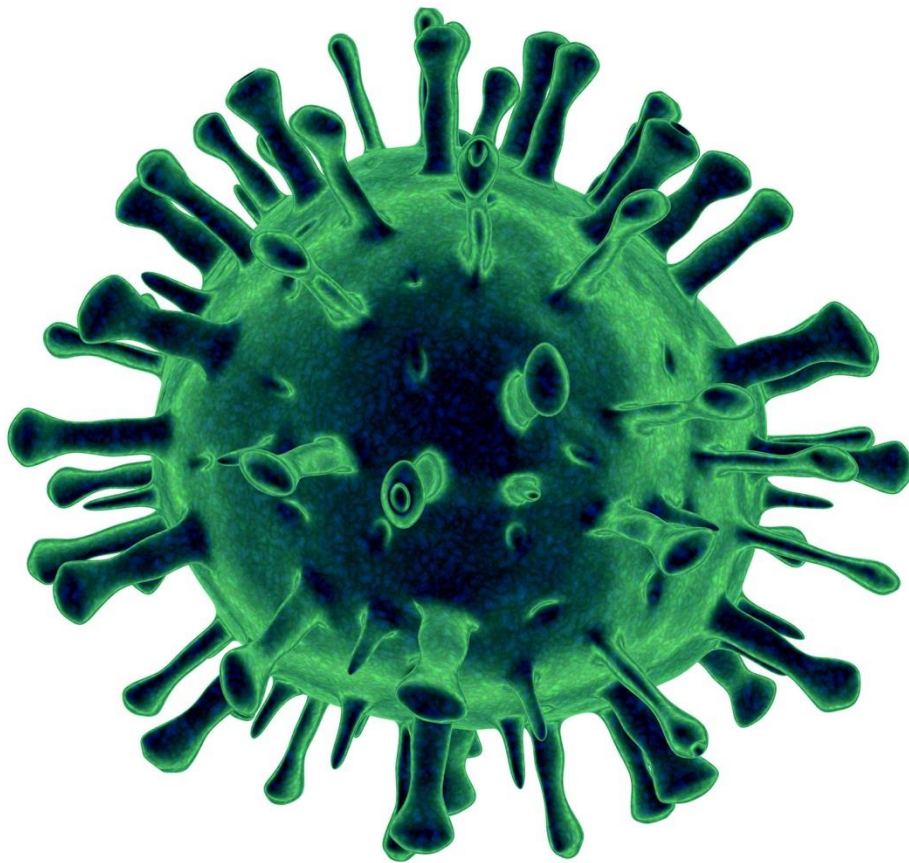


# Surveillance of Influenza in Northern Ireland

2016 – 2017



# Contents

---

- Summary ..... 1**
- Introduction..... 3**
- Enhanced influenza surveillance systems ..... 3**
  - In-hours Sentinel GP Practice surveillance..... 3
  - GP Out-of-Hours surveillance..... 3
  - Virological surveillance ..... 4
  - Outbreak surveillance ..... 4
  - Intensive Care Unit/High Dependency Unit surveillance..... 4
  - Mortality surveillance ..... 4
  - Vaccine uptake surveillance ..... 5
- Observations..... 6**
  - Sentinel GP ‘flu/FLI’ consultation rates ..... 6
  - GP Out-of-Hours ‘flu/FLI’ consultation rates ..... 8
  - Virological activity ..... 10
    - Influenza ..... 10
    - Respiratory Syncytial Virus..... 13
    - Antiviral resistance..... 13
  - Respiratory Outbreaks..... 14
  - Intensive Care surveillance..... 15
  - Mortality ..... 17
  - Seasonal Influenza Vaccine uptake..... 18
- National situation ..... 21**
- Conclusion ..... 22**
- Acknowledgements ..... 22**
- References ..... 23**

## Summary

---

Overall, the 2016/17 influenza season was characterised by low levels of influenza activity in both the community and hospital setting. This season, influenza A (H3) was the predominant circulating strain (61%), followed by a substantial proportion of influenza B (23%) later in the season. The remaining cases were identified as influenza A (untyped) (16%), with a very small number of influenza A (H1N1) pdm09 cases also detected (<1%).

Primary care activity started to increase in late December with ILI rates peaking in early January, slightly earlier than the 2015/16 season. Influenza activity remained low throughout the season and did not cross the 2016/17 MEM baseline threshold. Peak ILI rates were lower than those seen in both the 2015/16 and 2014/15 seasons.

ILI consultation rates were not predominantly seen in any one age group, with rates fluctuating in all age groups throughout the season. The highest level of influenza activity was most frequently seen in the elderly population, peaking at 47.1 per 100,000 in week 2 in those aged 45-64 years and at 46.7 per 100,000 population in week 51 in those aged 65 years and over.

Levels of excess all-cause mortality were slightly elevated in the elderly. During the 2016/17 Influenza season excess deaths were reported in seven weeks compared with four weeks in both of the previous two seasons. In 2016/17 the majority of these excess deaths were in those aged 65 years and over.

The number of laboratory confirmed influenza cases in Intensive Care Units/High Dependency Units (ICU/HDU) was lower this season than the previous two seasons at 50 cases compared to 111 and 68 respectively. A total of 11 of these individuals died, giving a higher fatality rate (22%) than the previous two seasons (14% in 2015/16 and 15% in 2014/15). The proportion of cases with confirmed influenza in ICU/HDU with co-morbidities was also higher (80%) than previous years. Of the 50 cases with confirmed influenza, 41 (82%) were eligible to receive the Influenza vaccine and 20 (49%) of those eligible were vaccinated.

Influenza vaccine uptake in 2016 to 2017 in Northern Ireland was slightly lower in those aged over 65 years (71.9%) and in those under 65 years in a clinical risk group (57.1%) than the 2015 to 2016 season. However, vaccine uptake increased in all the other eligible cohorts with uptake increasing in primary school children (78.3%); in pre-school 2 to 4 year olds (52.6%); in pregnant women (58.6%) and in frontline healthcare workers (29.0%) compared to last season. Influenza vaccination uptake in Northern Ireland continues to be amongst the highest reported in Europe.

During the 2016/17 season there were 7625 respiratory samples tested from all sources (203 from GP sentinel practices; 7422 from non-sentinel sources). Overall, 12% (900/7625) of samples were positive for the influenza virus, a slight reduction compared with 2015/16 when 14% of samples tested positive for the virus. The number of tests from GP sentinel practices was lower than the previous two seasons and subsequently the overall proportion of positive influenza samples from GP sentinel practices was also lower at 34% (69/203) compared to 43% in 2015/16 and 41% in 2014/15, respectively. The proportion of samples positive for

influenza from non-sentinel sources was 11% (831/7422) in 2016/17 compared with 13% in 2015/16 and 11% in 2014/15. There were only two cases of influenza A (H1N1) pdm09 reported this season.

This season there were 27 respiratory outbreaks reported, fifteen (56%) of which were influenza positive. This compares with 2015/16 when there were 11 respiratory outbreaks reported of which 7 (64%) were confirmed as influenza. Reflecting the influenza A(H3) virus type that was circulating, which predominantly affects older adults, all the respiratory outbreaks in 2016/17 were in in Care Homes.

## Introduction

---

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 the type of influenza strains circulating in the region, the timing of influenza activity, the burden of influenza on the community and health services, the degree of excess mortality and the uptake of influenza vaccine. Outputs from the surveillance activities are used to produce timely reports that inform the Department of Health (DoH), health professionals, the media, and the public. Surveillance is carried out all year, with regular outputs published every week or second week from week 40 2016 (commencing 03/10/2016) to week 20 2017 (ending 21/05/2017).

This report describes influenza activity in Northern Ireland in the 2016/17 season from week 40 2016 to week 20 2017.

## Enhanced influenza surveillance systems

---

### In-hours Sentinel GP Practice surveillance

In 2016/17, 37 GP practices in Northern Ireland participated in the sentinel GP surveillance system, covering 12% of the population. Every week, all sentinel GP practices report the number of combined GP consultations for influenza and influenza-like illness ('flu/FLI) and the number of GP consultations for acute respiratory infections (ARI) by age group. Thirty-two of the 37 practices also participate in enhanced virological surveillance and provide nasal and throat swabs from a sample of patients presenting with clinical symptoms of influenza.

The PHA reports combined 'flu/FLI sentinel GP consultations rates per 100,000 population. Rates are calculated using the practice populations.

A threshold for 'flu/FLI GP consultation rate is calculated annually to distinguish baseline activity from seasonal influenza activity and compare activity with previous years. In 2016/17 the Northern Ireland threshold was 47.9 consultations per 100,000 population. The threshold is calculated using the Moving Epidemic Method (MEM), which is used by the European Centre for Disease Prevention and Control, and has been adopted by each UK scheme reporting GP 'flu/FLI consultation rates to standardise reporting of influenza activity across the UK and Europe. Further details of the method have been previously described (Vega et al, 2012).

### GP Out-of-Hours surveillance

Every week, the GP Out-of Hours (OOH) surveillance system automatically extracts clinical consultation figures for 'flu/FLI and ARI by age group from all GP OOH Centres in Northern Ireland. The PHA reports combined 'flu/FLI OOH call rates per 100,000 population. .

