

INFLUENZA WEEKLY UPDATE

2009/38: 14-20 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 38 (14-20 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 38 (14-20 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, Eastern Bay of Plenty and Hawke's Bay health districts. So far, the highest ILI consultation rates have been reported among children and teenagers aged 0 to 19 years.
- Up to 20 September 2009, a total of 4857 influenza viruses have been reported through sentinel (620, 13%) and non-sentinel surveillance (4237, 87%). All six influenza viruses reported in week 38 were pandemic (H1N1) 09, one from sentinel and five from non-sentinel surveillance. 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. Twenty six viruses have now been described from around the world which are resistant to oseltamivir, all carrying the same mutation (H275Y) that confers resistance to the antiviral oseltamivir but not to the antiviral zanamivir. During this winter season in New Zealand, a total of 145 Pandemic influenza (H1N1) 09 viruses were tested by phenotypic assay. All 145 viruses were sensitive to oseltamivir.
- Pandemic influenza (H1N1) 09 is a notifiable disease in New Zealand. As of 20 September 2009, there have been 3229¹ confirmed and probable cases recorded in EpiSurv. Seventeen deaths have been reported and 995 cases have been hospitalised. The age standardised rate for cases is 75.5 per 100 000 total population.

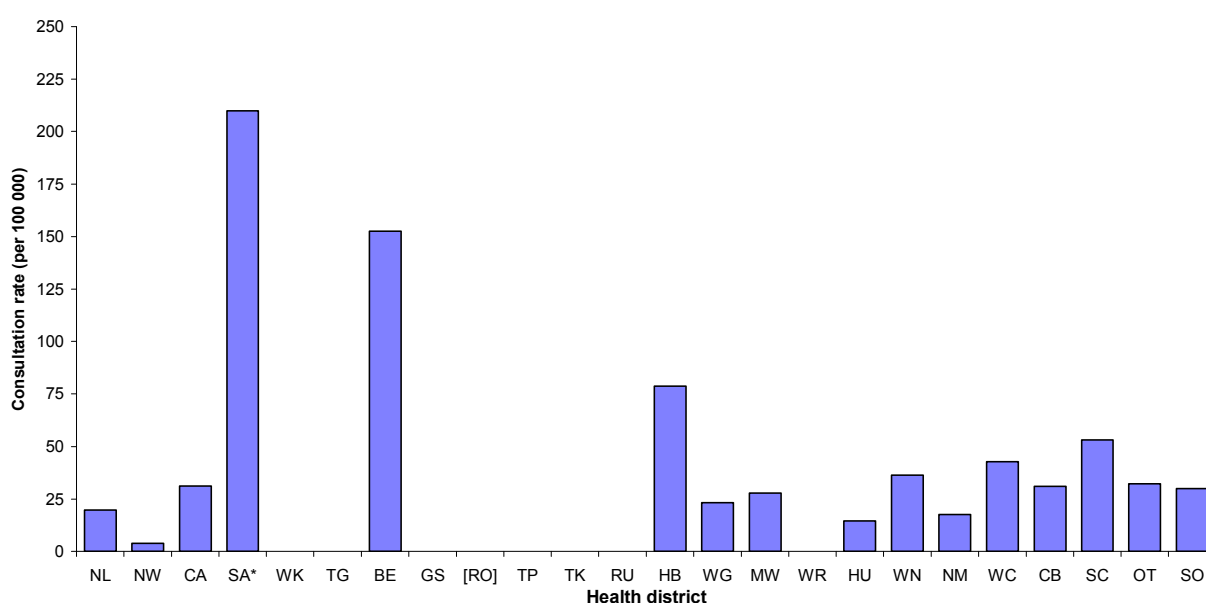
¹ This is a gross under-estimate as lab testing was discouraged on declaration of the "manage it" phase.

SENTINEL GENERAL PRACTICE SURVEILLANCE

In the past week, a total of 256² consultations for influenza-like illness were reported from 92 general practices in 23 of the 24 health districts. This gives a weekly consultation rate of 56.5 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 (210.0 per 100 000, 161 cases), followed by Eastern Bay of Plenty (152.6 per 100 000, 3 cases) and Hawke's Bay (78.6 per 100 000, 11 cases).

