

INFLUENZA WEEKLY UPDATE

2009/37:7-13 September 2009

The national influenza surveillance system in New Zealand is an essential public health component for assessing and implementing strategies to control influenza. This report summarises the data collected from sentinel general practice (GP) surveillance and non-sentinel surveillance for week 37 (7-13 September 2009). While the primary purpose of the sentinel surveillance system has been to contribute to the deliberations on the composition of the following year's seasonal influenza vaccine, it has provided timely information on the progress of the current pandemic.

IN THIS REPORT:

- There has been a decrease in consultations for influenza-like illness through sentinel surveillance in week 37 (7-13 September 2009). However, the weekly ILI consultation rate is still higher than previous years for the same week. The highest weekly ILI rates were reported from South Auckland, West Coast and Gisborne health districts. So far, the highest ILI consultation rates have been reported among children and teenagers aged 0 to 19 years.
- Up to 13 September 2009, a total of 4851 influenza viruses have been reported through sentinel (619, 13%) and non-sentinel surveillance (4232, 87%). Two influenza viruses were reported from sentinel surveillance in week 37, one as pandemic H1N1 09 and one as A (not sub-typed). Among four influenza viruses reported from non-sentinel surveillance in week 37, 2 (50%) were Pandemic H1N1 09. Pandemic H1N1 09 has become the predominant strain among all influenza viruses. Seasonal A H1N1 strain has been the predominant strain among all seasonal influenza viruses.
- Since January 2008, a global emergence and rapid spread of oseltamivir-resistant seasonal influenza A H1N1 viruses has been observed. Since 2009 in New Zealand, a total of 53 seasonal A H1N1 viruses have been tested by either a phenotypic assay or a molecular assay and all 53 viruses have been resistant to oseltamivir.
- Most Pandemic influenza (H1N1) 09 viruses reported globally are sensitive to oseltamivir with only six isolated cases reported from Denmark, Japan, Canada and Hong Kong showing oseltamivir resistance. During this winter season in New Zealand, a total of 92 Pandemic influenza (H1N1) 09 viruses were tested by phenotypic assay. All 92 viruses were sensitive to oseltamivir.
- Pandemic influenza (H1N1) 09 is a notifiable disease in New Zealand. As of 13 September 2009, there have been 3222¹ confirmed and probable cases recorded in EpiSurv. Sixteen deaths have been reported and 991 cases have been hospitalised. Pneumonia was recorded for 301 cases and acute respiratory distress syndrome (ARDS) for 46 cases. The age standardised rate for cases is 75.5 per 100,000 total population.

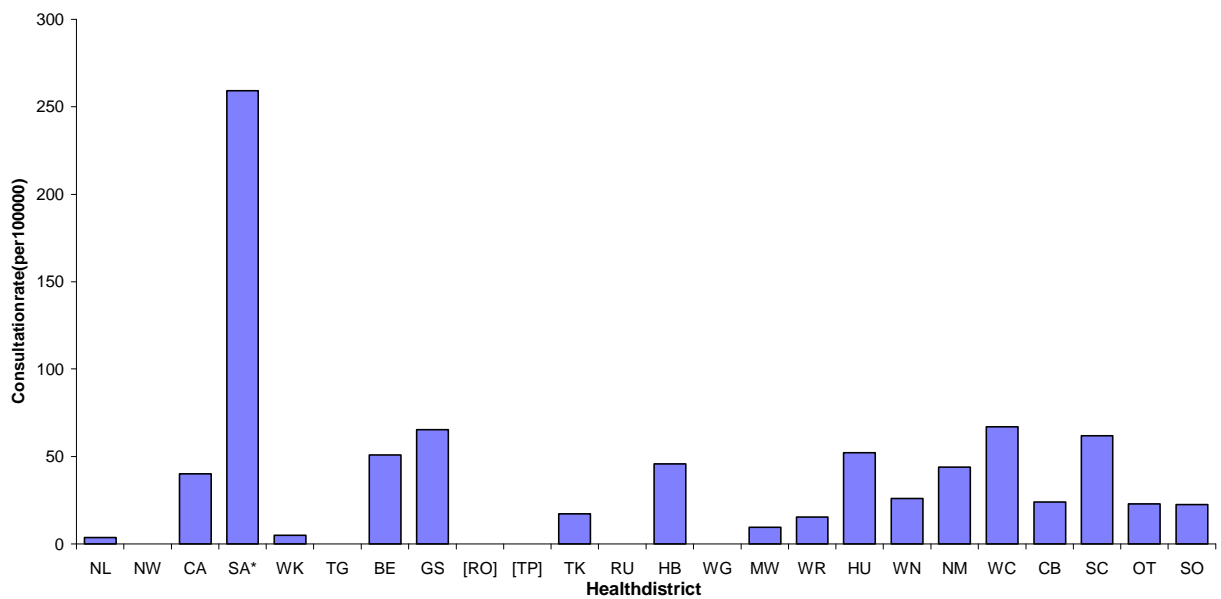
¹This is a gross under-estimate as lab testing was discouraged on declaration of the "manage it" phase.

