

NATIONAL ASTHMA STRATEGY 2018



Title: National Asthma Strategy 2018

ISBN: 978-1-76007-338-1

Online ISBN: 978-1-76007-337-4

Publications Number: 1 1983

Creative Commons Licence



This publication is licensed under the Creative Commons Attribution 4.0 International Public License available from <https://creativecommons.org/licenses/by/4.0/legalcode> (“Licence”). You must read and understand the Licence before using any material from this publication.

Restrictions

The Licence may not give you all the permissions necessary for your intended use. For example, other rights (such as publicity, privacy and moral rights) may limit how you use the material found in this publication.

The Licence does not cover, and there is no permission given for, use of any of the following material found in this publication:

- the Commonwealth Coat of Arms. (by way of information, the terms under which the Coat of Arms may be used can be found on the Department of Prime Minister and Cabinet website <http://www.dpmc.gov.au/government/commonwealth-coat-arms/>);
- any logos and trademarks;
- any photographs and images;
- any signatures; and
- any material belonging to third parties. The third party elements must be included here or have a footnote reference throughout the document showing where they are

Attribution

Without limiting your obligations under the Licence, the Department of Health requests that you attribute this publication in your work. Any reasonable form of words may be used provided that you:

- include a reference to this publication and where, practicable, the relevant page numbers;
- make it clear that you have permission to use the material under the Creative Commons Attribution 4.0 International Public License;
- make it clear whether or not you have changed the material used from this publication;
- include a copyright notice in relation to the material used. In the case of no change to the material, the words “© Commonwealth of Australia (Department of Health) 2018” may be used. In the case where the material has been changed or adapted, the words: “Based on Commonwealth of Australia (Department of Health) material” may be used; and
- do not suggest that the Department of Health endorses you or your use of the material.

Enquiries

Enquiries regarding any other use of this publication should be addressed to the Branch Manager, Communication Branch, Department of Health, GPO Box 9848, Canberra ACT 2601, or via e-mail to copyright@health.gov.au

NATIONAL ASTHMA STRATEGY 2018

Development of the National Asthma Strategy 2018 was led by the National Asthma Council Australia, in partnership with Asthma Australia and with funding from the Australian Government Department of Health.

Contents

Foreword	1	Objective 5: Promote research, evidence and data	16
Executive Summary.....	2	Monitoring progress	17
Introduction	3	Acknowledgements	18
The approach	4	Appendix 1: Asthma policy context	20
The challenge of asthma	6	Appendix 2: Health, social and economic impacts of asthma	22
Objective 1: Support effective self-management practices	10	Appendix 3: Key challenges facing asthma	27
Objective 2: Develop the health professional workforce	11	References	30
Objective 3: Enhance asthma care and management.....	13		
Objective 4: Create supportive community environments	14		

Foreword

The National Asthma Strategy 2018 (the Strategy) builds on the considerable progress made in asthma over the past three decades and leverages our strengths as a nation to continue to address the impact which asthma – one of Australia’s most widespread chronic health conditions – is having on the community.

Aligned with the National Strategic Framework for Chronic Conditions, and the Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013-2023, the Strategy outlines a targeted and comprehensive approach to optimise asthma diagnosis and management. With an emphasis on Aboriginal and Torres Strait Islander people and other priority populations, the Strategy focuses on areas where the biggest gaps between evidence and practice lie, and where the potential for impact is greatest. Increasing the uptake of asthma action plans for adults and children is a focus, as we strive to achieve the biggest gains in

improving patient quality of life, and reducing asthma morbidity and its associated costs.

Development of the Strategy is also occurring at a time of other significant reforms taking place within the Australian health care system. The results of these reforms are likely to affect any future roll-out of activity associated with the Strategy.

The Strategy is underpinned by a whole-of-system approach that has the person with asthma and their caregivers at the centre.

Support for research into the causes of asthma and finding a cure is an integral component of the Strategy.

The Strategy aims to significantly reduce the impact of asthma and other chronic conditions on individuals, the community and the economy, and take Australia to the next stage of improvement in asthma outcomes.

Dr Jonathan Burdon AM

Chairman
National Asthma Council Australia

Dr Simon Bowler

Chairman, Medical and Scientific Advisory
Committee
Asthma Australia

Executive Summary

The National Asthma Strategy 2018 (the Strategy) aims to outline Australia's national response to asthma and inform how existing limited health care resources can be better coordinated and targeted across all levels of government. This Strategy identifies the most effective and appropriate interventions to reduce the impact of asthma in the community and continue to be an international leader in asthma prevention, management and research.

Overcoming the many barriers to improving asthma diagnosis and management requires a multi-sectoral response that has the person with asthma and their caregivers at the centre. This Strategy provides guidance for collaborative efforts by governments and other parts of the community, including people with asthma, health care professionals, non-government organisations, researchers, families, carers, communities and industry, to improve asthma control and patient quality of life and reduce asthma morbidity and its associated costs and further reduce asthma mortality.

The goal of the Strategy is to reduce the health, social and economic impacts of asthma with a targeted and comprehensive approach to optimise asthma diagnosis and management, including within the Aboriginal and Torres Strait Islander population and other priority populations. To achieve this, the Strategy outlines five high-level objectives with potential areas for action. While the Strategy is not an action plan and does not mandate any specific activities, it does include potential initiatives that may be considered by governments and health organisations in planning any future action relating to asthma and other chronic respiratory conditions.

The five objectives of this Strategy are:

1. Support effective self-management practices
2. Develop the health professional workforce
3. Enhance asthma care and management
4. Create supportive community environments
5. Promote research, evidence and data.

The objectives fall under a number of guiding principles which will help to align and focus effort. These guiding principles need to be incorporated into any future action to address asthma.

Enabling factors which influence the ability to achieve the objectives include governance and leadership, health workforce, health literacy, research, data and information, technology and resources.

This Strategy responds to the unique challenges of asthma in Australia. Asthma is one of the most common chronic conditions in Australia, with prevalence and mortality rates that are high by international comparison. Asthma remains a significant cause of ill health, disability and poor quality of life in Australia. As is the case with many chronic conditions, asthma is markedly overrepresented in the Aboriginal and Torres Strait Islander population.

Australia is a world leader in the asthma field and an active member of the global asthma community. This Strategy builds on the considerable progress that Australia has made in asthma over recent decades and builds on our strengths as a nation in order to realise further improvements in asthma outcomes.

The National Asthma Council Australia led the development of this Strategy, in partnership with Asthma Australia, and with funding from the Australian Government Department of Health. This Strategy has been informed by the expert advice of the National Asthma Strategy Advisory Group and consultations with key stakeholders and the community.

This Strategy was developed in consultation with state and territory jurisdictions via the Community Care and Population Health Principal Committee, the National Aboriginal and Torres Strait Islander Health Standing Committee, the Australian Health Ministers' Advisory Council) and the Council of Australian Governments.

Future action to address asthma will involve collaboration with stakeholders across all levels of governments, the health sector and relevant organisations.

Introduction

The National Asthma Strategy 2018 (the Strategy) is an opportunity to articulate a shared goal for reducing the impact of asthma on the community; identify effective, evidence-based priority areas for action; and maximise the efficient use of health care resources. This Strategy aims to better coordinate health resources across all levels of government and to focus these resources where they are needed most.

There is currently no cure for asthma. However, good management can control the disease and prevent symptoms from occurring or worsening (1).

This Strategy focuses on improving asthma control in people with asthma, as this is where the biggest gap between evidence and practice lies, and where the potential for reducing the impact of asthma is greatest. Best practice asthma care is both effective and efficient. By optimising asthma diagnosis and management, significant gains can be achieved in patient quality of life and substantial reductions in asthma morbidity and associated costs.

In terms of prevention, the emphasis of the Strategy is on the reduction of asthma risk across the life course, and timely and appropriate asthma diagnosis and management (secondary and tertiary prevention only). The Strategy aims to strengthen the evidence base for asthma prevention as there is currently no reliable evidence for effective interventions to prevent the onset of asthma (primary prevention) (1). In accordance with this focus on secondary and tertiary prevention, the Strategy often refers to people with asthma as *patients*.

Asthma affects all Australians, but some populations are disproportionately affected. The Strategy includes a strong emphasis on improving asthma control in the Aboriginal and Torres Strait Islander population and other priority populations.

This Strategy is also an opportunity to align with policies at the jurisdictional, national and international levels. It is expected that jurisdictional and regional health policies to address asthma will evidence links between local policy, priorities and outcomes and this national Strategy.

At a national level there is considerable focus on the prevention and management of chronic conditions. This Strategy has been designed to align with, and support, the policy directions in the National Strategic Framework for Chronic Conditions (the Framework) (2), which provides the overarching national policy for the prevention and management of chronic conditions in Australia. Asthma often occurs alongside (and shares risk factors with) other chronic conditions. Potential initiatives in this Strategy aim to improve outcomes for

asthma and the conditions that exist alongside asthma and which can affect it.

Further, this Strategy also aligns with the Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013-2023 – Domain One: Health System Effectiveness (3), and international policies including the Global Action Plan for the Prevention and Control of Noncommunicable Diseases developed by the World Health Organization in 2013 (4), and the Global Strategy for Asthma Management and Prevention developed by the Global Initiative for Asthma in 2016 (5). See Appendix 1 for more information on the asthma policy context.

The health care system is subject to ongoing national reform, such as the establishment of Primary Health Networks, redevelopment of the My Health Record, and the Healthier Medicare Initiative. Future action to address asthma will be informed by this work.

The Strategy is not an action plan. The Strategy does incorporate examples of initiatives that could be undertaken in order to drive improvements in the treatment and management of persons affected by asthma, however, the introduction of any of these measures is not mandated and would require the support and agreement of jurisdictions to implement.

Purpose

This Strategy supersedes previous national asthma strategies (6-8) as the overarching strategy to reduce the impact of asthma in Australia. The Strategy 2018 sets out the strategic directions and key actions for a coordinated national response to asthma diagnosis and management. As a national strategy for a specific chronic condition, the Strategy has been designed to align with, and support, the policy directions in the Framework (2), which provides the overarching national policy for the prevention and management of chronic conditions in Australia.

Audience

This Strategy has been developed for policy makers at all levels of government, non-government organisations such as national peak bodies, stakeholder organisations, researchers and health professionals who advocate for and provide asthma care.

The approach

The Strategy articulates a goal supported by five high-level objectives. Each objective contains potential areas for action informed by the expert advice of the National Asthma Strategy Advisory Group and consultations with key stakeholders and the community.

This Strategy includes principles to guide action within the objectives and common enablers to achieve them. The enablers represent cross-cutting themes that will strengthen efforts across each of the objectives.

Goal

To reduce the health, social and economic impacts of asthma with a targeted and comprehensive approach to optimise asthma diagnosis and management.

Principles

In line with the Framework (2), this Strategy is underpinned by eight guiding principles. These principles are expected to guide future action to address asthma and other chronic respiratory conditions.

- Equity – all Australians, including Aboriginal and Torres Strait Islander people and other priority populations, receive culturally safe and appropriate, high quality health care.
- Collaboration and partnerships – identify linkages and act upon opportunities to cooperate and partner responsibly to achieve greater impacts than can occur in isolation.
- Access – high standard, appropriate support and services are available, accessible and affordable for all Australians.
- Evidence-based – rigorous, relevant and current evidence informs best practice and strengthens the knowledge base to effectively prevent and manage asthma and other chronic conditions.
- Person-centred approaches – the health system is shaped to recognise and value the needs of individuals, their carers and their families, to provide holistic care and support.
- Sustainability – strategic planning and responsible management of resources delivers long-term improved health outcomes.
- Accountability and transparency – decisions and responsibilities are clear and accountable, and achieve best value with public resources.
- Shared responsibility – all parties understand, accept and fulfil their roles and responsibilities to ensure enhanced health outcomes for all Australians (2).

Enablers

In line with the Framework (2), this Strategy draws on seven enablers that will assist in achieving the goal of this Strategy:

- Governance and leadership – supports evidence-based shared decision-making and encourages collaboration to enhance health system performance.
- Health workforce – a suitably trained, resourced and distributed workforce is supported to work to its full scope of practice and is responsive to change.
- Health literacy – people are supported to understand information about health and health care, to apply that information to their lives and to use it to make decisions and take actions relating to their health.
- Research – quality health research accompanied by the translation of research into practice and knowledge exchange strengthens the evidence base and improves health outcomes.
- Data and information – the use of consistent, quality data and real-time data sharing enables monitoring and quality improvement to achieve better health outcomes.
- Technology – supports more effective and accessible prevention and management strategies and offers avenues for new and improved technologically driven initiatives.
- Resources – adequate allocation, appropriate distribution and efficient use of resources, including funding, to address identified health needs over the long-term (2).

The table below lists the components of this Strategy.

