Influenza Surveillance in Ireland – Weekly Report

Influenza Week 4 2018 (22nd – 28th January 2018)

Summary

Overall, influenza activity in Ireland remained widespread and at high levels during week 4 2018 (week ending 28th January 2018), with some indicators starting to decrease. Influenza B and A(H3N2) are co-circulating, with a higher proportion of influenza B detected. 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.

- Influenza-like illness (ILI): The sentinel GP influenza-like illness (ILI) consultation rate was 90.5 per 100,000 population in week 4 2018, a slight decrease compared to the rate of 103.2 per 100,000 reported during week 3 2018.
  - ILI rates have been above the Irish baseline threshold (17.5 per 100,000) for seven consecutive weeks and the medium intensity threshold (59.6/100,000) for four consecutive weeks.
  - During week 4 2018, ILI age specific rates were highest in the 5-14 year age group.
- GP Out of Hours: The proportion of influenza–related calls to GP Out-of-Hours service remained at high levels during week 4 2018.
- Respiratory admissions: Data on respiratory admissions reported from a network of sentinel hospitals remained high.
- National Virus Reference Laboratory (NVRL):
  - Influenza positivity remained at high levels during week 4 2018, with 322 (29.9%) influenza positive specimens reported from the NVRL from sentinel GP and non-sentinel sources: 44% influenza A [123 A(H3N2), 14 A(H1N1)pdm09, 4 A (not subtyped)] and 56% (181) influenza B.
  - Influenza B and A(H3N2) are co-circulating, with a higher proportion of influenza B detected. Low numbers of influenza A(H1N1)pdm09 are also being reported each week.
  - Coinfections of all seasonal respiratory viruses were reported during week 4 2018, with 19% of influenza detections from non-sentinel sources co-infected with another respiratory virus.
  - Respiratory syncytial virus (RSV) positivity decreased further during week 4 2018.
  - Human metapneumovirus, adenovirus, parainfluenza virus, coronavirus and picornavirus (which includes both rhinovirus and enterovirus) continue to be detected in varying proportions.
- Hospitalisations: 318 confirmed influenza hospitalised cases were notified during week 4 2018, 33% associated with influenza A and 67% with influenza B. For the season to date, 1785 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: Ninety-two confirmed influenza cases were admitted to critical care units and reported to HPSC (weeks 40 2017–4 2018), 51% associated with influenza A and 49% with influenza B.
- Mortality: 55 deaths in notified influenza cases were reported to HPSC between weeks 40 2017 - 4 2018, with a median age of 77 years. Excess all-cause mortality was reported in those aged 65 years and older for weeks 52 2017 – 2 2018.
- Outbreaks: 37 acute respiratory infection (ARI) and influenza outbreaks were notified during week 4 2018, an increase compared to 21 in the previous week.
- International: Influenza activity was widespread in Europe, with increasing activity reported in Eastern European countries. Influenza A and B viruses were co-circulating, with a higher proportion of influenza B.

1. GP sentinel surveillance system - Clinical Data

- During week 4 2018, 237 influenza-like illness (ILI) cases were reported from sentinel GPs, corresponding to an ILI consultation rate of 90.5 per 100,000 population, a slight decrease compared to the rate of 103.2 per 100,000 reported during week 3 2018 (figure 1).
- The ILI rates have been above the Irish baseline ILI threshold (17.5/100,000 population) for seven consecutive weeks (weeks 50 2017 – 4 2018) and above the medium intensity threshold (59.6/100,000 population for four consecutive weeks (weeks 1 - 4 2018).
- During week 4 2018, ILI age specific rates were highest in the 5-14 year age group (123.8/100,000) (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.

