Influenza Surveillance in Ireland – Weekly Report

Influenza Week 8 2011 (21st – 27th February 2011)

Summary

- Influenza activity continued to decrease in Ireland during week 8 2011.
  - The sentinel GP influenza-like illness (ILI) consultation rate was 23.2 per 100,000 population in week 8 2011, a decrease from the updated rate of 36.0 per 100,000 reported during week 7 2011.
    - ILI rates have decreased in all age groups, with the exception of those aged 65 years or older.
    - ILI rates are just above baseline levels.
  - The proportion of influenza–related calls to GP Out-of-Hours services continued to decrease in week 8 2011, coinciding with the decrease in sentinel GP ILI consultation rates.
  - The proportion of influenza positive specimens detected by the NVRL decreased further in week 8 2011 to 6.6%, compared to 17.7% in the previous week.
  - All influenza types decreased in week 8 2011, with influenza B remaining the predominant circulating influenza type.
  - The weekly number of hospitalised cases of influenza decreased to 12 in week 8 2011, compared to 32 in the previous week.
  - To date (March 2nd 2011) this season, 922 confirmed influenza cases have been hospitalised, 121 cases have been admitted to ICU and 23 deaths have been reported to HPSC.
  - No new outbreaks of influenza/ILI have been reported since week 5 2011. As of March 2nd 2011, 14 influenza/ILI outbreaks have been reported to HPSC this season.
  - The proportion of respiratory syncytial virus (RSV) positive detections is slightly above average for the time of year.

Surveillance Systems

In order to monitor influenza activity in Ireland a number of surveillance systems are currently in place:

1. Irish College of General Practitioners (ICGP) GP sentinel surveillance system
2. Virological data from the National Virus Reference Laboratory (NVRL)
3. GP Out-of-Hours surveillance system
4. Influenza notifications reported on the Computerised Infectious Disease Reporting system (CIDR)
5. Enhanced surveillance of all hospitalised confirmed influenza cases aged 0-14 years
6. Intensive Care Society of Ireland (ICSI) enhanced surveillance of all critical care patients with confirmed influenza
7. Outbreak reporting on CIDR
8. Network of sentinel schools reporting absenteeism and sentinel hospitals reporting admission data

1. GP sentinel surveillance system

Clinical Data

During week 8 2011, 50 of 60 (83.3%) sentinel general practices provided data, with 25 practices (50.0%) reporting 54 influenza-like illness (ILI) cases. This corresponds to an ILI consultation rate of 23.2 per 100,000 population, a decrease compared to the updated rate of 36.0 per 100,000 reported during week 7 2011. The ILI rate for week 8 2011 is just above the Irish baseline threshold (17.8 per 100,000 population). Twenty-five (50.0%) sentinel practices reported no ILI cases during week 8 2011. Figure 1 shows the ILI consultation rates, the baseline threshold rate and the number of positive specimens detected by the NVRL.

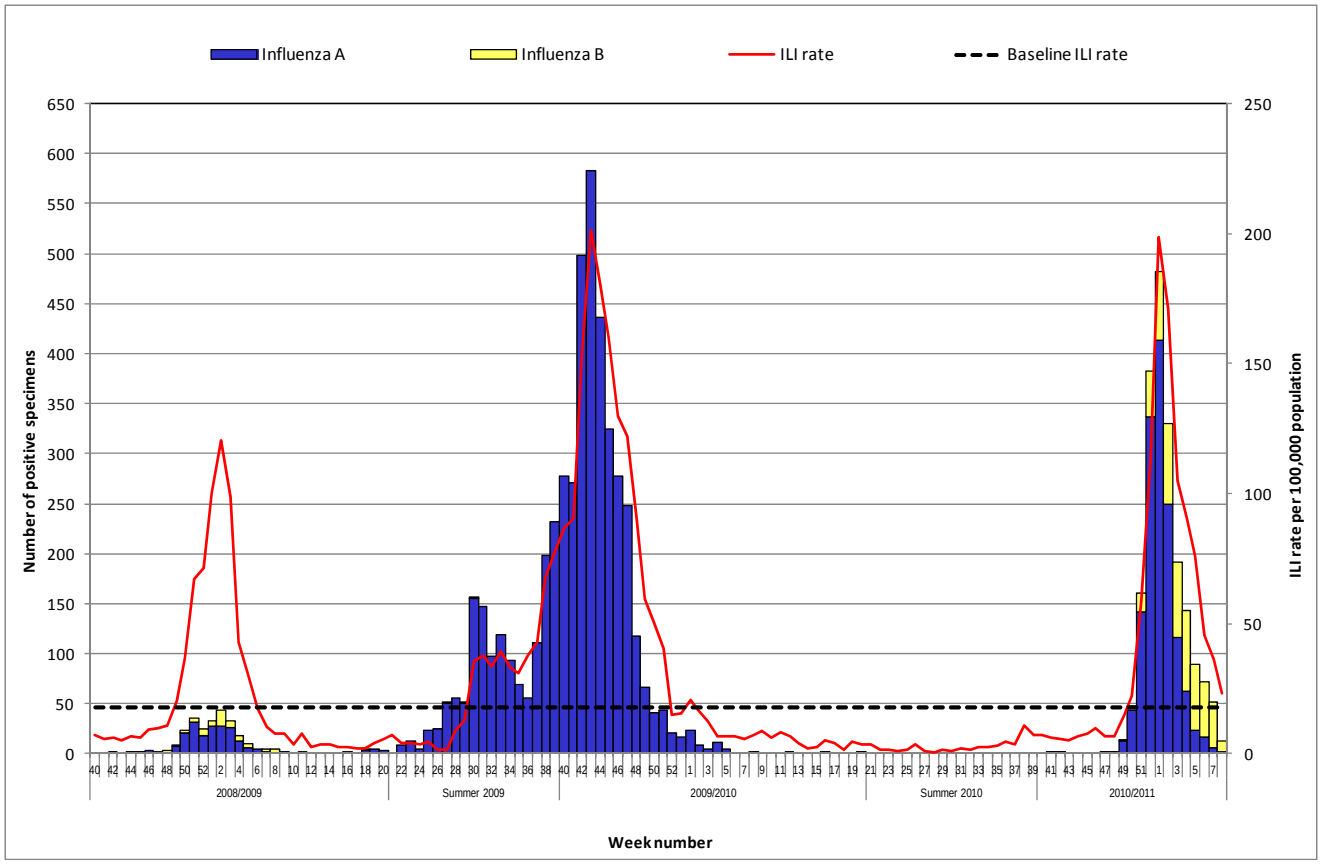

Figure 1. ILI sentinel GP consultation rates per 100,000 population, baseline ILI threshold rate, and number of positive influenza A and B specimens tested by the NVRL, by influenza week and season.
Source: Clinical ILI data from ICGP and virological data from the NVRL[1][2]

ILI age specific rates decreased in all age groups in week 8 2011, with the exception of those aged 65 years or older, compared to the previous week. ILI age specific rates were highest in the 0-4 year age group during week 8 2011. Eight ILI cases were reported in the 0-4 year age group (48.2 per 100,000), 8 cases were reported in the 5-14 year age group (25.9 per 100,000), 34 in the 15-64 year age group (21.3 per 100,000) and 4 ILI cases in those aged 65 years or older (15.6 per 100,000) during week 8 2011. Age specific ILI rates in the

[1] Please note that in addition to the NVRL, Cork University Hospital (CUH) and Galway University Hospital(s) (GUH) also tested for influenza A (H1N1 2009) during the pandemic period.
[2] Sentinel GP consultations and virological data are updated on an ongoing basis, ILI rates and virological data are adjusted accordingly.

