



No.10, 2009, REPORTING PERIOD: 10 July 2009 – 17 July 2009

Key Points

Influenza in Australia

- Influenza notifications started earlier in 2009 than in 2008, most likely due to increased testing of Influenza-like Illnesses (ILI) to detect pandemic (H1N1) 2009.
- **Recent reports from New South Wales, Victoria, Western Australia and the Northern Territory (NSW 59%, VIC 90%, WA 89%, NT 82%) showed that the average proportion of confirmed influenza which was pandemic (H1N1) 2009 was 80%, an increase from 76% in the previous reporting period.** This is similar to what other Southern Hemisphere countries (i.e. New Zealand, Chile) are reporting.
- **Testing through the ASPREN sentinel GP network showed that 39% of respiratory tests conducted on ILI patients were positive for influenza. Of these, 76% were pandemic (H1N1) 2009 and 24% were either influenza A unspecified, A/H1N1 or influenza B.**
- **ILI presentations in 2009 to the sentinel GP network have decreased in Victoria this reporting period but have increased in other states and territories. Nationally, rates are below levels seen at the same time in 2007 (the highest influenza season in recent years), but above levels seen in 2008, with 34 cases per 1,000 patients seen.**
- **ILI presentations in 2009 to Emergency Departments in WA have increased in the week ending 12 July, but are lower than in 2007. The rate of ILI presentations to NSW Emergency Departments has increased to 34.7 per 1,000 presentations, the highest rate recorded since data became available (2002).**
- **Absenteeism rates for 2009 have risen sharply and are higher than those seen at the same time in 2007 and 2008 but are following a similar trend.**
- **In the week ending 16 July 2009 the Australian Paediatric Surveillance Unit (APSU) reported 4 notifications of children hospitalised with severe complications of influenza. Three of the four had underlying conditions and one child died.**

Pandemic (H1N1) 2009

- **As of 17 July 2009, there were 11651 confirmed cases of pandemic (H1N1) 2009 in Australia (an increase from 7837 in the last report), including 31 deaths (an increase from 18 deaths in the last report).** It should be noted that testing is focused on those moderate to severe cases, those who are vulnerable, and those in special populations.
- **The median age of confirmed pandemic (H1N1) 2009 is 20 years (an increase from 19 years in the last report).** This may rise as the focus changes to testing the severely affected or hospitalised individuals.

- Currently the percentage and rates of national notifications are as follows:

Jurisdiction	Percentage of pandemic (H1N1) 2009 notifications	Age standardised rates per 100,000
ACT	2.8%	90.9
NSW	22.5%	36.8
NT	5.3%	255.1
QLD	29.4%	79.6
SA	10.6%	81.6
TAS	1.2%	28.3
VIC	20.9%	47.3
WA	6.4%	34.2
Australia	100%	54.6

However, these notifications also reflect the level of testing and do not accurately indicate the percentage of the population affected in each jurisdiction.

- High rates in the NT reflect high rates in indigenous communities and testing practices in the NT.
- 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. Figures to date show that Indigenous Australians are approximately three times more likely than non-Indigenous Australians to be a confirmed case of pandemic (H1N1) 2009. While it is estimated that 2.4% of the Australian population is of Aboriginal and/or Torres Strait Islander origin, 7% of Australian confirmed cases are Indigenous.
- The daily number of confirmed cases of pandemic (H1N1) 2009 requiring hospitalisation continues to increase, from 3% before the PROTECT phase to 11% since PROTECT. **In Week 29, an average of 42 hospitalised confirmed cases required intensive care on any given day compared to 30 in week 28.**
- Several jurisdictions have reported cases of pregnant women being admitted to hospital and ICU, reinforcing the fact that pregnancy, particularly in the second and third trimesters, is a risk factor for pandemic H1N1 2009 infection.
- WHO has reported three isolated cases of oseltamivir resistant viruses in Denmark, Japan and Hong Kong respectively. WHO considers that these were sporadic cases of resistance to oseltamivir and that there is no current evidence of widespread antiviral resistance. The Media has reported cases of oseltamivir resistance in Canada and a second case in Japan.
- To date, all 53 Australian Pandemic (H1N1) 2009 influenza isolates have tested sensitive to oseltamivir and zanamivir.

Seasonal Influenza

- All jurisdictions are reporting seasonal influenza activity with large numbers notified by Queensland this reporting period.

- Currently the percentage and rates of national notifications are as follows:

Jurisdiction	Percentage of Total Notifications	Age standardised rates per 100,000
ACT	3.6%	67.2
NSW	22.0%	20.2
NT	5.3%	157.0
QLD	41.3%	61.4
SA	16.2%	67.0
TAS	2.9%	38.2
VIC	0.4%	0.5
WA	8.1%	24.2
Australia	100%	45.2

- Influenza A is the predominant seasonal influenza type reported by all jurisdictions. Very few cases of influenza B have been reported. Of the seasonal influenza A notifications, A/H3N2 is the predominant subtype reported by most jurisdictions.
- **In 2009, rates of influenza are highest in both males and females in younger age groups.**
- To date, 97% of seasonal A/H1N1 isolates have tested resistant to oseltamivir. 100% of A/H3N2 and Type B isolates have tested sensitive to oseltamivir.

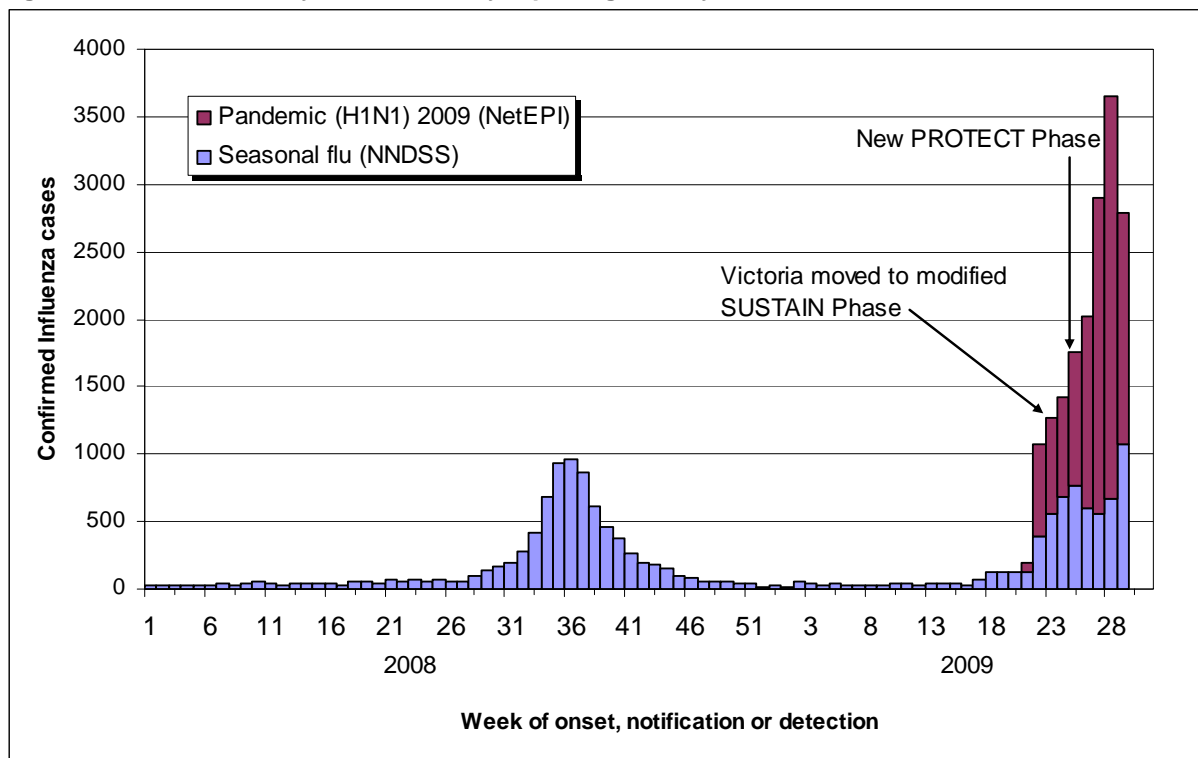
1. Influenza Activity in Australia

Epidemiology of Influenza in Australia

As Figure 1 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.

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, but reflects the number of confirmed cases among those most at risk.