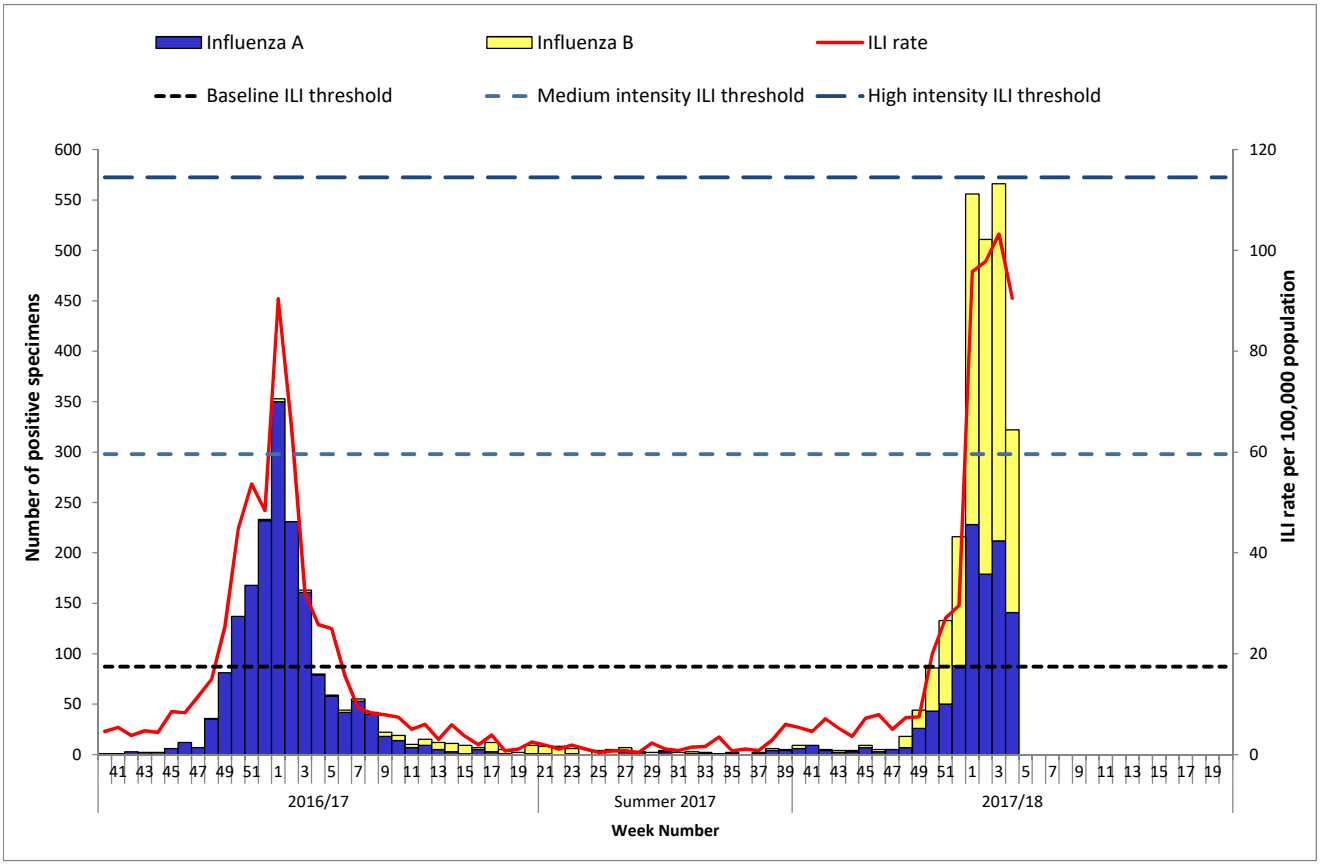

Figure 1: ILI sentinel GP consultation rates per 100,000 population, baseline ILI threshold, medium and high intensity ILI thresholds* and number of positive influenza A and B specimens tested by the NVRL, by influenza week and season.
Source: ICGP and NVRL

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

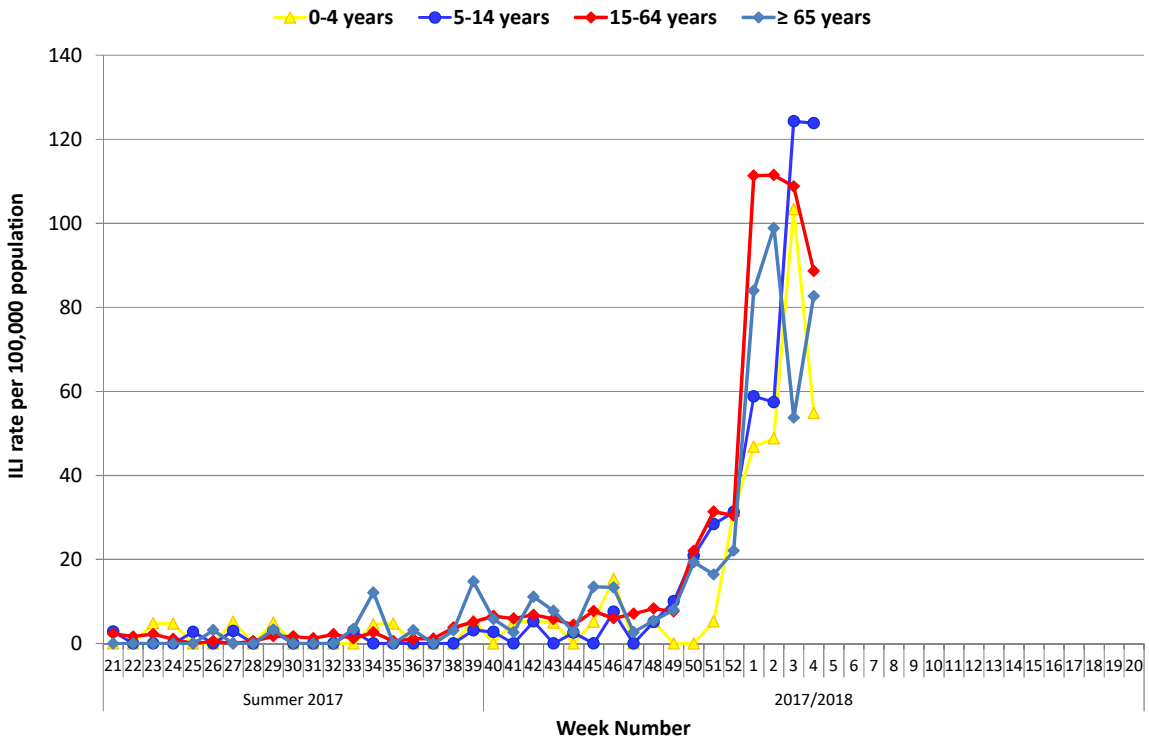

Figure 2: Age specific sentinel GP ILI consultation rate per 100,000 population by week during the summer of 2017 and the 2017/2018 influenza season to date. *Source: ICGP.*

