

OCCUPATIONAL DISEASE INDICATORS



October 2012

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Summary of findings

Over the nine-year period from 2000–01 to 2008–09, decreasing trends were observed for five of the eight priority disease groups in the National OHS Strategy 2002–12: Musculoskeletal disorders; Mental disorders; Infectious and parasitic diseases; Contact dermatitis; and Cardiovascular diseases. For three of the eight priority disease groups: Noise-induced hearing loss; Respiratory diseases; and Occupational cancers, rates over the period did not display a clear overall trend of increase or decrease.

Result	Disease	Findings
	Musculoskeletal disorders	The incidence rate of all workers' compensation claims involving musculoskeletal disorders that were caused by body stressing decreased over the period 2000–01 to 2008–09.
	Mental disorders	Despite increasing between 2000–01 and 2003–04, the incidence rate of all workers' compensation claims for mental disorders has since decreased.
	Noise-induced hearing loss	During the period 2002–03 to 2006–07 the incidence rate of all workers' compensation claims for noise-induced hearing loss stabilised. Since then the incidence rate has increased from 387 to 536 claims per million employees in 2008–09.
	Infectious and parasitic diseases	There was a large decline in the incidence rate of workers' compensation claims for infectious and parasitic diseases from the peak in 2003–04 to 2008–09. This declining trend was also observed when looking at disease notifications for specified zoonoses.
	Respiratory diseases	There was a large decline in the incidence rate of workers' compensation claims for diseases of the respiratory system over the period 2000–01 to 2008–09. However, hospital separation rates over the same period have remained relatively stable. Consequently the trend is summarised as stable.
	Contact dermatitis	The incidence rate of workers' compensation claims for contact dermatitis declined considerably between 2004–05 to 2008–09.
	Cardiovascular diseases	Since its peak in 2002–03 of 49 workers' compensation claims per million employees the overall incidence rate for diseases of the circulatory system declined to 26 claims per million employees in 2008–09.
	Occupational cancers	The incidence rate of workers' compensation claims for occupational cancer peaked in 2003–04 at 49 claims per million employees and then declined to 30 claims per million employees in 2008–09. The sharp decrease in 2008–09 was associated with a decline in the incidence rate of Other cancers.

Introduction

Occupational diseases

One of the functions of Safe Work Australia is to collect, analyse and publish data and other information in order to inform the development and evaluation of work health and safety policies. As part of this function Safe Work Australia seeks to establish and monitor credible baseline indicators of occupational disease. Occupational disease usually results from repeated or long-term exposure to an agent or event. For example, loss of hearing as a result of long-term exposure to noise, or Legionnaires disease from a single exposure to an infectious agent.

On 24 May 2002 the Workplace Relations Ministers' Council endorsed the release of the *National OHS Strategy 2002–2012*. Five national priority action areas were identified within the strategy. The Occupational Disease Indicators project supports the third priority area: to 'prevent occupational disease more effectively'. This report is the fourth in a series of biennial reports the first of which was published in April 2006.

Eight disease groups were identified in consultation with stakeholders for monitoring. These are:

- > musculoskeletal disorders
- > mental disorders
- > noise-induced hearing loss
- > infectious and parasitic diseases
- > respiratory diseases
- > contact dermatitis
- > cardiovascular diseases, and
- > occupational cancers.

The new *Australian Work Health and Safety Strategy 2012-22* has been developed and will be launched in October 2012. The following work-related disorder categories are identified as national priorities in the first five years of the Australian strategy. These have been chosen based on the severity of consequences for workers, the number of workers estimated to be affected, and the existence of known prevention options. The priority work-related disorders are:

- > musculoskeletal disorders
- > mental disorders
- > cancers (including skin cancer)
- > asthma
- > contact dermatitis, and
- > noise-induced hearing loss.

Data for the indicators published in this report come from four sources:

- > the National Data Set for Compensation Based Statistics (NDS)
- > the National Notifiable Disease Surveillance System (NNDSS)
- > the Australian Institute of Health and Welfare's (AIHW) National Hospital Morbidity Database (NHMD), and
- > the AIHW's National Cancer Statistics Clearing House (NCSCCH).

The indicators in this report primarily rely on workers' compensation claims data from the NDS. These data are augmented where possible with data from other sources. However, since the additional data sources (NHMD, NNDSS and NCSCCH) do not identify work-relatedness, they are only presented for diseases that are acknowledged as having a high attribution to exposure hazards found in the work environment.

Additional data sets are being assessed for their suitability in monitoring disease trends. These data sets may be incorporated in future reports where appropriate. Further details on the data sources used in this report can be found in the 'Explanatory notes' on page 17.

Issues for occupational disease statistics

Unlike injury where there is usually a clear cause and effect relationship between an incident and its health effect most occupational diseases are multi-factorial in nature, with workplace exposures constituting one important part of the risk

matrix. Many diseases, such as cancers and pneumoconioses, have long latency periods and for other diseases, such as asthma, the link between cause and effect can be difficult to establish. These factors lead to considerable under-reporting of occupational diseases through the workers' compensation system. Furthermore, for diseases with long latency periods, incidence rates based on workers' compensation claims may not be the most appropriate indicator of emerging trends as reductions in exposure to disease-causing agents may not lead to any reduction in the incidence rate of disease until many years later.

Changes over time in the pattern of workers' compensation claims for occupational diseases could be the result of many factors other than those directly associated with the disease. For example campaigns to increase awareness of occupational diseases may result in increased claims while conversely changes to legislation or standards may result in fewer accepted claims due to the application of higher acceptance thresholds.

Given the issues outlined the reader should note that the figures presented in this paper are indicators only, and should not be taken as representing the true incidence of these occupational diseases in Australia. The main purpose of these data is to highlight changes in the incidence rates over time.

Looking at current exposures

The data presented in this report mostly reflect occupational exposures that occurred in the past, possibly to hazards that no longer exist, or that are now well recognised and minimised. Safe Work Australia reported on research it conducted on the types of hazards currently found in the workplace that may cause occupational disease and the measures taken to ameliorate their impact on workers. The National Hazard Exposure Worker Surveillance Survey was instigated to gather information to help guide decision makers in the development of prevention initiatives that may ultimately lead to a reduction in occupational disease. Further information on the survey and the analysis of specific hazards can be found on the Safe Work Australia website.

Changes made since the previous report

Several changes have been made to both the format and analysis of the data since the first report was published in 2006.

The workers' compensation data presented in this and the previous report differs from the data included in the first two reports. The first two reports used workers' compensation data scoped to include *serious* claims only. Serious claims comprise temporary claims that involved one or more weeks away from work, permanent disabilities and fatalities. Because many disease claims involve less than a week away from work all claims involving time away from work, permanent disabilities and fatalities have been included in the two most recent reports. Consequently, in comparison with the two earliest editions of this publication some of the reported rates will be higher. Consistent with all previous reports, preliminary data are not included as they are likely to understate the total number of accepted claims. This report presents data up to 2008–09, the most recently available non-preliminary data.

Although all accepted compensation claims are now included in the indicators that use NDS data, the reader should note that the period within which a compensation claim can be made differs between jurisdictions. For example, in Western Australia an employee is covered from the first day of their injury or disease whereas in Victoria the employer has to fund the first 10 days of their employees' injury or disease. These employer-funded short-term claims should be notified to the relevant workcover authority and be counted among workers' compensation claims. However, this is not always the case and short-term claims are known to be undercounted. This undercount is compensated for in other Safe Work Australia publications — but the data presented in this report are not adjusted to compensate for likely under-reporting.

Other amendments have been made to some of the specifications of the disease groups. These are detailed in the relevant sections and in the 'Explanatory notes'.

1

Musculoskeletal disorders

The condition

Musculoskeletal disorders cover a broad group of clinical disorders that impact on the musculoskeletal system. Within these conditions the intensity of the disorder and the associated impact on the affected person's life varies greatly. These disorders include a wide range of inflammatory and degenerative conditions affecting muscles, tendons, ligaments, joints, peripheral nerves and supporting blood vessels.

Skeletal disorders include: fractures; fracture of vertebral column with or without mention of spinal cord lesion; dislocation; arthropathies (disorders of joints); dorsopathies (disorders of the spinal vertebrae and intervertebral discs); osteopathies (disorders of the bones); chondropathies (disorders of the cartilage); and acquired musculoskeletal deformities. Muscular disorders include strains and sprains of joints and adjacent muscles; disorders of muscle, tendons and other soft tissues; and hernia.

