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VIOLENCE—A COMPLEX BUT PREVENTABLE PUBLIC HEALTH ISSUE

GUEST EDITORIAL

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In December 2005, images of aggressive crowds of young people in Cronulla, a seaside suburb of Sydney, hit the media.[1] In January 2006, the focus had switched to groups of young men in West Dubbo, NSW, fighting with police.[2] Commentators acknowledged that the causes of youth violence were complex and included the disenfranchisement of young people, the consumption of alcohol, and specific cultural and historical circumstances. Talk of ethnocentrism, xenophobia, and racism underpinned the ensuing debate about whether a 'zero-tolerance' policy to crime should be adopted or whether potential solutions lay in understanding the causes of these events. Both these policy responses have their attractions and proponents. Both are, in themselves, inadequate.

The public health response to violence argues that it is not inevitable, but rather the outcome of interacting factors that operate at individual, family, community and societal levels; factors that can be scientifically studied and analysed. It recognises that the results of violence are a significant burden on the health sector and of direct relevance to a range of health workers, extending from those who treat the victims to those working upstream in policy and planning seeking to develop cost-effective preventive measures. The public health response also entails the careful documentation of prevention interventions acting at the primary, secondary and tertiary levels.

The questions that a public health practitioner might ask in response to the types of violence witnessed in Cronulla and Dubbo are:

- Why were these particular communities at risk of violence?
- What risk factors and protective factors are in place in these communities?

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- Who was most at risk of being either a victim or a perpetrator?
- What role did alcohol and other drugs play?
- How did the health sector respond to these incidents?
- Was there an increase in presentations to hospital, and what types of injuries were sustained?
- What role did general practice play in dealing with victims?
- Was there an increase in sexual assault or domestic violence in concert with the violence on the street?
- What type of interventions could be implemented to prevent further violence?
- What were the longer term effects on the sense of security within these communities?

WORLD REPORT ON VIOLENCE AND HEALTH

International public health efforts to prevent violence have been stimulated by the publication by the World Health Organization in 2002 of the *World Report on Violence and Health.*[3] This report documented the worldwide prevalence and burden of violence and described the effectiveness of interventions. Violence was defined broadly:

'Violence is the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation.'

The report documented the burden of, and risk factors for, self-directed violence, child abuse and neglect, sexual violence, intimate partner violence, youth violence, elder abuse, and collective violence. Insights included:

- Violence is among the leading causes of death worldwide for people aged 15–44 years.
- If current trends in violence continue, war, interpersonal violence and suicide will each individually feature in the top 15 burden-of-disease issues confronting global health in 2030.
- The majority of violent incidents are not reported to health, police or other agencies.
- Young men are both the primary victims and the perpetrators of many forms of interpersonal violence.
- Multisectoral, comprehensive interventions, particularly those delivered in childhood and sustained over time, are the most effective in preventing violence.

In NSW the prevention of violence is promoted by a wide range of agencies under the rubric of crime prevention or community safety interventions as well as through injury prevention, mental health promotion, family and domestic violence prevention, drug and alcohol interventions and others. While activities to prevent violence are taking place in many sectors, few are truly multisectoral to ensure a comprehensive effort.

RESEARCH ON VIOLENCE IN NSW

This is the first of two special issues of the *NSW Public Health Bulletin* that present research from NSW that focuses on violence, its causes and solutions, and public health responsibilities in its prevention. Given the broad range of issues that can be investigated under the label of violence, these collections of articles provide a snapshot of current activities and aim to stimulate interest in the documentation, analysis and prevention of violence and the ways in which different stakeholders might better address this problem. This first issue contains four articles that are related to the measurement and surveillance of violence.

Schmertmann and Finch in 'A demographic profile of deaths due to interpersonal violence in New South Wales' draw on Australian Bureau of Statistics death records to document mortality attributed to interpersonal violence in NSW. The authors present age-standardised death rates for the 17–year period 1986 to 2003 for interpersonal violence affecting males and females. They also describe the method of injury. Given anecdotal and media reports that NSW is becoming more violent, Schmertmann and Finch present important trend data. In particular, they document that while deaths from interpersonal violence have decreased over time, injuries caused by sharp or blunt objects or firearms remain a significant cause of death.

Hayen and Mitchell in 'A description of interpersonal violence-related hospitalisations in New South Wales' examine hospital admissions resulting from interpersonal violence in NSW. They consider the number of people admitted every year, and how they are identified. They present data on the most common methods of injury and consider who is most at risk of being a victim of violence. International classification of diseases codes for the relationship between victim and perpetrator have been available since the introduction of ICD-10-AM 3rd edition in 2002, and the authors discuss the results of this surveillance and the value that it adds to recent hospitalisation data in NSW. The demographic risk factors for interpersonal violence identified through the NSW Inpatient Statistics Collection are strikingly similar to those identified elsewhere in the world, suggesting that interventions documented elsewhere may be applicable in NSW.

Black and Degenhardt in 'Drug-related aggression among injecting drug users' examine a specific surveillance system, the Illicit Drug Reporting System, that focuses on the high-risk group of injecting drug users. They examine the links between aggressive behaviour and substance use, in particular the use of potent forms of amphetamines. The study found that injecting drug users experience, and are witness to, high levels of substance-related aggression. Substance-related aggression was significantly associated with younger injecting drug users (physical aggression) and self-reported crime (verbal and physical aggression).

The Illicit Drug Reporting System will provide pertinent information about changes in self reported aggression over time, as the availability and use of various drugs changes. These data can be examined alongside that of drug-related crime.

The article by Butler and Kariminia, 'Prison violence: Perspectives and epidemiology', provides an overview of violence in NSW prisons. The authors present the rates of violent crime in NSW and the number of prisoners in NSW convicted with a violent crime. The prisoner population itself is at significant risk of violence: 'a young predominantly male environment, low socioeconomic status, histories of abuse and neglect, poor educational attainment, unemployment, social isolation, interpersonal conflicts, financial dependence, mental illness and substance abuse'. The authors explain the two main theoretical causes of violence in prisons. They also discuss the potential role of traumatic brain injury in aggressive behaviour. The authors describe a 2002 pilot surveillance project to examine injury presentations in prisons. Their article concludes that interventions to prevent violence in prisons will need to take into account both environmental and biological factors.

Routine data provides valuable evidence regarding population sub-groups who may be at increased or decreased risk of violence, geographic areas with especially high or low rates of violence, and changes in rates of violence over time. Unexpected patterns should stimulate further action, a quest for greater understanding, a search for interventions, or a combination of these.

Alongside epidemiological data are important insights that can only be derived from qualitative studies and analysis. These include community perspectives, studies of perpetrators and victims, and sociological and other analyses of the policy environments in which risk is modified. A starting point, however, is making available routinely collected data, analysing and presenting it in the public domain, and facilitating debate about determinants, causes, consequences and interventions. The NSW data presented here offer one such starting point, and challenge public health practitioners to engage and grapple with this distressing social phenomenon. The second special issue of the *Bulletin* on violence will further investigate data collections, interventions and strategies for preventing violence in NSW. We invite you to submit articles about the work you may currently be doing for this edition (see box below).

Is violence a serious public health issue in NSW? Given the burden of violence outlined here, the knowledge that many forms of violence are known to be significantly under reported, and the documented severe long term physical and psychological effects of violence, it is timely that public health considers its role in preventing and mitigating the effects of violence.

CALL FOR PAPERS: DOES YOUR WORK INVOLVE PREVENTING VIOLENCE IN NSW?

We are currently seeking contributions for the second special issue of the *Bulletin* on the topic of violence, which will focus on interventions and strategies for preventing violence in NSW. If you would like to write a paper, please email a 100-word abstract to phb@doh.health.nsw.gov.au by 11 August 2006, or contact the *Bulletin* Production Manager on 02 9424 5876. Abstracts will be reviewed for suitability by the guest editors.

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A DEMOGRAPHIC PROFILE OF DEATHS DUE TO INTERPERSONAL VIOLENCE IN NEW SOUTH WALES

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When one person or a small group of people intentionally inflicts an injury on another person or persons, an act of interpersonal violence is committed.[1,2] Each act of interpersonal violence has many different factors associated with it. These include the type of relationship between the persons involved (for example, partners, caretaker-child), the nature of the act (for example, physical violence), the demographics of the people involved, the method or means used to commit the act, the events leading up to the act and the environment or location the act took place in.[1]

Interpersonal violence can result in a range of outcomes, including emergency department visits, hospitalisations and even death. [1,3–6] Information about different factors related to interpersonal violence can be obtained using a number of data sources[1], including death records. This article presents annual age-standardised death rates in NSW due to interpersonal violence for the period 1986–2003 and a demographic profile of these deaths for the years 1999–2003.

METHOD

Death data were obtained from the Australian Bureau of Statistics (ABS) for all NSW death records coded with an external cause of injury (Ecode) during 1986–2003. Deaths registered in NSW from 1986 to 1998 were coded using the International Classification of Diseases (ICD) version 9 (ICD-9) and deaths registered in NSW from 1999 to 2003 were coded using ICD-10.[7,8]

Cases were identified as those records where the underlying cause of death was determined to be interpersonal violence and the state of residence of the deceased person was NSW. The interpersonal violence Ecodes used were E960-E968.9 and X85–Y09 for ICD-9 and ICD-10 coded death data, respectively. Deaths attributed to the late effects of injury caused by interpersonal violence were also included in this analysis (Ecodes E969, Y87.1). Interpersonal violence death records were selected and analysed according to the year that the event occurred rather than the year that the death was registered with the ABS. Records for deaths that occurred in NSW from 1986 to 2003 but which have not yet been registered are not included in this analysis. The number of deaths excluded, however, is likely to be small. For example, 11 of the deaths registered in 2003 in NSW occurred in a previous year(s). In the case of the registration year 2003, all 11 of these deaths occurred in 2002.

Annual age- and sex-specific population estimates for NSW as at 30 June were obtained from the ABS for the years 1986-2003.[9] All age-standardised rates were calculated using the direct method of standardisation. The standard population was the estimated Australian residential population as at 30 June 2001.[9]

Death data from 1986 to 2003 were used to calculate annual age-standardised interpersonal violence death rates for males and females. Negative binomial regression analyses were performed to determine the statistical significance of changes in the male and female death rates from 1986 to 2003, and to calculate the annual percentage change in the rate of death.

Data from 1999 to 2003 were also grouped and used to calculate age-standardised interpersonal violence death rates for all people, males and females, as well as age-specific interpersonal violence death rates for males and females. Age-standardised death rates and frequencies for all people, males and females were also calculated for different methods of interpersonal violence, including:

- use of a sharp or blunt object to hit, cut or stab another person causing bleeding or other type of injury (X99, Y00)
- shooting by firearm (gun)(X93-X95)
- bodily force (Y04-Y05, Y07)
- hanging, strangulation or suffocation (X91); and
- poisoning (X85, X87-X90).

Interpersonal violence methods do not include any deaths due to self-harm or unintentional injury.

All analyses were performed using SAS statistical software.[10] Ninety-five per cent confidence intervals (95 per cent CI) were calculated for rates assuming a Poisson distribution.[11]

RESULTS

Interpersonal violence was the fifth leading cause of injury death in NSW from 1999–2003 and accounted for 4 per cent of all injury deaths. Over this period, 507 people died from interpersonal violence, an overall rate of 1.5/100,000 population. Seventy per cent of these people were male. Approximately 101 people died each year from 1999 to 2003 as the result of interpersonal violence.

Figure 1 shows the yearly trend in interpersonal violence death rates during 1986–2003 for males and females. A negative binomial regression of the trends for each sex showed that there were statistically significant declines from 1986 to 2003 in both sexes. For males, interpersonal violence deaths rates decreased by 2.6 per cent per year (95 per cent CI 1.7 to 3.5), while for females interpersonal violence death rates decreased by 4.6 per cent per year (95 per cent CI 3.2 to 6.0).

Figure 2 shows the age-specific death rates for interpersonal violence in NSW between 1999 and 2003 for males and females. Death rates for interpersonal violence were higher in males than females for all age groups except for males aged 75 years and over for this period. Males aged 30–34 years had the highest rate of death due to interpersonal violence and this group accounted for 10 per cent of all interpersonal violence deaths. Children under five years of age also experienced high rates of interpersonal violence. Deaths in this age group accounted for 6 per cent of interpersonal violence deaths between 1999 and 2003.

