

INFLUENZA WEEKLY UPDATE

2009/32: 3-9 August 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 32 (3-9 August 2009).

IN THIS REPORT:

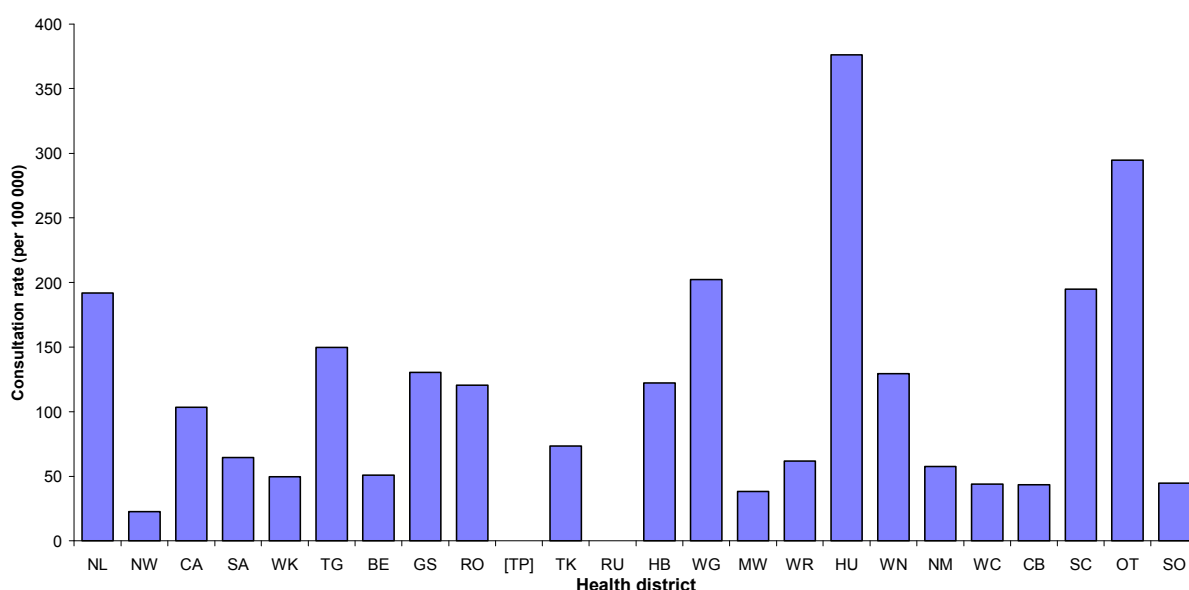
- There has been a continuing decline in consultations for influenza-like illness through sentinel surveillance in week 32 (3-9 August 2009). However, the weekly ILI consultation rate is still higher than previous years for the same week. The highest weekly ILI rates were reported from Hutt, Otago and Wanganui health districts. So far, the highest ILI consultation rates have been reported among children and teenagers aged 0 to 19 years.
- Up to 9 August 2009, a total of 4648 influenza viruses have been reported through sentinel (564, 12%) and non-sentinel surveillance (4084, 88%). Among 45 influenza viruses reported from sentinel surveillance in week 32, 33 (73%) were novel A H1N1 09 lineage. Among 138 influenza viruses reported from non-sentinel surveillance in week 32, 93 (67%) were novel A H1N1 09 lineage. Novel A H1N1 09 lineage 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 novel influenza A 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 novel influenza A H1N1 09 viruses were tested by phenotypic assay. All 92 viruses were sensitive to oseltamivir.
- Novel influenza A H1N1 09 is a notifiable disease in New Zealand. As of 9 August 2009, there have been 3051 confirmed and probable cases recorded in EpiSurv. Ten deaths have been reported and 914 cases have been hospitalised. Pneumonia was recorded for 225 cases and acute respiratory distress syndrome (ARDS) for 35 cases. The age standardised rate for cases is 77.7 per 100 000 total population.

