweight + obese may differ from the sum of the individual values for overweight and obese by 0.1 due to rounding.

**Figure 7.6: Sex-specific BMI distribution in children, 1998–00, 2002–02 and 2006–08 (95% CI)**

As discussed above, adjustment for age–sex-specific attendance rates among adults does not significantly change the crude rates.[26] Therefore, it seems reasonable to extrapolate the children's crude encounter rates to estimate prevalence among the general practice-attending child population (that is, attending general practice at least once in a year).

The MBS data show that in April 2007–March 2008, 1.53 million female patients aged 2–17 years attended general practice at least once, and 1.59 million male patients aged 2–17 years (MBS general practice claims data April 2007–March 2008 supplied by the Australian Government Department of Health and Ageing).

Extrapolation of the 2006–08 BEACH prevalence estimates for children aged 2–17 years suggest:

- that of female children who attend general practice about 260,000 were overweight and about 150,000 were obese
- that of male children who attend general practice about 300,000 were overweight and about 190,000 million were obese.

These results cannot be further extrapolated to the total population of Australian children, as any assumptions about the weight status of the 12% of the population who do not attend general practice cannot be made.

# 7.5 Length of consultation by patient BMI

Length of consultation was calculated for encounters where start and end times were recorded by GPs. Only encounters recorded as claimable from Medicare as an A1 item of service have been included.

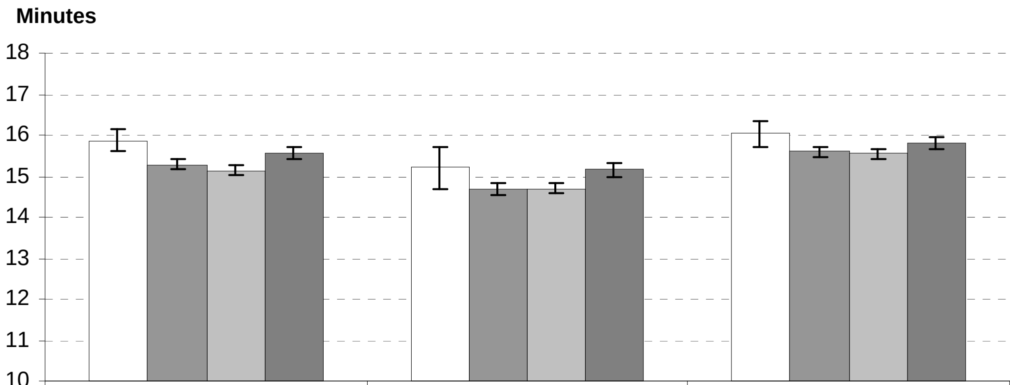
## Length of consultation in adults

At the 212,918 BEACH encounters in 2000–08 with adults where consultation length was available, the mean length of consultation was 15.3 minutes (95% CI: 15.2–15.4). The mean consultation length of encounters with adult female patients were significantly longer (15.7 minutes 95% CI: 15.6–15.8) than those with adult male patients (14.8 minutes 95% CI: 14.7–14.9) (results not shown).

Consultations for the period 2000–08 were on average significantly longer for underweight and obese adult patients (15.9 and 15.6 minutes) than for those who were of normal weight or overweight (15.3 and 15.1 minutes) (Figure 7.7).

The overall pattern of mean consultation length by patient BMI remained similar by patient sex, although statistically significant differences were noted only for obese male adults who had longer consultations than normal weight and overweight males (Figure 7.7).

Consultation length by BMI category in adult patients were compared over time, using 2-year blocks of data (2000–02, 2002–04, 2004–06, 2006–08) and were found not to have changed over the period (results not shown).




| | 2000–08 | Male 2000–08 | Female 2000–08 |
|---|---|---|---|
| Underweight | 15.9 | 15.2 | 16.0 |
| Normal | 15.3 | 14.7 | 15.6 |
| Overweight | 15.1 | 14.7 | 15.5 |
| Obese | 15.6 | 15.2 | 15.8 |

Data period by patient sex

**Figure 7.7: Mean consultation length by BMI in adult patients, 2000–08 (95% CI)**

## Length of consultation in children

At the 22,457 BEACH encounters in 2000–08 with children aged 2-17 years where consultation length was available, the mean length of consultation was 12.3 minutes (95% CI: 12.2–12.4). The mean consultation length for female and male children did not differ (12.5 and 12.1 minutes, respectively) (results not shown). The overall pattern of mean consultation length in children by patient BMI remained similar by patient sex (results not shown).

Consultation length by BMI category in children were compared over time, using 4-year blocks of data (2000–04 and 2004–08), and were found not to have changed over the period (results not shown).

## Length of consultation: comparing adults and children

General practice encounters with adults were on average longer than those with children aged 2-17 years (15.3 and 12.3 minutes, respectively) (results not shown).

As encounters with adults are already significantly longer, time constraints may limit the opportunity to add extra preventive care activities including lifestyle, dietary and exercise advice. At encounters with children, which are shorter, there may be more opportunity to tackle overweight and obesity as a clinical problem to be managed. Published data on BEACH encounters with children show that overweight and obesity are being managed at a low rate—once in every 58 encounters with an overweight or obese child.[20] This shows that even though encounters with children are shorter than those with adults, currently, the rate of management of overweight and obesity in children is low, and GPs are not taking the opportunities for management that are presented to them.

# 7.6 Discussion

The overall current BEACH prevalence of overweight and obesity in adults (58.8%) and children (28.7%) attending general practice is high, in line with international data showing disturbingly high population prevalence.

The 2004–05 NHS (based on self-report) estimated 53.3% of adults were overweight or obese.[12] The 2000–01 AusDiab study (based on measured height and weight), estimated 59.8% of adults aged 25 and over were overweight or obese.[28] More recently, the 2007–08 NHS indicated that 62% of adults were overweight or obese based on measured height and weight, compared with 56% based on participant self-report.[15] Both the NHS and AusDiab are population-based and neither provides confidence intervals around these prevalence estimates, making it impossible to assess whether these estimates and those of BEACH are statistically significantly different.

The current BEACH prevalence estimates for adults are higher than those from the 2004–05 NHS, and lower than, but more aligned with the 2000–01 AusDiab study. The lower prevalence reported by 2004–05 NHS may be because the 2004–05 NHS was based on self-report. The 2007–08 NHS reports higher self-reported rates of overweight/obesity, and the measured rates are higher than the 2000–01 AusDiab (measured) rates, highlighting the continued upward trend in overweight and obesity in Australian adults. Recent Australian research suggest that self-reported height and weight may underestimate BMI.[14] BEACH is also based on self-report, but patient self-report to a GP may be more accurate and reliable than to an unknown interviewer (NHS) due to the trust inherent in the doctor–patient relationship, going some way to explaining why BEACH estimates are higher than NHS, but lower than AusDiab.

The fact that the BEACH estimates are lower than those from AusDiab may be because some adult overweight and obese patients are not attending general practice, and are therefore not counted in BEACH estimates, which are based on adults attending at least once.

Another possible explanation for lower BEACH estimates is that BEACH includes adults aged 18–24 years, and this group is not included in AusDiab. These young adults are more likely to be in the healthy weight range so that BEACH estimates will be a little lower due to the inclusion of these young adults.

The AusDiab study is eight years old, and the prevalence of overweight and obesity in adults is likely to have increased, in line with the significant increase of overweigh and obesity reported by the BEACH study from 1998–00 to 2006–08. The 2007–08 NHS collected both self-reported and measured height and weight data from all respondents, so these new NHS results reported in May 2009[15] clearly show the continued increase in prevalence of overweight and obesity, and the differences between self-reported and measured BMI.

Prevalence of overweight and obesity in adults has increased over the 10 years to 2008, and the high rates pose a huge public health problem. The Australian Government has recognised overweight and obesity as a major public health problem that needs to be tackled[7], and is allocating resources towards further research and public health campaigns.[10]

Even though estimates of current prevalence from BEACH show that a significantly greater proportion of adult males attending general practice are overweight/obese than female adults, the female adults are more likely than males to be severely obese. This may have implications for any policy initiatives. Those specifically aimed at obese adults should be aimed at both sexes—but additional focus to severe obesity in women may also be beneficial.

The current BEACH prevalence of overweight and obesity in children aged 2–17 years is 28.7%. In contrast, the 2004 NSW SPANS study (based on measured height and weight), estimated about 24% of children aged 5–16 years were overweight or obese.[21] The more recent 2007 Children's Survey (based on interviewer-measured height and weight) estimated 23% of children aged 2–16 years were either overweight (17%) or obese (6%).[22] SPANS and the Children's Survey report similar prevalence of overweight and obesity in children; however, neither provides confidence intervals around these prevalence estimates, making it impossible to assess whether these estimates and those of BEACH are statistically significantly different. The recently published 2007–08 NHS indicate that 25% of children aged 5–17 years were overweight (17%) or obese (7.8%) based on measured data.

BEACH data report a higher current prevalence than SPANS, the Children's Survey and the 2007–08 NHS, which would be explained if the children attending general practice (a sample of whom are surveyed by BEACH) are more likely to be overweight and obese. The difference between BEACH and SPANS/Children's Survey/NHS would be further exacerbated if BEACH is underestimating overweight and obesity among children attending general practice due self- or carer-reported data, which tends to underestimate BMI.[14]

The SPANS study reports an increase in prevalence of overweight and obesity in school-aged boys between 1997 and 2004, but not among girls. The 2007 Children's Survey has similar estimates to the 2004 SPANS study, suggesting there has not be an increase in prevalence between 2004 and 2007.

BEACH suggests there was no change in prevalence of overweight and obesity in children aged 2–17 years between 1998 and 2008. It must be noted that BEACH data cover children who attend general practice and cannot be extrapolated to the total childhood population.

Regardless of whether prevalence of overweight and obesity in children is rising or static, the fact remains that the current prevalence of around 23% according to the Children's Survey, or 28.7% according to BEACH data, is alarmingly high, and an issue that definitely needs to be tackled. Certainly the prevalence among children attending general practice provides GPs with opportunities to intervene.

It is interesting to note that consultations with adults were significantly longer for those classified as underweight or obese than for those classified as normal or overweight. This has workforce implications for the already heavily burdened GP population. As the proportion of the adult population classified as obese increases, so too will the workload of GPs. In 2008, obesity was announced as a National Health Priority Area[7], and a recent Australian Government media release suggested a review of the Medicare schedule with consideration of new incentive items encouraging longer consultations.[29] Such initiatives, although welcomed by many, will place further pressure on the already stretched GP workforce, particularly in rural areas.

It is well documented that infertility is related to overweight and obesity.[30,31] The use of assisted reproductive technologies and in-vitro-fertilisation in Australia are increasing.[32] These techniques are heavily Medicare subsidised, and contribute significantly to Australian Government health spending. Similarly overweight and obesity are major risk factors for other chronic conditions including Type 2 diabetes, cardiovascular disease and cancer[2], and have a huge impact on health spending. Any policies and initiatives that are successful in reducing the prevalence of overweight and obesity in Australian adults will directly contribute to reducing Australian Government health spending.

Britt et al. investigated the occurrence of patient multimorbidities in BEACH SAND but this initial work did not include obesity as a morbidity domain.[33] Further SAND data collection on multimorbidity currently in the field includes 'Obesity (BMI>30)' as a morbidity domain, so prevalence of specific comorbidities of obesity could be reported at a future time.

The Australian Governments plans to expand and enhance research capacity in the area of overweight and obesity by partially funding the newly created Centre for Obesity, Diabetes and Cardiovascular Disease at the University of Sydney, due for completion by 2013.[11] The substantial funding provided in December 2008 by a fast-tracked Australian Government grant[10] again highlights the recognition of overweight as a major Australian public health problem needing immediate action.

## 7.7 Conclusion

The prevalence of overweight and obesity in the populations of adults and children attending general practice in Australia are high, in line with international trends. The Australian Government is in the process of formulating a coordinated and multifactorial approach to this major public health problem. The preventive health care approach being taken may be appropriate, but it remains to be seen what specific policies will be developed to tackle this important issue.

**Suggested chapter citation**

Valenti L 2009. Overweight and obesity. In: Britt H, Miller GC (eds). General practice activity in Australia, priorities and policies 1998 τo 2008. General practice series no. 24. Cat. no. GEP 24. Canberra: AIHW.

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# 8 Respiratory problems

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Respiratory problems include those affecting the nose, throat, larynx, trachea, bronchi, and lungs. They range from mild irritation to terminal conditions and are caused by numerous pathogens. Most of these problems will at some stage be presented to a GP, with a respiratory problem being managed at around 20% of all patient encounters (see Chapter 4).

## 8.1 Background

Over the decade to 2007–08, there have been several changes to national policy and primary care health service models for providing care to patients with respiratory problems. The focus has shifted somewhat from the historical model of reactive, acute care provided episodically, to incorporate preventive care. In July 2005, the policy framework of the MBS was changed to include 'Chronic disease management' items (721, 723, 725, 727, 729, 731)[1], replacing the Enhanced Primary Care Multidisciplinary Care Planning items (720, 722, 724, 726, 728), which were introduced in 1999.[2] These new items retained the multidisciplinary team care approach that include practice nurses and other health professionals (for example, the 'Team Care Arrangement'—item 723) but promote pre-emptive care.[3] While these items are non-specific and can apply to any chronic health problem, they can be used for chronic respiratory problems such as asthma and chronic obstructive pulmonary disease.[4]

Some respiratory problems, while acute in nature, have been focused on in policy areas because they are particularly debilitating, and because of their potential to affect a great proportion of the population. For example, complications from influenza can lead to pneumonia, hospitalisation, and in some cases, death. The National Influenza Vaccine Program for Older Australians, which began in 1998, was aimed at those aged 65 years and older, and those with certain chronic medical conditions, to receive influenza vaccine.[5] A similar program was introduced in January 2005, offering vaccination for pneumococcal disease to the same population groups (and to all infants born after this date).[6] These vaccinations are available free to the patient, and are supplied by the GP without the need for a prescription. The National Indigenous Pneumococcal and Influenza Program provides free influenza and pneumococcal vaccines for Aboriginal and Torres Strait Islander peoples aged 50 years and over, and those aged 15–49 years considered to be at high risk of complications and death because of other health problems.[7]

Asthma was included as one of the National Health Priority Areas in 1999. Given the key role GPs play in the management and monitoring of asthma, the Australian Government has funded initiatives encouraging GPs to improve patient care. The Asthma 3+ Visit Plan, introduced in 2001, and the Asthma Cycle of Care, which replaced it in November 2006, were both designed for patients with moderate to severe asthma. The Asthma 3+ Visit Plan involved patients being reviewed by their GP three times over a 4-month period. These reviews were difficult to achieve for both clinicians and patients.[8] The Asthma Cycle of Care involves at least two visits over a 12–month period, with specific activities that must be undertaken during those visits.[9] The Australian Government's funding of the Asthma Management Program, initiated in 2001, has supported the Asthma 3+ Visit plan and the Asthma Cycle of Care, as well as other initiatives such as the Australian System for

Monitoring Asthma, the Asthma Community Support and Grants Program, the Asthma Friendly Schools Program, and a range of public asthma awareness and professional education activities.[4] National strategic direction for asthma-focused initiatives since 2006 were outlined in the National Asthma Strategy 2006–2008. The strategy outlines objectives for raising community understanding of asthma, supporting consumer action and self-management, developing care models for priority population groups, improving integration of care, recognising networks, and improving understanding of the disease.[10]

Chronic obstructive pulmonary (also known as airways) disease (COPD) is the fourth leading cause of death in Australia and the fifth worldwide.[11] While there is increasing concern about the prevalence and burden of COPD both in Australia and internationally, prevalence data is scarce.[12-14] One international study focusing on city clusters from different nations reported that one in 10 Sydney residents aged over 40 years have COPD, with prevalence and severity increasing with age.[12] Another study estimated the national population prevalence (all ages) in Australia to be 2.3%.[15] There are similarities between COPD and asthma. They share similar symptoms and even the diagnostic test, reversibility of airflow limitation with bronchodilator use, does not completely distinguish the two entities.[16] Because of these similarities and the difficulty in diagnosing older people, it can be difficult to distinguish between the two where some elements of both diseases co-exist. Some researchers have reported evidence that COPD is under-diagnosed, and misdiagnosed as asthma.[17,18]

Although the growing concern about COPD has not brought about any specific changes in policy during recent years, the Australian Lung Foundation has been proactive in raising awareness and promoting early diagnosis to GPs and the public. In collaboration with the Thoracic Society of Australia and New Zealand, the foundation has developed and promoted evidence-based COPD-X guidelines for GP management of this condition. These guidelines are regularly updated and available on the foundation's website.[16]

Similarly, while there is national and international concern about the inappropriate use of antibiotics for respiratory conditions that are viral in aetiology, this situation has not been the focus of any national policy initiatives over the decade to 2007–08. However, guidelines for appropriate antibiotic use have been actively promoted in hospital, general practice, and community settings.[19-21] The National Prescribing Service runs educational campaigns to promote awareness to the public of the self-resolving nature of viral upper respiratory tract infections, and audit activities for GPs in an attempt to alter antibiotic prescribing behaviour of GPs.[22,23]

In this chapter, the most common respiratory problems managed by GP BEACH participants over the 10 years to 2007–08 will be reported, as will the most common medications used in the management of these conditions, to observe what changes have occurred over the period, and to check whether an effect of policy determinations can be detected in these changes. Aspects of the management of COPD and asthma will be discussed, as will the changes in antibiotic prescribing for the most common respiratory illnesses managed in general practice. In some cases, where condition-specific analyses were performed (for example, the prescribing rate of antibiotics for tonsillitis in children), a larger sample size was considered to give a more reliable estimate. In these cases, the first 2 years of BEACH data (1998–00) were combined and compared with the most recent 2 years of data (2006–08). In this chapter, some problem and concept labels include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). For a full list of inclusions see Appendix 3. Antibiotics included penicillins/cephalosporins, broad spectrum penicillins, tetracyclines, sulphonamides, and other selected antibiotics.

# 8.2 Most common respiratory problems managed

Despite a decrease in the management rate of respiratory problems over the decade, from 24.3 (95% CI: 23.6–25.0) per 100 encounters in 1998–99 to 19.4 (95% CI: 18.8–20.1) in 2007–08, these problems still represent a significant proportion of GP workload (Table 8.1).

Table 8.1 shows that upper respiratory tract infections (URTI) are still the most commonly managed respiratory problem in general practice. The management rate for URTI has remained stable at approximately 6 per 100 encounters. Generally, the most commonly managed respiratory problems had significant or marginal decreased management rates.

**Table 8.1: Management rates of respiratory problems, 1998–99 and 2007–08**

| | Rate per 100 encounters (95% CI) | | Percentage of all problems (95% CI) | | Percentage of respiratory problems | | |
|---|---|---|---|---|---|---|---|
| | **1998–99 (*n* = 96,901)** | **2007–08 (*n* = 95,898)** | **1998–99 (*n* = 140,824)** | **2007–08 (*n* = 145,078)** | **1998–99 (*n* = 23,554)** | **2007–08 (*n* = 18,641)** | **Change[(a)]** |
| **Respiratory—all (ICPC-2 rubric/group)** | **24.3 (23.6–25.0)** | **19.4 (18.8–20.1)** | **16.7 (16.2–17.2)** | **12.9 (12.4–13.3)** | **100.0** | **100.0** | **↓** |
| Upper respiratory tract infection | 6.8 (6.4–7.3) | 6.2 (5.7–6.7) | 4.7 | 4.1 | 28.1 | 31.9 | — |
| Acute bronchitis/ bronchiolitis | 3.3 (3.1–3.5) | 2.4 (2.2–2.6) | 2.3 | 1.6 | 13.5 | 12.4 | **↓** |
| Asthma | 3.2 (3.0–3.4) | 2.2 (2.0–2.3) | 2.2 | 1.4 | 13.1 | 11.2 | **↓** |
| Preventive immun/ vacc/meds—respiratory | 2.5 (2.1–2.9) | 1.8 (1.5–2.1) | 1.7 | 1.2 | 10.3 | 9.2 | ↓ |
| Sinusitis acute/chronic | 1.6 (1.4–1.7) | 1.3 (1.2–1.4) | 1.1 | 0.9 | 6.4 | 6.7 | ↓ |
| Tonsillitis | 1.5 (1.3–1.6) | 1.0 (0.9–1.1) | 1.0 | 0.6 | 6.0 | 5.0 | **↓** |
| Chronic obstructive pulmonary disease | 0.8 (0.7–0.9) | 0.8 (0.7–0.9) | 0.5 | 0.5 | 3.2 | 4.0 | — |
| Allergic rhinitis | 1.0 (0.9–1.1) | 0.6 (0.5–0.7) | 0.7 | 0.4 | 3.9 | 3.0 | **↓** |
| Cough | 0.6 (0.6–0.7) | 0.5 (0.5–0.6) | 0.4 | 0.4 | 2.6 | 2.7 | ↓ |
| Influenza | 0.5 (0.4–0.6) | 0.4 (0.3–0.5) | 0.3 | 0.3 | 1.9 | 2.1 | — |
| Respiratory infection, other | 0.5 (0.4–0.6) | 0.4 (0.3–0.5) | 0.3 | 0.3 | 2.0 | 1.9 | — |

(a) The direction and type of change is indicated for each variable: **↑**/**↓** indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

*Note*: CI—confidence interval; immun—immunisation; vacc—vaccination; meds—medications.

Significant decreases were noted in:

- acute bronchitis/bronchiolitis (ranked 2) decreased from 3.3 per 100 encounters to 2.4 per 100
- asthma (ranked 3) decreased from 3.2 per 100 to 2.2 per 100
- tonsillitis (ranked 6) decreased from 1.5 per 100 to 1.0 per 100
- allergic rhinitis (ranked 8) decreased from 1.0 to 0.6 per 100 (Table 8.1).

Marginal decreases were in:

- preventive respiratory immunisation/vaccinations (ranked 4), from 2.5 per 100 encounters to 1.8 per 100
- sinusitis (ranked 5), from 1.6 to 1.3 per 100
- cough (ranked 9), from 0.6 to 0.5 per 100 encounters (Table 8.1).

Apart from URTI, COPD was the only problem in the eight most frequently managed respiratory problems to remain unchanged (at 0.8 per 100 encounters) from 1998–99 to 2007–08. While the conditions listed in Table 8.1 show the results for two time points (that is, the beginning and end of a decade), the annual results for most of these conditions are reported elsewhere and show that these changes are linear trends over time.[24]

# 8.3 Influenza vaccinations

The total rate (per 100 encounters) of influenza vaccines (prescribed, supplied or advised) did not change significantly (2.6, 95% CI: 2.1–3.0 in 1998–99 compared with 1.9, 95% CI: 1.6–2.2 in 2007–08); however there was a shift in the provision mechanism. The rate of prescribed influenza vaccines significantly decreased, from 1.7 (95% CI: 1.4–2.1) per 100 encounters in 1998–99 to 0.4 (95% CI: 0.3–0.5) per 100 in 2007–08. In parallel there was a significant increase in GP-supplied influenza vaccines, from 0.8 (95% CI: 0.1–1.1) per 100 encounters in 1998–99 to 1.5 (95% CI: 1.2–1.7) per 100 in 2007–08. This probably reflects the increased awareness (through advertisement at introduction) and uptake of free vaccination available to those considered at risk.

However, while the National Influenza Vaccine Program for Older Australians began in 1999, the number of influenza vaccinations per 100 respiratory problems being prescribed rather than supplied, remained unchanged until 2003–04 (6.5 per 100 respiratory problems in 1998–99 compared with 5.2 per 100 in 2003–04). The shift from prescriptions to GP-supplied influenza vaccinations began from that year, with the prescription rate suddenly decreasing to 3.5 per 100 respiratory problems in 2004–05, and continuing the downward trend to the 2007–08 rate of 1.9 per 100 respiratory problems. The rise in GP-supplied influenza vaccinations coincided with these periods. It is possible that the introduction of the Pneumococcal Vaccine Program in January 2005, and its accompanying promotional campaign, may have affected the rate of vaccinations for both infections. The change from prescribed to GP supply for these vaccines is shown in Figure 8.1. As reported elsewhere[25], the decrease observed in 2007–08 coincided with an increase in influenza-like illness managed by GPs, the number of laboratory-confirmed notifications for influenza during that period being far higher than the 5 year mean, and the fact that unvaccinated people had much higher rates of illness than vaccinated people. Data from the first quarter of the 2008–09 BEACH year showed immunisation rates returning to the 2006–07 level.[25]

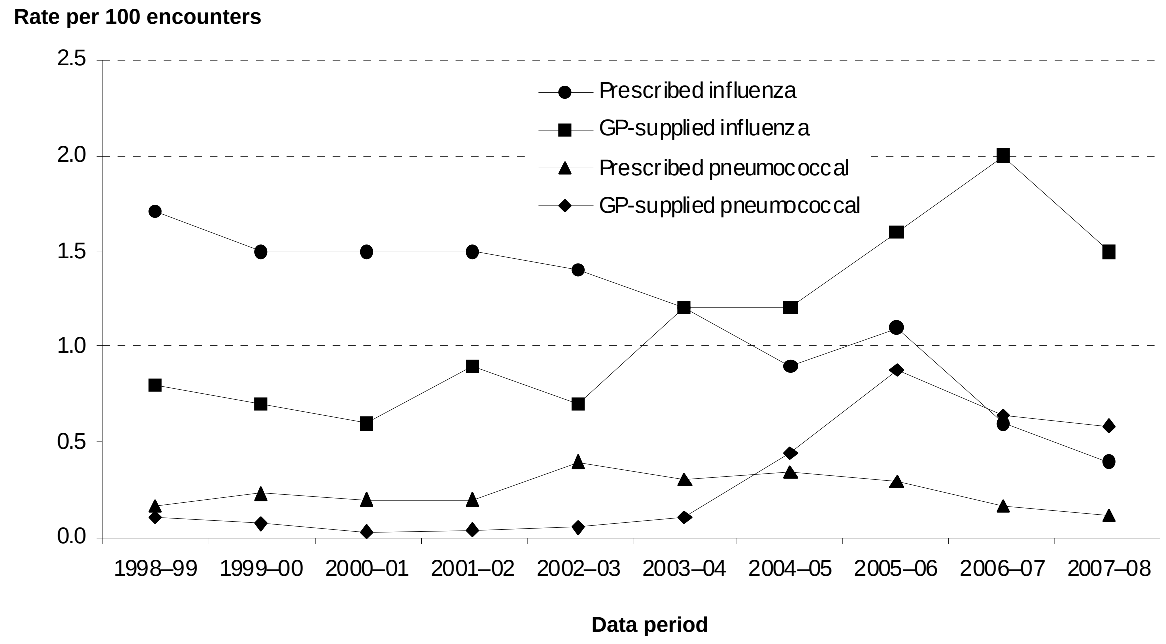


**Figure 8.1: Rates of prescribed and supplied influenza and pneumococcal vaccines**

# 8.4 Asthma

The designation of asthma as a national health priority reflects the political and health service concern regarding the impact of this problem in Australia. Since 1998, the prevalence of asthma has been investigated through nine SAND (Supplementary Analysis of Nominated Data) substudies in the BEACH program.[26,27] The SAND substudies occupy a section on the bottom of each BEACH encounter form, and are used to investigate aspects of patient health or health care delivery not managed at the general practice consultation (for description of SAND method, see Chapter 2). The time periods of these investigations, the prevalence reported, and sex-specific and age-specific prevalence are presented in Table 8.2.

The severity of asthma in adults and children, as defined by the National Asthma Council (Australia) is also presented for the SAND blocks including this information in Table 8.3.

There was no significant change in:

- the overall prevalence reported
- the prevalence among males, and among females
- the prevalence among adults, and among children
- the prevalence of each level of reported severity of asthma in children or in adults (severity levels were adapted from the National Asthma Council's *Asthma management handbook* 1998 edition, updated March 2002).

Among children, the point estimates in the 'persistent' group overall were very small. Though the estimate appears to take a sudden dive at the time of the introduction of the Asthma Cycle of Care Plan in late 2006 (there were no children in this severity category in the 2007 SAND sample) the consistently wide confidence intervals over all years make this an unreliable indicator.

There being no change in asthma prevalence among patients seen by GPs, it would be expected that there would be no change in the management rate of asthma in general practice over the time period. Yet the overall management rate for asthma significantly decreased from 3.2 to 2.2 per 100 encounters over the decade (Table 8.1). There was a marginal reduction at the time of asthma's inclusion as a National Health Priority Area (1999–00), and the decrease since 1998–99 became significant by the subsequent year (2000–01) when the Asthma 3+ Visit Plan was introduced. A further significant decrease was detected in 2004–05, and the management rate has since continued its downward trend.[24] This decrease coincided with the continued decrease in the mortality rates (declining since the late 1980s), the hospital admission rates (declining since the early 1990s) and emergency department visits attributed to asthma.[9] Nevertheless, asthma prevalence in Australia is persistently high by international standards, and is therefore a continuing health concern.

**Table 8.2: Summary of asthma prevalence estimates from SAND substudies, 1998–99 to 2007–08**

| SAND Abstract no. | Period | Sample size | Prevalence (Per cent) (95% CI) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Total | Adults (≥18) | Children (<18) | Males | Females |
| 3 | Mar–Jun 1999 | 4,285 | 14.7 (13.3–16.1) | 13.7 (12.2–15.1) | 19.6 (13.6–25.6) | 14.3 (12.0–16.6) | 14.9 (12.8–17.1) |
| 22 | Nov 2000–Jan 2001 | 5,495 | 12.8 (11.4–14.3) | 12.2 (10.6–13.7) | 16.4 (12.5–20.4) | 11.7 (9.6–13.9) | 13.5 (11.7–15.3) |
| 39 | Apr–May 2002 | 3,070 | 13.9 (12.0–15.7) | 12.8 (10.8–14.8) | 19.2 (12.2–26.2) | 13.4 (10.3–16.2) | 14.2 (11.6–16.8) |
| 48 | Sep–Oct 2002 | 2,686 | 14.5 (12.7–16.2) | 13.8 (12.0–15.7) | 17.9 (13.6–22.1) | 12.2 (9.9–14.4) | 16.1 (13.9–18.3) |
| 63 | Sep–Oct 2003 | 2,527 | 14.5 (12.6–16.4) | 14.2 (12.3–16.1) | 16.4 (12.0–20.8) | 12.7 (10.4–15.0) | 15.9 (13.5–18.2) |
| 70 | Jun–Jul 2004 | 7,919 | 13.0 (11.9–14.1) | 12.8 (11.7–14.0) | 14.3 (12.2–16.5) | 11.9 (10.6–13.3) | 13.6 (12.4–14.8) |
| 96 | Feb–Mar and May–June 2006 | 5,911 | 11.6 (10.6–12.7) | 11.3 (10.1–12.4) | 13.9 (11.5–16.3) | 11.1 (9.7–12.5) | 12.1 (10.8–13.3) |
| 104 | Sep–Oct 2006 | 2,862 | 15.4 (13.6–17.3) | 15.8 (13.9–17.8) | 12.7 (8.2–17.3) | 15.3 (12.7–17.9) | 15.5 (13.1–17.8) |
| 120 | Oct–Dec 2007 | 2,987 | 13.5 (11.9–14.7) | 13.0 (11.2–14.7) | 17.1 (12.7–21.4) | 12.4 (10.5–14.3) | 14.2 (12.0–16.4) |

*Note:* CI—confidence interval.

**Table 8.3: Summary of asthma severity from SAND substudies, 1998–99 to 2007–08**

| SAND Abstract no. | Period | Sample size | Children (<18 years) Infrequent | Children (<18 years) Frequent | Children (<18 years) Persistent | Adults (≥18 years) Very mild | Adults (≥18 years) Mild | Adults (≥18 years) Moderate | Adults (≥18 years) Severe |
|---|---|---|---|---|---|---|---|---|---|
| | | | Severity (Per cent, 95% CI) | | | | | | |
| 3 | Mar–Jun 1999 | 4,285 | 72.6 (63.8–77.3) *n = 98* | 22.2 (7.0–35.0) *n = 30* | 5.2 (0.0–46.2) *n = 7* | 34.3 (28.4–38.9) *n = 158* | 28.5 (22.6–33.3) *n = 131* | 28.9 (23.2–32.8) *n = 133* | 8.3 (0.0–19.1) *n = 38* |
| 22 | Nov 2000–Jan 2001 | 5,495 | 74.6 (66.1–83.1) *n = 88* | 20.3 (8.2–32.4) *n = 24* | 5.1 (0.0–22.1) *n = 6* | 42.7 (37.7–47.8) *n = 232* | 27.3 (22.8–31.7) *n = 148* | 24.5 (19.8–29.2) *n = 133* | 5.5 (0.0–13.2) *n = 30* |
| 39 | Apr–May 2002 | 3,070 | 82.5 (74.2–90.7) *n = 80* | 15.5 (0.0–44.3) *n = 15* | 2.1 (0.0–45.8) *n = 2* | 35.9 (30.5–41.3) *n = 112* | 31.4 (27.0–35.8) *n = 98* | 27.2 (22.0–32.4) *n = 85* | 5.5 (0.0–12.4) *n = 17* |
| 48 | Sep–Oct 2002 | 2,686 | Severity not available—data not collected | | | | | | |
| 63 | Sep–Oct 2003 | 2,527 | 77.4 (64.7–90.1) *n = 41* | 15.1 (4.2–26.0) *n = 8* | 7.6 (0.0–16.5) *n = 4* | 31.1 (24.7–37.6) *n = 94* | 40.7 (33.9–47.5) *n = 123* | 22.2 (16.5–27.9) *n = 67* | 6.0 (2.7–9.2) *n = 18* |
| 70 | June–July, and Sep–Dec 2004 | 7,919 | 78.0 (71.1–85.0) *n = 103* | 14.4 (8.5–20.3) *n = 19* | 7.6 (3.1–12.0) *n = 10* | 37.1 (33.0–41.2) *n = 285* | 34.0 (30.2–37.8) *n = 261* | 24.0 (20.5–27.4) *n = 184* | 5.0 (3.4–6.5) *n = 38* |
| 96 | Feb–March and May–June 2006 | 5,911 | 76.8 (67.1–86.6) *n = 63* | 22.0 (12.1–31.8) *n = 18* | 1.2 (0.0–3.6) *n = 1* | 34.8 (29.8–39.8) *n = 175* | 34.4 (29.7–39.1) *n = 173* | 24.0 (20.5–27.4) *n = 140* | 5.0 (3.4–6.5) *n = 15* |
| 104 | Sep–Oct 2006 | 2,862 | Severity not available—data not collected | | | | | | |
| 120 | Oct–Dec 2007 | 2,987 | 80.6 (71.0–90.2) *n = 54* | 19.4 (9.8–29.0) *n = 13* | 0.0 (–) *n = 0* | 42.7 (36.2–49.2) *n = 141* | 29.4 (24.4–34.4) *n = 97* | 22.1 (16.8–27.5) *n = 73* | 5.8 (3.1–8.4) *n = 19* |

*Note:* CI—confidence interval.

## Medications for asthma management

There were no significant changes in the age or sex distribution of patients who had asthma managed at the encounter, or for patients in any measured population subgroup (for example, Indigenous patients, patients of Non-English–speaking background, Commonwealth concession cardholders). There were also no changes in the rate per 100 asthma problems considered to be new, or work-related. A number of medications, such as short-acting beta-agonists, are used to treat a variety of respiratory problems, including asthma and COPD. In this section, the medications discussed and the changes noted refer specifically to their use for the management of asthma; that is, these are the medications reported by the GP as being prescribed, supplied or advised for over-the-counter purchase, where asthma was the problem being managed at the encounter.

Between 1998–99 and 2007–08, there was a significant decrease in the rate of total medications prescribed, supplied or advised by GPs for asthma management. The bulk of this change was associated with the significant reduction in the rate of prescribed medications (Table 8.4).

Since 1985, short-acting beta-agonists have been available for over-the-counter purchase from pharmacies, rather than being available only on prescription.[28] In 1990–91, results from the Australian Morbidity and Treatment Survey showed that 35.7% of total respiratory prescriptions by GPs were for the short-acting beta-agonist, salbutamol (Ventolin™).[29] However, by the start of BEACH in 1998–99, salbutamol comprised only 10.7% of prescriptions for respiratory problems. During this 8-year period, the asthma management rate by GPs fell by 0.5 (from 3.7 to 3.2) per 100 encounters.[30] This has led to some conjecture that the reduction in the management, and any change in the prescribing rate for asthma medications overall, may be the result of patients self-medicating with reliever medications rather than seeking GP-guided management. Unless the patients are in a position where the prescribed bronchodilator is less expensive (that is, they have a Commonwealth concession card), it may be more cost effective for them to purchase these products from their pharmacist rather than undergo the time and cost involved in seeking a GP consultation, especially if their GP does not bulk-bill. There may be consequences to not seeking GP management of which patients are unaware—Gibson et al. reported that those who purchased inhalers without prescription were about 3 times more likely to be under-treated compared with those who usually obtained inhalers by prescription.[28]

The overall prescribing rate of salbutamol significantly decreased over the 10 years, from 2.4 per 100 encounters (95% CI: 2.2–2.6) to 1.3 per 100 (95% CI: 1.2–1.5), but the decrease was gradual, with no year being significantly different from the one preceding it, or subsequent to it (results not tabulated). GP advice for over-the-counter purchase of salbutamol occurred at fewer than 0.1% of encounters in any year—in any case, an event that would most likely occur only once per patient—and there has been no change over the decade in the rate of this medication being supplied to the patient by the GP. Salbutamol prescribing specifically for asthma problems also significantly decreased over the 10 years, from 51.4 per 100 asthma problems in 1998–99 to 40.1 per 100 asthma problems in 2007–08 (Table 8.4a), again with no change in rates of GP advice or supply. The increase in awareness throughout the decade that salbutamol could be purchased from a pharmacist without prescription may have influenced the presentation rate for asthma management to some extent. Another influence is concern about the possible adverse effect of regular salbutamol use in the 1990s[31], which resulted in a change in regimen from two puffs, four times per day, to two puffs when required. The rate of use reflects the level of asthma severity and control. Salbutamol requirement would decline as asthma control improves, as would the need to visit a GP.

Changes in the rates of the most often prescribed medications for asthma management are shown in Table 8.4a. The prescribing rate of several bronchodilators (salbutamol, terbutaline, ipratropium, salmeterol) decreased significantly over the 10 years per 100 asthma problems managed. Some of this reduction will be due to the availability without prescription of some short-acting beta-agonists, and some appears to have been associated with the uptake of a combination product, since inhaled corticosteroids (ICS) in combination with long-acting beta-agonists (LABA) have become available (since 2000). Improved asthma control from the use of ICS and ICS/LABA combinations will also have reduced the need for salbutamol.

The most obvious change in ICS use is the move toward combination products—the prescribing rate for beclomethasone decreased significantly in favour of other ICSs available in combination with a bronchodilator (Table 8.4a). The prescribing rate for budesonide as a single product significantly decreased, with a move towards the prescribing of budesonide in combination with eformoterol. The greatest increase has been in the prescribing of fluticasone—it has maintained its prescription rate as a single product, but in combination with salmeterol, is being prescribed at more than one in four asthma problem contacts.

**Table 8.4a: Changes in prescribing rates of common generic medications for asthma, 1998–99 and 2007–08**

| Medication | Rate per 100 asthma problems (95% CI) 1998–99 (*n* = 3,079) | | 2007–08 (*n* = 2,088) | | Change[(a)] |
|---|---|---|---|---|---|
| Medications | 150.4 | (145.0–155.8) | 128.9 | (124.3–133.5) | ↓ |
| Prescribed meds (by ATC Level 4) | 143.4 | (137.9–148.9) | 122.3 | (117.5–127.2) | ↓ |
| Bronchodilators—short-acting | | | | | |
| Salbutamol | 51.4 | (48.5–54.4) | 40.1 | (37.1–43.1) | ↓ |
| Terbutaline | 8.5 | (7.3–9.7) | 2.7 | (2.0–3.5) | ↓ |
| Ipratropium | 9.9 | (8.4–11.4) | 1.9 | (1.2–2.6) | ↓ |
| Bronchodilator—long-acting | | | | | |
| Salmeterol | 3.2 | (2.4–3.9) | 0.4 | (0.1–0.8) | ↓ |
| Inhaled corticosteroids +/–LABA | | | | | |
| Beclomethasone | 16.4 | (14.6–18.1) | 0.7 | (0.3–1.1) | ↓ |
| Budesonide | 14.7 | (13.0–16.3) | 3.0 | (2.2–3.8) | ↓ |
| Budesonide/Eformoterol | N/A | N/A | 11.3 | (9.5–13.1) | ↑ |
| Fluticasone | 7.7 | (6.2–9.2) | 7.4 | (5.9–8.9) | — |
| Fluticasone/Salmeterol | N/A | N/A | 26.8 | (24.2–29.3) | ↑ |

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval; meds—medications; ATC—Anatomical Therapeutic Chemical classification; LABA—long-acting beta-agonist; N/A— Not applicable as combination product not available in 1998–99.

The National Asthma Council Australia's recommendations for therapy in adults are that the combination of budesonide plus eformoterol can be used either as maintenance therapy, or maintenance and reliever therapy, with the combination of fluticasone plus salmeterol to be used as maintenance therapy only. Assuming that these products are being prescribed appropriately, it appears that there has been an increase in the use of asthma maintenance therapy over time. This evidence, in combination with the decreased management rates, decreased mortality rates, and decreased hospitalisation and emergency room presentation rates attributed to asthma, suggest that asthma is being better controlled among Australian patients than it was in 1998–99.

For asthma management in children, the National Asthma Council Australia's recommendation is for infrequent episodes to be managed with bronchodilators as needed, and that long-term preventive medications are not required. To investigate whether the changes in ICS use noted in Table 8.4a differed between adults and children, they were analysed separately. The results for children (aged under 18 years) and adults (18 years and older) are presented in Table 8.4b. The observed changes applied to both adults and children, with the exception of fluticasone alone, where prescriptions for adults significantly decreased, but for children, significantly increased over the decade. It is possible that the children being managed with this ICS are those with more persistent asthma, but this cannot be concluded, as severity levels were unavailable for these data. It is also likely that children are more likely to be managed by fluticasone or budesonide alone, whereas adults are more likely to be prescribed an ICS/LABA combination product.

**Table 8.4b: Changes in rates of most frequently prescribed medications for asthma, adults and children—generic level, 1998–99 to 2007–08**

| | Rate per 100 asthma problems (95% CI) | | | | | |
|---|---|---|---|---|---|---|
| | Adults | | | Children | | |
| Medication | 1998–99 (*n* = 1,951) | 2007–08 (*n* = 1,456) | Change[(a)] | 1998–99 (*n* = 1,114) | 2007–08 (*n* = 614) | Change[(a)] |
| Bronchodilators | | | | | | |
| Short-acting | | | | | | |
| Salbutamol | 50.0 (48.5–54.4) | 36.0 (32.7–39.3) | ↓ | 53.8 (49.0–58.5) | 49.3 (43.7–54.9) | ↓ |
| Terbutaline | 7.7 (6.3–9.1) | 3.5 (2.5–4.5) | ↓ | 10.6 (7.8–12.3) | 0.9 (0.1–1.7) | ↓ |
| Ipratropium | 11.1 (9.3–12.8) | 1.5 (0.9–2.3) | ↓ | 7.8 (5.4–10.1) | 2.6 (1.0–4.2) | ↓ |
| Long-acting | | | | | | |
| Salmeterol | 4.6 (3.6–5.7) | 0.4 (0.1–0.8) | ↓ | 0.7 (0.2–1.2) | 0.4 (†) | ↓ |
| Inhaled corticosteroids +/–LABA | | | | | | |
| Beclomethasone | 18.4 (16.1–20.6) | 0.8 (0.3–1.3) | ↓ | 12.9 (10.2–15.5) | 0.4 (†) | ↓ |
| Budesonide | 16.8 (14.7–18.8) | 3.7 (2.7–4.8) | ↓ | 11.1 (8.6–13.5) | 1.0 (0.0–2.0) | ↓ |
| Budesonide/Eformoterol | N/A | 13.7 (11.5–16.0) | N/A | N/A | 5.6 (3.2–8.0) | N/A |
| Fluticasone | 8.9 (7.0–10.7) | 5.0 (3.6–6.3) | ↓ | 5.7 (3.4–7.9) | 12.9 (9.8–16.1) | ↑ |
| Fluticasone/Salmeterol | N/A | 29.4 (26.6–32.3) | N/A | N/A | 20.7 (16.1–25.2) | N/A |

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

† Fewer than three observations—CI not provided as data were insufficient to calculate a meaningful estimate.

Note: CI—confidence interval; LABA—long-acting beta-agonist; N/A—Not applicable as combination product not available in 1998–99.

# 8.5 Chronic obstructive pulmonary disease

Chronic obstructive pulmonary (airways) disease (COPD) was the eighth most frequently managed respiratory problem in 1998–99, moving to seventh place in 2007–08. However, there was no change in the management rate over the period, at a rate of 0.8 per 100 encounters (95% CI: 0.7–0.9) in 1998–99 and 2007–08.[24] In both years there were significantly more males (about 60%) than females (about 40%) managed for the condition, and the management rate for men was significantly higher than for women, which is in itself unusual, given that about 60% of general practice patients are female. However, between 1998–99 and 2007–08 there were no significant changes in the age-specific management rates of COPD for any age group, or in the proportions of patients managed for COPD who were:

- males, or females
- in any age group
- in any measured population subgroups (for example, Indigenous patients, patients from non-English-speaking backgrounds, Commonwealth concession cardholders).

There was a significant decrease in the proportion of patients managed for COPD who were Repatriation health cardholders. However, this was a reflection of the overall decreased attendance rate of patients with Repatriation health cards—2.8 per 100 encounters (95% CI: 2.5–3.0) in 2007–08 compared with 3.4 per 100 (95% CI: 3.1–3.6) in 1998–99.[24]

Table 8.5 summarises the presentation and management of COPD over the decade. There was a significant increase in the proportion of COPD problem contacts that were with new cases, and a significant decrease in the proportion of COPD problem contacts that were follow-up consultations (for previously diagnosed problems).

There were few significant changes in the other problems managed at encounters with COPD problems, but of note were:

- heart failure, which decreased from 7.5 per 100 COPD encounters (95% CI: 4.6–10.4) to 3.1 (95% CI: 1.8–4.3) per 100 COPD encounters
- asthma, which decreased from 3.4 per 100 COPD encounters (95% CI: 1.7–5.2) to 0.9 (95% CI: 0.1–1.6) per 100
- lipid disorders, which increased from 1.7 per 100 COPD encounters (95% CI: 0.8–2.7) in 1998–99 to 4.8 (95% CI: 3.1–6.5) per 100 in 2007–08.

The decrease in asthma management as a comorbid condition at COPD encounters parallels the overall decrease in the management rate of asthma for all patients. The decrease in asthma as a comorbidity in COPD, and the increase in new COPD problems being detected, does not support the theory that GPs are misdiagnosing COPD as asthma, although there may be cases where illness first presenting with asthma-type symptoms and labelled as asthma has since been confirmed as COPD, and the diagnosis changed accordingly.

The total medication rate for COPD problems also decreased, due to the decrease in the rate of prescribed medications over the 10-year period, from 138.7 to 115.4 per 100 COPD problem contacts. The greatest change in prescribed medication was the uptake of the long-acting anticholinergic, tiotropium, since its introduction to the market in December 2002, now being prescribed at a rate of 28.8 per 100 COPD problems managed. GP prescribing behaviour reflects that recommended in the most recent COPD-X guidelines.[16] The switch to long-acting bronchodilators (which includes increased prescription of combination LABA/ICS referred to below) was associated with a parallel decrease in prescription of short-acting bronchodilators, both beta-agonists (salbutamol and terbutaline) and anti-cholinergic (ipratropium). There has also been a shift from prescribing inhaled corticosteroids (for example, budesonide, beclomethasone, fluticasone) and long-acting beta-agonists (particularly salmeterol) as a single product, in favour of prescribing long-acting beta-agonists in combination with an inhaled corticosteroid (fluticasone/salmeterol and budesonide/eformoterol) (Table 8.5).

There was a significant increase in the prescribing rate of amoxycillin for COPD. Antibiotics have been shown to be effective for patients with acute exacerbations of COPD characterised by increased dyspnoea, increased sputum volume and sputum purulence.[32] Where antibiotics are indicated, Therapeutic Guidelines recommend amoxycillin[32], so it would appear that the selection of antibiotic is appropriate where GPs determine that this treatment is required.

Australian Lung Foundation guidelines[16] recommend an annual influenza vaccine as part of the prevention of deterioration strategy—the rate of influenza vaccine as a prescribed medication at encounters where COPD was managed did not change over time, but as previously discussed, these vaccinations were most likely GP-supplied under the policy guidelines for older patients and those at risk through chronic illness.

While there was no change in the rate at which clinical treatments (such as advice and education) were provided for COPD problems, there was a significant increase in the rate of procedures undertaken, from 2.6 (95% CI: 1.4–3.8) in 1998–99 to 8.1 (95% CI: 5.7–10.4) per 100 COPD problems in 2007–08. The main contributor to this change was the provision of physical function tests (for example, FEV-1, lung function, peak flow, spirometry), which increased dramatically over the decade, from 1.4 (95% CI: 0.6–2.2) per 100 COPD problems in 1998–99 to 4.6 per 100 (95% CI: 2.7–6.5) in 2007–08. The Australian Lung Foundation guidelines state that spirometry is the gold standard for finding new cases of COPD, and the increase of new cases between 1998–99 and 2007–08 coincides with the increase in testing, suggesting an effect of increased testing on the rates of newly diagnosed cases of COPD.

Over the period, there were no significant changes in rates of referrals overall, or to any specific service or speciality, nor in rates of pathology or imaging ordered per 100 COPD problems managed.

**Table 8.5: Presentations of new cases and management of COPD, 1998–99 and 2007–08**

| | **1998–99 (*n* = 759)** | | **2007–08 (*n* = 744)** | | |
|---|---|---|---|---|---|
| Variable | **Percentage of COPD encounters** | **(95% CI)** | **Percentage of COPD encounters** | **(95% CI)** | **Change[(a)]** |
| New problems | 6.5 | (4.6–8.4) | 15.5 | (12.3–18.8) | ↑ |
| **Managements** | **Rate per 100 COPD problems** | | **Rate per 100 COPD problems** | | |
| Medications (total) | 143.0 | (130.1–155.9) | 119.4 | (110.7–128.1) | ↓ |
| Prescribed medications | 138.7 | (125.5–151.8) | 115.4 | (106.7–124.2) | ↓ |
| Tiotropium | N/A | N/A | 28.8 | (24.9–32.6) | ↑ |
| Salbutamol | 38.3 | (33.3–43.2) | 18.9 | (15.2–22.5) | ↓ |
| Fluticasone/salmeterol | N/A | N/A | 14.5 | (11.1–18.0) | ↑ |
| Amoxycillin/potassium clavulanate | 1.9 | (0.3–3.4) | 6.0 | (3.9.–8.1) | ↑ |
| Ipratropium inhaled | 27.9 | (23.4–32.3) | 3.8 | (2.0–5.4) | ↓ |
| Budesonide | 10.3 | (7.2–13.4) | 1.6 | (0.4–2.8) | ↓ |
| Beclomethasone | 9.7 | (7.3–12.0) | 0.1 | (0.0–1.9) | ↓ |
| Budesonide/eformoterol | N/A | N/A | 5.9 | (3.9–7.9) | ↑ |
| Fluticasone propionate | 5.0 | (3.2–6.7) | 1.5 | (0.5–2.6) | ↓ |
| Terbutaline | 4.5 | (2.8–6.1) | 1.3 | (0.3–2.3) | ↓ |
| Salmeterol | 4.3 | (2.8–5.9) | 0.4 | (†) | ↓ |
| Influenza virus vaccine | 1.2 | (0.0–2.3) | 0.5 | (0.0–1.0) | — |
| Other treatments—procedural | 2.6 | (1.4–3.8) | 8.1 | (5.7–10.4) | ↑ |
| Physical (respiratory) function test | 1.4 | (0.6–2.2) | 4.6 | (2.7–6.5) | ↑ |

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—CI not provided as data were insufficient to calculate a meaningful estimate.

*Note*: COPD—chronic obstructive pulmonary disease; CI—confidence interval; N/A—not applicable as product not available in 1998–99.

## 8.6 Antibiotic use in respiratory problems

Between 1998–00 and 2006–08, the overall antibiotic prescribing rate decreased significantly from 15.8 per 100 encounters (95% CI: 15.5–16.2) to 13.5 per 100 encounters (95% CI: 13.1–13.8). In 2006, Pan et al. reported that the antibiotic prescribing rate had decreased by 24.3% between 1990–91 and 2002–03, from 18.9 to 14.3 prescriptions per 100 encounters.[33] The downward trend has continued since 2003. However, the previous study found that the decrease in prescribing rates was selective. It was not consistent across age groups or indications, and was greater among children than adults. The conditions examined by Pan et al. for both adults and children are investigated again in this report to determine any further change in prescribing rates for these conditions since 2003. The conditions were:

- all respiratory problems
- acute bronchitis/bronchiolitis
- upper respiratory tract infection
- sinusitis (acute or chronic)
- acute otitis media/myringitis
- tonsillitis.

The management rate per 100 encounters for all respiratory problems decreased significantly between 1998–00 and 2006–08, as did the management of acute bronchitis/bronchiolitis, acute otitis media/myringitis, and tonsillitis. There was a marginal decrease in the management rate of sinusitis, while the management of upper respiratory tract infections remained unchanged.[24]

The Therapeutic Guidelines state that the benefits of antibiotic therapy for a range of respiratory conditions are more limited than previously thought and, consequently, routine use of antibiotics in these conditions should be avoided to limit potential adverse effects and to reduce selection of bacterial resistance, both in individuals and in the community.[32]

Antibiotic prescribing for all respiratory problems decreased significantly for children over the period but remained constant for adults. The antibiotic prescribing rates for children with each of these conditions are presented in Table 8.6 and, and for adults in Table 8.7.

### Acute bronchitis/bronchiolitis

For acute bronchitis and bronchiolitis, the Therapeutic Guidelines recommend that, as these conditions are most often viral, they usually do not require antibiotic therapy, with only symptomatic care needed in most cases. The guidelines state that randomised controlled trials show antibiotic therapy to provide at most a marginal benefit (less than 1 day for symptom resolution) and may cause harm. Use is recommended in very ill younger children while viral identification takes place, or if unusually severe illness suggests the possibility of secondary bacterial infection.[32]

While the prescribing rate of antibiotics for children with acute bronchitis/bronchiolitis remained unchanged over the time period (Table 8.6), the prescribing rate for adults significantly increased, from 82.1 prescriptions per 100 bronchitis/bronchiolitis problems to 86.7 (Table 8.7).

## Upper respiratory tract infections

Upper respiratory tract infections (URTI) are mostly viral in origin, and although they may result in secondary infection that could benefit from antibiotic therapy (where the cause is bacterial), the initial infection does not require an antibiotic in most cases.[32]

While the antibiotic prescribing rate for URTI decreased significantly for both adults and children in 2006–08, one in five children still received an antibiotic for this condition. For adults, more than one in three received an antibiotic prescription in 2006–08, although this had reduced from almost one in two since 1998–00. The efforts being made to advise the public and clinicians of the inappropriate use of antibiotics for URTI are having some positive impact[23], but clearly more education is required in the area of antibiotic prescribing for adults. A flow chart describing management of URTI in 2007–08 is provided in Figure 8.2.

## Sinusitis

Sinusitis often occurs with viral infection or allergy and requires no antibacterial treatment. Oral or topical decongestants are useful for symptom relief, as are oral analgesics (for example, paracetamol) for pain relief. In up to 5% of cases, acute bacterial sinusitis may occur, and some benefit may result from antibiotic use (for example, shortened duration of illness), but spontaneous resolution of symptoms is common in 70% of cases. The Therapeutic Guidelines recommend antibiotic therapy in severe cases displaying at least three of the following features: persistent mucopurulent nasal discharge (more than 7 to 10 days); facial pain; poor response to decongestants; tenderness over the sinuses, especially unilateral maxillary tenderness; and tenderness on percussion of maxillary molar and premolar teeth that cannot be attributed to a single tooth. Acute infective exacerbations of chronic sinusitis should be managed in the same way as acute bacterial sinusitis, but with more prolonged courses of antibiotic therapy.[32]

Between 1998–00 and 2006–08, the antibiotic prescribing rate increased significantly for both children and adults with acute/chronic sinusitis—four out of five patients, either children or adults managed for sinusitis received an antibiotic prescription in 2006–08.