For this indicator, workers' compensation claims for musculoskeletal disorders are limited to those caused by body stressing (see Data notes). This restriction excludes many claims caused by a single traumatic event (an injury).

Known causes and impacts

Workers' compensation data shows that in 2008–09 59% of all claims for musculoskeletal disorders were the result of body stressing. This category includes: *disorders arising from muscular stress while lifting, carrying, putting down objects, or other ways of handling objects; stress from physical movements without handling an object, and stress from making repetitive movements.*

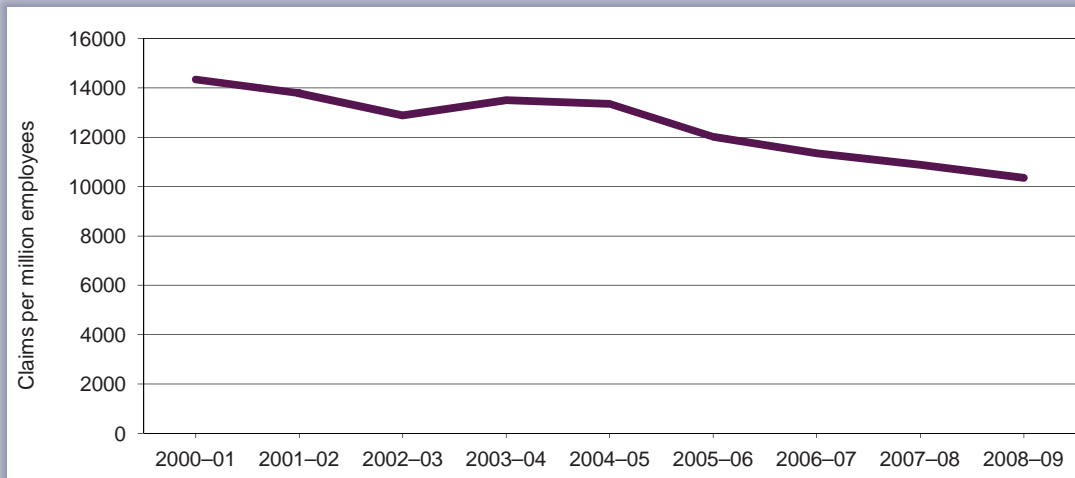
The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for musculoskeletal disorders resulting from body stressing include: Ambulance officers & paramedics; Domestic housekeepers; Wood products factory hands; Meat & fish process workers; Engine & boiler operators; Freight & furniture handlers (these include Stevedores); Garbage collectors; Engineering production process workers; Vehicle body makers; Mining support workers and drillers assistants; Sheetmetal tradespersons; Railway labourers; Clay, stone & concrete processing machine operators; Food trades assistants; Personal care & nursing assistants; and Shearers.

Preventative policy

All jurisdictions publish guidance information on how to identify and manage the risk of injury to workers who perform manual tasks. While a manual task can be any physical activity requiring a person to use part of their body to perform their work, guidance information generally focuses on identifying and managing hazardous manual tasks that have a greater likelihood of causing an injury.

The Heads of Workplace Safety Authorities (HWSA — www.hwsa.org.au) regularly implement national campaigns on work health and safety issues and in 2011 published a report titled *Delivering the Goods Safely—National manual tasks in road freight campaign*. The campaign aimed to reduce manual handling (body stressing) injuries in the Retail, Wholesale, and Transport and storage industries by focussing on the target sub sectors of Road freight forwarding and Road freight transport and their interface with supply chains.

Workers' compensation claims for musculoskeletal disorders: claims per million employees



Source: National Dataset for Compensation Based Statistics (NDS).

Over the period 2000–01 to 2008–09 there was an overall downward trend in the incidence of musculoskeletal disorders: the incidence rate for all claims involving musculoskeletal disorders that were caused by body stressing decreased by 28% — from 14 340 claims per million employees to 10 355.

Further information

Work-related Musculoskeletal Disease in Australia, ASCC, 2006.

National Standard for Manual Tasks, ASCC, 2006.

National Code of Practice for the Prevention of Musculoskeletal Disorders from Performing Manual Tasks at Work, ASCC, 2007.

Research on the prevention of work-related musculoskeletal disorders: Stage 1 - Literature review, ASCC, 2006.

Manual handling risks associated with the care, treatment and transportation of bariatric (severely obese) patients and clients in Australia, ASCC, 2009.

National Hazard Exposure Worker Surveillance: Exposure to biomechanical demands, pain and fatigue symptoms and the provision of controls in Australian workplaces, Safe Work Australia, 2011.

Data notes

From 2002–03 a revised coding system that provides additional advice on how to code musculoskeletal conditions has been progressively introduced across the jurisdictions. This system has resulted in many claims previously coded as injury (*Sprains and strains of joints and adjacent muscles*) now to be coded as disease (*Diseases of the musculoskeletal system and connective tissue*). To allow a useful time series for this report, all claims involving musculoskeletal conditions, regardless of whether they are classed as an injury or a disease, are included in the graphed data. However, cases where the disorder was most likely an injury because they resulted from a single event such as a fall or by being hit by an object, have been removed by restricting the claims included to those resulting from the mechanism *Body stressing*. *Body stressing* identifies disorders resulting from *Repetitive movement, low muscle loading; Muscular stress with no objects being handled; Muscular stress while handling objects other than lifting, carrying or putting down; and Muscular stress while lifting, carrying or putting down objects.*

2 Mental disorders

The condition

Mental disorders in this report refers to work-related mental disorders associated with mental stress. However, mental stress itself is not a clinically diagnosable health condition. Rather, it is a state of the individual that increases the risk of developing one or more of a wide range of physical and mental disorders.

This indicator is based on workers' compensation claims for mental disorders that were attributed to work-related mental stress. Included under mental disorders are conditions such as anxiety, depression, nervous breakdown, phobias, and obsessive and compulsive symptoms.

Known causes and impacts

Occupational mental disorders that result from mental stress can be caused by such events as exposure to a traumatic situation, exposure to violence, harassment, bullying or work pressure. There may be many factors that affect whether or not an individual feels mental stress. Some of these factors are external, e.g. those relating to aspects of their work, while some are internal and relate to the way people think and behave.

The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for mental disorders include: Train drivers & assistants; Police officers; Ambulance officers & paramedics; Prison officers; Welfare & community workers; Welfare associate professionals; Railway labourers; Firefighters; Secondary school teachers; Education managers; Social workers; Nurse managers; and Bus & tram drivers. Many of these occupation groups are characterised by high levels of personal responsibility for the welfare of others and/or being witness to extreme or traumatic situations.

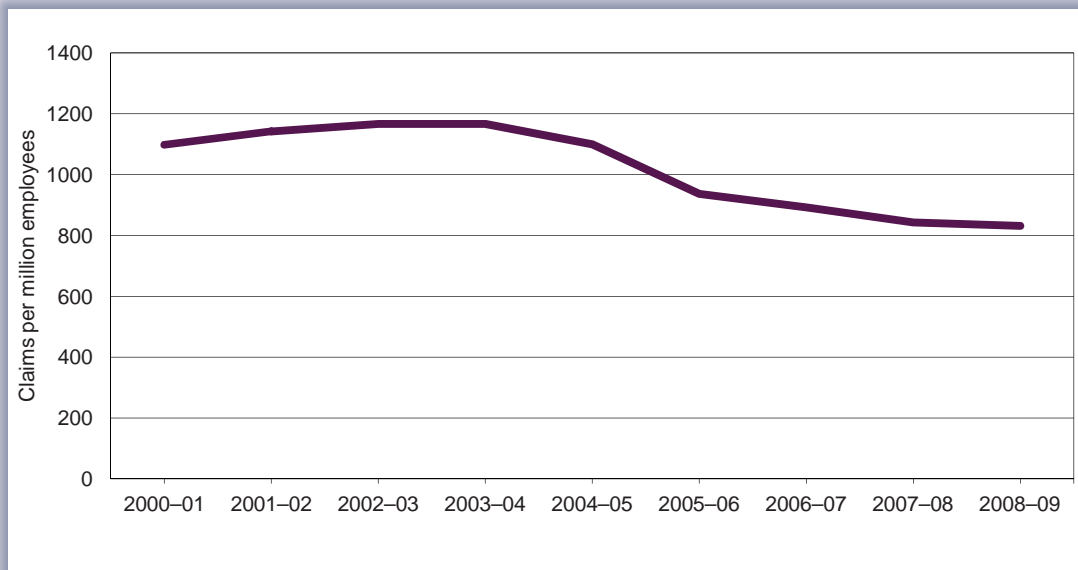
Preventative policy

Australian work health and safety authorities provide workers and employers with information promoting awareness of work-related mental disorders. The information includes advice on the possible causes, preventive measures to reduce the incidence, and guidelines for the management of those suffering from the condition. The Queensland and Western Australian jurisdictions have published Codes of Practice on harassment or bullying and Queensland inspectors are trained to inspect for bullying/harassment in the workplace. In addition many authorities actively support organisations already specialising in helping people with mental disorders as well as other initiatives. For example, NSW WorkCover sponsored events in regional and rural areas designed specifically to tackle the particular difficulties faced by workers in these locations.