SENTINEL GENERAL PRACTICE SURVEILLANCE

In the past week, a total of 506¹ consultations for influenza-like illness were reported from 85 general practices in 23 of the 24 health districts. This gives a weekly consultation rate of 133.8 per 100 000 patient population.

The graph below compares the consultation rates for influenza-like illness for each health district over the past week. Hutt had the highest consultation rate (376.2 per 100 000, 130 cases), followed by Otago (294.7 per 100 000, 128 cases) and Wanganui (202.3 per 100 000, 3 cases).

Figure 1: Weekly consultation rates for influenza-like illness by health district week ending 9 August 2009



[] 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. The current ILI rate of influenza is higher than at the same time last year.

¹ 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

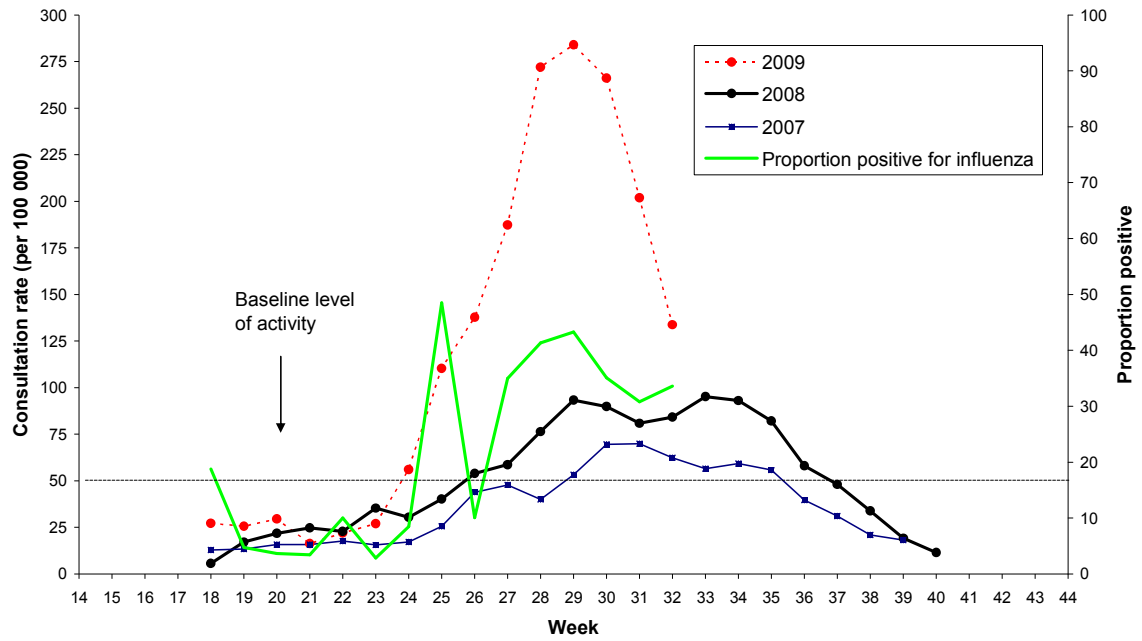
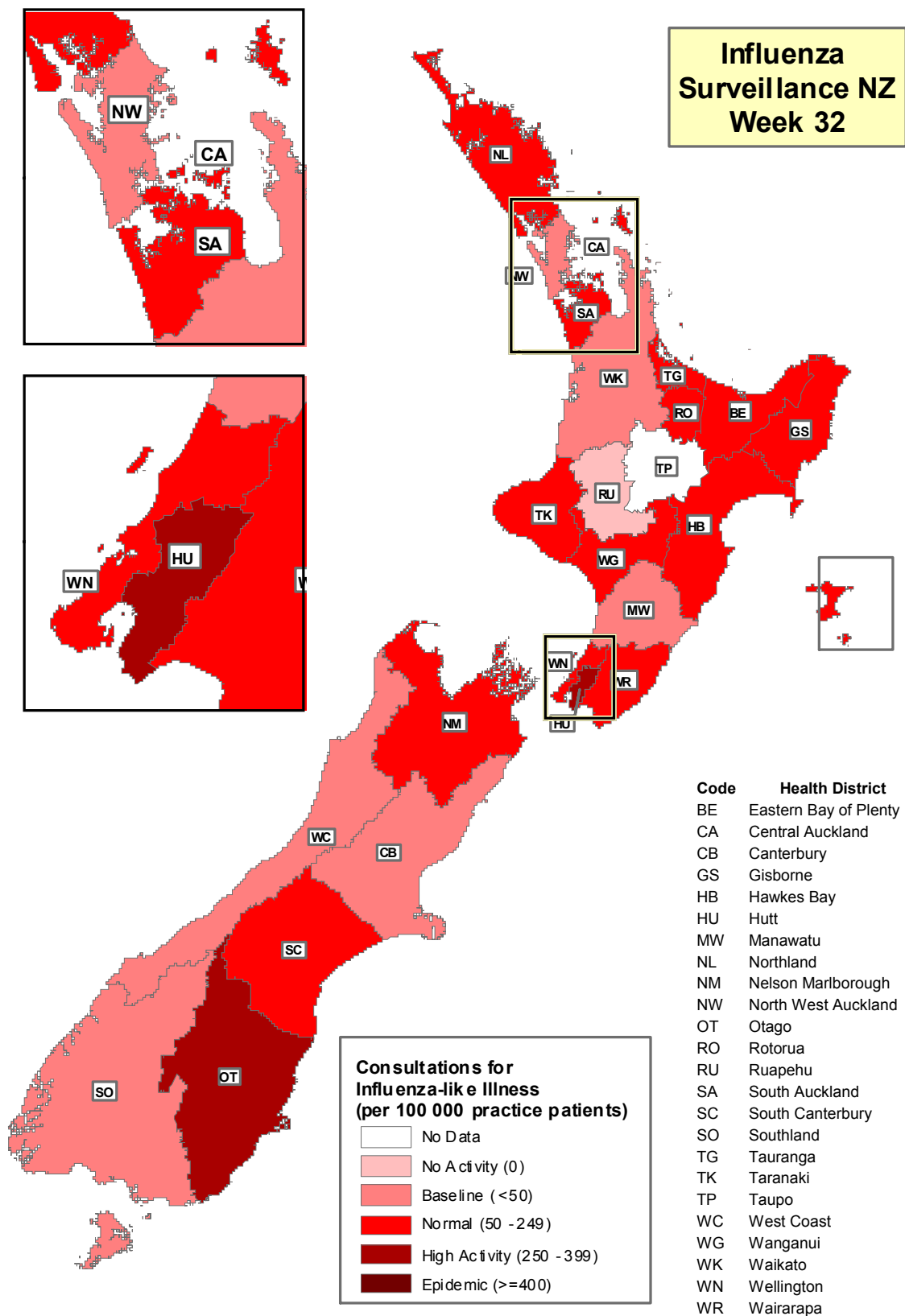