Table 1 shows the number of deaths caused by interpersonal violence and the death rates for the different methods used, for the period 1999–2003. Male interpersonal violence death rates significantly exceeded the corresponding rate for females for the methods 'sharp or blunt object'; 'firearm'; and 'bodily force'. The female death rates for interpersonal violence exceeded the male rates for 'poisoning' and

FIGURE 1

DEATH RATES FOR INJURY DUE TO INTERPERSONAL VIOLENCE FOR MALES AND FEMALES, ADJUSTED FOR AGE: NEW SOUTH WALES, 1986–2003

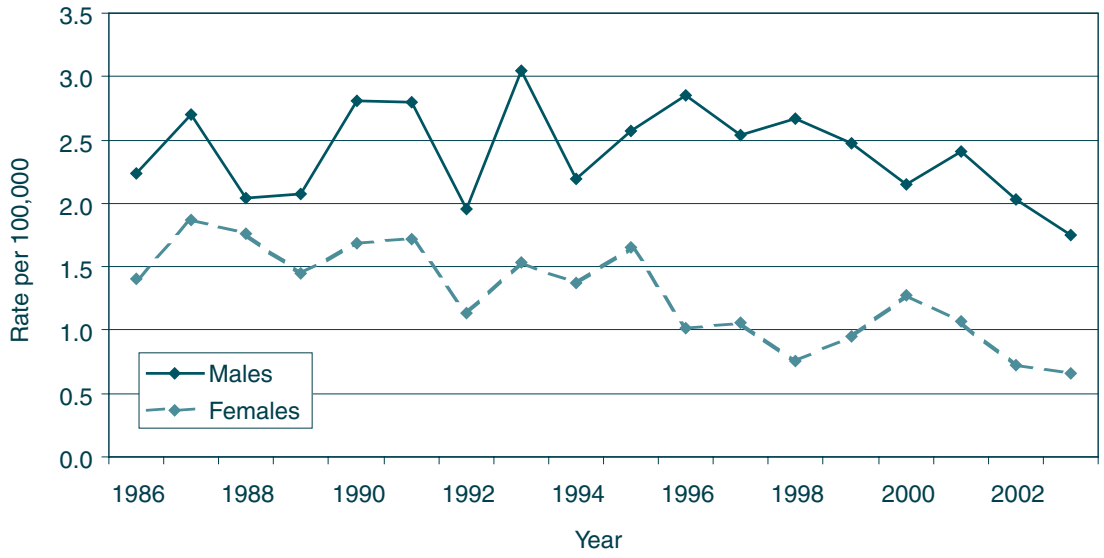

FIGURE 2

AGE-SPECIFIC DEATH RATES FOR INTERPERSONAL VIOLENCE FOR MALES AND FEMALES: NEW SOUTH WALES, 1999–2003

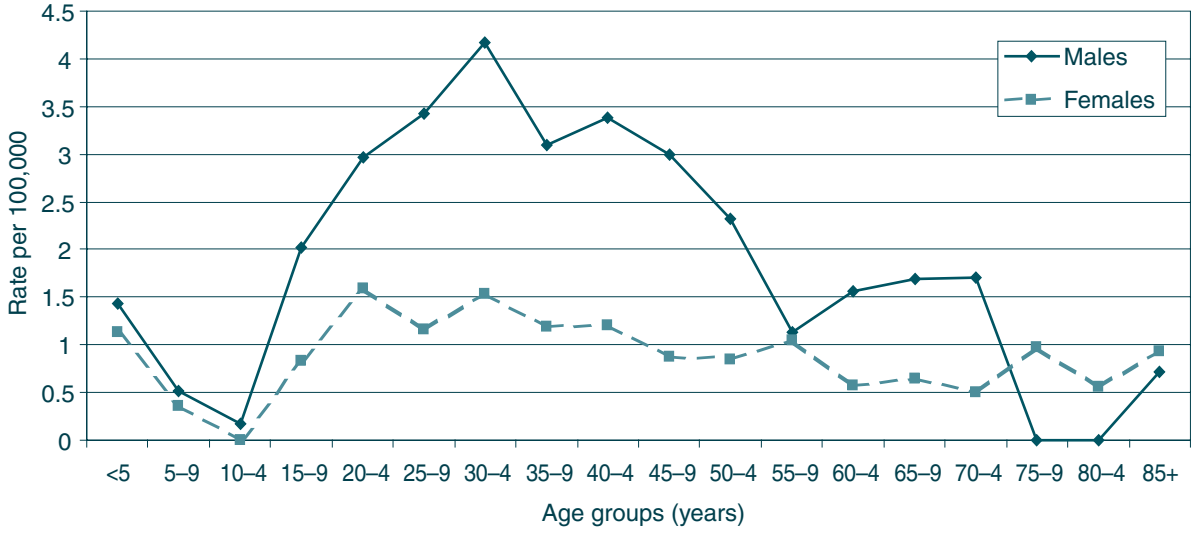

TABLE 1

NUMBER OF DEATHS DUE TO INTERPERSONAL VIOLENCE AND DEATH RATES, BY METHOD USED: NEW SOUTH WALES, 1999–2003

Interpersonal violence method (Ecode)	All persons		Males			Females			Ratio‡
	n	Rate†	n	Rate†	95% CI	n	Rate†	95% CI	
Sharp or blunt object (X99, Y00)	201	0.61	137	0.84	0.70–0.98	64	0.39	0.29–0.48	2.15
Firearm (X93-X95)	118	0.36	95	0.58	0.46–0.70	23	0.14	0.08–0.20	4.10
Bodily force (Y04-Y05, Y07)	64	0.20	54	0.33	0.24–0.42	10	0.06	0.02–0.10	5.42
Hanging, strangulation or suffocation (X91)	38	0.12	11	0.07	0.03–0.11	27	0.16	0.10–0.23	0.41
Poisoning (X85, X87–X90)	13	0.04	6	0.04	0.01–0.07	7	0.04	0.01–0.07	0.87
Other and unspecified means (X86, X92, X96-X98, Y01-Y03, Y06, Y08-Y09)	61	0.19	41	0.25	0.17–0.33	20	0.12	0.07–0.18	2.03
All interpersonal violence (X85–Y09)	**507**	**1.51**	**353**	**2.16**	**1.93–2.38**	**154**	**0.93**	**0.79–1.08**	**2.31**

*Death rates have been age-adjusted using the 2001 Australian estimated residency population (ERP).
† Rate per 100,000 population
‡ Mortality ratio for male/female

for 'hanging, strangulation or suffocation', but these differences were not significant.

The interpersonal violence methods that most often led to a death were 'sharp or blunt object' and 'firearms', which accounted for 40 per cent (n=201) and 23 per cent (n=118) of all interpersonal violence deaths, respectively. The leading method of interpersonal violence death for both males and females was 'sharp or blunt object', accounting for 39 per cent of all male deaths and 42 per cent of all female deaths during 1999–2003.

DISCUSSION

The results of our analyses show that interpersonal violence deaths have decreased over time for both males and females. However, interpersonal violence still remains a leading cause of fatal injury in NSW, with males accounting for approximately 70 per cent of these deaths.

The reasons for the disparity between the sexes cannot be identified using death record data, but the large differences between the methods used may indicate that males are being fatally injured in situations where the presence of sharp or blunt objects and firearms is common. These methods are potentially more lethal than other methods of intentional violence.[12]

The results also showed that three populations are particularly at risk—children aged under five, men aged 15–44 years and people over 60. Although the information provided by the death records is limited, it is conceivable that deaths in children and people aged 60 and over are due to child and elderly abuse and maltreatment, respectively.[1]

For men aged 15–44 years, it is more difficult to speculate on the types of violence that may be occurring. For example, the violence could be youth violence, gang violence, work-place violence or bar fights.

Although information regarding the factors that put men and certain age groups at increased risk of interpersonal violence is not obtainable from death record data, this information may be obtained from other sources.[13] For example, a report on deaths due to assault in children and young people found that factors such as having a parent with a mental illness, family breakdowns and recurrent abuse put children and young people in NSW at risk of fatal assault. [14] Other data sources include coroner's data and police records.[15,16]

These supplemental data sources can be used to explore other aspects of interpersonal violence that need to be understood before prevention policies and practices can be designed. These aspects include information about the events leading up to the incident of interpersonal violence, where it occurred and the persons involved. For example, information about the perpetrator of the violence and the location in which it occurred can be obtained using interpersonal violence hospitalisation records coded since July 2002.[16]

Given the current ICD coding system, death record data is only able to provide information about the demographics of the victims and the methods used to cause their deaths. Other sources of data identified above should be analysed in conjunction with death records to provide a more complete picture of the patterns of interpersonal violence in NSW.

ACKNOWLEDGEMENTS

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A DESCRIPTION OF INTERPERSONAL VIOLENCE-RELATED HOSPITALISATIONS IN NEW SOUTH WALES

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Interpersonal violence (IPV) includes a range of acts and behaviours, including physical violence, and is the term used to describe the intentional use of force or power by one individual or a group of individuals on another person.[1,2] Interpersonal violence has many contributing factors, often interrelated, which can include social, economic, political, cultural, and biological factors.[2]

Interpersonal violence and its effects on health are a growing concern to the public health sector.[3] Worldwide, there are around 520,000 IPV-related deaths (homicides) each year (8.8 per 100,000 population) and many more individuals are hospitalised as a result of IPV.[2]

In NSW, the lifetime cost of fatal and non-fatal physical injuries due to IPV has been estimated at $133.9 million—$21.9 million in direct costs and $112 million in mortality and morbidity costs.[4] Economic analyses of IPV-related prevention strategies have demonstrated that many IPV-related interventions are cost-effective.[5]

This article provides a description of IPV-related hospitalisations in NSW that resulted from a physical injury and includes information on where the incident took place and the relationship of the assailant to the injured person.

METHOD

Hospitalisation data were obtained from the NSW Inpatient Statistics Collection (ISC) for the financial years 1989–90 to 2003–04. The ISC is a census (since July 1, 1993) of patients admitted to public and private hospitals, private day procedures, and public psychiatric hospitals in NSW.[6]

Hospitalisation data include information on episodes of care in hospital which end with the discharge, transfer, or death of the patient, or where the service category for the admitted patient changes. The ISC also includes hospitalisations of NSW residents that occurred in another state or territory. While these data were not available for 2003–04, the number of interstate hospitalisations for this year was imputed based on hospitalisations from the previous three years. A detailed description of the method of imputation used is available elsewhere.[6]

Interpersonal violence-related hospitalisations for NSW residents were identified using the following criteria, all of which had to be met:

- The hospitalisation was for a patient who was a resident of NSW.
- There was a principal diagnosis in the ICD-10-AM range S00-T98 (1998–99 to 2003–04) or in the ICD-9-CM range 800-999 (for 1989–90 to 1997–98).
- There was an external cause code in the ICD-10-AM range X85-Y09 or Y87.1 (1998–99 to 2003–04) or in the ICD-9-CM range E960-E969 (for 1989–90 to 1997–98).

Hospitalisations relating to transfers or statistical discharges were excluded to eliminate 'multiple counts', which occur when an individual has more than one episode of care for a given injury. These exclusions refer to transfers between hospitals or changes in the service category for a patient during the one episode of accommodation in a single facility, respectively.[6] For the years 1999–2000 to 2003–04, the cause of IPV-related hospitalisations were categorised according to the method used to inflict injury (Table 1). Hospitalisations for IPV that ended in death were included in this analysis. Age- and sex-specific population estimates as at 31 December of each of the years under study were obtained from the NSW Department of Health and the Australian Bureau of Statistics. The place of occurrence of the incident for the years 2000–01 to 2003–04 and the relationship between the perpetrator and the victim of the violence for the years 2002–03 to 2003–04 were extracted. These were the years for which this information was available in the ISC.

Analyses were performed using SAS software.[7] Directly age-standardised rates were calculated using the estimated Australian residential population as at 30 June 2001 as the standard population. Ninety-five per cent confidence intervals were calculated assuming a Poisson distribution.[8] A negative-binomial regression analysis[9] was performed to examine the statistical significance of changes in the trend over the time period 1989–90 to 2003–04, and to calculate the annual percentage change in the rate of hospitalisations.

RESULTS

During the period 1999–2000 to 2003–04, there were 29,701 hospitalisations due to IPV, at a rate of 90.8 per 100,000 population (Table 1). There were approximately 5,940 hospitalisations per year during 1999–2000 to 2003–04 due to IPV.

Rates of hospitalisation for IPV were almost three times higher in males than females for the period 1989–90 to 2003–04 (Figure 1). The hospitalisation rate was estimated to have increased significantly by 0.9 per cent each year for males (95 per cent CI for the annual increase: 0.3 per cent to 1.5 per cent), and increased significantly by 2.7 per cent each year for females (95 per cent CI for the annual increase: 1.9 per cent to 3.5 per cent).

Rates of hospitalisation for IPV were higher in males than females for all age groups during 1999–00 to 2003–04

(Figure 2). Males aged 20–24 years had the highest hospitalisation rates for injuries due to IPV.

