Flu News Europe

Joint ECDC–WHO/Europe weekly influenza update

Summary

Week 12/2017 (20–26 March 2017)

- Influenza activity across the region continued to decrease with the great majority of countries reporting low intensity.
- The number of influenza virus detections further decreased, but the proportion of influenza virus detections (18%) among sentinel surveillance specimens remained at the same level as the previous week.
- This was the second week during the season that the proportion of type B viruses exceeded the proportion of type A viruses in sentinel detections, as is commonly seen in the second half of an influenza season. However, the overall number of type B virus detections remained low.

Season overview

- Influenza activity started early this season, in week 46/2016, which is the earliest week that the overall influenza virus-positivity rate in sentinel specimens reached 10% since the emergence of A(H1N1)pdm09 viruses in 2009/10.
- Since week 40/2016, influenza A viruses have predominated, accounting for 94% of all sentinel detections; the great majority (99%) of subtyped influenza A viruses from sentinel sites being A(H3N2).
- Confirmed cases of influenza virus type A infection reported from hospitals have predominantly been in adults aged 65 years or older. Excess all-cause mortality has been observed substantially in people aged 15–64 years and markedly in people aged 65 years or older in the majority of the 19 reporting countries. This is commonly seen when the predominant viruses circulating are A(H3N2).
- Two-thirds of the A(H3N2) viruses genetically characterized belong to genetic subclade (3C.2a1), which are in the main antigenically similar to the clade 3C.2a vaccine virus, as mentioned in the WHO recommendations for vaccine composition for the northern hemisphere 2017–18.
- Vaccine effectiveness estimates for all age groups against A(H3N2) illness from Canada (42%), the US (43%) and Europe (38%) are consistent for persons aged 65 years or older.
- Given typically suboptimal vaccination coverage and the partial effectiveness of influenza vaccines, rapid use of neuraminidase inhibitors (NAIs) for laboratory-confirmed or probable cases of influenza virus-infection should be considered for vaccinated and non-vaccinated patients at risk of developing complications.
- Of the viruses tested so far, only one A(H3N2) virus (<1%) has shown reduced susceptibility to oseltamivir this season.
- The developments during the season have confirmed the conclusions of the ECDC risk assessment on seasonal influenza, updated on 25 January 2017, specifically relating to increased severe outcomes in the elderly due to the prevalence of A(H3N2) viruses, that has put some health care systems under pressure.

Primary care data

Influenza activity

Among the 43 countries reporting on influenza activity for week 12/2017, 42 countries reported a return to baseline levels and 1 country reported medium intensity (Fig. 1). Of the 44 countries reporting on geographic spread, 3 reported widespread influenza activity (Fig. 2).

The percentage of influenza virus detections among sentinel specimens was 18%, which is similar to week 11/2017 (17%), with 12 of 20 countries reporting dominance of influenza B viruses.

