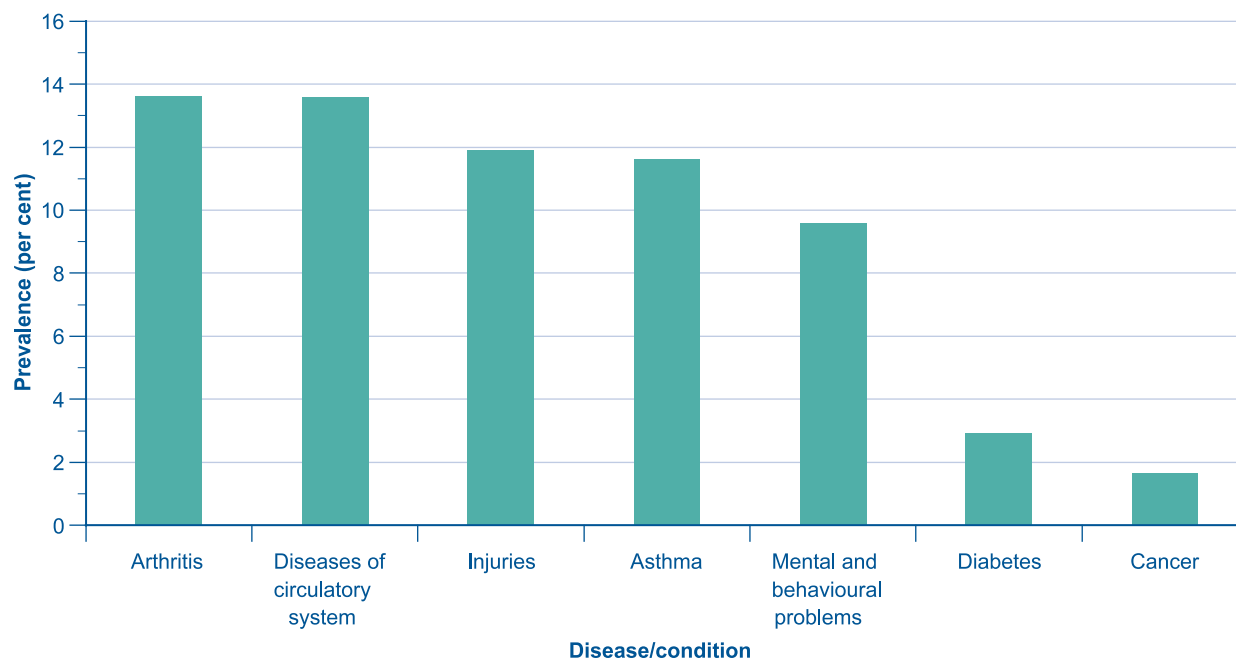


Key points

- Asthma is a chronic disease causing episodes of wheezing, chest tightness and shortness of breath due to widespread narrowing of the airways within the lungs and obstruction to airflow. The underlying problem is usually inflammation of the air passages, which tend to over-react by narrowing too often and too much in response to a wide range of triggers.
- The symptoms of asthma are variable and usually reversible, either spontaneously or with treatment.
- Some asthma-like symptoms occur in people with other diseases, particularly among the elderly and the very young. This causes problems in trying to count the number of people with asthma.
- In the late 1980s, health professionals and consumers concerned about rising prevalence, hospitalisation and mortality attributable to asthma developed a systematic approach to asthma management: the National Asthma Management Plan. In the early 1990s, the National Asthma Campaign was established as a collaboration of consumer groups and health professional bodies with the aim of improving community awareness of the problem of asthma and promoting better asthma management according to the published guidelines.
- In 1999 asthma was made a National Health Priority Area. This has resulted in a number of Australian Government-funded activities and projects to improve asthma management and care and the monitoring of asthma.
- Many state governments and non-government agencies have also implemented activities for consumers and health professionals to encourage improved asthma care.
- This report describes information on the number of people who have asthma, who receive various treatments and management strategies for asthma, who visit their GP, who go to hospital or who die due to asthma. Information has also been included on smoking and asthma, the impact of asthma on quality of life measures, and expenditure in the Australian health system for asthma.
- The report shows differences in these measures between Indigenous and other Australians, men and women, younger and older people, those who are well-off and those less well-off, and people living in major cities, regional centres and the bush.