## Acute otitis media/myringitis

Many children with viral upper respiratory tract infection have accompanying mild inflammation of the middle ear, with visible reddening and dullness of the tympanic membrane. Acute otitis media may be either viral or bacterial, but is usually a self-limiting disease, and antibiotics are usually unnecessary in children who do not have systemic features (vomiting and fever). The therapeutic guidelines recommend that, in some cases, a prescription for potential (delayed) antibiotic treatment, accompanied by clear instructions for use and/or clinical review and disposal of an unused prescription, may be useful. For children aged over 2 years, treatment of symptoms for the first 2 days is recommended, with re-evaluation and antibiotic treatment considered if symptoms persist. Children between 6 months and 2 years should be managed in the same way, except with review after 24 hours, when antibiotics or referral should be considered. For children aged less than 6 months, treatment with antibiotics is recommended. For adults, acute otitis media should be treated the same way as in children.[32]

The antibiotic prescribing rate for both adults and children increased significantly between 1998–00 and 2006–08, with four out of five patients managed for acute otitis media/myringitis in either age group, receiving an antibiotic prescription.

## Tonsillitis

Acute tonsillitis may be either viral or bacterial in etiology. Viral and bacterial causes of sore throat are difficult to distinguish at clinical observation. A bacterial cause (most likely Streptococcus pyogenes) of acute sore throat is more common in children aged 3–13 years (30% to 40%) than in children aged less than 3 years (5% to 10%) or adults (5% to 15%). Frequent recurrences are not usually caused by bacteria, so the long-term use of antibiotics is likely to be very limited. Antibiotic use is recommended where tonsillitis displays the four diagnostic features suggestive of Streptococcus pyogenes infection (fever of more than 38 ºC, tender cervical lymphadenopathy, tonsillar exudate, and no cough).[32]

Between 1998–00 and 2006–08, there was no change in the prescribing rate of antibiotics for tonsillitis, in either children or adults. For both age groups, an antibiotic was prescribed for over 90% of problems diagnosed as tonsillitis.

**Table 8.6: Antibiotic prescribing rates per 100 selected problems managed at encounters with children (aged less than 15 years), 1998–00 and 2006–08**

| | 1998–00 | | 2006–08 | | |
|---|---|---|---|---|---|
| **Selected problems** | **Number of problems** | **Rate per 100 problems (95% CI)** | **Number of problems** | **Rate per 100 problems (95% CI)** | **Change[(a)]** |
| R70–99 (respiratory diseases) | 10,720 | 37.8 (36.4–39.2) | 7,116 | 32.9 (31.4–34.5) | ↓ |
| Acute bronchitis/bronchiolitis | 1,325 | 66.6 (63.4–69.7) | 730 | 65.8 (61.5–70.0) | — |
| Acute upper respiratory infection | 4,769 | 28.0 (26.0–29.9) | 3,646 | 21.0 (19.1–23.0) | ↓ |
| Sinusitis acute/chronic | 261 | 73.9 (68.2–79.7) | 124 | 86.3 (79.9–92.7) | ↑ |
| Acute otitis media/myringitis | 2,298 | 77.5 (75.6–79.4) | 1,461 | 82.2 (80.0–84.4) | ↑ |
| Tonsillitis | 1,346 | 87.8 (85.9–89.8) | 779 | 90.2 (88.0–92.5) | — |

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval.

**Table 8.7: Antibiotic prescribing rates per 100 selected problems managed at encounters with adults (aged 15 years and over), 1998–00 and 2006–08**

| | 1998–00 | | 2006–08 | | |
|---|---|---|---|---|---|
| Selected problems | Number of problems | Rate per 100 problems (95% CI) | Number of problems | Rate per 100 problems (95% CI) | Change[(a)] |
| R70–99 (respiratory diseases) | 28,427 | 45.8 (44.9–46.8) | 21,532 | 46.7 (45.6–47.8) | — |
| Acute bronchitis/bronchiolitis | 4,726 | 82.1 (80.7–83.5) | 3,405 | 86.7 (85.1–88.3) | ↑ |
| Acute upper respiratory infection | 7,942 | 44.4 (42.4–46.3) | 6,545 | 36.8 (34.6–39.0) | ↓ |
| Sinusitis acute/chronic | 2,800 | 74.9 (73.0–76.8) | 2,404 | 80.1 (78.2–82.0) | ↑ |
| Acute otitis media/myringitis | 884 | 72.5 (69.4–75.6) | 588 | 82.7 (79.4–85.9) | ↑ |
| Tonsillitis | 1,296 | 93.9 (91.7–96.1) | 1,002 | 95.5 (93.2–97.8) | — |

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval.

## Summary

- The results found by Pan et al. in 2006 are supported here. There was a significant decrease in overall antibiotic prescribing, and this decrease was greater among children than adults.
- Antibiotic prescribing for children with acute bronchitis/bronchiolitis had decreased between 1990–91 and 2002–03, but has remained steady with no further change in the following 5 years.
- There was no change in antibiotic prescribing for adults with this condition in the previous study, but since then the prescribing rate has increased significantly.
- A significant increase was also observed for adults with acute otitis media—the prescribing rate had not increased by 2002–03, but has done so since then.
- For children with acute otitis media, the antibiotic prescribing rate increased significantly over the decade, but has increased no further since 2002–03.
- Antibiotic prescribing for sinusitis increased significantly for adults over the decade, but has not done so since 2002–03. However, the rate for children with sinusitis, unchanged between 1998–99 and 2002–03, is now significantly higher.
- For both adults and children with upper respiratory tract infection, the antibiotic prescribing rate decreased significantly over the decade, but the level is no further reduced since that observed in 2002–03.
- For tonsillitis, no significant changes were observed in either age group, in either the 2002–03 or this analysis.

These results may appear disheartening for those promoting more judicious use of antibiotics, but it should be remembered that the management rate for most of these conditions has decreased significantly over the decade. Where patients do present for treatment, many of them may have waited to see if the condition would resolve, and may well need antibiotics by the time they decide to seek treatment. It should also be remembered that for this condition, the Therapeutic Guidelines recommend offering a prescription for delayed treatment in some circumstances, a proportion of which may never be filled.

## 8.7 Upper respiratory tract infection (URTI)

URTI is commonly managed in general practice, with 5,943 recorded occurrences of the problem, a management rate of 6.2 per 100 encounters with patients in the 2007–08 period (Figure 8.2). This represents approximately 6.8 million encounters at which URTI was managed in general practice across Australia in that year.

**Patient age**

Patients aged less than 15 years were most likely to have URTI managed (18.6 per 100 encounters) followed by patients aged 15–24 years (9.3 per 100 encounters).

**Reasons for encounter**

The reason for encounter most often given by these patients was 'cough' (35.7 per 100 URTI encounters). Patients also frequently came for the management of throat symptoms, stated URTI, and fever.

**Other problems managed**

Hypertension was the problem most often managed with URTI (2.7 per 100 URTI encounters) followed by asthma (2.1 per 100), immunisation (1.7) and depression (1.1) and diabetes (1.1).

**Medications**

The rate of medications prescribed or advised for over-the-counter purchase/supplied by the GP was more frequent in the management of URTI (81.1 per 100 problems) than average for all problems (68 per 100 problems) in the 2007–08 BEACH year.

The most common medication provided for URTI was paracetamol given at a rate of 20 per 100 URTI problems, followed by amoxycillin (15.4 per 100), roxithromycin (5.1 per 100), and amoxycillin/potassium clavulanate, at 2.7 per 100 URTI problems.

**Other treatments**

The rate of other treatments provided (including clinical and procedural treatments) in the management of URTI (33.2 per 100 selected problems) was not significantly different from the rate for all problems in BEACH 2005–06 (33.9 per 100).

Advice and education about treatment (11.8 per 100 URTI problems), general education and advice (8.8 per 100 problems) and sickness certificate (5.3 per 100) were the most common clinical treatments provided to patients with URTI.

Procedural treatments were provided for only 1.2 per 100 URTI problems. Physical function tests and other procedures of a surgical nature, not elsewhere classified, were those most commonly performed for URTI but both were at very low rates (0.2 per 100, and 0.6 per 100 problems, respectively).

**Referrals**

Referrals for URTI were provided at a rate of 0.4 per 100 problems. This was 40 times lower than average in BEACH 2007–08 (8.3 per 100 problems). Only 16 patients were referred to specialists, and 14 of these were to ear, nose and throat specialists.

**The patients**

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| <15 | 35.2 | 18.6 |
| 15–24 | 14.1 | 9.3 |
| 25–44 | 24.9 | 6.6 |
| 45–64 | 17.7 | 3.9 |
| 65–74 | 4.5 | 2.2 |
| 75+ | 3.5 | 1.5 |

**Medications—prescribed/advised/supplied**
*n* = 4,820 (81.1 per 100 URTI problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Paracetamol | 20.0 |
| Amoxycillin | 15.4 |
| Roxithromycin | 5.1 |
| Amoxycillin/potassium clavulanate | 2.7 |
| Cefalclor monohydrate | 2.4 |
| Cephalexin | 2.0 |
| Saline bath/solution/gargle | 1.7 |
| Cold and flu medication NEC | 1.5 |
| Codeine/paracetamol/pseudoeph | 1.5 |
| Brompheniramine/phenylaphrine | 1.5 |

# Upper respiratory tract infection (URTI)

***n* = 5,943 (6.2 per 100 encounters)**

**Reasons for encounter**
*n* = 10,380 (174.8 per 100 URTI encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Cough | 35.7 |
| Throat symptom/complaint | 29.9 |
| Upper respiratory infection, acute | 27.1 |
| Fever | 12.3 |
| Sneezing/nasal congestion | 12.0 |
| Prescription—all | 3.0 |
| Headache | 2.7 |
| Influenza | 2.6 |
| Pain, ear/earache | 2.0 |
| Feeling ill | 1.9 |

**Other treatments**
*n* = 1,974 (33.2 per 100 URTI problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Advice/education—treatment | 11.8 |
| Advice/education | 8.8 |
| Sickness certificate | 5.3 |
| Counselling—problem | 2.5 |
| Reassurance/support | 1.9 |

**Referrals**
*n* = 24 (0.4 per 100 URTI problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Ear, nose, throat | 0.2 |
| Dermatologist | 0.03 |

**Other problems managed**
*n* = 2,320 (39.1 per 100 URTI encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Hypertension | 2.7 |
| Asthma | 2.1 |
| Immunisation/vaccination—all | 1.7 |
| Depression | 1.1 |
| Diabetes | 1.1 |
| Dermatitis, contact/allergic | 1.0 |
| Conjunctivitis, infections | 0.9 |
| Lipid disorders | 0.9 |
| Cardiac check-up | 0.6 |
| Oesophagus disease | 0.6 |

**Pathology/Imaging**
Pathology *n* = 206, imaging *n* = 30 (at least one)

| | Rate per 100 problems[(c)] |
|---|---|
| Pathology | 3.5 |
| Imaging | 0.5 |

(a) Specific rate per 1,000 encounters in each age group.
(b) Expressed as a rate per 100 encounters at which URTI was managed.
(c) Expressed as a rate per 100 URTI problems managed.

**Figure 8.2: Management of upper respiratory tract infections in general practice, 2007–08**

**Suggested chapter citation**

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# 9 Cardiovascular problems

*Joan Henderson, Ying Pan*

## 9.1 Background

Cardiovascular problems contribute to significant patient morbidity and loss of quality of life, and to financial burden for both patients and the health system. In Australia, 18% of the total burden of disease and injury in 2003 resulted from cardiovascular diseases, with coronary heart disease and stroke accounting for more than four-fifths of this burden.[1]

The 2007–08 National Health Survey reported that 16% of the population had one or more long-term conditions of the cardiovascular system.[2] In 2007–08, cardiovascular problems were managed at a rate of 17.6 per 100 encounters with GPs, which equates to 19.3 million Medicare encounters across Australia where a cardiovascular problem was managed in that year.[3]

Barraclough & Gardner (2007) commented that '…*the biggest challenge for Australian policy makers is to address the consequences of major success: that Australians are living a lot longer today and are not dying as rapidly as they used to after being diagnosed with, for example, heart disease or cancer*'.[4] This statement is true, in that the incidence of acute ischaemic heart disease events has decreased over time—between 1994 and 2005, the incidence among males decreased by 32% and among females, by 34%.[5]

But despite the decline of such events in recent decades, cardiovascular disease is still the major cause of premature death in Australia, and its health and economic burden continues to exceed that of any other disease.[1]

Biological and physiological factors such as age, gender and family history contribute to the development of cardiovascular disease, as do psychosocial factors such as depression, social isolation and lack of social support.[6] Many of the risk factors contributing to this disease are behavioural, and modifiable. These include smoking, excessive alcohol consumption, overweight or obesity, and poor dietary habits and sedentary lifestyles that contribute to excess weight, and increased blood pressure, glucose levels and abnormal cholesterol levels.[7] A major focus of preventive care has been the modification of risk factors for those at increased risk of cardiovascular disease to prevent or postpone its onset or progression.

The major interventions are lifestyle and pharmacological. Pharmacological interventions have improved, and new medications have become available over the decade to 2007–08 that can reduce the risk of heart attack and stroke in people with established symptomatic vascular disease, and others at increased risk of developing cardiovascular disease, including those with clinical evidence of target organ damage and those with multiple risk factors. The benefits of medications vary with the individual and their level of baseline risk, and depending on their level of morbidity (and comorbidity), targets for risk factors such as lipid levels and blood pressure may vary.[8] As new evidence emerges, Therapeutic Guidelines, and recommendations are updated.[8,9]

Generally people with established cardiovascular impairment require a combination of pharmacological and lifestyle modification therapy. In instances where patients may currently be asymptomatic but are at high absolute risk, in addition to lifestyle advice, pharmacological interventions are often recommended as a preventive measure. This is also an important consideration for those with a family history of premature cardiovascular disease. Asymptomatic patients with one or more risk factors are counselled to modify any risk behaviours such as smoking, excessive alcohol consumption, or poor diet contributing to excess weight or abnormal cholesterol.[8] The risk behaviours engaged in by patients contribute substantially to the sizeable proportion of preventable cardiovascular disease.[10]

Guidelines and recommendations have been developed:

- to determine those in healthy weight ranges and those at risk because of excess weight
- for dietary advice for adults, children and the elderly
- for determining safe and hazardous levels of alcohol consumption.[11]

The National Health and Medical Research Council guidelines for alcohol consumption have been the recommended guidelines for clinicians since 2001.[12] Work began to update them in 2008[11], and the revised guidelines were published in March 2009.[13] These, and the non-smoking policies and legislation introduced over the past 15 years, may have contributed to the decrease in cardiovascular events experienced over that time.[5]

However, there have been varying degrees of success in each of these areas. For example, among general practice patients sampled during the decade, there was a steady decrease in the proportion of patients who smoked daily or occasionally, no change in the proportion who reported drinking at responsible or at-risk levels, a steady increase in the proportion of adults considered overweight or obese, and no change in the proportion of children in these categories.[14]

## Policies and initiatives

Over the decade to 2007–08, national policy and primary care health service models for provision of care have undergone many changes. Preventive and ongoing care is promoted in place of the historical model of reactive, acute care provided episodically. A brief description of policy changes that may have affected the management of cardiovascular disease is provided below.

- In 1996, cardiovascular disease was established as one of the original National Health Priority Areas due its widespread nature and the potential for prevention in this area.[15]
- In 1999, health assessment items were introduced for GPs undertaking annual check-ups of people aged 75 years and older, and Aboriginal and Torres Strait Islander peoples aged 55 years and older.[16]
- In 1999, multidisciplinary care plans and case conference items were introduced.[17]
- In 2004, a specific item number was introduced to reimburse GPs for comprehensive medical assessment of patients in residential aged care facilities.[18]
- In 2004, a specific item number was introduced for patient care provided by a practice nurse under the supervision of a GP.[17]
- In 2005, the multidisciplinary care plan items introduced in 1999 were replaced with GP management plans, which included ‘Chronic disease management’ items (MBS item numbers 721, 723, 725, 727, 729, 731).[19] While many of these items are non-specific and can be applied to any chronic health problem, they can be used for chronic cardiovascular problems once these have been diagnosed.
- In 2006, a one-off health check item was introduced for people aged 45–49 years.[20]

- In 2006, PBS criteria for lipid-modifying medications were revised to facilitate treatment according to risk of future cardiovascular events, rather than cholesterol concentration alone.[21]
- In 2008, in recognition of the increasing risk of obesity to cardiovascular and other diseases, the Australian health ministers announced the inclusion of obesity as a National Health Priority Area.[22]

## Method

In this chapter, the most common cardiovascular problems managed by GP BEACH participants in the first year of data collection (1998–99) and the most recent year (2007–08) are compared and reported. For a full description of the BEACH methods see Chapter 2. Problems have been selected according to body system, and cardiac, vascular and cerebrovascular problems are reported separately. For this purpose, the problems listed in the 'K' Chapter of the International Classification of Primary Care—Version 2 (ICPC-2) at rubric level have each been assigned to either:

- a cardiac group (defined as problems associated specifically with the heart muscle and chambers)
- a vascular group (defined as problems associated with the blood vessels)
- a cerebrovascular group (defined as problems associated with the brain or blood vessels that supply it) (see Appendix 3).

Because of the impact of lipid problems on the vascular function, lipid problems identified from the 'T' Chapter of ICPC-2 have been included in the vascular group for this analysis (also specified in Appendix 3).

Data for about 40,000 patients in the BEACH study are collected each year on patient height, body weight, smoking status and alcohol consumption. For patients aged 18 years or older, those who had any cardiovascular or lipid problem managed at the encounter were investigated for the presence of cardiovascular risk factors. This analysis looks at patients from the year 2001–02, as this was the first of the years where all three risk factors (body mass index, smoking and alcohol) were included on the BEACH encounter form for the same patients. Before that year, smoking status was collected separately. Data from 2001–03 are compared with data from 2006–08, and any changes over that time reported. All risk factor information was reported to the GPs by the patients. Overweight/obesity levels, and at-risk alcohol consumption were derived from patient self-reported height, weight and measures of alcohol consumption (see Chapter 2). To measure alcohol consumption, three items from the WHO Alcohol Use Disorders Identification Test (AUDIT)[23] were used, with scoring for an Australian setting.[24] Levels of at-risk drinking were assessed using the WHO AUDIT calculation. Lipid problems were reported by the GP as a problem managed at the encounter.

## 9.2 Cardiac problems

In 1998–99 there were 15,257 cardiovascular and/or lipid problems managed, of which 24.8% were cardiac problems. In 2007–08, 16,469 cardiovascular and/or lipid problems were managed, of which 22.2% were cardiac problems.

### Most common cardiac problems managed

Table 9.1 shows the 10 most commonly managed cardiac problems in 1998–99 rank order, and their management rates in 1998–99 and in 2007–08.

There was no change in the overall management rate of cardiac problems over the decade. The management rate of ischaemic heart disease decreased significantly over the decade, from 1.5 problems per 100 encounters to 1.1 per 100; heart failure decreased from 0.9 to 0.6 per 100; and atrial fibrillation/flutter increased from 0.6 to 1.0 per 100 encounters. The management rates of all other cardiac problems remained unchanged over the period.

**Table 9.1: Management rates of cardiac problems managed, 1998–99 and 2007–08**

| | Rate per 100 encounters (95% CI) | | Percentage of all problems | | Percentage of cardiac problems | | |
|---|---|---|---|---|---|---|---|
| **Morbidity managed** | **1998–99 (*n* = 96,901)** | **2007–08 (*n* = 95,898)** | **1998–99 (*n* = 140,824)** | **2007–08 (*n* = 145,078)** | **1998–99 (*n* =3,785)** | **2007–08 (*n* = 3,658)** | **Change[(a)]** |
| Cardiac—all | 4.1 (3.9–4.4) | 4.0 (3.7–4.2) | 2.8 | 2.6 | 100.0 | 100.0 | — |
| Ischaemic heart disease | 1.5 (1.4–1.7) | 1.1 (1.0–1.2) | 1.1 | 0.7 | 37.4 | 27.5 | ↓ |
| Heart failure | 0.9 (0.8–1.0) | 0.6 (0.6–0.7) | 0.6 | 0.4 | 21.3 | 16.0 | ↓ |
| Atrial fibrillation/flutter | 0.6 (0.5–0.6) | 1.0 (0.9–1.1) | 0.4 | 0.7 | 13.9 | 25.9 | ↑ |
| Swollen ankles/ oedema | 0.2 (0.1–0.2) | 0.2 (0.2–0.3) | 0.1 | 0.1 | 3.8 | 5.4 | — |
| Palpitations/awareness of heart | 0.1 (0.1–0.2) | 0.2 (0.1–0.2) | 0.1 | 0.1 | 3.5 | 3.7 | — |
| Cardiac arrhythmia NOS | 0.1 (0.1–0.2) | 0.1 (0.1–0.2) | 0.1 | 0.1 | 3.2 | 3.7 | — |
| Heart disease, other | 0.1 (0.1–0.1) | 0.2 (0.1–0.2) | 0.1 | 0.1 | 2.7 | 4.0 | — |
| Heart valve disease NOS | 0.1 (0.1–0.1) | 0.1 (0.1–0.1) | 0.1 | 0.1 | 2.6 | 1.9 | — |
| Cardiac check-up | 0.1 (0.1–0.1) | 0.1 (0.0–0.1) | 0.1 | 0.0 | 2.0 | 1.7 | — |
| Acute myocardial infarction | 0.1 (0.0–0.1) | 0.1 (0.1–0.2) | 0.1 | 0.0 | 1.9 | 1.3 | — |

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval; NOS—not otherwise specified.

## Management of cardiac problems

### The patients

Table 9.2 summarises the management of cardiac problems in 1998–99 and 2007–08. There were no significant changes in age-specific management rates during the decade, but at both time points the sex-specific management rates for males were significantly higher than for females.

The age-specific rates did not change for patients in the younger age groups, but significantly decreased for patients aged 45–64 years, those aged 65–74 years and those aged 75 years and over.

The distribution of patients at cardiac encounters in 2007–08 did not differ from those of 1998–99 for:

- Commonwealth concession cardholder status
- Repatriation health cardholder status
- non-English-speaking background status
- Indigenous status
- new patient status
- state or territory of residence
- Rural, Remote and Metropolitan Area classification status.

### Comorbidity managed

At encounters where a cardiac problem was managed, hypertension, diabetes and lipid disorders were the conditions most often managed with a cardiac problem, although the management rates of these conditions with a cardiac problem did not change. The management of oesophageal disease as a comorbidity significantly increased, from 2.4 per 100 cardiac encounters to 3.9 per 100, and the management of asthma significantly decreased (2.3 per 100 to 1.3 per 100 cardiac encounters) over the decade. Other commonly managed comorbidities were osteoarthritis, sleep disturbance, depression, chronic obstructive pulmonary disease and osteoporosis.

### Medications

The proportion of cardiac problems with at least one medication being prescribed, supplied or advised for over-the-counter purchase decreased significantly. For prescribed medications, there were significant decreases in the prescribing rates of:

- organic nitrates
- plain sulfonamides
- digitalis glycosides
- plain angiotensin-converting enzymes (ACE) inhibitors
- benzothiazepine derivatives
- potassium
- dihydropyridine derivatives
- phenylalkylamine derivatives.

Significant increases were noted in the prescribing rate per 100 cardiac problems for:

- vitamin K antagonists
- platelet aggregation inhibitors excluding heparin
- HMG CoA reductase inhibitors
- Alpha- and beta-blocking agents.

Of medications most frequently prescribed, vitamin K antagonists moved from 5th position to 1st place, between 1998–99 and 2007–08. HMG CoA reductase inhibitors moved from 9th place up to 4th, and organic nitrates changed from 1st to 6th position. There were no significant changes in the prescribing rates of salicylic acid and derivatives, selective beta-blocking agents, low-ceiling diuretics and potassium-sparing agents, or plain angiotensin II antagonists. However, significant changes in the prescribing rates of other medications altered the ranking of these four medications—selective beta-blockers moved from 6th to 3rd most frequently prescribed medication for cardiac conditions, low-ceiling diuretics moved from 15th to 21st ranking, and plain angiotensin II antagonists from 18th position up to 13th (results not shown).

**Table 9.2: Changes in management of cardiac problems, 1998–99 and 2007–08**

| | 1998–99 (*n* = 3,785) | | 2007–08 (*n* = 3,658) | | |
|---|---|---|---|---|---|
| **Variable** | **Sex-specific rate** | **95% CI** | **Sex-specific rate** | **95% CI** | **Change**[(a)] |
| **Patients** | | | | | |
| Males | 5.0 | (4.6–5.3) | 4.9 | (4.5–5.3) | — |
| Females | 3.5 | (3.2–3.7) | 3.1 | (3.0–3.5) | — |
| | **Age-specific rate** | | **Age-specific rate** | | |
| <1 year | 0.6 | (0.2–0.9) | 0.7 | (0.3–1.1) | — |
| 1–4 years | 0.3 | (0.1–0.5) | 0.3 | (0.1–0.4) | — |
| 5–14 years | 0.3 | (0.1–0.4) | 0.2 | (0.1–0.3) | — |
| 15–24 years | 0.4 | (0.2–0.5) | 0.5 | (0.3–0.7) | — |
| 25–44 years | 0.7 | (0.6–0.9) | 0.7 | (0.6–0.9) | — |
| 45–64 years | 3.8 | (3.5–4.2) | 3.1 | (2.9–3.4) | ↓ |
| 65–74 years | 9.4 | (8.7–10.1) | 7.9 | (7.2–8.6) | ↓ |
| 75+ years | 14.7 | (13.8–15.7) | 12.5 | (11.6–13.3) | ↓ |
| **Other problems managed** | **Rate per 100 cardiac encs** | | **Rate per 100 cardiac encs** | | |
| Oesophageal disease | 2.4 | (1.9–3.0) | 3.9 | (3.1–4.6) | ↑ |
| Asthma | 2.3 | (1.8–2.9) | 1.3 | (0.9–1.6) | ↓ |
| **Management** | **Percentage of cardiac problems** | | **Percentage of cardiac problems** | | |
| At least one medication | 64.4 | (62.0–66.8) | 54.0 | (51.6–56.4) | ↓ |
| At least one other treatment | 16.3 | (14.7–17.9) | 23.9 | (21.6–26.2) | ↑ |
| At least one imaging order | 3.3 | (2.6–4.0) | 4.9 | (4.1–5.6) | ↑ |
| At least one pathology order | 16.5 | (15.0–18.1) | 22.5 | (20.5–24.4) | ↑ |

*(continued)*

**Table 9.2 (continued): Changes in management of cardiac problems, 1998–99 and 2007–08**

| Variable | 1998–99 (*n* = 3,785) Rate per 100 cardiac problems | 95% CI | 2007–08 (*n* = 3,658) Rate per 100 cardiac problems | 95% CI | Change(a) |
|---|---|---|---|---|---|
| **Medications (total)** | 110.0 | (104.0–116.0) | 87.1 | (81.8–92.3) | **↓** |
| Prescribed meds (ATC Level 4) | 106.1 | (99.9–112.3) | 84.2 | (79.0–89.4) | **↓** |
| Sulfonamides, plain | 15.3 | (13.7–16.8) | 9.8 | (8.5–11.1) | **↓** |
| Organic nitrates | 18.3 | (16.5–20.1) | 6.3 | (5.4–7.3) | **↓** |
| Digitalis glycosides | 11.7 | (10.4–13.0) | 4.3 | (3.4–5.2) | **↓** |
| ACE inhibitors, plain | 10.7 | (9.3–12.0) | 6.3 | (5.4.–7.3) | **↓** |
| Vitamin K antagonists | 7.6 | (6.6–8.6) | 16.6 | (14.1–19.1) | **↑** |
| Benzothiazepine derivatives | 4.4 | (3.6–5.3) | 0.2 | (0.0–0.3) | **↓** |
| Platelet aggregation inhibitors excluding heparin | (†) | (†) | 4.7 | (3.9–5.6) | **↑** |
| HMG CoA reductase inhibitors | 3.4 | (2.6–4.2) | 6.5 | (5.4–7.5) | **↑** |
| Potassium | 3.4 | (2.7–4.0) | 1.0 | (0.6–1.3) | **↓** |
| Beta blocking agents, non-selective | 2.7 | (2.0–3.3) | 1.5 | (1.0–2.0) | ↓ |
| Dihydropyridine derivatives | 2.6 | (2.0–3.1) | 1.0 | (0.4–1.5) | **↓** |
| Phenylalkylamine derivatives | 1.7 | (1.2–2.1) | 0.7 | (0.4–0.9) | **↓** |
| Aldosterone antagonists | 0.4 | (0.2–0.7) | 1.2 | (0.7–1.6) | ↑ |
| Alpha- & beta-blocking agents | 0.4 | (0.2–0.7) | 2.1 | (1.5–2.7) | **↑** |
| **Other treatments** | 18.1 | (16.3–19.9) | 26.1 | (23.5–28.7) | **↑** |
| Clinical | 12.7 | (11.2–14.3) | 14.0 | (12.4–15.6) | — |
| Advice/education—treatment | 2.5 | (1.6–3.3) | 0.8 | (0.4–1.1) | **↓** |
| Other admin/documentation | 0.3 | (0.1–0.4) | 1.0 | (0.6–1.3) | **↑** |
| Procedures | 5.3 | (4.4–6.3) | 12.1 | (10.0–14.2) | **↑** |
| INR test | (†) | (†) | 5.5 | (3.8–7.2) | **↑** |
| **Referrals—2000–01*** | 10.5 | (9.3–11.8) | 11.6 | (10.4–12.9) | — |
| Specialist—cardiologist | 6.6 | (5.6–7.6) | 8.7 | (7.6–9.8) | ↑ |
| Allied Health Services | 1.0 | (0.6–1.4) | 0.3 | (0.1–0.5) | **↓** |

(a) The direction and type of change is indicated for each variable: **↑**/**↓** indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—data were insufficient to calculate a meaningful estimate.

* Referrals, pathology and imaging were compared using data from 2000–01 because of a coding change which made data from 1998–00 incomparable.

*Note:* Probs—problems; encs—encounters; CI—confidence interval; ATC—Anatomical Therapeutic Chemical classification; meds—medications; INR—international normalised ratio.

## Other treatments

There was also a significant increase in the rate of other treatments provided for cardiac problems, particularly procedural treatments, which increased from 5.3 per 100 cardiac problems in 1998–99 to 12.1 per 100 in 2007–08. The main catalyst for this change was the availability of international normalised ratio (INR), a test of blood clotting for patients on warfarin) point-of-care testing, which was not available in 1998–99, but comprised 45.3% of total procedural treatments for all cardiac conditions in 2007–08, being performed at a rate of 5.5 per 100 cardiac problems. This coincided with the increase in the prescribing rate of warfarin sodium, from 7.6 per 100 cardiac problems in 1998–99, to 16.6 per 100 in 2007–08.

### Referrals

The rate of referrals to specialists for cardiac problems did not change over the period, however there was a marginal increase in the rate of referrals to cardiologists. The referral rate to allied health services significantly decreased between 2000–01 and 2007–08.

# 9.3 Vascular and lipid problems

In 1998–99, 72.2% of the 15,257 cardiovascular and/or lipid problems managed were vascular/lipid problems. In 2007–08, 16,469 cardiovascular and/or lipid problems were managed, of which 75.1% were vascular/lipid problems.

## Most common vascular/lipid problems managed

The management rate for vascular/lipid problems increased significantly, from 13.8 per 100 encounters in 1998–99 to 16.6 per 100 in 2007–08. Table 9.3 shows the only problems to have undergone change from the 10 most commonly managed vascular/lipid problems, and the management rates of these problems in 1998–99 and 2007–08.

**Table 9.3: Changes in management rates of vascular/lipid problems managed, 1998–99 and 2007–08**

| | Rate per 100 encounters (95% CI) | | Percentage of all problems | | Percentage of vascular/lipid problems | | |
|---|---|---|---|---|---|---|---|
| | **1998–99 (*n* = 96,901)** | **2007–08 (*n* = 95,898)** | **1998–99 (*n* = 140,824)** | **2007–08 (*n* = 145,078)** | **1998–99 (*n* =11,019)** | **2007–08 (*n* = 12,362)** | **Change[(a)]** |
| Vascular—all, including lipid disorders | 13.8 (13.2–14.5) | 16.6 (15.8–17.3) | 9.5 | 11.0 | 100.0 | 100.0 | **↑** |
| Hypertension | 8.3 (7.8–8.7) | 9.9 (9.3–10.4) | 5.7 | 6.5 | 59.6 | 59.7 | **↑** |
| Lipid disorders | 2.5 (2.3–2.6) | 3.7 (3.4–4.0) | 1.7 | 2.4 | 17.8 | 22.3 | **↑** |
| Elevated blood pressure | 0.3 (0.3–0.4) | 0.3 (0.2–0.3) | 0.2 | 0.2 | 2.5 | 1.5 | ↓ |
| Pulmonary embolism | 0.1 (0.0–0.1) | 0.1 (0.1–0.1) | 0.0 | 0.1 | 0.3 | 0.6 | ↑ |

(a) The direction and type of change is indicated for each variable: **↑**/**↓** indicates a statistically significant change, and ↑/↓ indicates a marginal change.

*Note:* CI—confidence interval.

The management rate of hypertension increased significantly, from 8.3 to 9.9 problems per 100 encounters, and of lipid disorders from 2.5 to 3.7 per 100. There was also a marginal increase in the management rate of pulmonary embolism, and a marginal decrease in that of elevated blood pressure.

Management rates for other commonly managed vascular/lipid problems remained unchanged over the period 1998–99 to 2007–08. These included cardiac check-ups, phlebitis/thrombophlebitis, haemorrhoids, postural hypertension, and atherosclerosis/peripheral arterial (vascular) disease.

## Management of vascular/lipid problems

### The patients

Table 9.4 summarises the management of vascular/lipid problems over the decade. At encounters where a vascular/lipid problem was managed, the sex-specific management rate increased for both males and females. While there was no difference between the sexes in 1998–99, by 2007–08 the management rate for males was significantly higher than for females.

There was a significant decrease in the age-specific management rate in the youngest age group, a marginal decrease in the 5–14 year age group, and a significant increase for patients aged 75 years or older. Significant decreases were also observed in the proportion of encounters with patients who:

- were Repatriation health cardholders
- were from a non–English speaking background, and
- were considered new to the practice.

The distribution of patients at encounters where a vascular/lipid problem was managed did not differ over the decade in terms of:

- Commonwealth concession cardholder status
- Indigenous status
- state or territory of residence
- Rural, Remote and Metropolitan Area classification status.

### Comorbidity managed

Diabetes remained the comorbidity most frequently managed at vascular/lipid encounters, and significantly increased from 6.7 to 8.7 per 100 vascular/lipid encounters. The management of oesophageal disease increased from 2.2 to 4.5 per 100 vascular/lipid encounters, which moved this condition from the 9th to the 3rd most commonly managed comorbidity with a vascular/lipid problem. A significant increase was noted in the management rate of osteoporosis with a vascular/lipid problem, which had ranked 27th in 1998–99 but was the 8th most frequently managed comorbidity in 2007–08. There was a marginal increase in the management rate of depression, and a significant decrease in the management rate of ischaemic heart disease.

### Management

At least one pathology test was ordered for 11.4 per 100 vascular/lipid problems in 1998–99, and this rate increased to 15.3 per 100 by 2007–08. While there was no change in the overall medication rate for vascular/lipid problems, or in the rate at which medications were prescribed or advised for over-the-counter purchase, there was a significant decrease in rate of GP-supplied medication for these problems.

## Medications

There were many significant changes in the rates of medications most frequently prescribed for vascular/lipid problems.

- There were significant decreases in the prescribing rates of plain ACE inhibitors, dihydropyridine derivatives, selective beta-blocking agents, phenylalkylamine derivatives, alpha-adrenoreceptor antagonists, low-ceiling diuretics and potassium-sparing agents, and non-selective beta-blocking agents.
- The most notable changes were the adoption of combination products or other products not available in 1998–99—angiotensin II antagonists with diuretic, ACE inhibitors with diuretic, combinations of HMG CoA reductase inhibitors and other lipid modifying agents.
- There was also a significant increase in the rate of HMG CoA reductase inhibitors as a single product, and plain angiotensin II antagonists prescribed per 100 vascular/lipid problems. These products, with plain ACE inhibitors, were the three most frequently prescribed for the management of vascular/lipid problems by 2007–08.

**Table 9.4: Vascular and lipid problems—summary of management changes, 1998–99 and 2007–08**

| | 1998–99 (*n* = 12,470) | | 2007–08 (*n* = 14,365) | | |
|---|---|---|---|---|---|
| **Patient variables** | **Sex-specific rate** | **95% CI** | **Sex-specific rate** | **95% CI** | **Change[(a)]** |
| Males | 13.9 | (13.2–14.6) | 17.9 | (17.0–18.8) | **↑** |
| Females | 13.8 | (13.1–14.5) | 15.6 | (14.8–16.4) | **↑** |
| | **Age-specific rate** | | **Age-specific rate** | | |
| <1 year | 0.4 | (0.1–0.6) | 0.0 | (0.0–0.0) | **↓** |
| 1–4 years | 0.1 | (0.0–0.3) | 0.1 | (0.0–0.2) | — |
| 5–14 years | 0.2 | (0.1–0.3) | 0.1 | (0.0–0.1) | ↓ |
| 15–24 years | 1.3 | (1.0–1.6) | 1.1 | (0.8–1.3) | — |
| 25–44 years | 5.6 | (5.2–6.0) | 5.7 | (5.2–6.1) | — |
| 45–64 years | 22.2 | (21.3–23.2) | 22.9 | (21.9–24.0) | — |
| 65–74 years | 31.7 | (30.2–33.2) | 33.8 | (32.1–35.5) | — |
| 75+ years | 25.3 | (24.1–26.5) | 30.5 | (28.9–32.1) | **↑** |
| | **Percentage of vascular/lipid encs** | | **Percentage of vascular/lipid encs** | | |
| Repatriation health cardholder | 5.9 | (5.4–6.4) | 4.6 | (4.1–5.1) | **↓** |
| Non–English speaking background | 18.0 | (15.7–20.2) | 13.2 | (10.7–15.6) | **↓** |
| New patient to the practice | 4.0 | (3.5–4.5) | 2.9 | (2.4–3.3) | **↓** |
| **Other problems managed** | **Rate per 100 vascular/lipid encs** | | **Rate per 100 vascular/lipid encs** | | |
| Diabetes | 6.7 | (6.1–7.3) | 8.7 | (8.0–9.3) | **↑** |
| Oesophageal disease | 2.2 | (1.9–2.5) | 4.5 | (4.0–5.0) | **↑** |
| Depression | 2.7 | (2.3–3.0) | 3.3 | (3.0–3.7) | ↑ |
| Osteoporosis | 0.9 | (0.7–1.1) | 2.0 | (1.7–2.4) | **↑** |
| Ischaemic heart disease | 3.0 | (2.6–3.4) | 2.0 | (1.6–2.3) | **↓** |

*(continued)*

**Table 9.4 (continued): Vascular and lipid problems—summary of management changes, 1998–99 and 2007–08**

| | 1998–99 (*n* = 12,470) | | 2007–08 (*n* = 14,365) | | |
|---|---|---|---|---|---|
| **Management actions** | **Percentage of vascular/lipid problems** | **95% CI** | **Percentage of vascular/lipid problems** | **95% CI** | **Change[(a)]** |
| At least one pathology order | 11.4 | (10.7–12.1) | 15.3 | (14.3–16.2) | ↑ |
| | **Rate per 100 vascular/lipid problems** | | **Rate per 100 vascular/lipid problems** | | |
| **Medications (total)** | 85.6 | (82.7–88.6) | 80.9 | (77.8–84.0) | — |
| GP-supplied | 3.0 | (2.2–3.9) | 1.7 | (1.3–2.0) | ↓ |
| Prescribed meds (by ATC Level 4) | 81.5 | (78.5–84.6) | 78.3 | (75.1–81.4) | — |
| HMG CoA reductase inhibitors | 10.8 | (10.0–11.6) | 14.4 | (13.4–15.4) | ↑ |
| ACE inhibitors, plain | 20.4 | (19.3–21.5) | 12.5 | (11.7–13.3) | ↓ |
| Angiotensin II antagonists, plain | 4.1 | (3.6–4.6) | 11.9 | (11.0–12.8) | ↑ |
| Dihydropyridine derivatives | 11.3 | (10.3–11.9) | 8.5 | (7.8–9.1) | ↓ |
| Angiotensin II antagonists and diuretics | N/A | N/A | 7.0 | (6.4–7.7) | ↑ |
| Beta-blocking agents, selective | 8.0 | (7.3–8.6) | 5.8 | (5.3–6.3) | ↓ |
| ACE inhibitors and diuretics | N/A | N/A | 3.1 | (2.7–3.4) | ↑ |
| Phenylalkylamine derivatives | 3.1 | (2.7–3.5) | 1.1 | (0.9–1.3) | ↓ |
| Sulfonamides, plain | 1.7 | (1.4–2.0) | 2.0 | (1.7–2.4) | — |
| Other lipid modifying agents | N/A | N/A | 0.7 | (0.5–0.8) | ↑ |
| Alpha-adrenoreceptor antagonists | 1.6 | (1.3–1.8) | 0.6 | (0.5–0.8) | ↓ |
| HMG CoA reductase inhibitors, other combinations | N/A | N/A | 0.4 | (0.3–0.6) | ↑ |
| Low-ceiling diuretics and potassium-sparing agents | 1.6 | (1.3–1.9) | 0.4 | (0.3–0.5) | ↓ |
| Beta blocking agents, non-selective | 1.2 | (0.9–1.4) | 0.4 | (0.2–0.5) | ↓ |
| HMG CoA reductase inhibitors in combination with other lipid-modifying agents | N/A | N/A | 0.4 | (0.2–0.5) | ↑ |
| **Other treatments** | 20.9 | (19.2–22.5) | 22.7 | (20.9–24.6) | — |
| Clinical | 19.6 | (18.0–21.2) | 20.1 | (18.3–21.9) | — |
| Advice/education—treatment | 1.5 | (1.2–1.8) | 0.3 | (0.2–0.4) | ↓ |
| Counselling—problem | 1.5 | (1.2–1.8) | 2.4 | (1.9–2.8) | ↑ |
| Procedures | 1.3 | (1.1–1.5) | 2.6 | (2.2–3.1) | ↑ |
| INR test | (†) | (†) | 0.5 | (0.3–0.7) | ↑ |
| Physical function test | (†) | (†) | 0.5 | (0.3–0.6) | ↑ |
| Check-up, practice nurse | N/A | N/A | 0.4 | (0.2–0.6) | ↑ |

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—CI not provided as data were insufficient to calculate a meaningful estimate.

*Note:* CI—confidence interval; encs—encounters; ATC—Anatomical Therapeutic Chemical Classification; N/A— not applicable as combination product not available in 1998–99.

### Other treatments

There was no significant change in the overall rate at which clinical treatments were provided for vascular/lipid problems. However, advice/education about treatment was given less often in 2007–08 (decreasing from 1.5 to 0.3 per 100 vascular/lipid problems), and the rate at which counselling was provided increased from 1.5 to 2.4 per 100 vascular/lipid problems.

Procedural treatments increased from 1.3 per 100 in 1998–99 to 2.6 per 100 in 2007–08, most likely due to the uptake of procedures not available in 1998–99, such as INR point-of-care testing, and check-ups performed by practice nurses, which comprised 19.0% and 16.6%, respectively, of total procedural treatments for all vascular/lipid conditions in 2007–08. A significant increase in the rate of physical function tests was also apparent, from fewer than 3 observations in 1998–99 to 0.6 per 100 vascular/lipid problems in 2007–08, which represented 17.0% of total procedural treatments for these problems in the latter year.

### Referrals

There were no significant changes in the rates of referrals in total, or in referrals to specialists or to allied health professionals.

# 9.4 Cerebrovascular problems

In 1998–99 15,257 cardiovascular and/or lipid problems were managed, of which 3.0% were cerebrovascular problems. In 2007–08, 2.7% of the 16,469 total cardiovascular and/or lipid problems managed were cerebrovascular problems.

## Most common cerebrovascular problems managed

The management rate of cerebrovascular problems remained unchanged over the decade, at 0.5 per 100 encounters in both 1998–99 and 2007–08. The management rate of stroke/cerebrovascular accident, transient cerebral ischaemia and other cerebrovascular disease also remained unchanged (Table 9.5).

**Table 9.5: Summary of cerebrovascular problems managed, 1998–99 and 2007–08**

| | Rate per 100 encounters (95% CI) | | Percentage of all problems (95% CI) | | Percentage of cerebrovascular problems | | |
|---|---|---|---|---|---|---|---|
| **Problem managed** | **1998–99 (*n* = 96,901)** | **2007–08 (*n* = 95,898)** | **1998–99 (*n* = 140,824)** | **2007–08 (*n* = 145,078)** | **1998–99 (*n* =453)** | **2007–08 (*n* = 449)** | **Change[(a)]** |
| Cerebrovascular—all | 0.47 (0.41–0.53) | 0.47 (0.41–0.53) | 0.3 | 0.3 | 100.0 | 100.0 | — |
| Stroke/Cerebrovascular accident | 0.17 (0.13–0.22) | 0.22 (0.18–0.26) | 0.1 | 0.2 | 36.5 | 47.7 | — |
| Transient cerebral ischaemia | 0.2 (0.1–0.2) | 0.15 (0.12–0.18) | 0.1 | 0.1 | 34.3 | 32.6 | — |
| Other cerebrovascular disease | 0.1 (0.1–0.2) | 0.09 (0.07–0.12) | 0.1 | 0.1 | 29.3 | 19.7 | — |

(a) The change is indicated for each variable:— indicates there was no change.

*Note:* CI—confidence interval.

## Management of cerebrovascular disease

### The patients

Table 9.6 summarises the management of cerebrovascular problems over the decade. There was no change in the sex-specific management rate over time for males, but there was a marginal increase for females. Males were significantly more likely to have cerebrovascular disease managed in 1998–99, but this difference was no longer apparent in 2007–08.

There were no significant changes over time in age-specific rates. The distribution of patients at cerebrovascular encounters in 2007–08 did not differ from those of 1998–99 for:

- Commonwealth concession cardholder status
- Repatriation health cardholder status
- non-English-speaking background status
- Indigenous status
- new patient status
- state or territory of residence
- Rural, Remote and Metropolitan Area classification status.

### Comorbidity managed

In both 1998–99 and 2007–08, hypertension and diabetes were the two other problems most frequently managed with a cerebrovascular problem. Lipid disorders moved to 3rd position in 2007–08 (from 7th in 1998–99), although no changes were noted in the management rate of these conditions with a cerebrovascular problem over time. Other commonly managed comorbidities in 2007–08 were osteoarthritis, oesophageal disease, urinary tract infections, dementia, ischaemic heart disease, osteoporosis and depression.

### Medications

The overall medication rate for cerebrovascular problems increased significantly over the decade, from 49.7 to 67.1 per 100 cerebrovascular problems. Most of this increase was in prescribed medications, which increased from 46.6 per 100 to 63.3 per 100 cerebrovascular problems. The most obvious changes were the 22-fold increase in the prescribing rate of platelet aggregation inhibitors (other than heparin), the five-fold increase in HMG CoA reductase inhibitors, and the increase for phenothiazines with piperazine structure.

### Other treatments

There was no significant change in the overall rate of other treatments provided for cerebrovascular problems, or in the rate of clinical treatments or procedures generally. There was an increase in international normalised ratio point-of-care testing, which comprised 34.4% of total procedural treatments for all cerebrovascular conditions in 2007–08.

### Referrals

There were no changes in the rates of referrals to specialists or allied health services, or in ordering rates of pathology or imaging from 2000–01 to 2007–08.

## Table 9.6: Cerebrovascular problems — summary of management changes, 1998–99 and 2007–08

| | 1998–99 (*n* = 12,470) | | 2007–08 (*n* = 14,365) | | |
|---|---|---|---|---|---|
| **Patients** | **Sex-specific rate** | **95% CI** | **Sex-specific rate** | **95% CI** | **Change**[(a)] |
| Males | 0.6 | (0.5–0.7) | 0.5 | (0.4–0.6) | — |
| Females | 0.3 | (0.3–0.4) | 0.5 | (0.4–0.6) | ↑ |
| | **Age-specific rate** | | **Age-specific rate** | | |
| <1 year | 0.0 | (0.0–0.1) | 0.0 | (0.0–0.0) | — |
| 1–4 years | 0.0 | (0.0–0.0) | 0.0 | (0.0–0.1) | — |
| 5–14 years | 0.0 | (0.0–0.0) | 0.0 | (0.0–0.0) | — |
| 15–24 years | 0.0 | (0.0–0.0) | 0.0 | (0.0–0.0) | — |
| 25–44 years | 0.1 | (0.0–0.1) | 0.1 | (0.0–0.1) | — |
| 45–64 years | 0.4 | (0.3–0.5) | 0.3 | (0.2–0.4) | — |
| 65–74 years | 1.0 | (0.8–1.2) | 1.0 | (0.7–1.2) | — |
| 75+ years | 1.9 | (1.5–2.3) | 1.7 | (1.4–1.9) | — |
| **Other problems managed** | **Rate per 100 cerebrovascular encounters** | | **Rate per 100 cerebrovascular encounters** | | |
| Hypertension | 17.0 | (13.0–21.0) | 18.8 | (14.5–23.1) | — |
| Diabetes | 4.4 | (2.8–7.0) | 6.7 | (3.8–9.3) | — |
| Lipid disorders | 2.8 | (1.1–4.4) | 5.2 | (3.0–7.5) | — |
| **Management actions** | **Rate per 100 cerebrovascular problems** | | **Rate per 100 cerebrovascular problems** | | |
| **Medications (total)** | 49.7 | (42.7–56.7) | 67.1 | (58.5–75.8) | **↑** |
| Prescribed medications (by ATC Level 4) | 46.6 | (39.6–53.6) | 63.3 | (54.5–72.0) | **↑** |
| Platelet aggregation inhibitors excluding heparin | 0.9 | (0.0–1.9) | 22.7 | (18.2–27.3) | **↑** |
| HMG CoA reductase inhibitors | 1.1 | (0.1–2.1) | 5.1 | (2.7–7.5) | **↑** |
| Phenothiazines with piperazine structure | 0.3 | (†) | 1.3 | (0.3–2.4) | **↑** |
| **Other treatments** | 20.3 | (15.7–24.8) | 20.4 | (16.3–24.5) | — |
| Clinical treatments | 17.5 | (13.3–21.7) | 16.4 | (12.6–20.1) | — |
| Procedures | 2.7 | (0.7–4.8) | 4.0 | (2.1–6.0) | — |
| INR test | (†) | (†) | 1.4 | (0.1–2.6) | **↑** |

(a) The direction and type of change is indicated for each variable: **↑**/**↓** indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—95% confidence interval not provided as data were insufficient to calculate a meaningful estimate.

*Note:* CI—confidence interval; ATC—Anatomical Therapeutic Chemical classification; INR—international normalised ratio.

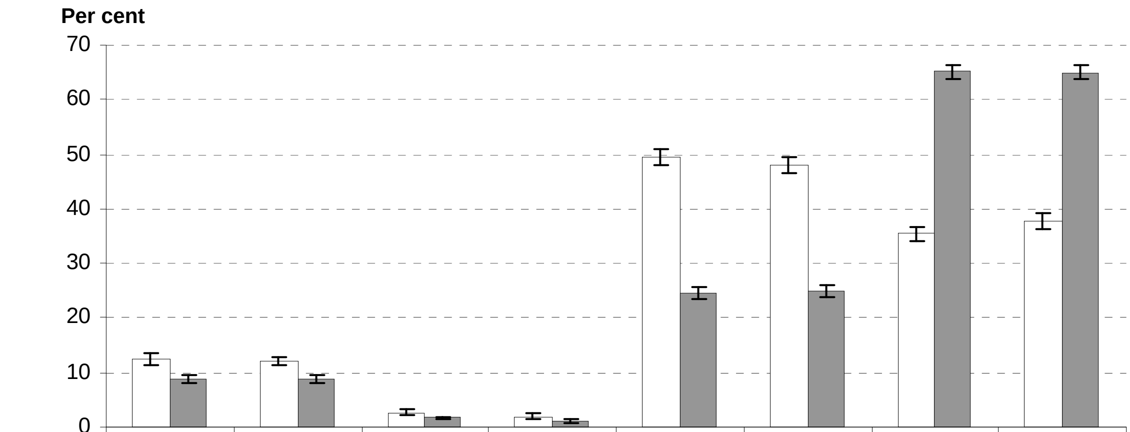
# 9.5 Health risk behaviours among patients with cardiovascular and/or lipid problems managed

In the 7-years from 2001–02 to 2007–08, information about height, weight (for calculation of body mass index; BMI), alcohol consumption and smoking status were collected from the same patients in the SAND section of the BEACH encounter form (see Chapter 2). Since then details have been reported for 231,413 patients aged 18 years or older. Not all information was provided for all patients; consequently, the denominators vary slightly depending on the number of responses for each risk factor. Patient sex was not stated for some respondents, and these were removed from the analyses.

For sufficient sample sizes to investigate differences in risk behaviours over time for patients at cerebrovascular encounters, data from the first 2 years of collecting all three risk behaviours from the same patients (2001–03) were selected and compared with the most recent 2 years (2006–08).

## Smoking prevalence

Patient age, sex and smoking status were specified for 12,767 (57.0% female and 43% male) adult respondents at cardiovascular/lipid encounters in 2001–03, and 13,041 patients (55.5% female and 44.5% male) in 2006–08. Almost two-thirds of females and more than one-third of males had never smoked. At both time points, smoking was significantly more prevalent among male patients than female patients with cardiovascular/lipid problems managed (Figure 9.1) The 2006–08 prevalence of daily smoking was significantly lower among these patients than among adult patients at all BEACH encounters in 2006–08, where 20% of males and 14% of females were daily smokers.[14]




| | Daily 2001–03 | Daily 2006–08 | Occasional 2001–03 | Occasional 2006–08 | Past 2001–03 | Past 2006–08 | Never 2001–03 | Never 2006–08 |
|---|---|---|---|---|---|---|---|---|
| □ Male | 12.5 | 12.1 | 2.7 | 2.0 | 49.5 | 48.1 | 35.4 | 37.8 |
| ■ Female | 8.7 | 8.8 | 1.7 | 1.2 | 24.4 | 25.1 | 65.2 | 64.9 |

**Smoking status by data period**

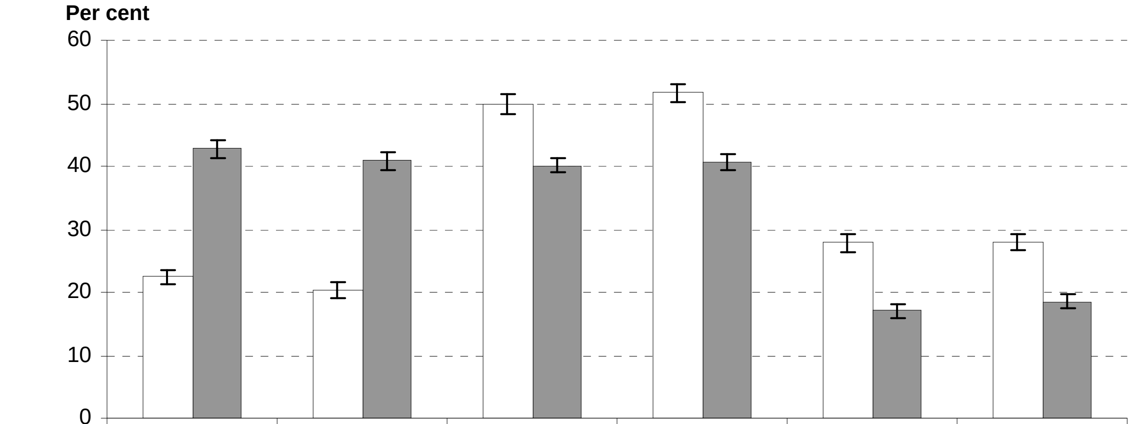
**Figure 9.1: Smoking status of adult patients at cardiovascular/lipid encounters by patient sex, 2001–03 and 2006–08 (95% CI)**

## Alcohol consumption

Patient age, sex and alcohol consumption were provided for 12,677 (57.1% female and 42.9% male) adult respondents at cardiovascular/lipid encounters in 2001–03, and 12,776 patients (55.6% female and 44.4% male) in 2006–08. Measures of alcohol consumption used are reported in Chapter 2.