Figure 1: Influenza activity in Australia, by reporting week, years 2008 and 2009*



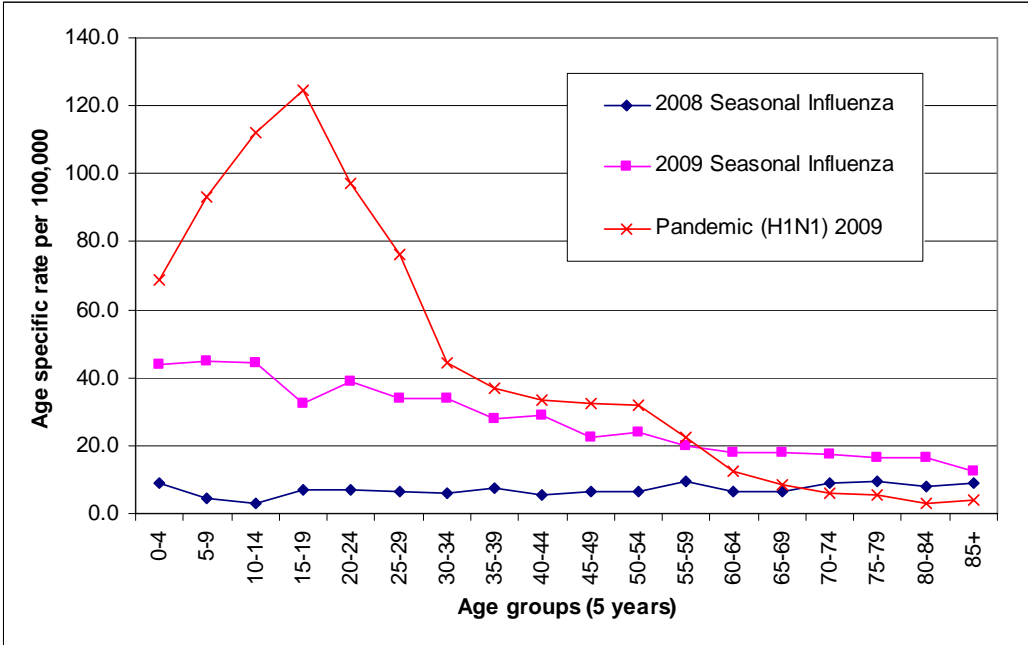
* Data on pandemic (H1N1) 2009 cases is extracted from NetEPI; data on seasonal influenza is extracted from the NNDSS. A small number of pandemic (H1N1) 2009 notifications from several jurisdictions were reported in NNDSS as Influenza A. Delays in the reporting of data may cause data to change retrospectively. **Influenza A notifications to NNDSS from Victoria have been excluded from the NNDSS data reported, as most of these notifications are pandemic (H1N1) 2009.** Sources: NNDSS and NetEPI databases

The age standardised rate of seasonal influenza notifications in 2009 as at 17 July 2009 is 30.1 per 100,000 population (a decrease from 38.6 per 100,000 population in the previous report). This is 1.8 times lower than the age standardised rate of pandemic (H1N1) 2009 notifications (54.6 per 100,000 population, an increase from 37.3 in the previous report) but is 4.5 times higher than the rate reported in 2008 for the same reporting period, which was 6.7 per 100,000 population. This difference is likely due to increased laboratory testing for all influenzas which has occurred during the current pandemic.

Figure 2 shows adolescents as having the highest notification rates per 100,000 for pandemic (H1N1) 2009 influenza. The difference in the pattern of age rates for the 2008 and 2009 seasonal influenza notifications may reflect testing protocols for seasonal influenza. The lower rate of

pandemic (H1N1) 2009 notifications in older age groups might reflect previous exposure and the consequent development of antibodies (as several studies have suggestedⁱ), or could also be an artefact of early testing during school outbreaks.

Figure 2: Age distribution of rates of influenza activity in Australia, years 2008 and 2009*



* Data on pandemic (H1N1) 2009 cases is extracted from NetEPI; data on seasonal influenza is extracted from the NNDSS. A small number of pandemic (H1N1) 2009 notifications from several jurisdictions were reported in NNDSS as Influenza A. Delays in the reporting of data may cause data to change retrospectively. **Influenza A notifications to NNDSS from Victoria have been excluded from the NNDSS data reported, as most of these notifications are pandemic (H1N1) 2009.**

Sources: NNDSS and NetEPI databases

Proportion of pandemic (H1N1) 2009 to seasonal influenza

The proportion of pandemic (H1N1) 2009 to seasonal influenza varies across jurisdictions. Jurisdictions have reported that the proportion of pandemic (H1N1) 2009 has increased in recent weeks to be greater than that of seasonal Influenza A. Recent reports from New South Wales (57%, week ending 17 July), Victoria (90%, week ending 19 July), Western Australia (89%, week ending 19 July) and the Northern Territory (82%, week ending 19 July) showed that the average proportion of confirmed influenza in Australia which was pandemic (H1N1) 2009 was 80%. The proportion of influenza detections identified as pandemic (H1N1) 2009 for the first 12 weeks of surveillance in Victoria was 98% (249/255).

Over the last two weeks, for the days on which surveillance testing was conducted, ASPREN GPs reported 103 people presenting with ILI. Of these, 63% (65/103) were tested for influenza. Thirty-nine percent (25/65) of these cases were influenza positive; 76% (19/25) were pandemic (H1N1) 2009 8% (2/25) were influenza A unspecified, A/H1N1 and influenza B.

2. Sentinel Data

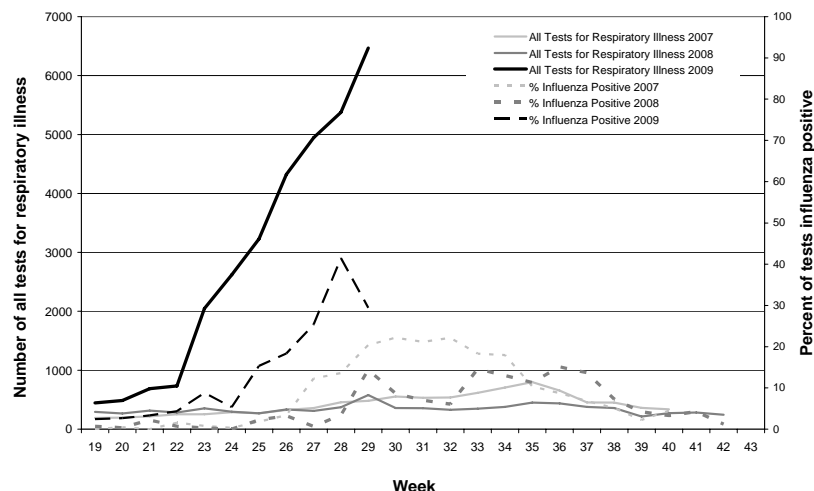
Laboratory surveillance

The Victorian Infectious Disease Reference Laboratory (VIDRL) reported that in the week ending 12 July 2009, Influenza A, picornavirus, and respiratory syncytial virus (RSV) were the most commonly detected respiratory viruses in Victoria (for full report see: www.vidrl.org.au). For the same period, South Australia reported that influenza A and RSV were the most commonly detected respiratory viruses. New South Wales reported (week ending 10 July 2009) pandemic (H1N1) 2009 as the most commonly identified respiratory virus.

The West Australian National Influenza Centre (NIC) reported that, for the week ending 19 July 2009, the proportion of tests positive for influenza was 41%.

In the week ending 10 July 2009, the number of virology samples tested in New South Wales increased while the proportion of tests positive for influenza decreased. The proportion of tests positive for influenza is approximately 30% and is much higher than at the same time in 2007 and 2008 (Figure 3). The expected decrease in testing as a result of the introduction of the PROTECT phase is not yet reflected in this graph.

Figure 3. Number of all tests for respiratory illness and percentage of tests positive for influenza, NSW, from 2007 to 10 July 2009



SOURCE: NSW HEALTH 'NSW Influenza Surveillance Report'

Sentinel General Practice

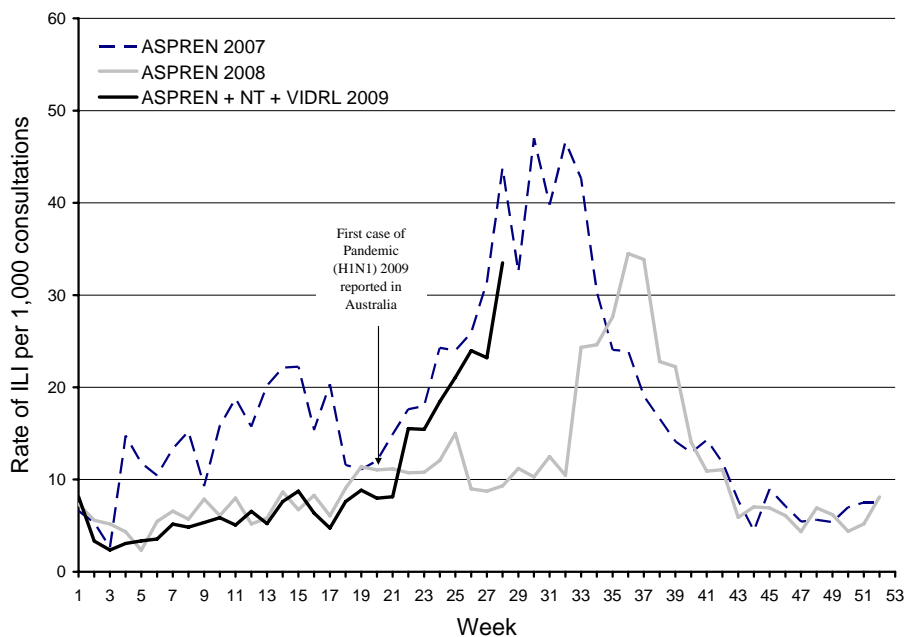
Data available from the Australian Sentinel Practices Research Network (ASPREN), the Northern Territory GP surveillance system and VIDRL, up until 12 July 2009, show that Influenza like Illness (ILI) consultation rates have increased but are below levels seen in 2007 (Figure 4). In the last week, the presentation rate to sentinel GPs in Australia was approximately 34 cases per 1,000 patients seen.

Figure 4a does not include GPs from Victoria reporting to ASPREN or VIDRL. Consultation rates of ILI (excluding Victoria) are significantly higher than in 2007 and 2008, demonstrating the impact of the Victorian data. Table 4b shows that the consultation rate of ILI from Victorian GPs in ASPREN and VIDRL is decreasing, corresponding with reports that ILI appears to have peaked in Victoria.