In 2011 the Victorian parliament passed the Crimes Amendment (Bullying) Bill 2011 (Brodie's law) in response to the suicide of Brodie Panlock in 2006 after being the victim of relentless workplace bullying by workmates. The passing of Brodie's law means that anyone found guilty of workplace bullying can be imprisoned for up to 10 years. Brodie's parents are campaigning for the law to be introduced throughout Australia.

On 26 May 2012, Prime Minister Julia Gillard and the Hon Bill Shorten, Minister for Employment and Workplace Relations announced a House of Representatives Parliament Inquiry into Workplace Bullying. Safe Work Australia provided a formal submission outlining the work it is doing in this area. A report outlining recommendations from the Inquiry is expected to be tabled in Parliament by the end of November 2012.

Workers' compensation claims for mental disorders: claims per million employees



Source: National Dataset for Compensation Based Statistics (NDS).

Despite increasing between 2000–01 and 2003–04, the rate of compensated claims for mental disorders has since decreased to a minimum over the nine-year period of 831 claims per million employees.

Information on this topic can be downloaded from the Safe Work Australia website or from each of the State and Territory work health and safety jurisdiction websites (the Safe Work Australia website has links to all the jurisdictions). In addition in 2011 the Heads of Workplace Safety Authorities (HWSA — www.hwsa.org.au) published a report on a national campaign titled *Managing Aggressive Behaviour in Healthcare* — a campaign intended to educate the healthcare sector through a balance of information, assistance and enforcement activity.

Further information

Work-related Mental Disorders in Australia, ASCC, 2006.

Preventing work-related stress — examples of risk control measures, Worksafe Victoria, 2009.

Management of Occupational Stress among Australian Workers: Perceived stressors and supports, Workcover WA, 2003.

Occupational Stress: Factors that contribute to its Occurrence and Effective Management, Workcover WA, 2000.

Data notes

The comparability of workers' compensation over time is impacted by legislative changes. Several jurisdictions including Comcare in April 2007 have introduced legislative changes to strengthen the required connection between work and eligibility for workers' compensation in relation to psychological claims.

3

Noise-induced hearing loss

The condition

Occupational noise-induced hearing loss is a hearing impairment arising from exposure to excessive noise at work. The degree of hearing loss is generally cumulative, increasing with both the length of time exposed and the level of noise. While occupational noise-induced hearing loss is almost entirely preventable once acquired the damage is irreversible. However, hearing loss also occurs naturally with ageing. Consequently, the effects of occupational noise exposure among older workers can be difficult to distinguish from age-induced hearing loss.

For this indicator workers' compensation claims for deafness are limited to those caused by long-term exposure to sounds and excludes deafness related to trauma.

Known causes and impacts

The exposure standard for noise is defined in the Work Health and Safety Regulations as an $L_{Aeq,8h}$ of 85 dB(A) or an $L_{C,peak}$ of 140 dB(C). There are two parts to the exposure standard for noise because noise can either cause gradual hearing loss over a period of time or be so loud that it causes immediate hearing loss. For more information refer to *Model Code of Practice - Managing Noise and Preventing Hearing Loss at Work*.

Noise-induced hearing loss is caused by excessive sound damaging the hair cells in the cochlea of the inner ear. Since most noise exposures are symmetric, the hearing loss usually occurs in both ears. Symptoms may include gradual loss of hearing, hearing sensitivity and tinnitus (ringing or other noises in the ears or head).

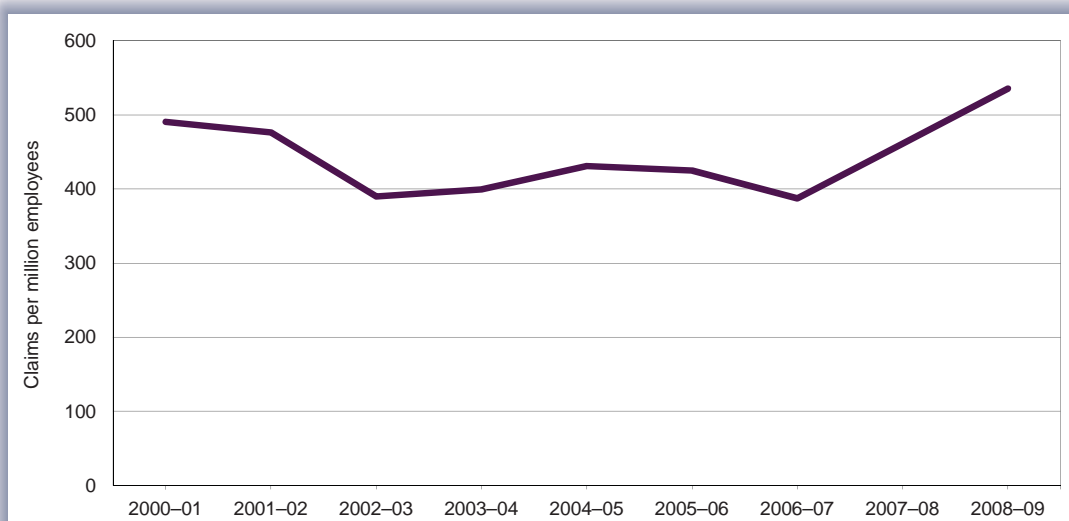
Of those people affected with noise-induced hearing loss, 20% or more also suffer from tinnitus, in some cases to a severe degree. Loss of hearing and the resulting communication difficulties can lead to impairment of relationships, social isolation and reduced quality of life.

The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for noise-induced hearing loss include: Engine & boiler operators; Railway labourers; Clay, stone & concrete processing machine operators; Power generation plant operators; Train drivers & assistants; Textile & footwear production machine operators; Earthmoving labourers; Vehicle body makers; Sheetmetal tradespersons; Crane hoist & lift operators; Toolmakers; Engineering production process workers; Miners; Structural steel & welding tradespersons; Metal fitters & machinists; Concreters; General mechanical engineering tradespersons; and Carpentry & joinery tradespersons.

Preventative policy

In 2012 Safe Work Australia published a model code of practice *Managing Noise and Preventing Hearing Loss at Work*. This Code of Practice applies to all types of work and all workplaces covered by the WHS Act and Regulations applying in a jurisdiction where there is the potential for exposure to noise that can contribute to hearing loss. It has been developed to provide practical guidance to persons conducting a business or undertaking on how noise affects hearing, how to identify and assess exposure to noise and how to control health and safety risks arising from hazardous noise.

Workers' compensation claims for noise induced deafness: claims per million employees



Source: National Dataset for Compensation Based Statistics (NDS).

The rate of compensated occupational noise-induced hearing loss increased from 491 claims per million employees to 523 over the nine-year period 2000-01 to 2008-09. This increase followed five years when the rate remained relatively stable. Most of this increase occurred between 2006-07 and 2008-09.

Further information

Occupational Noise-Induced Hearing Loss in Australia, Safe Work Australia, 2010.
Managing Noise and Preventing Hearing Loss at Work: Code of Practice, 2011.
Noise Management at Work - Control Guide, NOHSC, 1991.
National Hazard Exposure Worker Surveillance – Noise exposure and the provision of noise control measures in Australian workplaces, Safe Work Australia, 2010.

Data notes

Although all Australian workers' compensation jurisdictions have an impairment threshold for compensation for occupational noise-induced hearing loss, the thresholds differ between jurisdictions and have changed over time. At September 2011 the thresholds ranged between 5% and 10% hearing loss (*Comparison of Workers' Compensation Arrangements in Australia and New Zealand, April 2012*).

On 1 January 2012, new work health and safety laws commenced in New South Wales, Queensland, the Australian Capital Territory, the Commonwealth and the Northern Territory. Regulation 58 of the model WHS Regulations states that workers use personal protective equipment to protect the worker from the risk of hearing loss associated with noise that exceeds the exposure standard for noise. In addition, audiometric testing defined as the testing and measurement of the hearing threshold levels of each ear of a person by means of pure tone air conduction threshold tests, must be undertaken at particular intervals. To have legal effect in a jurisdiction, the model Code of Practice must be approved as a code of practice in that jurisdiction. To determine if this model Code of Practice has been approved as a code of practice in a particular jurisdiction check with the relevant regulator.

