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AN OUTBREAK OF NORWALK-LIKE VIRUS GASTROENTERITIS IN AN AGED-CARE RESIDENTIAL HOSTEL

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Norwalk-like viruses are members of the calicivirus family, first discovered in 1972 following an outbreak of gastroenteritis in Norwalk, Ohio,[1] and more recently renamed Norovirus.[2] They are a common cause of outbreaks of gastroenteritis in institutions throughout the winter months. The faecal–oral route is the primary method of transmission; however, airborne spread from vomitus and fomites (objects or places where infection survives apart from the host's body) has also been reported.[3,4] The infection typically presents with acute projectile vomiting, watery diarrhoea, and nausea. These symptoms usually resolve within 72 hours.[5] High concentrations of Norwalk-like virus (NLV) are found in infected faeces and vomitus, and as only small amounts of virus are required to cause infection, this contributes to the ease of transmission.[6]

In September 2002, the Central Sydney Public Health Unit (CSPHU) investigated an outbreak of gastroenteritis caused by NLV in an aged-care residential hostel. A possible index (or source) case was identified and over a two-week period a total of 28 residents and five staff became ill. A case-control study was conducted, which demonstrated a significant relationship between experiencing gastroenteritis and exposure to the two floors of the facility where the index case had been ill (OR=3.6; P=0.01). This article describes the investigation and the epidemiological characteristics of the outbreak, its management, and the potential role of fomites in the transmission of NLV.

BACKGROUND

The CSPHU was notified of 16 residents from an aged-care hostel who all commenced diarrhoea and vomiting within a period of 11 hours. The hostel has 66-rooms spread over four levels. A separate nursing home is located in an adjacent building. There was no recent history of a special event or excursion outside of the hostel to explain the illness; however,

continued on page 106

CONTENTS

there was a possible index case, a resident had become unwell with projectile vomiting and diarrhoea three days previously. Given the acute nature of the events, and the number of residents involved, the CSPHU conducted an investigation to: determine a potential source of the outbreak; identify a causative organism; and identify factors increasing the risk of transmission.

METHODS

The CSPHU conducted a case-control study to ascertain if there was an association between the illness and any particular food or environmental factor. Cases were defined as individuals who developed vomiting or diarrhoea and one other symptom (such as nausea, abdominal cramps, or fever) within 10 days of the index case. The control population were the remaining residents and staff of the hostel who had no symptoms. Using a questionnaire based on the daily menus, the CSPHU was able to determine the history of the illness and the food eaten by residents. Questions covered demographic information, onset and duration of illness, and symptoms, as well as food eaten over the four days preceding the outbreak. An attempt was made to interview all cases in the hostel and all other residents and staff in the control population; however, this objective was limited by the cognitive capabilities of some residents.

For all hostel residents, the location of their bedrooms was noted on a floor plan and their seating position in the dining room was recorded. A diagram of the dining room was constructed and the site where the index case had vomited, and the seating positions of other cases, was mapped.

Analysis was performed using Epi-Info version 6.04.[7] Attack (or infection) rates were calculated for menu items eaten and for those residents seated adjacent to the vomiting site. Crude odds ratios were used to estimate risk of illness for individual menu items, dining room seating position in relation to the site where the index case had vomited, and the floor plan of the residence. Statistical significance was calculated using two-tailed chi-squared tests.

Food and environment

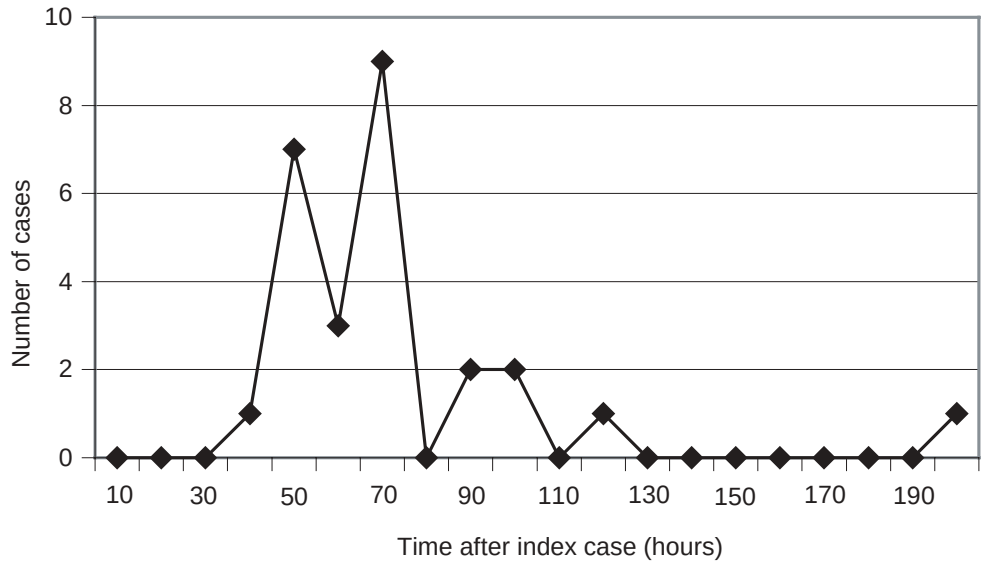
CSPHU staff visited the hostel on the day of notification and the common areas, room layout, and kitchen were inspected. The kitchen was examined for cleanliness and food handling procedures. There were no leftover food items that could be analysed. The dining room seating and bedroom of the index case were examined for their proximity to other residents. The availability of soap in common wash areas was assessed and common rooms were examined for cleanliness.

Laboratory investigations

Hostel staff were asked to submit stool specimens for all residents who were ill. These samples were examined by faecal microscopy, bacterial culture, and viral studies,

FIGURE 1

EPIDEMIC CURVE FOR AN OUTBREAK OF NORWALK-LIKE VIRUS GASTROENTERITIS IN A RESIDENTIAL HOSTEL, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, SEPTEMBER 2002



Source: Central Sydney Public Health Unit.

including testing for rotavirus and reverse transcriptase polymerase chain reaction (RT-PCR) testing for NLV.[6]

RESULTS

Identification of history relevant to transmission

The index case had had an episode of projectile vomiting in the common dining room of the hostel, located on the ground floor, during the evening meal, three days before the outbreak was notified. The next day, he had an episode of diarrhoea on the carpet of his bedroom floor, located on the second floor of the hostel. This resident is not independently mobile, nor does he socialise with other residents. Besides attending the dining room for meals, he remains in his bedroom and this pattern was followed in the period preceding and during his illness. Following the episode of diarrhoea, his bedroom was steam cleaned by contract professional cleaners who used their own equipment and were not involved in cleaning other areas of the hostel. The index case was transferred to hospital 30 hours after onset of vomiting for further management. He was discharged six days later with a diagnosis of viral gastroenteritis.

Over the following six days after the initial notification of the 16 cases, a further 12 cases among residents and five among staff were notified. Two of the cases notified among staff were food handlers. Two of the further cases notified among residents were admitted to hospital for one and five days respectively and both were diagnosed with viral gastroenteritis. The final case occurred nine days after the index case. Throughout this period, no cases were reported in the adjacent nursing home. An epidemic curve for the onset of illness is not consistent with a classic point source of infection but may represent a point source with secondary transmission (Figure 1).

Questionnaires were completed by 23 of the 28 residents who became ill and three of the five staff cases who became ill. A further 26 questionnaires were completed by the control group (23 residents and three staff). This represented a 70 per cent completion rate from the hostel residents in the control population, and a 79 per cent completion rate from notified cases. Non-completion of questionnaires in residents was due to a lack of cognitive capability and late onset of illness (one resident was reported as ill after the collection of the questionnaires). Failure to return questionnaires accounted for the non-completion by staff.

Among residents, there was no significant difference in age or sex distribution between cases and controls. The mean age of cases was 82.9 years compared with 82.5 years for controls. Twenty-four per cent of cases and 26 per cent of controls were males.

The attack rate for illness was 42 per cent. The most common symptom was diarrhoea followed by vomiting, fever, abdominal cramping and nausea (Table 1). The majority of resident cases (73 per cent) became ill within 72 hours of the index case vomiting in the dining room. The median time for the onset of illness was 64.5 hours and the mean time 69.9 hours; however, the range of time between the possible index case and illness presenting in other cases was wide—from 36 hours to 200 hours. Duration of illness had a median range of 36 hours (minimum 24 hours, maximum 72 hours).

TABLE 1

SUMMARY OF CHARACTERISTICS OF ILLNESS AMONG 26 CASES OF GASTROENTERITIS IN A RESIDENTIAL HOSTEL, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, SEPTEMBER 2002

Symptom	Number of cases	Total cases (%)
Diarrhoea	23	89
Vomiting	22	82
Abdominal cramping	16	62
Fever	16	62
Nausea	8	31

Source: Central Sydney Public Health Unit.

TABLE 2

ATTACK RATES AND ODD RATIOS FOR A SAMPLE OF MENU ITEMS IN AN OUTBREAK OF GASTROENTERITIS IN A RESIDENTIAL HOSTEL, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, SEPTEMBER 2002

Food	Attack Rate (%)	Odds Ratio	*P*-value
Salad	71	2.89	0.22
Chicken	51	1.27	0.73
Egg and bacon pie	47	0.82	0.76
Sausages	52	1.21	0.76
Pudding	52	2.14	0.23

Source: Central Sydney Public Health Unit.

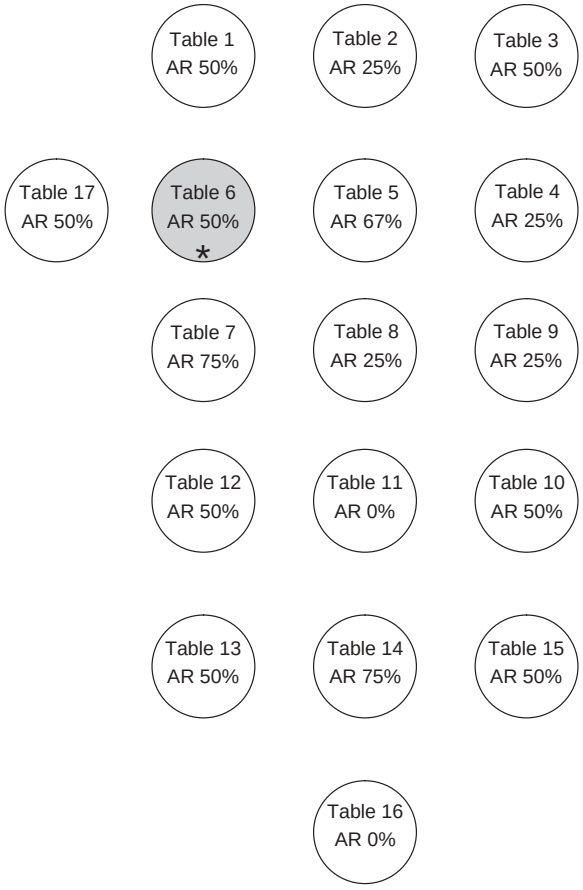
Food and environment

Attack rates and odds ratios for 46 menu items over five days were examined. No food was significantly associated with illness. Table 2 illustrates attack rates and odds ratios for a sample of menu items.