Overall, over one in four males, and almost one in five females reported drinking at-risk levels of alcohol. Significantly more male than female cardiovascular patients reported at-risk drinking levels at both time points (Figure 9.2). The 2006–08 prevalence of at-risk drinking was significantly lower in these patients than in adult patients at all BEACH encounters in 2006–08, where 32% of males and 23% of females reported at-risk drinking levels.[3]

In all categories, the difference between the sexes was significant, but no within-sex changes occurred over time in any category. Responsible drinkers accounted for half of the male respondents and two-fifths of the female respondents. In both periods, two-fifths of female patients reported that they did not drink at all, compared with one-fifth of male patients. The proportions of either sex who were non-drinkers did not differ for patients at encounters where a cardiovascular problem was managed. A significantly greater proportion of females with cardiovascular/lipid problems managed were non-drinkers compared with females at all BEACH encounters (2006–08), but there was no difference in the proportion of male non-drinkers.[14]




| | Non-drinker 2001–03 | Non-drinker 2006–08 | Responsible drinker 2001–03 | Responsible drinker 2006–08 | At-risk drinker 2001–03 | At-risk drinker 2006–08 |
|---|---|---|---|---|---|---|
| Male | 22.4 | 20.3 | 49.8 | 51.7 | 27.8 | 28.0 |
| Female | 42.8 | 40.8 | 40.1 | 40.7 | 17.0 | 18.5 |

**Alcohol consumption by data period**

**Figure 9.2: Alcohol consumption in adult patients at cardiovascular/lipid encounter, by patient sex, 2001–03 and 2006–08 (95% CI)**

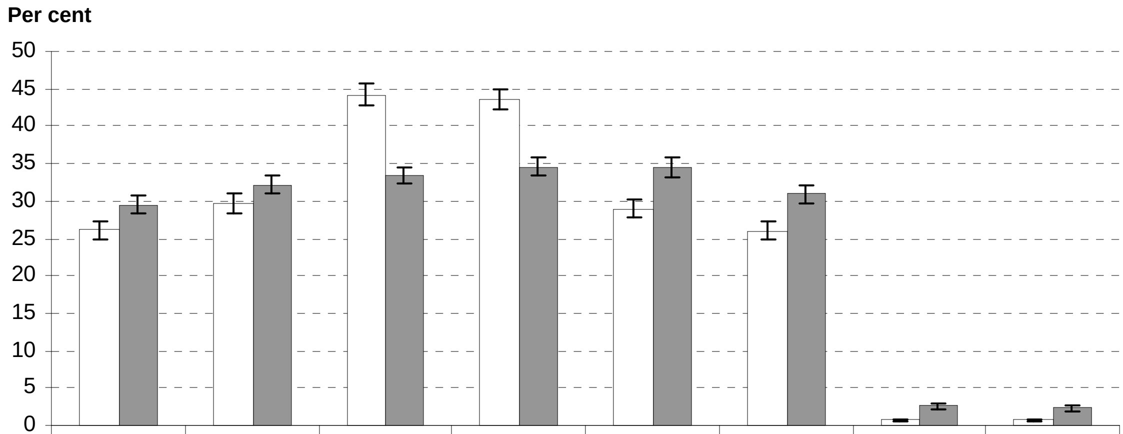
## Body mass index

Patient age, sex, and self-reported height and weight were provided for 12,646 (56.8% female and 43.2% male) adult respondents at cardiovascular/lipid encounters in 2001–03, and 12,793 adult patients (55.4% female and 44.6% male) in 2006–08. Body mass index (BMI) calculations used are reported in Chapter 2.

- At both time points, significantly fewer males compared with females were in the normal weight range.
- One-third of males, and about one-third of females were in the normal weight range, although the proportions for each sex significantly decreased over time.
- In total, two-thirds or more of both males and females were classified as overweight or obese—70.3% of males in 2001–03, and 73.3% in 2006–08; 62.9% of females in 2001–03, and 66.7% in 2006–08.
- There was a significant increase for both sexes in the obese category.
- More than one-quarter of males and nearly one-third of females were classified as obese, although there were significantly more females than males in the obese category at both time points.
- Males were far more likely to be overweight than females, but when both categories were combined, males at cardiovascular/lipid encounters were considerably more likely to have the excess weight risk factor than their female counterparts (Figure 9.3).

When compared with adult patients at all BEACH encounters 2006–08, the patients at cardiovascular/lipid encounters were:

- less likely to be in the normal weight range
- more likely to be obese
- more likely to be overweight[14] (results not shown).




| | Obese 2001–03 | Obese 2006–08 | Overweight 2001–03 | Overweight 2006–08 | Normal 2001–03 | Normal 2006–08 | Underweight 2001–03 | Underweight 2006–08 |
|---|---|---|---|---|---|---|---|---|
| Male | 26.1 | 29.7 | 44.2 | 43.6 | 29.0 | 26.0 | 0.7 | 0.7 |
| Female | 29.5 | 32.1 | 33.4 | 34.6 | 34.5 | 31.0 | 2.6 | 2.3 |

**BMI by data period**

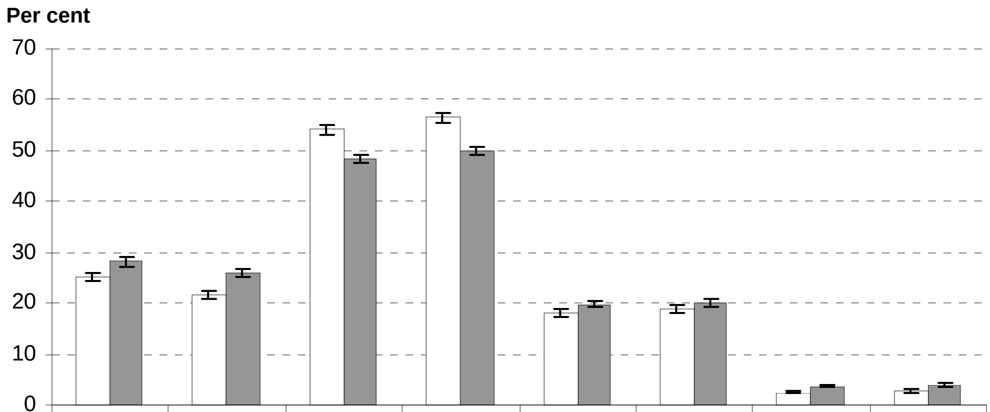
**Figure 9.3: Body mass index of adult patients at cardiovascular/lipid encounters by patient sex, 2001–03 and 2006–08 (95% CI)**

## Multiple lifestyle risk factors

All data elements (height and weight, alcohol and smoking behaviour) were reported for 12,263 (56.8% female and 43.2% male) adult respondents at cardiovascular/lipid encounters in 2001–03 and 12,438 (55.4% female and 44.6% male) in 2006–08.

Figure 9.4 summarises the prevalence of risk factors for patients at cardiovascular/lipid encounters and at all BEACH encounters at both time points. Compared with patients at all BEACH encounters, a greater proportion of cardiovascular/lipid patients had at least one risk factor, although a significantly smaller proportion had three risk factors. Between 2001–03 and 2006–08, in both groups:

- the proportion of patients with no risk factors significantly decreased
- the proportion with one risk factor significantly increased
- there were no changes for the proportions of patients with two risk factors, or with three.




| | No risk factors 2001–03 | No risk factors 2006–08 | One risk factor 2001–03 | One risk factor 2006–08 | Two risk factors 2001–03 | Two risk factors 2006–08 | Three risk factors 2001–03 | Three risk factors 2006–08 |
|---|---|---|---|---|---|---|---|---|
| CVD encs | 25.1 | 21.8 | 54.2 | 56.5 | 18.2 | 19.0 | 2.5 | 2.7 |
| All BEACH encs | 28.2 | 26.0 | 48.4 | 49.9 | 19.7 | 20.1 | 3.7 | 3.9 |

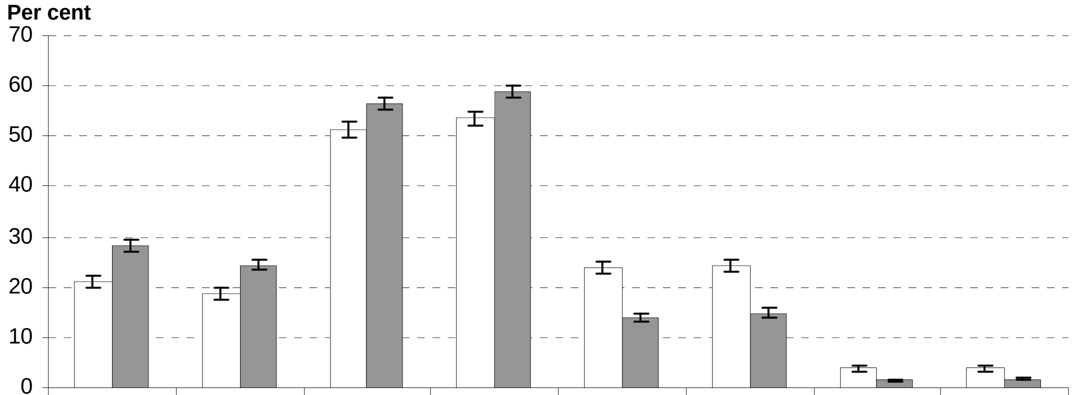
**Number of risk factors by data period**

*Note*: CVD—cardiovascular/lipid; encs—encounters.

**Figure 9.4: Prevalence of one or multiple risk factors in adult patients at cardiovascular/lipid encounters and all BEACH encounters, 2001–03 and 2006–08 (95% CI)**

Figure 9.5 shows that at both times, among patients at cardiovascular/lipid encounters:

- significantly more females than males had no risk factors, or only one risk factor. However, for both sexes, the proportion with no risk factors significantly decreased and the proportion with one significantly increased over time.
- more than half of all patients had one risk factor only (that is, overweight only, obese only, daily smoker only, or at-risk drinker only).
- one-quarter of males and one in seven females had two risk factors, and at both time points, significantly more males than females had two risk factors, although there were no changes over time within either sex group.
- compared with females, males were twice as likely to have all three risk factors at both time points, although there were no within-sex changes over time.




| | No risk factors 2001–03 | No risk factors 2006–08 | One risk factor 2001–03 | One risk factor 2006–08 | Two risk factors 2001–03 | Two risk factors 2006–08 | Three risk factors 2001–03 | Three risk factors 2006–08 |
|---|---|---|---|---|---|---|---|---|
| Male | 21.1 | 18.6 | 51.3 | 53.5 | 23.8 | 24.1 | 3.8 | 3.9 |
| Female | 28.2 | 24.4 | 56.4 | 59.0 | 14.0 | 14.9 | 1.4 | 1.7 |

Number of risk factors by data period

**Figure 9.5: Prevalence of one or multiple risk factors in adult patients at cardiovascular/lipid encounters by patient sex, 2001–03 and 2006–08 (95% CI)**

Table 9.7 shows the proportions of patients with each combination of risk factors, by sex.

- Where patients had only one risk factor:
  - males were more likely to be overweight than females
  - females were more likely to be obese
  - females were more likely to have at-risk drinking as their sole risk factor.
- Males were far more likely than females to have two risk factors.
- A greater proportion of males were overweight or obese in combination with at-risk drinking than their female counterparts.
- There was no difference between the sexes for the combination of smoking and at-risk drinking at either time point.

**Table 9.7: Prevalence of risk factor combinations for patients at cardiovascular/lipid management encounters, 2001–03 and 2006–08**

| | Per cent (95% CI) | | | | | |
|---|---|---|---|---|---|---|
| | Males | | Females | | Total | |
| Risk factors | 2001–03 (*n* = 5,296) | 2006–08 (*n* = 5,543) | 2001–03 (*n* = 6,967) | 2006–08 (*n* = 6,895) | 2001–03 (*n* = 12,263) | 2006–08 (*n* = 12,438) |
| No risk factors | 21.1 (19.9–22.3) | 18.6 (17.5–19.6) | 28.2 (26.9–29.4) | 24.4 (23.3–25.5) | 25.1 24.2–26.0) | 21.8 (21.0–22.6) |
| One risk factor | 51.3 (49.9–52.7) | 53.5 (52.1–54.8) | 56.4 (55.1–57.6) | 59.0 (57.8–60.2) | 54.2 (53.2–55.1) | 56.5 (55.6–57.4) |
| Overweight only | 28.8 (27.5–30.1) | 28.7 (27.5–29.9) | 25.7 (24.6–26.7) | 25.6 (24.6–26.7) | 27.0 (26.2–27.9) | 27.0 (26.2–27.8) |
| Obese only | 15.1 (14.1–16.2) | 18.4 (17.4–19.5) | 23.2 (22.1–24.3) | 25.8 (24.6–26.9) | 19.7 (18.9–20.5) | 22.5 (21.7–23.3) |
| At-risk drinker only | 5.2 (4.6–5.8) | 4.3 (3.7–4.8) | 5.7 (5.1–6.3) | 5.7 (5.1–6.4) | 5.5 (5.0–5.9) | 5.1 (4.7–5.5) |
| Daily smoker only | 2.1 (1.7–2.5) | 2.1 (1.7–2.5) | 1.9 (1.5–2.2) | 1.9 (1.5–2.2) | 2.0 (1.7–2.2) | 2.0 (1.7–2.2) |
| Two risk factors | 23.8 (22.5–25.0) | 24.1 (22.9–25.3) | 14.0 (13.2–14.9) | 14.9 (14.0–15.8) | 18.2 (17.5–19.0) | 19.0 (18.2–19.8) |
| Overweight and at-risk drinker | 10.5 (9.6–11.3) | 10.1 (9.3–10.9) | 5.1 (4.6–5.6) | 6.2 (5.6–6.8) | 7.4 (6.9–7.9) | 8.0 (7.4–8.5) |
| Obese and at-risk drinker | 7.0 (6.3–7.8) | 7.9 (7.2–8.7) | 3.6 (3.1–4.0) | 3.7 (3.3–4.2) | 5.1 (4.6–5.5) | 5.6 (5.2–6.0) |
| Daily smoker and at-risk drinker | 1.4 (1.1–1.7) | 1.8 (1.4–2.1) | 1.4 (1.1–1.7) | 1.3 (1.0–1.6) | 1.4 (1.2–1.6) | 1.5 (1.3–1.7) |
| Overweight and daily smoker | 2.7 (2.2–3.1) | 2.6 (2.2–3.1) | 2.0 (1.6–2.3) | 1.9 (1.6–2.3) | 2.3 (2.0–2.6) | 2.3 (2.0–2.5) |
| Obese and daily smoker | 2.2 (1.8–2.6) | 1.7 (1.3–2.0) | 2.0 (1.6–2.3) | 1.7 (1.4–2.1) | 2.1 (1.8–2.3) | 1.7 (1.5–1.9) |
| Three risk factors | 3.8 (3.3–4.3) | 3.9 (3.3–4.4) | 1.4 (1.2–1.7) | 1.7 (1.4–2.0) | 2.5 (2.2–2.8) | 2.7 (2.4–3.0) |
| Overweight, daily smoker and at-risk drinker | 2.3 (1.9–2.8) | 2.2 (1.8–2.6) | 0.7 (0.5–0.9) | 0.9 (0.7–1.1) | 1.4 (1.2–1.6) | 1.5 (1.3–1.7) |
| Obese, daily smoker and at-risk drinker | 1.5 (1.2–1.8) | 1.6 (1.3–2.0) | 0.7 (0.5–0.9) | 0.8 (0.6–1.0) | 1.1 (0.9–1.2) | 1.2 (1.0–1.4) |

*Note:* CI—confidence interval. Shading indicates significant differences between males and females, or significant changes over time.

# 9.6 Management of hypertension 2007–08

Hypertension was the most commonly managed problem in general practice ($n$ = 9,486) at a rate of 9.9 per 100 encounters in 2007–08 (Figure 9.6). This represents approximately 10.8 million management occasions in general practice for hypertension across Australia in that year.

### Patient age and sex

Patients aged 65–74 years were most likely to have hypertension managed (21.1 contacts per 100 encounters) followed by patients aged 75 years and older (20.3 per 100 encounters). There was no difference between the sex-specific management rates for males and females.

**Reasons for encounter**

The reason for encounter most often given by these patients was cardiac check-up (37.3 per 100 hypertension encounters). Patients also frequently came for prescriptions, the management of stated hypertension, and test results.

**Other problems managed**

Lipid disorder was the problem most often managed with hypertension (13.1 per 100 hypertension encounters) followed by diabetes (9.8 per 100), oesophageal disease (4.9) and osteoarthritis (4.6).

**Medications**

The rate of medications prescribed or advised for over-the-counter purchase, or supplied by the GP (96 per 100 hypertension problems) was significantly higher than the average for all problems (68 per 100 problems) in the 2007–08 BEACH year.[3] Medications were prescribed at a rate of 94.2 per 100 hypertension problems. The most common medication prescribed for hypertension was perindopril, given at a rate of 9.3 per 100 hypertension problems, followed by ibersartan (8.0 per 100), ibersartan with hydroclorothiazide (6.6 per 100), and atenolol (6.5 per 100 hypertension problems).

**Other treatments**

The rate of other treatments provided (including clinical and procedural treatments) was significantly different in the management of hypertension (16.7 per 100 selected problems) than for all problems in BEACH 2007–08 (33.9 per 100).[3] Counselling/advice about nutrition and weight (4.5 per 100 hypertension problems), advice/education about medication (2.0 per 100 problems) and counselling/advice about exercise (2.0 per 100) were the most common clinical treatments provided to patients with hypertension. Procedural treatments were provided at a rate of 1.8 per 100 hypertension problems. Check-up performed by practice nurse and physical function tests were the most commonly performed procedures for hypertension but both were at very low rates (0.5 per 100 problems, respectively).

**Referrals and tests ordered**

Referrals for hypertension were provided at a rate of 1.4 per 100 problems. This was significantly lower than the average in BEACH 2007–08 (8.3 per 100 problems). The majority of referrals were to a cardiologist (0.6 per 100 hypertension problems).

Pathology tests were ordered at 30.5 per 100 hypertension problems. Lipid tests accounted for 20% of these (at 6.2 per 100 hypertension problem contacts). Imaging tests were ordered at a rate of 0.8 per 100 hypertension problems managed. The majority were chest X-rays (0.2 per 100 hypertension contacts) and echocardiography (0.2 per 100), which accounted for 20% and 18% of orders, respectively.

**The patients**

| Sex | Per cent | Rate[(a)] |
|---|---|---|
| Males | 45.9 | 10.6 |
| Females | 54.1 | 9.4 |

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| 15–24 | 0.3 | 0.4 |
| 25–44 | 6.1 | 2.6 |
| 45–64 | 36.8 | 13.0 |
| 65–74 | 26.7 | 21.1 |
| 75+ | 30.1 | 20.3 |

**Medications—prescribed**

*n* = 8,933 (94.2 per 100 HT problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Perindopril | 9.3 |
| Ibersartan | 8.0 |
| Ibersartan/hydroclorothiazide | 6.6 |
| Atenolol | 6.5 |
| Amlodipine | 6.1 |
| Candesartan cilexetil | 5.6 |
| Ramipril | 5.5 |
| Telmisartan | 4.6 |

# Hypertension

***n* = 9,486 (9.9 per 100 encounters)**

**Reasons for encounter**

(*n* = 17,570, 185.2 per 100 HT encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Cardiac check-up | 37.3 |
| Prescription—all | 33.8 |
| Hypertension | 19.2 |
| Test results | 8.1 |
| General check-up | 5.7 |
| Immunisation/vaccination—all | 3.2 |
| Diabetes | 2.9 |
| Cough | 2.2 |
| Blood test NOS | 1.8 |
| Lipid disorders | 1.8 |

**Other treatments**

*n* = 1,586 (16.7 per 100 HT problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Counselling/advice—nutrition/weight | 4.5 |
| Advice/education—medication | 2.0 |
| Counselling/advice—exercise | 2.0 |
| Advice/education | 1.9 |
| Counselling—problem | 1.8 |
| Counselling/advice—lifestyle | 1.2 |

**Referrals**

*n* = 136 (1.4 per 100 HT problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Cardiologist | 0.6 |
| Physician | 0.1 |

**Other problems managed**

*n* = 11,939 (125.9 per 100 HT encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Lipid disorders | 13.1 |
| Diabetes | 9.8 |
| Oesophagus disease | 4.9 |
| Osteoarthritis | 4.6 |
| Immunisation/vaccination—all | 3.8 |
| Depression | 3.5 |
| Sleep disturbance | 2.6 |
| Osteoporosis | 2.2 |
| Ischaemic heart disease | 2.1 |
| Back complaint | 1.9 |

**Pathology/Imaging**

(Pathology *n* = 2,894, imaging *n* = 77)

| | Rate per 100 problems[(c)] |
|---|---|
| Pathology | 30.5 |
| Imaging | 0.8 |

(a) Specific rate per 100 encounters in each age and sex group.
(b) Expressed as a rate per 100 encounters at which hypertension was managed.
(c) Expressed as a rate per 100 hypertension problems managed.
*Note:* NOS—not otherwise specified; HT—hypertension. Extrapolation base is MBS data of 109.5 million encounters in 2007–08.

**Figure 9.6: Management of hypertension in general practice, 2007–08**

# 9.7 Management of ischaemic heart disease

Figure 9.7 summarises the management of ischaemic heart disease (IHD) in 2007–08. IHD was managed on 1,046 occasions at a rate of 1.1 per 100. This represents about 1.2 million occasions of GP management of IHD across Australia in that year.

**Patient age and sex**

Patients aged 75 years and older were most likely to have IHD managed (3.3 per 100 encounters), followed by those aged 65–74 years (2.5 per 100). The sex-specific management rate for males (1.6 per 100, 95% CI: 1.4–1.8) was significantly higher than for females (0.7 per 100, 95% CI: 0.6–0.8).

**Reasons for encounter**

The reason for encounter most often given by patients was for prescriptions (37.2 per 100 IHD encounters), followed by the management of stated IHD, and cardiac check-ups.

**Other problems managed**

Hypertension was the problem most often managed with IHD (19.2 per 100 IHD encounters) followed by diabetes (12.8 per 100), lipid disorders (10.3) and oesophageal disease (5.9).

**Medications**

The rate of medications prescribed or advised for over-the-counter purchase, or supplied by the GP in the management of IHD (120 per 100 problems) was almost twice the average for all problems (68 per 100 problems) in the 2007–08 BEACH year.[3] Medications were prescribed at a rate of 116.3 per 100 IHD problems, the most common being clopidogrel (13.5 per 100 IHD problems), followed by aspirin (12.9 per 100), glyceryl trinitrate (12.8 per 100), and atorvastatin (10.2 per 100 problems).

**Other treatments**

The rate of other treatments provided (including clinical and procedural treatments) was significantly lower in the management of IHD (18.6 per 100 IHD problems) than for all problems in BEACH 2007–08 (33.9 per 100).[3] Advice and education (2.5 per 100 IHD problems), counselling about the problem (2.4 per 100 problems) and counselling/ advice about nutrition/weight (2.1 per 100) were the most common clinical treatments provided. Procedural treatments were used at a rate of 5.8 per 100 IHD problems. Electrical tracings (3.3 per 100 problems) were most common, followed by international normalised ratio tests at 0.9 per 100 IHD problems.

**Referrals and tests ordered**

Referrals for IHD were provided at a rate of 12.4 per 100 problems. This was higher than the average in BEACH 2007–08 (8.3 per 100 problems).[3] The majority of these were to a cardiologist (9.9 per 100 IHD problems).

Pathology tests were ordered at a rate of 38.9 per 100 IHD problems. Lipid tests accounted for 27% of these, and were ordered at a rate of 10.5 per 100 IHD problem contacts. Imaging tests were ordered at a rate of 2.3 per 100 IHD problems. The majority were chest X-rays (0.8 per 100 hypertension contacts), which accounted for 34% of imaging orders for IHD.

**The patients**

| Sex | Per cent | Rate[(a)] |
|---|---|---|
| Males | 63.0 | 1.6 |
| Females | 37.0 | 0.7 |

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| 15–24 | 0.1 | 0.01 |
| 25–44 | 2.0 | 0.1 |
| 45–64 | 25.1 | 1.0 |
| 65–74 | 28.3 | 2.5 |
| 75+ | 44.6 | 3.3 |

**Medications—prescribed**
*n* = 1,217 (116.3 per 100 IHD problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Clopidogrel | 13.5 |
| Aspirin | 12.9 |
| Glyceryl trinitrate | 12.8 |
| Atorvastatin | 10.2 |
| Isosorbide mononitrate | 7.8 |
| Metoprolol | 6.6 |
| Simvastatin | 4.7 |
| Ramipril | 5.4 |
| Atenolol | 5.5 |
| Perindopril | 3.5 |

## Ischaemic heart disease (IHD)

***n* = 1,046 (1.1 per 100 encounters)**

**Reasons for encounter**
(*n* = 1,857, 177.5 per 100 IHD encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Prescription—all | 37.2 |
| Ischaemic heart disease | 14.7 |
| Cardiac check-up | 9.9 |
| Test results | 9.5 |
| Chest pain NOS | 9.0 |
| General check-up | 8.3 |
| Follow-up cardiovascular | 3.5 |
| Diabetes | 3.4 |
| Administrative procedures NOS | 3.3 |
| Hypertension | 3.2 |

**Other treatments**
*n* = 195 (18.6 per 100 IHD problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Electrical tracings | 3.3 |
| Advice/education | 2.5 |
| Counselling—problem | 2.4 |
| Counselling/advice—nutrition/weight | 2.1 |
| Advice/education—medication | 1.6 |

**Referrals**
*n* = 129 (12.4 per 100 IHD problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Cardiologist | 9.9 |
| Physician | 0.2 |

**Other problems managed**
*n* = 1,436 (137.3 per 100 IHD encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Hypertension | 19.2 |
| Diabetes | 12.8 |
| Lipid disorders | 10.3 |
| Oesophagus disease | 5.9 |
| Osteoarthritis | 3.8 |
| Chronic obstructive pulmonary disease | 3.4 |
| Immunisation/vaccination—all | 3.2 |
| Sleep disturbance | 3.1 |
| Depression | 2.6 |
| Heart failure | 2.2 |

**Pathology/Imaging**
(Pathology *n* = 407, imaging *n* = 24)

| | Rate per 100 problems[(c)] |
|---|---|
| Pathology | 38.9 |
| Imaging | 2.3 |

(a) Specific rate per 100 encounters in each age and sex group.
(b) Expressed as a rate per 100 encounters at which ischaemic heart disease was managed.
(c) Expressed as a rate per 100 ischaemic heart disease problems managed.
*Note:* NOS—not otherwise specified. Extrapolation based on MBS data of 109.5 million encounters in 2007–08.

**Figure 9.7: Management of ischaemic heart disease in general practice, 2007–08**

## 9.8 Discussion

These results show the main changes in the management of cardiovascular disease in general practice between 1998–99 and 2007–08. While two time points have been compared, some of the variables examined have been reported elsewhere, showing trends including point estimates (with confidence intervals) in each year of the decade.[14] As the data sample is large, prospective, produced through rigorous methods and with robust confidence intervals, any differences detected can be assumed to represent a true change.

The most evident changes were associated with vascular problems, particularly hypertension and lipid disorders. Problems in the vascular/lipid group accounted for the majority (more than 70%) of all cardiovascular and lipid problems investigated at both time points. The management rate of vascular/lipid problems increased over time for both males and females, and for patients aged 75 years and older. While management increased for patients in this age group, there was a decrease for Repatriation health cardholders, although this was most likely a reflection of the decreased attendance rate of patients with Repatriation health cards overall.[14] The increase in pathology ordering for vascular/lipid problems was most likely associated with the increase in management of lipid disorders, and the increase in management of diabetes as the most common comorbidity. The greatest change in management for vascular/lipid conditions is the increased use statin medications (HMG CoA reductase inhibitors), and uptake of combination products not available in 1998–99.

While there was no change in the overall management rate of cardiac problems, there was an overall decrease in cardiac problem management for patients aged 45 years and older. There were significant decreases in the management rates of ischaemic heart disease and heart failure, and an increase in that for atrial fibrillation. Management changes included an increase in the use of statins, vitamin K antagonists (particularly warfarin), and alpha- and beta-blocking agents.

No discernable changes were found in the management rate of cerebrovascular problems, which in most cases were managed in patients aged 75 years and older. There was also no change in the management rate of stroke/cerebrovascular accident or of other cerebrovascular disease. Management again involved the greatly increased use of statin medications, and a large increase in prescribing of platelet aggregation inhibitors. There was also a significant increase in the rate of antipsycholeptics, quite possibly associated with the high prevalence of dementia in older patients.[25]

Common to the management of all three groups of problems was the increased prescribing rate of HMG CoA reductase inhibitor (statin) medications. The reduction in the management rate of ischaemic heart disease as a cardiac problem, and as a comorbidity with vascular/lipid problems, suggests that the use of these medications may be resulting in better prevention of the progression to these disease states.

It is likely that the significant increase in international normalised ratio (INR) point-of-care testing, also common to all three cardiovascular/lipid problem groups, is associated with the increase in the management rate for atrial fibrillation, and with increased prescribing of Vitamin K antagonists (particularly warfarin) for patients with this condition. In recent years, GPs and cardiologists have been encouraged to aggressively manage atrial fibrillation with warfarin, reducing the risk of death from stroke. The point-of-care testing improves the capacity to monitor these patients, particularly in country areas. This may also have contributed to the lack of change in the management rate of stroke/cerebrovascular accident where, given the ageing population, it may have been reasonable to expect an increase in this morbidity.

GP selection of medications for the problems managed appear to be in accordance with Therapeutic Guidelines.[8] A more thorough investigation would be required to judge guideline adherence of medications for individual cardiovascular problems, and is out of the scope of this report. The increasing availability of combination products and statins has led to some significant prescribing changes for each of the cardiovascular groups examined. While medication rates may appear low for some of the problems, it is likely that patients are medicated for the condition under management, but were not necessarily provided with a prescription on the day of the recorded consultation, especially where medication is well tolerated and several repeats are provided at the time of prescribing. This is particularly likely with this group of older patients—those most likely to have a cardiovascular condition, and to have chronic comorbidity, leading to more frequent GP visits.

The increased prescribing rate of lipid medications corresponds with an increase in management of lipid disorders, and this may in part reflect the change in PBS criteria, making PBS subsidised statins available to more patients. While the management rate of lipid disorders increased significantly, it should also be considered that such an increase does not necessarily infer an increase in prevalence. Lipid problems are an example of the types of problems people have existed with for many years, but the capacity to detect them has been comparatively recent, and the ability to treat them even more so. As access to medication and other managements for a condition improve, the likelihood of managing that condition is also likely to increase. Similarly, the access to international normalised ratio (INR) point-of-care testing may have allowed more patients to be managed with warfarin.

The uptake of check-ups by practice nurses since the introduction in 2004 of the item number for GPs to claim for this service has had an obvious impact on GP activity. Although not attributable to a specific time point, the increasing availability of point-of-care INR testing for patients on warfarin is also reflected in these data, where the uptake of this procedure was noted for both cardiac and vascular/lipid problems. INR testing is currently not claimable when performed at the practice, and therefore neither is practice nurses involvement, yet practice nurses are increasingly being involved with this procedure (practice nurses were doing INRs at a rate of 4.9 per 100 BEACH encounters in 2007–08).[3]

There is no indication that the chronic disease management MBS items introduced in 2005 affected either the management rate of cardiovascular/lipid problems, or how they are managed by the GP. There were no increased referrals to allied health services for any of the morbidity groups, and a significant decrease in the rate of these referrals for patients with cardiac problems. Other policies and initiatives, while applicable to cardiovascular disease management, do not appear to have resulted in any change in its management. The introduction of the one-off health check item introduced in 2006 for people aged 45–49 years corresponds with a significant increase in the rate of general check-ups[14], but as yet there has been no apparent influence on the management rates of cardiovascular/lipid problems.

The decrease in GP advice about problems has corresponded with an increase in counselling. This may infer that GPs are applying more intensive effort into improving cardiovascular health for these patients. However, what is most apparent from these results is the lack of change over the decade, for patient risk behaviours. There are fewer patients with no risk factors, and more patients with one. This is apparent both in patients with a cardiovascular/lipid problem, and those at all BEACH encounters. Females are more likely to have one risk factor, but only because males are more likely to have two or three.

On a positive note, there are far fewer patients smoking, but over the 7 years examined, neither sex has altered their drinking behaviour—nearly 30% of males and 20% of females drink alcohol at levels considered at-risk. Clearly, there is an increasing weight problem—literally. Considering the chronic nature of the morbidity (often multimorbidity) present in these patients, it would be reasonable to expect a reduction in excess weight. The proportion of both males and females in the normal weight range significantly decreased over this time period, and the corresponding increase was noted in the obese category. For this particular risk factor, women 'outweigh' men.

These results are supportive of the Heart Foundation comment that 'Australians are getting older, heavier and less active, putting themselves at greater risk of cardiovascular disease'.[26] The patients in this study already have diagnosed cardiovascular disease, yet are not changing risk behaviours. Initiatives specific to tackling cardiovascular health may be helpful in the long term, but ultimately it is patients' attitude and willingness to involve themselves in their health care that will make a difference.

**Suggested chapter citation**

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# 10 Type 2 diabetes

*Graeme Miller, Lisa Valenti*

## 10.1 Background

Type 2 diabetes is a major cause of illness and disability in Australia. Many policies and initiatives have been developed to tackle this problem, but the prevalence continues to rise along with the associated complications and disability. General practice has the major role in caring for patients with Type 2 diabetes, and this section of the report highlights the care given by GPs. Some problem and concept labels in this chapter include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

### Specific policies and initiatives

- In 1996, the Australian Government recognised diabetes as a National Health Priority Area.[1]
- In 1999, the Australian Government introduced the Enhanced Primary Care package, which included remuneration for participation in the multidisciplinary care of patients with chronic or complex conditions such as diabetes.[2]
- In June 2000, the World Health Organization (WHO) lowered the diagnostic value for fasting plasma/blood glucose concentrations, which had the effect of raising the potential number of patients diagnosed with diabetes.[3]
- In 2000, an initiative by the Queensland Government, Diabetes Mellitus 2000–04, was followed by similar initiatives in other states. During this period, all other states and territories initiated their own diabetes strategic plans.
- In 2001, the Australian Government introduced a $76 million program that included incentives to GPs and GP divisions for programs aiming to improve diabetes care in general practice.[4] The National Integrated Diabetes Program included MBS items for Diabetes Annual Cycle of Care, and incentive payments to practices through the Practice Incentive Program. The National Health and Medical Research Council released new guidelines for the detection and management of Type 2 diabetes.[5]
- In 2004, the Enhanced Primary Care multidisciplinary care plan for chronic disease management was superseded by the Allied Health and Dental Care Initiative, allowing patients with a care plan to access Medicare rebates for five allied health or dental services a year. This led to a doubling in claims for care plan items from the MBS. At the same time the Australian Government launched its action plan on diabetes.[6]
- In 2004, the Australian Primary Care Collaboratives (previously the National Primary Care Collaboratives), initially a $14.6 million, 3-year program to help GPs improve patient clinical outcomes, was also launched in 2004, and a second phase was funded in 2007. One major topic of the Collaboratives' quality improvement program was diabetes.[7]
- In 2005, GP Management Plans and team care arrangements replaced Enhanced Primary Care plans.

- In 2007, the criteria for PBS prescription of lipid lowering agents was widened allowing many more patients with Type 2 diabetes to be prescribed these drugs.[8]
- From 1 May 2007, new allied health items (81100 to 81125) allowed people with type 2 diabetes to receive Medicare rebates for group services provided by eligible diabetes educators, exercise physiologists and dietitians, on referral from a GP.

# 10.2 Prevalence of Type 2 diabetes in general practice patients

The prevalence of Type 2 diabetes in the BEACH sample of patients attending general practice has been studied in a number of BEACH SAND substudies (see Chapter 2). There has been a significant increase in the prevalence of Type 2 diabetes patients between 2000–01 and 2007–08. The results of the relevant studies are set out in Table 10.1.

**Table 10.1: Prevalence estimates of Type 2 diabetes in SAND studies**

| SAND study abstract number[9,10] | Study year | Number of patients in study | Prevalence (per cent) | 95%CI |
|---|---|---|---|---|
| Abstract 21 | 2000 | 2,810 | 6.0 | 4.8–7.2 |
| Abstract 25 | 2001 | 2,810 | 6.0 | 4.6–7.3 |
| Abstract 40 | 2002 | 2,876 | 7.1 | 5.6–8.7 |
| Abstract 45 | 2002 | 3,165 | 7.2 | 5.9–8.5 |
| Abstract 86 | 2005–06 | 3,099 | 7.7 | 6.4–9.0 |
| Abstract 89 | 2005 | 9,156 | 7.2 | 6.5–7.9 |
| Abstract 94 | 2006 | 2,713 | 8.3 | 6.7–9.8 |
| Abstract 107 | 2006–07 | 2,331 | 8.8 | 7.1–10.4 |
| Abstract 108 | 2007 | 2,832 | 7.5 | 6.1–8.9 |
| Abstract 115 | 2007 | 2,784 | 7.7 | 6.6–8.9 |
| Abstract 119 | 2007–08 | 5,989 | 8.5 | 7.4–9.5 |

*Note:* CI—confidence limit.

Using BEACH SAND data from 2005, Knox et al. estimated the prevalence of Type 2 diabetes in a BEACH sample of over 9,000 patients to be 7.2% (95%, CI: 6.5–7.9); 5.7% (95%, CI: 5.1–6.3) in the GP-attending population and 5.0% (95%, CI: 4.5–5.5) in the general population.[11] This is higher than the National Health Survey 2007–08 estimate of 4% in the general population[12], but less than the estimated 7.1% of the population 25 years and older reported from the AusDiab study of 1999–00 by the Australian Institute of Health and Welfare, which included undiagnosed Type 2 diabetes picked up in the survey.[13]

# 10.3 Multimorbidity occurring with diabetes

Using the method developed by Knox et al.[11], and Britt et al. investigated the population prevalence of multimorbidity in patients with diabetes (all types) using data from BEACH SAND substudy 89.[14] The Cumulative Illness Rating Scale was used to group chronic illnesses into domains according to the method described by Fortin et al.[15] For patients with diabetes, the most common associated morbidity was vascular disease, a combination that was present in 4.4% of the general population. Of these patients 26.5% had a morbidity in a third domain and 53.2% had 2 or more additional morbidities.

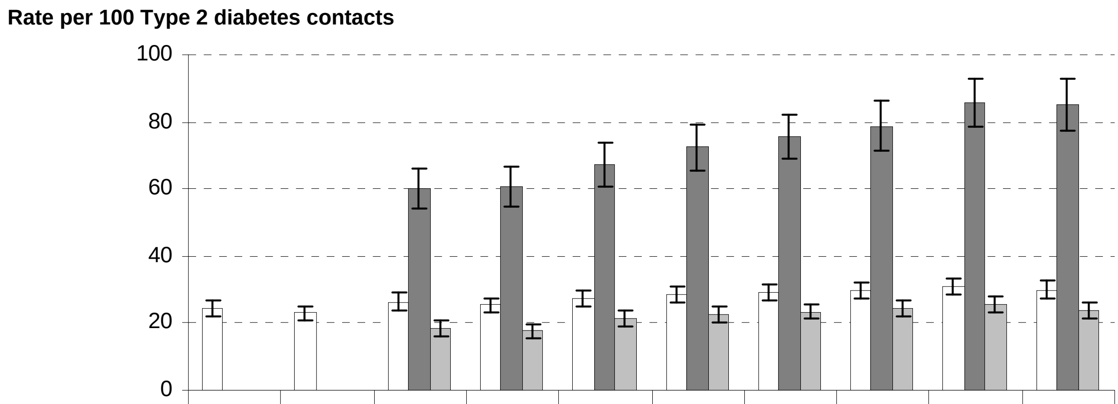
Diabetes patients with one or more additional morbidities constituted 6.1% of the population (estimated to be 1.3 million patients), 4.5% had 3 or more morbidities (estimated to be 945,000 patients) and 2.8% had 4 or more additional morbidities (estimated to be 588,000 patients).

# 10.4 Investigations

## Pathology test ordering

Between 1998–99 and 2007–08, there was a significant increase in the likelihood of GPs ordering pathology tests for Type 2 diabetes. In 1998–99, 24.5% (95% CI: 22.1–27.0) of Type 2 diabetes problem contacts generated at least one pathology test order compared with 30.0% (95% CI: 27.5–32.6) in 2007–08.

The number of pathology tests ordered per 100 Type 2 diabetes problems managed also increased from 60.1 (95% CI: 54.0–66.1) in 2000–01 to 85.1 (95% CI: 77.6–92.6) per 100 problem contacts in 2007–08. The rate at whichHbA1c tests were ordered for Type 2 diabetes reflected the change in the overall test order rate, increasing by about 33%, from 17.7 (95% CI: 15.7–19.7) in 2001–02 to 23.6 (95% CI: 21.2–26.0) in 2007–08 (Figure 10.1).




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| □ At least one path | 24.5 | 23.0 | 26.5 | 25.3 | 27.4 | 28.6 | 29.2 | 29.9 | 30.8 | 30.0 |
| ■ Rate per 100 diab | | | 60.1 | 60.8 | 67.3 | 72.5 | 75.6 | 78.7 | 85.6 | 85.1 |
| ■ HbA1c | | | 18.5 | 17.7 | 21.3 | 22.7 | 23.3 | 24.3 | 25.6 | 23.6 |

**Data period**

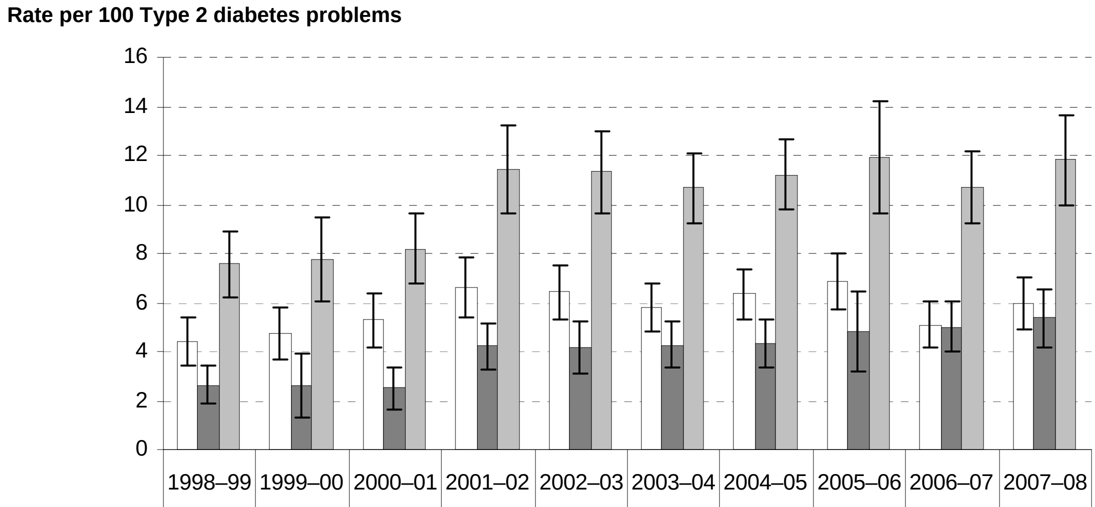
*Note:* Detailed pathology data are not available for 1998–99 and 1999–00. Path—pathology test ordered; diab—diabetes contact.

**Figure 10.1: Pathology test—likelihood of order and rate per 100 Type 2 diabetes contacts, 1998–99 (or 2000–01) to 2007–08 (95% CI)**

## Referrals

The method of collecting referral data changed significantly at the end of 1999–00, so referral data are reported from 2000–01 onwards. There was a significant increase in the rate at which patients were referred for Type 2 diabetes, from 8.2 (95% CI: 6.8–9.6) per 100 Type 2 diabetes problems in 2000–01 to 11.8 per 100 (95% CI: 10.0–13.6) in 2007–08 (Figure 10.2). This increase may have been due to the introduction of the National Integrated Diabetes Program (2001)[4], which encouraged partnerships with other health care professionals, and gave support for the divisions of general practice to work with GPs and other health professionals to improve access to better care for people with diabetes. The level has been maintained through subsequent years.

The rate of referrals to specialists did not change significantly between 2000–01 and 2007–08. However, the rate of referrals to allied health professionals doubled from 2.5 (95% CI: 1.7–3.3) per 100 Type 2 diabetes problems in 2000–01 to 5.4 (95% CI: 4.2–6.6) per 100 in 2007–08, with a major change between 2000–01 and 2001–02, perhaps in response to the national program changes (Figure 10.2).



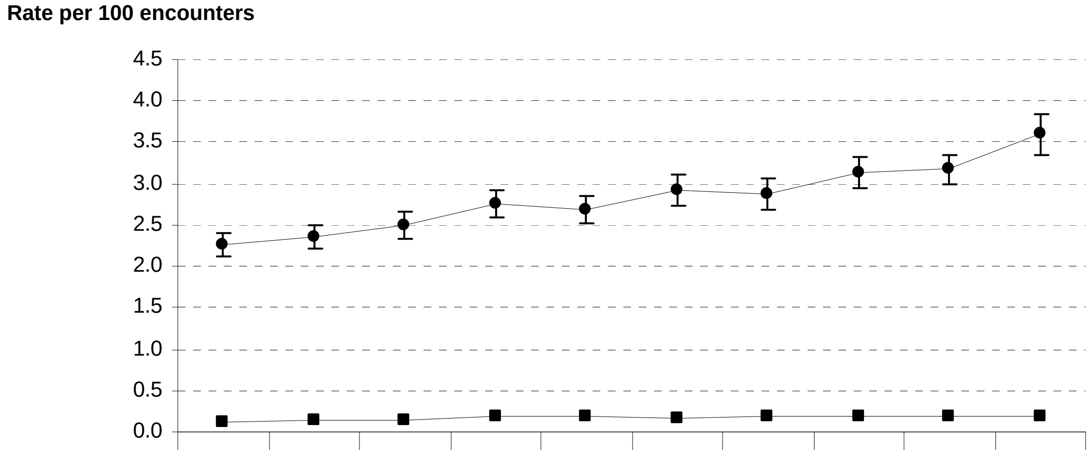

| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Specialist | 4.4 | 4.8 | 5.3 | 6.6 | 6.4 | 5.8 | 6.3 | 6.9 | 5.1 | 5.9 |
| Allied Health | 2.6 | 2.6 | 2.5 | 4.2 | 4.2 | 4.3 | 4.4 | 4.8 | 5.0 | 5.4 |
| Total | 7.6 | 7.7 | 8.2 | 11.4 | 11.3 | 10.7 | 11.2 | 11.9 | 10.7 | 11.8 |

Data period

**Figure 10.2: Referral rate per 100 Type 2 diabetes contacts, 1998–99 to 2007–08 (95% CI)**

# 10.5 Management

As shown in Figure 10.3, since 1998–99 there has been a 57% increase in the management rate of Type 2 diabetes in general practice, from 2.3 per 100 encounters in 1998–99 (95% CI: 2.1–2.4) to 3.6 per 100 encounters in 2007–08 (95% CI: 3.3–3.8). There has also been a significant increase in the rate of new diagnoses of Type 2 diabetes, from 0.11 per 100 encounters in 1998–99 (95% CI: 0.09–0.14) to 0.21 per 100 encounters in 2007–08 (95% CI: 0.18–0.24).



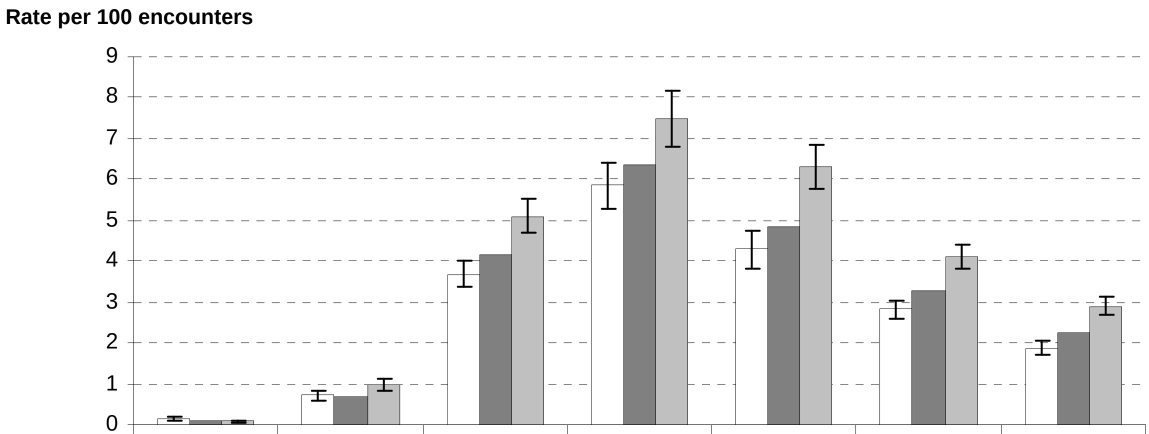

| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Diabetes mellitus | 2.3 | 2.4 | 2.5 | 2.8 | 2.7 | 2.9 | 2.9 | 3.1 | 3.2 | 3.6 |
| New diabetes mellitus | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

**Data period**

**Figure 10.3: Type 2 diabetes management rates per 100 encounters, 1998–99 to 2007–08 (95% CI)**

## The patients

The rate at which Type 2 diabetes was managed steadily increased over the study period for patients aged 45 years and over. There was no change for patients younger than 45 years. The significant increase in the rate of management of Type 2 diabetes applied to both male and female patients (Figure 10.4).



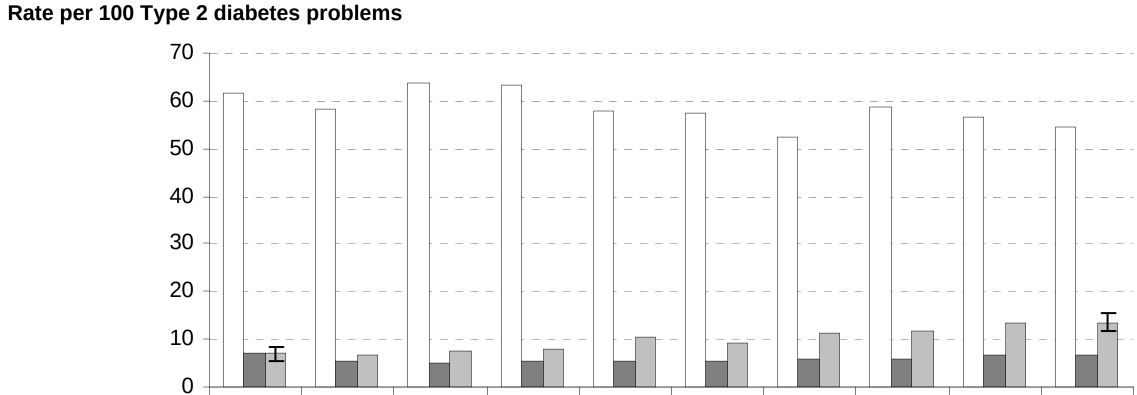

| | 0–24 | 25–44 | 45–64 | 65–74 | 75+ | Male | Female |
|---|---|---|---|---|---|---|---|
| 1998–99 | 0.1 | 0.7 | 3.7 | 5.9 | 4.3 | 2.8 | 1.9 |
| 2002–03 | 0.1 | 0.7 | 4.2 | 6.4 | 4.8 | 3.3 | 2.3 |
| 2007–08 | 0.1 | 1.0 | 5.1 | 7.5 | 6.3 | 4.1 | 2.9 |

**Age and sex-specific rate**

**Figure 10.4: Age and sex-specific management rates of Type 2 diabetes (95% CI)**

## Medications

There was no change in total medication rates per 100 Type 2 diabetes problem contacts from 1998–99 (75.6, 95% CI: 70.5–80.8) to 2007–08 (74.9, 95% CI: 70.4–79.3). The majority of medications recorded for the management of patients' Type 2 diabetes were oral blood glucose lowering agents, followed by insulin. Medication rates for both of these medication types per 100 Type 2 diabetes problems managed remained relatively constant over the 10-year study period. However other medications increased significantly from 7.0 (95% CI: 5.5–8.4) per 100 Type 2 diabetes problems managed in 1998–99 to 13.6 (95% CI: 11.6–15.5) in 2007–08 (Figure 10.5).



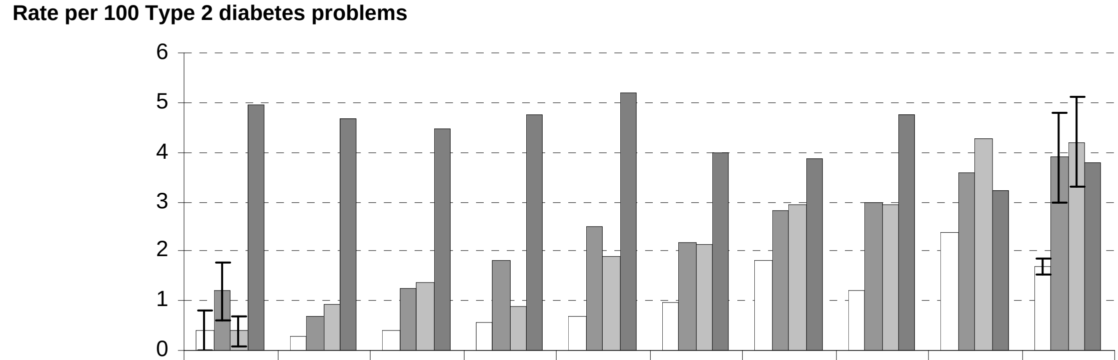

| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Blood glucose low ering | 61.6 | 58.1 | 63.6 | 63.1 | 57.7 | 57.3 | 52.3 | 58.7 | 56.6 | 54.6 |
| Insulin | 7.0 | 5.4 | 4.9 | 5.7 | 5.4 | 5.4 | 5.8 | 5.9 | 6.8 | 6.7 |
| Other medications | 7.0 | 6.5 | 7.5 | 8.1 | 10.3 | 9.3 | 11.5 | 11.9 | 13.4 | 13.6 |

Data period

**Figure 10.5: Medication rates per 100 Type 2 diabetes contacts, 1998–99 to 2007–08 (95% CI)**

Figure 10.6 shows a breakdown of the changes over time in the other medication group.