4 Infectious and parasitic diseases

The condition

Infectious and parasitic diseases include:

- > Zoonoses: infectious diseases that can be transmitted from animals, both wild and domestic, to humans. The most commonly compensated zoonoses include Q-fever; leptospirosis; and brucellosis.
- > Diseases such as hepatitis (includes hepatitis A, B and C).
- > Other infectious diseases such as protozoal diseases (like malaria), human immunodeficiency virus (HIV), rubella, cowpox, mumps, foot and mouth disease, Ross River disease and mycoses (fungal infections).
- > Intestinal infectious diseases such as cholera, typhoid, salmonella, dysentery and gastroenteritis.

Known causes and impacts

Because of the large variety of infectious and parasitic diseases, even a brief description is beyond the scope of this summary publication. However, the main occupational causes of the commonly compensated zoonoses are listed below.

- > Q-fever is caused by infection with *Coxiella burnetii*. The main occupational sources of infection are sheep, cattle and goats. Infection usually arises through contact with the placental tissue or fluid, or urine of infected animals.
- > Leptospirosis is caused by a range of bacteria called *Leptospira*. The main occupational source of infection is the urine of infected animals and water or soil contaminated by infected urine.
- > Brucellosis is caused by *Brucella* bacteria. Since the eradication of *brucella abortus* in cattle the main occupational sources of infection are feral pigs or laboratory exposure.
- > Anthrax is caused by *Bacillus anthracis* bacteria. Although rare in Australia, the bacteria can be transmitted to humans from livestock by exposure to dead infected pigs, eating tissue from infected animals, or exposure to anthrax spores from fur, hide or wool.

The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for infectious and parasitic diseases include: Nurse managers; Ambulance officers & paramedics; Meat & fish process workers; Enrolled nurses; Personal care & nursing assistants; Registered nurses; Meat tradespersons; Farm hands; Police officers; Children's care workers; Primary school teachers; and Special care workers.

Preventative policy

Vaccination, hand-washing, education, training and the use of personal protective equipment where appropriate are the main control strategies for the prevention of occupation-related infectious and parasitic diseases. Several recent Australian studies have documented that many at-risk worker groups are not fully vaccinated against infectious diseases for which they are at increased risk, suggesting an on-going need for information and training for both workers and employers on the availability and importance of vaccination for certain worker groups.

Further information

Work-related Infectious and Parasitic Diseases in Australia, ASCC, 2006.

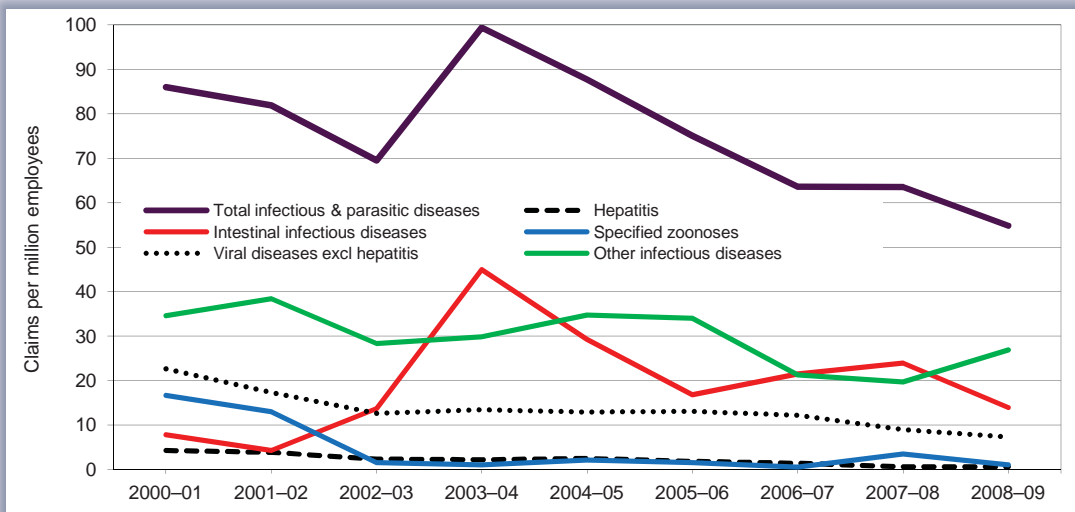
National Code of Practice for the Control of Work-related Exposure to Hepatitis and HIV (Blood-borne) Viruses, NOSH, 2003.

National Hazard Exposure Worker Surveillance: Exposure to biological hazards and the provision of controls against biological hazards in Australian workplaces, Safe Work Australia, 2011.

Data notes

The NDS incidence rates for zoonosis are lower than those reported by the National Notifiable Disease Surveillance System (NNDSS) because around half of all Agricultural workers are self-employed and therefore not covered by workers' compensation.

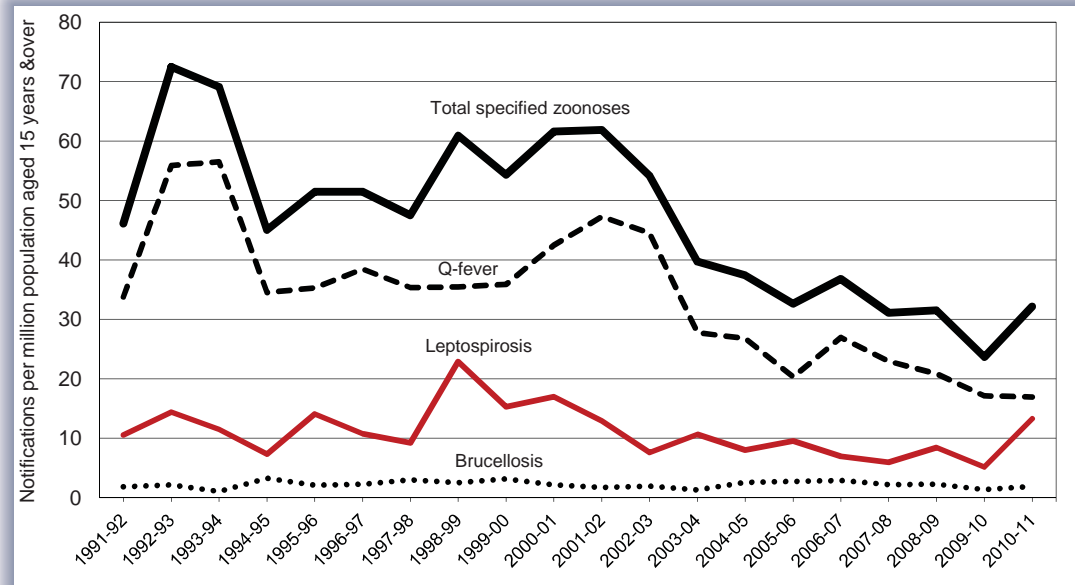
Workers' compensation claims for infectious and parasitic diseases: claims per million employees



Source: National Dataset for Compensation Based Statistics (NDS).

There was a large decline in the overall rate of compensation claims for Infectious and parasitic diseases from the peak in 2003–04 to 2008–09. The underlying data shows that Intestinal infectious diseases were the main cause of the overall mid-period peak (related to an outbreak of gastroenteritis in NSW in 2004). The other underlying categories have all declined over the period.

Disease notifications of specified zoonoses: notifications per million adults



Source: National Notifiable Disease Surveillance System (NNSS).

The overall notification rate for the three specified zoonoses has decreased by 48% since 2001–02 coinciding with the introduction of a national vaccination program for Q-fever in 2001. The resultant drop in the notification rate for Q-fever, from 48 notifications per million adults in 2001–02 to 17 in 2009–10, probably reflects the impact of this program. Notification rates for leptospirosis have also declined from a peak in 1998–99 (related to an outbreak in Queensland in 1999), while notifications for brucellosis remained relatively low and stable over the time period assessed. The rise in the overall notification rate of the specified zoonoses in 2010–11 reflected the rise in Leptospirosis cases in Queensland that were a consequence of severe flooding.

5 Respiratory diseases

The condition

Occupational respiratory diseases include asthma, pneumoconioses (lung disorders related to exposure to mineral dusts, such as asbestosis and silicosis, legionnaires disease (pneumonia caused by *Legionella* bacteria), hypersensitivity to organic dusts (an allergic reaction), and respiratory conditions related to breathing in chemicals, gases, fumes and vapours.