For the period 1999–2000 to 2003–04, IPV using bodily force accounted for just over half (58.0 per cent) of the hospitalisations due to IPV (Table 1). For males, bodily force represented over three-quarters of the hospitalisations for IPV. The overall hospitalisation rate for males was about 266 per cent higher than for females.

For females, the most common relationship between the perpetrator and the victim was spouse or domestic partner

TABLE 1

NUMBER AND RATE OF HOSPITALISATIONS FOR INJURY FOR MALES AND FEMALES IN NEW SOUTH WALES CAUSED BY DIFFERENT TYPES OF INTERPERSONAL VIOLENCE 1999–2000 TO 2003–04

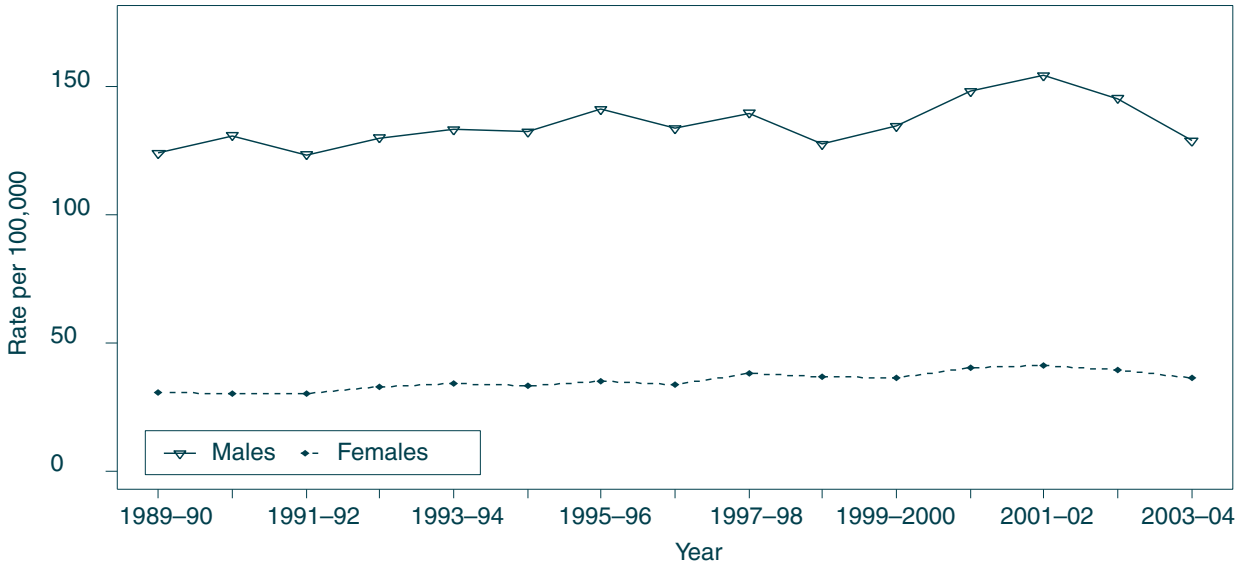
	All persons			Male			Female		
Interpersonal violence method	**n**	**Rate***	**95% CI**	**n**	**Rate***	**95% CI**	**n**	**Rate***	**95% CI**
Bodily force (Y04–Y05, Y07)	17,238	52.7	51.9–53.5	13,000	79.1	77.7–80.4	4,239	26.0	25.2–26.8
Sharp or blunt object (X99, Y00)	6,830	20.9	20.4–21.4	5,870	35.7	34.8–36.7	960	5.9	5.5–6.3
Firearm (X93–X95)	308	0.9	0.8–1.1	286	1.7	1.5–1.9	22	0.1	0.1–0.2
Poisoning (X85, X87–X90)	5,172	15.8	15.4–16.2	4,132	25.1	24.4–25.9	1,039	6.3	5.9–6.7
Suffocation (X91)	39	0.1	0.1–0.2	15	0.1	0.1–0.1	24	0.1	0.1–0.2
Other (All remaining IPV codes)	5,172	15.8	15.4–16.2	4,132	25.1	24.4–25.9	1,039	6.3	5.9–6.7
All‡	**29,701**	**90.8**	**89.8–91.8**	**23,356**	**142.1**	**140.3–143.9**	**6,343**	**38.8**	**37.8–39.8**

* Rate per 100,000 population.

‡ The number of NSW residents hospitalised interstate during 2003–04 was imputed and as a result the sum of sub mechanisms may not equal the total.

FIGURE 1

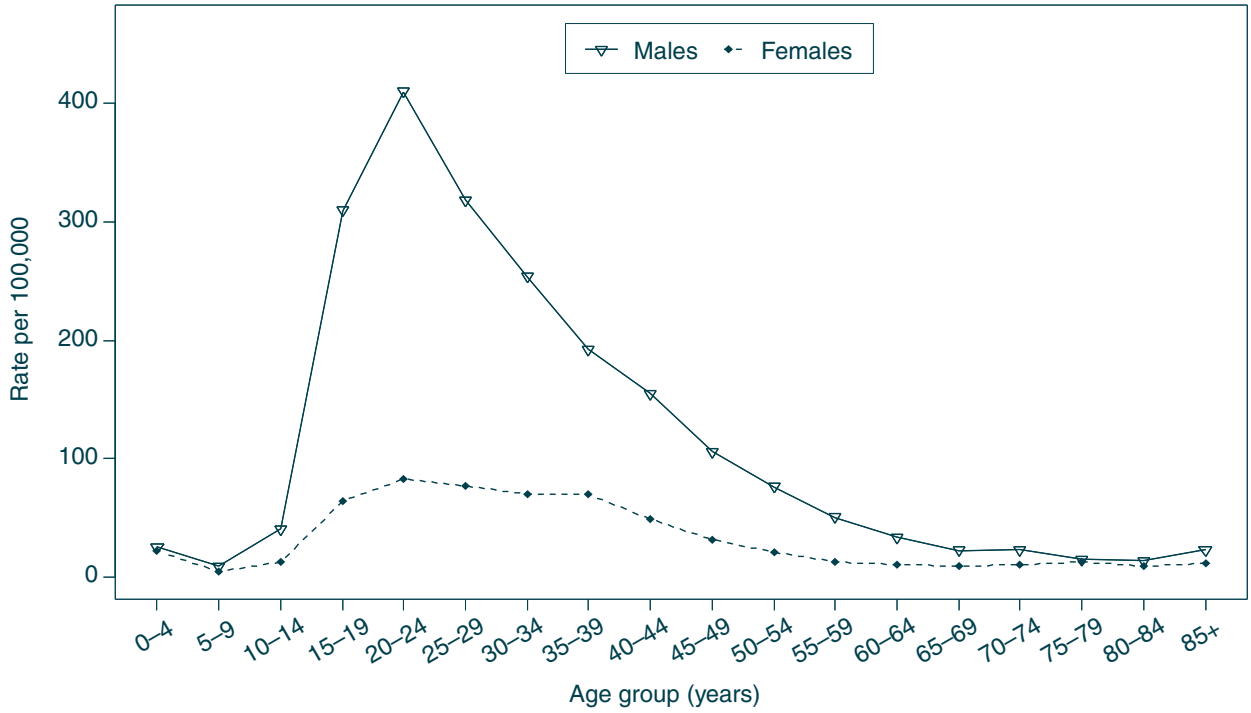
HOSPITALISATION RATE* FOR INJURY DUE TO INTERPERSONAL VIOLENCE FOR MALES AND FEMALES, NEW SOUTH WALES 1989-90 TO 2003-04



* Age-standardised rate per 100,000 population.

FIGURE 2

AGE-SPECIFIC HOSPITALISATION RATE FOR INTERPERSONAL VIOLENCE FOR MALES AND FEMALES, NEW SOUTH WALES: 1999-00 TO 2003-04



(39.2 per cent). For males, the relationship with the perpetrator was coded as 'unspecified person' for nearly two-thirds (65.1 per cent) of hospitalisations (Table 2).

Place of occurrence was recorded as unspecified for about half (49.2 per cent) of IPV-related hospitalisations in NSW from 2000–01 to 2003–04 (Table 3). For females, the most commonly recorded location was the home (42.2 per cent), while for males it was a trade or service area (13.5 per cent).

DISCUSSION

Interpersonal violence was the sixth leading cause of injury-related hospitalisation for the period 1999–00 to 2003–04, and accounted for 4.9 per cent of all injury-related hospitalisations.[10] This analysis shows that IPV is one of the leading causes of injury-related hospitalisation in NSW. In the period 1989–90 to 2003–04, rates of IPV-related hospitalisations increased significantly in NSW for both males and females. However, because of changes in coding and possible changes in hospital admission practices over time, caution should be exercised when interpreting these trends.

Bodily force was the most common method of IPV that caused hospitalisation for all age groups. The results suggest that males aged 15–44 years are a population at particular risk, as they had very high rates of hospitalisation compared to all other age groups. The very high rate of IPV-related hospitalisation among males aged 20–24 years has been noted elsewhere and may be due to a number of factors including substance use, family-related factors, peer influence, and situational and exposure-related factors.[11]

Hospitalisations as a result of IPV only represent a proportion of the burden from this mode of injury. Interpersonal violence-related deaths accounted for 4 per cent of all injury-related deaths during 1999 to 2003 in NSW[12], and the number of injuries as a result of IPV that do not require hospitalisation or where medical treatment was not sought (or available) has not been quantified in NSW. There is the potential in NSW to develop mechanisms that would assist in the estimation of the often less serious injuries that do not require hospitalisation. However, currently the number and rate of emergency department presentations and general practice visits in NSW caused by IPV are not easily obtainable across the state.

A better understanding of IPV-injuries that resulted in hospitalisation would also require information about the relationship between the perpetrator and the victim of the violence. Although this information became available in ISC data in 2002–03 with the introduction of ICD-10-AM 3rd edition, the perpetrator of the violence was coded as an unspecified person for nearly two-thirds (65.1 per cent) of hospitalisations of males in 2002–03 and 2003–04. However, for females who were hospitalised the perpetrator of the violence was coded as an unspecified person in less

TABLE 2

RELATIONSHIP OF THE ASSAILANT TO THE INJURED PERSON FOR INJURY HOSPITALISATIONS DUE TO INTERPERSONAL VIOLENCE IN NEW SOUTH WALES, 2002–03 TO 2003–04*

	All persons		Male		Female	
	n	%	n	%	n	%
Relationship of the assailant to the injured person						
Spouse or domestic partner	1,150	10.1	185	2.1	965	39.2
Parent	256	2.2	142	1.6	114	4.6
Other family member	437	3.8	275	3.1	162	6.6
Carer	20	0.2	5	0.1	15	0.6
Acquaintance or friend	671	5.9	490	5.5	181	7.3
Official authorities	66	0.6	61	0.7	5	0.2
Person unknown to the victim	1,267	11.1	1,118	12.5	149	6.0
Multiple persons known to the victim	500	4.4	465	5.2	35	1.4
Other specified person	504	4.4	388	4.3	116	4.7
Unspecified person	6,551	57.4	5,830	65.1	721	29.3
Total	**11,422**	**100.0**	**8,959**	**100.0**	**2,463**	**100.0**

*Does not include interstate hospitalisations of NSW residents for 2003–04.

TABLE 3

LOCATION OF THE INJURY INCIDENT FOR HOSPITALISATIONS DUE TO INTERPERSONAL VIOLENCE IN NEW SOUTH WALES, 2000-01 TO 2003-04*

	All persons		Male		Female	
	n	%	n	%	n	%
Location of incident						
Home	4,724	18.0	2,387	11.5	2,337	42.2
Residential institution	530	2.0	476	2.3	54	1.0
School, other institution and public administrative area	558	2.1	464	2.2	94	1.7
Sports and athletics area	225	0.9	206	1.0	19	0.3
Street and highway	2,763	10.5	2,396	11.6	367	6.6
Trade and service area	3,092	11.8	2,802	13.5	290	5.2
Industrial and construction area	137	0.5	126	0.6	11	0.2
Other specified place of occurrence (including farm)	1,171	4.5	1,000	4.8	171	3.1
Unspecified place of occurrence	12,900	49.2	10,735	51.9	2,164	39.1
Missing	137	0.5	104	0.5	33	0.6
Total	**26,237**	**100.0**	**20,696**	**100.0**	**5,540**	**100.0**

*Does not include interstate hospitalisations of NSW residents for 2003–04.

than one third of records (29.3 per cent). Because of this lack of detail, it is difficult to obtain accurate estimates of the rates of IPV according to the type of relationship between perpetrator and victim, such as 'intimate partner (domestic)' violence, 'family' violence, or 'community' violence, particularly for males.

