Influenza Surveillance in Ireland – Weekly Report

Influenza Weeks 51 & 52 2017 (18th – 31st December 2017)

Data for week 52 2017 should be interpreted with caution, as reporting levels are affected during the Christmas/New Year Holiday period.

Summary

Overall, influenza activity in Ireland continued to increase during weeks 51 and 52 2017 (week ending 31st December 2017). 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 increase. 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 29.4 per 100,000 population in week 52 2017 and 26.8 during week 51 2017, an increase compared to the updated rate of 20.0 per 100,000 reported during week 50 2017.
  - ILI rates are above the Irish baseline threshold (17.5 per 100,000 population) since week 50 2017.
  - ILI age specific rates were elevated in all age groups during week 52 2017, with the highest rates reported in the 0-4 year age group.
- GP Out of Hours: The proportion of influenza–related calls to GP Out-of-Hours service increased significantly during 52 2017 and was at high levels.
- National Virus Reference Laboratory (NVRL):
  - Influenza positivity increased during weeks 51 and 52 2017, compared to recent weeks, with 187 (21.3%) influenza positive specimens reported from the NVRL from sentinel GP and non-sentinel sources: 57 A(H3N2), 12 A(H1N1)pdm09, 2 A (not subtyped) and 116 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.
  - Respiratory syncytial virus (RSV) positivity remained at high levels during weeks 51 and 52 2017.
  - Coinfections of all seasonal respiratory viruses were reported during weeks 51 and 52 2017.
  - Human metapneumovirus, adenovirus, parainfluenza virus and picornavirus (which includes both rhinovirus and enterovirus) positive detections have continued to be detected.
- Hospitalisations: Ninety-four confirmed influenza hospitalised cases were notified to HPSC during weeks 51 and 52 2017, bringing the season total to 169. These hospitalisations were associated with a mix of influenza A(H3N2), A(H1N1)pdm09 and influenza B, with an increased proportion of influenza B cases reported during weeks 51 and 52 2017.
- Critical care admissions: Twelve confirmed influenza cases were admitted to critical care units and reported to HPSC during weeks 40-52 2017.
- Mortality: A number (<10) of deaths in influenza cases were notified to HPSC during weeks 40-52 2017.
- Outbreaks: Ten acute respiratory infection (ARI)/influenza general outbreaks were notified to HPSC during weeks 51 and 52 2017. Seven of these outbreaks were associated with influenza.
- 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 52 2017, 74 influenza-like illness (ILI) cases were reported from sentinel GPs, corresponding to an ILI consultation rate of 29.4 per 100,000 population, an increase compared to the rate of 26.8 per 100,000 reported during week 51 2017 and the updated rate of 20 per 100,000 in week 50 2017 (figure 1).
- The ILI rates have been above the Irish baseline ILI threshold (17.5/100,000 population) for three consecutive weeks (weeks 50 - 52 2017)
- ILI age specific rates were elevated in all age groups during week 52 2017, with the highest rates reported in the 0-4 year age group (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.

