Influenza Surveillance in Ireland – Weekly Report

Influenza Week 1 2018 (1st – 7th January 2018)

Summary

Overall, influenza activity in Ireland was at high levels during week 1 2018 (week ending 7th January 2018). Influenza B and A(H3N2) are co-circulating, with more influenza B than is usually observed at this time of year. Confirmed influenza hospitalisations and influenza outbreaks are continuing to be reported at high levels. It is recommended that antivirals be considered for the treatment and prophylaxis of influenza in at-risk groups. Respiratory syncytial virus (RSV) activity remains at high levels.

- Influenza-like illness (ILI): The sentinel GP influenza-like illness (ILI) consultation rate was 98.2 per 100,000 population in week 1 2018, a significant increase compared to the updated rate of 29.9 per 100,000 reported during week 52 2017.
  - ILI rates have been above the Irish baseline threshold (17.5 per 100,000 population) for four consecutive weeks.
  - ILI age specific rates increased in all age groups during week 1 2018, with the highest rates reported in the 15-64 year age group, followed by those aged 65 years and older.
- GP Out of Hours: The proportion of influenza–related calls to GP Out-of-Hours service increased significantly during 1 2018 and was at very high levels.
- Respiratory admissions: Respiratory admissions data reported from a network of sentinel hospitals for week 1 2018 were at high levels.
- National Virus Reference Laboratory (NVRL):
  - Influenza positivity increased during week 1 2018, compared to recent weeks, with 411 (34.5%) influenza positive specimens reported from the NVRL from sentinel GP and non-sentinel sources: 40% influenza A [142 A(H3N2), 19 A(H1N1)pdm09, 3 A (not subtyped)] and 60% (247) influenza B.
  - Influenza B and A(H3N2) are co-circulating this season, with low numbers of influenza A(H1N1)pdm09 also being reported. Influenza B positive detections are at higher levels than are usually observed at this time of year.
  - Coinfections of all seasonal respiratory viruses were reported during week 1 2018, with 20% of influenza detections co-infected with another respiratory virus.
  - Respiratory syncytial virus (RSV) positivity remained at high levels during week 1 2018.
  - Human metapneumovirus, adenovirus, parainfluenza virus, coronavirus and picornavirus (which includes both rhinovirus and enterovirus) positive detections have continued to be detected.
- Hospitalisations: 367 confirmed influenza hospitalised cases were notified during week 1 2018, 47% associated with influenza A and 53% with influenza B. For the season to date, 535 confirmed influenza hospitalised cases have been notified to HPSC, with the highest rates occurring in those aged ≥65 years, followed by those aged less than one year.
- Critical care admissions: Twenty-eight confirmed influenza cases were admitted to critical care units and reported to HPSC during weeks 40 2017 – 1 2018.
- Mortality: A number (<10) of deaths in influenza cases were notified to HPSC for the season to date.
- Outbreaks: 29 acute respiratory infection (ARI) and influenza outbreaks were notified during week 1 2018.
- International: Influenza activity increased in countries in western, northern and southern Europe, with influenza A and B/Yamagata viruses co-circulating. ECDC published an early risk assessment.

1. GP sentinel surveillance system - Clinical Data

- During week 1 2018, 245 influenza-like illness (ILI) cases were reported from sentinel GPs, corresponding to an ILI consultation rate of 98.2 per 100,000 population, an increase compared to the updated rate of 29.9 per 100,000 reported during week 52 2017 (figure 1).
- The ILI rates have been above the Irish baseline ILI threshold (17.5/100,000 population) for four consecutive weeks (weeks 50 2017 – 1 2018).
- ILI age specific rates increased in all age groups during week 1 2018, except for the 0-4 year age group. The highest rates reported were in the 15-64 year age group, followed by those aged 65 years and older (figure 2).
- HPSC in consultation with the European Centre for Disease Prevention and Control (ECDC) has revised the Irish baseline ILI threshold for the 2017/2018 influenza season to 17.5 per 100,000 population; this threshold indicates the likelihood that influenza is circulating in the community. The Moving Epidemic Method (MEM) has been adopted by ECDC to calculate thresholds for GP ILI consultations in a standardised approach across Europe.[1]
- The baseline ILI threshold (17.5/100,000 population), medium (59.6/100,000 population) and high (114.5/100,000 population) intensity ILI thresholds are shown in figure 1.

