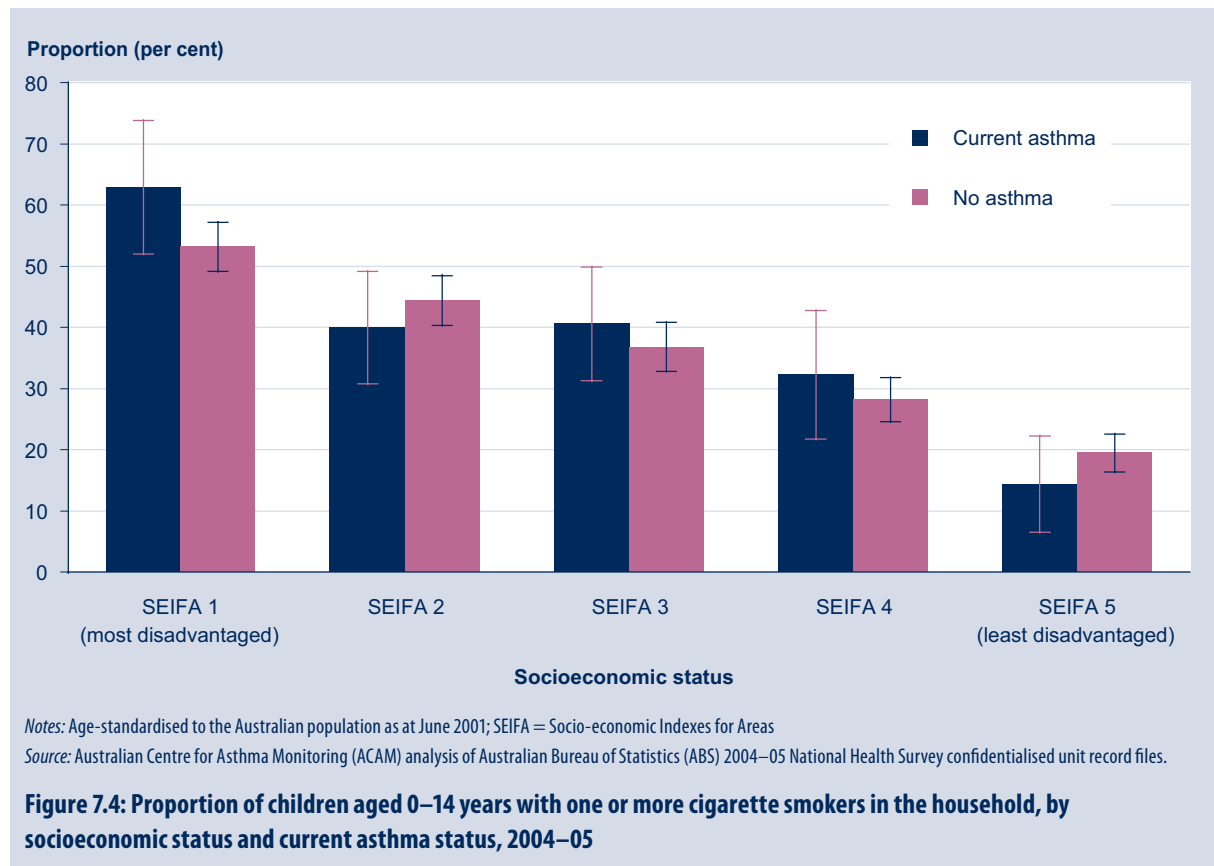


Socioeconomic disadvantage

In the most socioeconomically disadvantaged localities, nearly two-thirds of children with current asthma reside with a smoker. This proportion declines to 14% in the least socioeconomically disadvantaged localities (Figure 7.4).



7.3 Occupational asthma

Occupational asthma represents the most prevalent occupational lung disease in the developed world (Nicholson et al. 2005). The term refers to asthma caused, or made worse, by exposures in the workplace. International studies suggest that 9–15% of cases of asthma in adults of working age are either caused or aggravated by occupational factors (Nicholson et al. 2005).