Table 1: Components of the Australian National Asthma Strategy 2018

Goal
To reduce the health, social and economic impacts of asthma with a targeted and comprehensive approach to optimise asthma diagnosis and management.
Principles
<ul style="list-style-type: none"> ▪ Equity for all Australians – including Aboriginal and Torres Strait Islander people ▪ Collaboration and partnerships ▪ Access ▪ Evidence-based ▪ Person-centred approaches ▪ Sustainability ▪ Accountability and transparency ▪ Shared responsibility
Objectives
<ol style="list-style-type: none"> 1. To support effective self-management practices through increasing patient knowledge, confidence and skills 2. To ensure consistent, best practice asthma care through improving health professional adherence to treatment guidelines for asthma diagnosis and management 3. To enhance asthma care and management by creating an integrated, equitable and accessible health care system 4. To promote health and reduce asthma risk through supportive community environments 5. To improve asthma prevention, diagnosis and management through increased support for research, evidence and data
Enablers
Factors which influence the ability to achieve success such as governance and leadership, health workforce, health literacy, research, data and information, technology and resources.

The challenge of asthma

Asthma defined

Asthma is a common, chronic respiratory disease. People with asthma experience episodes of wheezing, breathlessness and chest tightness due to widespread narrowing of the airways.

The symptoms of asthma are usually reversible, either spontaneously or with treatment, and may sometimes be absent for weeks or months at a time. On the other hand, asthma can have a severe adverse impact on quality of life, and patients can experience episodic flare-ups (exacerbations) of asthma that may be life-threatening (5, 9).

The underlying causes of asthma are still not well understood, although there is evidence that environmental and lifestyle factors, as well as genetic factors such as an allergic tendency, increase the risk of developing asthma (9).

There is currently no reliable evidence for effective interventions to prevent the onset of asthma, and no cure for asthma (1). However, good management can control the disease and prevent symptoms from occurring or worsening.

Asthma is one of several chronic conditions that are prevalent in Australia but, unlike most other chronic conditions such as arthritis or cardiovascular disease, it is not progressive – that is, it does not typically worsen with increasing age (9).

Comorbid conditions

Asthma commonly coexists with other chronic conditions. According to the Australian Health Survey 2011–12, 57.5% of people with asthma had another chronic condition, and nearly 30% had two or more chronic conditions (10).

The presence of one or more comorbid conditions in people with asthma is likely to compromise their quality of life and may complicate the management of asthma. People with asthma have a higher prevalence of:

- Arthritis
- Back problems
- Cancer
- Cardiovascular disease/diseases of the circulatory system (CVD)
- Chronic obstructive pulmonary disease (COPD)
- Diabetes
- Mental health problems (10).

Additional chronic conditions that are commonly found in people with asthma, and that can impact on asthma, include allergic rhinitis, obesity, obstructive sleep apnoea, nasal polyps (soft, painless, non-cancerous growths) and gastro-oesophageal reflux disease (10).

Asthma affects people of all ages; however, many of the people with asthma and comorbid conditions are older Australians, reflecting the fact that chronic conditions are more prevalent in older age groups (10). Older people with asthma often suffer from more than one chronic respiratory condition as well as experiencing acute respiratory conditions.

Approximately 15–20% of people with a diagnosis of asthma or COPD have both conditions (11). People with both asthma and COPD experience significantly worse health outcomes than those with asthma or COPD alone (12).

The conditions that may affect asthma are presented in Figure 1 (1).

Asthma shares a number of risk factors with other chronic conditions. Modifiable risk factors for asthma include tobacco use, exposure to environmental hazards, being overweight and/or obese and a sedentary lifestyle (9, 13). Evidence is emerging that thunderstorms may trigger asthma in people who have never experienced asthma before, particularly among people with a history of hay fever and rye grass allergy (14–17).

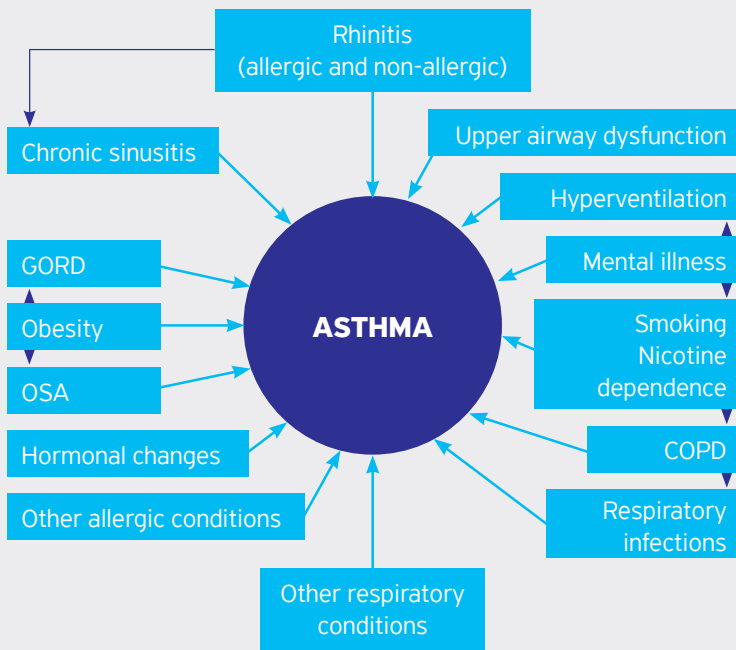
The impact of asthma

Asthma is one of the most common chronic conditions in Australia, with prevalence rates that are high by international comparison (9). In 2016, it was estimated that 10.8% of the population had asthma – that is, around one in ten Australians (10).

Despite asthma affecting around 2.5 million Australians, there is a widespread misperception that it is no longer a problem in Australia, especially following the marked decrease in asthma mortality from its peak in the late 1980s (18).

The *Australian Burden of Disease Study 2011* (19), however, illustrates that improvements are still needed in order to ensure improved health outcomes for Australians affected by asthma. In 2011, asthma was the 11th largest cause of disability adjusted life years (DALYs) and the 5th leading cause of non-fatal disease burden, being responsible for around 100,000 years lived with a disability (YLDs) (19).

Figure 1: Conditions that may affect asthma symptom control, risk or management (25)



GORD: gastro-oesophageal reflux disease;
OSA: obstructive sleep apnoea;
COPD: chronic obstructive pulmonary disease

Asthma remains a significant cause of ill health, disability and poor quality of life in Australia. Around 2.5 million Australians have asthma, and poor control of this chronic condition is common.

In 2015, there were 421 deaths due to asthma, which is high by international standards (9, 20).

People with chronic conditions, such as asthma, experience a significant burden associated with the treatment of their condition and are also affected by psychosocial issues (21). Asthma has a long-term impact on quality of life, and people with asthma may live for a long period of time with its associated disability (22).

It is difficult to estimate the total economic and social impact of asthma. The total annual costs of asthma, including indirect costs such as lost productivity, were calculated in a recent report by Deloitte Access Economics as \$27.9 billion (23).

More information on the health, social and economic impacts of asthma is presented in Appendix 2.

Australia’s strengths and key challenges

Australia is a world leader in the asthma field and an active member of the global asthma community. Asthma management in Australia has made considerable progress over recent decades, most notably the marked decrease in asthma mortality. Australia is in a strong position to realise further improvements in asthma

outcomes based on its past progress and current strengths which include:

- World-leading treatment guidelines – *Australian Asthma Handbook* (1)
- Availability of effective therapies and adoption of different management strategies
- Government commitment and ongoing funding since 2001
- World-leading asthma researchers and health professionals
- Strong stakeholder coordination and collaboration
- Strong research and data collection activities, including by AIHW’s National Centre for Monitoring Asthma and Other Chronic Respiratory Conditions and the Australian Centre for Airways disease Monitoring
- A rigorously developed set of 10 national asthma indicators that are feasible for population-level monitoring
- Comprehensive, evidence-based strategies to coordinate national action on asthma since 1999 (6-8)
- Models of asthma care and asthma action plan ownership
- Innovations in digital health technology
- Education programs for health professionals and people with asthma
- Community-based support services for people with asthma
- Universal health insurance through Medicare.

While there is currently no cure for asthma, there are effective management strategies available to control the disease and prevent the worsening of asthma symptoms, such as uptake of asthma action plans (1). However, uptake of effective self-management practices is seldom reported by patients and there is evidence of health professional non-adherence to best practice treatment guidelines (9, 18, 24-29).

Most asthma is mild, and can be well-controlled with regular low dose preventer (anti-inflammatory) treatment, but many people with asthma do not take this, or do not take it regularly (9, 24, 30). Uncontrolled asthma carries the risk of permanent loss of lung function, persistent symptoms and acute attacks or flare-ups (9).

People with asthma often treat their asthma as an acute condition rather than a chronic condition, using medication to relieve symptoms with a short-acting reliever rather than to avoid symptoms occurring with a preventer (31). Suboptimal asthma control is a critical issue in Australia. Poor asthma control (frequent symptoms and/or flare-ups) is common in both adults and children: for half of the people with asthma, there is a gap between the potential control of their asthma symptoms and the level of symptoms currently experienced (18).

Overall, levels of asthma symptoms and frequency of dispensing reliever medication in the Australian community are higher than is consistent with good asthma control (31).

There is great opportunity to realise effective change for asthma, as it is a common chronic condition with clearly defined interventions that can reduce its impact on individuals and the community (9). Evidence-based effective strategies are available to address patient factors such as medication adherence, correct inhaler technique, use of asthma action plans and understanding asthma triggers. Similarly, health professionals need to work in partnership with patients to conduct regular reviews, prescribe appropriate medications, update asthma action plans, and assist patients to use their inhalers correctly (1).

Innovation in digital health technology and more integrated health care systems are likely to transform asthma care and ease pressure on the healthcare system by reducing routine GP appointments and enabling people to manage their own condition (32).

However, a proactive approach towards asthma self-management is seldom reported by patients, with many experiencing daily symptoms, struggling with medication use and adherence, and feeling ill-informed and disempowered about their condition (18, 31, 33). Similarly, there is evidence of health professional non-adherence to Australia's best practice treatment

guidelines, the *Australian Asthma Handbook*, despite high awareness of the guidelines (9, 24-29).

More information on the key challenges facing asthma in Australia, and the broader international context, is presented in Appendix 3.

Aboriginal and Torres Strait Islander people and other priority populations

Asthma affects all Australians, but some populations are disproportionately affected. These populations experience a higher prevalence of asthma and a greater burden of disease, resulting in inequitable health outcomes. Due to the disparity in health outcomes, equal focus is not sufficient: greater investment and sustained efforts are required to positively advantage priority populations and overcome current inequalities in asthma outcomes (2).

The Strategy focuses on improving asthma control in people with asthma (secondary and tertiary prevention), as this is where the biggest gap between evidence and practice lies, and where the potential for impact is greatest. The Strategy includes a strong emphasis on improving asthma control in high risk and vulnerable populations, while maintaining good practice in other population groups.

Aboriginal and Torres Strait Islander people

As is the case with many chronic conditions, asthma is markedly overrepresented in the Aboriginal and Torres Strait Islander population. In 2012-13, 18% of Aboriginal and Torres Strait Islander Australians had asthma (an estimated 111,900 people), meaning that prevalence of the condition was almost twice as high as for the non-Indigenous population (34).

Asthma was 33% more common among 0-14 year olds and 58% more common among 15-24 year olds in the Aboriginal and Torres Strait Islander population, as it was among the general Australian population. Identifying and effectively addressing asthma among Aboriginal and Torres Strait Islander children carries extra importance, as health inequalities in the Indigenous population begin prior to birth, and continue through early childhood, significantly increasing the prospects of illness, poor health and premature death for this population compared with the non-Indigenous population (35).

The disparity in prevalence rates is even more stark when older age cohorts are compared, with Aboriginal and Torres Strait Islander people aged 45 years and over experiencing rates of asthma that were approximately double the rate experienced by this age cohort in the general population (34, 35).

Continuing this theme, asthma mortality rates are substantially higher among Aboriginal and Torres Strait

Islander Australians compared with non-Indigenous Australians. During the period from 2007 to 2011, the mortality rate for asthma among Aboriginal and Torres Strait Islander Australians was 4.0 per 100,000 population, which was 2.3 times that of non-Indigenous Australians (1.7 per 100,000) (36).

The *Aboriginal and Torres Strait Islander Burden of Disease Study*, provides further evidence of the impact being wrought upon the Indigenous population by asthma. In 2011, asthma was the 8th largest cause of disability adjusted life years (DALYs) and the 5th leading cause of non-fatal disease burden, being responsible for around 5,802 years lived with a disability (YLDs) (37).

Addressing asthma in the Aboriginal and Torres Strait Islander population

While Aboriginal and Torres Strait Islander people are a priority population due to their overrepresentation in the asthma data, it is expected that – given the broad national nature of the Strategy – issues relating to this population cohort will be addressed, where possible, in any actions undertaken for each of the five priority areas outlined in the Strategy. This mirrors the approach taken by the Framework, which presents Aboriginal and Torres Strait Islander people as a target priority population, noting that extra consideration need be provided to this group on account of the ‘disproportionate burden of chronic conditions’ it experiences (2).

