Australian Government
Department of Health and Ageing

AUSTRALIAN INFLUENZA SURVEILLANCE SUMMARY REPORT

No.14, 2009, REPORTING PERIOD: 8 August 2009 – 14 August 2009

Key Indicators

The counting of every case of pandemic influenza is no longer feasible in the PROTECT phase. Influenza activity and severity in community is instead monitored by the surveillance systems listed below.

Is the situation changing?	Indicated by: laboratory confirmed cases reported to NetEpi/NNDSS; GP Sentinel ILI Surveillance; and ED presentations of ILI at sentinel hospitals (NSW and WA). Laboratory data are used to determine the proportion of pandemic (H1N1) 2009 circulating in the community.
How severe is the disease, and is severity changing?	Indicated by: number of hospitalisations, ICU admissions and deaths from sentinel hospital surveillance; emergence of more severe clinical picture in hospitalised cases and ICU admissions.
Is the virus changing?	Indicated by: emergence of drug resistance or gene drift/shift from laboratory surveillance.
What is ahead?	Forward projections of cases, morbidity and mortality.

Key Points

Is the situation changing?

- As of 14 August 2009 there were 28,619 confirmed cases of pandemic (H1N1) 2009 in Australia. The number of cases reported is only a small proportion of pandemic (H1N1) 2009 circulating in the community.

- Overall, current national influenza activity appears to be steady. Most jurisdictions have reported that pandemic (H1N1) 2009 activity has peaked or has plateaued. Activity varies across jurisdictions.
    - ILI presentations to General Practitioners have spiked in Western Australia and are also increasing in the Northern Territory and Queensland. GP presentations in all other jurisdictions are decreasing. At a national level they are below 2007 rates.
    - Most jurisdictions are reporting that ILI presentations to Emergency Departments are decreasing.
    - Absenteeism rates have decreased in the last week and are below levels seen at the same time in 2007.

- Type A influenza is the predominant seasonal influenza type reported by all jurisdictions. The pandemic strain appears to be replacing the current seasonal H1N1 virus. The proportion of influenza positive tests that were pandemic (H1N1) 2009 remained stable and varied between jurisdictional reporting systems from 69% (NT) to 94% (WA) for this reporting period, with an average proportion of 80%. Of the seasonal influenza A notifications, A/H3N2 is the predominant subtype reported by most jurisdictions.

How severe is the disease?

- The number of people with pandemic (H1N1) 2009 requiring hospitalisation continues to increase. As of 14 August there were 447 people in hospital and 104 in ICU. In total, 3,524 people have been hospitalised. The highest hospitalisation rate occurred in young children aged less than 5 years of age (34.5 per 100,000 population).

- Due to the presence of underlying chronic disease, some of which is undiagnosed, and their higher level of social disadvantage, Indigenous Australians are vulnerable to complications from the pandemic H1N1 2009 virus. Indigenous Australians are approximately 5 times more likely than non-Indigenous Australians to be hospitalised for pandemic (H1N1) 2009. In total, 451 (12.8%) hospitalisations have been Indigenous Australians.

- Four percent of hospitalised cases have been reported as pregnant, reinforcing the fact that pregnancy, particularly in the second and third trimesters, is a risk factor for pandemic H1N1 2009 infection. For the month of July, pregnant women accounted for 32% of hospitalised confirmed cases for women aged between 25 and 29 years.

- The percentage of hospitalised cases who have been admitted to an ICU since the beginning of the outbreak is available for 2 States:14.8% for New South Wales and 13.3% in Queensland.

- Since reporting began, the Australian Paediatric Surveillance Unit (APSU) has reported a total of 93 notifications of children hospitalised with severe complications of influenza.

- The number of deaths associated with pandemic (H1N1) 2009 continues to increase. As of 14 August, 106 people have died. Of these deaths, four were pregnant women and 14 (13.2%) were Indigenous.

- The median age of confirmed cases that died is 56 years (range 3-86 years of age), compared to the median age for deaths from seasonal flu from 2001 to 2006 which is 83 years.

- Reports from the jurisdictions in Australia indicate that most of the deaths had underlying medical conditions; including cancer, diabetes mellitus and morbid obesity. A small number of deaths have occurred where the individual was previously healthy.

Is the virus changing?

- To date in Australia, all of the 159 pandemic (H1N1) 2009 viral isolates tested have been sensitive to the neuraminidase inhibitors oseltamivir and zanamivir, and none of the 73 pandemic (H1N1) 2009 clinical specimens tested positive for the H275Y mutation which confers resistance to oseltamivir.
- Media has reported that there have been 11 cases reported of oseltamivir resistance pandemic (H1N1) 2009 virus up to 18 August, including a second case in Hong Kong and 2 new cases in the US in two severely immunosuppressed leukaemia patients. While WHO has received formal notification of 7 cases of oseltamivir resistance pandemic (H1N1) 2009 viruses to date (1 in Singapore, 1 in Denmark, 1 in Hong Kong, 1 in Canada and 3 in Japan), China has informally alerted WHO to the discovery of a small number of other oseltamivir-resistant pandemic (H1N1) 2009 viruses.

What is ahead?

- With a 20% clinical attack rate and no intervention; it has been estimated that by the end of winter 1 in 5 Australian (4.3 million) could become infected with the pandemic virus, leading to 40 to 80,000 hospitalisations, and 6,000 deaths. Currently the number of hospitalisations and deaths are tracking below these estimations, suggesting that efforts to protect the vulnerable are effective.

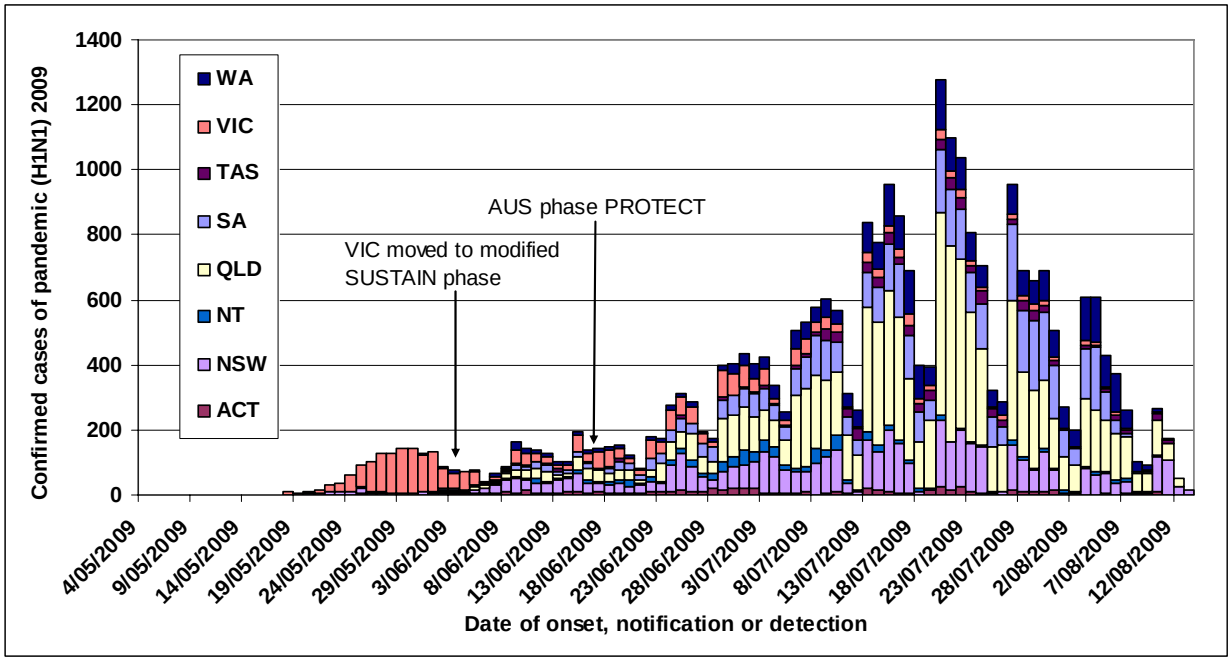
1. Current influenza activity in Australia – Is the situation changing?

Notifications of confirmed pandemic (H1N1) 2009 and seasonal influenza

As of 14 August 2009 there were 28,619 confirmed cases of pandemic (H1N1) 2009 in Australia, including 106 deaths. Notifications of laboratory confirmed pandemic (H1N1) 2009 have decreased nationally over the last week. The number of cases reported represents only a small proportion of pandemic (H1N1) 2009 circulating in the community.

The national epidemic curve shows the jurisdictional distribution of confirmed cases of pandemic (H1N1) 2009 over time in Australia (Figure 1). The epidemic curve shows several peaks, however the pattern is a surveillance artefact due to a change in testing policy. The majority of earlier confirmed cases occurred in Victoria, where case reporting peaked in late May before declining rapidly in early June. This change was due to targeted laboratory testing implemented on 3 June 2009 as part of the modified SUSTAIN phase.

