

# INFECTIOUS DISEASES, NSW: JULY 1998

## TRENDS

Reports of most notifiable infectious diseases through to June are largely on the decline, in line with seasonal expectations (Figure 7).

## INFLUENZA SURVEILLANCE ACTIVITY UPDATE

Influenza activity during July continued to increase, as for this period in previous years.

### Clinical activity

Reports of influenza-like illness from the NSW Sentinel General Practitioner Surveillance Scheme were received through four Public Health Units (PHUs) from approximately 30 general practitioners (GPs). Influenza-like illness activity has been variable but generally increasing to levels similar to those for the same period in previous years (25 to 30 cases per 1000 consultations).

### Virological activity

Laboratory reports of influenza also continued to increase. In the third week of July there were 42 reported diagnoses of influenza A and one of influenza B. The number of influenza A diagnoses reported per week increased to the highest recorded during last year; however, there are more laboratories reporting this year (six compared with four). Diagnoses of respiratory syncytial virus appear to have peaked, with 159 in the third week of July compared with 181 the week before.

### Directed virological surveillance

Directed virological surveillance, in which GPs each week submit swabs from up to five patients who are suffering from influenza-like illness, commenced early in July. Fifteen participating GPs submitted 108 swabs during this month from people with influenza-like illness. Eighteen (17 per cent) were positive for influenza A, none for influenza B and three for respiratory syncytial virus. Samples were received from patients with a wide range of ages. Children under five years of age had a higher rate of positive results for influenza A (32 per cent). No subtyping information is available yet.

### Australian surveillance

The following data have been reported by the National Centre for Disease Control. Influenza-like illness activity reported by sentinel general practices peaked in July for the ASPREN scheme (Australian Sentinel Practice Research Network) at 21 per 1000 consultations, a rate considerably lower than the 1997 peak of 50. Results under the Victorian Department of Health's sentinel general practice network also peaked in July at 26 per 1000. However, the number of whole-of-Australia laboratory reports of influenza A this year was higher than in recent years (as was the case for NSW). There may be higher rates of testing or reporting of laboratory results this year. Eight per cent of laboratory-reported influenza cases this year were influenza B and 92

per cent influenza A. All influenza A isolates typed this year by the World Health Organization reference laboratory in Melbourne were H3N2.

### International surveillance

Reports are being received by few countries at this time of year, as it is summer in the northern hemisphere and therefore it is a low period for influenza activity in many countries. South Africa reported only local outbreaks in early July following widespread outbreaks in May. Chile reported sporadic activity in early July. All virological reports of influenza to the World Health Organization worldwide since mid-June have been for influenza A; there have been none for influenza B.

## INFLUENZA IN 1919

On 3 May [1919], Mr EAB, a 30-year-old man, became ill with pains in the head and back. He was admitted to the City Road Emergency Hospital in Sydney on 9 May, and on examination his doctors found that he had a high fever (104 deg F), a rapid pulse (112 beats per minute), and rapid breathing (32 breaths per minute). He was cyanosed (blue from lack of oxygen) with rhonchi all over his chest and crepitations at the left base indicating lung infection. He deteriorated and died on 13 May. At autopsy the same day, his left lung was plum-coloured, with petechial haemorrhages throughout. Blood stained fluid filled the air sacs of the lower lobe rendering it solid.

The next day, DO, a 15½-year-old-girl was admitted with a week's history of illness. Examination found that she also had a high fever (103 deg F), a rapid pulse (128) and rapid breathing (40). Her sputum was rusty, and rales and crepitations were heard throughout her lungs. On May 12, the doctors caring for her noted that she had developed air hunger and water logging, and she died. At autopsy, her lungs were found to have had a similar pathology to those of Mr EAB.

