

Summary

The fluTAS report is a fortnightly update on the influenza season produced by the Communicable Diseases Prevention Unit to inform healthcare organisations and the public about the current level of influenza disease activity within Tasmania. Multiple data sources are used to obtain measures of influenza disease activity in the community. Tasmania is an island State located off the southern coast of mainland Australia. Tasmania has a cool temperate climate and has a population of approximately 510,000 people.

This report describes influenza activity within Tasmania during the first 48 weeks of 2013; from 1 January to 1 December 2013. Notified influenza diagnoses and other laboratory data are presented together with influenza-like illness data from the syndromic-surveillance systems FluTracking and Australian Sentinel Practices Research Network (ASPREN).

The 2013 influenza season when compared with past seasons was one of low to moderate influenza activity across Tasmania. This reduced level of influenza laboratory diagnosis was apparent with both Influenza A and Influenza B. The 2013 peak in weekly influenza diagnoses occurred during late September.

During 2013 there were lower rates of influenza diagnosis in females than in males. The rate of influenza diagnosis in Hobart and Southern residents was approximately double the rates for North and North-West residents after adjusting for population differences. Higher rates of infection were observed in children as well as adults aged 40 to 60 years.

Influenza A virus was the main cause of influenza infections within Tasmania during 2013. The H1N1 subtype of Influenza A virus that first appeared during the 2009 Influenza Pandemic now circulates annually as one of several 'seasonal' strains. This subtype was the most common strain in circulation during 2013. This is in contrast to 2012 which saw a high level of Influenza A H3N2 infections within Tasmania. The lower level of Influenza A H3N2 infections notified during 2013 may reflect a higher level of immunity to the H3N2 subtype within the Tasmanian community. Influenza B diagnoses during 2013 were approximately half that of Influenza A virus and occurred predominantly in the latter half of the influenza season.

Data collected through Syndromic Surveillance systems to monitor Influenza-like Illness in Tasmanian residents also showed that 2013 was a season of lower activity compared to recent years. Higher levels of illness were reported by individuals who had not received the 2013 annual influenza vaccine.

Influenza notifications

Tasmanian laboratories are required to notify the Director of Public Health of evidence of influenza infection in specimens collected from patients. These specimens are usually nose or throat swabs but can also include a blood sample. The best test for influenza involves PCR¹ to detect influenza virus RNA present in a nose or throat swab.

Overall Notifications

This report examines the 2013 influenza season over a 48-week surveillance period from 1 January to 1 December 2013. During this period **277 laboratory diagnoses of influenza were notified** to DHHS. Notified diagnoses during this period are considered on the basis of *specimen collection date* thereby avoiding delays between a patient being tested, the process of laboratory detection and the eventual notification of influenza to DHHS. These 277 diagnoses related to patients who identified as Tasmanian residents.

Of the 277 influenza laboratory diagnoses notified during the first 48-weeks of 2013, 196 (71%) were diagnoses of **Influenza A virus** infection and 81 (29%) were diagnoses of **Influenza B virus** infection. The 196 Influenza A and 81 Influenza B diagnoses represent diagnosis rates of 38 and 16 diagnoses of influenza per 100,000 Tasmanians respectively. These rates fall within the range of minimum and maximum annual rates observed in recent years (see Figure 1).

Figure 1: Annual Influenza Laboratory Diagnosis counts and population rates, Tasmania

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 ² |
|--|------------|------------|--------------|------------|------------|--------------|-------------------|
| Count of Influenza Diagnoses | | | | | | | |
| Influenza A | 389 | 208 | 1,294 | 95 | 189 | 1,008 | 196 |
| Influenza B | 26 | 176 | 1 | 12 | 174 | 85 | 81 |
| All Influenza | 415 | 384 | 1,295 | 107 | 363 | 1,093 | 277 |
| Influenza Diagnosis Rates (per 100,000 persons)³ | | | | | | | |
| Influenza A | 79 | 42 | 260 | 19 | 37 | 197 | 38 |
| Influenza B | 5 | 35 | 0 | 2 | 34 | 17 | 16 |
| All Influenza | 84 | 77 | 260 | 21 | 71 | 213 | 54 |

One outbreak of Influenza A infection occurred during late November 2013 in a Tasmanian aged-care facility.

Influenza subtyping

Tasmanian laboratories locally conduct a limited range of subtyping of Influenza A virus from PCR-based diagnoses. This is an important aspect of influenza surveillance for monitoring levels of seasonal strains, for vaccine design, and for the early detection of emerging novel influenza stains. Nationally a subset of Influenza A and Influenza B laboratory isolates are routinely forwarded by local laboratories to the World Health Organisation Collaborating Centre for Reference & Research on Influenza (WHO CC) in Melbourne for detailed subtyping.

Subtyping data was available for 63% of Influenza A and 18% of influenza B PCR-based diagnoses during 2013. The Influenza A H1N1 subtype responsible for the 2009 Influenza Pandemic (designated A(H1N1)pdm09) was the most common Influenza A subtype in circulation during 2013. This was a change from the 2012 season during which the A(H3N2) subtype was most common (see Figure 2).

All Influenza B isolates subtyped during 2013 were of the B/Yamagata lineage.

Oseltamivir resistance was not reported in Tasmanian specimens subtyped during 2013.

¹ Polymerase Chain Reaction.