The first confirmed case of pandemic (H1N1) 2009 reported in Australia was on 9 May 2009 (week 20), corresponding with a subsequent increase in ILI consultations reported by sentinel GPs.

As data from the Northern Territory and the VIDRL surveillance systems are combined with ASPREN data, rates may not be directly comparable across 2007, 2008 and 2009.

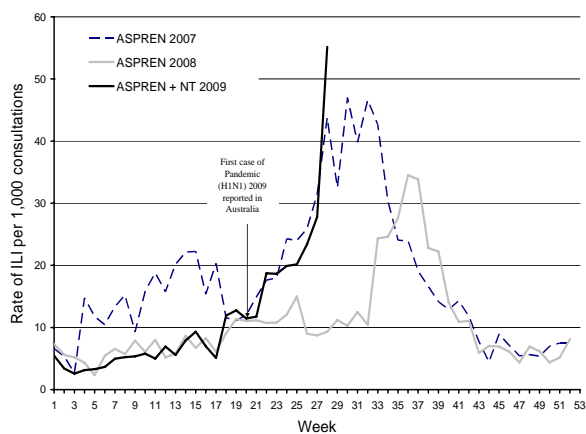
Figure 4. Rate of ILI reported from GP ILI surveillance systems from 2007 to 12 July 2009 by week*



* Delays in the reporting of data may cause data to change retrospectively.

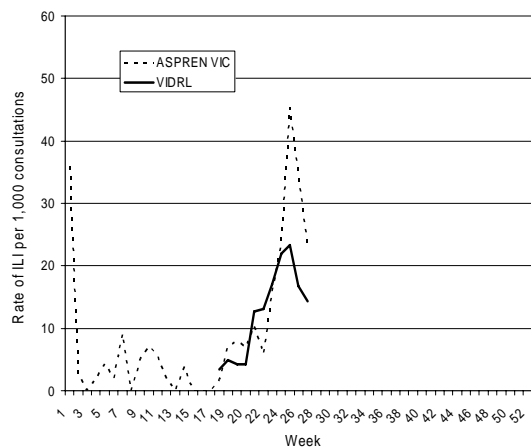
SOURCE: ASPREN, NT, VIDRL

Figure 4a. Rate of ILI reported from ASPREN and NT (excluding VIC) from 2007 to 12 July 2009 by week



SOURCE: ASPREN, NT

Figure 4b. Rate of ILI reported from VIC GPs reporting to ASPREN and VIDRL up to 12 July 2009

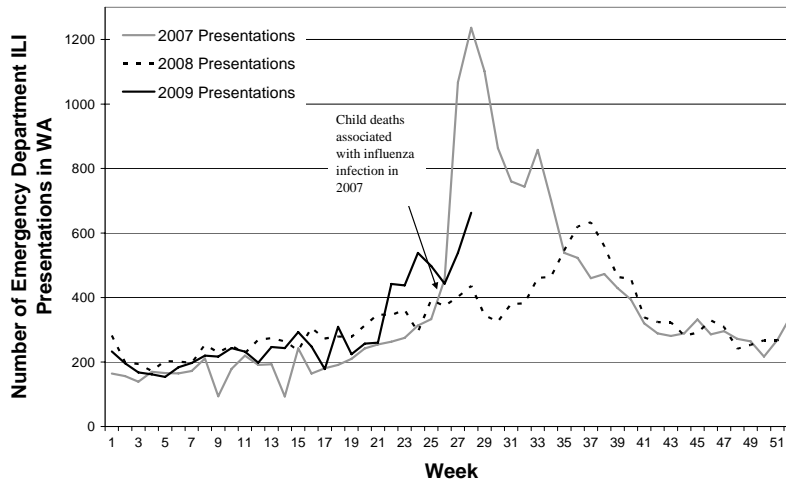


SOURCE: ASPREN (VIC) & VIDRL

Emergency departments

The Western Australia Influenza Surveillance Program collects data from 8 Perth Emergency Departments (EDs). The number of ILI presentations reported in Western Australia EDs has increased in the week ending 12 July 2009, but is lower than in 2007 (Figure 5). The number of persons with respiratory viral illnesses presenting to Perth EDs increased in the week ending 12 July 2009 to its highest point this year, but the proportion of ILI presentations admitted to hospital fell from 5.8% to 5.6%.

Figure 5. Number of Emergency Department presentations due to ILI in Western Australia from 1 January 2007 to 12 July 2009 by week

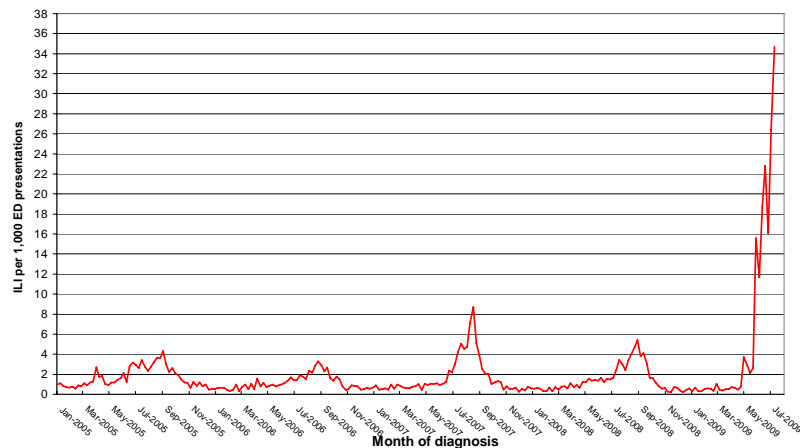


In early July 2007 (week 26), several deaths associated with influenza infection were reported in children from Western Australia. The public response to these deaths could account for the sudden increase in ILI presentations to Perth EDs in 2007.

SOURCE: WA 'EDSS News' Report

The New South Wales Influenza Surveillance Program collects data from 49 EDs across New South Wales. In the week ending 10 July 2009, ILI presentations to EDs increased further and are at the highest rate recorded since data became available (2002) (rate 34.7 per 1,000 presentations) (Figure 6). Presentations were mainly for mild illnesses and 4% of presentations with ILI were admitted.

Figure 6. Rate of ILI diagnosed in people presenting to selected Emergency Departments, NSW 1 January 2005 to 10 July 2009 by month*



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

Paediatric hospital admissions

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. Details of admissions are reported on a weekly basis.

In the last week up to 16 July 2009, the APSU reported four notifications of children hospitalised with severe complications of influenza. Of these cases, one death occurred, two have been discharged and one is still in hospital. All cases were positive for influenza A. Complications were recorded in all four cases and three had underlying conditions.

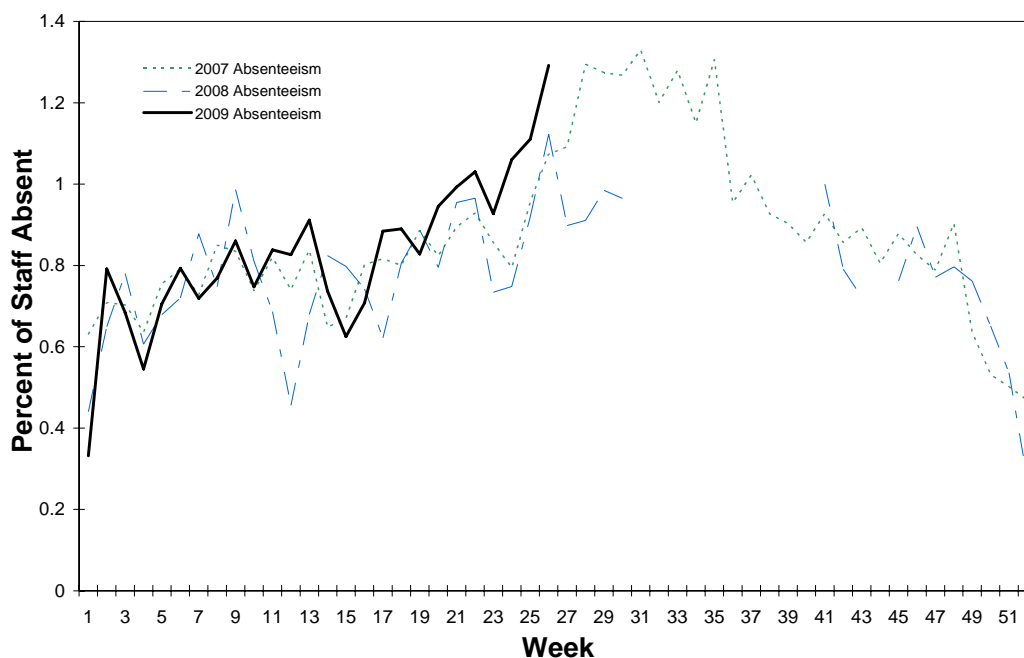
Since reporting began in 2009, 39 children have been reported as hospitalised with complications from influenza. Of the 28 cases for which data is available, the average age of children admitted to hospital was three years, with an age range from one month to 16 years. All of the 28 cases for which data is available were reported to have had complications mostly with pneumonia and encephalitis, while 11 of the 20 cases for which data is available had underlying conditions.

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.

Absenteeism rates continue to rise, possibly reflecting greater rates of illness in the community. Rates in 2009, have risen sharply in the last week but are still following similar trends to those seen in 2007 (Figure 7).