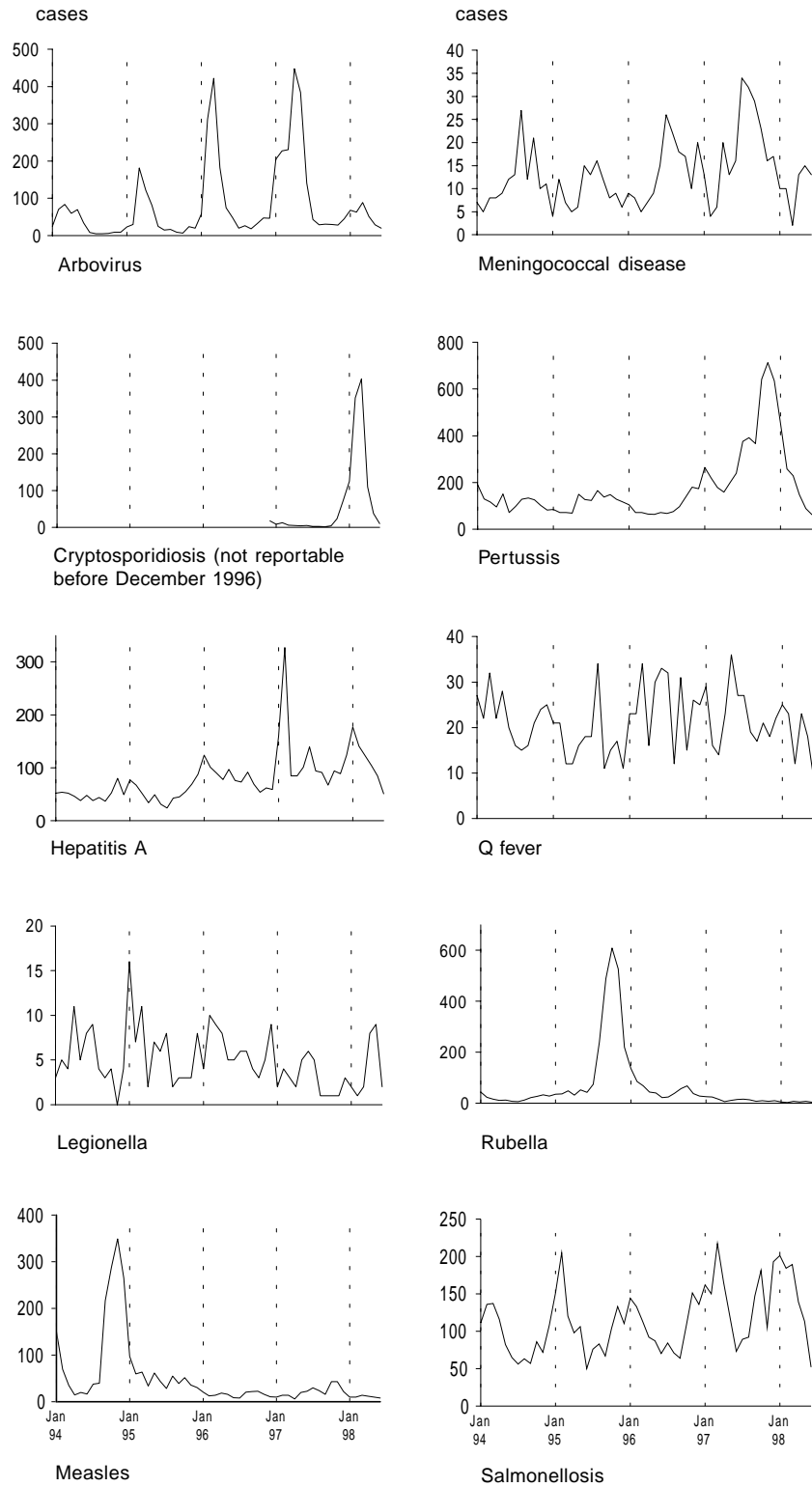
These are just two of the 130 case reports listed in the NSW Department of Public Health's report on the influenza epidemic in 1919.<sup>1</sup> Here we present some highlights of their report, which provide a rather chilling account of just how devastating this tragedy was to the people of NSW.

Having received reports of a pandemic of influenza raging in Europe and North America, in his 1918 annual report, Robert T. Paton, NSW Director-General of Public Health, outlined precautionary and preventive measures that might prevent influenza from taking hold in the State. These measures included opening 2500 extra hospital beds, closing and converting country schools into emergency hospitals, diversion of the Civil Ambulance and Transport Brigade for influenza activities, installation of inhalation sprays, recommending the wearing of masks, preparation of vaccine, and establishing depots from which to vaccinate the population. For three months the government imposed a sea quarantine that for a while seemed destined to save the State.

**FIGURE 7**

**REPORTS OF SELECTED INFECTIOUS DISEASES, NSW, JANUARY 1994 TO JUNE 1998, BY MONTH OF ONSET**

These are preliminary data: case counts in recent months may increase because of reporting delays



Then, on 24 January 1919, the Randwick Military Hospital reported 'a suspicious case of illness' in a man who had arrived in Sydney after travelling overland from Melbourne. The illness soon showed all the hallmarks of pneumonic influenza.