0-4 and 5-14 year age groups to date this season remain at a significantly lower level than those reported during the pandemic period in 2009/2010. During the pandemic period, ILI rates in 0-4 year olds peaked at 387.3 per 100,000 population and at 772.0 per 100,000 population in 5-14 year olds.

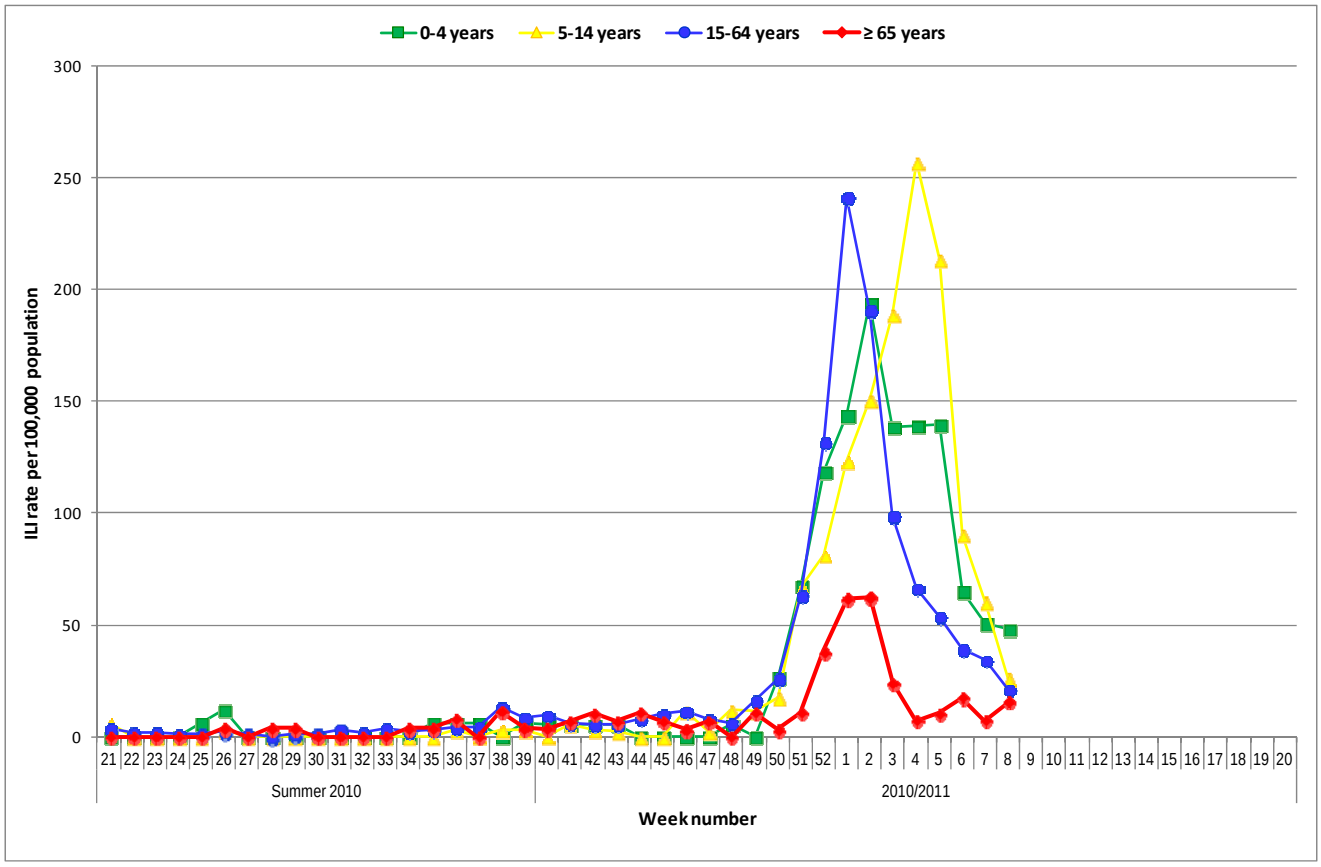

Figure 2: Age specific sentinel GP ILI consultation rate per 100,000 population by week during the summer of 2010 and the 2010/2011 influenza season to date
Source: ICGP ILI clinical data

2. Virological Data from the National Virus Reference Laboratory (NVRL)[‡]

The data reported in this section for the 2010/2011 influenza season refers to specimens tested by the National Virus Reference Laboratory (NVRL). A total of 182 specimens (18 sentinel and 164 non-sentinel[§] specimens) were tested by the NVRL during week 8 2011. Twelve (6.6%) specimens were positive for influenza: 2 (16.7%) influenza A (H1N1 2009) and 10 (83.3%) influenza B. Influenza B is the predominant circulating influenza type in Ireland, accounting for 83.3% of all positive influenza specimens detected by the NVRL in week 8 2011.

Of the 18 GP sentinel specimens taken during week 8 2011, 4 (22.2%) were positive for influenza. All four positive specimens were influenza B. There were no positive influenza A sentinel specimens during week 8 2011. Of the 164 non-sentinel specimens taken during week 8 2011, 8 (4.9%) were positive for influenza: 2 (25.0%) influenza A (H1N1 2009) and 6 (75.0%) influenza B.

To date this season, 6854 sentinel and non-sentinel specimens have been tested by the NVRL, 1982 (28.9%) specimens tested positive for influenza: 1364 influenza A (H1N1 2009), 36 influenza A (H3), 30 influenza A (unsubtyped) and 552 influenza B. Of the 1982 positive influenza specimens, 1430 (72.1%) were influenza A and 552 (27.9%) were influenza B (figures 3 & 4). To date this season, six influenza B cases were co-infected with influenza A: 5 with influenza A (H1N1 2009) and one with influenza A (unsubtyped).

The NVRL has tested eight non-sentinel specimens from six confirmed influenza A (H1N1 2009) cases for antiviral resistance. All six patients were hospitalised and admitted to intensive care. One (12.5%) of the eight specimens tested was resistant to oseltamivir, carrying the H275Y mutation.

[‡] It should be noted that virological data refer to weekly data received from the NVRL on Tuesday of each week.

[§] Please note that non-sentinel specimens relate to specimens referred to the NVRL (other than sentinel specimens) and may include more than one specimen from each case.