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 remained at high levels during week 4 2018, with 322 (29.9%) influenza positive specimens reported from the NVRL from sentinel GP and non-sentinel sources: 44% influenza A [123 A(H3N2), 14 A(H1N1)pdm09, 4 A (not subtyped)] and 56% (181) influenza B. It should be noted that data on respiratory specimens tested for the season to date are updated each week.
- Week 4 2018:
  - 58 of 121 (47.9%) sentinel specimens were influenza positive: 26% influenza A and 74% influenza B
  - 264 of 956 (27.6%) non-sentinel specimens were influenza positive: 48% influenza A and 52% B
- Data from the NVRL for week 4 2018 and the 2017/2018 season to date are detailed in tables 1 and 2.
- Influenza B and A(H3N2) are co-circulating, with a higher proportion of influenza B detected. Low numbers of influenza A(H1N1)pdm09 continue to be reported each week (figures 3 & 4).
- Coinfections of all seasonal respiratory viruses were reported during week 4 2018, with 19% of influenza detections from non-sentinel sources co-infected with another respiratory virus.
- Respiratory syncytial virus (RSV) positivity decreased further during week 4 2018 (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] remained high at 37% during week 4 2018, however decreased compared to 53% during week 3 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 21 influenza A(H3N2), 16 influenza A(H1N1)pdm09 and 42 influenza B positive specimens to date. Further genetic and antigenic testing is ongoing at the NVRL.
- Of the 21 influenza A(H3N2) viruses genetically characterised, the majority (71.4%; n=15) of viruses belonged to the vaccine virus clade, clade 3C.2a represented by A/Hong Kong/4801/2014. Six (28.6%) viruses 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.
- Sixteen influenza A(H1N1)pdm09 viruses were characterised and all viruses (100%) belonged to the influenza A(H1N1)pdm09 vaccine virus clade, genetic clade 6B.1, represented by A/Michigan/45/2015.
- Forty-two influenza B viruses were genetically characterised, the vast majority (97.6%; n=41) 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. All circulating B Yamagata viruses have been associated with the AA mutations L172Q and M251V in the haemagglutinin gene. One (2.4%) B/Victoria lineage virus was detected by the NVRL. B/Victoria viruses are circulating at low levels in Europe this season. See ECDC influenza surveillance reports for further information.

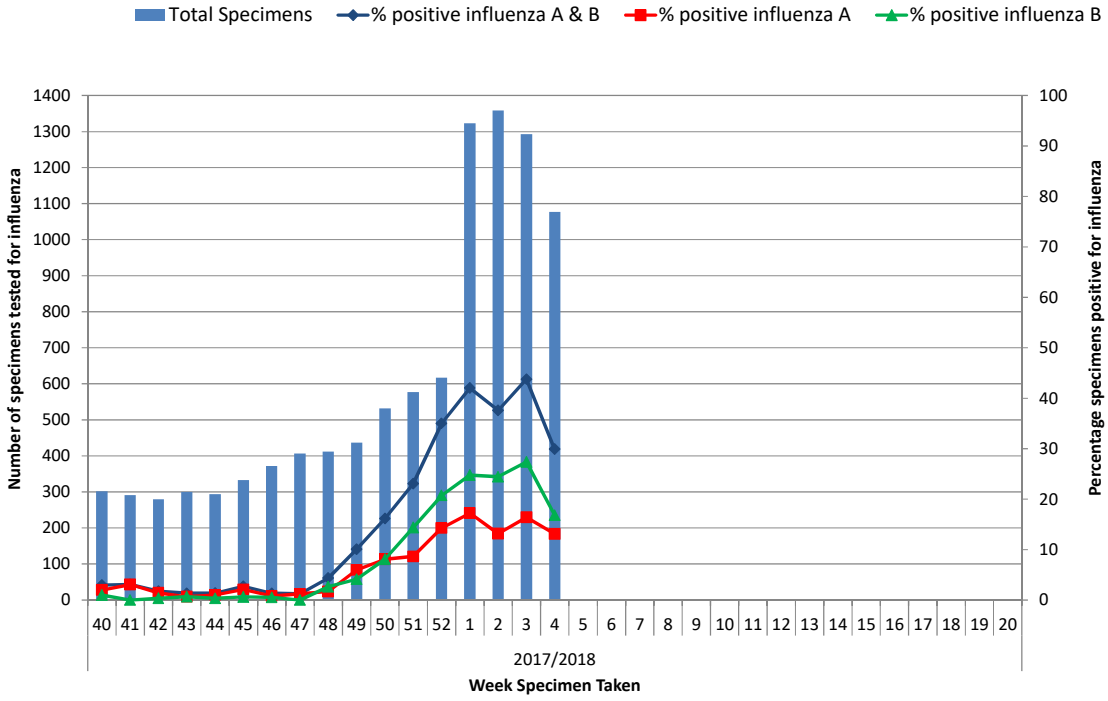

Figure 3: Number of specimens (from sentinel and non-sentinel sources combined) tested by the NVRL for influenza and percentage influenza positive by week for the 2017/2018 influenza season. *Source: NVRL*