- Rates of anti-thrombotic agents, mainly aspirin antiplatelet therapy showed some variability from year to year; however, there was a significant increase over the 10 years. The 2007–08 rate was 4 times higher than that of 1998–99.
- The rate of anti-hypertensive prescription/supply for Type 2 diabetes increased significantly from 2004–05 onwards compared with the period from 1998–99 to 2000–01. In 1998–99, anti-hypertensives were prescribed at a rate of 1.2 (95% CI: 0.6–1.8) per 100 Type 2 diabetes problems managed, while in 2007–08 the rate was 3 times as high, at 3.9 (95% CI: 3.0–4.8).
- Lipid lowering agent prescription/supply for Type 2 diabetes followed a similar pattern, with a significantly higher rate from 2002–03 onwards. In 1998–99, lipid medication was prescribed at a rate of 0.4 (95% CI: 0.1–0.7) per 100 Type 2 diabetes problems managed, while in 2007–08 the rate was 10 times as high, at 4.2 (95% CI: 3.3–5.1).
- The miscellaneous group includes a wide range of therapeutic agents, which together accounted for almost half of this group. Prescription/supply rates did not change over time.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Anti-thrombotic | 0.4 | 0.3 | 0.4 | 0.6 | 0.7 | 1.0 | 1.8 | 1.2 | 2.4 | 1.7 |
| Anti-hypertensive | 1.2 | 0.7 | 1.3 | 1.8 | 2.5 | 2.2 | 2.8 | 3.0 | 3.6 | 3.9 |
| Lipid low ering | 0.4 | 0.9 | 1.4 | 0.9 | 1.9 | 2.1 | 2.9 | 2.9 | 4.3 | 4.2 |
| Miscellaneous | 5.0 | 4.7 | 4.5 | 4.8 | 5.2 | 4.0 | 3.9 | 4.8 | 3.2 | 3.8 |

**Data period**

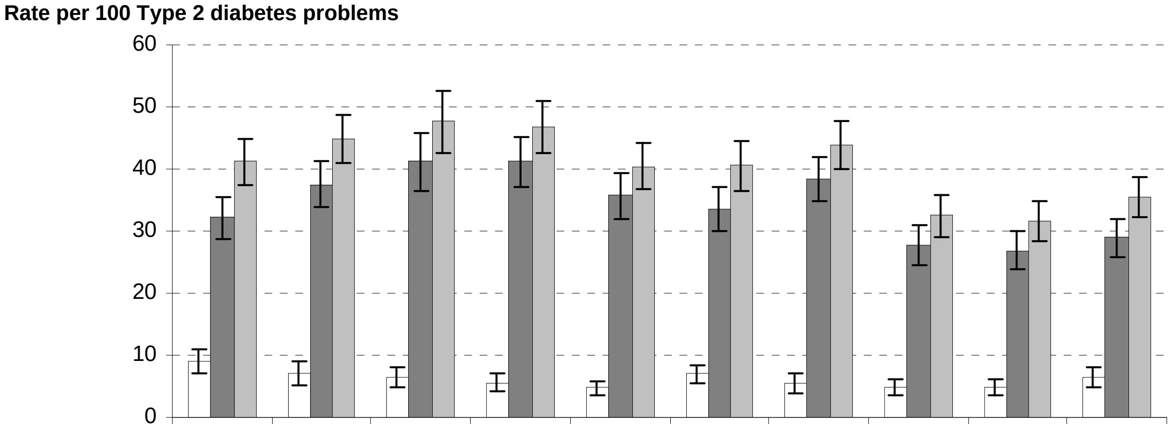
**Figure 10.6: Medication rates per 100 Type 2 diabetes contacts, 1998–99 to 2007–08 (95% CI)**

## Other treatments

The rate at which other treatments (including procedures, and clinical treatments such as advice, education and counselling) were recorded for the management of Type 2 diabetes remained fairly constant from 1998–99 to 2004–05. Between 2004–05 and 2005–06, the rate dropped significantly from 43.9 (95% CI: 40.1–47.7) per 100 Type 2 diabetes problems to 32.4 (95% CI: 29.0–35.9), and has since remained at the lower level. In 2007–08:

- clinical treatments rose significantly from 32.2 (95% CI: 28.7–35.6) per 100 Type 2 diabetes problems managed in 1998–99 to 41.1 (95% CI: 36.5–45.8) in 2000–01, then decreased to 33.6 (95% CI: 30.0–37.2) in 2003–04 and again to 27.7 (95% CI: 24.5–31.0) in 2005–06 and has since remained constant
- the rate of procedural treatments for Type 2 diabetes decreased from 9.0 per 100 contacts in 1998–99 (95% CI: 7.1–11.0) to 4.8 (95% CI: 3.6–5.9) in 2002–03 and then stayed relatively stable (Figure 10.7).

The sudden decrease in other treatments between 2004–05 and 2005–06 coincided with several new major diabetes initiatives, such as the introduction of EPC items and the accompanying increase in allied health referrals. However GPs overall were recording fewer other treatments. The research team believes that the decrease may reflect the increasing use of practice nurses to provide advice and education, and to undertake procedures (such as treating leg ulcers) independent of the GP–patient encounter as well as the greater referrals to allied health professionals. This could also reflect a reduced rate of complications due to earlier diagnosis and improved management.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Procedural | 9.0 | 7.2 | 6.5 | 5.6 | 4.8 | 6.9 | 5.5 | 4.7 | 4.7 | 6.5 |
| Clinical | 32.2 | 37.6 | 41.1 | 41.3 | 35.7 | 33.6 | 38.5 | 27.7 | 26.8 | 28.9 |
| Total | 41.2 | 44.7 | 47.6 | 46.9 | 40.5 | 40.5 | 43.9 | 32.4 | 31.5 | 35.4 |

Data period

**Figure 10.7: Other treatment rates per 100 Type 2 diabetes contacts, 1998–99 to 2006–07 (95% CI)**

# 10.6 Time use of patients with Type 2 diabetes

## Length of consultation

Measured length of consultation was introduced to BEACH in 2000–01 for a subsample of 40% of the GP–patient encounters. In all years (2000–01 to 2007–08) encounters where Type 2 diabetes was managed were significantly longer (by 2 minutes) than encounters where Type 2 diabetes was not managed. Between 2000–01 and 2007–08, there was no significant change in the average lengths of encounters with or without Type 2 diabetes (Figure 10.8).

## Encounter frequency per year

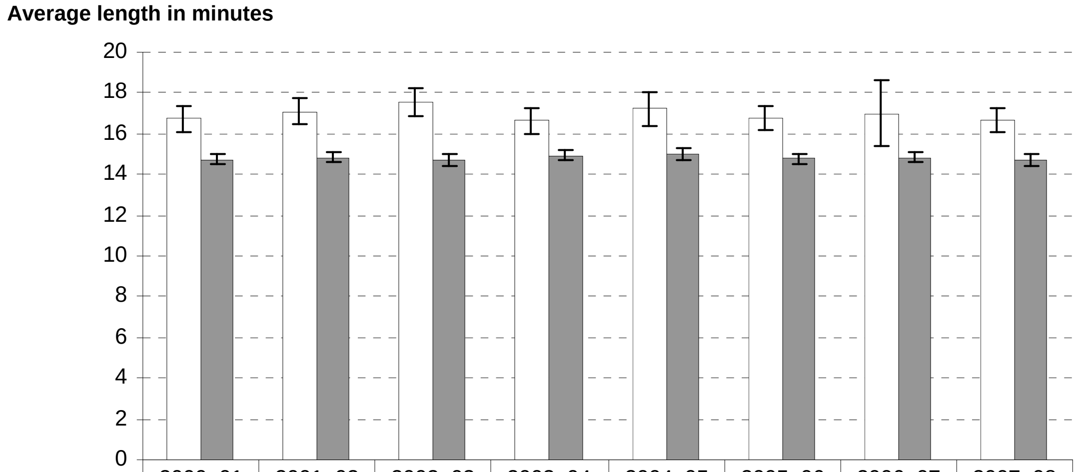
Encounter frequency was measured in several SAND substudies, related to the prevalence and severity of patient problems designated as National Health priority Areas. Two substudies have been analysed to compare encounter frequency in 2001–02 and 2006–07.

The mean number of annual GP encounters reported in 2001–02 was 13.0 (95% CI: 12.0–14.1) for SAND patients with diagnosed diabetes and 8.8 (95% CI: 8.2–9.3) for all patients in the SAND block. In 2006–07, the rate of annual GP encounters with patients with diabetes was 11.8 (95% CI: 10.4–13.2) and 8.9 (95% CI: 8.4–9.5) for all patients in the SAND block. There has been no significant change in the encounter rate for patients with diabetes between the two studies, and there has been no increase in the encounter rate for all patients in the samples between 2001–02 and 2006–07.

## GP time use per year

General practitioner time use per year is calculated as the product of the consultation length and the frequency of encounters, and is expressed in hours per year. While these results give some indication of the disease burden of diabetes, unreported studies by the research team have shown that comorbidity in patients with diabetes is the major contributor to this increased resource use.

Annual GP time use in 2001–02 was about 3.7 hours per patient with diabetes compared with about 1.9 hours for all patients in this SAND block. In 2006–07, GP time use by patients with diabetes was about 3.3 hours and about 2.2 hours for all patients in the SAND block (Figure 10.8).




| | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|
| □ With diabetes | 16.7 | 17.1 | 17.6 | 16.6 | 17.2 | 16.7 | 17.0 | 16.7 |
| ■ Without diabetes | 14.8 | 14.9 | 14.7 | 14.9 | 15.0 | 14.8 | 14.8 | 14.7 |

Data period

**Figure 10.8: Length (in minutes) of consultations with and without management of diabetes (95% CI)**

# 10.7 Management of Type 2 diabetes in 2007–08

Figure 10.9 provides an overview of the management of Type 2 diabetes at GP encounters during 2007–08. Type 2 diabetes was managed in BEACH 3,407 times in the year from April 2007 to March 2008, at a rate of 3.6 per 100 general practice encounters (Figure 10.9). This extrapolates to about 3.9 million encounters where Type 2 diabetes was managed that year.

### Age and sex of patients

Just under 50% of encounters at which Type 2 diabetes was managed (Type 2 diabetes encounters) were with female patients, lower than the percentage of female encounters in BEACH. The sex-specific rates showed Type 2 diabetes management rates of 4.2 per 100 encounters with males and 3.0 per 100 encounters with females.

The age distribution for Type 2 diabetes encounters showed significant differences from the total BEACH data. There were higher than average encounters with patients aged 45–64 years (40.5%), those aged 65–74 years (26.6%) and those aged 75+ (26.3%). Age-specific rates of Type 2 diabetes management were highest among those age groups.

**Reasons for encounter**

Diabetes was the most common reason for encounter stated by patients (30.5 per 100 of these encounters). Request for prescription was the reason given by patients at 24.9 per 100 Type 2 diabetes encounters.

**Other problems managed**

Hypertension was the most commonly managed problems with Type 2 diabetes, at a rate of 26.2 per 100 of these encounters. This was followed by lipid disorders at 10.4 per 100 Type 2 diabetes encounters. Osteoarthritis and ischaemic heart disease (at 3.8 and 3.6 per 100 Type 2 diabetes encounters, respectively) were managed at significantly higher than average rates for BEACH. The pattern of other problems managed with Type 2 diabetes is consistent with the older age of Type 2 diabetes patients and the known consequences of the disease.

**Medications**

The rate of medications prescribed/supplied or advised was above the BEACH average at 74.9 per 100 Type 2 diabetes problems managed. Metformin was the medication most often prescribed, at a rate of 29.8 per 100 Type 2 diabetes problems managed, followed by gliclazide at 14.0 per 100 problems. Insulins in the top 10 medications were together prescribed at a rate of 5.8 per 100 Type 2 diabetes problems.

**Other treatments**

The rate of other treatments provided, 36.0 per 100 of these problems, was close to the average for BEACH. Most commonly the treatment was counselling/advice/education provided at a rate of 26.5 per 100 Type 2 diabetes problems managed.

**Referrals**

The average referral rate for BEACH is 8 per 100 problems managed. Patients with Type 2 diabetes were referred at a rate of 11.8 per 100 problems. Referrals were made most frequently to ophthalmologists (2.7 per 100 Type 2 diabetes problems) and endocrinologists (1.8 per 100 Type 2 diabetes problems).

**Pathology and imaging orders**

The pathology ordering rate of 85.0 per 100 Type 2 diabetes problems was 3 times the average. HbA1c test was the most commonly ordered, at a rate of 23.6 per 100 of these problems. A lipid profile was ordered for 13.3 per 100 Type 2 diabetes problems managed.

## Type 2 diabetes

***n* = 3,407 (3.6 per 100 encounters)**

**The patients**

| Sex | Per cent | Rate[(a)] |
|---|---|---|
| Males | 51.4 | 4.2 |
| Females | 48.6 | 3.0 |

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| 25–44 | 6.3 | 1.0 |
| 45–64 | 40.5 | 5.1 |
| 65–74 | 26.6 | 7.5 |
| 75+ | 26.3 | 6.3 |

**Top 10 medications**

*n* = 2,551 (74.9 per 100 diabetes problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Metformin | 29.8 |
| Gliclazide | 14.0 |
| Glimepiride | 2.8 |
| Rosiglitazone | 2.5 |
| Insulin isophane | 2.4 |
| Glibenclamide | 2.4 |
| Atorvastatin | 2.2 |
| Pioglitazone | 1.9 |
| Insulin aspart | 1.7 |
| Insulin glargine | 1.7 |

**Reasons for encounter**

*n* = 6,175 (181.2 per 100 diabetes encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Diabetes | 30.5 |
| Prescription—all | 24.9 |
| Test results | 13.5 |
| Endocrine check-up | 10.0 |
| Cardiac check-up | 9.0 |
| Hypertension | 5.9 |
| General check-up | 5.4 |
| Blood test endocrine/metabolic | 4.3 |
| Follow-up endocrine | 3.9 |
| Administrative procedure NOS | 3.4 |

**Other treatments**

*n* = 1,208 (36.0 per 100 diabetes problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Counselling/advice/education | 26.5 |
| Glucose test | 3.3 |
| Administrative procedure | 1.7 |
| Check-up–practice nurse | 1.4 |
| Electrical tracing | 0.6 |

**Referrals**

*n* = 385 (11.8 per 100 diabetes problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Ophthalmologist | 2.7 |
| Endocrinologist | 1.8 |
| Podiatrist/chiropodist | 1.7 |
| Diabetes education | 1.5 |
| Dietitian/nutritionist | 1.4 |

**Other problems managed**

*n* = 4,331 (127.1 per 100 diabetes encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Hypertension | 26.2 |
| Lipid disorders | 10.4 |
| Osteoarthritis | 3.8 |
| Ischaemic heart disease | 3.6 |
| Oesophageal disease | 3.1 |
| Depression | 3.1 |
| Immunisation/vaccination—all | 3.0 |
| Atrial fibrillation/flutter | 2.0 |
| Prescription—all | 1.9 |
| Obesity | 1.4 |

**Pathology**

*n* = 2,900 (85.0 per 100 diabetes problems)

| | Rate per 100 problems[(c)] |
|---|---|
| HbA1c test | 23.6 |
| Lipids profile | 13.3 |
| Glucose test | 8.4 |
| Full blood count | 7.3 |
| Chemistry other | 7.3 |
| Electrolytes, urea and creatinine | 7.2 |

(a) Specific rate per 100 encounters in each sex and age group.
(b) Expressed as a rate per 100 encounters at which Type 2 diabetes was managed.
(c) Expressed as a rate per 100 Type 2 diabetes problems managed.

*Note:* Some problem and concept labels in this figure include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

**Figure 10.9: Management of Type 2 diabetes in general practice, 2007–08**

# 10.8 Discussion

Both the diagnosed prevalence and the management rate of Type 2 diabetes have increased significantly over the 10 years of the BEACH study.

Policies that may have influenced the increase in prevalence of diagnosed Type 2 diabetes may be:

- the lowering of the diagnostic value for fasting plasma/blood glucose concentrations by the World Health Organization in 2000
- the new National Health and Medical Research Council guidelines for the detection and management of Type 2 diabetes, published in 2001 and promulgated through RACGP and Diabetes Australia handbooks
- the National Integrated Diabetes Program including the introduction of the diabetes Annual Cycle of Care I in 2001
- the Australian Government action plan on diabetes
- the continuing Australian Primary Care Collaboratives Program.

These may have led to an increase in the detection rate of Type 2 diabetes. However, it may be inferred from the higher rate of diabetes in epidemiological studies such as AusDiab and the North West Adelaide Health Study that there may still be a significant pool of undiagnosed Type 2 diabetes in the community.[16]

The new Diabetes risk evaluation item (for those aged 40–49 years at high risk of developing Type 2 diabetes), introduced in mid-2008, may also influence future detection rates.

The frequent occurrence of multimorbidity with diabetes has significant implications for its management and for the development of guidelines for best practice care in complex patient situations.

The increase in the likelihood of ordering pathology tests for Type 2 diabetes, and in the number of tests ordered on ordering occasions, could both be due to the introduction of the Annual Cycle of Care initiative in 2001, which required GPs to measure diabetes patients' HbA1c, cholesterol, triglycerides and high-density lipoprotein cholesterol levels at least once each year, to be able to claim the incentive. The increased prescribing of lipid lowering agents for patients with diabetes, and the resulting necessity to monitor both lipid levels and hepatic function also probably played a part in increasing test rates.

Allied health referrals have increased in line with the MBS changes encouraging team-based care of Type 2 diabetes patients.

Changes in guidelines and PBS regulations for the management of Type 2 diabetes may have contributed to significantly changed management by GPs. Research such as the Heart Protection Study[17], demonstrating the effectiveness of lipid lowering agents in preventing vascular incidents in patients with diabetes may have also led to an increase in prescribing.

Although the overall medication rate for lipid lowering, antithrombotic agents, and some types of anti-hypertensives, increased significantly in the total BEACH sample[10], they did not show the large increase that has been demonstrated in the management of Type 2 diabetes. The increase is probably due to the initiatives encouraging GPs to manage hypertension and hyperlipidaemia at a lower clinical threshold for patients with diabetes[8,18-20] and to provide antiplatelet therapy for those with added cardiovascular risk.[18,21]

There has been no change in length of consultations, despite an increase in number and complexity of tasks set out in cycle of care guidelines. Some of this extra work may be done by practice nurses.

# 10.9 Conclusion

In the first 10 years of the BEACH program, both diagnosed prevalence and management rates for Type 2 diabetes has increased significantly. Over the 10 years, management patterns have changed in line with changes in National Health and Medical Research Council evidence-based guidelines, PBS prescribing rules and annual cycle of care guidelines.

The undiagnosed pool of patients with Type 2 diabetes in the community is being tackled through increased surveillance programs such as the Australian Primary Care Collaboratives and the Diabetes Risk Evaluation program introduced in mid-2008.

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# 11 Arthritis and musculoskeletal conditions

*Julie O'Halloran, Ying Pan*

## 11.1 Background

The *Burden of disease and injury in Australia 2003* study reported that musculoskeletal conditions accounted for 4% of the total burden of disease and injury in Australia in 2003. Of musculoskeletal conditions, the greatest burden was caused by osteoarthritis (33% of all musculoskeletal burden), followed by back pain (28%) and rheumatoid arthritis (16%). The majority of the musculoskeletal burden was in females (58%).[1]

According to the 2007–08 National Health Survey, 15% of Australians reported they had arthritis. Of these, 51% of people specified they had osteoarthritis and 14% specified rheumatoid arthritis. The proportion of the survey population who reported having osteoarthritis increased with age, to 48% of those aged 65 years and over. Osteoporosis was reported by 3% of those surveyed.[2]

A 2007 report by Access Economics estimated that $4.2 billion in health system expenditure was related to arthritis, including $300 million for medical services provided outside hospitals.[3]

In recognition of the burden caused by musculoskeletal conditions, in 2002 Arthritis and musculoskeletal conditions were added to the Australian National Health Priority Areas.[4] A national action plan for osteoarthritis, rheumatoid arthritis and osteoporosis was released in 2004. Its goal was 'to decrease the burden of disease and disability associated with osteoarthritis, rheumatoid arthritis and osteoporosis within Australia and improve health-related quality of life'. One area highlighted in the plan related to encouraging best practice in the management of the listed musculoskeletal conditions. Specifically, decision support mechanisms, medical workforce issues and education of health professionals about musculoskeletal conditions were strategies identified.[5]

Subsequently, a national service improvement framework for osteoarthritis, rheumatoid arthritis and osteoporosis was released in 2005 and endorsed by the Australian Health Ministers' Conference. The content of the framework reiterated the areas identified in the national action plan, and developed nine priorities for action, which again emphasised the importance of evidence-based care and workforce issues.[6]

Internationally, the decade of 2000–2010 is designated the 'Bone and Joint Decade'. This initiative aims to raise the profile of bone and joint disorders as a growing burden of disease, and to advance research and education about these conditions.[7] Australia endorsed the initiative in 2001.[8]

Other health policies introduced over the 10-year period from 1998–99 to 2007–08 influencing but not directly related to arthritis and musculoskeletal conditions were contained in the Enhanced Primary Care Program in the Medicare Benefits Schedule. This program began in 1999 for the general practice management of Australians with chronic and complex health conditions[9], with subsequent modifications to this program occurring since.

Initiatives such as multidisciplinary team care arrangements (formerly chronic disease management plans) and general practice management plans aim to improve the quality of care for these patients and allow GPs to develop and maintain a plan of care directly relating to chronic and complex conditions.[10]

## Previous research undertaken by the BEACH program

The BEACH program includes a series of substudies, where the GP and/or the patient are asked about a particular topic of interest. These are referred to as Supplementary Analysis of Nominated Data (SAND) (see Chapter 2 for more detail). SAND substudies have been used to investigate a variety of topics related to musculoskeletal disease.[11]

- In a 2005 SAND substudy about arthritis, the prevalence of all diagnosed arthritis was estimated to be 26.5% of the sample, with the majority of these patients having diagnosed osteoarthritis (23.6%). Of the patients with any arthritis, 43.9% indicated that they had taken a non-steroidal anti-inflammatory drug (NSAID) for their arthritis in the previous 12 months.[11]
- Other BEACH substudies have investigated the use of NSAIDs:
  - A 2002 substudy indicated that 14.3% of general practice patients were taking an NSAID.
  - A 2004–05 substudy reported that 7.7% of patients were using non-specific NSAIDs and 6.9% were taking cox-2 inhibitors. One quarter of patients on non-specific NSAIDs and 70% of patients on cox-2 inhibitors were taking these medications for arthritis.
- A 2007 substudy that investigated the risk factors for osteoporosis indicated that half (51.9%) of those screened for osteoporosis had been diagnosed with the condition, with no difference in the likelihood of being diagnosed after screening between males and females. Over half (54.1%) the patients who had diagnosed osteoporosis or were screened for it were aged 75 years or more.[12]
- Estimates of the population prevalence of selected chronic conditions in 2005 suggest that:
  - 14.8% of the Australian population had any type of arthritis: 12.6% with osteoarthritis and 0.7% with rheumatoid arthritis
  - 7.4% of the population were under management for chronic back pain.[13]
- Of the 20.4% of the GP patient population with arthritis and/or chronic back pain, 16.6% had at least one other listed morbidity, 10.7% experienced two or more other morbidities and 5.7% had 3 or more other morbidities. The multimorbidity combination most frequently reported was arthritis/chronic back pain and vascular disease, by 10.6% of the general practice patient population in Australia.[14]

## 11.2 Overview of musculoskeletal problems managed

Details of the BEACH method are outlined in Chapter 2. Some problem and concept labels in this chapter include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

Figure 11.1 provides an overview of the management of musculoskeletal problems in Australian general practice in 2007–08. Musculoskeletal problems were managed at a rate of 17.3 problems per 100 encounters (95% CI: 16.8–17.9). The management rate of musculoskeletal problems has not changed since 1998–99 (17.0 per 100 encounters, 95% CI: 16.4–17.6). The figure shows that those aged 45–64 years accounted for one-third of all musculoskeletal problems.

- At encounters where one or more musculoskeletal problems were managed, the most common patient reasons for encounter were back complaints, followed by requests for prescriptions and for test results. Other commonly recorded reasons for encounter centred on symptoms and complaints of body parts (for example, knees, shoulder).
- Another problem was managed with a musculoskeletal problem at three out of four musculoskeletal encounters, with hypertension the comorbidity managed most often (9.3 per 100).
- Medications were given in the management of two-thirds of musculoskeletal problems. The most frequent medication listed was paracetamol (10.9 per 100 musculoskeletal problems), followed by a combination product of paracetamol and codeine (6.7 per 100).
- Other treatments were given for one-third of musculoskeletal problems, with physical medicine/rehabilitation the most frequent other treatment provided (6.1 per 100 musculoskeletal problems).
- Referrals were provided at a rate of 14.7 per 100 musculoskeletal problems managed, with referrals to physiotherapists (6.0 per 100 musculoskeletal problems) and orthopaedic surgeons (3.6 per 100) the most common (Figure 11.1).

Table 11.1 compares the management rates of musculoskeletal problems in general practice in 1998–99 and 2007–08.

- In both years back complaint was the musculoskeletal problem managed most frequently, at a rate of 2.7 per 100 encounters. This problem accounted for 16% of all musculoskeletal problems managed and 1.8% of all problems managed in each of the 2 years reported.
- There was a marginal increase in the management rate of osteoarthritis between 1998–99 and 2007–08, from 2.2 per 100 encounters to 2.6 per 100.
- There was a marginal decrease in the management rate of arthritis (not specified as either osteoarthritis or rheumatoid arthritis) from 0.8 per 100 encounters to 0.6 per 100. This suggests a drift in labelling from 'arthritis' to the more specific 'osteoarthritis', perhaps reflecting more frequent gathering of evidence for the more specific diagnosis.
- The rate at which osteoporosis was managed doubled over the 10-year period from 0.5 per 100 encounters in 1998–99 to 1.0 per 100 in 2007–08 (Table 11.1).

**The patients**

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| <5 | 0.7 | 1.8 |
| 5–24 | 9.2 | 10.1 |
| 25–44 | 20.4 | 14.9 |
| 45–64 | 35.6 | 22.1 |
| 65–74 | 16.5 | 23.3 |
| 75+ | 17.6 | 20.9 |

| Sex | Per cent | Rate[(a)] |
|---|---|---|
| Male | 43.8 | 17.6 |
| Female | 56.2 | 17.1 |

**Medications—prescribed**

*n* = 10,977 (66.1 per 100 musc problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Paracetamol | 10.9 |
| Paracetamol/codeine | 6.7 |
| Meloxicam | 5.7 |
| Ibuprofen | 3.6 |
| Oxycodone | 3.5 |
| Tramadol | 3.5 |
| Diclofenac sodium systemic | 3.3 |
| Celecoxib | 2.7 |
| Naproxen | 1.5 |
| Alendronate | 1.4 |

# Musculoskeletal problems

***n* = 16,616 (17.3 per 100 encounters)**

**Reasons for encounter**

*n* = 26,318 (165.8 per 100 musc. encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Back complaint | 17.9 |
| Prescription—all | 14.6 |
| Test results | 8.8 |
| Knee symptom/complaint | 7.3 |
| Shoulder symptom/complaint | 5.5 |
| Neck symptom/complaint | 4.6 |
| Cardiac check-up | 4.4 |
| Foot/toe symptom/complaint | 4.3 |
| Leg/thigh symptom/complaint | 3.6 |
| Musculoskeletal injury NOS | 3.3 |

**Other treatments**

*n* = 5,841 (35.2 per 100 musc. problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Physical medicine/rehabilitation | 8.4 |
| Advice/education | 7.1 |
| Counselling—problem | 3.0 |
| Local injection/infiltration | 2.9 |

**Referrals**

*n* = 2,450 (14.7 per 100 musc problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Physiotherapy | 6.0 |
| Orthopaedic surgeon | 3.6 |
| Rheumatologist | 1.0 |
| Podiatrist/chiropodist | 0.7 |
| Neurosurgeon | 0.4 |

**Other problems managed**

*n* = 11,731 (73.9 per 100 musc. encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Hypertension | 9.3 |
| Lipid disorders | 3.5 |
| Diabetes | 2.9 |
| Depression | 2.9 |
| Oesophageal disease | 2.3 |
| Immunisation—all | 2.0 |
| Sleep disturbance | 1.7 |
| Upper respiratory tract infection | 1.3 |
| Prescription—all | 1.2 |
| Asthma | 1.1 |

**Pathology/Imaging**

Pathology *n* = 2,151; Imaging *n* = 3,746)

| | Rate per 100 problems[(c)] |
|---|---|
| Pathology | 12.9 |
| Imaging | 22.5 |

(a) Specific rate per 1,000 encounters in each sex and age group.
(b) Expressed as a rate per 100 encounters at which musculoskeletal problems were managed.
(c) Expressed as a rate per 100 musculoskeletal problems managed.
*Note:* Musc—musculoskeletal; NOS—not otherwise specified.

**Figure 11.1: Management of musculoskeletal problems in general practice, 2007–08**

**Table 11.1: Most frequently managed musculoskeletal problems, 1998–99 and 2007–08**

| | Rate per 100 encounters (95% CI) | | Percentage of all problems | | Percentage of musculoskeletal problems | | |
|---|---|---|---|---|---|---|---|
| **Problem managed** | **1998–99 (*n* = 96,901)** | **2007–08 (*n* = 95,898)** | **1998–99 (*n* = 140,824)** | **2007–08 (*n* = 145,078)** | **1998–99 (*n* = 16,466)** | **2007–08 (*n* = 16,616)** | **Change[(a)]** |
| Musculoskeletal problems (all) | 17.0 (16.4–17.6) | 17.3 (16.8–17.9) | 11.7 | 11.5 | 100.0 | 100.0 | — |
| Back complaint | 2.7 (2.4–2.9) | 2.7 (2.6–2.9) | 1.8 | 1.8 | 15.6 | 15.8 | — |
| Osteoarthritis | 2.2 (2.0–2.4) | 2.6 (2.4–2.8) | 1.5 | 1.7 | 12.9 | 15.0 | ↑ |
| Sprain/strain | 1.9 (1.7–2.2) | 1.6 (1.4–1.7) | 1.3 | 1.0 | 11.4 | 9.1 | ↓ |
| Fracture | 1.1 (1.0–1.2) | 1.0 (0.9–1.1) | 0.7 | 0.7 | 6.4 | 5.8 | — |
| Unspecified arthritis | 0.8 (0.7–0.9) | 0.6 (0.5–0.7) | 0.6 | 0.4 | 4.7 | 3.3 | ↓ |
| Musculoskeletal injury NOS | 0.8 (0.7–0.9) | 0.9 (0.8–1.0) | 0.5 | 0.6 | 4.6 | 5.1 | — |
| Bursitis/tendonitis/ synovitis NOS | 0.7 (0.6–0.8) | 0.8 (0.8–0.9) | 0.5 | 0.5 | 4.1 | 4.8 | — |
| Musculoskeletal disease, other | 0.7 (0.6–0.7) | 0.7 (0.6–0.7) | 0.5 | 0.4 | 4.0 | 3.9 | — |
| Muscle pain | 0.6 (0.5–0.6) | 0.4 (0.3–0.5) | 0.4 | 0.3 | 3.2 | 2.3 | — |
| Osteoporosis | 0.5 (0.4–0.6) | 1.0 (0.9–1.1) | 0.3 | 0.6 | 2.9 | 5.6 | 🡅 |
| Shoulder syndrome | 0.5 (0.4–0.6) | 0.5 (0.4–0.5) | 0.3 | 0.3 | 2.9 | 2.6 | — |
| Rheumatoid arthritis | 0.5 (0.4–0.5) | 0.5 (0.4–0.5) | 0.3 | 0.3 | 2.8 | 2.6 | — |

(a) The direction and type of change is indicated for each variable: 🡅/🡇 indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

*Note:* CI—confidence interval; NOS—not otherwise specified.

Table 11.2 provides an overview of changes in the management of musculoskeletal problems over the 10 years from 1998–99 to 2007–08. There was no overall change in the total medication rate; however, the prescription rate of medications for musculoskeletal problems decreased significantly with a concurrent significant increase in the rates of advised over-the-counter and GP-supplied medications. There were no changes in the rate at which other treatments were provided for musculoskeletal problems. The rate of referrals for musculoskeletal problems increased between 2000–01 and 2007–08, from 12.5 per 100 encounters to 14.7 per 100.

Between 2000–01 and 2007–08, there were significant increases in the rates of both pathology and imaging tests ordered in the management of musculoskeletal problems (Table 11.2).

**Table 11.2: Musculoskeletal problems — summary of management changes, 1998–99 to 2007–08**

| | Rate per 100 problems (95% CI) | | | |
|---|---|---|---|---|
| | **1998–99 (*n* = 16,466)** | **2000–01 (*n* = 17,408)** | **2007–08 (*n* = 16,616)** | **Change(a)** |
| Medications | 69.8 (67.4–72.3) | 72.1 (69.6–74.6) | 66.1 (63.7–68.4) | — |
| Prescribed | 60.4 (58.0–62.9) | 60.5 (58.0–62.9) | 52.2 (50.0–54.4) | **↓** |
| Advised over-the-counter | 6.0 (5.3–6.6) | 6.4 (5.5–7.3) | 8.9 (8.0–9.9) | **↑** |
| GP-supplied | 3.5 (2.9–4.0) | 5.2 (4.2–6.2) | 4.9 (4.2–5.6) | **↑** |
| Other treatments | 38.9 (36.1–41.7) | 40.3 (38.0–42.7) | 35.2 (32.9–37.4) | — |
| Clinical treatments | 21.4 (19.7–23.0) | 23.7 (22.0–25.3) | 20.6 (19.1–22.2) | — |
| Procedures | 17.5 (15.1–19.9) | 16.7 (15.0–18.4) | 14.5 (12.8–16.2) | — |
| Referrals | NAv | 12.5 (11.7–13.2) | 14.7 (13.8–15.7) | **↑** |
| Specialist | 5.3 (4.8–5.8) | 5.9 (5.4–6.4) | 6.3 (5.8–6.8) | ↑ |
| Allied health | NAv | 6.0 (5.4–6.5) | 7.5 (6.8–8.3) | — |
| Other referrals | 0.0 (0.0–0.0) | 0.2 (0.1–0.2) | 0.5 (0.3–0.6) | **↑** |
| Pathology orders | NAv | 9.1 (8.1–10.1) | 12.9 (11.6–14.3) | **↑** |
| Imaging orders | NAv | 18.6 (17.6–19.7) | 22.5 (21.3–23.8) | **↑** |

(a) The direction and type of change is indicated for each variable: **↑**/**↓** indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

*Note:* CI—confidence interval; NAv—not available.

## Length of consultation

Start and finish times were recorded for a subsample of encounters during each year of the BEACH study, allowing the calculation of the length of consultations with at least one musculoskeletal problem managed. Table 11.3 shows that the length of consultations with at least one musculoskeletal problem managed did not change between 2000–01 and 2007–08. However, in both years, these consultations were on average significantly longer than the average MBS/DVA-claimable consultations in BEACH which were 14.9 minutes (95% CI: 14.6–15.2) in 2000–01 and 15.1 minutes (95% CI: 14.8–15.3) in 2007–08.[15]

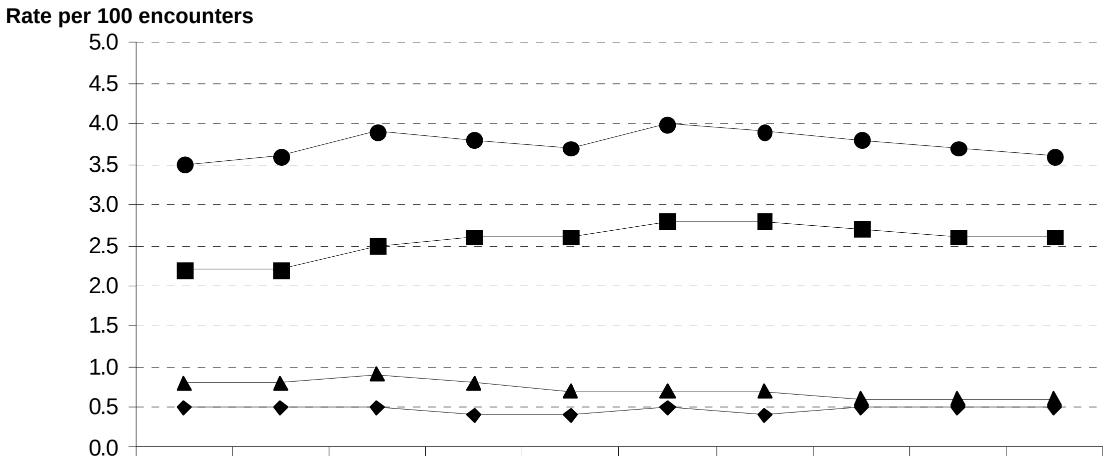
**Table 11.3: Mean length of MBS/DVA claimed musculoskeletal consultations, 2000–01, 2003–04 and 2007–08**

| | **2000–01 (*n* = 6,367) (95% CI)** | **2003–04 (*n* = 6,219) (95% CI)** | **2007–08 (*n* = 5,830) (95% CI)** |
|---|---|---|---|
| Mean consultation length (minutes) | 16.0 (15.6–16.3) | 15.9 (15.5–16.2) | 16.2 (15.8–16.6) |

*Note:* CI—confidence interval.

# 11.3 Arthritis

Figure 11.2 shows the annual management rate of all types of arthritis between 1998–99 and 2007–08, and demonstrates there was no change over the 10-year period. Osteoarthritis was the most frequently managed type of arthritis, and there was a marginal increase in the management rate of this problem from 2.2 per 100 encounters in 1998–99 (95% CI: 2.0–2.4) to 2.6 per 100 in 2007–08 (95% CI: 2.4–2.8). Unspecified arthritis was managed less frequently than osteoarthritis and decreased significantly over the 10 years, from 0.8 per 100 encounters in 1998–99 (95% CI: 0.7–0.9) to 0.6 per 100 in 2007–08 (95% CI: 0.5–0.6). The management rate of rheumatoid arthritis did not change throughout the decade.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Arthritis (all) | 3.5 | 3.6 | 3.9 | 3.8 | 3.7 | 4.0 | 3.9 | 3.8 | 3.7 | 3.6 |
| Osteoarthritis | 2.2 | 2.2 | 2.5 | 2.6 | 2.6 | 2.8 | 2.8 | 2.7 | 2.6 | 2.6 |
| Unspec. arthritis | 0.8 | 0.8 | 0.9 | 0.8 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 |
| Rheum. arthritis | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 | 0.4 | 0.5 | 0.5 | 0.5 |

**Data period**

*Note:* Unspec—unspecified; rheum—rheumatoid.

**Figure 11.2: Management rates of arthritis, 1998–99 to 2007–08**

## Medications for arthritis

Table 11.4 provides a summary of the medications provided for the different types of arthritis over the 10-year period from 1998–99 to 2007–08. There were no significant changes in the overall medication rates for any type of arthritis. Changes were observed however, in the method used to provide medication to patients:

- Significantly fewer prescriptions were given to patients for arthritis overall in 2007–08 than in 1998–99. This was reflected in the significant decrease in the prescription rate for both osteoarthritis (from 80.5 per 100 problems to 71.5 per 100 problems) and rheumatoid arthritis (from 116.2 per 100 to 88.2 per 100).

- In contrast, the rate of medications advised for over-the-counter purchase increased significantly for arthritis overall, from 3.8 per 100 problems in 1998–99 to 7.4 per 100 in 2007–08. This was reflected in the rise of over-the-counter medications advised for osteoarthritis, from 4.4 per 100 problems in 1998–99 to 8.6 per 100 in 2007–08.
- There was a marginal increase in the rate of GP-supplied medications for arthritis overall, from 3.0 per 100 problems in 1998–99 to 5.0 in 2007–08. However, it is notable that GP supply of medications for rheumatoid arthritis increased four-fold, from 3.0 per 100 problems in 1998–99 to 12.3 per 100 problems in 2007–08.

**Table 11.4: Changes in medications provided for arthritis, 1998–99 to 2007–08**

| | Medication rate per 100 problems (95% CI) | | | | |
|---|---|---|---|---|---|
| **Medications** | **1998–99** | **2000–01** | **2003–04** | **2007–08** | **Change[(a)]** |
| **All medication** | | | | | |
| Arthritis (all) | 91.9 (88.7–95.2) | 95.3 (92.1–98.4) | 92.2 (89.1–95.3) | 87.7 (83.6–91.8) | — |
| Osteoarthritis | 88.2 (84.4–91.9) | 91.9 (88.4–95.5) | 90.1 (86.8–93.4) | 84.3 (79.9–88.7) | — |
| Rheumatoid arthritis | 120.6 (109.2–132.1) | 115.7 (106.1–125.3) | 108.1 (98.1–118.1) | 102.7 (91.3–114.1) | — |
| Unspecified arthritis | 85.2 (79.7–90.7) | 94.2 (88.6–99.8) | 89.2 (82.8–95.5) | 91.2 (83.8–98.6) | — |
| **Prescribed** | | | | | |
| Arthritis (all) | 85.2 (81.8–88.5) | 85.0 (81.6–88.3) | 81.8 (78.4–85.2) | 75.3 (71.4–79.2) | **↓** |
| Osteoarthritis | 80.5 (76.6–84.4) | 80.7 (76.9–84.4) | 79.8 (76.2–83.5) | 71.5 (67.3–75.7) | **↓** |
| Rheumatoid arthritis | 116.2 (104.9–127.5) | 106.9 (96.6–117.2) | 99.5 (89.3–109.7) | 88.2 (77.2–99.3) | **↓** |
| Unspecified arthritis | 79.5 (73.7–85.2) | 85.6 (79.7–91.5) | 77.0 (70.6–83.3) | 82.2 (75.3–89.0) | — |
| **Advised over-the-counter** | | | | | |
| Arthritis (all) | 3.8 (2.9–4.6) | 3.6 (2.5–4.8) | 5.3 (4.2–6.4) | 7.4 (6.0–8.7) | **↑** |
| Osteoarthritis | 4.4 (3.2–5.6) | 4.3 (2.7–5.9) | 6.2 (4.7–7.7) | 8.6 (6.8–10.3) | **↑** |
| Rheumatoid arthritis | 1.4 (0.1–2.7) | 1.2 (0.2–2.3) | 2.2 (0.2–4.2) | 2.2 (0.4–4.0) | — |
| Unspecified arthritis | 3.5 (2.0–5.0) | 3.0 (1.7–4.4) | 4.0 (2.1–5.8) | 6.2 (3.3–9.0) | — |
| **GP-supplied** | | | | | |
| Arthritis (all) | 3.0 (2.1–4.0) | 6.7 (5.0–8.4) | 5.1 (4.0–6.3) | 5.0 (4.0–6.1) | ↑ |
| Osteoarthritis | 3.3 (2.1–4.5) | 7.0 (5.0–9.0) | 4.1 (2.9–5.2) | 4.2 (3.1–5.4) | — |
| Rheumatoid arthritis | 3.0 (1.3–4.8) | 7.5 (4.3–10.8) | 6.4 (3.8–9.0) | 12.3 (8.3–16.3) | **↑** |
| Unspecified arthritis | 2.2 (0.6–3.9) | 5.5 (3.7–7.4) | 8.2 (5.3–11.1) | 2.8 (1.4–4.3) | — |

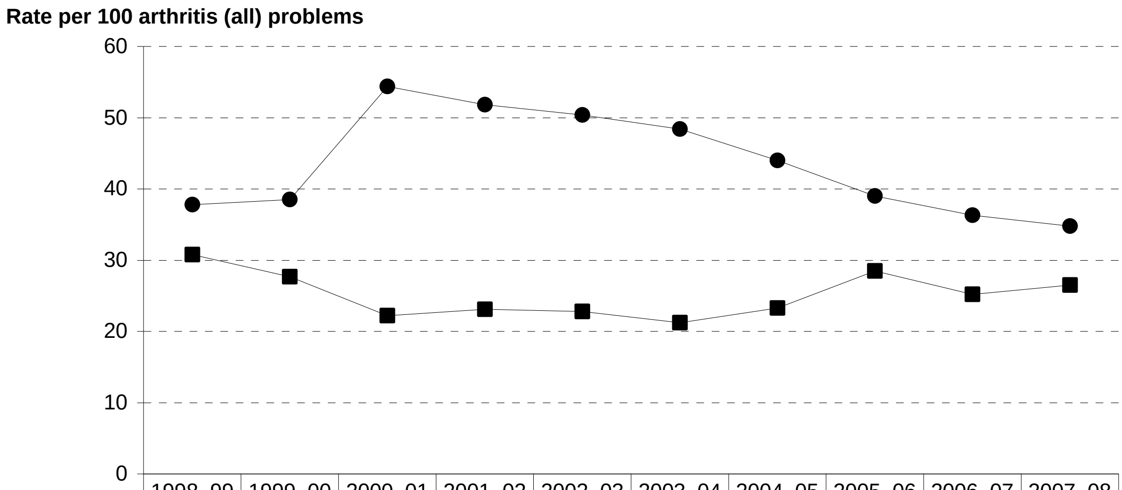
(a) The direction and type of change is indicated for each variable: **↑**/**↓** indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

*Note:* CI—confidence interval.

Figure 11.3 shows all medications given (prescribed/advised/supplied) for any arthritis, comparing total NSAIDs with the Anatomical Therapeutic Chemical group 'Other analgesics/antipyretics', which contains both aspirin and paracetamol. The graph shows that NSAIDs given for arthritis peaked in 2000–01 at a rate of 54.4 per 100 arthritis problems (95% CI: 52.0–56.8), stayed relatively steady until 2003–04 when it steadily declined to a rate of 34.8 per 100 arthritis problems (95% CI: 32.1–37.6) in 2007–08.

The rate of analgesic/antipyretic medications prescribed/advised/supplied was 30.8 per 100 arthritis problems in 1998–99 (95% CI: 28.5–33.1). The rate dropped in 2000–01 to 22.2 per

100 (95% CI: 20.2–24.2), rose significantly to 28.5 per 100 in 2005–06 (95% CI: 24.4–30.6), and in 2007–08, was 26.5 per 100 arthritis encounters (95% CI: 26.5–28.6). This would be an underestimate of use of analgesics/antipyretics for arthritis, as many would purchase these over-the-counter after initial advice from their GP.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| NSAIDs | 37.8 | 38.5 | 54.4 | 51.8 | 50.4 | 48.4 | 44.0 | 39.0 | 36.3 | 34.8 |
| Other analg. | 30.8 | 27.7 | 22.2 | 23.1 | 22.8 | 21.2 | 23.3 | 28.5 | 25.2 | 26.5 |

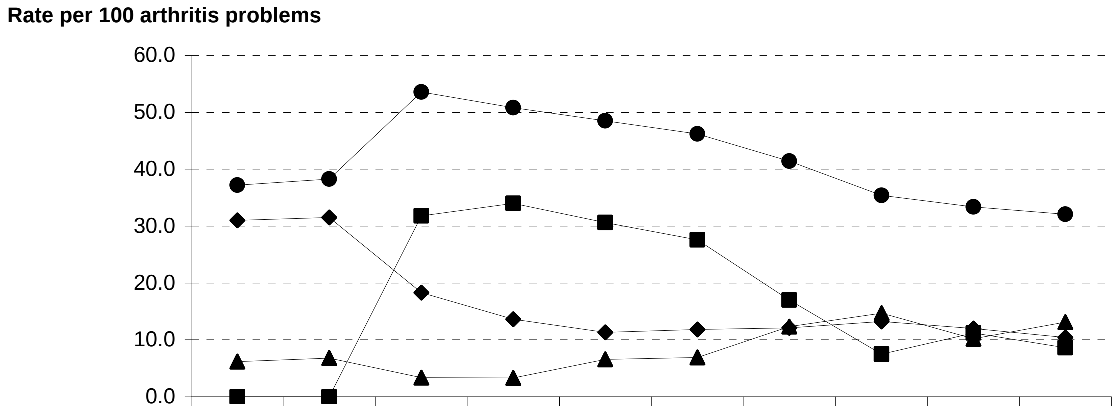
**Data period**

*Note:* NSAID—non-steroidal anti-inflammatory drug; analg—analgesics/antipyretics.

**Figure 11.3: NSAID and analgesic medications for all arthritis, 1998–99 to 2007–08**

Figure 11.4 shows the pattern of GP prescribing of the different types of NSAIDs over the decade.

- The majority of the changes can be accounted for by the introduction of coxibs in 1999, their sudden uptake in 2000–01 when approved under the Pharmaceutical Benefits Scheme (31.8 per 100 arthritis problems, 95% CI: 29.4–34.2), and the withdrawal of rofecoxib from the Australian market in September 2004.[16] This created concern about coxibs in general and the rate of coxib prescriptions dropped to 7.5 per 100 arthritis problems (95% CI: 6.4–8.5) in 2005–06. It has remained steady since this time (8.6 per 100 arthritis problems in 2007–08, 95% CI: 7.3–9.9).
- The rate of oxicams prescribed in general practice decreased between 1998–99 and 2000–01, from 6.2 per 100 arthritis problems (95% CI: 5.2–7.3) to 3.4 per 100 (95% CI: 2.7–4.2), coinciding with the rapid uptake of coxibs. However, their prescription rate doubled between 2003–04 (6.9 per 100 arthritis problems, 95% CI: 5.8–7.9) and 2005–06 (14.7 per 100, 95% CI: 13.0–16.4), coinciding with the move away from coxibs. The prescribing rate of oxicams remained steady from then on.
- The prescription of traditional NSAIDs nearly halved between 1999–00 and 2000–01, from 31.5 per 100 arthritis problems (95% CI: 29.2–33.8) to 18.3 per 100 (95% CI: 16.6–20.1). This rate continued to decline steadily over time, to a rate of 10.4 per 100 arthritis problems in 2007–08 (95% CI: 9.0–11.7) (Figure 11.4).




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007-08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total NSAIDs | 37.2 | 38.3 | 53.6 | 50.8 | 48.5 | 46.2 | 41.4 | 35.4 | 33.4 | 32.1 |
| Coxibs | 0.0 | 0.0 | 31.8 | 34 | 30.6 | 27.6 | 17.0 | 7.5 | 11.2 | 8.6 |
| Oxicams | 6.2 | 6.8 | 3.4 | 3.3 | 6.6 | 6.9 | 12.3 | 14.7 | 10.2 | 13.1 |
| Traditional NSAIDs | 31.0 | 31.5 | 18.3 | 13.6 | 11.3 | 11.8 | 12.1 | 13.2 | 12.0 | 10.4 |

**Data period**

*Note:* NSAIDs—non-steroidal anti-inflammatory drugs.

**Figure 11.4: NSAID prescribing rate per 100 arthritis problems, 1998–99 to 2007–08**

## Other management of arthritis

There were few changes in the rates of other treatments provided in the management of arthritis between 1998–99 and 2007–08. However, there was a significant increase in the rate of other treatments provided for rheumatoid arthritis, from 18.4 per 100 problems to 31.6 per 100, due to a rise in the number of procedures performed for rheumatoid arthritis, from 6.6 per 100 problems in 1998–99 to 17.5 per 100 in 2007–08 (Table 11.5). This may in part be due to a change in the BEACH methods used to code injections over the 10 years of the study.

**Table 11.5: Changes in other treatments provided for arthritis, 1998–99 to 2007–08**

| | Rate per 100 problems (95% CI) | | | | |
|---|---|---|---|---|---|
| **Treatment type** | **1998–99** | **2000–01** | **2003–04** | **2007–08** | **Change[(a)]** |
| **All other treatments** | | | | | |
| Arthritis (all) | 22.2 (19.6–24.7) | 23.4 (21.1–25.7) | 23.9 (21.5–26.3) | 23.1 (20.6–25.5) | — |
| Osteoarthritis | 24.5 (21.1–27.9) | 25.0 (22.2–27.7) | 23.4 (20.5–26.4) | 22.8 (20.1–25.6) | — |
| Rheumatoid arthritis | 18.4 (14.1–22.7) | 19.1 (14.3–23.9) | 27.2 (22.3–32.0) | 31.6 (25.5–37.8) | ↑ |
| Unspecified arthritis | 18.0 (14.2–21.7) | 21.3 (17.2–25.4) | 23.5 (19.2–27.8) | 17.1 (13.1–21.2) | — |
| **Clinical treatments** | | | | | |
| Arthritis (all) | 14.3 (12.3–16.2) | 15.5 (13.7–17.3) | 15.0 (13.1–16.9) | 15.1 (13.1–17.1) | — |
| Osteoarthritis | 15.4 (12.9–18.0) | 16.0 (13.8–18.2) | 14.8 (12.6–17.0) | 15.9 (13.6–18.2) | — |
| Rheumatoid arthritis | 11.8 (8.5–15.1) | 13.2 (9.4–17.0) | 14.0 (10.3–17.8) | 14.1 (9.7–18.5) | — |
| Unspecified arthritis | 12.5 (9.2–15.7) | 15.0 (11.7–18.4) | 16.4 (12.7–20.1) | 12.6 (9.2–15.9) | — |
| **Procedures** | | | | | |
| Arthritis (all) | 7.9 (6.2–9.6) | 7.9 (6.5–9.3) | 8.9 (7.5–10.4) | 7.9 (6.7–9.2) | — |
| Osteoarthritis | 9.1 (6.8–11.3) | 8.9 (7.2–10.6) | 8.6 (6.8–10.4) | 7.0 (5.6–8.3) | — |
| Rheumatoid arthritis | 6.6 (3.3–9.9) | 5.9 (2.5–9.2) | 13.1 (9.6–16.6) | 17.5 (12.7–22.3) | ↑ |
| Unspecified arthritis | 5.5 (3.6–7.5) | 6.3 (4.0–8.6) | 7.2 (4.9–9.4) | 4.6 (2.5–6.6) | — |

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval.

Table 11.6 shows that referrals for all arthritis increased significantly between 2000–01 and 2007–08 from 7.2 per 100 problems to 11.3 per 100. However, this was largely due to a doubling of referrals for rheumatoid arthritis from 8.0 per 100 problems in 2000–01 to 15.5 per 100 in 2007–08, particularly to specialists for rheumatoid arthritis, from 4.8 per 100 problems in 1998–99 to 11.8 per 100 in 2007–08.

No changes were demonstrated in the referral rates to any other group of health providers for any type of arthritis. Significantly, more imaging tests were ordered for unspecified arthritis in 2007–08 than in 1998–99 (Table 11.7). There were no other significant changes in pathology and imaging test order rates for arthritis problems over the 10-year period.

### Table 11.6: Changes in referrals provided for arthritis problems, 1998–99 to 2007–08

| | Rate per 100 problems (95% CI) | | | | |
|---|---|---|---|---|---|
| | 1998–99 | 2000–01 | 2003–04 | 2007–08 | Change[(a)] |
| **Referrals (all)** | | | | | |
| Arthritis (all) | NAv | 7.2 (6.2–8.2) | 9.1 (8.0–10.2) | 11.3 (9.9–12.8) | ↑ |
| Osteoarthritis | NAv | 7.6 (6.3–8.9) | 8.6 (7.2–9.9) | 11.2 (9.6–12.8) | — |
| Rheumatoid arthritis | NAv | 8.0 (5.0–11.0) | 13.1 (8.8–17.5) | 15.5 (11.2–19.9) | ↑ |
| Unspecified arthritis | NAv | 5.6 (3.9–7.4) | 8.2 (6.0–10.5) | 8.8 (5.7–11.9) | — |
| **Specialist** | | | | | |
| Arthritis (all) | 4.9 (4.1–5.7) | 4.8 (4.0–5.6) | 5.4 (4.6–6.2) | 6.7 (5.6–7.8) | — |
| Osteoarthritis | 5.1 (4.0–6.2) | 5.0 (4.0–6.1) | 4.5 (3.6–5.5) | 6.2 (5.0–7.5) | — |
| Rheumatoid arthritis | 4.8 (2.8–6.8) | 6.5 (3.7–9.2) | 9.2 (6.3–12.2) | 11.8 (8.2–15.4) | ↑ |
| Unspecified arthritis | 4.4 (2.9–5.9) | 3.4 (1.9–4.8) | 6.1 (4.1–8.2) | 4.7 (2.5–7.0) | — |
| **Allied health services** | | | | | |
| Arthritis (all) | NAv | **2.1 (1.6–2.6)** | **3.3 (2.6–4.0)** | **4.1 (3.2–4.9)** | — |
| Osteoarthritis | NAv | 2.4 (1.7–3.0) | 3.7 (2.8–4.6) | 4.4 (3.4–5.4) | — |
| Rheumatoid arthritis | NAv | 1.2 (0.0–2.4) | 3.3 (0.9–5.8) | 3.5 (1.3–5.7) | — |
| Unspecified arthritis | NAv | 1.8 (0.9–2.7) | 1.6 (0.7–2.5) | 3.0 (1.5–4.6) | — |

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change and — indicates there was no change.

*Note:* CI—confidence interval; NAv—not available.

### Table 11.7: Changes in pathology and imaging orders made in the management of arthritis, 1998–99 to 2007–08

| | Rate per 100 problems (95% CI) | | | | |
|---|---|---|---|---|---|
| **Test type** | **1998–99** | **2000–01** | **2003–04** | **2007–08** | **Change[(a)]** |
| **Pathology orders** | | | | | |
| Arthritis (all) | NAv | 15.6 (12.8–18.4) | 18.8 (16.0–21.7) | 15.8 (13.1–18.4) | — |
| Osteoarthritis | NAv | 4.6 (3.0–6.2) | 6.1 (4.1–8.1) | 4.8 (3.2–6.5) | — |
| Rheumatoid arthritis | NAv | 59.6 (45.5–73.6) | 71.9 (58.2–85.7) | 61.7 (48.5–74.9) | — |
| Unspecified arthritis | NAv | 23.6 (16.2–30.1) | 30.3 (21.5–39.1) | 29.0 (19.4–38.6) | — |
| **Imaging orders** | | | | | |
| Arthritis (all) | NAv | 12.3 (10.8–13.8) | 12.4 (10.9–13.9) | 15.5 (13.7–17.2) | — |
| Osteoarthritis | NAv | 14.7 (12.7–16.8) | 13.6 (11.9–15.4) | 16.6 (14.5–18.7) | — |
| Rheumatoid arthritis | NAv | 3.8 (1.3–6.4) | 4.5 (2.4–6.6) | 6.8 (3.5–10.0) | — |
| Unspecified arthritis | NAv | 9.9 (7.2–12.5) | 13.1 (9.2–17.0) | 17.2 (13.4–21.3) | ↑ |

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval; NAv—not available.