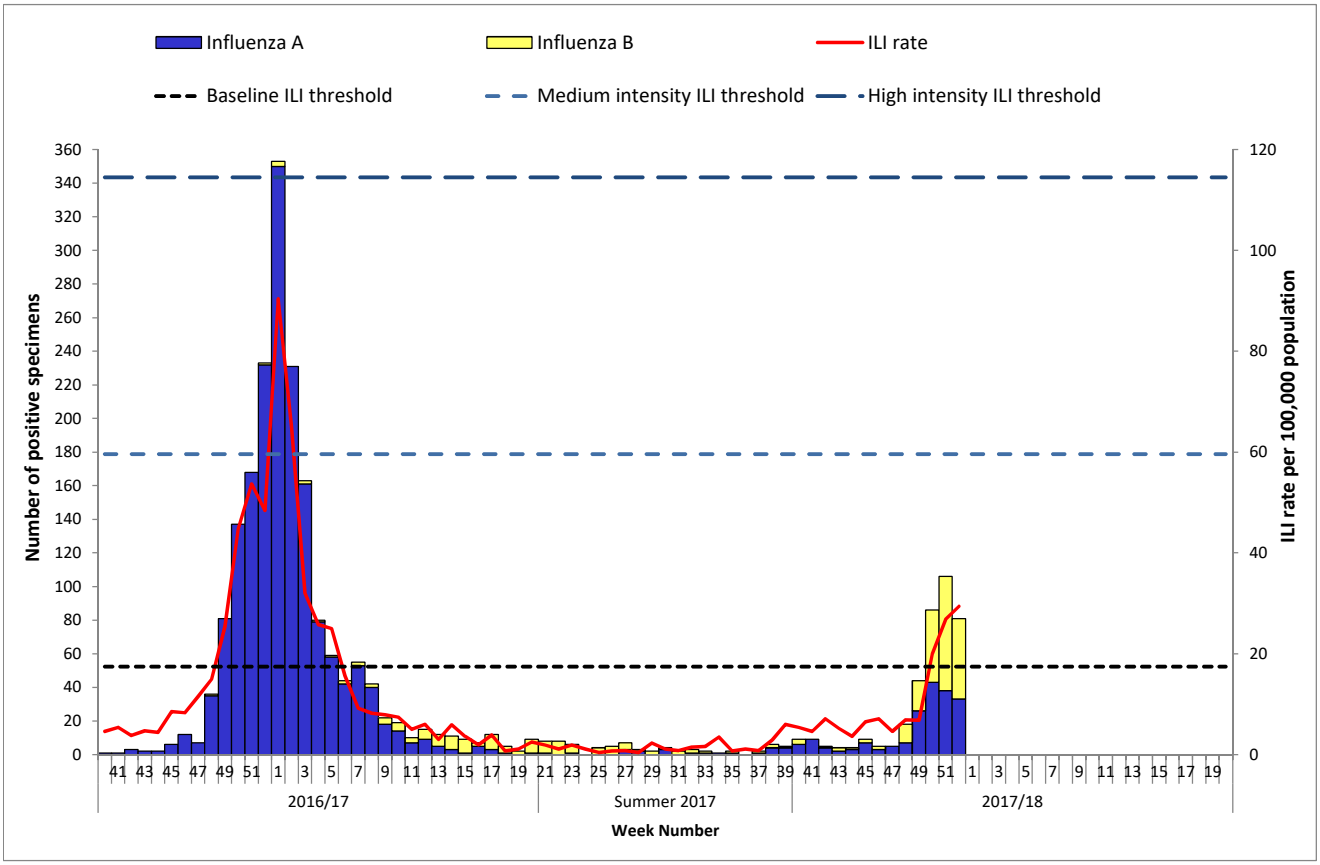

Figure 1: ILI sentinel GP consultation rates per 100,000 population, baseline ILI threshold, medium and high intensity ILI thresholds* and number of positive influenza A and B specimens tested by the NVRL, by influenza week and season.
Source: ICGP and NVRL