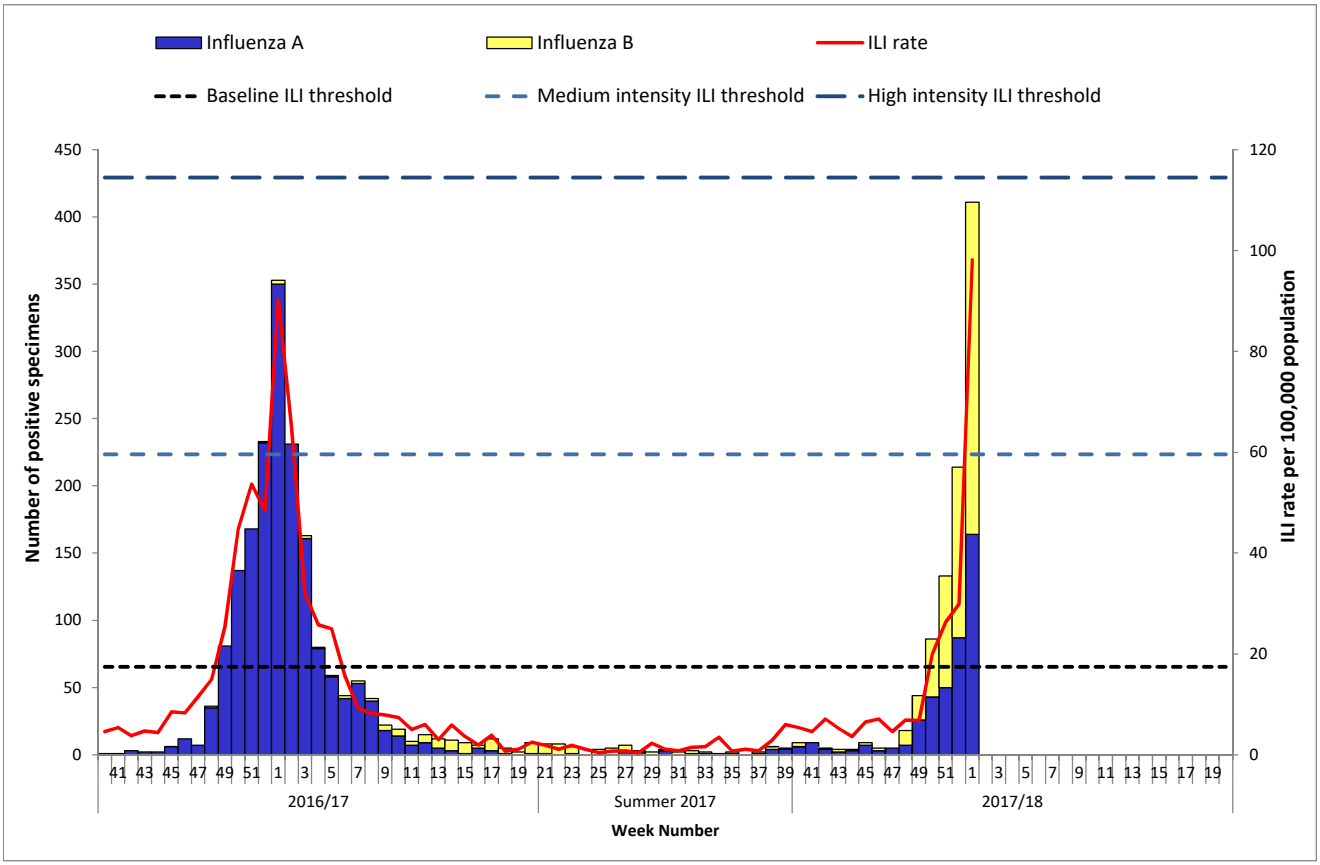

Figure 1: ILI sentinel GP consultation rates per 100,000 population, baseline ILI threshold, medium and high intensity ILI thresholds[*] and number of positive influenza A and B specimens tested by the NVRL, by influenza week and season.
Source: ICGP and NVRL

[*] For further information on the Moving Epidemic Method (MEM) to calculate ILI thresholds: http://www.ncbi.nlm.nih.gov/pubmed/22897919

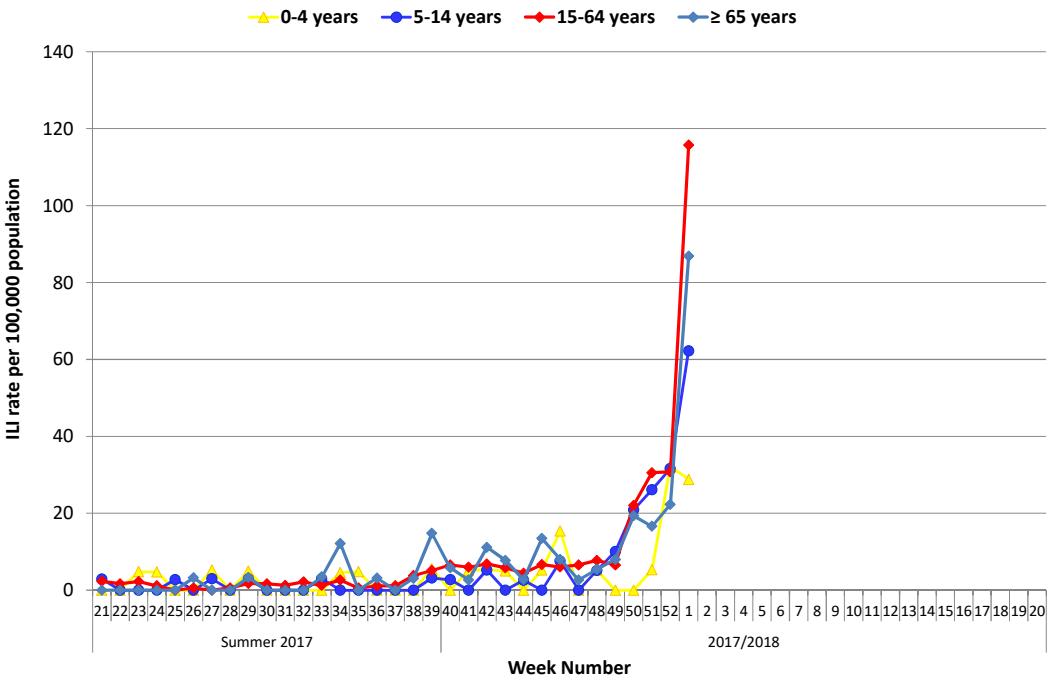

Figure 2: Age specific sentinel GP ILI consultation rate per 100,000 population by week during the summer of 2017 and the 2017/2018 influenza season to date. *Source: ICGP.*

2. Influenza and Other Respiratory Virus Detections - NVRL

The data reported in this section for the 2017/2018 influenza season refer to sentinel and non-sentinel respiratory specimens routinely tested for influenza, respiratory syncytial virus (RSV), adenovirus, parainfluenza viruses types 1, 2, 3 & 4 (PIV-1, -2, -3 & -4) and human metapneumovirus (hMPV) by the National Virus Reference Laboratory (NVRL) (figures 3, 4 & 5 and tables 1 & 2).