Figure 1. Laboratory confirmed cases of pandemic (H1N1) 2009 in Australia, to 14 August 2009 by jurisdiction

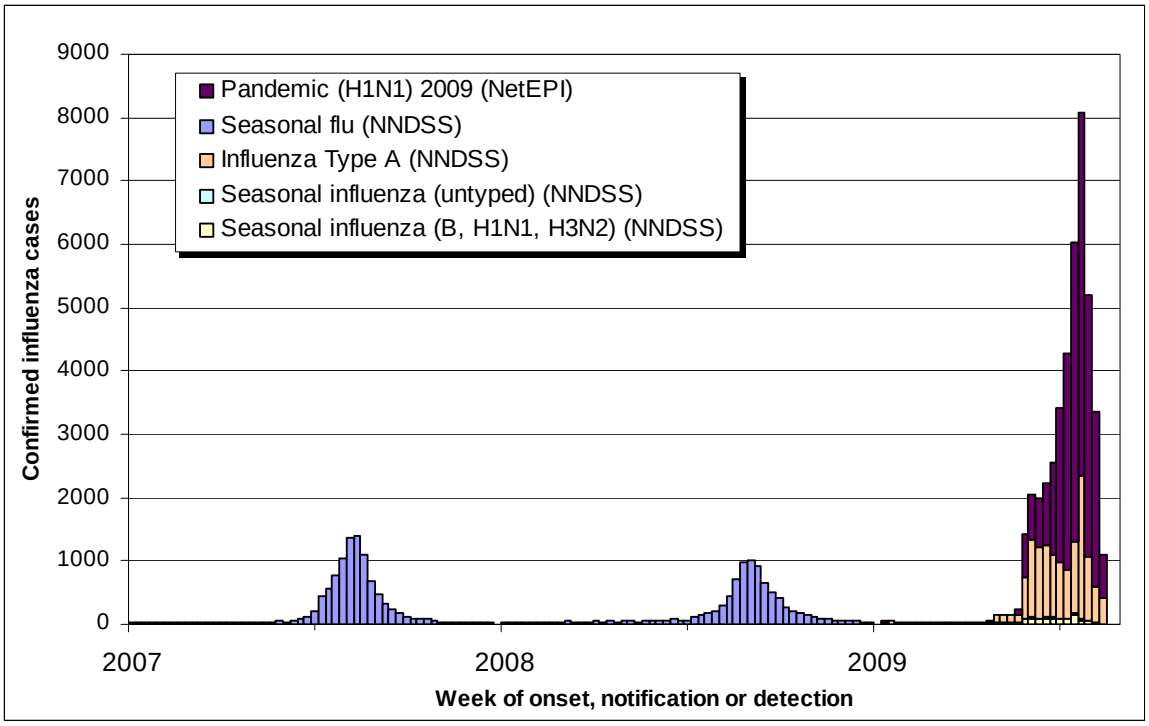


Source: NetEPI database

As Figure 2 shows, influenza activity in 2009 started earlier than in 2008 and there was a rapid increase in the number of confirmed influenza cases (both seasonal and pandemic (H1N1) 2009) from week 21 (starting 16 May 2009). The high number of seasonal influenza seen during May and June are most likely due to the increase in testing for pandemic (H1N1) 2009.

Laboratory confirmed notifications of influenza are currently at 2.6 times the 5 year rolling mean.

Figure 2. Influenza activity in Australia, by reporting week, years 2007, 2008 and 2009*



* Data on pandemic (H1N1) 2001 cases is extracted from NetEPI; data on seasonal influenza is extracted from the NNDSS.

Sources: NNDSS and NetEPI databases

On 17 June 2009, Australia commenced the transition to a new response phase called PROTECT, in which laboratory testing is directed towards people with moderate or severe illness; those more vulnerable to severe illness; and those in institutional settings. This means that the number of confirmed cases will not reflect how many people in the community have acquired pandemic (H1N1) 2009 infection.

As the counting of every case is no longer feasible in the PROTECT phase. Influenza activity, including Influenza Like Illness (ILI) activity in the community is instead monitored by surveillance systems including:

- GP Sentinel ILI surveillance;
- Emergency Department presentations of ILI at sentinel hospitals (NSW and WA); and
- Absenteeism rates.

Laboratory data are used to determine the proportion of pandemic (H1N1) 2009 circulating in the community.

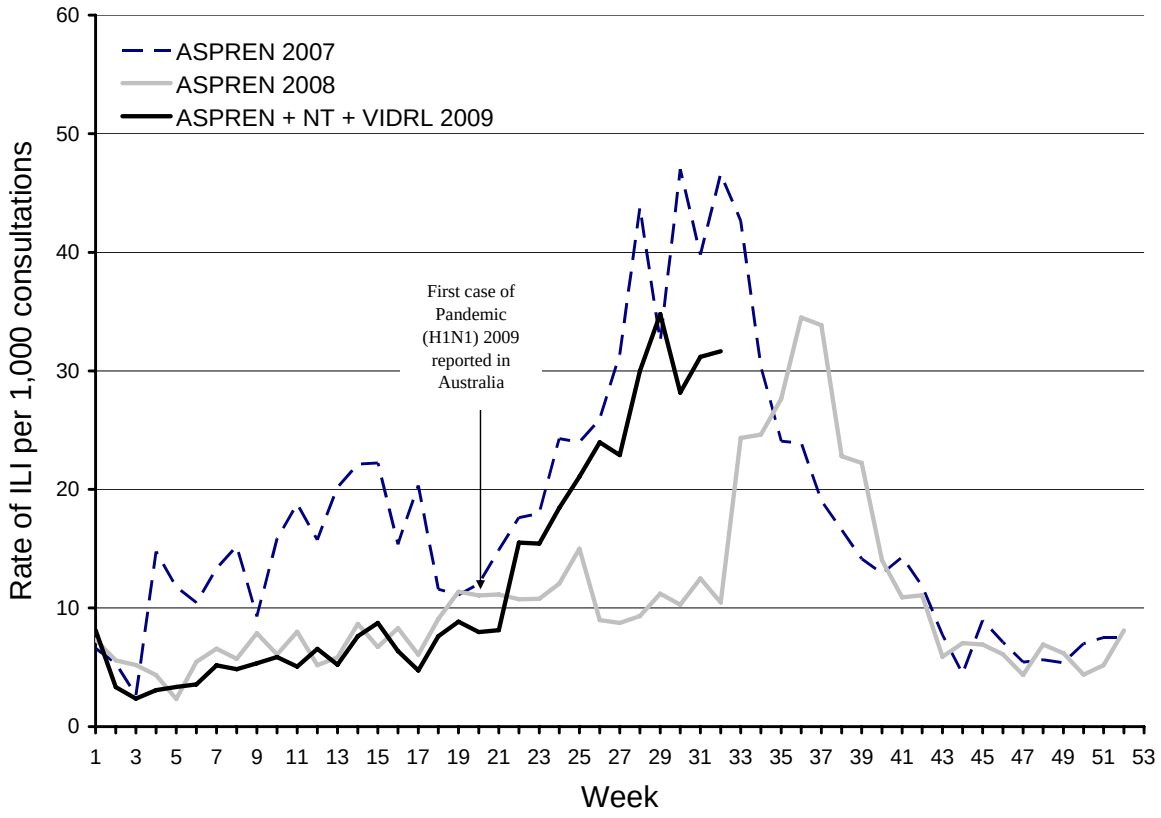
Influenza Like Illness activity in Australia

Sentinel General Practice

ILI presentations to General Practitioners remain high but lower than 2007 rates nationally. Decreases have been seen in Victoria, New South Wales and Queensland[1] this reporting period.

Combined data available from the Australian Sentinel Practices Research Network (ASPREN), the Northern Territory GP surveillance system and VIDRL, up until 9 August 2009, show that nationally, influenza like Illness (ILI) consultation rates have increased this reporting period at a slower rate than previous periods and are below levels seen in 2007 (Figure 3). In the last week, the presentation rate to sentinel GPs in Australia was approximately 32 cases per 1,000 patients seen.

Figure 3. Rate of ILI reported from GP ILI surveillance systems from 2007 to 9 August 2009 by week*



* Delays in the reporting of data may cause data to change retrospectively. As data from the NT and the VIDRL surveillance systems are combined with ASPREN data, rates may not be directly comparable across 2007, 2008 and 2009.