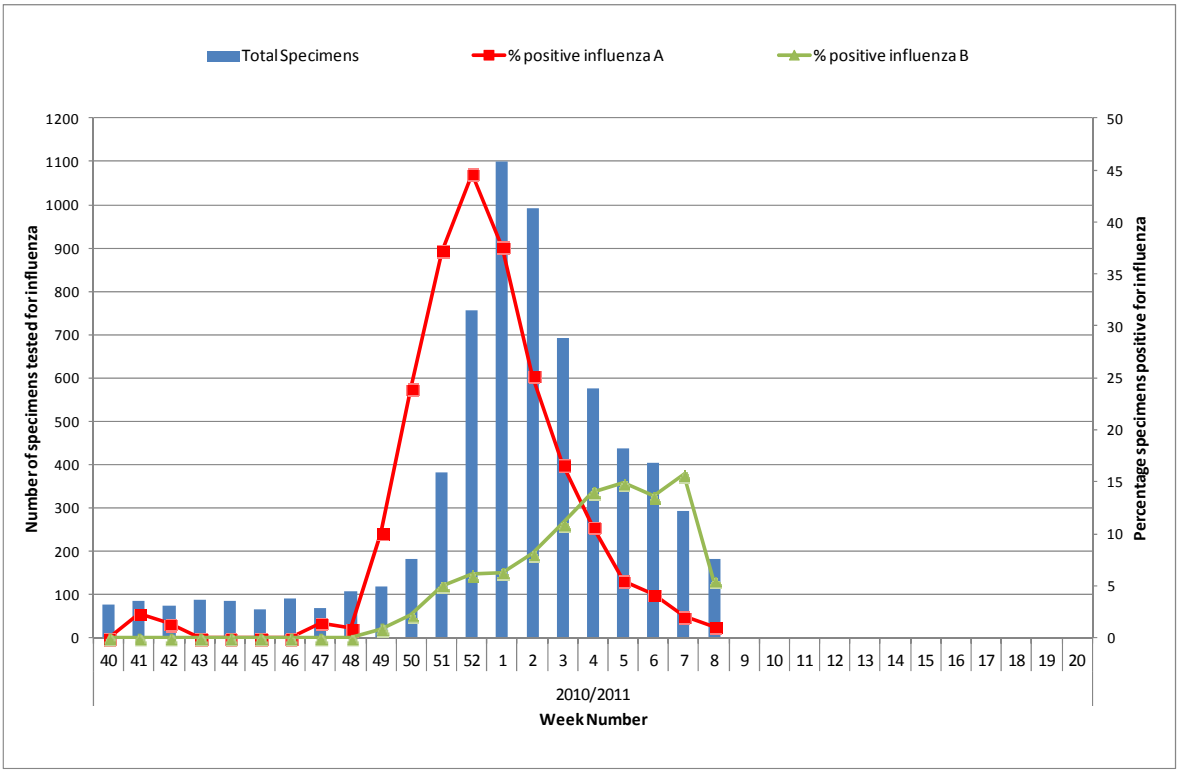

Figure 3: Number of sentinel and non-sentinel specimens tested for influenza and percentage influenza positive by week for the 2010/2011 influenza season. *Source: NVRL*

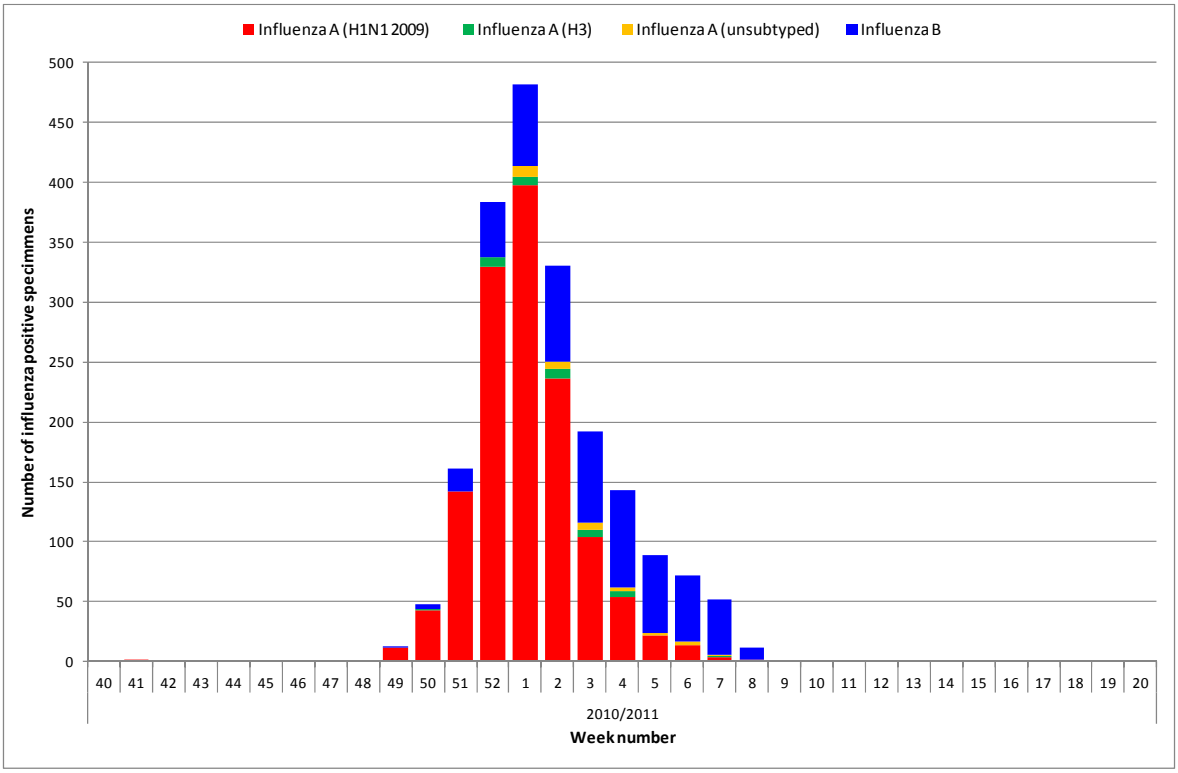

Figure 4: Number of sentinel and non-sentinel specimens positive for influenza by type/subtype and week for the 2010/2011 influenza season. *Source: NVRL*

Of the 164 non-sentinel specimens tested during week 8 2011, 18.3% (n=30) were positive for RSV. RSV positive specimens remain at higher levels than for the same period during the 2009/2010 season (Tables 1 & 2). It should be noted that RSV data only include specimens referred to the NVRL for RSV testing. Not all hospitals refer respiratory specimens for RSV testing to the NVRL. Figure 5 shows the number and percentage of non-sentinel RSV positive specimens detected by the NVRL during the 2010/2011 and 2009/2010 seasons.[**]

There were no positive detections of adenovirus or parainfluenza viruses during week 8 2011. To date this season, there have been sporadic detections of adenovirus and parainfluenza virus (PIV) types -1, -2 and -3.