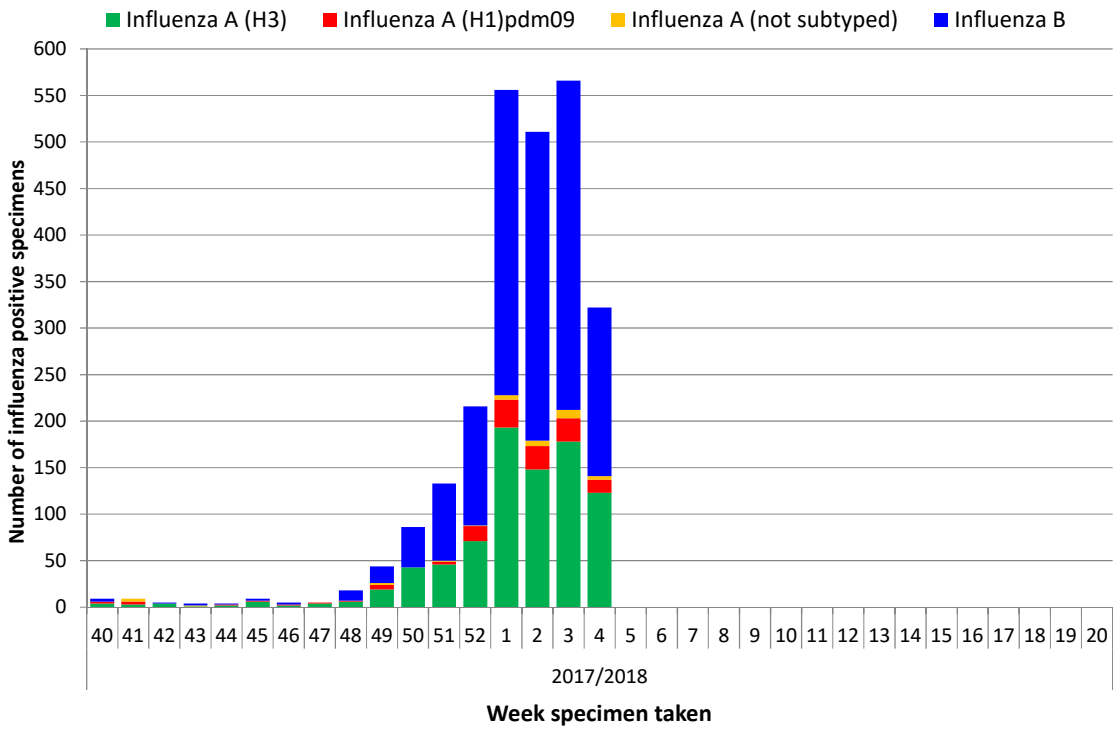

Figure 4: Number of positive influenza specimens (from sentinel and non-sentinel sources combined) by influenza type/subtype tested by the NVRL, by week for the 2017/2018 influenza season. *Source: NVRL.*

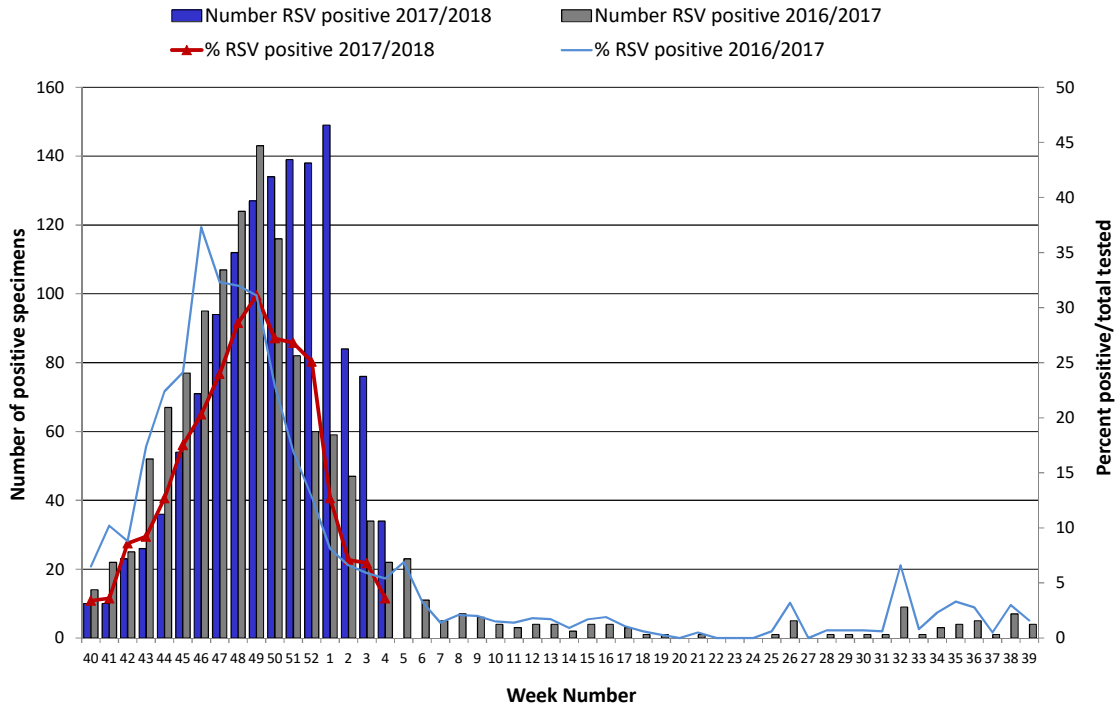

Figure 5: Number and percentage of non-sentinel RSV positive specimens detected by the NVRL during the 2017/2018 season, compared to the 2016/2017 season. *Source: NVRL.*

Table 1: Number of sentinel and non-sentinel[†] respiratory specimens tested by the NVRL and positive influenza results, for week 4 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	
4 2018	Sentinel	121	58	47.9	0	12	3	15	43
	Non-sentinel	956	264	27.6	14	111	1	126	138
	Total	**1077**	**322**	**29.9**	**14**	**123**	**4**	**141**	**181**
2017/2018	Sentinel	968	479	49.5	23	121	8	152	327
	Non-sentinel	9238	2023	21.9	105	732	24	861	1162
	Total	**10206**	**2502**	**24.5**	**128**	**853**	**32**	**1013**	**1489**