Maps of qualitative indicators in the European Region

Fig. 1. Intensity in the European Region, week 12/2017

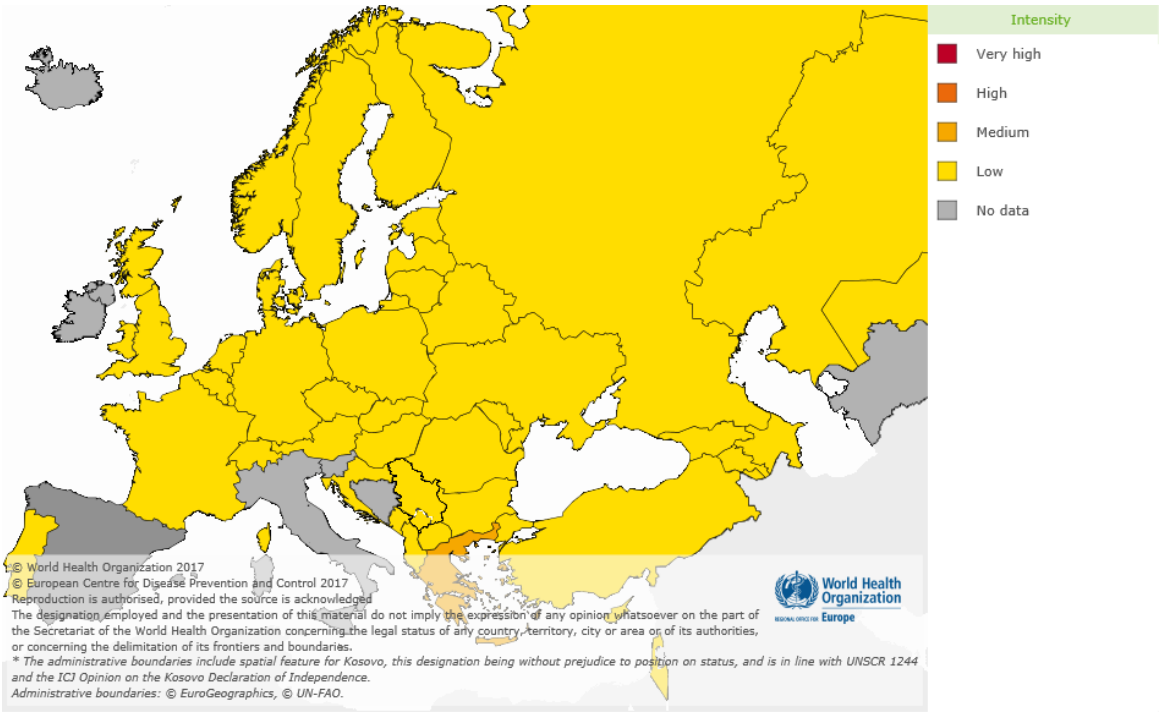
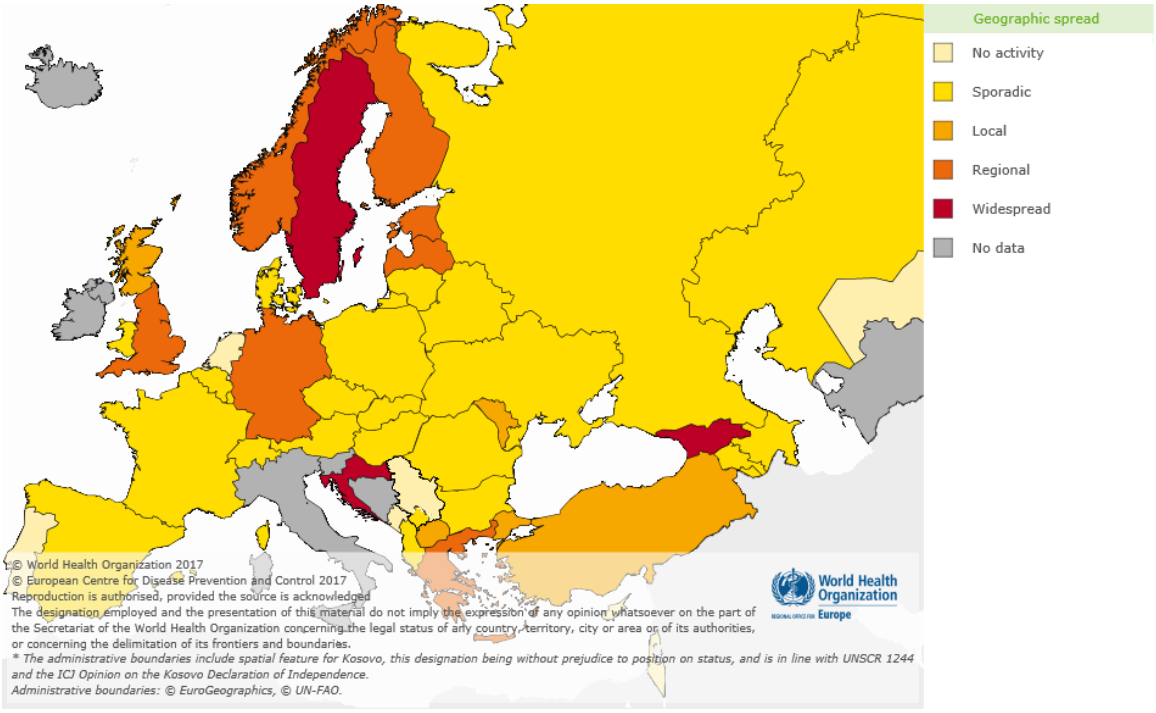


