# HEPATITIS A IN NEW SOUTH WALES, 1991–2000

***Valerie Delpech, Mohamid Habib, Ming Lin and Jeremy McAnulty***
*Communicable Diseases Surveillance and Control Unit*
*NSW Department of Health*

Hepatitis A is an acute illness typically presenting with fever, malaise, anorexia, nausea and abdominal discomfort followed by jaundice and dark urine a few days later. The illness usually persists for several weeks and adults are more likely than children to be symptomatic.[1]

Transmission of the hepatitis A virus (HAV) occurs through the ingestion of contaminated food or drinking water; and through faecal material transferred by direct contact, including during sexual contact. Parenteral transmission is rare but can occur during the short viraemic phase of the infection.[2]

The incubation period ranges from 15 to 50 days but is generally around 28 days. Cases are most infectious during the latter half of the incubation period until one week after the onset of jaundice.[1]

Under the NSW Public Health Act 1991, all laboratories must notify cases of hepatitis A infection confirmed by serology to their local public health unit (PHU). In addition, medical practitioners and hospital chief executive officers must notify a diagnosis of acute viral hepatitis on clinical suspicion. PHU staff investigate cases that are notified to them and intervene to control the spread of the infection. Interventions include education about appropriate hygiene measures and the administration of immunoglobulin to close contacts.

PHU staff record details of laboratory confirmed cases on the confidential statewide Notifiable Diseases Database (NDD). Where a cluster of cases is identified, PHUs collect additional information including potential sources of infection, risk factors, and exposures.

Here we report on the epidemiology of hepatitis A surveillance in NSW over the last decade, and highlight significant outbreaks of disease.

## METHODS

Data for this review were extracted from NDD for the period January 1991 to December 2000. We analysed the characteristics of the notified cases for age, sex, area health service (AHS) of residence and occupation by date of onset of their illness. Notification rates were calculated using mid-year population estimates from the Australian Bureau of Statistics (ABS) for each year.

The NSW Department of Health Inpatients Statistics Collection (ISC) for the years 1991–1999 was used to identify hospital separations of NSW residents with an ICD-9 diagnosis code of 070.0 and 070.1 (hepatitis A). ABS Causes of Death data was reviewed to identify deaths from hepatitis A in NSW residents for the years 1991–1999.

**TABLE 1**

**HEPATITIS A NOTIFICATIONS, HOSPITALISATIONS AND DEATHS, NSW, 1991–2000**

| Year of onset | Notified cases *N* | (%) | Notification Rate /100,000 | Hospital admissions *N* | (%)* | Deaths |
|---|---|---|---|---|---|---|
| 1991 | 1128 | (14.6) | 19.1 | 191 | (16.9) | 1 |
| 1992 | 906 | (11.7) | 15.4 | 263 | (24.9) | 1 |
| 1993 | 580 | (7.4) | 9.8 | 227 | (39.1) | 0 |
| 1994 | 586 | (7.6) | 9.9 | 213 | (36.4) | 1 |
| 1995 | 615 | (7.9) | 10.4 | 218 | (35.4) | 0 |
| 1996 | 958 | (12.4) | 16.2 | 281 | (29.3) | 1 |
| 1997 | 1429 | (18.5) | 24.2 | 467 | (32.7) | 2 |
| 1998 | 927 | (12.0) | 15.7 | 371 | (40.0) | 2 |
| 1999 | 408 | (5.3) | 6.9 | 184 | (45.1) | 1 |
| 2000 | 202 | (2.6) | 3.4 | N/A | N/A | |
| **Total** | 7739 | (100.0) | 13.1 | 2415 | (31.2) | 9 |

* Percentage of notifications

## RESULTS

### Notifications

Over the 10-year period, 7,739 laboratory confirmed cases of hepatitis A were reported in NSW (Table 1). The number of reported cases in 1999 and 2000 was low compared to previous years. The average annual incidence for the 10-year period was 13.1 notifications per 100,000 persons. The number of notifications fluctuated from year to year with notable peaks in 1991 (14.6 per cent of all cases) and 1997 (18.5 per cent of all cases).