Figure 3 illustrates consultation rates for influenza-like illness mapped by health district for week 32, 2009.



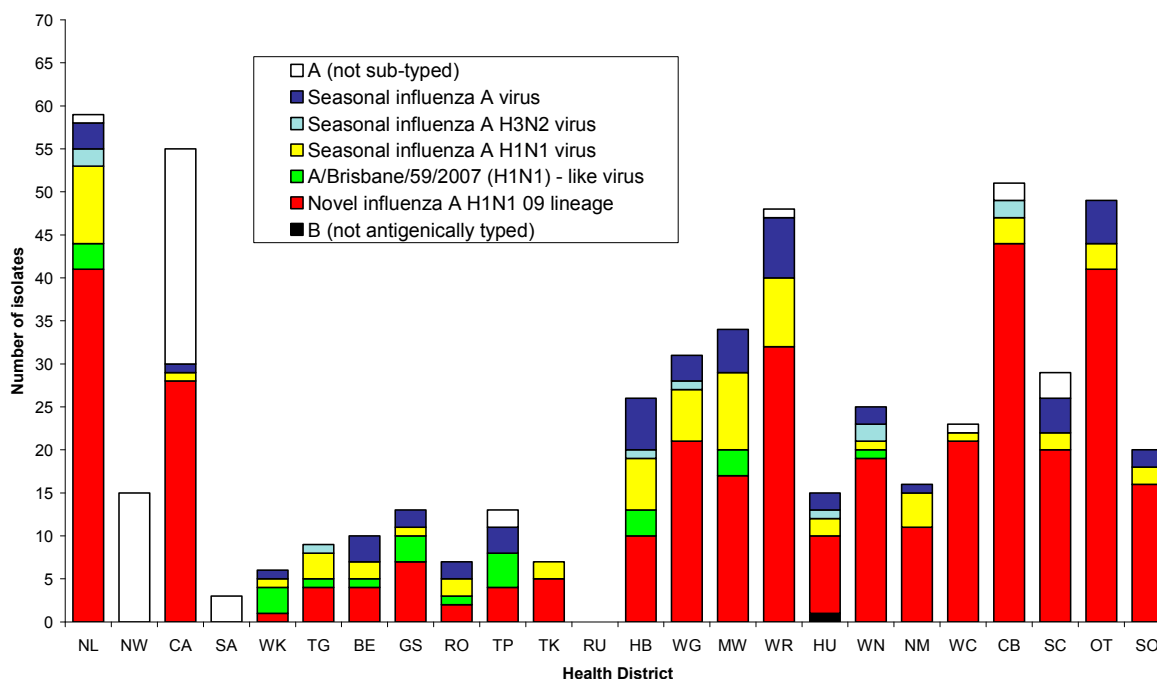
Sixty-five swabs were sent from the sentinel surveillance system in the past week. A total of 134 swabs were received by the virology laboratories from which 45 influenza viruses were identified: novel influenza A H1N1 09 lineage (33), influenza A (not sub-typed) (9), seasonal influenza A H3N2 (2), and seasonal influenza A H1N1 virus (1). The distribution by health district is shown in Table 1.

Table 1: Influenza viruses from sentinel surveillance for week 32 by Health District

Antigenic Strain	NL	CA	GS	TP	TK	HB	WG	MW	WR	WN	CB	SC	OT	SO	Total
A (not sub-typed)	1	2	0	2	0	0	0	0	1	0	0	3	0	0	9
Novel A H1N1 09 lineage	1	1	1	0	2	1	2	1	1	1	3	6	11	2	33
Seasonal A H1N1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Seasonal A H3N2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Total	2	3	1	2	2	1	2	1	3	1	5	9	11	2	45

