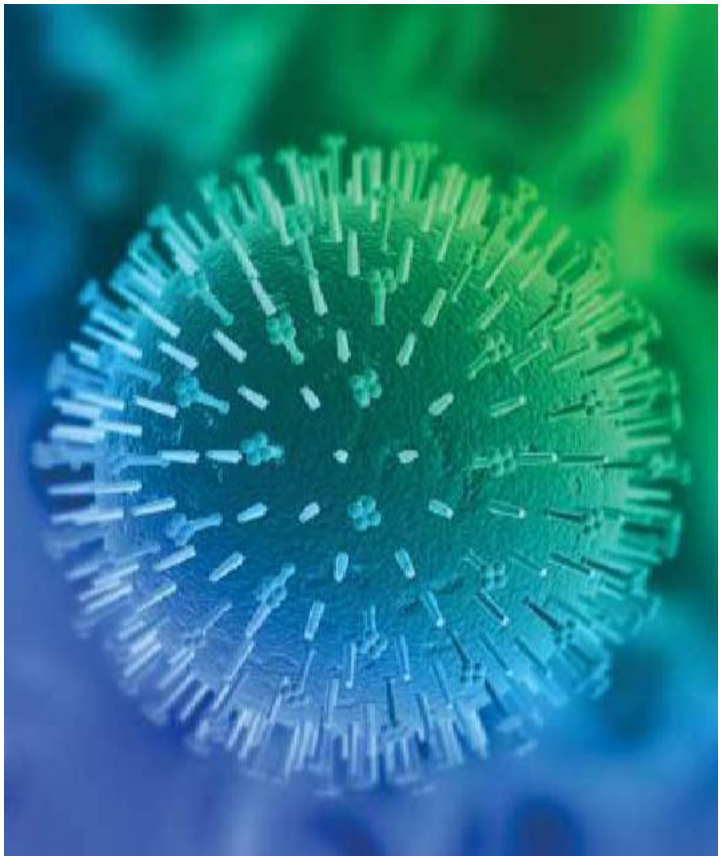
Surveillance of influenza in Northern Ireland
2011-2012



Summary:

The influenza season started later than normal, clinical indices began to increase marginally in mid-February, much later than previous seasons, and activity remained very low throughout, with community syndromic indicators not reaching the baseline warning threshold during the season. The peak GP influenza-like illness consultation rates in 2011/12 were the lowest since surveillance began in Northern Ireland in 2000. No one age-group appeared predominantly affected, with low levels of activity in all age groups, however, GP consultation rates increased in both children and adults.

Influenza A (H3) was the predominant strain of the virus circulating, with small numbers of the influenza B strain circulating later in the season. Unlike the 2010/11 season when Influenza A (H1N1)2009 strain dominated in Northern Ireland, there were no detections of this subtype in 2011/12; virological activity generally corresponded to clinical activity.

There were however, patients with confirmed influenza admitted to Intensive care units, across Northern Ireland during the season. Numbers were low, the average age of these patients increased compared with the previous season and one fatality was reported in this group.

The proportion of over 65 year olds who received the 2011/12 seasonal influenza vaccine was 77.0%, and in those in a clinical risk group aged under 65 years was 81.7%, both of these vaccination uptake figures were a slight increase on the previous year. Influenza vaccine uptake in frontline healthcare workers also increased marginally this season to 20.8%, as did the proportion of pregnant women vaccinated during the season.

Introduction:

This report describes influenza activity in Northern Ireland in the 2011/12 winter season period. In Northern Ireland, the activity of influenza and other respiratory viruses is monitored by the Public Health Agency (PHA). Data are collated from a number of surveillance systems to provide information on types and extent of influenza strains circulating in the region. Outputs from the surveillance activities produce timely reports to inform health professionals, the media and the public, on influenza activity trends and uptake of the seasonal influenza vaccine. Surveillance is carried out all year; however, the focus in this report is primarily on the winter season (October (week 40) to May (week 20)) activity.

Sources of data:

Sentinel GP surveillance:

In 2011/12, data were reported weekly by age group on clinical consultations for influenza and influenza-like ('flu/FLI) illness and acute respiratory infections, from 37 sentinel GP practices across Northern Ireland. Together, these practices account for 11.6% of the population. Thirty-two of the 37 practices agreed to participate in enhanced virological surveillance during the winter period, taking nasal and throat swabs of a sample of patients presenting with clinical influenza.

To aid interpretation of GP consultation rates and comparison with previous years, a provisional threshold 'flu/FLI rate of 70/100,000 population has been established to distinguish baseline from seasonal influenza activity

Out-of-Hours centres:

Automated data extractions on clinical consultations for 'flu/FLI and Acute Respiratory Infections (ARI) by age groups were collected weekly from all Out-of Hour (OOH) centres across the region, covering the entire population of Northern Ireland. This data supplements the GP in-hours surveillance programme.