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

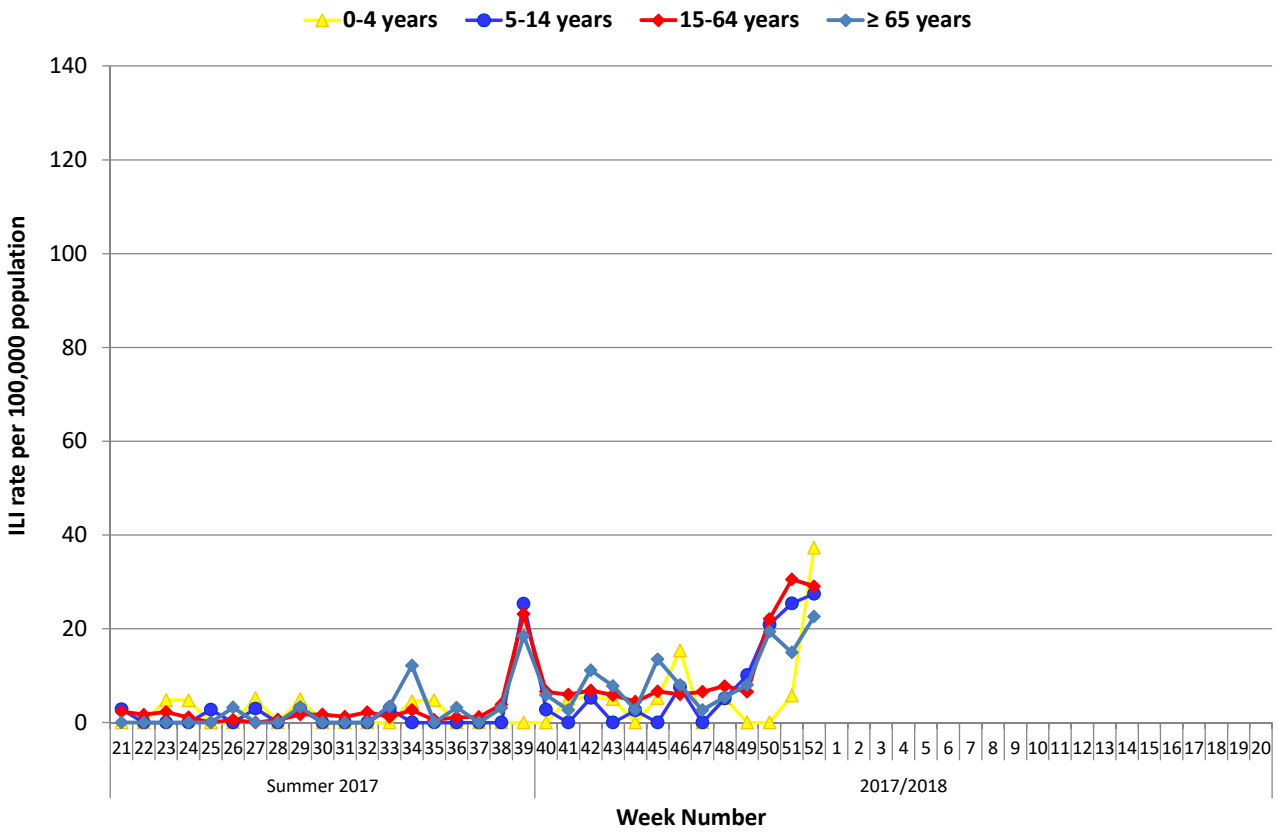

Figure 2: Age specific sentinel GP ILI consultation rate per 100,000 population by week during the summer of 2017 and the 2017/2018 influenza season to date. *Source: ICGP.*

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 during weeks 51 and 52 2017, compared to recent weeks, with 187 (21.3%) influenza positive specimens reported from the NVRL from sentinel GP and non-sentinel sources: 57 A(H3N2), 12 A(H1N1)pdm09, 2 A (not subtyped) and 116 B.
- Data from the NVRL for weeks 51 and 52 2017 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).
- Respiratory syncytial virus (RSV) positivity remained at high levels during weeks 51 and 52 2017. (table 2 & figure 5).
- Coinfections of all seasonal respiratory viruses were reported during weeks 51 and 52 2017.
- Human metapneumovirus, adenovirus, parainfluenza virus and picornavirus[1] (which includes both rhinovirus and enterovirus) positive detections have continued to be detected (table 2).

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

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.

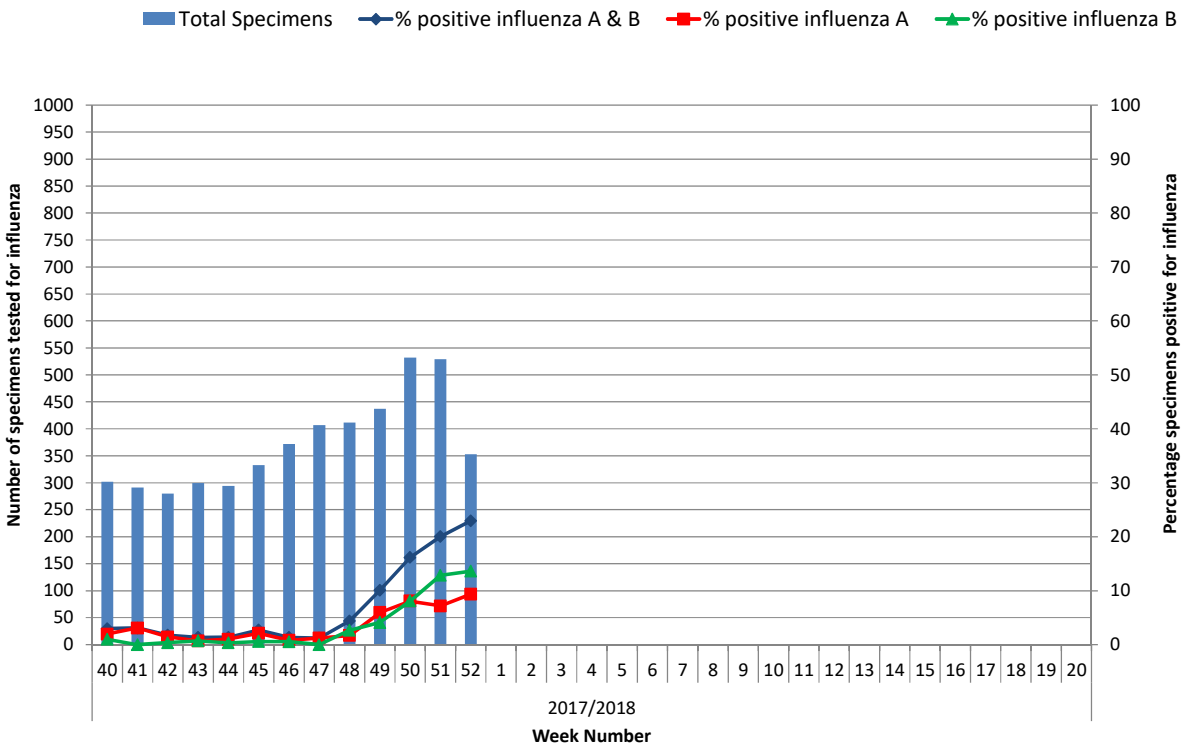

Figure 3: Number of specimens (from sentinel and non-sentinel sources combined) tested by the NVRL for influenza and percentage influenza positive by week for the 2017/2018 influenza season. *Source: NVRL*