- Influenza positivity increased and was at high levels during week 1 2018, compared to recent weeks, with 411 (34.5%) influenza positive specimens reported from the NVRL from sentinel GP and non-sentinel sources: 40% influenza A [142 A(H3N2), 19 A(H1N1)pdm09, 3 A-not subtyped] and 40% (247) influenza B.
- Week 1 2018:
  - 47 of 125 (37.6%) sentinel specimens were influenza positive: 25.5% influenza A and 74.5% influenza B
  - 364 of 1065 (34.2%) non-sentinel specimens were influenza positive: 41.8% influenza A and 58.2% B
- Data from the NVRL for week 1 2018 and the 2017/2018 season to date are detailed in tables 1 and 2.
- Influenza B and A(H3N2) are co-circulating this season, with low numbers of influenza A(H1N1)pdm09 also being reported. Influenza B positive detections are at higher levels than are usually observed at this time of year (figures 3 & 4).
- Coinfections of all seasonal respiratory viruses were reported during week 1 2018, with 20% of influenza detections co-infected with another respiratory virus.
- Respiratory syncytial virus (RSV) positive detections remained at high levels during weeks 1 2018; however are starting to decrease (table 2 & figure 5).
- Human metapneumovirus, adenovirus, parainfluenza virus, coronavirus and picornavirus (which includes both rhinovirus and enterovirus) positive detections have continued to be detected (table 2).[1]
- The overall proportion of non-sentinel specimens positive for respiratory viruses[1] was high at 52.8% during week 1 2018.

[1] *Respiratory viruses routinely tested by the NVRL and included in this report are detailed above. It should be noted that there are no historic data on picornaviruses or coronaviruses for seasonal comparisons, data on these viruses are not included in this report.*

Virus Characterisation:

- The recommended composition of trivalent influenza vaccines for the 2017/2018 influenza season in the Northern Hemisphere included: an A/Michigan/45/2015 (H1N1)pdm09-like virus; an A/Hong Kong/4801/2014 (H3N2)-like virus; and a B/Brisbane/60/2008-like virus (B/Victoria lineage). For quadrivalent vaccines, a B/Phuket/3073/2013-like virus (B/Yamagata lineage) was recommended. Trivalent influenza vaccines are the most widely used influenza vaccines in Europe. http://www.who.int/influenza/vaccines/virus/recommendations/en/
- Genetic characterisation of influenza viruses circulating this season in Ireland has been carried out by the NVRL on six influenza A(H3N2), five influenza A(H1N1)pdm09 and three influenza B positive specimens to date. Further genetic and antigenic testing is ongoing at the NVRL.
- Of the six influenza A(H3N2) viruses genetically characterised, five viruses belonged to clade 3C.2a, the vaccine virus clade, represented by A/Hong Kong/4801/2014. One virus belonged to subclade 3C.2a1, represented by A/Singapore/INFIMH-16-0019/2016. Both 3C.2a (vaccine virus clade) and 3C.2a1 viruses circulated last season in Ireland and Europe, with 3C.2a1 viruses predominating last season. Viruses in these two groups are antigenically similar; however both clade and subclade are evolving rapidly, thereby requiring continued monitoring.
- Five influenza A(H1N1)pdm09 viruses were characterised and belonged to the 6B.1 genetic clade, represented by A/Michigan/45/2015, the influenza A(H1N1)pdm09 vaccine virus clade.
- Three influenza B viruses were genetically characterised, all were B/Yamagata lineage viruses, clustering in clade 3 represented by B/Phuket/3073/2013. The most prevalent influenza B lineage virus detected this season to date in Europe, is B/Yamagata, which is not included in the 2017/2018 trivalent influenza vaccine.

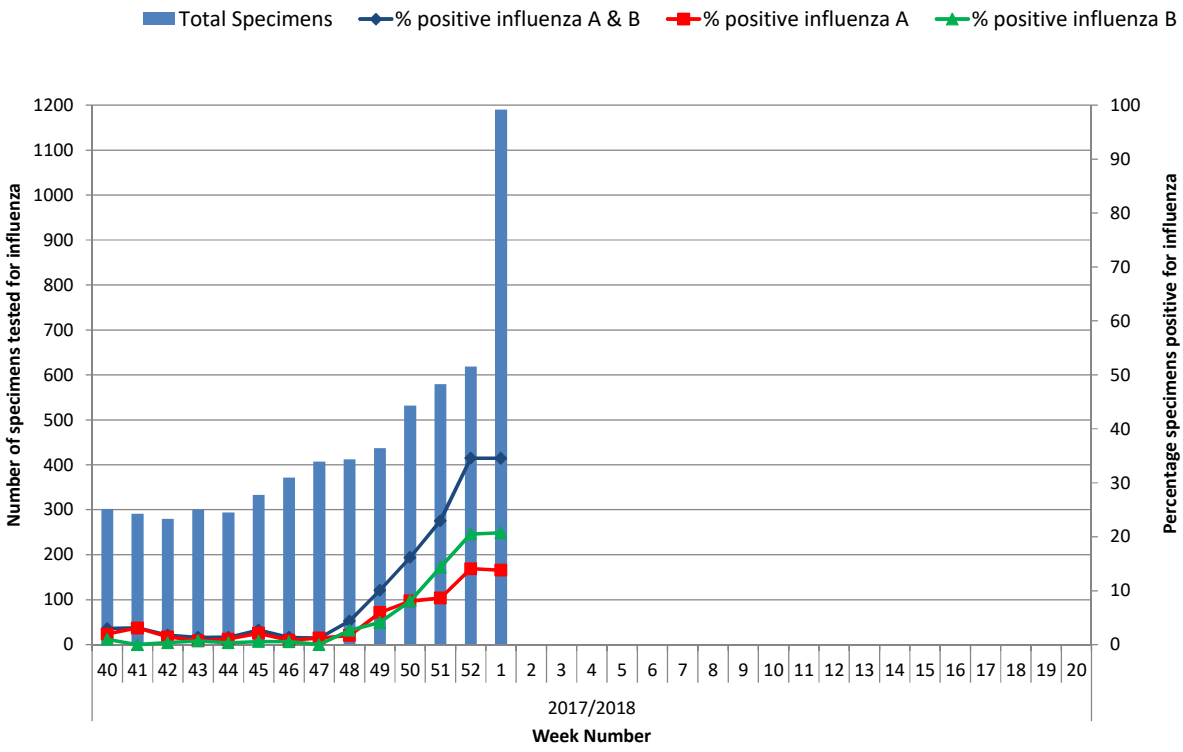

Figure 3: Number of specimens (from sentinel and non-sentinel sources combined) tested by the NVRL for influenza and percentage influenza positive by week for the 2017/2018 influenza season. *Source: NVRL*

