

INFLUENZA WEEKLY UPDATE

2009/41:5-11 October 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 41 (5-11 October 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:

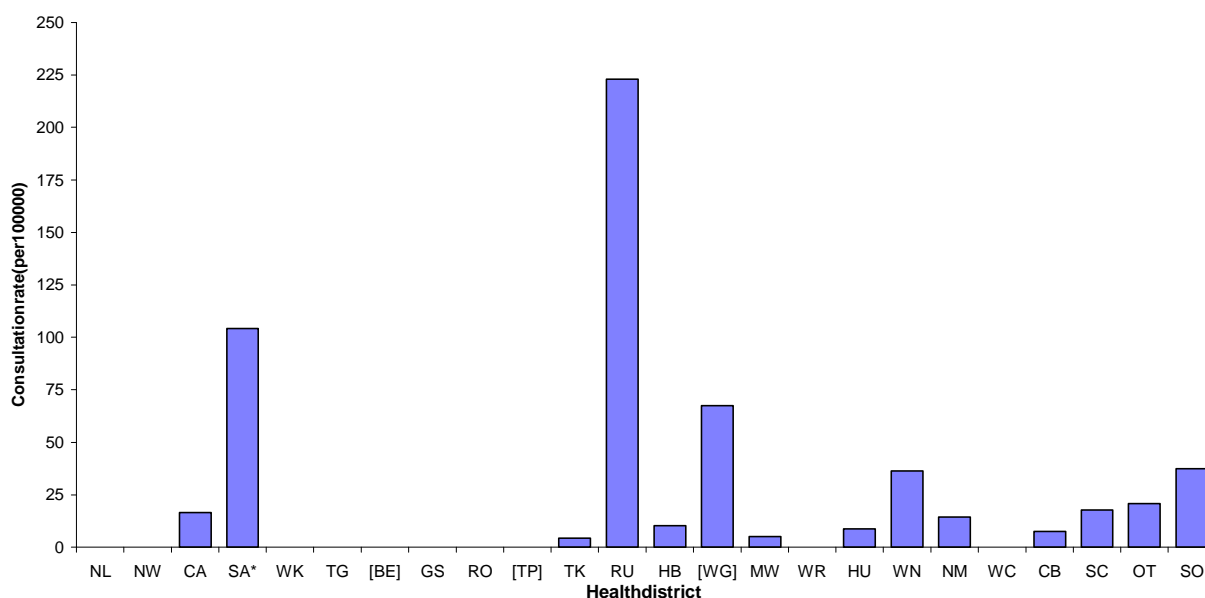
- There has been a decrease in consultations for influenza-like illness through sentinel surveillance in week 41 (5-11 October 2009). The highest weekly ILI rates were reported from Ruapehu, South Auckland, and Wanganui health districts. So far, the highest ILI consultation rates have been reported among children and teenagers aged 0 to 19 years.
- Up to 11 October 2009, a total of 4867 influenza viruses have been reported through sentinel (621, 13%) and non-sentinel surveillance (4246, 87%). No influenza viruses were reported in week 41. 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 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 325 Pandemic influenza (H1N1) 09 viruses were tested by phenotypic assay. All 325 viruses were sensitive to oseltamivir.

SENTINEL GENERAL PRACTICES SURVEILLANCE

In the past week, a total of 125¹ 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 29.7 per 100 000 patient population.

The graph below compares the consultation rates for influenza-like illness for each health district over the past week. Ruapehu had the highest consultation rate (222.9 per 100 000, 5 cases), followed by South Auckland (104.2 per 100 000, 78 cases) and Wanganui (67.4 per 100 000, 1 case).

Figure 1: Weekly consultation rates for influenza-like illness by health district week ending 11 October 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.