Figure 1: Weekly consultation rates for influenza-like illness by health district week ending 20 September 2009



* Six additional South Auckland practices added in week 33 (10-16 August).
[] Health district 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.

² Includes 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

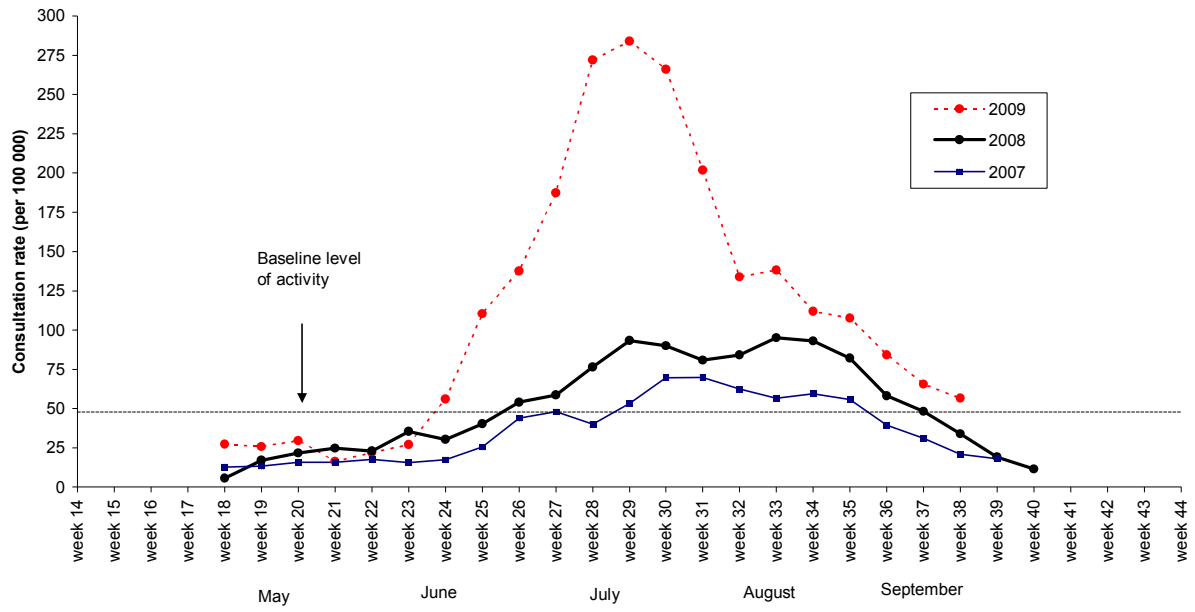
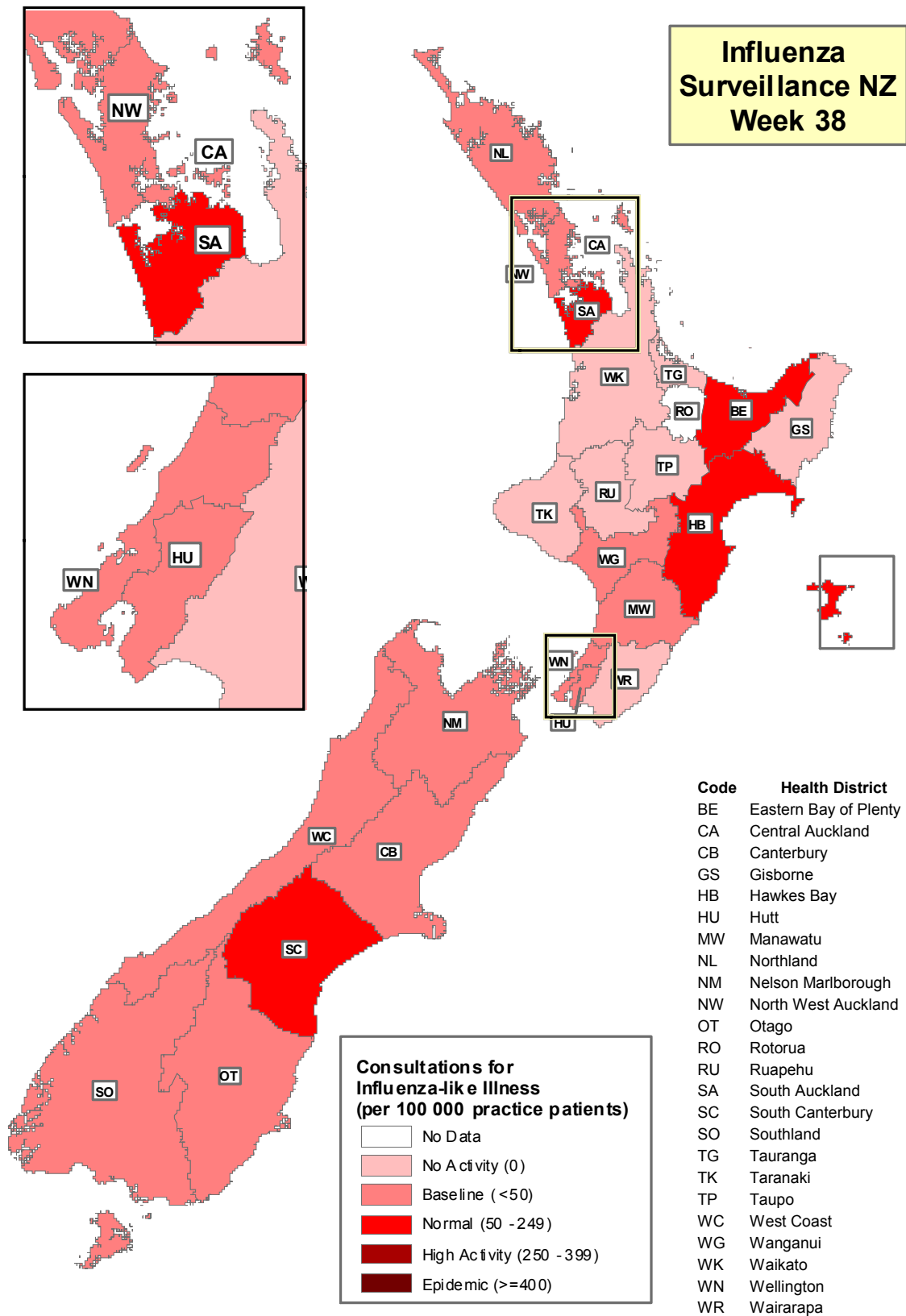


