Influenza Surveillance in Ireland – Weekly Report

Influenza Week 50 2019 (9th – 15th December 2019)

Summary

During week 50 2019 (week ending 15th December 2019) influenza activity increased in Ireland and is now at medium levels. Influenza A(H3N2) is the dominant circulating virus to date this season. Confirmed influenza hospitalisations continue to increase. 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 57.9 per 100,000 population in week 50 2019. This is an increase compared to the updated rate of 36.8 per 100,000 population reported during week 49 2019.
  - ILI rates are just above the medium Irish ILI threshold (57.5/100,000 population).
  - ILI age specific rates increased in all age groups except in persons aged 65 years and older.
- GP Out of Hours: The proportion of influenza–related calls to GP Out-of-Hours services was at medium levels during week 50 2019.
- National Virus Reference Laboratory (NVRL):
  - Influenza positivity reported by the NVRL was at medium levels during week 50 2019, at 30%.
  - 187 confirmed influenza positive specimens were reported from non-sentinel sources during week 50 2019; 155 were influenza A (H3N2), 20 were influenza A(H1N1)pdm09 and 12 were influenza B.
  - Eighteen confirmed influenza positive specimens were reported from the sentinel GP network during week 50 2019; all 18 were influenza A(H3N2).
  - Respiratory syncytial virus (RSV) positivity has been increasing in recent weeks and RSV activity remains at high levels nationally.
  - Sporadic detections of parainfluenza virus, adenovirus and human metapneumovirus (hMPV) have been reported to date this season.
- Hospitalisations: During week 50 2019, 307 confirmed influenza hospitalised cases were notified to HPSC. During the 2019/2020 influenza season to date, 627 confirmed influenza hospitalised cases have been notified to HPSC.
- Critical care admissions: Six confirmed influenza cases were admitted to critical care units and reported to HPSC during week 50 2019. Twenty-five confirmed influenza cases have been reported as admitted to ICU in the 2019/2020 season to date.
- Mortality: Five influenza-associated deaths were reported during week 50 2019. During the 2019/2020 influenza season to date, eight influenza-associated deaths have been reported to HPSC.
- Outbreaks: Seven influenza outbreaks and six acute respiratory infection outbreaks were reported to HPSC during week 50 2019.
- International: Influenza activity is increasing in the European Region, although most countries still reported influenza activity rates below baselines or at low levels.

1. GP sentinel surveillance system - Clinical Data

- During week 50 2019, 147 influenza-like illness (ILI) cases were reported by sentinel GPs, corresponding to an ILI consultation rate of 57.9 per 100,000 population, an increase compared to the updated rate of 36.8 per 100,000 reported for week 49 2019.
- The ILI rate for week 50 2019 is just above the medium Irish ILI threshold (57.5/100,000 population) (figure 1).
- ILI age specific rates increased in all age groups except in the 65 years and older age group during week 50 2019 (figure 2).
- HPSC in consultation with the European Centre for Disease Prevention and Control (ECDC) has revised the Irish baseline ILI threshold for the 2019/2020 influenza season to 18.1 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 (18.1/100,000 population), medium (57.5/100,000 population) and high (86.5/100,000 population). Intensity ILI thresholds are shown in figure 1.