SENTINEL GENERAL PRACTICES SURVEILLANCE

In the past week, a total of 294² consultations for influenza-like illness were reported from 87 general practices in 22 of the 24 health districts. This gives a weekly consultation rate of 65.4 per 100 000 patient population.

The graph below compares the consultation rates for influenza-like illness for each health district over the past week. South Auckland had the highest consultation rate (259.1 per 100 000, 194 cases) followed by West Coast (67.0 per 100 000, 11 cases), and Gisborne (65.3 per 100 000, 2 cases).

Figure 1: Weekly consultation rates for influenza-like illness by health district week ending 13 September 2009



*Six additional South Auckland practices added in week 33 (10-16 August).
 [] Health districts did not participate for the week.

The weekly national consultation rates are shown in Figure 2 for 2007 and 2008 seasons, and 2009 so far. While the current ILI consultation rate is declining it is still higher than at the same time last year.

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²Includes ILI consultations through telephone assessment by sentinel GPs starting from week 29 (13-19 July).

Figure 2: Weekly consultation rates for influenza-like illness in New Zealand, 2007, 2008 and 2009

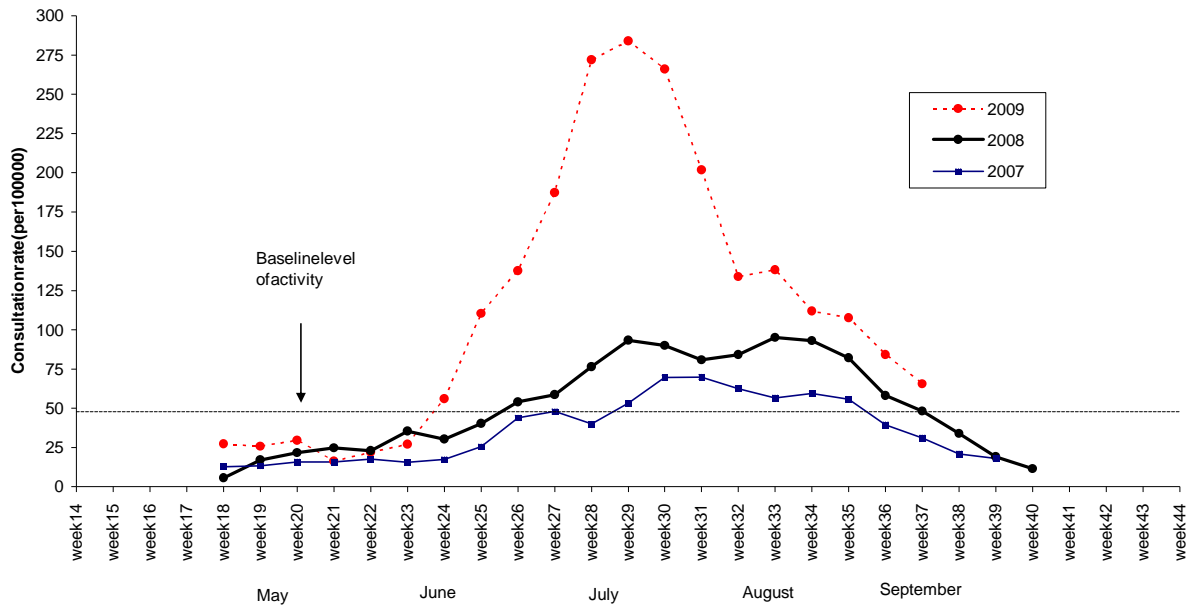
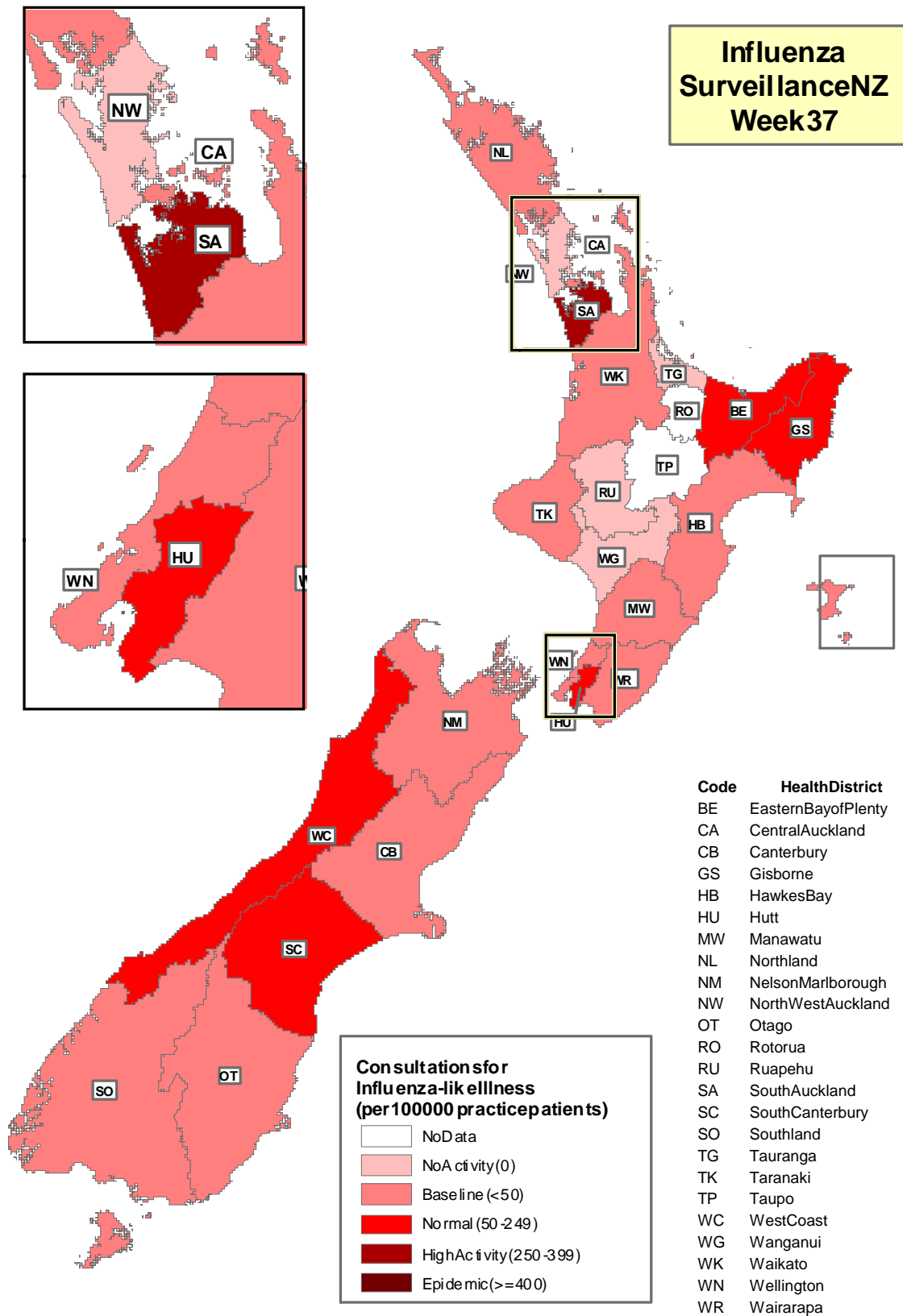


Figure 3 illustrates consultation rates for influenza-like illness mapped by health district for week 37, 2009.