The dining room contained 17 dining tables with approximately four residents seated at each table. Mapping the seating of the residents with illness showed no obvious pattern (Figure 2). There was no significant association between illness and being seated directly adjacent to the vomiting point (OR 1.3, 95 per cent; CI 0.5–3.6). Attack rates for those residents seated on dining tables on or immediately adjacent to the vomiting point

FIGURE 2

PLAN OF DINING ROOM SEATING IN A RESIDENTIAL HOSTEL, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, SEPTEMBER 2002



* Position where index case vomited;
AR = Attack rate for table.
Source: Central Sydney Public Health Unit.

(dining tables 1,2,5,6,7,8,17) was 44 per cent, while for other dining tables it was 39 per cent.

There was no significant association found between any floor of residence and illness; however, there was a significant association found when the analysis for ground and second floor residents was combined (Table 3).

Laboratory investigations

Five stool samples were sent and analysed for enteric bacterial pathogens, rotavirus and NLV. Presence of NLV was confirmed in all five samples by RT-PCR. There was no growth on bacterial culture. One vomitus sample was sent and returned with a positive reading for NLV. Unfortunately, no stool sample was available for testing from the index case.

TABLE 3

RISK ASSOCIATED WITH FLOOR OF RESIDENCE IN AN OUTBREAK OF GASTROENTERITIS IN A RESIDENTIAL HOSTEL, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, SEPTEMBER 2002

Floor	Odds Ratio	*P*-Value	95% CI
0 (dining room)	2.3	0.15	0.6–8.3
1	0.4	0.14	0.1–1.7
2	2.6	0.09	0.8–9.1
3	0.3	0.07	0.1–1.3
Combined 0 + 2	3.6	0.01	1.2–11.1

Source: Central Sydney Public Health Unit.

DISCUSSION

Outbreaks of NLV gastroenteritis in residential aged-care institutions are commonly reported.[8,9,10] Prompt infection control measures, along with epidemiological investigation, can prevent further transmission of the virus. On notification of this outbreak, staff at the CSPHU immediately advised of measures to reduce the potential for transmission. The hostel staff were advised to minimise contact between residents, particularly those who were unwell. The need for careful hand-washing by staff was reinforced and all sick employees were excluded from work for 48 hours after the resolution of their symptoms of gastroenteritis. During the outbreak, the movement of staff between the hostel and the adjacent nursing home was minimised. Fostering a working partnership between the management of the hostel and the public health unit, assisted in the strict implementation of these recommendations.

Given the initial reporting of this outbreak, suspicion of food-borne illness was high, however the identification of an index case with vomiting in the common dining room 36 hours before other cases alerted the CSPHU to the possibility that this individual was a potential point source. Odds ratios assessing risk of food and illness showed no significant association. Similarly, no association was found between seating proximity to the vomiting point of the index case in the dining room with illness. Therefore, alternate routes of transmission were considered. Presumably, residents residing on the ground floor, where the dining room is located, and the second floor, where the index case resides, would have more potential for contact with the index case. In addition, the carpets on these two floors had been soiled. The increased risk of illness among residents found on both these floors supports the likelihood of transmission related to direct contact with the index case and fomites.

The incubation period for NLV gastroenteritis is in the vicinity of 24–48 hours.[5,11] The bimodal distribution of the epidemic curve with an early initial peak occurring at 50 hours, and a second peak at 70 hours, may represent direct transmission of NLV from the index case and then subsequent secondary transmission. While well recognised routes such as faecal–oral and airborne spread are likely to be the route of direct and secondary transmission in this outbreak,[5] high proportions of NLV have been found in areas directly and indirectly exposed to vomitus such as carpets and furniture.[3] This hostel is extensively carpeted, including the dining room and the residents' bedrooms. Although the bedroom of the index case was professionally steam cleaned after his episode of diarrhoea on the carpet, there are no clear recommendations on the efficacy of carpet cleaning methods, and NLV has been shown to be resistant to chlorination (10ppm chlorine) and stable in the environment up to 60^0C.[12] There are suggestions that steam cleaners may fail to achieve these temperatures within carpets;[13] and, in this case, there exists a possibility that organisms remained viable in the immediate environment following cleaning.

Environmental swabs for NLV in this situation may have contributed to more conclusive evidence to support this hypothesis; however, timeliness, cost, and issues such as 'infective dose' of the virus are factors that need to be considered before obtaining environmental swabs. In this case, the prevention of the spread of NLV gastroenteritis to the adjacent nursing home supports the value of early strict infection control practices in containing an outbreak.

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FIREWORK INJURIES IN NEW SOUTH WALES, 1992–93 TO 2001–02

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Fireworks have a long tradition of use in Australia, in association with festivities such as New Year's Eve celebrations, Australia Day, and sporting events. However, recognition of the risk of injury posed by fireworks has led to increasing regulation of their sale and use. In order to identify the size and nature of fireworks-related injuries and the characteristics of people who incur these injuries in NSW, this article presents an analysis of firework injuries over the 10-year period 1992–93 to 2001–02. Statewide emergency department data for NSW do not include information on external causes of injury. Accordingly, this analysis was restricted to data describing hospital separations and deaths.

BACKGROUND

In NSW, current restrictions to the use of fireworks are made under the *Dangerous Goods (General) Regulation 1999*. Toy fireworks (such as sparklers, party poppers, Christmas crackers, and gun caps) are freely available, but display fireworks may only be bought or used by holders of a One Day Display Fireworks Permit or General Permit to Use Display Fireworks (pyrotechnics licence). Permit holders must: be 18 years of age or over; demonstrate a good or sufficient reason for the display; and have adequate training and experience in the use of fireworks. In 2002, the Regulation was amended to allow WorkCover inspectors and police officers to issue a penalty notice for using or receiving display fireworks without a permit, with penalties set at up to $550.[1]

METHODS

Hospital separations due to firework injuries were identified using the NSW Inpatients Statistics Collection (ISC) for the financial years 1992–93 to 2001–02, using the ICD-9-CM external cause code E923.0 (Accident caused by explosive material—Fireworks) for the years up to 1997–98, and the WHO ICD-10-AM external cause code W39 (Discharge of firework) for the later years. Records relating to acute hospital transfer or statistical discharge (change in service category) and records with non-injury principal diagnoses were excluded. To allow aggregation of diagnosis data over the entire 10-year period, principal diagnosis codes for the years up to 1997–98, which were recorded using ICD-9-CM, were mapped to ICD-10-AM codes. Rates were age-standardised using the Australian population at 30 June 1991.

Deaths due to firework injuries were sought using Australian Bureau of Statistics mortality data for the calendar years 1990 to 2000, using the ICD-9 external cause code E923.0 (Accident caused by explosive material—Fireworks) for the years up to 1998 and the

TABLE 1

HOSPITAL SEPARATIONS FOR FIREWORK INJURIES BY YEAR, NSW, 1992–93 TO 2001–02

Financial year	Hospital separations		
	Number	Crude rate per 100,000 person years	Age-standardised rate per 100,000 person years
1992–93	5	0.08	0.08
1993–94	2	0.03	0.04
1994–95	6	0.10	0.10
1995–96	7	0.11	0.12
1996–97	10	0.16	0.17
1997–98	10	0.16	0.17
1998–99	18	0.28	0.29
1999–00	18	0.28	0.30
2000–01	17	0.26	0.28
2001–02	21	0.32	0.33
Total	**114**	**0.18**	**0.19**

Note: Records were identified using the ICD-9-CM external cause code E923.0 for the years up to 1997–98 and the ICD-10-AM external cause code W39 for the later years. Records relating to acute hospital transfer or statistical discharge and records with non-injury principal diagnoses were excluded. Data for the 2001–02 financial year do not include all private hospital or interstate records. Rates were age-standardised using the Australian population as at 30 June 1991.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

WHO ICD-10 external cause code W39 (Discharge of firework) for the later years.

RESULTS

A total of 114 hospital separations for firework injuries were identified for the 10-year period, giving a crude separation rate of 0.18 per 100,000 population per year and age-standardised separation rate of 0.19 per 100,000 population per year. The number and rate of separations per year is shown in Table 1, and a breakdown by age and sex is given in Table 2.

The number and rate of hospital separations for firework injuries increased over the 10-year period, with 21 separations recorded in 2001–02 (corresponding to an age-standardised rate of 0.33 per 100,000 population), compared with only five in 1992–93 (0.08 per 100,000). Most of those hospitalised (84.2 per cent) were males. More than one-quarter (27.2 per cent) were children aged less than 15 years, and almost two-thirds (64 per cent) were people aged less than 30 years. The majority of people hospitalised for firework injuries (86.8 per cent) were Australian-born.

People hospitalised for firework injuries included residents from every NSW area health service. Age-standardised separation rates per 100,000 population per year were similar in urban (0.18) and rural (0.21) health areas.

Hospital admissions for firework injuries occurred in every month of the year, although December and January combined accounted for around 30 per cent of all admissions. Close to half of admissions (45.6 per cent) occurred on Saturdays or Sundays. Small clusters of admissions for firework injuries occurred around New Year's Eve in 1998–1999 (three separations), 1999–2000 (three separations) and 2000–2001 (six separations).

TABLE 2

HOSPITAL SEPARATIONS FOR FIREWORK INJURIES BY AGE GROUP AND GENDER, NSW, 1992–93 TO 2001–02

Age (years)	Males		Females		Total	
	n	(%)	*n*	(%)	*n*	(%)
0–4	2	(1.8)	1	(0.9)	3	(2.6)
5–9	8	(7)	3	(2.6)	11	(9.7)
10–14	17	(14.9)	0	(0)	17	(14.9)
15–19	17	(14.9)	1	(0.9)	18	(15.8)
20–24	13	(11.4)	1	(0.9)	14	(12.3)
25–29	9	(7.9)	1	(0.9)	10	(8.8)
30–34	11	(9.7)	1	(0.9)	12	(10.5)
35–39	6	(5.3)	1	(0.9)	7	(6.1)
40+	13	(11.4)	9	(7.9)	22	(19.3)
Total	**96**	**(84.2)**	**18**	**(15.8)**	**114**	**(100)**

Note: Records were identified using the ICD-9-CM external cause code E923.0 for the years up to 1997–98 and the ICD-10-AM external cause code W39 for the later years. Records relating to acute hospital transfer or statistical discharge and records with non-injury principal diagnoses were excluded. Data for the 2001–02 financial year do not include all private hospital or interstate records.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

TABLE 3

HOSPITAL SEPARATIONS FOR FIREWORK INJURIES BY BODY SITE AND TYPE OF INJURY, NSW, 1992–93 TO 2001–02

Body site	Injury type							
	Burn injury		Traumatic amputation		Other injury type		Total	
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Head (not eye)	6	(5.3)	0	(0)	13	(11.4)	19	(16.7)
Eye	2	(1.8)	0	(0)	10	(8.8)	12	(10.5)
Neck and trunk	2	(1.8)	0	(0)	6	(5.3)	8	(7)
Upper extremity (not hand)	2	(1.8)	2	(1.8)	6	(5.3)	10	(8.8)
Hand	17	(14.9)	18	(15.8)	22	(19.3)	57	(50)
Lower extremity	2	(1.8)	0	(0)	5	(4.4)	7	(6.1)
Multiple sites	1	(0.9)	0	(0)	0	(0)	1	(0.9)
Total	**32**	**(28.1)**	**20**	**(17.5)**	**62**	**(54.4)**	**114**	**(100)**

Note: Records were identified using the ICD-9-CM external cause code E923.0 for the years up to 1997–98 and the ICD-10-AM external cause code W39 for the later years. Records relating to acute hospital transfer or statistical discharge and records with non-injury principal diagnoses were excluded. Data for the 2001–02 financial year do not include all private hospital or interstate records.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

The bodily locations of injuries and type of injury are shown in Table 3. The most common site of injuries was the upper extremity (58.8 per cent) and most of these (50 per cent of all injuries) were to the hand. The head was the site of more than one-quarter (27.2 per cent) of injuries, with close to half of these (10.5 per cent of all injuries) being eye injuries. The eye injuries included two instances each of: ocular lacerations and rupture with prolapse or loss of intraocular tissue; and penetrating wounds of the eyeball.