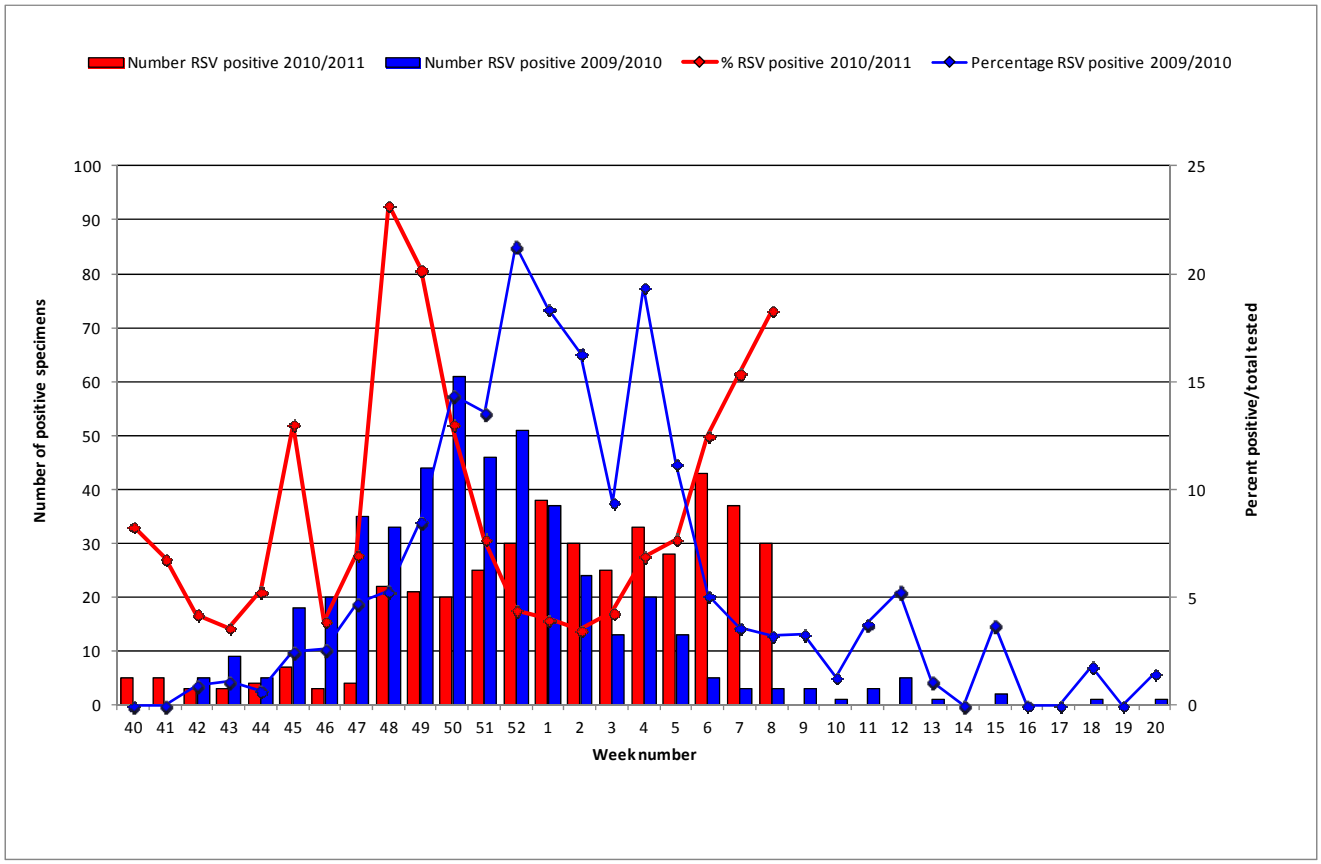

Figure 5: Number and percentage of non-sentinel RSV positive specimens detected by the NVRL during the 2010/2011 season, compared to the 2009/2010 season. *Source: NVRL*

[**] Please note that non-sentinel specimens relate to specimens referred to the NVRL (other than sentinel specimens) and may include more than one specimen from each case.

Table 1: Number of sentinel and non-sentinel[††] respiratory specimens tested by the NVRL and positive influenza results, for week 8 2011 and the season to date *Source: NVRL*

Week number	Specimen type	Total specimens tested	Number influenza positive	% Influenza positive	Influenza A					Influenza B
					Total influenza A	A (H1N1 2009)	A (H3)	A (H1)	A (unsubtyped)	
8 2011	Sentinel	18	4	22.2	0	0	0	0	0	4
	Non-sentinel	164	8	4.9	2	2	0	0	0	6
	Total	**182**	**12**	**6.6**	**2**	**2**	**0**	**0**	**0**	**10**
2010/2011 season	Sentinel	969	495	51.1	277	267	7	0	3	218
	Non-sentinel	5885	1487	25.3	1153	1097	29	0	27	334
	Total	**6854**	**1982**	**28.9**	**1430**	**1364**	**36**	**0**	**30**	**552**

Table 2: Number of non-sentinel specimens tested by the NVRL for other respiratory viruses and positive results, for week 8 2011 and the season to date *Source: NVRL*

Week number	Total specimens tested	RSV	% RSV Positive	Adenovirus	% Adenovirus positive	Parainfluenza virus type 1	% Parainfluenza virus type 1	Parainfluenza virus type 2	% Parainfluenza virus type 2	Parainfluenza virus type 3	% Parainfluenza virus type 3
8 2011	164	30	18.3	0	0.0	0	0.0	0	0.0	0	0.0
2010/2011 season	5885	416	7.1	14	0.2	6	0.1	2	0.03	6	0.1

[††] Please note that non-sentinel specimens relate to specimens referred to the NVRL (other than sentinel specimens) and may include more than one specimen from each case.

3. Regional Influenza Activity by HSE-Area

Influenza activity is reported on a weekly basis for each HSE area. Influenza activity is based on sentinel GP ILI consultation rates, laboratory confirmed influenza cases and ILI/influenza outbreaks.

During week 8 2011, regional influenza activity was reported from one HSE-Area (HSE-MW), localised influenza activity from HSE-E and sporadic influenza activity was reported from all other HSE-Areas (HSE-M,-NE –NW, -S –SE and –W) (figure 6).

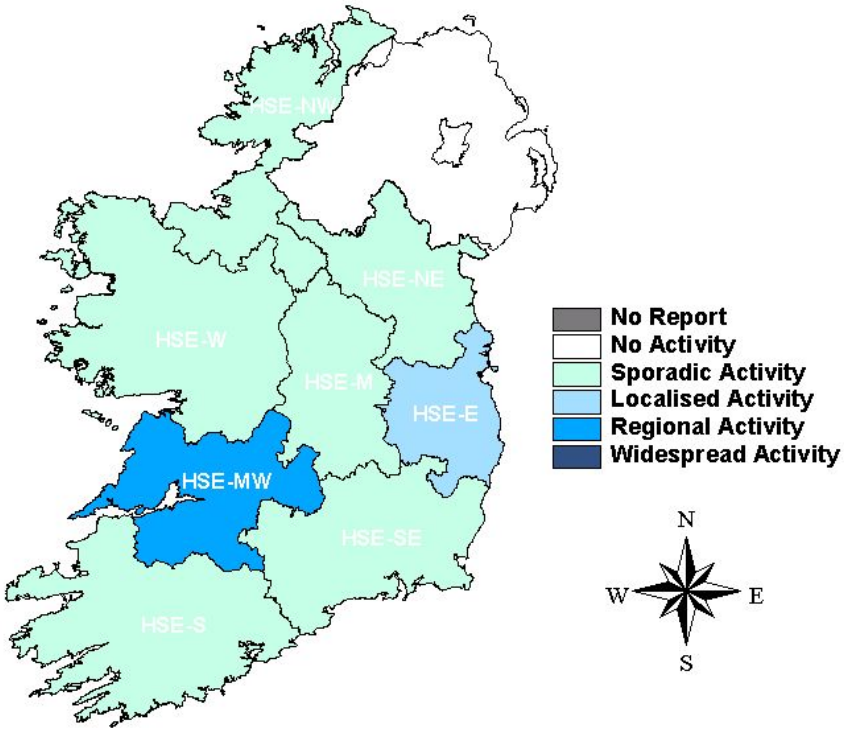

Figure 6: Map of provisional influenza activity by HSE-Area during influenza week 8 2011

Sentinel hospitals and schools

The Departments of Public Health have established at least one sentinel hospital in each HSE-Area, to report data on total hospital admissions, total emergency admissions and total respiratory admissions by age group on a weekly basis. Sentinel primary and secondary schools were also established in each HSE-Area, in close proximity to the sentinel GPs, to report absenteeism data on a weekly basis. Hospital admissions and school absenteeism data act as a crude indicator for influenza activity.