The place of occurrence for an IPV-related hospitalisation is also recorded in hospitalisation data. Disappointingly, this variable was coded as 'unspecified' for around half (50.8 per cent) of IPV-related hospitalisations in NSW from 2000–01 to 2003–04. In addition, the level of specificity of coding does not allow detection of IPV-incidents at licensed premises, except through the multiple location code of 'trade and service area, cafe, hotel and restaurant'.

The design of relevant intervention strategies that are likely to be effective in preventing IPV relies on the ability to access detailed information regarding the IPV incident and its circumstances. Improved recording of the relationship between the victim and perpetrator of IPV-related injuries and the place of occurrence of an IPV incident in hospitalisation data would assist in the monitoring and subsequent prevention of IPV injuries in NSW.

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DRUG-RELATED AGGRESSION AMONG INJECTING DRUG USERS

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Recent years have seen the diversification of the methamphetamine markets in Australia, with increased availability and the use of more potent forms of methamphetamine such as ice/crystal and base methamphetamine.[1] Intoxication due to the use of stimulants such as methamphetamine has been associated with aggressive and violent behaviour. The connection is not a direct causal relationship, but is thought to be influenced by a number of other factors such as individual, situational and cultural factors.[2,3,4,5]

As a consequence of these changes to the methamphetamine market, there has been understandable concern that there could also be a concomitant increase in aggressive behaviour among those using the drug.

An association between alcohol and aggression is established[2,3], although a range of other factors, such as context, pharmacology and individual differences, also play a role. [3,6, 7] Evidence supporting a link between benzodiazepines and aggression is less conclusive. However, as with alcohol, a wide range of variables including age, genetics, mood, environment and personality characteristics, such as poor impulse control, have been implicated in modifying individual responses.[8,3]

This article examines associations between self-reported aggressive behaviour and substance use among an Australia-wide sample of injecting drug users (IDU), where substance-related aggression was defined as aggression while being either under the influence of a drug or during withdrawal.

METHODS

The study utilised the cross sectional survey component of the Illicit Drug Reporting System (IDRS), an annual survey of IDU in metropolitan Australia.

Participants were injecting drug users (n=948) recruited in key drug market areas in capital cities in all Australian jurisdictions. To be eligible, participants had to have been injecting at least monthly during the six months preceding the interview and have lived for at least 12 months in the capital city in which they were interviewed. Data are presented here from 2004. The number of participants from each state or territory were: NSW 157, Victoria 150, Northern Territory 111, Queensland 129, Australian Capital Territory 100, South Australia 101, Tasmania 100, and

TABLE 1

DEMOGRAPHIC CHARACTERISTICS OF THE INJECTING DRUG USER SAMPLE, (N=948), AUSTRALIA, 2004

Characteristic	%
Male	66
English-speaking background	95
Aboriginal or Torres Strait Islander*	10
Employment:	
Unemployed / on income support	77
Full-time employment	10
Part-time / casual employment	5
Student	2
Home duties	6
Prison history	46
Currently in drug treatment	
Methadone	30
Buprenorphine	12
Other†	4
Not currently in treatment	54

Source: Illicit Drug Reporting System

* Percentage reflects all jurisdictions except NSW, where data were not collected in 2004.

† Includes, but is not restricted to, counselling, naltrexone, detox, therapeutic community and Narcotics Anonymous.

Western Australia 100. Each jurisdiction aims to recruit 100 participants each year, with the exception of NSW and Victoria, where 150 are recruited.

The IDRS IDU survey contains questions on a number of areas including: demographic information; drug use history; the price, perceived purity and availability of illicit drugs; criminal activity; injecting risk behaviours; health; and general drug trends. In 2004, in response to concerns raised about substance-related aggression, the following self-report items were included: 'In the last six months have you become verbally aggressive [threatening, shouting, abusive] following the use of alcohol and/or any other drug?' and 'In the last six months have you become physically aggressive [shoving, hitting, fighting] following use of alcohol and/or any other drug?' Questions were worded in such a way that participants might interpret them as referring to while they were under the influence of a drug, while experiencing withdrawal, or both. The questions could be answered by referring to incident(s) in which one or both forms of aggression (verbal/physical) were experienced. Multiple drugs could be nominated, referring to one or more occasions of aggression. However, it was not possible to identify particular combinations of drugs that may have been implicated.

IDU were interviewed between June and August of each year. Interviews took approximately 30 to 50 minutes to complete. The method of recruitment has remained consistent across years and jurisdictions, and further details are available elsewhere.[9]

Data were analysed using SPSS for Windows, Release 13.0 (2004). Statistical tests were two tailed using a 5 per cent level of significance. Categorical variables were analysed using a multivariate logistic regression and odds ratios with 95 per cent confidence intervals were calculated.

RESULTS

Demographics

The majority of the sample were male, from an English-speaking background, and with a mean age of 33 years (see Table 1). The IDRS sample in general represents a marginalised group, with large numbers of participants reporting that they were unemployed or receiving income support (77 per cent), had significant prison histories and were poorly educated (with a mean of 10 years of education,

TABLE 2

FREQUENCY OF DRUG USE* IN THE PAST SIX MONTHS AMONG INJECTING DRUG USERS, BY DRUG, AUSTRALIA 2004 (N=948)

Drug	Injecting drug users reporting use in the past 6 months		Median number of days used in the past 6 months among those reporting use in the past 6 months	
	n	%		
Heroin	657	69	72	(3 days/week)
Benzodiazepines	633	67	30	(1–2 days/week)
Alcohol	645	68	12	(once per fortnight)
Speed (powder form)	501	53	9	
Base	357	38	10	
Ice	488	52	6	
Methamphetamine (any form)†	689	74	22	(once per week)

Source: Illicit Drug Reporting System

* ' Use' refers to any of the following: injection, inhalation, ingestion and/or intranasal administration.

† Includes 'speed' (the powder form, rather than the generic term applied to all forms of amphetamine/methamphetamine), base (aka 'pure'), ice (aka 'crystal', 'shabu') and liquid methamphetamine ('oxblood').

range 2-13 years). Although not strictly comparable, only 5 per cent of the general population are unemployed at any one time (this figure does not include those on income support).[10]

Recent drug use

Recent use refers to use on at least one occasion in the six months preceding the participant's interview. As has been demonstrated elsewhere, polydrug use is the norm among Australian IDU, and high rates of polydrug use were observed in this sample (Table 2). Full results of recent drug use patterns by the 2004 national sample are reported elsewhere.[9]

Self-reported aggressive behaviour

Overall, 28 per cent of participants reported becoming verbally aggressive following use of alcohol and/or another drug in the six months preceding their interview (Figure 1). A smaller proportion (15 per cent) reported becoming physically aggressive following substance use in the preceding six months. There were no significant gender differences. The most commonly reported drugs after which aggression occurred were alcohol, methamphetamine (particularly ice/crystal), benzodiazepines and heroin.

Logistic regressions were conducted to determine predictors of verbal and physical self-reported substance-related aggression. Variables that were significant at the univariate level were included in the model; these were drug of choice, age, arrest within the past year and self-reported crime in the past month. Participants reporting methamphetamine (including ice/crystal) as their drug of choice were significantly more likely to report becoming verbally and physically aggressive than those reporting preference for another drug (Table 3).

Age was also significantly associated with substance-related physical aggression, with younger IDU (under 25 years of age) more likely to report becoming physically aggressive following use of a drug than those aged 25 and over (Table 3). This was not due to heavier methamphetamine use in this group. There was no association between particular age groups and self-reported verbal aggression.

Criminal activity

Participants reporting a prison history (46 per cent of the sample) were no more or less likely to report substance-related aggressive behaviour towards another person. Those who reported having been arrested in the preceding 12 months (42 per cent of the sample), however, were more likely to report having become verbally and/or physically aggressive following drug use (Table 3).

Those IDU who reported committing a crime in the preceding month (49 per cent, n=453) also reported significantly higher levels of aggression than those who did not report recent criminal activity (Table 3).

BOX 1

POLICIES FOR HEALTH SERVICES TO HELP MANAGE POTENTIAL AGGRESSIVE BEHAVIOUR AMONG THE INJECTING DRUG USER POPULATION

- The development and regular review of management strategies for staff and client safety
- Improving the competence and safety of staff working with clients or users who may be prone to aggressive behaviour. This may include training for dealing with difficult clients, increasing awareness of security protocols for staff, and improving co-operative links between mental health, law enforcement and drug service personnel.
- Providing anger management and assertiveness training to health service clients, particularly younger users.
- Providing staff training in the identification, management and/or treatment of individuals with signs of amphetamine psychosis.

DISCUSSION

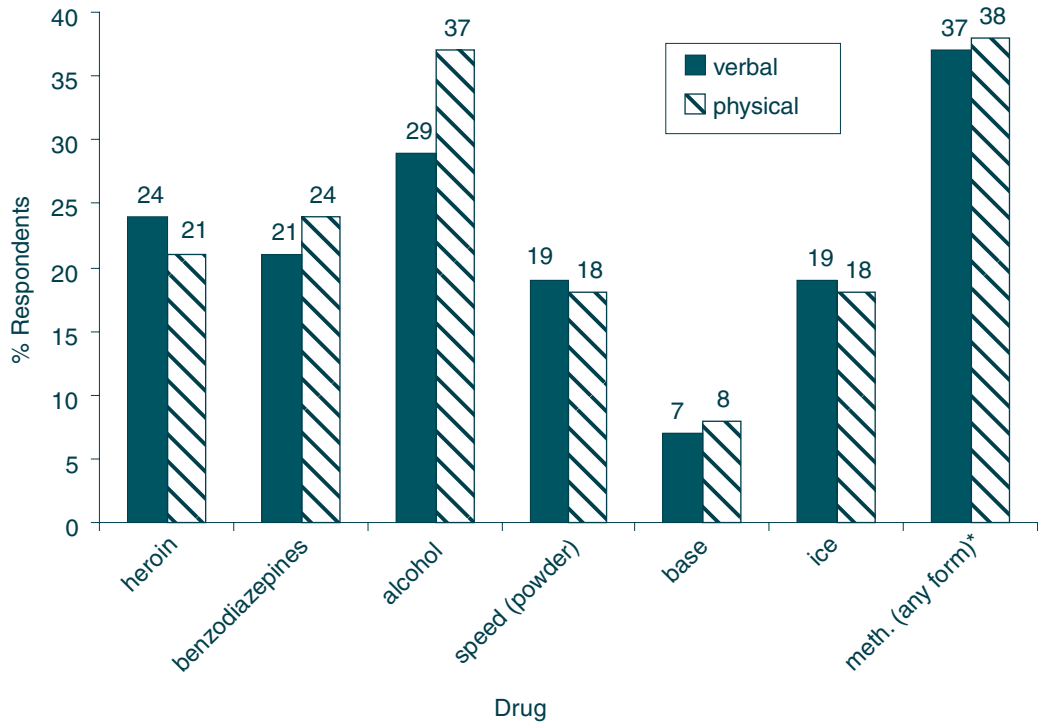
Although collection of more specific information surrounding the frequency, occasions, situations and contexts in which aggression occurred was beyond the scope of the current project, these findings confirm anecdotal reports suggesting that injecting drug users both experience and are subject to substantial levels of substance-related aggression. Consistent with previous research, three of the four most commonly reported drugs preceding aggressive behaviour were alcohol, methamphetamine (particularly ice/crystal) and benzodiazepines.

It may seem surprising that heroin, a depressant not known for its aggression-inducing qualities, was also commonly nominated as being linked to aggressive behaviour. This may be due partly to the high rates of heroin use among the sample as a whole. It is also likely, however, that results may reflect behaviors during withdrawal from heroin—for example being more prone to aggression when feeling unwell, and/or engaging in aggressive behaviour to obtain the drug— rather than its direct effects per se. This will be investigated in more detail in the 2005 IDRS (forthcoming).

Participants with a preference for methamphetamine were more likely to report becoming verbally and physically aggressive following use of a drug than participants nominating another substance (typically heroin) as their drug of choice. As methamphetamine is increasing in availability in NSW, police and health agencies may see an increase in methamphetamine-related aggression or violence. This has implications for treatment services, given that half of the current sample were engaged in treatment (mainly opioid pharmacotherapy). Box 1 contains a list of measures that could assist health and other sectors

FIGURE 1

PROPORTIONS OF INJECTING DRUG USERS REPORTING VERBAL AND PHYSICAL AGGRESSION FOLLOWING USE OF A DRUG (N=948), AUSTRALIA, 2004



Source: Illicit Drug Reporting System

* Includes 'speed' (referring to the powder form, rather than the generic term applied to all forms of amphetamine/methamphetamine), base (aka 'pure'), ice (aka 'crystal', 'shabu') and liquid methamphetamine ('oxblood'; not shown separately).