Over the next few days, several more cases of influenza were reported in others who had travelled from Melbourne, and the disease began to spread through the city in two 10-week waves (Figure 8).

Dr W.G. Armstrong, the Deputy Director-General of Public Health, described the syndrome thus:

The onset was sudden, sometimes fulminant in its character. Instances occurred in which individuals were suddenly attacked by giddiness, muscular weakness, and severe headache while walking in the street, and frequently patients stated that they had gone to bed feeling perfectly well, and a few hours later had awakened in a state of miserable illness.<sup>1</sup>

Other reported symptoms included chills, coryza, a flushed face, conjunctival injection, sore throat, bleeding nose, chest pain, headache, nausea, sweating and high temperature. Among the 12 786 hospitalised cases, 61 per cent were complicated by pneumonia, sometimes right from the very first influenzal attack, but more usually on the third or fourth days. Doctors were struck by the lilac or lavender hue that patients took on because of cyanosis.

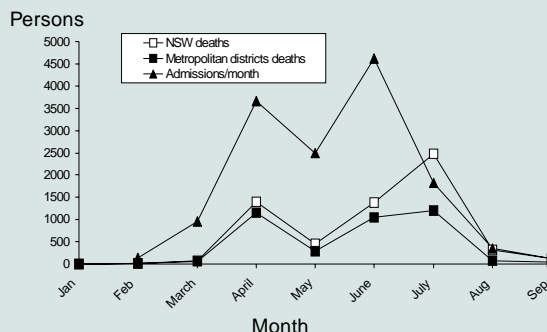
In all, the 1919 flu epidemic infected an estimated 36 per cent of Sydney's population. In a single week in mid-June, 1315 patients were hospitalised with influenza. In country areas, ambulance officers sometimes resorted to carrying patients on foot through the bush or over sand for over a mile. The first wave from 19 March to 27 May killed 1892 people; the second more severe wave, from 28 May to 25 August, killed 2989 people. The epidemic killed at least 6387 NSW residents (or 24 per cent of all deaths that year), including several health workers, one of whom was the principal medical officer with the Education Department, Dr C.S. Willis. The age-specific death rate showed highly unusual characteristics: fatalities were highest among young adults (Figure 9), and in 1919, it was the second wave that proved most deadly (Figure 8).

### The Public Health Department responds

In desperation, authorities first restricted travel from Victoria, and then travel from Sydney to country areas. At first, all land traffic was prohibited, and later, quarantine detention camps were set up on the Victorian border, requiring prospective travellers from Victoria to undergo at first seven, and later, four days of quarantine. Ships from Victoria were quarantined for four days after leaving the infected port, after which crew and passengers were medically inspected. Influenza was made a notifiable disease, and patients and contacts were placed in compulsory isolation. Schools and churches were closed and public meetings restricted, and authorities ordered the wearing of masks by the population. Early in the outbreak,

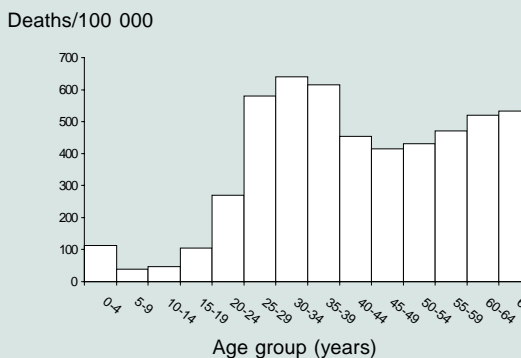
**FIGURE 8**

**INFLUENZA-RELATED ADMISSIONS TO METROPOLITAN HOSPITALS, AND DEATHS IN NSW, 1919**



**FIGURE 9**

**INFLUENZA-RELATED DEATH RATES, NSW, 1919, BY AGE GROUP**



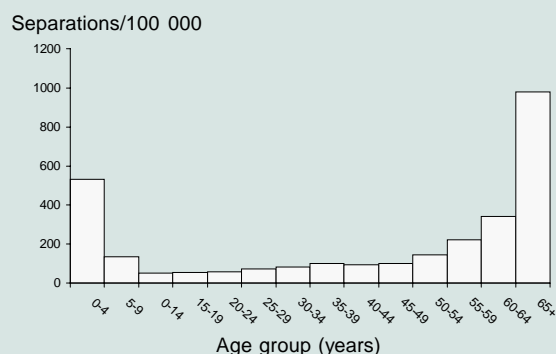
persons exposed to the infection were invited to enter one of several chambers set up across the city for a 120-minute disinfection session, in which a mist containing sulphate of zinc was inhaled for 10 minutes. Portable versions of these machines were used early in the epidemic to disinfect houses occupied by influenza victims.