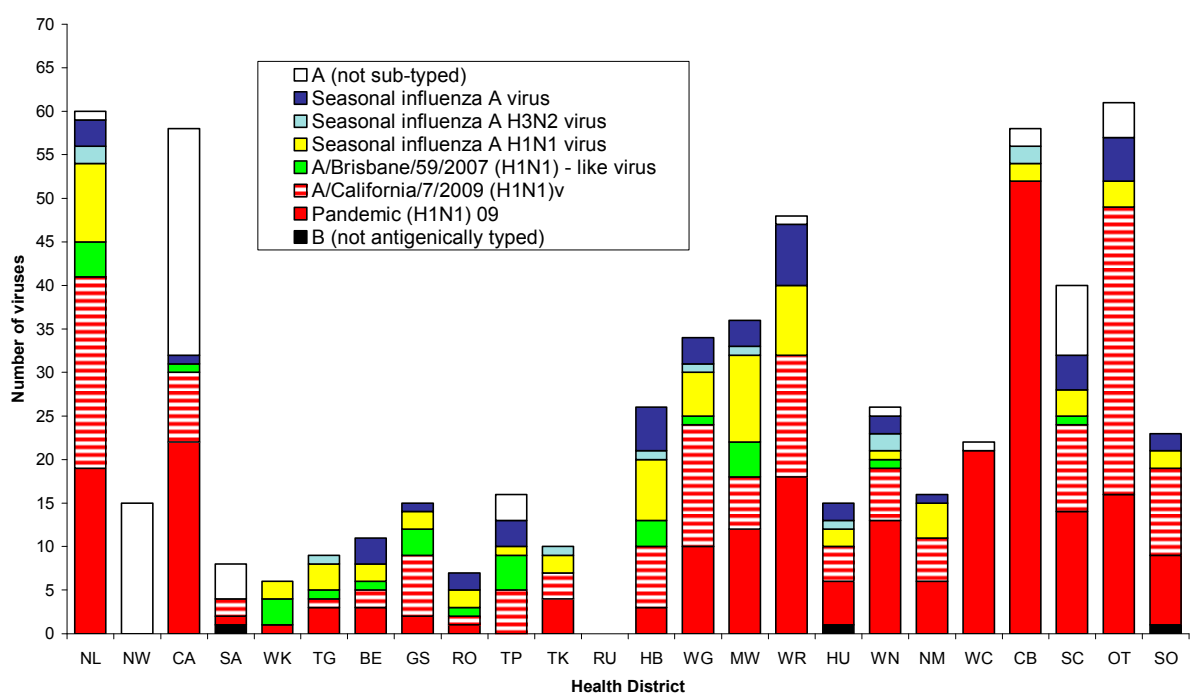
Figure 3 illustrates consultation rates for influenza-like illness mapped by health district for week 38, 2009.