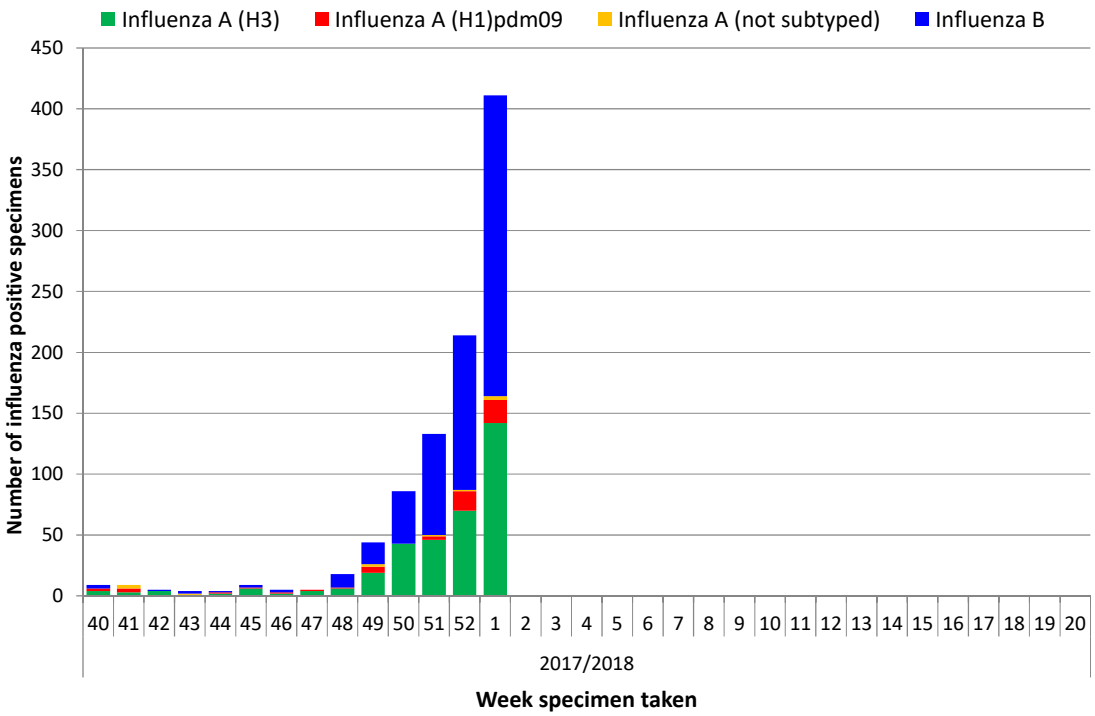

Figure 4: Number of positive influenza specimens (from sentinel and non-sentinel sources combined) by influenza type/subtype tested by the NVRL, by week for the 2017/2018 influenza season. *Source: NVRL.*

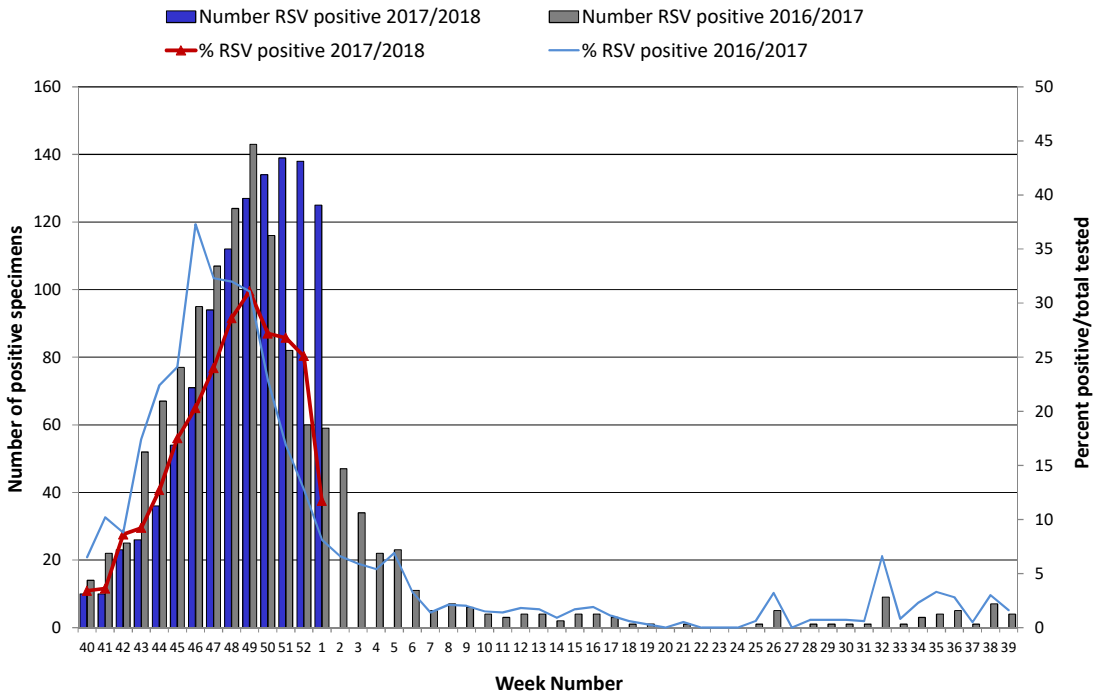

Figure 5: Number and percentage of non-sentinel RSV positive specimens detected by the NVRL during the 2017/2018 season, compared to the 2016/2017 season. *Source: NVRL.*

Table 1: Number of sentinel and non-sentinel[†] respiratory specimens tested by the NVRL and positive influenza results, for week 1 2018 and the 2017/2018 season to date. *Source: NVRL*