Table 2: Number of non-sentinel specimens tested by the NVRL for other respiratory viruses and positive results, for week 4 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
4 2018	Sentinel	121	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Non-sentinel	956	34	3.6	7	0.7	2	0.2	3	0.3	1	0.1	2	0.2	39	4.1
	Total	**1077**	**35**	**3.2**	**7**	**0.6**	**2**	**0.2**	**3**	**0.3**	**1**	**0.1**	**2**	**0.2**	**39**	**3.6**
2017/2018	Sentinel	968	26	2.7	14	1.4	12	1.2	1	0.1	0	0.0	3	0.3	25	2.6
	Non-sentinel	9238	1317	14.3	154	1.7	162	1.8	71	0.8	13	0.1	47	0.5	591	6.4
	Total	**10206**	**1343**	**13.2**	**168**	**1.6**	**174**	**1.7**	**72**	**0.7**	**13**	**0.1**	**50**	**0.5**	**616**	**6.0**

[†] 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

The geographical spread of influenza is reviewed on a weekly basis using sentinel GP ILI consultation rates, laboratory data and outbreak data.

Widespread influenza activity was reported in HSE-East, -Midwest, -Northeast, -Southeast, and -South and regional influenza activity was reported in HSE-Midlands, -Northwest and -West during week 4 2018 (figure 6).

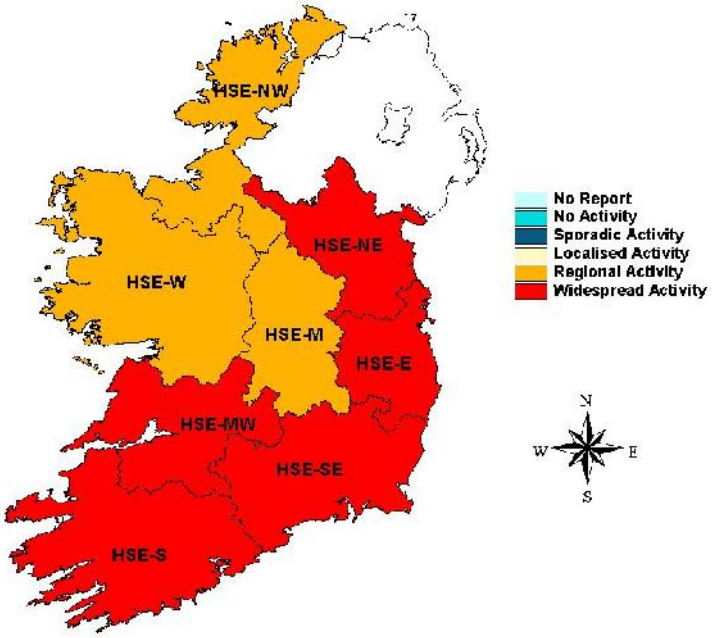

Figure 6: Map of provisional influenza activity by HSE-Area during week 4 2018

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 were at high levels, with 461 respiratory admissions reported during week 4 2018, an increase compared to 377 in week 3 2018, however a decline from 501 reported during week 52 2017 (figure 7).