² 2013 counts are for the 48-week period 1 January to 1 December 2013. 2013 rates are calculated as an equivalent 52-week rate.

³ Calculated using population data provided by the Australian Bureau of Statistics (*Estimated Residential Population*)

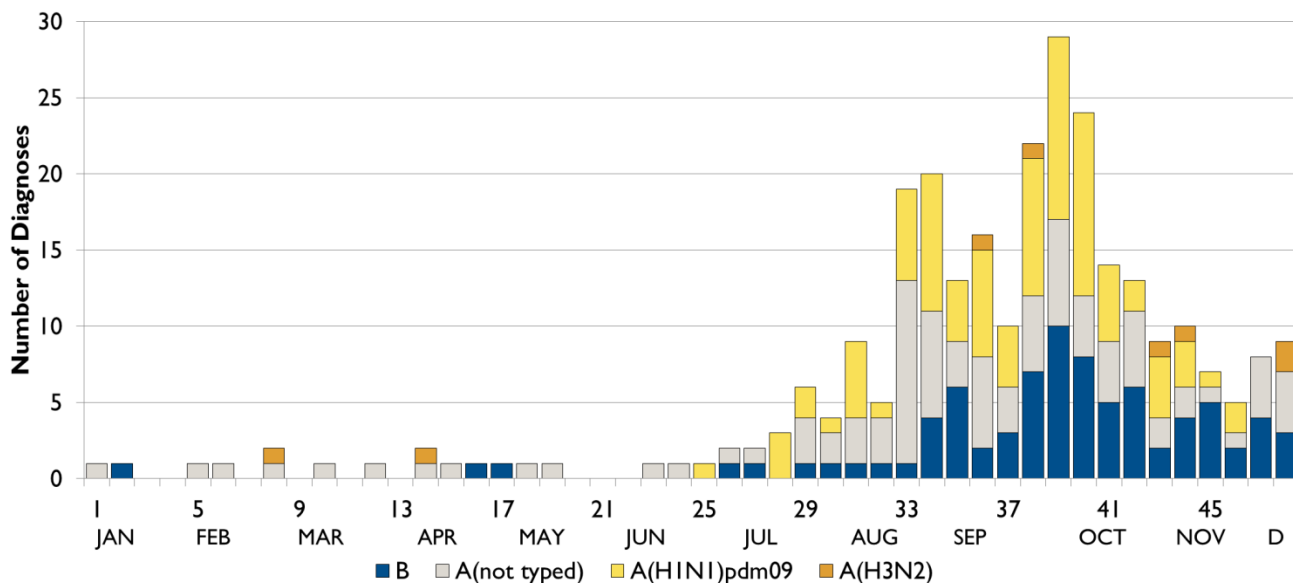
Figure 2: Influenza subtyping for PCR and non-PCR diagnoses, Tasmania

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 ⁴ |
|--------------------------|------------|------------|------------------|------------------|--|--------------|--|
| INFLUENZA A | | | | | | | |
| A(H1N1)pdm09 | | | 984 | 47 | 74 | 2 | 93 |
| A(H3N2) | 1 | 5 | 65 | 11 | 26 | 352 | 8 |
| Others | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtype unknown | 387 | 203 | 245 | 37 | 89 | 654 | 95 |
| Total Influenza A | 389 | 208 | 1,294 | 95 | 189 | 1,008 | 196 |
| INFLUENZA B | | | | | | | |
| Total Influenza B | 26 | 176 | 1 | 12 | 174 | 85 | 81 |
| ALL INFLUENZA | | | | | | | |
| Total Influenza | 415 | 384 | 1,295 | 107 | 363 | 1,093 | 277 |
| Major subtype(s) | unknown | unknown | A(H1N1) pdm09 | A(H1N1) pdm09 | A(H1N1) pdm09 AND Influenza B | A(H3N2) | A(H1N1) pdm09 AND Influenza B |

The 2013 Influenza Season

The 2013 influenza season peaked during September (see Figure 3). The peak in weekly diagnosis counts for both Influenza A and Influenza B infections were in the same week of September (week number⁵ 39).

Figure 3: 2013 Influenza Diagnoses by subtype and week of specimen collection, 1 January to 1 December



The annual total of Influenza A diagnoses for 2009 was exceptionally high due to the occurrence of an Influenza A H1N1 pandemic. A suitable average of historic seasonal influenza within Tasmania can be calculated by taking the mean of data from non-pandemic years only (i.e. excluding 2009 data). Influenza A and Influenza B laboratory diagnoses at the end of the 48-week surveillance period of 2013 were below the historic mean of the 5 non-pandemic years; 2007 to 2008 and 2010 to 2012 (see Figure 4). Influenza A diagnoses during 2013 were significantly lower than the total for 2012, a year with relatively high levels of Influenza A H3N2.

⁴ 2013 counts are for the 48-week period 1 January to 1 December 2013.

⁵ Weeks are defined as commencing on a Monday and concluding on a Sunday. Week number 1 is defined as the earliest week to contain 4 or more January days from the calendar year in question.