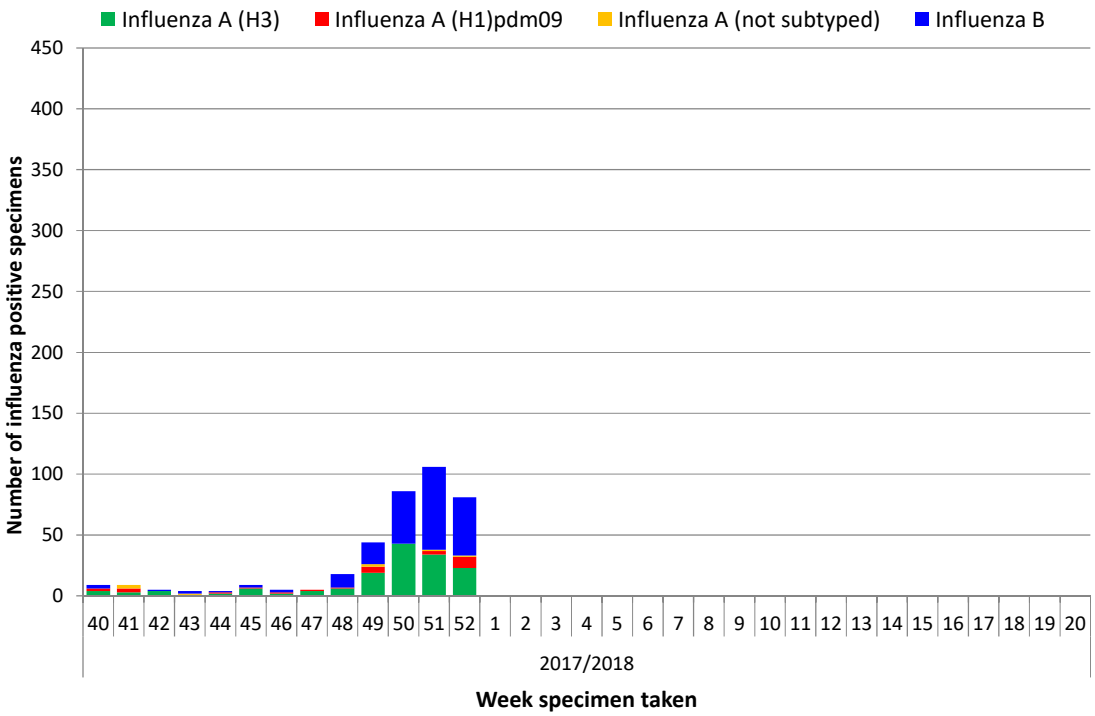

Figure 4: Number of positive influenza specimens (from sentinel and non-sentinel sources combined) by influenza type/subtype tested by the NVRL, by week for the 2017/2018 influenza season. *Source: NVRL.*