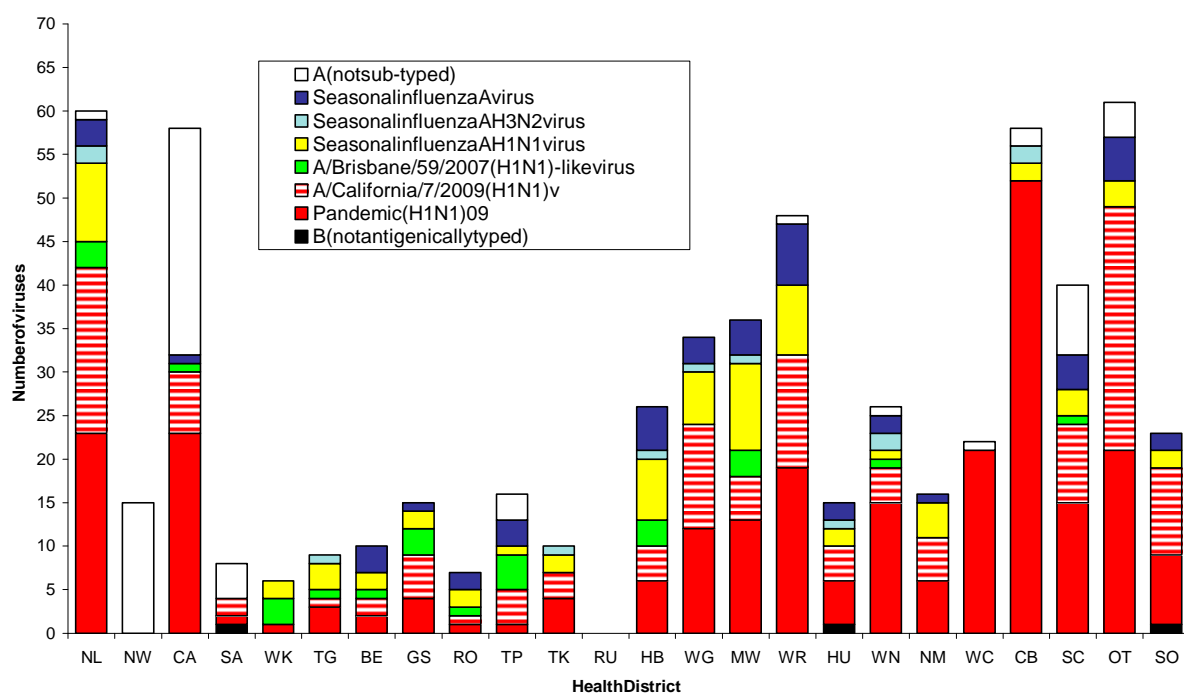


A total of 35 swabs were received by the virology laboratories from which two influenza viruses were identified: one as Pandemic influenza (not sub-typed) from South Canterbury.

aboratories from which two influenza (H1N1)09 from Taranaki and one as A

The cumulative figures are shown in Figure 4 for sentinel surveillance by health district from week 18 (27 April-3 May) to week 37 (7-13 September 2009). A total of 619 influenza viruses were identified: Pandemic influenza (H1N1) 09 (256), A/California/7/2009 (H1N1)v³ (138), seasonal influenza A H1N1 virus (71), influenza A virus (48), A/Brisbane/59/2007 (H1N1)-virus (12), and B (not typed) (3). Pandemic influenza (H1N1) 09 has become the predominant strain among all influenza viruses from sentinel surveillance.

Figure 4: Cumulative influenza viruses from sentinel surveillance by health district to 13 September 2009