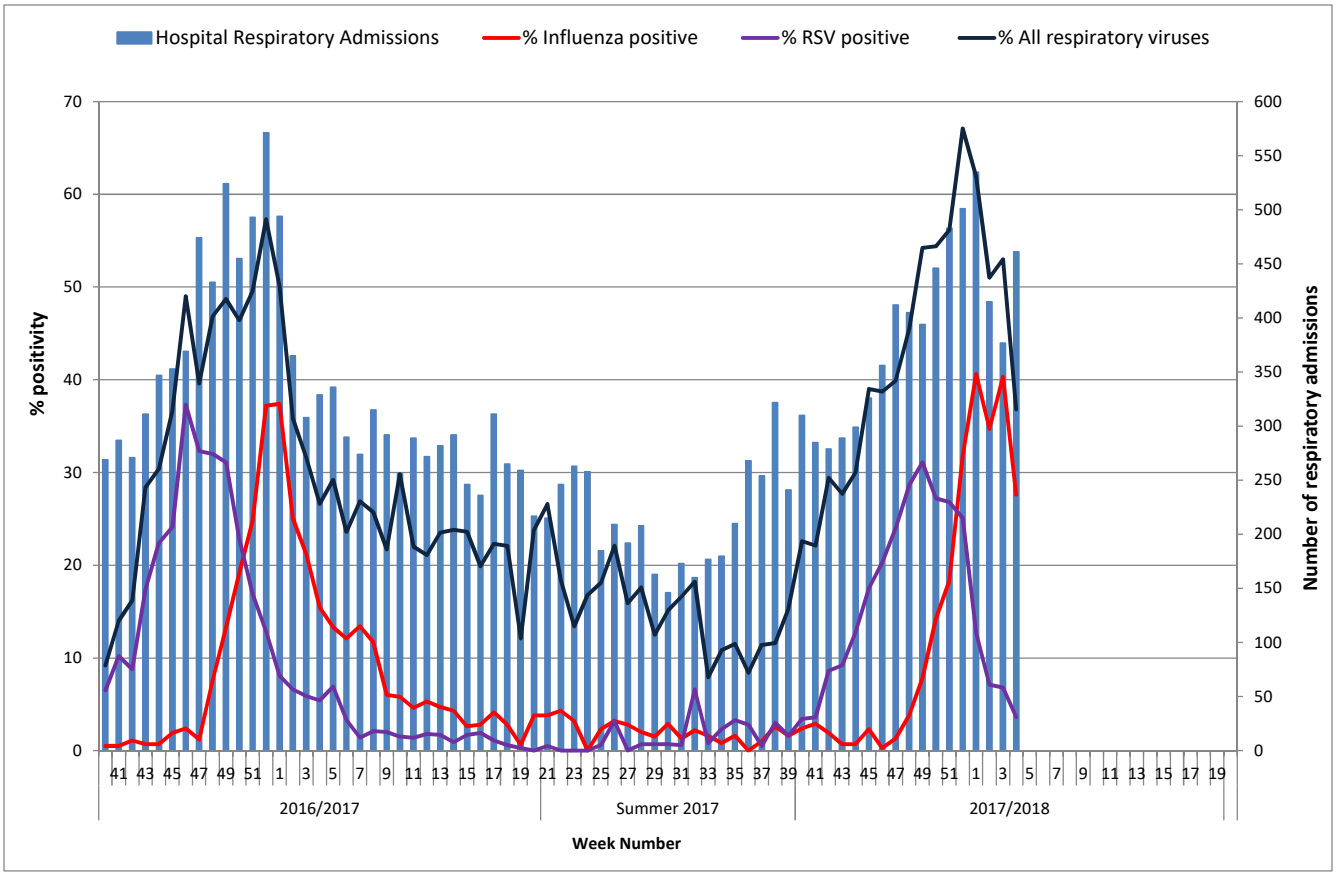

Figure 7: Number of respiratory admissions reported from the sentinel hospital network and % positivity for influenza, RSV and all seasonal respiratory viruses tested* by the NVRL by week and season. *Source: Departments of Public Health - Sentinel Hospitals & NVRL. *All seasonal respiratory viruses 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 remained at high levels during week 4 2018 at 6.8%, unchanged from 6.8% reported during week 3 2018 (figure 8).

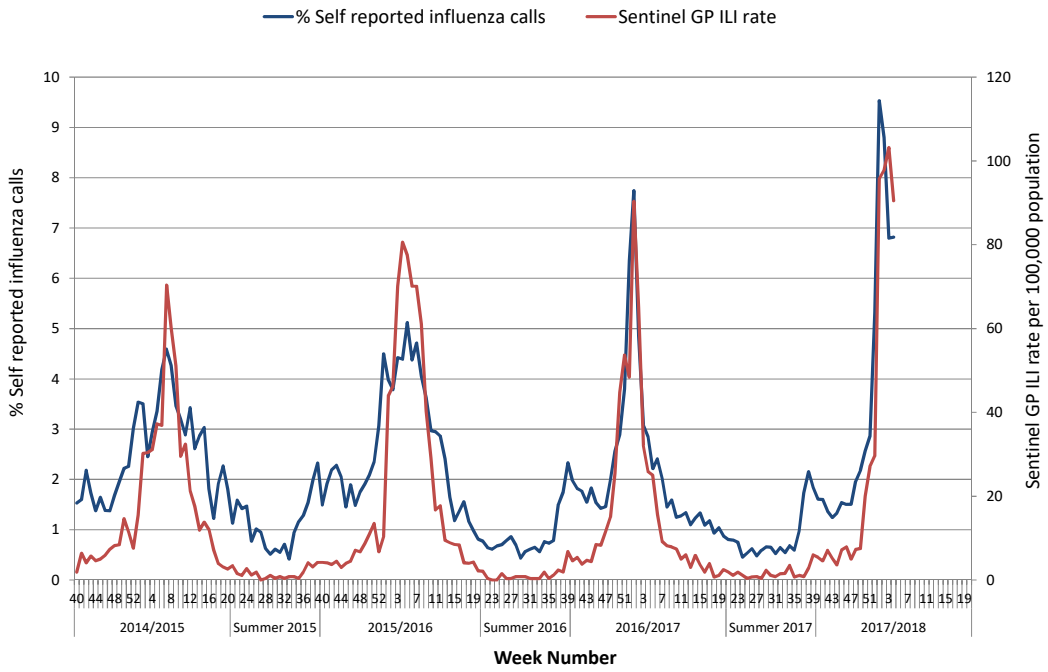

Figure 8: Self-reported influenza-related calls as a proportion of total calls to Out-of-Hours GP Co-ops and sentinel GP ILI consultation rate per 100,000 population by week and season. *Source: GP Out-Of-Hours services in Ireland (collated by HSE-NE) & ICGP.*

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 remained at very high levels during week 4 2018, at 975, a slight decrease compared to 1153 in the previous week. During week 4 2018, 323 (33%) cases were associated with influenza A [104 A(H3N2), 26 A(H1N1)pdm09 and 193 A (not subtyped)], 631 (65%) cases were associated with influenza B, and 21 (2%) cases with influenza type not reported.
- For the 2017/2018 influenza season to date, 4670 confirmed influenza cases have been notified to HPSC: 1698 (36%) cases were associated with influenza A [633 A(H3N2), 127 A(H1N1)pdm09, 938 A (not subtyped)], 2907 (62%) cases with influenza B, and 65 (2.0%) cases with influenza type not reported. The median age of notified confirmed influenza cases this season to date was 57 years.
- RSV notifications continued to decrease during week 4 2018, with 159 cases notified, compared to 207 notified cases during week 3 2018.

6. Influenza Hospitalisations

- 318 confirmed influenza hospitalised cases were notified during week 4 2018, a decrease from 409 notified during week 3 2018. Of typed influenza viruses notified during week 4 2018, 33% were associated with influenza A and 67% with influenza B.
- For the 2017/2018 influenza season to date, 1785 confirmed influenza hospitalised cases have been notified to HPSC: 708 (39.7%) were associated with influenza A [185 associated with A(H3N2), 53 with A(H1N1)pdm09, 470 with A (not subtyped)], 1034 (57.9%) with influenza B and 43 (2.4%) 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 median age of hospitalised cases this season to date was 66 years. The number of confirmed influenza hospitalised cases by influenza type/subtype and by week of notification is shown in figure 9.