A total of 29 swabs were received by the virology laboratories from which one influenza virus was identified as Pandemic influenza (H1N1) 09 from Eastern Bay of Plenty.

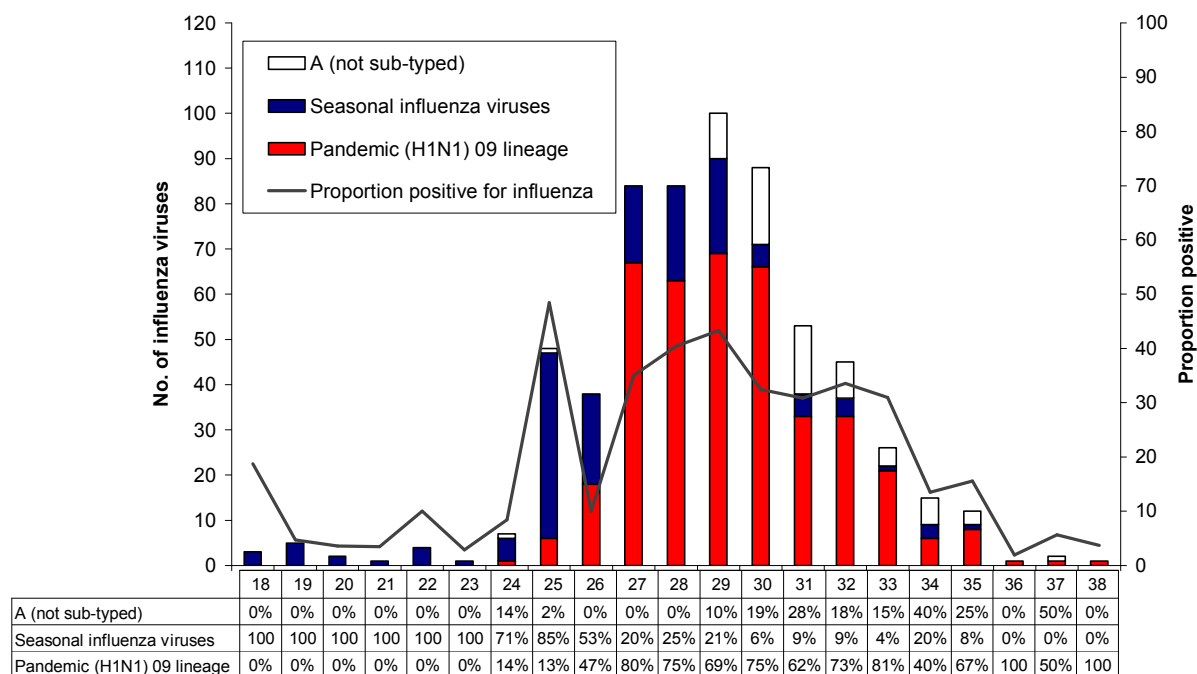
The cumulative figures are shown in Figure 4 for sentinel surveillance by health district from week 18 (27 April-3 May) to week 38 (14-20 September 2009). A total of 620 influenza viruses were identified. The predominant strain was pandemic (H1N1) 2009 (394) including 160 of pandemic influenza A/California/7/2009 (H1N1)v-like strains, followed by seasonal influenza A (H1N1) (98) including 28 of A/Brisbane/59/2007 (H1N1) – like strains, influenza A not subtyped (66), seasonal influenza A (47), seasonal influenza A (H3N2) (12), and influenza 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 20 September 2009