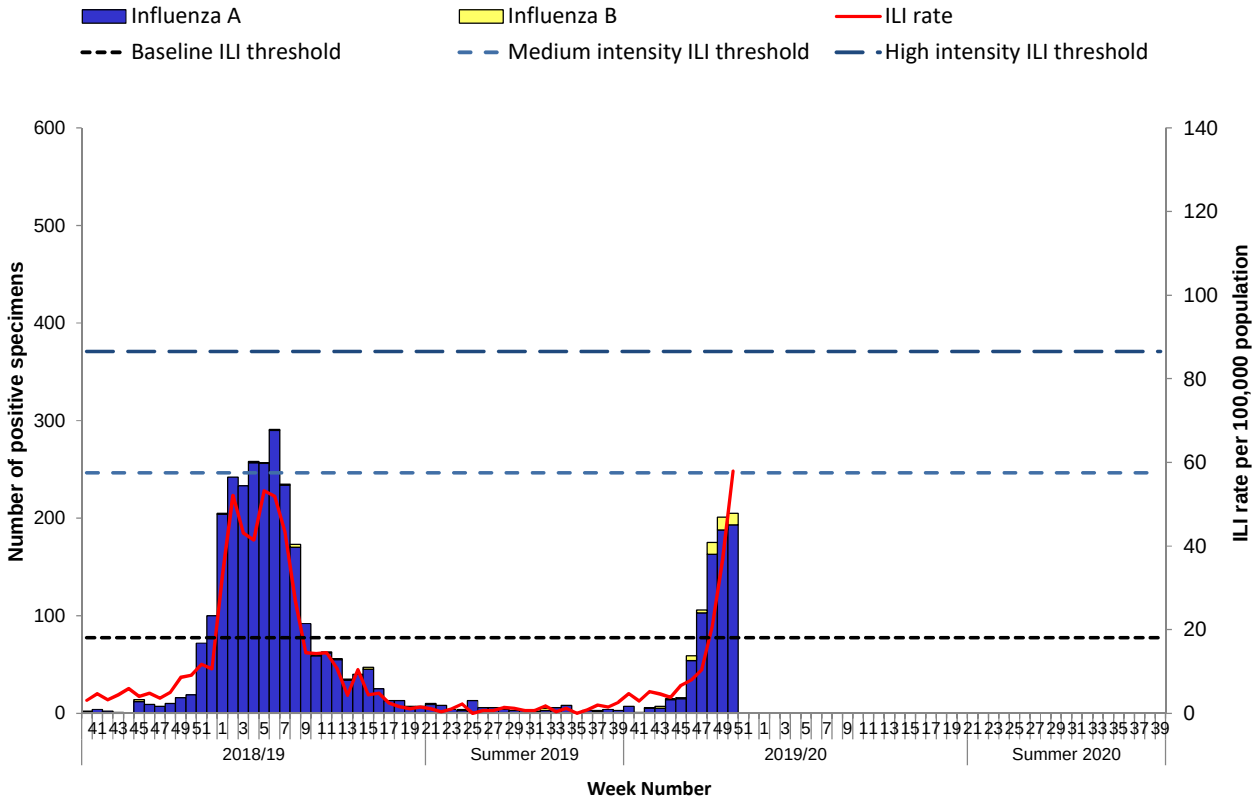

Figure 1: ILI sentinel GP consultation rates per 100,000 population, baseline ILI threshold, medium and high intensity ILI thresholds[*] and number of positive influenza A and B specimens tested by the NVRL, by influenza week and season. *Source: ICGP and NVRL*

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

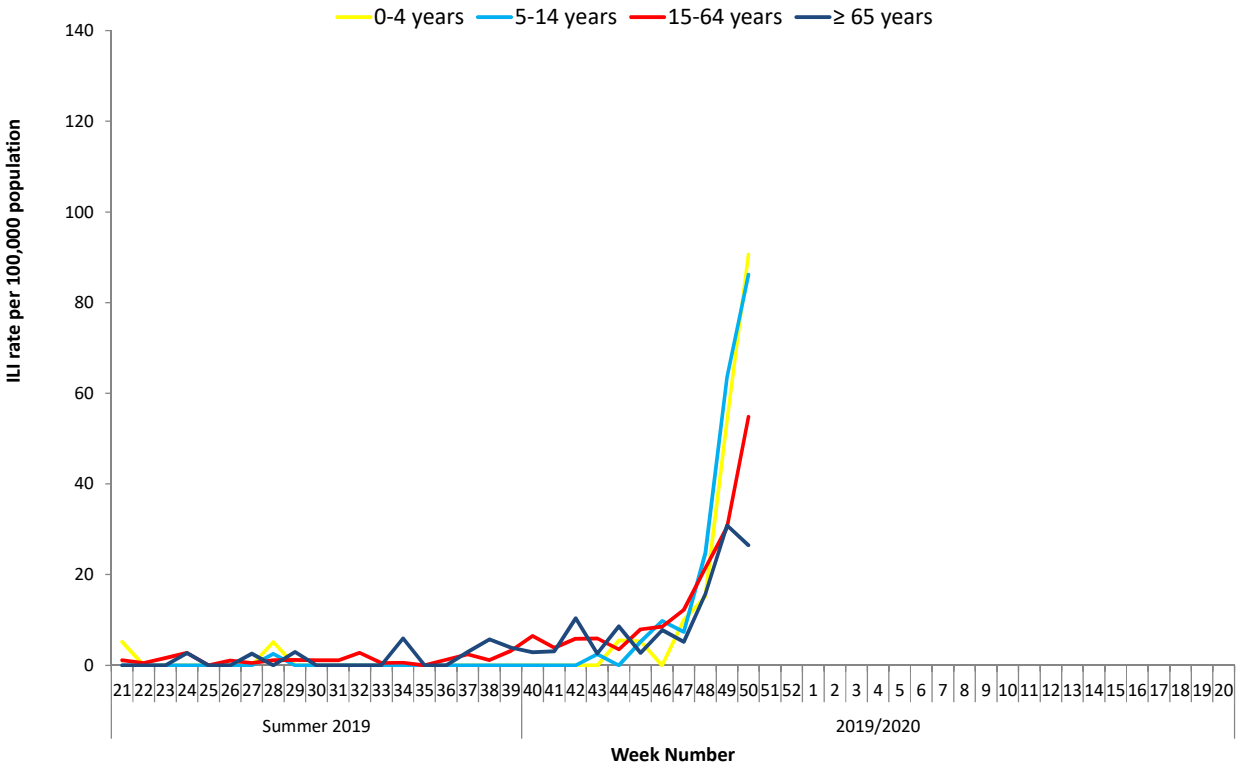

Figure 2: Age specific sentinel GP ILI consultation rate per 100,000 population by week during the summer of 2019 and the 2019/2020 influenza season to date. *Source: ICGP.*

2. Influenza and Other Respiratory Virus Detections - NVRL

The data reported in this section for the 2019/2020 influenza season refer to sentinel specimens routinely tested for influenza and respiratory syncytial virus (RSV) 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) (figure 3, 4, & 5 and tables 1, 2 & 3).

- During week 50, influenza detections remained stable with 205 (30%) influenza positive specimens reported by the NVRL from sentinel and non-sentinel sources, compared to an updated figure of 201 (29.9%) detections during week 49 2019.
- During week 50, 187 confirmed influenza positive specimens were reported from non-sentinel sources, 155 were influenza A (H3N2), 20 were influenza A(H1N1)pdm09 and 12 were influenza B.
- During week 50, 18 confirmed influenza positive specimens were reported from the sentinel GP network 2019; all of which were influenza A(H3N2).
- Data from the NVRL for week 50 2019 are detailed in tables 1, 2 and 3.
- Respiratory syncytial virus (RSV) positivity has been increasing since week 40 2019 and RSV activity is now at high levels nationally (figure 5).
- Sporadic detections of parainfluenza virus, adenovirus and human metapneumovirus (hMPV) have been reported to date this season (table 3).
- The overall proportion of non-sentinel specimens positive for respiratory viruses was 48.1% during week 50 2019.

Genetic Characterisation of Influenza Viruses– Early season 2019/20

A selection of influenza positive specimens between week 40 and week 47, 2019 (n=43) was chosen for further molecular characterisation. The full hemagglutinin genes of circulating influenza viruses were sequenced from original clinical specimens. Sequences were compared to a bank of reference sequences recommended in the ECDC/TESSY Technical Note: Influenza virus characterisation guidelines for the northern hemisphere influenza season 2019-2020.