Just over one-quarter of separations (32; 28.1 per cent) were for burn injuries, including six full-thickness burns and 19 partial thickness burns with blistering and epidermal loss.

Almost one in five separations (20; 17.5 per cent) were for traumatic amputation of part of the upper extremity. These included four complete or partial amputations of thumbs, 14 complete or partial amputations of other single fingers, one traumatic amputation at a level between the elbow and wrist and one amputation of the upper limb at an unspecified level. Other injuries included a variety of open wounds; fractures of nasal bones, mandible, ribs and bones of the arm, wrist and hand; traumatic pneumothorax; and traumatic haemothorax.

For separations recorded in the period 1999–00 to 2001–02, the ICD-10-AM external cause code could include digits to specify the place of occurrence of the injury and the activity in which the victim was engaged at the time of injury. However, of these 56 separations, only nine (16.1 per cent) specified a place of occurrence, and only 20 (35.7 per cent) specified an activity, with half of the latter specifying the activity as 'other'.

No deaths due to firework injury were recorded in the Australian Bureau of Statistics mortality data for the calendar years 1990 to 2000.

DISCUSSION

This analysis shows that firework injury is relatively uncommon in NSW, and that no deaths from this cause have been recorded in the most recent 10 years. However, important features of firework injuries include the high proportion of serious and disabling injuries, and the higher risk of injury among children and young people, especially males.

Unfortunately, few recent data for firework injuries from other Australian states are available for comparison. A Victorian study of hospital data for the period 1987–88 to 1995–96 found only 16 separations for firework injury over the 10-year period (giving a rate of approximately 0.04 per 100,000 population).[2] However, a more recent Victorian study reported 20 admissions for these injuries, and 122 emergency department presentations, to 28 major hospitals over the five-year period October 1995 to December 2000.[3]

The rate of hospital separations for firework injuries in NSW increased fourfold over the 10-year period examined, from an age-standardised rate of 0.08 per 100,000 population in 1992–93 to 0.33 per 100,000 in 2001–02. This increase may well reflect improvements in recording of these injuries in hospital data—the introduction of ICD-10-AM in 1998–99 coincided with a big jump in separations—rather than increasing incidence. Nonetheless, it indicates that there is still substantial scope for preventing these injuries, despite the introduction of more stringent regulation in NSW in 1999 and 2002.

The scope for prevention extends also to less serious firework injuries, which were not identified in this analysis. Only about one in five presentations to emergency departments for firework injuries results in admission to hospital.[3] Therefore, the number of presentations to emergency departments in NSW for these injuries is likely to be in the order of 100 per year, with a further (unknown) number of injuries treated in general practice.

The data used here contained no information about the type of fireworks that caused injury. The recent Victorian study of firework injuries concluded that around one-third were associated with legal fireworks (sparklers, party poppers, and public firework displays), while the remaining two-thirds were associated with fireworks that are not on general sale in that state.[3] The variation among Australian states and territories in regulations restricting sale and use of fireworks acts to limit the effectiveness of regulation. Indeed, serious hand injuries have been reported in association with the explosion of hand-held crackers that were purchased in the ACT and brought into NSW for use.[4]

Disappointingly, the data used here also contained only very limited information on the place that injuries occurred, and the activity that victims were engaged in at the time of injury. Although the ICD-10-AM coding system theoretically enables capture of this information in the external cause code for injuries, it is only rarely recorded. This presumably relates to lack of detail in the clinical record from which the external cause is coded.

Important strategies for reduction of firework injuries include national harmonisation of regulations regarding sale and use of fireworks, active enforcement of these regulations, and increasing community awareness of the degree of risk associated with illegal fireworks.[3,4] Improved recording of firework injuries in hospital data, including information regarding the type of firework involved, and the circumstances of the injury, could provide a stronger information base on which to build and monitor prevention strategies in NSW.

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AN INNOVATIVE SEXUAL HEALTH MEDICATION ORDER SYSTEM FOR THE FAR WEST AREA HEALTH SERVICE

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This article describes the development of sexual health services in the Far West Area Health Service, and the contribution of a medication order system that has been established between the Sydney Sexual Health Centre (SSHC) and the Far West Area Sexual Health Service (FWASHS).

The management of sexually transmissible infections (STIs) in rural and remote areas is difficult because of issues of access to health care and treatment,[1,2,3] confidentiality,[4,5] community attitudes,[6,7] and the transient nature of some sectors of the population. Many models of care—such as syndromic management (treatment based on patterns of symptoms and signs rather than on specific aetiologic diagnoses)—have met with limited success due to inaccurate diagnosis and treatment and poor patient follow-up.[8,9] The prevalence of STIs in rural and remote populations of Australia is not completely understood; however, evidence exists demonstrating higher rates of STIs among the indigenous population.[2,10,11]

The Far West Area Health Service (FWAHS) provides health care in rural and remote NSW across an area equivalent to one-third of the landmass of NSW, and has a population of 47,563.[12] Thirty-three per cent of these residents are aged 15–40 years, and 13 per cent identify as indigenous Australians. The FWAHS has the largest percentage indigenous population, compared with the other area health services in NSW, which reflects its remoteness.

SEXUAL HEALTH SERVICES IN FAR WESTERN NSW

Pre-1998

Prior to the creation of two area health services for western NSW in 1998, the Far West Area Health Service and the Macquarie Area Health Service, sexual health services to far western and north western NSW were provided by a centralised model based in Dubbo. Outreach services to several sites, including Broken Hill, were provided by medical and nursing staff. Visits varied in frequency from monthly to three-monthly, resulting in a restricted service. Between visits, communication between local primary care providers and the service was limited. In addition, there was also a full-time Aboriginal sexual health worker based at Walgett, and an Aboriginal health worker based at Dubbo who had a part-time role in sexual health. Both these workers were employed by the community-controlled health services.

A new sexual health service for the Far West Area Health Service

Since 1999, four sexual health nurse specialists (SHNs) located at four sites in the FWAHS (Broken Hill, Bourke, Lightning Ridge, and Dareton) have provided the new foundations of a regionalised sexual health service. This service is supported by medical staff from the Sydney Sexual Health Centre (SSHC), a large urban sexual health centre. Specialist medical officers visit each site on a monthly basis and provide telephone support to the nurses between visits. The SHNs work in collaboration with four Aboriginal sexual health workers, who are employed by the community-controlled health services at the same sites.[13] The SHNs link closely with the general practitioners in the towns, in managing sexual health clients. Some of the SHNs fulfil roles other than sexual health care, assisting with other primary health care roles and covering staff absences.

It was anticipated that the four SHNs would make most of the diagnoses of STIs in the FWAHS through their STI screening activities; however, as nurses in NSW cannot prescribe medication, immediate treatment of STIs was hindered by the infrequent visits of the medical staff.

Therefore, a system was implemented whereby an SHN was able to supply and administer medication to patients. This system uses two types of medication orders: standing medication orders, and faxed medication orders.

Standing medication orders

Standing orders are pre-authorised medications for specific sexual health conditions. Using a standing medication order, the SHN can administer medication when the diagnosis is made, according to set protocols, without first having to speak to a doctor. The seven conditions managed using the standing orders have been authorised by sexual health physicians from the SSHC and approved by the Far West Area Drug and Therapeutics Committee.

Faxed medication orders

Where the required treatment falls outside current predetermined standing orders, or the patient's condition is complicated, the SHN telephones the SSHC to speak to a medical officer for management and treatment advice. If medication is indicated, a faxed order is used.

During 2001, a quality audit was undertaken of the medication order system. The aim was to 'map' both the medication order system and the conditions managed using this sytem. The contribution of the newly-expanded sexual health service to the identification and management of treatable STIs in the Far West of NSW, was also described.

METHOD

To map the medication order system, the staff responsible for its development were interviewed and the protocols for using existing standing orders were reviewed. All standing and faxed medication orders received throughout 2000 at the SSHC were manually reviewed, and a profile was created of the conditions that were managed.

The number of treatable and notifiable STIs (that is, chlamydia, gonorrhoea, and syphilis) diagnosed by the staff of the FWASHS was then compared to the total number of cases of each infection diagnosed within the FWAHS during 2000. This information was obtained from the NSW Notifiable Disease Database (NDD) via the Health Outcomes Information and Statistical Toolkit (HOIST). Similar information was obtained from the NDD for the years 1996–1999.

Study population

All patients presenting to the FWASHS requiring treatment for sexual health conditions were included in the study. Patients presenting to the FWASHS are identified by using a code for their name. Information such as country of birth and Aboriginality were not recorded on medication forms and were not collected for this study. Patient medical records were not viewed.

Data were manually extracted from individual medication order forms received at the SSHC and entered into a database. Percentage calculations were used to compare the treatable conditions managed by the FWASHS and the whole of the FWAHS.

Ethical considerations

The study was approved by the FWAHS Health Research Ethics Committee. Individuals and communities were not identified in this study. The identity of any individual was unknown to the investigators.

RESULTS

Mapping the medication order system

Standing orders

The standing order is faxed by the SHN to the SSHC to be signed by a sexual health physician within 24 hours of dispensing the medication, in accordance with the *NSW Poisons and Therapeutic Goods Act (1966)*. The information provided on the faxed treatment request should include date, relevant medical history, allergy status, patient identification, and requested medication and its indication. Table 1 shows the standing orders available in 2000.