Fig. 2. Geographic spread in the European Region, week 12/2017



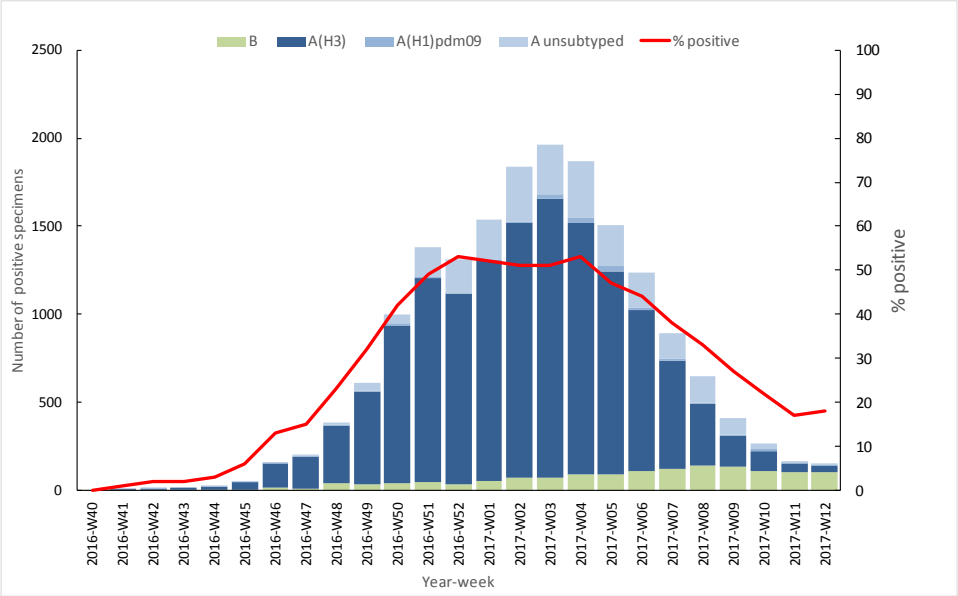
For interactive maps of influenza intensity and geographic spread, please see the Flu News Europe website.

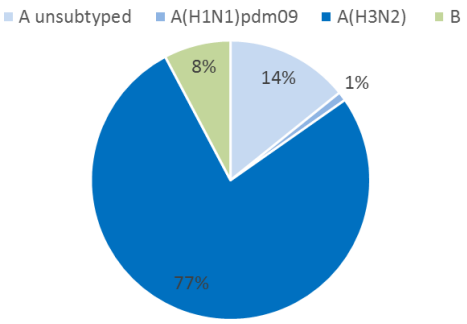
Viruses detected in sentinel-source specimens (ILI and ARI)

For week 12/2017, 150 of 836 (18%) sentinel specimens tested positive for influenza viruses (Table 1). Of these, 71% were type B and 29% type A viruses. The proportion of type B viruses commonly increases in the second half of an influenza season. The great majority (90%) of subtyped influenza A viruses were A(H3N2). The lineage of 43 influenza B viruses was determined, of which 30 (70%) fell in B/Yamagata and 13 (30%) in B/Victoria lineages, similar to proportions in recent weeks. Of 19 countries across the region that each tested at least 10 sentinel specimens, 5 reported proportions of influenza virus detections of 30% or above.

Since week 40/2016, similar cumulative distributions of influenza types and type A subtypes have been observed: of all typed viruses, 92% were type A, with 99% of those subtyped being A(H3N2) (Fig. 3, Table 1). Of the 665 influenza B viruses that have been ascribed a lineage since week 40/2016, 375 (56%) were of the B/Yamagata lineage and 290 (44%) were of the B/Victoria lineage.

Fig. 3. Influenza virus detections in sentinel-source specimens by type and subtype, by week





The data in the pie chart is cumulative.

Table 1. Influenza virus detections in sentinel-source specimens by type and subtype, week 12/2017 and cumulatively

Virus type and subtype	Current Week		Season 2016-2017	
	Number	%[a]	Number	%[a]
Influenza A	**43**	**29**	**16 185**	**92**
A(H1N1)pdm09	4	10	185	1
A(H3N2)	35	90	13 508	99
A not subtyped	4	-	2 492	-
Influenza B	**107**	**71**	**1463**	**8**
B/Victoria lineage	13	30	290	44
B/Yamagata lineage	30	70	375	56
Unknown lineage	64	-	798	-
Total detections / Total tested	**150 / 836**	**18**	**17 648 / 47 268**	**37**

[a]For influenza type percentage calculations, the denominator is total detections; for subtype and lineage, it is total influenza A subtyped and total influenza B lineage determined, respectively; for total detections, it is total tested.