Influenza A(H1) pdm 09 (5)

Of the 5 Influenza (H1) pdm 09 viruses characterised, 4 (80%) fell within A(H1) pdm 09 6B.1A5A group represented by A/Norway/3433/2018. This virus is the predominant A(H1) pdm 09 group reported in Europe at the moment. One of the five viruses fell within the A(H1) pdm 09 6B.1A5B group represented by A/Switzerland/3330/2018. The current Northern Hemisphere A(H1) pdm vaccine component is clade 6B.1A1, represented by A/Brisbane/02/2018 (H1N1)pdm-09 virus. However, it is anticipated that the vaccine virus will be effective based upon heamagglutination Inhibition assays conducted with post-infection ferret antisera raised against the vaccine virus.

Influenza A(H3N2) (33)

Of the 33 Influenza (H3) viruses characterised, 25 (76%) fell within the current Northern Hemisphere H3 vaccine component clade 3C.3a1, represented by A/Kansas/14/2017. However, 8 subclade 3C.2a1b were also detected. Five (62.5%) were classified as 3C.2a1 + T131K mutation, represented by A/South Australia/34/2009 and this virus is the predominant 3C.2a1b virus reported in Europe at the moment. In addition, 3 viruses were classified as subclade 3c.2a1b + T135K mutation. Two viruses were further characterised based upon the presence of additional mutations into the 3C.2A1B + T135K-A cluster represented by A/La Rioja/ 2202/2018 and one virus from the recently emerged 3c.2a1b + T135K –B cluster characterised by A/Hong Kong/2675/2019.

Influenza B (5)

Five influenza B viruses were characterised. All five were Influenza B Victoria lineage 1A with the triple amino acid deletion (Δ 162-164 B subgroup) represented by B/Washington/02/2019. This is the predominant influenza B reported in Europe and is not included in the current Northern Hemisphere vaccine. The World Health Organization, in the "Recommended composition of influenza virus vaccine for use in the 2019-2020 northern hemisphere season" stated that post vaccination sera collected from humans vaccine with the current vaccine component B/Colorado/06/2017 like-virus (B/Victoria/2/87 lineage) (clade 1A_Δ2) reacted similarly with representative B/Victoria lineage virus with three, two or no amino acid deletions

Further genetic and antigenic testing is ongoing at the National Virus Reference Laboratory.

See ECDC influenza surveillance reports for further information.

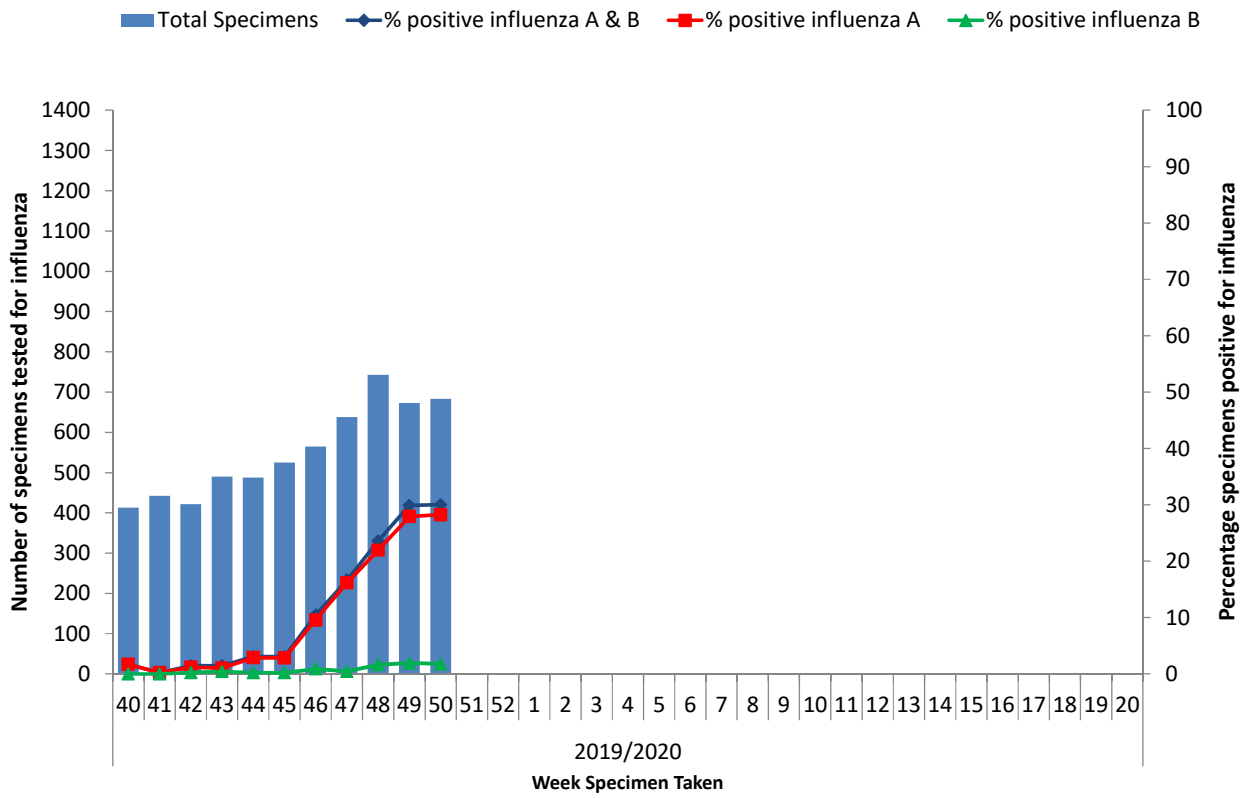

Figure 3: Number of specimens (from sentinel and non-sentinel sources combined) tested by the NVRL for influenza and percentage influenza positive by week for the 2019/2020 influenza season. *Source: NVRL.*