Virological surveillance:

Respiratory samples accompanied with demographic and epidemiological information about the patient are sent from primary care sentinel practices (and from other non-sentinel sources) to the Regional Virology Laboratory (RVL) for testing. Specimens are tested by PCR for influenza and other respiratory virus infections. Number of specimens tested refers to the date the specimen was received by the laboratory. This year sentinel samples were tested for influenza A, and its main subtypes, influenza B, RSV, mycoplasma pneumoniae and metapneumovirus. Non-sentinel samples are tested for the above, and pending laboratory workload may or may not be tested for bocavirus, coronavirus, parainfluenza, respiratory adenovirus and rhinovirus. However, due to the variation in testing methods for other respiratory viruses only RSV is reported in this report. The RVL also sends a subsample of influenza specimens to the Health Protection Agency, Respiratory Virus Unit (RVU) annually during the winter influenza season for antiviral resistance monitoring and further strain identification.

Mortality and morbidity data:

The Northern Ireland Statistics and Research Agency (NISRA) provides weekly mortality data to the PHA on total number of deaths from all causes and number of deaths from selected respiratory infections (some of which may be attributable to influenza, and other respiratory infections or complications thereof) registered each week in Northern Ireland. This is not necessarily the same as the number of deaths

occurring in that period. Searches of the medical certificates of the cause of death are performed using a number of keywords that could be associated with influenza (bronchiolitis, bronchitis, influenza and pneumonia). Death registrations containing these keywords are presented as a proportion of all registered deaths.

Mandatory ICU surveillance scheme:

Northern Ireland participated in the national mandatory ICU surveillance scheme, reporting the aggregate number of admissions and fatal cases of patients admitted to ICU/HDU with confirmed influenza, from the five Health and Social Care Trusts (HSCT). The Critical Care Network for Northern Ireland reported this data weekly to the PHA. 2011/12 was the first season of this new component of the influenza surveillance programme.

Vaccine uptake monitoring:

The Joint Committee on Vaccination and Immunisation (JCVI) recommended that all those aged 65 years and over, and those aged between 6 months and less than 65 years and falling into a clinical at-risk group, be offered the seasonal 2011/12 trivalent influenza vaccine. Pregnant women were also included in the recommendation for seasonal vaccination, being vaccinated this season by their GPs. Healthcare workers were also recommended for vaccination.

For winter 2011/12 the Department of Health, Social Services and Public Safety Northern Ireland (DHSSPSNI), raised the regional target of influenza immunisation uptake for the under 65 “at risk” group from 60% to 70%. As in the 2010/11 season the uptake target for those aged 65 and over remained at 75%.

The Public Health Agency, in liaison with influenza immunisation co-ordinators in primary care, the Health and Social Care Board and Trusts in Northern Ireland, collates influenza immunisation statistics at intervals over the winter.

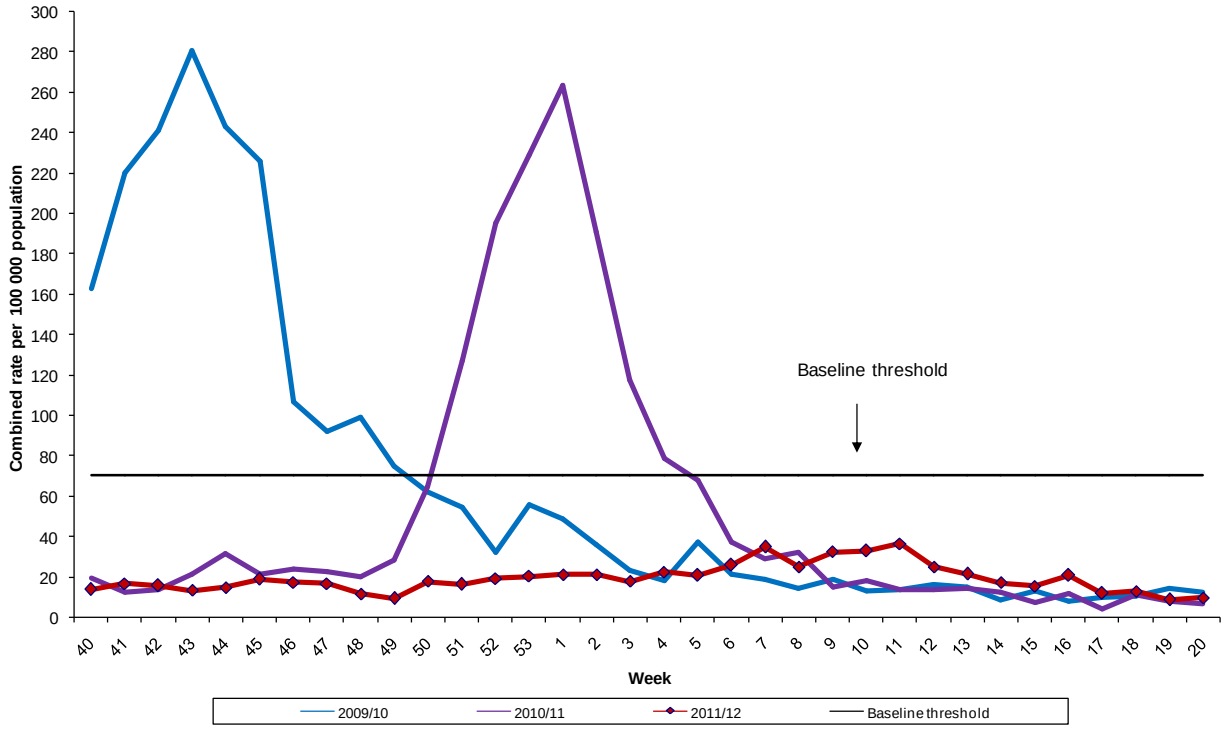
Enhanced influenza surveillance system results:

GP clinical ‘flu/FLI surveillance:

The GP sentinel consultation rate for ‘flu/FLI did not exceed the provisional baseline level of 70 consultations per 100,000 during the 2011/12 flu season. Similar to elsewhere in the UK, influenza activity remained low throughout the season and started later than normally seen in previous years. Influenza rates started to increase after week 5 (05 February 2012), peaking at 36.3 per 100,000 population in week 11 (ending 18 March 2012) after which rates continued to decrease. This is compared to a peak of

263.5 per 100,000 in week 1 2010/11. From week 9 (ending 04 March 2012) to week 20 (ending 20 May 2012) rates were higher than the same weeks last year (Figure 1).

Figure 1. Sentinel GP consultation rate for combined flu and flu-like illness 2009/10-2011/12

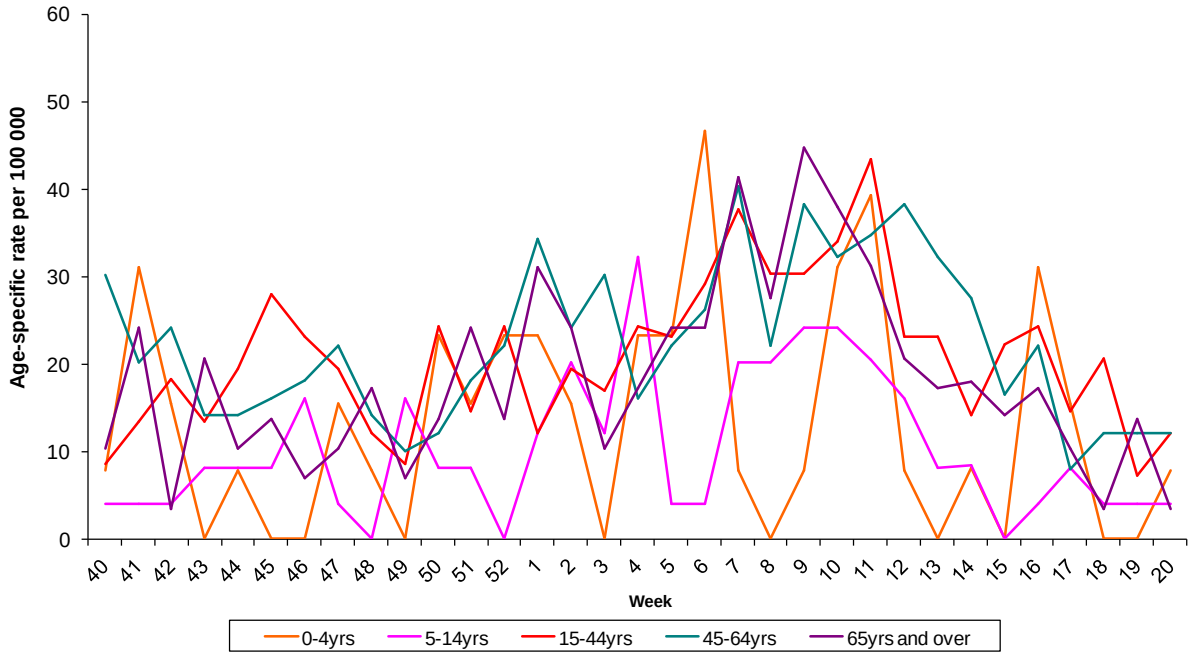


The highest age specific rate in Northern Ireland was observed in the 1-4 year age group at 57.1 per 100,000 in week 6 (ending 12 February 2012), with the lowest age-specific peak rate in the 5-14 year olds at 32.2/ 100,000. Over 65 year olds were also affected with the highest rate in this age group being in week 9 (ending 04 March 2012) at 44.8 per 100,000 population. The 15-44 year age group peaked at 43.4/100,000 in week 11 (ending 18 March) (Figure 2).

The highest rates in 2011/12 in England and Wales were also in the 1-4 year olds; however, rates in Scotland were highest in the 45-64 year olds.

Figure 2. Sentinel GP age-specific consultation rates for combined flu and flu-like

illness from weeks 40 -20, 2011/12



Out-of-Hours (OOH) Centres

Out-of-Hours centres 'flu/FLI call rates remained low throughout the season. With the exception of holiday periods when the GP surgeries in-hours were closed and peaks were seen approximating to 11/100,000, the highest peaks outside this period were 8.1/100,000 and 8.2/100,000 in week 6 and week 10, respectively. The highest age-specific rate was in the 0-4 year age-group at 16.4/100,000 in week 7 (ending 19 February 2012).