## 11.4 Osteoporosis

Figure 11.5 provides an overview of the management of osteoporosis in Australian general practice in 2007–08. Osteoporosis was managed at a rate of 1.0 per 100 encounters, and the rate increased with the age of the patient, with 47.9% of patients being aged 75 years or over.

- Hypertension was the problem most frequently managed with osteoporosis, at a rate of 22.0 per 100 osteoporosis problems.
- Requests for prescriptions were the most commonly reported reasons for encounters (37.9 per 100 encounters).
- Medications were prescribed/advised/supplied in the management of more than four out of five osteoporosis problems. The most frequently prescribed was alendronate (23.4 per 100 osteoporosis problems), followed by a combination product of alendronate and cholecalciferol (12.2 per 100).
- Other treatments were given for one-fifth of osteoporosis problems, with counselling/advice about exercise the most frequently provided (4.0 per 100 osteoporosis problems).
- Referrals were provided at a rate of 3.2 per 100 osteoporosis problems, with endocrinologists the most common health provider referred to (1.2 per 100 osteoporosis problems) (Figure 11.5).

# Osteoporosis

***n* = 928 (1.0 per 100 encounters)**

**The patients**

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| 15–24 | 0.2 | 0.0 |
| 25–44 | 1.7 | 0.1 |
| 45–64 | 22.4 | 0.8 |
| 65–74 | 27.8 | 2.2 |
| 75+ | 47.9 | 3.2 |

| Sex | Per cent | Rate[(a)] |
|---|---|---|
| Male | 20.0 | 0.5 |
| Female | 80.0 | 1.4 |

**Medications**

*n* = 779 (84.0 per 100 osteoporosis problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Alendronate | 23.4 |
| Alendronate/cholecalciferol | 12.2 |
| Risedronate sodium/calcium carbonate | 11.0 |
| Risedonate sodium | 6.9 |
| Calcium carbonate | 5.5 |
| Raloxifene | 3.5 |
| Strontium ranelate | 3.3 |
| Calcium carbonate/vitamin D | 3.2 |
| Paracetamol | 1.8 |
| Calcitrol (vitamin D analogue) | 1.5 |

**Reasons for encounter**

*n* = 1,712 (184.5 per 100 encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Prescription—all | 37.9 |
| Test results | 21.4 |
| Osteoporosis | 16.8 |
| Cardiac check-up | 9.7 |
| General check-up | 6.3 |
| Back complaint | 5.7 |
| Immunisation/vaccination—all | 3.0 |
| Observation/education/advice NOS | 2.4 |
| Cough | 2.3 |
| Other musc. diagnostic procedure | 2.3 |

**Other treatments**

*n* = 178 (19.2 per 100 osteoporosis problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Counselling/advice—exercise | 4.0 |
| Counselling/advice—nutrition/weight | 3.7 |
| Advice/education | 3.5 |
| Counselling—problem | 2.7 |

**Referrals**

*n* = 30 (3.2 per 100 osteoporosis problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Endocrinologist | 1.2 |
| Rheumatologist | 0.3 |
| Orthopaedic surgeon | 0.2 |
| Physiotherapist | 0.2 |

**Other problems managed**

*n* = 1,396 (150.5 per 100 encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Hypertension | 22.0 |
| Lipid disorders | 8.5 |
| Oesophageal disease | 6.2 |
| Osteoarthritis | 5.9 |
| Diabetes | 4.1 |
| Depression | 3.4 |
| Immunisation—all | 3.2 |
| COPD | 2.8 |
| Cardiac check-up | 2.6 |
| Ischaemic heart disease | 2.4 |

**Pathology/Imaging**

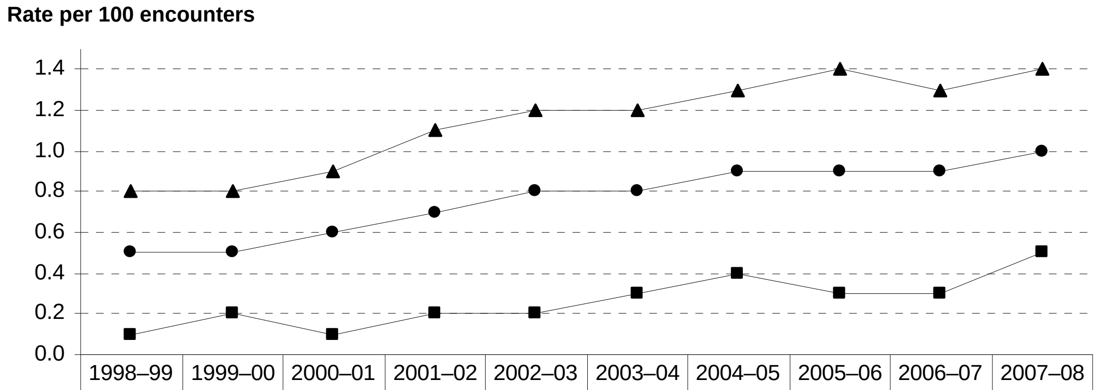
Pathology *n* = 168; Imaging *n* = 129)

| | Rate per 100 problems[(c)] |
|---|---|
| Pathology | 18.2 |
| Imaging | 13.9 |

(a) Specific rate per 1,000 encounters in each sex and age group.
(b) Expressed as a rate per 100 encounters at which osteoporosis was managed.
(c) Expressed as a rate per 100 osteoporosis problems managed.
*Note:* Musc—musculoskeletal; NOS—not otherwise specified; COPD—chronic obstructive pulmonary disease.

**Figure 11.5: Management of osteoporosis in general practice, 2007–08**

The management rate of osteoporosis doubled between 1998–99 and 2007–08, from 0.5 per 100 encounters (95% CI: 0.4–0.6) to 1.0 per 100 encounters (95% CI: 0.9–1.1). This increase was apparent for both males and females. For females, the management rate almost doubled from 0.8 per 100 encounters in 1998–99 (95% CI: 0.7–0.9) to 1.4 per 100 encounters in 2007–08 (95% CI: 1.2–1.5). For males, it increased five-fold from 0.1 per 100 encounters in 1998–99 (95% CI: 0.1–0.2) to 0.5 per 100 in 2007–08 (95% CI: 0.4–0.6).




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| All | 0.5 | 0.5 | 0.6 | 0.7 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 1.0 |
| Males | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.3 | 0.3 | 0.5 |
| Females | 0.8 | 0.8 | 0.9 | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.3 | 1.4 |

Data period

**Figure 11.6: Management rate of osteoporosis, 1998–99 to 2007–08**

Investigation of the management of osteoporosis between 1998–99 and 2007–08 showed few changes. There was no change in the overall medication rate, but the rate of prescribed medications for osteoporosis decreased significantly from 91.9 per 100 problems to 72.9 per 100 problems. Partly counteracting this was a large and significant increase in the rate of medications advised for over-the-counter purchase from 1.0 per 100 problems to 9.6 per 100 (Table 11.8). This is largely due to a trend towards the purchase of vitamin D and calcium over-the-counter rather than through prescription, and the increased availability of combination products including vitamin D and calcium.

Table 11.9 shows that in the management of osteoporosis, orders for calcium phosphate tests more than doubled between 2000–01 and 2007–08 from 3.1 per 100 problems to 8.3 per 100 problems. The ordering of densitometry tests (bone mineral density tests) did not change significantly, although the sample size may have been too small to identify changes.

**Table 11.8: Osteoporosis—summary of management changes, 1998–99 to 2007–08**

| | Rate per 100 problems (95% CI) | | | |
|---|---|---|---|---|
| | **1998–99 (*n* = 481)** | **2000–01 (*n* = 560)** | **2007–08 (*n* = 928)** | **Change[(a)]** |
| Medications | 96.1 (88.9–103.4) | 91.6 (83.6–99.5) | 84.0 (78.6–89.4) | — |
| Prescribed | 91.9 (85.0–98.9) | 84.8 (77.3–92.3) | 72.9 (67.8–78.0) | ↓ |
| Advised OTC | 1.0 (0.2–1.8) | 1.7 (0.5–2.9) | 9.6 (6.7–12.6) | ↑ |
| GP-supplied | 3.2 (1.3–5.1) | 5.1 (1.0–9.2) | 1.4 (0.6–2.3) | — |
| Other treatments | 18.0 (13.3–22.7) | 22.2 (17.5–27.0) | 19.2 (15.4–22.9) | — |
| Clinical treatments | 16.5 (12.1–21.0) | 20.0 (15.3–24.6) | 18.2 (14.5–21.8) | — |
| Procedures | 1.5 (0.2–2.7) | 2.3 (0.9–3.6) | 1.0 (0.3–1.7) | — |
| Referrals | NAv | 2.9 (1.5–4.4) | 3.2 (2.0–4.4) | — |
| Specialist | 4.0 (2.3–5.6) | 2.3 (1.0–3.6) | 2.2 (1.2–3.2) | — |
| Allied health | NAv | 0.6 (0.1–1.2) | 0.7 (0.2–1.2) | — |
| Other referrals | 0.1 (0.0–0.3) | NAv | 0.3 (0.0–0.8) | — |
| Pathology orders | NAv | 11.7 (6.2–17.2) | 18.2 (12.9–23.4) | — |
| Imaging orders | NAv | 13.0 (9.4–16.6) | 13.9 (10.7–17.2) | — |

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval; OTC—over-the-counter; NAv—not available.

**Table 11.9: Changes in pathology and imaging tests ordered for osteoporosis, 1998–99 and 2007–08**

| | Rate per 100 problems (95% CI) | | |
|---|---|---|---|
| | **2000–01 (*n* = 481)** | **2007–08 (*n* = 928)** | **Change[(a)]** |
| Calcium phosphate test | 3.1 (1.5–4.6) | 8.3 (5.5–11.2) | ↑ |
| Densitometry test | 7.1 (4.8–9.4) | 11.5 (8.6–14.5) | — |

(a) The direction and type of change is indicated for each variable: ↑ indicates a statistically significant increase, and — indicates there was no change.

*Note:* CI—confidence interval.

# 11.5 Back complaints

Figure 11.7 provides an overview of the management of back complaints in Australian general practice in 2007–08. Back complaints were managed at a rate of 2.7 problems per 100 encounters, remaining steady since 1998–99 (Table 11.1). Figure 11.7 shows that almost half the encounters (42.6%) involving management of back complaints were with patients aged 45–64 years, who were managed at a rate of 4.2 back complaint problems per 100 encounters.

- Two-thirds of these patients (66.9 per 100 encounters) specifically presented to the GP about their back problem. Requests for prescriptions were also often stated as reasons for encounters (16.7 per 100 encounters).
- The problem most frequently managed concurrently with back complaints was hypertension at a rate of 6.9 per 100 encounters.
- Medications were prescribed/advised/supplied at a rate of 81.4 per 100 back complaint problems. The most frequently prescribed was the combination of paracetamol/codeine (13.1 per 100 back complaint problems), followed by paracetamol (9.8 per 100).
- Other treatments were given at a rate of 33.2 per 100 back complaint problems, with physical medicine/rehabilitation used most often (7.3 per 100 back complaint problems).
- Referrals were provided at a rate of 16.1 per 100 back complaint problems, with physiotherapists (8.6 per 100 back complaint problems) and neurosurgeons (2.0 per 100) the most common recipients (Figure 11.7).

There were few changes in the form of management of back complaints over the decade. Table 11.10 indicates that there were no changes in the rates of medications, referrals or orders for pathology or imaging tests. However, the rate at which other treatments were provided, particularly procedural treatments, marginally decreased over this period.

Back pain is currently not specified as a condition included in the National Health Priority Area (NHPA) for arthritis and musculoskeletal conditions. Recent debate has led some people to suggest it may warrant becoming a NHPA in its own right in the same manner as obesity, or be specified as an inclusion in the NHPA for musculoskeletal conditions.[17]

**Table 11.10: Back complaints—summary of management changes, 1998–99 to 2007–08**

| | Rate per 100 problems (95% CI) | | | |
|---|---|---|---|---|
| | **1998–99 (*n* = 2,573)** | **2000–01 (*n* = 2,568)** | **2007–08 (*n* = 2,624)** | **Change[(a)]** |
| Medications | 84.3 (78.6–90.1) | 84.9 (79.9–89.8) | 81.4 (77.2–85.6) | — |
| Prescribed | 74.9 (69.2–80.5) | 75.1 (70.4–79.9) | 70.3 (66.1–74.4) | — |
| Advised OTC | 5.2 (4.0–6.3) | 4.2 (3.0–5.4) | 7.7 (6.1–9.3) | — |
| GP-supplied | 4.3 (3.0–5.7) | 5.6 (4.1–7.0) | 3.5 (2.4–4.6) | — |
| Other treatments | 40.5 (33.8–47.2) | 44.1 (39.9–48.2) | 33.2 (29.9–36.5) | § |
| Clinical treatments | 22.5 (19.2–25.9) | 27.1 (23.9–30.2) | 21.7 (19.0–24.4) | — |
| Procedures | 17.9 (12.6–23.3) | 17.0 (13.8–20.2) | 11.5 (9.4–13.6) | § |
| Referrals | NAv | 13.9 (12.1–15.7) | 16.1 (13.8–18.3) | — |
| Specialist | 3.4 (2.6–4.2) | 5.7 (4.5–6.9) | 5.3 (4.1–6.4) | — |
| Allied health | NAv | 7.8 (6.4–9.2) | 10.4 (8.8–12.1) | — |
| Other referrals | NAv | 0.2 (0.1–0.4) | 0.2 (0.0–0.4) | — |
| Pathology orders | NAv | 3.5 (1.9–5.1) | 4.7 (3.1–6.4) | — |
| Imaging orders | NAv | 15.7 (13.5–17.8) | 20.0 (17.6–22.4) | — |

(a) The direction and type of change is indicated for each variable: § indicates a non-linear significant or marginal change, and — indicates there was no change.

*Note:* CI—confidence interval; OTC—over-the-counter; NAv—not available.

**The patients**

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| <5 | 0.0 | 0.1 |
| 5–24 | 5.6 | 1.0 |
| 25–44 | 27.7 | 3.2 |
| 45–64 | 42.6 | 4.2 |
| 65–74 | 12.3 | 2.7 |
| 75+ | 11.8 | 2.2 |

| Sex | Per cent | Rate[(a)] |
|---|---|---|
| Male | 47.0 | 3.0 |
| Female | 53.0 | 2.5 |

**Medications—prescibed**
*n* = 2,136 (81.4 per 100 back complaint problems)

| | Rate per 100 back problems[(c)] |
|---|---|
| Paracetamol/codeine | 13.1 |
| Paracetamol | 9.8 |
| Oxycodone | 9.7 |
| Tramadol | 8.4 |
| Meloxicam | 4.9 |
| Ibuprofen | 4.3 |
| Morphine sulphate | 3.8 |
| Diclofenac sodium systemic | 3.5 |
| Buprenorphine | 2.6 |
| Dextropropoxyphene/paracetamol | 2.2 |

## Back complaints

***n* = 2,624 (2.7 per 100 encounters)**

**Reasons for encounter**
*n* = 4,272 (163.3 per 100 encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Back complaint | 66.9 |
| Prescription—all | 16.7 |
| Test results | 5.9 |
| Leg/thigh symptom/complaint | 4.7 |
| Administrative procedure NOS | 3.7 |
| Cardiac check-up | 3.5 |
| Depression | 2.2 |
| General check-up | 1.8 |
| Follow-up musculoskeletal | 1.5 |
| Neck symptom/complaint | 1.3 |

**Other treatments**
*n* = 871 (33.2 per 100 back complaint problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Physical medicine/rehabilitation | 7.3 |
| Advice/education | 5.5 |
| Counselling–problem | 4.1 |
| Sickness certificate | 4.0 |

**Referrals**
*n* = 422 (16.1 per 100 back complaint problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Physiotherapy | 8.6 |
| Neurosurgeon | 2.0 |
| Orthopaedic surgeon | 1.8 |
| Chiropractor | 0.7 |
| Pain clinic | 0.4 |

**Other problems managed**
*n* = 1,925 (73.6 per 100 encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Hypertension | 6.9 |
| Depression | 4.4 |
| Lipid disorders | 3.3 |
| Diabetes | 2.4 |
| Oesophageal disease | 2.4 |
| Sleep disturbance | 1.9 |
| Anxiety | 1.5 |
| Upper respiratory tract infection | 1.3 |
| Immunisation—all | 1.2 |
| Dermatitis (contact/allergic) | 1.1 |

**Pathology/Imaging**
Pathology *n* = 124, imaging *n* = 524)

| | Rate per 100 problems[(c)] |
|---|---|
| Pathology | 4.7 |
| Imaging | 20.0 |

(a) Specific rate per 1,000 encounters in each sex and age group.
(b) Expressed as a rate per 100 encounters at which back complaints were managed.
(c) Expressed as a rate per 100 back complaint problems managed.

*Note:* NOS—not otherwise specified.

**Figure 11.7: Management of back complaints in general practice, 2007–08**

# 11.6 Work-related musculoskeletal problems

In the BEACH study, GPs are asked to indicate whether they consider the problem under management to be related to workplace activity, workplace exposure, or a pre-existing condition that has been exacerbated by work-related activity or exposure. In 2007–08, there were 2,719 work-related problems managed, of which 59.3% were musculoskeletal. Back complaints accounted for 14.6% of work-related problems and 11.3% were sprains and strains. Fractures accounted for 3.3%, and unspecified musculoskeletal injuries a further 9.0%. It is notable that there were no changes in the proportion of work-related problems specified as musculoskeletal between 1998–99 and 2007–08 (Table 11.11).

**Table 11.11: Changes in the proportion of work-related problems managed, that were musculoskeletal, 1998–99 and 2007–08**

| | Percentage of work-related problems specified as musculoskeletal (95% CI) | | Percentage of musculoskeletal problems specified as work-related (95% CI) | | |
|---|---|---|---|---|---|
| **Problem managed** | **1998–99 (*n* = 3,860)** | **2007–08 (*n* = 2,719)** | **1998–99 (*n* = 16,466)** | **2007–08 (*n* = 16,616)** | **Change[(a)]** |
| **Musculoskeletal problems (all)** | **56.3 (53.9–58.8)** | **59.3 (56.5–62.0)** | **13.2 (12.2–14.2)** | **9.7 (8.9–10.5)** | ↓ |
| Back complaint | 13.9 (12.4–15.4) | 14.6 (12.9–16.3) | 20.9 (18.5–23.2) | 15.1 (13.3–16.9) | ↓ |
| Sprain/strain | 11.0 (9.5–12.5) | 11.3 (9.6–13.0) | 22.6 (19.3–25.9) | 20.4 (17.2–23.5) | — |
| Musculoskeletal injury NOS | 7.0 (5.5–8.4) | 9.0 (7.2–10.9) | 35.8 (30.7–40.9) | 29.2 (24.2–34.2) | — |
| Fracture | 3.3 (2.5–4.2) | 3.3 (2.4–4.1) | 12.3 (9.4–15.3) | 9.3 (7.0–11.6) | — |
| Shoulder syndrome | 2.4 (1.8–3.0) | 2.9 (2.2–3.7) | 19.4 (15.1–23.8) | 18.4 (14.2–22.6) | — |
| Bursitis/tendonitis/synovitis NOS | 2.3 (1.8–2.9) | 2.4 (1.6–3.3) | 13.4 (10.2–16.6) | 8.4 (5.7–11.1) | — |
| Osteoarthritis | 1.5 (1.1–2.0) | 1.1 (0.6–1.6) | 2.7 (2.0–3.5) | 1.2 (0.7–1.7) | ↓ |
| Musculoskeletal disease, other | 1.2 (0.7–1.6) | 1.3 (0.6–1.9) | 6.9 (4.5–9.4) | 5.4 (2.7–8.1) | — |
| Muscle pain | 0.6 (0.3–0.9) | 0.5 (0.0–1.0) | 4.5 (2.5–6.5) | 3.6 (0.3–6.9) | — |
| Arthritis | 0.5 (0.2–0.8) | 0.4 (0.1–0.6) | 2.6 (1.1–4.1) | 1.9 (0.5–3.2) | — |
| Rheumatoid arthritis | 0.1 (0.0–0.3) | 0.1[(b)] | 1.1 (0.1–2.2) | 0.4[(b)] | — |
| Osteoporosis | 0.0[(b)] | 0.0[(b)] | 0.1[(b)] | 0.0[(b)] | — |

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

(b) No 95% confidence intervals are provided as the data were insufficient to calculate a meaningful estimate.

*Note:* CI—confidence interval; NOS—not otherwise specified.

Table 11.11 also shows the proportion of total contacts with each problem that were regarded as work-related.

- Nearly one in 10 (9.7%) musculoskeletal problems was regarded as work-related in 2007–08, and this proportion had decreased significantly since 1998–99 (13.2%).
- In 2007–08, almost one-third of unspecified musculoskeletal injuries (where no detail was given by the GP) were regarded as work-related, and this proportion had not significantly changed since 1998–99.

- One-fifth of sprains and strains managed were work-related in 1998–99 and 2007–08.
- The proportion of back complaints specified as work-related declined significantly, from 20.9% in 1998–99 to 15.1% in 2007–08.
- The proportion of osteoarthritis problems specified as work-related also significantly decreased over the 10-year period (from 2.7% in 1998–99 to 1.2% in 2007–08).

# 11.7 Discussion

Few changes are evident in the rates at which musculoskeletal problems were managed between 1998–99 and 2007–08. However, these problems are managed at nearly one in five encounters, and therefore constitute a considerable proportion of the general practice workload.

The most notable change was in the management rate of osteoporosis, which doubled over the 10-year period. This increase was apparent for both males and females. Given the constant and steady rise of osteoporosis management, it is not possible to attribute this increase to the inclusion of the condition as a National Health Priority Area. Previous research indicates that while the screening rate for osteoporosis has increased in males since 2000[18], it remains well below that for females.[18,19] Although there is no national screening program for osteoporosis, the association found by Charles et al.[18] between osteoporosis screening in men and a diagnosis of osteoporosis indicates that the management of this condition may continue to increase significantly in future years.

It is possible that there is a relationship between the marginal increase in the management rate of osteoarthritis and the marginal decrease in the rate of unspecified arthritis, indicating a trend for GPs to use the more specific label of 'osteoarthritis' when possible. This could be regarded as a change in labelling practice over the 10-year period. The increase in the rate of imaging test orders for unspecified arthritis over the 10 years supports this hypothesis.

Regarding medications provided for arthritis, the overall medication rate has not changed, but the practices within medications have changed. The overall increases and decreases in prescribing for all arthritis, and specifically for osteoarthritis, can largely be attributed to the availability of certain types of medications. The sudden rise in the prescription of NSAIDs in 1999–00 was caused by the introduction of coxibs onto the Australian market, which were regarded as less likely to cause gastrointestinal and renal side-effects.[20] However, rofecoxib was subsequently found to cause an increased risk of cardiovascular events[21,22], and was withdrawn from purchase in September 2004.[16] This led to a considerable decrease in prescriptions of coxibs overall. The rate of provision of other analgesic medication increased in parallel. The Therapeutic Guidelines for osteoarthritis recommend that NSAIDs should be used for the shortest time period possible, and that paracetamol can be used to reduce the amount of NSAIDs or opioids required to treat severe pain.[23]

Another area of interest is the decrease in GP prescribing of medications for rheumatoid arthritis, which occurred in parallel with an increase in the rate of GP-supplied medications for rheumatoid arthritis, and also with an increase in the number of referrals made to specialists for this condition. It is possible that medications for rheumatoid arthritis are more often given by specialists than GPs in recent years, though the GP management rate of this problem did not change over the decade.

# 11.8 Conclusion

Policies on the GP management of chronic and complex conditions do not appear to have had much, if any, measurable impact on the management of musculoskeletal problems in general practice. All the conditions profiled in this chapter fit within the policy guidelines, but the rate of musculoskeletal problems managed is almost identical in 1998–99 and 2007–08. However, given the ageing population, it may have been reasonable to expect an increase in the management rate of these morbidities. Therefore, the lack of measurable change in management rates may suggest is a positive effect of policy. Nor has the designation of arthritis and musculoskeletal conditions as a National Health Priority Area changed the GP management of these problems, according to results presented in this chapter. The inclusion of arthritis and musculoskeletal conditions is one of the more recent additions to the National Health Priority Areas, so there may not yet have been sufficient time for the impact of this initiative to be seen in general practice. The main impetus for change in the management of musculoskeletal problems over the decade to 2007–08 appears to have come from the development of new medications and priorities in osteoporosis screening for men.

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# 12 Injury

*Salma Fahridin*

## 12.1 Background

In 1986, injuries were recognised as a leading cause of morbidity and death, and were made one of the original National Health Priority Areas in 1996. Injuries were responsible for 7% of the total burden of disease in Australia in 2003, represented 11% of the fatality burden, and were the largest cause of fatalities in people under the age of 35 years. The major contributors to the injury burden in 2003 were suicide and self-inflicted injury, road traffic accidents, and falls, which together accounted for 64% of the burden.[1]

Injuries, as defined by the National Injury Prevention Advisory Council, include traumatic injuries and poisonings.[2] However, the definition set by the International Classification of Primary Care—Version 2 (ICPC-2)[3], used in BEACH, includes adverse medical events, so these data are also presented. The injury-specific code groups are listed in Appendix 3.

## 12.2 Policies and initiatives

Policies on injury prevention and control are predominantly aimed at population groups that are considered at risk, including children, young males, older people, Aboriginal and Torres Strait Islander peoples, and people living in rural and remote areas. The policies also cover situational factors such as alcohol-related injuries, sports-related injuries and self-inflicted injuries.

- The National Injury Prevention Plan: Priorities for 2001–2003 listed falls in older people, falls in children, drowning and near drowning, and poisoning among children as the top priorities for the 3-year plan.[4] Some of the strategies that involved general practitioners aimed to encourage their use of health assessments for people aged 75 years and over and for Indigenous Australians, and to educate them about the risks of psychotropic medications and encourage reduction in their use.
- Following this plan, the National Injury Prevention and Safety Promotion Plan: 2004–2014[5] listed as priority populations: children, youth and young people, adults, older people, Aboriginal and Torres Strait Islander peoples, and rural and remote populations, as well as those who suffered alcohol-related injuries. Each group have their own key issues and priority activities.
- The National Falls Prevention for Older People Plan: 2004 Onwards[6] aimed to involve multiple sectors of government and community in preventing falls.
- The National Aboriginal and Torres Strait Islander Safety Promotion Strategy (2005)[7] aimed to promote safety, and strengthen leadership in the Indigenous community to prevent injuries.

Since 2001, the Australian Transport Council has provided advice to governments with the aim of improving the safety and efficiency of the Australian transport system. They have released a National Road Safety Action Plan every 2 years, and three progress reports.[8] The most recent action plan was released in 2007–08, and the most recent progress report in 2006.

- The National Suicide Prevention Strategy[9] which began in 1999, aims to improve support networks for those who have attempted suicide or are suicidal, and to increase the community's understanding of suicide.

# 12.3 Management rates in general practice

As shown in Table 12.1, in both 1998–00 and 2006–08, National Health Priority Area (NHPA) musculoskeletal injuries made up almost half of all injuries managed at BEACH encounters, led by sprain/strain and fracture. Skin injuries made up a further third of all injuries with laceration/cut and bruise/contusion being the largest contributors.

Over the study period, while the management rates of musculoskeletal and skin injuries did not change, there was a decrease in sprains/strains, bruises/contusions and insect bites/stings. There was no change in the management rates of injuries related to the eye, the neurological system and the ear, or of those of a social nature.

Adverse events from medical care injuries (included in the injury class in ICPC-2) were managed at a rate of 1.0 per 100 encounters in 2006–08. While effects of prosthetic devices were less often managed in 2006–08 than in 1998–00, adverse effects of a medical agent were managed significantly more often in 2006–08 than in 1998–00 (Table 12.1). In a 2003–04 BEACH substudy, 10.4% of patients had experienced an adverse drug event within the previous 6 months. Patients aged 45 years and over, children aged 1–4 years, and female patients were significantly more likely to have had an adverse drug event.[10]

**Table 12.1: Changes in injury management rates in general practice, 1998–00 and 2006–08**

| | 1998–00 (*n* = 203,100) | | 2006–08 (*n* = 188,300) | | |
|---|---|---|---|---|---|
| **NHPA injuries** | **Number** | **Rate per 100 encs (95% CI)** | **Number** | **Rate per 100 encs (95% CI)** | **Change**[(a)] |
| **Musculoskeletal injuries** | **8,223** | **4.05 (3.90–4.20)** | **7,149** | **3.80 (3.64–3.95)** | **—** |
| Sprain/strain | 3,676 | 1.81 (1.71–1.91) | 2,800 | 1.49 (1.39–1.58) | ↓ |
| Fracture | 2,245 | 1.11 (1.04–1.17) | 2,001 | 1.06 (1.00–1.12) | — |
| Injury musculoskeletal NOS | 1,542 | 0.76 (0.70–0.81) | 1,607 | 0.85 (0.80–0.91) | — |
| Acute internal damage knee | 520 | 0.26 (0.23–0.28) | 516 | 0.27 (0.25–0.30) | — |
| Neck injury | 272 | 0.13 (0.11–0.16) | 191 | 0.10 (0.08–0.12) | — |
| Dislocation/subluxation | 158 | 0.08 (0.06–0.09) | 153 | 0.08 (0.06–0.10) | — |
| **Skin injuries** | **5,461** | **2.69 (2.58–2.80)** | **4,709** | **2.50 (2.40–2.60)** | **—** |
| Laceration/cut | 1,769 | 0.87 (0.82–0.92) | 1,687 | 0.90 (0.84–0.95) | — |
| Injury skin, other | 1,107 | 0.55 (0.50–0.59) | 1,062 | 0.56 (0.51–0.62) | — |
| Bruise/contusion | 1,122 | 0.55 (0.51–0.59) | 851 | 0.45 (0.42–0.49) | ↓ |
| Abrasion/scratch/blister | 377 | 0.19 (0.17–0.21) | 303 | 0.16 (0.14–0.18) | — |
| Insect bite/sting | 369 | 0.18 (0.16–0.20) | 254 | 0.13 (0.12–0.15) | ↓ |

*(continued)*

**Table 12.1 (continued): Changes in injury management rates in general practice, 1998–00 and 2006–08**

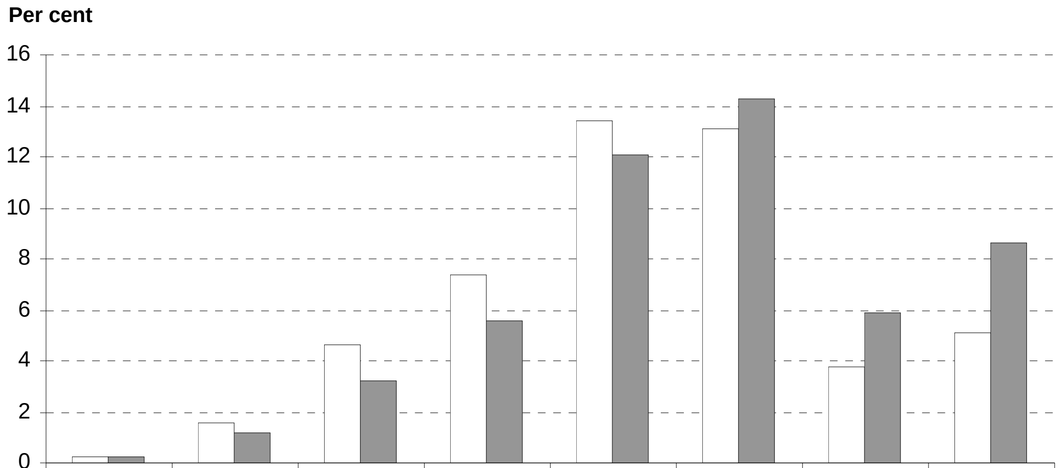
| | 1998–00 (*n* = 203,100) | | 2006–08 (*n* = 188,300) | | |
|---|---|---|---|---|---|
| **NHPA injuries** | **Number** | **Rate per 100 encs (95% CI)** | **Number** | **Rate per 100 encs (95% CI)** | **Change[(a)]** |
| **Skin injuries (continued)** | | | | | |
| Foreign body in skin | 235 | 0.12 (0.10–0.13) | 172 | 0.09 (0.08–0.11) | — |
| Animal/human bite | 156 | 0.08 (0.06–0.09) | 94 | 0.05 (0.04–0.06) | ↓ |
| **General injuries/poisonings** | **399** | **0.20 (0.18–0.22)** | **358** | **0.19 (0.17–0.21)** | **—** |
| Trauma/injury NOS | 293 | 0.14 (0.13–0.16) | 275 | 0.15 (0.13–0.17) | — |
| Multiple trauma/injuries | 42 | 0.02 (0.01–0.03) | 40 | 0.02 (0.01–0.03) | — |
| Toxic effect non-medicinal substance | 40 | 0.02 (0.01–0.03) | 38 | 0.02 (0.01–0.03) | — |
| **Eye injuries** | **515** | **0.25 (0.23–0.28)** | **403** | **0.21 (0.19–0.24)** | **—** |
| Foreign body in eye | 262 | 0.13 (0.11–0.15) | 192 | 0.10 (0.09–0.12) | — |
| Contusion/haemorrhage eye | 104 | 0.05 (0.04–0.06) | 124 | 0.07 (0.05–0.08) | — |
| Injury eye, other | 149 | 0.07 (0.06–0.09) | 87 | 0.05 (0.04–0.06) | ↓ |
| **Neurological injuries** | **358** | **0.18 (0.15–0.20)** | **288** | **0.15 (0.13–0.17)** | **—** |
| Injury head, other | 242 | 0.12 (0.10–0.14) | 192 | 0.10 (0.09–0.12) | — |
| Concussion | 82 | 0.04 (0.03–0.05) | 61 | 0.03 (0.02–0.04) | — |
| Injury nervous system, other | 47 | 0.02 (0.02–0.03) | 38 | 0.02 (0.01–0.03) | — |
| **Ear injuries** | **164** | **0.08 (0.07–0.09)** | **162** | **0.09 (0.07–0.10)** | **—** |
| Perforation, ear drum | 72 | 0.04 (0.03–0.04) | 76 | 0.4 (0.03–0.05) | — |
| **Social injuries** | **117** | **0.06 (0.03–0.08)** | **96** | **0.05 (0.04–0.06)** | **—** |
| Assault/harmful event | 117 | 0.06 (0.03–0.08) | 96 | 0.05 (0.04–0.06) | — |
| **Other NHPA Injuries (*n*, percentage of total)** | **89** | **0.6%** | **93** | **0.7%** | **—** |
| ***Total NHPA injuries (n, percentage of total)*** | ***15,326*** | ***88.2%*** | ***13,258*** | ***87.2%*** | **—** |
| **Non-NHPA injuries** | | | | | |
| **Adverse effect/poisoning by medical agent** | **2,045** | **1.01 (0.96–1.06)** | **1,943** | **1.03 (0.97–1.09)** | **—** |
| Adverse effect medical agent | 992 | 0.49 (0.45–0.52) | 1,135 | 0.60 (0.56–0.65) | **↑** |
| Complication of medical treatment | 703 | 0.35 (0.32–0.37) | 563 | 0.30 (0.27–0.33) | — |
| Effect of prosthetic device | 184 | 0.09 (0.08–0.11) | 129 | 0.07 (0.06–0.08) | ↓ |
| Adverse effects of physical factors | 116 | 0.06 (0.05–0.07) | 85 | 0.05 (0.03–0.06) | — |
| Poisoning by medical agent | 50 | 0.02 (0.02–0.03) | 31 | 0.02 (0.01–0.02) | ↓ |
| **Total ICPC-2 injuries** | **17,371** | **8.55 (8.33–8.78)** | **15,201** | **8.07 (7.86–8.29)** | **↓** |

(a) The direction and type of change is indicated for each result: **↑**/**↓** indicates a statistically significant change, ↑/↓ indicates a marginal change; — indicates there was no change.

*Note:* CI—confidence interval; NOS—not otherwise specified; Encs—encounters. NHPA—National Health Priority Area 95% Confidence intervals are presented to two decimal places to show statistical significance.

# 12.4 Age and sex distribution

Of the 14,917 encounters at which an injury was managed (ICPC-2 definition), 51.0% (95% CI: 49.9–52.0) were with females and 49.0% (95% CI: 48.0–50.1) were with males. Male patients accounted for a significantly greater proportion of these encounters than in total BEACH (42.9%, 95% CI: 42.1–43.7).[11] The age–sex distribution of patients at encounters involving injury is shown in Figure 12.1.



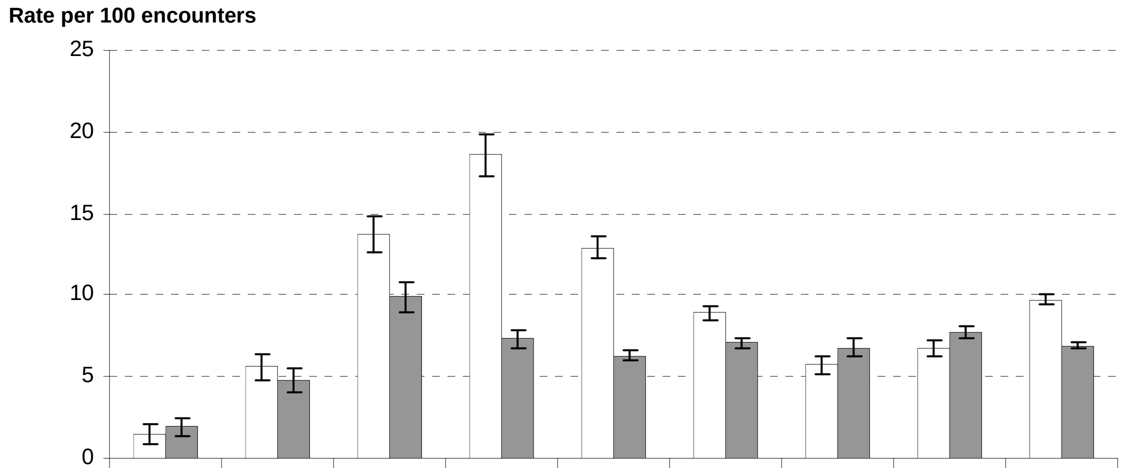

| | <1 | 1–4 | 5–14 | 15–24 | 25–44 | 45–64 | 65–74 | 75+ |
|---|---|---|---|---|---|---|---|---|
| Males | 0.2 | 1.6 | 4.6 | 7.4 | 13.4 | 13.1 | 3.8 | 5.1 |
| Females | 0.2 | 1.2 | 3.2 | 5.6 | 12.1 | 14.3 | 5.9 | 8.6 |

Age group (years)

**Figure 12.1: Age–sex distribution of patients at encounters with at least one injury problem managed, 2006–08**

Patients aged 45–64 years accounted for the largest proportion (27.4%) of all injury encounters, followed closely by those aged 25–44 years (25.5%). Male patients made up a greater proportion of patients within each age group up to 44 years. In patients aged 45 years and over, females made up the greater proportion of patients with injuries in each age group. This is almost an inverse of the age-sex distribution at all BEACH encounters in 2007–08, where males accounted for a smaller proportion of all encounters in all age groups except among the very young (aged less than five years).[11]

The age–sex-specific rates of injury problems managed demonstrate that males were significantly more likely to be managed for injury than were females, 9.7 per 100 encounters, compared with 6.9 per 100 female encounters. Further, the 15–24 year age group had the highest management rate, followed by younger patients in the 5–14 year age group, and then by those aged 25–44 years. The management rate for males aged 15–24 years was very high, at 18.6 injuries managed per 100 GP encounters (Figure 12.2).




| | <1 | 1–4 | 5–14 | 15–24 | 25–44 | 45–64 | 65–74 | 75+ | Total |
|---|---|---|---|---|---|---|---|---|---|
| Males | 1.5 | 5.6 | 13.7 | 18.6 | 12.9 | 8.9 | 5.7 | 6.7 | 9.7 |
| Females | 1.9 | 4.8 | 9.9 | 7.3 | 6.3 | 7.1 | 6.8 | 7.7 | 6.9 |

Age group (years)

**Figure 12.2: Age–sex-specific rates of injury management, 2006–08 (95% CI)**

# 12.5 Management

The remainder of this chapter uses all injuries as defined by ICPC-2 as the denominator which includes adverse effects of medical agents, rather than the National Health Priority Area definition.

## Medications

In the 2006–08 BEACH years, 6,802 medications were prescribed/supplied by the GP or advised for over-the-counter purchase for an injury problem, at a rate of 44.8 per 100 injury problems. This was a significant decrease from the 1998–00 period, which showed medications at a rate of 50.2 per 100 injury contacts (Table 12.2). There was a significant shift from prescription to advice for over-the-counter medications over the study period: prescribed medications significantly decreased, from 37.8 per 100 injury problems managed in 1998–00, to 30.4 in 2006–08; medications advised for over-the-counter purchase increased from 7.5 in 1998–00 to 9.5 per 100 injury problems managed in 2006–08.

Prescription of other analgesics and antipyretics decreased (from 11.0 to 7.6 per 100 injury problems) as did anti-inflammatory and anti-rheumatic non-steroidal products (8.7 to 6.1 per 100 injury problems). However, opioid prescriptions increased significantly from 2.3 to 4.2 per 100 injury problems managed over the 10-year period.

**Table 12.2: Injuries—summary of medication changes, 1998–00 and 2006–08**

| | 1998–00 (*n* = 17,371) | 2006–08 (*n* = 15,201) | |
|---|---|---|---|
| **Type of management** | **Rate per 100 injury problems (95% CI)** | **Rate per 100 injury problems (95% CI)** | **Change[(a)]** |
| **Medications** | **50.2 (48.7–51.6)** | **44.8 (43.3–46.2)** | ↓ |
| Prescribed | 37.8 (36.5–39.1) | 30.4 (29.2–31.6) | ↓ |
| Other analgesics and antipyretics | 11.0 (10.4–11.7) | 7.6 (7.0–8.1) | ↓ |
| Non-steroidal anti-inflammatory and anti-rheumatic products | 8.7 (8.2–9.3) | 6.1 (5.6–6.6) | ↓ |
| Opioids | 2.3 (1.9–2.5) | 4.2 (3.7–4.6) | ↑ |
| Advised for over-the-counter purchase | 7.5 (7.0–8.1) | 9.5 (8.7–10.2) | ↑ |
| GP-supplied | 4.8 (4.3–5.4) | 4.9 (4.4–5.4) | — |

(a) The direction and type of change is indicated for each result: ↑/↓ indicates a statistically significant change; — indicates there was no change.

*Note:* CI—confidence interval

## Other treatments

In 2006–08, 7,879 clinical and procedural treatments were performed at a rate of 51.8 per 100 injury problems. More than half of these were procedural treatments (such as dressings, fixations and physical medicine/rehabilitation) at a rate of 29.3 per 100 injury contacts. The remainder (22.5 per 100 injury contacts) were clinical treatments, such as advice/education and counselling. There have been some significant changes in the clinical and procedural treatments recorded in the management of injuries over the 10 years of BEACH. The overall rate of clinical treatments in the management of injuries decreased from 25.9 per 100 injury problems in 1998–00 to 22.5 per 100 in 2006–08 (Table 12.3).

The rate at which GPs provided sickness certificates in the management of injuries increased from 0.8 per 100 injuries in 1998–00 to 3.1 per 100 in 2006–08; however, this merely reflected the overall increase in their provision in the total BEACH encounter sample.[12]

Although there was no significant change in the rate at which procedures were undertaken in the management of injuries, physical medicine/rehabilitation decreased significantly from 6.2 per 100 injuries in 1998–00 to 3.8 per 100 in 2006–08. Repair/fixation-suture/cast/prosthetic device (apply/remove) also significantly decreased from 7.3 per 100 injury problems in 1998–00 to 5.9 per 100 in 2006–08. However, the rate at which a local injection/infiltration was given increased significantly from 0.5 per 100 injuries to 2.5 per 100 (Table 12.3). The latter change is similar to the overall increase seen in local injections/infiltrations in the total BEACH data set, partially explained by the development of more specific instructions to participating GPs about completing the 'other treatment' section.[13]

**Table 12.3: Injuries—changes in clinical and procedural treatments in management, 1998–00 and 2006–08**

| | 1998–00 (*n* = 17,371) | 2006–08 (*n* = 15,201) | |
|---|---|---|---|
| **Management action** | **Rate per 100 injury problems (95% CI)** | **Rate per 100 injury problems (95% CI)** | **Change[(a)]** |
| **Clinical treatments** | **25.9 (24.7–27.0)** | **22.5 (21.3–23.8)** | ↓ |
| Advice/education | 3.2 (2.8–3.6) | 5.6 (4.9–6.3) | ↑ |
| Advice/education—treatment | 8.5 (7.8–9.1) | 2.9 (2.5–3.3) | ↓ |
| Counselling–problem | 1.8 (1.5–2.1) | 2.9 (2.5–3.2) | ↑ |
| Sickness certificate | 0.8 (0.7–1.0) | 3.1 (2.7–3.5) | ↑ |
| Advice/education/counselling–exercise | 2.0 (1.7–2.4) | 0.7 (0.4–1.1) | ↓ |
| **Procedural treatments** | **30.4 (29.1–31.6)** | **29.3 (27.8–30.8)** | — |
| Dressing/pressure/compression/tamponade | 11.5 (10.8–12.1) | 12.5 (11.8–13.2) | — |
| Repair/fixation-suture/cast/prosthetic device (apply/remove) | 7.3 (6.7–7.9) | 5.9 (5.4–6.4) | ↓ |
| Physical medicine/rehabilitation | 6.2 (5.5–6.8) | 3.8 (2.9–4.6) | ↓ |
| Excision/removal tissue/biopsy/ destruction/debridement/cauterisation | 3.0 (2.7–3.3) | 2.5 (2.2–2.8) | — |
| Local injection/infiltration | 0.5 (0.2–0.9) | 2.5 (2.0–3.0) | ↑ |

(a) The direction and type of change is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

*Note:* CI—confidence interval.

## Referrals

Referrals for injury problems were given at a rate of 12.3 per 100 injury problems in 2006–08 (*n* = 1,862), made up of 5.7 referrals per 100 injury problems to an allied health service, and 5.3 referrals per 100 injury problems to a specialist. Referrals to hospitals/emergency departments were relatively rare at 0.8 per 100 injury contacts.

There were no significant changes in the rates of patient referrals to medical specialists and allied health professionals between 1998 and 2008. Only referrals to orthopaedic surgeons showed a marginal increase, from 2.7 (95% CI: 2.4–3.0) per 100 injury contacts in 1998–00 to 3.4 (95% CI: 3.0–3.7) per 100 in 2006–08.

## Imaging

Imaging tests were ordered for an injury at a rate of 19.1 per 100 injury problems. Imaging test ordering data from the first 2 years are not comparable to later data because the imaging codes were expanded to incorporate greater specificity from April 2000 onward. While between 2000–02 and 2006–08 there was no change in the rate at which GPs ordered imaging in the management of injuries, orders for ultrasounds were significantly more frequent in 2006–08, increasing from 2.1 (95% CI: 1.8–2.3) ultrasounds per 100 injuries in 2000–02 to 3.1 (95% CI: 2.7–3.4) per 100 in 2006–08. The largest contributors to this change were shoulder ultrasounds which increased by about 55% from 0.9 (95% CI: 0.9–1.0) per 100 injuries contacts in 2000–02, to 1.4 (95% CI: 1.2–1.6) per 100 in 2006–08.

## 12.6 Groups at risk of an injury

The following four groups of patients have been investigated separately, as they are widely recognised as being at risk of developing an injury. These groups include patients aged 15–24 years, patients aged 75 years and over, Aboriginal and Torres Strait Islander patients and patients living in a rural or remote area.

### Patients aged 15–24 years

In BEACH, between April 2006 and March 2008, there were 1,776 injury problems (11.2 per 100 encounters) managed at encounters with patients aged 15–24 years (Table 12.4). Patients in this group had the highest age-specific rates of injury problems, with males having an injury problem managed at 18.6 per 100 injury problems, and 7.3 per 100 for females (Figure 12.2). Sprains and strains were the most frequently managed injury in this age group, at a rate of 2.4 per 100 encounters, followed by fractures (1.4 per 100 encounters).

Male patients dominated in injuries associated with sports, such as fracture, dislocation/subluxation, and acute internal knee damage. Of all the male injuries, 18.1% were work-related (results not shown). Work-related musculoskeletal problems are discussed further in Section 11.6.

It is interesting to see that adverse effects of medical agents ranked as the sixth most commonly managed injury in this age group at a rate of 0.9 per 100 injuries (Table 12.4). Females accounted for 91.5% of these, and for more than half of the complications resulting from a medical treatment, including medication adverse effect and contraceptive breakthrough bleeding (results not shown).

Dressings were the most common procedural treatment given for injuries in patients aged 15–24 years, at a rate of 11.2 per 100 injury problems (results not shown).

Referrals to orthopaedic surgeons were given at a rate of 3.2 per 100 injury contacts, and to physiotherapists at a rate of 5.0 per 100 injury contacts. Imaging tests were ordered at a rate of 22.4 per 100 injury problems, with 82.9% being for an X-ray, of which ankle, foot, hand and wrist X-rays made up half (results not shown).

### Patients aged 75 years and over

There were 2,070 injury problems (7.3 per 100 encounters) managed at encounters with patients aged 75 years and over between April 2006 and March 2008. Females accounted for two thirds of injury problems in older people, and had a higher injury management rate than males (Figure 12.2). Almost half of the injuries in patients aged 75 years and over consisted of laceration/cut (managed at a rate of 1.5 per 100 injury encounters), fracture (1.2 per 100) and adverse effect of a medical agent (0.8 per 100) (Table 12.4). Not surprisingly, osteoporosis was managed as a comorbidity at 2.4 per 100 injury problems with patients aged 75 years and older (results not shown).

Referrals to physiotherapists and orthopaedic surgeons were also relatively common among this age group (2.7 and 2.9 per 100 injury contacts, respectively), though referrals to physiotherapists were made significantly less often (2.7 per 100 injury problems, 95% CI: 1.9–3.4) than at injury encounters with patients aged 15–24 years (5.0 per 100 injury problems, 95% CI: 3.9–6.0) (results not shown).

**Table 12.4: Most common injuries managed at encounters with patients aged 15–24 years, and patients aged 75 years and over, 2006–08**

| | Encounters with patients aged 15–24 years, 2006–08 (*n* = 15,835) | |
|---|---|---|
| **Problem** | **Number** | **Rate per 100 encounters[(a)] (95% CI)** |
| Sprain/strain | 375 | 2.4 (2.1–2.6) |
| Fracture | 216 | 1.4 (1.1–1.6) |
| Laceration/cut | 178 | 1.1 (0.9–1.3) |
| Injury musculoskeletal NOS | 168 | 1.1 (0.9–1.2) |
| Injury skin, other | 151 | 1.0 (0.8–1.1) |
| Adverse effect, medical agent | 140 | 0.9 (0.7–1.0) |
| Bruise/contusion | 120 | 0.8 (0.6–0.9) |
| *Subtotal (n, percentage of total injuries managed)* | *1,348* | *75.9* |
| **Total injuries, patients 15–24 years** | **1,776** | **11.2 (10.6–11.9)** |
| | **Encounters with patients aged 75+ years, 2006–08 (*n* = 28,300)** | |
| **Problem** | **Number** | **Rate per 100 encounters[(a)] (95% CI)** |
| Laceration/cut | 424 | 1.5 (1.3–1.7) |
| Fracture | 329 | 1.2 (1.0–1.3) |
| Adverse effect, medical agent | 223 | 0.8 (0.7–0.9) |
| Sprain/strain | 178 | 0.6 (0.5–0.7) |
| Injury musculoskeletal NOS | 161 | 0.6 (0.5–0.7) |
| Bruise/contusion | 136 | 0.5 (0.4–0.6) |
| *Subtotal (n, percentage of total injuries managed)* | *1,451* | *70.1* |
| **Total injuries, patients 75+ years** | **2,070** | **7.3 (7.0–7.7)** |

(a) Figures do not total 100, as more than one injury type can be recorded for each encounter and only the most frequently managed are listed.

*Note:* CI—confidence interval; NOS—not otherwise specified.

## Aboriginal and Torres Strait Islander patients

Indigenous encounter data between 2000 and 2008 was combined to allow a comparison between Indigenous encounters at which at least one injury was managed (*n* = 1,027) and total encounters between 2006 and 2008 where at least one injury was managed (*n* = 14,917). Injuries were managed significantly more often at encounters with Aboriginal and Torres Strait Islander patients (9.9 per 100 encounters, 95% CI: 9.0–10.7) than at all encounters (8.1 per 100 encounters, 95% CI: 7.9–8.3). This difference may be partly explained by the younger age distribution of Indigenous patients (see Chapter 6). The injuries most frequently managed at encounters with Indigenous patients were fractures (1.6 per 100 encounters), sprain/strain (1.4 per 100 encounters) and laceration/cut (1.2 per 100 encounters). Lacerations/cuts were managed marginally more often than at total BEACH encounters, and fractures were managed significantly more often at Indigenous encounters (tables 12.1 and 12.5). Assault/harmful events were also managed significantly more often, at almost 6 times the average rate of all encounters (Table 12.5).

**Table 12.5: Most common injuries managed at encounters with Indigenous patients, 2000–08**

| Problem | Number | Rate per 100 encounters with Indigenous patients)[(a)] (95% CI) (*n* = 10,701 |
|---|---|---|
| Fracture | 170 | 1.6 (1.3–1.9) |
| Sprain/strain | 149 | 1.4 (1.2–1.6) |
| Laceration/cut | 127 | 1.2 (1.0–1.4) |
| Injury skin, other | 89 | 0.8 (0.6–1.1) |
| Injury musculoskeletal NOS | 76 | 0.7 (0.5–0.9) |
| Assault/harmful event | 31 | 0.3 (0.2–0.4) |
| *Subtotal (n, percentage of total injuries managed)* | *611* | *57.9* |
| **Total injuries, Indigenous patients** | **1,056** | **9.9 (9.0–10.7)** |

(a) Figures do not total 100, as more than one injury type can be recorded for each encounter and only the most frequently managed are listed.

*Note*; CI:—confidence interval; NOS—not otherwise specified.

## Patients living in rural/remote areas

The Australian Standard Geographical Classification (ASGC)[14] was used to compare management rates of injuries at encounters with patients from different regions. There were no significant differences in the management rates between encounters with patients from Major City areas, Inner Regional and Outer Regional areas. However, there was a marginally higher management rate of work-related injuries at encounters with patients from Outer Regional areas (16.1 per 100 injury contacts, 95% CI: 13.4–18.9) than at those with patients from Major Cities (12.5 per 100 injury contacts, 95% CI: 11.6–13.4), and a significantly higher rate than patients from Inner Regional areas (11.4 per 100 injury contacts, 95% CI: 9.9–12.9).

# 12.7 Discussion

The management rates of some injuries (mainly sprains/strains and bruises/contusions) significantly decreased over the 10 years recorded in BEACH, which may have caused the overall management rate of injuries to decrease, possibly indicating the effectiveness of policies. The only increase was in the management rate of adverse effects of medical agents, which is not included as an injury by the National Health Priority Action Council, but is recognised as an injury by international standards in the International Classification of Primary Care—Version 2 (ICPC-2).[3]

Overall, males and females had an injury problem managed at 9.7 and 6.9 per 100 encounters, respectively. The inclusion of males aged 15–24 years in the National Health Priority Areas as a group at risk is justified, as injuries were managed among this group more frequently than any other group, particularly in sports-related injuries. Males under the age of 65 years were more likely to be managed for an injury than their female counterparts, but females aged 65 years and over were managed for an injury more often than were older males.

Of all injury problems managed at encounters with patients over the age of 75 years, 11% were adverse effects of a medical agent. At encounters with patients aged 15–24 years, such adverse effects made up 8% of all injury problems managed, with 92% of these at encounters with females.