TABLE 3

PROPORTIONS OF INJECTING DRUG USERS REPORTING SUBSTANCE-RELATED AGGRESSION, AND ODDS RATIOS, FOR DRUG OF CHOICE, AGE GROUP, RECENT ARREST AND CRIME COMMITTED IN PAST MONTH, (N=948), AUSTRALIA, 2004

		Participant becomes verbally aggressive			Participant becomes physically aggressive		
	n	%	OR	95% CI	%	OR	95% CI
Drug of choice							
Methamphetamine (any form) †	190	37	1.69	1.18–2.37**	21	1.68	1.10–2.57*
Other^	758	25			14		
Age group							
Under 25 yrs	171	36	1.33	0.92–1.92	23	1.63	1.06–2.50*
25 years and over	777	26			13		
Arrested in past 12 months							
Yes	398	34	1.42	1.04–1.92*	20	1.52	1.04–2.24*
No	545	23			11		
Unknown	5						
Committed crime in last month							
Yes	453	34	1.75	1.29–2.38***	21	2.18	1.47–3.24***
No	485	21			10		
Unknown	10						

Source: Illicit Drug Reporting System

† Including ice/crystal (n=86)

^ In the 'other' category, heroin was by far the most commonly reported drug of choice (n=545), followed by cannabis (n=68), morphine (n=55) and cocaine (n=30).

* p<0.05 **p<0.01 ***p<0.001

who regularly interact with this population to manage the potential for aggressive behaviour.

Younger IDU were more likely to report physically aggressive behaviour than were their older counterparts. IDU who had been arrested in the past year were also more likely to report substance-related aggression, as were IDU who reported committing a crime in the month preceding interview. This suggests that aggressive individuals may be more likely to come to the attention of police and have greater involvement with law enforcement and related agencies such as the Magistrates Early Referral Into Treatment program (MERIT) and Drug Courts.

These findings suggest that for a proportion of IDU, but not all, there is a link between substance use and aggressive behaviour. Unfortunately it was not possible to assess this association over time as survey items concerning substance-related aggression were first included in the IDRS questionnaire in 2004. Within this sample, it did appear that methamphetamine was attributed by IDU as being one of the drugs most commonly linked to aggressive behaviour—this was particularly true of ice/crystal.

Some drug users may be more likely to come to the attention of police because of a combination of individual predisposition and the effects of drug use. This finding suggests the importance of improving the awareness and knowledge of where to seek help among substance users, and developing harm reduction messages around methamphetamine use, such as having rest breaks between occasions of use.

While aggression may be an important issue in relation to methamphetamine use, this should not detract attention from other substances identified as related to aggression, for example alcohol, heroin and benzodiazepines. Further, the context within which substance-related aggressive incidents occur should also be considered, as previous research (and common sense) suggests that a combination of factors in addition to substance use may mediate aggressive behaviour, and might be usefully considered in future work.

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PRISON VIOLENCE: PERSPECTIVES AND EPIDEMIOLOGY

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Violent crime receives considerable media attention. Its importance to the community is such that it is used as a yardstick against which to judge the effectiveness of social policy and the performance of governments. Programs and interventions to reduce violence and its consequences are needed given the level of community concern and the impact violence has on both the victim and society. Many of those who commit violent crimes receive custodial sentences and spend prolonged periods behind bars. Violence in prison presents a challenge to custodial authorities because of the risk of injury to prisoners and staff, and the impact violence has on the provision of services, staffing, contact between inmates, and rehabilitation. In this article we present the rates of violent crime in Australia, NSW and within NSW prisons. We also outline some of the major theories that seek to explain violence in prisons, and discuss the difficulties in recording violence within prisons. Recent findings from the Prison Injury Surveillance Program by Justice Health are also presented.

CRIME IN AUSTRALIA

The latest Australian crime data reported 197,612 violent acts (homicide, assault, sexual assault, robbery, and kidnapping) for 2003, an increase of 35 per cent from 145,902 in 1996.[1] Assaults account for most (80 per cent) of these incidents. During the same period, the national rate of crime per 100,000 adults increased by 53 per cent (from 740 to 1130), assault increased by 23 per cent (from 652 to 804), sexual assault was up by 11 per cent (from 83 to 92) and robbery rose by 6 per cent (from 94 to 100). Homicide, however, fell 15 per cent (from 2.0 to 1.7).

Comparing rates of violent crime across international jurisdictions is difficult, mainly because of the use of different recording methods. However, one comparison of criminal justice statistics from 39 countries ranked Australia in the middle-range with respect to both the number of crimes and the increasing trend.[2] A comparison of crime rates during 1996–2003 with three other industrialised nations reveals Australia had the second worst violent crime rate after the United Kingdom. During this period Australia and the United Kingdom had an increasing rate of violent crime, while Canada and the United States had a falling rate.[3]

The full-time Australian prison inmate population in 2005 was 25,353, with approximately 35 per cent held in NSW prisons.[4] Despite an observed increase in the rate of violent crime, the proportion of prisoners charged with, or convicted of, a violent crime has remained unchanged since 1996 at around 47 per cent. Repeat offenders comprise a large proportion of the prisoner population. In NSW, for instance, 44 per cent of prisoners released in 2002–03 returned to prison within two years.[5] Prisoners released from a term of imprisonment for assault and robbery have the highest rate of return to custody.

PERSPECTIVES ON PRISON VIOLENCE

Criminal behaviour often continues during incarceration. Studies show that inmate misconduct, inmate – correctional officer discord, prison gang violence, and rioting occur even in well managed correctional facilities. Nevertheless, most empirical data indicates lower rates of violence in prison than on the streets, even when prisons are compared with the high crime rate districts from which offenders are drawn. An inmate from a maximum security prison in the United States provided the following insight:

> 'If you expect the usual prison tale of constant violence, brutal guards, gang rapes, daily escape efforts, turmoil, and fearsome adventure, you will be disappointed. Prison life is really nothing like what the press, television, and movies suggest. It is not a daily round of threats, fights, plots, and "shanks"- though you have to be constantly careful to avoid situations or behaviour that might lead to violence. A sense of impending danger is always with you; you must be careful to move around people rather than against or through them, but with care and reasonable sense you can move safely enough. For me and many like me in prison, violence is not the major problem; the major problem is monotony.'[6]

Penologists attempt to explain inmate misconduct and violence in terms of 'importation' and 'deprivation' theories: the former centres on violent inmates while the latter portrays inmate violence as a product of the prison milieu. Both theories are based on broader cultural and structural perspectives that have been developed by sociologists to explain patterns of violence in the broader society.

Most of the literature on prison violence deals with the characteristics of the prisoner population. The 'importation' or 'cultural' model attributes inmate conduct to the influence of pre-prison identities, values, and experiences.[7,8] Factors that correlate with violence are common in prisoner populations – a young, predominantly male environment, low socio-economic status, histories of abuse and neglect, poor educational attainment, unemployment, social isolation, interpersonal conflicts, financial dependence, mental illness and substance abuse.

Age is one of the best predictors of prison violence.[9] Younger inmates are volatile, more resistant to prison

officials, and more likely to be involved in violent acts. One study from the United States described the violence-related misconduct of inmates in a large state prison. The authors identified the following offender groups: 'innocents' (no prison violence), 'once only offenders', 'minor recidivists' (2–4 violations), 'chronic offenders' (5–29 prison offences), and 'extreme chronic offenders' (30+ prison offences). According to the author a small cadre of inmates accounted for 100 per cent of the homicides, 75 per cent of the rapes, 80 per cent of the arsons, and 50 per cent of the aggravated assaults occurring behind bars.[10]

The 'deprivation' or 'prisonisation' model, on the other hand, provides a structural explanation that views inmate behaviour as a response to the stressful and oppressive conditions within the prison itself. Prison specific characteristics such as crowding, visiting patterns, involvement in prison programs, and rule enforcement are all related to prison violence.[11,12] Such deprivations may provide some inmates with an incentive for the exploitation and predation of other inmates as a means of reducing the pain of imprisonment.[13]

While these two perspectives offer valid arguments for explaining prison violence, neither model alone can adequately predict inmate misconduct. As Porporino and Zamble[14] suggest, 'Generally speaking, there are few attitudinal or behavioural dispositions that are so powerful as to totally determine actions in all situations, and few environmental events which can compel identical responses from people with varying dispositions. We would expect that the interaction between the individual and his environment would be the most powerful determinant of behaviour'.

NEUROPSYCHIATRIC FACTORS IN VIOLENT BEHAVIOUR

Recently, attention has focused on examining the role of neuropsychiatric factors in violent behaviour among offender populations. Indeed, the link between impulsivity and offending has long been established in the criminology literature. Heilbrun developed a rating scale to classify offences based on independent assessments of police reports.[15] Violent crimes (manslaughter, murder, assault and rape) were more likely to be classified as impulsive while non-violent crimes (arson and forgery) were the least impulsive offences.

Impulsive aggression is a common complication of traumatic brain injury (TBI), reflecting the special vulnerability of frontal lobe structures to trauma. Although persistent sequelae are more common with increasing severity of TBI, even a single, apparently mild TBI may be associated with neuropathological abnormalities and ongoing behavioural and/or cognitive impairments.[16,17] A number of studies suggest a link between TBI and offending behaviour.[18]

Following reports from prison health staff that many prisoners appeared to have histories of TBI, we examined neuropsychiatric factors in two studies. Firstly, the 2001 NSW Inmate Health Survey found that over 45 per cent of prisoners reported sustaining a head injury resulting in a loss of consciousness.[19] Being struck by an object or person (a euphemism for assault) was the most common cause of the head injury (60 per cent). This work was expanded in the Hunter Area where it was found that 80 per cent of detainees entering the criminal justice system had experienced a TBI sufficient to cause at least transient confusion at some time in the past, and 65 per cent reported a head injury associated with loss of consciousness. These findings suggest that biological factors have an important role to play in offending behaviour but require further investigation to support the biological perspective.

One intriguing study undertaken at a young offender institution in the United Kingdom[20] found that supplementing inmates' diets with vitamins, minerals, and fatty acids resulted in a 26 per cent reduction in disciplinary incidents (including violence) in the inmates given supplements compared with those receiving placebos. The control group showed little change in antisocial behaviour. Hibbeln[21] published a study entitled *Seafood consumption and homicide mortality* and found a remarkable correlation between a higher intake of omega-3 fatty acids (most often obtained from fish) and lower murder rates. These studies and the evidence mentioned above support the notion that brain metabolism has a role to play in violent behaviour.

RECORDING VIOLENCE IN PRISON

Overall, serious violence-related misconduct is relatively infrequent in prison. In a study on a probability sample of 1,005 inmates in the United States[10], with the exception of simple assault (14 per cent), threatening staff (12.5 per cent), and weapons possession (12 per cent), most inmates were not involved in serious offences. Indeed, the prevalence for aggravated assault (8.6 per cent), rioting (5.4 per cent), arson (2.1 per cent), rape (0.4 per cent), and homicide (0.3 per cent) were low. In this study, minor recidivists, chronic offenders and extreme chronic offenders made up 16 per cent, 33 per cent and 8 per cent respectively of the inmate population.

Using data from the United States Federal prisoner population for 1991–1998, Harrer and Langan[22] found the rate of serious violent misconduct (murder/attempted murder, serious assault, and weapons possession) during the first year in prison to be 0.71 per 100 in men, while less serious violent misconduct (fighting, bodily harm, less serious assault) was 4.56 per 100 men. For women, the comparable rates were 0.08 per 100 for serious violent misconduct and 2.53 per 100 for less serious violent misconduct.

According to a 2001 NSW Department of Corrective Services report[23], there was a rate of 14.7 per hundred

inmates for prisoner-prisoner assaults causing non-serious injuries and a rate of 2.8 per hundred inmates involving minor injuries. Maximum and medium security prisons were found to have a much higher rate of assaults than minimum security facilities (25.6, 22.0 and 9.5 per hundred inmates respectively).

Reporting violence in prison through official channels is difficult. Recorded incidents grossly underestimate the actual level of institutional violence, particularly among certain groups (for example women). It is also recognised that some groups are under greater scrutiny from the authorities and are therefore over-represented in official reporting systems. Perpetrators often invite punitive retribution from the authorities and victims incur the wrath of fellow inmates for violating the prisoners' code of silence. To overcome this, Hewitt[24] used a questionnaire-based approach comparing inmates' self-reported violations with prison guards' observations of rule violations and those documented in official records. He found that:

- Inmates were more extensively involved in misconduct than is presumed from official records.
- Guards observed nearly as many acts of misconduct as admitted by inmates, but reported very few of them.
- The findings bore little relationship to the sex or race of inmates.