Known causes and impacts

For some occupational respiratory diseases, such as the pneumoconioses the causative agents are specific to a few industries. For other respiratory diseases such as occupational asthma the causative agents can be found in a broad spectrum of jobs and industries. Respiratory diseases also vary considerably in their latency and sensitivity to causative agents: pneumoconioses tend to occur after medium to long periods of time of moderately high exposure, whereas occupational asthma can occur after a short period of low to moderate exposure.

Exposure to chemicals, gases, fumes and vapours could include such work-related hazards as welding gases; fuel vapours; solvents; and cleaning agent fumes.

Legionella bacteria thrive in warm water: outbreaks have been associated with poorly disinfected cooling towers and spa pools. *Legionella* can also be found in soil and potting mix. The disease is usually contracted by breathing in the bacteria in aerosols (very small droplets of water).

The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for diseases of the respiratory system include: Freight & furniture handlers; Ambulance officers & paramedics; Primary school teachers; Secondary school teachers; Bank workers; Structural steel & welding tradespersons; General clerks; Metal fitters & machinists; Construction & plumbers assistants; Carpentry & joinery tradespersons; and Police officers.

Preventative policy

Prevention of occupational respiratory disease at the workplace requires the identification of exposure and assessment of risk from airborne substances known to cause such diseases. Elimination or minimisation of workers' exposure can be achieved by substitution with a less hazardous substance whenever possible or exposure reduction based on the hierarchy of controls. The use of personal protective equipment can be effective as long as it is used in conjunction with other recognised control measures.

Further information

Occupational Respiratory Disorders in Australia, ASCC, 2006.

National Model Regulations for the Control of Workplace Hazardous Substances, NOHSC, 1994.

Code of Practice for the Management and Control of Asbestos in Workplaces, NOHSC, 2005.

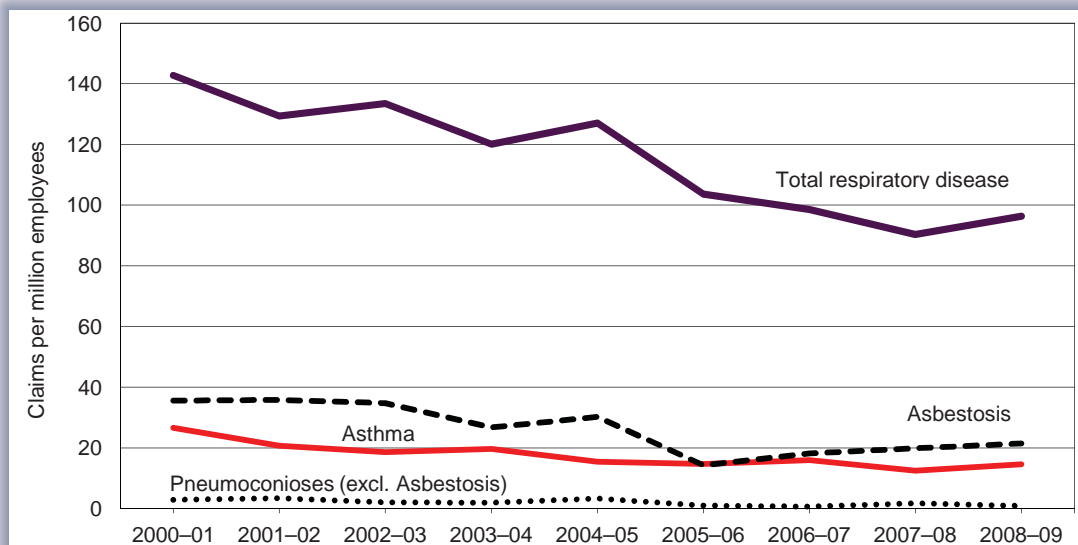
National Hazard Exposure Worker Surveillance: Exposure to dust, gases, vapours, smoke and fumes and the provision of controls for these airborne hazards in Australian workplaces, Safe Work Australia, 2010.

Data notes

In New South Wales claims for compensation for pneumoconioses such as asbestosis and silicosis can also be made through the New South Wales Dust Diseases Board.

Although all respiratory disease claims reported through the workers' compensation schemes have been assessed as work-related, hospitalisations for respiratory disease are not necessarily work-related. However, most of the diseases presented are highly attributable to work-related exposures, particularly the pneumoconioses.

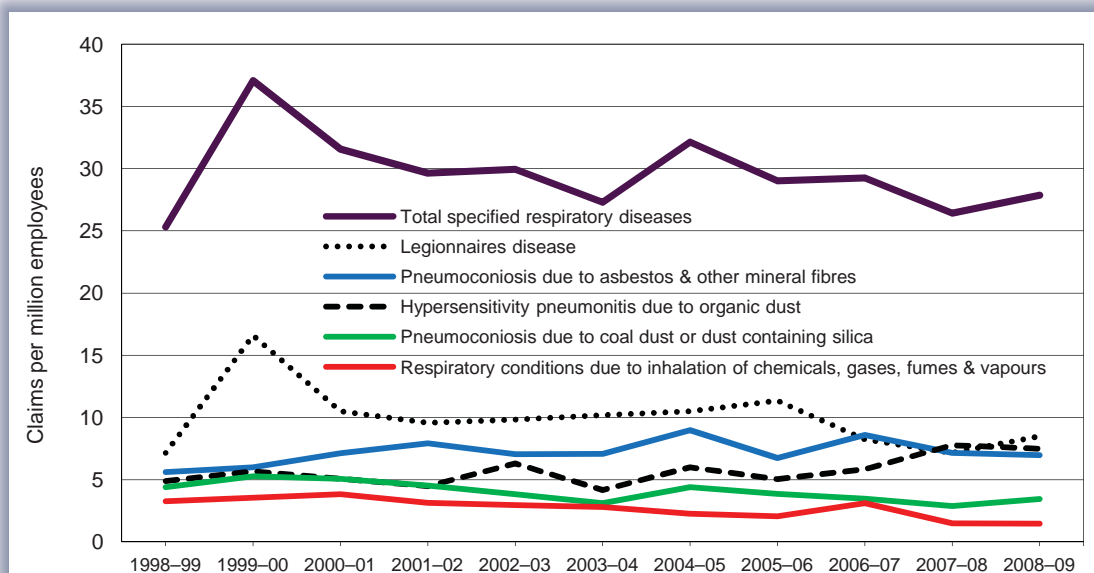
Workers' compensation claims for diseases of the respiratory system: claims per million employees



Source: National Dataset for Compensation Based Statistics (NDS).

There was a large decline in the overall rate of workers' compensation claims for diseases of the respiratory system over the period 2000-01 to 2008-09 from 143 to 96 claims per million employees. The incidence rate of claims for asbestosis also declined overall despite increasing since 2005-06 (see Data notes) while the rate for asthma decreased slightly.

Hospitalisations for respiratory diseases: hospitalisations per million adults



Source: Australian Institute of Health & Welfare's National Hospital Morbidity Database (AIHW NHMD).

The overall hospitalisations rate for the specified respiratory diseases has remained relatively stable, around 30 hospitalisations per million adults, since declining from a peak of 37 hospitalisations per million adults in 1999-2000. This peak was due to a large number of hospitalisations for legionnaires disease in 1999-2000 (related to an outbreak in Melbourne). Underlying the overall rate are decreases in Pneumoconiosis due to coal dust or dust containing silica and Respiratory conditions due to inhalation of chemicals, gases, fumes & vapours and increases in Pneumoconiosis due to asbestos & other mineral fibres and Hypersensitivity pneumonitis due to organic dust.

6

Contact dermatitis

The condition

Contact dermatitis is a condition usually caused by substances interacting with the skin. The condition predominantly affects the hands, although other exposed areas may be involved, such as the arms and face.

There are three types of contact dermatitis: the most common accounting for about three-quarters of all cases is irritant contact dermatitis. With repeated exposure irritants can eventually cause an inflammatory reaction in the skin that may take many months to heal.

Nearly all the other cases involve allergic contact dermatitis: a delayed hypersensitivity reaction to a chemical (an allergen) which on contact with the skin can induce an allergic reaction that may take days or even weeks to settle.

A very small proportion of cases involve contact urticaria: an immediate hypersensitivity reaction. It usually presents as reddening and itching of the skin within fifteen minutes of skin contact with an allergen.

Known causes and impacts

Irritant contact dermatitis, the most common contact dermatitis, is caused by substances that dry and irritate the skin, such as acids and alkalies, or by the cumulative effect of substances such as soaps, detergents and solvents.