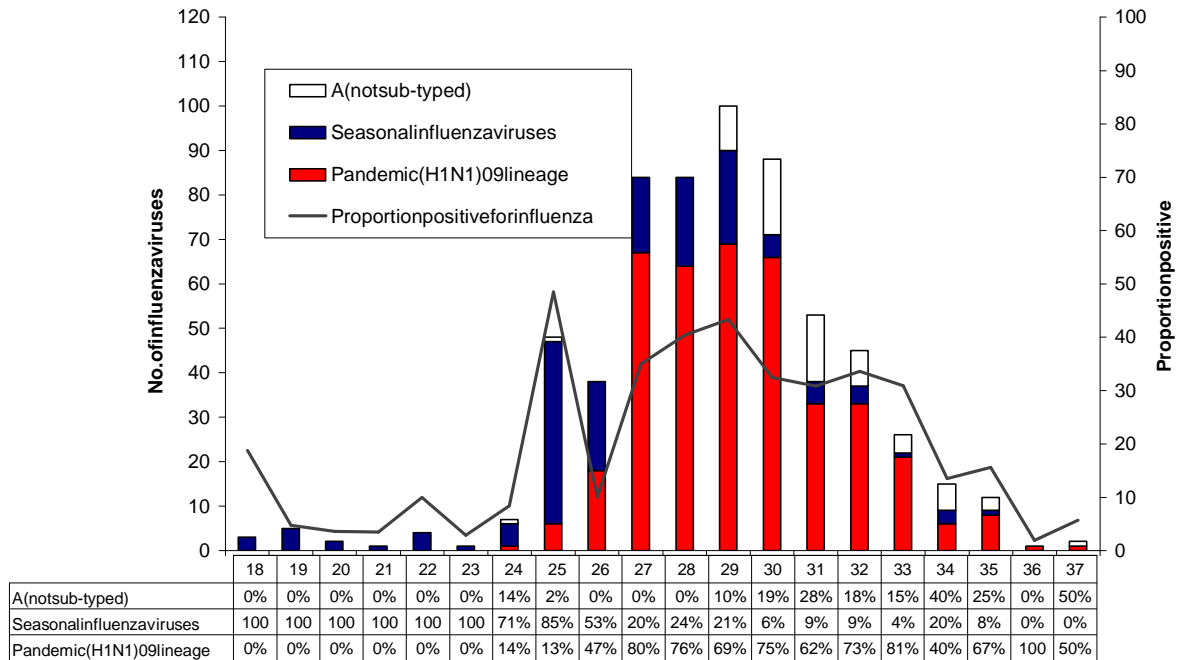


³A/California/7/2009 (H1N1)v-like strain is a pandemic (H1N1) 2009 virus. Representative pandemic influenza (H1N1) 09 PCR positive samples were further antigenically typed by hemagglutination inhibition assay using ferret antisera against A/California/7/2009 (H1N1)v.

The temporal distribution of influenza viruses is shown in the graph below for sentinel surveillance from week 18 (27 April-3 May) to week 37 (7-13 September 2009). Pandemic influenza (H1N1)09 is greater than the number of

seasonal influenza viruses.

Figure 5: Total influenza viruses from sentinel surveillance by type and week reported to 13 September 2009 and the total percentage positive from the swabs received



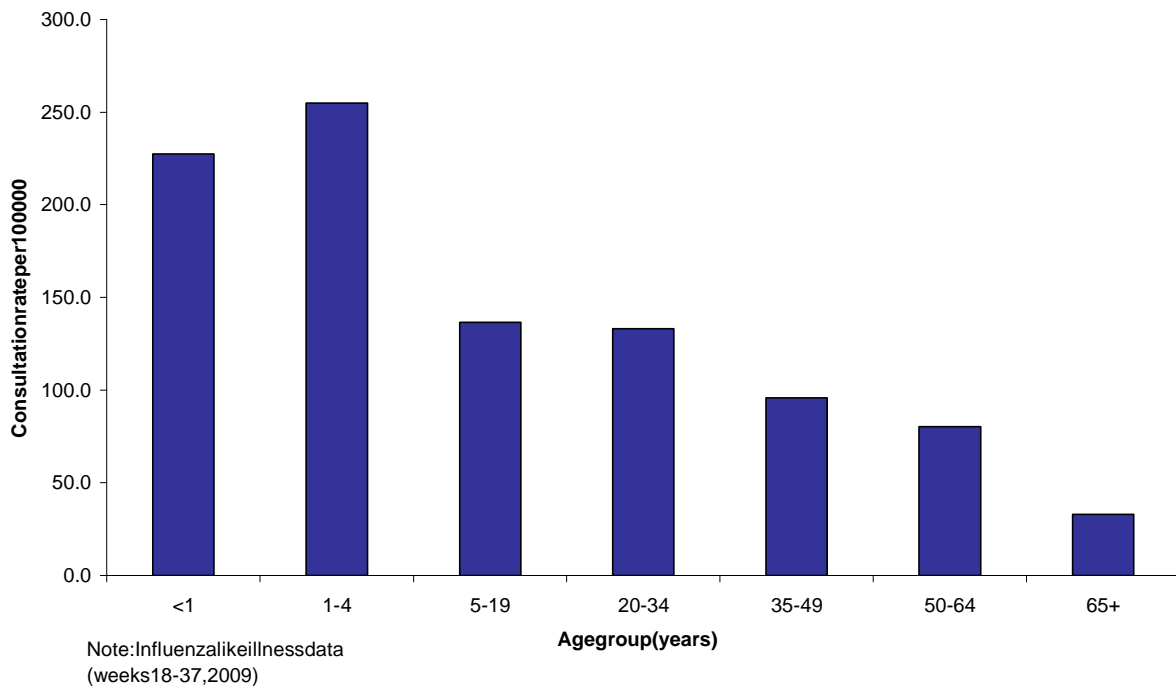
Note: All results of sentinel swabs are received by those swabs that test positive for any type of influenza virus. A low proportion may be due to the swabs not successfully retrieving the virus, or the influenza virus is not present in the swab.

ESR. The line shows the proportion of influenza. A low proportion may be due to the influenza virus is not present in the swab.