NSW PRISON INJURY SURVEILLANCE

The European Committee for the Prevention of Torture and Inhuman or Degrading Treatment or Punishment has recommended that 'prison health care services can contribute to the prevention of violence against detained persons, through the systematic recording of injuries'.[25] To this end, NSW Justice Health established a pilot surveillance project in 2002 to examine injury presentations to the prison clinics.[26] Assaults were the second most common injury treated by the prison nurses (24 per cent of all injuries). They were most often associated with injuries to the eyes (26 per cent), head (21 per cent) and face (18 per cent). The value of injury surveillance is seen in the rich information it yields and the potential for this to inform the development of interventions to reduce violence. For example, we identified that assaults occurred in similar proportions in both violent (homicide, sexual, robbery, assault) and non-violent (property, driving, fraud, drugs, order breaches) offenders and were more common on Sundays. Fifty-three per cent of injuries reported on Sundays were intentional compared with a weekday average of 23 per cent. Sunday is a day traditionally reserved for family visits. This surveillance system has now been expanded to seventeen correctional facilities across NSW.

SUMMARY

Many prisoners have histories of exposure to inter-personal violence and continue to be at risk of further violence during incarceration. Programs to reduce violence during imprisonment are needed, as are interventions that reduce violent offending on release from prison. Preventing assaults and violence in prison may be difficult given the nature of the correctional environment and some of the possible causes of violent behaviour. Criminology is replete with well intentioned programs based largely on sociological theories with limited evidence to support them. There is a trend towards taking process evaluation and qualitative feedback as evidence in support of a program rather than utilising more rigorous studies that generate higher levels of evidence. Many of these programs ultimately fail. It is likely that successful interventions will require a multi-disciplinary approach taking into account personal, environmental and biological factors. In addition, reliable and accurate injury surveillance systems are necessary to detect broad trends in violence within prisons.

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FACT*SHEET*

DIOXINS

WHAT ARE DIOXINS?

Dioxins are produced by natural processes (eg.bushfires) and industrial processes (eg.power generation, pesticide manufacture). Dioxins occur in small amounts in air, water and soil throughout the world. Dioxins do not break down easily in the environment and their concentration increases up the food chain. Nearly all people in developed countries have dioxins in their body. This is mainly from the food that we eat, in particular food from animals such as meat and dairy products. The level of dioxin in our bodies increases with age. However, around the world overall human levels of dioxin have been falling due to international efforts to reduce production. The National Dioxins Project demonstrated that the level of dioxins found in people in Australia is low compared to other countries.

WHAT EFFECTS CAN DIOXINS HAVE?

One of the main health effects in question for dioxins is the risk of cancer in adults. Dioxins have been linked to cancer in animal studies and in studies of people exposed to high levels. In animals, effects on hormones, reproduction and development have also been seen and there is some non conclusive evidence that there may be some similar effects among humans. These effects have occurred at dioxin levels 100 to 1000 times higher than the dioxin levels that people are generally exposed to in developed countries, and 100 to 1000 times higher than the levels found in prawns in Parramatta River. The World Health Organisation states that dioxin does not affect genetic material and there is a level of exposure below which cancer risk would be negligible.

EFFECTS OF EATING PRAWNS OR FISH CONTAINING DIOXINS

Australian health authorities have established a 'tolerable monthly intake' of dioxins. The current recommendation to restrict consumption of fish from Sydney Harbour and Parramatta River to 150gm per month for a 70kg adult (less for lighter adults or children) is based upon this guideline and is protective of human health. A similar recommendation to restrict prawn intake to two 150gm serves has been made. It is highly unlikely that the occasional eating of prawns or fish containing the level of dioxins found in the recent study from the Parramatta River and Sydney Harbour would have any adverse effect on health.

SHOULD I HAVE A HEALTH CHECK IF I HAVE EATEN FISH OR PRAWNS?

There is no good predictor between body dioxin levels and health effects. Dioxins enter the body from many sources. There is no test that can distinguish where an individual's dioxin intake has come from. Undergoing routine health check-ups is all that is recommended.

WHAT ABOUT IF I AM PREGNANT?

The same 'tolerable monthly intake' applies for pregnant women and they should restrict their intake of seafood from Sydney Harbour as recommended.

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

January–February 2005

NSW HEALTH

HIV IN 2005: THE CURRENT SITUATION AND DIRECTIONS FOR THE FUTURE

Kerri Viney
NSW Public Health Officer Training Program
NSW Department of Health

Kim Stewart
AIDS and Infectious Diseases Branch
NSW Department of Health

Roger Garsia
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The Bug Breakfast topic for October was 'HIV in 2005: The current situation and directions for the future'. The presenters covered the history and epidemiology of HIV, emerging HIV epidemics, clinical aspects of HIV, future treatment options and NSW Health's *NSW HIV/AIDS Strategy 2006–2009*.

EPIDEMIOLOGY OF HIV

The World Health Organization estimates that in 2004 there were 39.4 million people living with HIV (including 4.9 million people who were newly infected) and 3.1 million deaths due to AIDS.[1] More than 95 per cent of new HIV infections occurred in low and middle-income countries, with people aged between 15 and 49 years accounting for 86 per cent of these.[1] In 2004, the global prevalence of HIV ranged from 0.1 per cent in East Asia to 7.4 per cent in Sub Saharan Africa.[1]

In Australia the adult prevalence of HIV is 0.1 per cent.[2] Nationally, the number of HIV notifications peaked in 1985 with 1770 notifications while AIDS notifications peaked in 1994 with 952.[3] Although notifications have declined since this time, there has been a recent increase in HIV notifications: rising from 656 in 2000 to 818 in 2004.[3] AIDS diagnoses have increased marginally from 206 in 1999 to 239 in 2004.[3] The highest notification rate for HIV in 2004 was in NSW (5.9 cases per 100,000), followed by Victoria (4.3 cases per 100,000) and Queensland (3.4 cases per 100,000).[3]

In NSW, the number of HIV notifications peaked in 1987 and AIDS notifications in 1994.[4] After 1987 there was a continual decline in HIV notifications until 2002–2003, when a slight increase was observed. However, a subsequent decline was reported in 2004. AIDS notifications also followed this pattern.[4] Figure 1 displays the HIV and AIDS notifications in NSW for 1986–2004.

In NSW, 'men who have sex with men' remains the largest exposure category for patients with HIV infection, and in 2004 accounted for 62 per cent of total cases. Heterosexual exposure accounted for 18 per cent of all cases, and injecting drug use for 4 per cent.[4]

*Bug Breakfast is the name given to a monthly series of hour-long breakfast seminars on communicable diseases delivered by the NSW Department of Health's Division of Population Health.

THE *NSW HIV/AIDS STRATEGY 2006–2009*

The NSW Department of Health is in the process of finalising the *NSW HIV/AIDS Strategy 2006–2009*. The *Strategy* will provide the overarching framework and priorities for HIV/AIDS prevention, treatment, care and support, research, and workforce development in NSW.

The *Strategy* identifies six targets for the NSW HIV/AIDS program for the period of 2006–2009; these include:

- to reduce newly acquired HIV infections by 25 per cent by 2009
- to achieve annual reductions in the notification rates of gonorrhoea, infectious syphilis and chlamydia infections among priority populations
- to reduce the physical and psychological disorders and associated disabilities in people living with HIV/ AIDS
- to decrease the number of late diagnoses of HIV infection by 25 per cent by 2009
- to achieve successive annual reductions in AIDS-related deaths by 2009
- to increase the number and distribution of clinicians authorised to prescribe highly specialised oral HIV drugs under section 100 of the *National Health Act, 1953* across NSW
- to increase the number of general practitioners involved in HIV care by 20 per cent by 2009.

The introduction of these targets establishes measurable health outcomes that decision makers can use to monitor the impact of the NSW HIV/AIDS program and inform the allocation of resources.

The challenges that face NSW in the future include:

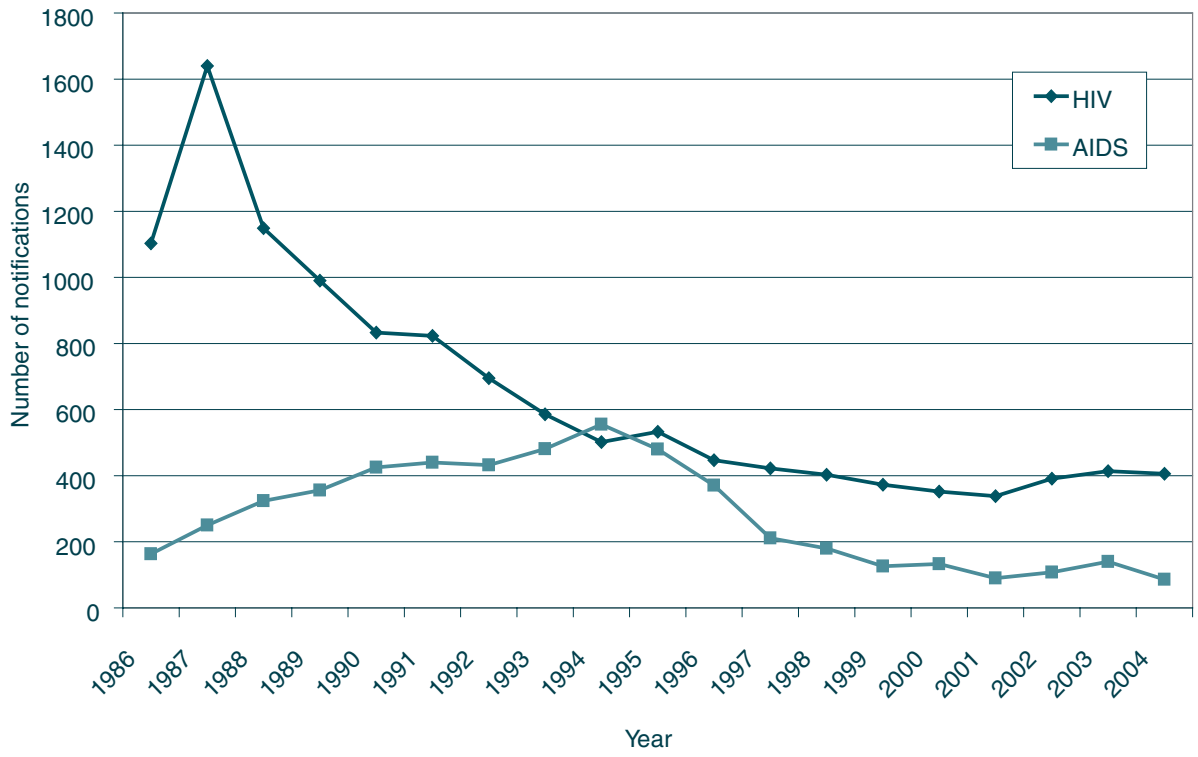
- safeguarding gains in HIV prevention among injecting drug users, Aboriginal people and sex workers
- reducing HIV infections among inner city gay men
- addressing synergy between HIV and sexually transmissible infections (on the basis of research that shows that some sexually transmissible infections can facilitate HIV transmission)
- reducing new HIV infections and improving early diagnosis.

HIV TREATMENT

Combining multiple drugs in treatment regimens known as Highly Active Anti-Retroviral Therapy (HAART) results in large reductions in HIV viral load in previously untreated patients. This has revolutionized treatment outcomes, with

FIGURE 1

NEW HIV AND AIDS NOTIFICATIONS BY YEAR OF DIAGNOSIS IN NEW SOUTH WALES, 1986–2004



many patients continuing to achieve viral suppression for more than seven years after initiation of HAART.

However, HAART is associated with an increased rate of cardiovascular morbidity, proportionate to the duration of therapy. This has prompted enhanced efforts to control cardiovascular risk factors in HIV patients, in particular the management of lipid levels, smoking, diabetes and hypertension. More recently licensed antiretroviral drugs have demonstrated variable impact on lipid levels and may provide advantages over earlier agents.

The emergence of resistance to HIV drugs results from mutation. Initially the virus experiences a change in the genetic code and this results in structural change to the target of the drug, usually a critical enzyme or outer component of the HIV virus.

To combat drug resistance, scientists have attempted to develop drugs that target other stages of the viral life cycle. Some of these strategies look promising. Studies of new protease inhibitors and non-nucleoside reverse transcriptase inhibitors suggest that they may be beneficial in patients who have developed resistance.

Studies to develop effective vaccines are underway in many countries, including Australia; however, it is likely to be many years before an effective vaccine will be available. In addition, controversy surrounds the level of vaccine efficacy that would be needed to justify a vaccination campaign. If the protection rate were only modest, there would be a risk of producing a false sense of protection among those who were vaccinated.

CONCLUSION

HIV continues to be a problem of major public health importance globally and in NSW, where new notifications increased in the early 2000s. NSW Health has developed The *NSW HIV/AIDS Strategy 2006-2009* to address this problem. While great advances have been made in treatment in the past five years, a vaccine remains some way off.