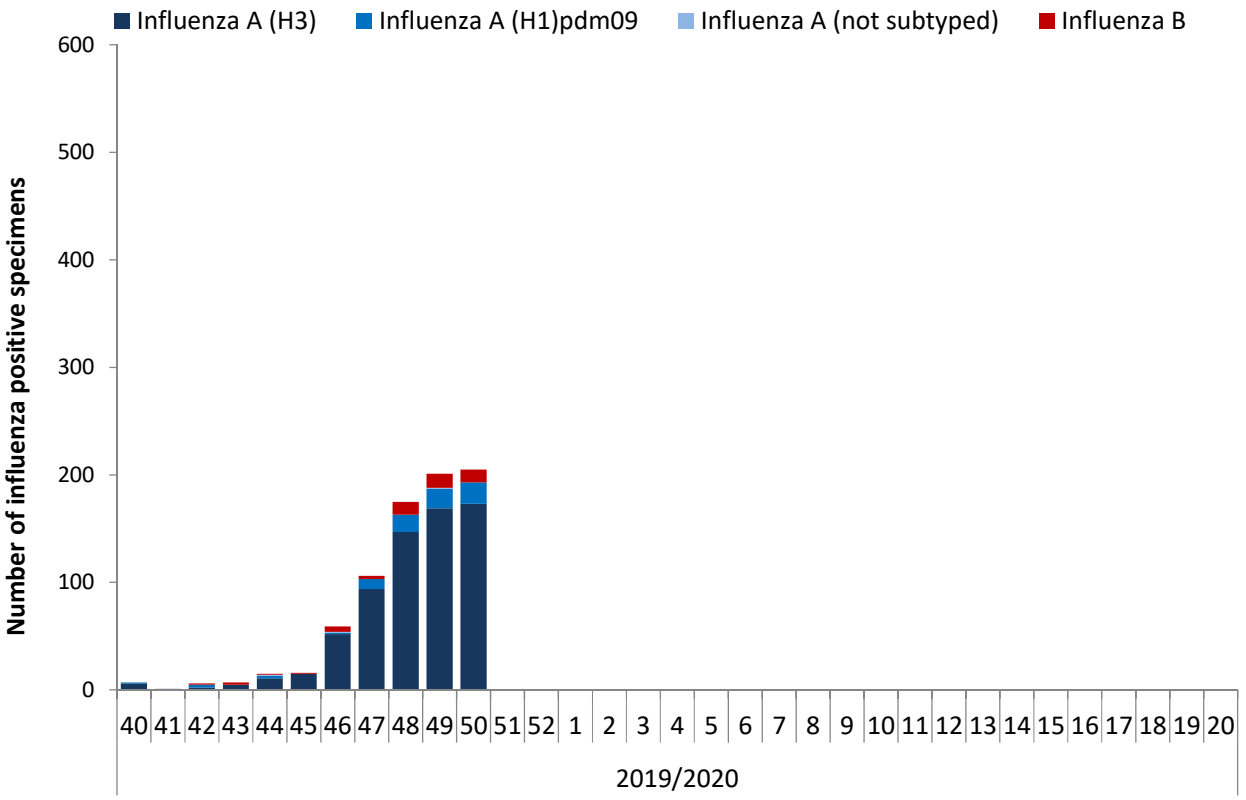

Figure 4: Number of positive influenza specimens (from sentinel and non-sentinel sources combined) by influenza type/subtype tested by the NVRL, by week for the 2019/2020 influenza season. *Source: NVRL.*

