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WORK- AND FARM-RELATED INJURY

GUEST EDITORIAL

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Work-related injury and illness are significant public health problems that, traditionally, have not been well addressed by the health sector. However, with increasing commitment to intersectoral planning, and the growth of community-based approaches in injury prevention, the health sector is becoming a key player in worker health and safety.

The public health approach to work-related injury shares much in common with the approach of occupational health and safety (OHS). Both draw significantly from the work begun in the 1960s on traffic safety by William Haddon of the United States National Highway Safety Institute. Haddon, who came from an engineering background, merged the detailed examination of individual injuries with a population approach to identify common risk factors; the title of the article he wrote on this subject was a 'transition to approaches epidemiologically rather than descriptively based'.[1]

Outside of traffic injuries, one of the first safety areas to pick up on the work of Haddon was that of OHS. In 1982, the United States National Institute for Occupational Safety and Health (NIOSH) developed the Fatality Assessment and Control Evaluation (FACE) research program for the identification and investigation of fatal work-related injuries.[2] The goal of FACE was to collect information on traumatic occupational fatalities using an epidemiologic approach, and to develop and disseminate recommendations to prevent similar events in the future.[3] This approach reflected the public health stance that the aetiology of injuries is multifactorial and, largely, preventable.

This issue of the *NSW Public Health Bulletin* presents an epidemiological view of farm- and other work-related injuries in New South Wales, with examples of initiatives by the health and OHS sectors to address these injuries and the burden they present. As you will see through the articles presented, the prevention of farm work-related injuries provides an interesting nexus between the approaches of health and OHS. Because

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the work setting on farms is also the place of residence for the farm family, the significance of the often overlooked area of 'bystander' injuries is highlighted. Further, the value of community-based approaches (more typically the realm of the health sector) is also apparent—given the difficulty of applying regulatory inspections and enforcement strategies to the farm worksite.

Driscoll and Mitchell provide an overview of work-related fatalities in NSW, by pulling together the findings from national studies on work-related fatalities and more recent workers' compensation data. Through this article we learn that there has been a steady decline of 3.1 per cent per annum in all deaths covered by the workers' compensation system for the period 1991–92 to 1998–99. The article highlights the need for a comprehensive database describing work-related fatalities. Through checking the records contained in each of the databases currently available, the authors revealed that workers' compensation and OHS databases between them identify only 68 per cent of work-related fatalities.

Franklin and Crosby describe their findings from the same national study, but in connection with farm-related fatal injuries. We can identify that fatalities in connection with farm work represent 67 per cent of farm-related fatalities (that is 124 of the 185 farm-related deaths in NSW during 1989 to 1992). Of these farm-related deaths, 34 were bystanders—reflecting the fact that most farm enterprises are also the farm family residence—and 27 deaths were of people involved in other incidents on a farm. Acknowledging the gaps in our understanding of the causes of injuries associated with the complex problem of farm-related injuries, the authors identify current directions for prevention activities. Many of these priorities are being taken up by Farmsafe NSW in partnership with Farmsafe Australia, the Australian Centre for Agricultural Health and Safety, WorkCover NSW, the NSW Water Safety Taskforce, NSW Agriculture, and NSW Technical and Further Education Commission.

Fragar and Houlahan provide us with a picture of the context of planning farm injury prevention strategies, including an appreciation of the variety of farming enterprises and the associated hazards. The public health approach to farm injuries acknowledges the multifactorial nature of farm-related injuries and the importance of evidence-based planning. This sits alongside the regulatory context of OHS and the unique features of farms as worksites. The Australian Centre for Agricultural Health and Safety and Farmsafe are key driving forces behind the growing understanding of, commitment to, and action on, farm-related injuries.

Two short articles illustrate current planning and action to prevent farm-related injuries. The rebate scheme implemented by WorkCover to address the often fatal, yet highly preventable, problem of the operators of tractors being crushed in the event of a tractor rolling over is described. A brief report on the *Child Safety on Farms* strategy presents the priority areas that are being raised at a national level to reduce the deaths, each year, of 30 children and the hospitalisation of around 600 others as a result of injuries sustained on farms.

Another article describes the extent of, and trends in, work-related injuries and diseases in poultry farming in NSW, using data from the Workers' Compensation Scheme. Poultry farming was the fifth largest rural industry in NSW in 1999–2000, employing about three per cent of the total workforce in the rural industry sector.

The final article in this issue presents another work health matter of concern to the rural sector—Q fever, and the recent introduction of the Q Fever Register. Q fever is generally transmitted to humans via airborne particles or dust from the waste and body fluids of infected livestock—making it a concern to workers in the meat industry, livestock farmers and rural veterinarians. The NSW Department of Health has been represented on the industry sub-group advisory committee to the matter of Q fever since the inception of the Q Fever Register, which is now operational and attracting a significant number of new registrations each month.

The progress described in enhancing worker health and safety is encouraging. Our understanding of work injuries and illness is growing—although alongside such knowledge we can also see more clearly the gaps in our knowledge. Opportunities such as those provided by the National Coronial Information System and, in the future, the potential to generate comprehensive reports from the NSW Department of Health and WorkCover NSW databases will help to fill these gaps.

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FATAL WORK INJURIES IN NEW SOUTH WALES

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There is no comprehensive source of information describing work-related fatalities in any Australian state or territory. Information for NSW is available from WorkCover NSW but this information is based heavily on workers' compensation data. Significant groups within the population, and particular types of injury, are excluded from the available data, either by design or practice.[1,2] This lack of comprehensive information makes the planning and evaluation of prevention initiatives very difficult, and forces occupational health and safety (OHS) agencies to base their decisions on incomplete, biased, or old data.

The most comprehensive up-to-date data describing work-related fatalities in NSW come from the more recent of two studies on work-related fatalities in Australia, Work Related Fatalities 2 (WRFS2) conducted by the National Occupational Health and Safety Commission (NOHSC).[3–5] An earlier NOHSC study of work-related fatalities, Work Related Fatalities 1 (WRFS1),[6] and more recent workers' compensation data from WorkCover NSW,[7] and from the Comparative Performance Monitoring (CPM) project,[8] also provide useful information. This article uses all these sources of information to shed light on some key questions relevant to work-related fatal injury in NSW.

METHODS

The second work-related fatalities study (WRFS2) investigated all work-related fatalities in Australia for the period 1989 to 1992. Primarily utilising coronial files, detailed information was collected concerning work-related deaths. A general overview of the main results and a detailed description of the methods used in the study are available elsewhere.[3,4] The study included only deaths caused by external causes and excluded suicide. A broad definition of 'work-related' was used, and deaths were separated into various categories that had relevance to particular aspects of OHS. The deaths of people fatally injured at work ('workplace', 'work-road', and 'working' deaths) provide the main focus of the current report. 'Working' deaths covered people who were fatally injured as a result of some kind of work activity for pay, profit, or kind. The working deaths were divided into two subgroups—workplace (workers who were fatally injured as a result of work activity in some form of fixed work-place) and work-road (workers, but not commuters, who were killed in motor vehicle incidents on public roads in the course of their work). The study also considered the deaths of people fatally injured while commuting to or from work ('commuters'), and the deaths of people not working but fatally injured as a result of the work activities of others ('bystanders'). Bystanders were further separated into 'workplace bystanders' (that is, those fatally injured as a result of workplace activities not usually associated with public roads or public transport) and 'road bystanders' (that is, those fatally injured in motor vehicle incidents on a public road, or on public transport, as a result of other people's work, where the working vehicle was primarily 'at fault' in the incident).

RESULTS

How big a problem are work-related fatalities in NSW?

There were 741 working and commuting deaths in NSW in the four-year period from 1989 to 1992 (approximately 185 deaths each year). Of the 741 people killed, 580 were fatally injured while working (78.3 per cent) and 161 were fatally injured while either commuting to or from work (21.7 per cent). The working deaths involved 388 workplace deaths (66.9 per cent) and 192 work-road deaths (33.1 per cent). The 580 working deaths over the four-year period equated to 145 deaths per year in NSW or approximately three deaths per week.

How does NSW compare to Australia?

The overall rate of work-related death for workers in NSW was 5.3 per 100,000 workers per year, similar to the national figure of 5.5 deaths per 100,000 workers per year.

Is work becoming safer for NSW workers?

Using information from both WRFS1 and WRFS2, it appears that the overall rate of working deaths in NSW declined fairly steadily from 1982 to 1992. This pattern of a declining rate of working deaths was also seen in the national figures covering the same period (Figure 1). Data from WorkCover NSW suggest this trend has continued since then, with a reasonably steady fall of 3.1 per cent per year across all deaths covered by the workers' compensation system from 1991–92 to 1998–99. Information from the Comparative Performance Monitoring project on compensated fatal injury in NSW also suggests a decline in risk in the last six years. So, available data suggest working in NSW is becoming safer. However, the situation is not as straightforward as these results suggest. Consideration of the percentage change in fatality rates for different industries in NSW between WRFS2 and WRFS1, where the number of deaths was high

enough to allow meaningful comparison, showed the construction (49.0 per cent), mining (32.1 per cent), agriculture (17.9 per cent) and transport and storage (11.8 per cent) industries had higher rates of death, and the manufacturing industry (-27.9 per cent) had a lower rate of death in WRFS2 compared with WRFS1. What has happened since 1992, and what factors may have influenced the observed changes in risk for different industries, is not known.

Are men in NSW more likely than women to be fatally injured at work?

The vast majority of working deaths were of males (95.3 per cent), with the rates of death for working males and females at 8.7 and 0.6 per 100,000 workers per year, respectively. It is likely that the higher rates for men are due almost entirely to more men being employed in occupations and industries that have a high risk of injury. However, the number of women fatally injured is too small to allow the hypothesis to be tested appropriately by examining occupation and industry-specific rates.

Are young workers at higher risk of fatal work-related injury?

The average age of workers who were fatally injured was 39.8 years, and two-thirds of all working deaths occurred to persons in the 20 to 49 year age range. However, work-related death rates showed a fairly gradual rise with age, and a considerable increase for those workers aged 65 and over (Figure 2). WorkCover NSW data for all deaths covered by the workers compensation system (including disease) suggest a very similar pattern—the number of young people fatally injured at work is too small to allow occupation and industry-specific rates to be determined. So, contrary to widespread belief, there is no evidence—either in NSW or elsewhere in Australia—that young workers are at increased risk of work-related fatal injury. In fact, available evidence suggests that they have the lowest risk, at least for workers 15 years of age or older.