When adverse effects were investigated in the past, it was shown that half of the events were moderate to severe, and that some could potentially be prevented.[10] These findings reinforce the fact that adverse events are a significant common problem being managed by GPs.

Aboriginal and Torres Strait Islander patients, for whom specific policies have been designed to try to reduce their rates of injury, had an injury managed significantly more often than the average for all encounters. The most notable of these was a rate six times higher for assault/harmful event. Another patient group considered at risk are those in Outer Regional areas, but the only difference found was a higher work-related injury management rate at these encounters than at encounters in Inner Regional and Major City areas, which perhaps reflects the more physical nature of their work.

While the most common medications prescribed in the management of injuries were NSAIDS, and analgesics/antipyretics in the 10 years, there has been a move away from these medications, and a move towards opioid prescriptions. The move to opioids has been seen by some as of considerable concern.[15]

The lower rates of non-medicinal treatment in injury management, including advice/education, counselling and physical medicine/rehabilitation, coupled with the rise in opioid prescriptions, may indicate that pharmaceutical management has become the preferred choice for injury management.

# 12.8 Conclusion

The BEACH data show that the high rate of assault/harmful event in the Aboriginal and Torres Strait Islander population is a significant issue for GP management, and so may be the increasing use of opioids as the method of managing physical injuries.

In particular, an emerging issue is the increased management rates of adverse medical events in older patients and young women. Adverse events in older patients are raising some concern, as Australia has an ageing population with increasing multimorbidity. In turn, this results in more polypharmacy, increasing the chance of adverse drug events. The data suggest that this is an area for future policy consideration.

**Suggested chapter citation**

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# 13 Cancer

*Salma Fahridin*

## 13.1 Background

Cancer was one of the original National Health Priority Areas. It made up the largest portion (19.4%) of the total burden of disease and injury in Australia in 2003[1], and accounted for 30% of all deaths in 2006.[2] The National Health Priority Area Initiative for cancer control focuses on eight types of cancer: lung cancer, melanoma, non-melanocytic skin cancers (including basal cell and squamous cell carcinomas), colorectal cancer, prostate cancer, non-Hodgkin lymphoma, cervical cancer and breast cancer. These eight cancers accounted for about 53% of all cancer deaths in Australia in 2005.[3]

Knox et al. (2008) estimated that in the Australian population, the prevalence of malignant neoplasms currently under medical management was 2.0% (95% CI: 1.7–2.3).[4] This equates to about 400,000 Australians being managed for a malignant neoplasm. Of these, 78% also suffered from one or more comorbidities, the most common being vascular disease with 47% of people with cancer also having vascular disease.[5] In 2005, the risk of being diagnosed with cancer before the age of 75 was one in three for males, and one in four for females.[6]

## 13.2 Policies and initiatives

In response to the 1981 World Health Organization's Global Strategy for Health for All by the Year 2000, cancer was identified as a priority area in the *Health for all Australians* report (1988). In 1993, the *Goals and targets for Australia's health in the Year 2000 and beyond* report set revised goals, which included cancer control as a priority for improving health.[7]

Policies relating to cancer mainly aim to prevent cancer, and detect it in its early stages rather than manage it. The following list describes some of the main policies to emerge following the recognition of cancer as a health priority.

- BreastScreen Australia was established by the Commonwealth and the states and territories in 1991, with an aim to reduce mortality from breast cancer by providing free screening mammograms to women aged 50–69 years.[8]
- Since 1991, the National Cervical Screening Program has aimed to reduce mortality from cervical cancer by encouraging women aged 18–69 years to have regular Pap smears and this resulted in an increase over time in the number of Pap smears performed.[9]
- In 1997, the first *Cancer control* report was produced, identifying the general practitioner as a key player in the prevention and early detection of cancer.[10]
- In 1998, the National Cancer Strategies Group was set up to bring together clinicians, governments and consumers to develop the National Cancer Control Plan as a national approach to controlling cancer.[11]
- Priorities for Action in Cancer Control 2001–2003 was created by the National Cancer Strategies Group, and identified 13 interventions and priorities for action in cancer control.[12,13]

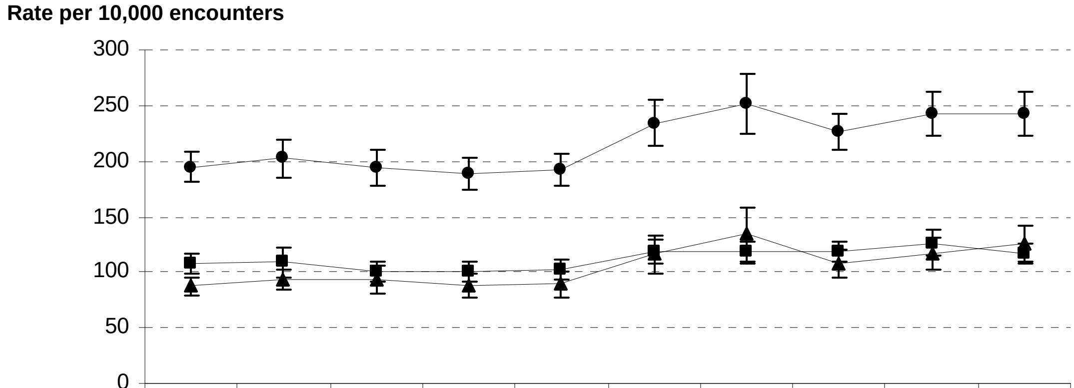
- The Australian National Tobacco Strategy 2004–09, a continuation of the National Tobacco Strategy 1999 to 2003–04 aims to reduce the burden of disease that smoking causes, including cancer.[14]
- The National Skin Cancer Awareness Campaign (2006) aimed to educate young people about the risks of sun exposure.[15]
- Phase 1 of the National Bowel Cancer Screening Program was launched in August 2006, offering free testing to people turning 55 or 65 years between May 2006 and June 2008. Phase 2 offers free testing to people turning 50, 55 or 65 years between January 2008 and December 2010.[16]
- The Cancer Council Australia's National Cancer Prevention Policy 2007–09 provides a plan for cancer prevention and early detection, by focusing on lifestyle issues as risk factors for cancer. This policy followed four prior policies beginning in 1987.[17]
- From mid-2007 to June 2009, the Australian Government subsidised Human Papillomavirus vaccine for females aged 12–26 years as part of the National HPV Vaccination Program.[18]
- As a result of the 2020 Summit, the National Health Preventative Taskforce was created. It aims to reduce the burden of chronic disease-related to lifestyle factors, such as obesity, smoking, alcohol consumption and lack of physical activity.[19]

## 13.3 Management rates in general practice

Management rates are presented per 10,000 encounters, as numbers are small. Skin neoplasms (including melanomas and other skin malignancies) are analysed separately from non-skin malignancies, as they contribute to a large proportion of the neoplasms managed in general practice. Some problem and concept labels include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

In 2007–08, all malignancies (including skin) were managed at a rate of 243.2 per 10,000 encounters. This was significantly higher than the 1998–99 rate of 194.6 per 10,000 encounters (Figure 13.1). When skin neoplasms were excluded, the management rate of other malignant neoplasms remained relatively stable over the 10 years recorded in BEACH, showing no significant change.

However, the management rate of skin malignancies significantly increased from 87.4 per 10,000 encounters in 1998–99, peaking in 2004–05 at 134.1 per 10,000 encounters, then decreasing (though the decrease was not significant) to 125.8 per 10,000 in 2007–08 (Figure 13.1). This pattern of change mirrors the requests for complete skin check-ups. In 1998–99, patients requested a skin check-up at a rate of 83.2 per 10,000 encounters (95% CI: 75.0–94.4). This rate reached its lowest point in 2001–02 (64.2 per 10,000 encounters, 95% CI: 55.5–72.9), then increased significantly between 2003 and 2005, before settling at 153.6 per 10,000 encounters (95% CI: 124.5–182.7) in 2007–08. As a result of the increased demand, complete skin check-ups were performed more frequently in 2007–08 at a rate of 517.3 per 10,000 encounters (95% CI: 386.6–648.1) than in 1998–99 (211.4 per 10,000 encounters; 95% CI: 174.6–248.2) (results not shown). This patient-driven increase is likely to be due to public education campaigns, but may also be associated with the growth of general practice skin clinics at about the same time.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| All malignancies | 194.6 | 202.1 | 194.3 | 188.5 | 192.0 | 234.2 | 252.2 | 226.7 | 243.2 | 243.2 |
| Non-skin malig. | 107.2 | 108.7 | 101.1 | 100.1 | 103.0 | 118.0 | 118.0 | 118.7 | 126.6 | 117.4 |
| Skin malignancies | 87.4 | 93.4 | 93.2 | 88.4 | 89.0 | 116.2 | 134.1 | 108.1 | 116.7 | 125.8 |

Data period

*Note*: malig—malignancies.

**Figure 13.1: Management rate of malignant neoplasms, rate per 10,000 encounters, 1998–99 to 2007–08 (95% CI)**

The primary contributors to the increase in the management rate of all malignant neoplasms are shown in Table 13.1, which lists the malignant neoplasms managed most frequently in general practice. Management rates of prostate cancer, breast cancer and cervical cancer all increased significantly. Unspecified/multiple malignancies, which includes metastases and cancer of an unknown site also showed a significant increase.

**Table 13.1: Changes in management rates of malignant neoplasms, 1998–00 and 2006–08**

| Malignant neoplasm | 1998–00 (*n* = 203,100) Rate per 10,000 encounters (95% CI) | 2006–08 (*n* = 188,300) Rate per 10,000 encounters (95% CI) | Change(a) |
|---|---|---|---|
| **Skin malignancies** | **90.5 (84.5–96.5)** | **121.3 (110.1–132.5)** | ↑ |
| Melanoma | 7.3 (6.0–8.6) | 9.9 (8.2–11.6) | — |
| Other skin malignancies (non-melanoma) | 82.5 (76.7–88.2) | 110.7 (100.1–121.4) | ↑ |
| **Respiratory malignancies** | **12.1 (9.8–14.3)** | **9.9 (8.2–11.7)** | — |
| Lung/bronchus malignancy | 9.9 (7.9–11.9) | 8.6 (7.0–10.1) | — |
| **Digestive malignancies** | **20.6 (17.5–23.6)** | **19.4 (17.2–21.6)** | — |
| Colon/rectum malignancy | 12.8 (10.8–14.8) | 12.3 (10.5–14.0) | — |
| **Male genital malignancies** | **23.8 (21.0–26.5)** | **29.6 (26.7–32.4)** | ↑ |
| Prostate cancer | 23.3 (20.6–26.0) | 28.9 (26.1–31.8) | ↑ |
| **Female genital malignancies** | **22.2 (19.8–24.5)** | **28.7 (25.7–31.7)** | ↑ |
| Breast cancer | 17.6 (15.5–19.6) | 22.8 (20.3–25.4) | ↑ |
| Cervical cancer | 1.0 (0.6–1.4) | 2.3 (1.6–3.1) | ↑ |
| **Blood malignancies** | **14.6 (12.7–16.5)** | **15.9 (13.9–17.9)** | — |
| Non-Hodgkin lymphoma | 2.0 (1.4–2.7) | 2.2 (1.4–3.0) | — |
| Hodgkin lymphoma | 3.9 (3.0–4.8) | 4.3 (3.3–5.2) | — |
| Myeloma | 2.4 (1.6–3.2) | 2.3 (1.6–3.0) | — |
| Leukaemia | 5.5 (4.3–6.6) | 5.9 (4.7–7.1) | — |
| **Urological malignancies** | **5.2 (4.0–6.3)** | **5.1 (4.0–6.2)** | — |
| Bladder | 2.9 (2.0–3.7) | 2.8 (2.0–3.5) | — |
| Kidney | 2.1 (1.3–2.8) | 2.3 (1.5–3.0) | — |
| **Unspecified/multiple malignancies** | **6.0 (4.7–7.2)** | **9.7 (8.1–11.3)** | ↑ |
| *Subtotal* | 194.8 (184.2–205.4) | 239.5 (225.7–253.3) | ↑ |
| **Total malignant neoplasms** | **198.5 (187.7–209.2)** | **243.2 (229.3–257.2)** | ↑ |

(a) The direction and type of change is indicated for each result: ↑/↓ indicates a statistically significant change; — indicates no change.

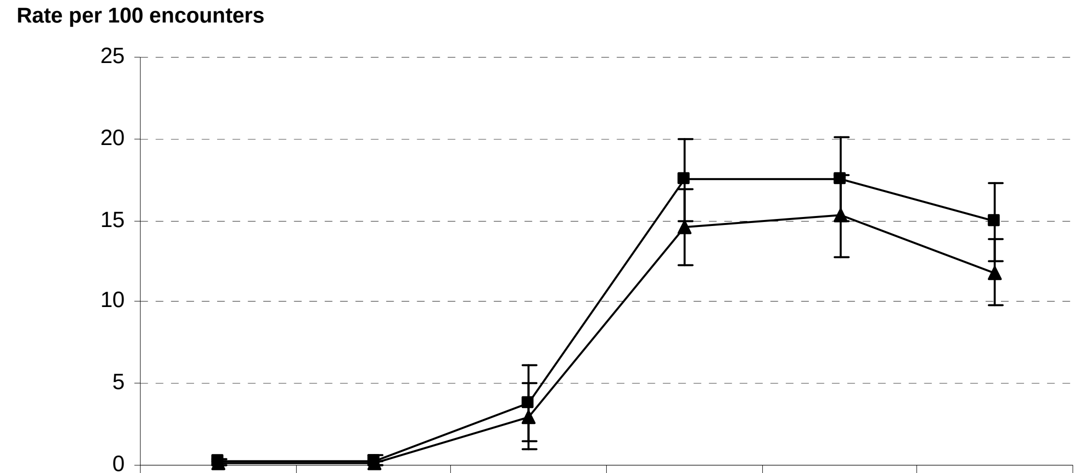
*Note:* CI—confidence interval.

# 13.4 Management rates by patient sex

The management rate of malignant neoplasms was significantly higher among men than among women in all years, and it increased significantly from 1998 to 2008 for both males and females. In 1998–99, GPs managed cancer in males at a rate of 255.3 (95% CI: 233.6–277.0) per 10,000 encounters, increasing to 322.2 (95% CI: 293.0–351.4) per 10,000 in 2007–08. A similar growth was seen in females, where cancer management rates rose from 152.5 (95% CI: 139.8–165.2) per 10,000 encounters in 1998–99 to 190.6 (95% CI: 172.1–209.2) per 10,000 in 2007–08 (results not tabled).

# 13.5 Human Papillomavirus vaccine

The Australian Government-funded subsidisation of the Human Papillomavirus (HPV) vaccine for females aged 12–26 years, encouraged a rapid uptake of the vaccine. The vaccine was available from November 2006; however the campaign and subsidisation began in mid-2007.[20] Figure 13.2 shows the rate of HPV vaccines given to female patients aged 12–26 years by a GP before and after the subsidisation of the vaccine. The rate of vaccines has already begun to drop as the number of new entrants into this age group is small, and the campaign has probably encouraged patients to get their injections early. The rate is likely to settle once subsidisation for those who have not had their first dose ceases from July 2009.[21]




| | Oct-Dec06 | Jan-Mar07 | Apr-Jun07 | Jul-Sep07 | Oct-Dec07 | Jan-Mar08 |
|---|---|---|---|---|---|---|
| Prescription | 0.2 | 0.3 | 3.8 | 17.5 | 17.5 | 14.9 |
| GP-supplied | 0.1 | 0.1 | 3.0 | 14.6 | 15.3 | 11.8 |

Data period

**Figure 13.2: Age–sex-specific rate of HPV prescriptions and GP-supplied vaccines for females aged 12–26 years, April 2006–March 2008 (95% CI)**

# 13.6 Referrals to medical specialists

Although there were no significant changes in the total referral rates for both non-skin and skin malignancies, there were significant increases in referrals to oncologists and gynaecologists for non-skin malignancies and to clinics/centres for skin malignancies. Referrals to surgeons for skin malignancies significantly decreased, while referrals to dermatologists showed no significant change (Table 13.2).

**Table 13.2: Changes in rates of referral to specialists by malignancy, 1998–00 and 2006–08**

| | 1998–00 (*n* = 203,100) | 2006–08 (*n* = 188,300) | |
|---|---|---|---|
| **Medical specialist** | **Rate per 10,000 encounters (95% CI)** | **Rate per 10,000 encounters (95% CI)** | **Change[(a)]** |
| **Referrals for non-skin malignancies** | **1,308.7 (1,152.0–1,465.0)** | **1,589.7 (1,418.0–1,761.0)** | — |
| Oncologist | 218.9 (154.0–283.8) | 387.6 (306.2–469.0) | ↑ |
| Specialist (unspecified) | 150.5 (100.2–200.7) | 34.8 (10.7–59.0) | ↓ |
| Gynaecologist | 36.5 (11.2–61.7) | 104.5 (63.2–145.9) | ↑ |
| **Referrals for skin malignancies** | **2,236 (2,015.0–2,457.0)** | **1,843.3 (1,629.0–2,058.0)** | — |
| Surgeon | 598.5 (484.6–712.4) | 315.2 (238.4–392.0) | ↓ |
| Dermatologist | 995.7 (839.2–1152.0) | 888.8 (738.1–1039.0) | — |
| Clinic/centre | 5.4 (0.0[‡]) | 52.5 (22.7–82.2) | ↑ |

(a) The direction and type of change is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates no change.

*Note:* CI—confidence interval

Earlier investigations into the management of skin malignancies across Australian Standard Geographical Classification areas[22] found that GPs practising in Inner and Outer Regional areas managed skin malignancies almost twice as often as GPs in Major Cities, but were far less likely to refer their patients to a dermatologist or plastic surgeon. Inner/Outer Regional GPs were more likely to refer their patients to a surgeon.[23] This difference is probably due to varying availability of dermatologists and plastic surgeons in rural areas.

# 13.7 Procedural treatments

Procedural treatments for malignant neoplasms increased over the 10 years of BEACH. In the management of non-skin malignancies, procedures significantly increased from 373.9 (95% CI: 283.6–464.2) per 10,000 problem contacts in 1998–00 to 797.3 (95% CI: 680.1–914.4) per 10,000 in 2006–08. A large increase was seen in local injection/infiltration (22.8 per 10,000 contacts, 95% CI: 2.8–42.8, in 1998–00 to 387.2, 95% CI: 306.6–467.9, in 2006–08), of which more than half were given in the management of prostate cancer.

Preventive check-ups for prostate and cervical cancer both increased significantly. Prostate examinations almost doubled from 4.7 (95% CI: 3.2–6.1) per 10,000 encounters in 2003–04 to 8.4 (95% CI: 6.5–10.4) per 10,000 encounters in 2007–08 (data not available pre-2003). Similarly, Pap smears have been previously reported as significantly increasing from 60 per 10,000 encounters in 1998–99 to 110 per 10,000 encounters in 2007–08.[24]

Procedures undertaken in the management of skin neoplasms increased from 4,575.6 (95% CI: 4,281.0–4,870.0) per 10,000 skin neoplasm problems in 1998–00 to 5,192.6 (95% CI: 4,821.0–5,564.0) in 2006–08 (results not tabled). Excisions accounted for about 75% of these procedures.

## 13.8 Pathology test orders

While BEACH began in April 1998, pathology test ordering data from the first 2 years are not comparable to later data because the pathology codes were expanded to incorporate greater specificity from April 2000 onward. Between 2000–01 and 2007–08, there were no significant changes in the pathology test ordering rate where non-skin malignancies were managed; however, the prostate specific antigen test, which aims to detect prostate cancer, increased significantly from 46.8 (95% CI: 40.0–53.7 per 10,000 encounters in 2000–01 to 85.7 (95% CI: 77.5–94.0) in 2007–08 for all BEACH encounters. Similarly, the faecal occult blood test which is currently the most reliable pathology screening test for bowel cancer, significantly increased from 37.3 (95% CI: 21.1–53.5) per 10,000 encounters in 2000–01 to 109.4 (95% CI: 85.2–133.7) in 2007–08. An apparent trend for increased pathology order rates in the management of skin malignancies did not reach statistical significance (results not tabled).

## 13.9 Discussion

The management rate of malignant neoplasms increased over the study period; however, this was due to increased management of skin neoplasms with no change in management rates of non-skin malignancies as a group. Males were managed for malignant neoplasms significantly more often than females, although both sexes experienced significant increases in management rates over the 10 years.

There were significant increases in the management rates of prostate cancer, breast cancer and cervical cancer. In the case of prostate cancer, this may be the result of higher detection rates emanating from increased prostate specific antigen testing. However, the increased management rate of cervical cancer is more likely to be due to improved survival rates (72%)[25] leading to long-term follow-up of the problem. Breast examinations are recorded at BEACH encounters, but do not indicate increasing rates of breast screening. Some may be 'hidden' under the label of female genital checks where the breast examination itself is not specifically mentioned. In addition, there are many screening facilities available that do not require GP involvement, particularly the BreastScreen Australia Program. Although the National Bowel Cancer Screening Program only invited a specific group of patients to take part in the program, it seemed to have generated increased awareness, as faecal occult blood tests were ordered more often. However, so far this has not led to the increased management rate of bowel cancer, seen with cervical and prostate cancers.

The controversy over use of prostate specific antigen testing as a population-based screening tool for prostate cancer[26] has not prevented GPs from increasingly ordering the test. This may be in response to increased patient demand, as there has been considerable media attention given to the risks of prostate cancer. The higher rate of injections administered in the management of prostate cancer suggest that GPs are not only diagnosing the cancer, but are continuing to manage it through regular hormonal injections.

The data indicate that the subsidised Human Papillomavirus vaccine has been strongly taken up by females aged 12–26 years, who are required to have their first dose by July 2009 if they are to take advantage of the subsidisation.

The management rate of skin malignancies increased by about 30% over the decade. This trend matches the increase in complete skin check-ups, indicating that the check-ups may have led to improved detection. Complete skin check-ups increased sharply in 2002, and then settled at a significantly higher rate than in the first 5 years of BEACH (1998–2002). This may be linked to public health campaigns increasing awareness of skin cancer, and to the emergence of GP skin clinics in recent years.

Although skin neoplasms were referred to other services equally as often a decade ago as they were in 2007–08, GPs increased their referrals to clinics/centres, and decreased their referrals to surgeons, while referral rates to dermatologists did not change. Unfortunately, it is not clear whether these clinics/centres were GP skin clinics.

Though not significant, there was a trend towards increasing rates of skin excisions and skin histopathology orders. This result, together with the lack of change in the overall proportion of skin malignancies referred, may indicate that GPs are beginning to perform more excisions themselves. Future BEACH data will allow testing of this hypothesis.

Referral rates for skin malignancies differed between rural and metropolitan areas. Patients living in Inner Regional/Remote areas were more likely to be referred to surgeons than to dermatologists or plastic surgeons, to whom Major City patients were more likely to be referred. This is likely to be an access issue for people living in some country areas.

## 13.10 Conclusion

It appears that policies that aim to minimise the effects of cancer, and the registers (which send regular reminders to be tested) of patients are increasing patient demand for screening tests, and resulting in GPs being more involved in the cancer detection process. In particular, the increased management rate of skin neoplasms suggests that GPs are increasingly detecting and managing skin malignancies with less frequent referral of the patient to specialists. With a greater emphasis on GP contribution to cancer care[27], their role is evolving towards that of the primary coordinator of the cancer patient's care.

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# 14 Mental health

*Christopher Harrison, Janice Charles*

This chapter looks at the management of mental health problems in BEACH, and the changes that have occurred over the decade from 1998–99 to 2007–08. It summarises the top 10 psychological problems managed in 1998–99 and 2007–08, and looks at changes over time in depression, anxiety, and drug and alcohol problems. Characteristics of patients with these conditions, and changes in management, medications, other treatments—counselling, referrals, and length of consultations where these problems were managed are also discussed. An overview of the current management of schizophrenia and bipolar disorder is provided.

## 14.1 Background

Results from the *Burden of disease* report, the National Survey of Mental Health and Wellbeing (NSMHW) and several BEACH SAND substudies provide a picture of the current state of mental health in Australia. Mental disorders were responsible for 13.3% of the total burden of disease and injury in Australia in 2003, with anxiety and depression accounting for over half, and alcohol dependence making up 10% of this result.[1] The NSMHW found the prevalence of a diagnosed mental disorder over the previous 12 months to be 20%, generalised anxiety disorder 2.7%, depressive episode 4.1%, and alcohol or drug harmful use or dependence, to be 5.7%.[2] The prevalence of 20% for psychological problems found in the NSMHW is also supported by a SAND substudy done in 2005, in which the prevalence of diagnosed psychological problems currently under management was estimated at 19.4% in the Australian population.[3]

The NSMHW shows that of people with a psychological problem, 35% accessed health services for their problem and two-thirds (67.8%) of these consulted a GP at some point regarding their psychological problem.[2]

### Policies and initiatives

Health policies specifically addressing mental health began to appear in the early 1990s. Some of those most relevant to general practice are described here:

- The first National Mental Health Plan was put in place in 1993 to strengthen the mental health system and improve general understanding of mental illness. This was followed by the 1998–2003 plan. Both plans relied on bilateral funding agreements between the Australian and state and territory governments.[4]
- In 1994, Australian state and territory governments endorsed the National Health Goals and Targets, which identified mental health as one of the four national priority areas together with cardiovascular health, cancer control and injury prevention.[5] In 1996 these were changed to National Health Priority Areas.[6]

- The year 2000 saw the establishment of beyondblue, an organisation focusing on prevention and treatment of depression. In 2006, it went into its second 5-year phase, with funding of $36 million from the Australian Government and a similar contribution from state and territory governments.[7]
- In 2001, Australian Government funding of $120 million in the form of Medicare payments and Practice Incentive Program points was provided over four years to Better Outcomes in Mental Health Care (BOIMHC) and to incentives through the Practice Incentives program. This initiative was introduced in recognition of the important role of GPs in managing mental health problems, and to enable team arrangements for referral of patients to allied health services.

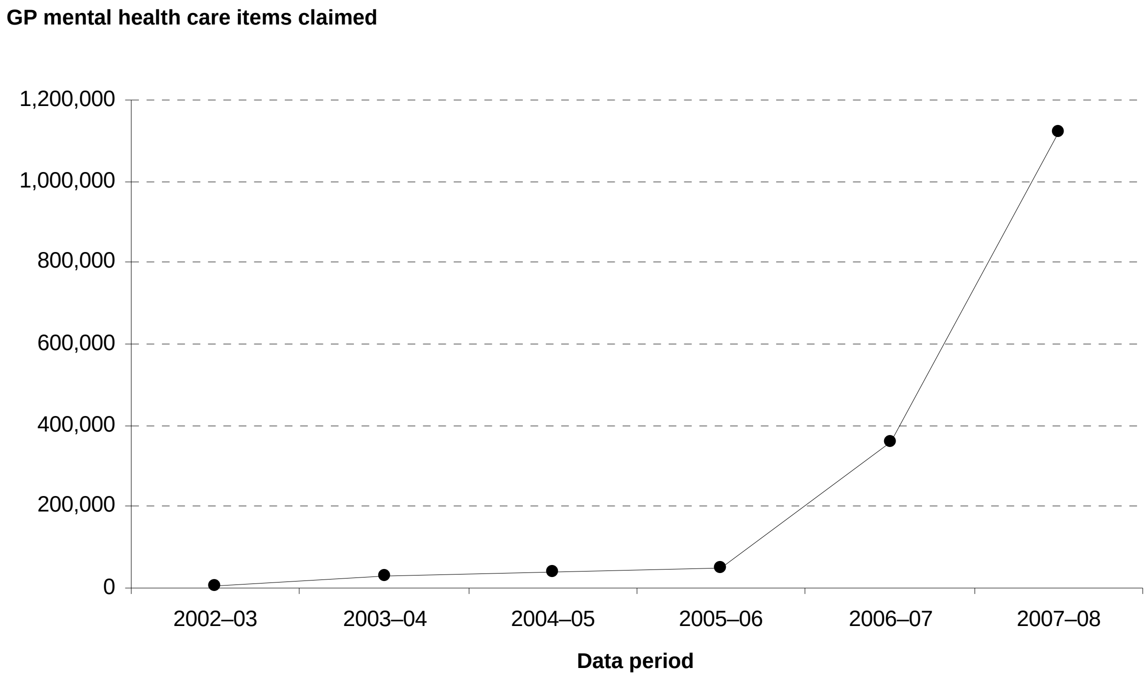
  This initiative had five components relevant to GPs:

  - Education and training: To access the MBS item numbers GPs had to undergo two levels of training in psycho-education, cognitive behavioural therapy and interpersonal therapy.
  - Access to MBS items for focused psychological strategies: Eligible GPs were able to provide patient care with the use of the above therapies. The therapies are time limited, normally deliverable in up to six planned sessions, each lasting a minimum of 30 minutes. In some instances, following review, another six planned sessions may be warranted.
  - MBS incentive items covering a three-step mental health process: The three steps were: assessment; provision of a care plan; and review of the plan; and required at least two planned follow-up consultations, and a review of the patient between four weeks and six months from the initial consultation.
  - Funding to divisions of general practice to operate a program of access to allied psychological services, which allowed GPs to refer patients to allied health professionals who delivered focused psychological strategies.
  - GP Psych Support: This provides GPs with patient management advice from psychiatrists within 24 hours.[8]
- The National Mental Health Plan 2003–2008 built on the earlier mental health plans, and focused on prevention, responsiveness, quality and research, embodying the United Nations' resolution on the protection of rights of people with mental illness.[9]
- In 2006, the GP Mental Health Care Plan replaced the three-step mental health process component, as part of the Better Access to Psychiatrists, Psychologists and General Practitioners through MBS initiative, worth $1.9 billion, to provide Medicare rebates encouraging team-based mental health care.[10] This was part of a Council of Australian Governments pledge of $4 billion over 5 years for a National Action Plan on Mental Health 2006–2011.[11] There are some major differences between Better Outcomes in Mental Health Care and Better Access. The most important change was that GPs no longer had to take additional training to conduct a GP Mental Health Care Plan. A GP Mental Health Care Plan involves both an assessment and preparation of the plan for care, but unlike the three-step process a review is not required to claim the incentive. The review is a separate item in itself. By preparing a GP Mental Health Care Plan, GPs are able to refer to psychologists for Medicare-subsidised care.

## Uptake of GP mental health care items

Between 2002 and 2006, there was a modest uptake of the new GP mental health care items, with only 4,865 claimed in 2002–03 and 50,214 in 2005–06. This was probably due to the fact that GPs were required to undertake training to claim these items.

From November 2006, the Better Access initiative was introduced which allowed any GP to claim for preparing a mental health care plan. It seems this scheme is popular, with over 1.1 million claims in 2007–08 alone, thought by some to be far in excess of government (and budget) forecasts.[12]




*Source:* Medicare Australia.

**Figure 14.1: Number of Medicare GP Mental Health Care items claimed, 2002–03 to 2007–08**

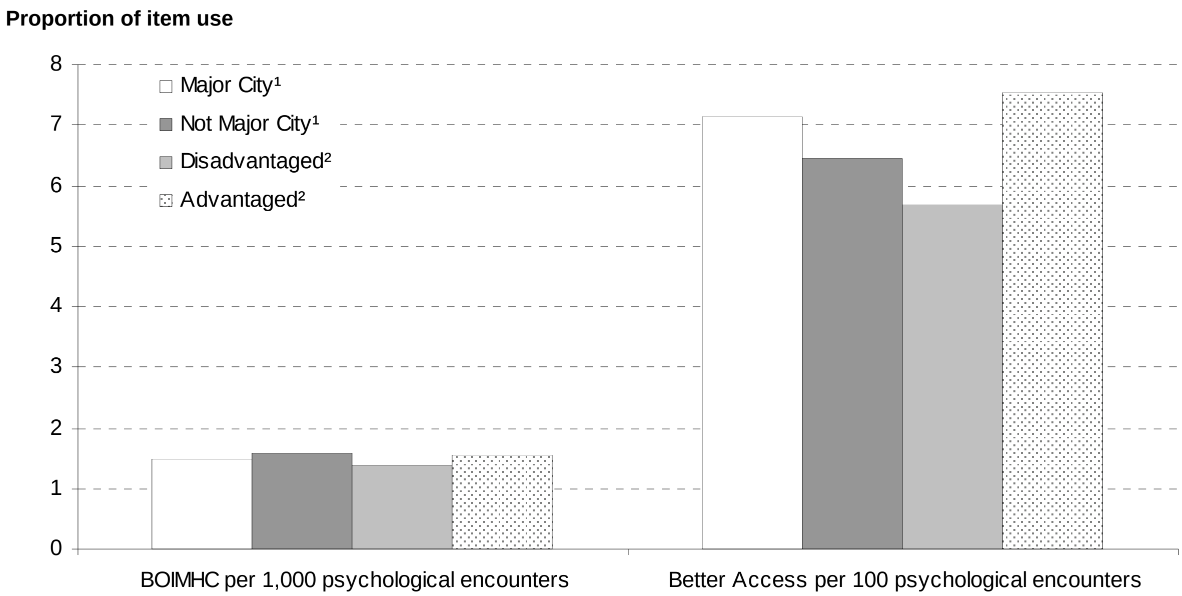
## Which patients used the BOIMHC and Better Access initiative item numbers?

Examination of Medicare claims data shows that the majority of patients who claimed a Better Access initiative item number were from advantaged and/or metropolitan areas.[12] This led to criticism and concern in popular media that the new plan and incentives favour patients from these areas over those from disadvantaged or rural areas. So, use of the Better Access initiative by geographical area was tested using the BEACH dataset.

Figure 14.2 shows the proportion of encounters in BEACH that involved the management of at least one eligible psychological problem, and claimed for using the two initiatives' (BOIMHC and Better Access) item numbers. Dementia, delirium, tobacco abuse and mental retardation are excluded, as they are not covered by these initiatives. The BOIMHC data are for 1 April 2002 to 31 March 2007 and the Better Access data are from 1 November 2006 to 31 March 2008. Since the BOIMHC items were rarely used, they are reported as a rate per 1,000 psychological encounters rather than as the rate per 100 encounters used for the Better Access items.

As shown in Figure 14.2, at encounters where an eligible psychological problem was managed, the proportion that were covered using a BOIMHC item number was similar for patients living in a Major City compared with patients living outside a Major City, and was similar for disadvantaged patients and advantaged patients.

The Better Access item numbers were claimed 40 times as often as BOIMHC item numbers for eligible psychological encounters in BEACH across the respective data periods. Figure 14.2 shows that there was no significant difference in the proportion of psychological encounters for which the Better Access item numbers were recorded between patients from Major Cities and those from outside Major Cities, and between disadvantaged and advantaged patients.




1 As defined by Australian Standard Geographical Classification.[13]

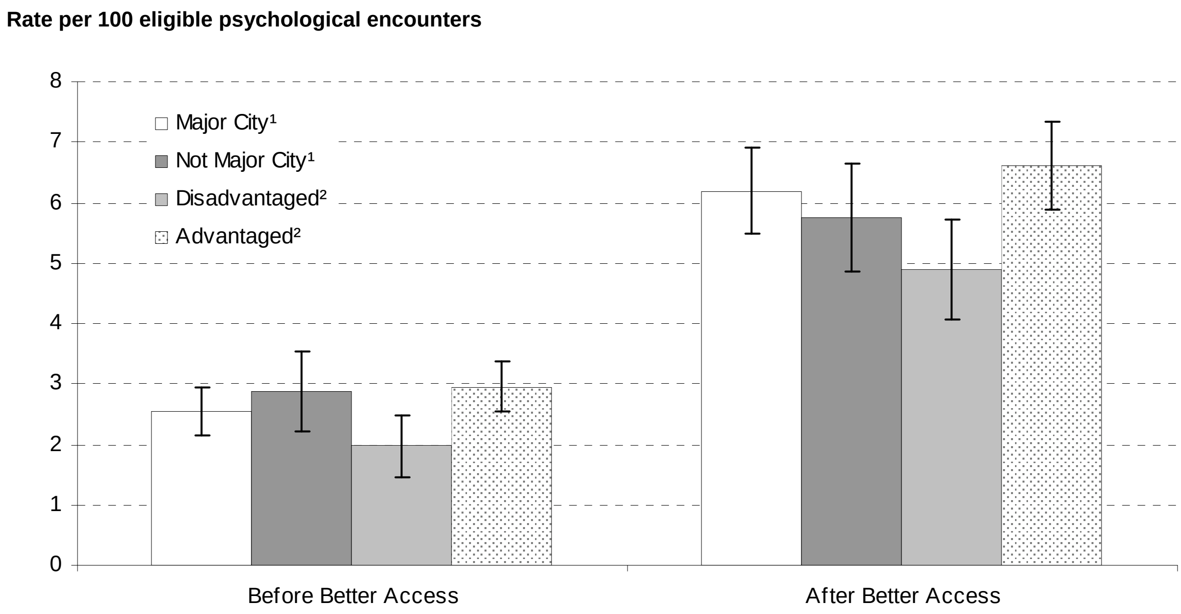
2 As defined by Socio-Economic Indexes for Areas (SEIFA).[14]

*Note*: BOIMHC data from 1 April 2002 to 30 March 2007; Better Access data from 1 November 2006 to 31 March 2008.

**Figure 14.2: Variable-specific proportion using BOIMHC and Better Access item numbers for eligible psychological encounters**

Figure 14.3 shows the likelihood of an eligible psychological problem being referred to a psychologist before and after the introduction of the Better Access initiative. Before the introduction of the Better Access initiative, the likelihood of referral to a psychologist was similar for patients from Major Cities and those from outside Major Cities. However, patients who were from relatively advantaged areas were 50% more likely to receive a referral to a psychologist than those who were from disadvantaged areas.

After the introduction of the Better Access initiative, the likelihood of referrals of an eligible psychological problem being referred to a psychologist increased significantly across all groups. There remained no significant difference between patients from Major Cities and patients from outside Major Cities in the proportion who received a psychologist referral. While patients from advantaged areas were still significantly more likely to receive a referral, they were only 35% more likely than patients from disadvantaged areas, compared with 50% previously. It therefore appears that the Better Access initiative has helped increase the referrals to psychologists for disadvantaged patients proportionally more than it has for advantaged patients. However, it is unknown from BEACH data how often these referrals were used by the patients. It is possible that patients from rural areas were less likely to see a psychologist due to lack of access.




1 As defined by Australian Standard Geographical Classification.[13]

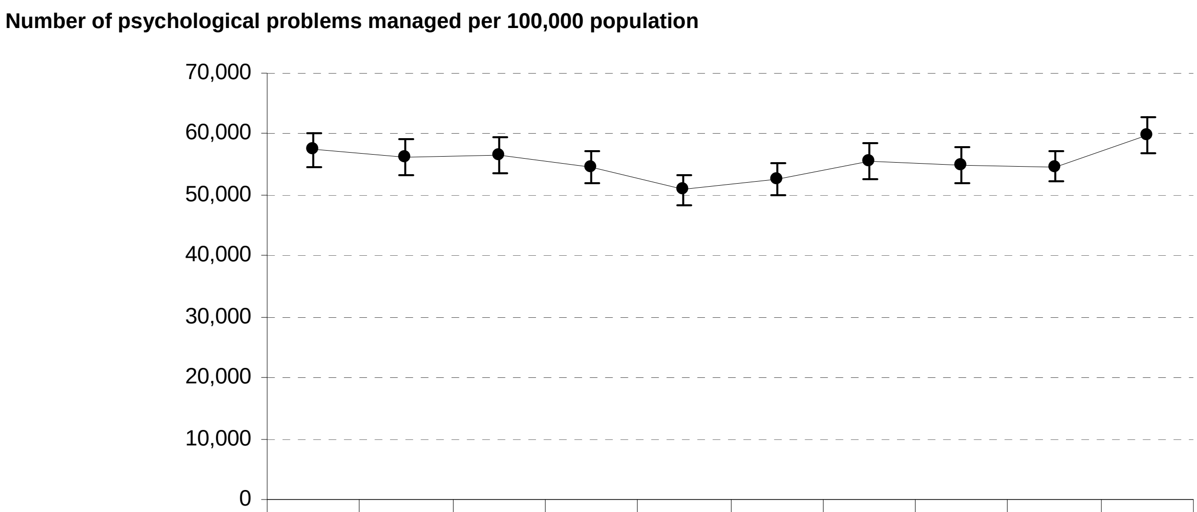
2 s defined by Socio-Economic Indexes for Areas (SEIFA).[14]

*Note*: Before data period is 1 April 2005 to 31 October 2006; After data period is 1 November 2006 to 31 March 2008.

**Figure 14.3: Referral rates for eligible psychological encounters before and after the Better Access initiative**

## 14.2 Management of psychological problems at BEACH encounters

Over the 10 years 1998–99 to 2007–08, psychological problems (ICPC-2 'P' codes, see Chapter 2) accounted for an average of 7.8% of all problems managed in BEACH. On average over that period, GPs managed 10.9 mental health problems per 100 encounters. In 1998–99, the rate was 10.5 per 100 encounters and in 2007–08 it was 11.5 per 100. The annual management rate ranged from 10.3 (95% CI: 9.8–10.8) in 2002–03 to the significantly higher rate of 11.5 per 100 encounters (95% CI: 10.9–12.0) in 2007–08. As Figure 14.4 shows the estimated number of psychological problems managed in general practice nationally per 100,000 population decreased from 57,400 in 1998–99 to 50,800 in 2002–03, and then increased significantly to 59,800 in 2007–08.




| | 1998-99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rate per 100,000 | 57,400 | 56,300 | 56,500 | 54,700 | 50,800 | 52,500 | 55,500 | 54,800 | 54,700 | 59,800 |

**Data period**

*Sources:* Number of GP encounters based on Medicare statistics found at http://www.health.gov.au/internet/main/publishing.nsf/Content/medstat-mar08-tables-b

Australian population based on ABS figures found at www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/3426C038D443CB5ACA25748E0012451C/$File/41020_Population_Indicators_2008.xls

**Figure 14.4: Number of psychological problems managed per 100,000 population 1998–2008**

## Most frequently managed psychological problems

The most frequently managed psychological problems in 1998–99 and 2007–08 are shown in Table 14.1. Comparison of the 2 years shows there was no significant change in the management rate of total psychological problems. The pattern of the most frequently managed problems did not change, with the exception of tobacco and alcohol abuse. The management of depression and tobacco abuse both significantly increased between 1998–99 and 2007–08. The management rate of schizophrenia and affective psychosis marginally increased over the same period.

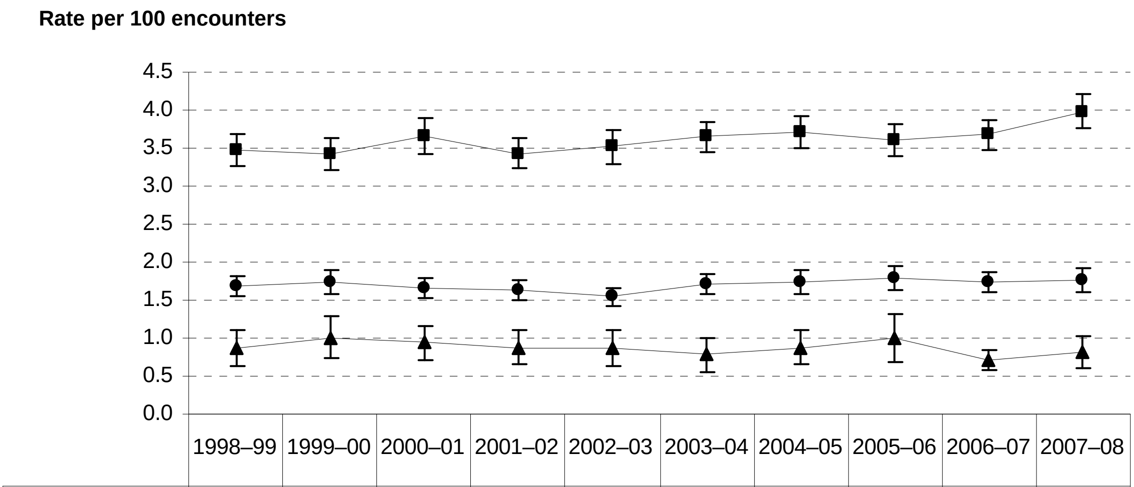
**Table 14.1: Changes in management rates of common psychological problems, 1998–99 and 2007–08**

| | 1998–99 | | | 2007–08 | | | |
|---|---|---|---|---|---|---|---|
| **Problem managed** | **Number** | **Percentage of psych. problems** | **Rate per 100 encounters (*n* = 96,901) (95% CI)** | **Number** | **Percentage of psych. problems** | **Rate per 100 encounters (*n* = 95,898) (95% CI)** | **Change[(a)]** |
| Depression | 3,367 | 33.2 | 3.5 (3.3–3.7) | 3,822 | 34.7 | 4.0 (3.8–4.2) | **↑** |
| Anxiety | 1,639 | 16.2 | 1.7 (1.6–1.8) | 1,691 | 15.4 | 1.8 (1.6–1.9) | — |
| Sleep disturbance | 1,579 | 15.6 | 1.6 (1.5–1.8) | 1,547 | 14.1 | 1.6 (1.5–1.7) | — |
| Acute stress reaction | 584 | 5.8 | 0.6 (0.5–0.7) | 567 | 5.2 | 0.6 (0.5–0.7) | — |
| Drug abuse | 552 | 5.4 | 0.6 (0.4–0.8) | 473 | 4.3 | 0.5 (0.3–0.7) | — |
| Dementia (incl senile, Alzheimer's) | 350 | 3.5 | 0.4 (0.3–0.4) | 472 | 4.3 | 0.4 (0.3–0.6) | — |
| Schizophrenia | 345 | 3.4 | 0.4 (0.3–0.4) | 417 | 3.8 | 0.5 (0.4–0.6) | ↑ |
| Alcohol abuse | 288 | 2.8 | 0.3 (0.2–0.4) | 319 | 2.9 | 0.3 (0.3–0.4) | — |
| Tobacco abuse | 275 | 2.7 | 0.3 (0.2–0.3) | 400 | 3.6 | 0.4 (0.4–0.5) | **↑** |
| Affective psychosis | 132 | 1.3 | 0.1 (0.1–0.2) | 194 | 1.8 | 0.2 (0.2–0.2) | — |
| *Subtotal (n, percentage of total)* | *9,110* | *89.8* | . . | *9,902* | *90.0* | . . | . . |
| **Total psychological problems** | **10,142** | **100.0** | **10.5 (10.0–11.0)** | **11,009** | **100.0** | **11.5 (10.9–12.0)** | **—** |

(a) The direction and type of change is indicated for each result: **↑**/**↓** indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

*Note:* Psych—psychological; CI—confidence interval.

As shown in Figure 14.5, while the management rate of depression increased steadily from 2001–02 onwards, the management rate of anxiety and drug and alcohol problems remained relatively constant.



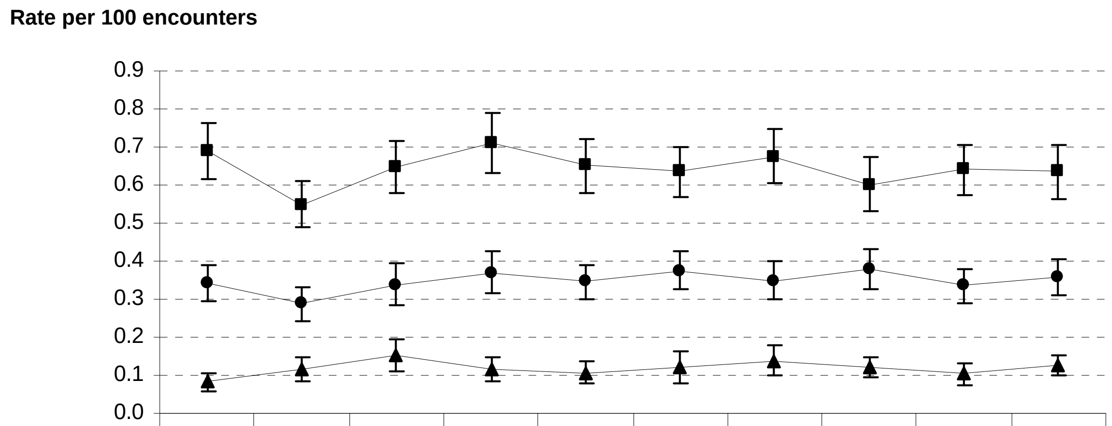

| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Anxiety | 1.7 | 1.7 | 1.7 | 1.6 | 1.5 | 1.7 | 1.7 | 1.8 | 1.7 | 1.8 |
| Depression | 3.5 | 3.4 | 3.6 | 3.4 | 3.5 | 3.6 | 3.7 | 3.6 | 3.7 | 4.0 |
| D&A | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 | 0.8 | 0.9 | 1.0 | 0.7 | 0.8 |

**Data period**

*Note:* D&A–drug and alcohol problem.

**Figure 14.5: Rates of management for psychological problems, 1998–99 to 2007–08 (95% CI)**

While there was a significant increase in the management rate of depression, Figure 14.6 shows that there was no corresponding increase in the management rate of new cases of depression. There was also no significant change in the management of new anxiety or new drug and alcohol problems over the decade. This suggests there was no change in the rate at which new cases were diagnosed, which is an interesting finding considering the recent efforts to improve diagnosis and treatment by GPs.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Anxiety | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.4 | 0.3 | 0.4 | 0.3 | 0.4 |
| Depression | 0.7 | 0.5 | 0.6 | 0.7 | 0.7 | 0.6 | 0.7 | 0.6 | 0.6 | 0.6 |
| D&A | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

**Data period**

*Note*: D&A–drug and alcohol problem.

**Figure 14.6: Management rates of new psychological problems, 1998–99 to 2007–08 (95% CI)**

# 14.3 Management of depression

Depression is the most common psychological problem experienced by Australians [3] and is also the most frequently managed in Australian general practice (Table 14.1). The NSMHW found that in 2007, 6.2% of Australians met the criteria for a diagnosis of an affective disorder in the previous 12 months, 4.1% meeting the criteria for a depressive episode.[2] In a BEACH SAND substudy in 2005, it was estimated that 11.3% of Australians currently had diagnosed depression requiring ongoing management.[3]

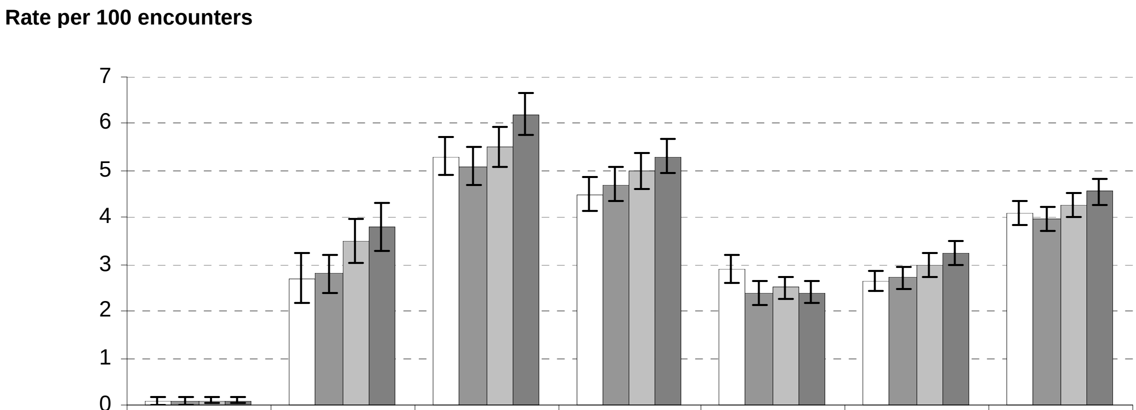
The following analysis includes diagnosed depression (Depressive disorder: ICPC code P76), which encompasses anxiety with depression, postnatal and reactive depression, affective disorder and depressive psychosis. It also includes problems labelled by the GP as symptoms of depression (Feeling depressed: ICPC code P03; for example, feeling hopeless, miserable, sad or unhappy; see Appendix 3).

There was a significant increase in the management rate of depression in Australian general practice between 1998–99 and 2007–08, from 3.5 per 100 encounters to 4.0 per 100 encounters. The current rate of management is significantly higher than the rate recorded during all of the earlier BEACH years except in 2000–01 when the rate of 3.6 per 100 was not significantly lower (Figure 14.5). The average management rate over the 10-year period was 3.6 per 100 encounters, and new diagnoses of depressions were made at an average rate of 0.6 per 100 encounters. Depression accounted for an average 2.5% of all problems managed in BEACH over the 10-year period.

## The patients

### 2007–08

As shown in Figure 14.7, the management rate of depression was significantly higher among female patients in 2007–08 than among male patients. Patients aged 25–44 years had depression managed at 6.2 times per 100 encounters, which was significantly higher than any other age group. Patients aged 45–64 years had the second highest management rate, at 5.3 per 100 encounters. Depression was rarely managed in children under the age of 15. The rate of depression management in patients aged 65 years and older was about half that of those aged 45–64 years. This lower management rate may be due to the well-documented under-recognition of depression in the elderly by both the GPs and the patients.[15,16]




| | 0–14 | 15–24 | 25–44 | 45–64 | 65+ | Male | Female |
|---|---|---|---|---|---|---|---|
| 1998–99 | 0.1 | 2.7 | 5.3 | 4.5 | 2.9 | 2.6 | 4.1 |
| 2001–02 | 0.1 | 2.8 | 5.1 | 4.7 | 2.4 | 2.7 | 4.0 |
| 2004–05 | 0.1 | 3.5 | 5.5 | 5.0 | 2.5 | 3.0 | 4.3 |
| 2007–08 | 0.1 | 3.8 | 6.2 | 5.3 | 2.4 | 3.2 | 4.6 |

Age group (years) or sex

**Figure 14.7: Age and sex-specific management rates of depression, 1998–99 to 2007–08 (95% CI)**

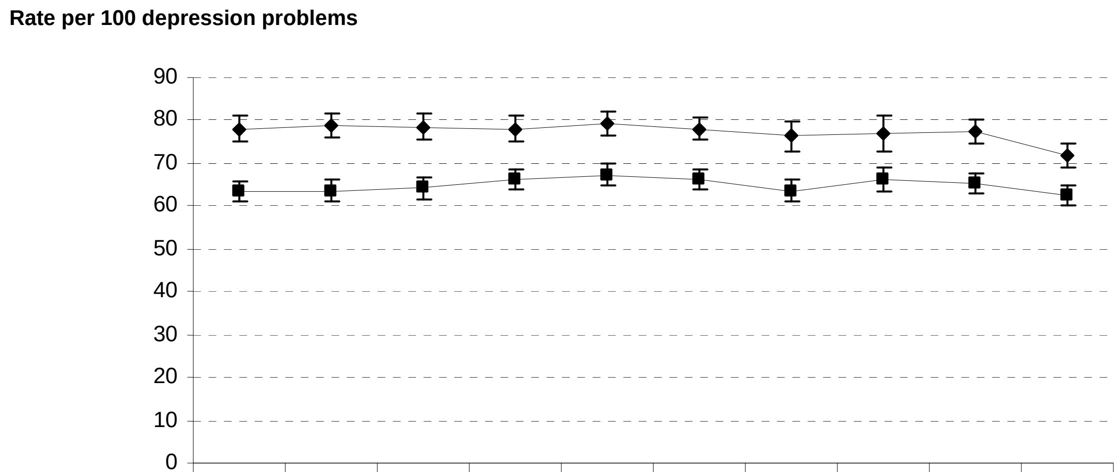
### 1998–99 to 2007–08

The increase over the decade in the management of depression was apparent for all patient age groups in the 15–64 years range (which all increased significantly). There was a marginal decrease across the decade in the rate of depression management in patients aged 65 years and older.

- Female patients were managed for depression more often than were male patients across all years.
- Management of depression for male patients increased from 2.6 per 100 encounters in 1998–99 to 3.2 in 2007–08. However this difference was not found in female patients.

## Medications for depression

In 2007–08, GPs prescribed medications at a rate of 72.0 per 100 depression problems managed, significantly less than between 1998–99 and 2003–04 (Figure 14.8). However, the rate at which anti-depressants were prescribed did not change significantly across this period. It is interesting to note that the decrease between 2006–07 and 2007–08 coincided with an increase in the rate at which patients with depression were referred to psychologists (Figure 14.10).