## **Virological surveillance**

The Regional Virology Laboratory (RVL) tests respiratory samples from sentinel GP practices, as well as from hospitals and non-sentinel GP practices (non-sentinel sources).

In 2016/17, all respiratory specimens were tested by PCR for influenza A and its main subtypes (AH1 and AH3), influenza B and Respiratory Syncytial Virus (RSV). In addition, selected respiratory samples were tested for *mycoplasma pneumoniae*, *legionella pneumophila* and *chlamydomphila pneumoniae*, *bordetella pertussis*, *pneumocystis jirovecii*, metapneumovirus, respiratory adenovirus, coronavirus, parainfluenza, rhinovirus and bocavirus.

The PHA annual report also provides surveillance information on RSV. It is not useful to report on other respiratory viruses due to the variation in testing methods from year to year.

Every year, during the influenza season, RVL also sends a sample of influenza specimens to the Public Health England - Respiratory Virus Unit (PHE- RVU) for antiviral resistance monitoring and further strain identification.

## **Outbreak surveillance**

Respiratory-related outbreaks in institutional settings (e.g. care homes, hospitals, and schools etc.) are reported to the PHA as they occur. Sampling to identify the virus involved is encouraged throughout the season. The PHA uses a standardised proforma at the beginning, during, and at the end of each confirmed influenza outbreak to collect relevant epidemiological information.

## **Intensive Care Unit/High Dependency Unit surveillance**

Since 2011/12, Northern Ireland has participated in the UK mandatory Intensive Care Unit (ICU) surveillance scheme. Epidemiological information on laboratory-confirmed cases of influenza admitted to Intensive Care Unit/High Dependency Unit (ICU/HDU) is collected weekly, in collaboration with the Critical Care Network for Northern Ireland (CCANNI). The PHA reports weekly aggregate data on the number of cases, deaths and other relevant epidemiological information.

## **Mortality surveillance**

The Northern Ireland Statistics and Research Agency (NISRA) provide data to the PHA on the number of death registrations by registration week, both all-cause and deaths due to selected respiratory infections. NISRA obtains deaths on selected respiratory infections by searching death certificates for keywords associated with influenza, including; bronchiolitis; bronchitis; influenza; and pneumonia. The PHA reports the number of death registrations with selected

respiratory infections by week and as a proportion of all-cause death registrations. Due to delays in death registrations, the number of registered deaths in any given week will not equal the number of deaths that actually occurred in the week.

The PHA also reports excess mortality estimations by week of death. Public Health England (PHE) calculates excess mortality on behalf of PHA using the Mortality Monitoring in Europe (EuroMOMO) model. EuroMOMO is a project coordinated by the Statens Serum Institut in Denmark. It provides European countries with a common approach to analyse mortality data and compare it to other countries. The model produces weekly expected and observed number of deaths, corrected for reporting delay and standardised for the population by age group and region. Excess mortality is reported if the number of observed deaths exceeds the number of expected deaths. Despite delay correction, reported mortality data is still provisional due to the time delay in registration and observations can vary from week to week.

## **Vaccine uptake surveillance**

The PHA, in liaison with influenza immunisation co-ordinators in primary care, the Health and Social Care Board (HSCB), and Health and Social Care Trusts (HSCT), collect, collate and report influenza vaccination uptake rates for the Joint Committee on Vaccination and Immunisation (JCVI) recommended target groups at intervals over the winter season.

In 2016/17, the JCVI recommended the seasonal 2016/17 trivalent influenza vaccine for: all individuals aged 65 years and over; individuals between 6 months and 65 years of age in a clinical at-risk group, including pregnant women and individuals defined as morbidly obese; and Health Care Workers. The quadrivalent live attenuated influenza vaccine (LAIV) continued to be offered to all pre-school children aged 2 years or older on 1 September 2016 and all children attending primary school.

Every year the DHSSPS establishes regional targets for influenza immunisation uptake. This year's targets are:

- 75% for individuals 65 years and over
- 75% for individuals under 65 years in a clinical at risk group
- 60% for pregnant women
- 60% for pre-school children over the age of 2 years
- 75% for primary-school aged children
- 40% for frontline HSC staff

## Observations

---

### Sentinel GP 'flu/FLI' consultation rates

In the early part of the 2016/17 season the weekly sentinel GP consultation rate for 'flu/FLI' followed a similar trend to 2014/15 until beginning to increase in week 48. Rates continued to increase thereafter with some fluctuation, reaching a peak in week 2 (Figure 1). Rates peaked in week 2 at 33.0 consultations per 100,000 population, but did not reach the MEM threshold of 47.9 consultations per 100,000 population. In week 3, rates fell to 21.4 per 100,000 population and remained around this point for seven weeks before beginning to decline further in week 10. Rates increased again slightly in week 11 and remained raised with some fluctuation until settling at pre-season levels by week 16. (Figure 1).

When compared to previous seasons, sentinel GP consultation rates followed a similar pattern to 2014/15 initially, before increasing around the same time as rates in 2015/16, in week 48. The 2016/17 consultation rate peak occurred earlier than either of these previous seasons (week 8 in 2015/16 and week in 7 2014/15). Rates did not peak at comparable levels to 2015/16 or 2014/15 and stayed at peak levels for a shorter duration than the previous two seasons. Rates in 2016/17 were generally lower throughout than during the previous two seasons (Figure 1).

Age-specific GP sentinel consultation rates fluctuated in all age groups throughout the season, but were generally higher than those seen in 2014/15 and 2013/14 in the early part season and lower in the latter part. The highest level of activity was most frequently seen in those aged 45-64 years (peaking at 47.1 per 100,000 in week 2 2017). The next highest peak was seen in those aged 65 years and over, at 46.7 per 100,000 in week 51, while the lowest peak occurred in those aged 5-14 years, at 16.4 per 100,000 in week 45 (Figure 2).



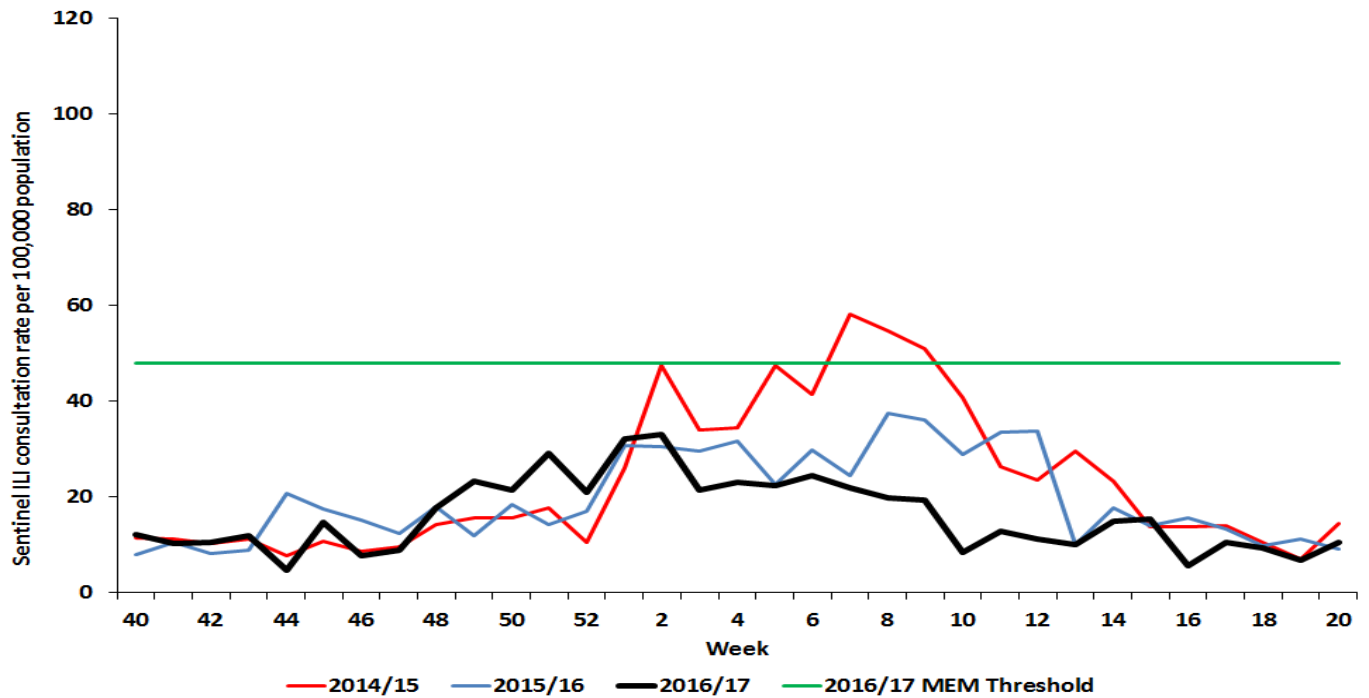


Figure 1: Sentinel GP consultation rate per 100,000 population for combined flu and flu-like illness 2014/15 – 2016/17