There are over 400 substances that are recognised as triggers for asthma in the workplace including various chemicals used in paints, manufacturing and cleaning products, latex gloves, animals and dusts from grain, flour and wood (Nicholson et al. 2005). These agents pose most risk for people employed in the plastics, rubber and chemical industries, nurses, timber workers and welders, and jobs involving painting (particularly spray painting), dyeing, cleaning, baking and food processing, farming, laboratory work and working with animals (NAC 2006; Nicholson et al. 2005).

The importance of occupational asthma is that it is relatively common and it is preventable. A population-based study in Canada (Johnson et al. 2000) concluded that the removal of exposure to known triggers could prevent as much as 18% of adult-onset asthma in that country, although a



subsequent, similar study in Australia found a lower proportion of cases attributable to workplace exposures (see section on 'Prevalence of occupational asthma' below). Early removal from exposure is important for treatment and preventing persistent disease. Reducing or eliminating exposure to the triggering agent(s) will usually reduce the severity of symptoms or, in some cases of early intervention, it may eliminate symptoms completely. Persons who remain exposed are more likely to have persistent and troublesome asthma. The AIHW has recently published a review of occupational asthma (AIHW 2008e) that summarises known occupational risk factors for asthma, current knowledge about incidence and prevalence and approaches to prevention and disease monitoring, with particular reference to the Australian context. Here we present a brief coverage of those issues.

7.3.1 Current surveillance

Since occupational exposure represents a potentially avoidable cause of asthma, exposure to occupational allergens and the occurrence of occupational asthma are important targets for surveillance. Therefore, the prevalence of occupational asthma has been identified as one of the 24 national health indicators for asthma (AIHW: Baker et al. 2004). The intent of the indicator is to:

- monitor exposure to, and the impact of, occupational risk factors for asthma
- evaluate population health interventions to prevent the onset and exacerbations of asthma (in the occupational setting)
- monitor the provision of a safe environment for people with asthma.

In spite of its identification as an asthma indicator, there is no consistent, thorough and reliable scheme to monitor the prevalence of occupational asthma in Australia at the present time.

Conventional monitoring for chronic diseases is largely based on measures of late-stage events such as hospitalisation and mortality and on cross-sectional prevalence surveys. Unfortunately, both of these sources provide very limited and potentially biased evidence about the impact of occupational asthma.

Causal exposures are very rarely recorded in hospitalisation and mortality data and, hence, there is virtually no information on the contribution of occupational exposures to these outcomes of asthma. Furthermore, these outcomes represent only the 'tip of the iceberg' of this issue.

A more fundamental problem is that the disease may be transient and the main impact may be to cause someone to leave his or her job. People who find that their work is causing or aggravating asthma (or other symptoms) tend to seek alternative employment or leave the workforce altogether. Some cross-sectional surveys have been performed to estimate the prevalence of occupational asthma. These have generally asked respondents about previous employment or exposures that may have caused asthma or asthma-like symptoms. Australian data from two surveys are reported below in the section entitled 'prevalence of occupational asthma'.

Since some industries are at particularly high risk for cases of occupational asthma, there may be value in conducting surveillance in specific workplaces. However, workplace-based cross-sectional surveys are particularly likely to underestimate the burden of the disease since many of the affected workers will have left the workplace. The remaining workers will tend to be the healthy ones. This bias is a major problem in surveillance for occupational disease and is known as the 'healthy worker effect'.

In order to accurately estimate the impact of occupational asthma in the community or in a specific workplace, it is necessary to measure the incidence of asthma in a cohort followed over time. Well-conducted cohort studies will not be affected by the healthy worker bias described above. Some examples of measures of the incidence of occupational asthma in Australia are cited in the section below entitled 'Incidence of occupational asthma'.

7.3.2 Prevalence

It has been estimated that occupational exposures cause of 9.5% of cases of adult-onset asthma in New South Wales (Johnson et al. 2006). This estimate was based on data from a self-completed postal questionnaire administered to a randomly selected sample of adults in New South Wales. Information on adult-onset asthma and ever being employed in occupations identified as being of high risk for the development of occupational asthma were collected. The triggering agents associated with the greatest risk of adult-onset asthma were exposure to ammonia (odds ratio 2.54; 95% CI 1.72–3.78) and photographic development (odds ratio 2.25; 95% CI 1.04–4.85). One of the strengths of this study is its population-based design, which allows for the inclusion of people who have had occupational asthma and have left the workplace.