Any Aboriginal and Torres Strait Islander health specific action for asthma will need to take into account the range of mitigating factors that inhibit effective health service provision to, and reinforce health inequalities for, this disadvantaged population group. Prominent among these mitigating factors are:

- Understanding that Aboriginal and Torres Strait Islander people will be more likely to frequent services where Aboriginal and Torres Strait Islander workers are on staff.
- Acknowledging that this population is more likely to access care where provided locally and where provided in a culturally appropriate manner by culturally aware staff, but such services are commonly not available in rural and remote areas.
- Recognising that socioeconomic disadvantage hinders access to required health services among the general population, and that this disadvantage is more commonly experienced by Indigenous Australians.
- Noting that Aboriginal and Torres Strait Islander people are commonly adversely affected by social determinants (e.g. healthy housing, employment, education, food security, sanitation, etc.), which impact their capacity to access required services and treatment, and to maintain effective treatment regimes.

- Awareness that disease co-morbidity is commonly experienced by Aboriginal and Torres Strait Islander people, which increases the need for, and likely effectiveness of, cross-disease approaches to treatment and management, where appropriate.

Other groups disproportionately affected by asthma

Amongst people who have asthma, some populations are at greater risk of poor outcomes. Children are much more likely than adults to be hospitalised for asthma. Over the last few decades, asthma management in younger age groups has improved greatly so there are now few deaths. Conversely, older people with asthma are at higher risk of dying from asthma than younger people, and often have comorbidities (9).

In 2014-15, asthma was more common among people living in areas of lower socioeconomic status (13%) compared with those in areas of higher socioeconomic status (10%) (38).

There is evidence of a widening gap in the prevalence of asthma across socioeconomic groups, suggesting that asthma is shifting from a condition more prevalent among the higher socioeconomic group to one more strongly associated with socioeconomic disadvantage (9).

- People with asthma who have special considerations for diagnosis and management:
 - ♦ Children and their parents/carers
 - ♦ Adolescents and young adults
 - ♦ Pregnant women
 - ♦ Older Australians
- People with asthma who face specific challenges with their condition and where the potential to improve health outcomes and reduce costs is greatest:
 - ♦ Are newly diagnosed
 - ♦ Have severe or poorly controlled asthma
 - ♦ Have complex and comorbid chronic conditions
 - ♦ Are frequent users of medical and health services.

In order to prevent asthma from developing in people who do not already have a diagnosis of asthma (primary prevention of asthma), a number of additional priority populations exist. These include people without asthma who may be at increased risk due to the presence of risk factors for asthma and other chronic conditions:

- Smokers and people exposed to cigarette smoke, including children and pregnant women
- People exposed to environmental hazards and events (e.g. poor air quality/air pollution, bushfires, thunderstorms)
- People who are overweight/obese
- People who are sedentary
- People with allergic rhinitis.

Objective 1:

Support effective self-management practices

Effective self-management practices to control asthma symptoms and prevent flare-ups are known. These strategies include regular treatment with anti-inflammatory medication, regular medical review, and provision of support for people with asthma to self-regulate their asthma treatment and health related behaviours. Effective self-management practices include self-monitoring of asthma symptoms and/or lung function, presenting for regular medical review, medication adherence, correct inhaler technique, uptake of asthma action plans and understanding asthma triggers.

The uptake of these strategies is not optimal among people who could benefit greatly, in terms of reducing the impact of asthma on both themselves and the community (9, 24, 30-31, 33). Supporting people with asthma to increase knowledge, confidence and skills for effective self-management practices will empower them to play an active role in their own health care, better control their condition and lead full and active lives. Support should be tailored to the person with asthma and appropriate for their treatment regimen, asthma severity, culture, language, literacy level and ability to self-manage (1). Ongoing support of evidence-based patient interventions that enhance self-management practices is critical.

Actions

1.1 Deliver education programs and skills training

Continue to deliver education programs that target people with asthma and their caregivers in order to increase knowledge, confidence and skills, and drive health behaviours that optimise asthma control and active engagement in health care and shared decision-making processes. Education programs to focus on medication adherence, inhaler technique, risk reduction, understanding asthma triggers and managing asthma alongside other conditions. Mechanisms for regular evaluation and improvement to be established to ensure education programs and skills training have a measurable impact.

1.2 Deliver awareness campaigns

Deliver awareness campaigns that target people with asthma and their caregivers to increase understanding of asthma preventer medicines including costs. Awareness campaigns would aim to increase the uptake of asthma action plans, enhance asthma health literacy and address myths and misperceptions around appropriate self-management practices. Mechanisms for regular

evaluation and improvement to be established to ensure awareness campaigns have a measurable impact.

1.3 Provide information and support services

Continue to provide information and support services for people with asthma, their carers and families, with a focus on priority populations. Information and support services to be provided via accessible channels, with a nationally consistent approach tailored for the local situation.

1.4 Enhance asthma health literacy

Employ innovative approaches to enhance asthma health literacy, and support people with asthma, their carers and families to understand information about asthma, to apply that information to their lives and to use it to make decisions and take actions relating to their health.

Consider ways that people with asthma participate in health care and employ approaches that build their capacity to navigate the health care system and make informed decisions about their asthma care, with a focus on priority populations.

1.5 Promote, provide and implement asthma action plans

Increase uptake of asthma action plans along with effective delivery which involves education in self-monitoring, review of medicines and assessment of severity. Explore approaches to maximise uptake of written asthma action plans in different settings (e.g. schools) and through partnerships (e.g. health insurance industry). Investigate actual use of asthma action plans including e-health adaptations.

1.6 Promote, provide and implement asthma and anaphylaxis first aid protocols

Increase awareness and use of asthma and anaphylaxis first aid protocols. Explore approaches to maximise uptake of consistent, standard first aid protocols in educational and other settings.

1.7 Explore innovative new adherence strategies

Explore new and emerging strategies and digital technologies to support self-management and active engagement, with a focus on understanding and improving medication adherence and improving inhaler technique. Investigate and adopt, at scale, the effective and validated use of technologies, such as telehealth and medication reminder strategies.

Objective 2:

Develop the health professional workforce

Asthma care is provided by a number of different health professionals within the health care system. This includes those working in primary health care (e.g. GPs, primary health care nurses, nurse practitioners, asthma and respiratory educators, Aboriginal health workers, pharmacists, and physiotherapists) and secondary care (e.g. hospital staff including emergency department staff, generalist physicians and nurses, and specialists such as respiratory physicians and allergists).

It is critical that a suitably trained, resourced and distributed health workforce is supported to work to its full scope of practice and is responsive to change. Asthma is predominantly managed in primary health care by GPs, however there is potential for increased participation by primary health care nurses and pharmacists. Pharmacists, particularly through community pharmacy, play an important role in providing advice and support for self-management practices. Similarly, primary health care nurses have an important role in this area that is likely to increase as their scope of practice expands over time. The role of respiratory specialists remains vital, particularly for patients with poorly controlled and severe asthma. A number of professionals working outside the health care system are also involved in asthma care. This includes early childhood educators and teachers, sports coaches and Home and Community Care workers. Asthma care involves a multidisciplinary and holistic approach, and initiatives to develop the workforce should include inter-professional and inter-disciplinary training opportunities where appropriate.

Australia has world-leading, evidence-based treatment guidelines – the *Australian Asthma Handbook* – to guide primary care health professionals in the diagnosis and management of asthma. Proven strategies for health professionals who provide asthma care include the imperative to conduct regular reviews, prescribe appropriate medications, provide and update asthma action plans, and support the patient to develop effective self-management practices so as to control their asthma (e.g. correct use of inhalers) (1).

There is evidence of health professional non-adherence to Australia's best practice guidelines (9, 24-29). Supporting health professionals to realise their full scope of practice and deliver consistent, best practice asthma care based on the asthma treatment guidelines will close the gap between evidence and practice, and improve patient quality of life and reduce asthma morbidity and its associated costs. Greater investment and sustained effort is required to support professionals working with

priority population groups that are disproportionately impacted by asthma, such as Aboriginal health professionals and non-health professionals in Aboriginal community controlled organisations.

Actions

2.1 Develop and implement a health workforce plan to ensure people with asthma receive patient-centred, multidisciplinary care

Develop and implement a national health workforce plan to ensure people with asthma receive person-centred, multidisciplinary care that is delivered at the right time and meets the needs of all Australians, including priority populations. The plan will explore innovative and cost effective workforce strategies to ensure the health workforce is suitably trained, resourced and distributed, and is working to its full scope of practice. This includes investigating obtaining Medical Provider status for specifically trained asthma educators, and enabling appropriately trained health care professionals such as practice nurses to prepare asthma action plans (i.e. communicate/explain the plan and discuss options with the patient). Preparation of asthma action plans would be undertaken in partnership with the prescriber, usually the GP who is currently legally required to sign off the plans.

The health workforce plan will include a review of existing training (Vocational, Undergraduate and Post-Graduate) to identify how future education and training can improve asthma outcomes and meet the evolving needs of people with asthma.

2.2 Ongoing revision, dissemination and implementation of the best practice treatment guidelines for asthma diagnosis and management

Continue to disseminate and implement the best practice treatment guidelines for asthma diagnosis and management in primary care – the *Australian Asthma Handbook* – including regular updates in response to emerging issues and new evidence, to ensure clinical care reflects evidence-based best practice guidelines. For example, revise current asthma treatment guidelines to address issues associated with asthma management in those with psychosocial problems, including drug and alcohol addiction, given that both are problematic and widespread.

2.3 Deliver education, training and support for health professionals

Continue face-to-face and online education, training and support of health professionals to develop the workforce and its capacity to provide consistent, best practice asthma care. Education, training and support to focus on:

- Detecting and diagnosing asthma and other acute and chronic respiratory conditions in a timely and appropriate manner
- Supporting patient self-management practices (particularly for newly diagnosed) and assisting patient behaviour change, with a focus on addressing incorrect inhaler technique, poor adherence, patient preferences and practical issues
- Managing asthma alongside comorbid conditions
- Enhancing asthma health literacy and evidence-based shared decision making
- Appropriate prescribing of preventer medicine
- Delivery of asthma action plans combined with patient education in self-monitoring, review of medicines and assessment of severity
- Annual review of asthma patients
- Work-related asthma including importance of eliminating exposures at work
- Management strategies in school and childcare services
- Mental health impact of asthma on patients.

Continue delivery of evidence-based workshops on asthma management and lung function testing to GPs, primary health care nurses, pharmacists, asthma and respiratory educators, generalist physicians and nurses, and Aboriginal health workers and practitioners in remote, regional and urban Australia.

Education, training and support for health professionals providing services to Aboriginal and Torres Strait Islander people to include cultural awareness training to ensure culturally safe and appropriate asthma care.

2.4 Support the development of communication and counselling techniques

Support the development of effective and culturally safe and appropriate communication and counselling techniques to improve the cultural competence of the health workforce. A culturally competent workforce communicates respectfully and is able to establish good relationships in order to support people with asthma and their caregivers to understand information about asthma and health care, to apply that information to their lives and to use it to navigate the health care system and make decisions about their asthma care. Culturally safe and appropriate communication and counselling techniques will improve asthma outcomes for Aboriginal and Torres Strait Islander people and other priority populations.

2.5 Develop quality use of medicine initiatives for prescribing preventer medicines

Develop initiatives to improve health professional understanding of the efficacy and cost-effectiveness of ICS only preventer medicines compared to combination (ICS/LABA) preventer medicines, with treatment targeted to individual patient needs. Support patients to make informed decisions about their asthma medication that take into account medication expenses and their capacity to fund treatment.

2.6 Deliver training and support for non-health professionals

Deliver training and provide support to professionals working outside the health care system, including community environments where people live, learn, work and play, e.g. Aboriginal community controlled organisations, early childhood educators and teachers, sports coaches and Home and Community Care workers. Professionals in different sectors and settings have an important role to play in asthma care, including responding to emergency situations and promoting health and reducing asthma risk across the life course.

Objective 3:

Enhance asthma care and management

Australia's health care system is a complex and multi-faceted web of public and private providers, patients, settings and supporting mechanisms. Health providers deliver a plethora of services across many levels, from public health and preventive services in the community, to primary health care, emergency health services, hospital-based treatment, and rehabilitation and palliative care. It can be difficult for people to navigate their way through the 'maze' of health service providers and receive integrated, 'joined-up' care (39, 40).

Strong governance and leadership that supports evidence-based shared decision-making and encourages collaboration to enhance health system performance is required. Powerful approaches can be adopted within the health care system to facilitate the efforts of people with asthma, their caregivers and health professionals to work together to enhance asthma care and management. This includes multidisciplinary, collaborative care models to ensure the different levels of care are linked. Links between different sectors and settings – such as a GP and nurse working in primary care, a secondary care hospital emergency department, ambulance services, pharmacist advice and a school in the community – enables appropriate management and systematic follow-up. Removing system barriers to optimal care and creating an integrated, equitable and accessible system for all stages of asthma care will ensure health services are accessible to priority populations such as Aboriginal and Torres Strait Islander people, and deliver better health, social and economic outcomes for all Australians.

Actions

3.1 Explore initiatives that positively advantage Aboriginal and Torres Strait Islander people and other priority populations to overcome current inequities in asthma outcomes

Explore initiatives that positively advantage Aboriginal and Torres Strait Islander people and other priority populations to overcome current inequities in asthma outcomes. Accessible health services that are culturally safe and appropriate, effective, high quality, affordable and flexible are critical to address the disproportionate burden of asthma experienced by priority populations and ensure the health system at all levels is responsive to the specific needs of priority populations.