TABLE 1

INDICATIONS FOR AND MEDICATIONS AVAILABLE THROUGH STANDING ORDERS, FAR WEST AREA SEXUAL HEALTH SERVICE, NSW, 2000

Indication	Medication
Genital warts	Podophyllin
Trichomoniasis	Tinidazole
Chlamydia (urethral–endocervical–rectal)	Azithromycin
Gonorrhoea (urethral–endocervical–rectal–pharynx)	Ciprofloxacin
Hepatitis B vaccine schedule	Ecombinant hepaitis B vaccine
Hepatitis A vaccine schedule	Hepatis A vaccine (HM 175 strain)
Emergency (post coital) contraception	Levonorgestrel + ethinyloestradiol +/- metaclopramide

TABLE 2

NUMBER OF REQUESTS FOR STANDING ORDERS FOR THE SEVEN PRE-AUTHORISED CONDITIONS, FAR WEST AREA SEXUAL HEALTH SERVICE, NSW, 2000

Condition managed or treatment prescribed	*n*	%
Chlamydia	33	(35)
Gonorrhoea	7	(8)
Trichomoniasis	7	(8)
Genital warts	3	(3)
Hepatitis B vaccination	29	(31)
Hepatitis A vaccination	2	(2)
Emergency contraception	12	(13)
Total	**93**	**(100)**

TABLE 3

CONDITIONS MANAGED THROUGH THE USE OF FAXED ORDERS, FAR WEST AREA SEXUAL HEALTH SERVICE, NSW, 2000

Condition managed or treatment prescribed	*n*	%
Syphilis (any stage)	16	(25)
Injectable progesterone contraception	21	(33)
Urinary tract infection	8	(13)
Chlamydia contact	6	(9)
Pelvic Inflammatory Disease	5	(8)
Bacterial vaginosis	3	(5)
Trichomonas contact	1	(2)
Other: vaginal candidiasis (1) oral contraceptive pill (1) genital herpes (1)	3	(5)
Total	**63**	**(100)**

Faxed orders

The SHN faxes a medication order form to the consulting doctor containing relevant information discussed during the telephone consultation. The doctor then orders the medication and faxes the order form back to the SHN for administration. The medication that can be ordered and administered is restricted by the *NSW Poisons and Therapeutic Goods Act (1966)*, which stipulates that the medication be a single treatment dose. Only doctors and pharmacists are able to dispense ongoing courses of medication.

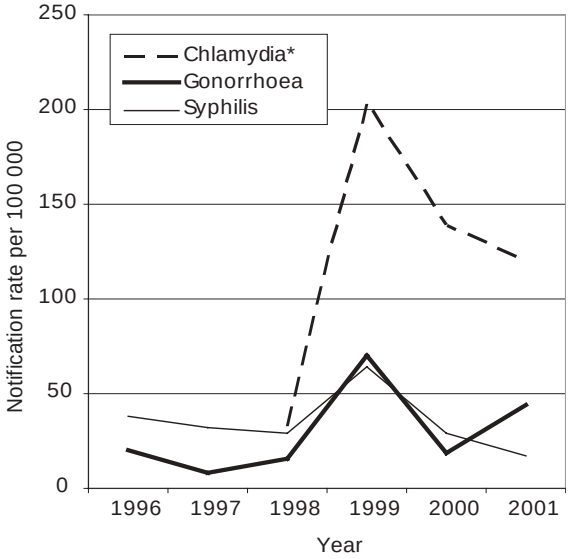
Conditions managed

Standing orders

Ninety-three standing order requests were received from FWASHS during 2000. Of the seven pre-authorised conditions, treatment was requested most commonly for chlamydia (35 per cent) and hepatitis B vaccination (31 per cent), and least often for hepatitis A vaccination (two per cent) (Table 2).

FIGURE 1

NOTIFICATION RATE PER 100,000 POPULATION FOR SELECTED SEXUALLY TRANSMISSIBLE INFECTIONS, FAR WEST AREA HEALTH SERVICE, NSW, 1996–2001



* Genital chlamydia became notifiable by laboratories in October 1998.

Source: Communicable Diseases Branch, Notifiable Diseases Database (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

Faxed orders

There were 63 faxed orders received from the FWASHS during 2000. Faxed orders were most commonly completed for injectable progesterone contraception (33 per cent) followed by treatment for syphilis (25 per cent). Other conditions treated by faxed order were bacterial vaginosis, urinary tract infections, pelvic inflammatory disease, and STI contacts (Table 3).

Trends in STI treatment in far western NSW

During the study period, the Far West Public Health Unit (FWPHU) received 66 notifications for genital chlamydia, five for gonorrhoea, and 24 for syphilis.[14] Of these notifications, the FWASHS provided diagnosis and treatment for 60 per cent of the cases of chlamydia, 40 per cent of cases of gonorrhoea, and 58 per cent of syphilis. Overall, 56 per cent of all treatable STIs notified to the FWPHU ($n = 55$) were diagnosed and treated by the FWASHS using the medication order system. Figure 1

shows the change in notification rate for selected STIs before and after the development of the current sexual health services.[14]

DISCUSSON

People with sexual health problems in isolated and small communities are likely to be fearful of recognition and breaches of confidentiality and therefore may be reticent to seek care. The medication order system overcomes some of these barriers to care, by offering a discreet and confidential service. Patients are able to access specialist sexual health care via the sexual health nurse in areas where there are limited or no medical services available. As the title 'sexual health nurse' may deter patients from accessing the service, some nurses have several roles and titles: for example, women's health nurse or primary health care nurse. An expanded role for remote area nurses is not uncommon because of staff shortages. Also, medication does not need to be purchased at the local pharmacy; it is provided free of cost by the sexual health service.

Faxed orders were used less frequently than standing orders, reflecting that common conditions are treated using the pre-authorised standing orders. The number of faxed orders used also may be influenced by the experience of the sexual health nurse and other local medical practitioners. To improve both the efficiency of the system and access to patient care, some of the frequently requested faxed orders have become standing medication orders: for example, repeat doses of injectable progesterone contraception, treatments for bacterial vaginosis, and contacts of gonorrhoea and chlamydia.

The development of the service has more than doubled the notification rate of bacterial STIs in the FWAHS with more than 50 per cent of cases managed using the medication order system. This demonstrates a significant public health benefit to the people of Far Western NSW.

The medication order system is easy for the sexual health nurses to access in remote areas and provides immediate medical support for isolated practitioners. Both the remote staff and their patients benefit from the arrangement. The monthly visits by medical officers allow for regular supervision of patient records, staff education, and direct consultation for patients with complicated conditions. The visits also allow medical officers to gain valuable experience working in remote areas.

CONCLUSION

Most common sexual health treatments provided by the FWASHS can be accessed using the medication order system. This medication system, with the assistance of medical support, provides a prompt, efficient, confidential service with a large public health benefit. This model of management of STIs in this rural and remote location may serve as an example of effective resource use in this setting.

CONTRIBUTORS

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A CONSUMER-INITIATED SURVEY OF WOMEN'S EXPERIENCES OF BREAST CANCER SERVICES IN NSW

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Advocates of consumers of breast cancer care are increasingly seeking to influence the cancer research agenda, by urging the investigation of those aspects of cancer prevention and treatment that are of most interest to them. Consumer advocates can either influence existing scientific and behavioural research, or they can instigate consumer-driven research themselves. This article describes an example of the latter—a survey of women's experiences of breast cancer services in NSW, initiated and conducted by the cancer advocacy group, Breast Cancer Action Group NSW. While the response to the survey was low (20 per cent), the article presents an analysis of the qualitative questions, which provides insight into both the perceived gaps and deficiencies in services and the areas of satisfaction with services.

BREAST CANCER SERVICES DEVELOPMENT GROUP

Reorganising breast cancer services, to overcome fragmentation and reduce unacceptable variations in treatment and outcomes, has been recognised nationally as a key priority in cancer control.[1] In March 2000, The Cancer Council NSW established a Breast Cancer Services Development Group with the goal of improving breast cancer services in NSW and encouraging the adoption of multidisciplinary care based on 'best practice'. Membership of the group comprises representatives from The Cancer Council NSW, the NSW Breast Cancer Institute at Westmead, and the Breast Cancer Action Group NSW (BCAG).

As a first step, the Breast Cancer Services Development Group agreed to obtain baseline information about breast cancer services in NSW, by compiling material from a variety of sources and perspectives, including cancer registry data. It proposed to map the breast cancer services provided across the 17 area health services. The BCAG undertook a survey of its members in May 2001, regarding their experiences of the treatment of breast cancer. The main objective of this survey was to provide a consumer perspective on gaps in breast cancer care, and to prioritise issues relating to improving breast cancer services.

METHODS

The BCAG developed a short eight-item postal questionnaire, in collaboration with The Cancer Council NSW and the Cancer Education and Research Program (CERP) at the University of Newcastle. The questionnaire included: closed questions concerning each respondent's care—the number and type of clinicians and hospitals involved, and the organisation and coordination of care; and open-ended questions regarding the respondent's personal experience of her treatment, both positive and negative. A convenience sample was taken, as the questionnaire was mailed to the entire BCAG membership in May 2001. In total, 400 questionnaires were sent and participants were asked to respond within three weeks.

Responses to the closed questions were analysed using simple summary statistics. The qualitative, open-ended responses were analysed using a pragmatic, grounded-theory approach; written responses were read a number of times to identify emerging themes. Responses focusing on similar aspects of service delivery were grouped together into categories in order to identify common issues.

RESULTS

Seventy-nine completed questionnaires were received, giving a response rate of 20 per cent. This response rate is low for a survey of this type and, as such, the quantitative data obtained are of limited value. However, respondents' answers to the open-ended questions appeared thoughtful and detailed and provided a rich source of qualitative information about the women's experiences.

The average age of respondents was 54.3 years (median 54 years), with a range of 32 to 86 years. More than 80 per cent lived in an area of NSW covered by a metropolitan area health service; and over 88 per cent of women received the majority of their care at hospitals located in a metropolitan area health service. Only six women stated that they received the majority of their breast cancer care at a hospital located in a rural area health service.

Coordination of care

Nearly two-thirds of women (60 per cent) attended more than one hospital for their breast cancer treatment, with 39 respondents mentioning one other hospital besides their main treatment provider, and a further nine women mentioning two additional hospitals involved in their care. Less than half of all respondents (46.8 per cent) perceived their care to be coordinated by a multi-disciplinary team. A further five respondents gave a qualified positive response, indicating that elements of the care pathway had been coordinated, or that efforts towards coordination had been partially successful.

Positive aspects of breast cancer care

Respondents were asked to highlight three or four elements that went well during their treatment and care for breast cancer. Common aspects of care that were perceived positively by respondents were:

- supportive and caring attitudes of staff throughout various stages of the care pathway;
- role played by support groups, counsellors, friends, and family in meeting the emotional, psychological, and practical needs of women;
- quality and organisation of the clinical care received—many women indicated their general satisfaction with their clinical treatment as a whole, while others highlighted particular elements of care that went well, in particular surgery, radiotherapy, chemotherapy, reconstructive surgery, or follow-up;
- accessibility and availability of certain services, such as community nursing post-discharge and breast reconstruction;
- control or absence of pain, discomfort, or other physical symptoms and side-effects.