### Vaccination

In November 1918 the Department of Public Health began developing a vaccine to protect people against the complications of influenza (rather than the infection itself). Vaccines were prepared using as many strains as possible of pneumococci, streptococci, *Staphylococcus aureus*, Pfeiffer's influenza bacilli and other organisms believed at the time to be associated with the disease, derived from postmortem material from two fatal cases at the North Head Quarantine Station and over 100 other sources. A course

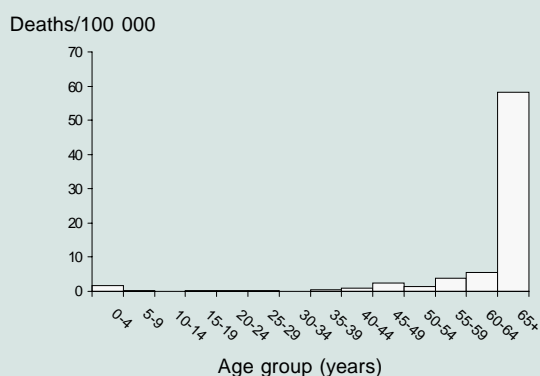
**FIGURE 10**

**INFLUENZA-RELATED (ICD9 480–487<sup>2</sup>) HOSPITAL SEPARATION RATES, NSW, 1995, BY AGE GROUP**



**FIGURE 11**

**INFLUENZA-RELATED (ICD9 480–487<sup>2</sup>) DEATH RATES, NSW, 1995, BY AGE GROUP**



of two or three doses over two to three weeks was recommended. Free inoculations were offered from November 1918 to May 1919, from 1265 depots open day and night throughout Sydney and others in most country towns. Over 819 000 inoculations were given, with many depots rushed when news of the first cases began to appear, especially by people believing it helped unrelated conditions such as rheumatic disease and catarrh (some of whom submitted themselves to regular injections at two- to three-week intervals).

**Health outcomes?**

The Health Department realised fairly early on that many of these interventions were of dubious value, especially once the epidemic was in full swing, although at the time it was felt that restricting assembly and the use of masks in confined spaces might have been useful.

To evaluate the effect of vaccination, the Department asked several Sydney hospitals to provide cards on each patient admitted with influenza. These cards gathered information on name, age, sex, date of inoculation (as reported by the patient), dates of onset and admission, severity of disease, complications, outcome, and postmortem results. The vaccination status of patients treated at Sydney hospitals is shown in Table 6.

While there was little evidence that vaccinations actually prevented influenza infection, health authorities did think that vaccines were able to prevent serious complications. The data in Table 6 indicate that persons who had received vaccine were significantly less likely to die from influenza than those who did not receive vaccine (odds ratio 0.60, 95 per cent confidence interval 0.53-0.68). There are doubtless many provisos to these conclusions: selection and information biases and possible confounding factors could have resulted in a false association. Nonetheless, these data are tantalisingly suggestive that perhaps something in the vaccine (possibly pneumococcal antigens) afforded some protection against serious complications of influenza.

**Back to the future**

Some 80 years later, mystery still surrounds the exact nature of the influenza virus that caused the devastating pandemic, of which the NSW experience was just a part. In 1998, researchers are attempting to recover remnants of the 1919 pandemic virus that may have persisted in six young Norwegian miners who died in October 1918 and were buried in the permafrost of Longyearbyen, north of the Arctic circle. Some features of that virus noted above,

*continued on p. 84*

**TABLE 6**

**VACCINATION STATUS PRIOR TO ADMISSION TO HOSPITAL AND TYPE OF DISEASE (OR DEATH) OF 11 972 PATIENTS TREATED FOR INFLUENZA IN 25 SYDNEY HOSPITALS, 27 JANUARY TO 30 SEPTEMBER 1919**