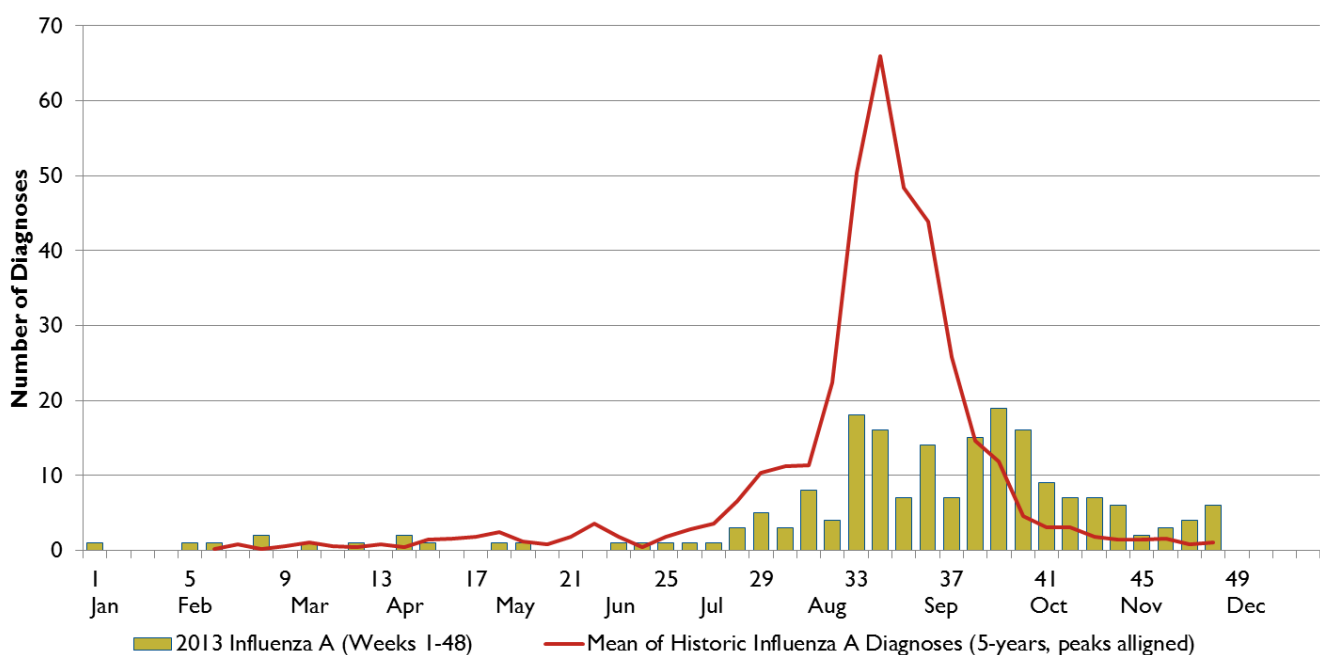
Figure 4: Tasmanian Influenza Seasons – count of laboratory diagnoses, 2007 to 2013

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | mean | 2013 ⁶ |
|----------------------------------|------------|------------|--------------|------------|------------|--------------|------------|-------------------|
| Influenza A rate | 389 | 208 | 1,294 | 95 | 189 | 1,008 | 378 | 196 |
| Influenza B rate | 26 | 176 | 1 | 12 | 174 | 85 | 95 | 81 |
| All-Influenza Rate | 415 | 384 | 1,295 | 107 | 363 | 1,093 | 472 | 277 |
| Influenza A Seasonal Peak | | | | | | | | |
| Peak Month | Late Aug | Early Sep | Late July | Mid Sep | Mid Aug | Mid July | Late Aug | Late Sep |
| Peak week number | 34 | 37 | 30 | 37 | 33 | 29 | 34 | 39 |
| Influenza B Seasonal Peak | | | | | | | | |
| Peak Month | Early Sep | Early Sep | no peak | Early Oct | Early Aug | Early Aug | Early Sep | Late Sep |
| Peak week number | 36 | 36 | no peak | 40 | 32 | 32 | 35 | 39 |

The annual peak in weekly seasonal Influenza A diagnoses from 2007 onwards has occurred as early as July to as late as September. Two peaks in Influenza A diagnoses occurred during 2013; one during August and a later slightly larger peak during late September. The late September 2013 peak is 5 weeks later than the mean peak of past seasons not including 2009. Historic peaks in Influenza B diagnoses since 2007 have varied similarly. The peak in weekly Influenza B diagnoses during 2013 occurred on the same week in September as the Influenza A peak and is 4 weeks later than the mean peak of the past seasons.