Negative aspects of breast cancer care

Women were also invited to describe three or four areas of their care in which they experienced problems. A small number reported no major problems; however, most women cited at least two or three areas of concern. Some of the key negative experiences described by respondents were:

- poor communication and information provision;
- inappropriate, unsupportive, or uncaring attitudes of health professionals;
- problems with the quality of the clinical care received, including misdiagnosis or delayed diagnosis, poor management of radiotherapy burns, poor infection control, and poor management of other clinical symptoms and conditions, such as depression and lymphoedema;
- problems relating to the organisation and delivery of treatment, including: delays throughout the treatment pathway; limited ongoing follow-up and after care, particularly in primary care; long clinic waiting times; travelling long distances for treatment; follow up and support groups; inconvenient appointment times; and seeing different doctors each time;
- physical and psychological effects of diagnosis and treatment, such as pain, discomfort, swelling, wound infection, scarring, depression and anxiety;
- limited attention paid to women's emotional and psychological needs;
- lack of a coordinating or central focus to treatment; no single point of contact for information, advice, and access to different components of care;
- inadequate, inconsistent coordination and communication between secondary–tertiary cancer services and local health services, including primary care.

Areas for improvement

Women wanted to see improvements in those areas of treatment and care in which they perceived problems, or reported negative experiences. Some of the key areas for improvement highlighted by respondents were:

- patient communication and information, including the accessibility, timeliness and reliability of information;
- coordination of care and a multidisciplinary team approach, including access to a designated person to coordinate the breast cancer journey and to provide advice and support;
- services and support mechanisms to better meet women's psychological, social, and information needs;
- the attitude of health professionals, and communication between clinicians and patients;
- the availability and accessibility of local services, particularly for women living in rural areas.

DISCUSSION

The principal value of this survey is in providing qualitative insights into both the positive and the negative aspects of women's experience of breast cancer treatment and care in NSW, and reporting those areas of care in which women would like to see improvement.

As the majority of the respondents to the survey were from metropolitan areas of NSW, the issues and priorities reported here potentially underplay issues of importance to rural women.

The ways in which they are treated and the care and support they receive from breast care services influences women's overall experience of breast cancer. This survey indicates that the presence or absence of a number of key features strongly determines women's negative or positive experiences of the treatment pathway. These features include a multidisciplinary, coordinated approach to care; provision of information and patient–clinician communication; and the availability and accessibility of services, in distance and time, including supportive care services. These fundamental elements of care are widely recognised, and have been incorporated into models and guidelines for best practice in Australia and internationally.[2, 3, 4] The consumer experiences reported here serve to highlight that some women experience a gap between these recommended models of care and on-the-ground service delivery.

The key challenge facing the health system is how to achieve a statewide system of care that is responsive to, and meets the needs of, all women with breast cancer and

also of their families and carers. By undertaking this survey, and disseminating its findings widely, the BCAG hopes that consumers' views will inform service development and quality improvement strategies in breast cancer services across NSW.

CONCLUSION

This survey also demonstrates that consumer-initiated and designed research can make a contribution to the treatment experiences of people living with cancer. It also provides consumer groups, such as the BCAG, with an evidence-based platform for their advocacy and lobbying activities.

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RELEASE OF THE 2002 AREA HEALTH SERVICE REPORTS

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The *2002 Area Health Service Reports* (AHSRs) are the first of a series of annual reports produced to assist the area health services monitor the health status of their population, and to support policy development and service planning at the area level.

The AHSRs present data from the 1997, 1998, and 2002 NSW Health Surveys that is specific to each of the 17 area health services. These surveys were conducted by the Centre for Epidemiology and Research through the NSW Department of Health's Computer Assisted Telephone Interviewing (CATI) Facility. The 2002 NSW Health Survey reports on data collected from approximately 15,000 randomly-selected adults.

The NSW Department of Health, in consultation with the 17 area health services, has identified 15 indicators that will be reported on annually. These are:

Health Behaviours
- alcohol risk drinking behaviour
- fruit intake
- vegetable intake
- physical activity
- smoking status
- smoke-free households

Health Status
- self-rated health status
- asthma
- diabetes or high blood sugar
- oral health—no natural teeth missing
- overweight and obesity
- psychological distress

Health Services
- difficulties getting health care when needing it
- emergency department care rating
- hospital care rating.

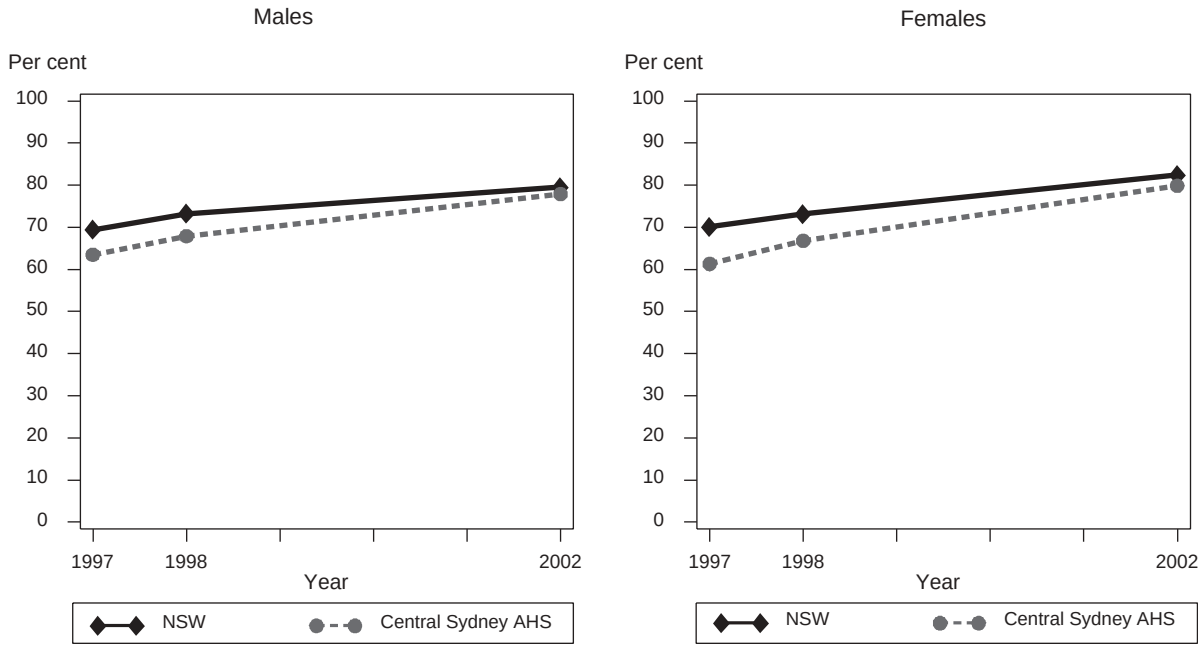
These indicators are presented in graphical and tabular form. For each indicator, the AHSRs include line charts of trend by sex (1997, 1998, 2002 data) comparing the area health service with the whole of NSW, and a bar chart of the indicator by age group (2002 Area Health Service data).

Examples of the trend graph for one of the indicators used in the Health Survey Program Area Reports—Smoke-free households by sex for people aged 16 years and over—are shown for an urban area (Central Sydney Area Health Service, Figure 1) and a rural area (New England Area Health Service, Figure 2).

The AHSRs were released during May 2003 and are available via the NSW Department of Health intranet as both PDF and HTML files.

FIGURE 1

SMOKE-FREE HOUSEHOLDS BY SEX, PEOPLE AGED 16 YEARS AND OVER, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, 1997–2002



Area	Year	Males	(95% CI)	Males (est. no.)	Females	(95% CI)	Females (est. no.)	Persons	(95% CI)	Persons (est. no.)
Central	1997	63.5	(59.2–67.9)	122000	61.3	(57.3–65.3)	119000	62.4	(59.4–65.4)	241000
Sydney AHS	1998	67.9	(62.6–73.2)	132000	66.8	(62.6–71.0)	132000	67.4	(64.0–70.7)	264000
	2002	77.9	(72.6–83.2)	156000	79.9	(75.7–84.1)	164000	78.9	(75.5–82.3)	320000
NSW	1997	69.4	(68.1–70.7)	1644000	70.1	(68.9–71.3)	1704000	69.8	(68.9–70.6)	3348000
	1998	73.2	(71.9–74.6)	1755000	73.2	(72.0–74.3)	1798000	73.2	(72.3–74.1)	3553000
	2002	79.6	(78.0–81.1)	1966000	82.4	(81.2–83.7)	2106000	81.0	(80.0–82.0)	4072000

Source: NSW Health Survey 1997, 1998, and 2002 (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

Notes: Estimates are based on the following numbers of respondents:

1997–1225 (Central Sydney AHS) and 17495 (NSW).

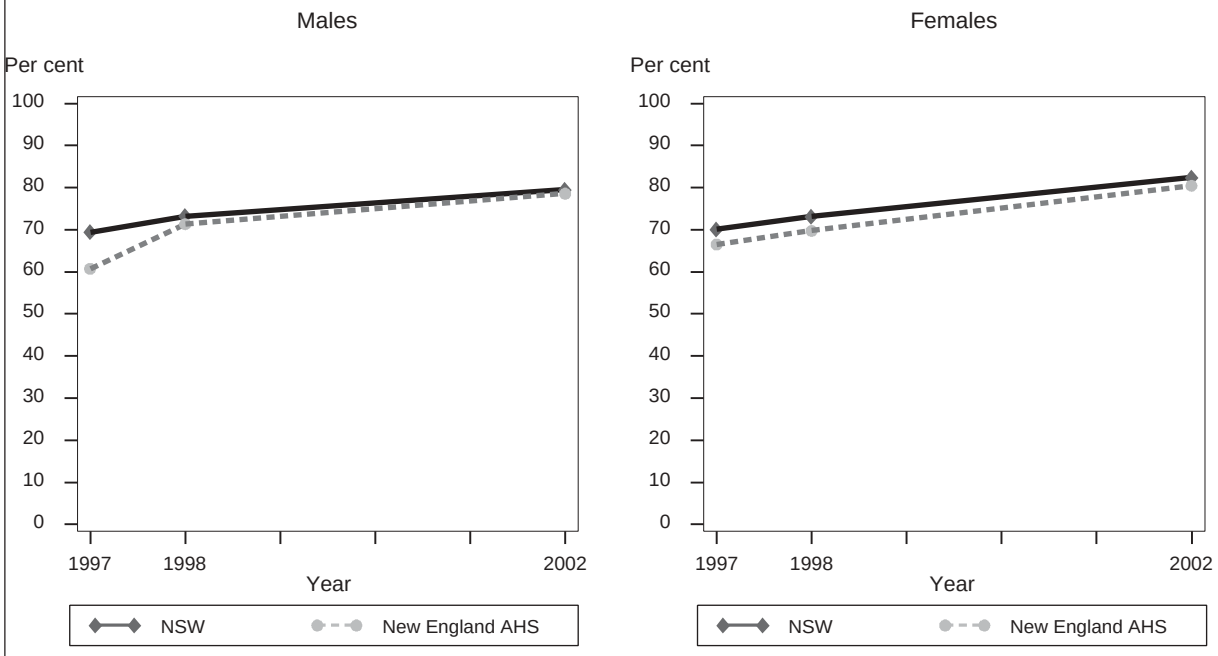
1998–1037 (Central Sydney AHS) and 17451 (NSW).

