The Department of Health acknowledges the providers of the many sources of data used in this report and greatly appreciates their contribution.

### KEY MESSAGES

- In the fortnight ending 2 September 2016, influenza activity continued to increase at the national level, with most regions of Australia reporting widespread and increasing activity.
- National indicators of influenza-like illness (ILI) declined in the last fortnight, suggesting that the season may be close to peaking. The proportion of patients presenting to sentinel general practitioners with ILI and testing positive for influenza declined slightly this fortnight.
- Influenza A(H3N2) continued to be the dominant circulating influenza virus nationally in recent weeks, noting jurisdictional variation.
- Notification rates this year to date have been highest in adults aged 85 years or older, with a secondary peak in the very young, aged less than 5 years. This is consistent with influenza A(H3N2) being typically more prevalent in older age groups.
- Clinical severity for the season to date, as measured through the proportion of patients admitted directly to ICU and deaths attributable to pneumonia or influenza, is low to moderate.
- To date, the seasonal influenza vaccines appear to be a good match for circulating virus strains.

### ANALYSIS

#### 1. Geographic Spread of Influenza Activity in Australia

In the fortnight ending 2 September 2016 (week 35), influenza activity was reported by state and territory health departments as unchanged when compared with the previous fortnight in Central Australia region of the Northern Territory (NT), Southern and Central regions of Queensland (QLD), New South Wales (NSW) and all regions of Western Australia (WA); and as increased in South Australia (SA); Australian Capital Territory (ACT), Victoria (VIC), Tasmania (TAS), the Top End of the NT and Tropical region of QLD (Figure 1).

The geographic spread of influenza activity was reported as localised in Central Australia region of NT; regional in TAS and the Tropical region of QLD; and widespread in all other regions of Australia.

Influenza-like illness (ILI) activity reported from syndromic surveillance systems when compared with the previous fortnight was reported as decreased in NSW, unchanged in WA and NT and increased in all other regions.

**Figure 1. Map of influenza activity by state and territory, Australia, 20 August to 2 September 2016.**
2. Laboratory Confirmed Influenza Activity

Sentinel Laboratory Surveillance

Influenza was detected by sentinel laboratories at increasing levels from week 34 to 35. There was a marginal decrease from week 33 to 34. The percentage of tests positive for influenza across all sentinel laboratories was 20.1% in week 35, an increase from 19.1% in week 34 (Figure 2). Influenza A was the respiratory virus most commonly detected by sentinel laboratories in NSW, VIC and WA and TAS this reporting fortnight. However, rhinovirus was the respiratory virus most commonly detected by the sentinel laboratory in SA.

Figure 2. Proportion of sentinel laboratory tests positive for influenza, 21 May to 2 September 2016, by subtype and month and week.

Notifications of Influenza to Health Departments

Notifications of laboratory confirmed influenza to the National Notifiable Diseases Surveillance System (NNDSS) have continued to increase this reporting fortnight (Figure 3). For the year to 2 September, a total of 53,159 notifications of laboratory confirmed influenza were reported to the NNDSS: 23,038 in NSW; 14,171 in QLD; 6,666 in VIC; 4,729 in WA; 2,682 in SA; 1,077 in ACT; 543 in TAS and 253 in the NT (Figure 4). Nationally, the number of notifications reported this fortnight has accounted for 28% of the notifications received this year to date. This indicator ranges jurisdictionally from 15% in the NT to 45% in TAS.

For the year to 2 September, 90% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (69% A(unsubtyped), 9% influenza A(H1N1)pdm09 and 12% influenza A (H3N2)), 10% were influenza B and less than 1% were influenza C, influenza A&B co-infections or untyped (Figure 5). In the most recent fortnight, 93% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (84% influenza A(unsubtyped), 2% influenza A(H1N1)pdm09 and 8% influenza A (H3N2)), 6% were influenza B and less than 1% were influenza C, influenza A&B co-infections or untyped.