For allergic contact dermatitis the development of an allergic reaction to a particular chemical is a mechanism unique to certain individuals; whereas all people may develop skin irritation given sufficient exposure to an irritant. Sensitisation to a substance may occur after days, weeks or years of exposure. Once a person is sensitised the allergy is likely to be lifelong.

The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for contact dermatitis include: Ambulance officers & paramedics; Meat & fish process workers; Engineering production process workers; Nurse managers; Meat tradespersons; Concreters; Metal fitters & machinists; Personal care & nursing assistants; Miners; Farm hands; Enrolled nurses; Gardeners; Hairdressers; Motor mechanics; Registered nurses; Cleaners; Structural steel & welding tradespersons; and Kitchen hands.

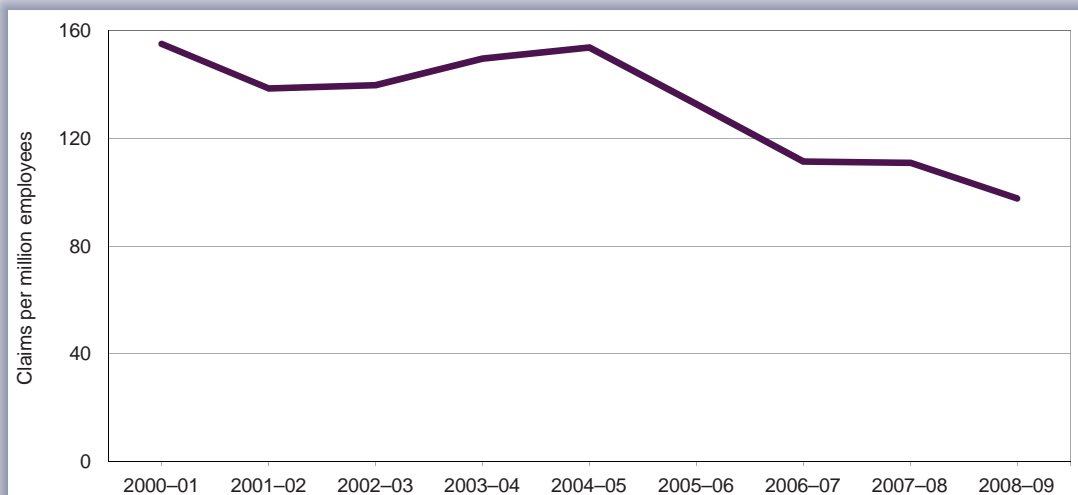
Preventative policy

Occupational contact dermatitis is a condition of concern to most jurisdictions. Consequently many have already produced a range of advice and guidance material for those occupations where this condition is acknowledged to be a problem.

The guidance material provided to employers mainly focus on prevention and management of risk by either eliminating the substance of concern, substituting alternative materials, isolating the process exposing workers or minimizing the risk by engineering, and using personal protective equipment. In addition, employers are urged to ensure all hazardous chemicals are labelled with appropriate information such as warnings, directions for use, ingredients and first aid procedures.

Workers on the other hand are provided with information advising them of the symptoms of contact dermatitis along with advice on what to do if the condition arises, i.e. halt exposure to the cause, advise their employer and seek professional medical advice.

Workers' compensation claims for contact dermatitis: claims per million employees



Source: National Dataset for Compensation Based Statistics (NDS).

The incidence rate of contact dermatitis has declined considerably since 2000–01 despite the rate increasing between 2001–02 to 2004–05 from 155 claims per million employees in 2001–02 to 98 in 2008–09.

The RASH (Resources about Skin Health) program, an initiative of the Occupational Dermatology Research & Education Centre (ODREC), is designed to educate students attending vocational training institutions about occupational contact dermatitis and to raise awareness about appropriate methods of prevention and to reinforce safe work practices.

Other ODREC initiatives are the Contact Allergen Bank Australia (CABA) and the Skin School. The CABA has been set up to provide dermatologists with access to patch testing resources, to improve diagnosis and identification of allergens, to collect national data on test results and to share experience and expertise with other dermatologists. The Skin School is designed to educate workers who have been diagnosed with occupational contact dermatitis about managing the condition.

Further information

Occupational Contact Dermatitis in Australia, ASCC, 2006.

Collecting surveillance data on risks for occupational contact dermatitis, ASCC, 2008.

Guidance on the Prevention of Dermatitis Caused by Wet Work, ASCC, 2005.

Dermatitis: The facts starting from scratch, NSW Workcover, 2002.

Occupational Contact Dermatitis: A review of 18 years of data from an occupational dermatology clinic in Australia, Safe Work Australia, 2012.

National Hazard Exposure Worker Surveillance: wet work exposure and the provision of wet work control measures in Australia workplaces, Safe Work Australia, 2011.

Data notes

Other and unspecified dermatitis or eczema has been included in the occupational contact dermatitis category in order to include all compensated contact dermatitis claims.

7 Cardiovascular diseases

The condition

Work-related cardiovascular disease refers to cardiovascular diseases caused or exacerbated by occupational factors. While ischaemic heart disease (IHD) is the most common cardiovascular disease, a number of other circulatory diseases are also considered within this grouping. These include heart diseases other than IHD; cerebrovascular disease; arterial disease; hypertension (high blood pressure); varicose veins; and other diseases of the circulatory system. However, linking work-related exposure to the development of cardiovascular disease in an individual person is problematic. This is due to the long latency of the disease, multiple possible risk factors and the lack of specific work-related causes of the disease.

Workers' compensation claims for diseases of the circulatory system are used for this indicator.

Known causes and impacts

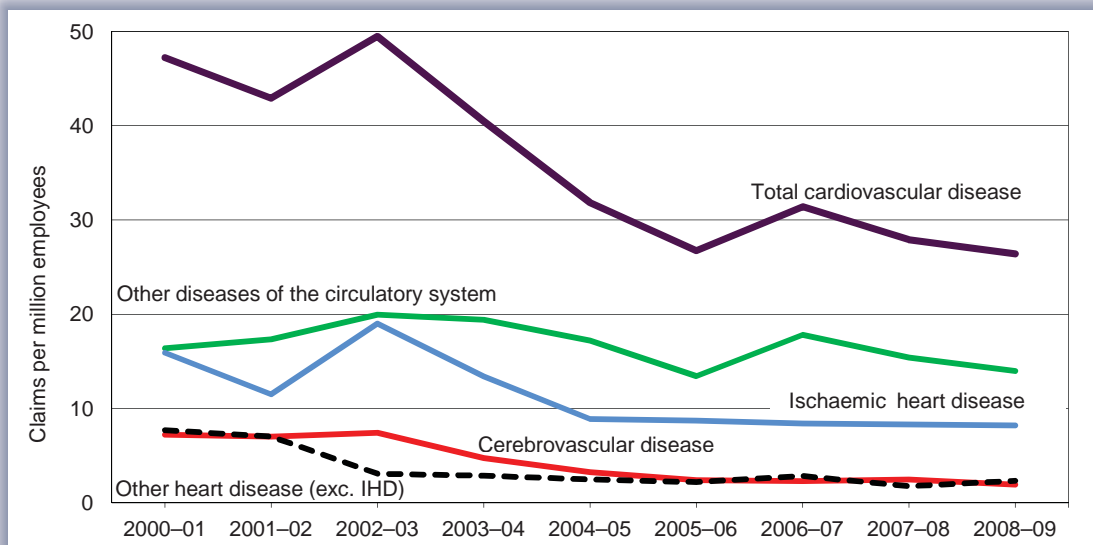
Of the many work-related factors that have been implicated with increasing the risk of a cardiovascular event, the evidence is strongest for exposure to four particular chemicals: carbon disulphide and, in terms of acute exposure, carbon monoxide, methylene chloride and nitroglycerin. There is also good evidence for the role of environmental tobacco smoke and psychosocial factors, particularly low job control, and considerable evidence for noise and shiftwork.

The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for diseases of the circulatory system include: Truck drivers; Guards & security officers; Police officers; Delivery drivers; General clerks; General managers; Sales & marketing managers; Electricians; Office managers; Secondary school teachers; Cleaners; Storepersons; and Sales assistants.

Preventative policy

Because the onset of cardiovascular disease may be related to lifestyle factors or exposures other than those found at work and genetic predispositions preventions necessarily broadly target the causes outlined above — some of which overlap other indicators discussed in this report. Relevant preventative policies include the implementation and enforcement of non-smoking policies; promoting exercise and sensible diets (particularly for sedentary workers); prevention of exposure to carbon monoxide (primarily from vehicle exhausts); minimising noise exposure; minimising exposure to psychosocial risk factors such as stress; and optimising shiftwork design.