The concept of health for Aboriginal and Torres Strait Islander people is holistic, with culture, land and spirituality playing a key role (3). Explore initiatives to enhance the cultural competency of the health workforce

such as increasing the number of Aboriginal and Torres Strait Islander people in the workforce and enhancing the focus on culture within health care education. Responsible partnerships and an inclusive and locally responsive approach is required.

3.2 Develop and implement nationally consistent hospital discharge protocols for asthma

Effective discharge pathways between health services, particularly between the acute and primary care settings, are essential to providing coordinated asthma care across multiple health settings and services. In collaboration with stakeholders across all levels of governments, develop and adopt national hospital and emergency department discharge and outpatient follow-up protocols/guidelines, with a focus on priority population groups such as Aboriginal and Torres Strait Islander people. This would include the use of technology to identify patients who are frequent users of emergency departments.

3.3 Contribute to health system reforms and reviews

Contribute to health system reforms and reviews in order to improve asthma outcomes and meet the evolving needs of people with asthma.

Contribute to PBS reviews and continue to provide advice to the Pharmaceutical Benefits Advisory Committee.

Contribute to the Australian Government Healthier Medicare Initiative to explore opportunities for the MBS to recognise and encourage best practice and quality improvement in asthma diagnosis and management. The initiative's MBS and/or Primary Health Care reviews to include an economic modelling and investment review of all asthma-related Medicare Provider Numbers and PIP payments provided to health professionals, and make recommendations on an integrated model of care which may include, but is not limited to:

- The effectiveness of the Asthma Cycle of Care Program, GP Management Plans, Team Care Arrangements
- The adequacy of PIPs for lung function testing and the need to update the wording of these PIPs to reflect current medicines
- Consideration of health professionals who do not have a provider number, such as nurse practitioners.

3.4 Identify and use new and emerging technologies and strategies in asthma interventions

Monitor, identify and utilise, as appropriate, new and emerging technologies, digital tools and platforms to support people with asthma and health professionals. Technology supports more effective and accessible prevention and management strategies by empowering people with asthma to engage in effective self-management practices (e.g. supports medication adherence) and supporting health professionals to provide best practice asthma care (e.g. asthma action plans and decision support tools in medical software and other digital platforms).

Consider innovative and flexible service provision options such as e-health technologies, as a means of delivering information and services (e.g. telehealth), particularly for those in rural and remote areas where access is problematic.

Explore the opportunity to pilot the use of personal e-health records using asthma as a chronic condition test case, with asthma action plans a key component.

3.5 Explore innovative strategies to support cost-effective prescribing of asthma medications to improve access to affordable medication

Explore innovative strategies to support cost-effective prescribing of asthma medications to improve access to effective affordable medication.

3.6 Optimally implement and disseminate new evidence-based asthma treatments

Optimally implement and disseminate effective and efficient treatments for asthma, ensuring affordability, accessibility and appropriate targeting of therapy. Continue to work in a coordinated and collaborative way to introduce novel therapies into the Australian market using a sustainable and cost-effective approach. Ensure new evidence-based treatments are disseminated through treatment guidelines and other forms, and integrated into clinical practice.

Objective 4:

Create supportive community environments

The environments where Australians live, learn, work and play are important settings in which to promote health and reduce asthma risk.

There is currently no reliable evidence for effective interventions to prevent the onset of asthma (primary prevention), however risk factors may increase the chance of a person developing asthma in the first place, or may increase the chance that a person with asthma will develop additional health problems. Actions to create supportive community environments will promote health and reduce asthma risk, with a focus on minimising or preventing asthma from worsening (secondary prevention) and reducing the risk of people with asthma developing additional chronic conditions, complications and/or associated disabilities (tertiary prevention).

Asthma shares a number of risk factors with other chronic conditions. The *Australian Burden of Disease Study* in 2011 (19) identified that almost one-third of the burden of disease in Australia in 2011 could be prevented by eliminating exposure to risk factors such as tobacco use, overweight and obesity, and sedentary lifestyle/physical inactivity. Hence, actions to improve asthma outcomes are applicable for a broad range of

chronic conditions and may improve outcomes for other chronic conditions that commonly coexist with and can affect asthma.

International and national experience shows that a multi-sectoral approach is most effective at improving asthma care and patient outcomes. Different sectors and settings – such as workplaces, schools and communities – have an important role in promoting health and reducing asthma risk across the life course.

Actions

4.1 Explore innovative strategies to reduce modifiable risk factors for asthma and strengthen asthma prevention

Explore innovative strategies to reduce modifiable risk factors in the general population and strengthen asthma prevention. Drive change to support the development of health-promoting community environments that encourage people to increase levels of physical activity, reduce sedentary behaviour and tobacco use, and improve healthy eating. Address maternal, family and child health, enhancing early life and growth patterns.

4.2 Raise awareness for exposures that can trigger asthma symptoms and flare ups

Raise awareness for exposures that can trigger asthma symptoms and flare ups and drive policy and practice change to reduce exposure to known agents harmful to asthma, e.g. unflued gas heaters in schools/homes, wood fire heaters in winter, and poor air filtration in road tunnels. Identify high-risk people and populations for evidence-based targeted interventions.

4.3 Explore new approaches to create healthy workplace environments and reduce work-related asthma

Explore new approaches to create healthy workplace environments and reduce work-related asthma. Work-related asthma includes both worsening of asthma control (work-exacerbated asthma) and new-onset

asthma (occupational asthma) due to workplace conditions. Identify high-risk occupations and industries for evidence-based targeted interventions. Develop and test innovative workplace strategies, including interventions to reduce exposure to airborne sensitising agents in the workplace.

4.4 Explore new approaches to predict and manage public health advice and clinical treatment in relation to specific environmental risk events

Explore new approaches to predict and manage public health advice on self-management practices and clinical treatment in relation to specific environmental risk events, such as thunderstorms. Implement monitoring and warning systems so people can avoid exposure where possible to bushfire smoke, thunderstorms, high pollen levels and poor air quality/air pollution.

Objective 5:

Promote research, evidence and data

Asthma has a significant impact on Australia's health and productivity, and research into the condition – including the basic science of the disease, its social and economic impacts, and appropriate behavioural, institutional and environmental responses – is an important priority. Quality research accompanied by the translation of research into policy and practice strengthens the evidence base and improves health outcomes.

Australian asthma research is internationally renowned and dynamic, pursuing a range of outcomes related to prevention, cure and asthma care. With a focus on basic science and clinical research, there are a range of population health and economic research activities underway. This research may be independent from individual institutions or multinational or national collaborations like the Medical Research Future Fund.

Currently, in Australia there is a polarity of views on asthma research priorities so the overarching strategic direction remains unclear. Some researchers highlight the need to continue and press for a cure whilst others state this is unattainable, electing to focus on treatment to reduce the burden of disease. No single body is dedicated to promoting collaboration and 'joining the dots' in the asthma and broader airways disease research community.

In Australia, asthma research is primarily funded by:

- Australian Government, through research grants awarded through the NHMRC (41)

- Industry (pharmaceutical companies being the dominant contributor)
- Philanthropic sources such as Asthma Foundations, individual donors and trusts.

Research, evidence and data are essential to strengthening evidence-based practice for the diagnosis and management of asthma, identifying ways of preventing or curing asthma, informing health policy, offering new and improved treatments, and evaluating the effectiveness of efforts to reduce the health, social and economic impacts of asthma.

Actions

5.1 Develop a national asthma research agenda

Develop an internationally relevant and nationally coordinated asthma research agenda to focus, coordinate and translate quality health research into policy and practice. The national asthma research agenda will fill information and evidence gaps and facilitate reporting against the national asthma indicators, particularly where data not routinely collected. The asthma research agenda will be situated within a broader respiratory, lung health and chronic conditions context.

Priority areas for the national agenda include:

- The complex interaction of factors which cause asthma
- Identifying ways of preventing or curing asthma
- New and improved treatments for asthma
- The use of digital health technologies to optimise asthma care
- Up-to-date economic data on the direct and indirect costs of asthma; indirect costs include, but are not limited to, reduced productivity, absence from work, early retirement and premature death and bereavement
- Treatment for asthma in primary health care settings, across health care settings, and over time
- Reasons for health professional non-adherence to treatment guidelines
- The social and environmental determinants of asthma, particularly in priority populations including Aboriginal and Torres Strait Islander people
- The psychosocial influences on patient self-management behaviour
- Feasible strategies to bring about changes in patient self-management and health professional practice
- Understanding what patients need and want when they engage with health professionals as part of their asthma care.
- Asthma terminology to enhance health literacy and provide a common and accessible language for both patients and health professionals (e.g. explore new terminologies such as ‘daily asthma medication’ and ‘emergency medication’).
- Current prevalence of work-related asthma and which Australian industries are most affected, and how this relates to workplace health and safety issues (42)
- The impact of electronic cigarettes (also called e-cigarettes) on people with asthma and those around them.

5.2 Increase the investment in asthma research

Increase the investment in asthma research across the airways disease research community, drawing on existing and new funding sources, to ensure adequate resources are allocated to address identified needs over the long-term.

Work collaboratively to strategically allocate resources in order to optimise the impact on asthma outcomes and achieve the greatest return on investment.

5.3 Conduct and support research to generate new evidence and address gaps in current knowledge

Conduct quality research in line with the proposed national asthma research agenda to generate new knowledge to reduce the health, social and economic impacts of asthma, including research into best practice approaches to support patient self-management and behaviour changes to improve asthma outcomes. Translate research into policy and practice to strengthen the evidence base and improve asthma outcomes.

5.4 Develop and test innovative new models of asthma care

Develop and test innovative new models of asthma care that incentivise access, quality and efficiency in asthma diagnosis and management, such as telehealth technology to improve access to services for people living in regional, rural and remote areas. Investigate digital health technologies that support more effective and accessible prevention and management strategies.

Investigate and evaluate evidence-based services within pharmacy that support patient self-management practices.

Monitoring progress

Progress in achieving the Goal and Objectives of this Strategy will be measured by the following outcome measures:

- Decrease in suboptimal asthma control
- Increase in asthma action plan uptake for both adults and children
- Improved adherence with appropriate preventer medicines
- Increase in annual General Practitioner (GP) reviews of people with asthma
- Reduced avoidable asthma-related hospitalisations (Indigenous and non-Indigenous)
- Improved quality of life among people with asthma
- Reduced costs of asthma to patients, the healthcare system and government, including indirect costs such as reduced productivity
- Reduced prevalence of asthma (Indigenous and non-Indigenous)
- Reduced asthma-related deaths (Indigenous and non-Indigenous).

Additional measures will be developed to monitor progress against key initiatives and areas of work.

It is intended that monitoring and reporting on the outcome measures of this Strategy will be undertaken by the AIHW, as part of its broader chronic condition surveillance and monitoring activities, and will not place any additional burden or responsibility on state and territory jurisdictions. Data is routinely collected by the AIHW and others for most of the outcome measures (e.g. national asthma indicators). Where data is not routinely collected, options for filling information and evidence gaps to facilitate reporting will be explored and could include an annual web-based survey of a nationally representative population with asthma.

National asthma indicators

The national asthma indicators have been the focus of ongoing national surveillance efforts. The national asthma indicators provide a core set of 10 indicators that are feasible for population-level monitoring, and that provide valuable information for policy-makers about the status of asthma in Australia (9, 43). The indicators are:

- Asthma control
- Asthma action plans*
- Preventer use*
- General practice encounters
- Hospitalisations*
- Quality of life
- Costs of asthma (routine administrative data captures direct costs only and not indirect costs)*
- Prevalence of current asthma*
- Deaths (all ages)*
- Deaths (5 to 34 years)*.

* Data routinely collected (e.g. PBS, MBS, health surveys, including the Aboriginal and Torres Strait Islander Health Survey).

Acknowledgements

The National Asthma Council Australia led the development of the Strategy, in partnership with Asthma Australia and with funding from the Department.

Development of the Strategy took place during 2015-2017. Many individuals and organisations contributed time and expertise to the development of the Strategy, including people with asthma, key respiratory organisations, health professionals, pharmaceutical and medicine bodies, the research community and the Australian Government and State and Territory Governments.

The Strategy was developed in consultation with state and territory jurisdictions via the Community Care and Population Health Principal Committee, the National Aboriginal and Torres Strait Islander Health Standing Committee, the Australian Health Ministers' Advisory Council, and the Council of Australian Governments.

The National Asthma Council Australia and Asthma Australia sincerely thank the members of the National Asthma Strategy Advisory Group and all those who completed the stakeholder surveys, provided feedback on the draft Strategy, and participated in workshops in 2015. The involvement and willingness of all concerned to share their experience and expertise is greatly appreciated.