Total call rate peaks throughout the season occurred during the holiday periods of Christmas / New Year, St. Patrick's day and Easter when GP practices are closed. The overall proportion of total calls for 'flu or flu-like illness also remained low with proportions peaking at 1.4% in week 12 (ending 25 March 2012) This is much lower than in 2010/11 where a peak of 11.1% was seen in week 1, 2011. The 15-44 year age-group had the highest proportion of consultations peaking at 2.4% also occurring in

week 12 (Figures 3 and 4). (DN: is it worth including the graph from 10/11 highlighting the difference between 10/11 and 11/12?)

Figure 3. OOH consultation rate for combined flu and flu-like illness 2009/10-2011/12

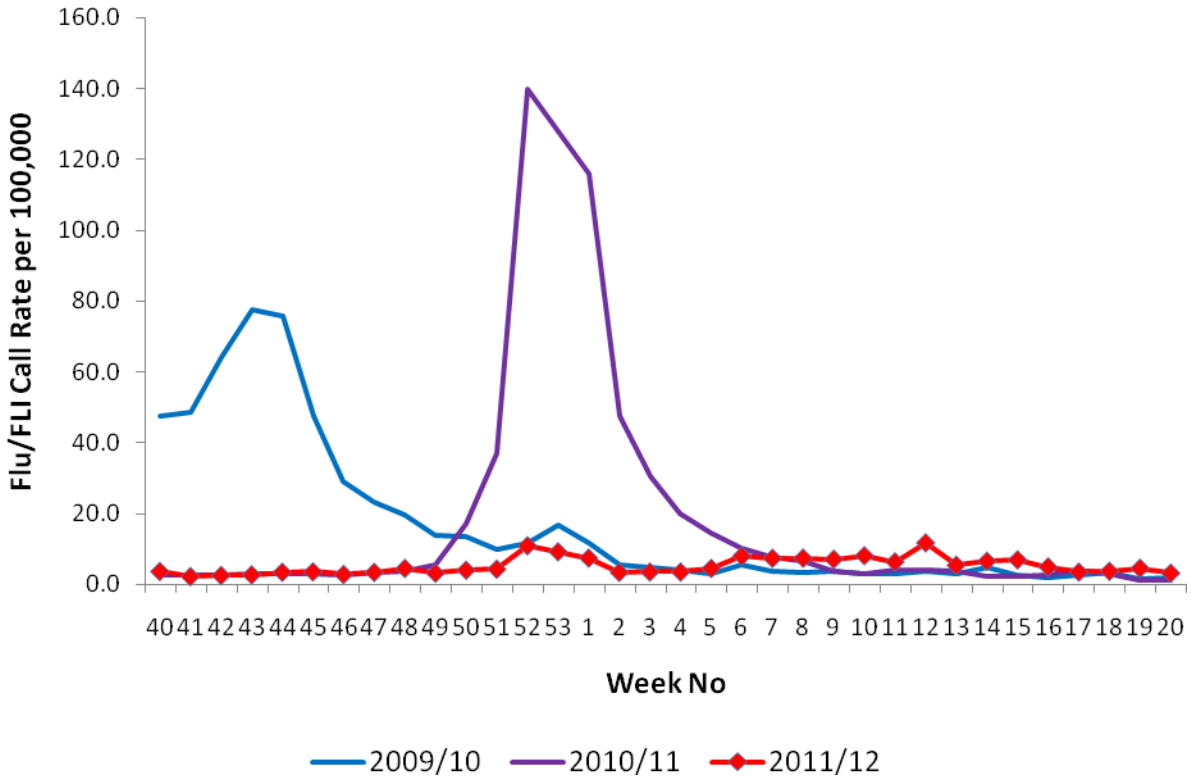
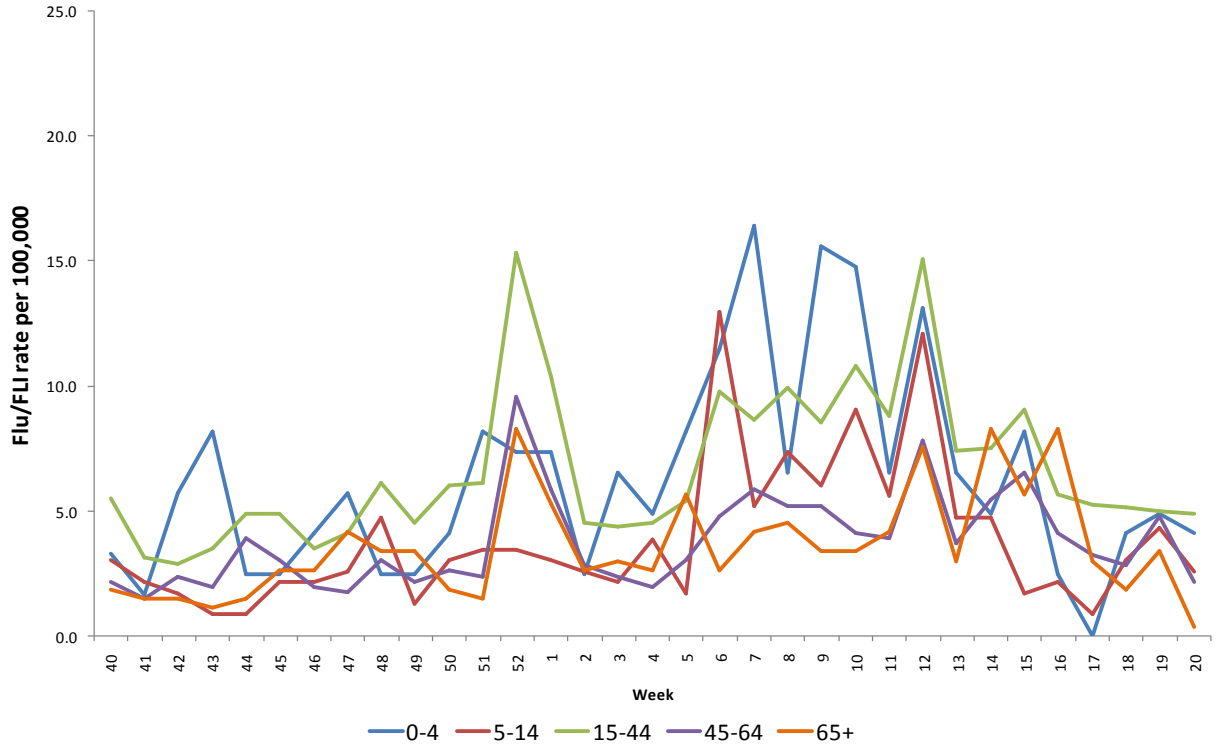