Asthma is a National Health Priority Area for Australia because it is a common chronic condition with a substantial impact on the community and with clearly defined interventions that can reduce its impact on individuals and the community. In comparison to other National Health Priority Areas in Australia, the prevalence of asthma is similar to that of injuries, moderately less than arthritis and cardiovascular diseases and higher than mental health problems, diabetes and cancer (Figure 1.1).

Figure 1.1
Prevalence of National Health Priority Area diseases, all ages, Australia, 2001



Note: Based on self-reports of respondents. Injuries are those reported the last four weeks. All other conditions are those reported as long-term conditions.

Source: ABS National Health Survey 2001.

This report describes the status of asthma in Australia in 2005 using data from a wide range of sources. It aims to provide health professionals, health planners and policy makers, academics, consumers and interested readers with concise summaries of the latest available data and trends for asthma in Australia.

In this introductory chapter, we describe the characteristics of asthma and some of the difficulties inherent in measuring the disease in populations. We then outline the historical background from which this report has arisen and some of the activities that are in place to address asthma in Australia. The last part of this chapter provides an overview of the other sections of this report.

1.1 What is asthma?

It has long been recognised that asthma is characterised by the presence of widespread, variable airflow obstruction and by the respiratory symptoms that accompany this. Over the last 10 to 20 years, there has been increasing recognition that the pathological changes underlying this physiological abnormality are characteristic and essential components of this entity. An important corollary of this understanding is that asthma is a chronic disease. Although it may have intermittent manifestations, it is most helpful to consider the disease in terms of the underlying chronic abnormality, rather than the intermittent or episodic manifestations.

The following descriptive 'definition' of asthma has been adopted by several international expert bodies since 1997: 'Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role, in particular, mast cells, eosinophils, T lymphocytes, macrophages, neutrophils and epithelial cells. In susceptible individuals this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment.

The inflammation also causes an increase in existing bronchial hyperresponsiveness to a variety of stimuli' (DoHA: Li et al. 2002; GINA 2002; NAC 2002; National Asthma Education and Prevention Program 1997).

While this understanding of the nature of asthma enables clinicians, physiologists, pathologists, and epidemiologists to correctly identify many people with this disease, unfortunately it is not universally applicable. There are several theoretical and practical reasons for this:

- The symptoms are not unique to asthma but are shared by other diseases, particularly in the young and the elderly.
- It is rare in clinical practice or epidemiological studies to have the opportunity to elicit the pathological features of the disease.
- The lung function abnormalities that are characteristic of asthma (reversible airflow obstruction and airway hyperresponsiveness) exist in a continuum: the distinction between asthma and non-asthma in this continuum is arbitrary.
- Asthma symptoms, lung function abnormalities, airway hyperresponsiveness and airway inflammation appear to be independent factors in the description of asthma; therefore, asthma can not be described by any single one of these variables (Rosi et al. 1999).
- The disease is variable over time and hence any or all of the features may not be present on any particular occasion.
- It is rare in clinical practice or epidemiological studies to be able to measure lung function in young children (and this is the age at which most cases first arise and in which most hospitalisations are attributed to asthma).
- Certain disease entities, which share some of the features of asthma, may be classified as a type of asthma or as a separate disease entity (e.g. wheezy

bronchitis, virus-associated wheeze, chronic asthma with chronic airflow limitation, and allergic bronchopulmonary aspergillosis).