Week	Specimen type	Total tested	Number influenza positive	% Influenza positive	Influenza A				Influenza B
					A (H1)pdm09	A (H3)	A (not subtyped)	Total influenza A	
1 2018	Sentinel	125	47	37.6	3	8	1	12	35
	Non-sentinel	1065	364	34.2	16	134	2	152	212
	Total	**1190**	**411**	**34.5**	**19**	**142**	**3**	**164**	**247**
2017/2018	Sentinel	464	168	36.2	9	50	3	62	106
	Non-sentinel	5880	788	13.4	44	302	8	354	434
	Total	**6344**	**956**	**15.1**	**53**	**352**	**11**	**416**	**540**

Table 2: Number of non-sentinel specimens tested by the NVRL for other respiratory viruses and positive results, for week 1 2018 and the 2017/2018 season to date. *Source: NVRL*

Week	Specimen type	Total tested	RSV	% RSV	Adenovirus	% Adenovirus	PIV-1	% PIV-1	PIV-2	% PIV-2	PIV-3	% PIV-3	PIV-4	% PIV-4	hMPV	% hMPV
1 2018	Sentinel	125	3	2.4	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0	5	4.0
	Non-sentinel	1065	125	11.7	10	0.9	3	0.3	3	0.3	0	0.0	3	0.3	54	5.1
	Total	**1190**	**128**	**10.8**	**11**	**0.9**	**3**	**0.3**	**3**	**0.3**	**0**	**0.0**	**3**	**0.3**	**59**	**5.0**
2017/2018	Sentinel	464	14	3.0	11	2.4	12	2.6	1	0.2	0	0.0	2	0.4	14	3.0
	Non-sentinel	5880	1099	18.7	117	2.0	144	2.4	56	1.0	10	0.2	40	0.7	416	7.1
	Total	**6344**	**1113**	**17.5**	**128**	**2.0**	**156**	**2.5**	**57**	**0.9**	**10**	**0.2**	**42**	**0.7**	**430**	**6.8**

[†] 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 based on sentinel GP ILI consultation rates, laboratory data and outbreaks.

The geographical spread of influenza/ILI during week 1 2018 is shown in figure 6. Widespread influenza activity was reported in all HSE-Areas, with the exception of HSE-Midlands during week 1 2018 (figure 6). Influenza activity increased in all HSE-Areas during week 1 2018.

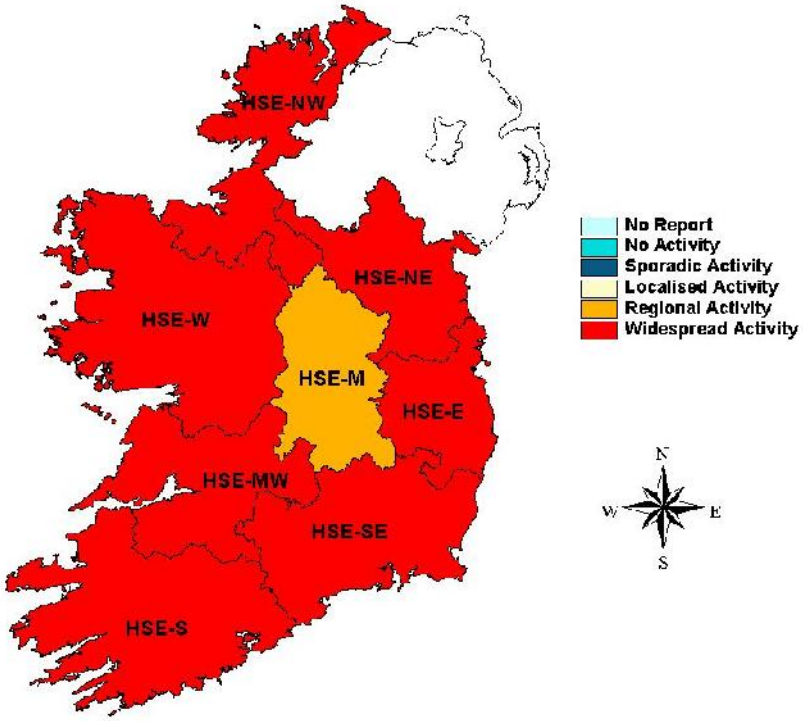

Figure 6: Map of provisional influenza activity by HSE-Area during week 1 2018

Sentinel hospitals

The Departments of Public Health have established at least one sentinel hospital in each HSE-Area, to report data on total, emergency and respiratory admissions on a weekly basis.

Respiratory admissions reported from a network of sentinel hospitals, based on the latest complete data, were at high levels; with 501 respiratory admissions reported during week 52 2017 and 483 reported during week 51 2017 (figure 7). Data were incomplete during week 1 2018, with 484 respiratory admissions reported from seven of eight hospitals. The respiratory admissions reported during week 52 2017 were at a lower level than the same period in 2016, when 571 admissions were reported.