What are the most dangerous occupations and industries in NSW?

Not surprisingly, the high-risk occupations in NSW are very similar to those for the whole of Australia. This reflects the fact that the extent of a worker's exposure to hazards, and the nature of those hazards, is closely connected to the worker's occupation. Specific occupations (of those where the number of deaths was high enough to allow a meaningful rate to be determined) with a particularly high fatality rate (deaths per 100,000 workers per year) in NSW were pilots (190.4 per 100,000), truck drivers (47.4 per 100,000), mining labourers (45.2 per 100,000), mobile plant operators (30.9 per 100,000) and farmers (25.1 per 100,000).

Also, the high-risk industries in NSW generally had similar rates to those in the whole of Australia: forestry and logging (113.9 per 100,000); fishing and hunting industry (59.8 per 100,000); mining (32.3 per 100,000); agriculture (23.5 per 100,000); transport and storage (23.4 per 100,000); and construction (10.4 per 100,000).

What sort of injuries are involved?

Multiple injuries (29.2 per cent), head injuries (24.3 per cent) and injuries to the chest (8.3 per cent) were the most common types of injuries associated with working deaths. Electrocution, crush asphyxia, and drowning were other common causes of death in the workplace. Approximately six per cent of all fatally injured working people died of the medical complications resulting from their injuries.

Do work activities have any adverse injury impacts on the general community?

There were 293 bystanders who were fatally injured in NSW in the four-year period from 1989 to 1992. Of the 293 deaths, 83 were of workplace bystanders (28.3 per cent) and 210 were of road bystanders (71.7 per cent), a rate of death of 0.36 per 100,000 persons per year for workplace bystanders, and 1.0 per 100,000 persons per year for road bystanders. Thirty-one per cent of workplace bystanders were aged less than five years and 44.6 per cent were aged less than 15 years. The rate of workplace bystander deaths of children aged less than 15 years was two to three times the rate of the other age groups.

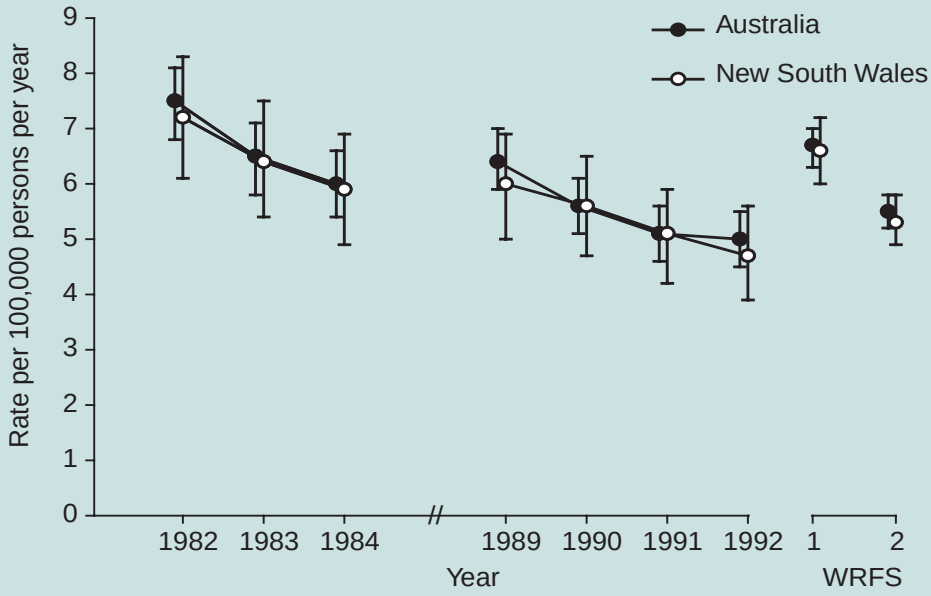
Nearly half (49.1 per cent) of the workplace bystander incidents occurred in rural areas or in a farmhouse, and 28.9 per cent occurred on a public road. The most common mechanism involved in bystander deaths was vehicle incidents, including where persons were travelling as passengers in work vehicles; being hit by moving objects; and drowning. Eighty-nine per cent of road bystanders were passengers or drivers of motor vehicles and the remaining 11.0 per cent were pedestrians. Trucks (51.0 per cent), cars (22.9 per cent) and buses (20.5 per cent) were commonly involved in road bystander deaths.

Are children at risk?

These results show that about one non-working person is fatally injured every five days in NSW as a result of the work activity of another person. Most of the child deaths were due to drowning in farm dams, or involved work vehicles or mobile machines (such as trucks, utilities, trailers, and tractors) in which children were travelling, or around which they were playing. One or more of the following factors were found to be involved in the indents: childcare availability, fencing, vehicle and machinery design, shift length, and economic pressures on the family. This raises many important but difficult issues that need to be addressed by any well-grounded prevention efforts.

FIGURE 1

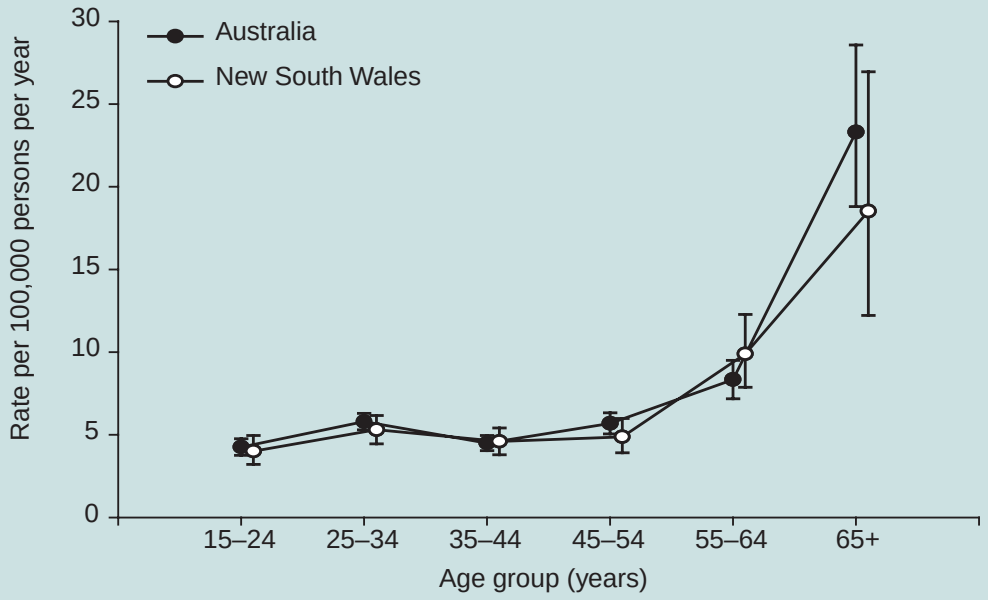
RATE OF WORKING DEATHS PER YEAR, AND AS AN AVERAGE FOR NSW AND AUSTRALIA, 1982–1984 (WRFS1) AND 1989–1992 (WRFS2)



Note: Incidence rates—deaths per 100,000 working persons per year. 95% confidence interval.

FIGURE 2

RATE OF WORKING DEATHS BY AGE AT TIME OF DEATH, NSW AND AUSTRALIA, 1989–1992



Note: Incidence rates—deaths per 100,000 working persons per year. 95% confidence interval.

What circumstances commonly lead to fatal work-related injuries in NSW?

The common circumstances leading to fatal work-related injury in NSW were similar to those seen for the whole of Australia, and included:

- working on a roof without a safety harness and falling through a skylight that was not properly signposted, is a similar colour to the roof, and has no underlying protective mesh;
- working alone under raised vehicles that were not adequately secured and/or supported;
- operating a tractor, without rollover protective devices and/or without seat belts fitted or used, on a steep slope and the tractor overturning;
- performing maintenance or installation work and coming into contact with live wires on a circuit not protected by a residual current device;
- a combination of high speed, lack of sleep, night driving, and sometimes alcohol and/or drugs in long distance truck drivers involved in motor vehicle crashes;
- construction and mining labourers on worksites being run over by reversing vehicles from which the driver's vision was restricted because of blind spots;
- members of the public being killed when their vehicle was struck by a semi-trailer whose driver had lost control of the truck;
- children (especially those under five) on farms drowning in dams when they wandered away from their parents, often climbing through inadequate fencing and/or following a pet to a small dam into which they fell due to the steep slopes.

These circumstances all identify important issues that need to be addressed by any effective injury prevention program that targets work-related fatal injury. Anecdotal evidence (for example, short descriptions in the press and the quarterly *WorkCover News*) suggests that, although the number of work-related deaths may be declining, little has changed in the type of circumstances that lead to fatal work-related injury.

Are all work-related deaths reported to, and recorded by, WorkCover NSW?

The WRFS2 information was checked against unit record information about work-related fatalities for NSW (and other jurisdictions) for the period of the study. This revealed that just over half (56.4 per cent) of the working fatalities were covered by the workers' compensation system. The OHS agencies covered 38.3 per cent of worker deaths. Overall, 68.1 per cent of work-related fatalities in NSW were recorded by either the OHS or workers' compensation system, with 31.9 per cent of worker deaths in NSW not covered by any of these agencies. For workplace bystanders, 1.2 per cent of cases were recorded in compensation data and 6.0 per cent in OHS data. No road bystander deaths were recorded.

Published compensation information significantly underestimates the magnitude of work-related traumatic death of workers and provides virtually no information on the deaths of non-working persons fatally injured as a result of someone else's work, whether in a workplace or on the road. The relatively low coverage by the OHS agencies is of particular concern because it is the investigations by these agencies that should provide the detailed information necessary to appropriately target prevention activity. Therefore, if it is assumed that this activity by OHS agencies is useful in improving the level of OHS, lack of awareness by the authorities of the details of a large proportion of incidents in particular areas is not helpful.