Particular problems in distinguishing asthma from non-asthma arise in young children, where recurrent virus-associated wheeze and transient early wheeze (Martinez et al. 1998) have been described. Likewise, in the elderly, asthma and chronic obstructive pulmonary disease (COPD) can have similar symptoms and overlapping physiological abnormalities (Kennedy et al. 1990; Peat et al. 1987).

Types of asthma

It is clear that asthma is not a homogeneous disease entity. Several patterns have emerged. Historically, the methods of classifying asthma have reflected the existing disease paradigms.

Most existing guidelines classify patients with asthma as having intermittent or persistent asthma (NAC 2002; National Asthma Education and Prevention Program 1997; Warner & Naspitz 1998). It is not clear whether this distinction represents a fundamental characteristic of the illness, a marker of disease severity or, possibly, a marker of the periodical nature of exposure to triggers. The last may be partially true since intermittent asthma seems to be more common in children, where it is associated with viral infections (Johnston et al. 1995), and in regions where seasonal allergens play an important role as triggers for asthma (Boulet et al. 1983). Nevertheless, the distinction between intermittent and persistent asthma does appear to have long-term prognostic significance, as does the distinction between frequent and infrequent intermittent asthma (Phelan et al. 2002).

Studies of the natural history of asthma have revealed several longitudinal patterns of asthma. For example, the Tucson birth cohort study has identified 'transient early wheeze', which presents with symptoms before age 3 that remit before age 6, 'late onset wheeze', in which children develop wheeze after age 3 years, and 'persistent wheeze', a group of children who have wheeze before age 3 that persists at least until age 6 years (Martinez et al. 1998).

Asthma is also classified according to severity. However, many of the features of asthma are responsive to therapy, particularly with corticosteroids, and hence most 'severity' classifications are actually better described as assessments of disease control. Distinctions are necessarily arbitrary but most classifications are based on the presence and frequency of daytime and night-time symptoms, the frequency of need for bronchodilator (reliever medication), and the level and variability of lung

function (NAC 2002; Reddel et al. 2000). Some classifications also incorporate information on the frequency and severity of disease exacerbations.

There are other subgroups among people with asthma that have been separately identified: for example, childhood asthma, exercise-induced asthma, aspirin-sensitive asthma and occupational asthma. While each of these groups has some features that distinguish it from other groups of people with asthma, there is no evidence that these distinctions represent fundamental characteristics of asthma.

Risk factors for asthma

While the underlying causes of asthma are still not well understood, there are several recognised factors that may increase the risk of developing the condition or trigger asthma symptoms in people who already have the condition. Risk factors for asthma may be broadly classified as:

- *constitutional factors* which predispose to the development of asthma or particular outcomes of asthma. The presence of family members with asthma, certain genetic mutations, sex, age group, the presence of an atopic (allergic) disposition are all examples of such factors that serve to identify at-risk individuals and also to generate hypotheses about the underlying mechanisms of the disease. As they cannot be modified by intervention, surveillance of these factors is of limited value; and
- *environmental exposures or other factors* which are associated with an increased risk of acquiring asthma or having certain adverse outcomes of the disease. These exposures serve as potential targets for interventions to prevent the development of asthma or to improve the course of the disease because exposure to such factors can be modified and monitored. Hence, surveillance of these factors may be valuable and informative.

Environmental and other related factors, such as diet and lifestyle, may:

- affect the risk of acquiring asthma;
- change the course of the disease; or
- trigger attacks of airway narrowing and symptoms.

There is a wide range of factors that trigger airway narrowing and symptoms in people with asthma, including exercise, viral infections, irritants (including smoking and indoor and outdoor air pollutants), specific allergens (for example, house dust mites and mould spores), and certain ingested food preservatives. In most cases, apart from viral infections and air pollutants, avoidance of exposure to these

factors or control of symptoms before or after exposure is not particularly problematic for people with asthma. Apart from environmental tobacco smoke exposure in children and smoking in adults, which is an irritant exposure, this publication does not report on these factors.