The age distribution for influenza-like illness (ILI) is shown in Figure 6. The highest ILI consultation rate was in 1-4 years (254.9 per 100 000) followed by those < 1 year (227.6 per 100 000) and 5

-19 years (136.6 per 100 000).

Figure 6: Sentinel consultation rate for influenza-like illness by age group for weeks 18-37, 2009



NON-SENTINEL SURVEILLANCE

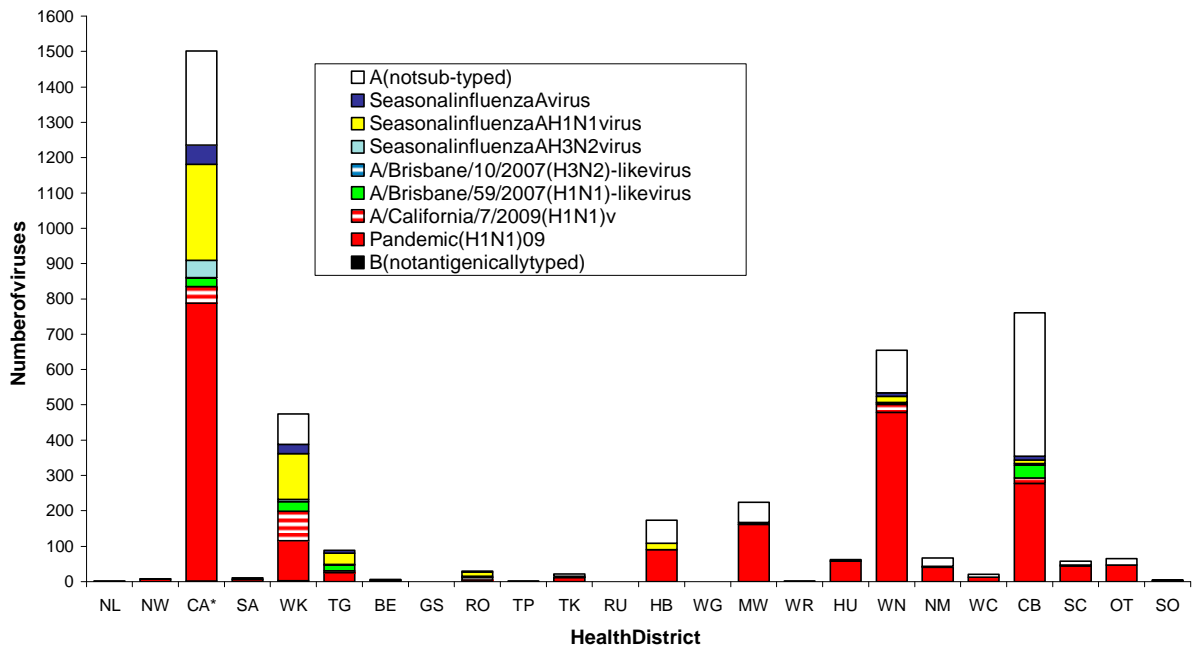
In addition, four influenza viruses were reported this week from the laboratory-based (non-sentinel) surveillance: Pandemic influenza (H1N1) 09 (2) and influenza A (not sub-typed) (2). The distribution by health district is shown in Table 1.

Table 1: Influenza viruses from non-sentinel surveillance for week 37 by Health District

Antigenic Strain	CA	MW	Total
A (not sub-typed)	2	0	2
Pandemic A (H1N1)	1	1	2
Total	3	1	4

The cumulative influenza viruses are shown in Figure 7 for non-sentinel surveillance by health district from week 1 (1-4 Jan) to week 37 (7-13 September 2009). A total of 4232 influenza viruses were identified: Pandemic influenza (H1N1) 09 (2171), influenza A (not sub-typed) (1084), seasonal influenza A H1N1 virus (502), A/California/7/2009 (H1N1) virus (182), seasonal influenza A H1N1 virus (111), A/Brisbane/59/2007 (H1N1)-like (112), seasonal influenza A H3N2 virus (65), B (not typed) (3), and A/Brisbane/10/2007 (H3N2)-like (2). Pandemic influenza (H1N1) 09 has become the predominant strain among all influenza viruses from non-sentinel surveillance.