Nationally, the number of influenza A(H3N2) notifications continued to exceed the number of influenza A(H1N1)pdm09 notifications for the tenth consecutive week, with almost four notifications of influenza A(H3N2) reported to the NNDSS for every one influenza A(H1N1)pdm09 in the reporting fortnight.

So far in 2016, notification rates have been highest in adults aged 85 years or older, with a secondary peak in the very young, aged less than 5 years (Figure 6). While influenza A(H3N2) is detected across all age groups, it accounts for a greater proportion of influenza A where subtyping is available in people aged 65 years or older, than in any other age group (Figure 7).
Figure 3. Notifications of laboratory confirmed influenza, Australia, 1 January 2012 to 2 September 2016, by month and week of diagnosis.

Source: NNDSS

Figure 4. Notifications of laboratory confirmed influenza, 2 January to 2 September 2016, by state or territory and week.

Source: NNDSS
Figure 5. Notifications of laboratory confirmed influenza, Australia, 2 January to 2 September 2016, by subtype and week.

Source: NNDSS

Figure 6. Rate of notifications of laboratory confirmed influenza, Australia, 1 January to 2 September 2016, by age group and subtype.

Source: NNDSS
3. Influenza-like Illness Activity

Community Level Surveillance

FluTracking, a national online system for collecting data on ILI in the community, indicated that rates of ILI among participants so far this year remain on the lower range of recent seasons (Figure 8). The proportion of participants reporting fever and cough declined slightly from week 34 (2.8%) to 35 (2.6%). The proportion of participants reporting fever, cough and absence from normal duties remained stable over the fortnight from 1.9% in week 34 to 2.0% in week 35. So far this year 61% of all participants and 81% of participants who identify as working face-to-face with patients reported receiving the seasonal influenza vaccine. ¹
Figure 8. Proportion of fever and cough among FluTracking participants, Australia, between May and October, 2012 to 2016, by month and week.

Source: FluTracking

Sentinel General Practice Surveillance

Sentinel general practitioner ILI consultations decreased this fortnight to 11.6 per 1,000 consultations in week 35, down from a peak of 15.3 per 1,000 consultations in week 33 (Figure 9).

Of the 89 specimens taken from ILI patients seen by a sentinel practitioner during the current reporting fortnight, 40 (45%) were positive for influenza, with influenza A (H3N2) being the predominant influenza subtype identified (Figure 10).

Figure 9. Unweighted rate of ILI reported from sentinel GP surveillance systems, Australia, 1 January 2012 to 4 September 2016, by month and week.

SOURCE: ASPREN and VicSPIN
4. Hospitalisations

Sentinel Hospital Surveillance

Admissions with confirmed influenza to sentinel hospitals declined in week 34, but increased in week 35 (Figure 11). Since seasonal surveillance commenced through the Influenza Complications Alert Network (FluCAN) sentinel hospital surveillance system on 1 April 2016, a total of 1,085 people have been admitted with confirmed influenza, of which 220 (20%) were children aged less than 15 years and 458 (42%) were adults aged 65 years or older. Approximately 10% of influenza patients have been admitted directly to ICU and consistent with other systems, the majority of influenza admissions have been due to influenza A (93%). Overall, 70% of patients were reported with significant risk factors, with the presence of risk factors increasing with age.

Figure 11. Number of influenza hospitalisations at sentinel hospitals, 1 April to 2 September 2016, by month and week of and influenza subtype.

Source: FluCAN Sentinel Hospitals
Paediatric Severe Complications of Influenza
The Australian Paediatric Surveillance Unit (APSU) conducts seasonal surveillance between July and October annually of children aged 15 years and under who are hospitalised with severe complications of influenza. Between 1 July 2016 and 4 September 2016, there were 6 hospitalisations associated with severe complications of influenza reported to APSU. The median age of the cases was 3.2 years. All cases were associated with influenza A infection. One-third of the cases reported having an underlying chronic condition and none of the cases were vaccinated for influenza.