Figure 4. OOH call rates of flu and flu-like illness by age-group from weeks 40- 20 2011/12



Virus activity in Northern Ireland:

The dominant circulating virus was Influenza A (H3), with 90% (n=208) of all Influenza positives being of this type, 7% (n=16) were Influenza B and the remaining 3% (n=7) were Influenza A sub type not known.

The proportion of samples positive (all sources) for influenza began increasing from week 52 (ending 01 January 2012) with an initial peak of 18.9% (23/122 tests) in week 10 (ending 11 March 2012) followed by a decrease in positivity levels until week 14 (ending 08 April 2012) when positivity levels peaked for the season at 29.8% (36/121 tests). (Figure 5).

From week 40 (ending 09 October 2011) to week 20 (ending 20 May 2012) an estimated 173 samples were tested from samples taken by GPs in the sentinel scheme of which 14 (8%) tested positive for influenza. Of these 14 samples 86% (n=12) were positive for influenza A (H3), with the two additional positive samples being influenza B

and Influenza A (untyped), respectively. The number of tests and positivity rate is much lower than the same period last year, when 365 sentinel samples were tested of which 39% were positive for influenza.

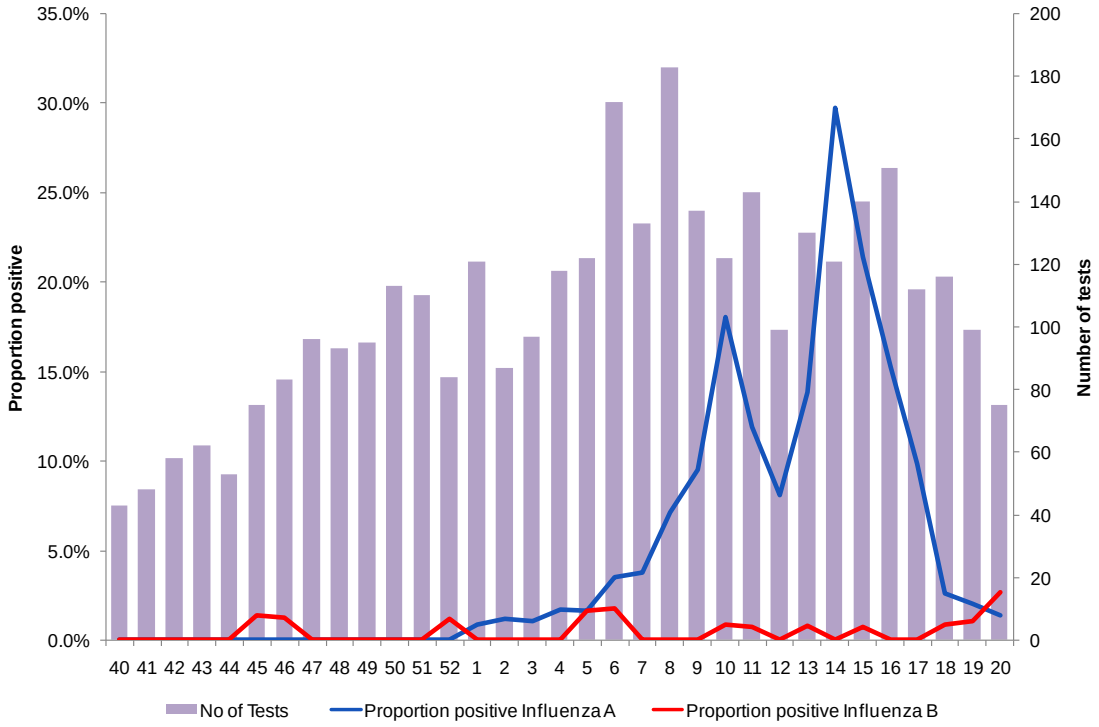
Numbers tested and positivity levels were also low from GP sentinel surveillance schemes elsewhere in the UK, with 13% (320/2,458 tests) positivity in England and 7.1% (6/85 tests) positivity in Wales.