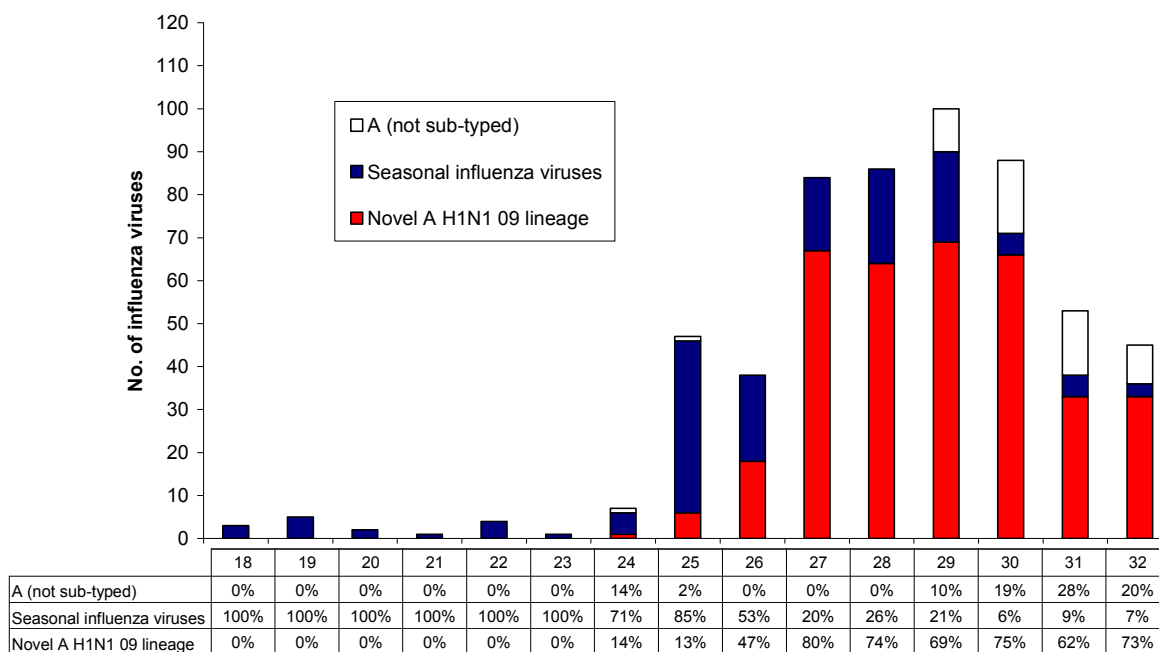
The cumulative figures are shown in Figure 4 for sentinel surveillance by health district from week 18 (27 April-3 May) to week 32 (3-9 August 2009). A total of 564 influenza viruses were identified: novel influenza A H1N1 09 lineage (357), seasonal influenza A H1N1 virus (68), influenza A (not sub-typed) (53), seasonal influenza A virus (52), A/Brisbane/59/2007 (H1N1) - like (23), seasonal influenza A H3N2 virus (10), and B (not typed) (1). Novel A H1N1 09 lineage has become the predominant strain among all influenza viruses from sentinel surveillance.

Figure 4: Cumulative influenza viruses from sentinel surveillance by health district to 9 August 2009



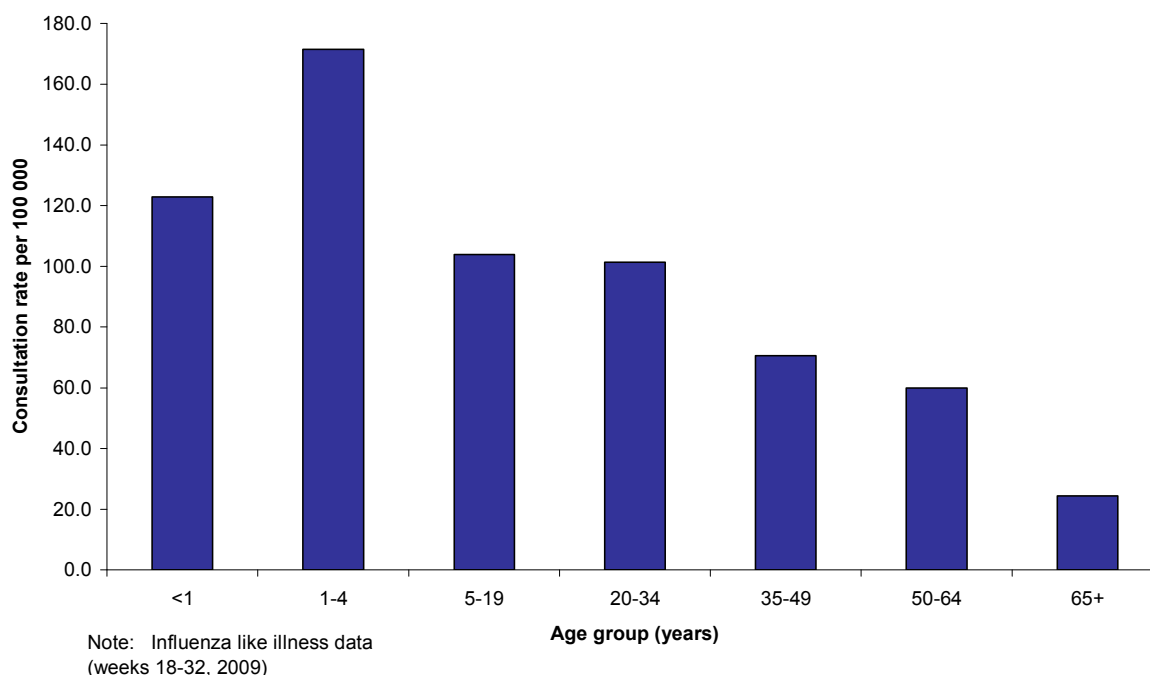
The temporal distribution of influenza viruses is shown in the graph below for sentinel surveillance from week 18 (27 April-3 May) to week 32 (3-9 August 2009). Among 45 influenza viruses reported from sentinel surveillance in week 32, the number of novel A H1N1 09 lineage is greater than the number of seasonal influenza viruses.