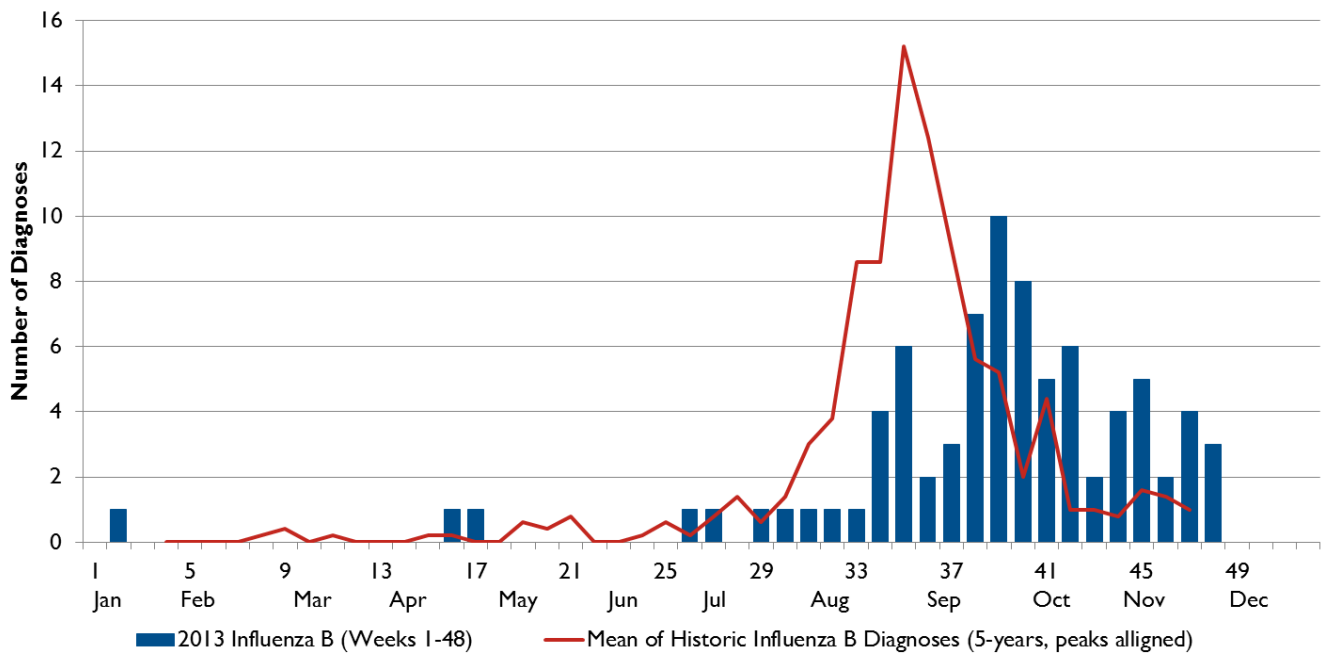
The seasonal increase in Influenza A and B diagnoses during 2013 commenced slightly later than the mean of past seasons. Diagnoses for both persisted above the baseline from September through to the end of this report's surveillance period (1 December 2013) (see figures 5 and 6).

Figure 5: Weekly Influenza A diagnoses during 2013 compared with the mean of 5 past seasons (2007-08 and 2010-12). Weekly means are calculated from data with the peaks in diagnoses aligned on week 34 (the mean week of peak activity).



⁶ 2013 counts are for the 48-week period 1 January to 1 December 2013.

Figure 6: 2013 weekly Influenza B diagnoses compared with mean of 5 past seasons (2007-08 and 2010-12). Weekly means are calculated from data with the peaks in diagnoses aligned on week 34 (the mean week of peak activity). Note the different vertical scale for Influenza B compared to Influenza A (Figure 5).



Influenza Demography

Tasmania’s influenza laboratory diagnosis rates were highest for residents from Hobart and other southern regions of Tasmania. There were 67 diagnoses of influenza per 100,000 residents in the South during the 48 week surveillance period ending 1 December 2013. The North and North-West regions had 36 and 49 diagnoses per 100,000 respectively. These rates were all lower than the mean seasonal diagnosis rates of recent non-pandemic years (South – 137 diagnoses, North – 52 diagnoses, North-West – 48 diagnoses, all per 100,000 residents). Regional differences in influenza diagnosis may not precisely reflect the true levels of influenza within each region. Factors likely to cause differences in diagnosis rates include variations in the level of healthcare-seeking behaviour and the testing practices of individual doctors.

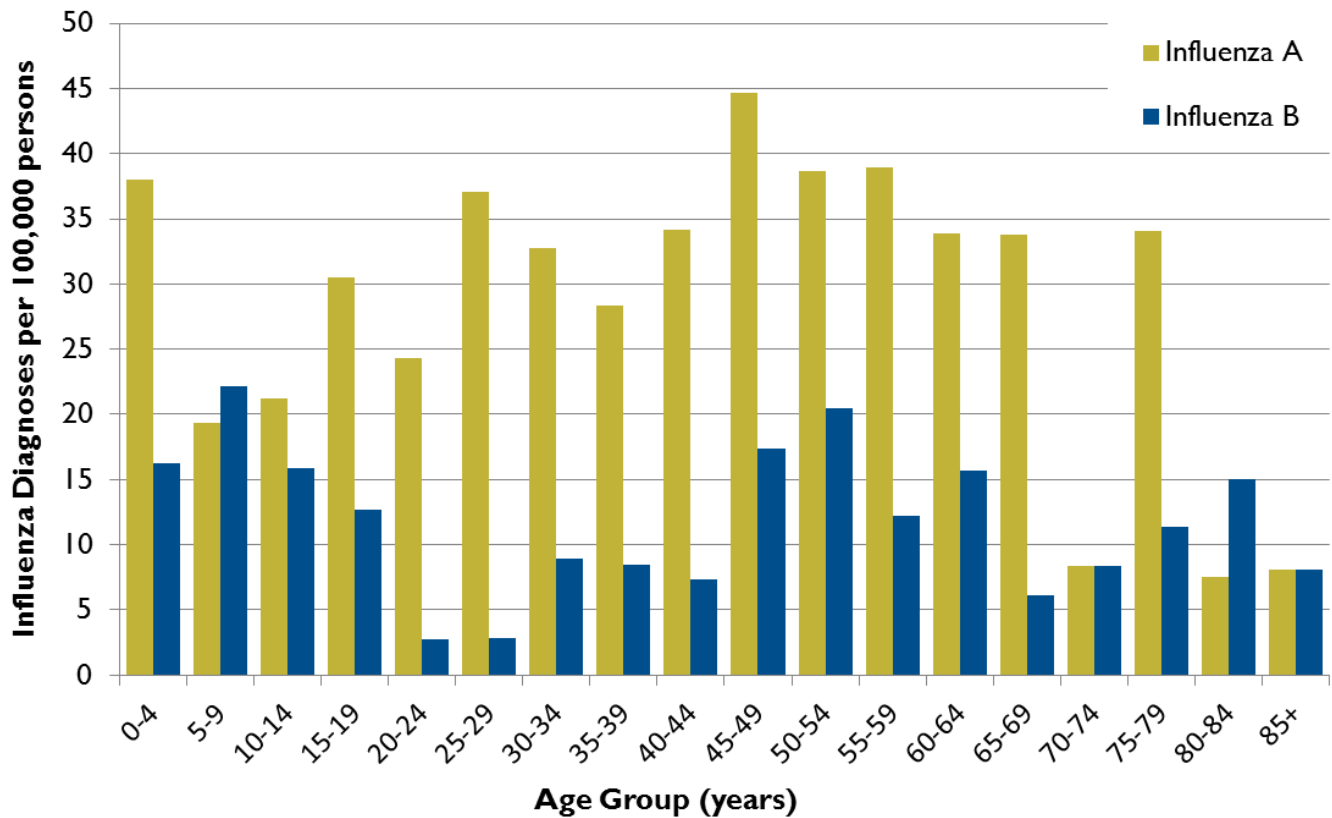
During 2013, influenza diagnosis rates in females were similar (51 per 100,000) to the rates in male residents (48 per 100,000). The mean diagnosis rates for females and males during the non-pandemic years 2007 to 2008 and 2010 to 2012 were 102 per 100,000 and 85 per 100,000 respectively.