¹Includes 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

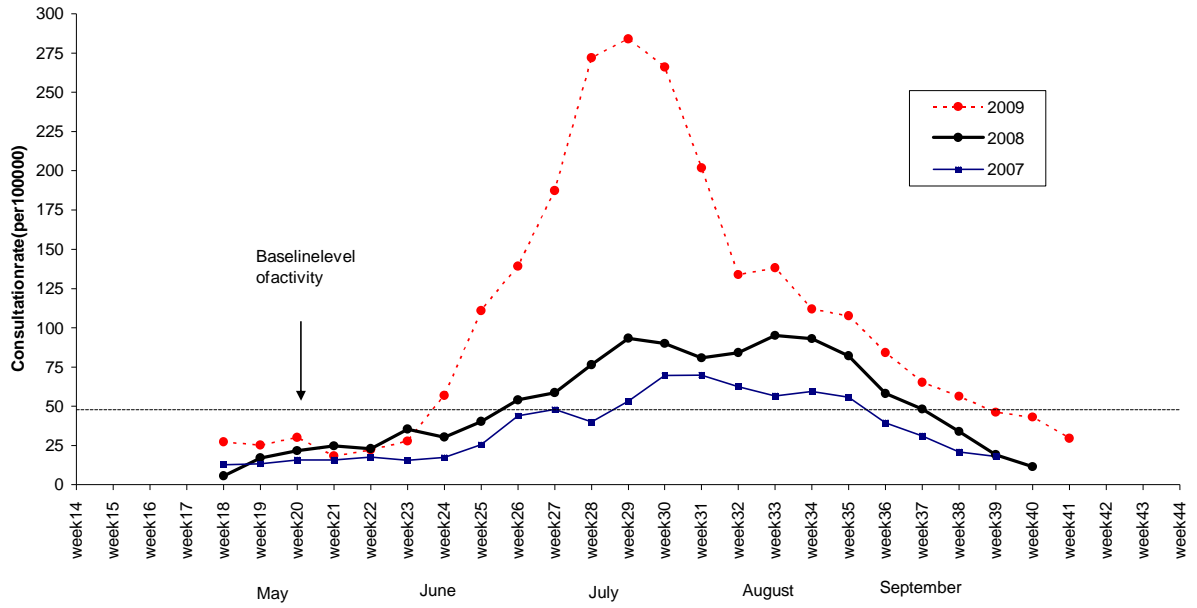
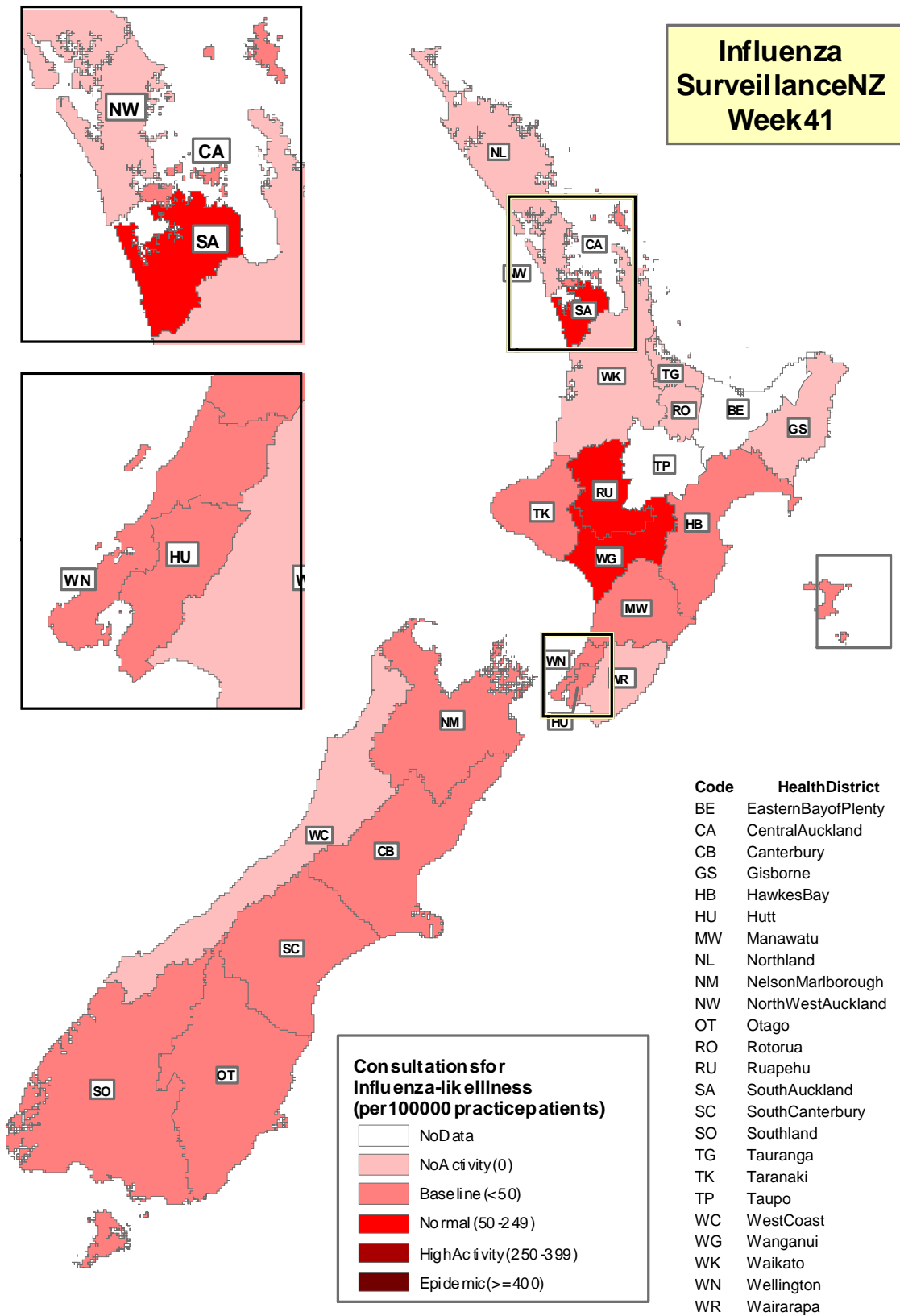