The environmental causes of asthma have been extensively investigated and reviewed (NSW Health Department 1997; Peat 1994; Rural and Regional Health and Aged Care Services Division 2004). The subject remains controversial with conflicting evidence on the effects of exposure to pets and other allergen sources, the protective effects of breast-feeding and other aspects of diet and feeding, overweight and obesity, and the role of infections in childhood. A number of randomised controlled trials evaluating the effects of specific interventions for the prevention of asthma are currently underway. Without clear evidence of an important, avoidable causal role in asthma, these factors are not suitable targets for surveillance and have not been included in this report.

Exposure to occupational allergens has been conclusively linked both to the development of asthma, *de novo*, and to progression of the disease (Venables & Chan-Yeung 1997). Since this is a potentially avoidable cause of asthma, exposure to occupational allergens and the occurrence of occupational asthma are important targets for surveillance. Unfortunately, there are no comprehensive data on the incidence or prevalence of occupational asthma in Australia at the present time (Baker et al. 2004).

1.2 Responses to asthma in Australia

Historical background

Asthma has long been recognised as a major problem in Australia. In the late 1980s, health professionals, consumers and governments shared a common concern about rising morbidity and mortality attributable to this illness (Health Targets and Implementation Committee 1988; NHMRC 1988). Although inhaled corticosteroids had been available for the treatment of asthma since the early 1970s (Anon. 1972), it was not until around the late 1980s that compelling evidence of their effectiveness in the long-term treatment of asthma became available (Haahtela et al. 1991). Also at this time, consensus developed around the value of a systematic approach to asthma management and Australian respiratory physicians led the world in publishing a national asthma management plan (Woolcock et al. 1989).

It was against this background of rising concern about the problem of asthma, increasing awareness of the value of new approaches to treatment, recognition that information about these new approaches was not being disseminated or implemented, lack of strategies to inform people with asthma, and lack of national coordination that the National Asthma Campaign (NAC) was established (Pierce & Irving 1991). It arose as a collaboration between the Thoracic Society of Australia and New Zealand, the Royal Australian College of General Practitioners, the Pharmaceutical Society of Australia and the Asthma Foundations of Australia, with the aim of improving community awareness of the problem of asthma and promoting better asthma management according to the published guidelines (Woolcock et al. 1989). Among other initiatives, in 1988 the NAC undertook the first national public education campaigns, a mix of television and radio advertising, supported by substantial public relations activities in 1988 (Bauman et al. 1993), 1991, 1992, 1993 (Comino et al. 1997) and 2002 (Whorlow et al. 2003).

During the 1990s it became clear that the NAC's National Asthma Strategy Goals and Targets could not be implemented without Australian Government support. In collaboration with many significant stakeholders in asthma, public health and government, the NAC worked to have asthma made a National Health Priority Area in 1999. Since then both the Australian and state governments have made a significant commitment to addressing the challenges by initiating a range of activities described in the following sections.

Australian Government initiatives

In 1999, Australian Health Ministers designated asthma as a National Health Priority Area. The National Health Priority Action Council and its expert advisory groups oversee the National Health Priority Areas initiative. The National Asthma Reference Group (NARG) is the expert advisory group for asthma.

The Asthma Management Program, which was announced in the 2001–02 Australian Government Budget, aimed at encouraging best practice asthma management. A major specific objective of the Program was to improve the quality of care provided by general practitioners to people with moderate to severe asthma. The four year Program is managed by the Department of Health and Ageing (DoHA).