The average annual notification rate among males (16.4 per 100,000 population) was almost double the female rate (8.6) for the period (Table 2). Adults aged 20–29 years (30.1 percent of cases) and 30–39 years (23.1 per cent) were more commonly notified, with an average annual age-specific rate of 24.9 and 18.4 per 100,000 population respectively. Most cases in children occurred among 5–9 year olds, accounting for 9.8 per cent of all notifications (an age-specific notification rate of 17.4 per 100,000 population).

The notification rate among Sydney residents was similar to the rate among rural residents (12.8 compared to 12.1 per 100,000 population). South Eastern Sydney (SES) AHS had the highest number of notifications accounting for 21.6 per cent of all cases. However, the Far West AHS had the highest average annual notification rate (30.0 per 100,000) followed by SES (22.6) and New England (22.2).

Data on Aboriginal or Torres Strait Islander status was complete for 3,729 (48 per cent) of notifications and of these 9.0 per cent were identified as Aboriginal or Torres Strait Islander. The rate of infection among Aboriginal and Torres Strait Islanders was higher (31.1 per 100,000 population) than for the state's population as a whole.

Occupational information was provided for 3,349 (43 per cent) of all notifications; and, of these, 148 people (4.4 per cent) were employed in the food or hospitality industry and 35 (1.0 per cent) were reported to be inmates of correctional facilities at the time of infection.

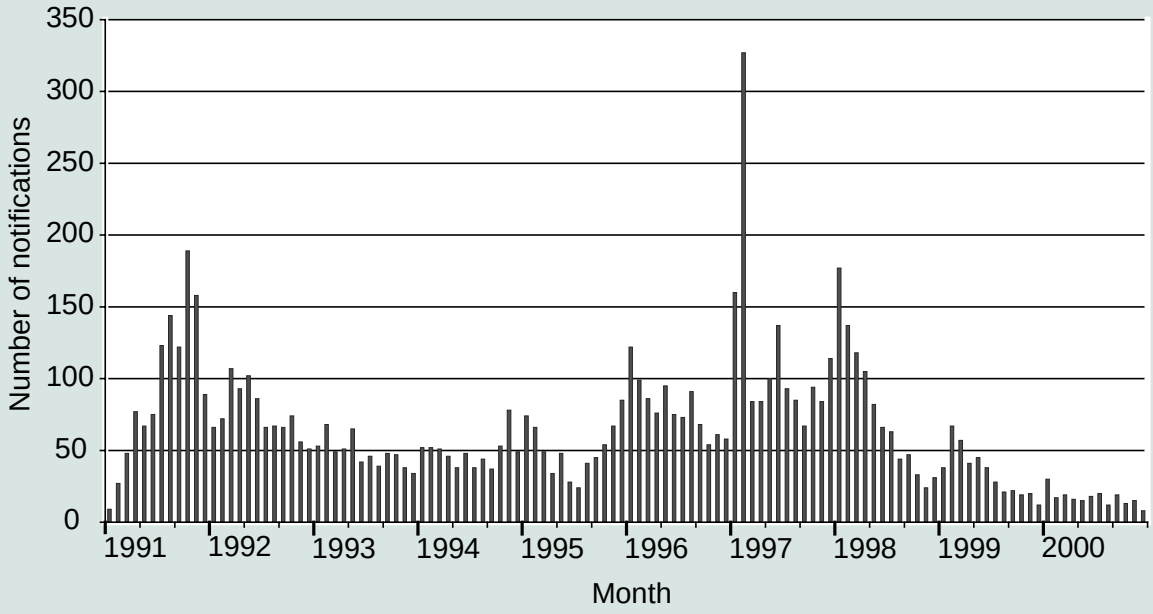
There was considerable variation in the number of notifications reported by month (Figure 1). The median number of notifications received monthly across NSW was 54.0 with an average of 64.5 notifications (standard deviation = 43.8).