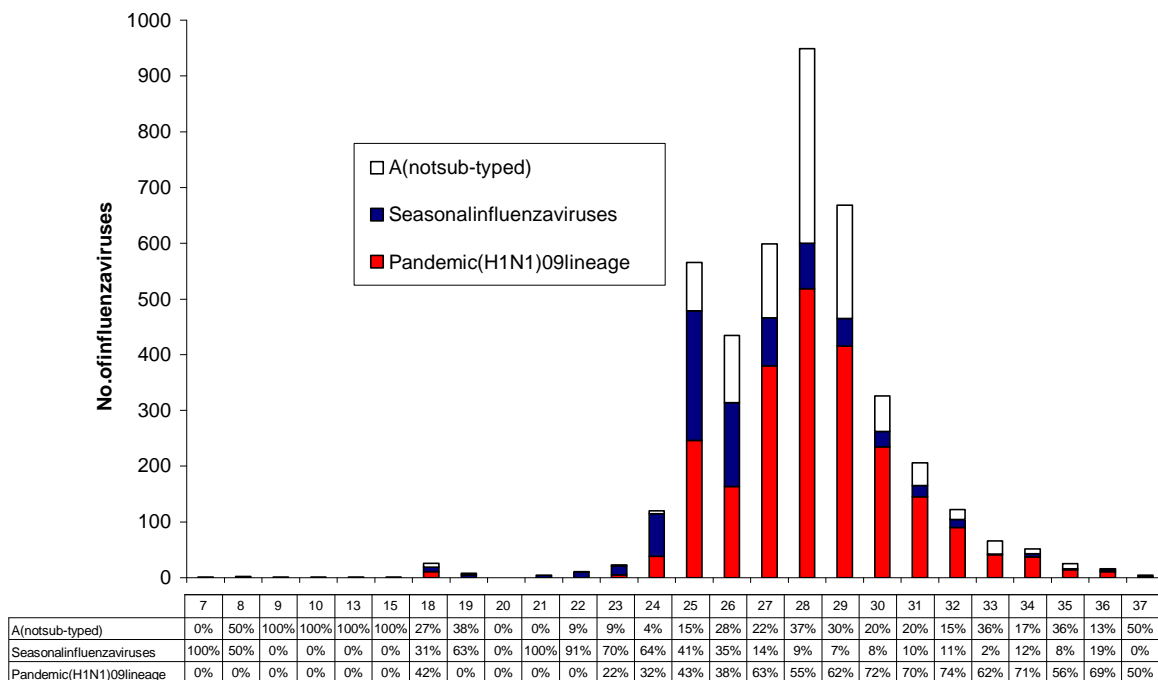
Figure7: Cumulativeinfluenzavirusesfromnon-sentinel surveillancebyhealthdistrict to13September2009



Note: Viruses from Auckland without health district codes have been temporarily assigned to Central Auckland(CA).

The temporal distribution is shown in Figure 8 for influenza viruses reported by type and subtype for each week from non-sentinel surveillance from week 7 (9-15 February) to week 37 (7-13 September 2009). The number of Pandemic influenza (H1N1)09 is greater than the number of seasonal influenza viruses.

Figure8: Totalinfluenzavirusesfromnon-sentinel surveillancebytypeandweekreported to13September2009



ANTIVIRAL SUSCEPTIBILITY MONITORING

Since January 2008, a global emergence and rapid spread of influenza A(H1N1) viruses has been observed. During this winter season in New Zealand, a total of 28 seasonal A(H1N1) viruses have been tested for the H275Y mutation (histidine-to-tyrosine) which is known to confer resistance to oseltamivir. All 28 viruses had the H275Y mutation. In addition, a total of 25 seasonal A(H1N1) viruses were tested using a phenotypic assay called fluorometric neuraminidase inhibition assay. The results of the fluorometric neuraminidase inhibition assay indicated that these viruses had highly reduced sensitivity to oseltamivir with IC50 values in the range of 305-7912 nM, typical of the recently global emergence of oseltamivir-resistant A(H1N1) viruses. (Table 3).

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Twelve Pandemic influenza (H1N1)09 viruses were sequenced to see whether they possess the H275Y mutation. All 12 viruses, including one from a 21 year-old male fatality, did not possess the H275Y mutation. This indicates that these Pandemic influenza A(H1N1) viruses are sensitive to oseltamivir. In addition, a total of 92 Pandemic influenza (H1N1)09 viruses were tested using the phenotypic assay and all 92 viruses were sensitive to oseltamivir with IC50 values in the range of 0.2 to 0.9 nM (Table 3).