CONCLUSION

Work-related fatal injury is an important public health problem in NSW, both for workers and non-workers. Although WorkCover NSW and the National Occupational Health and Safety Commission provide data on fatal incidents, much of the information is either not comprehensive or is becoming dated. Older comprehensive data are still useful in developing an understanding of the circumstances leading to fatal injury, since these circumstances are unlikely to change quickly. The data, while useful for planning prevention efforts, do not provide on-going information on changes in the number, rate, or circumstances of work-related fatal injuries, and so cannot be used to evaluate prevention efforts. The National Coronial Information System, which is currently being implemented, will provide on-going information on work-related fatalities. This, combined with continuing improvements in the information provided by WorkCover NSW, should fill many of the gaps that currently impede the effective design, targeting, and evaluation of efforts to prevent work-related fatalities in NSW.

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FARM-RELATED INJURY IN NSW: INFORMATION FOR PREVENTION

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Over the past decade, information about injuries on farms has grown; however, due to the time-consuming and costly nature of its capture, detailed analysis of events of injury has been limited. The aggregation of information has also proven difficult due to various coding frameworks and definitions being used. This article describes some of the information that can assist in the prevention of farm-related injury in NSW.

THE FARM INJURY OPTIMAL DATASET

In 1994, the Australian Centre for Agricultural Health and Safety started to develop an optimal dataset for use in the collection of information describing agricultural injury.[1] This dataset was made available for use in late 1996. In 1999 the dataset was updated, after it had been used for various studies and some of the practical problems associated with its application had been resolved.[2] The production of an optimal dataset for farm injury has allowed both the aggregation of data from studies from different areas and over different time frames and the subsequent comparison of these studies.

In 1995, the National Occupational Health and Safety Commission undertook the largest collection of data describing work-related fatalities in Australia covering the period 1989–1992.[3] As part of this study, the Farm Injury Optimal Dataset was used to code farm-related deaths. The Australian Centre for Agricultural Health and Safety and the National Occupational Health and Safety Commission produced a detailed report on farm-related fatalities.[4]

FARM-RELATED FATALITIES IN NSW

The investigation of farm-related fatalities in NSW during the period 1989–1992, which was undertaken as part of the national study, found that there were 185 unintentional deaths on or related to farms. At the time of their fatal injury, 124 people (67.0 per cent) were working, 34 (18.4 per cent) were bystanders to the incident (a person who was injured as a result of workplace activities or by a piece of equipment which was present on the farm to perform work functions), and 27 (14.6 per cent) were involved in other farm incidents (injuries that were not a result of work or work-related).[4]

On average, there were 46 farm-related fatalities on NSW farms per annum, or 39 work-related farm fatalities on NSW farms per annum. There were 193 people who were fatally injured on NSW farms (both intentionally and unintentionally); this gave a rate of 1.09 fatalities per 10,000 agricultural establishments in NSW.[4]

Rates and numbers are all very well when you are examining an issue over time or determining the size of a problem, or if you are examining the effect that a program has had in reducing the problem. Rates and numbers are less able to determine where you should be directing your prevention activities, what these activities should be, or where you should spend resources gathering greater detail about the event of injury.[4]

The study by Franklin et al. (2000) examined the farm-related deaths in NSW in detail including information about gender, age, farm enterprise, location on farm, agent, mechanism, activity at time of injury, pathophysiological cause of death, blood-alcohol content, month, day, and status of visitor to the farm.[4]

Examining the overall results of the study for NSW, it was found that the most common types of farm enterprises where the fatal incident occurred were producing:

- cereal grains, sheep, cattle, and pigs;
- cattle for meat;
- sheep for meat and wool.

The most common locations of the fatal incident were roads and lanes, paddocks cleared for grazing, and paddocks under crop. For working fatalities, tractors, aircraft, and trucks were common agents involved in the incident. Dams and tractors were common agents of the fatal incident for bystanders.[4]

The common mechanisms of the fatal incident for workers were vehicle accidents, being hit by moving objects (most commonly tractors), being hit by falling objects (mainly trees being felled), and rollovers of mobile machinery (mainly tractors). Common mechanisms of the fatal incident for bystanders were drowning and being hit by moving objects. The most common activities undertaken by workers at the time of the fatal incident were transport for work purposes, maintenance activities, and working with crops. Bystanders were commonly involved in recreation or playing activities.[4]

HOSPITAL ADMISSION FROM FARM INJURIES

Information collected when there is a fatality on a farm provides substantial information about the event of injury, but fatalities only represent about 10 per cent of all injuries sustained on farms. Injuries resulting in hospitalisation often represent injuries that are more severe than injuries that are presented to the surgeries of general practitioners. In NSW, there are over 1000 hospitalisations for injury per annum, where the location is a farm. Farmsafe Australia has selected a group of E codes to describe key injuries occurring on farms (Table 1).[5]

Causes of farm-related injury, where there are a large number of injuries requiring hospitalisation include injuries from:

- riding animals;
- riding motorcycles, but often involving animals;
- riding agricultural vehicles;
- using agricultural machinery, which result in cutting and piercing.[5]

Does information from hospital admissions help with prevention efforts? Unlike information from coronial records, information recorded by a hospital has few details describing the circumstances surrounding the event of injury. There is, however, a large number of hospital admissions; for NSW we can see from Table 1 that over seven fiscal years there has been no reduction in the number of injuries to individuals who have been hospitalised as a result of farm-related injury. This information is useful at a local level and can be analysed by gender and age groups. The information on farm-related

TABLE 1

HOSPITAL SEPARATIONS FOR FARM INJURY, ALL AGES, NSW, 1989–90 TO 1995–96 [5]

E-Code	Description	NSW hospital separations all ages						
		1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96
E820–E829	Motor vehicle non traffic accidents & other road vehicle accidents							
	Motor cycle	205	206	236	266	236	254	270
	Other vehicle	100	115	122	116	94	144	111
	Animal ridden	224	249	277	269	240	231	196
E862	Poisoning by petroleum products	*	*	5	*	-	*	*
E863	Poisoning by agricultural chemicals	13	10	17	18	22	20	11
E864	Poisoning by corrosives & caustics	*	-	*	*	*	-	-
E866	Poisoning by gases and vapours	-	*	*	*	*	5	*
E890–899	Fire and flames	19	26	29	22	18	21	15
E905	Venomous animals and plants	17	32	75	43	41	46	50
E906.0	Dog bite	*	5	10	7	6	*	*
E906.8	Injury by other animal	147	130	150	140	137	133	122
E919.0	Agricultural machinery	123	120	121	114	129	96	134
E919.1-9	Other machinery	58	27	43	48	25	43	32
E920	Cutting and piercing	104	96	144	119	102	88	106
E922	Firearms	10	13	18	18	15	11	10
	TOTAL SUBSET	**1025**	**1030**	**1251**	**1186**	**1069**	**1096**	**1062**

Source: NSW Inpatients Statistics Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.
* Number less than five.

injury is a guide to where the work of prevention should be directed, and the information can be used to monitor injury prevention programs. With the updating of the ICD-9 to ICD-10, there will be more information about the event of injury available for informing injury prevention.

EMERGENCY DEPARTMENT AND GENERAL PRACTICE SURGERIES

Another valuable source of information is presentations to emergency departments and to surgeries of general practitioners (GPs) for the treatment of injury. Again, there are large numbers of farm injuries each year that present to these services, but often the information recorded does not identify those injuries that are farm-related. Currently in NSW, there is no statewide system for collecting emergency department presentations or GP presentations. However, a number of hospitals over the last decade have started to collect injury information from their emergency departments using the Emergency Department Information System (EDIS) system.[6,7,8]

A study of farm injuries presenting to the Tamworth Base Hospital found that during the 15 month study period there were 422 people who sustained an injury on farms, three-quarters were males and 40 per cent were aged 24 years or less.[9] The majority were Australian (97.4 per cent) who lived in the study area (94.3 per cent). Of the people who presented to the emergency department only 28.5 per cent were then admitted to hospital, the majority were discharged (68.9 per cent). Of those killed, just over half (55.1 per cent) were working for an income. The most common agents involved in the injurious event were horses and motorcycles.

In NSW there has not been a study examining injuries that present to the surgeries of GPs; however, a study in Queensland collected injury presentation information from both emergency departments and surgeries of GPs.[10] The study found that similar injuries present to both places, with a slight tendency for the more serious injuries of fracture and concussion to present directly to an emergency department.

Information collected from emergency departments and the surgeries of GPs is useful for prioritising work at the local community level, directing where further research needs to be undertaken, monitoring programs, and for allocating resources.

WHERE DOES THIS INFORMATION LEAD US?

Analysis of injury and fatality data suggests that in NSW we need to do further work to reduce fatal injuries as a result of tractor rollovers, vehicle accidents, drowning in dams (especially for children less than five years of age), felling trees, and injuries in those working in the cereal grains, sheep, meat cattle, and pig industries. To reduce injuries that lead to hospitalisation, we need to be working on prevention efforts in the areas of animal-related injuries, in particular horse riding; motorcycle injuries; agricultural machinery; and farm vehicles. Emergency department information suggests that we need to do further work with injury involving horses and motorcycles, injuries to children, and work-related injuries.

Some of the work specified above is already underway. A major program of training is happening through the Managing Farm Safety Course. The course is aimed at farm managers and owners, to help them develop the knowledge and practical skills to manage the risks of injury and illness associated with life and work on farms, and thereby increase their productivity. Farmsafe NSW is working with Farmsafe Australia and individual agricultural industries to develop resources aimed at providing specific information in the Managing Farm Safety Course for particular commodity groups.

In May 2000, WorkCover NSW allocated $2.4 million for a program that provides a $200 rebate per tractor for farmers to fit a Roll Over Protective Structure; this campaign is described elsewhere in this issue of the Bulletin. Farmsafe NSW is heavily involved in both the NSW Water Safety Taskforce and the Farmsafe Australia *Child Safety on Farms* strategy, which is trying to reduce the number of children who drown in dams. NSW Agriculture and TAFE have developed a 'Tractor Operation and Maintenance' Course for all people who use tractors. The Australian Centre for Agricultural Health and Safety is currently developing resources for vehicle safety on the farm.