Recent Influenza A diagnosis rates have been higher for children under 10 years, adults aged 25 to 34 years and adults aged 85 years and older. For Influenza B historic rates have been higher in children aged 5 to 14 years and adults aged 25-29 years. Significant variations in diagnosis rate between age-groups during 2013 are difficult to discern because of the few cases (see figures 7 and 8).

Figure 7: Count of influenza laboratory diagnoses by 5-year age group, 1 December 2013

| Age (years) | 0 to 4 | 5 to 9 | 10 to 14 | 15 to 19 | 20 to 24 | 25 to 29 | 30 to 34 | 35 to 39 | 40 to 44 | 45 to 49 | 50 to 54 | 55 to 59 | 60 to 64 | 65 to 69 | 70 to 74 | 75 to 79 | 80 to 84 | 85+ |
|-------------|--------|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----|
| Influenza A | 14 | 7 | 10 | 12 | 9 | 14 | 11 | 12 | 14 | 20 | 17 | 17 | 13 | 12 | 2 | 8 | 2 | 2 |
| Influenza B | 6 | 9 | 8 | 5 | 1 | 1 | 3 | 4 | 6 | 8 | 9 | 5 | 7 | 2 | 2 | 2 | 2 | 1 |

Figure 8: 5-year age group influenza diagnosis rates, 1 December 2013 (diagnoses per 100,000 persons)



Comparison with Interstate Activity

The 2013 Australian Influenza Report was produced by the Australian Government Department of Health from a number of data sources, including laboratory-confirmed notifications to NNDSS, sentinel influenza-like illness reporting from general practitioners and emergency departments, workplace absenteeism, and laboratory testing. Reports are available at <http://www.health.gov.au/internet/main/publishing.nsf/content/cda-surveil-ozflu-flucurr.htm>.

The final report (No. 9) for the reporting period 28 September to 11 October 2013 indicated that nationally Influenza A and Influenza B notifications peaked during the period 24 to 30 August; equivalent to week 35 as defined in this report. Influenza A subtype A(H1N1)pdm09 was the most common virus in circulation nationally during 2013. Some jurisdictions reported H1N1 as the more common Influenza A subtype in circulation while others reported H3N2 as being most common.