The temporal distribution of influenza viruses is shown in the graph below for sentinel surveillance from week 18 (27 April-3 May) to week 38 (14-20 September 2009). Pandemic influenza (H1N1) 09 is greater than the number of seasonal influenza viruses.

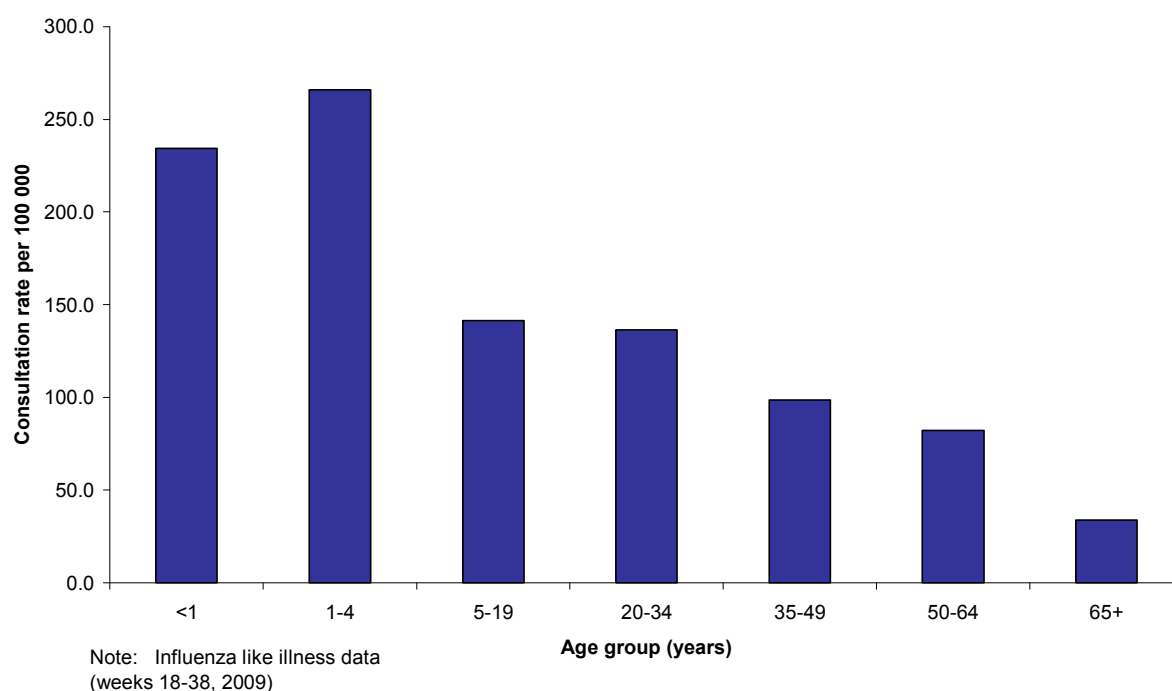
Figure 5: Total influenza viruses from sentinel surveillance by type and week reported to 20 September 2009 and the total percentage positive from the swabs received



Note: All results of sentinel swabs are received by ESR. The line shows the proportion of those swabs that test positive for any type of influenza. A low proportion may be due to the swabs not successfully retrieving the virus, or that ILI presentations to sentinel GPs are due to other viruses.