Figure 7. Absenteeism rates, 1 January 2007 to 1 July 2009, by week



SOURCE: Absenteeism data

3. Pandemic (H1N1) 2009 Activity in Australia

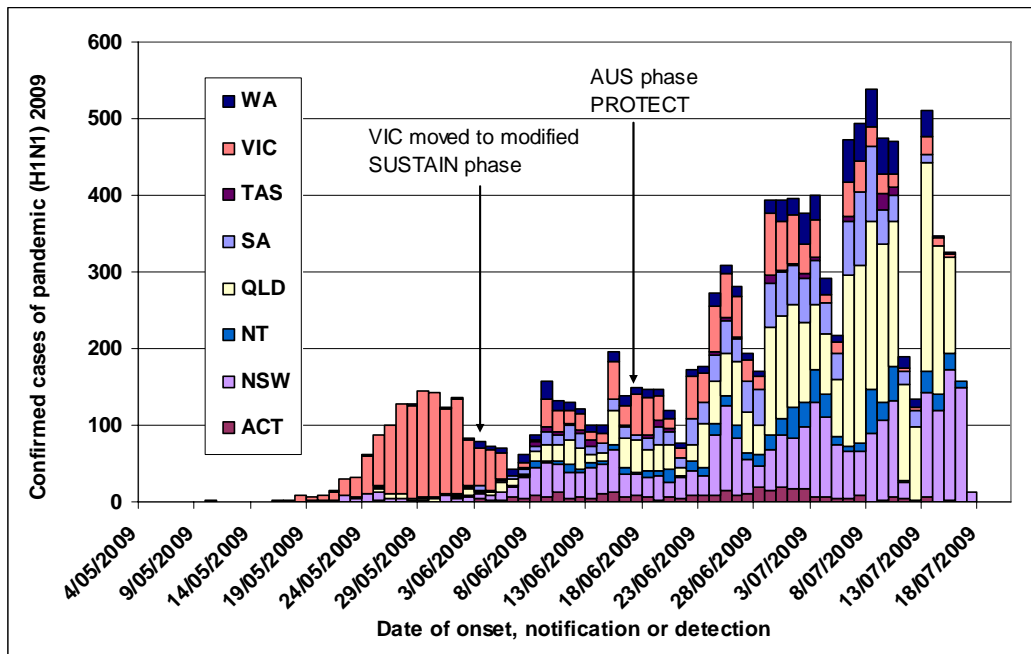
Epidemiology of H1N1 Influenza in Australia

As of 17 July 2009 there were 11651 confirmed cases of pandemic (H1N1) 2009 in Australia, including 31 deaths (a Case Fatality Rate of 0.27). Since the PROTECT phase commenced on 17 June 2009 there have been 8,899 confirmed cases.

Distribution of cases over time

The national epidemic curve shows the jurisdictional distribution of confirmed cases of pandemic (H1N1) 2009 over time in Australia (Figure 8). The epidemic curve shows several peaks, however the pattern is a surveillance artefact due to a change in testing policy. The vast 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 8. Epidemic curve of confirmed cases of pandemic (H1N1) 2009 in Australia, by jurisdiction



Source: NetEPI database

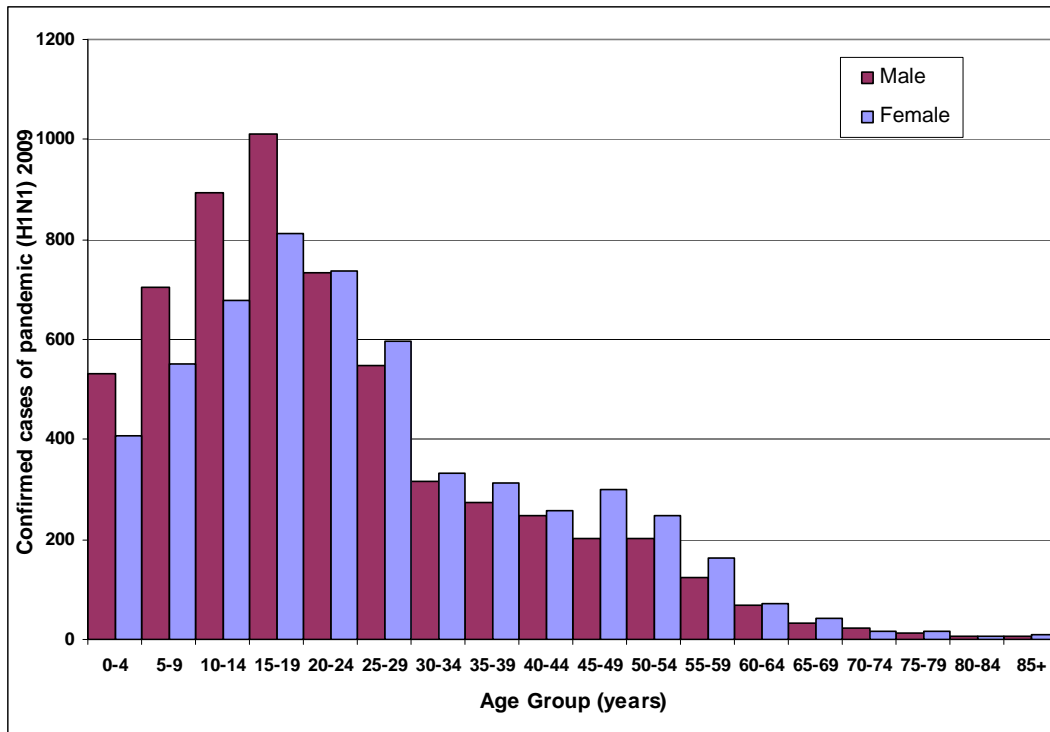
Distribution of cases by age and sex

The distribution of confirmed pandemic (H1N1) 2009 cases in Australia shows higher reporting rates in younger age groups, consistent with the age distribution of confirmed cases observed in other parts of the world.² Of the 11651 confirmed Australian cases for whom age was known, the median age is 20 years (an increase from 19 in the previous week). People aged less than 30 years accounted for 71% (8212) of all confirmed cases. The highest number of cases was in the 10-19 year age group (30% or 3398 cases), while children under 5 years of age accounted for 8% (940) of cases and people over 60 years of age accounted for 3% (310) of cases (Figure 9). The data need to be interpreted with caution, as case ascertainment could bias results. In the early weeks, active surveillance in schools may have skewed reporting, while the current focus on testing more severe cases or those with underlying illness may skew the age distribution towards an older age group. On the other hand, more disease among younger age groups may indicate

pre-existing immunity in older age groups from exposure to previously circulating H1N1 influenza viruses.

Of the confirmed cases where gender was reported, 52% were male. The gender distribution of cases in Figure 9 shows that males were over represented among confirmed cases in the younger age groups (from 0 to 19 years), while the number of females is slightly higher from age 20 years.

Figure 9. Laboratory confirmed cases of pandemic (H1N1) 2009 in Australia to 17 July 2009, by age group and sex



Source: NetEPI database

There are some differences in the age distribution among confirmed cases in different states and territories (Figure 10), reflecting the predominance of outbreaks in school-aged children in some states and territories; or higher numbers among Aboriginal and/or Torres Strait Islanders.

Geographic distribution of cases

Australia's rate of pandemic (H1N1) 2009 notifications as at 17 July 2009 was 54.6 notifications per 100,000 population, an increase from 37.3 notifications per 100,000 population in the previous week.

As at 17 July 2009, Queensland has overtaken Victoria with the greatest proportion of pandemic (H1N1) 2009 notifications reported in Australia (29.4%), followed by New South Wales (22.5%) (Table 1).

Age standardised rates per capita vary across the jurisdictions with the highest rate per 100,000 population occurring in the Northern Territory (255.1 per 100,000), the Australian Capital Territory (90.9 per 100,000) and South Australia (81.6 per 100,000), although the population in these jurisdictions represent a small percentage of Australia population

The high rate of confirmed cases in the Northern Territory is primarily due to the high number of Indigenous cases when compared with other jurisdictions. Many of the confirmed Indigenous cases are from remote communities and have risk factors that make them vulnerable to infection. The higher rate may also reflect the increased laboratory testing of those who are most at risk under the PROTECT phase.

Table 1. Notifications and age standardised rates of laboratory-confirmed pandemic (H1N1) 2009, by jurisdiction to 17 July 2009

Jurisdiction	Total H1N1 Influenza 09 notifications	Percentage of pandemic (H1N1) 2009 notifications	Age standardised rates per 100,000#	Percentage of Australian population
ACT	330	2.8%	90.9	1.6%
NSW	2617	22.5%	36.8	32.6%
NT	616	5.3%	255.1	1.0%
QLD	3426	29.4%	79.6	20.0%
SA	1240	10.6%	81.6	7.5%
TAS	138	1.2%	28.3	2.3%
VIC	2433	20.9%	47.3	24.8%
WA	741	6.4%	34.2	10.1%
Australia	11651*	100%	54.6	100%

*No jurisdiction identifier was available for 110 confirmed cases.

Standardised to the 2006 Australia population.

Source: NetEPI database

Aboriginal and Torres Strait Islander people/communities

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.

Figures to date show that Indigenous Australians are three times more likely than non-Indigenous Australians to be or have been a confirmed case of pandemic (H1N1) 2009. As of the 17 July 2009, seven percent (n=817) of confirmed cases (n=11,651) are reported as Aboriginal and/or Torres Strait Islander¹ in the NetEpi database.