National Asthma Strategy Advisory Group

- Dr Simon Bowler, Respiratory and Sleep Physician, Asthma Australia
- Dr Jonathan Burdon AM, Respiratory Physician and Chairman, National Asthma Council Australia
- Ms Julianne Badenoch, Vice-President, and Ms Lisa Collison, Professional Development Coordinator, Australian Primary Health Care Nurses Association
- Mr Kevin de Vries, Project Pharmacist, Pharmacy Guild of Australia
- Mr Stephen Hughes, Community Pharmacist, Pharmaceutical Society of Australia
- Professor Matthew Peters, Respiratory Physician and Immediate Past President, Thoracic Society of Australia and New Zealand
- Associate Professor Guy Marks, Research Leader, and Ms Leanne Poulos, Project Manager, Australian Centre for Airways disease Monitoring
- Associate Professor Janet Rimmer, Respiratory Physician and Allergist, Australasian Society of Clinical Immunology and Allergy
- Professor Bastian Seidel, General Practitioner, Royal Australian College of General Practitioners

Consulted member bodies and advisory committees

- Asthma Australia Medical and Scientific Advisory Committee
- Asthma Australia National Research Council
- National Asthma Council Australia *Australian Asthma Handbook* Guidelines Committee
- National Asthma Council Australia General Practitioners' Asthma Group
- National Asthma Council Australia Pharmacists' Asthma Group
- Asthma Foundation ACT
- Asthma Foundation NSW
- Asthma Foundation NT
- Asthma Foundation of Queensland
- Asthma Foundation of South Australia
- Asthma Foundation of Tasmania
- Asthma Foundation of Victoria
- Asthma Foundation of Western Australia

Consulted stakeholder organisations

- Australian Government Department of Health
- Department of Health of each State and Territory
- Australasian College for Emergency Medicine
- Australian and New Zealand Society of Respiratory Science
- Australian College of Rural and Remote Medicine
- Australian Commission on Safety and Quality in Health Care
- Australian Institute of Health and Welfare (in its role as the manager of the National Centre for Monitoring Asthma and Other Chronic Respiratory Conditions)
- BeyondBlue
- Brisbane South Primary Health Network
- Cancer Council Western Australia
- Consumers Health Forum
- Council on the Ageing
- Exercise and Sports Science Australia
- Federation of Ethnic Communities' Councils Australia
- Generic Medicines Industry Association
- Global Initiative for Asthma
- Internal Medicine Society of Australia and New Zealand
- Lung Foundation Australia

- Lung Health Research Centre
 - Medical Software Industry Association
 - Medicines Australia
 - National Aboriginal Community Controlled Health Organisation
 - NPS MedicineWise
 - Society of Hospital Pharmacists of Australia
 - St John Ambulance Australia
 - The Society of Hospital Pharmacists of Australia
 - The University of Western Australia Centre for the Optimisation of Medicines (Pharmacy)
 - Wollongong Hospital
-
- Aerocrine AB
 - Apotex Australia
 - AstraZeneca Australia
 - Boehringer-Ingelheim
 - GlaxoSmithKline Australia
 - Mundipharma Australia
 - Novartis Australia
 - Sanofi Australia
 - Stallergenes Australia

Individual advisors

- Associate Professor Grant Blashki, Nossal Institute for Global Health
- Dr Ryan Hoy, Monash Centre for Occupational and Environmental Health
- Professor Christine Jenkins AM, The George Institute for Global Health
- Associate Professor Helen Reddel, Woolcock Institute of Medical Research

National Asthma Strategy Secretariat

- Mr Mark Brooke, Chief Executive Officer, Asthma Australia (until December 2016)
- Ms Siobhan Brophy, Strategy and Communications Manager, National Asthma Council Australia
- Ms Maree Davidson AM, Davidson Consulting (Facilitator)
- Mrs Michele Goldman, Chief Executive Officer, Asthma Australia (from December 2016)
- Ms Kristine Whorlow AM, Chief Executive Officer, National Asthma Council Australia
- Ms Rebecca Zosel, Zosel Consulting (Principal Writer)

Appendix 1: Asthma policy context

Asthma within a broad health policy environment

The Strategy outlines a targeted and comprehensive approach to reduce the health, social and economic impacts of asthma – one of Australia’s most prevalent chronic health conditions. This Strategy has been designed to align with, and support, the policy directions in the National Strategic Framework for Chronic Conditions (the Framework), which provides the overarching national policy for the prevention and management of chronic conditions in Australia (2). It also has links to jurisdictional and regional health policies, and national health services and infrastructure.

As shown in Figure 2, asthma is often considered as part of airways disease, more broadly as part of respiratory and lung health, or as part of an integrated approach to addressing chronic conditions. Efforts to prevent and manage a broad range of chronic and complex health conditions are often underpinned by common elements, such as shared priorities, risk factors, principles and enablers (2, 13). Hence, the priority areas and key

actions in the Strategy to improve asthma outcomes are applicable for a broad range of chronic conditions and may improve outcomes for other chronic conditions that commonly coexist with and can affect asthma.

State and Territory policy context

State and Territory Governments have an important policy and service delivery role in support of optimal asthma care. Asthma policies and strategies vary considerably across jurisdictions and include a mix of disease-specific, respiratory medicine, chronic conditions, and broader health and wellbeing approaches (Table 2).

The Strategy sets out the strategic directions and offers guidance on key actions that may be taken to support an integrated national response to asthma diagnosis and management. It is expected that jurisdictional and regional health policies to address asthma will evidence links between local policy, priorities and outcomes and the national Strategy.

Figure 2: Asthma within a broad health policy environment

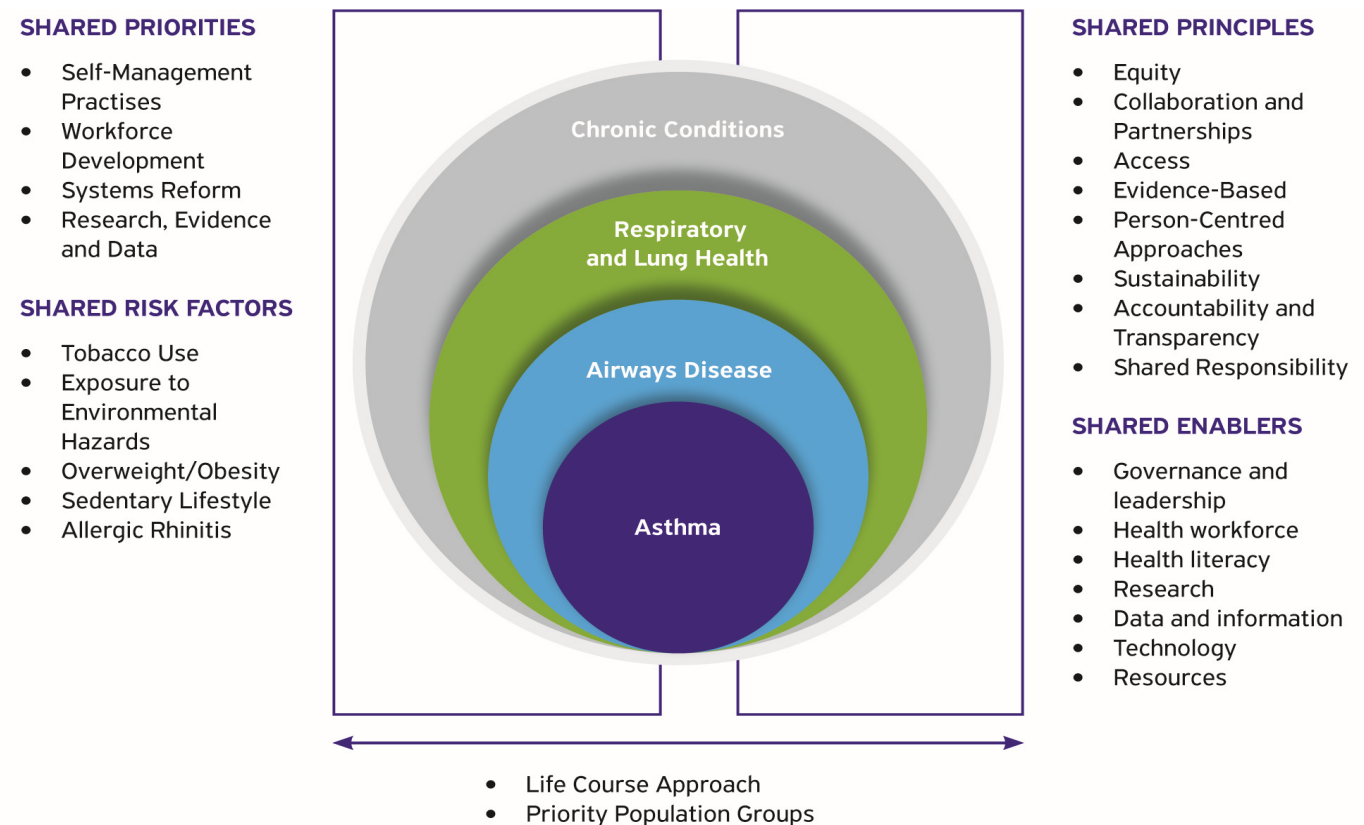


Table 2: State and Territory asthma-related policies

State	Policy
ACT	ACT Chronic Conditions Strategy – Improving Care and Support 2013–18
NSW	Chronic Disease Management Program – Connecting Care in the Community (CDMP)
NT	Chronic Conditions Prevention and Management Strategy 2010–2020 (NTCCPMS)
QLD	QLD Department of Health Strategic Plan 2014–18 QLD Strategy for Chronic Disease 2005–2015 Respiratory medicine state wide health service strategy 2014
SA	South Australia's Strategic Plan
TAS	Strategic Framework for Health Workforce 2013–18
VIC	Integrated Chronic Disease Management – Chronic Disease Management Program Guidelines for Primary Care Partnerships and Primary Health Care Services
WA	Asthma Model of Care WA Chronic Health Conditions Framework 2011–16 WA Chronic Conditions Self-Management Strategic Framework 2011–2015

National policy context

The Strategy accommodates existing and new national policies and strategies that address relevant health conditions, risk factors and population groups, including:

- National Strategic Framework for Chronic Conditions (2)
- National Aboriginal and Torres Strait Islander Health Plan 2013–2023 (3).
- National Allergy Strategy (44)
- National Tobacco Strategy 2012–2018 (45).

National Strategic Framework for Chronic Conditions

The Framework provides the overarching national policy for the prevention and management of chronic conditions in Australia. Chronic conditions are the leading cause of illness, disability and death in Australia (35).

The Strategy supports the Vision of the Framework that “all Australians live healthier lives through effective prevention and management of chronic conditions” (2). Regarding the Objectives of the National Strategic Framework for Chronic Conditions, the Strategy aligns with *Objective 2: Provide efficient, effective and appropriate care to support people with chronic conditions to optimise quality of life*, and *Objective 3: Target priority populations*. The Framework addresses prevention in

Objective 1: Focus on prevention for a healthier Australia. In terms of prevention, the emphasis of the Strategy is on the reduction of asthma risk across the life course, and timely and appropriate asthma diagnosis and management (secondary and tertiary prevention only). The Strategy aims to strengthen the evidence base for asthma prevention as there is currently no reliable evidence for effective interventions to prevent the onset of asthma (primary prevention) (1).

Current health system reforms

Considerable change is underway through ongoing national reforms to deliver a more sustainable, person-centred health system. The reforms taking place within the Australian health care system are likely to affect the future roll-out of the Strategy.

Current health system reforms include:

- Redevelopment of the My Health Record
- Healthier Medicare Initiative
 - o Health Care Homes – Reform of Primary Health Care System
 - o Medicare Benefits Schedule review
 - o Primary Health Care Advisory Group
 - o Medicare Compliance Rules and Benchmarks
- The Sixth Community Pharmacy Agreement
- Pharmacy Remuneration and Regulation Review
- Pharmaceutical Benefits Scheme
- The establishment of Primary Health Networks
- Implementation of the broad ranging recommendations of the National Mental Health Commission's Review
- Reforms to improve aged care services
- National Medical Training Advisory Network project, which will provide advice on Australia's future health workforce.

International policy context

The Strategy supports Australia's international commitments as a member state of the World Health Organization to address noncommunicable diseases in line with the Global Action Plan (4), and complements other global health agendas including:

- Global Strategy for Asthma Management and Prevention (5)
- Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020 (4) and the Global Monitoring Framework for Non-Communicable Diseases (46)
- Global Strategy for the Diagnosis, Management and Prevention of COPD (47)
- Mental Health Action Plan 2013–2020 (48).

Appendix 2: Health, social and economic impacts of asthma

Prevalence

Asthma is one of the most common chronic conditions in Australia, with prevalence rates that are high by international comparison (9). In 2016, it was estimated that 10.8% of the population had asthma – that is, around one in ten Australians (10).

The current prevalence of asthma is significantly lower than the rate in 2001 of 11.6% (9). Since 2001, asthma prevalence has declined in children and young adults but remained stable in adults aged 35 years and over (9).

Asthma affects people of all ages. In 2011–12, among those aged 0–14, asthma was more common in males, but among those aged 15 and over, asthma was more common in females (9). Asthma is more common among Aboriginal and Torres Strait Islander Australians than non-Indigenous Australians, particularly in adults (9). The prevalence of asthma is higher among people living in socioeconomically disadvantaged areas compared with those in the least disadvantaged areas (9).

An estimated 15% of adult-onset asthma is work-related (9, 49). Work-related asthma includes both worsening of asthma control (work-exacerbated asthma) and new-onset asthma (occupational asthma) due to workplace conditions.

The prevalence of asthma does not differ significantly from the national average in any of the states and territories (9).