During week 8 2011, there was a slight increase in respiratory admissions in sentinel hospitals in HSE-NW and –W, compared to the previous week. The proportion of respiratory admissions from reporting sentinel hospitals

in HSE-E, -S, -SE and -W peaked during weeks 51 and 52 2010. No sentinel school data were available for week 8 2011, as schools were on midterm holidays.

4. GP Out-Of-Hours services surveillance

The Department of Public Health in HSE-NE is collating national data on calls to nine of thirteen GP Out-of-Hours services in Ireland. Clinical details from all calls are recorded. Records with clinical symptoms reported as flu or influenza are extracted for analysis. This information may act as an early indicator of increased ILI activity. However, data are self-reported by callers and are not based on coded influenza diagnoses.

The proportion of influenza–related calls to GP Out-of-Hours services decreased to 2.2% during week 8 2011, compared to 3.0% in week 7 2011. Seven GP Out-of-Hours services reported during week 8 2011 (figure 7).

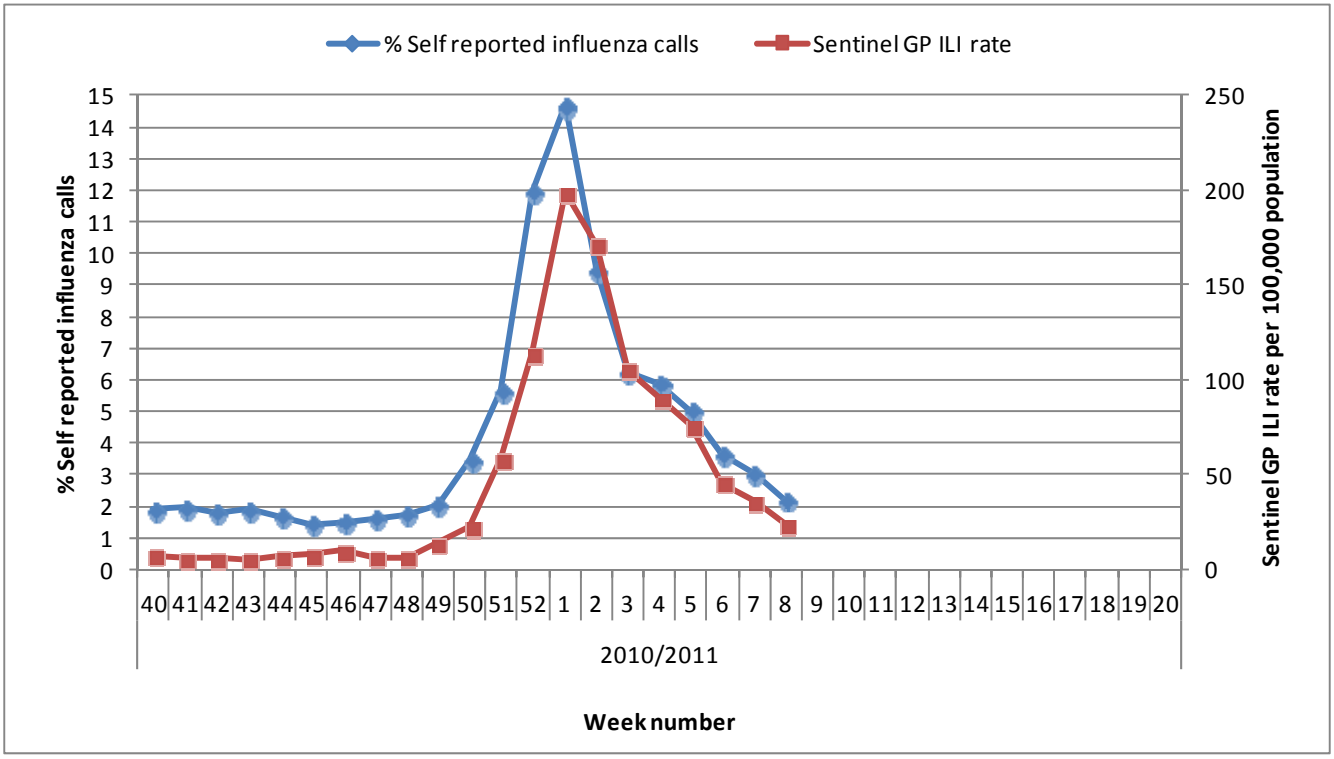

Figure 7: Self reported influenza-related calls as a proportion of total calls to Out-of-Hours GP Co-ops and national sentinel GP ILI consultation rate per 100,000 population by week for the 2010/2011 season
Source: GP Out-Of-Hours services in Ireland (collated by HSE-NE) & ICGP.

5. Influenza notifications (CIDR)

As of 2nd March 2011 (09:00), 2167 confirmed influenza cases were notified on CIDR for the 2010/2011 influenza season. Laboratory confirmed influenza cases notified on CIDR include all positive influenza specimens reported from all laboratories testing for influenza and reporting to CIDR. Currently, the NVRL is the only laboratory subtyping positive influenza A specimens for *all* influenza A subtypes. Of the 2167 confirmed influenza cases, 1321 (61.0%) were confirmed influenza A (H1N1 2009), 21 (1.0%) were influenza A (H3), 201 (9.3%) were influenza A (unsubtyped), 624 (28.8%) were influenza B cases. It should be noted that data for week 9 2011 are incomplete and only include notified cases as of Wednesday 2nd March 2011 (09:00).