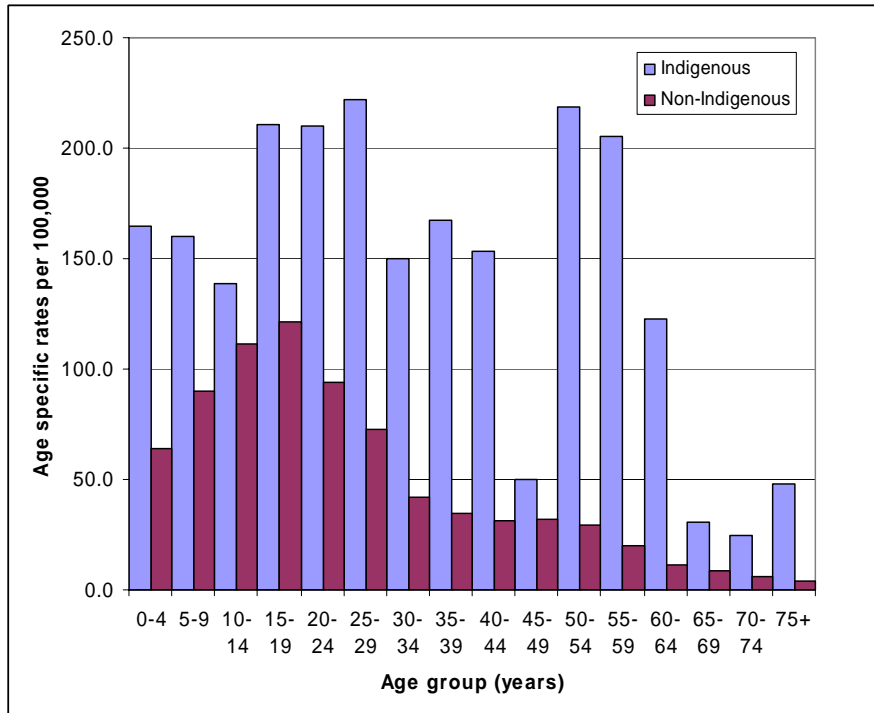
The median age of Aboriginal and/or Torres Strait Islander confirmed cases is 21 years of age (range 0-79 years of age) which is similar to the median age for all Australian confirmed cases (20 years). Sixty seven percent (n=550) of Aboriginal and/or Torres Strait Islander confirmed cases are aged less than 30 years of age. As Figure 11 illustrates, the age specific rates for Indigenous

¹ It is estimated that 2.4 percent of the total Australian population are Aboriginal and/or Torres Strait Islander.

peoples are higher across all age groups when compared with non-Indigenous Australians, with the most marked discrepancy in the higher age groups. The crude rate ratio of Indigenous confirmed cases to all confirmed cases is 3.

Fifty three percent (n=436) are female and forty six percent (n=376) are male. No data on gender is available for five cases.

Figure 10: Age specific rates for confirmed cases of pandemic (H1N1) 2009 in Indigenous and non-Indigenous peoples in Australia, to 17 July 2009



Source: NetEpi database

Fifty percent (n=410) of Aboriginal and/or Torres Strait Islander confirmed cases are in the Northern Territory, followed by 30% (n=246) in Queensland, 7% (n=61) in New South Wales, 6% (n=49) in Western Australia, 3% (n=27) in South Australia and 2% in the Australian Capital Territory (n=17). Victoria has 4 cases and Tasmania has two cases²³.

The states and territories have reported that 143 (11%) of all 1332 cases hospitalised since the beginning of the outbreak were Aboriginal and/or Torres Strait Islander.

² New South Wales has the largest Indigenous population (30% or 152,685), followed by Queensland (28% or 144,885), Western Australia (14% or 70,966), Northern Territory (12% or 64,005), Victoria (7% or 33,517), South Australia (5% or 28,055), Tasmania (4% or 18,415) and the Australian Capital Territory has the smallest (0.8% or 4,282).

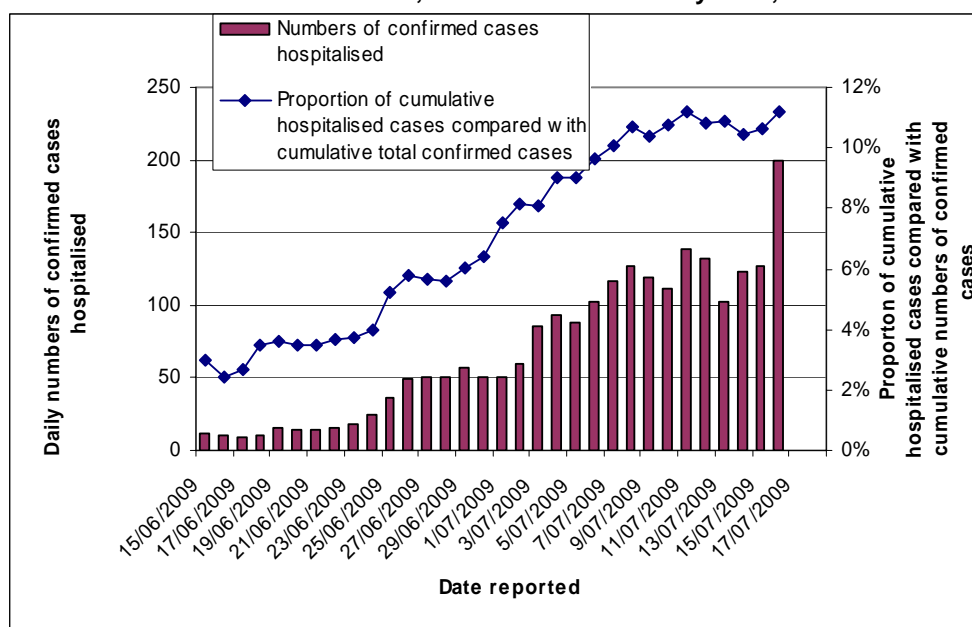
Severe cases and hospitalisations of pandemic (H1N1) 2009, in Australia

As of 17 July 2009, the jurisdictions have reported that 1332 confirmed cases have been hospitalised, this will include people who are hospitalized for co-morbidities. The number of cases per day requiring hospitalisation has been increasing since mid June (Figure 11) and 479 additional cases have been hospitalized over the last week. This rise is to be expected with the increasing detection of pandemic (H1N1) 2009 in the community and may also reflect improved reporting of hospitalisation data by states and territories. The proportion of cumulative cases requiring hospitalisation compared with the total number of confirmed cases increased from 3% on 15 June 2009 to 11% on 17 July 2009 (Figure 11). This reflects the change to the response phase PROTECT where laboratory testing is directed towards people with moderate or severe illness or those more vulnerable to severe illness who are more likely to require hospitalisation.

For comparative purposes, for the period 2000-01 to 2006-07, an average of 1,925 people with influenza were admitted to hospital each year. For all influenzas and pneumonias, for the same period, an average of 73,271 people were admitted to hospital.⁴

In Week 29 (week ending 17 July 2009), an average of 42 hospitalised cases required intensive care on any given day - an increase over the previous week where an average of 30 cases required intensive care on any given day. 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. The length of stay in an ICU will differ depending on the severity of a particular case. In the last week, the average proportion of hospitalised cases in an ICU³ on any day was 27% (Figure 12).

Figure 11. Hospitalisations of pandemic (H1N1) 2009 and proportion of cumulative hospitalised cases compared with cumulative number of cases, 15 June 2009 to 17 July 2009, Australia

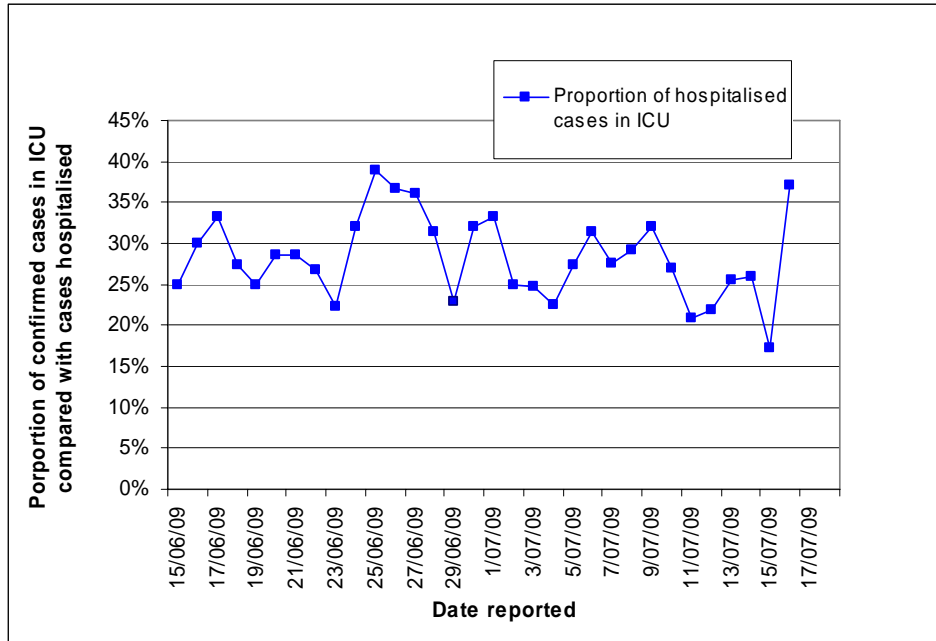


*The jurisdictions report directly to the National Incident Room, Commonwealth Department of Health and Ageing, on hospitalisations and numbers admitted to ICUs.