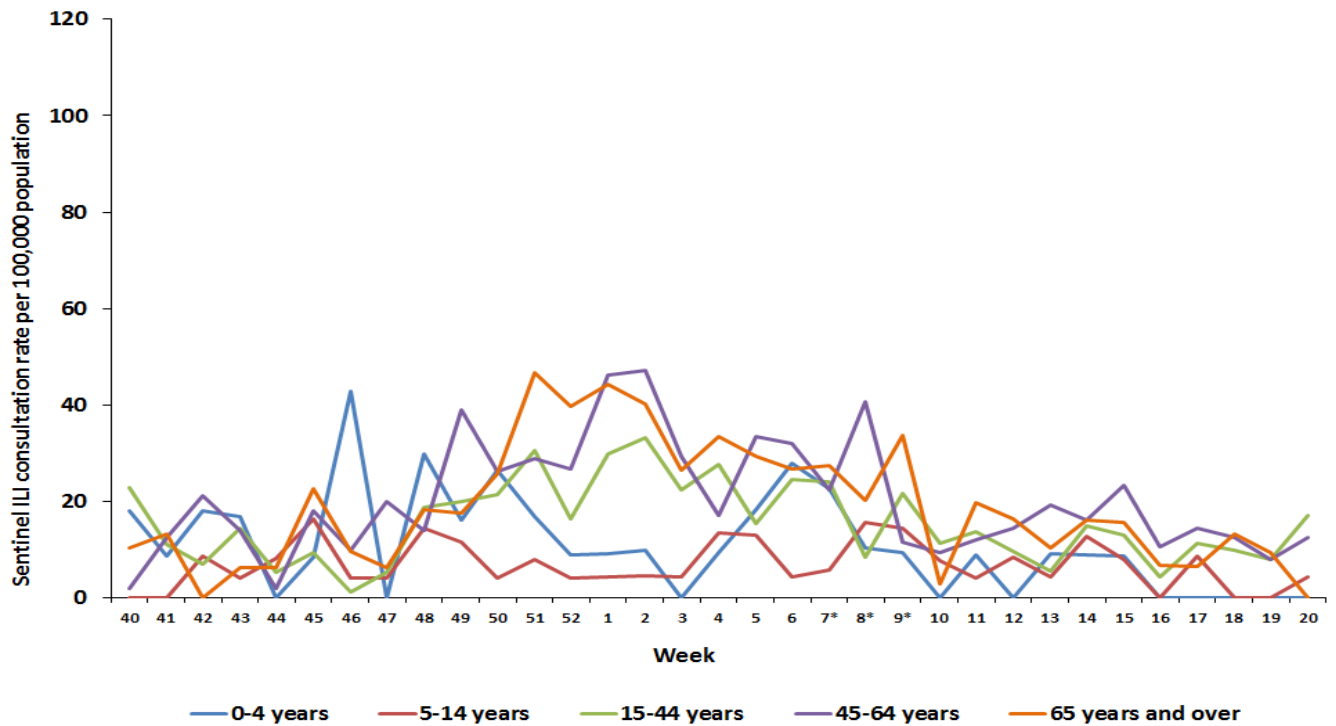


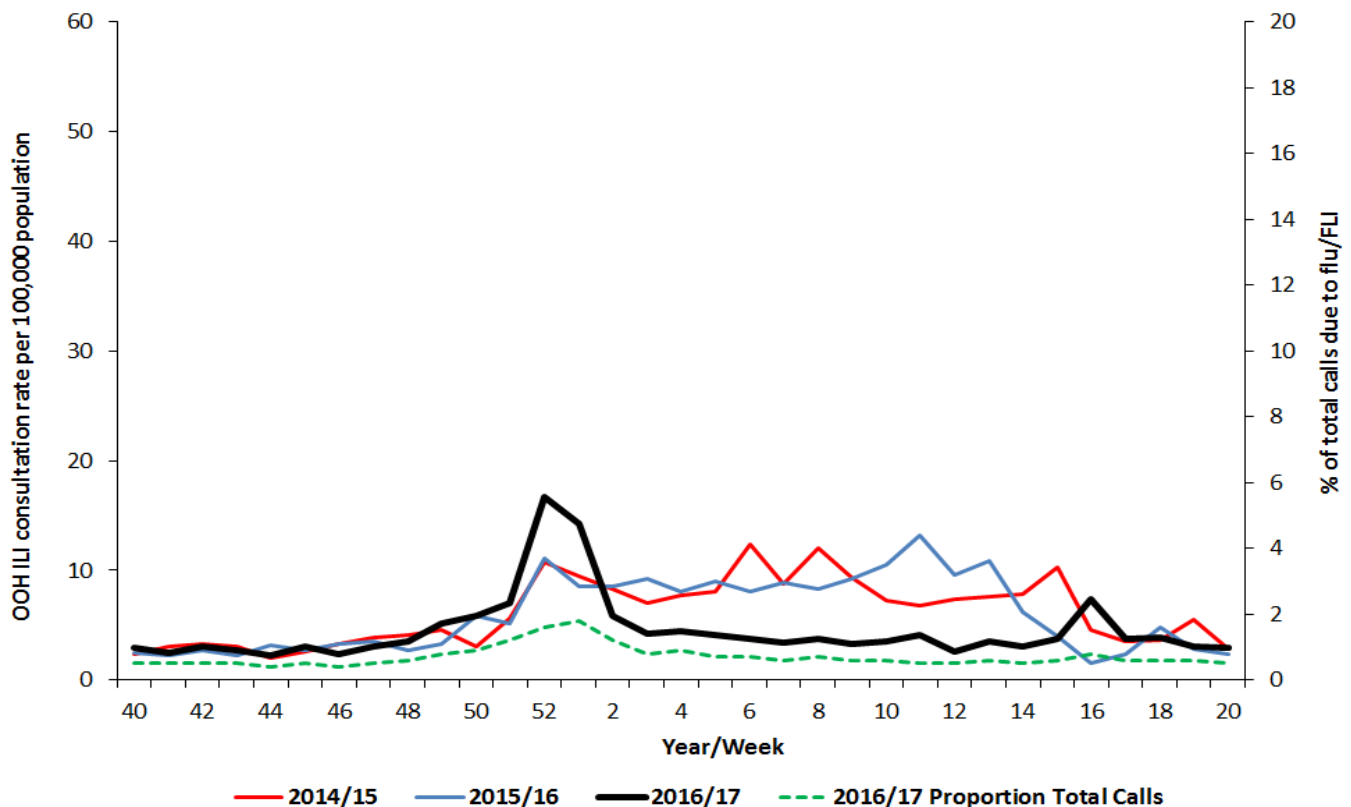
Figure 2: Sentinel GP age-specific consultation rates per 100,000 population for combined flu and flu-like illness from weeks 40 - 20, 2016/17

## GP Out-of-Hours 'flu/FLI consultation rates

In 2016/17, GP OOH 'flu/FLI consultation rates remained low throughout the majority of the season. Activity began to increase in week 48 2016, peaking in week 52 (16.7 per 100,000). Rates then fell sharply and remained steady for 15 weeks, before increasing slightly in week 16 (7.4 per 100,000). Since week 17 rates have remained low and were at pre-season activity levels by week 19 (Figure 3). The proportion of 'flu/FLI calls to total calls also remained low throughout the season, peaking at 1.8% in week 1, 2017. Total call rates peaked during the holiday periods of New Year, St Patrick's Day, Easter and May-Day, which are all periods when GP practices are closed. GP OOH 'flu/FLI consultation rates were also highest during these holiday periods; however, with the exception of the Christmas holiday period when a rise was noted, 'flu/FLI calls as a proportion of total calls remained steady (below 1%).

In comparison with previous seasons, activity was similar to both 2015/16 and 2014/15 and throughout the earlier part of the season with a higher peak around the Christmas holiday period, but generally lower than both previous years after the holiday period and into the later parts of the season.

By age group, the highest consultation rates were in the 15-44 year olds (20.6 per 100,000 in week 52) (Figure 4).