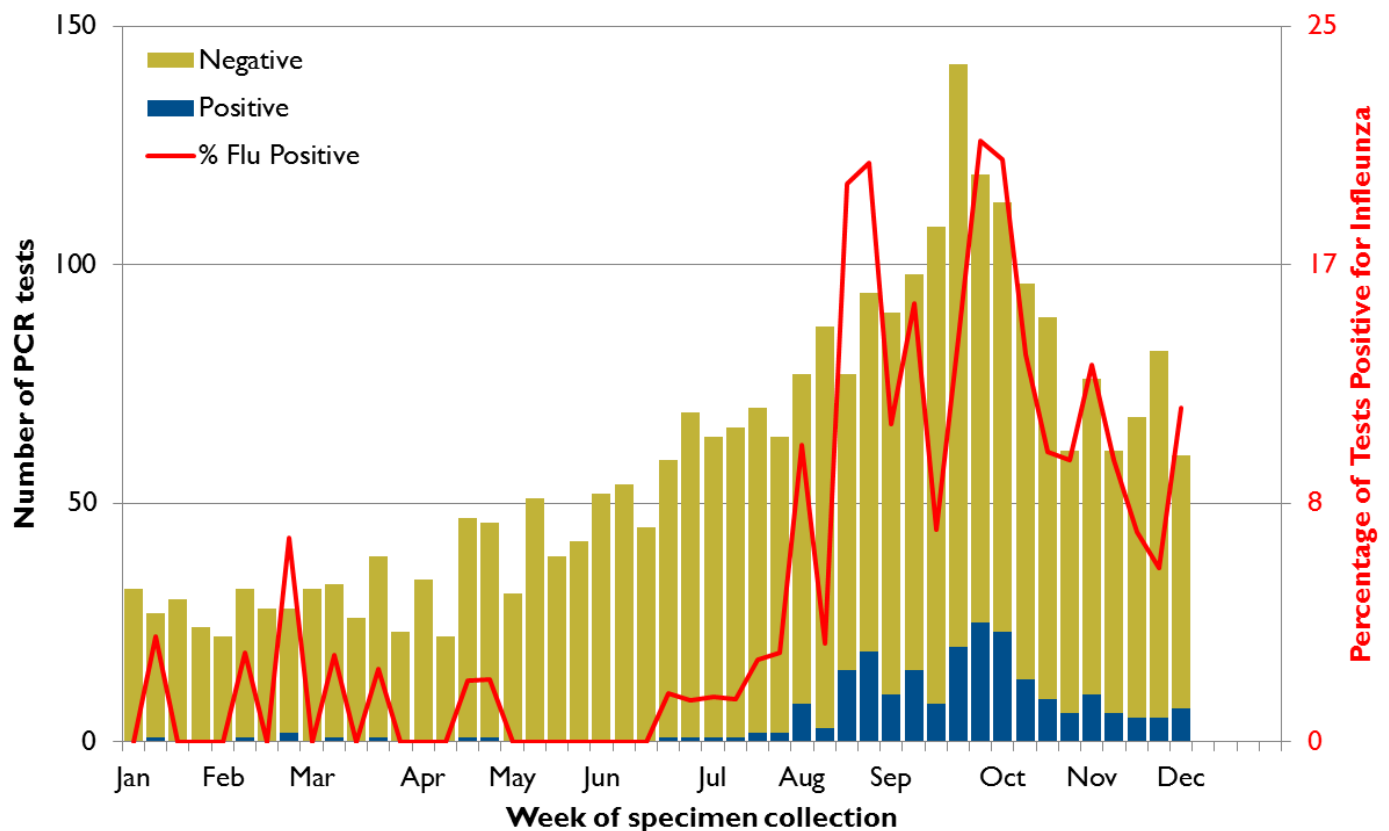
Laboratory Testing

Laboratory Testing Effort

A wide range of pathogens (mostly viruses) commonly cause winter coughs, colds and influenza-like illnesses. Some people with these symptoms will visit their doctor. The decision whether to test someone for influenza rests with their treating doctor, and depends on their symptoms. The best test for influenza is a PCR test, which detects influenza virus RNA in a nose or throat swab. The number of these tests being performed in public and private Tasmanian laboratories is a useful indicator of the level of respiratory illness in the community.

The total number of influenza tests performed by Tasmanian laboratories during 48-week surveillance period 1 January to 1 December 2013 was 29% lower than the number conducted during the same period in 2012. The 2013 peak in the number of weekly tests conducted occurred during September (week 38). The 2012 peak in weekly testing occurred during early July. The proportions of weekly tests positive for influenza peaked during late August and again in late September (see Figure 9).

Figure 9: 2013 Influenza Tests via PCR by week of specimen collection, 1 December



Of all laboratory influenza diagnoses notified up to and including 1 December 2013, 86% were conducted via the PCR method at Tasmanian laboratories (see Figure 10).

Figure 10: Influenza laboratory diagnosis method employed for positive influenza tests

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 ⁷ |
|------------------------------|------------|------------|--------------|------------|------------|--------------|-------------------|
| ALL INFLUENZA | | | | | | | |
| Laboratory Diagnosis Method: | | | | | | | |
| Serology | 73 | 51 | 40 | 31 | 71 | 58 | 38 |
| PCR | 340 | 308 | 1,255 | 75 | 292 | 1,034 | 239 |
| Both | 2 | 3 | 0 | 0 | 0 | 1 | 0 |
| Other | 0 | 22 | 0 | 1 | 0 | 0 | 0 |
| Total Influenza | 415 | 384 | 1,295 | 107 | 363 | 1,093 | 277 |