Source: Jurisdictions

³ Most cases admitted to an ICU would be ventilated.

Figure 12. Proportion of hospitalised pandemic (H1N1) 2009 confirmed cases admitted to ICU compared with cases hospitalised*, 15 June 2009 to 17 July 2009, Australia



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

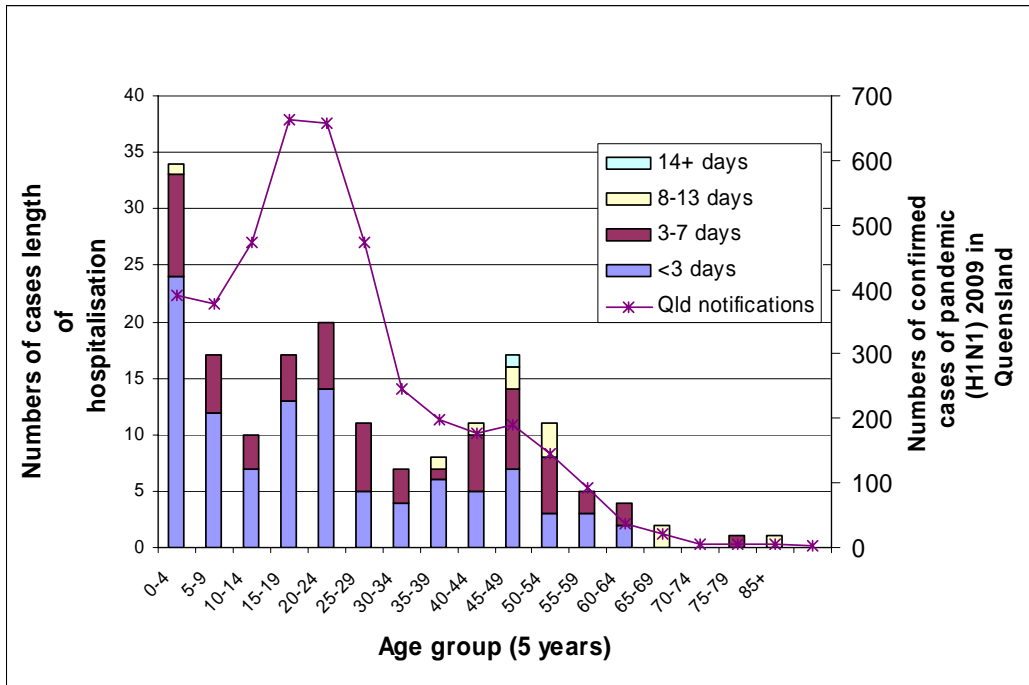
Source: Jurisdictions

Queensland snapshot on hospitalisations

Two hundred and twenty seven people have been hospitalised in Queensland for pandemic (H1N1) 2009 between 25 May 2009 and 17 July 2009, a crude rate of 5.3 per 100,000 population. Of these hospitalised cases, 23 were admitted to an ICU for a period of 1 to 10 days with thirteen cases remaining in ICU as of 17 July 2009. No children aged less than 15 years of age were admitted to an ICU. Sixty eight percent (n=154) of cases were admitted to hospital within 48 hours of onset of symptoms. Information on co-morbidities was available for 187 cases. Of these cases, co-morbidities included chronic respiratory 32% (n=60); chronic cardiac 7% (n=14); immunocompromised 9% (n=17); diabetes 5% (n=10); pregnancy 5% (n=9); morbid obesity 4% (n=7); and renal 3% (n=5).

Figure 13 illustrates that the 0-4 years age group is more likely to be hospitalised but that the length of stay is of less than 3 days duration. For those in the 40-54 year age group more than half of the cases require hospital stays of longer than 3 days. This age group is more likely to have co-morbidities and Figure 13 may indicate that there is deterioration in these co-morbidities; or that the disease is having a severe impact leading to an extended period of hospitalisation.

Figure 13. Hospitalised confirmed cases of pandemic (H1N1) 2009, by length of hospital stay compared with number of notifications by age group, to 17 July 2009, Queensland



Source: NetEpi database

Deaths

Thirty one people in Australia⁴ with confirmed pandemic (H1N1) 2009 infection died up to 10 July 2009, with 14 reported in Victoria, 10 in New South Wales, two reported in both South Australia and the Northern Territory and one each in Queensland, Tasmania and Western Australia. The average age of confirmed cases that died was 51 years of age and the median age was 52 years (range 3-85 years of age). Reports from the jurisdictions indicate that most of the cases had underlying medical conditions; including cancer, diabetes mellitus and morbid obesity.

As a comparison, during the years 2001-2006 the average number of deaths from all influenzas for the month of June was 5 deaths and for July was 7 deaths. Deaths from all influenzas and pneumonias in June and July for the same period averaged 294 deaths and 347 deaths respectively. These account for 2-3% of all deaths in Australia during these months.⁵

⁴. 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>

4. Seasonal Influenza Activity in Australia

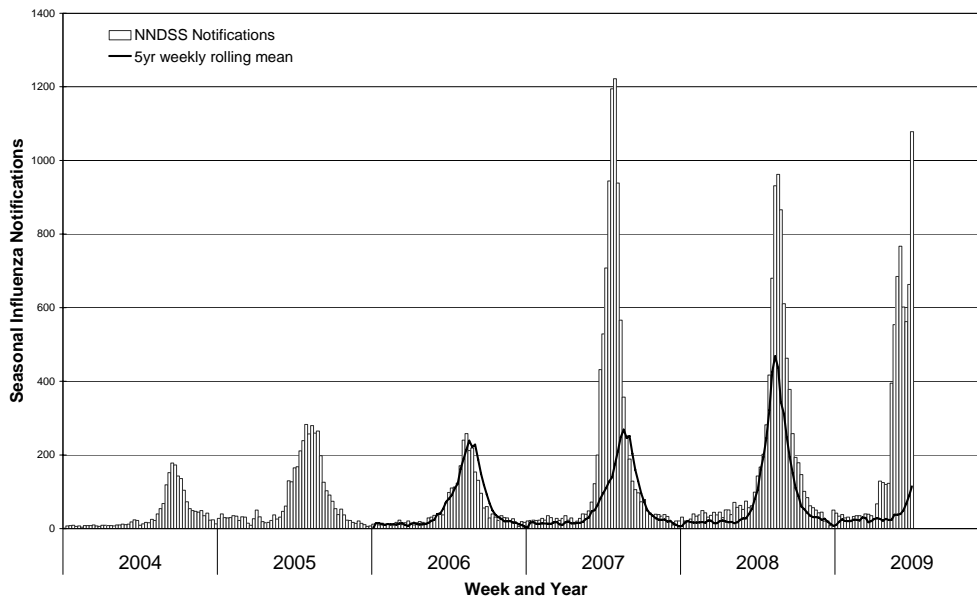
Laboratory Confirmed Influenza

There have been 6,397 cases of laboratory confirmed influenza diagnosed and reported to the National Notifiable Diseases Surveillance System (NNDSS) from 1 January 2009 to 17 July 2009 (Figure 14). There were 1,431 laboratory confirmed influenza cases in the same period last year (1 January 2008 to 17 July 2008).

In this report data are presented differently to previous reports. Victorian notifications of influenza A have been removed from all seasonal influenza figures and tables reporting NNDSS data as these notifications are not being subtyped and it is likely that the majority of influenza A notifications in Victoria are pandemic (H1N1) 2009.

Influenza notifications are above the 5 year rolling mean for this period (Figure 14). The high notification rates are predominantly due to increased testing for influenza associated with the pandemic (H1N1) 2009 outbreak. Seasonal Influenza notifications appear to have reached a peak around week 25 (week ending 19 June 2009) then decreased. However, in this reporting period notifications have again increased largely due to an increase in notifications from Queensland (Figure 14 and 15).

Figure 14. Number of laboratory-confirmed influenza notifications, NNDSS, 1 January 2004 to 17 July 2009, by jurisdiction and week of diagnosis*



*NNDSS data excludes all the identifiable notifications of pandemic (H1N1) 2009. However, there are a small number of pandemic (H1N1) 2009 notifications reported in NNDSS as Influenza A, from states other than Vic. Influenza A notifications from Victoria are not included in this data as these are likely to be pandemic (H1N1) 2009.

SOURCE: NNDSS

Notifications in 2009 have been predominantly from Queensland (41%), New South Wales (22%) and South Australia (16%). The Australian Capital Territory, the Northern Territory, Tasmania, Victoria and Western Australia accounted for the other 21% (Table 2 and Figure 14).

The Northern Territory has reported the highest age standardised rate of seasonal influenza notifications per 100,000 population (157) followed by the Australian Capital Territory (67) and South Australia (67) and Queensland (61).