**Figure 3: OOH consultation rate per 100,000 population and proportion of total OOH calls for combined flu and flu-like illness 2014/15 - 2016/17**

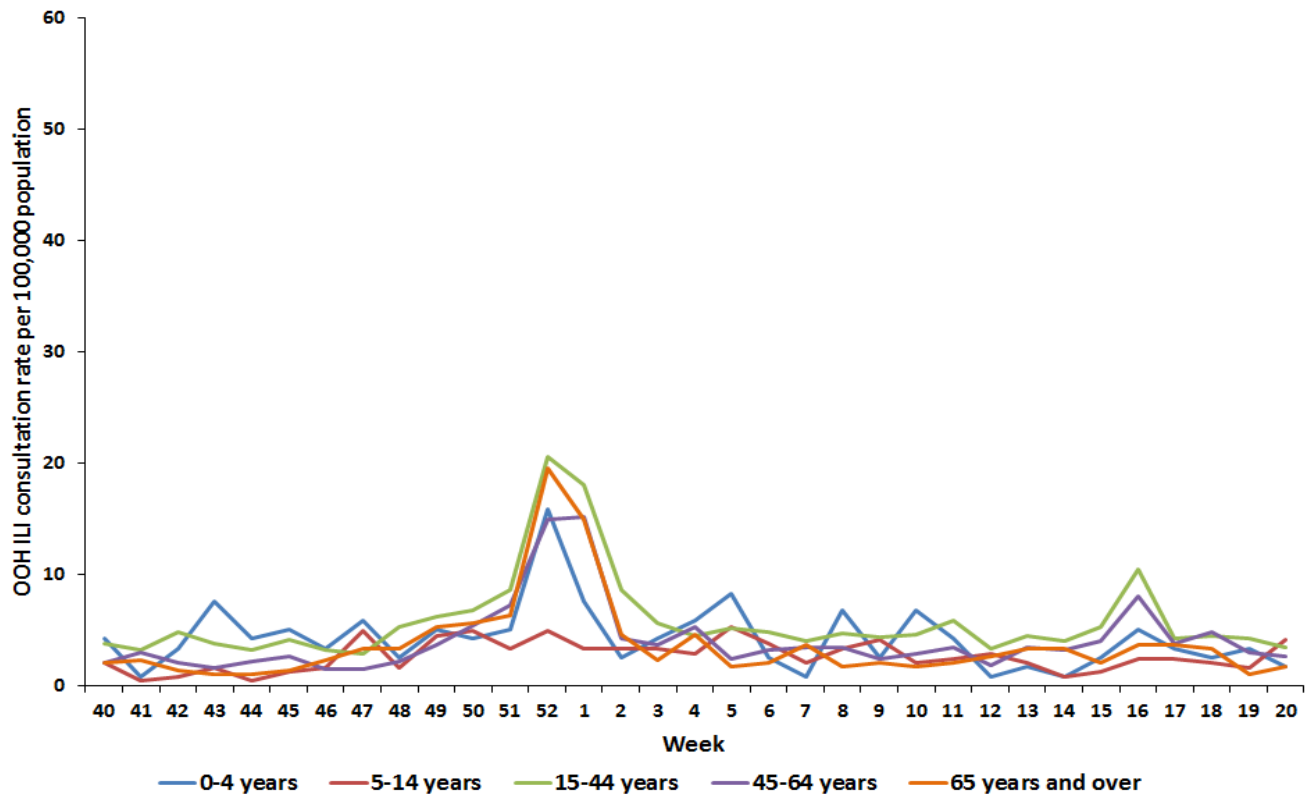
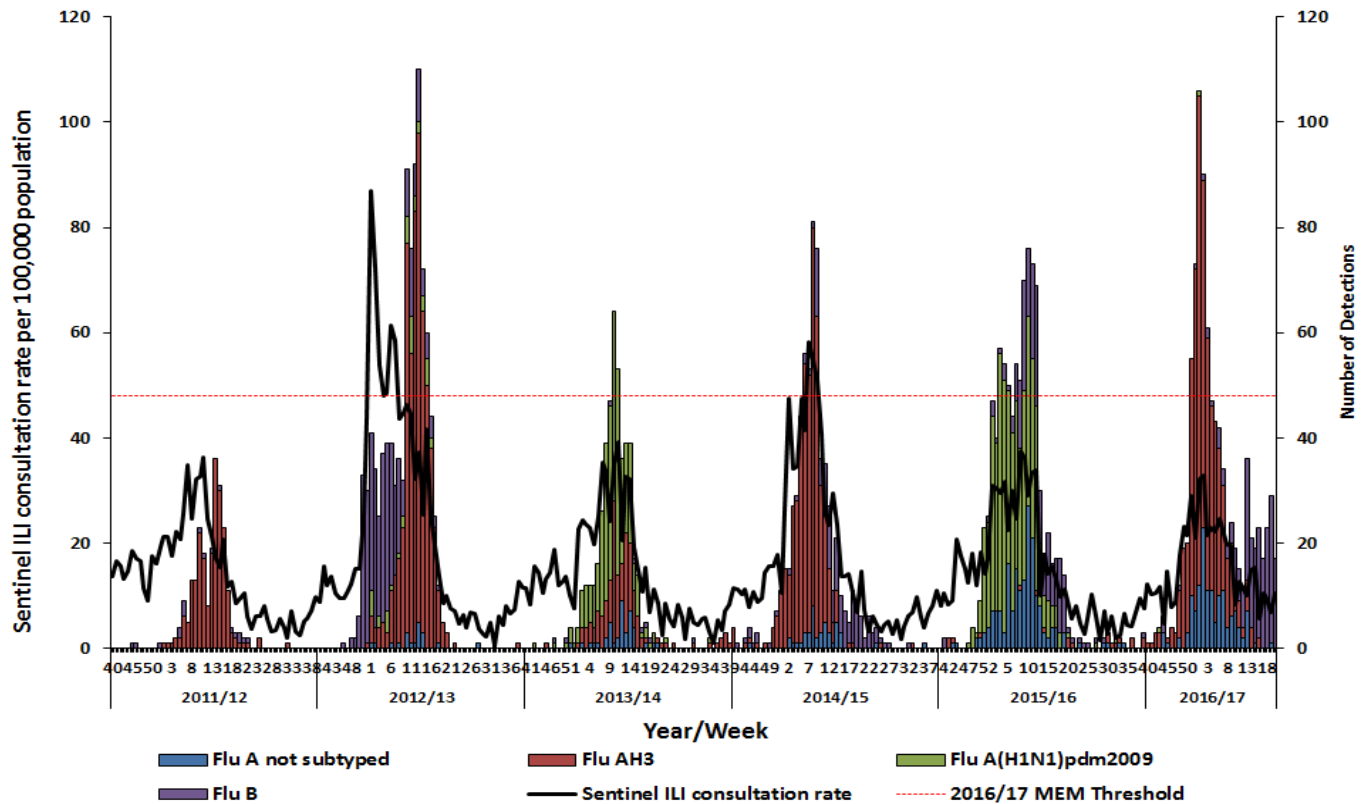


Figure 4: OOH call rates of flu and flu-like illness by age-group from weeks 40- 20 2016/17

# Virological activity

## Influenza



**Figure 5: Sentinel GP combined consultation rates for flu/ILI and number of influenza positive detections 2011/12 – 2016/17**

During the 2016/17 season (from week 40 2016 to week 20 2017), RVL tested 7625 respiratory samples from all sources (203 from GP sentinel practices; 7422 from non-sentinel sources). Overall, 12% (900/7625) samples were positive for influenza virus. The overall proportion of positive influenza samples from GP sentinel practices was 34% (69/203) compared to 11% (831/7422) from non-sentinel sources.

Influenza A(H3) was the dominant circulating virus for most of the season, especially early in the season, accounting for 61% (551/900) of all positive specimens. Influenza B made up the next highest proportion with 23% of positive specimens (206/900) and predominated later in the season, while influenza A(H1N1)pdm09 accounted for less than 1% (2/900). Again this season a significant proportion of samples were typed as influenza A (subtype not reported) which accounted for 16% (141/900) of positive influenza specimens, lower than the 20% typed as influenza A (subtype not reported) in 2015/16. The relative proportion of influenza strains followed the same pattern for GP sentinel samples and non-sentinel samples (Table 1).

The first influenza A(H3) detection occurred in week 40 2016 and the first influenza B detection in week 44 2016. The proportion of positive samples (all sources) began to increase in week 48 2016, and peaked in week 1 2017 (30%; 106/357). This was earlier and at a higher magnitude than the positivity proportion in the 2015/16 season (28% in week 10 2016) (Figure 6).

Overall, the highest proportion of positive influenza samples was seen in those aged 65 years and over (51%), with influenza A(H3) most frequently seen in this age group (Table 2). The median age for confirmed cases of influenza A(H3) was 65.7 years. This compares to a median age of 46 years in 2015/16 for influenza A(H1N1pdm09), the predominant strain.

**Table 1: Number and proportion of influenza strains to positive influenza samples according to sample source, during week 40 2016 to week 20 2017**

	All Sources (n=900)	GP Sentinel Practices (n= 69)	Non-Sentinel Sources (n=831)
Influenza A (H1N1)pdm09	2 (0.2%)	2 (3%)	0 (0%)
Influenza B	206 (23%)	22 (32%)	184 (22%)
Influenza A (H3)	551 (61%)	38 (55%)	513 (62%)
Influenza A (not subtyped)	141 (16%)	7 (10%)	134 (16%)
<b>Total Positive</b>	<b>12%</b>	<b>34%</b>	<b>11%</b>