An estimated 3,318 samples were tested in Northern Ireland from non-sentinel sources during the same period of which 217 (7%) tested positive for influenza. Of these 217 samples 90% (n=196) were positive for influenza A (H3) and 7% (n=15) were positive for influenza B with the remaining 6 samples positive for Influenza A, subtype not known. This compares with a positivity level of 19% (892/4736 samples) from non-sentinel sources last year.

The first flu detection of the season was Influenza B in week 45 (ending 13 November 2011), with the first Influenza A (H3) detection in week 1 (ending 08 January 2012). The median age for influenza A (H3) and influenza B was 52 and 17 years, respectively.

Of note there were no detections of influenza A (H1N1)pdm09 reported during the seasonal influenza reporting period in Northern Ireland.

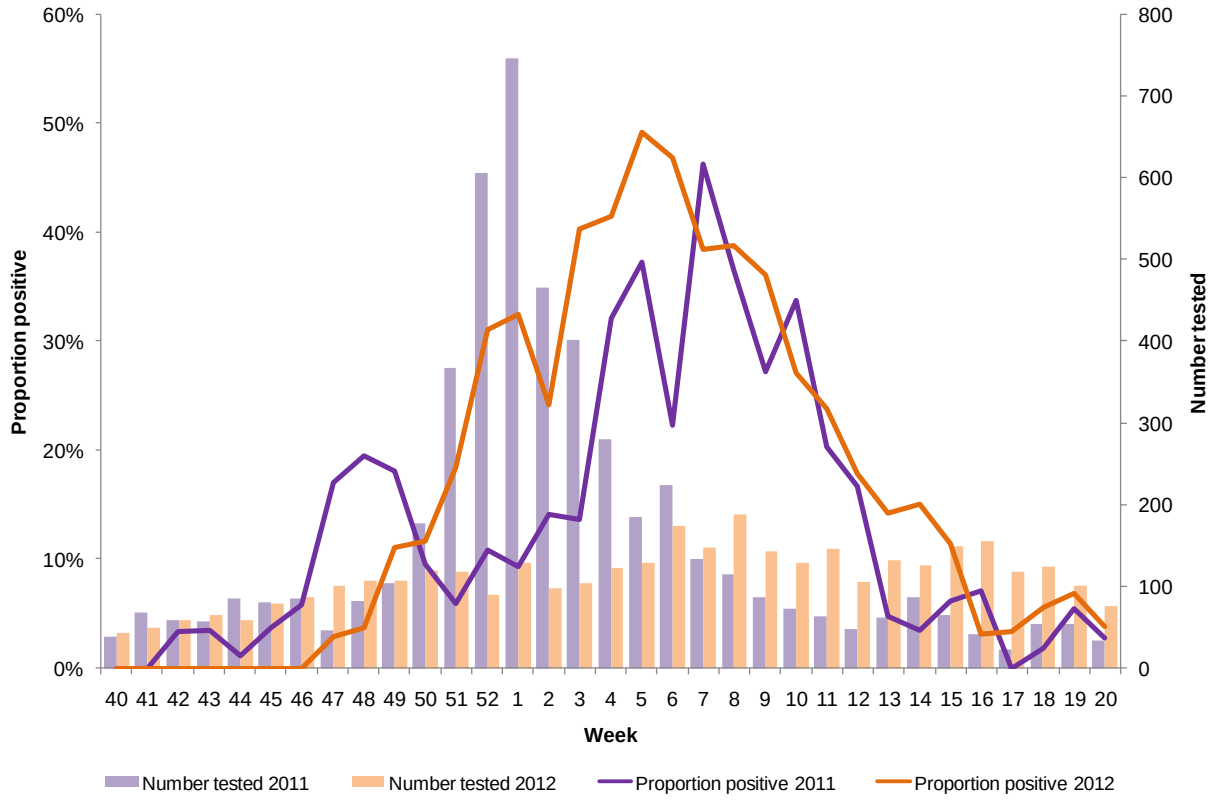
Figure 5: The number of samples tested (all sources) for influenza in Northern Ireland from weeks 40-20, 2011/12 with the proportion positive.



Other respiratory viruses:

The most frequently reported respiratory virus this season was RSV. There were 740 RSV detections reported from week 40 to week 20 2011/12, giving a positivity of 20% (740/3699). The principal activity period for RSV was from week 3 (ending 22 January 2012) to week 9 (ending 04 March 2012), with numbers of detections peaking in week 6 (ending 12 February 2012) (Figure 6). The majority (91%) of RSV detections were in the 0-4 year age group.