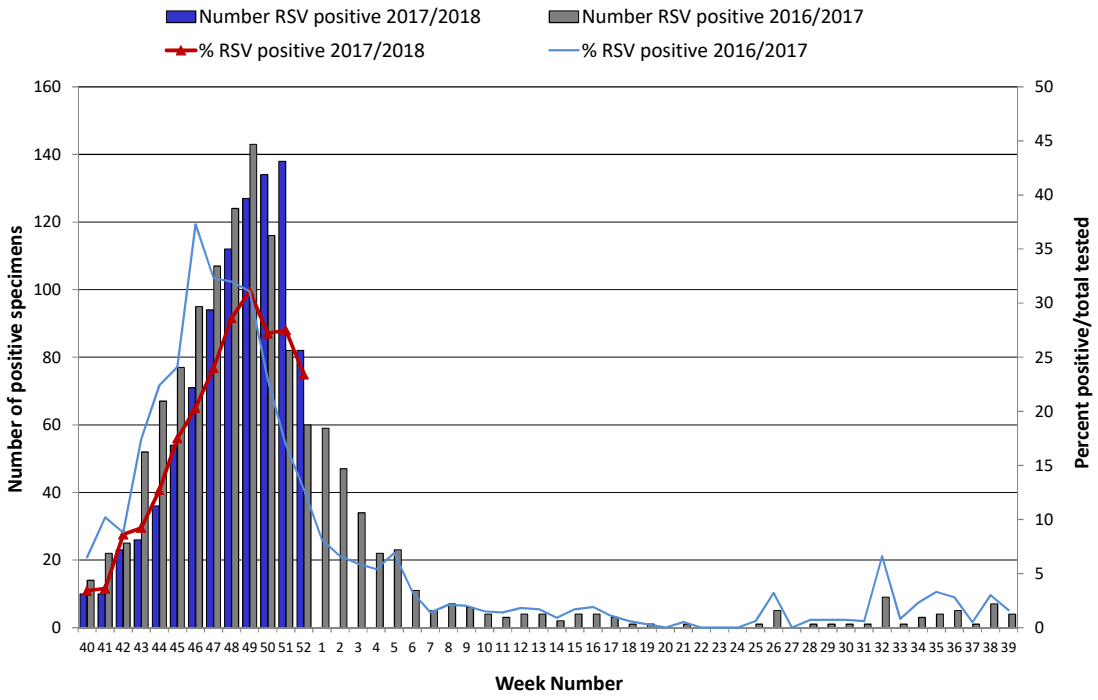

Figure 5: Number and percentage of non-sentinel RSV positive specimens detected by the NVRL during the 2017/2018 season, compared to the 2016/2017 season. *Source: NVRL.*

Table 1: Number of sentinel and non-sentinel[†] respiratory specimens tested by the NVRL and positive influenza results, for weeks 51 and 52 2017 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	
51 2017	Sentinel	26	18	69.2	1	6	1	8	10
	Non-sentinel	501	88	17.6	2	28	0	30	58
	Total	**527**	**106**	**20.1**	**3**	**34**	**1**	**38**	**68**
52 2017	Sentinel	2	0	0.0	0	0	0	0	0
	Non-sentinel	351	81	23.1	9	23	1	33	48
	Total	**353**	**81**	**22.9**	**9**	**23**	**1**	**33**	**48**
2017/2018	Sentinel	244	62	25.4	3	21	2	26	36
	Non-sentinel	4598	323	7.0	24	130	6	160	163
	Total	**4842**	**385**	**8.0**	**27**	**151**	**8**	**186**	**199**

Table 2: Number of non-sentinel specimens tested by the NVRL for other respiratory viruses and positive results, for weeks 51 and 52 2017 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
51 2017	Sentinel	26	1	3.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Non-sentinel	501	138	27.5	7	1.4	2	0.4	6	1.2	0	0.0	1	0.2	41	8.2
	Total	**527**	**139**	**26.4**	**7**	**1.3**	**2**	**0.4**	**6**	**1.1**	**0**	**0.0**	**1**	**0.2**	**41**	**7.8**
52 2017	Sentinel	2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Non-sentinel	351	82	23.4	6	1.7	2	0.6	1	0.3	0	0.0	0	0.0	21	6.0
	Total	**353**	**82**	**23.2**	**6**	**1.7**	**2**	**0.6**	**1**	**0.3**	**0**	**0.0**	**0**	**0.0**	**21**	**5.9**
2017/2018	Sentinel	244	11	4.5	8	3.3	12	4.9	0	0.0	0	0.0	2	0.8	7	2.9
	Non-sentinel	4598	917	19.9	106	2.3	141	3.1	52	1.1	10	0.2	36	0.8	339	7.4
	Total	**4842**	**928**	**19.2**	**114**	**2.4**	**153**	**3.2**	**52**	**1.1**	**10**	**0.2**	**38**	**0.8**	**346**	**7.1**

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

The geographical spread of influenza/ILI during weeks 51 and 52 2017 is shown in figure 6. Widespread influenza activity was reported in HSE-East, localised activity was reported in HSE-Midlands, -Midwest, Northeast and –West, sporadic influenza activity was reported in HSE-Northwest and South and no influenza activity was reported in HSE-Southeast during week 51 2017. During week 52 2017, widespread influenza activity was reported in HSE-East, localised activity was reported in HSE-Midlands, -Midwest, -Northeast and -Northwest and sporadic influenza activity was reported in HSE-South, -Southeast and -West (figure 6). Influenza activity has continued to increase in all HSE-Areas.