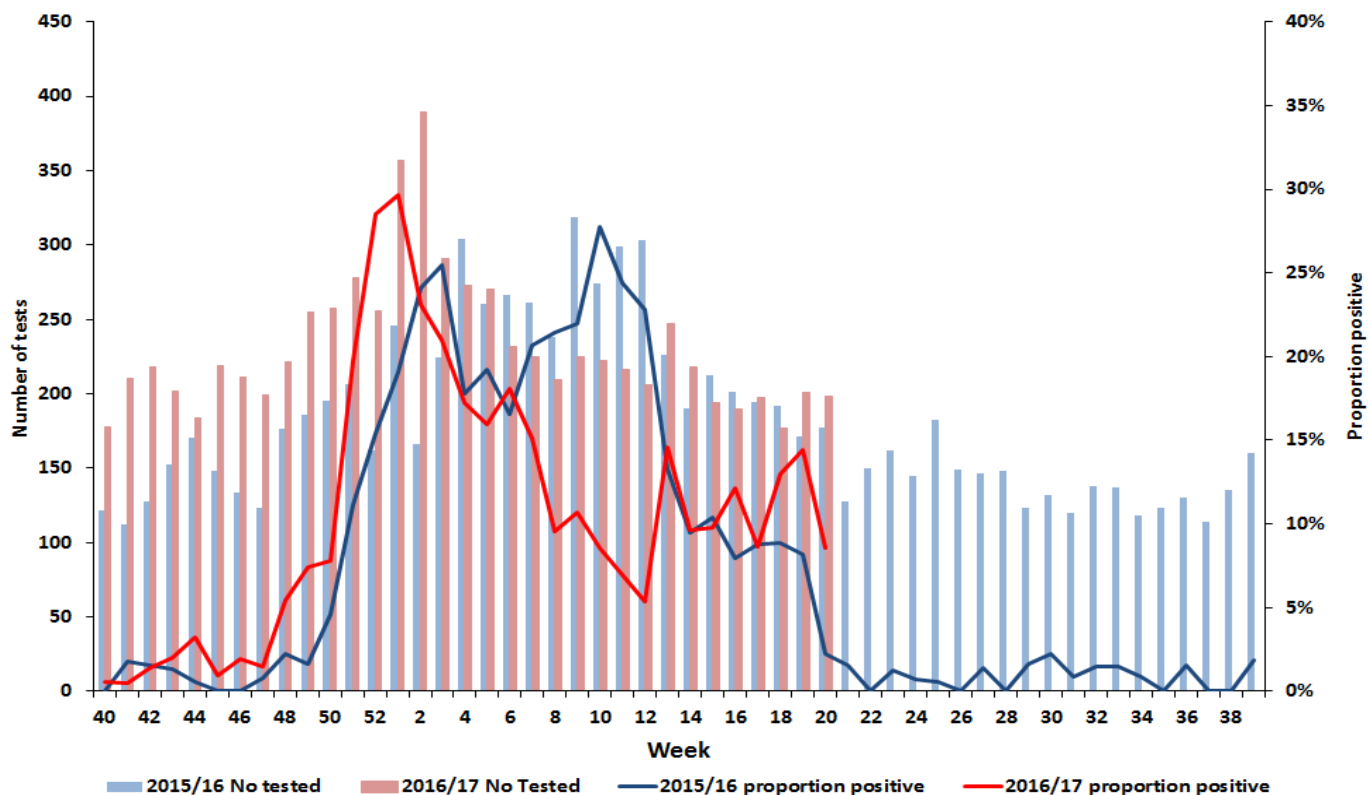


Figure 6: The number of samples tested (all sources) for influenza in Northern Ireland from weeks 40-20, 2015/16 & 2016/17 with the proportion positive

Table 2: Proportion of positive influenza samples by age group, all sources, during week 40 2016 to week 20 2017

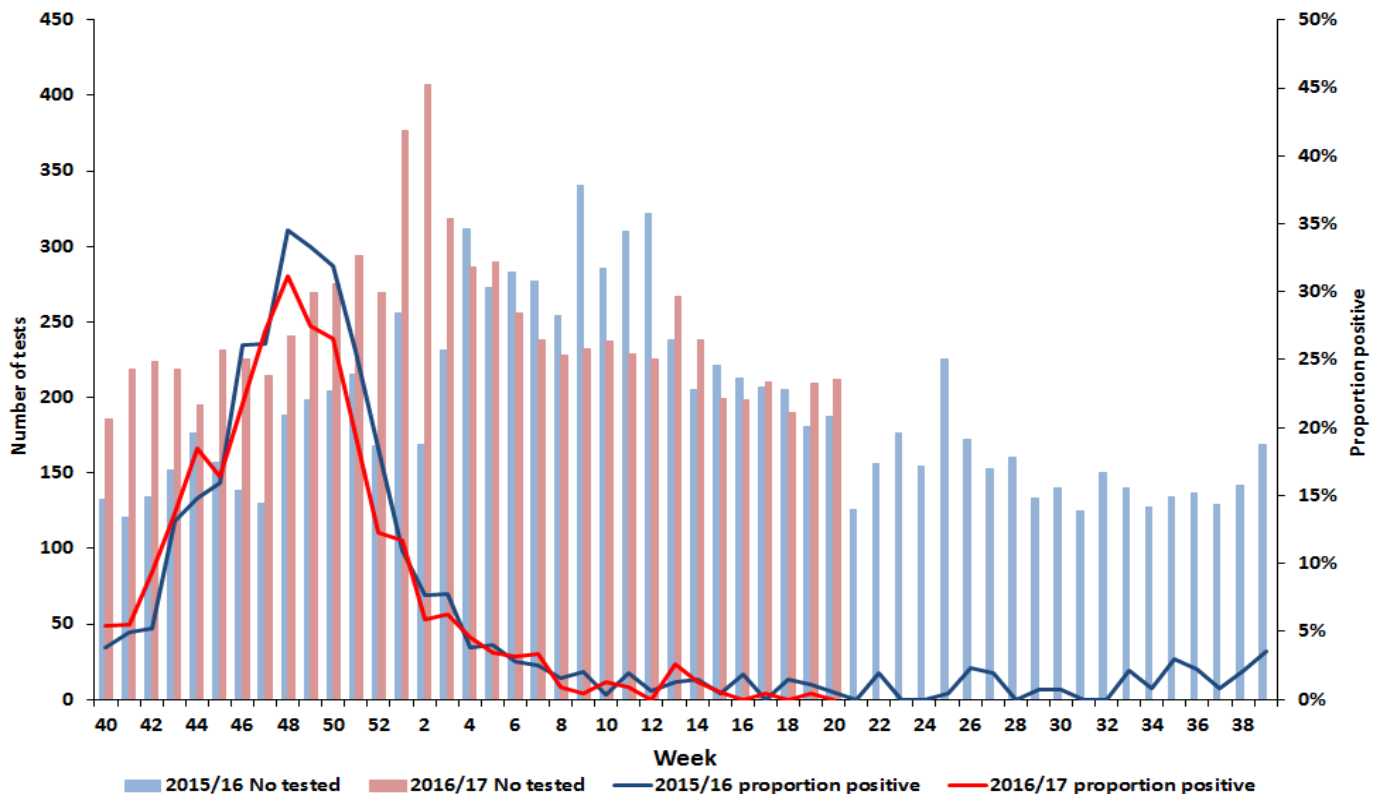
	0-4 yrs	5-14 yrs	15-44 yrs	45-64 yrs	Over 65 yrs
Influenza A (H1N1)pdm09	0 (0%)	0 (0%)	1 (1%)	0 (0%)	1 (0.2%)
Influenza B	8 (24%)	4 (21%)	31 (18%)	60 (29%)	103 (22%)
Influenza A (H3)	20 (59%)	12 (63%)	121 (69%)	116 (55%)	282 (61%)
Influenza A (not subtyped)	6 (18%)	3 (16%)	22 (13%)	34 (16%)	76 (17%)
<b>Total Positive*</b>	<b>34 (4%)</b>	<b>19 (2%)</b>	<b>175 (19%)</b>	<b>210 (23%)</b>	<b>462 (51%)</b>

\*Due to rounding, total percentages do not add-up to 100%

## Respiratory Syncytial Virus

During the 2016/17 season from week 40 2016 to week 20 2017, RVL tested 7625 respiratory samples from all sources, with an overall RSV positivity proportion of 9% (714/7625). The principal activity period occurred from week 42 2016 to week 3 2017, with the proportion of positive samples peaking in week 48 at 31% (75/241) (Figure 7).

The majority (64%; 456/714) of RSV detections were in the 0-4 year age group. This is lower than the proportion seen in this age group for season 2015/16 but slightly higher than 2014/15 (71% and 60% respectively).



**Figure 7: Number of samples tested for RSV and proportion positive in Northern Ireland 2015/16 and 2016/17**

## Antiviral resistance and genetic typing

In 2016/17, the PHE-RVU reported no cases from Northern Ireland resistant to the antiviral treatments oseltamivir or zanamivir. Six influenza B samples were sent for genetic typing this year, sequencing of the haemagglutinin gene showed all six belonged to the influenza B Yamagata lineage, HA genetic group 3 and were genetically similar to the strain included in the 2016/17 influenza quadrivalent vaccine.

## Respiratory Outbreaks

During the 2016/17 season, 27 respiratory-related outbreaks were reported to the PHA, of which 15 were laboratory-confirmed as influenza. The majority were caused by influenza A(H3) (n=8). Four outbreaks were caused by influenza B, with the remaining three caused by influenza A (not subtyped). Of the 12 outbreaks negative for influenza, eight had another respiratory organism detected. Five had positive detections of RSV, one coronavirus, one parainfluenza and one detected both adenovirus and pneumocystis jirovecii. The three remaining had either no sample taken or no other organism detected.