Workers' compensation claims for cardiovascular diseases: claims per million employees



Source: National Dataset for Compensation Based Statistics (NDS).

From 2000-01 to 2008-09 the overall rate of workers' compensation claims for diseases of the circulatory system declined from 47 to 26 claims per million employees. The underlying rates for IHD; cerebrovascular disease; and other heart disease (exc. IHD) also declined over the period but have remained relatively stable since 2004-05.

Further information

Work-related Cardiovascular Disease, Australia, ASCC, 2006.

Data notes

Because there are few circumstances in which cardiovascular disease in an individual can be confidently connected to occupational exposures, workers' compensation data probably undercounts incidents of work-related cardiovascular disease in Australia. Nonetheless compensation data provides an indication of changes in the incidence over time.

8

Occupational Cancers

The condition

Cancer is a term that groups diseases characterised by the abnormal division of cells. These new cells (neoplasms) can invade nearby tissues and spread throughout the body via the circulatory system and grow in major organs (metastasise).

Included under occupational cancer is mesothelioma, a fatal cancer that occurs in some people who have been exposed to asbestos. It usually occurs 20 to 40 years after exposure to asbestos. Other occupational cancers include skin cancer (melanoma), usually related to ultra-violet light exposure; and neoplasms of the lymphatic and haematopoietic tissue; which include leukemia and lymphoma.

Known causes and impacts

Current theories on cancer suggest that its cause is a multi-step process arising from a combination of factors that vary by nature and degree of exposure to carcinogens over time, mediated by individual behaviour, as well as genetic factors. There are a number of known carcinogens, however the specific toxicity, potency and latency periods associated with many agents are unknown. Further, given the long latency period associated with many carcinogenic exposures, workplace exposures and the onset of a specific cancer may not be readily associated.

The occupations with the highest rates of workers' compensation claims over the three-year period 2006–07 to 2008–09 for cancers include: Railway labourers; Electrical distribution tradespersons; Freight & furniture handlers (these include Stevedores); Sea transport professionals; Communications tradespersons; Gardeners; Carpentry & joinery tradespersons; Plumbers; Truck drivers; and Electricians.

Preventative policy

The International Agency for Research on Cancer (IARC — <http://www.iarc.fr/>) has identified more than 400 agents that are carcinogenic or potentially carcinogenic to humans. Elimination is the preferred method of dealing with known carcinogens used in the workplace (an example is the ban on the import and use of most asbestos products in Australia) usually by replacing the carcinogen with a safer alternative.

Skin cancer is the most commonly diagnosed cancer in Australia and outdoor workers are at particular risk. Non-government organisations such as the Cancer Council publish extensive information on protection from excessive ultra-violet radiation exposure. All Australian work health and safety jurisdictions publish guidance information on protecting workers from exposure to the sun: in most jurisdictions publications are provided to both highlight the employer's responsibilities, and advise employees on skin cancer and personal protection from exposure.

Further information

Occupational Cancers in Australia, ASCC, 2006.

Mesothelioma in Australia: Incidence 1982 to 2006, Deaths 1997 to 2006, Safe Work Australia, 2010.

National Model Regulations for the Control of Scheduled Carcinogenic Substances, NOHSC, 1995.

Guidance note for the protection of workers from the ultra-violet radiation in sunlight ASCC, 2008.

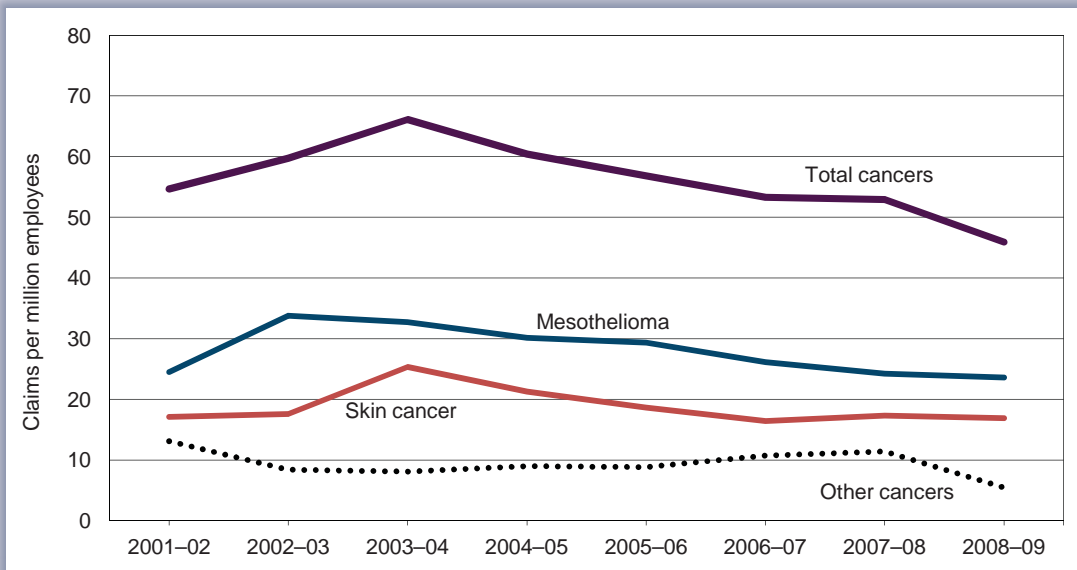
National Hazard Exposure Worker Surveillance: Exposure to direct sunlight and the provision of sun exposure controls in Australian workplaces, Safe Work Australia, 2010.

Data notes

For mesothelioma, the number of claims compensated by the New South Wales Dust Diseases Board has been combined with state, territory and Commonwealth workers' compensation schemes.

Because claims for compensation for some cancers, including mesothelioma, can rarely be connected to occupational exposures confidently, it is likely that workers' compensation data greatly understate the actual incidence of work-related cancer.

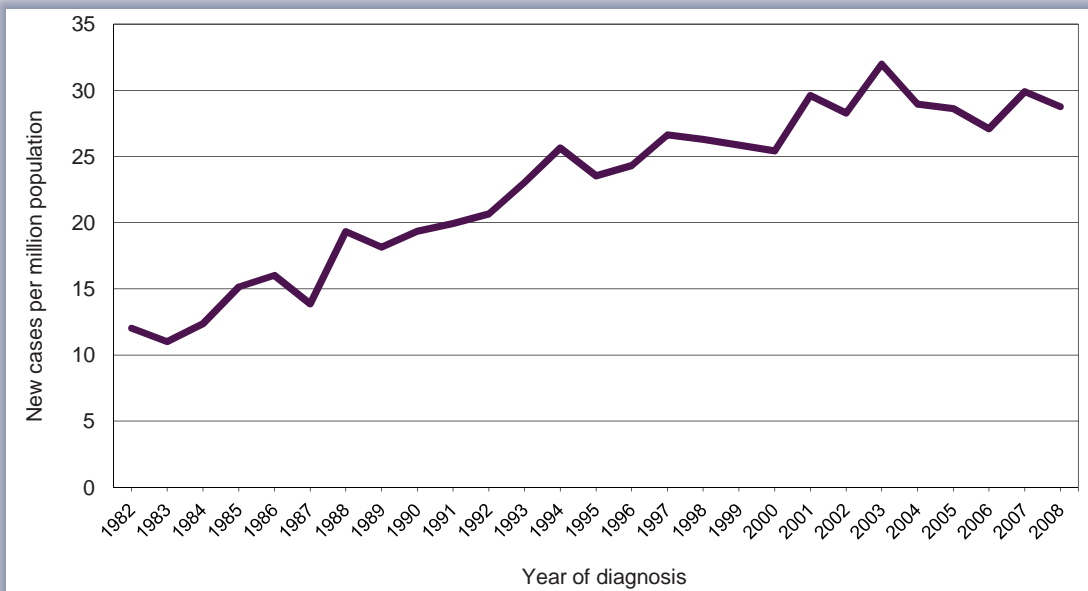
Workers' compensation claims for cancers: claims per million employees



Sources: National Dataset for Compensation Based Statistics (NDS) and the New South Wales Dust Diseases Board (DDB).

The overall incidence rate of workers' compensation claims for occupational cancer peaked in 2003-04 but since then has declined. This reflected a similar pattern in the incidence rates for skin cancers. However, the decline in Other cancers is largely responsible for the more recent decrease in the overall rate of cancers recorded in 2008-09.

New diagnosis of mesothelioma: notifications per million population



Source: Australian Institute of Health and Welfare, ACIM workbook on mesothelioma, age-standardised rates.