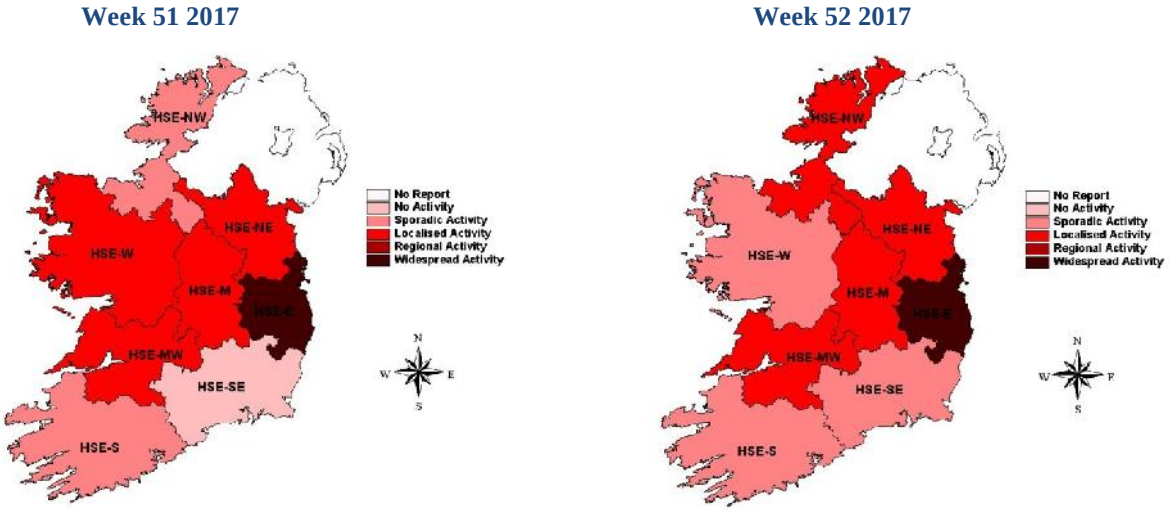

Figure 6: Map of provisional influenza activity by HSE-Area during weeks 51 and 52 2017

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). Respiratory admissions reported during week 52 2017 are at a lower level than the same period in 2016, when 571 admissions were reported.