In 2001, 1.6% (95% CI 1.0–2.2%) of respondents with asthma in the NHS aged 15 years and over stated that their asthma was work-related. In 2004–05, the prevalence of work-related asthma among those with asthma was 2.2% (95% CI 1.5–2.8%). Among those aged 35–64 years, 3.1% (95% CI 1.9–4.3) of all asthma cases in 2004–05 were attributed to work while among those aged 15–34 years, 0.7% (95% CI 0.1–1.3) of people with asthma reported that their condition was work-related.

The estimate for the proportion of adult-onset asthma attributable to occupational exposures in New South Wales falls towards the lower end of the range observed in international studies (Nicholson et al. 2005).

7.3.3 Incidence

Population-based surveillance for incident cases of occupational asthma has been established in three Australian states.

The Surveillance of Australian Workplace-Based Respiratory Events (SABRE) is a voluntary notification scheme that has been in operation in Victoria and Tasmania since 1997 and in New South Wales since 2001. In this scheme, respiratory physicians, occupational physicians and, in the case of New South Wales, accredited general practitioners report newly diagnosed cases of occupational respiratory diseases.

Since the scheme started, the incidence of occupational asthma was 5 cases per million employed people per year in Tasmania and Victoria combined and 2 cases per million employed people per year in New South Wales (Hannaford-Turner et al. 2007). On an international scale, this is a relatively low incidence rate.

Unfortunately, the voluntary nature of this scheme means that this is almost certainly an underestimate of the true incidence. As there is no legislative requirement to report benign occupational lung disease (as there is for certain infectious diseases and for cancer, for example) and there is no comprehensive compensation scheme for people with occupational asthma, there is no incentive for patients or health-care professionals to notify new cases. Furthermore, the notification scheme does not impose a standard for the diagnosis of occupational asthma. Hence, estimates of the incidence of occupational asthma based on these notifications may be inaccurate. The net effect is likely to be an underestimate.

The lower incidence in New South Wales compared with other settings may be attributable to underestimation. For example, in Finland, physicians are required by law to report all cases of known or suspected work-related disease to a national register. In addition, all employees in Finland must carry insurance for occupational diseases. Reports of disease and accident diagnoses, recorded by the insurance companies, are provided to the national register. It has been reported that the mean annual incidence of occupational asthma in Finland, where all cases of occupationally-related disease are captured in the Finnish Registry of Occupational Diseases, is 174 cases per million employed workers (Karjalainen et al. 2000). International estimates of the incidence of occupational asthma average around 47 cases per million workers (range 12–174 cases per million workers) (Karjalainen et al. 2000; Nicholson et al. 2005).

7.3.4 Improving surveillance

Cross-sectional community-based population studies do provide some valuable information on the prevalence of occupational asthma in the population. However, they are only successful if they are truly population-based—that is, they include individuals who have left the workforce and they include a detailed historical record of respondents' occupational exposures. Since this is very time-consuming, it is best achieved using a nested survey design in which this information is only sought from respondents with adult-onset asthma and a sample of controls without asthma.

Workplace and community surveillance for incident cases is the 'gold standard' for monitoring the impact of occupational asthma and also for managing the problem in real time. For the reasons outlined above, community-level surveillance has been difficult to achieve in Australia. Improved rates of notification require incentives in the form of a legislative requirement or, preferably, a link to compensation payments, and the application of standards for the diagnosis.

Summary

Asthma caused or aggravated by exposures at work is the one truly preventable form of the disease. It is estimated, based on data from New South Wales, that around 9.5% of adult-onset asthma is caused by occupational exposures and, hence, could be avoided if exposure to triggering agents in the workplace was eliminated. There are limited surveillance data on occupational asthma in Australia and there is a need to improve the completeness of notification to existing voluntary schemes in Victoria, Tasmania and New South Wales.