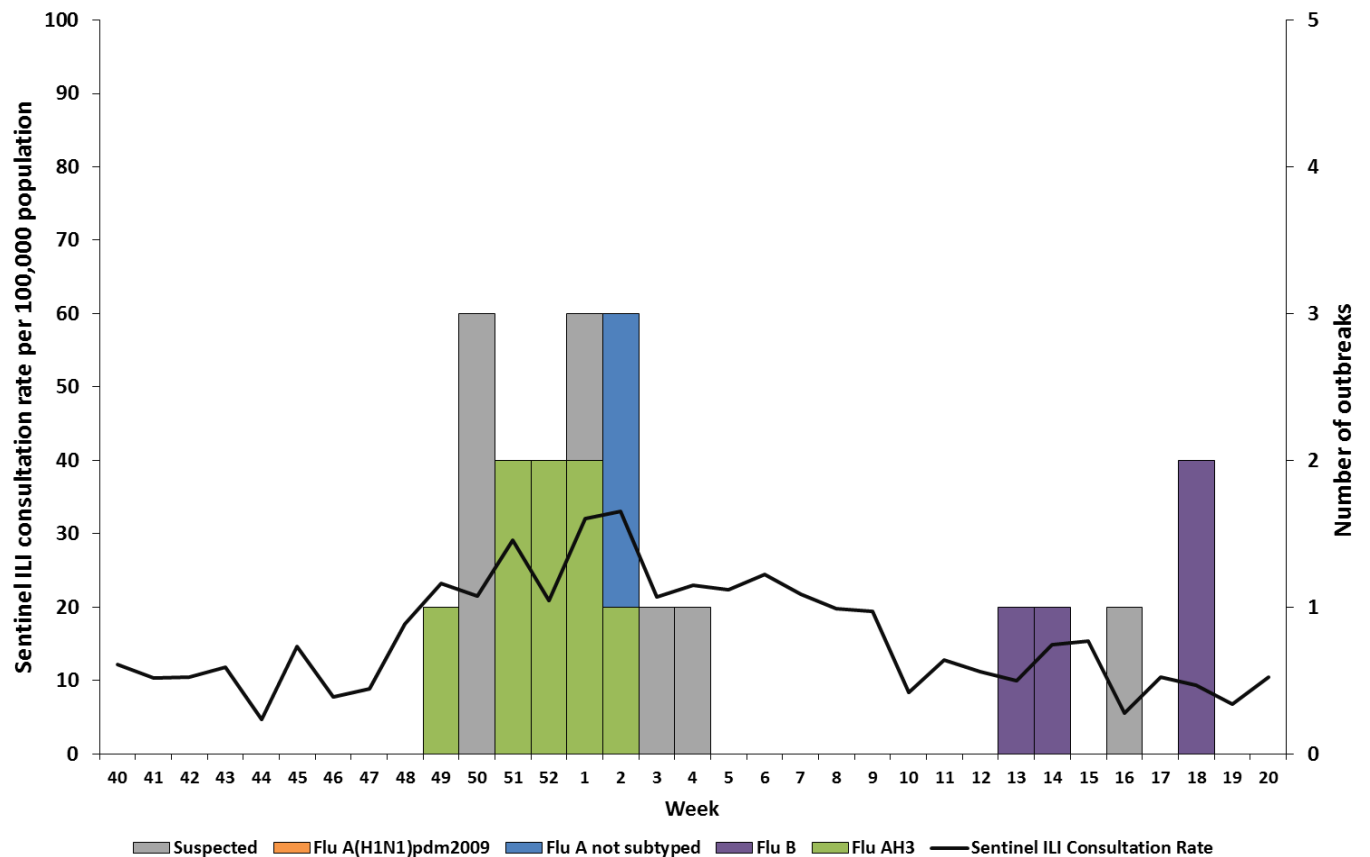
All 27 outbreaks occurred in care homes, including residential homes, nursing homes and/or homes for adults with specialist needs.

Outbreaks were notified to the PHA between weeks 49 and week 18, peaking in week 2 (n=5) (Figure 8).

From the information reported by care homes for laboratory-confirmed influenza outbreaks, the median attack rate among residents was 26% (range 10% to 39%). Vaccine coverage for care home residents was high, as seen in previous years, with a median vaccination uptake of 88% (range 44% - 100%). A mean of 25% (range 0 - 83%) of cases from the 15 confirmed care home flu outbreaks were hospitalised due to respiratory conditions.

More respiratory outbreaks were reported to the PHA this season in comparison with 2015/16, when 11 were reported, seven of which were confirmed as influenza. Respiratory outbreaks were reported slightly later in the season this year; beginning in December (compared to November in 2015/16).





**Figure 8: Number of influenza outbreaks by subtype per week and sentinel consultation rate, 2016/17**

### Intensive Care surveillance

During the 2016/17 season, there were 50 laboratory-confirmed influenza cases in ICU/HDU in Northern Ireland, of which 11 died, giving a case fatality rate of 22%. The predominant strain was influenza A(H3) (33/50; 66%), followed by influenza B (10/50; 20%) occurring later in the season. The remaining strain was influenza A (subtype not reported) (7/50; 14%), with no cases of influenza A(H1N1)pdm09 in ICU/HDU reported (Figure 9).

The median age of cases admitted to ICU/HDU was 61.5 years (range 0–88 years). More than half of ICU/HDU cases were over 45 years of age (33/50; 66%). Six out of 50 (12%) were under 15 years of age. Forty-one (82%) cases were in a clinical risk group and eligible for the 2016/17 influenza vaccine, of which only 20/41 (49%) received it. Ten out of eleven deaths had one or more co-morbidity, and nine were in a clinical at risk group and thus eligible for influenza vaccination. Five of the nine individuals (56%) in a clinical at risk group who died received the 2016/17 influenza vaccine (Table 3).

This season saw fewer ICU/HDU cases than in 2015/16 (n=111), however the case fatality ratio was higher (22% versus 14%). The predominant strain was influenza A(H3), compared to A(H1N1)pdm09 in 2015/16. The proportion of cases under 15 years of age was lower this season (6/50; 12%) compared to last (20/111; 18%).

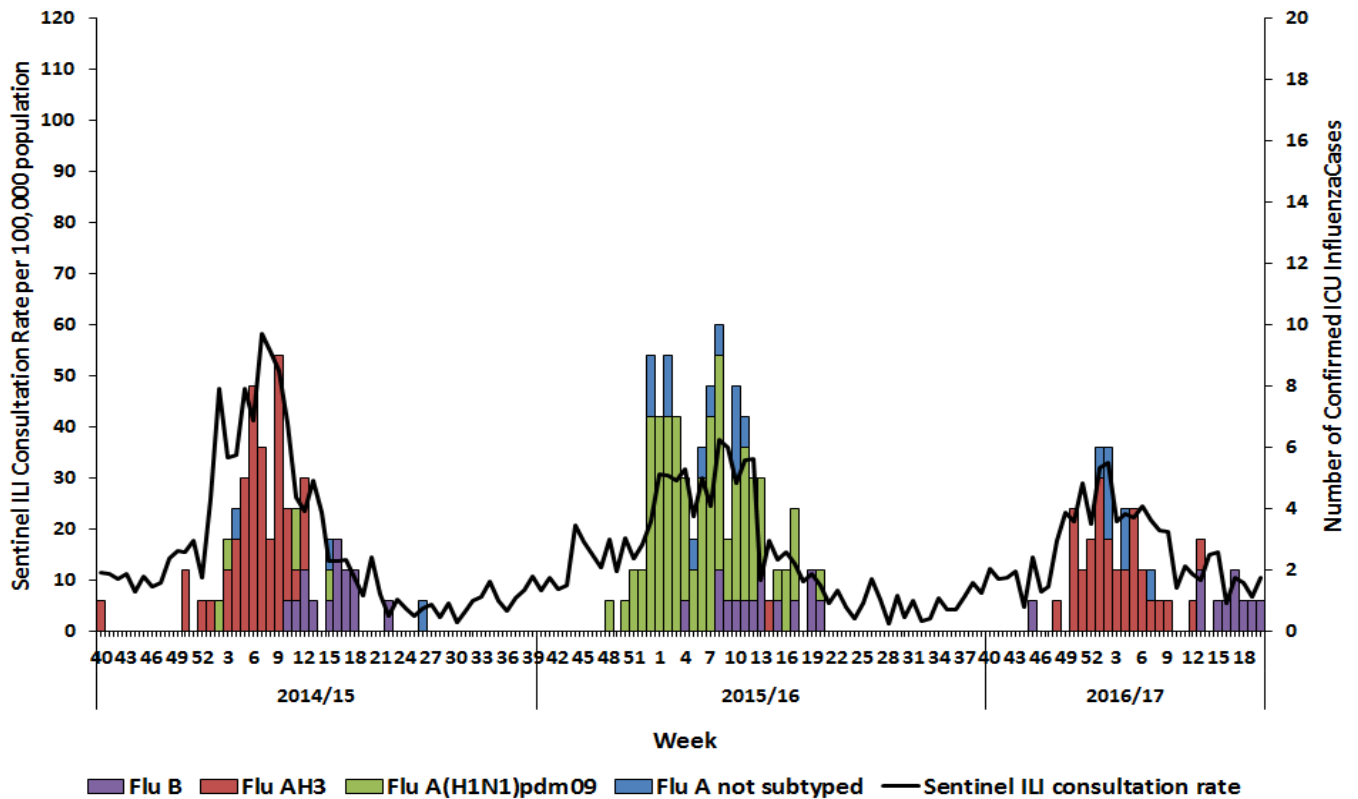


Figure 9: Number of ICU cases with confirmed influenza and sentinel consultation rate 2014/15 – 2016/17