Table 2. Number and rate of laboratory-confirmed influenza notifications by jurisdiction, NNDSS, 1 January 2009 to 17 July 2009*

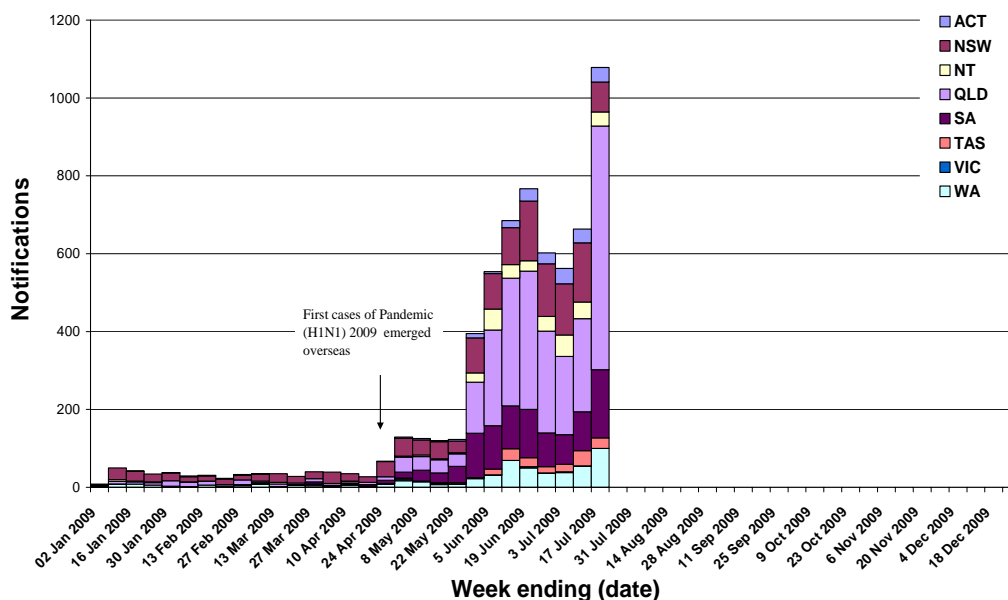
State	Cases	Percentage of Total Notifications	Crude rate per 100,000	Average Rate YTD 2004-2008	Age standardised rates per 100,000	Percentage of Australian population
ACT	231	3.6%	68.0	38.1	67.2	1.6%
NSW	1409	22.0%	20.5	26.1	20.2	32.6%
NT	341	5.3%	158.6	45.9	157.0	1.0%
QLD	2644	41.3%	63.2	46.3	61.4	20.0%
SA	1038	16.2%	65.5	15.2	67.0	7.5%
TAS	186	2.9%	37.7	28.1	38.2	2.3%
VIC	28	0.4%	0.5	16.7	0.5	24.8%
WA	520	8.1%	24.7	37.6	24.2	10.1%
AUS	6397	100%	30.4	5.7	45.2	100%

*NNDSS data excludes all the identifiable notifications of pandemic (H1N1) 2009. However, there are a small number of pandemic (H1N1) 2009 notifications reported in NNDSS as Influenza A, from states other than Vic. Influenza A notifications from Victoria are not included in this data as these are likely to be pandemic (H1N1) 2009.

Standardised to the 2006 Australia population.

SOURCE: NNDSS, ABS (2008 population)

Figure 15. Number of laboratory-confirmed influenza notifications, NNDSS, 1 January 2009 to 17 July 2009, by jurisdiction and week of diagnosis*



*NNDSS data excludes all the identifiable notifications of pandemic (H1N1) 2009. However, there are a small number of pandemic (H1N1) 2009 notifications reported in NNDSS as Influenza A, from states other than Vic. Influenza A notifications from Victoria are not included in this data as these are likely to be pandemic (H1N1) 2009.

SOURCE: NNDSS

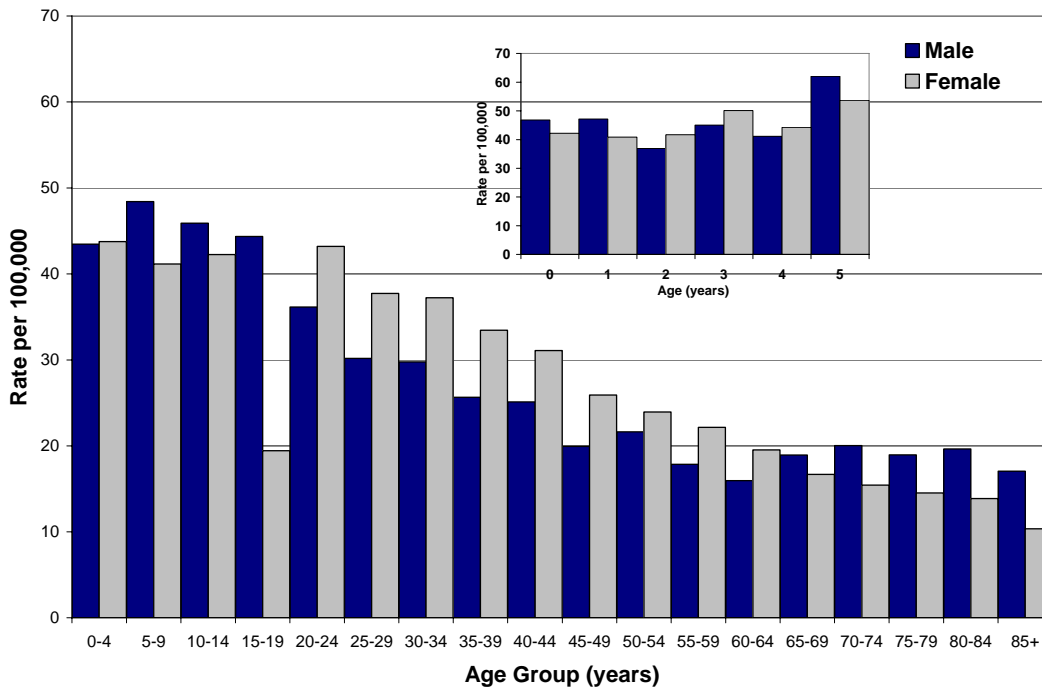
Subtyping information

Of the 5,851 cases of influenza Type A notifications to NNDSS, 338 (5.8%) have been typed as A/H3N2, 161 (2.8%) have been typed as A/H1N1 and 5,316 (90.9%) as influenza A untyped. Influenza A untyped notifications in NNDSS may potentially be pandemic (H1N1) 2009. In some laboratories subtyping and pandemic (H1N1) 2009 testing is not carried out.

Age/ Sex Distribution

National age-specific notification rates year to date have changed since removing Victorian influenza A notifications. The highest rates of notifications are in both males and females of younger age groups (Figure 16). Rates are still highest in those aged under 25 and this is likely to be a result of increase testing for pandemic (H1N1) 2009 across all age groups (Figure 16).

Figure 16. Notification rates of laboratory-confirmed influenza, NNDSS, Australia, 1 January 2009 to 17 July 2009, by age group and sex*

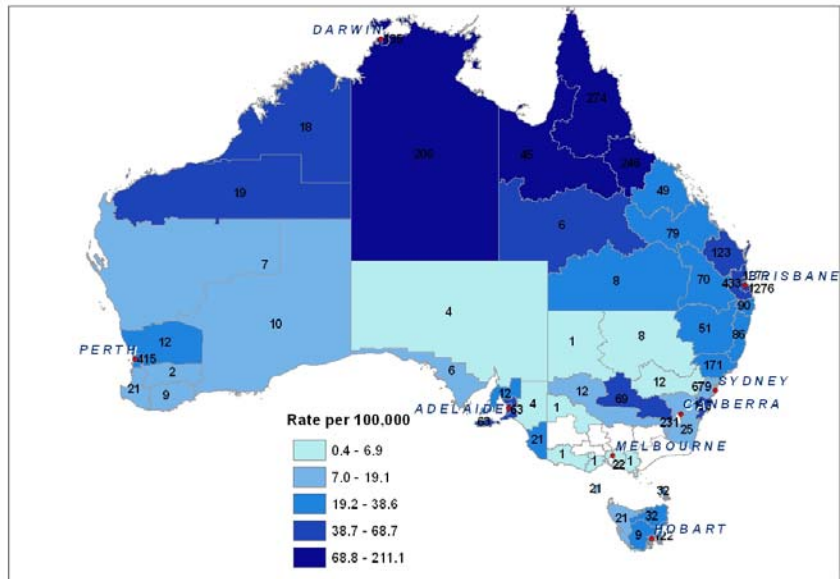


*NNDSS data excludes all the identifiable notifications of pandemic (H1N1) 2009. However, there are a small number of pandemic (H1N1) 2009 notifications reported in NNDSS as Influenza A, from states other than Vic. Influenza A notifications from Victoria are not included in this data as these are likely to be pandemic (H1N1) 2009.

SOURCE: NNDSS

Mapping of influenza notifications by statistical division of residence indicates that there are areas within jurisdictions with higher rates compared to the rest of the jurisdiction or Australia (Figure 17). The numbers on the map indicate the number of cases occurring within each region.

Figure 17. Map of notification rates of laboratory-confirmed influenza, NNDSS, Australia, 1 January 2008 to 17 July 2009, by Statistical Division of residence*



*NNDSS data excludes all the identifiable notifications of pandemic (H1N1) 2009. However, there are a small number of pandemic (H1N1) 2009 notifications reported in NNDSS as Influenza A, from states other than Vic. Influenza A notifications from Victoria are not included in this data as these are likely to be pandemic (H1N1) 2009.

SOURCE: NNDSS

Attachments

International influenza surveillance

As at 22 July, the WHO has stated that there are over 125,000 laboratory-confirmed cases of the pandemic (H1N1) 2009 virus worldwide, but the number of actual cases far exceeds what has been reported. The pandemic (H1N1) 2009 virus has been associated with more than 700 deaths around the world since the outbreak began (an estimated Case Fatality Rate of 0.56).⁶

A number of countries with widespread transmission (the US, Mexico, Chile, Argentina, the UK) have moved towards a phase similar to the Australian phase PROTECT, where resources (including testing) are focused on providing the appropriate treatment for moderate to severe cases of pandemic (H1N1) 2009. These changes should be considered when looking at the following data.