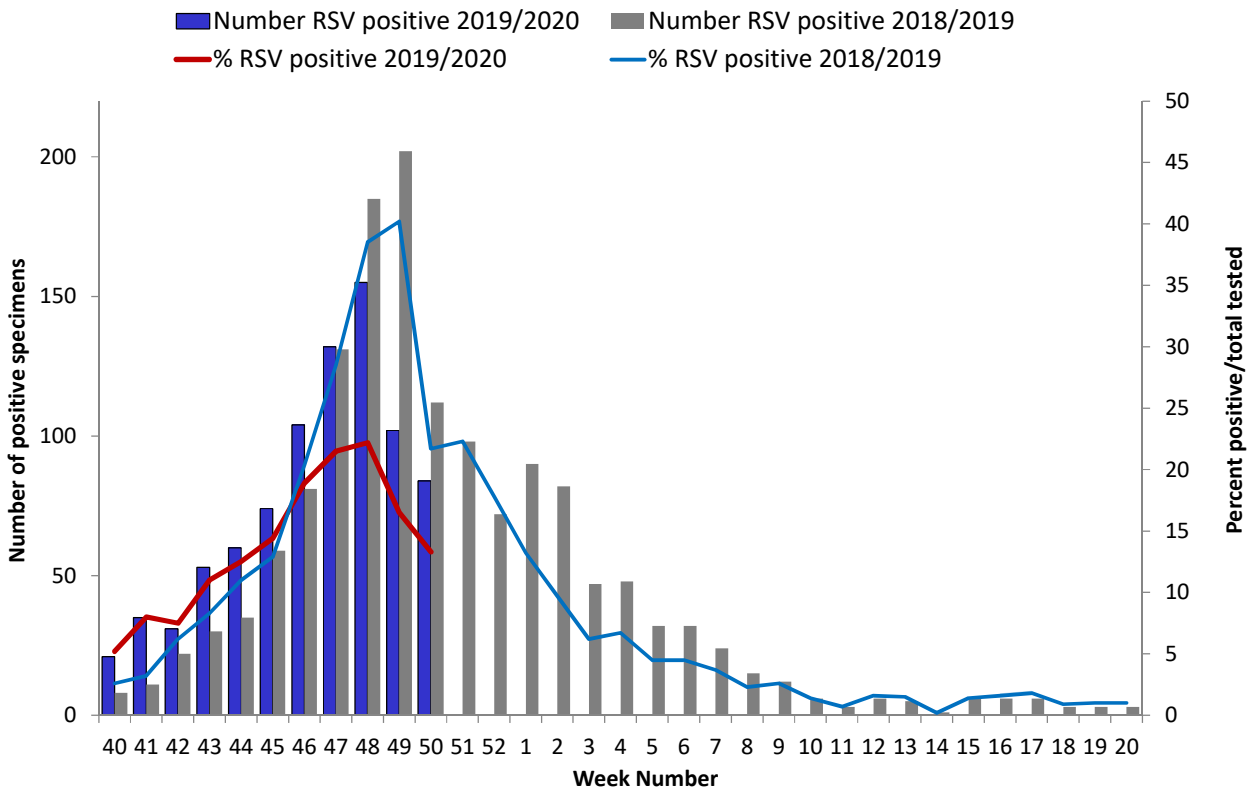

Figure 5: Number and percentage of non-sentinel RSV positive specimens detected by the NVRL during the 2019/2020 season, compared to the 2018/2019 season. *Source: NVRL.*

Table 1: Number of sentinel* and non-sentinel† respiratory specimens tested by the NVRL and positive influenza results, for week 50 2019. *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	B (unspecified)	B Victoria lineage	B Yamagata lineage	Total influenza B
50 2019	Sentinel	51	18	35.3	0	18	0	18	0	0	0	0
	Non-sentinel	632	187	29.6	20	155	0	175	12	0	0	12
	Total	**683**	**205**	**30.0**	**20**	**173**	**0**	**193**	**12**	**0**	**0**	**12**
2019/2020	Sentinel	244	97	39.8	9	73	1	83	3	10	1	14
	Non-sentinel	5838	701	12.0	61	602	2	665	36	0	0	36
	Total	**6082**	**798**	**13.1**	**70**	**675**	**3**	**748**	**39**	**10**	**1**	**50**

Table 2: Number of sentinel* and non-sentinel respiratory specimens tested by the NVRL and positive RSV results, for week 50 2019. *Source: NVRL*

Week	Specimen type	Total tested	Total RSV	% RSV	RSV A	RSV B	RSV (unspecified)
50 2019	Sentinel	51	1	2.0	1	0	0
	Non-sentinel	632	84	13.3	0	0	84
	Total	**683**	**85**	**12.4**	**1**	**0**	**84**
2019/2020	Sentinel	244	11	4.5	11	0	0
	Non-sentinel	5838	851	14.6	0	0	851
	Total	**6082**	**862**	**14.2**	**11**	**0**	**851**

Table 3: Number of non-sentinel specimens tested by the NVRL for other respiratory viruses and positive results, for week 50 2019. *Source: NVRL*

Week	Specimen type	Total tested	Adenovirus	% Adenovirus	PIV-1	% PIV-1	PIV-2	% PIV-2	PIV-3	% PIV-3	PIV-4	% PIV-4	hMPV	% hMPV
50 2019	Non-sentinel	632	5	0.8	7	1.1	8	1.3	1	0.2	0	0.0	12	1.9
2019/2020	Non-sentinel	5838	122	2.1	188	3.2	84	1.4	17	0.3	19	0.3	211	3.6

*Sentinel specimens are only tested for influenza and RSV

† 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 50 2019 is shown in figure 6. During week 50, widespread influenza activity was reported in HSE-E and –NW while regional influenza activity was reported in HSE-MW, -NE, -SE and -S. The remaining HSE areas, HSE-M and -W reported localised activity.