Patient's vaccination status	Simple		Mild or severe		Dead		Total n
	n	%	n	%	n	%	
Vaccinated	1740	42	1973	48	442	11	4 155
Not vaccinated	2130	34	3086	49	1033	17	6 249
Unknown	534	34	617	39	417	27	1 568
Total	4404	37	5676	47	1892	16	11 972

TABLE 7

## INFECTIOUS DISEASE NOTIFICATIONS RECEIVED IN JUNE 1998 BY AREA HEALTH SERVICES

Condition	Area Health Service (1998)																	Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	for Jun**	to date**
<b>Blood-borne and sexually transmitted</b>																			
AIDS	-	-	1	-	-	-	-	-	6	1	1	-	-	-	-	-	-	9	81
HIV infection*	HIV data provided on alternate months																		
Hepatitis B: acute viral*	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	4	31
Hepatitis B: other*	22	33	103	3	74	2	6	7	73	5	2	5	1	1	3	2	1	350	2051
Hepatitis C: acute viral*	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	34
Hepatitis C: other*	29	38	147	37	121	74	56	23	135	37	23	20	9	25	1	14	23	819	4985
Hepatitis D: unspecified*	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	2
Hepatitis: acute viral (not otherwise specified)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Gonorrhoea*	5	3	6	-	-	2	1	-	42	1	2	1	-	-	-	2	3	69	463
Syphilis	2	3	5	-	-	1	-	-	13	1	1	1	3	1	5	-	-	39	281
<b>Vector-borne</b>																			
Arboviral infection*	-	2	-	1	1	-	1	2	2	6	6	2	1	-	3	2	1	30	354
Malaria*	-	2	1	-	1	-	2	-	2	3	3	-	-	-	-	-	-	14	94
<b>Zoonoses</b>																			
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptospirosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Q fever*	-	-	-	1	-	-	1	-	1	2	3	2	6	-	-	-	1	17	113
<b>Respiratory and other</b>																			
Blood lead level	3	1	12	9	15	3	6	1	1	1	1	1	2	2	-	-	-	58	539
Legionnaires' disease	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	23
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Meningococcal (invasive) infection	-	-	3	1	1	2	3	-	2	1	-	-	-	1	-	-	-	14	63
Mycobacterial tuberculosis	2	3	6	-	5	-	-	4	7	-	-	-	-	-	-	-	-	27	205
Mycobacteria other than TB	1	10	-	-	-	-	2	-	4	-	1	-	-	-	-	-	-	18	143
<b>Vaccine-preventable</b>																			
Adverse event after immunisation	1	1	1	1	-	-	-	2	-	-	3	-	1	-	1	1	12	135	-
<i>H. influenzae</i> b (invasive) infection	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	6
Measles	-	-	-	-	1	-	2	4	-	-	2	-	1	1	-	-	-	11	66
Mumps*	-	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	3	21
Pertussis	1	2	1	9	7	1	16	7	12	4	1	2	2	3	5	3	3	79	1654
Rubella*	-	1	-	-	-	-	1	-	1	1	1	-	-	1	-	-	-	6	31
Tetanus	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	4
<b>Faecal-oral</b>																			
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cryptosporidiosis	3	5	4	1	2	4	5	1	6	3	6	2	-	-	1	3	1	47	1070
Food-borne illness (not otherwise specified)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	2	13
Gastroenteritis (in institution)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	132
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Hepatitis A	3	1	1	6	12	6	1	6	9	16	6	-	-	-	-	-	1	68	711
Hepatitis E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Listeriosis*	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	2	20
Salmonella (not otherwise specified)*	4	13	-	-	8	3	5	5	10	9	2	5	1	2	-	2	-	70	970
Typhoid and paratyphoid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
Verotoxin-producing <i>E. coli</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

\* lab-confirmed cases only \*\* includes cases with unknown postcode

CSA = Central Sydney Area  
NSA = Northern Sydney Area  
WSA = Western Sydney AreaWEN = Wentworth Area  
SWS = South Western Sydney Area  
CCA = Central Coast AreaHUN = Hunter Area  
ILL = Illawarra Area  
SES = South Eastern Sydney AreaNRA = Northern Rivers Area  
MNC = North Coast Area  
NEA = New England AreaMAC = Macquarie Area  
MWA = Mid Western Area  
FWA = Far West AreaGMA = Greater Murray Area  
SA = Southern Area