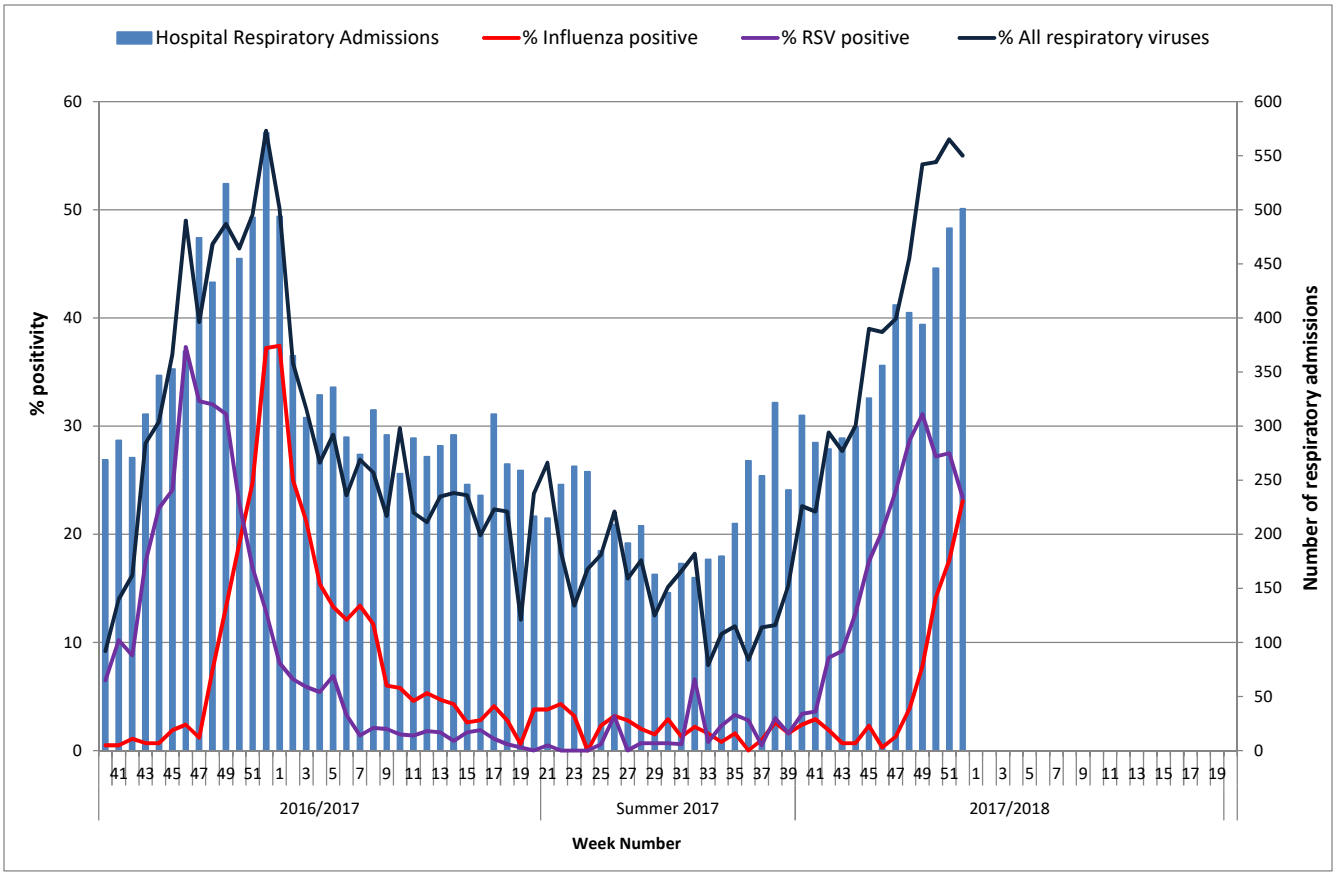

Figure 7: Number of respiratory admissions reported from the sentinel hospital network and % positivity for influenza, RSV and all seasonal respiratory viruses tested* by the NVRL by week and season. *Source: Departments of Public Health - Sentinel Hospitals & NVRL. *All seasonal respiratory viruses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

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 increased significantly during week 52 2017 to 5.1%, compared to 2.8% during week 51 2017 and 2.6% during week 50 2017 (figure 8). The increase during week 52 2017 is lower than levels reported during week 52 2016 (which were at 6.4%).

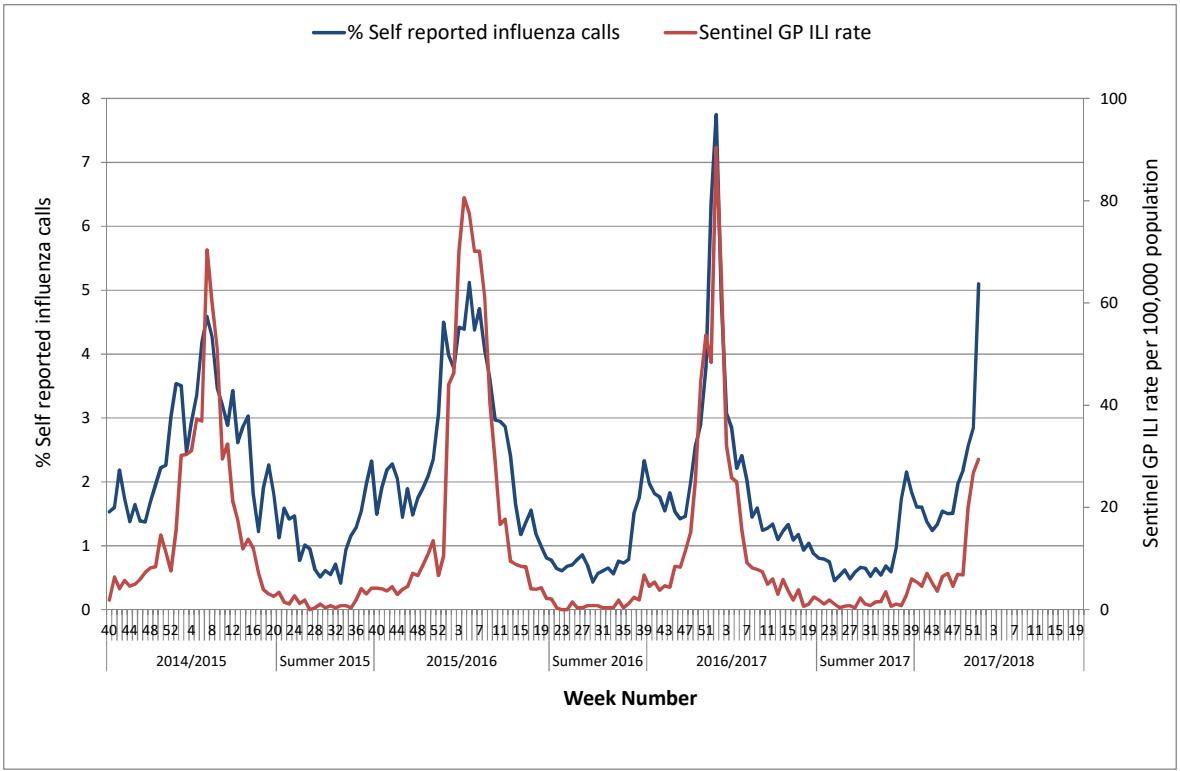

Figure 8: Self-reported influenza-related calls as a proportion of total calls to Out-of-Hours GP Co-ops and sentinel GP ILI consultation rate per 100,000 population by week and season. *Source: GP Out-Of-Hours services in Ireland (collated by HSE-NE) & ICGP.*