Severity

For week 12/2017, of the 16 countries that conduct sentinel surveillance on severe acute respiratory infection (SARI), 12 countries reported a total of 1 482 SARI cases. Among these cases, 344 respiratory specimens were collected, 37 (11%) of which tested positive for influenza. Since week 40/2016, 32 938 SARI cases have been reported from 16 countries; 9 561 of these cases were tested for influenza viruses, 3 371 (35%) of which were positive: 2 694 (80%) were type A and 677 (20%) type B viruses. Of the influenza A viruses, 2 480 (92%) were A(H3N2), 6 (<1%) were A(H1N1)pdm09 and 208 (8%) were not subtyped.

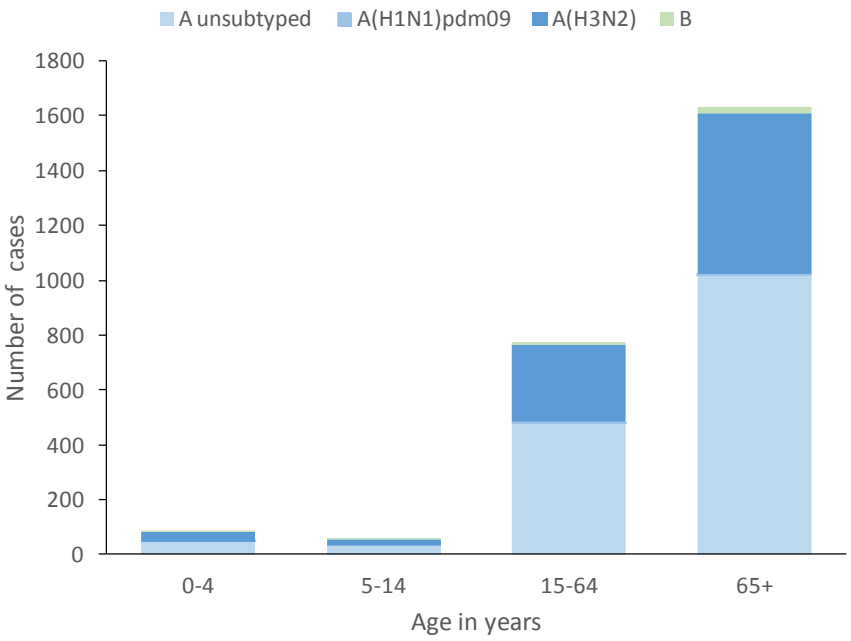
For week 12/2017, of 9 countries that conduct surveillance on hospitalized laboratory-confirmed influenza cases in intensive care units (ICU) or other wards, 3 countries reported a total of 16 cases, 13 in ICU and 3 in other wards. For both ward types, this was a decrease compared to the numbers observed in the previous week. Of the patients admitted to ICU, 10 were infected with influenza type A viruses (9 influenza A not subtyped and 1 influenza A(H1N1)pdm09), and 3 with influenza B. In other wards, 2 cases were infected with A(H3N2) viruses and 1 with influenza B.

Since week 40/2016, 5 countries have reported 3 669 laboratory-confirmed influenza cases admitted to non-ICU wards; 3 631 (99%) were infected with influenza type A viruses (2 044 unsubtyped, 1 580 A(H3N2), 7 A(H1N1)pdm09), and 38 were infected with type B influenza viruses.

Since week 40/2016, 9 countries reported a total of 3 591 cases that have been admitted to ICU, 3 507 (98%) were infected with influenza type A viruses (2 134 unsubtyped, 1 248 A(H3N2) and 125 A(H1N1)pdm09) and 84 with type B viruses. The proportion of cases admitted to ICU due to A(H1N1)pdm09 is higher than observed in other wards and higher than observed in the outpatient setting among sentinel detections (9%, <1% and 1% of subtyped influenza A viruses, respectively).

Since the start of the season, most of the hospitalized laboratory-confirmed influenza cases reported have occurred in people aged 65 years or older (Fig. 4). Information on patient age and influenza virus (sub)type was available for 2 545 cases admitted to ICU; the majority of cases (64%; n=1 633) were aged ≥65 years, 775 (30%) were aged 15–64 years and 137 (5%) were aged under 15 years. In total, 870 deaths have been reported, 484 from ICUs and 386 from other wards, with 709 (81%) of the patients being 65 years or older; 863 (99%) of all fatal cases were due to influenza A with 401 (99%) of those subtyped being A(H3N2) viruses.

Fig. 4. Distribution of virus (sub)type in influenza-confirmed cases admitted to ICU by age-group, cumulatively



Mortality monitoring

Data from 19 countries or regions reporting to the Euromomo project were received for week 12/2017 and included in the pooled analyses of excess all-cause mortality.