The incidence rate of mesothelioma per million population has increased over time, from 12 in 1982 to a peak of 32 in 2003. In 2008, the rate of new cases of mesothelioma was 29 per million population. However, due to the long latency of this disease and the exposure periods to asbestos it has been estimated that this rate will continue to increase, reaching a peak in the next 10 to 15 years.

Explanatory notes

Several data sets were examined in order to collect work-related disease information for this publication. The data sources used are the:

- > National Data Set for Compensation Based Statistics (NDS)
- > National Hospital Morbidity Database (NHMD)
- > National Notifiable Disease Surveillance System (NNDSS), and
- > National Cancer Statistics Clearing House (NCSCH).

A summary of the data sources used for each disease category is presented in Table 1, with further information on these sources detailed below.

Table 1 Summary of data sources

Disease	Indicator	Data Source/s
Musculoskeletal disorders	Incidence of musculoskeletal claims per million employees	NDS
Mental disorders	Incidence of mental disorders claims per million employees	NDS
Noise-induced hearing loss	Incidence of noise-induced hearing loss per million employees	NDS
Infectious disease	Incidence of infectious disease per million employees	NDS
	Notification rate of selected zoonoses per million adults	NNDSS
Respiratory disease	Incidence of respiratory disease claims per million employees/ persons	NDS
	Hospitalisation rate of asbestosis, legionnaires and other respiratory diseases due to substances, cases per million adults	NHMD
Contact dermatitis	Incidence of contact dermatitis per million employees	NDS
Cardiovascular disease	Incidence of cardiovascular claims per million employees	NDS
Cancer	Incidence of cancer claims per million employees	NDS
	Incidence of new mesothelioma cases per 100 000 population	NCSCH

National Data Set for Compensation Based Statistics (NDS)

The NDS data set used in this report comprise all accepted workers' compensation claims lodged in the reference year. Temporary claims involving only medical costs are not included in the NDS dataset. Claims that fall within jurisdiction excess periods may be under-reported. The excess period is the time the employer must fund a compensation claim before being covered by the workers' compensation authority. Although employer-funded claims should be reported to the workers' compensation authority they are known to be under-reported.

NDS data are based on information received annually from Australian workers' compensation authorities. The data supplied includes both new data for the most recent year available and updated data for the five years prior. Because some claims lodged in the most recent year may not be accepted until the following year, the number of accepted claims reported lodged in the most recent year is likely to increase by about 3% when updated. Because of these issues, only updated data is used for time series comparison in this publication.

The NDS is the only national data set that provides information on workers' compensation claims that involve work-related disease. For a claim to be accepted the workers' compensation authorities require that the connection between workplace and disease be made by a medical practitioner. This may lead to considerable under-reporting of occupational disease in the NDS. The reader should also note that claims data are based on date of lodgement of claims which is usually closer to the date of diagnosis than the date of exposure. Further information on the NDS can be found on the Safe Work Australia website.

Table 2 shows the Type of Occurrence Coding System (TOOCS2.1) codes for the disease data extracted from the NDS.

Table 2: TOOCS Nature of injury/disease variables used in this report

Disease group and diseases included	NDS code	Specific Variables
Musculoskeletal disorders (limited to <i>Body Stressing</i> mechanism of injury or disease)		
Skeletal disorders	010	Fractures
	020	Fracture of vertebral column with or without mention of spinal cord lesion
	030	Dislocation
	310	Arthropathies & related disorders - disorders of the joints
	320	Dorsopathies - disorders of the spinal vertebrae & intervertebral discs
	340	Osteopathies, chondropathies & acquired musculoskeletal deformities
Muscular disorders	040	Sprains & strains of joints & adjacent muscles
	330	Disorders of muscle, tendons & other soft tissues
	450	Hernia
Mental disorders (limited to claims with <i>Mental Stress</i> mechanism of injury or disease)		
Mental disorders	910	Mental disorders
Occupational noise-induced hearing loss (limited to claims with <i>Long-term exposure to sound</i> mechanism of injury or disease)		
Deafness	250	Deafness
Infectious and parasitic diseases		
Intestinal infectious diseases	510	Intestinal infectious diseases
Specified zoonoses	521-525	Specified zoonoses (includes anthrax, brucellosis, Q-fever, leptospirosis & 'Other' zoonoses)
Viral diseases excluding hepatitis	540	Viral diseases excluding hepatitis, sexually transmitted diseases & Acquired immune deficiency syndrome (AIDS)
Hepatitis	550	Viral hepatitis
Other infectious diseases	530	Protozoal diseases
	560	Specified sexually transmitted diseases excluding AIDS
	561	Human Immunodeficiency virus (HIV) - AIDS
	570	Mycoses
	580	Other Infectious & parasitic diseases
Respiratory diseases		
Asthma	610	Asthma
Legionnaires disease	620	Legionnaires disease
Asbestosis	630	Asbestosis (excludes mesothelioma)
Pneumoconioses (exc. asbestosis)	640	Pneumoconioses due to other silica or silicates
	650	Pneumoconioses excluding asbestosis or silicosis
Other respiratory conditions due to substances	660	Other respiratory conditions due to substances
Other respiratory disease	670	Chronic bronchitis, emphysema & allied conditions
	680	Other diseases of the respiratory system
Contact dermatitis		
Contact dermatitis	410	Contact dermatitis
	420	Other & unspecified dermatitis & eczema
Cardiovascular disease		
Ischaemic heart disease (IHD)	710	Ischaemic heart disease
Other heart disease excluding IHD	720	Other heart disease excluding IHD
Cerebrovascular disease	730	Cerebrovascular disease
Arterial disease	740	Arterial disease
Other diseases of the circulatory system	750	Hypertension (high blood pressure)
	760	Varicose veins
	780	Other diseases of the circulatory system

Occupational cancer		
Mesothelioma	810	Malignant neoplasm of pleura (mesothelioma)
Skin cancer	820	Malignant melanoma of skin
	830	Other malignant neoplasm of skin
	850	Carcinoma in situ of skin
Other cancer	840	Malignant neoplasm of lymphatic & haematopoietic tissue
	860	Other malignant neoplasms & carcinomas
	890	Neoplasms of uncertain or unspecified nature

National Hospital Morbidity Database (NHMD)

The NHMD provides data on patients admitted to hospital in Australia (both public and private hospitals): these are counted as hospitalisations. This data set is compiled by the Australian Institute of Health and Welfare (AIHW). Data items include principal diagnosis, duration of hospital stay and procedures performed. Work relatedness is not consistently recorded in the data set. Therefore, only diseases considered to have a high attribution to work are presented in this report. NHMD data may include the same individual presenting for multiple hospitalisations during the year and transfers of a patient between one hospital and another. Consequently the data could overstate the incidence of disease.

The National Notifiable Diseases Surveillance System (NNDSS)

The NNDSS was established in 1990 by the Communicable Disease Network of Australia who publish these data on a quarterly basis. The system co-ordinates the national surveillance of more than 50 communicable diseases or disease groups. Under this system notifications are made to the State or Territory health authorities under the public health legislation in their jurisdiction. Computerised, de-identified unit records of notifications are supplied to the Commonwealth Department of Health and Ageing for collation, analysis and publication on the internet and in the quarterly journal, *Communicable Diseases Intelligence*. Only Infectious diseases with a high attribution to the workplace have been used in this report.

AIHW — National Cancer Statistics Clearing House (NCSCCH)

The NCSCCH receives data from individual State and Territory cancer registries on cancer diagnosed in residents of Australia. This data set is maintained by the AIHW. Data for new cases of cancers date back to 1982 and are currently available until 2008. The NCSCCH produces reports of national incidence and mortality data. Periodically, additional reports are produced that analyse specific cancer sites, cancer histology, differentials in cancer rates by country of birth, geographical variation, trends over time and survival rates. The aim of the NCSCCH is to foster the development and dissemination of national cancer statistics in Australia.

Calculation of incidence rates

The calculation of incidence rates from NDS data requires the number of employees in the Australian work force. These data are supplied to Safe Work Australia by the Australian Bureau of Statistics (ABS) and are specifically calculated to match the scope of workers' compensation coverage. More information on the NDS can be found in the NDS Technical Manual on the Safe Work Australia website.

Data obtained from the NHMD and NNDSS are drawn from the general population as work-relatedness is not consistently identifiable using these data sources. As a result ABS estimated resident population data are used when calculating incidence rates for these data sources. The figures used are estimated for June of the reference year and are limited to residents aged 15 years and over (referred to in graphs and text as adults).

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