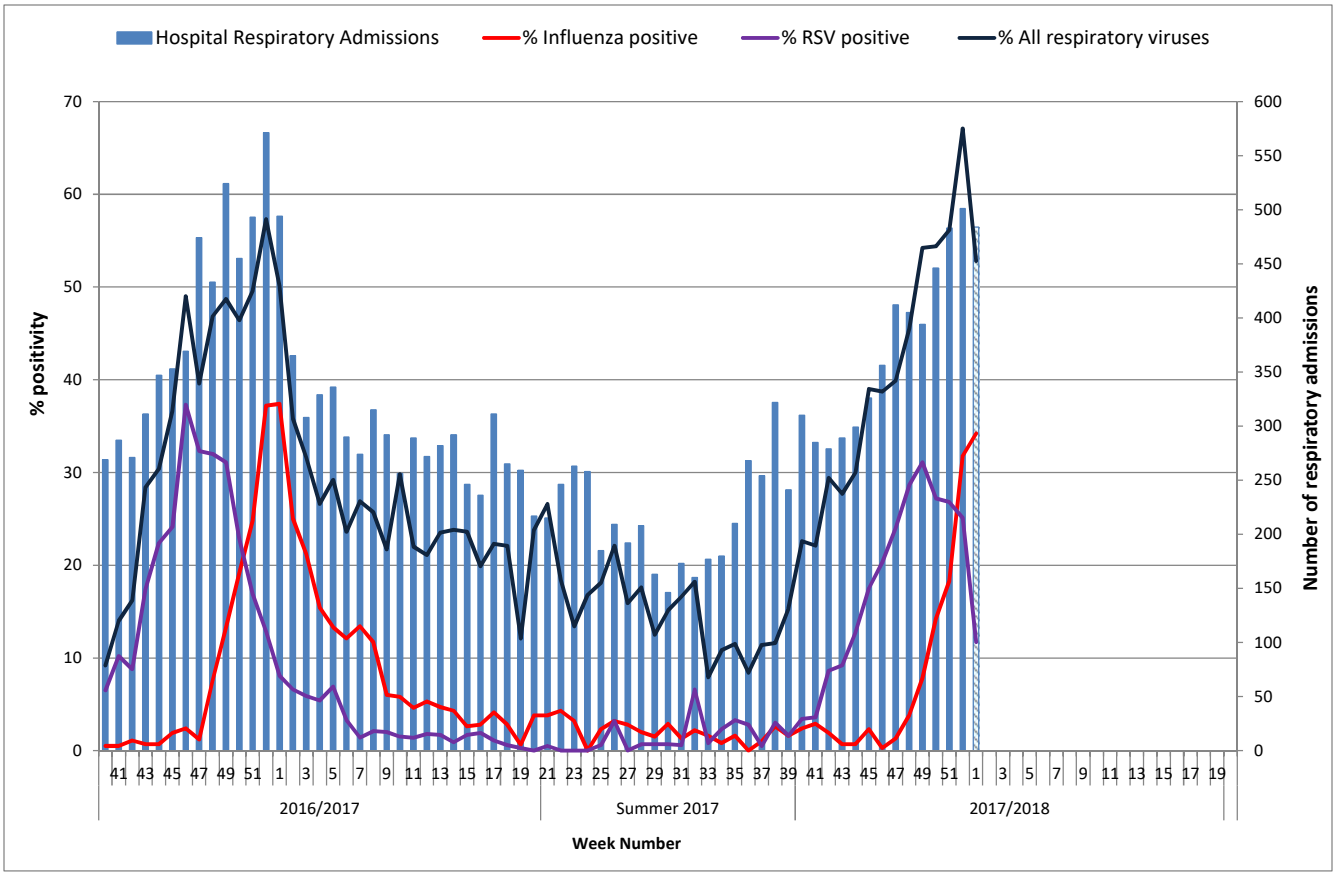

Figure 7: Number of respiratory admissions reported from the sentinel hospital network and % positivity for influenza, RSV and all seasonal respiratory viruses tested* by the NVRL by week and season. *Source: Departments of Public Health - Sentinel Hospitals & NVRL. *All seasonal respiratory viruses tested refer to non-sentinel respiratory specimens routinely tested by the NVRL including influenza, RSV, adenovirus, parainfluenza viruses and human metapneumovirus (hMPV). Data were incomplete during weeks 43 2017; this week is represented by the hatched bar.*

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. 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 was at very high levels and increased significantly during week 1 2018 to 9.5%, compared to 5.3% during week 52 2017 (figure 8). The proportion of influenza-related calls during week 1 2018 is at the highest level since the 2010/2011 season.

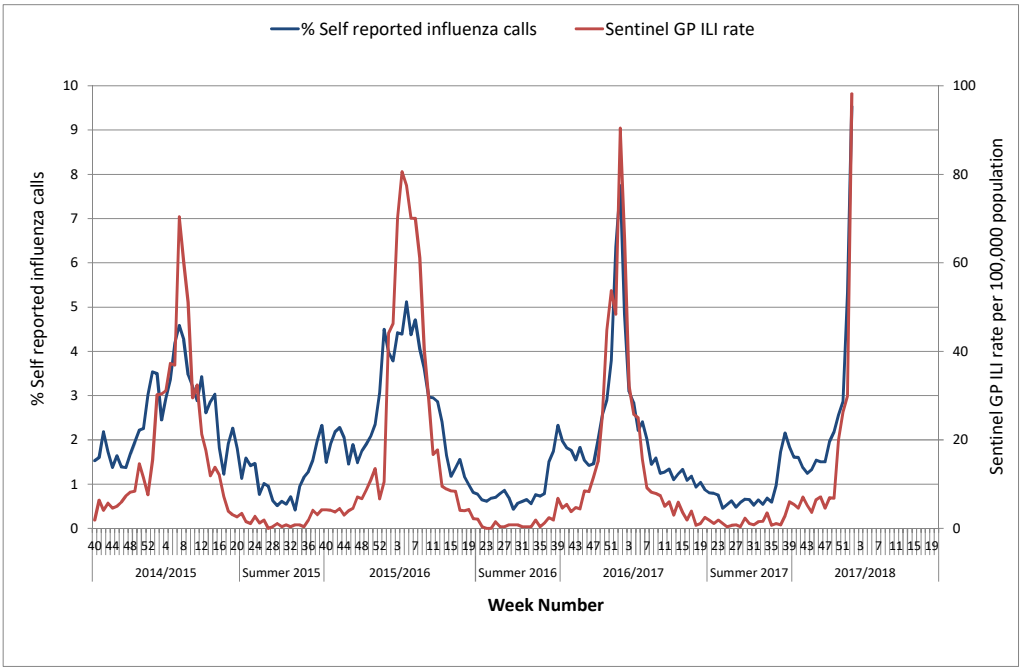

Figure 8: Self-reported influenza-related calls as a proportion of total calls to Out-of-Hours GP Co-ops and sentinel GP ILI consultation rate per 100,000 population by week and season. *Source: GP Out-Of-Hours services in Ireland (collated by HSE-NE) & ICGP.*

5. Influenza & RSV notifications

Influenza and RSV cases notifications are reported on Ireland's Computerised Infectious Disease Reporting System (CIDR), including all positive influenza /RSV specimens reported from all laboratories testing for influenza/RSV and reporting to CIDR.

Influenza and RSV notifications are reported in the Weekly Infectious Disease Report for Ireland.