Other Respiratory Pathogens

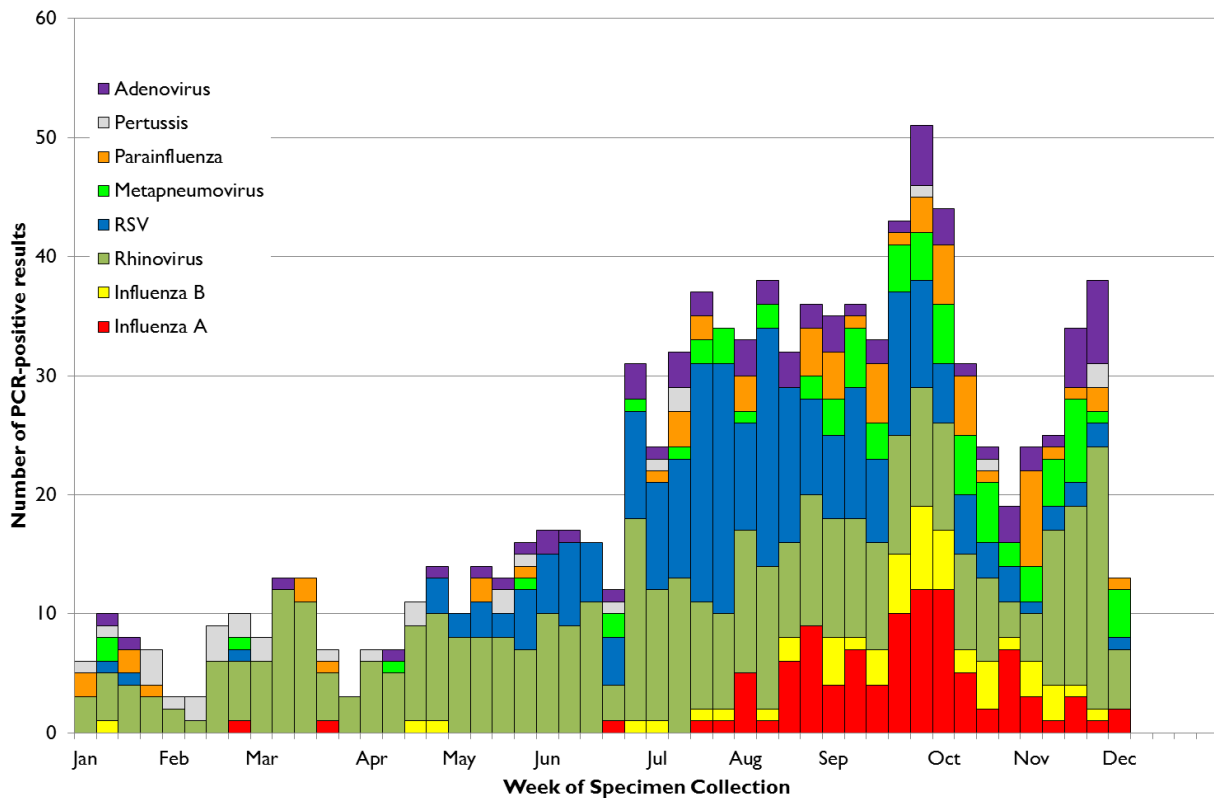
The Royal Hobart Hospital (RHH) performs PCR tests on nose and throat swabs that detect influenza and multiple non-influenza respiratory pathogens which cause illness. These specimens have mostly been collected from state-wide Emergency Departments or hospitalised patients across the Tasmania. The monitoring of non-influenza respiratory pathogen activity can assist the interpretation of Testing Effort and Syndromic Surveillance trends.

The total number of tests positive for any pathogen peaked during late September 2013 (see Figure 11). This peak corresponded with the peak number of Influenza A and Influenza B positive tests from all Tasmanian Laboratories.

Similar to previous years Rhinovirus and Respiratory Syncytial Virus (RSV) were the two most commonly detected respiratory pathogens in 2013. The numbers of positive tests for Rhinovirus and RSV as well as pathogens Human Parainfluenza virus and Metapneumovirus increased during Tasmanian winter and spring months. One outbreak of Parainfluenza occurred in an aged care facility during early November.

⁷ 2013 counts are for the 48-week period 1 January to 1 December 2013.

Figure 11: Various Respiratory Pathogen detections by week of specimen collection, 1 January to 1 December 2013



Influenza-like illnesses (Syndromic Surveillance)

Influenza-like illness (ILI) is much more common than microbiologically confirmed influenza (see Figure 10). For much of the year, common colds and other respiratory illnesses make up most of the ILI occurring in the community. However, during the annual influenza season, the proportion of the population experiencing symptoms of ILI who have influenza usually increases. It is therefore useful to monitor the proportion of people reporting ILI, regardless of the cause.

FluTracking

FluTracking is a weekly online survey that asks participants to report whether they have had fever and cough in the preceding week. It is a joint initiative of Newcastle University, Hunter New England Population Health and the Hunter Medical Research Institute. For more information, go to www.flutracking.net.