The NSW Department of Health and Farmsafe NSW have developed a health promotion package called the 'Safer farm environments project', which is a scheme that provides resources and offers mini-grants for farm safety interventions for rural area health services.[11] Farmsafe NSW and WorkCover NSW have developed a Future Farmers resource package that provides material and guidance to run a field day to introduce Year 9 and 10 agricultural students to hazards on farms and safe work practices.[12]

There is an increasing awareness of the need for training programs for drivers of All Terrain Vehicles (ATV or 4-wheeled motorcycles) and 2-wheel motorcycles; many manufacturers are now examining the possibilities for providing suitable training before purchase or at the point of sale. Resources promoting safe horse riding and handling have been developed and distributed to pony clubs and other interested groups.[13]

WHAT ELSE SHOULD WE BE DOING?

The effectiveness of the interventions that are currently being undertaken will need to be studied, including cost-benefit analyses. More work needs to be done to develop resources aimed at adolescent males who ride motorcycles and adolescent females who ride horses. Further work needs to be undertaken in addressing the issue of vehicle safety on farms. Further resources and infrastructure for local farm safety action groups need to be identified and implemented. Continued promotion of the Managing Farm Safety Course is required, in order to provide skills to farmers to effectively manage their occupational health and safety risk.

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AUSTRALIAN APPROACHES TO THE PREVENTION OF FARM INJURY

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In Australia, farm injury is associated with many hazards in differing production systems; farm injury is a high risk for the population that lives and works in rural settings, settings that are often isolated—physically and socially. The prevention of farm injury requires a multifaceted collaboration on the part of a number of key stakeholder agencies and the employment of contemporary public health approaches that are proving valuable in maintaining the collaboration at the national as well as at the state level. The investment by the NSW Department of Health and the New England Area Health Service in the Australian Centre for Agricultural Health and Safety at Moree—in northwest NSW—has supported the progress being made in the prevention of farm injury. This article describes some Australian approaches to the prevention of farm injury.

BACKGROUND

Farmsafe Australia was incorporated as an association in 1994 to bring together key stakeholder agencies to improve the productivity of Australian agriculture and horticulture, and the wellbeing of the workforce, through improved health and safety performance.

In 1996, Farmsafe Australia agreed on a defined set of goals, targets, and strategic activities, that have governed the plans and programs of its member agencies as they relate to the prevention of farm injury.[1] Progress was reviewed in 1999, and a more extensive review and revision of the role and function of Farmsafe Australia, and its strategic directions, is currently being undertaken.[2]

FARM INJURY—ISSUES

Across all systems of agricultural production, the key hazards associated with preventable on-farm death and severe injury have been defined as:[3,4]

- tractors and other plant and machinery;
- motorcycles (2-wheeled and 4-wheeled);
- other motor vehicles;
- dams and waterways;
- noise;
- animal handling;
- horse handling;
- stress and suicide.

As a population group, children have been identified as being at special risk; there is also evidence of high risk to young men and to older men.[3]

Injury on farms in Australia is associated with many hazards in differing production systems. Researchers and injury prevention professionals have identified that there are some common characteristics for risk of injury and hence prevention of injury shared by many Australian farms. These include the key hazards of tractors, motorcycles, and farm workshops, as well as factors such as having a high proportion of family involved in the business arrangements on farms, and a relative isolation from services such as education and medical facilities.

However, there are many differences that relate to the actual production system requirements for specific commodities. For example, even between animal production systems there is significant variation in exposure to physical hazards and injury risk factors—beef cattle production may use either extensive grazing systems or more intensive, outdoor feedlot systems; while piggeries are generally intensive indoor systems. Harvesting systems and labour demands for milk production are very different to those for wool harvesting; for example, dairies require labour input twice or three times a day for 365 days per year, while shearing is an annual intensive activity often using contract labour for between a few days to a few weeks of the year. There is similar significant variability in injury risk factors between cropping systems for grains, tree crops, and the range of vegetable crops, and these are significantly different to the injury risk factors associated with animal handling systems.

Depending on geography, season, cash flow, and availability of labour, the nature and degree of mechanisation and exposure to hazardous pesticides also varies between different systems at different times and in different places.

The Farmsafe Australia network has had to address:

- a previous lack of awareness of farmers and the industry of the nature and scale of the injury risk;
- the commonly held view among individual farmers, the industry and wider community that a health and safety improvement is costly and time consuming;
- no one location for obtaining relevant information on farm injury – hampering the efforts of stakeholders to develop effective policies and to drive change; and

- a lack of understanding of the preventability of injury.

In this latter characteristic, the farming community is probably not alone.

The focus of previous approaches to occupational health and safety (OHS) had been on protecting employees in larger enterprises. However, as much of the labour in the agriculture and horticulture sector is family labour, their needs and those of their employed workforce have been largely overlooked. There has been a general lack of awareness of both the OHS approaches to risk management being adopted, and to improvements being made in other larger scale industries. Farming businesses share these features with other small businesses across Australia.

During the 1990s, the economic and social environment for agriculture has become more challenging, due to lower commodity prices and higher input costs. Also, farmers have reported feelings of tension and frustration due to loss of control over their business decision-making, in light of perceived increasing government intrusion into decision making in the farm family business. These feelings relate, for example, to native vegetation regulations and land and water reforms; taxation demands; and regulatory requirements to keep pesticide records; these demands cause both reduced availability of skilled labour and increased pressure on farmers' time.

As the problems of risk of injury were made more public during the late 1980s and early 1990s, it became clear that there was significant potential for fragmented and inconsistent messages about farm safety solutions being sent to farm families and farm managers. Farmers have frequently reported that they have been so barraged by media reports of a wide range of specific injury and death occurrences and that they 'don't know where to start'.

FARM INJURY—PUBLIC HEALTH APPROACHES

Public health approaches have been used to tackle the problem of farm injury in Australia, and have gained the support of industry and government in a way that is unique among all industries. Features of these public health approaches are basic, but they have now been generally accepted as:

A community development approach

The aim of this approach has been to assemble key partnerships; and to support the target group to take control and leadership, supported by relevant players who commit to playing their part in the adopted plan. The Farmsafe network has been based within industry organisations. Member agencies of Farmsafe Australia are listed in Table 1. State and local Farmsafe associations have similar but locally-relevant membership.

Development of an understanding of the farming populations at risk

This approach has included knowledge of the key characteristics of the population and their organisation at the levels of family unit, business enterprise, community, and peak body—that is, their environment (social, economic, and physical); their key issues; and their preoccupations.

A sound evidence base

In this approach, data have been collected and reported in a manner that is relevant to the needs of organisations, and have been used by the Farmsafe collaborations to define the priorities for action, to define effective solutions, and to establish standards and benchmarks.[5] For the agriculture sector, it has been essential to use population data, as few farming enterprises are large enough to experience the whole range of potential injury outcomes.

TABLE 1

MEMBER AGENCIES OF FARMSAFE AUSTRALIA

National Farmers Federation	Australian Centre for Agricultural Health and Safety
Country Women's Association of Australia	Tractor and Machinery Association of Australia
Australian Workers Union	Farmsafe Queensland Ltd
Department of Agriculture, Fisheries and Forestry	Farmsafe New South Wales
Department of Transport and Regional Services	Farmsafe Victoria
National Occupational Health and Safety Commission	Farmsafe South Australia
Rural Industries Research & Development Corporation	Farmsafe Western Australia Inc.
Rural Training Council of Australia	Tasmanian Rural Industry Training Board

APPROACHES TO PREVENTION OF FARM INJURY

Faced with so many injury hazards, Farmsafe Australia has focused industry attention on:

- injuries associated with high severity—that is, those associated with death and/or hospital admissions;
- injuries occurring with high frequency;
- injuries associated with high cost—that is, those associated with high workers' compensation cost, long length of stay in hospital, and high replacement labour cost;
- injuries that are most readily preventable.

Current approaches to identify effective interventions for a specific injury risk, consider the following mix of solutions:

- improved design to reduce injury—engineering solutions;
- education and training to reduce injury—education;
- legislation and standards—enforcement.

These principles, together with the work of William Haddon,[6] have been translated into a 'hierarchy of control' used in contemporary OHS risk management. The order of effectiveness is:

- eliminate the hazard;
- substitute the hazard for a lesser risk;
- engineering—design to reduce risk;
- improve practice—administrative approaches include training, safe operating procedures, other rules for work;
- personal protective equipment;
- good first aid, injury management, and rehabilitation.

OCCUPATIONAL HEALTH AND SAFETY AND OTHER LEGISLATED REQUIREMENTS

As farms are workplaces, Farmsafe Australia has recognised that injury prevention must be undertaken within the context of state OHS regulatory frameworks. In NSW, OHS legislative requirements that must be met include:

- consultation with workers and worker participation in safety processes;
- safety induction and training of workers;
- identification of hazards and assessment of risks in the workplace;
- effective risk control measures;
- records of OHS processes;
- health surveillance of workers for hazardous substances exposures where relevant.

THE MULTIFACETED STRATEGIC APPROACH OF FARMSAFE AUSTRALIA

Based on evidence of priority hazards that represent high risk, vulnerable populations, and major agricultural industries, the following have formed the basis of a strategic approach being implemented by the member agencies of Farmsafe Australia.

Establishing the national, state, and local frameworks for action, as well as the commodity specific frameworks

This has involved encouraging and coordinating local Farm Safety Action Groups, state Farmsafe programs, and reference groups established for commodity-specific programs and for specific issues.

Preparing on-farm injury management resources relevant to production systems and small business, and to meet regulatory requirements

The preparation of injury management resources has included commodity-specific aids to hazard identification and risk assessment, templates for worker safety induction, and the keeping of OHS records. A video to assist the safety induction of workers has also been produced. This resource is provided to farmers and farm managers and others who participate in *Managing Farm Safety* training programs.[7]

Education and training

A key program of Farmsafe Australia has been the establishment of Farm Safety Training Centres in all states to oversee delivery of the *Managing Farm Safety* training programs. The program has included training of instructors to deliver the course. The course has been mapped to the competency standards of the Australian Quality Framework.[8,9]

Data collection and dissemination

The National Farm Injury Data Centre has become the 'engine room' for program development of the Farmsafe network. It provides relevant information regarding the nature and scale of farm injury problems for the relevant programs, and is working to develop more appropriate data standards and definitions to support the injury prevention activities.[10]

Research program

The Rural Industries Research and Development Corporation has mobilised a group of research and development funding agencies of other rural industries and formed the Farm Health and Safety Joint Research Venture. The Joint Research Venture funds a modest research program that is providing the Farmsafe network with the evidence base for its program.