Approximately two-thirds of the budget for the Asthma Management Program was allocated for payment of financial incentives, through DoHA's Practice Incentives Program (PIP), to encourage GPs to

implement the Asthma 3+ Visit Plan. The Plan involves a series of three GP visits by patients with moderate to severe asthma, for the purpose of diagnosis and assessment, patient education, and development and review of a written asthma action plan. The balance of the Program's funds has been made available for a range of other initiatives relating to the Asthma 3+ Visit Plan or to the broader objectives of the Asthma Management Program. These have included, for example:

- the Australian System for Monitoring Asthma;
- an Asthma Community Support and Grants Program;
- the Asthma Innovative Management initiative;
- the Asthma Friendly Schools Program; and
- a range of professional education activities.

Australian System for Monitoring Asthma

At the time of the commencement of the NHPA initiative for asthma, it was recognised that there was a need for a systematic approach to monitoring asthma in Australia. This had also been proposed in the NAC's National Asthma Strategy Implementation Plan. Hence, the Australian Government Department of Health and Ageing funded the Australian Institute of Health and Welfare (AIHW) to establish and manage such a system, which was to include a national monitoring centre. The Australian Centre for Asthma Monitoring (ACAM) was established in February 2002 as a collaborating unit of the AIHW as part of what has become known as the Australian System for Monitoring Asthma (ASMA). ACAM is based at the Woolcock Institute of Medical Research, Sydney. The Centre aims to assist in reducing the burden of asthma in Australia by developing, collating and interpreting data relevant to asthma prevention, management and health policy.

ACAM's tasks have included:

- consulting with a broad range of stakeholders about available asthma data and information needs through two series of state/territory workshops, in 2002 and in 2004;
- advising on the development of national indicators for asthma. After consultations with stakeholders and a review of available data sources, a report and recommendations were published (Baker et al. 2004);
- producing several other reports (all available from <www.asthamonitoring.org> or <www.aihw.gov.au>):

- *Asthma in Australia 2003* (ACAM 2003) and this update for 2005. Using the recommended national asthma indicator set as a basis, these reports provide up-to-date information on the number of people with asthma in the population, its impact on individuals and the community, risk factors for asthma, a description of current management of asthma at a population level and health service utilisation, and expenditure related to asthma.
- *Measuring the Impact of Asthma on Quality of Life in the Australian Population* (ACAM 2004). This report includes recommendations for measuring quality of life in populations with asthma at a population level.
- *Enhancing Asthma-related Information for Population Monitoring: Asthma Data Development Plan 2005* (ACAM 2005a). This report provides details of the data development required to be able to monitor the national asthma indicators proposed by ACAM in an effective manner.
- *Expenditure and Burden of Disease Due to Asthma in Australia* (ACAM 2005b). This report describes the pattern and distribution of health care expenditure in Australia that is attributable to asthma. It also reports on the burden of asthma in terms of premature death and years of life lived with disability due to asthma.

In the future, ACAM will continue to work with data users and providers to further enhance the value of asthma monitoring data for their broad range of purposes. This may include recommendations for the measurement of new indicators and more detailed analyses of data as they become available.

State government asthma programs

Concurrently with the activities of the Australian Government, some state health authorities have implemented special projects to improve the management of asthma in their jurisdictions based on substantial advances in knowledge about the most effective management of this disease.

New South Wales

In New South Wales, the principal activity of the government in relation to clinical care of patients with asthma is the New South Wales Clinical Services Framework for Chronic Respiratory Disease. This forms part of the Chronic and Complex Care Program, established under the New South Wales Government's Action Plan for Health. Important components of

this program include the establishment of agreed state-wide standards of care for patients with asthma and the integration of care across the continuum from hospital to the community setting. The NSW Department of Health also includes asthma as one of the priority areas monitored in its continuous program of health interview surveys. Finally, asthma is a target disease for activities in environmental health, including the issuing of health warnings when high air pollution days are forecast.

Queensland

Queensland Health has developed the Asthma Health Outcomes Plan 2001–2006, focusing on reducing asthma severity and risk factors and optimising clinical management, as well as improving quality of life and health outcomes for asthma. Asthma among Aboriginal and Torres Strait Islander peoples has been identified as a key health indicator in the Social Determinants of Health 2004 developed within Queensland Health. Asthma is also a target condition in the annual community omnibus survey in Queensland. Currently, Queensland Health is developing a Chronic Disease Prevention and Management Implementation Initiative, which includes asthma.