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COMMUNICABLE DISEASES REPORT, NEW SOUTH WALES, FOR NOVEMBER AND DECEMBER 2005

For updated information, including data and facts on specific diseases, visit www.health.nsw.gov.au and click on **Infectious Diseases.**

TRENDS

Tables 2 and 3 and Figure 1 show reports of communicable diseases received through to the end of November and December 2005 for each area health service in NSW.

ENTERIC DISEASE

Cryptosporidiosis

The number of people reported with cryptosporidiosis increased from 51 cases in October to 143 cases in November. There were 100 cases in December. Cryptosporidiosis occurs after ingestion of the parasite *Cryptosporidium* and is characterised by watery diarrhoea, abdominal cramps, vomiting and occasionally fever. Symptoms can last for many weeks or even months in some people. No specific treatment is recommended, other than supportive care.

In response to the increase, NSW public health units were asked to interview all patients, using a standard form to identify risk factors for illness. Interviews identified no single source for the outbreak. However, most cases (75 per cent) were from rural parts of the state, and some people reported having direct contact with farm animals, visiting farms, drinking untreated water, or swimming in rivers and pools. The Department of Primary Industries reports that there has been a recent increase in calves with scours (diarrhoea that can be caused by *Cryptosporidium* infection). While investigations continue, these data suggest that the outbreak may have begun when a small number of people acquired the illness from infected animals, either through direct contact, contact with the animals' faeces, or from contaminated waterways in which they swam or from which they drank untreated water. Once in humans, the infection is readily transmitted through person-to-person contact. A major public health concern is that recovering cases will unwittingly carry the parasite into swimming pools where the chlorine resistance of the organism allows it to remain infectious for weeks. Consequently, swimmers who swallow small amounts of pool water will be at increased risk of acquiring the infection. A massive outbreak of cryptosporidiosis occurred across NSW in 1998 after several pools were contaminated in this way.[1]

To avoid infection people should:

- thoroughly wash their hands with soap and running water for at least 10 seconds after handling animals or their manure; before handling food; after using the toilet; and after changing nappies
- avoid getting water in their mouth when swimming
- avoid drinking untreated water.

Water taken directly from a creek, river or lake should be brought to a rolling boil (and allowed to cool) before drinking. Otherwise the water should be filtered and disinfected using a treatment system certified against the standards to remove *Cryptosporidium* (for example, AS/NZS 4348 or NASI/NSF 53).

To avoid contaminating swimming facilities, people who have had a diarrhoeal illness should not enter a swimming area for at least one week after complete recovery.

Reference

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Other enteric infections

Several outbreaks of other enteric diseases were reported in November and December. Notable among these were:

- an increase in cases of infection with ***Salmonella* typhimurium phage type 44 (STm44)** across NSW with a total of 14 cases reported in November, including one cluster of five people who had consumed, on different days, a chicken Caesar salad wrap from a retailer in the South Eastern Sydney/Illawarra area. The NSW Food Authority (NSWFA) confirmed that the wrap was prepared using raw egg. Samples of product from the establishment tested negative for Salmonella, but a further trace-back of eggs by the NSWFA is underway. In December a further 32 cases of STm44 were reported. Among these were three clusters:
  - seven people who attended a dinner party in the South Eastern Sydney/Illawarra area. Two of the seven were confirmed as having STm44 infection, and one of these two was admitted to hospital. Among the foods eaten was a tiramisu cake prepared using raw egg
  - four people from the Central Coast. The source of the cluster remains unclear, and the investigation is continuing
  - three people in a residential facility on the North Coast.
- an outbreak of seven cases of ***Salmonella* Singapore** infection in the Sydney West area in December. Public health unit staff interviewed the patients and found that the source was likely to have been food served at a wedding and then served as leftovers at a church gathering the next day. In addition to the seven confirmed cases, many other wedding guests reported diarrhoeal illness after the wedding. Among high risk items served at the wedding (and as leftovers) were home prepared potato salad, pork and meatballs.

- an increase in cases of infection with ***Salmonella* typhimurium phage type 135a** across the state
- an outbreak of gastroenteritis among 23 of 29 attendees of a party in November, most likely due to ***Clostridium perfringens*** contamination of prepared foods
- nine cases of **scombroid fish poisoning** linked to eating fish in the Sydney South West and South Eastern Sydney/Illawarra areas in November. Scombroid poisoning occurs after a person ingests fish that contains high levels of histamine that has been produced in the flesh, generally when the fish has been mishandled. Symptoms develop within a few hours of eating the fish, and include tingling and burning around the mouth, facial flushing, sweating, nausea, vomiting, headaches and palpitations. Eight of the cases reported eating tuna before the onset of the illness, and the remaining patient could not specify the type of fish consumed

Notification of both STm135a and STm44 infections have increased in several Australian states in recent weeks. A national investigation, including multi-state case-control studies, is underway in an attempt to identify the likely sources of infection.

Nine cases of infection with **verotoxigenic *E. coli*** have been notified in the Hunter area in 2005, including six notified since 28 November. No links among the cases have been detected to date. The recent increase in notification may relate to changes in laboratory testing procedures by the reporting laboratory.

AVIAN INFLUENZA

In December, under the *NSW Public Health Act 1991*, the diagnosis of avian influenza in humans became notifiable by doctors, hospitals and laboratories. Avian influenza is primarily a disease of birds, and human infection is very rare. Currently it is unlikely that people with avian influenza will present to doctors in Australia, but if they do, it is important that they be identified and isolated as quickly as possible. A doctor may suspect that a patient has avian influenza if the person:

- has a fever and respiratory symptoms, and
- has travelled to a part of the world where avian influenza is prevalent (currently mainly in parts of Asia and eastern Europe) within seven days of onset of symptoms, and
- had contact with poultry, dead birds, or patients (or samples from patients) with avian influenza.

The patient should be advised to wear a surgical mask, be isolated, and be managed as clinically appropriate. The local public health unit should be informed.

On 23 December 2005, the Department of Primary Industries reported that a chicken from a backyard flock in Wentworth (Greater Western Area Health Service) had tested positive, in preliminary testing, for avian influenza. Some of the chickens in the small flock had died in the preceding weeks. A thorough investigation by animal health experts, however, found that the cause of death in the chicken was Marek's disease (a common viral disease of poultry), and in repeat testing, avian influenza was ruled out. As a precaution, public health unit staff identified the people who had had contact with the chickens, and prepared for further actions (such as accessing personal protective equipment and the antiviral neuraminidase inhibitors) had the diagnosis been confirmed.

Pandemic planning

The NSW Health Interim Influenza Pandemic Action Plan was released in November 2005. The *Plan* is available on the NSW Health web site (see: www.health.nsw.gov.au/infect/pandemic_flu.html), with links to other resources including advice on infection control. NSW Health will keep this page updated with the latest information on pandemic preparedness, as well as information on the current avian influenza outbreak occurring overseas. NSW Health is working with a range of doctors (including nominees of the NSW General Practice Council) and scientists to better define the roles of different health care workers in the event of a pandemic.

HIV SURVEILLANCE

Notifications of people newly diagnosed with HIV infection in NSW from 1981 through to June 2005 are shown in Table 1. The annual number of notifications had been generally declining in NSW from the mid-1980s until 2001, when there were 338 notifications. However, case notifications increased in 2002 and again in 2003 to 415 (a 23 per cent increase over the 2-year period). Notifications declined a little in 2004 (to 404), but in the first half of 2005 alone, 230 have been reported, indicating a further rise. Among the 2005 notifications to date, men who have sex with men were slightly more commonly reported (72 per cent) than in previous recent years (less than 70 per cent). The increase in notifications among women seen in 2004 (60 compared with less than 33 in previous recent years) does not appear to have been sustained in 2005; the reason for this short-lived increase is unclear.

TABLE 1

CHARACTERISTICS OF NEW SOUTH WALES RESIDENTS DIAGNOSED WITH NEW HIV NOTIFICATIONS, 1981 TO JUNE 2005

	1981–1999		2000		2001		2002		2003		2004		Jan–June 2005		1981–June 2005	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Gender																
Female	591	5.0	30	8.5	30	8.9	30	7.7	32	7.7	60	14.9	14	6.1	787	5.7
Male	10881	92.8	313	88.7	306	90.5	352	89.8	374	90.1	341	84.4	216	93.9	12783	92.2
Transgender	22	0.2	0	0.0	0	0.0	4	1.0	0	0.0	0	0.0	0	0.0	26	0.2
Not stated	231	2.0	10	2.8	2	0.6	6	1.5	9	2.2	3	0.7	0	0.0	261	1.9
Age (years)																
0–2	24	0.2	2	0.6	0	0.0	1	0.3	0	0.0	1	0.2	0	0.0	28	0.2
3–12	36	0.3	1	0.3	0	0.0	0	0.0	2	0.5	0	0.0	1	0.4	40	0.3
13–14	12	0.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	0	0.0	13	0.1
15–19	187	1.6	2	0.6	3	0.9	1	0.3	3	0.7	6	1.5	2	0.9	204	1.5
20–24	1390	11.9	28	7.9	23	6.8	25	6.4	35	8.4	30	7.4	21	9.1	1552	11.2
25–29	2408	20.5	44	12.5	61	18.0	62	15.8	59	14.2	58	14.4	34	14.8	2726	19.7
30–39	4459	38.0	147	41.6	146	43.2	180	45.9	167	40.2	161	39.9	81	35.2	5341	38.5
40–49	2186	18.6	76	21.5	71	21.0	85	21.7	89	21.4	98	24.3	60	26.1	2665	19.2
50–59	702	6.0	38	10.8	20	5.9	26	6.6	45	10.8	32	7.9	22	9.6	885	6.4
60 +	243	2.1	7	2.0	9	2.7	12	3.1	15	3.6	17	4.2	9	3.9	312	2.3
Not reported	78	0.7	8	2.3	5	1.5	0	0.0	0	0.0	0	0.0	0	0.0	91	0.7
Exposure																
Male Homosexual–bisexual	6988	59.6	235	66.6	218	64.5	251	64.0	288	69.4	256	63.4	165	71.7	8401	60.6
Male homosexual–bisexual and IDU*	289	2.5	8	2.3	18	5.3	14	3.6	10	2.4	9	2.2	2	0.9	350	2.5
Injecting Drug Use	383	3.3	19	5.4	19	5.6	9	2.3	11	2.7	16	4.0	4	1.7	461	3.3
Heterosexual	724	6.2	60	17.0	54	16.0	58	14.8	62	14.9	73	18.1	27	11.7	1058	7.6
Haemophilia–Coagulation Disorders	114	1.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	114	0.8
Blood–tissue Recipient	137	1.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	137	1.0
Vertical	34	0.3	3	0.8	0	0.0	1	0.3	2	0.5	1	0.2	1	0.4	42	0.3
Undetermined	3045	26.0	21	5.9	22	6.5	44	11.2	39	9.4	47	11.6	25	10.9	3243	23.4
Not Stated	11	0.1	7	2.0	7	2.1	15	3.8	3	0.7	2	0.5	6	2.6	51	0.4
Residence																
Greater Sydney**	6204	52.9	300	85.0	299	88.5	335	85.5	322	77.6	320	79.2	189	82.2	7969	57.5
Rest of New South Wales	730	6.2	44	12.5	37	10.9	39	9.9	64	15.4	58	14.4	21	9.1	993	7.2
Unknown	4791	40.9	9	2.5	2	0.6	18	4.6	29	7.0	26	6.4	20	8.7	4895	35.3
Total	**11725**	**100.0**	**353**	**100.0**	**338**	**100.0**	**392**	**100.0**	**415**	**100.0**	**404**	**100.0**	**230**	**100.0**	**13857**	**100.0**

Data source:NSW HIV / AIDS database, Communicable Diseases Branch, NSW Department of Health.
Note:Recent HIV data may contain duplicates; Data excludes notifications where a previous diagnosis occurred in another Australian jurisdiction.
*IDU = injecting drug use
** Greater Sydney = Northern Sydney Area, South Eastern Sydney Area, Central Sydney Area, South Western Sydney Area, Wentworth Area, and Western Sydney Area.

FIGURE 1

REPORTS OF SELECTED COMMUNICABLE DISEASES, NSW, JAN 2000 TO DEC 2005, 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

Lab conf = laboratory confirmed

Men Gp C and Gp B = meningococcal disease due to serogroup C and serogroup B infection, other/unk = other or unknown serogroups.

NB: multiple series in graphs are stacked, except gastroenteritis outbreaks.