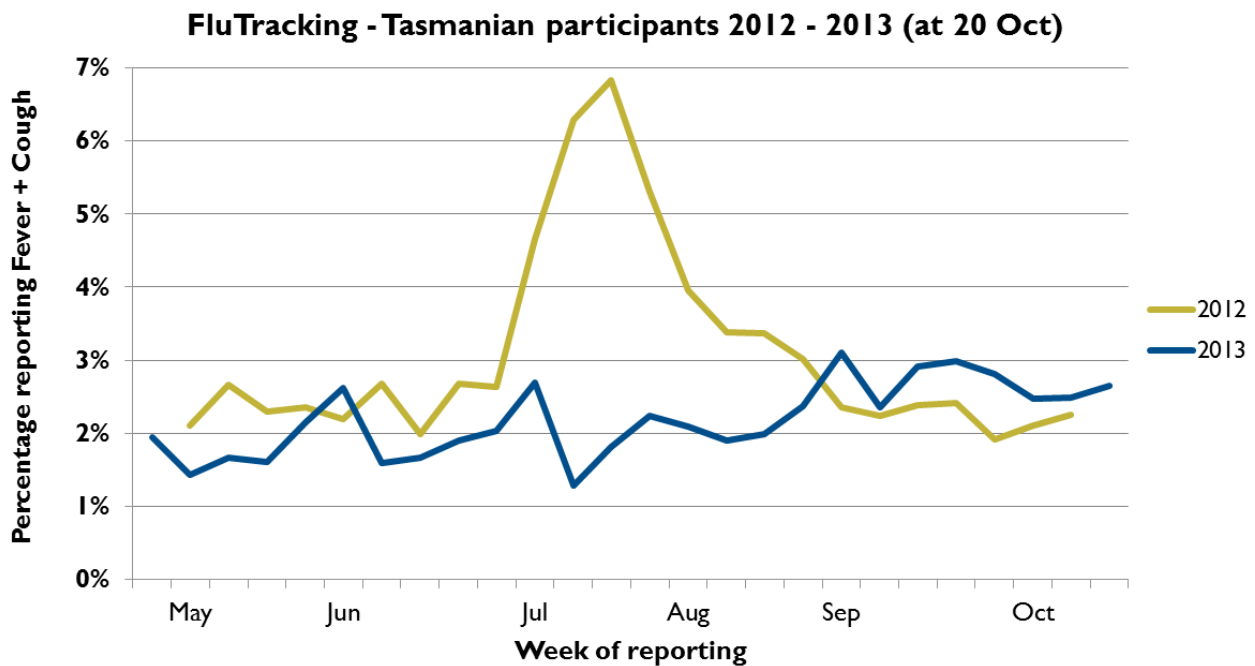
The 2013 *FluTracking* survey was conducted for the period 22 April to 20 October. An average of 1,800 Tasmanians participated weekly and 2,059 completed at least one survey during 2013. Two-thirds of participants lived in the south of the State.

Variation in the reported levels of illness throughout the year was low in 2013 when compared to past years and illness rates were mostly close to baseline levels. The mean weekly proportion of participants reporting *fever plus cough* with or without absenteeism was 30% lower in comparison with 2012. There was a modest increase in 2013 *FluTracking* activity commencing in early September which remained slightly elevated until the end of the survey period in October (see Figure 12). This time period is comparable with the observed increase in 2013 laboratory influenza diagnoses.

The variation in illness levels between participants of the different Tasmanian regions was unremarkable. Similar to 2012, reported levels of illness during 2013 were higher in those participants who did not receive the annual seasonal influenza vaccine. This was particularly apparent from mid-August until the end of the survey period.

During that period mean and peak levels of fever plus cough in unvaccinated participants were 50% higher than those reported by vaccinated participants.

Figure 12: FluTracking activity 2012 and 2013, Tasmanian Participants



General Practice surveillance

ASPREN is a network of registered sentinel GPs throughout the state who report fortnightly on the number and proportion of presentations of patients with fever, cough and fatigue. ASPREN is a joint initiative of the Royal Australian College of General Practitioners and University of Adelaide: www.dmac.adelaide.edu.au/aspren.

Tasmanian data from participating General Practices up to fortnight ending 6 October 2013 indicated lower levels of influenza-like illness (ILI) presentations during 2013 in comparison to 2012. Two peaks in ILI presentations were observed during 2013: one during late July of 40 per 1,000 presentations, and a second peak averaging 16 per 1,000 presentations during September. These are substantially lower than the main peak in ILI during 2012 which was 125 per 1,000 presentations.

Other measures of influenza activity

FluCAN

The Influenza Complications Alert Network (FluCAN) reports on influenza related hospitalisations and complications in sentinel hospitals in each state including Tasmania. The Royal Hobart Hospital participates in this network.

Despite the 2013 Influenza Season being of lower activity compared to past years admission of persons with severe influenza to Tasmanian Hospitals still occurred. National admission numbers up to 18 October 2013 peaked during the week commencing Saturday 24 August to Friday 30 August 2013.

Annual Influenza Vaccine

The contents of the annual influenza vaccine are reviewed late each year with the aim to produce vaccines for the following year that provide protection from influenza strains likely to be common during winter. The recommended formulation of the 2013 vaccine included two significant changes from the vaccines used in 2011 and 2012. These are described at <http://www.tga.gov.au/about/committees-aivc.htm> along with recommendations for the 2014 influenza vaccine.

Annual vaccination is recommended in the National Immunisation Program and is free* for Tasmanians at risk of severe influenza, including:

- anyone aged 65 and over
- Indigenous people who are aged 15 years or over
- pregnant women
- any person six months of age and over with a chronic condition predisposing to severe influenza illness that requires regular medical follow-up or hospitalisation such as: cardiac disease, respiratory disease including severe asthmatics, kidney disease, diabetes, impaired immunity, neuromuscular disease.

* The cost of the vaccine is covered for these groups; there may be a consultation fee for the medical provider to administer the vaccine.

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- FluTracking (Newcastle University, Hunter-New England Population Health and the Hunter Medical Research Institute)
- Australian Sentinel Practices Research Network (ASPREN)
- World Health Organisation (WHO)
- Australian Government Department of Health
- Australian Bureau of Statistics (ABS)



The **fluTAS Report** is a fortnightly flu season update produced by the DHHS Public and Environmental Health Service to inform healthcare organisations and the public about the current level of flu activity in Tasmania.

Alongside routine surveillance of diseases in Tasmania, the report combines multiple data sources to obtain a measure of flu activity in the community, which can be used by our health system to prepare and respond.

To provide feedback on the fluTAS Report, email the [Communicable Disease Prevention Unit](#) or call the Public Health Hotline on 1800 671 738.