Figure 6: Number of samples tested for RSV and proportion positive in Northern Ireland 2010/11 and 2011/12.



Antiviral resistance

A subset of influenza specimens from a cross section of patients are sent annually from the RVL in Belfast to the HPA Respiratory Virus Unit for molecular characterisation including antiviral testing for the marker commonly associated with resistance to oseltamivir in influenza viruses. Of the samples sent from Northern Ireland for testing, this season no cases were found to be resistant to oseltamivir.

Outbreaks:

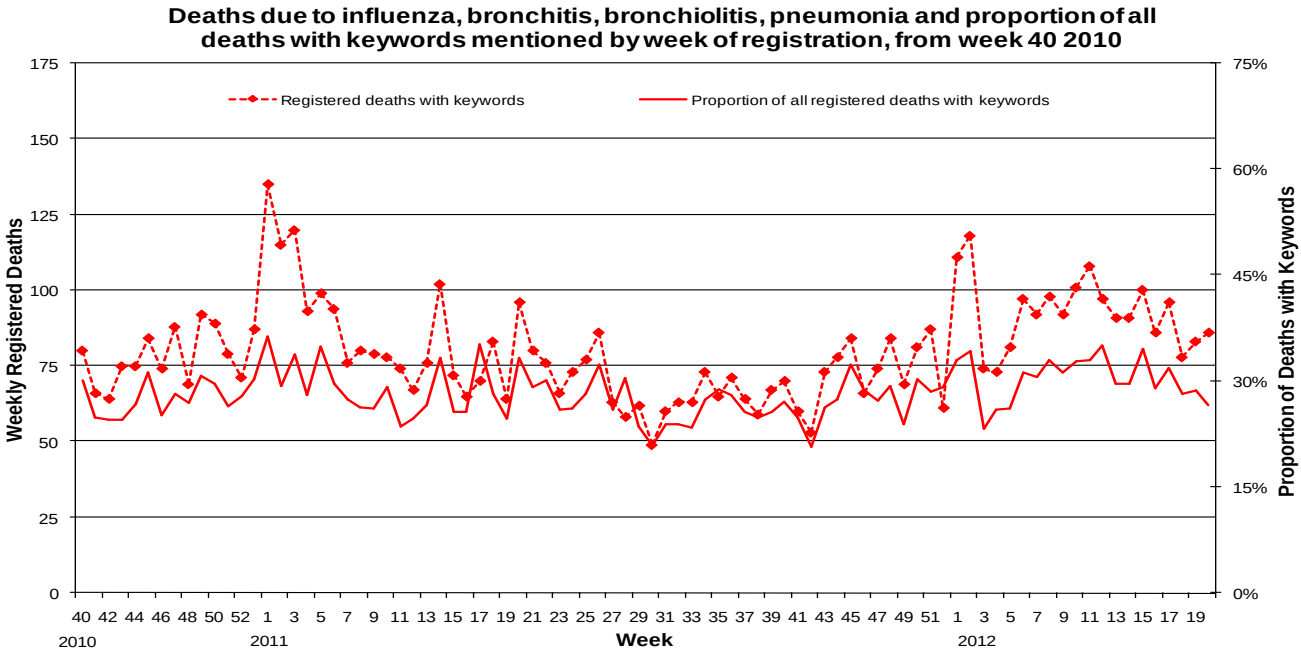
A total of 14 respiratory related outbreaks were reported to the Public Health Agency from week 14 (02 April, 2012) to week 20 (15 May, 2012), all of which were from care homes. Of the 14 outbreaks reported 10 had influenza A (H3) detected. Vaccine coverage among residents in the affected homes was generally high, with 79% (range 20- 100%) of cases in the 10 confirmed outbreaks receiving the seasonal influenza vaccine.

A total of five fatalities were reported, which occurred in three of the outbreaks, however, not all fatalities were attributable to influenza. The majority of these cases had received the seasonal influenza vaccine.

Mortality and morbidity monitoring:

Total weekly registered deaths due to respiratory causes were highest in week 2, with the proportion of registered deaths due to such conditions peaking at 35% in week 12. This was after the sentinel consultation rates peaked (week 11) for 'flu/FLI. Overall, the proportion of total registered deaths with respiratory keywords for the 2011/12 flu season was similar to the previous year's flu season at 29%. (Figure 7).

Figure 7: Weekly registered deaths



Mandatory ICU surveillance scheme:

From week 40, 2011 to week 20 2012, a total of 11 ICU admissions of confirmed influenza were reported from across Northern Ireland, including one fatality. Of these admissions, 10 (90%) were reported as influenza A (H3) subtype and one as influenza B. The median age of cases admitted to ICU with influenza was 67 years (range 49-

87years). Ten of the cases were reported to have risk factors for influenza vaccination, with 36% (4/11) receiving the 2011/12 seasonal influenza vaccine.

Vaccine uptake:

As at the end of March 2012, the proportion of people in Northern Ireland aged 65 years and over who had received the 2011/12 seasonal influenza vaccine was 77.0%, while the uptake in those aged under 65 in an at risk group was 81.7%. This compares with 74.9% uptake in the over 65 years, and 78.7% in the under 65 at risk group for the same period in 2010/11.