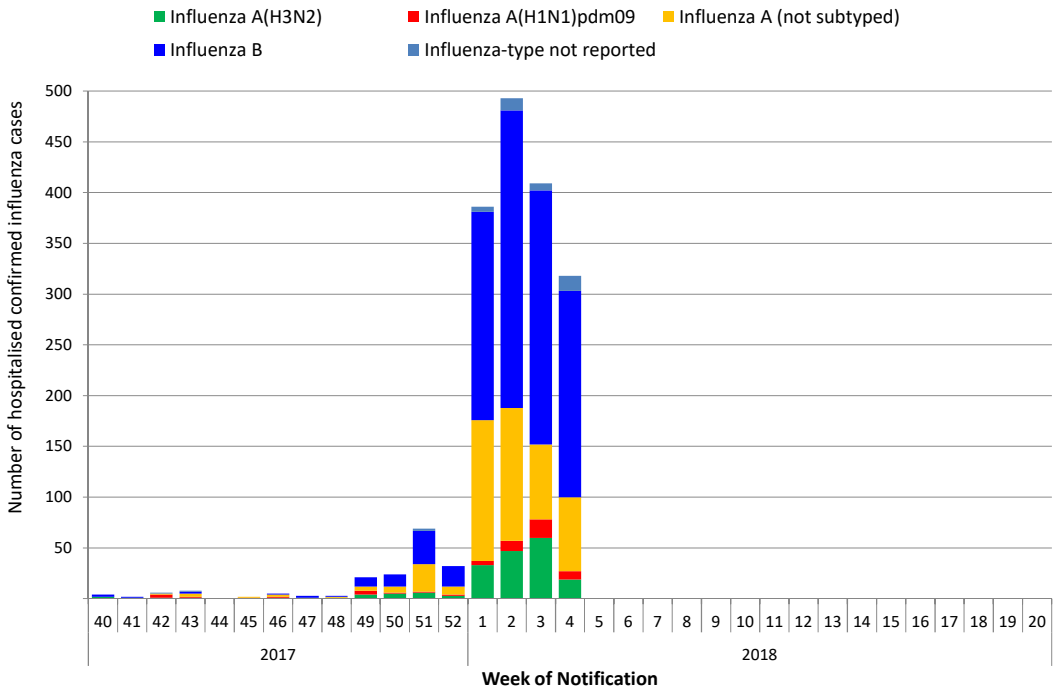

Figure 9: Number of confirmed influenza cases hospitalised by influenza type/subtype and by week of notification. *Source: Ireland's Computerised Infectious Disease Reporting System (CIDR).*

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.

Ninety-two confirmed influenza cases were admitted to critical care units and reported to HPSC during weeks 40 2017 – 4 2018, 51% associated with influenza A and 49% with influenza B: 17 A(H3N2), two influenza A(H1N1)pdm09, 28 A - not subtyped, and 45 influenza B. 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). The median age of cases was 59 years.

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.

Age (years)	Number	Age specific rate per 100,000 pop.	Number	Age specific rate per 100,000 pop.
<1	59	94.8	6	9.6
1-4	119	44.2	2	0.7
5-14	122	18.1	7	1.0
15-24	68	11.8	2	0.3
25-34	72	10.9	3	0.5
35-44	113	17.1	11	1.5
45-54	131	20.9	9	1.4
55-64	180	35.4	16	3.1
≥65	920	144.3	36	5.6
Unknown Age	1		0	
Total	**1785**	**37.5**	**92**	**1.9**

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/

- Fifty-five deaths in notified influenza cases have been reported to HPSC during weeks 40 2017 – 4 2018. The median age at the time of death was 77 years. Influenza A was confirmed for 40% of these notified cases that died; influenza B for 49% and influenza type was not reported for 11%.
- All-cause excess mortality was reported in Ireland in those aged 65 years and older during weeks 52 2017 - 2 2018, after correcting GRO data for reporting delays with the standardised EuroMOMO algorithm. It is important to note that these data are provisional due to the time delay in deaths' registration in Ireland.
- Increased all-cause mortality among the elderly has been reported in parts of Europe in recent weeks, especially in the Southwestern part of Europe and in Scotland. http://www.euromomo.eu/

9. Outbreak Surveillance

- Thirty-seven influenza and acute respiratory infection (ARI) general outbreaks were notified to HPSC during week 4 2018, from all HSE-Areas, with 59% of outbreaks notified from HSE-East.
- 25 influenza outbreaks were notified to HPSC during week 4 2018: seven were associated with influenza A (one with influenza A(H3N2) and six with influenza A-not subtyped), 12 with influenza B, three with influenza A and B and three with no influenza type reported. Three of these outbreaks were reported in acute hospital settings, 21 in residential care facilities/long stay units and the outbreak setting was not specified for one outbreak.
- Twelve acute respiratory infection (ARI) outbreaks were notified during week 4 2018, two associated with RSV and 10 with no pathogens identified. One RSV outbreak was notified in an acute hospital setting and the remaining 11 outbreaks were reported in residential care facilities/long stay units.
- For the 2017/2018 influenza season to date, 133 influenza/ARI general outbreaks have been notified: 107 associated with influenza (reported from all HSE-Areas), seven associated with RSV (in HSE-East, -Midwest, -Northwest and -South) and 19 ARI outbreaks in residential care facilities (the majority with no pathogen identified) in HSE-East, -Northwest, -Southeast, -South, and -West. Of the 107 influenza outbreaks notified, 33 were associated with influenza A [11 with A(H3N2), two with A(H1N1)pdm09 and 20 with influenza A-not subtyped], 48 with influenza B, 8 with both influenza A and B and 18 with no influenza type reported. Sixteen influenza outbreaks were reported in acute hospital settings, one in a school, one in a child care facility, 85 in residential care facilities/other residential setting and four with the outbreak setting not reported. The number of influenza, ARI, and RSV outbreaks by week of notification is shown in figure 10. *Family outbreaks are not included in this surveillance report.*