Over the last 10 years, NSW has had a number of notable outbreaks of hepatitis A:

- large outbreaks occurred in 1991–1992, 1995–1996 and 1997–1998, and were reported predominantly in residents of the inner and eastern suburbs of Sydney and were associated with male-to-male sex.[3,4,5] Peak notification rates of 520 per 100,000 population per year were reported in 25–29 year old males residing in eastern Sydney (the former Eastern Sydney Health Area) during an outbreak in 1991–1992, and 405 per 100,000 population per year in 30–34 year old males

**FIGURE 1**

**HEPATITIS A NOTIFICATIONS, NSW, 1991–2000**



during an outbreak in 1995–1996.[3] Over 80 per cent of the cases notified in SES between June 1997–May 1998 were in males and the age-specific rate among 20–39 year old males was 110.1 per 100,000 population. Sixty-one per cent of cases reported male-to-male sexual contact.[5]

- a large outbreak beginning January 1997 to April 1997 associated with the consumption of oysters from the Wallis Lake area.[6] A total of 467 cases linked to this outbreak were notified between 22 January and 4 April 1997 with a notifications reaching a peak in February 1997 (327).
- smaller outbreaks in 1994–1995 and 1998–1999 predominantly in SES have been associated with illicit drug use.[5,7,8] In the 1994–1995 outbreak, one quarter of all cases of hepatitis A notified in SES reported a recent history of injecting drug use.[7] A second outbreak was reported between December 1998 and May 1999. Forty-five of the 76 notifications in SES over this six month period reported illicit drug use or contact with an illicit drug user. The male to female ratio was 1 to 1.2 and the mean age was 28 years (range 7–72).[5]

**Morbidity**

Over the nine year period 1991–1999, there were 2,415 hospitalisations for hepatitis A recorded on the Inpatient Statistics Collection in NSW. The peak in hospitalisations was in 1997 (467) corresponding to the Wallis Lake outbreak. The male to female ratio was 1.2 to 1. About a quarter (24.1 per cent) of hospitalised cases were aged 20–29 years (age-specific rate of 44.7 per 100,000 population) and less than five per cent were aged between 0–10 years (age-specific rate of 6.4 per 100,000 population).

The number of cases hospitalised represented about one third (32.2 per cent) of cases notified for the same period. The proportion of women and men hospitalised was 46.3 per cent and 32.8 per cent respectively (odds ratio = 1.77 or 1.60–1.97).

A total of nine deaths attributed to hepatitis A were reported by the ABS for the period 1991–1999. This compares with five deaths identified on the NDD data for the same period. The case fatality rate (using ABS data) was 1.2 per 1000 notifications. (one woman aged more than 85 years old and eight men aged more than 30 years old). The deaths occurred in one woman aged more than 85 years and eight men aged more than 30 years old.

**TABLE 2**

**HEPATITIS A NOTIFICATIONS, NSW, 1991–2000**

| | No. | % | Average annual rate / 100,000 |
|---|---|---|---|
| Gender | | | |
| Males | 5026 | 64.9 | 16.4 |
| Females | 2668 | 34.5 | 8.6 |
| Not stated | 45 | 0.6 | - |
| Age group | | | |
| 0–4 | 391 | 5.1 | 9.0 |
| 5–9 | 759 | 9.8 | 17.4 |
| 10–14 | 526 | 6.8 | 12.2 |
| 15–19 | 516 | 6.7 | 11.9 |
| 20–29 | 2329 | 30.1 | 24.9 |
| 30–39 | 1789 | 23.1 | 18.4 |
| 40–49 | 758 | 9.8 | 8.7 |
| 50–59 | 326 | 4.2 | 5.2 |
| 60+ | 345 | 4.5 | 3.4 |
| AHS | | | |
| Central Sydney | 926 | 12 | 19.6 |
| Northern Sydney | 659 | 8.5 | 8.8 |
| Western Sydney | 687 | 8.9 | 10.7 |
| Wentworth | 189 | 2.4 | 6.3 |
| South Western Sydney | 531 | 6.9 | 7.3 |
| Central Coast | 185 | 2.4 | 6.9 |
| Hunter | 335 | 4.3 | 6.5 |
| Illawarra | 275 | 3.6 | 8.3 |
| South Eastern Sydney | 1670 | 21.6 | 22.6 |
| Northern Rivers | 521 | 6.7 | 21.3 |
| Mid North Coast | 329 | 4.3 | 13.4 |
| New England | 399 | 5.2 | 22.2 |
| Macquarie AHS | 172 | 2.2 | 16.8 |
| Mid Western | 261 | 3.4 | 15.8 |
| Far West | 152 | 2 | 30.1 |
| Greater Murray | 193 | 2.5 | 7.5 |
| Southern | 98 | 1.3 | 5.5 |
| Not Stated | 157 | 1.9 | - |

## DISCUSSION

Hepatitis A infection remains endemic in NSW at an average annual rate of 13.1 notifications per 100 000 population. Hepatitis A causes significant morbidity in the community with a relatively high proportion of hospitalisations. Women are more likely to be hospitalised. However, despite significant morbidity associated with infection, hepatitis A is rarely fatal.