2002–810 (Central Sydney AHS) and 12610 (NSW).

The indicator includes those households with respondents indicating that their home was smoke free. The question used to define the indicator was: "Which of the following best describes your home situation? My home is smoke free (includes smoking is allowed outside only), people occasionally smoke in the house, and people frequently smoke in the house".

FIGURE 2

SMOKE-FREE HOUSEHOLDS BY SEX, PEOPLE AGED 16 YEARS AND OVER, NEW ENGLAND AREA HEALTH SERVICE, NSW, 1997–2002



Area	Year	Males	(95% CI)	Males (est. no.)	Females	(95% CI)	Females (est. no.)	Persons	(95% CI)	Persons (est. no.)
New England AHS	1997	60.7	(55.7–65.7)	39000	66.5	(62.5–70.6)	44000	63.7	(60.5–66.9)	84000
	1998	71.3	(66.5–76.2)	46000	69.8	(65.8–73.8)	46000	70.5	(67.4–73.7)	92000
	2002	78.6	(72.7–84.5)	50000	80.5	(76.0–84.9)	53000	79.6	(75.9–83.2)	103000
NSW	1997	69.4	(68.1–70.7)	1644000	70.1	(68.9–71.3)	1704000	69.8	(68.9–70.6)	3348000
	1998	73.2	(71.9–74.6)	1755000	73.2	(72.0–74.3)	1798000	73.2	(72.3–74.1)	3553000
	2002	79.6	(78.0–81.1)	1966000	82.4	(81.2–83.7)	2106000	81.0	(80.0–82.0)	4072000

Source: NSW Health Survey 1997, 1998, and 2002 (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

Notes: Estimates are based on the following numbers of respondents:

1997–1030 (New England AHS) and 17495 (NSW).

1998–1017 (New England AHS) and 17451 (NSW).

2002–745 (New England AHS) and 12610 (NSW).

The indicator includes those households with respondents indicating that their home was smoke free. The question used to define the indicator was: “Which of the following best describes your home situation? My home is smoke free (includes smoking is allowed outside only), people occasionally smoke in the house, and people frequently smoke in the house”.

RELEASE OF *NEW SOUTH WALES MOTHERS AND BABIES 2001*

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New South Wales Mothers and Babies 2001, the NSW Department of Health's latest report on the health of mothers and babies in NSW, was released on 21 January 2003. The Report found that the trend towards more mothers aged 35 years and over has continued to grow, as has the number of caesarean births over the last five years. The Report also found:

- there were 85,858 babies born to 84,379 mothers in 2001, the lowest number for the last five years;
- the number of teenage mothers continued to decline, falling from 4,291 (4.9 per cent of all mothers) in 1997 to 3,797 (4.5 per cent) in 2001;
- there was an increase in the number of mothers aged 35 years and over from 13,465 in 1997 to 15,250 in 2001, an increase from 15.5 to 18.1 per cent;
- caesarean section rates increased from 18.2 in 1997 to 23.6 per cent in 2001;
- around one in four mothers in 2001 were born overseas, most commonly in the United Kingdom (2.8 per cent), New Zealand (2.4 per cent), China (2.1 per cent), Vietnam (2.0 per cent), and Lebanon (2.0 per cent).

Over the past five years, the rate of low birthweight and perinatal mortality (a stillborn or livebirth but subsequent death within 28 days) has remained stable. In 2001, 6.4 per cent of babies were low birthweight and there were 9.2 perinatal deaths per 1000 births. An interesting finding of the Report was that, despite 2001 recording the lowest number of births in the last five years, there was an increase in the number of multiple births of twins and triplets from 2.7 to 3.4 per cent.

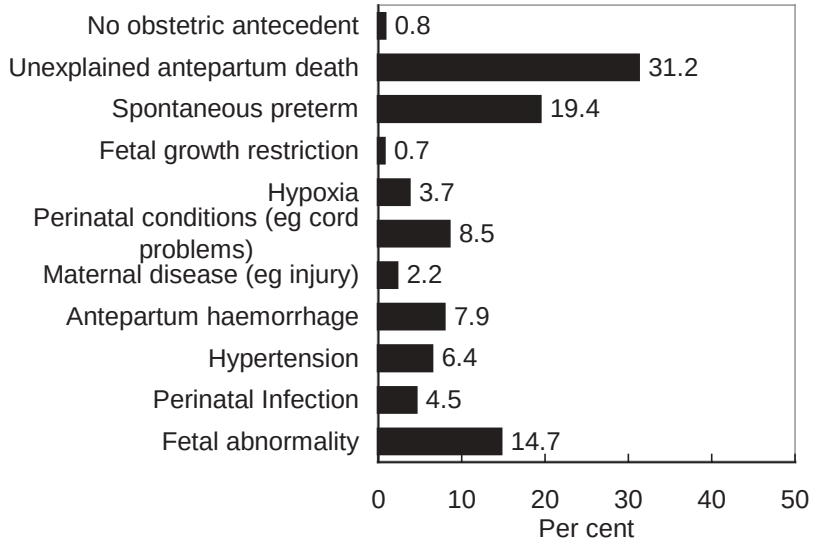
New South Wales Mothers and Babies 2001 is the fifth annual report on mothers and babies in NSW, and includes an additional chapter this year on chromosomal abnormalities detected by prenatal testing by amniocentesis or chorionic villus sampling.

The Report consolidates findings of the NSW Midwives Data Collection (MDC), the NSW Birth Defects Register and the Neonatal Intensive Care Units Data Collection. It also contains summary information on maternal deaths and perinatal deaths in NSW, each of which are reviewed by the NSW Maternal and Perinatal Committee. The most common cause of perinatal death was found to be unexplained death prior to birth (Figure 1), accounting for 31.2 per cent of all perinatal deaths. The high proportion of unexplained perinatal deaths highlights the importance of hospital or area-based reviews to assist in identifying potentially preventable factors.

New South Wales Mothers and Babies 2001 is available on the NSW Department of Health's website at **www.health.nsw.gov.au/public-health/mdc/mdcrep01.html.**

FIGURE 1

OBSTETRIC CAUSES OF PERINATAL DEATHS, NSW, 2001



Source: Centre for Epidemiology and Research, NSW Department of Health. New South Wales Mothers and Babies 2001. *N S W Public Health Bull* 2002; 13(S-4).

FACT*SHEET*

METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS*

WHAT IS METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA)?

Staphylococcus aureus (or staph) are bacteria that are found on the skin and in the nose of people. Staph are usually harmless, but they can sometimes cause infection and serious illness.

Some strains of staph have become resistant to the antibiotic methicillin and to other antibiotics that were used in the past to treat infections. Infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA) are hard to treat, as most antibiotics will not kill the bacteria.

HOW DO YOU GET MRSA INFECTIONS?

You can get infected with MRSA in the community as well as in a hospital or other health care setting.

MRSA and other staph can cause infection by getting into the body through broken skin or into the blood stream. People who have health problems such as diabetes or a poor immune system—or who have broken skin due to wounds, recent surgery, or dermatitis—are more likely than others to get a staph infection.

MRSA can cause:

- skin infections such as boils and impetigo (school sores);
- infection under the skin (cellulitis);
- more serious infections of the bone, blood, lungs and other parts of the body.

HOW DO YOU KNOW IF YOU HAVE AN MRSA INFECTION?

A doctor will take swabs or samples from boils, wounds, or other sites of infection. These samples will then be sent to a laboratory for testing.

HOW ARE MRSA INFECTIONS TREATED?

MRSA may be treated with special antibiotics. Other treatments include dressings, and surgery, depending on the type of infection. Your doctor will advise on the best treatment for your infection.

HOW ARE MRSA SPREAD?

MRSA can be spread by:

- touching or squeezing the infected body area, such as a boil or wound;
- using soiled towels, clothes or bed sheets that have been used by a person with an MRSA infection;
- using grooming items that have been used by a person with an MRSA infection;
- not washing hands carefully.

HOW CAN YOU PREVENT THE SPREAD OF MRSA?

Wash your hands

Hand washing is the most important thing to do to prevent the spread of MRSA. Wash your hands:

- before and after touching or dressing an infected area;
- after going to the toilet;
- after blowing your nose;
- before handling or eating food;
- before handling newborn babies;
- after touching or handling unwashed clothing or linen.

How should I wash my hands?

Wash all parts of your hands well using soap and running water. Rinse well and dry your hands after washing.

Cover boils or other skin infections

Cover boils or other skin infections with a watertight dressing during the daytime. A child with impetigo (small blisters or flat, honey-coloured crusty sores on the skin, caused by either *Staphylococcus* or *Streptococcus* bacteria) should not go to school or childcare until after one full day of treatment.

Don't share:

- soiled towels, clothes or bed sheets. If you share a bed with someone, keep sores or wounds dressed overnight;
- grooming items such as nail scissors, tweezers, razors and toothbrushes.

Wash towels, clothes, bed sheets and other items that might have pus or MRSA on them in a washing machine. No special washing temperature is recommended. Dry clothing and linen in direct sunlight, if possible, as sunlight kills bacteria. All eating utensils and dishes can be washed as normal.

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

Please note: There are more specific measures for the prevention and control of MRSA in health care settings. For information about the prevention and control of MRSA in health care settings, please see the NSW Health Infection Control Policy (2002/45), which is downloadable from NSW HealthWeb at www.health.nsw.gov.au/fcsd/rmc/cib/circulars/2002/cir2002–45.pdf or by contacting the NSW Infection Control Resource Centre on (02) 9332 9712.

June 2003

NSW HEALTH
Working as a Team

COMMUNICABLE DISEASES REPORT, NSW: JUNE 2003

TRENDS

Summaries of case notifications through to April 2003 are shown in Figure 3 and Table 3.

BLOOD BORNE AND SEXUALLY TRANSMISSIBLE INFECTIONS

Reports of new **syphilis** infections continued to increase in recent months, mainly from South Eastern Sydney. Enhanced surveillance for syphilis began in 2000, and involved public health unit staff writing to doctors caring for the patients who were notified by laboratories as having serological markers of syphilis infection.

In 2000, doctors reported that 81 people in NSW had syphilis that was acquired within the previous year; 66 people were reported in 2001, and 126 people were reported in 2002. So far in 2003, 56 patients have been reported with onset of new syphilis to the end of April. Of these 33, (59 per cent) reside in the South Eastern Sydney Area. Anecdotal reports indicate that many of these infections are in men who have sex with men.

In response, South Eastern Sydney Area Health Service, with the Sexually Transmissible Infections in Gay Men Action Group, initiated an awareness-raising campaign among the community and doctors. This campaign began in 2002.

VECTOR-BORNE DISEASES

The number of reports of arbovirus infections rose substantially in April, with **Ross River virus** and **Barmah Forest virus** infections both increasing mainly in the Northern Rivers Area. These infections generally increase in Autumn and are expected to decline after May as the temperatures fall.