The majority of participating European countries have had a marked excess in all-cause mortality since the end of 2016; in particular among elderly aged 65 years and above. However, mortality seems to have normalized again. This season's excess mortality coincided with circulation of influenza A(H3N2), which usually leads to increased mortality among the elderly. Some countries also experienced extremely cold weather at the beginning of 2017, which also may have contributed to the excess mortality.

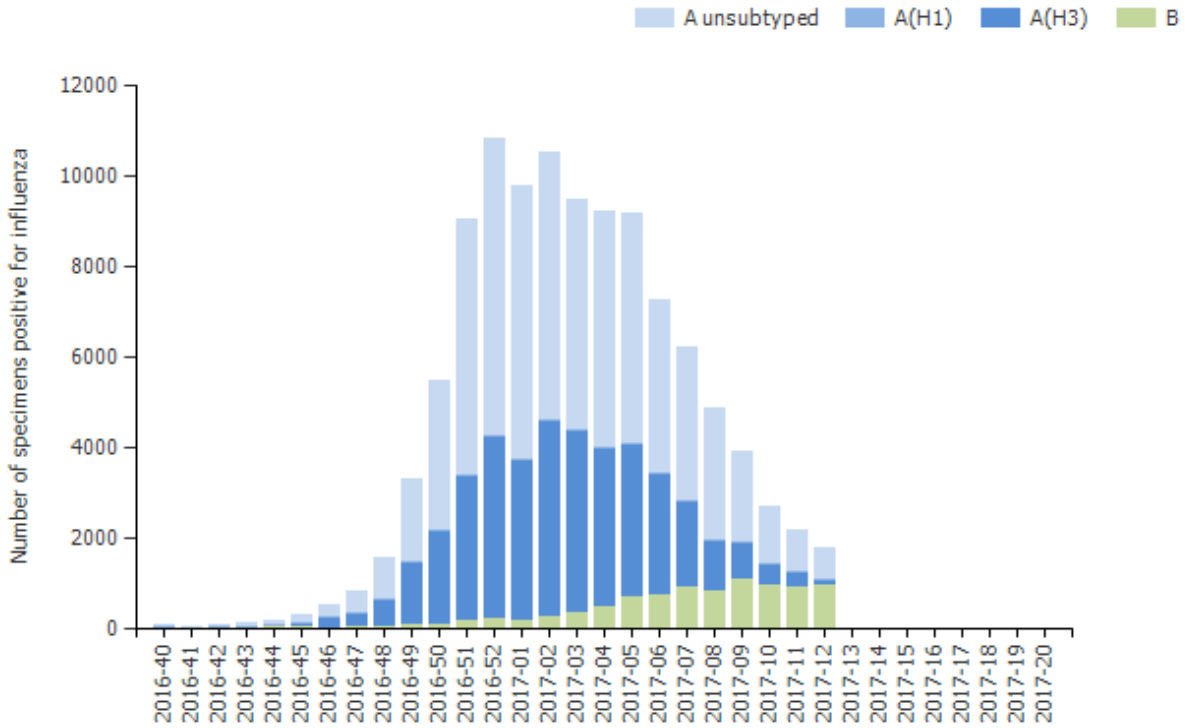
Virus characteristics

Viruses detected in non-sentinel-source specimens

For week 12/2017, 1 799 specimens from non-sentinel sources (such as hospitals, schools, non-sentinel primary care facilities, nursing homes and other institutions) were tested positive for influenza viruses (Fig. 5,

Table 2). Of these, 45% were type A (with 96% of the subtyped viruses being A(H3N2)), and 55% type B. The increase in proportion of type B viruses corresponds to the data seen in sentinel detections, however the number of B viruses detected remained low and similar to that seen in the previous 5 weeks.

Fig. 5. Influenza virus detections in non-sentinel-source specimens by type and subtype, by week



Whilst no subtype or lineage was determined for the majority of influenza viruses, similar cumulative distributions of types and type A subtypes as seen in sentinel detections have been observed since week 40/2016: of all typed viruses, 91% were type A, with 99% of those subtyped being A(H3N2). Of 1073 influenza type B viruses ascribed to a lineage, 74% were B/Yamagata lineage and 26% were B/Victoria lineage (

Table 2), which differs from sentinel detections where B/Victoria lineage and B/Yamagata lineage viruses have been evenly distributed this season. The difference is mainly driven by the proportion of influenza B lineage detections in sentinel specimens in Latvia, Norway and Slovenia (B/Yamagata lineage predominant).