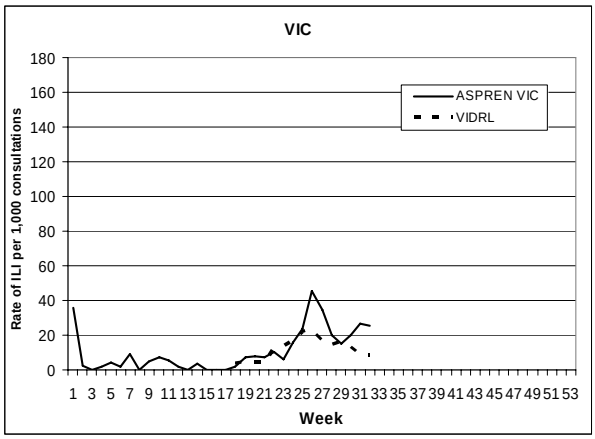
SOURCE: ASPREN, NT, VIDRL

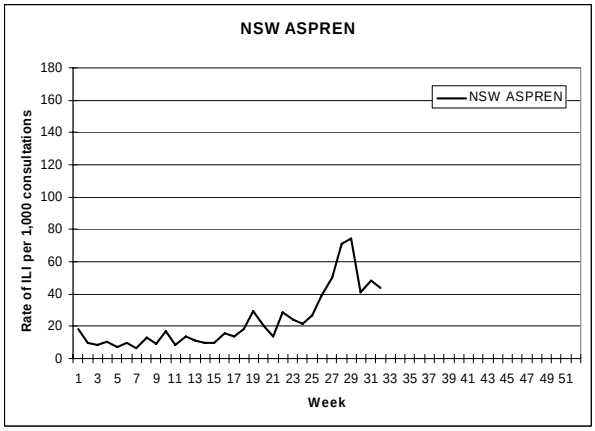
Further analysis of the ILI data showed levels in Victoria (both from ASPREN and VIDRL), NSW and QLD dropped in this period. Rates of ILI have increased in SA, Tas, WA, NT and ACT (Figure 4).

Care should be taken when interpreting Figure 5 graphs due to lags in reporting in some instances and small numbers being reported from jurisdictions. The last data point may be modified in future reports.

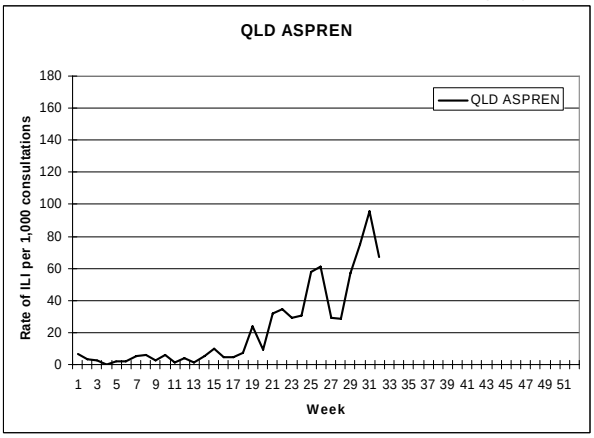
[1] Qld has since reported a rise in ILI presentations

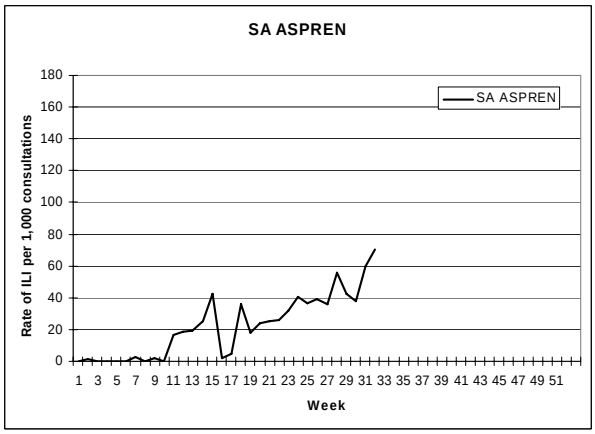
Figure 4. Rate of ILI reported from ASPREN, VIDRL and NT by State from January 2009 to 9 August 2009 by week

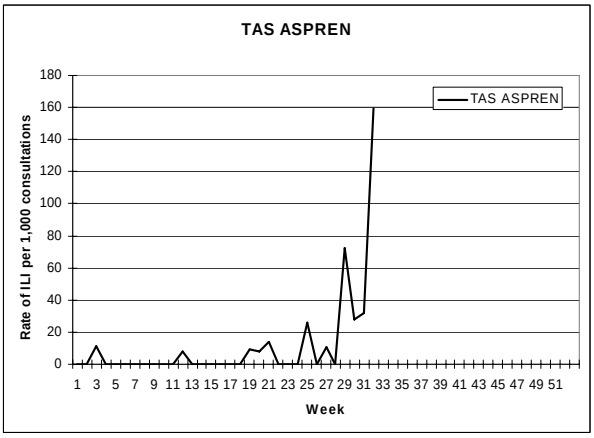


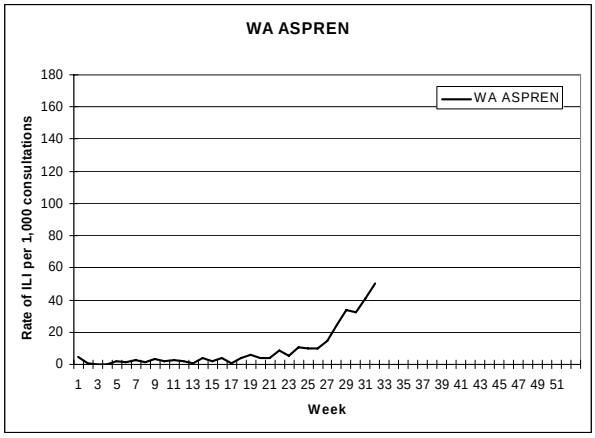


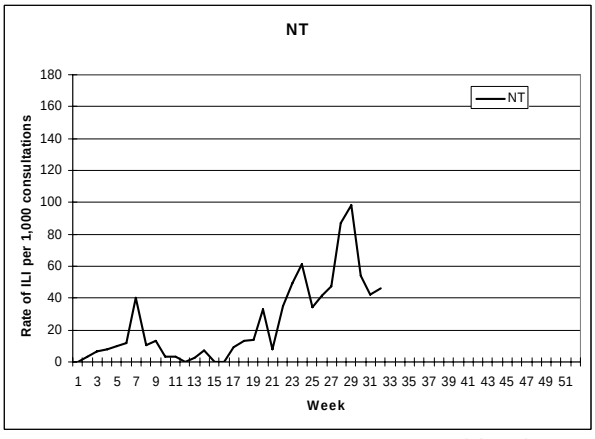
SOURCE: ASPREN (VIC) & VIDRL

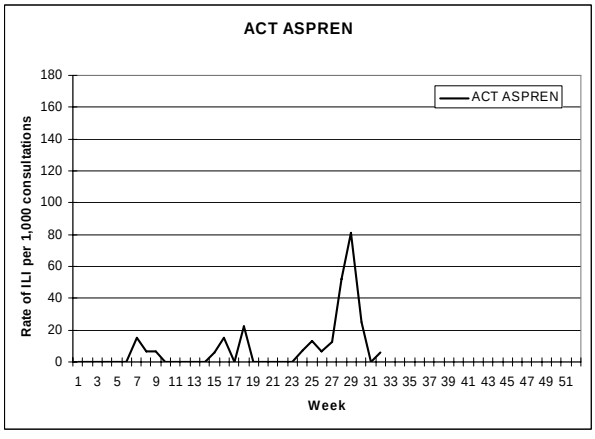












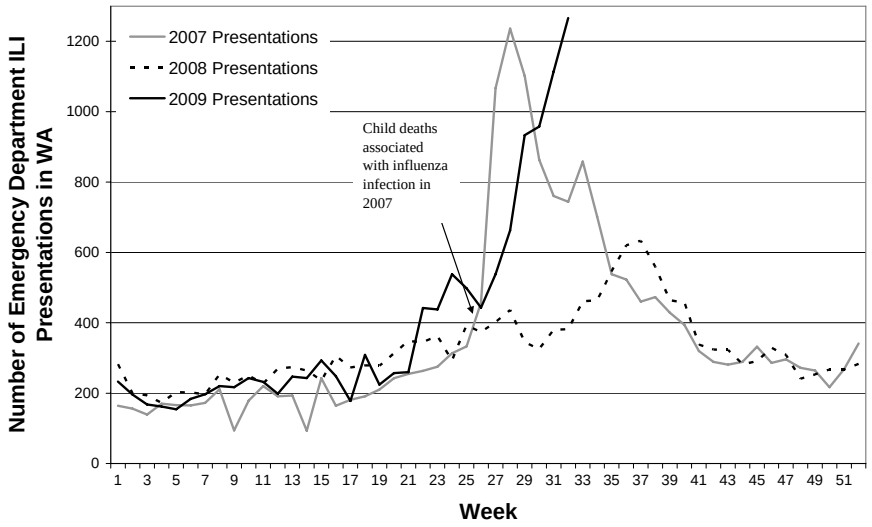
SOURCE: NT

Emergency departments

Trends in ILI presentations to EDs varied this reporting period, with WA (Figure 5) reporting a sharp increase and SA and NSW (Figure 6) reporting a decrease.

The number of ILI presentations reported in Western Australian EDs has sharply increased in the week ending 9 August 2009 to its highest point this year and is significantly higher than at the same time in 2007 and 2008 (Figure 5). The proportion of ILI presentations admitted to hospital decreased from 4.9% to 4.4%.