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Influenza type/subtype	Seasonal A(H1N1)				Pandemic influenza (H1N1)09
	2006	2007	2008	2009	2009
Year	2006	2007	2008	2009	2009
Number of viruses	17	138	4	25	92
Mean IC50 *	1.84	0.83	728	1399	0.372
Std. dev.	0.71	0.63	136	2690	0.163
Min IC50	0.25	0.01	547	305	0.113
Max IC50	3.099	4.226	870	7912	0.918

*IC50: Concentration of oseltamivir (nM) at which there is 50% inhibition of neuraminidase activity.

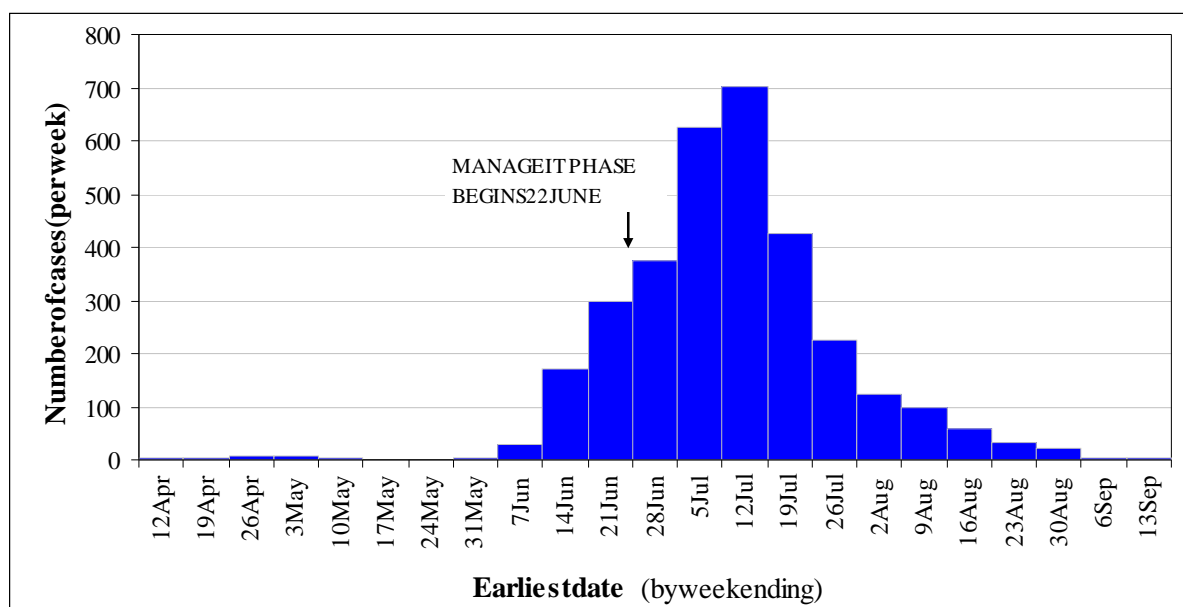
PANDEMIC INFLUENZA (H1N1) 09 VIRUS UPDATE IN NEW ZEALAND

Pandemic influenza (H1N1) 09 is a notifiable disease in New Zealand.

- A total of 3222 confirmed and probable cases of pandemic influenza (H1N1) 09 were reported.
- The total number of notifications and hospitalisations reported each week has decreased since the weekend ending 12 July 2009.
- Only three cases and two hospitalisations were reported the week 7-13 September 2009.
- There have been a total of 991 hospitalised cases reported. Pneumonia was recorded for 301 cases and acute respiratory distress syndrome (ARDS) for 46 cases.
- Highest overall rates were seen in West Coast (194.6 per 100,000 population) up to the 13 September 2009. The highest cumulative rates of hospitalisations were reported from the Hutt Valley (52.9 per 100,000) and the Capital and Coast DHB (39.4 per 100,000).
- Pandemic influenza (H1N1) 09 was recorded in EpiSurv as being the primary cause of death in 16 cases. For current information on deaths visit the Ministry of Health website <http://www.moh.govt.nz/moh.nsf/indexmh/influenza-a-h1n1-news-media>

Figure 9: Pandemic influenza (H1N1) 09 epidemic curve using earliest date entered in EpiSurv up to 13 September 2009

The epidemic curve for pandemic influenza (H1N1) 09 is shown in Figure 9. This epidemic curve was constructed using the earliest date recorded in EpiSurv (onset, hospitalised or report date) and is displayed as cases per week since 6 April 2009. For the purposes of this epidemic curve confirmed and probable cases were combined.



Confirmed cases n=3153, probable cases n=69

Data was extracted from EpiSurv at midnight 15 September 2009

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