Countries in the Southern Hemisphere currently going through the winter influenza season have seen the highest increases in rates of pandemic (H1N1) 2009 notifications compared to the last report.

At 17 July 2009, the rate of pandemic (H1N1) 2009 notifications in Australia was 53.4 per 100,000 population, an increase from 35.9 per 100,000 population in the last report. Chile continues to have the highest rate at 62.0 per 100,000 population (an increase from 48.2 per 100,000 population in the last report), while Japan had the lowest at 2.5 per 100,000 population (Table 3).

As the weekly notifications in most of the countries listed below do not reflect the pandemic (H1N1) 2009 activity in the community, but rather the number of confirmed cases among those most at risk, the Case Fatality Rate is a rough indicative measure. Argentina continues to have the highest number of confirmed deaths associated with pandemic (H1N1) 2009 (137 deaths, mostly concentrated in the metropolitan region of Buenos Aires) in the Southern Hemisphere, and second highest internationally after the US which reported 211 deaths. In the Southern hemisphere, Argentina is followed by Chile (33 deaths), Australia (31 deaths) and New Zealand (10 deaths).

Table 3. Notification rates for pandemic (H1N1) 2009 in a selection of affected countries

Country	Confirmed cases	Crude rate per 100,000 population*	Deaths	Case Fatality Rate
Southern Hemisphere				
Chile	10491	62.0	33	0.31
Australia	11651	53.4	31	0.27
New Zealand	2107	48.9	10	0.47
Argentina	3056	7.6	137	4.48
Northern Hemisphere				
Canada	10156	30.1	45	0.44
UK	9718	15.8	29	0.30
USA	37246	12.1	211	0.57
Mexico	12645	11.5	124	0.98
Japan	3124	2.5	0	0.00

*The above crude rates are calculated from the number of confirmed cases for each particular country as at 17 July 2009. The crude rate per 100,000 for Australia might differ from the age standardised rate reported previously.

Influenza Activity

Southern Hemisphere

Southern Hemisphere countries are experiencing overall increases in confirmed pandemic (H1N1) 2009 cases to the point of overtaking the number of seasonal influenza cases in the last few weeks. This could indicate that pandemic (H1N1) 2009 is replacing seasonal flu activity in the Southern Hemisphere winter.

- In New Zealand, seasonal influenza reporting commenced on 27 April 2009. New Zealand reported a sharp increase in Influenza-Like-Illness (ILI) consultations through sentinel surveillance in the week ending 12 July (particularly in those aged under 19 years) with much higher consultation rates than in previous years for the same period. About 74% of influenza viruses reported from sentinel surveillance and 54% of influenza viruses reported in non-sentinel surveillance were pandemic (H1N1) 2009. As of 12 July, New Zealand has reported a total of 1942 confirmed and probable cases of pandemic (H1N1) 2009, including 2 deaths and 345 hospitalisations. Of the 345 hospitalisations, pneumonia was recorded for 44 cases and acute respiratory distress syndrome was recorded of 6 cases. The highest notification and hospitalisation rates were seen in the less than 1 year age group.⁷
- In Chile, ILI activity is high when compared to previous years, and continues to rapidly increase.⁸ Type A influenza was the predominant virus in week 20, representing 68% of all positive influenza tests.⁹ Up to 14 July, pandemic (H1N1) 2009 represented 92% of the total circulating viruses in people over 5 years of age and 47% in those aged under 5 years. Of the pandemic (H1N1) 2009 confirmed cases as at 14 July (10,491), 62% are under 19 years of age, and 5.4% required hospitalisation. There has been 33 deaths associated with pandemic (H1N1) 2009.¹⁰
- Argentina reported low to moderate influenza activity in week 26 (ending on 4 July), with widespread community transmission. There has been more pneumonia cases reported than in the previous 2 years. A similar pattern was observed with bronchiolitis in children under 2 years of age.¹¹ Pneumonia and bronchiolitis are associated with influenza diagnosis as an outcome of infection.
- In Hong Kong, 2009 seasonal influenza reporting commenced on 2 January 2009. The average consultation rates for ILI among sentinel private doctors increased in the week starting 28 July. Pandemic (H1N1) 2009 cases continue to increase and dominate all influenza subtypes, accounting for 53% of all the influenza tested in the week starting 21 June and 68% in the week starting 28 July. Influenza A (H3N2) has been the other circulating seasonal influenza strain although it decreased from 36% of all the influenza tested to 25% over the same period.¹²

Northern Hemisphere

Some Northern Hemisphere countries are experiencing higher influenza activity than usual for this time of the year (their summer), possibly reflecting the rapid spread of pandemic (H1N1) 2009.

- In Canada, for week 27 (ending 15 July) the overall influenza activity levels remain high for this time of the year, but has been decreasing compared to the previous weeks. ILI consultations rates (21 consultations per 1,000 visits) and the proportion of influenza positive tests (13.4%) are still higher than expected for this time of the year, but are decreasing relative to the previous weeks. The majority (81.6%) of influenza virus detections this season have been for influenza A. For the week ending 15 July, a total of 864 specimen tested positive for influenza (862 A and 2 B). Of the 453 influenza A subtyped, 95.1% were due to pandemic (H1N1) 2009 and 4.9% to A(H3) virus.¹³

- During the week of 28 June to 4 July 2009, influenza activity decreased in the United States. However, there were still higher levels of ILI than is normal for this time of year. Over 97% of all subtyped influenza A viruses being reported to CDC were pandemic (H1N1) 2009 viruses.¹⁴
- From 6 July to 12 July 2009 (week 28), all European countries reporting indicated low levels of influenza activity except the UK which reported high and widespread influenza activity, reflecting its status as being the European country most affected by pandemic (H1N1) 2009 infection. About 90% of all the samples collected by GPs and 23% of sample collected by hospitals that tested positive from influenza were pandemic (H1N1) 2009. Physician consultation rates in the UK for individuals presenting with ILI show increased rates, and are now above the threshold level for normal seasonal flu activity. There has been a reduction in the number of laboratory confirmed cases as physicians move towards clinical diagnoses.¹⁵

Antiviral Resistance Global update

Pandemic (H1N1) 2009

- As at 17 July 2009, WHO announced three cases of laboratory-confirmed oseltamivir resistance to the pandemic (H1N1) 2009 virus have been detected in Denmark, Japan and Hong Kong respectively. These viruses were found in three patients who did not have severe disease and all have recovered. The Hong Kong isolate was identified in a case who had not been treated with antivirals, meaning that she was infected with a resistant strain that was circulating in the community. It is likely that the case acquired the infection in the USA.¹⁶ Investigations have not found the resistant virus in the close contacts of these three people. The viruses, while resistant to oseltamivir, remain sensitive to zanamivir. WHO considers that these were sporadic cases of resistance to oseltamivir and that there is no current evidence of widespread antiviral resistance. Based on this risk assessment, there are no changes in WHO's clinical treatment guidance.¹⁷
- The Media reported on 21 July a new case of oseltamivir resistance in a 60 year old Quebec man who was given a low preventive dose of Tamiflu and who has since recovered.¹⁸
- Japan reported on 21 July a second case of Tamiflu resistance in a person who has no ties to the country's earlier reported case.¹⁹
- Samples of Australian pandemic (H1N1) 2009 viruses are routinely tested for sensitivity to antivirals. All pandemic (H1N1) 2009 viruses tested to date of report continue to be sensitive to oseltamivir and zanamivir
- In New Zealand, all pandemic (H1N1) 2009 viruses tested to date continue to be sensitive to oseltamivir.²⁰
- The US CDC reported in week 26 ending 4 July that all the pandemic (H1N1) 2009 viruses tested were susceptible to oseltamivir and zanamivir and resistant to amantadine and rimantadine.²¹

Seasonal Influenza

- The last WHO report on oseltamivir resistance to seasonal strains was released in 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, indicating a substantial increase in seasonal influenza A (H1N1) resistance to oseltamivir from 15% in the 2007-2008 Northern Hemisphere influenza season.^{22,23}

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- In Australia, all A(H3N2) and B viruses have been shown to be susceptible to both NI inhibitors (oseltamivir and zanamivir), while 97% of seasonal A/H1N1 isolates were resistant to oseltamivir but all were sensitive zanamivir.
 - In New Zealand, all of the 28 seasonal influenza A (H1N1) isolates tested were resistant to oseltamivir.²⁴
 - In Canada, 99.7% (304/305) of seasonal A/H1N1 isolates were resistant to oseltamivir; all seasonal A/H1N1 isolates tested were sensitive Zanamivir; and 100% seasonal A/H3N2 isolates were resistant to amantadine.²⁵
 - The US CDC reported in 'week 26 ending 4 July that 99.5% of the seasonal A(H1N1) tested was resistant to oseltamivir and 100% of the Influenza A(H3N2) tested was resistant to *adamantanes*'.²⁶

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 20 July 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. The Northern Territory and Tasmania are currently unable to distinguish between seasonal and pandemic (H1N1) 2009 cases and are reported as Influenza A.

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 'EDSS News' Report. This report is provided weekly.

NSW - ED surveillance data are extracted from the 'NSW Influenza Surveillance Report'. This report is provided weekly.

Paediatric hospital admissions data

Reports of ICU admissions are provided to the Surveillance Branch on a weekly basis by the Australian Paediatric Surveillance Unit.

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