Figure 3 illustrates consultation rates for influenza-like illness mapped by health district for week 41, 2009.



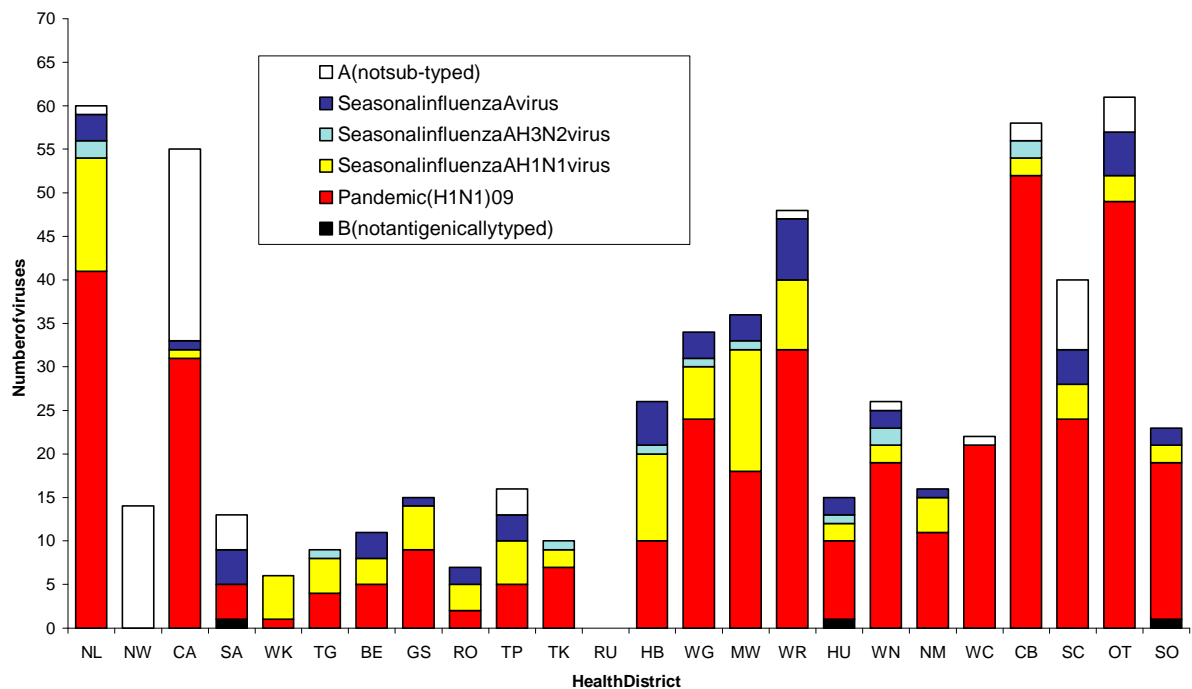
A total of 18 swabs were received by the virology laboratories. No influenza viruses were identified.