South Australia

The Department of Health in South Australia has an active surveillance program monitoring key asthma-related variables. South Australia also has a collaborative research program with partners from Department of Health, universities and major teaching hospitals. The program includes the omnibus surveys and the North West Adelaide Health Study (NWAHS), a biomedical cohort study, in which over 4,000 participants are currently being assessed for the second time. Early results from the initial analysis highlight the unidentified asthma burden in older people, indicating the need for an awareness program. In 2003–04, the Department of Human Services provided financial assistance to Asthma South Australia to develop a self-management education program. This proved successful for many people but also highlighted the deficiencies in these programs in meeting the needs of children and carers.

Tasmania

The Tasmanian approach is to embed improved asthma management skills in the clinical/community setting while dealing with acute asthma episode prevention through a range of policies, partnerships and legislative initiatives. Within hospital and ambulances services there are initiatives to improve

asthma prevention and management including use of peak flow meters and asthma action plans. Self-management of asthma also forms part of the Department of Health and Human Services' self-management education strategy. The Tasmanian Government funds the Asthma Foundation of Tasmania to assist it in providing specific asthma prevention and management services across the state. The Asthma Foundation has been providing Emergency Asthma Management Training to teachers and childcare staff, assisted by legislation enabling provision of accredited training to undertake emergency administration of medications. Tasmania also has strategies in place to reduce smoking rates and to reduce exposure to particulates in the form of wood smoke emissions.

Victoria

The Department of Human Services in Victoria has established an Asthma Expert Advisory Group, bringing Victorian asthma experts together to advise the Department on relevant health policy and program priorities. An evidence-based review of Public Health Interventions for Asthma has been undertaken to assist policy makers and service deliverers in the planning and delivery of public health asthma prevention and management initiatives.

As a result of this review and advice from the Asthma Expert Advisory Group, a number of key projects have been funded including: the prevention, detection and surveillance of the disease burden arising from occupational asthma; introduction of training in Emergency Asthma Management for staff in disability residential services; smoking prevention projects in Indigenous communities; projects to improve the community care of people with asthma; and reducing hospital admissions for asthma, funded through the Primary Care Partnership (PCP) Strategy and the Hospital Admission Risk Program (HARP). The Victorian Health Information Surveillance System continues to monitor the prevalence and management of asthma in the Victorian population.

Western Australia

In Western Australia, a multi-disciplinary group of experts is developing a Chronic Respiratory Disease Clinical Service Improvement Framework. This evidence-based framework has a specific focus on chronic obstructive airways disease (COPD) and asthma and seeks to standardise best practice care across Western Australia and to realign health care services around the needs of patients and their carers. Membership of this group comprises senior

respiratory consultants from the four teaching hospitals, asthma educators, general practitioners (GPs), nurse consultants, physiotherapists, academics and members of the Thoracic Society, Asthma Western Australia, Australian Lung Foundation and corresponding rural representatives.

National Asthma Council Australia

The National Asthma Campaign was renamed the National Asthma Council Australia (NAC) in 2001 and now includes the Australasian Society of Clinical Immunology and Allergy. It continues to play a major role in professional and community education about asthma and working with state and federal governments to develop policy to improve asthma care and asthma research in Australia (DoHA 2003; Whorlow et al. 2003).

In consultation with all relevant stakeholders the NAC and the DoHA are developing the National Asthma Strategy 2, which builds on the earlier National Asthma Strategy and the National Asthma Action Plan and indicates what still needs to be done to improve the community's capacity to prevent asthma and care for people with asthma.