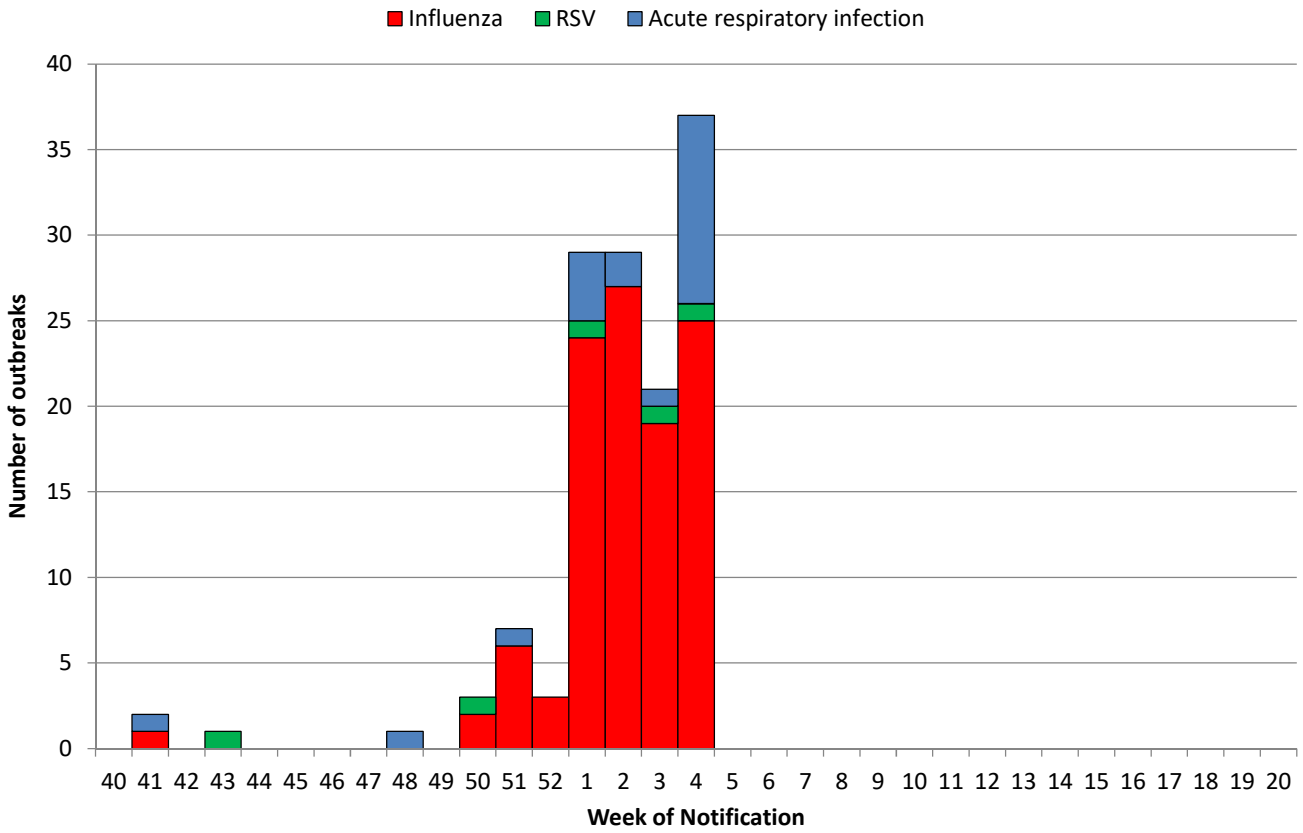

Figure 10: Number of acute respiratory infection, influenza and RSV outbreaks notified by week of notification. *Source: Ireland's Computerised Infectious Disease Reporting System (CIDR).*

10. International Summary

- During week 3 2018, influenza activity was widespread in the majority of reporting European countries, with increasing activity observed in eastern European countries. Both influenza A and B were co-circulating and mixed patterns were observed across the region. From sentinel and non-sentinel sources, a higher proportion of influenza B viruses compared to A viruses was detected during week 3 2018. Of subtyped A viruses from sentinel sources, A(H1N1)pdm09 viruses have outnumbered A(H3N2) viruses. Conversely, the majority of subtyped influenza A detections from non-sentinel systems have been influenza 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. Of the genetically characterised A(H3N2) viruses, 64% 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 36% to clade 3C.2a1, with viruses in both clades being antigenically similar.
- As of January 22 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 accounted still for the majority of influenza detections (62%) but influenza B (mostly from the Yamagata lineage) has increased proportionally.
- ECDC has published a Risk assessment for seasonal influenza, EU/EEA, 2017–2018.
- A situation analysis that describes the early season evolving epidemiological pattern was published by WHO Regional Office for Europe in January.
- 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. 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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