The epidemiological investigation of cases and clusters of illness remain essential to the identification of transmission routes and risk factors, many of which are amenable to preventative measures. In the Wallis Lake outbreak, for instance, a case-control study identified that over two-thirds of cases and no controls reported eating oysters (odds radio 42; 95 per cent, confidence interval 5–379).[6] In response, a public warning was issued and the oysters withdrawn from sale. Hepatitis A virus was subsequently identified in oyster samples from Wallis Lake.[6]

Men who have sex with men remain a high risk group for contracting hepatitis A in SES, and account for the

majority of male notifications. Outbreaks of HAV among injecting drug users have been documented in recent years in NSW as well as in other states.[9,10,11] The route of transmission among injecting drug users remains unclear, and is probably multi-factorial, but poor personal hygiene is likely to play a significant role.[11,12]

Recent seroprevalence data indicates that at some time during their lifetime about 41 per cent of the Australian population have been exposed to the hepatitis A virus.[13] Seroprevalence significantly increases with age. The majority of Australians therefore remain susceptible to acquiring the infection.

The epidemiological investigation of reported cases is critical to the control of the disease. Vaccination against hepatitis A among high risk groups, including travellers to endemic regions, people in high risk occupations, men who have sex with men, and illicit drug users, remains an important preventative strategy.

## REFERENCES


1. Chin J, editor. *Control of communicable diseases manual, 17th edition.* Washington: American Public Health Association, 2000.
2. Evans A and Kaslow R (editors). *Viral Infections in humans: Epidemiology and Control, 4th edition.* New York: Plenum Medical Book Company, 1997.
3. Ferson MJ, Young LC, Stokes ML. Changing epidemiology of hepatitis A in the 1990s in Sydney, Australia. *Epidemiol Infect,* 1998; 121: 631–6.
4. Stokes ML, Ferson MJ, Young LC. Outbreak of hepatitis A among homosexual and bisexual men. *Am J Public Health 1995*; 154: 828–31.
5. Delpech VC, Thackway SV, Young LC, Pontivivo G, Smedley EJ, Morgan KR & Ferson MJ. Hepatitis A in South Eastern Sydney 1997–1999: Continuing concerns for gay men and an outbreak among illicit drug users. *Comm Dis Intell* 2000: 24: 7.
6. Conaty S, Bird P, Bell G, Kraa E, Grohmann G, McAnulty J. Hepatitis A in New South Wales, Australia, from consumption of oysters: the first reported outbreak. *Epidemiol Infect* 2000; 124: 121–130.
7. Ferson MJ, Young LC. Hepatitis A in injecting drug users-preliminary report. *Commun Dis Intell* 1994; 18: 655.
8. Delpech VC, Thackway SV, Young LC, Pontivivo G, Smedley EJ, Morgan KR & Ferson MJ. Outbreak of hepatitis A among illicit drug users in South Eastern Sydney. *Med J Aust* 2000; 172: 143 (letter).
9. Shaw D, Whiteman D, Merritt A, El-Saadi D, Stafford R, Heel K, Smith G. Hepatitis A outbreaks among illicit drug users and their contacts in Queensland, 1996. *Med J Aust*. 1999; 170(12): 584–587.
10. Gilroy N, Tribe G, Passaris I, Hall R, Beers M. Hepatitis A in injecting drug users: a national problem. *Med J Aust*. 2000; 172 (3): 142–3.
11. Crofts N, Cooper G, Stewart T et al. Exposure to hepatitis A virus among blood donors, injecting drug users and prison entrants in Victoria. *J Viral Hepatitis*, 1997; 4: 333–8.
12. Schade CP, Lambert EY. Factors in hepatitis A transmission. *Am J Public Health*, 1989; 79: 1571.
13. Amin J, Gilbert GL, Escott RG, Heath TC, Burgess MA. Hepatitis A epidemiology in Australia: national seroprevalence and notifications. *Med J Aust.*2001; 174(7): 338–41.