Figure 5. Number of Emergency Department presentations due to ILI in Western Australia from 1 January 2007 to 9 August 2009 by week

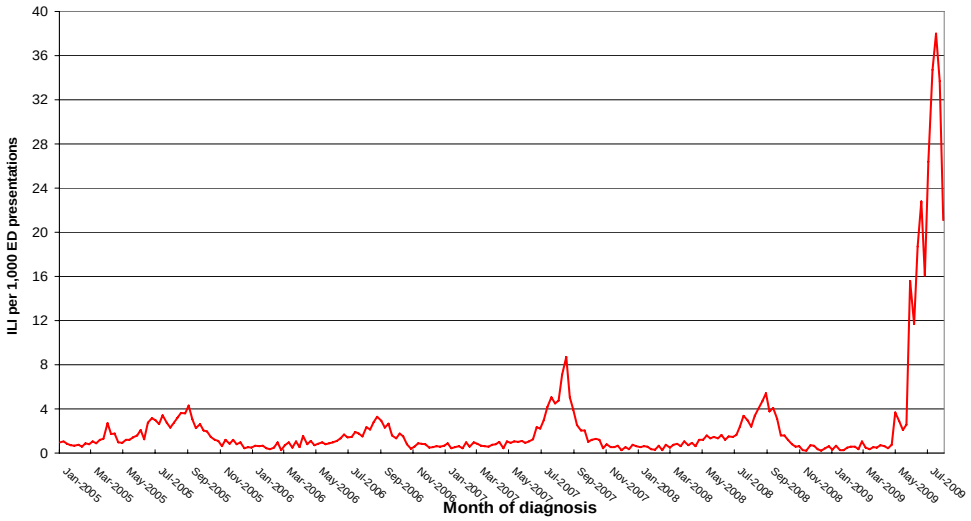


In early July 2007 (week 26), several deaths associated with influenza infection were reported in children from Western Australia. The public response to these deaths could account for the sudden increase in ILI presentations to Perth EDs in 2007.

SOURCE: WA 'Virus Watch' Report

In the week ending 31 July 2009, ILI presentations to New South Wales EDs decreased (rate 22 per 1,000 presentations) (Figure 6). Presentations were mainly for mild illnesses and 11% of presentations with ILI were admitted.

Figure 6. Rate of ILI diagnosed in people presenting to selected Emergency Departments, NSW 1 January 2005 to 31 July 2009 by month*



* Emergency department data are preliminary and may be updated in later weeks.

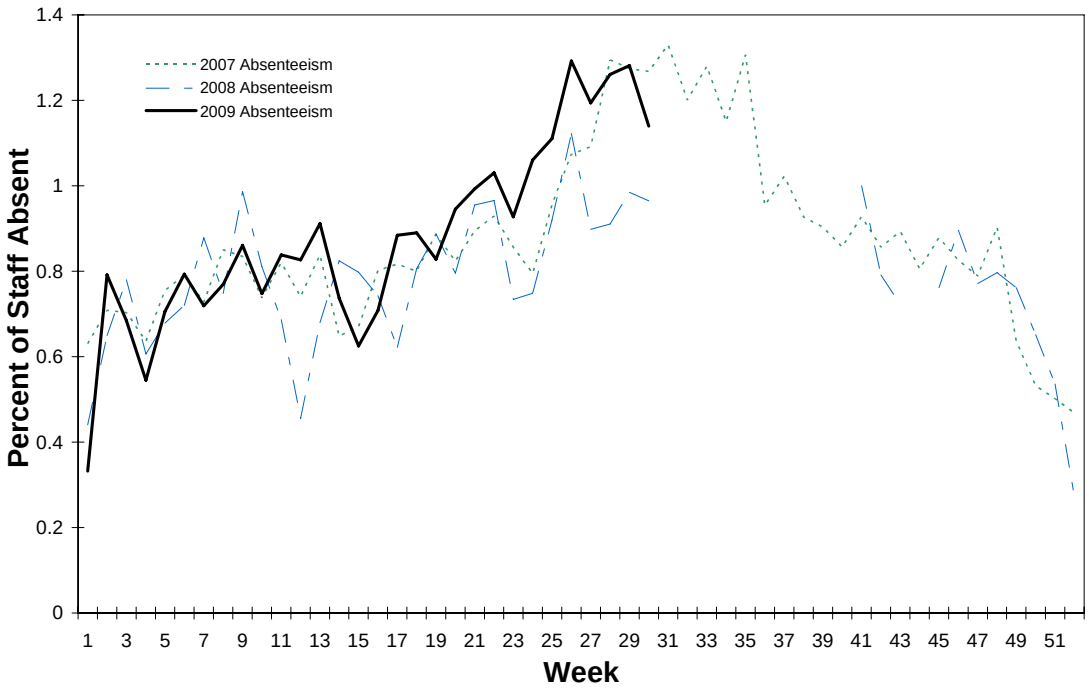
SOURCE: NSW HEALTH 'NSW Influenza Surveillance Report'

ILI presentations to South Australian EDs decreased to 151 presentations this reporting period compared with 217 presentations in the previous week. The number of admissions decreased from 19 to 12.[1]

Absenteeism

Absenteeism rates have decreased in the last week and are below levels seen in 2007 (Figure 7).

Figure 7. Rates of absenteeism of greater than 3 days absent, National employer, 1 January 2007 to 29 July 2009, by week.



SOURCE: Absenteeism data

Laboratory surveillance:
How much ILI and influenza is due to pandemic (H1N1) 2009?

As shown in Table 1 below, the proportion of respiratory tests positive for influenza varied between jurisdictional reporting laboratories and ranged from 12% to 100% for this reporting period.

Of those tests that were positive for Influenza A, the proportion of tests that were pandemic (H1N1) 2009 remained stable in most jurisdictions, and varied between jurisdictions from 69% (NT) to 94% (WA).

The proportion of pandemic (H1N1) 2009 to seasonal influenza varies across jurisdictions. This proportion is used as an indicator to help determine if a person has influenza, how likely it is to be pandemic (H1N1) 2009. The proportion of pandemic (H1N1) 2009 to seasonal influenza as reported by the jurisdictions is shown in Table 1. The average proportion of confirmed influenza in Australia which was pandemic (H1N1) 2009 decreased slightly to 80%.

Over the last two weeks, for the days on which surveillance testing was conducted, ASPREN GPs reported 155 people presenting with ILI. Of these, 49% (76/155) were tested for influenza. Thirty-seven percent (28/76) of these cases were influenza positive; 93% (26/28) were pandemic (H1N1) 2009 and 7% (2/28) were influenza A unspecified.

Table 1. Laboratory tests that tested positive for influenza A and pandemic (H1N1) 2009

	ASPREN – national	NSW report^	VIDRL Sentinel GP #	WA NIC	NT (reported by WA NIC)
Latest report					
Number of specimens tested	76	1918 (at 7/8)	45 (at 9/8)	476 (at 20/8)	32 (at 9/8)
% tested which were Influenza A	37%	12%	42%	100%	100%
% tested which were pandemic (H1N1) 2009	93%	71%	89%	94%	69%
Previous report					
Number of specimens tested	92	2637 (at 5/8)	45 (at 26/7)	n/a	n/a
% tested which were Influenza A	27%	21%	42%	558 (at 7/8)	32% (at 7/8)
% tested which were pandemic (H1N1) 2009	92%	79%	89%	97%	70%

*ASPREN tests are collected every Tuesday. Results are reported for a rolling fortnight as data changes retrospectively.
^NSW Influenza Report available from: http://www.emergency.health.nsw.gov.au/swineflu/index.asp
#VIDRL Influenza Report available from: http://www.vidrl.org.au/surveillance/flu%20reports/flurpt09/flu09.html
^^ 8 Influenza A specimens were untyped.

The proportion of pandemic (H1N1) 2009 compared with seasonal influenza in Australia is very similar to that reported by a number of other countries in both the Northern and Southern Hemispheres. Argentina reported that 93% of the respiratory viruses circulating in those aged over 5 years is due to pandemic (H1N1) 2009[2], while Canada reported that pandemic (H1N1) 2009 represents 99% of all influenzas[3], and the US is reporting that it represents 98% of the total circulating influenza viruses.[4] In New Zealand, pandemic (H1N1) 2009 represents 73% of influenza viruses reported from sentinel surveillance and 67% of influenza viruses reported in non-sentinel surveillance.[5]

2. How severe is the disease, and is severity changing?

Overview of pandemic (H1N1) 2009 severity

Table 2 provides a summary of measures that indicate the severity of pandemic (H1N1) 2009 since the beginning of the outbreak. Of particular note is the increasing median age as the severity of the disease progresses: 21 years for all confirmed cases; 31 years for hospitalised cases; 42 years for ICU cases; and 56 years for cases who have died.