ZOONOSES

There have been 149 cases of **Q fever** reported through to the end of April. Cases increased in 2002, reaching a nine-year peak of 304. The reason for the increase is unclear, but may relate to increased awareness and screening associated with the Q fever vaccination program aimed at meat and agricultural workers.

RESPIRATORY AND OTHER DISEASES

Four cases of *Legionella pneumophila* infections were reported in April, in NSW, although no links were identified among cases. April traditionally marks a high point in the **legionnaires disease** season.

QUARTERLY REPORT: AUSTRALIAN CHILDHOOD IMMUNISATION REGISTER

Table 1 details the percentage of fully immunised children aged 12 months to less than 15 months in each area health service, reported by all service providers.

TABLE 1

PERCENTAGE OF FULLY IMMUNISED CHILDREN AGED 12 MONTHS TO LESS THAN 15 MONTHS BY AREA HEALTH SERVICE

Area Health Service	31 Mar 02	30 June 02	30 Sept 02	31 Dec 02	31 Mar 02
Central Coast	92	90	92	93	93
Central Sydney	88	89	90	90	91
Hunter	94	94	93	94	94
Illawarra	93	89	94	92	92
Northern Sydney	90	89	91	91	90
South Eastern Sydney	90	89	92	91	90
South Western Sydney	90	90	90	92	91
Wentworth	92	90	91	90	93
Western Sydney	90	90	91	92	92
Far West	92	90	90	89	93
Greater Murray	93	92	94	93	92
Macquarie	92	93	91	92	92
Mid North Coast	90	90	88	90	90
Mid Western	92	91	91	94	94
New England	94	92	91	93	92
Northern Rivers	80	84	84	85	85
Southern	93	90	91	91	89
NSW	**91**	**90**	**91**	**91**	**91**
Australia	**91**	**90**	**91**	**92**	**91**

TABLE 2

PERCENTAGE OF FULLY IMMUNISED CHILDREN IDENTIFIED AS ABORIGINAL AND TORRES STRAIT ISLANDER, AGED 12 MONTHS TO LESS THAN 15 MONTHS

	30 June 02	30 Sept 02	31 Dec 02	31 Mar 02
NSW	87	85	86	86
Australia	85	85	84	86

These data refer to five different cohorts of children whose age has been calculated 90 days before data extraction. The information contained in each of the reports has been extracted from the Australian Childhood Immunisation Register (ACIR) and may not reflect actual coverage due to under-reporting. Table 2 details the percentage of fully immunised children identified as Aboriginal or Torres Strait Islander in New South Wales for the same cohort, reported by all service providers.

VACCINE-PREVENTABLE DISEASES

One case of **measles** was reported in South Eastern Sydney in April, breaking an eight-month hiatus in measles in NSW. The case was a teenager who presented with a history of a week-long blotchy rash on her face, which began three days after onset of fever and cough. A serological sample taken one week after onset of the rash tested positive for measles IgM and IgG. Parvovirus serology was negative. The case reported measles vaccination four years before, and no contact with other possible cases or travel outside NSW. Other public health units were notified, but no further spread has been identified.

ENTERIC DISEASES

In NSW, in April, a baby with listeriosis was born prematurely. Listeriosis is a relatively rare disease caused by eating foods contaminated with the bacteria *Listeria monocytogenes*. Most people who eat contaminated food do not get sick. However, it can cause serious disease in pregnant women, newborns, and people who are immunocompromised. Such people should avoid foods that are known to be prone to contamination by *Listeria monocytogenes*. These foods include soft cheeses, small goods (such as sausages), and pre-packaged foods. Ensuring foods are well cooked and simple hygiene measures, like hand washing, are also good ways to prevent listeriosis. A fact sheet on listeriosis is available at **www.health.nsw.gov.au** under Common Health Topics.

AN OUTBREAK OF *SALMONELLA ENTERICA* SEROVAR TYPHIMURIUM (*S. TYPHIMURIUM*) PHAGE TYPE 135A IN THE GREATER MURRAY

Tracey Oakman, Tony Kolbe, Ian Hamilton
Centre for Public Health, Albury

On 18 October 2002, the Centre for Public Health, Albury, was notified by a local pathology laboratory of three cases of *Salmonella* infection among residents of a town. Two of these cases were from the same household. On 21 and 22 October the laboratory notified the Centre of two further cases. All these cases were children under seven years of age. Discussions with the microbiologist revealed that the laboratory was processing several more faecal cultures from young children. This report presents the result of the public health investigation into the outbreak.

Methods

Under the *NSW Public Health Act 1991*, pathology laboratories are required to notify the public health unit of cases of *Salmonella* infection. In this investigation, cases were initially followed up using the response protocol described in the NSW Health Notifiable Diseases Manual. Further interviews with cases used a detailed risk factor questionnaire.

FIGURE 1

AGE DISTRIBUTION OF ALL CASES OF *SALMONELLA*, OCTOBER–NOVEMBER 2002

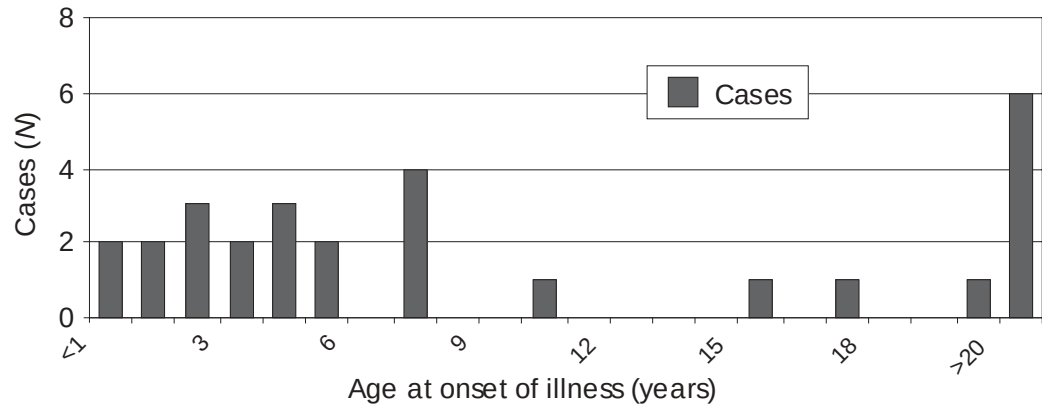
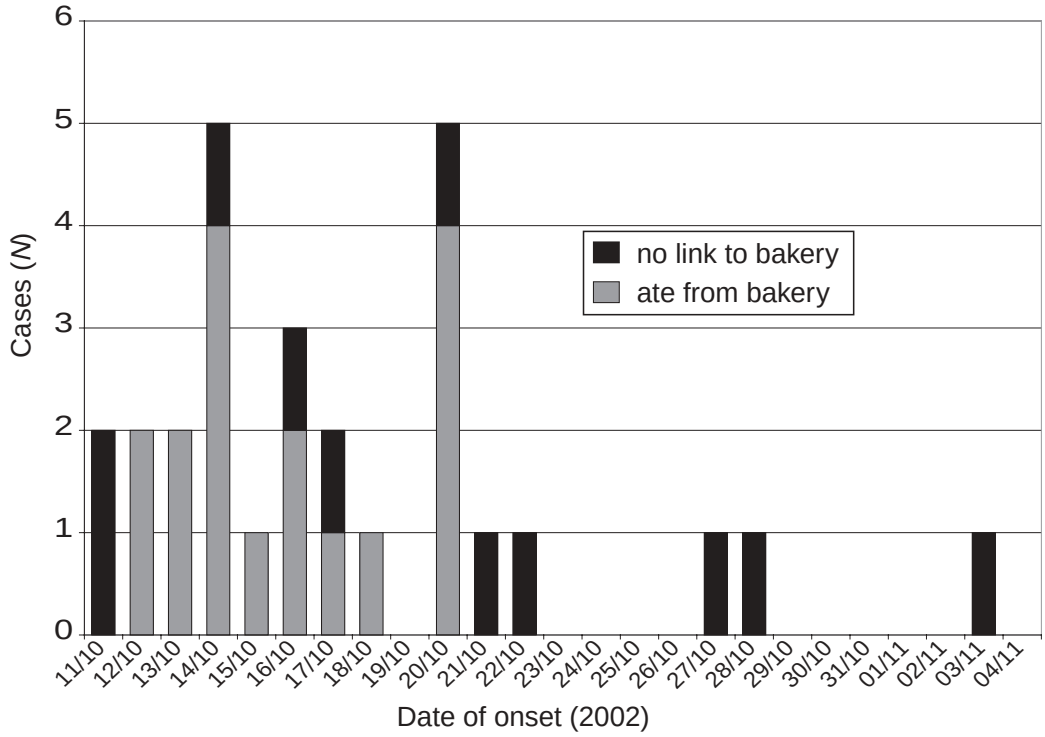


FIGURE 2

DATE OF ONSET OF ILLNESS AND LINKS OF THE CASES OF *SALMONELLA* INFECTION TO A SUSPECTED BAKERY SOURCE, OCTOBER–NOVEMBER 2002



Salmonella isolates from cases were sent for phage typing. The food inspector assessed several food premises, restaurants, produce suppliers and a children's play facility for infection hazards. Food and environmental samples were sent for microbiological analysis.

Teleconferences were held on several occasions with the NSW Communicable Disease Branch, the Food Branch and Oz Food Net staff at the NSW Department of Health to help direct the investigation.

Results

Between 18 October and 12 November, the laboratory reported 27 cases of *Salmonella* infection in residents of the town. Two further presumptive cases were identified in people who reported symptoms consistent with salmonellosis and who were household contacts of a confirmed case (samples were not collected for these people). Laboratory phage typing identified that isolates from 26 cases were all the same: *S. Typhimurium* phage type 135a. One case was identified as STM 197 and was not included in the outbreak investigation.

All 26 cases identified as phage type 135a and the two presumptive cases were included in the study. Of these 28 cases, 18 were aged seven years or less; the remaining were aged 10 to 45 years of age (Figure 1). Sixty-one per cent of the cases were women. The illness was characterised by abdominal pain, vomiting and diarrhoea, with diarrhoea lasting approximately seven days or longer. Four children were admitted to the local hospital. Several patients were seen in the Emergency Department; the remainder of the patients were seen by their local general practitioner. Onset of illness ranged from 11 October to 3 November (Figure 2), with peak onset occurring in the week 13–20 October.

Fourteen of the cases reported eating a cream cake or a portion of a large cream-filled cake, which was made and sold from one bakery. The cream cakes from the bakery had been purchased between about 8 and 17 October. No raw egg was used in the preparation of the cream and custard products at the bakery. The three samples and three swabs collected from the bakery tested negative for *Salmonella*. None of the bakery staff reported illness.

Investigations revealed that the cases that occurred after the 27 October had not eaten products from the bakery. In total, seven cases could not be linked directly to the bakery although there was strong evidence that three of these seven cases were infected by an earlier case linked to the bakery.