With funding from the DoHA, the NAC continues to provide a range of professional training and support to encourage the use of evidence-based methods of diagnosis and treatment for people with asthma. They are currently working through Divisions of General Practice to train GPs and practice nurses to support the Asthma 3+ Visit Plan and are conducting a virtual roadshow on childhood asthma management for GPs.

The NAC also make available a compendium of information, from consumer fact sheets to scientific reviews of the evidence related to asthma treatments (e.g. 'Inhaled Corticosteroids: A Practical Perspective' for GPs, pharmacists and asthma educators). This information is available in hard copy or via their website at <www.nationalasthma.org.au>.

Asthma Foundations of Australia

The Asthma Foundations of Australia is an association of state-based Asthma Foundations throughout Australia and provides programs and activities that work towards eliminating asthma as a major cause of ill-health and disruption within the community as well as educating people regarding optimum management of the condition.

An important highlight for the Asthma Foundations in 2004 was the 'Be Active for Asthma' campaign, which promoted the message that asthma is a condition that can be successfully managed. It was launched

for National Asthma Week in September 2004 with champion swimmer Sam Riley, who has had chronic asthma since childhood, as its patron.

The 'Asthma Friendly Schools' program focuses on education in the school environment about asthma symptoms and triggers and how to manage asthma. By the end of 2004, approximately 7,400 schools had registered in the program and become 'asthma friendly'.

A currently planned activity is the 'Asthma in older Australians' project, which proposes to deliver a general awareness and education program throughout Australia over a 12-month period.

Another important service provided by the Foundations is the Asthma Information Line. This offers independent advice, education, counselling and support for people with asthma and their carers.

1.3 Overview of this report

The complexity that underlies asthma poses major problems in identifying a single health surveillance definition for the disease. For some monitoring purposes there are limitations in the extent to which criteria used for the clinical diagnosis of asthma can be implemented. In particular, in cross-sectional surveys it is usually not possible to observe subjects at the time of disease exacerbations or examine changes over time, both of which are important elements in the clinical diagnostic process. On the other hand, in surveillance studies it is feasible to implement one or more criterion-based measurements and, hence, overcome much of the variability inherent in the clinical diagnostic process.

In the future, it is hoped that improved understanding of the nature of asthma, together with the evolution of data monitoring systems, will mean that the available data will accurately reflect the complex nature of this disease. For this present report, we have taken a pragmatic approach to evaluating and reporting the data that are currently available. While those data may not be ideal, we believe that, interpreted with due care, they do provide a valuable insight into the levels, trends and patterns relating to asthma in Australia in 2005.

The scope of this report is based on the indicator framework for asthma, initially proposed in August 2000 (AIHW 2000) and recently revised (Baker et al. 2004). In this report, we have included a focus chapter on asthma in children (Chapter 2). This draws together information from a range of sources to highlight the specific impacts of asthma in those aged 0 to 18 years. The remainder of the report contains data for all age

groups on disease prevalence (Chapter 3), mortality (Chapter 4), health service utilisation (Chapter 5), asthma management including the application of asthma action plans, use of pharmaceuticals and measurement of lung function (Chapter 6), exposure to smoking and environmental tobacco smoke among people with asthma (Chapter 7), quality of life and markers of asthma control (Chapter 8) and expenditure on asthma (Chapter 9). The report describes recent time trends and seasonal patterns in these indicators and, where data are available, examines differences between age groups, between males and females, between socioeconomic groups, and between urban, rural and remote populations. Data for Aboriginal and Torres Strait Islander Australians and for people of culturally and linguistically diverse backgrounds are also presented where these are available. Finally, for some of the indicators, comparisons among states and territories and with selected overseas countries are described.

An outline of data sources, classifications and analysis methods is included in Appendix 1, and Appendix 2 contains statistical data tables. A full description of the data sources can be found in the report *Review of Proposed National Health Priority Area Asthma Indicators and Data Sources* (Baker et al. 2004), available at <www.asthmamonitoring.org>.