Table 3: ICU cases with confirmed influenza

Age Group	No. of patients	Co-morbidity	Flu vaccine clinical risk group	Vaccinated	Flu A (H1N1) pdm09	Flu A (H3)	Flu A (untyped)	Flu B	Deaths*
0-4	3	1	2	0	0	2	1	0	0
5-14	3	1	2	1	0	0	1	2	0
15-44	9	6	5	3	0	9	0	0	2
45-64	13	12	10	5	0	7	2	4	3
65+	22	20	22	12	0	15	3	4	6
<b>All</b>	<b>50</b>	<b>40</b>	<b>41</b>	<b>21</b>	<b>0</b>	<b>33</b>	<b>7</b>	<b>10</b>	<b>11</b>

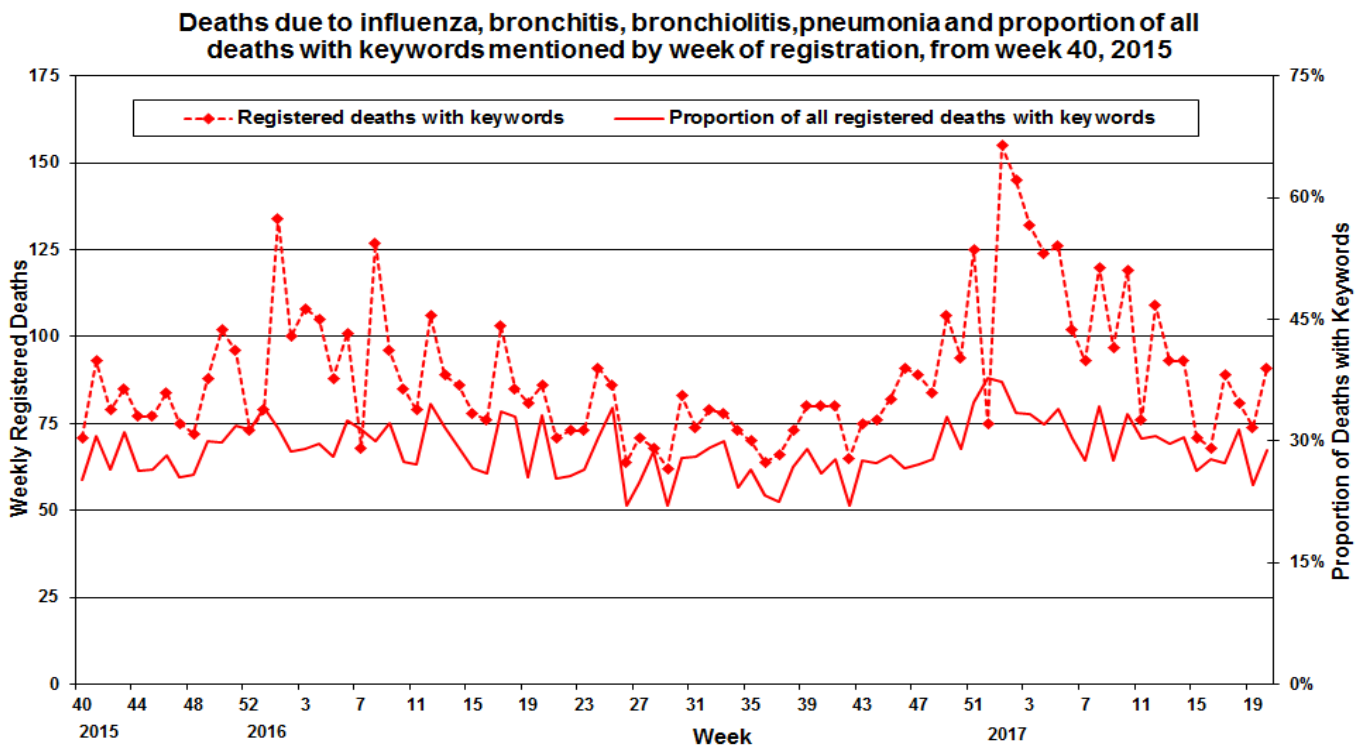
\*Includes deaths in critical care patients who have confirmed influenza, however these deaths may not necessarily be due to influenza. All eleven deaths mentioned respiratory factors as a cause of death on the medical certificate, six mentioned influenza specifically.

## Mortality

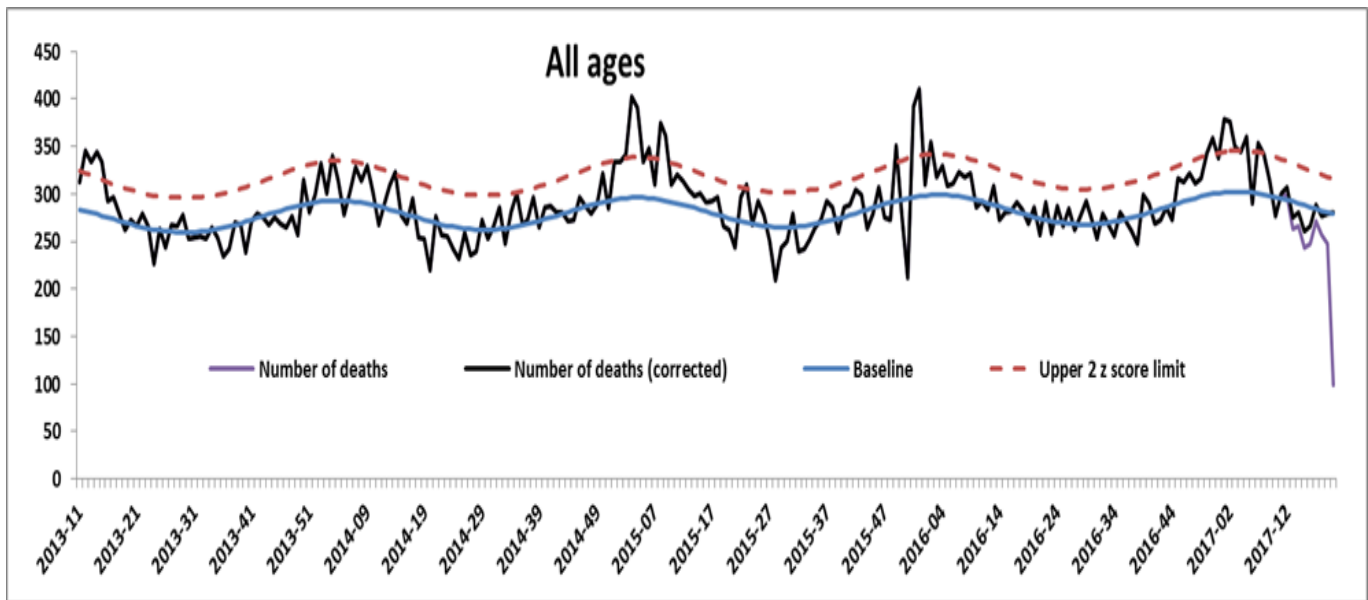
During the 2016/17 season, the overall proportion of registered deaths with respiratory keywords to all-cause death registrations was 30% (3180/10593). The total number of weekly registered deaths with respiratory keywords peaked at 155 in week 1, with the proportion of registered deaths with respiratory keywords peaking at 38% (75/199) in week 52 (Figure 10). The highest proportion of deaths with respiratory keywords occurred around the same time as the highest 'flu/FLI sentinel GP consultation rates were seen (weeks 51 to 10) (Figure 10).

The overall proportion of registered deaths with respiratory deaths this year (30%) was higher than in 2015/16 (29%), and the weekly proportion peaked at a higher percentage (38% in week 52, 2016 compared to 36% in weeks 8 & 10, 2016) (Figure 10).

During 2016/17 season, excess mortality in Northern Ireland was reported in weeks 50, 51, 1, 2, 3, 5 and 7 (Figure 11). This compares with three periods of excess mortality in 2015/16.



**Figure 10: Deaths due to influenza, bronchitis, pneumonia and proportion of all deaths with keywords mentioned by week of registration, from week 40, 2015**



**Figure 11: All age excess all-cause mortality by week of death, Northern Ireland 2013-2017 (calculated using the standardised EuroMOMO algorithm)**

## Seasonal Influenza Vaccine uptake

As of the end of March 2017, the proportion of people aged 65 years and over who received the 2016/17 seasonal influenza vaccine was 71.9% and the proportion of people aged under 65 years of age in a clinical risk group who received the 2016/17 seasonal influenza vaccine was 57.1%. Compared to 2015/16, vaccine uptake decreased slightly in both these groups from 74.4% in those aged over 65 years and from 59.9% in those aged under 65 years in a clinical risk group. In the over 65 year age group the population has remained similar to the previous season, with a small (3%) decrease in the number of individuals vaccinated compared with last season and in the under 65 years in a clinical risk group the population increased by approximately 3% whilst the number vaccinated in this group decreased by 2%. (Table 4).