Table 2. Summary severity indicators# of pandemic (H1N1) in Australia

	Confirmed pandemic (H1N1) 2009 cases	Hospitalised cases	ICU cases	Deaths
Total number	28,619	3,524 (12%)	112 (daily average)	106
% Females	50%	50% (1,088/2,168)	52% (124/237)	34%
Median age (years)	21	31	42	56
Indigenous status	7% (1140/15,426)	13%	21% (39/225)	13% (14/106)
Underlying medical conditions*	n/a	61%	58%	n/a
% Pregnant	n/a	4% (84/2,231)	13% (11/84)	4% (4/106)

#Data are extracted from a number of sources depending on the availability of information. Where complete data are not available, information on the figures used in the analysis have been provided in parentheses.
*Information on underlying medical conditions is currently available for only one jurisdiction

Table 3. Summary of hospitalisations and deaths for pandemic (H1N1) in Australia, by States and Territories

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
Total pandemic (H1N1) 2009 hospitalisations	43	1048	252	901	370	78	468	364	**3524**
Percentage of national pandemic (H1N1) 2009 hospitalisations	1.2%	29.7%	7.2%	25.6%	10.5%	2.2%	13.3%	10.3%	100%
Crude rate per 100,000	12.5	15.0	114.6	21.1	23.1	15.7	8.8	1.7	**16.5**
Total pandemic (H1N1) 2009 deaths	1	33	4	22	9	4	21	12	**106**
Percentage of national pandemic (H1N1) 2009 deaths	0.9%	31.1%	3.8%	20.8%	8.5%	3.8%	19.8%	11.3%	100%
Crude rate per 100,000	0.3	0.5	1.8	0.5	0.6	0.8	0.4	0.6	**0.5**

Pandemic morbidity (hospitalisations)

Hospitalisations of Pandemic (H1N1) 2009 confirmed cases

As of 14 August 2009, the jurisdictions have reported that 3,524 confirmed cases of pandemic (H1N1) 2009 have been hospitalised (this figure includes people who are hospitalised for associated conditions). The number of cases per day requiring hospitalisation has been increasing since mid June. There has been 515 additional new cases hospitalised[b] over the last week (Figure 8).

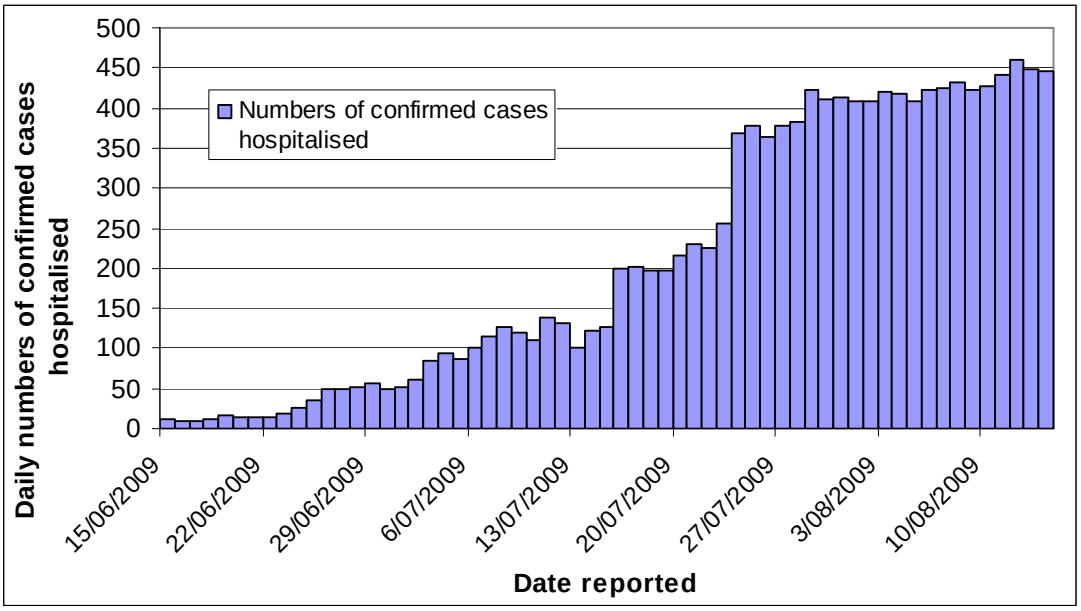
Indigenous Australians are approximately 5 times more likely than non-Indigenous Australians to be hospitalised for pandemic (H1N1) 2009. The states and territories have reported that 451

[b] The numbers hospitalised should be treated with caution as there may be case ascertainment bias in the reporting of confirmed cases being hospitalised. All paediatric cases admitted to hospital are being tested for pandemic (H1N1) 2009 while not all hospitalised adults might be tested. There may be a significant underestimation of the numbers of adults hospitalised from pandemic (H1N1) 2009 due to limited testing.

(12.8%) of all 3,524 cases hospitalised since the beginning of the outbreak were Aboriginal and/or Torres Strait Islander.

For comparative purposes, for the period 2000-01 to 2006-07, an average of 1,925 people with influenza are admitted to hospital each year. For all influenzas[c] and pneumonias[d], for the same period, an average of 73,271 people were admitted to hospital.[6]

Figure 8. Hospitalisations of pandemic (H1N1) 2009, 15 June 2009 to 14 August 2009, Australia



*The jurisdictions report directly to the National Incident Room, Commonwealth Department of Health and Ageing, on hospitalisations and numbers admitted to ICUs.

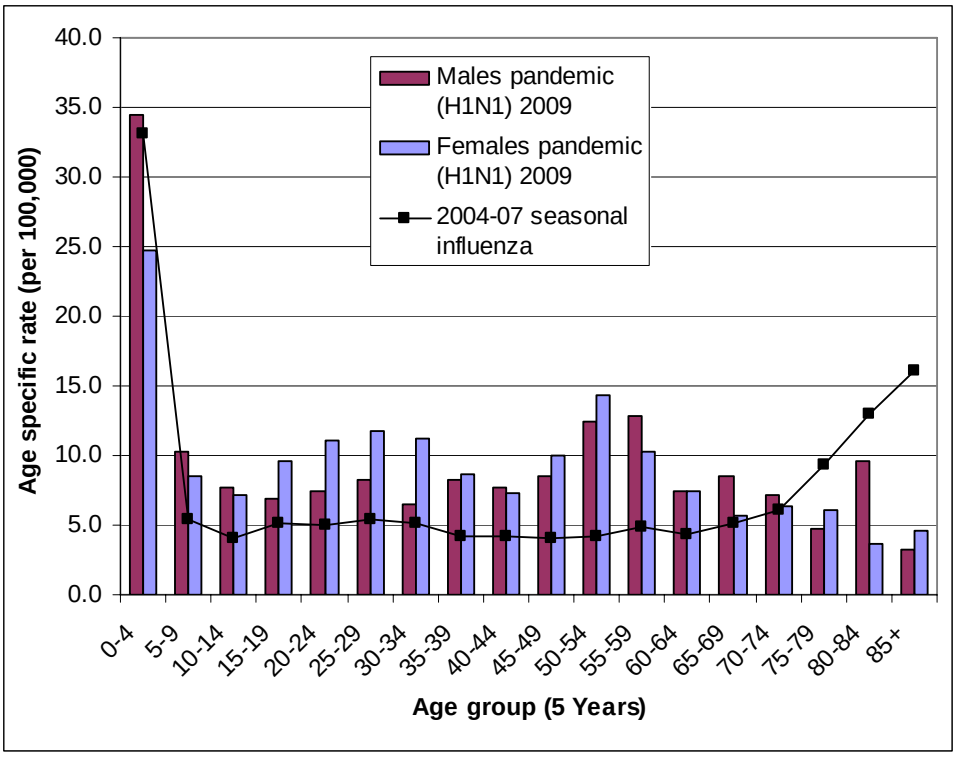
Source: Jurisdictions

Age and sex distribution of hospitalised confirmed cases

Limited further information is available for 2231 (58%) of the 3,524 confirmed cases hospitalised since the beginning of the outbreak. Of these cases, the overall hospitalisation rate is 10.4 per 100,000 population with the highest rates in males aged less than 5 years of age (34.5 per 100,000 population). The median age of hospitalised cases is 31 years (range 0-98). Figure 9 illustrates that the age distribution of hospitalised cases of pandemic (H1N1) 2009 is different to previous influenza seasons. In comparison with the 2004-2007 influenza season, young children aged less than 5 years of age continue to be hospitalised at a higher rate than other age groups but for pandemic (H1N1) 2009 there is a peak in the 50 to 60 years age group and a marked decrease in those aged more than 75 years.