Supportive legislation

Farmsafe Australia advocates for improved legislation and standards, where relevant to enhance farm safety. Recent programs have focused on the interpretation of the responsibilities of farms with regard to pesticides safety legislation in state pesticides acts and state hazardous substances regulations under their respective occupational health and safety acts. In each state, these two pieces of legislation overlap in terms of what users are required to do to ensure safety—that is, to use a pesticide in accordance with the label safety requirements in the pesticides act, but to undertake a risk assessment that allows registration of the pesticide and to determine that the safety directions on the label are in accordance with the occupational health and safety act.

Other work relates to participation in relevant standards development, according to the requirements of Standards Australia, and in reviews of legislation.

Specific nationwide campaigns and programs

National programs have been or are being mounted under the guidance of relevant reference groups to address the following:

- *Tractor safety*—to date, there are tractor rollover protective structure subsidy and enforcement schemes in two states. For example, the *ROPS Retro-fitment Campaign* for tractor safety in NSW is described elsewhere in this issue of the Bulletin;
- *Machinery safety*—national strategies are being mounted that involve systematic investigation of safety of a list of specific machinery hazards;
- *Child safety*—a national *Child Safety on Farms* strategy, being implemented with funding from the Australian Department of Health and Ageing, is described elsewhere in this issue of the Bulletin;
- *Farm motorcycle safety*—a national approach is being developed to improve the safety of motorcycles on farms;
- *Hearing conservation*—a national reference group is being assembled to define a national strategy for hearing conservation, to be adopted by Farmsafe Australia.

THE ROLE OF THE AUSTRALIAN CENTRE FOR AGRICULTURAL HEALTH AND SAFETY

The Australian Centre for Agricultural Health and Safety is a research centre of the University of Sydney, based in Moree in northwest NSW. The centre receives infrastructure funding from the NSW Department of Health and the New England Area Health Service. The centre also receives research funding from grants from other government agencies whose grant programs are jointly funded by commodity levies on farmers and the Commonwealth Government, as well as from the research and development authorities of industry.

The Centre has played a pivotal role in the development of a unified approach to reducing farm injury by:

- preparing the initial document that used relevant injury–illness data, to establish goals and targets;
- bringing together the key players at state and national level, NSW Farmsafe played a key role in establishing the national association;
- establishing the secretariats for Farmsafe Australia and Farmsafe NSW as well as the local North West Farmsafe group;
- establishing the National Farm Injury Data Centre and Data Collection;
- developing and piloting the *Managing Farm Safety* training programs and facilitating the establishment of Farm Safety Training Centres in all states to deliver the programs to farmers and farm managers;
- developing, in association with industry reference groups, 'commodity-specific enterprise management tools', which are on-farm occupational health and safety risk management packages that include:
  - —hazard checklists for each workplace in the farm, and risk area of the farming enterprise;
  - —templates for occupational health and safety business plans and budgets;
  - —induction guides for new workers, induction guides for contractors;
  - —record forms for training, pesticides, injuries; and guidance notes for managing 20 specific major risks;
- undertaking research in relevant areas—for example, motorbike injury, farm machinery injury, child injury on farms, noise injury, road traffic injury, stress and suicide in the agricultural industries, and pesticides and human health.

CONCLUSION

Farmsafe Australia has brought together all key stakeholder agencies and has initiated multifaceted strategies and programs that support the prevention of injury and illness associated with farm work and farm life in Australia. The Australian Centre for Agricultural Health and Safety has played a pivotal role in the identification of needs, in generating data, and in enabling other agencies to implement programs that are both relevant and evidence based.

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TRACTOR SAFETY IN NEW SOUTH WALES—*ROPS RETRO-FITMENT CAMPAIGN*

A ROPS, or Roll Over Protection Structure, is a frame fitted to a tractor to protect the operator in the event of the tractor rolling over or flipping backwards. In May 2000, WorkCover NSW announced a $2.4 million ROPS Rebate Scheme, giving farmers access to a $200 rebate for the fitting of an approved ROPS to their tractors. The ROPS must comply with the Australian Standard AS 1636 'Tractor Roll-Over Protective Structures—Criteria for Tests for AS Earth-Moving Protective Structures'.[1]

Tractors do not merely pull equipment; they provide the power to operate often quite complex machines—for example: cultivating equipment, hay balers, fertiliser spreaders, machines that drill seeds into the ground, slashers, and milling equipment, among others. Tractors on Australian farms are the single most common agent involved in serious injury and deaths. The three mechanisms commonly involved in tractor-related injuries are rollovers, run overs, and becoming entangled in the Power Take Off (PTO), which is the long shaft—rotating at high speed—that transfers power from the tractor to operate the attached machinery. Of these three mechanisms, tractor rollovers are the most common,[2] and are preventable by having a ROPS fitted and through the wearing of a seatbelt.

Over the past decade, WorkCover NSW has investigated 45 fatalities on farms in NSW, of which 15 were directly attributed to tractor rollover. On average each year, 30 claims are made for permanent disability and 100 claims are made for temporary disability from tractor related incidents.[1]

Legislation for the provision of ROPS on tractors has been in place in NSW since 1982, which requires all tractors weighing between 560 kg and 15,000 kg to be fitted with ROPS.[1] Davidson (1996) found that 26 per cent of tractors in use on farms in NSW did not have a ROPS.[3] He estimated that at that time there were 88,000 tractors in use on NSW farms and extrapolated that there were 24,000 tractors without ROPS.

Following the National Tractor Safety Project,[3] the Victorian WorkCover Authority implemented a *ROPS Retro-fitment Campaign* that fitted 12,129 ROPS.[4] WorkCover NSW has initiated a similar program. Under the *ROPS Retro-fitment Campaign* in NSW there are funds to provide a subsidy for 10,000 ROPS. The scheme will finish at the end of 2002 and as of the 31 March 2002 there have been 5239 ROPS fitted.

Anyone interested in further information regarding the *ROPS Retro-fitment Campaign* should contact Kerri-Lynn Stark on 02 6752 8210.

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CHILD SAFETY ON FARMS STRATEGY

It is estimated that the number of children residing on Australian farms in 1994–95 was 53,336. Each year on Australian farms there are on average 30 child fatalities and 575 injuries resulting in hospitalisation.[1,2] After extensive consultation with farm families, industry, and government *Child Safety on Farms: A Framework for a National Strategy in Australia* was published in 1999 by Farmsafe Australia.[3] The strategy has been distributed widely through the Farmsafe Australia network. In May 2001, the then Commonwealth Department of Health and Aged Care announced funding of $887,000 over three years to support the implementation of the strategy.

The strategy identifies the following dimensions associated with child safety on farms:

- child growth and development;
- farm family needs and aspirations;
- rural economy and farm business management;
- management of occupational health and safety in the agricultural sector;
- child care;
- education and training of children and young people for farm work;
- child protection;
- access of farm families to information.

The eight components of the strategy are:

- establishment of a national framework for action;
- identification of key hazards for children on farms;
- identification of effective strategies to control key injury risks;
- identification of educational needs and development of resources for children, parents and teachers;
- identification and development of flexible child care options;
- promotion of strategies to farm parents, farm managers, schools, service providers and others;
- identification of further research needs;
- evaluation of the national strategic plan.

Anyone interested in further information or becoming part of the *Child Safety on Farms* strategy should contact Farmsafe Australia on (02) 6752 8218.

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COUNTING THE COST OF WORK-RELATED INJURIES AND DISEASES IN POULTRY FARMING IN NEW SOUTH WALES

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This article describes the extent of, and trends in, work-related injuries and diseases in poultry farming in NSW, using new major claims data from the Workers' Compensation Scheme over a nine-year period (1991–1992 to 1999–2000) for the analysis. Poultry farming, which includes industries that produce poultry for meat and poultry for eggs, was the fifth largest rural industry in NSW in 1999–2000, employing about 3700 workers or three per cent of the total workforce in the rural industry sector.[1] New major claims are claims where the result of injury was death, permanent disability, or temporary disability with five or more days being paid for total incapacity, and which have been entered into the insurer's database in the relevant year.

BACKGROUND

Unlike other rural industries, a large proportion (96.5 per cent) of the poultry farming workforce are employees who are covered by the Workers' Compensation Scheme. This presents an opportunity to investigate the full range and extent of occupational health and safety risks within the poultry farming industry, using the data available in the Workers' Compensation database. For the purpose of this analysis, selected data fields were extracted for the period 1991–1992 to 1999–2000. The data represent new major claims for work-related injuries and diseases; and include the number, severity, nature, and mechanisms of injury–disease, as well as costs.

