

RUBELLA IN NSW 1991–2000

Julia Brotherton

NSW Public Health Officer Training Program

Mohammad Habib

Communicable Diseases Surveillance and Control Unit

In this article we review the epidemiology of rubella cases notified in NSW since 1991.

Rubella (German Measles) is an infectious, generally mild viral disease. It is of public health importance because rubella infection acquired during early pregnancy often results in foetal anomalies (congenital rubella syndrome). Vaccination against rubella provides a high degree of protection, and rates of rubella and congenital rubella syndrome have been reduced by community vaccination programs.

Humans are the only known host of the rubella virus, which is transmitted from person to person through respiratory droplets. The incubation period is 14–21 days, and the disease is infectious from one week before until four days after the onset of rash.

Symptoms of rubella may include signs of upper respiratory infection, mild fever and a rash that typically starts on the face and then progresses down the body. Swelling of lymph nodes, particularly around the jaw and ears, is common and generally precedes the rash. Joint aches are also common, particularly in women. Rare complications include thrombocytopenia (low platelet count) and encephalitis.

Congenital rubella syndrome occurs in up to 90 per cent of infants born to women who are infected with rubella during their first trimester of pregnancy.¹ Rubella infection can also lead to miscarriage. Problems associated with congenital rubella syndrome include heart defects, deafness, mental retardation, and eye problems including cataracts.

Confirmed cases of rubella and congenital rubella syndrome should be notified to public health units. Only laboratory confirmed cases of rubella are notifiable due to the low specificity of symptoms including the rash, which is variably present.^{1,2} Rubella notification in NSW allows monitoring of the epidemiology of the disease to inform prevention strategies.

METHODS

Under the NSW Public Health Act 1991, all laboratories, school principals, and directors of child care facilities must notify suspected cases of rubella to their local public health unit (PHU). PHU staff record the details of confirmed cases on a confidential statewide Notifiable Diseases Database (NDD). We analysed the characteristics of notified cases from NDD during the period 1991 to 2000

by date of onset. Notification rates were calculated using mid-year population estimates from the Australian Bureau of Statistics for each year.

RESULTS

During the 10-year period, 5270 laboratory confirmed cases of rubella were reported in NSW. The least number of reports of the disease were received in 1991 (60), the year when rubella first became notifiable, and the most in 1995 (2375) (Table 1). The average annual incidence for this period was 8.5 notifications per 100,000 persons.

Most rubella cases occurred in the spring, with 55 per cent of notifications occurring in September, October and November (see Figure 7). In 2000 the majority of cases notified resided in the Hunter and South Eastern Sydney areas; this clustering of cases by local area and time is typical of the overall pattern, with periodic outbreaks occurring in different geographical areas.

Age and Sex

Over the 10-year period 70 per cent (3693/5270) of cases were male (sex not reported in 74 cases). By year the percentage of males fluctuated between 51 per cent (1998) and 80 per cent (2000). Most male cases were aged 15–24 years (54 per cent). During the 1995 epidemic, notifications peaked in this group at 218 per 100,000 (see Table 2).

There were 736 notifications of rubella in women of child bearing age (15–44 years) reported in the 10 years (49 per cent of all female notifications). Notification rates among women of child bearing age peaked in 1995 at 18.8 per 100,000.

Comparing the periods 1991–1995 and 1996–2000, the distribution of notifications by age group changed; falling slightly in those aged 10–19 years and rising in those aged 20–29 (see Figure 8). During 1991–1995, 44 per cent of all notifications were in 10–19 year olds; during 1996–2000 this percentage fell to 36 per cent of notifications. Conversely notifications in 20–29 year olds rose from 24 per cent of notifications during 1991–1995 to 35 per cent of notifications during 1996–2000.