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The cumulative figures are shown in Figure 4 for week 18 (27 April-3 May) to week 41 (5-11 October 2009). The predominant strain was pandemic influenza A/California/7/2009 (H1N1) virus-like strains, followed by seasonal influenza A (H1N1) (98) including 28 of A/Brisbane/59/2007 (H1N1)-like strains, influenza A not subtyped (61), seasonal influenza A (51), 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.

sentinel surveillance by health district from week 18 (27 April-3 May) to week 41 (5-11 October 2009). A total of 621 influenza viruses were identified. The predominant strain was pandemic influenza A/California/7/2009 (H1N1) virus-like strains, followed by seasonal influenza A (H1N1) (98) including 28 of A/Brisbane/59/2007 (H1N1)-like strains, influenza A not subtyped (61), seasonal influenza A (51), 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.

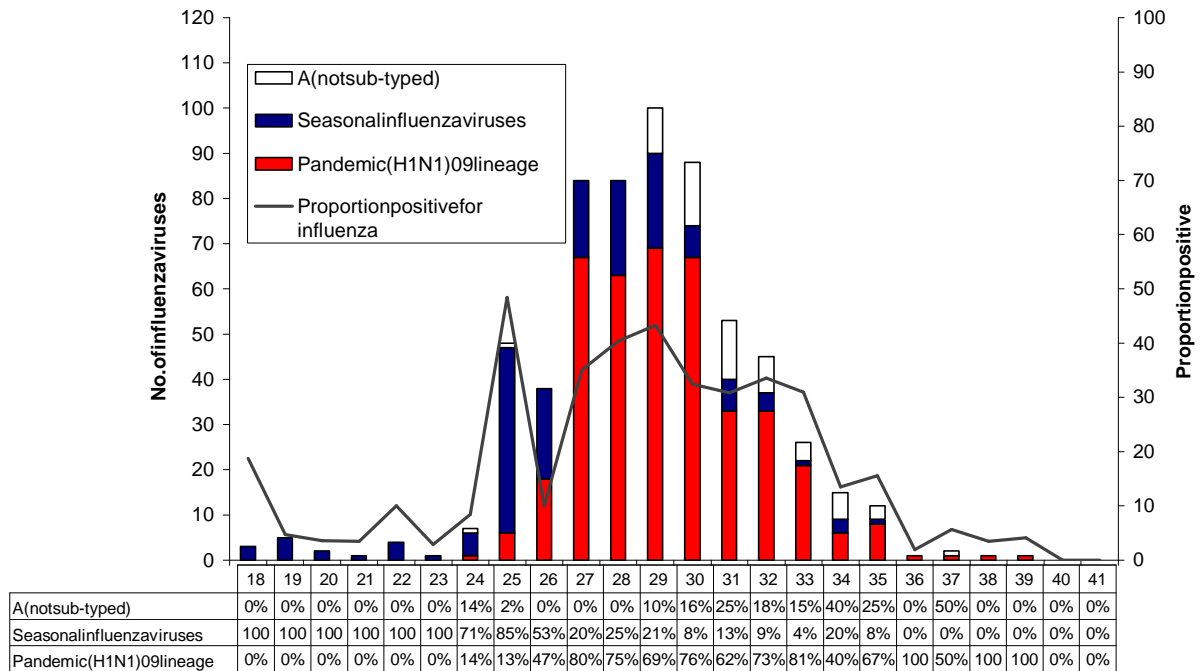
Figure 4: Cumulative influenza viruses from sentinel surveillance by health district to 11 October 2009