Mortality

After peaking in the 1980s, the death rate due to asthma declined by almost 70% to 1.6 per 100,000 population in 2003 and has since remained stable, below 2.0 per 100,000 population (36). Throughout this period death rates have been higher in women than in men (36).

In 2015, there were 421 deaths due to asthma (20). Asthma-related deaths in Australia are high by international standards, although asthma is not a leading cause of mortality (9).

It is important to identify risk factors for near fatal or fatal asthma in order to prevent asthma-related mortality and intensive care admission. Certain population groups have a higher mortality rate for asthma. Asthma deaths are more common among Aboriginal and Torres Strait Islander Australians compared with non-Indigenous

Australians (36). Deaths due to asthma are also higher for people living in rural and remote areas, people living in areas of socioeconomic disadvantage, those in institutionalised care, those with psychosocial issues (mental illness, living alone, unemployed), and those with smoking or drug and alcohol dependence (20, 36, 50, 51).

Deaths due to asthma occur in all age groups, although the risk of dying from asthma increases with age, largely due to comorbidities (9).

Most deaths due to asthma (70%) occur in people aged 65 and over (9, 20). Little is known about preventable deaths in this older age group which are often associated with comorbidities. Asthma severity and poor device use may be contributing factors and are both unexplored areas.

Use of health services

Asthma care is provided by a number of different health professionals within the health care system. This includes those working in primary health care (i.e. GPs, primary health care nurses, asthma and respiratory educators, Aboriginal health workers and pharmacists) and secondary care (i.e. ambulance services, hospital staff including emergency department staff, and specialists such as respiratory physicians and allergists).

Asthma is predominantly managed in primary health care by GPs and Aboriginal and Torres Strait Islander community controlled health services, however there is potential for increased participation by primary health care nurses and pharmacists. Pharmacists, particularly through community pharmacy, play an important role in providing advice and support for self-management practices. The potential for pharmacists to play increased role in asthma care is currently being explored in local pilot projects as part of the Sixth Community Pharmacy Agreement. Similarly, primary health care nurses have an important role in this area that is likely to increase as their scope of practice expands over time. The role of respiratory specialists remains vital, particularly for patients with poorly controlled and severe asthma.

Overall, Australians see GPs on average 5.6 times per year (52). Asthma was the most common chronic respiratory condition managed by GPs in 2012–13 (35).

Between 2007 and 2010, 10% of the Australian population saw a GP for their asthma. The rates of GP encounters where asthma was managed in Western Australia (7%) and the Northern Territory (4%) were lower than the national average. There was little variation in rates of asthma managed at GP encounters from the national average among other states (Table 3) (9).

Table 3: GP encounters for asthma per 100 population, April 2007 to March 2010

State/territory	GP encounters per 100 population
NSW	11
VIC	10
QLD	10
WA	7
SA	11
TAS	10
ACT	8
NT	4
Australia (national average)	10

In Australia, many people with asthma are not under regular care by a GP (9, 52). Survey data indicate that only half of people with asthma have seen their GP for a non-urgent review during the previous year, and almost a quarter have visited a GP urgently about asthma at least once during the previous year (18). In 2012–13, 3.8% of Australians were very high GP attenders and visited a GP 20 or more times a year. Asthma affects at least 15% of all very high and frequent GP attenders (52).

In terms of hospitalisations and emergency department visits for asthma, Australia has seen a marked change in the frequency and severity of asthma episodes that require hospital admission, intensive care unit treatment and assisted ventilation. The age-standardised hospitalisation rate fell by 38% between 1998–99 and 2011–12 (37% for males and 39% for females) (35). In 2011–12, the hospitalisation rate for asthma was 173 per 100,000 population (35). The rate of hospitalisation for people with asthma is low by comparison with other countries (9).

After declining steadily during the 1990s and early 2000s, the rate of health service use related to asthma has not changed substantially over recent years (9). Hospitalisations for asthma are much more common amongst children than adults (9).

In 2008–09, the rate of hospitalisation for asthma

was significantly higher in South Australia (244 per 100,000 population) and lower in the Australian Capital Territory (113 per 100,000 population) compared with other states and territories. Compared with the national average, South Australia, New South Wales, Victoria and the Northern Territory had higher rates of hospitalisation while Queensland, Western Australia, Tasmania and the Australian Capital Territory had lower rates (9).

Alongside the health care system, the environments where Australians live, learn, work and play are important settings in which to promote health and reduce asthma risk. Different sectors and settings – such as workplaces, schools, and communities – have an important role in promoting health and reducing asthma risk across the life course.

Living with asthma

Asthma affects people of all ages. The impact of asthma ranges from mild, intermittent symptoms causing few problems for the individual, to severe and persistent wheezing, coughing and shortness of breath. Symptoms vary in severity and frequency from person to person. Symptoms may occur several times in a day or week, and for some people are worse during physical activity or at night.

Among those with the condition, airway narrowing and symptoms can be triggered by:

- Viral infections
- Exposure to specific allergens such as house dust mites, pollens, mould spores, animal dander and occupational allergens
- Irritants such as tobacco smoke and other air pollutants
- Exercise
- Some food chemicals or additives (9).

Asthma is also associated with flare-ups (worsening of symptoms, also called exacerbations or attacks), which may be severe or life-threatening. Flare-ups can occur even in patients with mild or well-controlled asthma, but the risk of flare-ups is higher in people not taking regular preventer treatment, people with uncontrolled asthma symptoms, and people with additional risk factors such as smoking (9).

Most asthma is mild, and can be well-controlled with regular low dose preventer (anti-inflammatory) treatment, but many people with asthma do not take this, or do not take it regularly (9, 24, 30). Uncontrolled asthma carries the risk of permanent loss of lung function, persistent symptoms and acute attacks or flare-ups (9).

People with asthma often treat their asthma as an acute condition rather than a chronic condition, using

medication to relieve symptoms with a short-acting reliever rather than to avoid symptoms occurring with a preventer (31). Poor asthma control (frequent symptoms and/or flare-ups) is a common problem in both adults and children. Survey data suggests that for almost half of the people with asthma, there is a gap between the potential control of their asthma symptoms and the level currently experienced (18).

Overall, levels of asthma symptoms and frequency of dispensing reliever medication in the Australian community are higher than is consistent with good asthma control (31).

In people with asthma, risk factors associated with an increased risk of asthma symptoms or flare-ups include:

- Having frequent symptoms (e.g. more than 3 days/week)
- Not taking preventer (inhaled corticosteroid) treatment regularly
- Frequent reliever use
- Major psychological or socioeconomic problems
- Tobacco use (smoking or exposure to passive smoke)
- Environmental hazards and events including bushfires, thunderstorms, high pollen days, poor air quality/air pollution (9, 13-17).

An estimated 5–10% of people with asthma have uncontrolled symptoms and frequent flare-ups despite taking regular high dose preventer treatment (53). This is called severe asthma and is an area of substantial need. Severe asthma contributes much of the cost of asthma (54). Research into the development of new treatments for severe asthma is ongoing.

People with chronic conditions, such as asthma, experience a significant burden associated with the treatment of their condition and are also affected by psychosocial issues (21). Asthma is associated with a poorer quality of life. Australians with asthma report worse psychological health than those without asthma, including more anxiety and depression (55). Some people with asthma experience feelings of stigma due to their condition, which may create a barrier to effective self-management practices (56). In a recent survey of young people with asthma, mental health and wellbeing was poor, particularly for young people whose asthma was poorly controlled. Just over 50% of those surveyed had scores on the Kessler Psychological Distress scale (K10) that suggest they are likely to have a mental disorder, which is double the rate in the wider population of young people (55).

People with asthma rate their health worse than do people without the condition (9). Most of the impact of asthma is on physical functioning and on the person's social and work life. Uncontrolled asthma reduces young people's participation in school, childcare, sports

and social events and impacts on leading enjoyable, productive lives and, similarly, is likely to affect family members and caregivers. Recurrent asthma symptoms frequently cause disturbed sleep, daytime fatigue and reduced activity levels. People with asthma are more likely to take days off work, school, childcare or study than people without asthma (57).

One in five adults with asthma is a current smoker (9). The rate of smoking among people with asthma is the same, if not higher than, the rate of smoking among people without asthma (9). The harmful effects of both active and passive smoking are well known. People with asthma who smoke have particular problems and find their asthma more difficult to control than non-smokers. This is because smoking triggers asthma symptoms and reduces the effectiveness of preventer medications. Australian children with asthma continue to be exposed to environmental tobacco smoke in the home despite the known adverse effects. In 2007–08, 38.1% of children with asthma aged 0–14 years lived with one or more daily cigarette smokers, and 7.8% of children with asthma lived in homes where smoking occurred daily inside the home (9).

Health burden of disease

In Australasia (a region that covers Australia and New Zealand), the non-fatal burden from asthma (measured in terms of years lived with illness or disability from the disease) was ranked 11th highest for the population overall and ranked 1st among children aged 5–14 years (19).

Asthma contributes the highest proportion of years lived with disability (YLD) of all lung diseases, since it affects people of all ages, including children, and because asthma deaths occur mostly in older adults (22).

While mortality rates are low, asthma has a long-term impact on quality of life and people with asthma may live for a long period of time with its associated disability (22). The Australian Burden of Disease Study 2011 estimated that asthma was responsible for around 100,000 YLD, i.e. 100,000 years lived with less than perfect health (19). Asthma accounted for 4.5% of all YLD due to any disease, and was the leading cause for children aged 14 years and under (19). A 2015 report by Deloitte Access Economics estimated that the burden of disease costs 133,555 disability adjusted life years (DALYS), which comprises 128,463 years of healthy life lost due to disability and 5,092 years of life lost due to premature death (23).

The net value of the burden of disease for asthma was estimated to be \$24.7 billion in 2015 (23).

Asthma expenditure

Asthma poses a substantial economic burden on our health care system, and on society through loss of productivity. Much is known about the direct cost of asthma. Direct health expenditure includes Pharmaceutical Benefits Scheme (PBS) expenditure, hospitalisations and general practice visits. The distribution of expenditure is different for asthma than for total health expenditure. In particular, relatively more money is spent on pharmaceuticals than hospitalisations (9). Much less is known about the indirect costs of asthma.

A recent report by Deloitte Access Economics makes an important contribution to the understanding of the total cost of asthma to Australia, including *indirect* costs such as lost productivity. The total costs of asthma were calculated by Deloitte Access Economics as \$27.9 billion (23). A breakdown of the costs is provided in Table 4.

Table 4: Total costs of asthma (2015)

Component	Value (\$m)
Health system costs <i>Prescription pharmaceuticals, hospitalisations, out of hospital expenditure</i>	1,245.5
Productivity costs <i>Time away from work, the opportunity cost of informal care, administrative costs</i>	1,130.2
Other financial costs <i>Government programs, formal care, travel</i>	246.4
Deadweight losses <i>Accrue as a result of government transfers and lower taxation revenue receipts due to asthma</i>	635.9
Total economic costs	3,258.0
Total burden of disease costs	24,671.6
TOTAL COSTS	27,929.6

The total government costs of asthma calculated over a 25 year period, from 1990-2015, are estimated to be \$30.6 billion, in 2015 dollars (23). Total government costs for 2016-2019 are projected to be \$4.0 billion (23). The total government costs are shown in Figure 3.

Deloitte Access Economics calculated which sections of society bear the health system costs of asthma, based on data from the AIHW. In 2015, asthma cost:

- Federal Government (e.g. MBS and PBS) \$5 15.6 million
- State and Territory Governments (e.g. hospital funding) \$335.0 million
- Individuals and families (e.g. co-payments and out-of-pocket hospital expenditure) \$22 1.7 million
- Other parties (such as private health insurers and charities) \$173.1 million (23).

The breakdown of these costs is shown in Figure 4.

Additional data on the cost to individuals of having asthma are not available. A previous 2005 cohort study of people with asthma in New South Wales estimated the median costs per person were \$89 per year (range \$0 to \$4,882) which included \$8 for services and \$40 for medications and asthma related equipment (58). This data would not be indicative of current costs. The cost of preventer medications is a concern for people with asthma, and contributes to poor adherence (59).