Extent and severity of injury–disease

From an occupational health and safety perspective, poultry farming is a high-risk industry. In 1999–2000, it ranked second among rural industries, with an incidence

FIGURE 1

NUMBER OF CLAIMS, INCIDENCE RATE, AND GROSS INCURRED COST, NSW, 1991–1992 TO 1999–2000

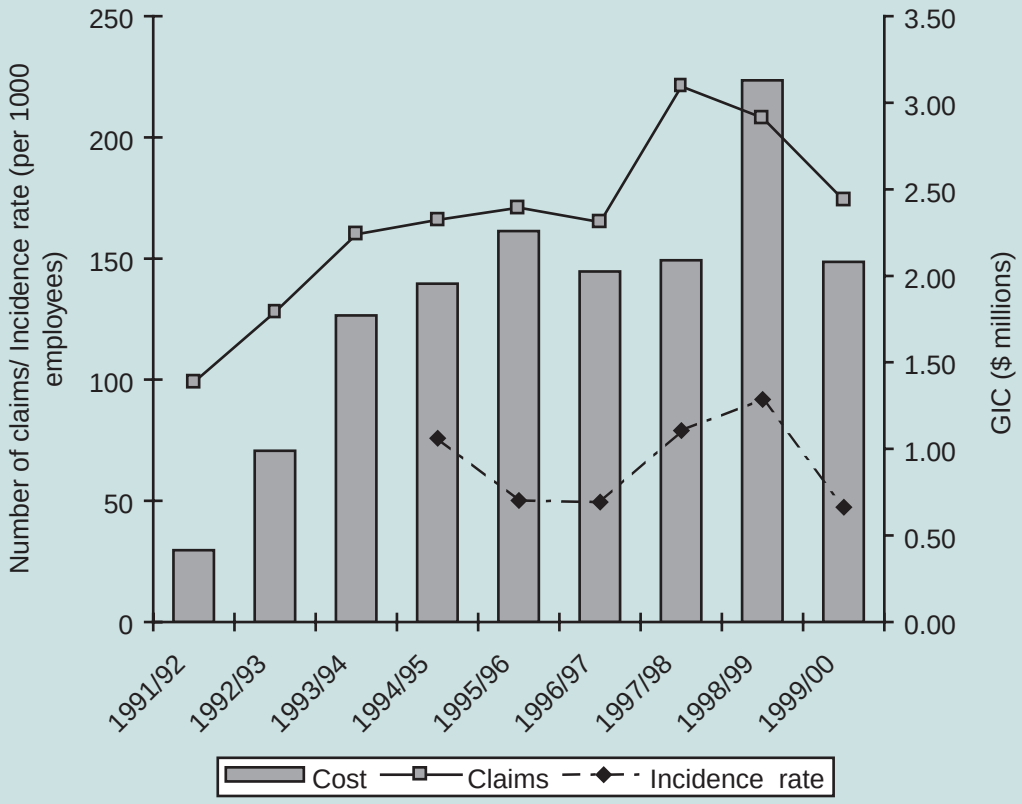


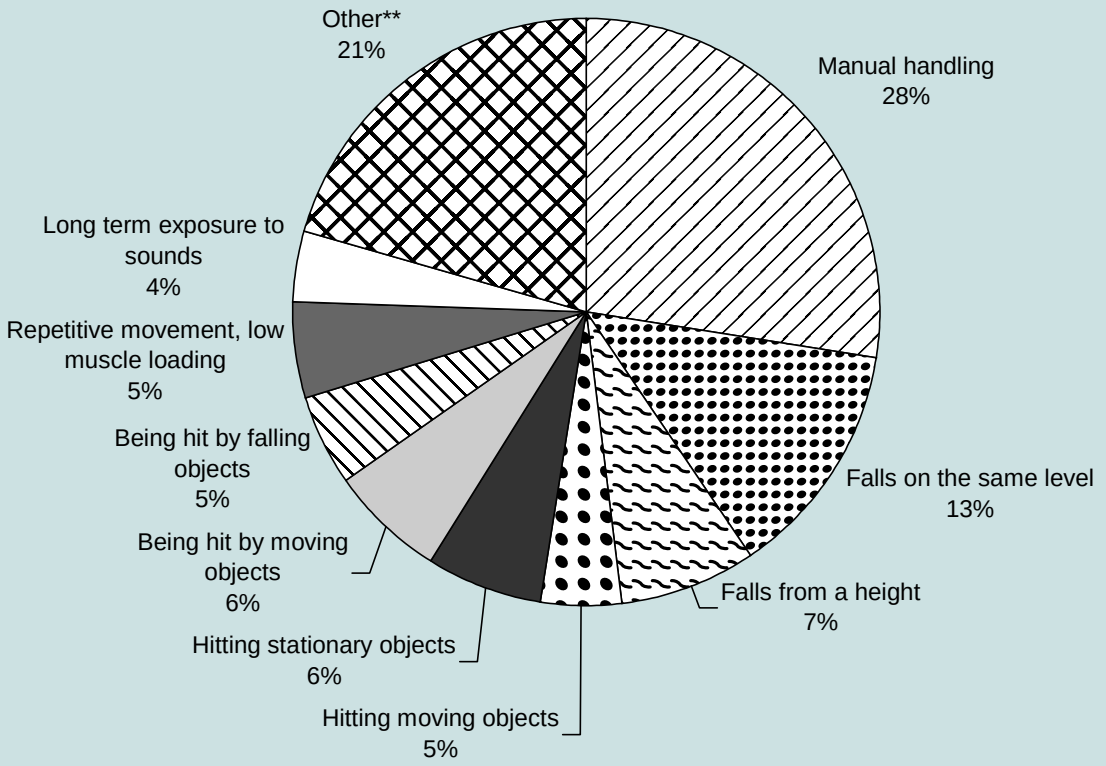
TABLE 1

SEVERITY OF INJURY–DISEASE IN POULTRY FARMING EMPLOYEES, NSW, 1999–2000

Severity	Number of claims	% of total claims	Gross incurred cost ($)		
			Total	% of total	Median
Permanent disability	46	26.4	1,377,023	66.2	26,674
Temporary disability—six months or more off work	11	6.3	169,333	8.1	10,873
Temporary disability—less than six months off work	117	67.2	534,697	25.7	1,946
Total claims	174	100	2,081,053	100	3,471

FIGURE 2

MECHANISMS OF INJURY–DISEASE IN POULTRY FARMING EMPLOYEES, NSW, 1999–2000



**Other includes 21 other mechanisms

rate of 47.4 claims per 1000 employees. This was slightly lower than the incidence rate for the highest risk industry, dairy farming (47.8 per 1000), but higher than the rural industry average (36.6 per 1000) and higher than the average for all industries in NSW (19.5 per 1000).[2] As shown in Figure 1, the number of claims increased from 99 in 1991–1992 to 221 in 1997–1998 and then declined to 174 in 1999–2000. The incidence rate, for which data are available from 1994–1995, increased from 50.2 per 1000 in 1995–1996 to a maximum of 91.8 in 1998–1999 but declined to 47.8 per 1000 in 1999–2000. Despite the high incidence rate, this declining trend in 1999–2000 suggests that, overall, poultry farming is becoming a safer workplace.

There were three fatalities reported in the nine years to 1999–2000. The distribution of claims by severity of injury–disease and their associated cost are typified by

the statistics for 1999–2000 (Table 1). The majority of the claims (67 per cent) were related to temporary disability with less than six months off work. Permanent disability, on the other hand accounted for 26 per cent of all claims. The data also revealed a nine-fold increase (from five to 46) in the number of claims for permanent disability in the past nine years.

Cost of injury–disease

During the period under review, the total Gross Incurred Cost (GIC) through workers' compensation claims increased from $415,321 to $2.1 million, with a peak of $3.1 million in 1998–1999 (Figure 1). Gross Incurred Cost is the sum of payments plus an estimate of future liability if the claim is still open at the end of the relevant financial year. This peak coincided with an increase in the number of permanent disability claims, which accounted for 70 per cent of the total GIC. The median GIC also doubled from $1,743 to $3,471.

As shown in Table 1 permanent disabilities made up 26 per cent of all claims and accounted for 66 per cent of the total cost. Temporary disability with less than six months off work, on the other hand, made up 67 per cent of the claims but only 26 per cent of the cost. These statistics reflect the general pattern of the severity and costs of injury–disease within the entire rural industry sector.

PROFILE OF INJURY–DISEASE

Manual handling was the leading mechanism of injury–disease in poultry farming (Figure 2). As a percentage of the industry total, manual handling claims showed a steady increase from 28 per cent in 1991–1992 to a maximum of 41 per cent in 1995–1996, before declining to 28 per cent in 1999–2000. The key agency associated with manual handling injuries–diseases was fastening, packing, and packaging equipment (38 per cent).

Most injured workers suffered from sprains and strains (53 per cent) affecting the upper limbs (37 per cent) and the upper or lower back (25 per cent).

The occupations most at risk of sustaining an injury or contracting a disease were Trades Assistants and Factory Hands (32 per cent) followed by Agricultural Labourers and Related Workers (24 per cent).

CONCLUSION

Work-related injuries and diseases are still a major concern in poultry farming in NSW, despite a notable reduction in the incidence rate and costs in the past year. The statistics revealed that the incidence rate remains higher than the average for all rural industries and for all industries combined. In addition, most of the cost is due to injuries–diseases resulting in permanent disabilities. The results of this analysis will be of interest to major stakeholders in the industry.

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Q FEVER REGISTER DEVELOPED TO ADDRESS HEALTH CONCERN IN THE MEAT INDUSTRY

ACKNOWLEDGEMENT

Adapted from *WorkCover News*, March–May 2002 and the Australian Q Fever Register Web site.

WHAT IS Q FEVER?

Q fever symptoms tend to be flu-like, and in about 20 per cent of cases a more chronic debilitating illness, characterised by extreme fatigue, develops. In a small number of cases, serious cardiac and liver complications occur.

The organism, *Coxielia burnetii*, that causes Q fever in humans, is a bacteria that can exist in a variety of domestic and wild animals without the animal displaying apparent signs of infection. Infection most commonly occurs through inhalation. Transmission to humans most typically happens in connection with fine mists, or very small droplets liberated from the blood, milk, placenta, birth fluids, urine or faeces of infected animals. Infected aerosols generally result from the slaughter of infected livestock and during the livestock birth process. Hence workers in the meat industry, farmers and veterinarians are key occupational groups at risk of Q fever.

Each year there are approximately 600 reported cases of Q fever, 200 of which result in hospitalisation and there are around three fatalities. Ninety per cent of cases occur in New South Wales and southern Queensland. It has been estimated that workers' compensation costs associated with Q fever are more than $1 million per year.

THE Q FEVER REGISTER

The Australian Q Fever Register was established to register the Q fever immune status of individuals, to prevent unnecessary testing, and to minimise the risk of exposing susceptible individuals to the organism in the workplace.

Organisations linked to the register (primarily meat processors and medical practitioners) can both submit the results of screening tests and immunisation details to the register and use the register to check an individual's immunisation status. The register data are stored on a 'live' database linked to the Internet to allow users to access up-to-date information.

The register was initiated by the Meat Processing Industry Sub Group of WorkCover's Consumer Manufacturing Industry Reference Group. Two members of the Sub Group, the Australian Meat Processor Corporation and Meat and Livestock Australia are funding the register.