Vaccination status

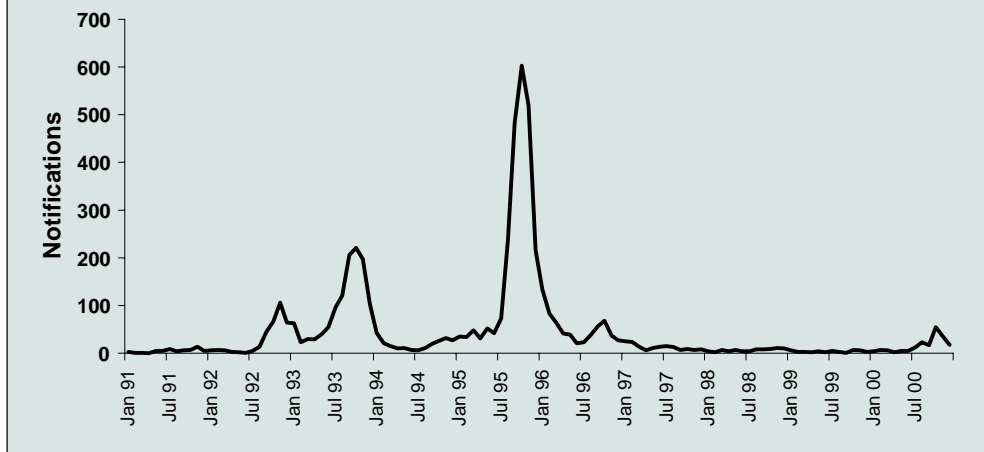
Vaccination status is poorly recorded on the NDD, probably because rubella is a laboratory notifiable disease and laboratories do not routinely report vaccination status. Since 1992, when vaccination status was sought on the NDD, only 18 per cent have had their vaccination status recorded. Only 15 per cent of these reported previous vaccination against rubella.

Congenital rubella syndrome

Fourteen cases of congenital rubella syndrome were notified. Most cases were reported in 1996 (5 cases), which occurred in the year following the peak in rubella

TABLE 1**RUBELLA NOTIFICATIONS IN NSW 1991–2000: OVERALL RATES, RATES BY SEX, AND NOTIFICATIONS OF CONGENITAL RUBELLA SYNDROME.**

Year of onset	Notified cases	Rate/100,000	Rate/100,000 males	Rate /100,000 females	Cases Congenital Rubella Syndrome
1991	60	1.0	1.1	0.9	1
1992	326	5.5	7.1	3.8	0
1993	1184	19.7	27.1	12.3	2
1994	229	3.8	4.9	2.6	4
1995	2375	38.8	57.7	18.1	1
1996	631	10.2	14.0	6.3	5
1997	153	2.4	2.9	2.0	0
1998	78	1.2	1.3	1.2	0
1999	45	0.7	0.8	0.6	1
2000	189	2.9	4.7	1.1	0
Total	5270	8.5	12.0	4.8	14

FIGURE 7**RUBELLA NOTIFICATIONS IN NSW 1991–2000 BY ONSET**

notifications. Since 1997 there has only been one case reported (in 1999).

DISCUSSION

The incidence of rubella, as reflected by notification data, continues to fluctuate in NSW although it would appear that immunisation has been successful in averting infection in recent years.

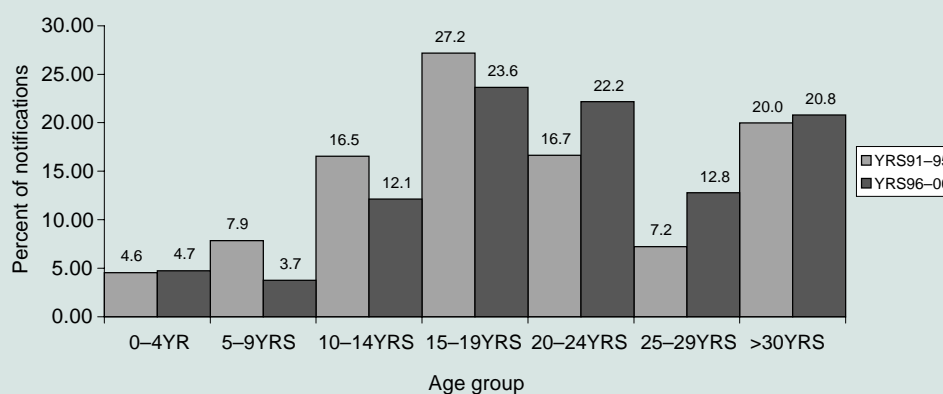
The age and sex distribution of notified cases demonstrates both the effectiveness of vaccination campaigns targeted at young women (the school girl rubella vaccination program commenced in 1971) and, paralleling this, the remaining susceptibility to the virus of the current cohort of young men.