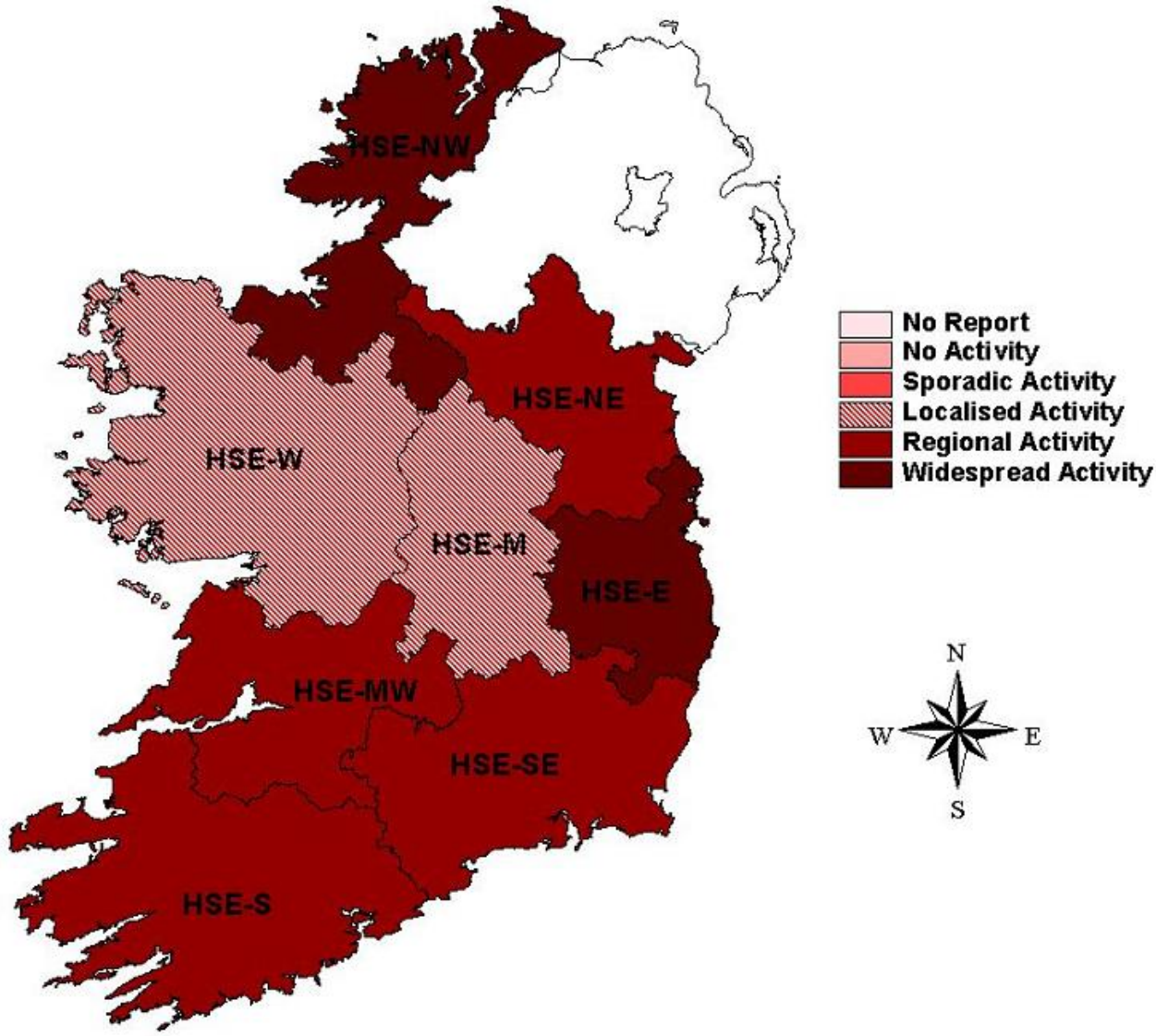

Figure 6: Map of provisional influenza activity by HSE-Area during influenza week 50 2019

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, at 566 admissions, during week 50 2019 (figure 7). This was an increase compared to the 529 respiratory admissions reported during week 49 2019. Seven of the eight hospitals reported data for week 50.

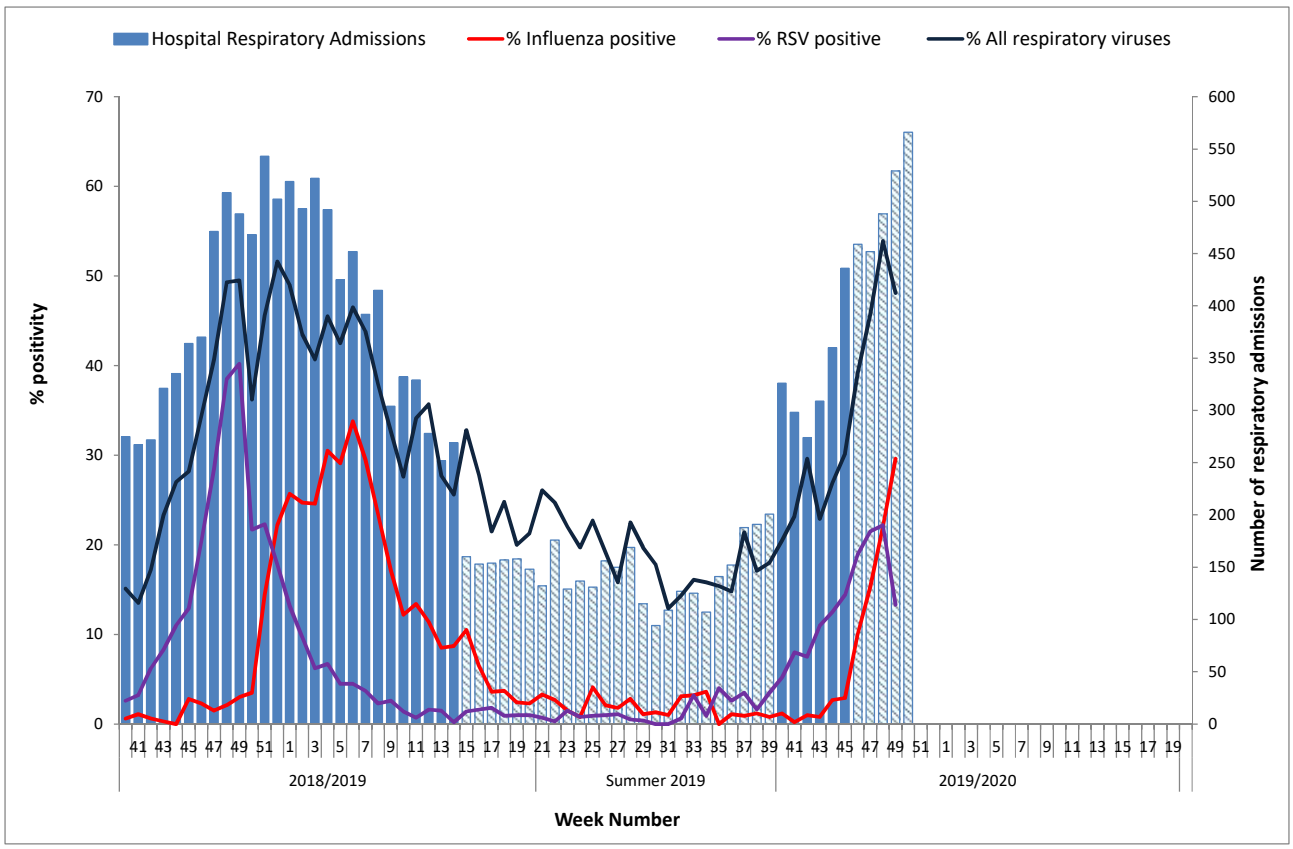

Figure 7: Number of respiratory admissions reported from the sentinel hospital network and % positivity for influenza, RSV and all seasonal respiratory viruses tested* by the NVRL by week and season. *Source: Departments of Public Health - Sentinel Hospitals & NVRL. *All seasonal respiratory viruses tested refer to non-sentinel respiratory specimens routinely tested by the NVRL including influenza, RSV, adenovirus, parainfluenza viruses and human metapneumovirus (hMPV). Weeks with missing data are 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 medium levels during week 50 2019 at 4.3%, an increase compared to the 3.0% reported for week 49. Four services reported data for week 50 and there were 814 calls relating to self-reported influenza (figure 8).