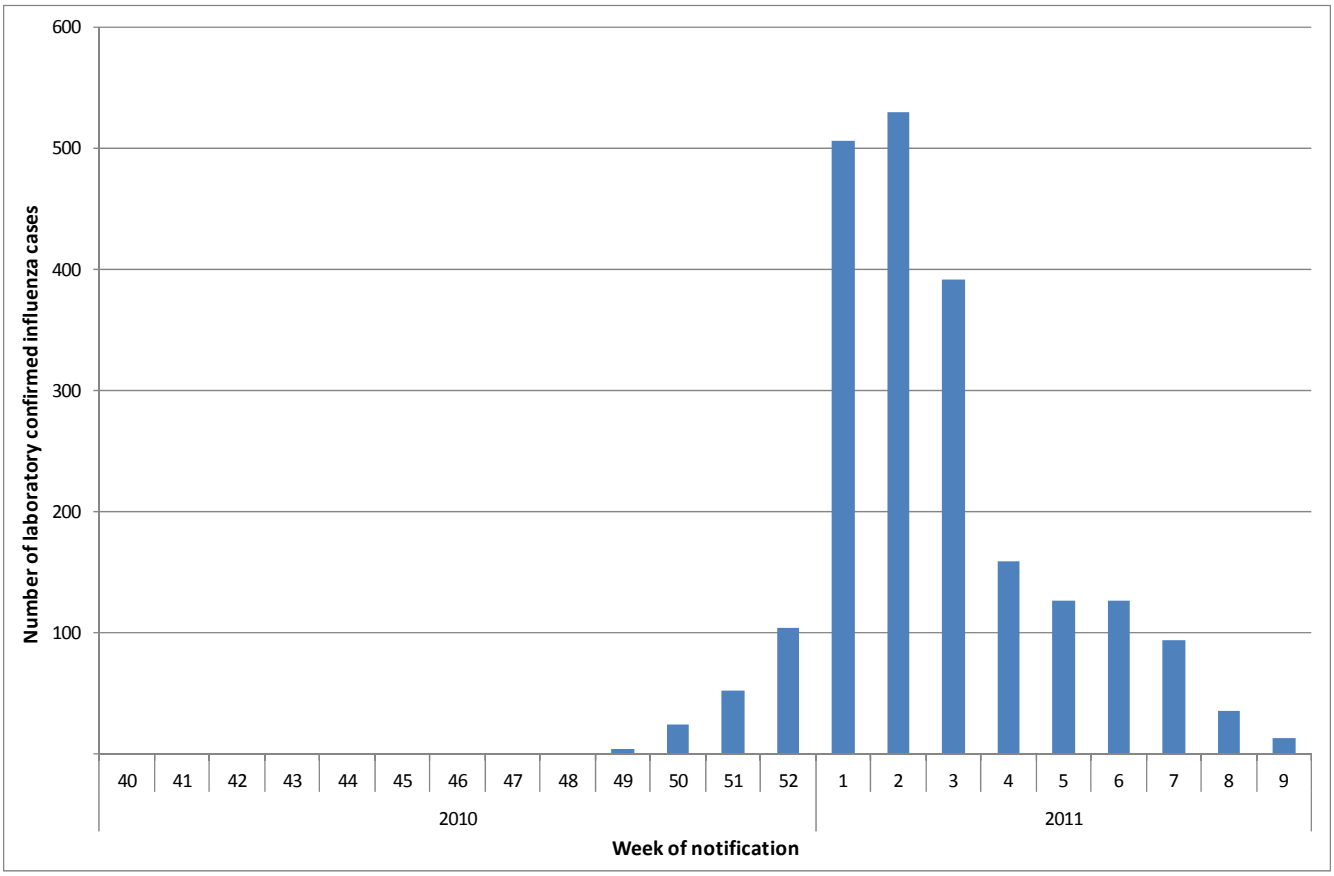

**Figure 8: Number of laboratory confirmed influenza cases by week of notification on CIDR for the 2010/2011 influenza season. ****It should be noted that data for week 9 2011 are incomplete and only include notified cases as of 2nd March 2011 (09:00). Source: CIDR 02/03/2011 09:00*

Nine hundred and twenty two (42.5%) of the 2167 confirmed influenza cases notified this influenza season were hospitalised (i.e. these cases were recorded on CIDR as hospital inpatients) (figure 9). Of the 922 hospitalised cases, 598 (64.9%) were influenza A (H1N1 2009) cases, 7 (0.8%) were influenza A (H3) cases, 109 (11.8%) were influenza A (unsubtyped) and 208 (22.6%) were influenza B cases. The weekly number of hospitalised cases of influenza decreased in week 8 2011 to 12, compared to 32 in the previous week. Nine of the 12 influenza cases admitted to hospital during week 8 2011 were positive for influenza B, two were positive for influenza A (H1N1 2009) and one was positive for influenza A (unsubtyped).

The highest cumulative age specific rate for influenza confirmed hospitalised cases for the 2010/2011 influenza season to date is currently in the 0-4 year age group (59.6 per 100,000 population) (table 3). It should be noted that age was unknown for one hospitalised case.

To date this season, 80 (3.7%) of the 2167 laboratory confirmed influenza cases were reported as pregnant. Fifty-one (63.8%) of these cases were reported as hospitalised: 43 influenza A (H1N1 2009), 2 influenza A (unsubtyped) cases and 6 influenza B cases.[‡‡]

[‡‡] It should be noted that information on pregnancy is not completed for all cases.

	Hospitalised		Admitted to ICU	
Age (years)	Number	Age specific rate per 100,000 population	Number	Age specific rate per 100,000 population
0-4	180	59.6	12	4.0
5-14	89	15.8	2	0.4
15-24	101	16.0	3	0.5
25-34	170	23.5	21	2.9
35-44	97	15.6	18	2.9
45-54	87	16.7	23	4.4
55-64	99	24.3	25	6.1
65+	98	20.9	17	3.6

Table 3: Age specific rate per 100,000 population by age group (years) for all influenza confirmed hospitalised cases and cases admitted to ICU for the 2010/2011 influenza season to date. *Source: CIDR and ICU enhanced surveillance system 02/03/2011 09:00*

6. Intensive Care Society of Ireland (ICSI) enhanced surveillance of all critical care patients with confirmed influenza

The Intensive Care Society of Ireland (ICSI) are continuing with the enhanced surveillance system, set up during the 2009 pandemic, on all critical care patients with confirmed influenza, and notify any cases to HPSC, who process and report on this information on behalf of the regional Director of Public Health/Medical Officer of Health.

As of 2nd March 2011 (09:00), HPSC has been notified of 121 hospitalised patients admitted to critical care units with confirmed influenza, 107 of whom are adults and 14 are paediatric cases. Thirteen (10.7%) of the 121 cases are currently in ICU[§§]. Ninety of the 121 (74.3%) cases have underlying medical conditions, 81 adults and nine paediatric cases. The underlying medical conditions include: chronic respiratory disease, chronic heart disease, immunosuppression, pregnancy, metabolic disorders and morbid obesity.

The age specific rates for all cases admitted to ICU are detailed in table 3 above. The number of confirmed influenza hospitalised cases by ICU status and by week of notification on CIDR for the 2010/2011 influenza season is detailed in figures 9. The number of adult and paediatric ICU admissions for confirmed influenza cases by date of first admission to ICU is detailed in figure 10.

[§§] This information is based on the enhanced surveillance data.