Public Health Action

A media statement was released on 29 October alerting the public to the outbreak of salmonellosis in the area, advising people with symptoms to seek medical attention and providing advice on hygiene and food handling. A further media release reported the findings of the investigation. Recommendations were made to the bakery staff about improved cleaning and sanitising of the piping bags used for applying cream. Two teenagers who were diagnosed with salmonellosis and who worked as part-time food handlers (unrelated to the bakery) were restricted from work until both their symptoms resolved and each had two stool samples that tested negative for *Salmonella*.

Discussion

Our investigation identified an outbreak of salmonellosis of approximately three-weeks duration involving 26 confirmed cases of *S. Typhimurium* 135a infection. The investigation suggested that there was a common food source for the infection for the first 10 days of the outbreak. The descriptive epidemiological study provided circumstantial evidence that a bakery was the source of the infection. An outbreak of *S. Typhimurium* 135a involving the use of raw egg in a bakery has previously been reported.[1]

Not all cases in this outbreak were linked to the one source, the identified bakery. It is possible that these cases did not recall eating a product from the bakery or the infections came from other sources. The majority of cases, or parents of cases, initially did not identify that they had eaten a cream cake, and this evidence was only reported with further prompting during a second interview. Many cases ate cake at a function and did not purchase the product directly from the bakery, which contributed to the difficulty in identifying the possible source of the infection. An alternative hypothesis, that a source other than the bakery was responsible for the outbreak, remains a possibility.

The patient interviews revealed that, among family members consuming the cakes, there was variation in the attack rate. The high rate of infection among children is an interesting aspect of the outbreak. The predominance of cases in children led investigators to focus initially on food products consumed mainly by children and venues frequented by children. In investigating outbreaks of salmonellosis, high attack rates in children should be interpreted cautiously. Variable susceptibility in people consuming contaminated food and higher sensitivity to gastrointestinal infection in children should be considered.[2]

Samples collected from the bakery on 1 November were negative for *Salmonella*. This result is not surprising given that no cases apparently linked to the common source occurred after 25 October. It is likely that a source of contamination existed in the bakery for the period 8–17 October. The source may have been a contaminated product or an inadequately cleaned utensil such as a cream-piping bag.

The use of a case-control study to determine the cause of the outbreak was considered but rejected because:

- recall may have been difficult given that two to three weeks had passed since the likely time of exposure
- the outbreak was considered to be over
- of the apparent low attack rate in people consuming the product, particularly adults.[3]

Salmonellosis outbreaks can have a substantial impact on rural communities. This investigation demonstrated some of the difficulties in identifying the source of a community outbreak of salmonellosis and that prompt investigation is useful in identifying and controlling suspected sources.

References

1. Hall R. Outbreak of gastroenteritis due to Salmonella Typhimurium phage type 135a following consumption of raw egg. *CDI* 2002;26(2).
2. AIFST (NSW Branch) Food Microbiology Group. *Foodborne microorganisms of public health significance.* Tempe: Trenear Printing Service, 1997.
3. Gregg M.B. *Field Epidemiology*. Oxford: Oxford University Press, 1996.

FIGURE 3

REPORTS OF SELECTED COMMUNICABLE DISEASES, NSW, JANUARY 1998 TO APRIL 2003, BY MONTH OF ONSET

Preliminary data: case counts in recent months may increase because of reporting delays.
Laboratory-confirmed cases only, except for measles, meningococcal disease and pertussis
BFV = Barmah Forest virus infections, RRV = Ross River virus infections
Ll = Legionella longbeachae infections, Lp = L. pneumophila infections
Gp C and Gp B = disease due to serogroup C and serogroup B infection, other/unk = other or unknown serogroups

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

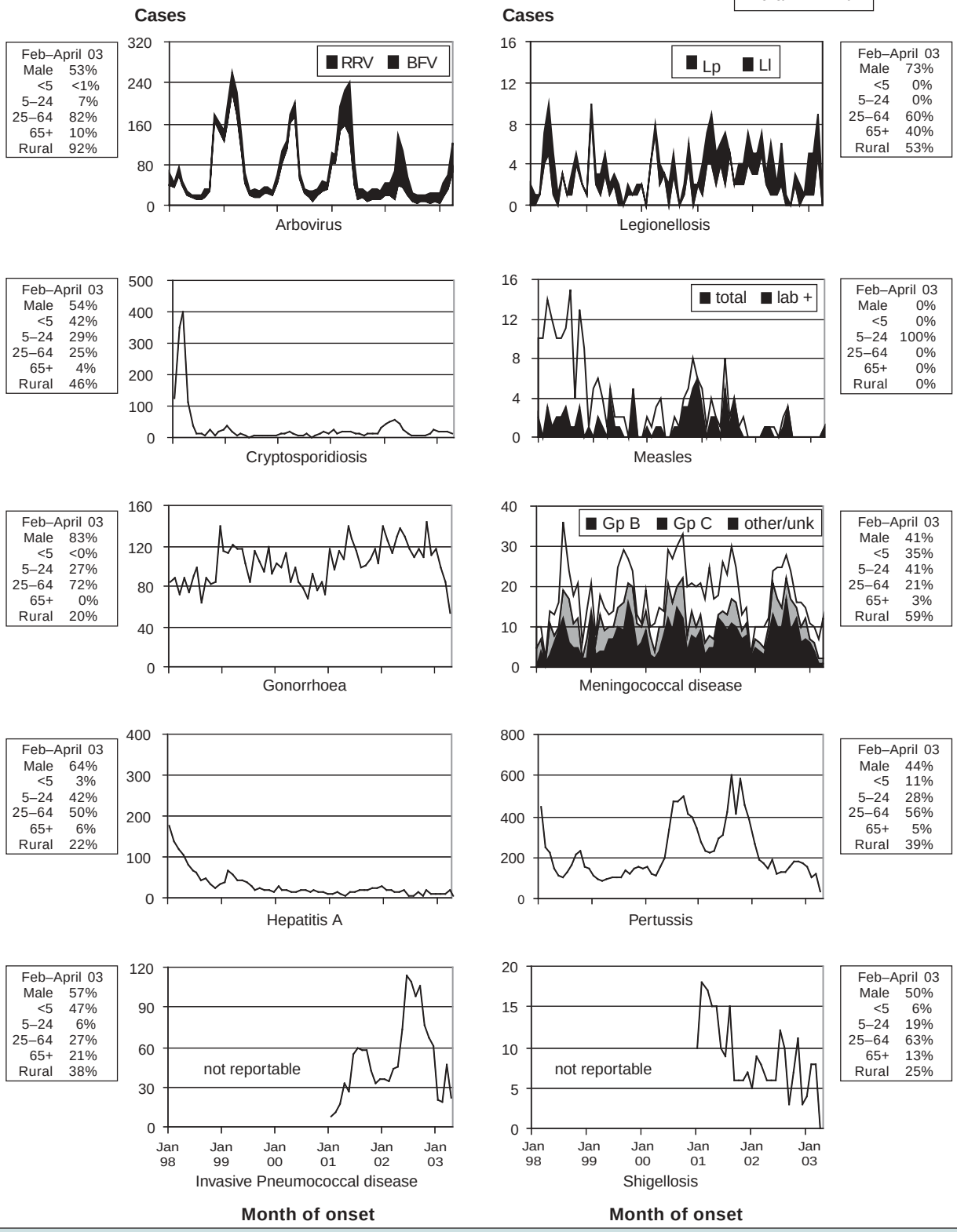


TABLE 3 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN APRIL 2003 BY AREA HEALTH SERVICES

Condition	Area Health Service																		Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	CHS	for April†	To date†
Blood-borne and sexually transmitted																				
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	43	51	42	6	14	22	55	19	84	20	12	15	13	10	18	18	9	1	459	2,214
Gonorrhoea*	15	7	9	2	1	-	5	-	28	-	3	2	5	-	2	1	-	-	81	434
Hepatitis B - acute viral*	1	1	-	1	-	-	-	2	1	-	-	-	-	-	-	-	-	-	6	26
Hepatitis B - other*	55	29	22	5	-	7	12	1	31	-	1	2	1	3	4	-	-	3	178	968
Hepatitis C - acute viral*	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	17
Hepatitis C - other*	62	23	31	16	1	27	44	29	69	28	24	15	8	17	4	5	9	27	443	2,155
Hepatitis D - unspecified*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Syphilis	14	-	6	1	1	1	2	4	25	2	-	3	2	-	2	-	1	-	64	291
Vector-borne																				
Barmah Forest virus*	-	-	-	-	-	1	5	-	-	36	12	-	-	-	-	-	2	-	56	127
Ross River virus*	-	1	-	1	-	1	7	-	-	41	8	4	1	2	1	3	-	-	70	113
Arboviral infection (Other)*	-	-	2	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	5	38
Malaria*	-	2	1	-	-	-	1	-	1	4	-	-	-	-	-	1	-	-	10	54
Zoonoses																				
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Leptospirosis*	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	4	25
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	10
Q fever*	-	-	-	-	-	1	4	1	-	3	8	4	7	4	5	-	1	-	38	149
Respiratory and other																				
Blood lead level*	1	2	-	1	5	-	4	3	-	1	-	-	2	-	1	1	-	-	21	182
Influenza*	5	2	-	-	-	1	2	4	4	2	1	1	-	-	-	-	-	-	23	81
Invasive pneumococcal infection*	3	6	5	1	1	4	3	1	7	-	1	-	-	2	-	-	2	-	36	134
Legionella longbeachae infection*	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	3	14
Legionella pneumophila infection*	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	4	8
Legionnaires disease (Other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meningococcal infection (invasive)*	1	1	-	-	1	1	2	1	1	1	-	1	-	-	-	-	-	-	10	40
Tuberculosis	5	1	2	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	10	116
Vaccine-preventable																				
Adverse event after immunisation	-	-	2	-	-	-	8	-	1	-	-	-	-	3	-	-	4	-	18	49
H. Influenzae b infection (invasive)*	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Measles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mumps*	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	15
Pertussis	6	16	18	2	4	4	13	1	20	2	4	2	2	1	-	1	-	-	96	549
Rubella*	-	1	4	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	7	15
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Enteric																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis*	2	-	2	2	-	-	2	-	2	2	1	1	1	-	1	1	-	-	17	75
Giardiasis*	5	12	19	3	2	2	9	-	12	1	3	2	-	1	-	8	1	-	80	341
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Hepatitis A*	1	1	3	1	4	-	-	-	2	-	-	-	-	1	-	-	-	-	13	47
Hepatitis E*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Listeriosis*	1	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4	10
Salmonellosis (not otherwise specified)*	17	15	8	7	6	7	10	8	30	8	2	9	1	2	1	6	5	-	144	923
Shigellosis*	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-	4	23
Typhoid and paratyphoid*	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	3	14
Verotoxin producing *E. coli**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* 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

NSW PUBLIC HEALTH BULLETIN

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The preferred length of Bulletin articles is 1500 words. Tables and figures may be additional to that.
News, comments, and other reports should be 500–600 words.
All manuscripts should contain a short introductory abstract that reflects the structure of the manuscript.
References should be set out in the Vancouver style.
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.
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