The Australian Q Fever Register is the first non-statutory health register to be established in Australia. The register adheres to strict privacy guidelines to ensure the security and privacy of personal information. The database and Web site are secure, with all data being encrypted during transmission. The register was developed and is managed by AusVet Animal Health Services Pty Ltd. It is overseen by the Australian Q Fever Register Technical Management Committee, which is made up of representatives from:

- Meat and Livestock Australia;
- Australian Meat Industry Employees Union;
- WorkCover NSW;
- the Health Departments of Queensland, New South Wales, Victoria, and South Australia;
- CSL Ltd (Commonwealth Serum Laboratories);
- Australian Department of Health and Ageing;
- medical experts;
- representatives of meat processing industry employers.

The register has been fully operational since November 2001; its coverage is increasing. *WorkCover News* (March–May 2002) reported that in February there were 36 organsiations, and the immunisation status of 1122 individuals, registered. By mid-May the number of registrations had expanded to 49 organisations and 3059 individuals; only 500 of these individuals, however, were from NSW.

With a high rate of employee turnover in the meat industry, the Q Fever Register will aid the industry in minimising the delay required before new employees can safely commence duties. Employers are less likely to start new workers of unknown immunity status, if this information is already available. In the long term, this should assist in reducing the incidence of Q fever.

The Q Fever Web site can be viewed at **www.qfever.org**.

RELEASE OF *PROGRAM FOR ENHANCED POPULATION HEALTH INFOSTRUCTURE (PEPHI): A REPORT OF RESPONSES TO THE NOVEMBER 2000 DISCUSSION PAPER*

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The Centre for Epidemiology and Research, NSW Department of Health, has been funded through the National Health Development Fund to enhance access to, and reporting of, population health information for NSW. To assist in developing and refining the work to be conducted under the Program for Enhanced Population Infostructure (PEPHI), we conducted a consultation process commencing in November 2000. The *Program for Enhanced Population Health Infostructure (PEPHI): A report of responses to the November 2000 Discussion Paper* describes the initiative and the responses received through the consultation process.

In summary, responses to the discussion paper confirm that:

- there is a strong demand for population health information from both within and outside the NSW public health system;
- information that is already available needs to be more visible to potential users;
- printed publications or reports are required for those consumers who have limited computing resources;
- it would be valuable to expand the range of data collections available through the NSW Health Outcomes and Information Statistical Toolkit (HOIST), particularly those that describe social determinants of health;
- making HOIST data more accessible through providing training in its use, and by providing more user-friendly means of obtaining analyses from it, would meet other needs;
- the quality and relevance of PEPHI developments should be monitored to ensure that the Program is meeting its goals.

Copies of the *Program for Enhanced Population Health Infostructure (PEPHI): A report of responses to the November 2000 Discussion Paper* can be obtained from the Centre for Epidemiology and Research by telephone (02) 9391 9408, or from the Department's Web site at: **www.health.nsw.gov.au/public-health/pephi/index.html**.

FACT*SHEET*

S A L M O N E L L O S I S

WHAT IS SALMONELLOSIS?

Salmonellosis is caused by infection with bacteria called *Salmonella*. In Australia, most *Salmonella* infections occur after eating contaminated food or sometimes after contact with another person with the infection.

WHAT ARE THE SYMPTOMS AND HOW IS IT DIAGNOSED?

People infected with *Salmonella* commonly develop headache, fever, stomach cramps, diarrhoea, nausea, and vomiting. Symptoms often start 6–72 hours after infection. Symptoms usually last for 4–7 days, sometimes much longer. Infants, the elderly, and people with poor immune systems, are more likely to have a severe illness. To diagnose it, your general practitioner or local hospital will send a stool sample to a laboratory for *Salmonella* testing.

HOW IS IT SPREAD?

Salmonella is mainly spread to humans by eating poorly cooked food made from infected animals (that is, meat, poultry, eggs, and their by-products). Spread by 'cross-contamination' occurs when *Salmonella* contaminates ready-to-eat food: for example, when food that will not be cooked further is cut with a contaminated knife or via the hands of an infected food handler. *Salmonella* can spread from person–to-person via the hands of an infected person. It can also be spread from animals to humans.

HOW IS IT TREATED?

Most people recover with rest and fluids. Some people may require hospitalisation due to dehydration, or if the infection spreads from the intestines to the blood stream or another part of the body. Antibiotics are not usually recommended, except in complicated cases.

HOW IS SALMONELLOSIS CONTROLLED AND PREVENTED?

Cooking

Thorough cooking of food kills *Salmonella*. Avoid raw or undercooked meat, poultry, or eggs. Poultry and meat—such as hamburgers, sausages, and rolled roasts—should not be eaten if pink in the middle.

Food handling

Because *Salmonella* can be carried on the hands, it is very important to always wash hands thoroughly after using the toilet and before preparing food. Hands should be washed with soap and water for at least 20 seconds, rinsed, and dried well. Particular attention should be given to the area under the fingernails and between fingers.

Infected food handlers can shed large numbers of *Salmonella*; they should not handle or serve food until the diarrhoea has stopped and their stools test is clear of *Salmonella*.

Temperature control

Poor food storage can allow *Salmonella* to grow. Refrigerated food should be kept at less than five degrees Celsius. Hot foods should be kept hot at above 60 degrees Celsius. Reheated foods should be quickly reheated until all parts of the food are steaming hot. Thawing frozen foods should be done in a fridge or microwave. The longer you leave food at room temperature the more *Salmonella* can multiply.

Food contamination

To prevent the contamination of food:

- store raw foods (such as meat) in sealed containers in the bottom of the fridge or freezer to prevent any fluid dripping or spilling onto other ready-to-eat food. Cover all foods in the refrigerator and freezer to protect them from contamination;
- wash hands immediately after going to the toilet or handling raw foods and before handling cooked or ready-to-eat food;
- use different chopping boards, trays, utensils and plates when preparing raw foods and ready to eat food. If you have only one chopping board wash it well in hot soapy water before reuse;
- thoroughly wash all dirt off any raw vegetables and fruits before preparing and eating them;
- dry dishes with a different cloth to that used for wiping hands or bench tops; wash dish cloths regularly.

Consumers with concerns about how a food business manages its food preparation or storage can contact the nearest public health unit for advice.

NSW HEALTH Working as a Team

WHAT IS NSW HEALTH DOING ABOUT SALMONELLOSIS?

NSW Health works with other state and national organisations on strategies such as:

- surveying food types across the states. High-risk foods are surveyed for the presence of bacteria such as *Salmonella*. Findings are reported to the government and the food industry to improve food standards;
- monitoring frequency of salmonellosis and investigating cases to determine the cause of infection;
- intervening to stop the spread of salmonellosis: for example, correcting food preparation practice in kitchens; public education (for example, fact sheets); withdrawing infected foods from the market; and auditing food outlets.

For further information please contact your local public health unit, community health centre, or doctor.

May 2002

COMMUNICABLE DISEASES, NSW: MAY 2002

TRENDS

The first quarter of 2002 saw relatively few notifications of people diagnosed with **arbovirus infections**, **meningococcal disease**, and **shigellosis** in NSW (Figure 1). The epidemic of **pertussis** continued to decline throughout the state. The increase in **hepatitis A** identified in December 2001 in Sydney among men-who-have-sex-with-men did not continue, with notifications of hepatitis A subsequently declining (20 cases notifications were received in March, Table 1). On the other hand, notifications of **cryptosporidiosis** remained relatively high in the first quarter of 2002, including 57 cases that were notified in March. Most cases are from rural areas, and children under five years of age are disproportionately affected.

MEASLES CASES REPORTED

Two cases of measles were reported in April, ending a five-month measles-free period in NSW. Both cases became infected while travelling overseas. The South Eastern, South Western, and Central Sydney Public Health Units investigated both cases.

Case 1 is a 23-year-old woman who travelled to Bali in March. After returning to Australia, she developed a fever, aches and pains, and headache, followed by a cough and sore throat. A rash appeared five days later. The rash began on the face and then spread to the neck, chest, arms, and legs. Case 1 made four visits to medical clinics before the rash appeared and the diagnosis was made. Case 1 had no clear history of measles vaccination, but states she had received her usual vaccines as a baby. Serology was taken four days after the rash first appeared and tested positive for measles IgM.

Case 2 is an 11-month-old girl who travelled in Asia until late March. While travelling, she developed some intermittent diarrhoea and a runny nose. In early April she developed a fever, anorexia, and was miserable. She developed a cough and a rash began on her forehead and back of neck. The rash spread to her face, neck, trunk, and limbs and she developed conjunctivitis. Case 2 made several visits to medical facilities before the rash appeared and diagnosis was made. Case 2 had not been vaccinated against measles. Serology and nasopharyngeal aspirates were taken in early April. The serum tested positive for measles IgM and the nasopharyngeal aspirate tested positive for measles on immuno-fluorescence testing.

The cases highlight two important public health messages:

- Measles is now rare in Australia but remains common overseas. The MMR vaccine (that protects against measles, mumps and rubella) should now be considered to be part of the overseas travellers' routine pre-travel health check, especially for anyone born after 1970.
- Because it is rare, measles is not often considered as a diagnosis by health care workers. The diagnosis should be considered in patients presenting with a rash-illness that includes cough, and fever at the onset of the rash, or if there is a history of possible exposure to measles (for example, contact with a suspected case or travel to an endemic area in the 7–18 days before onset of fever). Confirmation of the diagnosis with serology

(measles IgM) is essential. Early in the illness, viral cultures can be grown from blood samples, conjunctival swabs, nasopharyngeal swabs or aspirates, and even urine, and can help in the diagnosis. Doctors and laboratories must report all suspected cases by telephone to their local public health unit.

Individuals with measles are infectious from just before the onset of the symptoms (up to five days before onset of the rash) until four days after the rash appears. In clinical settings (such as waiting rooms), patients with suspected measles must be isolated from other patients, and the area in which they waited should be kept clear of susceptible patients for at least two hours after the infectious person has left.