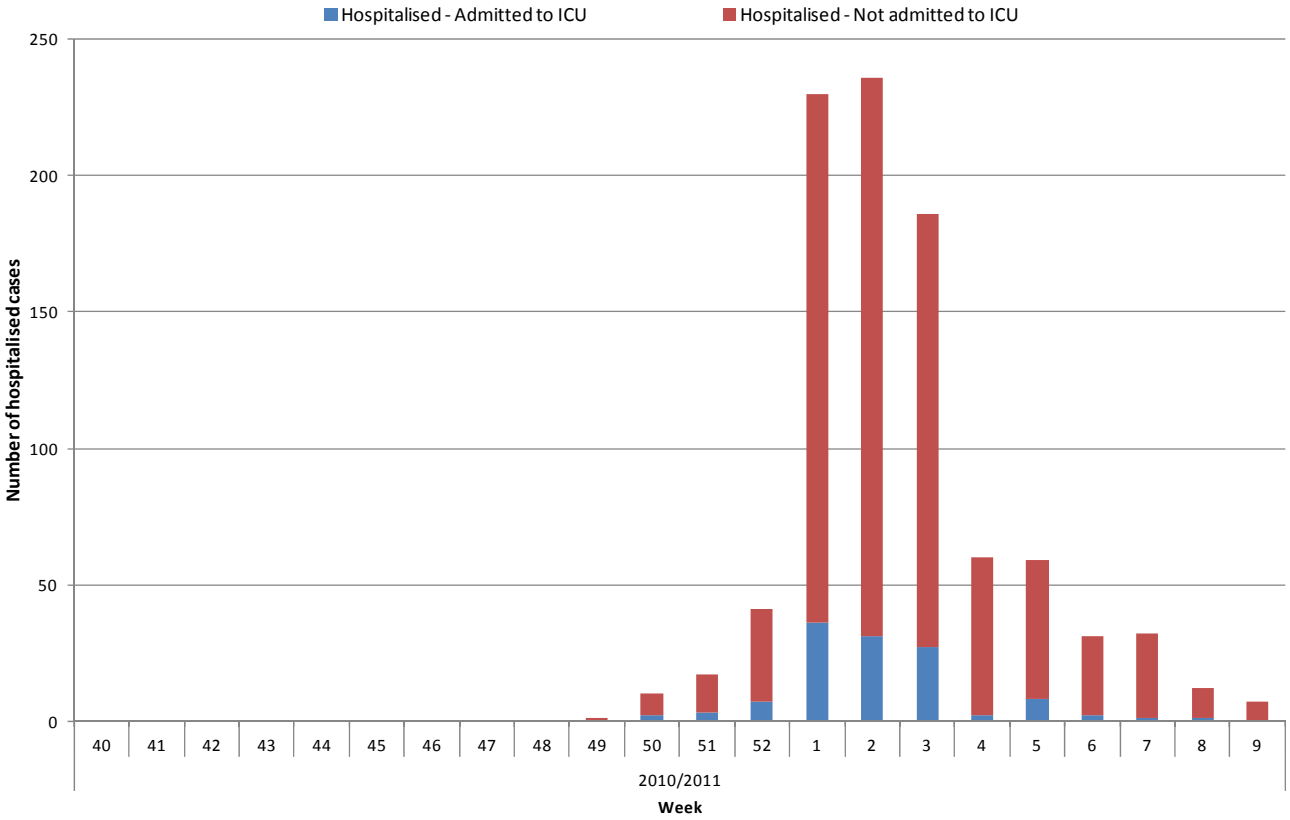

Figure 9: Number of confirmed influenza hospitalised cases by ICU status by week of notification on CIDR for the 2010/2011 influenza season. *It should be noted that data for week 9 2011 are incomplete and only include notified cases as of 2nd March 2011 (09:00). Source: CIDR and ICU enhanced surveillance system 02/03/2011 09:00*

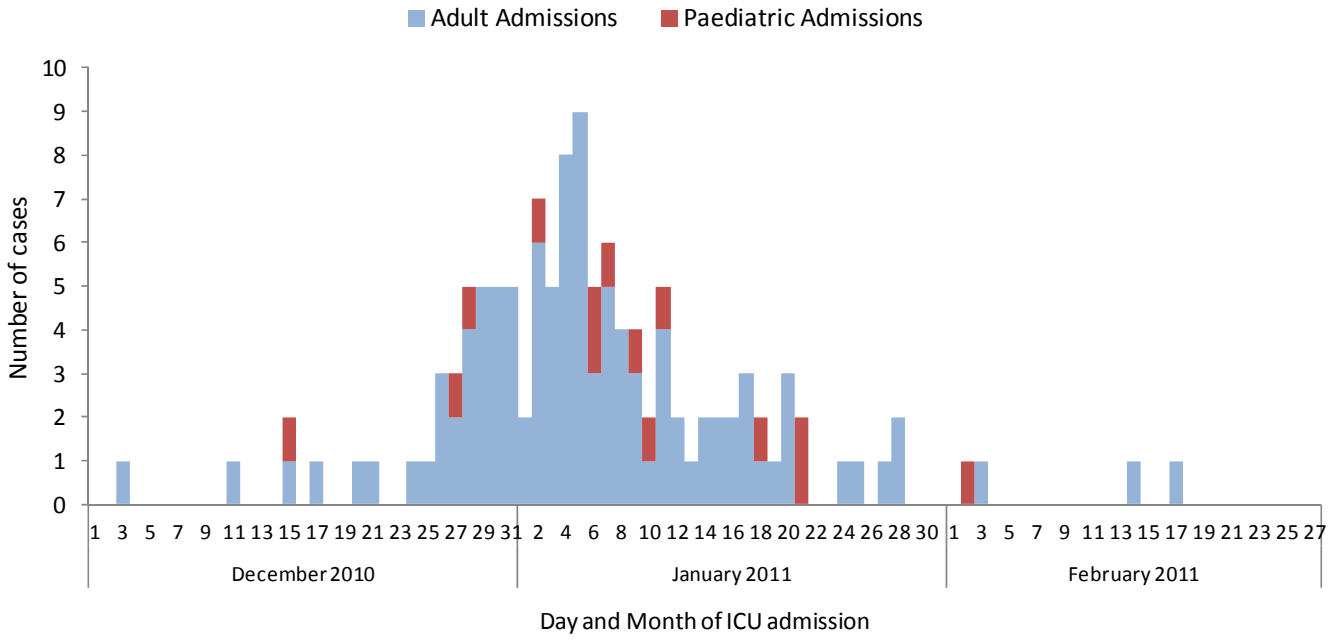

Figure 10: Number of confirmed influenza hospitalised adult and paediatric cases admitted to ICU, by date of first admission to ICU, for December 2010 - March 2011 to date (n=121). *Source: ICU enhanced surveillance system 02/03/2011 09:00*

7. Mortality surveillance

HPSC has been informed of 23 influenza associated deaths to date this season (as of 02/03/2011), 18 influenza A (H1N1 2009), one co-infection of influenza A (H1N1) and influenza B, one influenza A (unsubtyped) and three influenza B. One death was in a patient in the 0-4 year age group, 16 patients were in the 15-64 year age group and six patients were aged 65 years and older. Twenty-one deaths occurred in patients with underlying medical conditions. One death occurred in week 52 2010, two in week 1 2011, five in week 2 2011, six in week 3 2011, four in week 4 2011, four in week 5 2011 and one in week 6 2011. Table 4 outlines the influenza associated deaths by HSE-Area for the 2010/2011 influenza season to date.

Table 4: Influenza associated deaths in laboratory confirmed influenza cases by HSE-Area for the 2010/2011 influenza season to date. *Source: Deaths reported to HPSC as of 02/03/2011 09:00*

HSE Area	Influenza Deaths
HSE-E	12
HSE-M	1
HSE-MW	0
HSE-NE	2
HSE-NW	3
HSE-SE	2
HSE-S	2
HSE-W	1
Total	**23**

8. Outbreak surveillance

No new outbreaks of influenza/ILI have been reported since week 5 2011. To date this season, (as of 2nd March 2011 09:00), 14 general outbreaks of ILI/influenza/influenza A (H1N1 2009) were reported to CIDR: eight ILI outbreaks, five influenza A (H1N1 2009) outbreaks and one outbreak associated with both influenza A (H1N1 2009) and influenza B. One outbreak was reported in week 49 2010, two in week 50 2010, four in week 51 2010, three in week 2 2011, three in week 4 2011 and one in week 5 2011. Five outbreaks were reported from HSE-E, seven from HSE-S and two from HSE-W. Two outbreaks were in healthcare settings (one of which was a maternity hospital), seven in schools, one in a community setting, one in a residential institution, one in a prison, one travel related outbreak and one outbreak reported as 'Other' setting.