The temporal distribution of influenza viruses is shown in the graph below for sentinel surveillance from week 18 (27 April-3 May) to week 41 (5-11 October 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 the swabs received



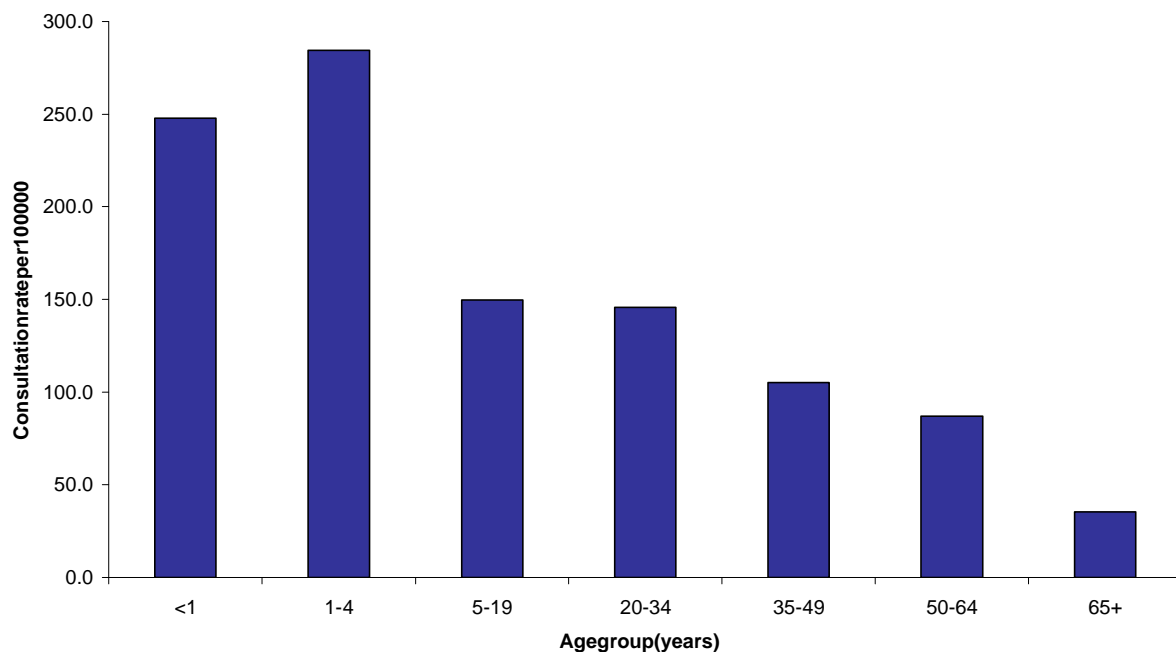
Note: All results of sentinel swabs are received by those swabs that test positive for any type of influenza. A low proportion may be due to the swabs not successfully retrieving the virus, or the presence of other viruses.