Figure 5: Total influenza viruses from sentinel surveillance by type and week reported to 9 August 2009



The age distribution for influenza-like illness (ILI) consultation rates for weeks 18-32 is shown in Figure 6. The highest ILI consultation rate was in 1-4 years (171.4 per 100 000) followed by those <1 year (122.9 per 100 000) and 5-19 years (103.9 per 100 000).

Figure 6: Sentinel consultation rate for influenza-like illness by age group for weeks 18-32, 2009



NON-SENTINEL SURVEILLANCE

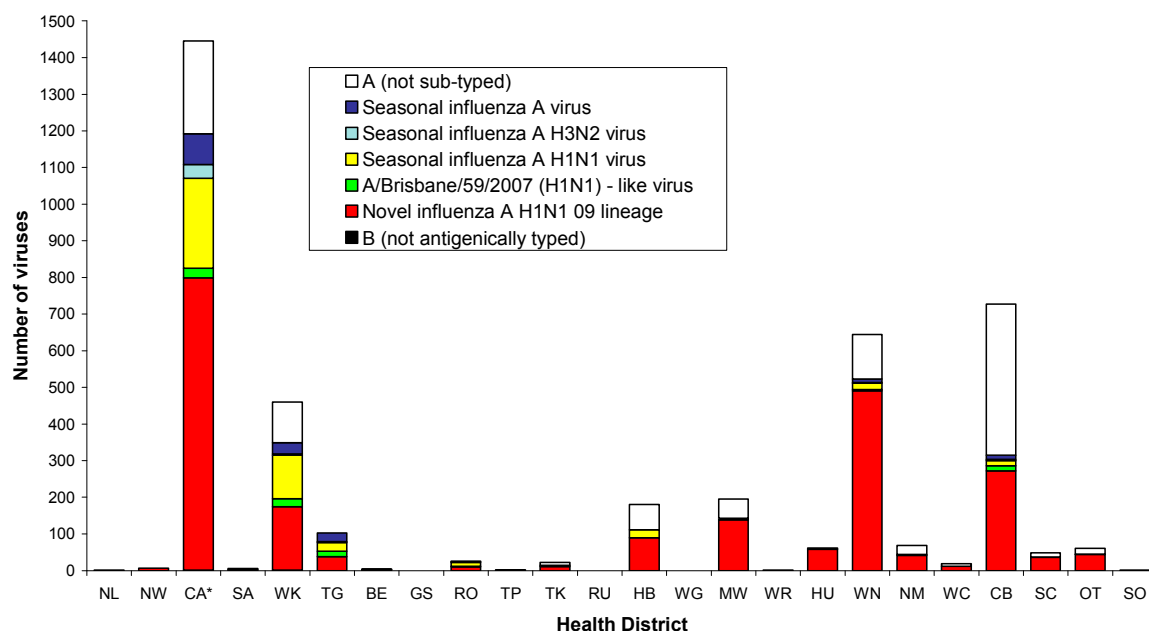
In addition, 138 influenza viruses were reported this week from the laboratory-based (non-sentinel) surveillance: novel influenza A H1N1 09 lineage (93), influenza A (not sub-typed) (23), seasonal influenza A H1N1 lineage (20), A/Brisbane/59/2007 (H1N1) - like (1), and seasonal influenza A H3N2 (1). The distribution by health district is shown in Table 2.