This is the second season where individuals with a BMI over 40 (morbidly obese category) were included in the under 65 years of age in a clinical risk group category and were offered the influenza vaccine. Data up to the end of March 2017 indicates uptake among those with BMI>40 and without other comorbidity conditions was similar to last year at 27.1% (27.4% in 2015/16).

An estimated 58.6% of pregnant women received the influenza vaccine in 2016/17, compared to 55.1% in 2015/16. Vaccination uptake in pregnant women is recorded as an estimate because of the difficulty in accurately determining the number of pregnant women during an influenza season.

As part of the healthy children's programme, seasonal influenza vaccination is offered to pre-school children aged 2 and over and all primary school children. The uptake rate among 2-4 year olds was 52.6% and the uptake rate in primary school children was 78.3% (Table 4). Both

of these rates slightly increased compared to 2015/16 when the uptake rates were 50.5% and 76.8% respectively.

Uptake of frontline Health Care Workers was 29.0% from all five Health and Social Care Trusts, which is a slight increase compared to last year (24.6%).

**Table 4: Seasonal Influenza vaccine uptake 2014/15 – 2016/17**

<b>Northern Ireland GP Influenza Vaccine Coverage Data</b>			
	<b>2016/17</b>	<b>2015/16</b>	<b>2014/15</b>
Number of Practices	344	349	350
Number of practices submitting return by 31 March	343	349	350
Number of 65+ receiving influenza vaccine between 1st October and 31 March	215,738	222,905	217,299
Registered 65+ population of practices submitting a return	299,873	299,465	295,947
<b>Uptake rate for 65+ population at 31 March</b>	<b>71.9%</b>	<b>74.4%</b>	<b>73.4%</b>
Number of under 65 "at risk" population receiving influenza vaccine between 1 October and 31 March	146,320	149,079	168,515
"At risk" population under 65 years of practices submitting a return	256,469	248,970	234,860
<b>Uptake rate for under 65 "at risk" population at 31 March</b>	<b>57.1%</b>	<b>59.9%</b>	<b>71.8%</b>
<b>Uptake rate for trust frontline staff at 31 March</b>	<b>29.0%</b>	<b>24.6%</b>	<b>22.6%</b>
Number of preschool children receiving influenza vaccine between 1st October and 31 March	28,054	28,386	30,746
Registered population of preschool children submitting a return	53,378	56,160	56,561
<b>Uptake rate for preschool children at 31 March</b>	<b>52.6%</b>	<b>50.5%</b>	<b>54.4%</b>
Total number of primary school children receiving influenza vaccine between 1st October and 31 March	134,545	131,118	133,425
Total number of primary school children offered the vaccine	171,777	170,721	167,491
<b>Uptake rate for primary school children at 31 March</b>	<b>78.3%</b>	<b>76.8%</b>	<b>79.7%</b>

\* preschool cohort includes children aged 2-4 years

† primary school cohort includes all children in primary school

## United Kingdom and Republic of Ireland Summary

---

During the 2016/17 season, varying levels of influenza activity were seen in the community in the UK with moderate to high levels observed in England, Wales and ROI, while Scotland and Northern Ireland saw lower levels. In all regions influenza A(H3) was the predominant circulating virus for the majority of the season, peaking at the mid-point of the season, with influenza B circulating towards the latter stage.

Primary care consultation rates were similar to 2014/15 (the last discernible influenza A(H3) dominated season), with an earlier peak (weeks 1- 2) compared to 2015/16 (weeks 8-12). Variation was seen across the devolved countries, with England, Wales, and ROI exceeding the MEM baseline threshold for a number of weeks. Rates in England exceeded their baseline threshold for 6 weeks, whilst Wales exceeded their baseline threshold for 11 weeks of which 3 weeks were also above the medium intensity threshold. Scotland and Northern Ireland did not exceed their threshold at any point during the season. ROI exceeded their baseline MEM threshold for 11 weeks during the season, with 2 of those weeks exceeding the medium intensity threshold.

The impact of A(H3) was predominantly seen in older adults, although numbers of hospital and ICU/HDU cases varied across the regions (moderate in England and Wales and low in Northern Ireland and Scotland), with ROI reporting lower admissions to both hospital and ICU than seen in the previous season, which had been the highest reported since 2009.

Levels of excess all-cause mortality were generally lower than in 2014/15 (the last influenza A(H3) dominated season), with excess mortality reported in the UK among all ages in six weeks of the season in England, one week in Wales, five weeks in Scotland, and seven weeks in Northern Ireland, with each region also reporting comparable excess among older adults (aged 65+). ROI reported excess mortality among those aged 65 years and over for eight consecutive weeks of the season, while excess all-cause mortality among children (aged under 5 years) was reported in Scotland (for three weeks in total). The majority of circulating A(H3N2) strains were antigenically similar to the Northern Hemisphere 2016/17 (H3N2) vaccine strain.

Similar to NI, the UK reported more respiratory illness outbreaks than in the 2015/16 season, with the majority of these occurring in care home settings (826/1,055; 78%). This compares to 35% (236/668) of outbreaks occurring in care homes in 2015/2016. Of those that were tested, the majority of outbreaks were caused by influenza A(unknown subtype) (429/617; 69.5%), while 9.6% (59/617) were caused by influenza A(H3), 2.4% by influenza B (15/617) and 14.9% (92/617) by other non-influenza viruses. No outbreaks in 2016/17 were caused by influenza A(H1N1)pdm09.

A total of 305 influenza A(H3N2), 17 influenza B and nine influenza A(H1N1)pdm09 have been tested for oseltamivir susceptibility in the UK by PHE RVU, of which all but five influenza A(H3N2) virus found to be susceptible. 286 influenza A(H3N2), 17 influenza B and nine influenza A(H1N1)pdm09 have also been tested for zanamivir susceptibility in the UK of which 280 were found to be sensitive.

## Conclusion

---

This year's influenza season was characterised by low levels of both community and hospital influenza activity, with the ILI consultation rate in primary care remaining below the MEM threshold throughout the season and the lowest number of individuals with confirmed influenza in ICU/HDU units since surveillance in this group was initiated. The impact of the virus was principally seen in the older adult population, with higher number of care home outbreaks and excess mortality seen in those aged over 65 years in particular.

The 2016/17 season was dominated by influenza A (H3), with influenza B increasing later in the season. A small number of influenza A (H1N1) pdm09 specimens were also detected. The UK, as with many Northern Hemisphere countries has reported that the majority of circulating A(H3N2) circulating strains were genetically and antigenically similar to the Northern Hemisphere 2016/17 (H3N2)vaccine strain.

In Northern Ireland, seasonal influenza vaccine uptake rates were generally high. This season, compared to last year, a marginal decrease was seen in those over 65 years of age with an uptake of 71.9% compared to 74.4% in 2015/16 and in those under 65 in a clinical risk group the uptake was 57.1% compare to 59.9% last season. The uptake in the childhood LAIV programme continued to increase this year exceeding the 75% target uptake, the effect of which may be a contributory factor in the low levels of influenza activity being seen in the region. Estimated uptake rates in pregnant women increased marginally compared to last year. Vaccine uptake rate for Health Care Workers in the region increased since last year but failed to reach the uptake target of 40% across all five Health and Social Care Trusts. The importance of ensuring high uptake in target groups of the national influenza vaccination programme remains.

## Acknowledgements

---

Compiled by C Nugent, N Gallagher, C. Kearns, M Sartaj

Contributions from J Johnston

Public Health Agency wish to thank NISRA, the sentinel GPs, Out-of-Hours Centres, Regional Virus Laboratory, Health and Social Care Trusts, Health and Social Care Board, Critical Care Network Northern Ireland, Public Health England and all who have contributed to the surveillance system and who have contributed towards this report.



## References

---

Surveillance of influenza and other respiratory viruses in the UK: 2016-17 report

Available online:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/613493/Surveillance\\_of\\_influenza\\_and\\_other\\_respiratory\\_viruses\\_in\\_the\\_UK\\_2016\\_to\\_2017.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/613493/Surveillance_of_influenza_and_other_respiratory_viruses_in_the_UK_2016_to_2017.pdf)

World Health Organization (2015) WHO: Recommended composition of influenza virus vaccines for use in the 2016-2017 northern hemisphere influenza season.

Available online:

[http://www.who.int/influenza/vaccines/virus/recommendations/201602\\_recommendation.pdf?ua=1](http://www.who.int/influenza/vaccines/virus/recommendations/201602_recommendation.pdf?ua=1)

Vega T, et al. Influenza surveillance in Europe: establishing epidemic thresholds by the Moving Epidemic Method. Influenza and Other Respiratory Viruses 2012. doi: 10.1111/j.1750-2659.2012.00422.x.

EuroMOMO, European Monitoring of Excess Mortality for Public Health Action. Available online: <http://www.euromomo.eu/>