[c] ICD10-AM codes J10-J11
[d] ICD10-AM codes J12-J18

Figure 9. Age specific rates of hospitalised confirmed cases of pandemic (H1N1) 2009 to 14 August 2009, compared with average annual age specific rates of hospitalisations from seasonal influenza 2004-05 to 2006-07*, Australia

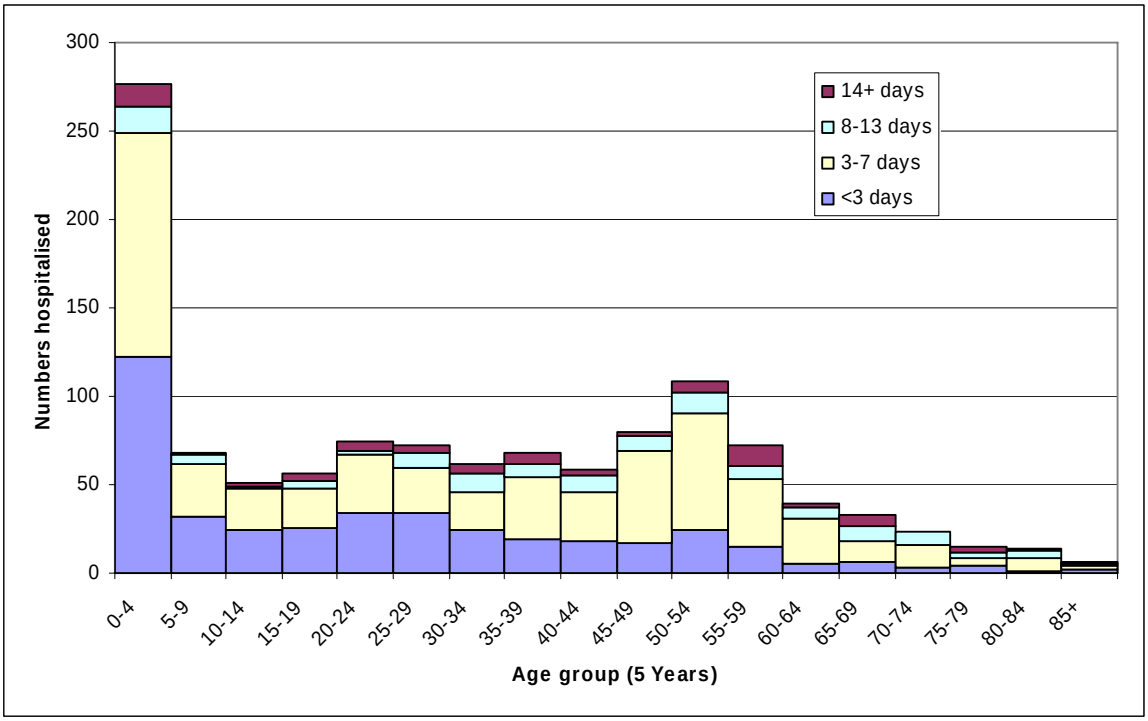


*The rates for pandemic (H1N1) 2009 are for a six week period 15 June to 7 August 2009 whereas the rates for seasonal influenza are averaged annual rates (i.e. for a full influenza season).

Source: NETEPI database

Information on length of stay is available for 53% (1,180) of hospitalised cases. The median length of stay in hospital is 3 days (range 1-47 days). Approximately 17% of all hospitalised patients stayed in hospital for more that 7 days (Figure 10). A breakdown by age group shows that children aged less than 5 years, although more likely to be hospitalised, tend to be hospitalised for shorter periods than older children and adults. Only 10% of children aged less than 5 years remain in hospital for longer than 7 days, this compares with 23% for those in the age group 30 years and over.

Figure 10. Hospitalised confirmed cases of pandemic (H1N1) 2009, by length of hospital stay and age group, to 14 August 2009, Australia

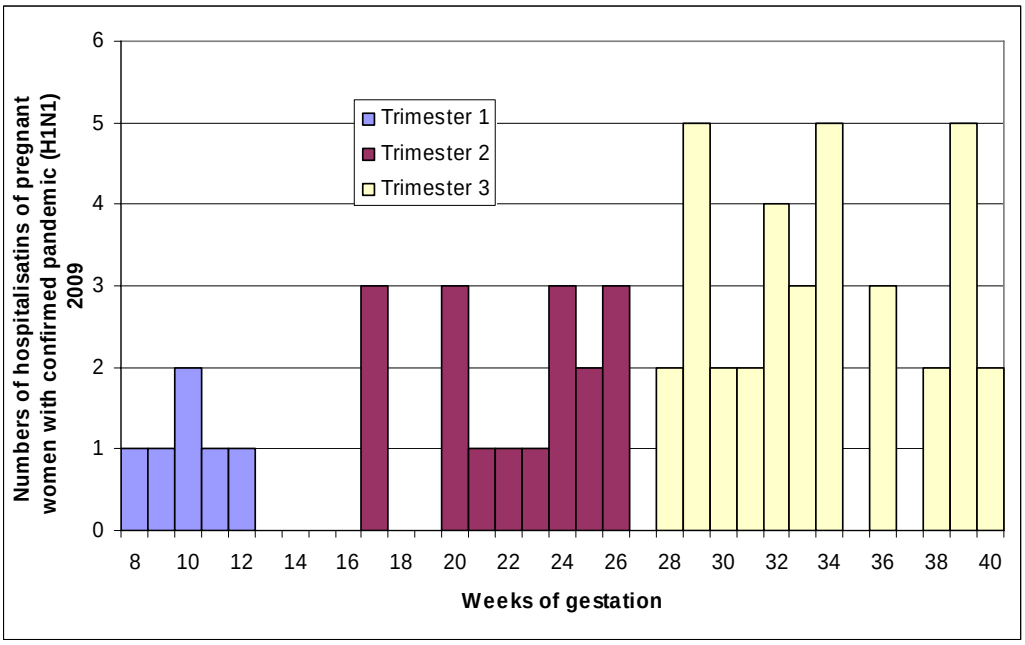


Source: NETEPI database

Pregnancy as a risk factor for pandemic (H1N1) 2009

Eighty four (4%) of the 2,231 hospitalised confirmed cases for whom further information was known were pregnant women. For the month of July, pregnant women accounted for 32% of for all women who were hospitalised confirmed cases aged between 25 to 29 years. Information on gestation is available for 58 of the 84 cases. Approximately 10% (6) were in their 1st trimester (weeks 1-12); 29% (17) were in their 2nd trimester (weeks 13-26); and 60% (35) were in their 3rd trimester (weeks 27-40) (Figure 11). Eleven pregnant women were admitted to ICU: 3 were in their 2nd trimester and 6 were in the 3rd trimester (information on gestation was unknown for 2 cases). Pregnant women stayed an average of 11 days in hospital (range 3-24 days). Four pregnant women are known to have died.

Figure 11. Hospitalised confirmed cases of pandemic (H1N1) 2009 in pregnant women by weeks of gestation, to 14 August 2009, Australia



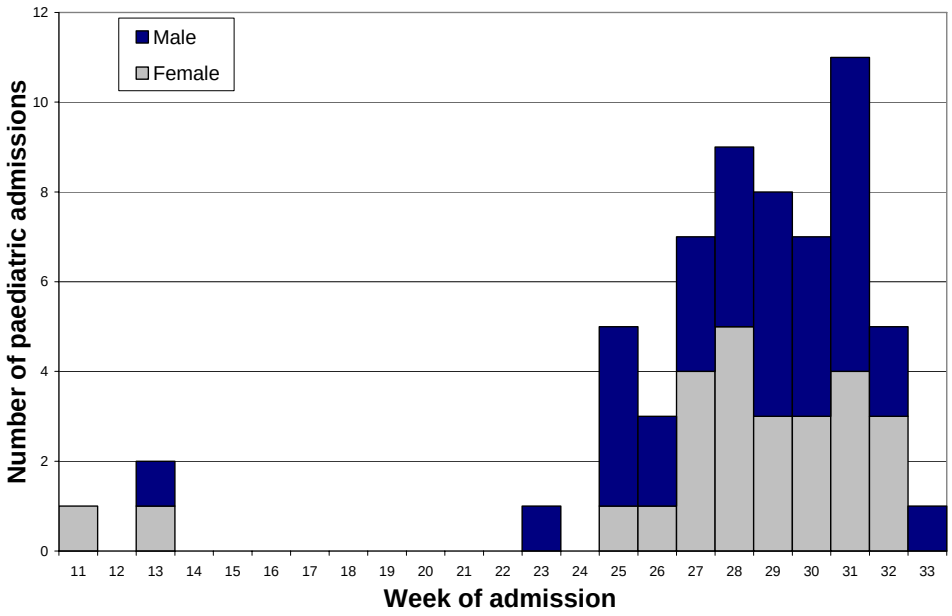
Source: NETEPI database

Paediatric hospital admissions

Since reporting began in 2009, 93 children have been reported as hospitalised with complications from influenza by the Australian Paediatric Surveillance Unit (APSU). Admission data has been provided in 60 cases (Figure 12).

Of the 64 cases, for which data are available, the average age of children admitted to hospital was four years, with an age range from one month to 16 years. Complications were mostly for pneumonia and encephalitis. Twenty-four of the 57 (42%) cases for which data is available had underlying conditions.

Figure 12. Number of paediatric hospital admissions APSU, 11 March 2009 to 10 August 2009, by week of admission.



SOURCE: APSU

Confirmed cases requiring intensive care

In Week 33 (week ending 14 August 2009), an average of 112 hospitalised cases required intensive care on any given day[e]. This is the same as the previous reporting period. The average age of cases in ICU is 42 years (range 0-84). For those cases for which Indigenous status was known (n=225), 21% (n=39) cases have been reported as Indigenous.

Information on the percentage of hospitalised cases admitted to an ICU since the beginning of the pandemic is available for two States. In New South Wales the percentage of hospitalised cases admitted to an ICU is 14.8% and for Queensland the percentage is 13.3%.