The estimated uptake rate for frontline health care workers across the five HSCTs in Northern Ireland receiving the seasonal influenza vaccine in 2011/12 was 20.8%, a slight increase from the previous year (18%). An estimated 58% of pregnant women in Northern Ireland were vaccinated in the 2011/12 season, with uptake rates similar to last year. However, it should be noted that these are estimates due to denominators in some instances being an approximation.

Table 2: Seasonal Influenza vaccine uptake 2009/10 – 2011/12

Northern Ireland GP Influenza Vaccine Coverage Data			
	To 31st March 2012	**To 31st March 2011**	**To 31st March 2010**
	2011/2012	**2010/2011**	**2009/2010**
Number of Practices	353	355	357
Number of practices submitting return by 31st March	353	355	357
Number of 65+ receiving influenza vaccine between 1st October and 31st March	211,416	198,505	201,052
Registered 65+ population of practices submitting a return	274,678	265,123	261,828
Uptake rate for 65+ population at 31st March	**77.0%**	**74.9%**	**76.9%**
Number of under 65 "at risk" population receiving influenza vaccine between 1st October and 31st March	168,837	152,712	147,903
"At risk" population under 65 years of practices submitting a return	206,585	193,939	184,986

Uptake rate for under 65 "at risk" population at 31st March	**81.7%**	**78.7%**	**80.0%**

Note: slight differences in figures due to rounding of numbers and at risk under 65 population in 2009/10 was taken to be 10% of the under 65 year old population.

National and International situation:

Nationally, seasonal activity was also late and low with the peak national GP influenza-like illness consultation rate the lowest on record in England and Wales. Similar to Northern Ireland clinical indices of activity peaked in February and did not cross the early warning thresholds. Despite the low activity the number of acute respiratory outbreaks associated with influenza during the 2011/12 season was higher than normal influenza seasons, with the majority of these outbreaks in care homes for the elderly. The majority of influenza viruses detected nationally in 2011/12 was influenza A (H3N2). Excess all-cause mortality in 2011/12 nationally was limited to the over 65 year old age group with excess deaths coinciding in time with peak respiratory syncytial virus and influenza virus activity in December and Feburary[1].

There was a late start also to the season across Europe, with most countries reporting low intensity and few countries crossing their epidemic threshold, and most countries reaching their epidemic peak by week 9 2012. Unlike the 2010/11 season when influenza activity spread from west to east across Europe, there was no clear geographic progression of influenza activity in 2011/12[2]. Numbers of Influenza-like illness cases in primary care across Europe were also more variable than usual. Influenza transmission peaked in most countries in Western Europe at the end of February/early March. Influenza A (H3N2) was the predominant virus strain circulating during the 2011/12 season, with the proportion of influenza B virus detections increasing as the season progressed, the A (H1N1) pdm09 strain was also detected at generally low levels in a number of European countries[3, 4].

Similarly, influenza activity in the United States was also low and later than the usual influenza seasons. The most commonly detected influenza virus type in North America was A(H3N2), Influenza A(H1N1)pdm09 and B subtypes were also detected, with the later subtype predominating in Canada and the A(H1N1)pdm09 subtype predominating in Mexico[5].

No zoonotic influenza infections of humans within Europe were reported[5], however in the United States, 13 human infections with influenza A (H3N2) variant viruses with genes from avian, swine and human viruses were reported after July 2011, these viruses contained the M gene from Influenza A (H1N1) pdm09. Subsequently WHO released a statement reminding countries of the importance of global monitoring for variants of influenza viruses[6].

Oseltamivir resistance levels this year remained low and similar to previous years.

Discussion:

Overall seasonal influenza activity in Northern Ireland was low and occurred later in 2011/12 compared to 2010/11, with peak GP influenza-like illness consultation rates the lowest on record. No single age group was principally affected with clinical consultation increases observed in both children and adults.

Similar to elsewhere in the UK and in many European countries, the predominant strain detected was influenza A (H3N2), with virological activity reflecting clinical activity. A small number of influenza B virus was also detected with no influenza A (H1N1) pdm09 viruses detected in Northern Ireland this season.

Despite the general low activity a number of patients were admitted to intensive care units across the region, and a number of influenza associated outbreaks were reported in elderly care-home settings, during the winter season, with many of the outbreaks involving highly vaccinated populations.

There was a slight increase in vaccine uptake (77%) in the over 65 year olds compared to the previous year (74.9%). This was also reflected in uptake rates for those patients in the under 65 years at risk group in which the uptake rate was 81.7% this year compared with 78.7% last year. An uptake of 58.4% was also achieved for pregnant women and the uptake rate for frontline healthcare workers (20.8%) met the 20% target set by the DHSSPS. The importance of vaccination in health care workers cannot be underestimated in contributing to protection for both themselves and their patients.

Globally a notable proportion of A (H3N2) viruses were found to differ from the strain included in the 2011/12 northern hemisphere vaccine.

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