9. International summary

United Kingdom

Influenza activity continued to decline in the UK during week 7 2011. GP consultation rates were below baseline levels in England, Wales, Scotland and Northern Ireland. All influenza types were reducing, with influenza B remaining the predominant virus; influenza A (H1N1 2009) continued to circulate, with very few, sporadic influenza A (H3N2) virus detections. The A (H1N1 2009) virus strain is virologically and epidemiologically similar to that seen during the pandemic. The virus strains circulating are overall well matched to the current influenza vaccine. In week 7 2011, the weekly ILI consultation rate decreased in England (12.1 per 100,000), Wales (6.2 per 100,000), Northern Ireland (29.2 per 100,000) and Scotland (41.2 per 100,000). The weekly national proportions of NHS Direct calls for cold/flu and fever decreased. No acute respiratory disease outbreaks were reported in the UK in week 7, bringing the total reported this season to 170. Ten of 55 (18.2%) specimens from ILI patients presenting to sentinel GPs in England in week 7 2011, were positive for influenza. The proportion of specimens reported to Data Mart (England) as positive for influenza

decreased to 4.8% (43 of 892). The proportion of positive samples decreased for rhinovirus and remained stable for parainfluenza. Slight increases in positivity were reported for RSV, human metapneumovirus and adenovirus. Since week 36 2011, 523 confirmed UK deaths associated with influenza infection have been reported. Following the excess all-cause mortality observed over the Christmas period, excess mortality remains below the upper limit of expected levels for this time of year in week 6 2011.
http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/SeasonalInfluenza/

Europe

Most European countries reported medium ILI/acute respiratory infection (ARI) consultation rates and widespread activity. Decreasing ILI/ARI trends were reported by 17 countries. The proportion of influenza virus-positive sentinel specimens has gradually decreased to 40% after peaking in week 52 2010 at 57%. In week 7 2011, 66% of influenza virus detections in week 7 2011 were type A and 33% were type B. More than 98% of subtyped influenza A viruses were A (H1N1 2009). Six countries reported influenza B virus as the dominant circulating influenza virus. Numbers of influenza infections with severe outcome have decreased in western European countries (Denmark, France, the Netherlands, Ireland, Spain and the UK) and increased considerably in Greece in recent weeks. Since week 40 2010, 1993 influenza viruses from sentinel and non-sentinel specimens have been characterised antigenically: 1103 (55%) as A/California/7/2009 (H1N1)-like; 92 (5%) as A/Perth/16/2009 (H3N2)-like; 735 (37%) as B/Brisbane/60/2008-like (Victoria lineage); and 63 (3%) as B/Florida/4/2006-like (Yamagata lineage). Ireland, Italy, Norway, Spain and the UK have reported antiviral resistance data to ECDC. To date this season, 30 (4.0%) of 743 influenza A (H1 2009) viruses tested for susceptibility to neuraminidase inhibitors were resistant to oseltamivir, but remained sensitive to zanamivir. All the resistant viruses carried the H275Y substitution. Eight of 24 resistant viruses, from patients for which exposure to antivirals was known, were from patients that had not been treated with oseltamivir.
http://ecdc.europa.eu/en/healthtopics/influenza/epidemiological_data/Pages/Weekly_Influenza_Surveillance_Overview.aspx

USA

During week 7 2011, influenza activity in the United States remained elevated. The proportion of ILI outpatient visits was 4.9%, which is above the national baseline of 2.5%. Of the 9,154 specimens tested, 2,866 (31.3%) were positive for influenza: 585 A (H1N1 2009), 755 A (H3), 883 A (unsubtyped) and 642 B. The proportion of deaths attributed to pneumonia and influenza was above the epidemic threshold for the fourth consecutive week. Six influenza-associated paediatric deaths were reported bringing the season total to 41. Three of these deaths were associated with influenza B, one with influenza A (H3), one with influenza A (H1N1 2009) and one was associated with an influenza A virus for which the subtype was not determined. http://www.cdc.gov/flu/weekly/

Canada

In week 7 2011, there was an increase in overall influenza activity level, with 62.5% (35/56) of regions reporting localised influenza activity. There was a substantial increase in the number of outbreaks reported during this period. The proportion of positive influenza detections overall decreased slightly, though the ILI consultation rate remained similar to the previous week. Since the beginning of the season, 86.3% of the subtyped positive influenza A specimens have been influenza A (H3N2). In week 7 2011, influenza A (H1N1 2009) detections increased to 8% of positive influenza detections, while the proportion of influenza B detections remained stable at 10%. http://www.phac-aspc.gc.ca/fluwatch/index-eng.php

Worldwide (WHO)

The WHO Global Influenza Programme monitors influenza activity worldwide and publishes an update every two weeks. As of February 25th 2011, transmission in tropical zones of the world was sporadic (the Americas) or low (tropical Asia). Countries in the southern temperate zone reported little influenza activity; however Australia continued to report transmission of influenza A at low levels. The majority of the viruses characterised from North America and Europe are closely related to the vaccine viruses for the current

seasonal vaccines, though small numbers of influenza type B of the Yamagata lineage are reported in both regions. http://www.who.int/csr/disease/influenza/en/

Avian influenza

As of 2nd March 2011, 526 confirmed human cases of avian influenza A (H5N1) and 311 (59.1%) deaths have been reported to WHO from 15 countries since 2003. The latest confirmed cases were reported from Indonesia and Egypt. In Indonesia, a 26 year old female developed symptoms on 30th January, was hospitalised and treated with oseltamivir, but died on 8th February 2011. On 28th February 2011, the Ministry of Health in Egypt announced three new confirmed cases of human infection with avian influenza A (H5N1) virus, one of which died. Investigations into the source of infection indicate that all cases had exposure to poultry (suspected of avian influenza infection). http://www.who.int/csr/disease/avian_influenza/en/index.html

8. Northern hemisphere influenza vaccine for the 2011/2012 season:

Following a WHO Consultation, it is recommended that vaccines for use in the 2011/2012 influenza season (northern hemisphere) contain the following viruses:

- an A/California/7/2009 (H1N1)-like virus;
- an A/Perth/16/2009 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus.

http://www.who.int/csr/disease/influenza/recommendations_2011_12north/en/index.html

9. Northern hemisphere influenza vaccine for the 2010/2011 season:

For the 2010/2011 influenza season in the Northern Hemisphere, the members of the WHO Collaborating Centres on Influenza have recommended that seasonal influenza vaccines contain the following strains:

- an A/California/7/2009 (H1N1)-like virus
- an A/Perth/16/2009 (H3N2)-like virus
- a B/Brisbane/60/2008-like virus

http://www.who.int/csr/disease/influenza/recommendations2010_11north/en/index.html

Further information on influenza in Ireland and internationally can be found on the following websites:

Ireland	www.hpsc.ie
Northern Ireland	http://www.cdscni.org.uk/
Europe – ECDC	http://ecdc.europa.eu/
Europe – EISN	http://ecdc.europa.eu/en/activities/surveillance/EISN/Pages/home.aspx

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