The age distribution for influenza-like illness (ILI) consultation rates for weeks 18-38 is shown in Figure 6. The highest ILI consultation rate was in 1-4 years (265.9 per 100 000) followed by those <1 year (234.3 per 100 000) and 5-19 years (141.4 per 100 000).

Figure 6: Sentinel consultation rate for influenza-like illness by age group for weeks 18-38, 2009

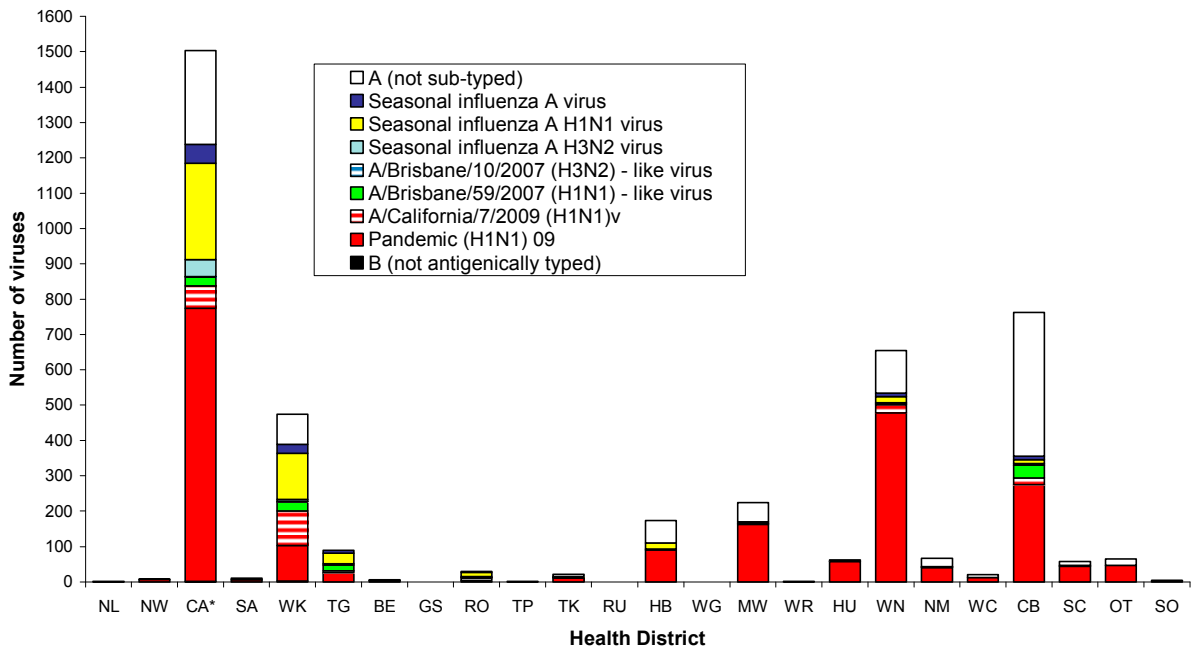


NON-SENTINEL SURVEILLANCE

In addition, five influenza viruses were reported this week from the laboratory-based (non-sentinel) surveillance as Pandemic influenza (H1N1) 09, from Central Auckland (2), Tauranga (1), Manawatu (1), and Canterbury (1) health districts.

The cumulative influenza viruses are shown in Figure 7 for non-sentinel surveillance by health district from week 1 (1-4 Jan) to week 38 (14-20 September 2009). A total of 4237 influenza viruses were identified. The predominant strain was pandemic (H1N1) 2009 (2360) including 217 of pandemic influenza A/California/7/2009 (H1N1)v-like strains, followed by seasonal influenza A (H1N1) (617) including 117 of A/Brisbane/59/2007 (H1N1) - like strains, influenza A not subtyped (1079), seasonal influenza A (111), seasonal influenza A (H3N2) (67) including two A/Brisbane/10/2007 (H3N2) - like, and influenza B not typed (3). Pandemic influenza (H1N1) 09 has become the predominant strain among all influenza viruses from non-sentinel surveillance.