ESR. The line shows the proportion of influenza. A low proportion may be due to the tILIP presentation to sentinel GPs are due to

The age distribution for influenza-like illness (ILI) is shown in Figure 6. The highest ILI consultation rate followed by those <1 year (247.7 per 100000) and 5

1) consultation rates for weeks 18-41 is 284.4 per 100000) and 5-19 years (149.8 per 100000).

Figure 6: Sentinel consultation rate for influenza-like illness by age group for weeks 18-41, 2009

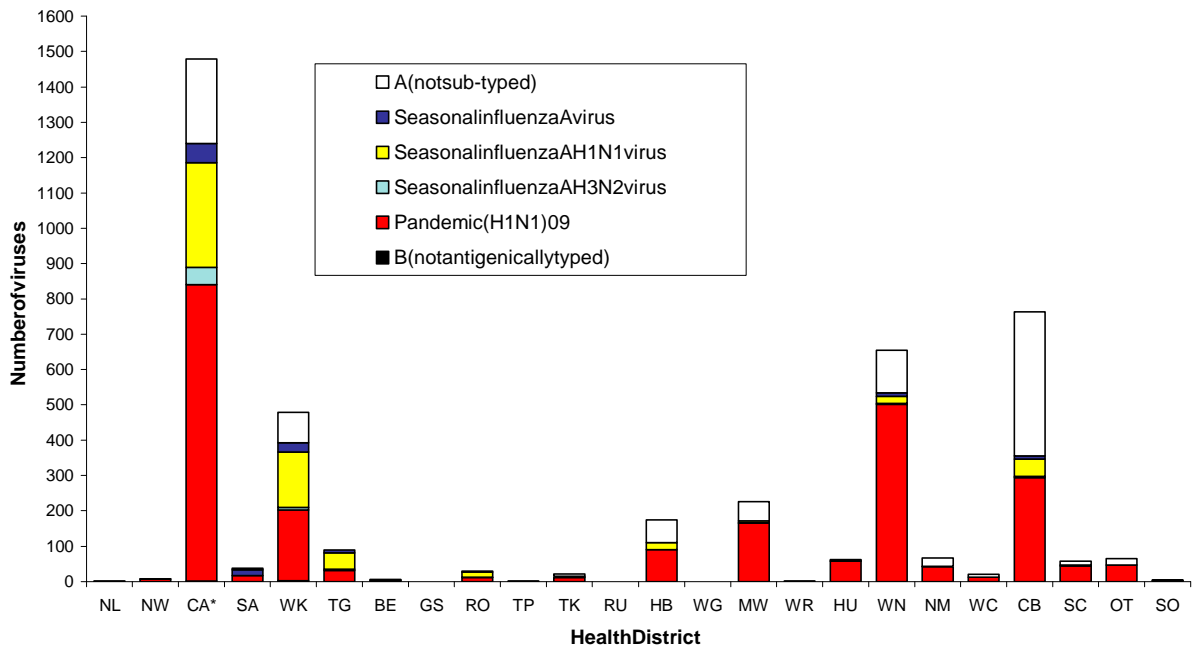


NON-SENTINEL SURVEILLANCE

No influenza viruses were reported this week from sentinel laboratory-based (non-sentinel) surveillance.

The cumulative influenza viruses are shown in Figure 7 for non-sentinel surveillance by health district from week 1 (1-4 Jan) to week 41 (5-11 October 2009). A total of 4246 influenza viruses were identified. The predominant strain was pandemic (H1N1) 2009 (2378) including 223 of pandemic influenza A/California/7/2009 (H1N1)v-like strains, followed by seasonal influenza A (H1N1) (617) including 118 of A/Brisbane/59/2007 (H1N1) - like strains, influenza A not subtyped (1053), seasonal influenza A (127), seasonal influenza A (H3N2) (68) 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.