Pandemic Mortality

Deaths associated with pandemic (H1N1) 2009

One hundred and six people in Australia[f] with confirmed pandemic (H1N1) 2009 infection died between 19 June 2009 and 14 August 2009, with 33 reported in New South Wales, 21 in Victoria, 22 in Queensland, 12 in Western Australia, 9 in South Australia, 4 each in the Northern Territory and Tasmania, and 1 in the Australian Capital Territory[g]. Of the 106 deaths, 14 (13.2%) were Indigenous.[h] Reports from the jurisdictions in Australia indicate that most of the cases had underlying medical conditions; including cancer, diabetes mellitus and morbid obesity. The Pan-American Health Organization have reported that for Agentina, Chile and Mexico, between 53% and 59% of cases who have died have had underlying conditions.

Further information was available on 66 of the 106 deaths in Australia. Sixty six percent (n=44) of deaths were in males, a male to female ratio of 2:1. The median age of confirmed cases that died was 56 years (range 3-86 years). This compares with deaths from seasonal influenza where the median age, for the period 2001-2006, was 83 years. The highest proportion of deaths (19%) have occurred in the 55-59 year age group (n=13). Most deaths have occurred in those aged between 35 to 79 years (Figure 13). Noting the apparent biases in these data, the pattern of deaths across age groups is very different to the age distribution of hospitalisations and confirmed cases.

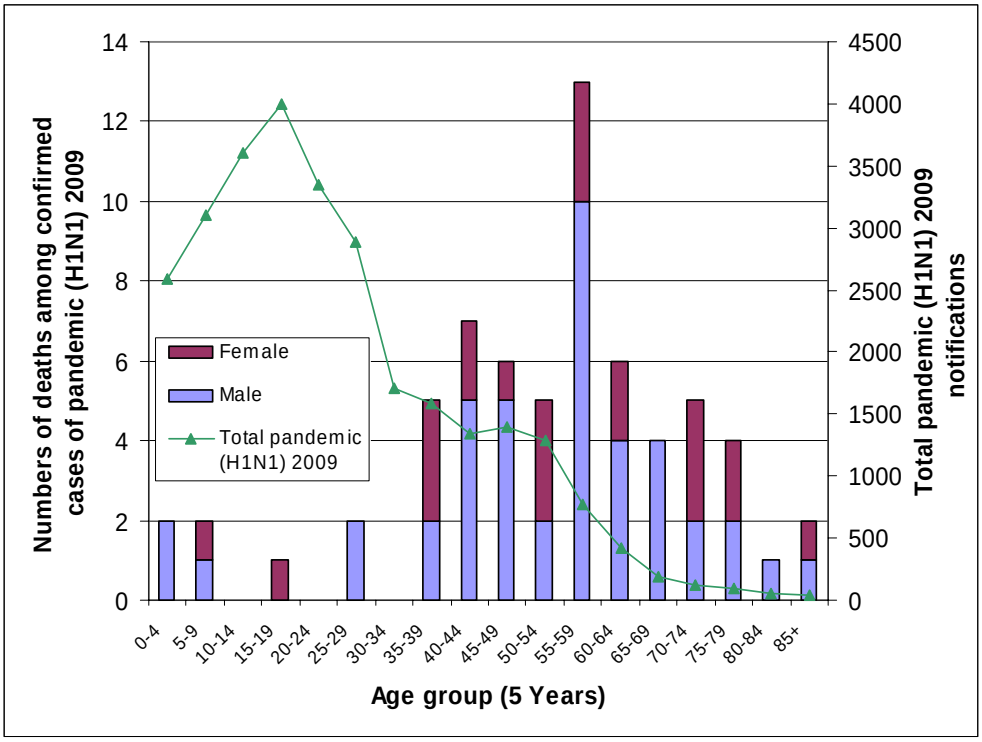
[e] This does not represent the number of new cases requiring admittance to an Intensive Care Unit (ICU) but is a repeated measure of the prevalence of confirmed cases in an ICU on a particular day.

[f]. For the most recent figures on hospitalisations and deaths please access the latest Situation Report at http://www.healthemergency.gov.au/internet/healthemergency/publishing.nsf/Content/updates

[g] This death has yet to be confirmed by the Coroner.

[h] It is estimated that 2.4% of the total Australian population are Aboriginal and/or Torres Strait Islander.

Figure 13. Numbers of deaths among confirmed cases of pandemic (H1N1) 2009, by age group and sex, compared with total laboratory confirmed pandemic (H1N1) 2009 notifications by age group, to 14 August 2009, Australia



Source: NETEPI database

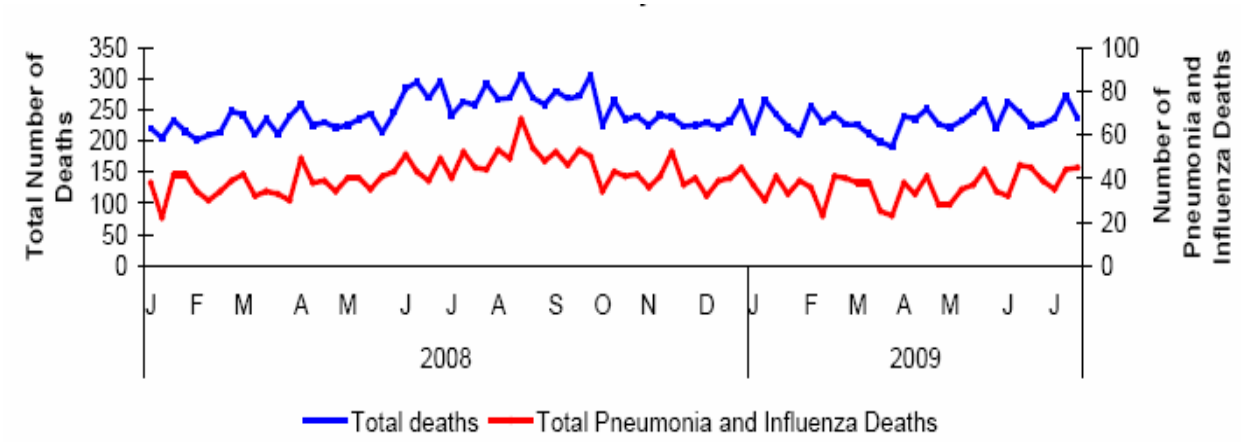
Deaths associated with influenza and pneumonia

There are difficulties estimating the number of deaths due to influenza in Australia. Deaths coded as being due to laboratory confirmed influenza are known to underestimate the true number. Influenza may not be listed on the death certificate if it wasn't recognised as the underlying cause. Coding of pneumonia and influenza provides an additional measure, although this will overestimate the number of deaths as it will include other causes of pneumonia.

The median number of annual deaths in Australia for the years 2001 to 2006 from influenza and pneumonia is 3,089 and for laboratory diagnosed influenza is 40. In 2007 (the latest year for which data has been released) there were 2,623 deaths with influenza and pneumonia as the underlying cause of death. In 2007, influenza and pneumonia was the 13th leading cause of death in Australia *(Source: ABS, Causes of Death 2007.).* Mortality figures are likely to be an underestimate due to inherent difficulties in assigning causes of death and therefore appropriate ICD codes. ABS mortality data are released two years in arrears.

Although mortality data from all causes are generally not available for the current year, some information on influenza and pneumonia deaths are reported by individual jurisdictions from their Births, Deaths and Marriages Registers. In Western Australia, in the final week of July, pneumonia and influenza deaths accounted for 19.1% of all deaths, which is slightly higher than at the same time in 2008 at 17.5% (Figure 14). This is an increase over the previous week where pneumonia and influenza deaths accounted for 16.9% of all deaths compared to 19.9% for the same time in 2008.

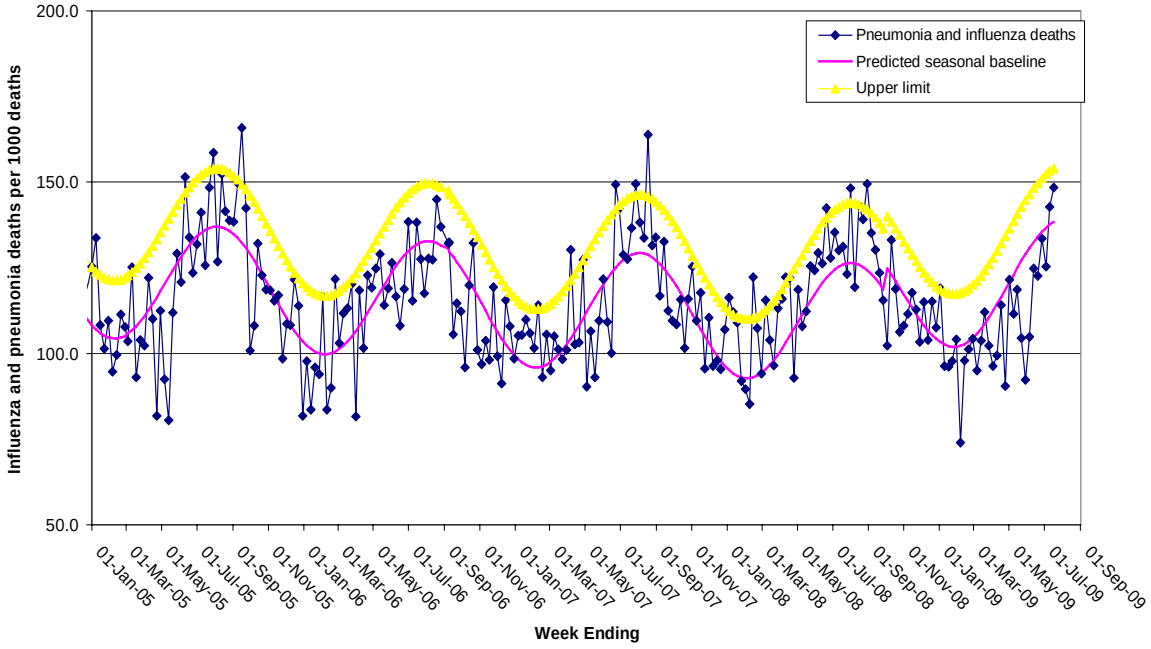
Figure 14: Total number of deaths classified as influenza and pneumonia, WA Registry of Births, Deaths and Marriages, 1 January 2008 to July 2009



SOURCE: WA 'Virus Watch' Report

In NSW, death certificate data as of 24 July 2009 show that there were 148 influenza or pneumonia deaths per 1,000 deaths in NSW, which was below the expected seasonal threshold for this time of year of 154 per 1,000 (Figure 15).