Table 2: Influenza viruses from non-sentinel surveillance for week 32 by Health District

Antigenic Strain	CA	WK	TG	RO	TP	TK	HB	MW	WN	NM	WC	CB	SC	OT	SO	Total
A (not sub-typed)	17	2	0	0	0	0	0	0	2	0	0	2	0	0	0	23
A/Brisbane/59/2007 (H1N1) - like	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Novel A (H1N1) 09 lineage	30	14	6	0	0	1	3	11	4	2	1	14	4	2	1	93
Seasonal A (H1N1)	8	0	10	1	1	0	0	0	0	0	0	0	0	0	0	20
Seasonal A (H3N2)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	56	16	16	1	1	1	3	11	6	2	1	17	4	2	1	138

The cumulative influenza viruses are shown in Figure 7 for non-sentinel surveillance by health district from week 1 (1-4 Jan) to week 32 (3-9 August 2009). A total of 4084 influenza viruses were identified: novel influenza A H1N1 09 lineage (2227), influenza A (not sub-typed) (1092), seasonal influenza A H1N1 virus (467), seasonal influenza A virus (162), A/Brisbane/59/2007 (H1N1) - like (82), seasonal influenza A H3N2 virus (51), B (not typed) (2) and A/Brisbane/10/2007 (H3N2) - like (1). Novel AH1N1 09 lineage has become the predominant strain among all influenza viruses from non-sentinel surveillance.

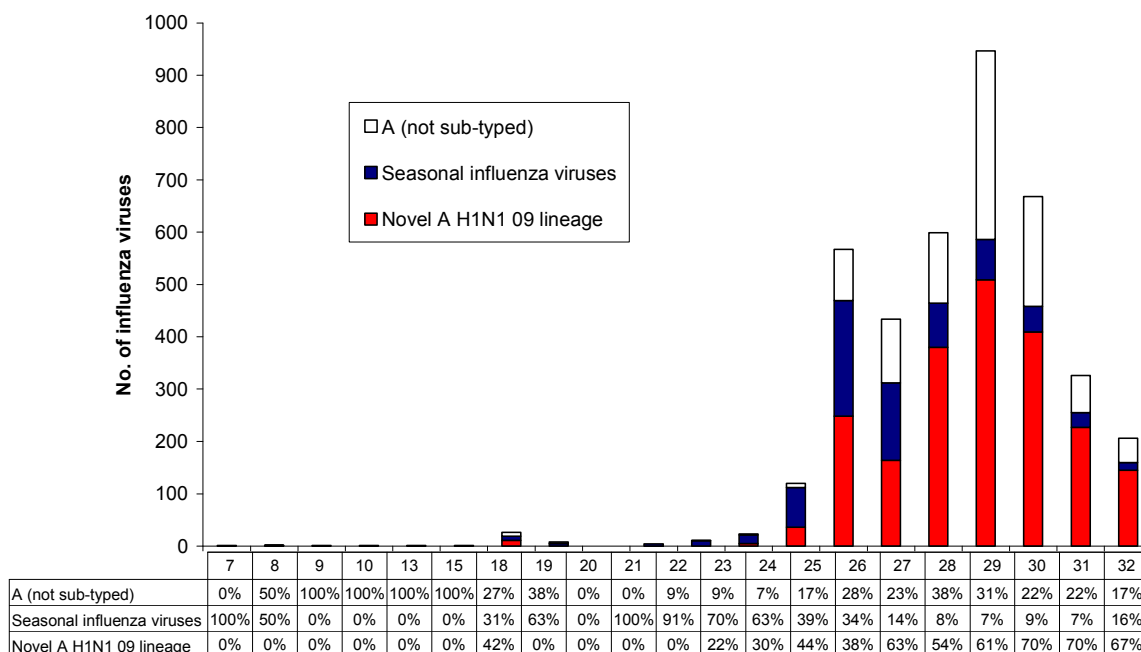
Figure 7: Cumulative influenza viruses from non-sentinel surveillance by health district to 9 August 2009



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 32 (3-9 August 2009). Again, the number of novel A H1N1 09 lineage is greater than the number of seasonal influenza viruses.