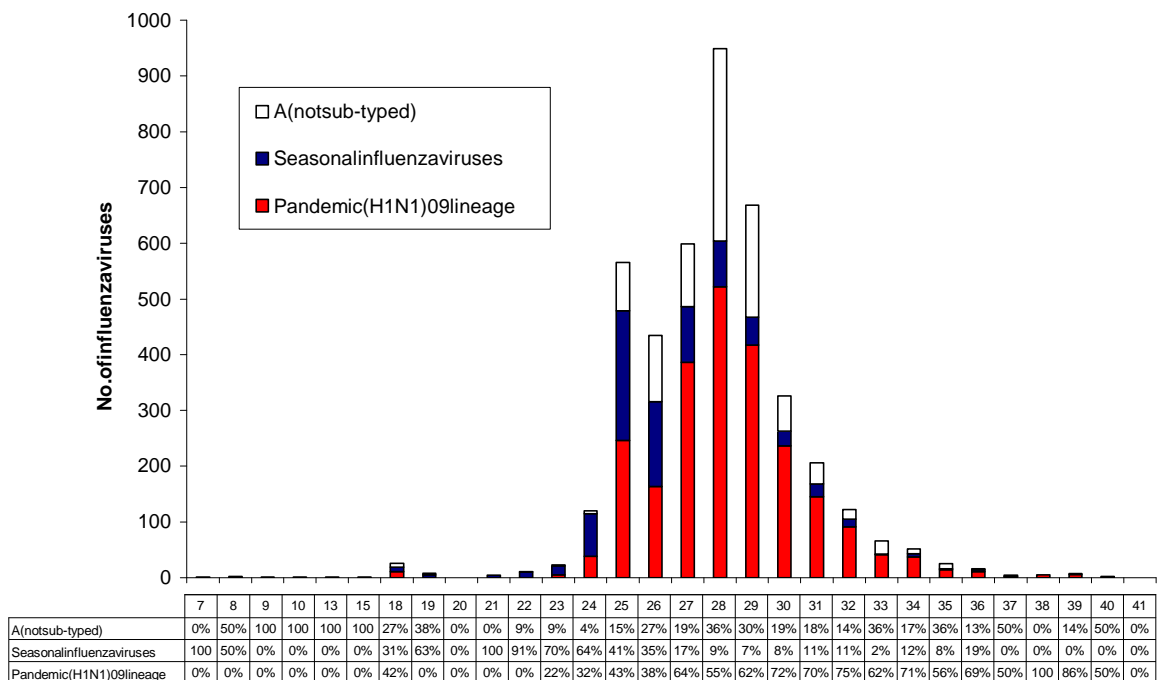
Figure7: Cumulativeinfluenzavirusesfromnon-sentinel surveillancebyhealthdistrict to11October2009



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 41 (5-11 October 2009). The number of Pandemic influenza (H1N1)09 is greater than the number of seasonal influenza viruses.

Figure8: Totalinfluenzavirusesfromnon-sentinel surveillance by type and week reported to 11 October 2009



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 identified for the H275Y mutation (histidine-to-tyrosine mutation at the codon of 275 in N1 number) to oseltamivir. All 28 viruses had the H275Y mutation. (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).

read of oseltamivir-resistant seasonal A(H1N1) viruses has been observed. During this winter season in New Zealand, a total of 28 seasonal A(H1N1) viruses have been identified for the H275Y mutation (histidine-to-tyrosine) which is known to confer resistance to oseltamivir. In addition, a total of 25 seasonal A(H1N1) viruses were tested using a phenotypic assay called 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.

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 325 Pandemic influenza (H1N1)09 viruses were tested using the phenotypic assay and all 325 viruses were sensitive to oseltamivir with IC50 values in the range of 0.2 to 0.9 nM (Table 1).

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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	325
Mean IC50*	1.84	0.83	728	1399	0.369
Std. dev.	0.71	0.63	136	1990	0.204
Min IC50	0.25	0.01	547	305	0.092
Max IC50	3.099	4.219	870	7912	1.107

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

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