- Influenza notifications were at very high levels during week 1 2018, at 852, compared to 98 in the previous week. During week 1 2018, 323 (38%) cases were associated with influenza A [29 A(H3N2), 10 A(H1N1)pdm09 and 284 A (not subtyped)], 520 (61%) cases were associated with influenza B, and nine (1%) cases with influenza type not reported.
- For the 2017/2018 influenza season to date, 1332 confirmed influenza cases have been notified to HPSC: 543 (41%) cases were associated with influenza A [88 A(H3N2), 30 A(H1N1)pdm09, 425 A (not subtyped)], 776 (58%) cases with influenza B, and 13 (1%) cases with influenza type not reported.
- RSV notifications were at high levels during weeks 1 2018, with 407 cases notified, compared to 119 notified cases during week 52 2017 and 323 during week 51 2017.

6. Influenza Hospitalisations

- Three hundred and sixty-seven confirmed influenza hospitalised cases were notified during week 1 2018, of typed influenza viruses, 47% were associated with influenza A and 53% with influenza B.
- For the 2017/2018 influenza season to date, 535 confirmed influenza hospitalised cases have been notified to HPSC: 256 (48%) were associated with influenza A [35 associated with A(H3N2), 14 with A(H1N1)pdm09, 207 with A (not subtyped)], 269 (50%) with influenza B and 10 (2%) with influenza type not reported. Age specific rates for hospitalised influenza cases are reported in table 3, with the highest rates reported in those aged 65 years and older, followed by those aged less than one year old. The number of confirmed influenza hospitalised cases by influenza type/subtype and by week of notification is shown in figure 9.

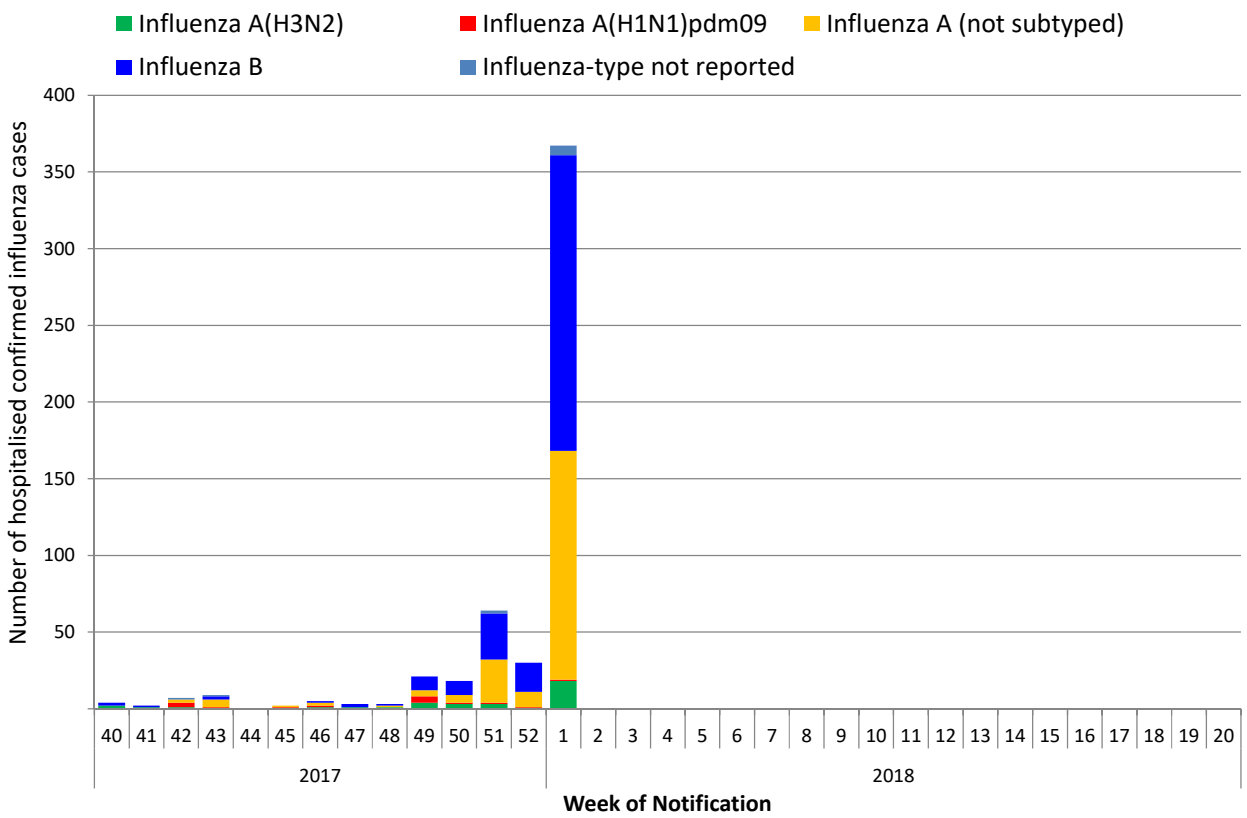

Figure 9: Number of confirmed influenza cases hospitalised by influenza type/subtype and by week of notification.
Source: Ireland's Computerised Infectious Disease Reporting System (CIDR).

7. Critical Care Surveillance

The Intensive Care Society of Ireland (ICSI) and the HSE Critical Care Programme are continuing with the enhanced surveillance system set up during the 2009 pandemic, on all critical care patients with confirmed influenza. HPSC processes and reports on this information on behalf of the regional Directors of Public Health/Medical Officers of Health.

Twenty-eight confirmed influenza cases (three associated with influenza A(H3N2), 14 with influenza A - not subtyped and 11 influenza B) were admitted to critical care units and reported to HPSC during weeks 40 2017 – 1 2018. The highest age specific rates were reported in those aged less than one year old, followed by those aged 65 years and older (table 3).

Table 3: Age specific rates for confirmed influenza cases hospitalised and admitted to critical care during the 2017/2018 influenza season to date. Age specific rates are based on the 2016 CSO census.