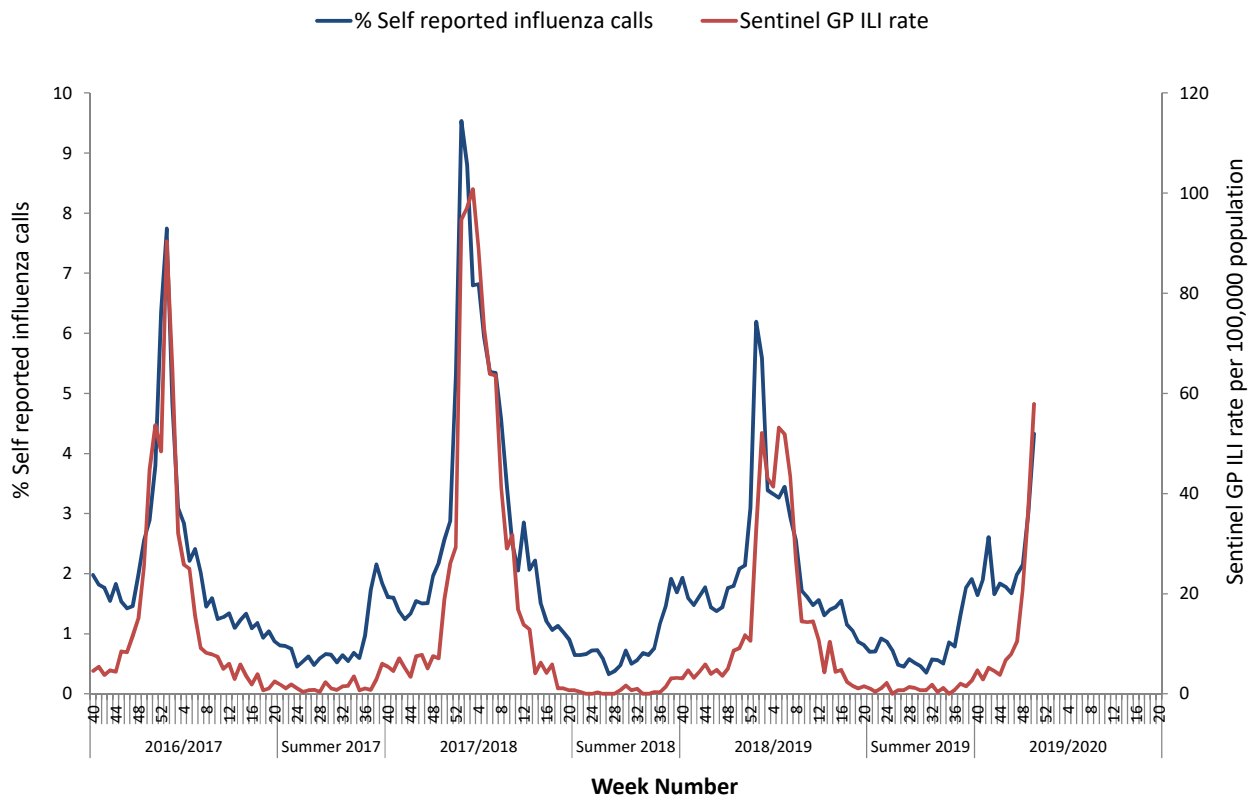

Figure 8: Self-reported influenza-related calls as a proportion of total calls to Out-of-Hours GP Co-ops and sentinel GP ILI consultation rate per 100,000 population by week and season. *Source: GP Out-Of-Hours services in Ireland (collated by HSE-NE) & ICGP.*

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 were at medium levels during week 50 2019, with 737 confirmed influenza cases notified. This was a notable increase compared to the previous week, when 369 cases were notified.
- Of the 737 cases, 151 were due to influenza A(H3N2), 12 were due to influenza A(H1N1)pdm09, 532 were due to influenza A (not subtyped) and 42 were due to influenza B.
- To date this season, 1506 confirmed cases of influenza have been notified to HPSC; 92.0% have been due to influenza A (n=1386) and 7.9% due to influenza B (n=119) and the remaining case did not have organism reported. Of the 468 influenza A viruses subtyped, 91.5% (n=428) were A(H3N2); 8,5% (n=40) were A(H1N1)pdm09.
- During week 50, 459 RSV cases were notified, a small decrease compared to the previous week (n=475). The number of cases of RSV notified has been increasing in recent weeks and remains at high levels

6. Influenza Hospitalisations

- 307 confirmed influenza hospitalised cases were notified to HPSC during week 50 2019, 55 were due to influenza A(H3N2), one due to influenza A(H1N1)pdm09, 235 due to influenza A (not subtyped) and 16 were due to influenza B.
- For the 2019/2020 season to date, 627 confirmed influenza hospitalised cases have been notified to HPSC; 188 due to influenza A(H3N2), nine due to influenza A(H1N1)pdm09, 392 due to influenza A (not subtyped) and 37 due to influenza B. The remaining case did not have organism reported.
- Age specific rates for hospitalised influenza cases are reported in table 4, with the highest rates reported in children aged under 5 years old and in those aged 65 years and older.