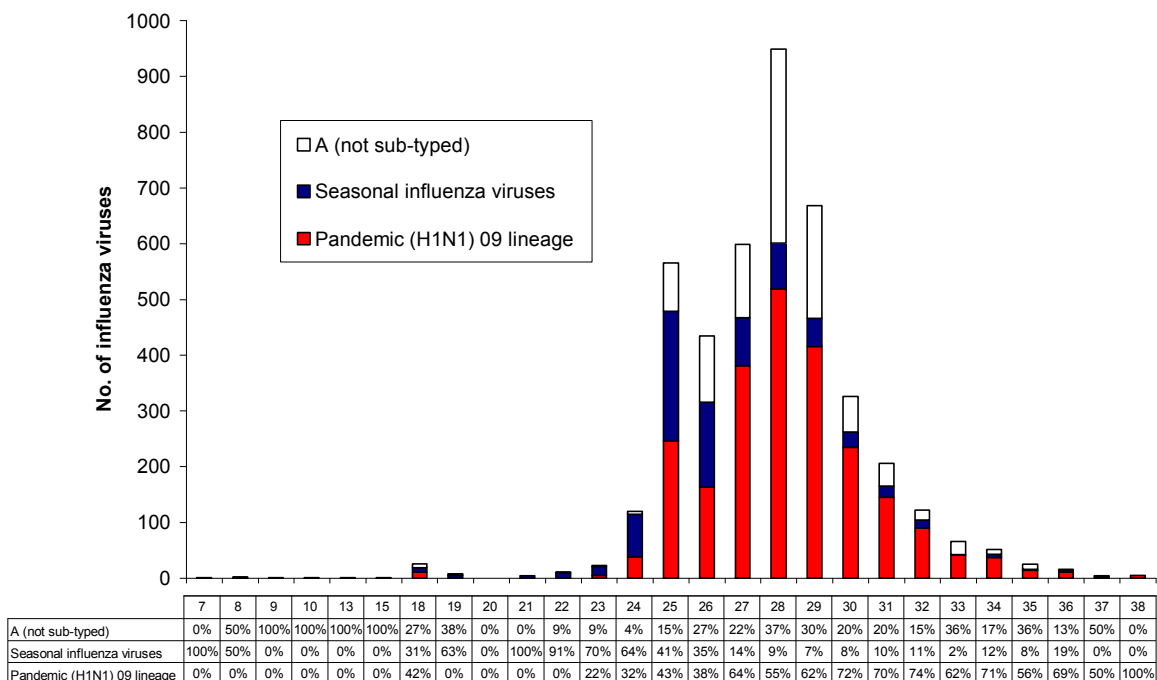
Figure 7: Cumulative influenza viruses from non-sentinel surveillance by health district to 20 September 2009



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 38 (14-20 September 2009). The number of Pandemic influenza (H1N1) 09 is greater than the number of seasonal influenza viruses.

Figure 8: Total influenza viruses from non-sentinel surveillance by type and week reported to 20 September 2009



ANTIVIRAL SUSCEPTIBILITY MONITORING

Since January 2008, a global emergence and rapid spread of oseltamivir-resistant seasonal 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 mutation at the codon of 275 in N1 numbering) 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 emerging oseltamivir-resistant A (H1N1) viruses. (Table 3).

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 145 Pandemic influenza (H1N1) 09 viruses were tested using the phenotypic assay and all 145 viruses were sensitive to oseltamivir with IC₅₀ values in the range of 0.2 to 0.9 nM (Table 3).