5. Deaths Associated with Influenza and Pneumonia

Nationally Notified Influenza Associated Deaths
So far in 2016, 33 influenza associated deaths have been notified to the NNDSS. The median age of deaths notified was 74 years (range 0 to 96 years). The number of influenza associated deaths reported to the NNDSS is reliant on the follow up of cases to determine the outcome of their infection and most likely does not represent the true mortality associated with this disease.

New South Wales Influenza and Pneumonia Death Registrations
Death registration data from NSW for 2016 up to the week ending 12 August 2016 show deaths attributed to pneumonia or influenza remained low. (Figure 12).²

Figure 12. Rate of deaths classified as influenza and pneumonia from the NSW Registered Death Certificates, 2011 to 12 August 2016.

6. Virological Surveillance

Australian Influenza Vaccines Composition 2016
The influenza virus strains included in the 2016 seasonal influenza vaccines in Australia are:
- A/California/7/2009, (H1N1)pdm09-like virus;
- A/Hong Kong/4801/2014, (H3N2)-like virus;
- B/Brisbane/60/2008-like virus, Victoria lineage;
- B/Phuket/3073/2013-like virus, Yamagata lineage (Quadrivalent influenza vaccine only).
Typing and Antigenic Characterisation

In 2016, up to 5 September the World Health Organization Collaborating Centre for Reference and Research on Influenza (WHOCC) characterised 602 influenza viruses (Table 1). When further characterised for similarity to the vaccine components, isolates appeared to be well matched. All the influenza B isolates were characterised as similar to the vaccine components. A small number of influenza A(H1N1)pdm09 isolates (n=27) and influenza A(H3N2) isolates (n=22) were characterised as low reactors.

Table 1. Australian influenza viruses typed by HI from the WHOCC, 1 January to 22 August 2016.

<table>
<thead>
<tr>
<th>Type/Subtype</th>
<th>ACT</th>
<th>NSW</th>
<th>NT</th>
<th>QLD</th>
<th>SA</th>
<th>TAS</th>
<th>VIC</th>
<th>WA</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A(H1N1)pdm09</td>
<td>4</td>
<td>133</td>
<td>14</td>
<td>143</td>
<td>30</td>
<td>16</td>
<td>48</td>
<td>19</td>
<td>409</td>
</tr>
<tr>
<td>A(H3N2)</td>
<td>4</td>
<td>57</td>
<td>0</td>
<td>7</td>
<td>13</td>
<td>5</td>
<td>23</td>
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<td>B/Victoria lineage</td>
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<td>10</td>
<td>1</td>
<td>14</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>B/Yamagata lineage</td>
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<td>7</td>
<td>0</td>
<td>15</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>207</td>
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<td>179</td>
<td>52</td>
<td>21</td>
<td>78</td>
<td>34</td>
<td>602</td>
</tr>
</tbody>
</table>

SOURCE: WHO CC

Note: Viruses tested by the WHO CC are not necessarily a random sample of all those in the community. State indicates the residential location for the individual tested, not the submitting laboratory. There may be up to a month delay on reporting of samples.

Antiviral Resistance

The WHOCC reported that from 1 January to 5 September 2016, of the 678 influenza viruses tested for neuraminidase inhibitor resistance, two influenza A(H1N1)pdm09 viruses have shown highly reduced inhibition to the antiviral drug Oseltamivir.

7. International Surveillance

The World Health Organization reported that influenza activity varied in countries of temperate South America and increased steadily in the last few weeks in South Africa and Oceania.\(^3\) Influenza activity in the temperate zone of the northern hemisphere was at inter-seasonal levels.

DATA CONSIDERATIONS

The information in this report is reliant on the surveillance sources available to the Department of Health. As access to sources vary throughout the season, this report will draw on available information.

Detailed notes on interpreting the data presented in this report are available at the Department of Health’s Australian Influenza Surveillance Report website (www.health.gov.au/flureport).

This report aims to increase awareness of influenza activity 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. 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 Surveillance Team (flu@health.gov.au).

REFERENCES