Figure 8: Total influenza viruses from non-sentinel surveillance by type and week reported to 9 August 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 novel influenza A 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 novel influenza A H1N1 viruses are sensitive to oseltamivir. In addition, a total of 92 novel influenza A 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).

Influenza type/subtype	Seasonal A H1N1				Novel A H1N1
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.

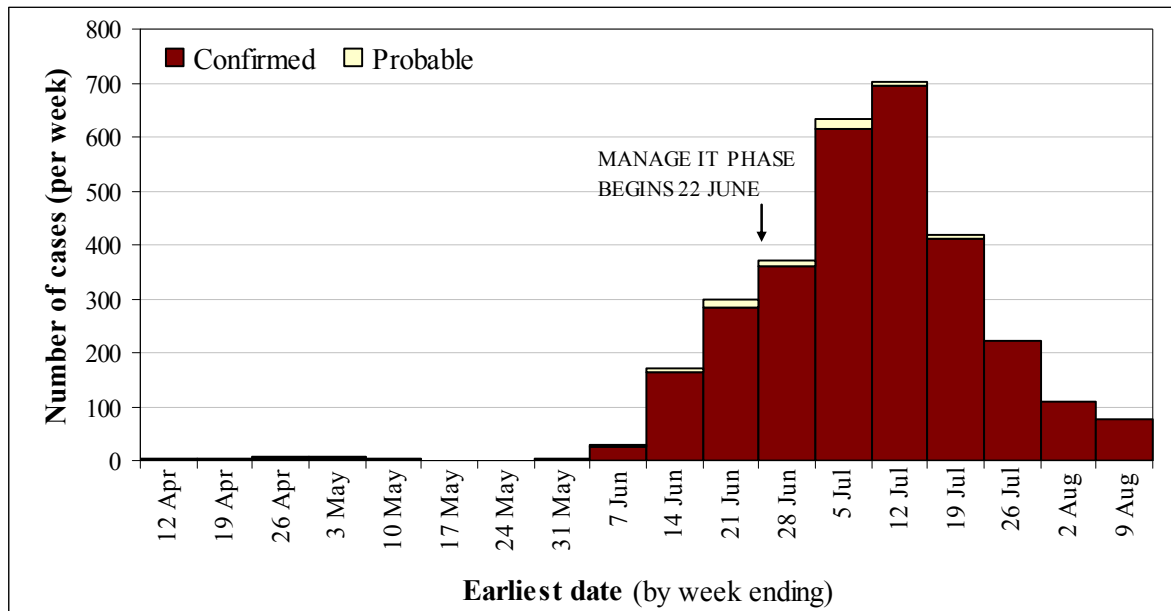
NOVEL INFLUENZA A H1N1 09 VIRUS UPDATE IN NEW ZEALAND

Novel influenza A H1N1 09 is a notifiable disease in New Zealand.

- A total of 3051 confirmed and probable cases of novel influenza A H1N1 09 were reported.
- The number of total notifications and hospitalisations reported each week has decreased since the week ending 12 July 2009.
- Highest notification and hospitalisation rates for last week were seen in the 10-14 year age group.
- There have been 914 hospitalised cases reported. Pneumonia was recorded for 225 cases and acute respiratory distress syndrome (ARDS) for 35 cases.
- There were 12 hospitalisations reported for the week 3-9 August 2009. Canterbury DHB has the highest cumulative number of hospitalisations with 182 cases up to the 09 August 2009.
- Novel influenza A H1N1 09 was recorded in EpiSurv as being the primary cause of death in 10 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: Novel influenza A H1N1 09 epidemic curve using earliest date entered in EpiSurv up to 9 August 2009.

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 separated.



Confirmed cases n=2982, probable cases n=69

Data was extracted from EpiSurv at midnight 11 August 2009