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Medication | 78.0 | 78.8 | 78.4 | 78.0 | 79.2 | 78.1 | 76.3 | 76.9 | 77.4 | 72.0 |
| Anti-depressants | 63.3 | 63.6 | 64.1 | 66.2 | 67.4 | 66.2 | 63.5 | 66.2 | 65.4 | 62.6 |

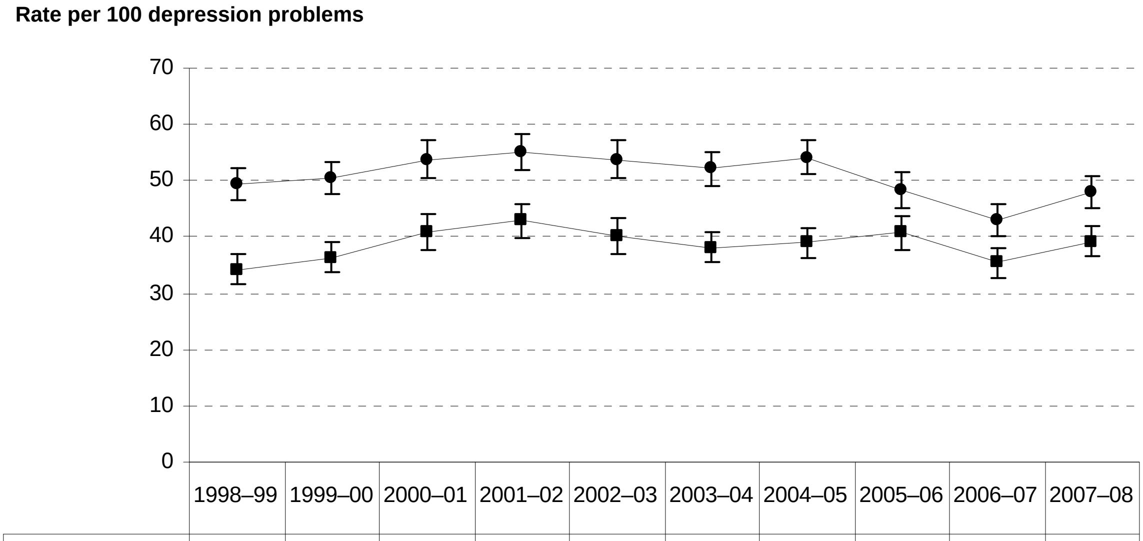
Data period

**Figure 14.8: Medication rates for depression, 1998–99 to 2007–08 (95% CI)**

## Other treatments for depression

Figure 14.9 shows the rates at which clinical treatments (mostly counselling, advice and education) were used by GPs in the management of depression. Among these clinical treatments:

- between 1998–99 and 2001–02, there was a significant increase in the rate of psychological counselling in the management of depression. Interestingly this was before the introduction of the BOIMHC initiative
- from 2001–02 to 2004–05 the rate of clinical treatments and psychological counselling for depression remained relatively stable
- between 2004–05 and 2006–07 there was a significant decrease in the use of clinical treatments overall; however, the rate at which psychological counselling is used did not change. The change in clinical treatment has come from a decrease in the rate at which other clinical treatments are used (such as non-psychological counselling, advice, education and administrative work). This decrease has been seen in the BEACH data set overall, and is thought to be related to the greater role that practice nurses have played in general practice since 2004–05.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Clinical | 49.4 | 50.4 | 53.8 | 55.1 | 53.8 | 52.1 | 54.1 | 48.3 | 43.0 | 47.8 |
| Counselling | 34.2 | 36.4 | 40.8 | 42.9 | 40.2 | 38.1 | 39.0 | 40.7 | 35.5 | 39.2 |

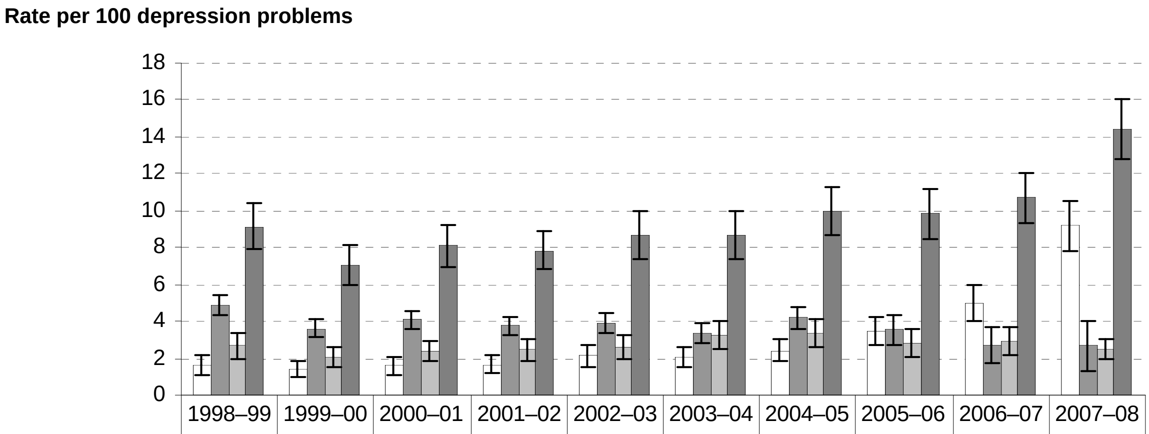
**Figure 14.9: Rates of clinical treatment (and psychological counselling in particular) for depression, 1998–99 to 2007–08**

## Referrals for depression

The rate at which patients were referred for depression increased by about 50% from 7.1 per 100 depression problems in 1999–00 to 10.7 per 100 in 2006–07. From 2006–07 to 2007–08, the rate of referral increased by one-third to 14.4. The pattern of referrals changed markedly over the decade (Figure 14.10).

- Referrals to psychiatrists almost halved over the decade, from 4.9 per 100 depression problems in 1998–99 to 2.7 per 100 in 2007–08.
- In contrast, the referral rate to psychologists doubled between 2004–05 (2.4 per 100 depression problems) and 2006–07 (5.0 per 100) and nearly doubled again in 2007–08 (9.2 per 100).
- Referrals to other health professionals did not significantly change across the decade.

These results suggest that the early increase in the rate of referrals to psychologists may have been due to the introduction of the access to allied psychological services initiative as part of BOIMHC in 2002. The later increase in referrals to psychologists is probably due to the Better Access initiative of November 2006, which allowed all GPs to refer to a psychologist for subsidised care after the preparation of a GP mental health care plan. The increase in referrals to psychologists seems initially to be a move away from psychiatrists. By 2005–06 referrals were equally distributed between the two professions. However, between 2006–07 and 2007–08 the rate of referrals to psychiatrists remained stable while referrals to psychologists continued to rise significantly.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Psychologist | 1.6 | 1.4 | 1.6 | 1.7 | 2.1 | 2.1 | 2.4 | 3.5 | 5.0 | 9.2 |
| Psychiatrist | 4.9 | 3.6 | 4.1 | 3.8 | 3.9 | 3.4 | 4.2 | 3.5 | 2.7 | 2.7 |
| Other | 2.7 | 2.1 | 2.4 | 2.5 | 2.6 | 3.2 | 3.4 | 2.8 | 2.9 | 2.5 |
| Referrals | 9.2 | 7.1 | 8.1 | 7.9 | 8.7 | 8.7 | 10.0 | 9.8 | 10.7 | 14.4 |

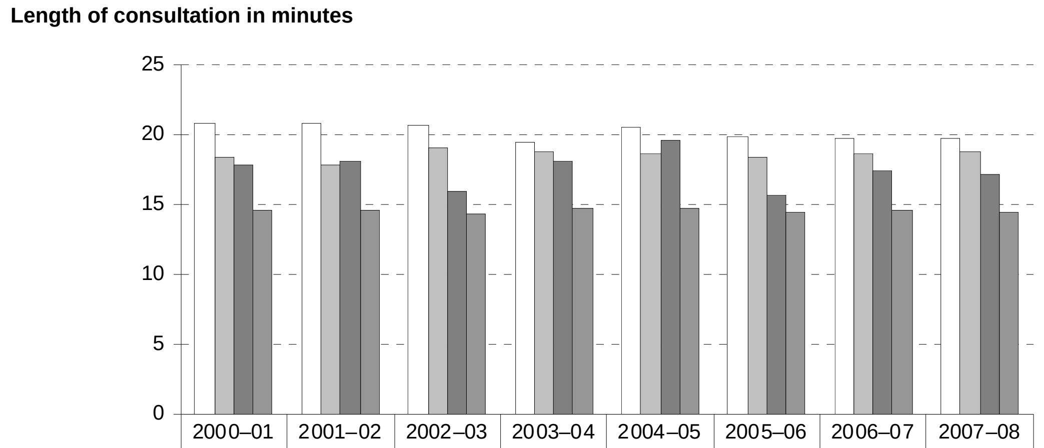
**Data period**

**Figure 14.10: Rates of referral of depression, 1998–99 to 2007–08 (95% CI)**

## Length of consultation

Since 2000–01, in a subsample of the BEACH program, 40 of the 100 encounters recorded by each GP also had the start and finish time recorded. This allows calculation of the consultation length (see Chapter 2). Figure 14.11 presents the annual average length of consultations where a depression, anxiety, drug or alcohol problem was managed, and the length of all other consultations where none of these problems were managed.

Across all the years studied, consultations where depression was managed were longer, by 5–6 minutes on average, than those consultations where a depression, anxiety, drug or alcohol problem was not managed. Between 2000–01 and 2007–08, there was no significant change in the lengths of consultation where depression was managed, nor where depression, anxiety, drug or alcohol were not managed (Figure 14.11).




| | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|
| With depression | 20.9 | 20.9 | 20.7 | 19.5 | 20.6 | 19.9 | 19.7 | 19.7 |
| With anxiety | 18.4 | 17.8 | 19.1 | 18.8 | 18.7 | 18.4 | 18.7 | 18.8 |
| With drug or alcohol | 17.9 | 18.2 | 16.0 | 18.1 | 19.6 | 15.7 | 17.5 | 17.2 |
| Other consultations | 14.6 | 14.6 | 14.4 | 14.7 | 14.7 | 14.5 | 14.6 | 14.5 |

Data period

*Note*: Only includes direct (patient seen) BEACH encounters. Other consultations—all encounters (patient seen) where a depression, anxiety, drug or alcohol problem were not managed.

**Figure 14.11: Length (minutes) of consultations with and without depression, anxiety, drug or alcohol problem management, 2000–01 to 2007–08**

# 14.4 Management of anxiety

The 2007 NSMHW estimated the prevalence of anxiety disorders in the Australian population to be 14.4%.[2] This was made up of a combination of panic disorders (2.6%), agoraphobia (2.8%), social phobia (4.7%), generalised anxiety disorder (2.7%), obsessive-compulsive disorder (1.9%) and post-traumatic stress disorder (6.4%). According to a BEACH substudy of more than 9,000 patients, the population prevalence of anxiety currently requiring management was 8.4%.[3]

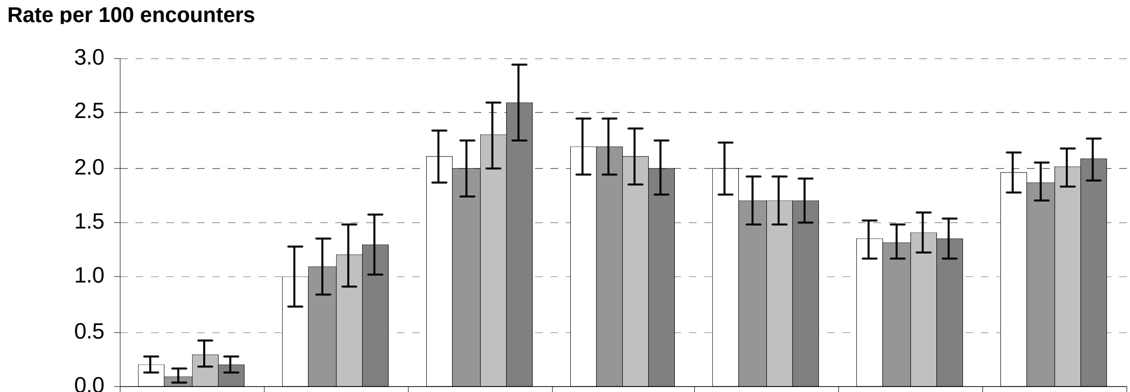
For the following analysis, anxiety was defined as diagnosed anxiety (Anxiety disorder/anxiety state: ICPC code P74), which encompasses anxiety neurosis and panic disorder. It also includes problems labelled by the GP as symptoms of anxiety (Feeling anxious/nervous/tense: ICPC code P01); for example, bad nerves, emotional, feeling frightened or unsettled. Symptoms are included because when a GP writes 'anxiety' as the problem managed, according to international coding rules it is classified as P01 in the ICPC-2.

From 1998–99 to 2007–08, the management rate of anxiety per 100 encounters remained steady. The mean rate of management was 1.7 per 100 encounters over the decade (Figure 14.5). The average rate at which new cases of anxiety were diagnosed was 0.3 per 100 encounters (Figure 14.6). Anxiety accounted for an average 1.2% of all problems managed in BEACH over the 10-year period.

## The patients

### 2007–08

In 2007–08, patients aged 25–44 years had the highest management rate of anxiety, at 2.6 cases per 100 encounters. Children under the age of 15 years had the lowest rate, at 0.2 anxiety problems managed per 100 encounters. Females were managed more often for anxiety (2.1 per 100 encounters) than male patients (1.3 per 100 encounters) (Figure 14.12).




| | 0–14 | 15–24 | 25–44 | 45–64 | 65+ | Male | Female |
|---|---|---|---|---|---|---|---|
| 1998–99 | 0.2 | 1.0 | 2.1 | 2.2 | 2.0 | 1.3 | 2.0 |
| 2001–02 | 0.1 | 1.1 | 2.0 | 2.2 | 1.7 | 1.3 | 1.9 |
| 2004–05 | 0.3 | 1.2 | 2.3 | 2.1 | 1.7 | 1.4 | 2.0 |
| 2007–08 | 0.2 | 1.3 | 2.6 | 2.0 | 1.7 | 1.3 | 2.1 |

Age group (years) or sex

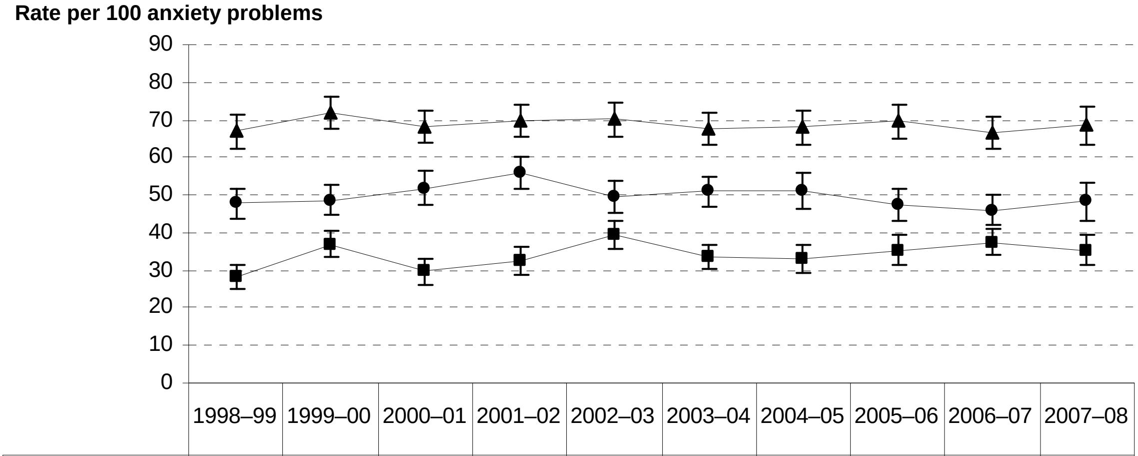
**Figure 14.12: Age and sex-specific management rates of anxiety, 1998–99 to 2007–08 (95% CI)**

### 1998–99 to 2007–08

In contrast, 10 years earlier the management rate of anxiety in those aged 25–44 years was similar to that of the 45–64 and 65 years and older age groups. Between 1998–99 and 2007–08, there was no significant change in the management rate of anxiety for any age or sex group. The higher management rate among female patients was consistent across all years (Figure 14.12).

## Medications for anxiety

There was no significant change in medication rates for anxiety between 1998–99 and 2007–08, the mean across the years being 68.8 medications prescribed, supplied or advised per 100 anxiety problems managed (Figure 14.13).




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Clinical Tx | 47.7 | 48.7 | 51.8 | 55.9 | 49.5 | 51.0 | 51.2 | 47.4 | 46.0 | 48.2 |
| Counselling | 28.2 | 36.9 | 29.7 | 32.3 | 39.4 | 33.4 | 33.0 | 35.3 | 37.5 | 35.2 |
| Medication | 67.0 | 72.1 | 67.9 | 69.7 | 70.2 | 67.7 | 68.1 | 69.6 | 66.6 | 68.5 |

Data period

*Note*: Tx–treatment.

**Figure 14.13: Pharmacological and clinical management of anxiety, 1998–99 to 2007–08 (95% CI)**

## Other treatments for anxiety

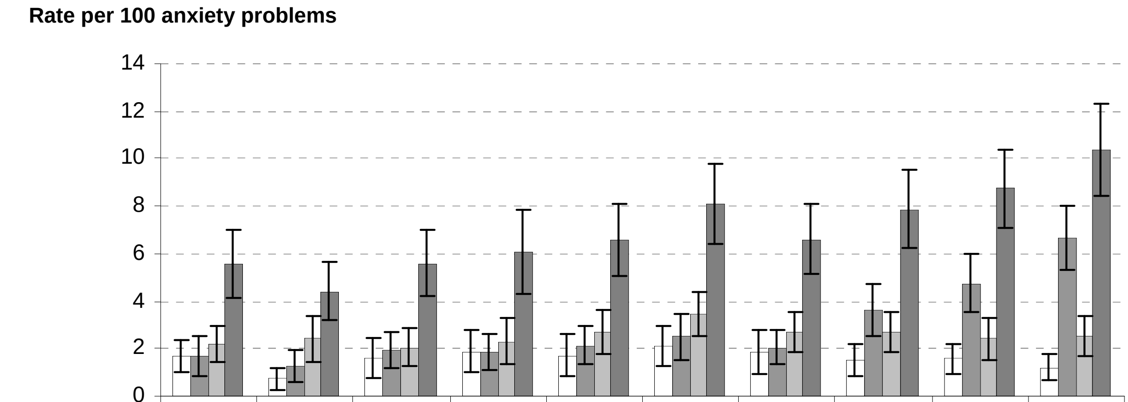
Between 2001–02 and 2006–07, the overall rate of clinical treatments (mostly counselling, advice and education) decreased significantly. In contrast, the rate at which psychological counselling was used in management of anxiety increased significantly between 1998–99 and 2002–03 and remained steady to 2007–08. (Figure 14.13).

It is interesting to note that while over the decade psychological counselling was more frequent for depression (38.7 per 100, 95% CI: 37.8–39.6) than for anxiety (34.1 per 100, 95% CI: 32.9–35.2), advice/education was used more frequently for anxiety (17.7 per 100, 95% CI: 16.8–18.6) than it was for depression (12.9, 95% CI: 12.3–13.5) (results not tabled).

## Referrals for anxiety

The referral of patients with anxiety doubled between 1998–99 to 2007–08 (Figure 14.14).

- In contrast to depression, referrals for anxiety to psychiatrists did not significantly change across the decade. Also unlike depression, the use of other referrals, mainly to social workers, counsellors, mental health teams and physiotherapists, was relatively high and constant across the decade.
- Referrals of anxiety to psychologists remained stable between 1998–99 (1.7 per 100 anxiety problems) and 2004–05 (2.1 per 100). However it then tripled across the next 3 years to 6.6 per 100 anxiety problems managed in 2007–08.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Psychiatrist | 1.7 | 0.7 | 1.6 | 1.9 | 1.7 | 2.1 | 1.8 | 1.5 | 1.6 | 1.2 |
| Psychologist | 1.7 | 1.3 | 1.9 | 1.9 | 2.1 | 2.5 | 2.1 | 3.6 | 4.8 | 6.6 |
| Other | 2.2 | 2.4 | 2.1 | 2.3 | 2.7 | 3.5 | 2.7 | 2.7 | 2.4 | 2.5 |
| Total | 5.6 | 4.4 | 5.6 | 6.1 | 6.6 | 8.1 | 6.6 | 7.9 | 8.7 | 10.4 |

Data period

**Figure 14.14: Referral rates for anxiety, 1998–99 to 2007–08 (95% CI)**

The introduction of the BOIMHC in 2002 did not appear to have any significant impact on referrals to psychologists for anxiety. However, like depression, there has been a large increase in the rate of referrals to psychologists since 2004–05. While the Better Access initiative of November 2006 can't explain the rise between 2004–05 and 2005–06 it would have probably had an impact on referrals since then.

## Length of consultation

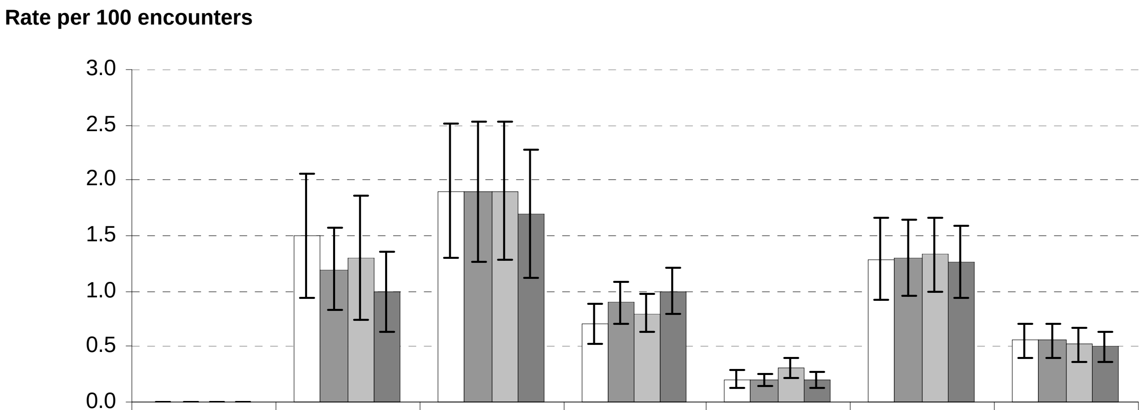
For all the years for which length of consultation was measured (2000–01 to 2007–08), encounters where anxiety was managed were significantly longer, by 3–4 minutes on average, than those where anxiety, depression, drug or alcohol problems were not managed. Between 2000–01 and 2007–08, there was no significant change in average length of consultations where anxiety was managed (Figure 14.11).

# 14.5 Management of drug and alcohol problems

The 2007 NSMHW estimated the prevalence of substance abuse disorders in the Australian population to be 5.1% and higher in men than in women.[2] This analysis of drug and alcohol problems investigated chronic and acute alcohol abuse, medication and drug abuse. It did not include nicotine addiction. From 1998–99 to 2007–08, the management rate of drug and alcohol problems remained steady at an average rate of 0.9 per 100 encounters over the 10-year period (Figure 14.5). The rate at which new cases of drug and alcohol problems were diagnosed also remained stable, averaging 0.1 per 100 encounters (Figure 14.6).

### The patients

Across the decade, management rate of drug and alcohol problems among patients aged 25–44 years were consistently higher than for the other age groups, although differences did not always reach statistical significance. Drug and alcohol problems were almost never recorded for patients aged less than 15 years, and rates were low for those aged 65 years and over. In contrast to depression and anxiety, male patients were managed for drug and alcohol problems more often than were female patients in all years (Figure 14.15).




| | 0–14 | 15–24 | 25–44 | 45–64 | 65+ | Male | Female |
|---|---|---|---|---|---|---|---|
| 1998–99 | 0.0 | 1.5 | 1.9 | 0.7 | 0.2 | 1.3 | 0.6 |
| 2000–01 | 0.0 | 1.2 | 1.9 | 0.9 | 0.2 | 1.3 | 0.6 |
| 2004–05 | 0.0 | 1.3 | 1.9 | 0.8 | 0.3 | 1.3 | 0.5 |
| 2007–08 | 0.0 | 1.0 | 1.7 | 1.0 | 0.2 | 1.3 | 0.5 |

Age group (years) or sex

**Figure 14.15: Age and sex-specific management rate of drug and alcohol problems, 1998–99 to 2007–08 (95% CI)**

### Medications for drug and alcohol problems

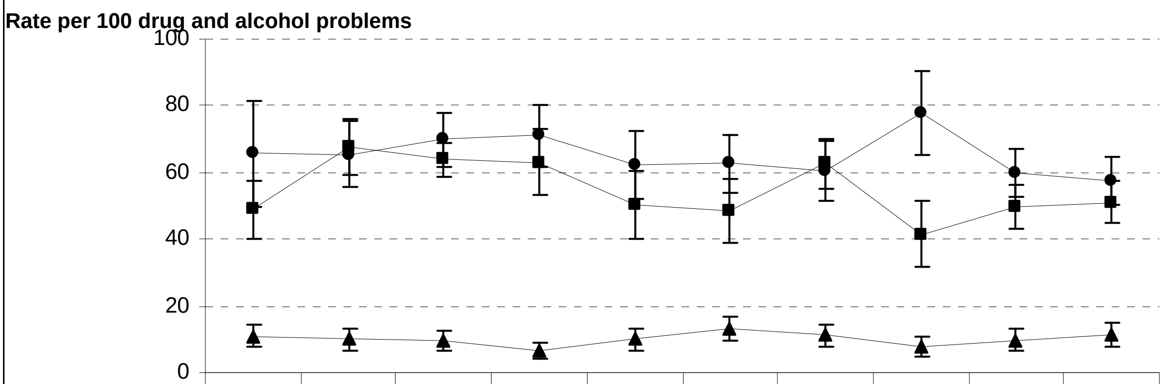
Across the decade the average rate of medications prescribed, supplied or advised was 65.9 per 100 drug and alcohol problems managed. Rates were consistent between 1998–99 and 2004–05 before a sudden and short-lived increase in medication rates (78.0 per 100) in 2005–06 (Figure 14.16).

### Other treatments for drug and alcohol problems

The average rate of clinical treatments (mostly drug and alcohol counselling) used in the management of drug and alcohol problems over the 10 years was 55.0 per 100 of these problems. However, rates fluctuated significantly from the highest rate of 67.5 per 100 in 1999–00 to the lowest rate of 41.5 per 100 in 2005–06. While this decrease is not surprising due to the previously mentioned practice nurse effect, it is interesting that this lowest rate of clinical treatments coincided with the highest rate of medications for drug and alcohol problems (Figure 14.16).

**Referrals for drug and alcohol problems**

The rate at which patients were referred for drug and alcohol problems was fairly constant with about one in 10 being referred (Figure 14.16). Most referrals were to drug and alcohol counsellors, psychologists and psychiatrists.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Medication | 65.8 | 65.3 | 69.8 | 71.2 | 62.3 | 62.9 | 60.7 | 78.0 | 60.1 | 57.5 |
| Clinical Tx | 48.9 | 67.5 | 63.8 | 63.0 | 50.2 | 48.5 | 62.6 | 41.5 | 49.6 | 51.2 |
| Referral | 10.9 | 10.0 | 9.7 | 6.6 | 9.9 | 13.3 | 11.3 | 7.8 | 9.8 | 11.6 |

Data period

*Note*: Tx–Treatment

**Figure 14.16: Pharmacological and clinical management of drug and alcohol problems, 1998–99 to 2007–08 (95% CI)**

## Length of consultation

Since 2001–02, in all but 2 years (2002–03 and 2004–05), consultations where a drug or alcohol problem was managed were significantly longer (by about 3 minutes on average) than all other encounters where a drug or alcohol problem, depression or anxiety were not managed. Between 2000–01 and 2007–08, there was no significant change in the lengths of consultation where a drug and alcohol problem was managed (Figure 14.11).

# 14.6 Management of schizophrenia in 2007–08

- According to the 2007 *Burden of disease* report, in 2003 an estimated 87,538 people or about 4 people per 1,000 had schizophrenia. Even though schizophrenia is not highly prevalent, for those it does affect, it is quite disabling, with 1% of the total disease burden being attributable to schizophrenia alone.[1] However, little is known about how schizophrenia is managed in general practice. Figure 14.17 summarises the management of schizophrenia in Australian general practice from April 2007 to March 2008.

**The patients**

| Sex | Per cent | Rate(a) |
|---|---|---|
| Males | 54.8 | 0.6 |
| Females | 45.2 | 0.4 |

| Age group | Per cent | Rate(a) |
|---|---|---|
| 15–24 | 6.1 | 0.1 |
| 25–44 | 40.1 | 0.8 |
| 45–64 | 37.6 | 0.7 |
| 65–74 | 11.0 | 0.4 |
| 75+ | 5.1 | 0.2 |

**Medications**

*n* = 421 (89.2 per 100 schizophrenia problems)

| | Rate per 100 problems(c) |
|---|---|
| Olanzapine | 14.0 |
| Risperidone | 11.7 |
| Quetiapine | 6.5 |
| Fluphenazine decanoate | 5.8 |
| Diazepam | 4.0 |
| Clozapine | 3.7 |
| Zuclopenthixol | 2.6 |
| Benztropine | 2.4 |
| Flupenthixol | 2.3 |
| Haloperidol | 2.0 |

## Schizophrenia

***n* = 472 (0.5 per 100 patient encounters)**

**Reasons for encounter**

*n* = 683 (144.8 per 100 schizophrenia encounters)

| | Rate per 100 encounters(b) |
|---|---|
| Prescription—all | 48.3 |
| Schizophrenia | 26.5 |
| Psychological symptom/complaint | 3.2 |
| Follow-up psychological | 3.1 |
| Cardiac check-up | 2.7 |
| Anxiety | 2.3 |
| General check-up | 2.2 |
| Test results | 2.2 |
| Diabetes | 2.1 |

**Other treatments**

*n* = 197 (41.7 per 100 schizophrenia problems)

| | Rate per 100 problems(c) |
|---|---|
| Local injection | 17.8 |
| Psychological counselling | 13.5 |
| Advice/education—medication | 3.3 |
| Advice/education | 2.2 |
| Other admin/document | 2.1 |

**Referrals**

*n* = 28 (5.9 per 100 schizophrenia problems)

| | Rate per 100 problems(c) |
|---|---|
| Psychiatrist | 2.8 |
| Mental health team | 0.7 |
| Psychologist | 0.7 |

**Other problems managed**

*n* = 318 (67.5 per 100 schizophrenia encounters)

| | Rate per 100 encounters(b) |
|---|---|
| Hypertension | 5.9 |
| Diabetes | 5.6 |
| Depression | 4.0 |
| Lipid disorders | 2.7 |
| Drug abuse | 2.3 |
| Sleep disturbance | 1.8 |
| Oesophageal disease | 1.6 |

**Pathology**

*n* = 37 (7.9 per 100 schizophrenia problems)

| | Rate per 100 problems(c) |
|---|---|
| Full blood count | 3.5 |
| Erythrocyte sedimentation rate test | 0.9 |
| Electrolytes, urea and creatinine test | 0.6 |

(a) Specific rate per 100 encounters in each sex and age group.
(b) Expressed as a rate per 100 encounters at which schizophrenia was managed.
(c) Expressed as a rate per 100 schizophrenia problems managed.

**Figure 14.17: Management of schizophrenia in general practice, 2007–08**

In 2007–08, schizophrenia was managed at a rate of 5 per 1,000 encounters. Male patients had a 50% higher management rate (6 per 1,000 encounters) than females (4 per 1,000). Patients aged 25–44 years and 45–64 years had the highest management rate (8 and 7 per 1,000)

- The reason most often expressed by the patient for the encounter was a need for their medication—either a renewal of their script or their regular injection (48.3 per 100 schizophrenia encounters).

The most frequent comorbidities managed with schizophrenia largely reflected common chronic conditions, including hypertension, diabetes, depression and lipid disorders. It is notable that drug abuse was managed at a significantly higher rate than average (2.3 per 100 schizophrenia encounters compared with 0.8 per 100 encounters overall).

- Schizophrenia was primarily managed with medications, which were recorded at a rate of 89.2 per 100 schizophrenia problems. The majority of medications were antipsychotics, led by olanzapine (14 per 100 schizophrenia encounters) and risperidone (11.7 per 100).
- Other treatments were provided at a rate of 41.7 per 100 schizophrenia problems, the most frequent being the injection of their antipsychotic medication.
- Unlike the other psychological problems such as depression or anxiety, GPs provided psychological counselling at a low rate of 13.5 per 100 schizophrenia problems.
- Referrals were rarely made (5.9 per 100 schizophrenia problems managed), the majority being to psychiatrists and pathology tests orders were for schizophrenia were low (7.9 per 100 problems) and the majority were for a full blood count.

# 14.7 Management of bipolar disorder in 2005–08

According to the NSMHW, in 2007, 285,600 people had bipolar disorder, about 1.8% of the population.[2] Figure 14.18 shows the management of bipolar disorder in Australian general practice from April 2005 to March 2008. Three years of data were analysed to increase the sample size for the analysis.

- Bipolar disorder was managed at a rate of 2 per 1,000 encounters, and at the same rate in males and females. Patients aged 25–44 years and 45–64 years had the highest management rate of bipolar disorder (4 and 3 per 1,000 encounters, respectively).
- The most frequent reasons given by patients for seeing the GP was to renew their prescription (26.2 per 100 bipolar disorder encounters).
- The most frequent comorbidities managed largely reflected common chronic conditions, including hypertension, diabetes, depression and lipid disorder. Interestingly, the co-management rate of hypothyroidism was unusually high, probably due to the known association of bipolar disorder and hypothyroidism.
- Bipolar disorder was primarily managed using medications, which were recorded at a rate of 89.6 per 100 bipolar disorder problems managed. The most frequent were sodium valproate (an anticonvulsant) (17.4 per 100 problems) and the antipsychotic drugs olanzapine (12.8 per 100) and lithium carbonate (11.3 per 100).
- Psychological counselling was undertaken at 29 per 100 bipolar disorders problems.
- There were 11.8 referrals for every 100 bipolar disorder problems managed, half of which were to psychiatrists, with fewer to psychologists and mental health workers.

Pathology tests were ordered at a rate of 32.5 per 100 bipolar disorder problems, with drug screens being the most frequent, at 11.4 per 100 bipolar disorder problems.

**The patients**

| Sex | Per cent | Rate(a) |
|---|---|---|
| Males | 39.2 | 0.2 |
| Females | 60.8 | 0.2 |

| Age group | Per cent | Rate(a) |
|---|---|---|
| 0–24 | 7.0 | 0.1 |
| 25–44 | 42.1 | 0.4 |
| 45–64 | 37.3 | 0.3 |
| 65–74 | 8.2 | 0.1 |
| 75+ | 5.4 | 0.1 |

**Medications**

*n* = 540 (89.6 per 100 bipolar problems)

| | Rate per 100 problems(c) |
|---|---|
| Sodium valproate | 17.4 |
| Olanzapine | 12.8 |
| Lithium carbonate | 11.3 |
| Venlafaxine | 5.5 |
| Diazepam | 4.3 |
| Quetiapine | 3.7 |
| Mirtazapine | 2.8 |
| Risperidone | 2.7 |
| Sertraline | 2.7 |

## Bipolar disorder

***n* = 603 (0.2 per 100 patient encounters)**

**Reasons for encounter**

*n* = 1,001 (166.0 per 100 bipolar encounters)

| | Rate per 100 encounters(b) |
|---|---|
| Prescriptions—all | 26.2 |
| Affective psychosis | 24.7 |
| Depression | 8.3 |
| Follow-up psychological | 5.6 |
| Administrative procedure | 4.8 |
| Test results | 4.6 |
| Anxiety | 4.2 |
| General check-up | 3.7 |
| Other psych symptom/complaint | 3.5 |
| Sleep disturbance | 3.2 |

**Other treatments**

*n* = 272 (45.1 per 100 bipolar problems)

| | Rate per 100 problems(c) |
|---|---|
| Psychological counselling | 29.0 |
| Advice/education—medication | 4.5 |
| Advice/education | 3.0 |

**Referrals**

*n* = 71 (11.8 per 100 bipolar problems)

| | Rate per 100 problems(c) |
|---|---|
| Psychiatrist | 6.1 |
| Psychologist | 2.2 |
| Mental health team | 1.5 |

**Other problems managed**

*n* = 527 (87.4 per 100 bipolar encounters)

| | Rate per 100 encounters(b) |
|---|---|
| Hypertension | 5.5 |
| Diabetes | 3.5 |
| Hypothyroidism/myxoedema | 2.7 |
| Depression | 2.5 |
| Lipid disorders | 2.5 |
| Oesophageal disease | 2.2 |
| Anxiety | 1.7 |
| Immunisation/vaccination—all | 1.7 |
| Asthma | 1.7 |

**Pathology**

*n* = 196 (32.5 per 100 bipolar problems)

| | Rate per 100 problems(c) |
|---|---|
| Drug screen | 11.4 |
| Thyroid function | 4.0 |
| Full blood count | 3.8 |
| Electrolytes, urea and creatinine test | 3.7 |
| Liver function | 3.0 |
| Multibiochemical analysis | 2.2 |

(a) Specific rate per 100 encounters in each sex and age group.
(b) Expressed as a rate per 100 encounters at which bipolar disorder was managed.
(c) Expressed as a rate per 100 bipolar disorder problems managed.

**Figure 14.18: Management of bipolar disorder in general practice, 2005–08**

# 14.8 Discussion

Mental health problems were responsible for 13.3% of the total burden of disease and injury in Australia in 2003.[1] When people seek professional help for a psychological problem, general practice is the service most often used, with two-thirds (67.8%) of people consulting a GP at some point about their psychological problem.[2]

This chapter looked at the major changes found in the management of psychological problems in Australian general practice between 1997–98 and 2007–08 and related them to policy introduced over that decade. The major changes are summarised below.

- There was a significant increase in the management of all psychological problems between 2002–03 and 2007–08, after the introduction of the 2002 BOIMHC initiative and the subsequent 2006 Better Access initiative.
- There was a significant increase in the management rate of depression from 1998–99 to 2007–08.
- There was a significant increase in the rate of psychological counselling for depression management between 1998–99 and 2001–02 and for anxiety management between 1998–99 and 2002–03. It is interesting to note that the majority of this increase in psychological counselling happened before the introduction of the 2002 BOIMHC initiative. During the course of the BOIMHC and the Better Access initiatives the use of psychological counselling remained relatively constant.
- There was a significant decrease in the use of clinical treatments (apart from psychological counselling) after 2004–05. This decrease was likely due to the increasing role of the practice nurse in helping the patients with advice and education.
- There was a significant increase in the rate at which patients with depression and anxiety problems were referred, with a significant shift in referral patterns for patients with depression from psychiatrists to psychologists associated with the introduction of the MBS items for psychologist services. This result suggests that patients are getting better access to psychologists, a focus of the BOIMHC initiative and the continuing focus of the Better Access initiative.
- The results in this report demonstrate that encounters involving the management of depression, anxiety and drug and alcohol problems are, on average, longer than those where they are not managed. The increased referral rate to psychologists may therefore also reflect GP acknowledgement that counselling and therapy are important in the management of depression, anxiety and drug and alcohol problems but are too time-consuming in the current general practice setting.
- No difference was found between patients from Major Cities and those from outside Major Cities in the proportion of psychological encounters covered by either the BOIMHC or Better Access item numbers, nor was there a difference between them in the proportion referred to a psychologist before or after the Better Access initiative was introduced. This finding runs contrary to the often heard criticism that the Better Access initiative favours patients from Major Cities.

- No difference was found between patients from disadvantaged areas and advantaged areas in the proportion of psychological encounters that were covered by BOIMHC or Better Access initiative item numbers. While patients from advantaged areas were referred more often to psychologists than patients from disadvantaged areas after the Better Access initiative, the difference was proportionally less than it was before the introduction of the Better Access initiative. This suggests that this initiative has had a greater positive impact on those from disadvantaged areas than on those from advantaged areas.

The Australian and state and territory governments have acknowledged the importance of mental health in Australia, and have spent billions in initiatives between 1998 and 2008 to improve it. GPs play a central role in this with many of the initiatives focussed on their management of mental health.

**Suggested chapter citation**

Harrison C & Charles J 2009. Mental health. In: Britt H & Miller GC (eds). General practice in Australia, health priorities and policies 1998 to 2008. General practice series no. 24. Cat. no. GEP 24. Canberra: Australian Institute of Health and Welfare.

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# 15 Sexual health

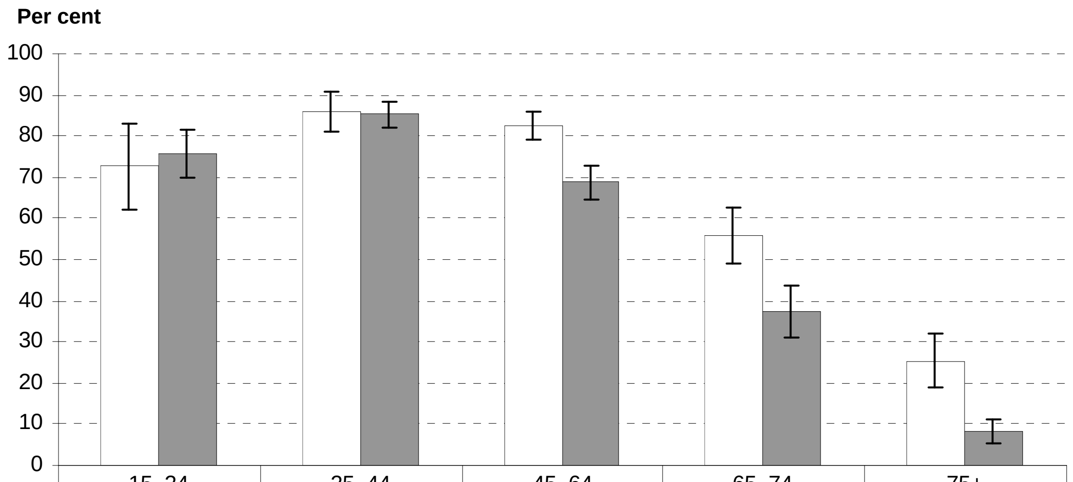
## *Christopher Harrison*

This chapter looks at the management of sexual health problems in BEACH, and changes that have occurred over the decade to 2007–08. It focuses on three areas of sexual health: sexual dysfunction, pregnancy and family planning, and sexually transmitted infections (STIs). Some problem and concept labels in this chapter include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

## 15.1 Background

According to an Australian study by de Visser et al.[1], in 2001–02, 87.9% of males and 86.5% of females aged 16–59 years had sex within the previous year. According to two BEACH substudies[2,3], two-thirds of adults at general practice encounters are sexually active, with adult male patients significant more likely to be sexually active (70.0%, 95% CI: 66.8–73.3) than their female counterparts (61.7%, 95% CI: 58.7–64.8). Results from BEACH studies for age groups similar to those of de Visser were 83.8% (95% CI: 80.2–87.5) among males aged 18–59 years and 78.9% (95% CI: 76.0–81.8) among females aged 18–59 years.

The advantage of the BEACH data is that it includes people aged 60 years and older. For patients aged 18–44 years, there was no difference in the proportions of male and female patients who were sexually active. For patients aged 45 years and older, a significantly greater proportion of male patients reported sexual activity, with males aged 75 years and older reporting sexual activity at 3 times the rate of females of the same age (Figure 15.1).




| | 15–24 | 25–44 | 45–64 | 65–74 | 75+ |
|---|---|---|---|---|---|
| Males | 72.7 | 85.9 | 82.6 | 55.9 | 25.4 |
| Females | 75.8 | 85.3 | 68.7 | 37.3 | 8.3 |

Age group (years)

**Figure 15.1: Age–sex-specific proportions of surveyed patients who are sexually active, 2006–07 (95% CI)**

## 15.2 Sexual dysfunction in men

Sexual dysfunction was managed at a rate of 10.0 (95% CI: 8.7–11.2) per 1,000 adult male encounters in the 2007–08 BEACH year. Males aged 65–74 years had a significantly higher management rate of sexual dysfunction, with 16.4 (95% CI: 13.7–19.1) per 1,000 encounters than males aged 18–44 years (5.4 per 1,000, 95% CI: 3.8–7.0), and males aged 75 years and older (2.3 per 1,000, 95% CI: 1.0–3.5). By far, the most common sexual dysfunction problem managed was erectile dysfunction, accounting for three-quarters of all male sexual dysfunction problems managed.

In October 1998, the erectile dysfunction medication sildenafil citrate was introduced to the Australian market. Up until that time the main pharmacological treatment for erectile dysfunction was alprostadil, which was listed on the PBS. Two applications to the Pharmaceutical Benefits Advisory Committee to have sildenafil listed on the PBS arguing that sildenafil citrate significantly increased the quality of life of those affected by erectile dysfunction were unsuccessful. On the third attempt, the application was limited to only coverage for patients with diabetes, multiple sclerosis, spina bifida, Parkinson's disease, prostate cancer and spinal cord injury. The Pharmaceutical Benefits Advisory Committee recommended sildenafil for listing on the PBS for the 'limited range of conditions for which evidence of cost-effectiveness had been provided'[4], however they thought the cost of its inclusion would be up to $100 million per year and not the $20 million estimated in the application. The application was denied in February 2002 by the Australian Government Health Minister because 'spending tens of millions of dollars a year for the treatment of erectile dysfunction is not the most cost-effective use of the PBS'.[5] As a result of this decision, the drug alprostadil was delisted from the PBS.

### Erectile dysfunction

Erectile dysfunction (ED) is relatively common among sexually active males.

- A 2003 telephone survey of men in Australia estimated the prevalence of erectile dysfunction in middle aged and older men to be 21%.[6]
- A global study of sexual attitudes and behaviour in 2001–02 found that 16% of Australian men experienced erectile difficulties.[7]
- In 2007, a BEACH substudy of 1,930 patients found that 20.3% (95% CI: 17.0–23.6, $n$ = 340) of sexually active adults stated they/their partners had experienced erectile dysfunction.[3]

In the BEACH substudy:

- A significantly greater proportion (27.5%, 95% CI: 22.6–32.4) of male patients reported having erectile dysfunction than female patients (16.2%, 95% CI: 12.7–19.7) reported their partners' experiencing erectile dysfunction. The same clinical definition of erectile dysfunction was applied in the question put to both female and male patients.
- The prevalence of erectile dysfunction leapt from 3.6% among male patients aged less than 40 years, to 54.1% among those aged 70 years and over. The proportion of male patients experiencing erectile dysfunction increased significantly with age (Mantel-Haenszel Chi-square test $p<0.0001$).
- Of those patients or their partners experiencing ED, 39.9% did so at 1–25% of occasions, 22.5% at 26–50% of occasions, and the remainder (37.5%) more than half of the time.[3]

Even though erectile dysfunction is prevalent, it has been shown that advice or treatment is infrequently sought.[6-8] In the BEACH substudy, less than a half of those experiencing erectile dysfunction (47.6%, 95% CI: 41.0–54.2) had sought help/advice for it. This is reflected in the low management rate of erectile dysfunction in general practice, at only 0.95 per 100 encounters with males aged 18 years and over in 2005–08 (Figure 15.3). Of those who did seek help, the majority sought it from their GP.

Of those patients with erectile dysfunction, 60% had tried at least one remedy, the majority (84.1%) using a prescribed medication from their doctor. Only 10.3% of patients had tried a behavioural treatment, and 7.1% had tried an over-the-counter product.

Over two-thirds of patients using a prescribed medication for erectile dysfunction reported that the medication was effective.

As Figure 15.2 shows, the rate of erectile dysfunction management increased significantly between 2001–02 and 2003–04, then remained steady through to 2007–08.

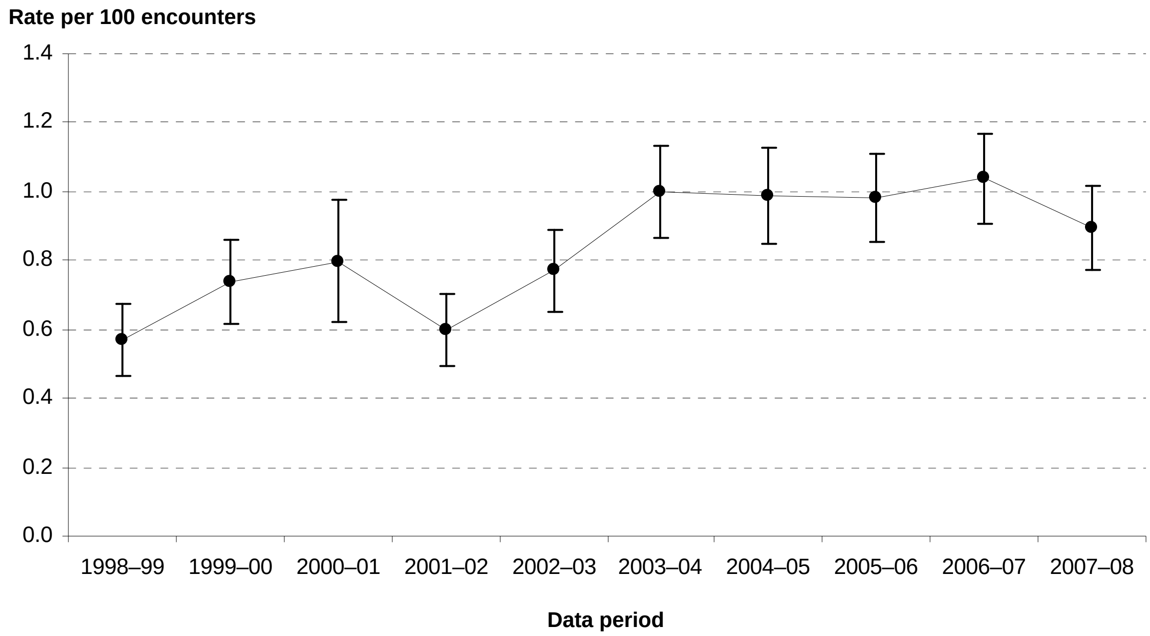



**Figure 15.2: Management rate of erectile dysfunction in male adults (18+ years), 1998–99 to 2007–08 (95% CI)**

GP management of erectile dysfunction using BEACH data over 3 years (2005–06 to 2007–08) is presented in Figure 15.3.

- The highest rate of erectile dysfunction management was in male patients aged 45–64 years, at 1.6 per 100 encounters
- When erectile dysfunction was managed, the most frequent patient reasons for the encounter were directly linked to erectile dysfunction, with presentation for sexual function symptoms/complaint (42.1 per 100 encounters) and impotence (11.9 per 100) being the most common. The other major reason for encounter where erectile dysfunction was managed was a need for prescription(s) (at 30.3 per 100 encounters).

**The patients**

| Age group | Per cent | Rate[(a)] |
|---|---|---|
| 18–24 | 1.2 | 0.2 |
| 25–44 | 16.5 | 0.7 |
| 45–64 | 58.4 | 1.6 |
| 65–74 | 18.3 | 1.1 |
| 75+ | 5.6 | 0.3 |

**Medications**

*n* = 797 (86.2 per 100 ED problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Sildenafil citrate | 42.3 |
| Tadalafil | 32.0 |
| Vardenafil | 7.6 |
| Alprostadil | 2.5 |

## Erectile dysfunction (ED)

***n* = 925 (0.95 per 100 adult male encounters)**

**Reasons for encounter**

*n* = 1,754 (189.6 per 100 ED encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Sexual function symptom/complaint | 42.1 |
| Prescriptions—all | 30.3 |
| Impotence NOS | 11.9 |
| Test results | 9.0 |
| Cardiac check-up | 7.2 |
| General check-up | 4.9 |
| Hypertension | 4.7 |

**Other treatments**

*n* = 238 (25.7 per 100 ED problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Counselling—problem | 14.9 |
| Advice/education | 4.7 |

**Referrals**

*n* = 29 (3.1 per 100 ED problems)

**Other problems managed**

*n* = 1,134 (122.6 per 100 ED encounters)

| | Rate per 100 encounters[(b)] |
|---|---|
| Hypertension | 17.6 |
| Lipid disorders | 7.7 |
| Diabetes | 5.5 |
| Immunisation/vaccination—all | 3.8 |
| Depression | 3.7 |
| Oesophagus disease | 3.1 |
| General check-up | 3.0 |

**Pathology**

*n* = 335 (36.2 per 100 ED problems)

| | Rate per 100 problems[(c)] |
|---|---|
| Other chemistry | 6.2 |
| Full blood count | 4.8 |
| Glucose tolerance | 4.3 |
| Lipids | 4.0 |
| Liver function test | 2.8 |

(a) Specific rate per 100 encounters in each age group.

(b) Expressed as a rate per 100 encounters at which erectile dysfunction was managed.

(c) Expressed as a rate per 100 erectile dysfunction problems managed.

**Figure 15.3: Management of erectile dysfunction, 2005–08**

The other problems managed at encounters with erectile dysfunction were mainly chronic conditions such as hypertension, lipid disorder, diabetes and depression, reflecting the fact that 82.3% of patients managed for erectile dysfunction were aged 45 years and older.

- The most frequently recorded management method was medication with 86.2 recorded per 100 erectile dysfunction problems managed. The majority of these medications were unsurprisingly drugs used to treat erectile dysfunction, with sildenafil citrate (42.3 per 100 erectile dysfunction problems) and tadalafil (32.0 per 100) the most common.
- Counselling and advice were used at a rate of 25.7 per 100 erectile dysfunction problems. This result of comparatively low counselling compared with medication reflects the results found in the substudy, where 84% of those who were managing their erectile dysfunction were using medication and only 10.3% behavioural treatment.
- Pathology was ordered at a rate of 36.2 per 100 erectile dysfunction problems managed, with other chemistry (6.2 per 100 erectile dysfunction problems), full blood count (4.8 per 100) and glucose tolerance (4.3 per 100) being the most frequent.
- Patients with erectile dysfunction were rarely referred elsewhere for this problem with a rate of only 3.1 per 100 erectile dysfunction problems managed.

## Premature ejaculation

Premature ejaculation is another sexual dysfunction which is common in the population.

- The global study of sexual attitudes and behaviour reported a prevalence of 16% among Australian men.[7]
- The Australian study of health and relationships found that 23.8% of men reported that they came to orgasm too quickly.[8]
- In a BEACH substudy of 2,186 patients, 18.4% (95% CI: 14.2–22.5) of patients stated that they or their partners had experienced premature ejaculation.[2]

The following results are from this BEACH substudy.

Similar to the result found for erectile dysfunction, a smaller proportion of female patients (13.0%, 95% CI: 9.6–16.5) reported their partners having premature ejaculation than male patients (24.0%, 95% CI: 18.3–29.7) reported having premature ejaculation.

Of those patients or their partners experiencing premature ejaculation, 61.4% experienced it on 1–25% of occasions, 19.7% on 26–50% of occasions and the remaining 18.9% more than half the time.

Of those patients or their partners with premature ejaculation, only 28.4% had sought help for the problem. The most common sources of help/advice were a GP (18.7%), their partner (5.8%) and other health professionals (4.7%). Just over a third (37.7%) of those with premature ejaculation had tried at least one remedy. The most common remedy was prescribed medications (16.0%) followed by behavioural treatment (13.7%) and alcohol/drugs (9.9%). Physical remedies (for example, more than one condom) were used by 8.5% of patients, over-the-counter products by 7.6%, herbal remedies by 4.3%, and a nasal spray by 1.4%.[2]

Premature ejaculation is rarely managed in Australian general practice: in 2007–08 it was only managed at a rate of 44 per 100,000 encounters with males aged 18 year and older.