<i>Influenza type/subtype</i>	<i>Seasonal A (H1N1)</i>				<i>Pandemic influenza (H1N1) 09</i>
	2006	2007	2008	2009	2009
Year					
Number of viruses	17	138	4	25	145
Mean IC₅₀[*]	1.84	0.83	728	1399	0.397
Std. dev.	0.71	0.63	136	2690	0.201
Min IC₅₀	0.25	0.01	547	305	0.141
Max IC₅₀	3.099	4.226	870	7912	0.964

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

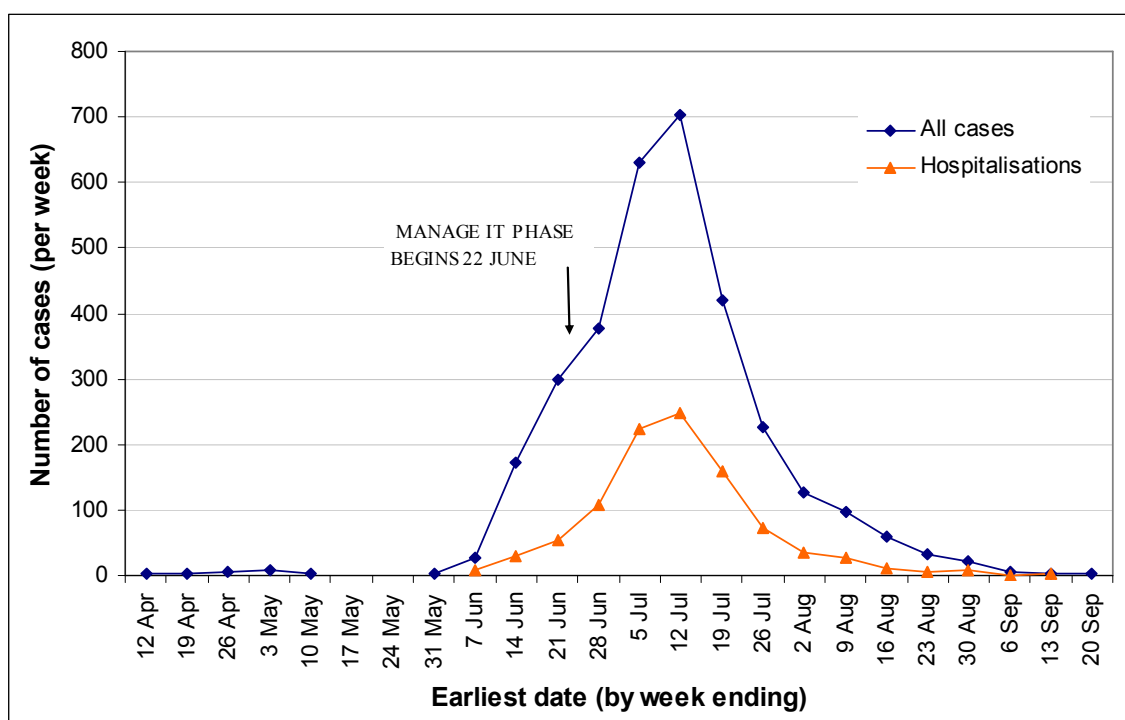
PANDEMIC INFLUENZA (H1N1) 09 VIRUS UPDATE IN NEW ZEALAND

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

- A total of 3229 cases of pandemic influenza (H1N1) 09, including 995 hospitalisations have been reported since 1 April 2009.
- However, the total number of notifications and hospitalisations reported each week has decreased since the week ending 12 July 2009.
- Six cases including two hospitalisations were reported in the past week, 14-20 September 2009.
- Highest overall rates were seen in West Coast (194.6 per 100 000 population) up to the 20 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 17 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 20 September 2009

The epidemic curve for pandemic influenza (H1N1) 09 is shown in Figure 9. Pandemic influenza (H1N1) 09 epidemic curve using earliest date entered in EpiSurv and hospitalised confirmed cases. Where hospitalisation date was not available, onset or report date has been used. Excludes n=4 cases where hospitalisation date was prior to 01 June 2009.



Confirmed cases n=3160, probable cases n=69

Data was extracted from EpiSurv at midnight 20 September 2009