Figure 3: Total government costs due to asthma (1990-2019)

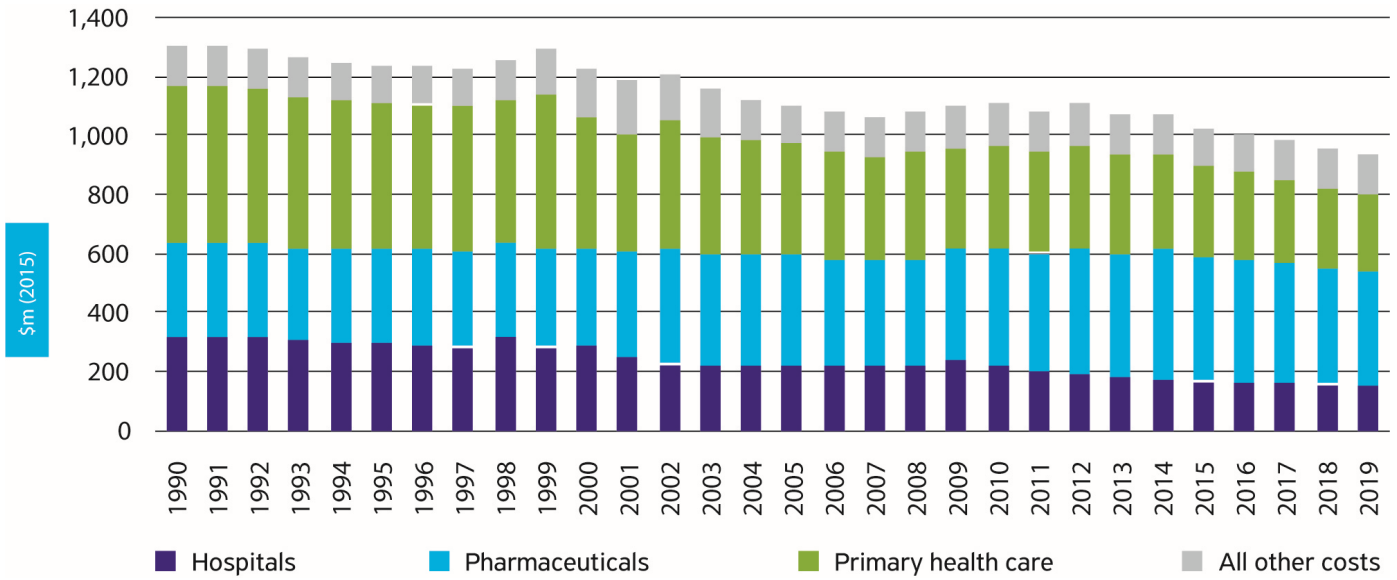
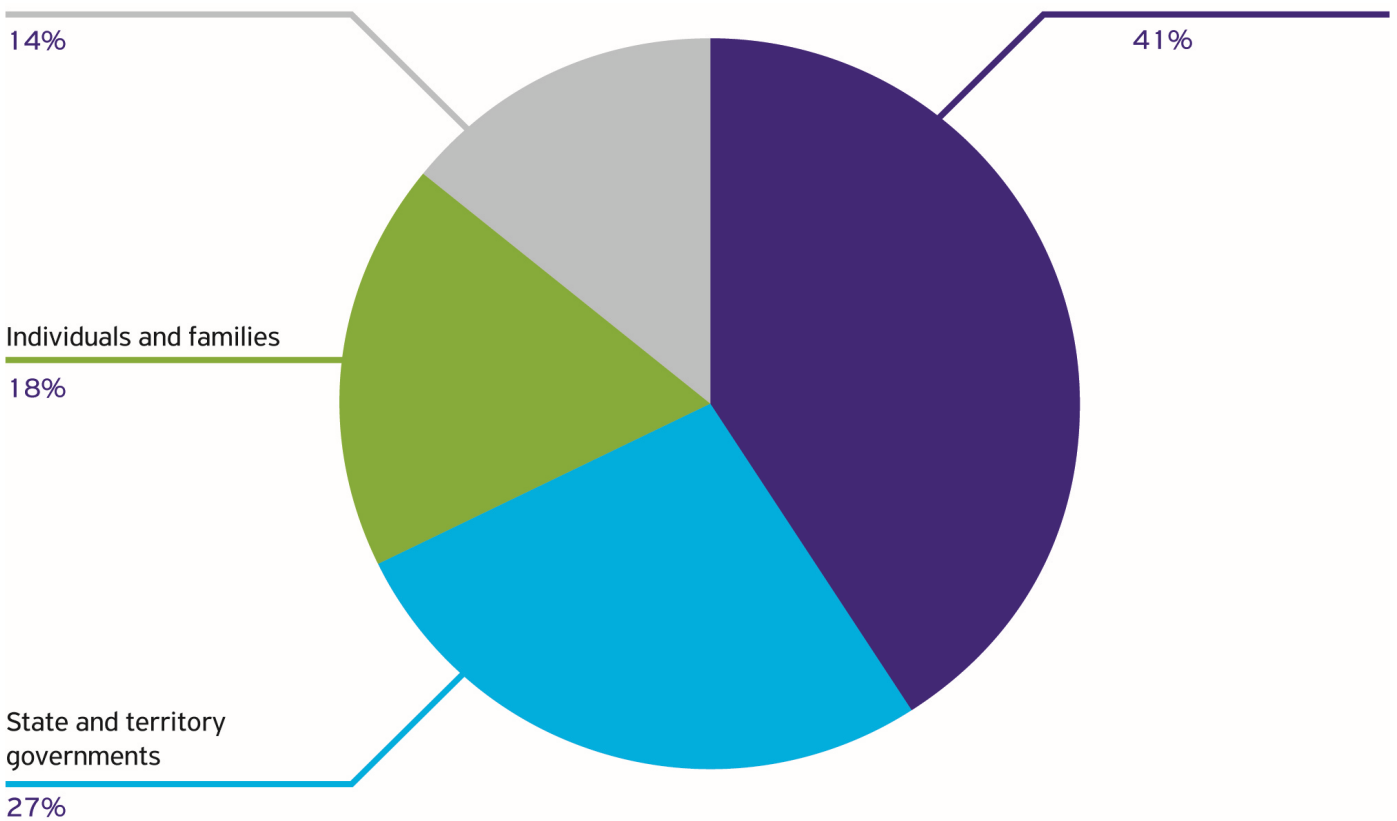


Figure 4: Breakdown of health system costs (2015)



Appendix 3: Key challenges facing asthma

International context

Asthma is a serious global health problem affecting all age groups. In spite of laudable efforts to improve asthma care over the past twenty years, many patients globally have not benefited from advances in asthma treatment (5). At a fundamental level, patients in many areas may not have access to low dose inhaled corticosteroids, which are the cornerstone of care for asthma patients of all severity. More broadly, medications remain the major contributor to the overall costs of asthma management, so the pricing of asthma medications continues to be an issue of urgent need and a growing area of research interest (5).

Based on an audit of a number of current international asthma strategies (60-65), it is evident that, similar to Australia, other countries face the challenge of suboptimal asthma control. A number of countries have looked to the well-known Australian guidelines as they develop their own national guidelines. Also, the Global Initiative for Asthma has developed a Global Strategy

for Asthma Management and Prevention (5), updated annually and available globally. It is important that countries have guidelines suited to their local context to ensure relevance.

Evidence-based recommendations must not only be developed, but also disseminated and implemented at a national and local level, and integrated into clinical practice. When asthma care is consistent with evidence-based recommendations, outcomes improve (5, 66, 67). Recommendations for implementing asthma care strategies are based on many successful programs worldwide. International and national experience shows that a comprehensive, sustained and multi-sectoral approach is most effective at improving asthma care and patient outcomes.

Key challenges facing asthma in Australia

Table 5 provides a summary of the key challenges facing asthma in Australia.

Table 5: Key challenges facing asthma in Australia

Area	Issues
Person with asthma and their caregiver	<ul style="list-style-type: none"> • Asthma is both under- and over-diagnosed, leading to patients having uncontrolled symptoms and risks of inappropriate treatment respectively (25-28, 68) • Suboptimal asthma control (poor symptom control and/or flare-ups) is common. For half of people with asthma, there is a gap between the potential control of their asthma symptoms and the level currently experienced (18). • The majority of people with asthma underestimate the severity of their condition and are unclear about how to manage their illness. Tolerance of controllable symptoms is common (18). • Many asthma patients are not using appropriate medications, for example, relying on reliever medication for symptomatic relief without using regular preventer medication to avoid symptoms occurring (31). • The majority of people with asthma are not using their inhalers correctly, resulting in suboptimal medication administration, poor asthma control, increased risk of flare-ups, and lack of perceived benefit by the patient. Up to 90% of patients demonstrate incorrect technique with either standard pressurised metered dose inhalers or dry-powder inhalers (33). • Adherence to inhaled maintenance therapy is poor. Many patients taking preventer medication are not using it regularly as recommended in guidelines (18). Australian data on dispensed medication indicate evidence of substantial under-use of preventer medication, with only 7% of young adults who received any inhaled preventer in 2013 having dispensing consistent with regular use (31). • The cost of preventer medications is a concern for people with asthma, and contributes to poor adherence (59). • People with asthma often have different perspectives and priorities from health professionals about the risks and treatment of asthma.

Area	Issues
Health professionals	<ul style="list-style-type: none"> • Lack of culturally competent services for Aboriginal and Torres Strait Islander people, particularly in non-Indigenous health services. • Non-adherence to best practice treatment guidelines (9, 24-29). • There is no single reliable diagnostic test ('gold standard') for asthma. The treatment guidelines support health professionals to diagnose and manage asthma, however clinical expertise and interpretation is required in their application (1). • Both under- and over-diagnosis of asthma are common (25-28, 68). The literature suggests that a number of people are diagnosed with asthma that don't have the condition, although data to quantify this is not available (31). Upskilling is needed to improve diagnostic accuracy for acute and chronic respiratory conditions leading to appropriate treatment. • Spirometry is the best lung function test for diagnosing asthma and for measuring lung function when assessing asthma control. It is underused in general practice for a number of reasons including lack of training in use and interpretation of results (9, 29). Access to respiratory function laboratories may be difficult for rural patients. • Lack of knowledge and skills to support patients with effective self-management practices, such as using inhalers correctly. • Limited opportunities, particularly for primary health care nurses and pharmacists, to provide asthma self-management advice. • Asthma action plans can only be signed off by the prescriber, usually the GP, who are time poor with multiple competing demands. • Only half of people with asthma report having seen their GP for a non-urgent review during the previous year, despite guidelines recommending that every person with asthma has at least an annual routine review. GPs report that most asthma visits are for management of flare-ups or repeat prescriptions (18). • Inappropriate prescribing of preventer medications: <ul style="list-style-type: none"> o More expensive combination medication (inhaled corticosteroid/long-acting beta-agonist (ICS/LABA)) prescribed when less expensive lower dose inhaled corticosteroids (ICS only) would be more appropriate and in accordance with the treatment guidelines (31) o Preventer medications are prescribed for many people who do not appear to have asthma (31). • The majority of people with asthma do not have a written asthma action plan, despite treatment guidelines recommending that every person with asthma should have one. Currently, only 40% of children with asthma and 25% of all people with asthma have an asthma action plan (69).
Health system and community environments	<ul style="list-style-type: none"> • Growing demands associated with increasing health needs and costs of Australia's ageing population (35, 70, 71). • Widespread misperception that the asthma problem is 'solved' in Australia (18). • Asthma management and coordination of care is fragmented; a review of health professional roles including scope of practice is required to ensure 'joined up' care and to meet patient expectations and needs (40). • Slow/limited uptake of the Digital Health Record (My Health Record) intended to enable more effective self-management by patients, sharing of records and facilitate coordination of care between health professionals. • Emerging digital technologies to support medication adherence and improve inhaler technique require testing and adoption at scale (32). • Lack of nationally consistent hospital discharge protocols for asthma. • Inconsistent patient access to asthma education, information and community support following asthma reviews with the GP.

Area	Issues
	<ul style="list-style-type: none"> • The cost of asthma medications is not visible at the point of prescription, to enable patients to discuss medication expenses and their capacity to fund treatment. • Different language is used by patients and health professionals to describe asthma and to judge the severity of the condition; terminology is confusing and often misunderstood (e.g. ‘control’ and ‘attack’ mean different things to health professionals and patients). • Limited availability of health services in rural and isolated communities. • Potential future impact of climate change (e.g. longer pollen seasons, more extreme weather events) on asthma prevalence and severity (72, 73). • The problem of severe asthma is not currently adequately addressed within the health system.
<p>Research, evidence and data</p>	<ul style="list-style-type: none"> • There is evidence of health professional non-adherence to Australia’s best practice guidelines, including diagnostic accuracy, and a need to explore ways to address this. • Research and data are lacking on: <ul style="list-style-type: none"> o The complex interaction of factors which causes asthma o Identifying ways of preventing or curing asthma o New and improved treatments for asthma o Up-to-date economic data on the direct and indirect costs of asthma; indirect costs include, but are not limited to, reduced productivity, absence from work, early retirement and premature death and bereavement o Treatment for asthma in primary health care settings, across health care settings, and over time o Reasons for health professional non-adherence to treatment guidelines o The social and environmental determinants of asthma, particularly for Aboriginal and Torres Strait Islander people and other priority populations o The impact of environmental hazards and risk events (thunderstorms, air pollution) on people with asthma o The psychosocial influences on asthma patient self-management behaviour o Feasible strategies to bring about changes in patient self-management and health professional practice o Understanding what patients need and want when they engage with health professionals as part of their asthma care. o Asthma terminology to enhance health literacy and provide a common and accessible language for both patients and health professionals (e.g. explore new terminologies such as ‘daily asthma medication’ and ‘emergency medication’). o Current prevalence of work-related asthma and which Australian industries are most affected, and how this relates to workplace health and safety issues (42). o The impact of electronic cigarettes (also called e-cigarettes) on people with asthma and those around them.