NB: Outbreaks are more likely to be reported by nursing homes and hospitals than by other institutions

NSW population	
Male	50%
<5 yrs	7%
5–24 yrs	27%
25–64 yrs	53%
65+ yrs	13%
Rural	46%

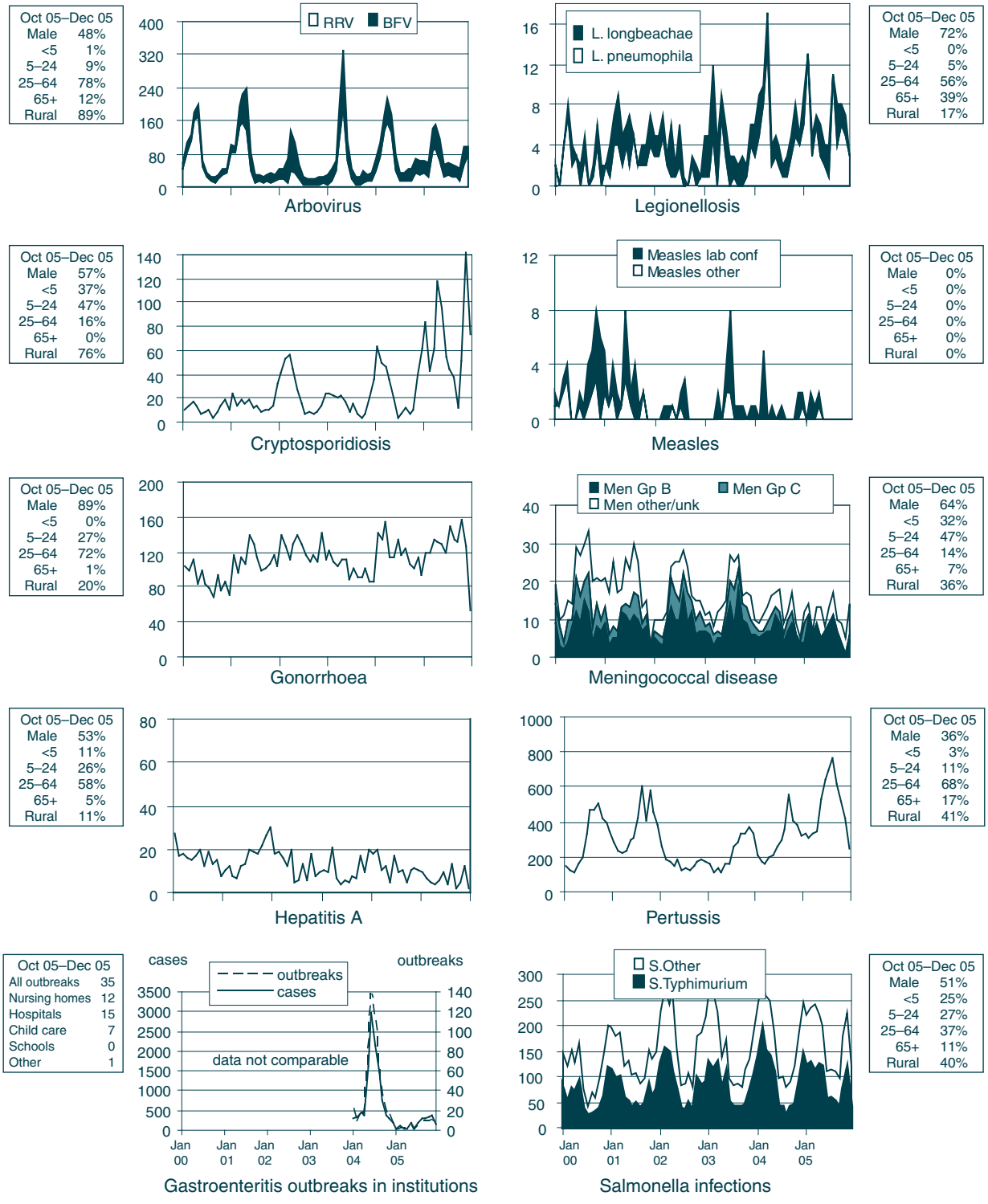

TABLE 2 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN NOVEMBER 2005 BY AREA HEALTH SERVICES

	Area Health Service (2005)																			Total	
	Greater Southern		Greater Western			Hunter / New England		North Coast		Northern Syd / Central Coast		South Eastern Syd / Illawarra		Sydney South West		Sydney West				
Condition	GMA	SA	FWA	MAC	MWA	HUN	NEA	MNC	NRA	CCA	NSA	ILL	SES	CSA	SWS	WEN	WSA	JHS	for Nov+	To date+
Blood-borne and sexually transmitted§																				
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	35	13	7	12	26	107	32	24	56	48	81	52	169	88	39	26	70	3	901	10350
Gonorrhoea*	1	-	-	-	-	14	4	3	2	2	5	4	49	21	9	1	4	1	120	1428
Hepatitis B–acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis B–other*	1	1	-	-	3	8	3	3	1	6	25	4	39	41	43	3	30	3	216	3271
Hepatitis C–acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Hepatitis C–other*	12	19	4	8	14	38	6	37	34	43	22	31	61	67	55	22	50	44	575	6188
Hepatitis D–unspecified*	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	14
Syphilis	-	-	-	-	1	1	5	-	1	-	2	2	14	9	13	-	10	-	59	821
Vector-borne																				
Barmah Forest virus*	1	-	-	1	1	3	3	20	9	1	-	1	-	-	1	-	-	-	41	438
Ross River virus*	7	1	-	2	-	2	3	6	4	2	-	-	4	1	1	-	-	-	33	458
Arboviral infection (other)*	-	-	-	-	-	-	-	-	-	-	1	-	2	3	-	1	1	-	8	43
Malaria*	-	-	-	-	-	4	-	-	-	-	1	-	2	-	-	-	2	-	9	194
Zoonoses																				
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Leptospirosis*	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	4	37
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	1	-	-	-	-	5	-	-	1	-	-	-	2	-	-	1	-	-	10	123
Q fever*	-	1	-	-	-	4	1	2	2	-	-	-	-	-	-	-	-	-	10	126
Respiratory and other																				
Blood lead level*	-	-	-	-	1	7	-	-	1	1	1	-	1	1	3	2	-	-	18	227
Influenza*	-	1	-	-	1	1	1	2	5	-	3	-	25	-	1	1	6	-	48	1318
Invasive pneumococcal infection*	-	2	-	2	4	7	-	3	3	1	6	1	2	2	3	1	6	-	43	629
Legionella longbeachae infection*	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	2	20
Legionella pneumophila infection*	-	-	1	-	1	-	-	-	-	-	1	-	1	-	-	-	3	-	7	61
Legionnaires' disease (other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Meningococcal infection (invasive)*	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	3	118
Tuberculosis	-	1	-	-	-	1	-	-	-	-	1	1	7	1	-	2	1	-	16	353
Vaccine-preventable																				
Adverse event after immunisation (AEFI)**	2	-	-	-	-	-	-	-	-	1	-	-	3	-	-	-	-	-	6	95
H. Influenzae b infection (invasive)*	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	7
Measles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Mumps*	-	-	-	-	-	-	-	1	2	-	-	-	1	-	1	-	-	-	5	102
Pertussis	40	24	1	38	8	33	9	11	19	15	48	16	81	43	38	33	60	-	517	5570
Rubella*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enteric																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis*	14	-	1	16	3	12	31	5	3	3	2	6	4	3	1	7	2	-	113	733
Giardiasis*	2	-	1	5	3	13	2	2	1	5	13	3	28	3	6	7	8	-	102	1309
Haemolytic uraemic syndrome	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5
Hepatitis A*	1	-	-	-	-	-	-	-	-	-	-	-	1	3	4	1	-	-	11	78
Hepatitis E*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Listeriosis*	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	4	23
Salmonellosis*	12	6	-	2	3	15	9	12	10	8	20	12	33	6	30	10	29	-	218	1994
Shigellosis*	1	-	1	-	-	-	-	-	-	-	1	-	1	3	-	2	1	-	11	129
Typhoid*	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	2	28
Verotoxin producing *E. coli**	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	8
Miscellaneous																				
Creutzfeldt-Jakob disease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Meningococcal conjunctivitis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4

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

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CCA = Central Coast Area
NSA = Northern Sydney Area
ILL = Illawarra Area
SES = South Eastern Sydney Area
CSA = Central Sydney Area
SWS = South Western Sydney Area
WEN = Wentworth Area
WSA = Western Sydney Area
JHS = Justice Health Service

TABLE 3 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN DECEMBER 2005 BY AREA HEALTH SERVICES

	Area Health Service (2005)																			Total	
	Greater Southern		Greater Western			Hunter / New England		North Coast		Northern Syd / Central Coast		South Eastern Syd / Illawarra		Sydney South West		Sydney West					
Condition	GMA	SA	FWA	MAC	MWA	HUN	NEA	MNC	NRA	CCA	NSA	ILL	SES	CSA	SWS	WEN	WSA	JHS		for Dec+	To date+
Blood-borne and sexually transmitted§																					
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Chlamydia (genital)*	29	13	8	9	20	103	18	40	33	17	68	26	161	92	35	26	61	1		766	11153
Gonorrhoea*	-	-	-	1	2	6	-	-	3	1	9	2	47	28	2	1	7	-		110	1541
Hepatitis B–acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Hepatitis B–other*	6	2	4	2	3	4	1	-	-	1	27	5	21	39	9	4	53	2		184	3478
Hepatitis C–acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	1
Hepatitis C–other*	8	16	1	10	7	32	9	25	20	31	16	22	50	59	10	11	37	19		384	6592
Hepatitis D–unspecified*	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-		1	15
Syphilis	1	-	3	-	2	1	1	2	1	-	10	-	14	16	-	-	10	-		61	883
Vector-borne																					
Barmah Forest virus*	2	1	1	-	-	5	1	10	4	2	1	1	-	-	-	-	-	-		28	467
Ross River virus*	10	-	7	16	16	8	5	10	4	3	-	2	-	2	-	-	-	-		83	542
Arboviral infection (other)*	-	-	-	-	-	-	-	-	-	-	3	-	3	1	-	-	-	-		8	51
Malaria*	-	-	-	-	1	-	-	2	2	2	-	-	-	-	-	-	-	-		7	201
Zoonoses																					
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-		1	4
Leptospirosis*	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-		2	39
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Psittacosis*	1	-	-	-	1	-	1	-	-	-	-	1	-	-	-	1	-	-		5	128
Q fever*	-	-	-	-	-	3	4	1	3	-	-	-	-	-	-	1	-	-		12	138
Respiratory and other																					
Blood lead level*	-	1	-	-	2	3	-	-	-	-	-	-	4	-	-	1	-	-		11	239
Influenza*	-	-	1	-	-	1	-	2	-	1	2	2	21	1	-	3	2	-		36	1354
Invasive pneumococcal infection*	2	1	-	2	2	7	1	-	3	3	4	-	4	7	3	2	2	-		43	675
Legionella longbeachae infection*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-		1	22
Legionella pneumophila infection*	-	-	1	-	-	-	-	-	-	-	-	1	-	1	-	1	2	-		6	65
Legionnaires' disease (other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-		1	2
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-		1	3
Meningococcal infection (invasive)*	-	3	-	-	-	-	1	-	1	-	1	-	4	-	4	1	1	-		16	135
Tuberculosis	-	-	-	-	1	1	-	1	1	-	-	-	9	4	-	1	5	-		24	388
Vaccine-preventable																					
Adverse event after immunisation (AEFI)**	1	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-		3	99
H. Influenzae b infection (invasive)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-		1	8
Measles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	6
Mumps*	-	1	-	-	-	-	-	-	-	-	1	1	-	1	-	-	1	-		6	109
Pertussis	39	13	-	13	6	35	9	14	12	12	53	25	68	22	18	15	40	-		394	5966
Rubella*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	10
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Enteric																					
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Cryptosporidiosis*	23	-	-	5	9	11	13	11	4	3	5	9	5	10	1	6	2	-		117	853
Giardiasis*	-	-	-	-	5	9	3	1	1	6	20	6	16	8	-	2	14	-		91	1408
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	5
Hepatitis A*	-	-	-	1	-	-	-	-	-	-	1	-	1	1	-	-	1	-		5	83
Hepatitis E*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	7
Listeriosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-		1	25
Salmonellosis*	3	2	-	1	1	13	3	8	22	7	17	6	23	13	23	11	20	-		174	2168
Shigellosis*	-	-	2	-	1	-	-	-	-	-	1	-	-	1	-	-	-	-		5	137
Typhoid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	28
Verotoxin producing *E. coli**	-	1	-	-	-	4	-	-	-	-	-	-	-	-	1	-	-	-		6	15
Miscellaneous																					
Creutzfeldt-Jakob disease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	5
Meningococcal conjunctivitis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	4

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