ENHANCED INFLUENZA SURVEILLANCE BEGINS

From late April, the NSW Department of Health has coordinated enhanced influenza surveillance. This will identify trends in influenza infections in NSW, and help characterise the strains of influenza prevalent in the community. As in 2001, surveillance brings together several data sources for weekly reporting. These sources are:

- routine laboratory notifications of confirmed influenza infections;
- enhanced laboratory surveillance from six major laboratories in Sydney and the Hunter Areas for respiratory virus testing and their results;
- sentinel surveillance around the state for influenza-like illness, in patients presenting to selected general practitioners each week;
- directed virological surveillance, where selected general practitioners take respiratory samples for viral testing from patients they suspect to have influenza.

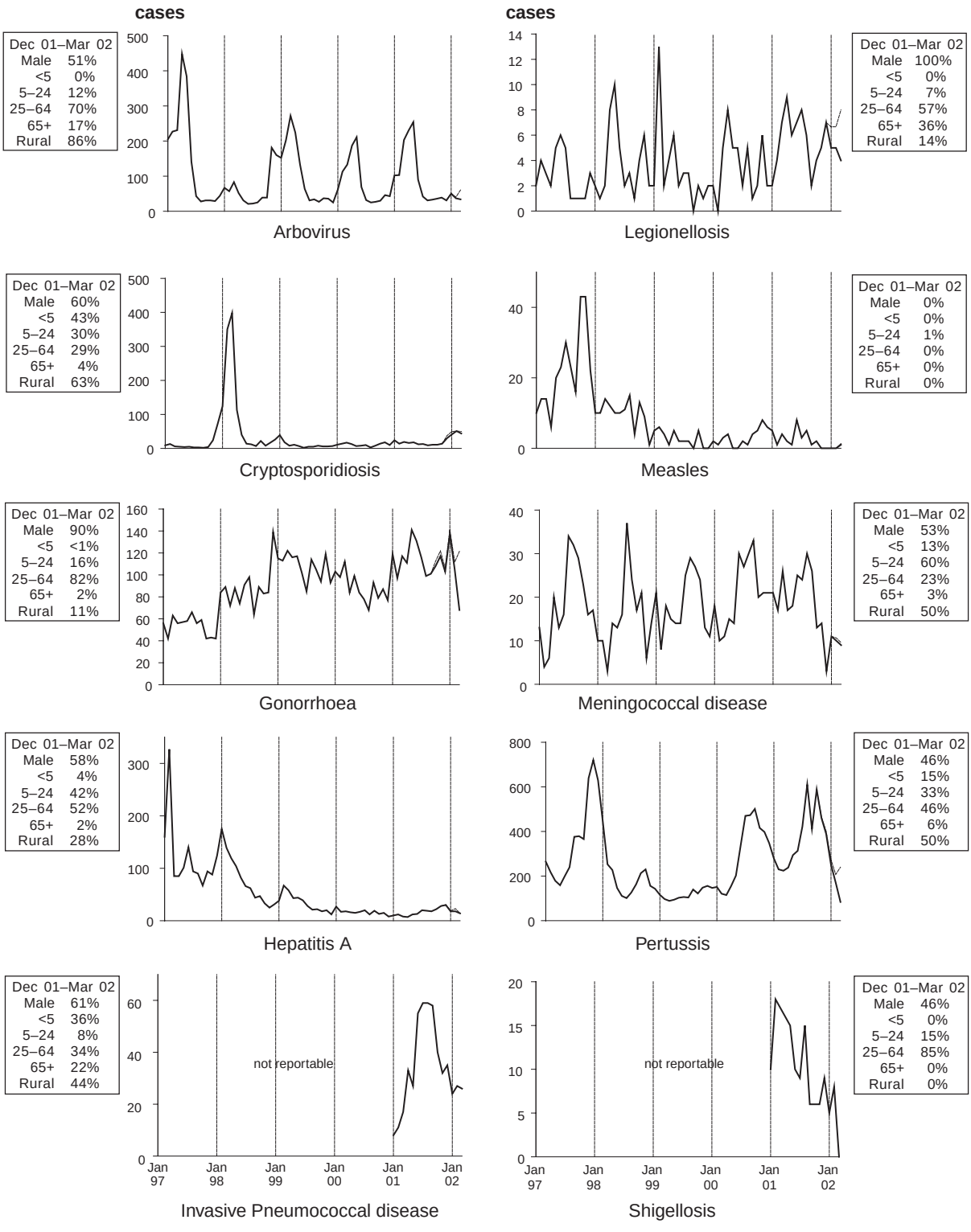
Influenza can cause a serious illness, especially in the elderly, or people with heart, lung or metabolic diseases, many of whom will require hospitalisation and some of whom may even die this winter as a result of their infection. People wishing to avoid influenza, especially those at high risk for complications, should be vaccinated each year with the influenza vaccine well before winter begins. In 2002, the influenza vaccine is designed to protect against three strains of influenza that are likely to be circulating in Australia. These are the H1N1 (A/New Caledonia/20/99), the H3N2 (A/Moscow/10/99) and the B (B/Sichuan/379/99) strains.

FIGURE 1

REPORTS OF SELECTED COMMUNICABLE DISEASES, NSW, JANUARY 1997 TO MARCH 2002, BY MONTH OF ONSET

These are preliminary data: case counts for recent months may increase because of reporting delays. Laboratory-confirmed cases, except for measles, meningococcal disease and pertussis _____ actual _ _ _ predicted after adjusting for likely reporting delays.

NSW population	
Male	50%
<5	7%
5–24	28%
25–64	52%
65+	13%
Rural*	42%



* For definition, see *NSW Public Health Bulletin*, April 2000

TABLE 1 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN MARCH 2002 BY AREA HEALTH SERVICES

Condition	Area Health Service																	Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	CHS	for Mar†	To date†
Blood-borne and sexually transmitted																				
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	34	44	28	15	-	12	25	23	82	2	17	15	4	13	3	17	7	1	346	1,147
Gonorrhoea*	12	8	7	5	-	2	-	4	41	-	-	-	2	1	1	-	-	-	83	336
Hepatitis B - acute viral*	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	17
Hepatitis B - other*	51	30	10	5	-	4	6	8	35	1	1	1	2	5	4	4	1	1	172	817
Hepatitis C - acute viral*	-	1	-	-	-	-	2	1	-	-	-	-	-	1	-	-	-	-	5	26
Hepatitis C - other*	97	47	61	24	1	37	60	27	71	1	50	9	6	28	3	14	11	7	573	1,819
Hepatitis D - unspecified*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Syphilis	3	1	6	-	-	1	-	-	14	-	2	1	-	1	-	1	-	-	30	150
Vector-borne																				
Barmah Forest virus*	-	-	-	-	-	1	13	1	-	-	17	1	-	1	-	-	1	-	35	63
Ross River virus*	-	-	-	-	-	2	1	-	-	-	1	3	-	2	2	1	2	-	14	50
Arboviral infection (Other)*	-	3	1	-	1	-	1	-	1	-	-	-	-	-	1	-	-	-	8	21
Malaria*	-	7	1	1	-	-	2	1	2	-	-	-	-	-	-	-	-	-	15	44
Zoonoses		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptospirosis*	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-	3	13
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	4
Q fever*	-	-	-	-	-	-	2	-	-	3	2	2	3	2	4	1	2	-	21	56
Respiratory and other																				
Blood lead level*	2	3	1	2	-	-	-	2	3	-	-	1	-	-	6	1	-	-	21	79
Influenza*	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3	16
Invasive pneumococcal infection	2	8	4	1	-	2	4	4	2	-	-	-	-	3	-	1	1	-	32	84
Legionella longbeachae infection*	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	6
Legionella pneumophila infection*	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	11
Legionnaires - diseases (other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meningococcal infection (invasive)	2	-	1	-	1	-	1	2	1	1	-	-	-	-	-	-	1	-	10	30
Tuberculosis	3	3	10	-	16	1	-	4	3	-	-	-	-	1	-	-	-	-	41	112
Vaccine-preventable																				
Adverse event after immunisation	-	4	2	1	1	1	-	4	5	-	-	-	-	-	-	1	-	-	19	35
H. Influenzae b infection (invasive)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Measles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mumps*	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7
Pertussis	13	22	16	9	12	8	29	5	34	12	6	3	4	4	1	1	5	-	184	826
Rubella*	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	9
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Faecal-oral																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis*	3	2	10	1	1	1	-	5	6	14	3	5	2	-	-	2	2	-	57	141
Food borne illness (not otherwise specified)	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	7	8
Gastroenteritis (in an institution)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	175
Giardiasis*	4	15	7	4	6	4	12	5	12	-	3	1	3	2	-	5	-	-	83	233
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Hepatitis A*	3	1	7	-	2	-	1	-	3	-	1	-	1	-	-	-	-	-	20	62
Hepatitis E*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Listeriosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Salmonellosis (not otherwise specified)*	13	32	31	10	28	2	25	6	37	21	15	7	1	2	-	9	4	-	243	711
Shigellosis*	-	2	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	5	19
Typhoid and paratyphoid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Verotoxin producing *E. coli**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

* lab-confirmed cases only + includes cases with unknown postcode * HIV and AIDS data are reported separately in the *NSW Public Health Bulletin* each quarter

CSA = Central Sydney Area
NSA = Northern Sydney Area
WSA = Western Sydney Area
WEN = Wentworth Area
SWS = South Western Sydney Area
CCA = Central Coast Area
HUN = Hunter Area
ILL = Illawarra Area
SES = South Eastern Sydney Area
NRA = Northern Rivers Area
MNC = North Coast Area
NEA = New England Area
MAC = Macquarie Area
MWA = Mid Western Area
FWA = Far West Area
GMA = Greater Murray Area
SA = Southern Area
CHS = Corrections Health Service

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Dr Michael Giffin is the managing editor.

The *Bulletin* aims to provide its readers with population health data and information to support effective public health action.

Submission of articles

Articles, news and comments should be 1000 words or less in length, and include a summary of key points to be made in the first paragraph.

References should be set out in the Vancouver style, described in the *New England Journal of Medicine*, 1997; 336: 309–315. Send submitted manuscripts on paper and in electronic form, either on disc (Word for Windows is preferred), or by email.

The manuscript must be accompanied by a letter signed by all authors. Full instructions for authors are available on request from the managing editor.

Editorial correspondence

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