Table 2. Influenza viruses detected in non-sentinel-source specimens, by virus (sub)type, week 12/2017 and cumulatively

Virus type and subtype	Current Week		Season 2016-2017	
	Number	%[a]	Number	%[a]
Influenza A	**809**	**45**	**100 226**	**91**
A(H1N1)pdm09	6	4	334	1
A(H3N2)	134	96	38 177	99
A not subtyped	669	-	61 715	-
Influenza B	**990**	**55**	**10 214**	**9**
B/Victoria lineage	11	29	278	26
B/Yamagata lineage	27	71	795	74
Unknown lineage	952	-	9 141	-
Total detections / Total tested	**1 799 /13 687**	**-**	**110 440 /511 325**	**-**

[a]For influenza type percentage calculations, the denominator is total detections; for subtype and lineage, it is total influenza A subtyped and total influenza B lineage determined, respectively; as not all countries have a true non-sentinel testing denominator, no percentage calculations for total tested are shown.

Genetic characterization

For specimens collected since week 40/2016, genetic characterizations of 2 651 viruses have been reported (Table 3). Among 2 410 A(H3N2) viruses, 754 fell in the vaccine component clade (3C.2a) and 1 625 in the 3C.2a1 subclade defined by N171K, often with N121K, amino acid substitutions in the haemagglutinin. Viruses in these two clades have been antigenically similar, but both clades are evolving rapidly with emergence of several virus clusters defined by additional amino acid substitutions in the haemagglutinin, thereby requiring continued monitoring of antigenic characteristics.

Table 3. Viruses attributed to genetic groups, cumulative for weeks 40/2016–12/2017

Phylogenetic group	Number of viruses
A(H1N1)pdm09 A/Michigan/45/2015 (subgroup 6B.1)[b, c]	23
A(H1N1)pdm09 A/South Africa/3626/2013 (subgroup 6B)	5
A(H3N2) A/Bolzano/7/2016 (subgroup 3C.2a1)	1 625
A(H3N2) A/Hong Kong/4801/2014 (subgroup 3C.2a)[a, b, c]	754
A(H3N2) A/Switzerland/9715293/2013 subgroup (3C.3a)	24
A(H3N2) A/Stockholm/28/2014 (subgroup3C.3b)	1
A(H3N2), subgroup not listed	6
B/Brisbane/60/2008 (Victoria lineage clade 1A)[a, b, c]	54
B/Phuket/3073/2013 (Yamagata lineage clade 3)[d]	159

[a] Vaccine component for Northern Hemisphere 2016–2017 season
[b] Vaccine component for Southern Hemisphere 2017 season
[c] Vaccine component for Northern Hemisphere 2017-2018 season
[d] Vaccine component of quadrivalent vaccines for use in both Northern and Southern Hemisphere

The recommended composition of trivalent influenza vaccines for the 2016–2017 season in the northern hemisphere was for inclusion of an A/California/7/2009 (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) virus was recommended. On 2 March 2017 WHO announced the recommended vaccine composition for the 2017–2018 season in the northern hemisphere. The recommendations matched those for the 2016–2017 season, however with the A(H1N1)pdm09 component changed to an A/Michigan/48/2015-like virus (clade 6B.1).

Early monitoring of vaccine effectiveness (VE) in Finland and Stockholm county suggested levels of effectiveness in persons aged 65 years or older (32% and 28% VE, respectively) similar to estimates from annual multicountry studies covering the 2011–2012 and 2014–2015 seasons. More recent VE estimates for all age groups against A(H3N2) illness from Canada (42%), from the US (43%) and from Europe (38%) were consistent with the early estimates from Finland and Sweden.

Given typically suboptimal vaccination coverage and the partial effectiveness of influenza vaccines, rapid use of neuraminidase inhibitors (NAIs) for laboratory-confirmed or probable cases of influenza infection should be considered for vaccinated and non-vaccinated patients at risk of developing complications.

Antiviral susceptibility testing

Neuraminidase inhibitor susceptibility has been assessed for 1 353 influenza viruses (1 232 A(H3N2), 23 A(H1N1)pdm09 and 98 type B) with collection dates since week 40/2016. One A(H3N2) virus, from a specimen collected in week 2/2017, showed reduced inhibition by oseltamivir in phenotypic assay. None have shown reduced inhibition by zanamivir.

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