	Hospitalised		Admitted to ICU	
Age (years)	Number	Age specific rate per 100,000 pop.	Number	Age specific rate per 100,000 pop.
<1	18	28.9	4	6.4
1-4	32	11.9	0	0.0
5-14	34	5.0	5	0.7
15-24	24	4.2	0	0.0
25-34	25	3.8	1	0.2
35-44	43	6.5	4	0.5
45-54	46	7.3	3	0.5
55-64	43	8.4	3	0.6
≥65	270	42.3	8	1.3
Total	**535**	**11.2**	**28**	**0.6**

8. Mortality Surveillance

Influenza-associated deaths include all deaths where influenza is reported as the primary/main cause of death by the physician or if influenza is listed anywhere on the death certificate as the cause of death. HPSC receives daily mortality data from the General Register Office (GRO) on all deaths from all causes registered in Ireland. These data have been used to monitor excess all-cause and influenza and pneumonia deaths as part of the influenza surveillance system and the European Mortality Monitoring Project. These data are provisional due to the time delay in deaths' registration in Ireland. http://www.euromomo.eu/

- A number of deaths (less than 10) in notified influenza cases have been reported to HPSC during weeks 40 2017 – 1 2018.
- No excess all-cause mortality was reported this season in Ireland after correcting GRO data for reporting delays with the standardised EuroMOMO algorithm.

9. Outbreak Surveillance

- Twenty-nine influenza and acute respiratory infection (ARI) general outbreaks were notified to HPSC during week 1 2018, from HSE-East, -Midlands, -Northeast, -Northwest, -South and –West.
- Twenty-two influenza outbreaks were notified to HPSC during week 1 2018: three associated with influenza A, eight with influenza B and 11 with no influenza type reported. Four of these outbreaks were reported in acute hospital settings and 18 in residential care facilities/long stay units.
- Seven acute respiratory infection (ARI) outbreaks in residential care facilities/long stay units were notified during week 1 2018, one associated with RSV, two with rhinovirus and four with no pathogens identified.
- For the 2017/2018 influenza season to date, 46 influenza/ARI general outbreaks have been notified: 34 associated with influenza (in HSE-East, -Midlands, -Northeast, -Northwest, -South and -West), three associated with RSV (in HSE-Midwest, -Northwest and -South) and nine ARI outbreaks in residential care facilities mainly associated with picornaviruses (in HSE-East, -Northwest, -South and -West). Of the 34 influenza outbreaks notified, 10 were associated with influenza A [five with A(H3N2), one with A(H1N1)pdm09 and four with influenza A-not subtyped], 11 with influenza B and 13 with no influenza type reported. Six influenza outbreaks were reported in acute hospital settings, one in a school and 27 in residential care facilities/other residential setting. *Family outbreaks are not included in this surveillance report.*

10. International Summary

- During week 52 2017, influenza activity was increasing in countries in western, northern and southern Europe, with sharp increases in respiratory illness indicators in some countries. Both influenza A and B were co-circulating and mixed patterns were observed across the Region. From sentinel sources, a higher proportion of influenza B viruses compared to A viruses has been detected. Of subtyped A viruses from sentinel sources, A(H1N1)pdm09 viruses have outnumbered A(H3N2) viruses. Conversely, the majority of detections from non-sentinel systems have been influenza A viruses, and of those subtyped, most were A(H3N2). For type B viruses from both sentinel and non-sentinel sources, B/Yamagata lineage viruses have greatly outnumbered those of the B/Victoria lineage. While low in number, 59% of the genetically characterized A(H3N2) viruses belonged to clade 3C.2a, the vaccine virus clade as described in the WHO recommendations for vaccine composition for the northern hemisphere 2017–18, and 40% to clade 3C.2a1, with viruses in both clades being antigenically similar.
- As of January 8 2018, influenza activity continued to increase in the temperate zone of the northern hemisphere while in the temperate zone of the southern hemisphere activity was at inter-seasonal levels. Worldwide, influenza A(H3N2) and B viruses accounted for the majority of influenza detections although influenza A(H1N1)pdm09 viruses were predominant in some countries.
- ECDC has published a Risk assessment for seasonal influenza, EU/EEA, 2017–2018.
- See ECDC and WHO influenza surveillance reports for further information.

- Further information is available on the following websites:

Northern Ireland	http://www.fluawareni.info/
Europe – ECDC	http://ecdc.europa.eu/
Public Health England	http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/SeasonalInfluenza/
United States CDC	http://www.cdc.gov/flu/weekly/fluactivitysurv.htm
Public Health Agency of Canada	http://www.phac-aspc.gc.ca/fluwatch/index-eng.php

- Information on Middle Eastern Respiratory Syndrome Coronavirus (MERS), including the latest ECDC rapid risk assessment is available on the ECDC website. Further information and guidance documents are also available on the HPSC and WHO websites.
- Further information on avian influenza is available on the ECDC website. The latest ECDC rapid risk assessment on highly pathogenic avian influenza A of H5 type is also available on the ECDC website.

11. WHO recommendations on the composition of influenza virus vaccines

On March 2, 2017, the WHO vaccine strain selection committee recommended that trivalent vaccines for use in the 2017/2018 northern hemisphere influenza season contain the following: an A/Michigan/45/2015 (H1N1)pdm09-like virus; an A/Hong Kong/4801/2014 (H3N2)-like virus; a B/Brisbane/60/2008-like virus. It is recommended that quadrivalent vaccines containing two influenza B viruses contain the above three viruses and a B/Phuket/3073/2013-like virus.

On September 28, 2017, the WHO vaccine strain selection committee recommended that trivalent vaccines for use in the 2018 southern hemisphere influenza season contain the following: an A/Michigan/45/2015 (H1N1)pdm09-like virus; an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus; a B/Phuket/3073/2013-like virus.It is recommended that quadrivalent vaccines containing two influenza B viruses contain the above three viruses and a B/Brisbane/60/2008-like virus.
http://www.who.int/influenza/vaccines/virus/recommendations/en/

Further information on influenza in Ireland is available at www.hpsc.ie

Acknowledgements

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