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 increased during week 51 2017 to 186, compared to 78 in the previous week. Confirmed influenza notifications during week 52 2017 were lower due to changes in reporting levels over the Christmas holiday period, with 98 cases notified. During weeks 51 and 52 2017, 108 cases were associated with influenza A (25 A(H3N2), five with A(H1N1)pdm09, 78 with A (not subtyped) and 174 cases were associated with influenza B. For the 2017/2018 influenza season to date, 480 confirmed influenza cases have been notified to HPSC: 220 (46%) were associated with influenza A (58 associated with A(H3N2), 20 with A(H1N1)pdm09, 142 with A (not subtyped)), 256 (53%) with influenza B and four (1%) with influenza type/subtype not reported.

6. Influenza Hospitalisations

Ninety-four confirmed influenza hospitalised cases were notified to HPSC during weeks 51 and 52 2017, bringing the season total to 169. These hospitalisations were associated with a mix of influenza A(H3N2), A(H1N1)pdm09 and influenza B, with a higher proportion of influenza B cases being reported during weeks 51 and 52 2017. For the 2017/2018 influenza season to date, 169 confirmed influenza hospitalised cases have been notified to HPSC: 89 (53%) were associated with influenza A (17 associated with A(H3N2), 13 with A(H1N1)pdm09, 59 with A (not subtyped)), 76 (45%) with influenza B and four (2%) with influenza type/subtype 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.

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.

Twelve confirmed influenza cases (two associated with influenza A(H3N2), five with influenza A - not subtyped and five influenza B) were admitted to critical care units and reported to HPSC during weeks 40 - 50 2017. The highest age specific rates were reported in those aged less than one year; these rates are based on small numbers (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	4	6.4	3	4.8
1-4	13	4.8	0	0.0
5-14	19	2.8	2	0.3
15-24	11	1.9	0	0.0
25-34	9	1.4	0	0.0
35-44	19	2.9	3	0.4
45-54	14	2.2	1	0.2
55-64	15	2.9	1	0.2
≥65	65	10.2	2	0.3
Unknown	0	-	0	-
Total	**169**	**3.5**	**12**	**0.3**

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 - 52 2017.
- 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

- Seven influenza outbreaks were notified to HPSC during weeks 51 and 52 2017: one associated with influenza A(H3N2), two with influenza A(not subtyped), three influenza B and one with no influenza type/subtype reported. Two of these outbreaks were reported in acute hospital settings, one in a school and four in residential care facilities. Three acute respiratory infection (ARI) outbreaks in residential care facilities were notified during weeks 51 and 52 2017, one associated with picornavirus and two with no pathogens identified. Influenza/ARI outbreaks were notified from HSE-East, -Northeast, -Northwest, -South and –West during weeks 51 and 52 2017.
- For the 2017/2018 influenza season to date, 17 influenza/ARI general outbreaks have been notified; 10 associated with influenza (in HSE-East, -Midlands, -Northeast, -South and -West), two associated with RSV (in HSE-Midwest and -Northwest) and five ARI outbreaks in residential care facilities mainly associated with picornaviruses (in HSE-East, -Northwest and -South). Of the 10 influenza outbreaks notified, two were associated with influenza A(H3N2), one with influenza A(H1N1)pdm09, three with influenza A (not subtyped), three influenza B and one with no influenza type/subtype reported. Two influenza outbreaks were reported in acute hospital settings, one in a school and seven in residential care facilities/other residential setting. *Family outbreaks are not included in this surveillance report.*

10. International Summary

- During week 51 2017, influenza activity was increasing in countries in western, northern and southern Europe. Both influenza A and B/Yamagata viruses were co-circulating and mixed patterns were observed across the Region. For reports based on sentinel surveillance systems this season, most influenza viruses detected were influenza B with those assigned to a lineage being mainly B/Yamagata viruses, while of the type A viruses subtyped most were influenza A(H1N1)pdm09 viruses. Conversely, most detections from non-sentinel systems have been influenza A viruses, with A(H3N2) being the majority. The B/Yamagata lineage has predominated among type B viruses, as seen in sentinel systems. 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, the viruses of which are antigenically similar to those of clade 3C.2a.
- As of December 25 2017, globally, Influenza activity continued to increase in the temperate zone of the northern hemisphere while in the temperate zone of the southern hemisphere activity decreased at inter-seasonal levels. In Central America and the Caribbean, influenza activity remained low. Worldwide, influenza A(H3N2) and B viruses accounted for the majority of influenza detections.
- 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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