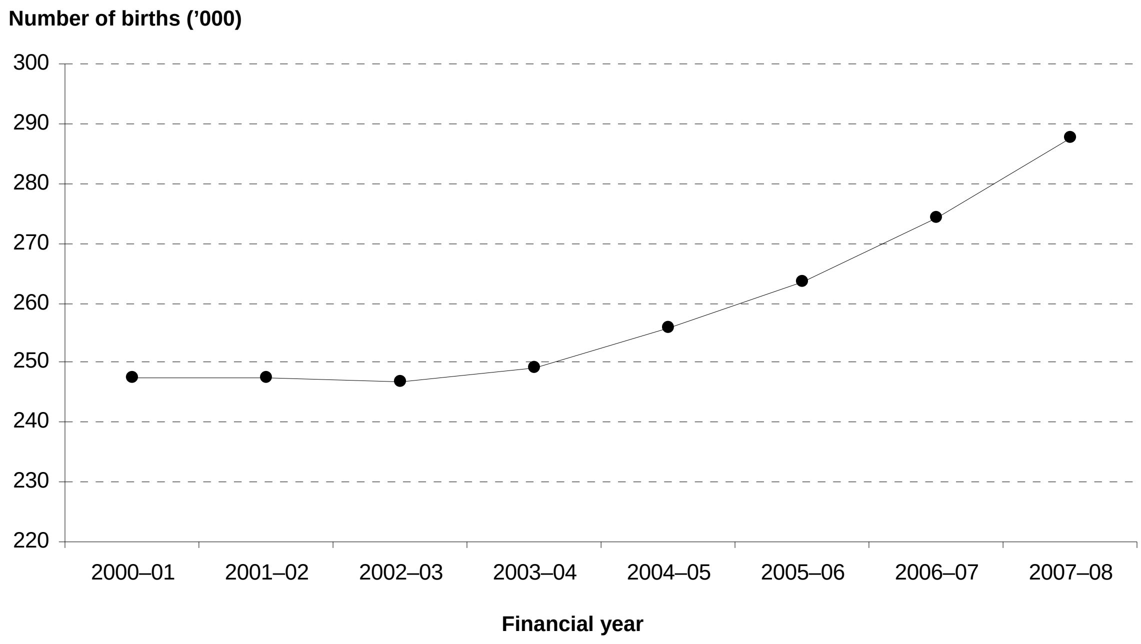
# 15.3 Sexual dysfunction in women

There is strong evidence to suggest that as many, if not more women than men, experience a sexual problem[7,8], yet women very rarely have such problems managed by a GP. In 2007–08, sexual problems were managed only 1.1 times per 1,000 encounters with women aged 18 years and over, the most commonly managed being painful intercourse (from vaginismus or dyspareunia) and lack or loss of libido, accounting for 47% and 37% of all female sexual dysfunction problems managed, respectively.

# 15.4 Pregnancy and family planning

## Background

Family planning and the diagnosis and management of pregnancy have been integral to general practice clinical activity. Changes in social attitude to contraception and to family size will affect the birth rate, and changes in the birth rate would be expected to affect the clinical workload in these areas. Figure 15.4 shows Australian births by financial year and demonstrates a steady rise in the birth rate since 2003–04




*Source:* Australian demographic statistics–June 2008 (ABS).

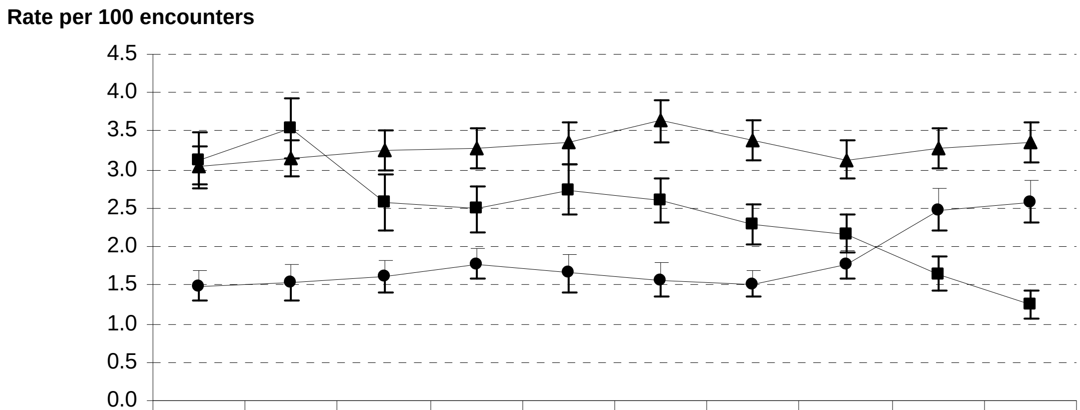
**Figure 15.4: Births in Australia by financial year, 2000–01 to 2007–08**

## Management of pregnancy and family planning 1998–99 to 2007–08

As Figure 15.5 shows, the rate at which pregnancy (tested or confirmed) was managed stayed relatively stable between 1998–99 and 2004–05. After the Baby Bonus was announced in June 2004, the management rate of pregnancy increased from 1.5 per 100 in 2004–05 (95%CI: 1.4–1.7) to 2.6 per 100 in 2007–08 (95% CI: 2.3–2.9), a 73 increase.

However, despite an increase in pregnancy tests and confirmations, from 1999–00, there was a steady decline in GP management of reproductive issues (including pre- and post-natal care, pregnancy-related check-ups, complications of pregnancy, complications due to pregnancy, terminations and births). In 1999–00, reproductive care was managed at a rate of 3.5 (95% CI: 3.1–3.9) per 100 encounters with women aged 10 years and older. By 2007–08, this had decreased to 1.3 (95% CI: 1.1–1.4) per 100 encounters, 37% of the 1999–00 rate. This result highlights the diminishing role GPs play in obstetrics apart from the initial confirmation of pregnancy. This decrease was predicted in the late1990s, with the number of GP obstetrics specialists retiring far outweighing those new to the field.[9,10] Common reasons for the decrease in GP obstetricians were the price of medical indemnity and the fear of litigation.

The management rate of contraception significantly increased from 3.0 per 100 encounters in 1998–99 (95% CI: 2.8–3.3) to a high of 3.6 per 100 in 2003–04 (95% CI: 3.4–3.9), then remained stable between 2004–05 and 2007–08.




| | 1998–99 | 1999–00 | 2000–01 | 2001–02 | 2002–03 | 2003–04 | 2004–05 | 2005–06 | 2006–07 | 2007–08 |
|---|---|---|---|---|---|---|---|---|---|---|
| Pregnancy | 1.5 | 1.5 | 1.6 | 1.8 | 1.7 | 1.6 | 1.5 | 1.8 | 2.5 | 2.6 |
| Reproductive care | 3.1 | 3.5 | 2.6 | 2.5 | 2.7 | 2.6 | 2.3 | 2.2 | 1.6 | 1.3 |
| Contraception | 3.0 | 3.2 | 3.2 | 3.3 | 3.3 | 3.6 | 3.4 | 3.1 | 3.3 | 3.4 |

Data period

**Figure 15.5: Management rates of pregnancy, reproductive care and contraception in women aged 10 years and older, 1998–99 to 2007–08 (95% CI)**

# 15.5 Sexually transmitted infections

## Background

A sexually transmitted infection (STI) is an illness that has a significant probability of transmission by means of sexual contact. According to the burden of disease report, in 2003 STIs (sexually transmitted disease, human immunodeficiency virus/acquired immune deficiency syndrome HIV/AIDS and hepatitis B) accounted for 0.6% of all burden of disease and 12.7% of the burden for communicable diseases.[11] The report estimated there were over 53,000 new cases of STIs in 2003, the majority being chlamydia, with over 40,000 new cases alone. It should be noted that the burden of disease report does not include the two most common STIs—the Human Papillomavirus (HPV) and genital herpes. HPV is the most common STI in the developed world, with a majority of sexually active adults contracting it at some point in their lives.[12] It is estimated that one in eight Australian adults has genital herpes.[13]

Sex education in schools was formalised in New South Wales in 1967 when it was incorporated into the health syllabus. All other states and territories quickly adopted similar programs.[14] Since the emergence of HIV/AIDS, there have been numerous public health campaigns on safe sex, especially in regards to AIDS prevention. In 1989, the Australian Government introduced the first National HIV/AIDS strategy,[15] and it has been updated four times since then. One of the core strategies has been the education of affected groups (particularly homosexual men and sex workers), linked to non-discriminatory HIV/AIDS testing, treatment and care. Another was the needle and syringe exchange programs.[16] These strategies appear to have been successful, the Australian prevalence of HIV in 2007 being about half that of France or Canada and about a third of the United States. However, a recent increase in HIV diagnoses in 2006–07 is of concern.[17]

The 2002 review of the fourth National HIV/AIDS Strategy took a broader view of prevention, recommending that in framing a fifth strategy, 'consideration be given to developing a national strategy for sexually transmissible infections'.[18]

This recommendation led to the Australian Government's introduction of the National Sexually Transmissible Infections Strategy 2005–2008, in parallel with the fifth National HIV/AIDs Strategy 2005–2008[16], and the National Aboriginal and Torres Strait Islander Sexual Health and Blood Borne Virus Strategy 2005–2008 (a continuation of the National Indigenous Australians' Sexual Health Strategy 1996–97 to 2003–04).[19] The goal of the National STIs Strategy is 'to reduce the transmission of STIs, with particular reference to STIs other than HIV, through improved awareness and access to appropriate health services'.[20]

The objectives of the National STIs Strategy were:

- to improve awareness of STIs, in particular their economic, social and personal effects, within the government, medical and community sectors
- to establish a basis for coordinated national action on STIs now and in the future
- to increase access to diagnosis, treatment and care of STIs
- to minimise the transmission and morbidity of STIs in identified priority groups
- to improve surveillance and research activities in order to guide the development and implementation of prevention initiatives. [20]

Three priority areas were also identified as part of the strategy:

- STIs in Aboriginal and Torres Strait Islander communities
- STIs in homosexually active men
- chlamydia control and prevention. [20]

## Management of STIs in Australian general practice

Table 15.1 lists the rates of STI screenings, STI risk factors and diagnosed STI problems managed in Australian general practice in 1998–99 and 2007–08. Over the decade the management rate of all STI-related problems increased from 480.5 per 100,000 encounters in 1998–99 to 781.7 per 100,000 encounters in 2007–08, an increase of two-thirds.

Examination of the rate of STI testing and risk factor management over the decade shows that it increased by more than 40% from 202.5 per 100,000 encounters in 1998–99 to 290.7 per 100,000 encounters in 2007–08. The increase was primarily due to the significant increase in management of problems labelled as STI tests, which tripled over the decade. Within this increase the rise in full STI screens in favour of specific tests such as HIV and hepatitis tests can be seen. It is likely that the six-fold increase in STI screens from 31.8 per 100,000 encounters in 1998–99 to 205.1 in 2007–08 was generated from patient demand. This may be due to success of public health campaigns promoting STI screens as standard practice for safe sex. [21]

It is interesting that the rate of unprotected sex as a problem managed decreased marginally over the decade. It is impossible to say whether this is because unprotected sex is happening less often in the population or that it is just being managed less in Australian general practice?

There was a marginal increase in the management rate of diagnosed STIs between 1998–99 (278 per 100,000 encounters) and 2007–08 (491 per 100,000). It should be noted that the 'diagnosed STIs' referred to in this chapter are in patients for whom the GP has recorded a STI diagnosis as the problem under management. Some of these may have been decided on the basis of clinical judgement. For example, a patient presents with symptoms that the GP judges to be caused by chlamydia, and records the problem under management as chlamydia. However the GP also orders pathology to confirm this clinical diagnosis. In this case, the problem managed would be classed as 'diagnosed STI' in this chapter, even though the diagnosis is not confirmed. Over the decade, the management rate doubled for both genital herpes (71.6 to 144.8 per 100,000 encounters) and HPV/genital warts (58.4 to 103.6 per 100,000 encounters). The management rate of chlamydia and syphilis increased significantly from very low rates in 1998–99. There was not a significant change in the management rate of HIV/AIDS between 1998–99 and 2007–08.

In 2000–08, the overall rate of STI management in Aboriginal and Torres Strait Islander peoples was 1,076 (95% CI: 828–1,325) per 100,000 encounters, significantly higher than that of non-Indigenous Australians (572 per 100,000, 95% CI: 528–617). Indigenous Australians had a higher rate of both screening/risk problems (397 per 100,000, 95% CI: 244–549) and diagnosed STI (680, 95% CI: 482–878) management than non-Indigenous Australian (220 per 100,000, 95% CI: 204–236 and 351, 95% CI: 314–389, respectively) (results not tabled). The higher rate of STI management in Indigenous Australians highlights the need for the National Aboriginal and Torres Strait Islander Sexual Health and Blood Borne Virus Strategy 2005–2008.

**Table 15.1: Changes in management rates of problems associated with sexually transmitted infections, 1998–99 and 2007–08**

| | 1998–99 (*n* = 96,901) | | 2007–08 (*n* = 95,898) | |
|---|---|---|---|---|
| | Rate per 100,000 encounters | 95% CI | Rate per 100,000 encounters | 95% CI |
| **Screening and risk problems** | **202.5** | **160.0–245.0** | **290.7** | **239.1–342.3** |
| All STI tests | 77.1 | 55.0–99.1 | 226.0 | 179.9–272.2 |
| STI screen NOS | 31.8 | 18.8–44.9 | 205.1 | 161.9–248.2 |
| Hepatitis B test | 21.4 | 10.1–32.6 | 8.7 | 0.4–17.0 |
| Chlamydia test | 0.6 | 0.0–1.8 | 6.2 | 0.4–12.1 |
| HIV test | 23.3 | 12.1–34.4 | 6.0 | 0.6–11.4 |
| Unprotected sex | 55.4 | 28.6–82.1 | 19.7 | 9.3–30.2 |
| Fear of STI | 32.8 | 15.8–49.8 | 16.5 | 6.4–26.5 |
| Fear of HIV | 15.5 | 5.7–25.3 | 5.4 | 0.3–10.4 |
| STI advice | 7.8 | 1.3–14.3 | 11.3 | 3.8–18.7 |
| Contact with STI | 14.0 | 6.4–21.6 | 11.8 | 4.3–19.3 |
| **Diagnosed STIs** | **278.0** | **175.9–380.0** | **491.0** | **359.7–622.2** |
| Genital herpes | 71.6 | 52.0–91.1 | 144.8 | 114.5–175.1 |
| HIV/AIDS | 76.8 | 0.0–167.7 | 103.4 | 7.8–199.1 |
| HPV/genital warts | 58.4 | 41.0–75.9 | 103.6 | 74.4–132.8 |
| Chlamydia | 4.4 | 0.0–10.4 | 57.9 | 37.2–78.5 |
| Hepatitis B | 48.2 | 29.1–67.4 | 41.9 | 24.7–59.2 |
| Syphilis | 0.3 | 0.0–1.0 | 23.0 | 4.7–41.2 |
| STI/STD/VD | 9.3 | 2.2–16.4 | 13.0 | 4.2–21.9 |
| Gonorrhoea | 0.8 | 0.0–1.9 | 2.9 | 0.0–6.3 |
| Trichomoniasis | 8.2 | 0.0–17.4 | 0.4 | 0.0–1.3 |
| **Total problems related to STIs** | **480.5** | **368.2–592.7** | **781.7** | **619.1–944.3** |

*Note:* CI—confidence interval; STI—sexually transmitted infection; HIV/AIDS—human immunodeficiency virus/ acquired immune deficiency syndrome; HPV—Human Papillomavirus ; NOS—not otherwise specified; STD—sexually transmitted disease; VD—venereal disease.

## Age and sex-specific STI management rates 1998–99 and 2007–08

As mentioned earlier, the overall rates of STI management (both testing and management of diagnosed STI) increased between 1998–99 and 2007–08. Figure 15.6 presents age and sex-specific rates of STI testing and diagnosed STI management in 1998–99 and 2007–08.

## Sex-specific rates

In both 1998–99 and 2007–08, there was no significant difference found between the rates of STI testing and management between male and female patients. In 1998–99, female patients had a significantly higher management rate of diagnosed STIs than they did of STI testing/risk factor management. This difference was not found in male patients.

Between 1998–99 and 2007–08, there was a significant increase in the management rate of both STI testing/risk factors and of diagnosed STIs among female patients. There was no significant difference found across this period for male patients. Therefore, it seems that the overall significant increase in STI management (management of risk factors, testing and diagnoses) was driven by an increase in management among female patients.

## Age-specific rates

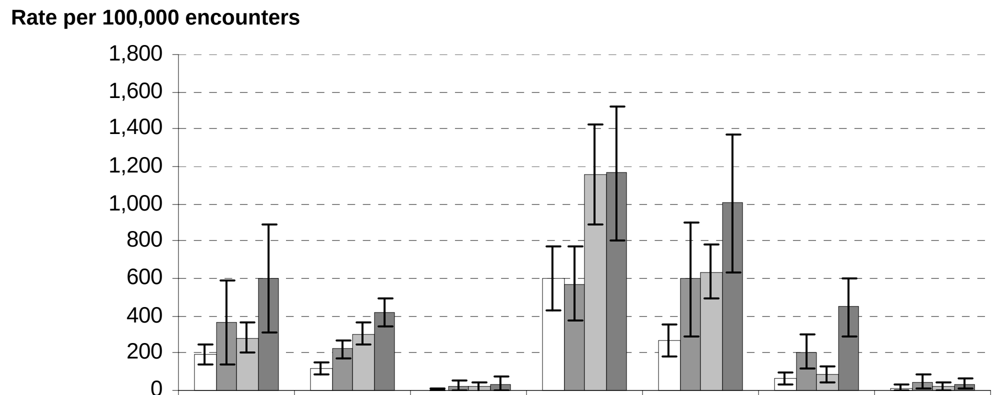
In both 1998–99 and 2007–08, the highest management rate of:

- STI screening and risk factors was in patients aged 15–24 years, and the lowest rate was in children aged less than 15 years and those aged 45 years and over
- diagnosed STIs was in patients aged 15–24 years and 25–44 years, while the lowest was among children aged less than 15 years of age and those aged 45 years and older.

Between 1998–99 and 2007–08, there was:

- a significant increase in management of diagnosed STIs in patients 15–24 and 25–44 years
- a marginal increase in the management among patients aged 45–64 years
- no significant difference in the management rate of diagnosed STIs for patients younger than 15 years and patients 65 years and older.

This means that the significant increase in STI testing/risk factor management was driven by an increase in patients aged 15–44 years, particularly among female patients, and that the marginal increase in the rate of diagnosed STIs came from a broader group, which included patients aged 45–64 years.




| | Male | Female | 0–14 | 15–24 | 25–44 | 45–64 | 65+ |
|---|---|---|---|---|---|---|---|
| 1998–99 Tests & risk factors | 189.9 | 117.0 | 4.5 | 596.0 | 269.7 | 64.1 | 14.2 |
| 1998–99 Diagnosed STI | 361.2 | 220.8 | 24.5 | 571.4 | 597.2 | 206.9 | 46.5 |
| 2007–08 Tests & risk factors | 280.2 | 302.1 | 18.4 | 1,155.8 | 636.5 | 88.5 | 18.6 |
| 2007–08 Diagnosed STI | 602.4 | 415.1 | 36.1 | 1,162.9 | 1,001.9 | 448.5 | 37.4 |

**Age group (years) or sex**

*Note:* STI—sexually transmitted infection.

**Figure 15.6: Age and sex-specific management rates of STI tests and diagnosed STIs per 100,000 encounters, 1998–99 and 2007–08 (95% CI)**

## Management of diagnosed STIs

Figure 15.7 shows the management patterns for all diagnosed STI problems in 2007–08.

- The management rate of diagnosed STIs problems was 491 per 100,000 encounters.
- The most common reasons given by the patient for the encounter where a diagnosed STI was managed were, with the exception of requests for prescription(s), mainly related to the STI. Presentations for receipt of test results was frequent, as were reasons for encounter that specified STI diagnoses such as HIV infection/AIDS, condylomata acuminate and genital herpes.

**Sexually transmitted infection (STI)**

***n* = 471 (491.0 per 100,000 encounters)**

**Reasons for encounter**

*n* = 754 (163.5 per 100 STI encounters)

| | **Rate per 100 encounters[(a)]** |
|---|---|
| Prescriptions all | 18.2 |
| Test results | 13.2 |
| HIV infection/AIDS | 9.0 |
| Condylomata acuminate (Male) | 8.0 |
| Genital herpes (Female) | 7.0 |
| Female genital check-up | 5.6 |
| Condylomata acuminate (Female) | 5.5 |
| Rash | 3.9 |
| Immunisation/vaccination all | 3.1 |
| Pain, genital (Female) | 2.5 |

**Other problems managed**

*n* = 391 (84.7 per 100 STI encounters)

| | **Rate per 100 encounters[(a)]** |
|---|---|
| Female genital check-up | 4.3 |
| Depression | 4.2 |
| Drug abuse | 3.3 |
| Immunisation/vaccination—all | 3.1 |
| Sleep disturbance | 2.5 |
| Acute upper respiratory infection | 2.5 |
| Microbiology/immunology test NOS | 2.4 |
| Urinary tract infection | 2.2 |

**Medications**

*n* = 311 (66.0 per 100 STI problems)

| | **Rate per 100 problems[(a)]** |
|---|---|
| Valaciclovir | 17.3 |
| Azithromycin | 9.0 |
| Famciclovir | 4.9 |
| Doxycycline | 2.9 |

**Other treatments**

*n* = 217 (46.2 per 100 STI problems)

| | **Rate per 100 problems[(a)]** |
|---|---|
| Excision/removal tissue/biopsy | 11.3 |
| Counselling—problem | 10.5 |
| Advice/education | 9.5 |
| Counselling/advice—STIs | 5.0 |
| Local injection | 3.2 |

**Referrals**

*n* = 25 (5.2 per 100 STI problems)

**Pathology**

*n* = 312 (66.4 per 100 STI problems)

| | **Rate per 100 problems[(a)]** |
|---|---|
| HIV | 8.7 |
| Liver function | 7.9 |
| Microbiology other | 7.2 |
| Hepatitis serology | 5.4 |
| Venereal disease | 5.3 |
| Other blood | 4.8 |
| Full blood count | 4.7 |
| Chlamydia | 4.6 |

(a) Expressed as a rate per 100 encounters at which a sexually transmitted infection was managed.

**Figure 15.7: Management of sexually transmitted infections in general practice, 2007–08**

- The most frequent other problems managed at diagnosed STI encounters were mainly acute in nature, with preventive reasons such as female genital check-up and immunisation/vaccination both being frequently given. Drug abuse was more often managed than usual, reflecting the risk-taking behaviour of many young people. Depression was the only chronic condition in the top three, once again not surprising since depression is common among the 15–44 age group (See Chapter 6).

# 15.6 Discussion

This chapter considered how STIs, sexual dysfunction, and pregnancy and family planning were managed in the Australian general practice. Changes over the 1998–99 to 2007–08 period have been presented and considered in relation to major policy changes. The major findings are discussed below:

- A similar proportion of male and female patients aged 18–44 years reported being sexually active. However male patients aged 45 years and over were significantly more likely to report being sexually active than females, with male patients aged 75 years and over being 3 times more likely to be sexually active than their female peers.
- For both erectile dysfunction and premature ejaculation, male patients were more likely to report that they had the problem than female patients when reporting about their partners. This is an interesting result, considering the definition of what erectile dysfunction and premature ejaculation constitute can be subjective.
- For both erectile dysfunction and premature ejaculation, advice and treatment were rarely sought, though when it was, GPs were the health professional most often seen.
- Since 2004, there has been a significant increase in the Australian birth rate as well as an increase in the number of pregnancy tests and confirmations in Australian general practice. However, although the rate of pregnancy increased after 2004, the GP management rate of pregnancy after 2004 continued to decrease. This is likely due to the decreasing role being played by general practice in obstetrics management.
- Over the 1998–99 to 2007–08 period, the rate of STI testing and screening significantly increased and the management rate of diagnosed STIs marginally increased. It remains unknown however, whether the increased management of diagnosed STI diagnoses represents a successful campaign with better testing for, recognition and management of STIs, or whether it represents a failure of educational programs focusing on safe sex with a resulting increase in prevalence in the wider population.

Since the 1980s, there has been a concerted effort to reduce the impact of HIV/AIDS in Australia. Comparing Australia's prevalence of HIV/AIDS to that of other developed countries, it seems that this effort has been successful.[17] However, with the focus on HIV/AIDS, the rate of diagnosis for other STIs (such as chlamydia and gonorrhoea) have increased. [20] Because of this, the Australian Government introduced the National Sexually Transmissible Infections Strategy 2005–2008. It remains to be seen if this new strategy will be as effective as the earlier HIV/AIDS strategies.

**Suggested chapter citation**

Harrison C 2009. Sexual health. In: Britt H & Miller GC (eds). General practice in Australia, health priorities and policies 1998 to 2008. General practice series no. 24. Cat. no. GEP 24. Canberra: Australian Institute of Health and Welfare.

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# 16 Gastro-oesophageal reflux disease

*Graeme Miller, Ying Pan*

## 16.1 Background, policies and initiatives

Although gastro-oesophageal reflux disease (GORD) has not been declared 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) estimate the prevalence of GP-diagnosed gastro-oesophageal reflux disease 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.[1] This equates to approximately 2 million Australians with GORD. The prevalence of GORD in the Australian community is similar to that of osteoarthritis, asthma or depression.[1]
- A systematic review by Dent et al. in 2005, using strict criteria for disease definition in population-based studies of GORD, found a prevalence varying from 20% in the United States and the United Kingdom to 5% in China.[2]
- Dent et al. reviewed the management of GORD, and found that it has a significant impact on quality of life, and that lifestyle modification measures are of low efficacy.[3]
- The hospital admission rate for GORD is also significant with 60,064 admissions to Australian hospitals with GORD with or without oesophagitis in 1998–00 and 61,049 in 2006–07.[4]
- In 1992, proton pump inhibitor (PPI) pharmaceuticals were introduced onto the Pharmaceutical Benefits Scheme (PBS) for the treatment of oesophagitis due to GORD. This was accompanied by a requirement that the diagnosis had to be proven by endoscopy, x-ray or surgery before PPIs were prescribed. This restriction was removed in 2001.[5]
- The number of Medicare-funded upper gastrointestinal endoscopy services rose from 163,963 in 1994 to 231,179 in 2001, and fell to 219,415 in 2002 (after the requirement for endoscopy was removed), before increasing steadily again to 258,357 in 2007.[6]
- In 2006–07, the cost to the Pharmaceutical Benefits Scheme of prescribed proton pump inhibitor medications was more than $400 million.[7]

## 16.2 Prevalence in general practice patients

Several BEACH SAND[8] substudies have investigated the prevalence and management of GORD. Prevalence estimates from those studies are shown in Table 16.1. The first study (GORD 1 1998) reported the prevalence of reflux symptoms/heartburn in the preceding 12 months. The GORD SAND 2, 3 and 4 studies reported the prevalence of GORD diagnosed at the current or a previous patient encounter. These three studies produced comparable results that did not statistically differ. The last study (GORD 5 2006) used GORD symptoms (similar to those used in GORD 1) that may have occurred at any time in the past and may have resolved, and found a much higher prevalence rate of 29.5% compared with the previous three studies. However of the 828 patients with symptoms of GORD in GORD

SAND 5, 46.1% had current symptoms and 30.8% had symptoms in the previous 12 months which would be similar to the findings in GORD 2–4.[9,10]

These results equate well with the systematic review by Dent referred to above[2] but are significantly higher than the prevalence reported by Knox. The latter reported patients with GORD currently under management, a method that would have underestimated the total GORD prevalence in patients attending general practice, as it excluded those patients with GORD who had not sought medical care for their problem.[1]

**Table 16.1: GORD prevalence estimates from SAND studies 1998 to 2006**

| SAND study[9,10] | Abstract number | Study year | Patients | Prevalence (per cent) | 95% CI |
|---|---|---|---|---|---|
| GORD 1 | Chapter 8 | 1998 | 3,368 | 12.5 | 10.5–14.5 |
| GORD 2 | Abstract 24 | 2001 | 2,767 | 15.7 | 13.3–18.0 |
| GORD 3 | Abstract 34 | 2001–02 | 3,018 | 19.9 | 16.8–22.9 |
| GORD 4 | Abstract 60 | 2003 | 2,538 | 16.2 | 14.1–18.4 |
| GORD 5 | Abstract 100 | 2006 | 2,801 | 29.5 | 26.4–32.6 |

*Note:* CI—confidence limit. Chapter 8 refers to Chapter 8 of AIHW publication, *Measures of health and health care delivery in general practice in Australia 2000.*

# 16.3 Multimorbidity occurring with GORD

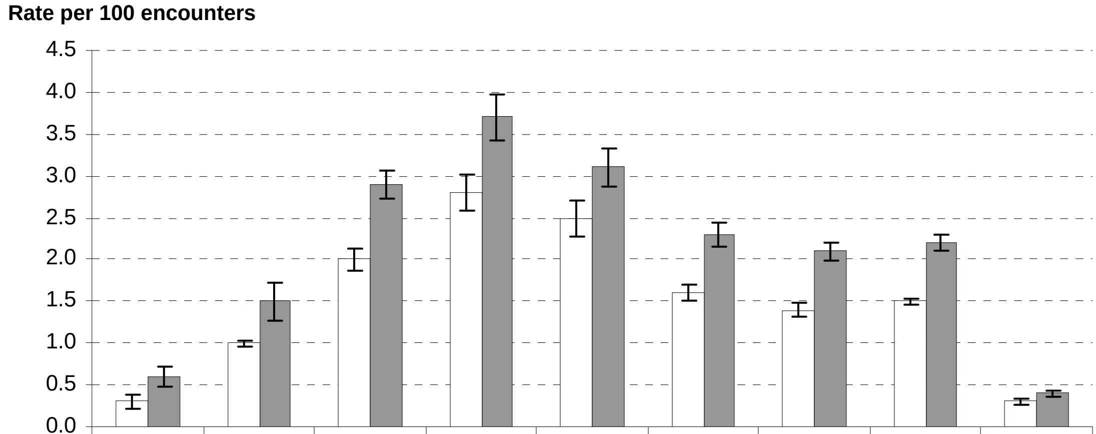
Britt et al. investigated the occurrence of multimorbidity in patients with GORD using data from another BEACH SAND substudy in 2005.[11] The Cumulative Illness Rating Scale was used to group chronic illnesses into domains according to the method described by Fortin et al.[12] For patients with GORD the most common associated morbidity was vascular disease, this combination occurring in 5.0% of the Australian population. Of those patients with GORD and vascular disease, 25.1% had a morbidity in a third domain and 63.7% had two or more additional morbidities.

GORD patients with one or more additional morbidity domains constituted 9.1% of the population (estimated to be 1.9 million patients nationally), 4.9% had three or more morbidity domains (more than 1 million patients) and 3.2% had four or more morbidity domains (estimated to be 672,000 patients).

# 16.4 Management in general practice

As shown in Figure 16.1, since 1998–00 there has been about a 45% increase in the management rate of GORD in general practice, from 1.5 per 100 encounters in 1998–00 (95% CI: 1.4–1.6) to 2.2 per 100 encounters in 2006–08 (95% CI: 2.1–2.3). This change was reflected in all age groups of 15 years and over and in both sexes.

There has also been a significant increase of 46% in the rate of new diagnoses of GORD, from 0.26 per 100 encounters in 1998–00 (95% CI: 0.23–0.28) to 0.38 per 100 encounters in 2006–08 (95% CI: 0.35–0.41) (Figure 16.1).




| | 15–24 | 25–44 | 45–64 | 65–74 | 75+ | Male | Female | Total | New cases |
|---|---|---|---|---|---|---|---|---|---|
| □ 1998–00 | 0.3 | 1.0 | 2.0 | 2.8 | 2.5 | 1.6 | 1.4 | 1.5 | 0.3 |
| ■ 2006–08 | 0.6 | 1.5 | 2.9 | 3.7 | 3.1 | 2.3 | 2.1 | 2.2 | 0.4 |

**Age and sex-specific rates**

*Note:* GORD—gastro-oesophageal reflux disease

**Figure 16.1: Age and sex-specific management rates of GORD, 1998–00 and 2006–08 (95% CI)**

## Pathology test ordering

In the coding of pathology tests, a different system was used in 1998–00 to that used in subsequent years. Pathology orders have therefore been compared between 2000–02 and 2006–08.

There was no significant change in the likelihood of at least one pathology test for GORD being ordered, for 4.3 % of GORD problems in 2000–02 and 4.7 in 2006–08. Total pathology orders for GORD also showed no significant change from 8.1 (95% CI: 6.4–9.8) per 100 GORD problems in 2000–02 to 10.6 (95% CI: 8.7–12.5) in 2006–08.

The most commonly ordered test, that for full blood count, remained constant at about 1.8 per 100 GORD problems. H. Pylori testing also remained constant at about 1.7 per 100 GORD problems. In 2006–08, the H. Pylori testing rate was 1.8 (95% CI: 1.3–2.2) per 100 total GORD problems, while for new cases of GORD the test rate was significantly higher at 4.3 (95% CI: 2.8–5.8) per 100 new GORD problems.

## Imaging orders

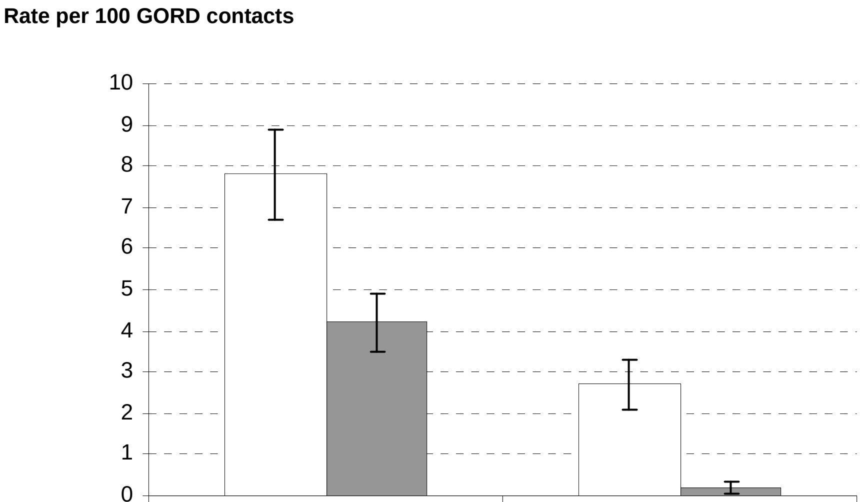
In the coding of imaging orders, a different coding system was used in BEACH in 1998–00 to that used in subsequent years. Imaging orders have therefore been compared between 2000–02 and 2006–08.

Imaging orders occurred at the low level of just over 2 per 100 GORD contacts in 2000–02, and were unchanged in 2006–08. This compares to just over six imaging orders per 100 problem contacts in the overall BEACH data.[13]

## Referrals

The rate at which patients were referred to specialists (including for endoscopy), for GORD halved over the study period, from 7.8 (95% CI: 6.7–8.9) per 100 GORD problems in 1998–00 to 4.2 (95% CI: 3.5–4.8) in 2006–08.

Referrals for endoscopy reduced substantially from 2.7 (95% CI: 2.1–3.3) per 100 GORD contacts in 1998–00 to 0.2 (95% CI: 0.0–0.3) per 100 contacts in 2006–08 (Figure 16.2).




| | Specialists | Endoscopy |
|---|---|---|
| 1998–00 | 7.8 | 2.7 |
| 2006–08 | 4.2 | 0.2 |

Referrals

*Note*: GORD—gastro-oesophageal reflux disease.

**Figure 16.2: Referral rates for GORD, 1998–00 and 2006–08 (95% CI)**

# 16.5 Therapeutic management

## Medications

There was no significant change in total medication rates (prescribed, supplied and advised) per 100 GORD problems managed between 1998–00 and 2006–08, at 95.5 (95% CI: 93.7–97.4) medications per 100 GORD problems in 1998–00 and 94.5 (95% CI: 93.3–95.7) in 2006–08. This is significantly higher than the medication rate in BEACH patients in 2006–08 of 65.7 (95% CI: 64.8–66.6) medications per 100 problems.

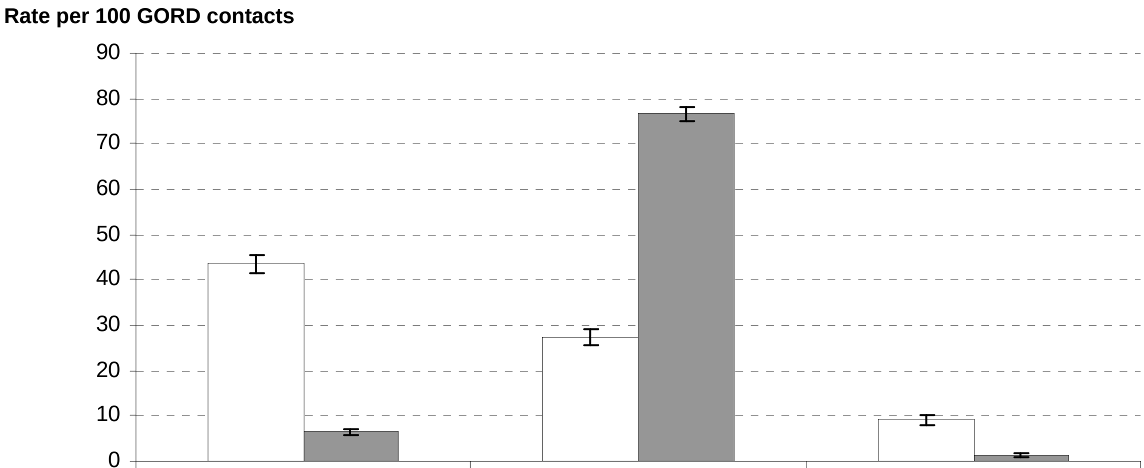
The majority of medications recorded for the management of patients' GORD were the acid suppressant agents, H2 receptor antagonists (H2RA) and proton pump inhibitors. Acid suppressant medications as a group showed no change in rate during the study period.

There was however a major shift in use between H2RAs and proton pump inhibitors between 1998–00 and 2006–08. H2RAs decreased massively in frequency of use from

43.5 (95% CI: 41.6–45.5) per 100 GORD problems in 1998–00 to 6.4 (95% CI: 5.5–7.2) in 2006–08. Proton pump inhibitors, on the other hand, increased from 27.3 (95% CI: 25.5–29.0) per 100 GORD problems in 1998–00 to 76.6 (95% CI: 75.1–78.1) in 2006–08 (Figure 16.3).

The second most frequently recorded medication group were propulsives, which decreased sharply in use from 9.1 (95% CI: 7.9–10.2) per 100 GORD problems in 1998–00 to 1.4 (95% CI: 1.1–1.8) in 2006–08.

Other therapies such as antacids, and antiregurgitants are now prescribed, advised or supplied at very low levels.




| | H2RAs | PPIs | Propulsives |
|---|---|---|---|
| 1998–00 | 43.5 | 27.3 | 9.1 |
| 2006–08 | 6.4 | 76.6 | 1.4 |

Medication type

*Note:* GORD—gastro-oesophageal reflux disease.

**Figure 16.3: Medication rates for GORD, 1998–00 and 2006–08 (95% CI)**

## Other treatments

There was no significant change in the level of clinical treatments such as advice and counselling between 1998–00 and 2006–08 which occurred at a rate of about 15 per 100 GORD problems managed. Clinical treatments were provided for new cases of GORD at about 26 per 100 new GORD problems managed, remaining unchanged over the period. Procedural treatments remained constant at about one procedure per 100 GORD problems.

# 16.6 Overview of management of GORD in 2006–08

Figure 16.4 provides an overview of the management of GORD at GP encounters during 2006–08. GORD was managed in BEACH 4,100 times in the 2 years from April 2006 to March 2008, at a rate of 2.2 per 100 encounters. This represents about 2.3 million encounters per year at which GORD is managed in general practice nationally. Some problem and concept labels in this section include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

**Age and sex of patients**

Of encounters at which GORD was managed (GORD encounters), 60% were with female patients, which is similar to the distribution for all BEACH encounters. The sex-specific rates showed similar GORD management rates of 2.3 per 100 total encounters with males and 2.1 per 100 encounters with females. The age distribution of patients at GORD encounters showed significant differences from the total BEACH data. There were higher than average proportions of patients aged 45–64 years (36.6%), 65–74 years (21.1%) and 75 years and over (21.3%). Age-specific management rates were highest among those age groups.

**Reasons for encounter**

Request for prescription was the most common reason for encounter stated by patients (38.2 per 100 of these encounters). Oesophageal disease was the reason given by patients for attendance at 19.5 per 100 GORD encounters.

**Other problems managed**

Hypertension problems were the most commonly managed problems with GORD, at a rate of 19.8 per 100 of these encounters, followed by lipid disorders at 8.9 per 100 GORD encounters. Depression and osteoarthritis (at 5.3 and 4.8 per 100 GORD encounters, respectively) were managed at significantly higher than average rates for BEACH.

**Specialist referrals**

Patients with GORD were referred at a rate of 4.2 per 100 problems, half the rate for all BEACH encounters.[13] Referrals were made most frequently to gastroenterologists.

**Pathology and imaging orders**

The pathology ordering rate of 10.6 (95% CI: 8.7–12.5) per 100 GORD problems was a third of the average for BEACH 30.3 (95% CI: 29.6–31.0). Full blood count was the most commonly ordered test, at a rate of 2.0 per 100 problems. Imaging ordering rates were also below average (2.1 per 100 GORD problems), the most common being ultrasound of the abdomen.

**Medications**

The rate of medications prescribed/supplied or advised was well above the BEACH average at 94.5 per 100 GORD problems managed. Esomeprazole was the medication most frequently prescribed, at a rate of 33.4 per 100 GORD problems managed. The proton pump inhibitors in the top 10 medications were together prescribed at a rate of 81.3 per 100 GORD problems, accounting for 87.3% of all medications prescribed for GORD.

**Clinical treatments**

The rate of other treatments provided, 13.4 per 100 of these problems, was significantly lower than the average for BEACH. Most commonly the treatment was Counselling/advice—nutrition/weight, provided at a rate of 4.7 per 100 GORD problems managed. Advice/education was provided for 2.7 per 100 GORD problems.

**The patients**

| Sex | Per cent | Rate(a) |
|---|---|---|
| Males | 42.8 | 2.3 |
| Females | 57.2 | 2.1 |

| Age group | Per cent | Rate(a) |
|---|---|---|
| 15–24 | 2.4 | 0.6 |
| 25–44 | 15.9 | 1.5 |
| 45–64 | 36.6 | 2.9 |
| 65–74 | 21.1 | 3.7 |
| 75+ | 21.3 | 3.1 |

**Medications**

*n* = 3,873 (94.5 per 100 GORD problems)

| | Rate per 100 problems(c) |
|---|---|
| Esomeprazole | 33.4 |
| Pantoprazole | 16.0 |
| Omeprazole | 15.9 |
| Rabeprazole | 11.1 |
| Ranitidine | 5.4 |
| Lansoprazole | 4.9 |
| Simethicone/Mag/Alu | 1.6 |
| Algin/Bicarb/Ca carb/Mag | 1.1 |
| Domperidone | 1.0 |
| Nizatidine | 0.7 |

## Gastro-oesophageal reflux disease (GORD)

***n* = 4,100 (2.2 per 100 patient encounters)**

**Reasons for encounter**

*n* = 7,685 (187.4 per 100 GORD encounters)

| | Rate per 100 encounters(b) |
|---|---|
| Prescription—all | 38.2 |
| Oesophageal disease | 19.5 |
| Test results | 7.8 |
| Cardiac check-up | 7.3 |
| Heartburn | 5.8 |
| General check-up | 4.3 |
| Pain, chest NOS | 4.0 |
| Abdominal pain | 4.0 |
| Pain, abdominal epigastric | 4.0 |

**Clinical treatments**

*n* = 548 (13.4 per 100 GORD problems)

| | Rate per 100 problems(c) |
|---|---|
| Counselling/advice—nutrition/weight | 4.7 |
| Advice/education | 2.7 |
| Counselling—problem* | 1.9 |

**Specialist referrals**

*n* = 171 (4.2 per 100 GORD problems)

| | Rate per 100 problems(c) |
|---|---|
| Gastroenterologist | 3.2 |
| Surgeon | 0.3 |
| Endoscopy | 0.2 |
| Paediatrician | 0.2 |

**Other problems managed**

*n* = 5,794 (141.3 per 100 GORD encounters)

| | Rate per 100 encounters(b) |
|---|---|
| Hypertension | 19.8 |
| Lipid disorders | 8.9 |
| Depression | 5.3 |
| Osteoarthritis | 4.8 |
| Diabetes | 4.6 |
| Immunisation/vaccination—all | 3.6 |
| Ischaemic heart disease | 3.2 |
| Asthma | 2.8 |
| Sleep disturbance | 2.7 |
| Back complaint | 2.6 |

**Pathology**

*n* = 435 (10.6 per 100 GORD problems)

| | Rate per 100 problems(c) |
|---|---|
| Full blood count | 2.0 |
| H. Pylori test | 1.8 |
| Liver function test | 1.1 |

**Imaging**

*n* = 86 (2.1 per 100 GORD problems)

| | Rate per 100 problems(c) |
|---|---|
| Ultrasound abdomen | 0.8 |
| Barium swallow/meal | 0.6 |
| X-ray chest | 0.3 |

(a) Specific rate per 100 encounters in each sex and age group.
(b) Expressed as a rate per 100 encounters at which gastro-oesophageal reflux disease problems was managed.
(c) Expressed as a rate per 100 gastro-oesophageal reflux disease problems managed.
*Note:* NOS—not otherwise specified.

**Figure 16.4: Management of gastro-oesophageal reflux disease, 2006–08**

## 16.7 Discussion

There is wide variance in the estimates of prevalence of GORD in the community reported in the literature. In recent unpublished studies prevalence of up to 63% are estimated (personal communication Prof T D Bolin). The variation in prevalence between studies seems to be due mainly to differences in the definition of GORD used in the studies.[2] Higher prevalence occurs particularly in developed countries, and may be associated with the reduction in H. Pylori colonisation of the gastric mucosa associated with better hygiene and greater use of antibiotics.[14] Within Australia, the lower prevalence estimated from GP encounter data[1] than that of community-based studies may indicate a significant level of unmet need for management of this condition in the Australian community. Therefore it may be expected that the management rate will continue to rise in the future.

GORD occurs commonly with other chronic problems, particularly with older patients.[11] As shown in Figure 16.4, conjoint management is quite common. The frequent occurrence of multimorbidity with GORD has significant implications for its management, and for the development of guidelines for best practice care in complex patients.

The Digestive Heart Foundation's *Gastro-oesophageal reflux disease in adults: guidelines for clinicians, 4th edition 2008* provides a guide to the investigation and management of GORD.[15] United States guidelines for 'Initial management of dyspepsia and GERD'[16], also provide a useful algorithm for management of GORD.

Both sets of guidelines suggest that it is inappropriate to undertake endoscopy on every patient with suspected GORD, and that this should only be carried out if alarm features are present. Australian GPs seem to be following this pattern of investigation since removal of the requirement to undertake endoscopy to confirm the presence of oesophagitis before prescribing proton pump inhibitors. The recent increase in Medicare-funded upper gastrointestinal endoscopy does not appear to be related to the investigation of GORD. The United States guidelines suggest that patients aged 50 years and older and with symptoms for 10 years or more should be considered for endoscopy. This may be an area in which a change in current management could be considered, given the increasing incidence of oesophageal cancer.[17,18]

The Australian guideline does not mention testing for H. Pylori and the United States guideline suggests that it is not indicated. However, patients may present with a mixed picture of GORD and dyspepsia which may reasonably lead to H. Pylori testing. The H. Pylori test rate of 1.8 per 100 GORD problems is not an unexpected response to uncertainty over the diagnosis. Patients with new presentations of GORD were tested at a higher rate of 4.3 per 100 new cases of GORD. As these are encounter rates, the per patient rate would be much higher (see Chapter 2).

Both the Australian and United States guidelines suggest the superiority of proton pump inhibitors in a therapeutic trial to establish diagnosis and in long-term therapy. The shift from H2RAs and other medications to proton pump inhibitors is consistent with current guidelines for the management of GORD.

## 16.8 Conclusion

In common with other developed countries, the prevalence of GORD is increasing in Australia. This increase in prevalence may be due to decreasing gastric colonisation by H. Pylori; however, the increasing frequency of overweight and obesity in the community may also be a contributing factor.

GORD causes significant impairment of quality of life unless effectively treated, and the financial burden of treatment is high.

GORD is a chronic problem requiring long-term drug therapy or endoscopic interventions, which are only appropriate for a small minority of patients who are not controlled on acid suppression.[15,16]

General practitioners appear to be managing almost all of the diagnosed instances of GORD; however, there appears to be a large pool of patients with probable GORD in the community not under current medical management.

General practitioner management of GORD appears consistent with both Australian and United States guidelines.[15,16]

**Suggested chapter citation**

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# Glossary

*A1 Medicare items:* Medicare item numbers 1, 2, 3, 4, 13, 19, 20, 23, 24, 25, 33, 35, 36, 37, 38, 40, 43, 44, 47, 48, 50, 51, 601, 602.

*Aboriginal:* The patient identifies himself or herself as an Aboriginal person.

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

*Analyte:* Any substance undergoing analysis, for example, the substance which a laboratory test aims to detect.

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

*Chronic problem:* see *Diagnosis/problem.*

*Commonwealth concession card:* An entitlement card provided by the Australian Government that entitles the holder to reduced cost medicines under the Pharmaceutical Benefits Scheme and a limited number of 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 which act as a second axis across all chapters.

*Consultation:* See *Encounter.*

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

- *New problem:* The first presentation of a problem, including the first presentation of a recurrence of a previously resolved problem, but excluding the presentation of a problem first assessed by another provider.
- *Old problem:* A previously assessed problem that requires ongoing care, 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 affect 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 exposures, 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.

*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).

*Indigenous:* The patient identifies himself or herself as an Aboriginal and/or Torres Strait Islander person.

*Marginal significant difference*: see S*ignificant.*

*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.
- *Continuation/old:* The medication prescribed/provided at the encounter/advised is a continuation or repeat of previous therapy for this problem.

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

*Patient status:* The status of the patient to the practice.

- *New patient*: The patient has not been seen before in the practice.
- *Old patient:* The patient has attended the practice before.

*Prescribed rates:* The rate of use of prescribed medications (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 health care system.

*Reasons for encounter:* 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 professionals, 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 of difference is measured at the 95% confidence level in this report. If the 95% confidence intervals for two results do not overlap the difference or change is regarded as statistically significant. If the 95% confidence intervals of two results do not overlap, but they butt (e.g. 95% CI: 4.5–4.7, and 95% CI: 4.7–4.9), the difference or change is regarded as marginally significant.

*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 2007–08 recording form

**BEACH (Bettering the Evaluation And Care of Health) - Morbidity and Treatment Survey - National** © BEACH General Practice & Statistics Classification Unit University of Sydney 1996 DOC ID

Encounter Number

| Date of encounter | Date of Birth | Sex | Patient Postcode |
|---|---|---|---|
| ___/___/___ | ___/___/_ _ _ _ | M ☐ F ☐ | |

**START Time**

: AM / PM (please circle)

Patient Reasons for Encounter
1.
2.
3.

| | Yes / No |
|---|---|
| New Patient | ☐ ☐ |
| Health Care/Benefits Card | ☐ ☐ |
| Veterans Affairs Card | ☐ ☐ |
| NESB | ☐ ☐ |
| Aboriginal | ☐ ☐ |
| Torres Strait Islander | ☐ ☐ |

PATIENT SEEN BY GP ☐
PATIENT NOT SEEN BY GP ☐

**Medicare Item Nos:** (if applicable)
1. ______ Workers comp paid ☐
2. ______ State Govt/Other paid ☐
3. ______ 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 | Drug status Cont. |
|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |

**Procedures, other treatments, counselling this consult** for this problem
1. Prac Nurse? ☐ 2. Prac Nurse? ☐

**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 | Drug status Cont. |
|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |

**Procedures, other treatments, counselling this consult** for this problem
1. Prac Nurse? ☐ 2. Prac Nurse? ☐

**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 | Drug status Cont. |
|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |

**Procedures, other treatments, counselling this consult** for this problem
1. Prac Nurse? ☐ 2. Prac Nurse? ☐

**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 | Drug status Cont. |
|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |

**Procedures, other treatments, counselling this consult** for this problem
1. Prac Nurse? ☐ 2. Prac Nurse? ☐

**NEW REFERRALS, ADMISSIONS** Problem(s)
1. ________ **1 2 3 4**
2. ________ **1 2 3 4**

**IMAGING/Other tests** Body site Problem(s)
1. ______ - ______ **1 2 3 4**
2. ______ - ______ **1 2 3 4**

**PATHOLOGY** Problem(s)
1. ________ **1 2 3 4**
2. ________ **1 2 3 4**
3. ________ **1 2 3 4**

**PATHOLOGY** (cont) Problem(s)
4. ________ **1 2 3 4**
5. ________ **1 2 3 4**

**Patient 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 ☐
- Once a week/fortnight ☐
- 2-3 times a week ☐
- 4+ times a week ☐

**How many 'standard' drinks do you have on a typical day when you are drinking?**

**How often do you have 6 or more standard drinks on one occasion?**
- Never ☐
- Less than monthly ☐
- Monthly ☐
- Weekly ☐
- Daily or almost daily ☐

**FINISH Time**

: AM / PM (please circle)

BA10

# Appendix 2: GP characteristics questionnaire, 2007–08

**The University of Sydney**
at Westmead Hospital

**Australian General Practice Statistics and Classification Centre**

a collaborating unit of the
**Australian Institute of Health and Welfare**

**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**. How many GPs (full time equivalents) work at this practice (including yourself)?
*(Practice = shared medical records)*

**5**. Postcode of major practice address ..

**6.** In which GP Division is this practice

______________________________

**7**. Year of graduation .............................

**8**. Place of graduation *(primary medical degree)*:

Aust ....................................................... 1
NZ .......................................................... 2
Asia ........................................................ 3
UK / Ireland............................................ 4
Other: (specify) ........................................ 5

**9**. Do you conduct any of your consultations in a language other than English?

No........................................................... 1
Yes - <25%.............................................. 2
Yes - 25 to 50%...................................... 3
Yes - >50%.............................................. 4

**10**. Are you a GP registrar (i.e. in training)?... **Yes / No**

**11**. Do you hold FRACGP ?......................... **Yes / No**

**12**. Is your major practice accredited ?........ **Yes / No**

**13**. Is there a practice nurse at your major practice address ?........................................ **Yes / No**

If yes, how many full time equivalents?

**14**. Number of general practice sessions you usually work per week?
*(1 session = ~4 hrs eg a morning session)* ....

**15**. Direct patient care hours worked per week?
(Include hours of direct patient care, instructions, counselling etc and other services such as referrals, prescriptions, phone calls etc.) .....

**16**. Over the past four weeks have you provided any patient care ....*(Circle all that apply)*

As a locum ........................................................ 1
In a deputising service .......................................... 2
In a residential aged care facility .......................... 3
As a salaried/sessional hospital medical officer..... 4
None of the above ................................................ 5

**17**. What are the normal after-hours arrangements for your practice? *(Circle all that apply)*

Practice does its own........................................1
Co-operative with other practices ...................2
Deputising service............................................3
Referral to other service (eg A&E) .................4
Other ...........................................................5
None ...........................................................6

**18**. Do you bulk bill ALL patients?............... **Yes / No**

**If No,** which groups are bulk billed?

| *(Tick those that apply)* | **All** | **Some** |
|---|---|---|
| Pensioner/Healthcare Card holders ... | ☐ | ☐ |
| Children <16 years..................... | ☐ | ☐ |
| Selected other patients ……………………... | | ☐ |

**19**. To what extent are computers used -

| (i) <u>at your major practice</u>? | (ii) <u>by you (at work)</u>? |
|---|---|
| Not at all .......................1 | Not at all ......................... 1 |
| Billing...........................2 | Test ordering .................. 2 |
| Prescribing....................3 | Prescribing ......................3 |
| Medical Records...........4 | Medical Records ............ 4 |
| Other Admin.................5 | Internet ........................... 5 |
| Internet / Email.............6 | Email ...............................6 |

(iii) <u>Prescribing / Health record software used is</u> —

______________________________

**20**. Is your major practice site a teaching practice?
*(Circle all that apply)*

for undergraduates............................................ 1
for GP registrars ............................................... 2
No.................................................................... 3

**21**. Did any of your BEACH consultations take place in an Aboriginal Community Controlled Health Service (ACCHS)?

No....................................................................1
Yes - all...........................................................2
Yes - some (which dates?) _______________ 3



*Thank you for participating in the* ***BEACH PROGRAM****.*

AGPSCC, Acacia House, Westmead Hospital, WESTMEAD, 2145.
Ph: 02 98458151 fax: 02 98458155 email: janc@med.usyd.edu.au Web http://www.fmrc.org.au

# Appendix 3: Code groups from ICPC-2 and ICPC-2 PLUS

Available from www.aihw.gov.au/publications/index.cfm/subject/19

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