References

- National Asthma Council Australia. *Australian Asthma Handbook, Version 1.2*. Melbourne: National Asthma Council Australia, 2016. Available from: <http://www.asthmahandbook.org.au/>
- Australian Government. *National Strategic Framework for Chronic Conditions*. Canberra: Australian Health Ministers' Advisory Council's Community Care and Population Health Principal Committee, 2016.
- Commonwealth of Australia. *National Aboriginal and Torres Strait Islander Health Plan 2013–2023*. Canberra: Commonwealth of Australia, 2013.
- World Health Organization. *Global action plan for the prevention and control of noncommunicable diseases 2013–2020*. Geneva: World Health Organization, 2013.
- Global Initiative for Asthma (GINA). *Global strategy for asthma management and prevention*. GINA, 2016. Available from: <http://www.ginasthma.org/>
- National Asthma Campaign. *National Asthma Strategy Implementation Plan 1999*. Melbourne: National Asthma Campaign; 1999. Available from: <https://assets.nationalasthma.org.au/resources/national-asthma-strategy-1999-implementation-plan.pdf>
- Australian Government Department of Health and Aged Care. *National Asthma Action Plan 1999–2002*. Canberra: Australian Government Department of Health and Aged Care, 2001.
- Australian Government Department of Health and Ageing. *National Asthma Strategy 2006–2008*. Canberra: Australian Health Ministers' Conference, 2006. Available from: <https://assets.nationalasthma.org.au/resources/national-asthma-strategy-2006-08.pdf>
- Australian Centre for Asthma Monitoring. *Asthma in Australia 2011*. Canberra: Australian Institute of Health and Welfare (AIHW), 2011.
- Australian Institute of Health and Welfare. Asthma and associated comorbidities: the numbers (webpage). Australian Institute of Health and Welfare, 2017 [accessed July 2017]. Available from: <http://www.aihw.gov.au/asthma/associated-comorbidities-and-risk-factors/numbers/>
- de Marco R, Pesce G, Marcon A et al. The coexistence of asthma and chronic obstructive pulmonary disease (COPD): prevalence and risk factors in young, middle-aged and elderly people from the general population. *PLoS One* 2013; 8: e62985.
- Andersen H, Lampela P, Nevanlinna A et al. High hospital burden in overlap syndrome of asthma and COPD. *Clin Respir J* 2013; 7: 342–6.
- Australian Institute of Health and Welfare. Risk factors associated with asthma (webpage). AIHW, 2017 [accessed July 2017]. Available from: <http://www.aihw.gov.au/asthma/associated-comorbidities-and-risk-factors/risk-factors/>
- Dabrera G, Murray V, Emberlin J et al. Thunderstorm asthma: an overview of the evidence base and implications for public health advice. *Q J Med* 2013; 106: 207–17.
- Marks GB, Bush RK. It's blowing in the wind: New insights into thunderstorm-related asthma. *J Allergy Clin Immunol* 2007; 120: 530–2.
- Marks GB, Colquhoun JR, Girgis ST et al. Thunderstorm outflows preceding epidemics of asthma during spring and summer. *Thorax* 2001; 55:468–71.
- Girgis ST, Marks GB, Downs SH et al. Thunderstorm-associated asthma in an inland town in south-eastern Australia. Who is at risk? *Eur Respir J* 2000; 16: 3–8.
- Reddel HK, Sawyer SM, Everett PW, Peters MJ. Asthma control in Australia: a cross-sectional web-based survey in a nationally representative population. *Med J Aust* 2015; 202: 492–7.
- Australian Institute of Health and Welfare. *Australian Burden of Disease Study: Impact and causes of illness and death in Australia 2011*. Australian Burden of Disease Study series no.3. BOD 4. Canberra: AIHW, 2016.
- National Asthma Council Australia. Asthma mortality statistics (webpage). National Asthma Council Australia, 2017 [accessed July 2017]. Available from: <http://www.nationalasthma.org.au/publication/asthma-mortality-statistics>
- Tran V, Barnes C, Montori VM, Falissard B, Ravaud P. Taxonomy of the burden of treatment: a multi-country web-based qualitative study of patients with chronic conditions. *BMC Medicine* 2015; 13: 115.
- Poulos L, Correll P, Toelle B et al. *Lung disease in Australia*. Brisbane: Lung Foundation Australia, 2014.
- Deloitte Access Economics Pty Ltd. *The Hidden Cost of Asthma*. Melbourne: Deloitte Access Economics Pty Ltd, 2015.
- Marks GB, Jalaludin B, Williamson M et al. Use of 'preventer' medications and written asthma management plans among adults with asthma in New South Wales. *Med J Aust* 2000; 173: 407–10.
- Lucas AE, Smeenk FW, Smeele IJ, van Schayck CP. Overtreatment with inhaled corticosteroids and diagnostic problems in primary care patients, an exploratory study. *Fam Pract* 2008; 25: 86–91.
- Marklund B, Tunsater A, Bengtsson. How often is the diagnosis bronchial asthma correct? *Fam Pract* 1999; 16: 112–6.
- Montnémery P, Hansson L, Lanke J et al. Accuracy of a first diagnosis of asthma in primary health care. *Fam Pract* 2002; 19: 365–8.
- Adams R, Wilson D, Appleton S et al. Underdiagnosed asthma in South Australia. *Thorax* 2003; 58: 846–50.
- Barton C, Proudfoot J, Amoroso C et al. Management of asthma in Australian general practice: care is still not in line with clinical practice guidelines. *Prim Care Respir J* 2009; 18: 100–5.
- Marks G, Abramson MJ, Jenkins CR et al. Asthma management and outcomes in Australia: a nation-wide telephone interview survey. *Respirology* 2007; 12: 212–9.

31. Australian Institute of Health and Welfare: Correll PK, Poulos L, Ampon R et al. *Respiratory medication use in Australia 2003–2013: treatment of asthma and COPD*. Canberra: AIHW, 2015.
32. Asthma UK. *Connected asthma: how technology will transform care*. London: Asthma UK, 2016. Available from: <https://www.asthma.org.uk/connectedasthma>
33. National Asthma Council Australia. *Inhaler technique for people with asthma or COPD*. Melbourne: National Asthma Council Australia, 2016.
34. Australian Bureau of Statistics. *Australian Aboriginal and Torres Strait Islander health survey: first results*, Australia, 2012–13. Canberra: Australian Bureau of Statistics, 2013.
35. Australian Institute of Health and Welfare. *Australia's health 2016*. Australia's health series no.15. Cat. no. AUS 199. Canberra: AIHW.
36. Australian Institute of Health and Welfare: Poulos L, Cooper S, Ampon R, Reddel H, Marks G. *Mortality from asthma and COPD in Australia*. Canberra: AIHW, 2014.
37. Australian Institute of Health and Welfare. *Australian Burden of Disease Study: fatal burden of disease in Aboriginal and Torres Strait Islander people 2010*. Australian Burden of Disease Study series no.2. BOD 2. Canberra:AIHW, 2016.
38. Australian Bureau of Statistics. *National Health Survey: First Results, 2014–15*. Canberra: Australian Bureau of Statistics, 2015.
39. Australian Institute of Health and Welfare. *Australia's health 2016*. Australia's health series no.15. Cat. no. AUS 199. Canberra: AIHW.
40. Commonwealth of Australia Department of Health. *Primary Health Care Advisory Group Final Report: Better Outcomes for People with Chronic and Complex Health Conditions*. Canberra: Commonwealth of Australia, 2016.
41. National Health and Medical Research Council (NHMRC). NHMRC research funding – asthma (National Health Priority Area) (webpage). NHMRC, 2017 [accessed July 2017]. Available from: <https://www.nhmrc.gov.au/grants-funding/research-funding-statistics-and-data>
42. Safe Work Australia. *Deemed diseases in Australia*. Canberra: Safe Work Australia, 2015.
43. Australian Centre for Asthma Monitoring. *Refining national asthma indicators: Delphi survey and correlation analysis*. Canberra: AIHW, 2009.
44. Australasian Society of Clinical Immunology and Allergy (ASCIA) and Allergy & Anaphylaxis Australia. *National allergy strategy*. Sydney: ASCIA, 2015. Available from: <http://www.allergy.org.au/national-allergy-strategy>
45. Commonwealth of Australia. *National Tobacco Strategy 2012–2018*. Canberra: Commonwealth of Australia, 2012.
46. World Health Organization. NCD Global Monitoring Framework (webpage). World Health Organization, 2017 [accessed July 2017]. Available from: http://www.who.int/nmh/global_monitoring_framework/en/
47. Global Initiative for Chronic Obstructive Lung Disease (GOLD). *Global strategy for the diagnosis, management and prevention of COPD*. GOLD, 2017. Available from: <http://www.goldcopd.org/>
48. World Health Organization. *Mental health action plan 2013–2020*. Geneva: World Health Organization, 2013.
49. Australian Institute of Health and Welfare, Bhatia K. *Occupational asthma in Australia*. Canberra: AIHW, 2008. Contract No.: Cat. no. AUS 101.
50. Goeman DP, Abramson MJ, McCarthy EA et al. Asthma mortality in Australia in the 21st century: a case series analysis. *BMJ Open* 2013; 3(e002539): doi:10.1136/bmjopen-2012-002539.
51. NSW Child Death Review Team. *NSW Child Death Review Team annual report 2013*. Sydney: NSW Ombudsman, 2014.
52. National Health Performance Authority. *Healthy Communities: Frequent GP attenders and their use of health services in 2012–13*. Sydney: National Health Performance Authority, 2015.
53. Chung KF, Wenzel SE, Brozek JL et al. International ERS/ATS guidelines on definition, evaluation and treatment of severe asthma. *Eur Respir J* 2014; 43: 343–73.
54. Sadatsafavi M, Lynd L, Marra C et al. Direct health care costs associated with asthma in British Columbia. *Can Respir J* 2010; 17: 74–80.
55. Blanchard M, Morris J, Birrell E et al. *National young people and asthma survey: issues and opportunities in supporting the health and wellbeing of young people living with asthma*. Melbourne: Young and Well CRC, 2014.
56. Andrews K, Jones S, Mullan J. Stigma: still an important issue for adults with asthma. *J Asthma Aller Educ* 2013; 4: 165–71.
57. O'Byrne P, Pedersen S, Schatz M et al. The poorly explored impact of uncontrolled asthma. *Chest* 2013; 143: 511–23.
58. Kenny P, Lancsar E, Hall J et al. The individual and health sector costs of asthma: the first year of a longitudinal study in New South Wales. *Aust NZ J Public Health* 2005; 29: 429–35.
59. Australian Centre for Asthma Monitoring. *Patterns of asthma medication use in Australia*. Canberra: AIHW, 2007.
60. Asthma Society of Ireland. *Vision 2020*. Asthma Society of Ireland, 2015. Available from: <https://www.asthma.ie/document-bank/asthma-society-irelands-strategy-vision-2020>
61. American Lung Association. *Strategic Framework*. American Lung Association, 2017. Available from: <http://www.lung.org/assets/documents/about-us/strategic-framework.pdf>
62. Asthma UK. *Asthma UK Strategy 2014–17: Reduce risk of asthma attacks*. Asthma UK, 2014. Available from: <https://www.asthma.org.uk/globalassets/about/asthma-uk-strategy-2014-17.pdf>
63. Haahtela T, Tuomisto LE, Pietinalho A, et al. A 10 year asthma programme in Finland: major change for the better. *Thorax* 2006; 61: 663–70.
64. Asthma Respiratory Foundation NZ. About (webpage). Asthma Respiratory Foundation NZ, 2016 [accessed September 2016]. Available from: <https://www.asthmafoundation.org.nz/about-us>

65. The Canadian Lung Association. National Lung Health Framework (webpage). The Canadian Lung Association, 2010 [accessed September 2016]. Available from: <http://www.lunghealthframework.ca/about-framework>
66. Burgers J, Eccles M. *Clinical guidelines as a tool for implementing change in patient care*. Oxford: Butterworth-Heinemann: 2005.
67. Woolf SH, Grol R, Hutchinson A, Eccles M, Grimshaw J. Clinical guidelines: potential benefits, limitations and harms of clinical guidelines. *BMJ* 1999; 318: 527–30
68. Aaron SD, Vandemheen KL, Boulet LP et al. Overdiagnosis of asthma in obese and nonobese adults. *Can Med Assoc J* 2008; 179: 1121–31.
69. Australian Institute of Health and Welfare. How many people have an asthma action plan? (webpage). AIHW; 2017 [accessed July 2017]. Available from: <http://www.aihw.gov.au/asthma/action-plan/>.
70. Australian Bureau of Statistics. *Australian social trends. Future population growth and ageing*. Canberra: Australian Bureau of Statistics, 2009 [accessed September 2016]. Available from: <http://www.abs.gov.au/AUSSTATS/abs@nsf/Lookup/4102.OMain+Features10March%202009>
71. Business Council of Australia. *Long-term funding of health and ageing: the rising pressure on Commonwealth and State budgets*. Melbourne: Business Council of Australia, 2013.
72. Blashki G, Armstrong G, Berry HL et al. Preparing health services for climate change in Australia. *Asia Pac J Public Health* 2011; 23 (2 suppl.): S133–43.
73. Hanna EG, Spickett JT. Climate change and human health: building Australia's adaptation capacity. *Asia Pac J Public Health* 2011; 23 (2 suppl.): S7–13.