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.

- Six confirmed influenza case was admitted to critical care and reported to HPSC during week 50 2019.
- During the 2019/2020 season to date, 25 influenza cases have been reported to HPSC as having been admitted to ICU. Eleven ICU cases were due to influenza A (H3N2), two were due to A(H1N1)pdm09 and the remaining 12 cases were due to influenza A (not subtyped).
- Over two-thirds of the cases admitted to ICU were aged 65 years and older. The age specific rates for admission to critical care are shown in table 4. These rates are based on small numbers.

Table 4: Age specific rates for confirmed influenza cases hospitalised and admitted to critical care during the 2019/2020 influenza season to date. Age specific rates are based on the 2016 CSO census.

Age (years)	Hospitalised		Admitted to ICU	
	Number	Age specific rate per 100,000 population	Number	Age specific rate per 100,000 population
<1	33	53.0	1	1.6
1-4	96	35.7	0	0
5-14	105	15.6	2	0.3
15-24	37	6.4	1	0.2
25-34	27	4.1	0	0
35-44	28	3.7	2	0.3
45-54	32	5.1	1	0.2
55-64	44	8.6	1	0.2
≥65	225	35.3	17	2.7
Total	**627**	**13.2**	**25**	**0.5**

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/

- Eight influenza-associated deaths were reported to HPSC to date this season. Seven deaths occurred in those aged 65 years and older and one was in those aged less than 65 years. .
- During week 50 2019, no excess all-cause mortality was reported in Ireland after correcting GRO data for reporting delays with the standardised EuroMOMO algorithm.

9. Outbreak Surveillance

- Seven influenza outbreaks and six acute respiratory infection outbreaks were reported to HPSC during week 50 2019.
- Influenza and acute respiratory outbreaks reported during the influenza 2019/2020 season to date are summarised by HSE area and by pathogen detected in tables 5 and 6.

Table 5: Summary of respiratory outbreaks by HSE area and disease during 2019/2020 season *Source: CIDR*

HSE area	Influenza	Respiratory syncytial virus infection	Acute respiratory infection	Total
HSE-E	5		4	9
HSE-M			1	1
HSE-MW	2		1	3
HSE-NE		1		1
HSE-NW	2	1	2	5
HSE-SE	3		4	7
HSE-S	2		2	4
HSE-W	3			3
Total	**17**	**2**	**14**	**33**

Table 6: Summary of respiratory outbreaks by outbreak location and pathogen during 2019/2020 season *Source: CIDR*

Outbreak location	Organism/Pathogen	Total
Nursing home	Coronavirus and Rhinovirus	1
	Human Metapneumovirus and Rhinovirus	1
	Influenza A	2
	Influenza AH3	2
	Not specified	1
	Rhino enterovirus	1
Nursing home Total		**8**
Comm. Hosp/Long-stay unit	Coronavirus	1
	Influenza	3
	Influenza A H3	1
	Not specified	1
	Rhinovirus	1
	RSV B	1
Comm. Hosp/Long-stay unit Total		**8**
Acute Hospital	Influenza	4
	Influenza A	1
	influenza AH3	1
	Influenza B	1
Acute Hospital Total		**7**
School	ILI	1
	Influenza A	2
	Not specified	1
	Suspected ILI	3
School Total		**7**
Residential institution	Rhino/Enterovirus	1
	RSV	1
Residential institution Total		**2**
Childcare facility	possible RSV	1
Childcare facility Total		**1**
Total		**33**

10. International Summary

Influenza activity is increasing in the European Region, although most countries still reported influenza activity rates below baselines or at low levels. Influenza activity in the European Region, based on sentinel sampling, first exceeded a positivity rate of 10% in week 47/2019. Type A viruses dominate across the European Region, although a number of countries have reported influenza type B virus dominance or co-dominance of types A and B virus.

In the temperate zone of the northern hemisphere, respiratory illness indicators and influenza activity started to increase in most countries. Influenza activity was elevated across the countries in Western Asia. Worldwide, seasonal influenza A(H3N2) viruses accounted for the majority of detections.

National Influenza Centres (NICs) and other national influenza laboratories from 119 countries, areas or territories reported data to FluNet for the time period from 11 November 2019 to 24 November 2019. The WHO GISRS laboratories tested more than 92883 specimens during that time period. 7914 were positive for influenza viruses, of which 5629 (71.1%) were typed as influenza A and 2285 (28.9%) as influenza B. Of the sub-typed influenza A viruses, 2682 (71.5%) were influenza A(H3N2) and 1069 (28.5%) were influenza A(H1N1)pdm09. Of the characterized B viruses, 1014 (96.8%) belonged to the B-Victoria lineage and 34 (3.2%) to the B-Yamagata lineage.

A joint ECDC and WHO Regional Office for Europe regional early situation assessment for the Influenza season 2019–2020 is available at influenza-situation-assessment-18-December-2019.pdf

- 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

Ireland has changed from using trivalent vaccine to using quadrivalent vaccine for the 2019/2020 influenza season. Quadrivalent vaccines include a 2nd influenza B virus in addition to the 2 influenza A viruses found in trivalent vaccines.

The WHO vaccine strain selection committee recommend that quadrivalent vaccines for use in the 2019/2020 northern hemisphere influenza season contain the following:

- an A/Brisbane/02/2018 (H1N1)pdm09-like virus;
- an A/Kansas/14/2017 (H3N2)-like virus;
- a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage); and
- a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage).

It is recommended that the influenza B virus component of trivalent vaccines for use in the 2019-2020 northern hemisphere influenza season be a B/Colorado/06/2017-like virus.
https://www.who.int/influenza/vaccines/virus/recommendations/201902_recommendation.pdf
https://www.who.int/influenza/vaccines/virus/recommendations/201902_recommendation_addendum.pdf

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

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