Figure 15: Rates of deaths classified as influenza and pneumonia, NSW Registry of Births, Deaths and Marriages, 1 January 2004 to 24 July 2009



SOURCE: NSW Health 'Weekly Influenza Report'

3. Is the virus changing?

Laboratory Confirmed Influenza

It is not possible to determine accurately the number of notifications due to seasonal influenza. Increasingly, not all influenza viruses are subtyped and the large proportion of influenza A (13,061 notifications) reported to NNDSS could be either pandemic (H1N1) 2009 or seasonal influenza. Laboratory reports in recent weeks estimate that 80% of all influenza positive tests are due to pandemic (H1N1) 2009.

From 1 January to 14 August 2009, type A is the predominant seasonal influenza type reported by all jurisdictions. Of the type A notifications for which there is subtyping information in NNDSS, 1.1% (261) are seasonal H1N1 and 2.0% (474) are H3N2.

Antigenic characteristics

WHO Collaborating Centre for Reference & Research on Influenza (WHO CC)

In 2009 up to 16 August 2009, 670 Australian influenza isolates have been subtyped by the WHO CC in Melbourne. Of these, 265 influenza isolates have been antigenically characterized.

In general, seasonal influenza A strains circulating this influenza season are the same as strains in the vaccine, with the A(H3N2) virus drifting. Influenza B strains match more closely with those in the 2009-10 Northern Hemisphere vaccine.

Antiviral Resistance

Pandemic (H1N1) 2009

- Media has reported that there have been 11 cases reported of oseltamivir resistance pandemic (H1N1) 2009 virus up to 18 August.[7] While WHO has received formal notification of 7 cases of oseltamivir resistance pandemic (H1N1) 2009 viruses to date (1 in Singapore, 1 in Denmark, 1 in Hong Kong, 1 in Canada and 3 in Japan), China has informally alerted WHO to the discovery of a small number of other oseltamivir-resistance pandemic (H1N1) 2009 viruses. The US CDC has reported 2 independent cases of oseltamivir resistance strains of pandemic (H1N1) 2009 developing in two severely immunosuppressed leukaemia patients. No secondary transmission was documented. Media has also reported a second case in Hong Kong.[8] WHO considers that these were sporadic cases of resistance to oseltamivir and that there is no current evidence of widespread antiviral resistance.[9]
- In Australia, all of the 159 pandemic (H1N1) 2009 viral isolates tested have been sensitive to oseltamivir and zanamivir, and none of the 73 pandemic (H1N1) 2009 clinical specimens tested positive for the H275Y mutation which confers resistance to oseltamivir.
- In New Zealand, all of the 92 pandemic (H1N1) 2009 viruses tested up to 9 August 2009 continued to be sensitive to oseltamivir, including one from a fatal case of a 21 year-old male. None of the 12 pandemic (H1N1) 2009 clinical specimens tested positive for the H275Y mutation which confers resistance to oseltamavir.[10]

<u>Seasonal Influenza</u>

- The last WHO report on oseltamivir resistance to seasonal strains was released on 4 June 2009, during the Northern Hemisphere influenza season 2008-2009. This report stated that 96% of seasonal influenza A (H1N1) isolates tested from 36 countries worldwide were resistant to oseltamivir.[11,]

- In New Zealand 28 seasonal A(H1N1) viruses have been tested up to 9 August 2009 for the H275Y mutation, which is known to confer resistance to oseltamivir. All 28 viruses tested had the mutation.[12]
- The US CDC reported in the week ending 8 August that 99.6% of the seasonal A(H1N1) isolates tested were resistant to oseltamivir and 100% of the Influenza A(H3N2) isolates tested were resistant to adamantanes.[13]

Data considerations

The information in this report is reliant on the surveillance sources available to the Department of Health and Ageing. As access to sources increase and improve, this report will be refined and additional information will be included.

This report aims to increase awareness of pandemic (H1N1) 2009 and seasonal influenza in Australia by providing an analysis of the various surveillance data sources throughout Australia. While every care has been taken in preparing this report, the Commonwealth does not accept liability for any injury or loss or damage arising from the use of, or reliance upon, the content of the report. Please note, the pandemic (H1N1) 2009 and seasonal influenza elements of this report are based on data available as at 17 August 2009. Delays in the reporting of data may cause data to change retrospectively. For further details about information contained in this report please contact the Influenza Team through flu@health.gov.au.

NetEpi
All jurisdictions except QLD are reporting pandemic (H1N1) 2009 cases using NetEpi, a web-based outbreak case reporting system. Data from jurisdictional systems are being imported into NetEpi by VIC, NSW and WA, the remainder are entering directly into NetEpi. Qld ceased reporting into NetEpi on 6 July 2009.

Analyses of Australian cases are based on clinical onset date, if this information is available. Where an onset date is not available, notification date has been used. Victorian cases use a calculated onset date which is the earliest available date calculated from specimen date, onset date, notification date or detection date. This assumption was made for all calculations and data on which the figures are based.

State and Territory reporting
The jurisdictions report directly to the National Incident Room, Commonwealth Department of Health and Ageing, on hospitalisations, numbers admitted to ICUs and deaths.

National Notifiable Diseases Surveillance System (NNDSS)
NNDSS comprises of notifications from jurisdictions of laboratory-confirmed influenza cases. Laboratory confirmed influenza is notifiable in all jurisdictions in Australia. Confirmed pandemic (H1N1) 2009 cases are being received from all jurisdictions through NNDSS except for Victoria and New South Wales.

Laboratory Surveillance data
Laboratory testing data are extracted from the 'NSW Influenza Report,' 'The 2009 Victorian Influenza Vaccine Effectiveness Audit Report' (VIDRL) and the 'South Australian Seasonal Influenza Report'. These reports are provided weekly.

WHO Collaborating Centre for Reference & Research on Influenza (WHO CC)
Data are provided weekly to the Surveillance Branch from the WHO CC.

Sentinel General Practice Surveillance
The Australian Sentinel Practices Research Network (ASPREN) has Sentinel GPs who report influenza-like-illness (ILI) presentation rates in NSW, SA, ACT, VIC, QLD, TAS and WA. As jurisdictions joined ASPREN at different times and the number of GPs reporting has changed over time, the representativeness of ASPREN data in 2009 may be different from that of previous years. ASPREN data are sent to the Surveillance Branch on a weekly basis. Northern Territory GP surveillance data are sent to the Surveillance Branch on a weekly basis. VIDRL influenza surveillance data are sent to the Surveillance Branch on a weekly basis.

A new testing protocol introduced through ASPREN requires GPs to test all patients presenting with an ILI on one day of the week. These data should provide a cross section of age, sex and severity of patients who seek GP assistance for ILI. This system is in the early stages of implementation and will be further developed over coming weeks.

Sentinel Emergency Department (ED) data
WA - ED surveillance data are extracted from the 'Virus Watch' Report. This report is provided weekly. The Western Australia Influenza Surveillance Program collects data from 8 Perth Emergency Departments (EDs).

NSW - ED surveillance data are extracted from the 'NSW Influenza Surveillance Report'. This report is provided weekly. The New South Wales Influenza Surveillance Program collects data from 49 EDs across New South Wales.

SA – ED surveillance data are extracted from the 'South Australian Seasonal Influenza Report'. This report is provided weekly. The South Australian Influenza Surveillance Program collects data from 4 EDs in South Australia.

Absenteeism
A national organisation provides data on the number of employees who have been on sick leave for a continuous period of more than three days. These data are not influenza or ILI specific and absenteeism may be a result of other illnesses.

Mortality data
Mortality data are extracted from the NSW Health 'Weekly Influenza Epidemiology Report' and the WA 'Virus Watch' Report.

Paediatric hospital admissions data
Reports of ICU admissions are provided to the Surveillance Branch on a weekly basis by the Australian Paediatric Surveillance Unit. APSU conducts surveillance of severe complications of influenza in children aged 15 years and under. Surveillance began on 1 June 2009.

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