In NSW, vaccination against rubella in childhood has been successfully implemented. The current vaccination schedule incorporates rubella vaccination as MMR

(measles, mumps and rubella vaccine) for all children at the age of 12 months, with a second dose at four years of age. MMR coverage is at over 90 per cent by age 24–27 months,³ and in 1998 during the Measles Control Campaign over 75 per cent of NSW primary school children received a dose of MMR.⁴ Thus rubella epidemics are now more likely to be sustained by non-immunised young adults than by children. In 1993 a school-based MMR vaccination program for 10–16 year olds replaced the school girl rubella vaccination program. The effect of this program may be reflected in the increasing proportion of notifications in the over-20s in more recent years, as this older group remains relatively under immunised. Because pregnant women are likely to have contact with non-immune young men, monitoring of cases of rubella and congenital rubella syndrome is critical to ensure that there is no paradoxical increase in cases of congenital rubella syndrome as rubella ceases to be a childhood disease that leads to long term immunity.⁵

TABLE 2**RUBELLA NOTIFICATION RATES NSW 1991–2001 IN YOUNG MEN AGED 15–24 AND WOMEN OF CHILD BEARING AGE (15–44 YEARS).**

Year of onset	Men aged 15–24 years		Women aged 15–44 years	
	Notified cases	Rate / 100,000	Notified cases	Rate / 100,000
1991	12	2.6	13	1.0
1992	115	24.7	53	3.9
1993	387	84.0	154	11.3
1994	82	17.9	43	3.1
1995	991	217.7	259	18.8
1996	238	52.8	113	8.1
1997	40	8.9	38	2.7
1998	13	2.9	23	1.6
1999	17	3.8	11	0.8
2000	109	24.1	29	2.0
Total 1991–2000	2004	44.0	736	5.3

FIGURE 8**RUBELLA NOTIFICATIONS NSW COMPARISON IN AGE COMPOSITION 1991–1995 WITH 1996–2000**

Notification data substantially underestimates rubella incidence since it only represents laboratory-confirmed cases. As just one of many causes of a febrile illness with rash, notifications reflect testing patterns rather than true incidence. Congenital rubella syndrome is also likely to be under reported to PHUs; a previous comparison of the number of cases identified by the Australian Paediatric Surveillance Unit, using active surveillance, with national notifications found that notifications recorded only a third of cases.⁵ However, rubella notification in NSW is likely to be highly specific, as the case definition requires laboratory confirmation.

Because vaccination is not 100 per cent effective in inducing life-long immunity to rubella,¹ ascertaining rubella immunity is a routine part of antenatal screening regardless of previous vaccination status. Rubella vaccination should not be given in pregnancy and it is therefore important that women considering pregnancy are aware of the need to check their immunity well before

they become pregnant. Women should be advised not to become pregnant until two months after vaccination.

REFERENCES

1. Chin J (editor). *Control of Communicable Diseases Manual, 17th edition*. Washington DC: American Public Health Association, 2000.
2. NHMRC. *The Australian Immunisation Handbook, 7th edition*. Canberra: National Health and Medical Research Council, 2000.
3. Australian Childhood Immunisation Register. Health Insurance Commission, Canberra. Date of processing 31 December 2000 (unpublished data).
4. Immunise Australia Program. *Let's work together to beat measles: a report on Australia's measles control campaign*. Canberra: Commonwealth Department of Health and Aged Care, 2000.
5. Sullivan EM, Burgess MA, Forrest JM. The epidemiology of rubella and congenital rubella in Australia, 1992 to 1997. *Commun Dis Intell* 1999; 23: 209–214. ☐