Flu News Europe

Joint ECDC–WHO/Europe weekly influenza update

Summary

Week 3/2017 (16–22 January 2017)

- Influenza activity remained elevated across the region with 32 of 43 countries reporting increased activity.
- Excess all-cause mortality among the elderly has been observed in the past 4 to 5 weeks in many of the 18 countries that take part in EuroMOMO and, most likely, this is mainly due to the circulation of influenza A(H3N2) virus.
- The proportion of influenza virus detections among sentinel surveillance specimens was 49%, similar to that in the previous week.
- The great majority of influenza viruses detected were type A (97%) and, of those subtyped, 98% were A(H3N2).
- Most of the hospitalized laboratory-confirmed cases reported have occurred in people aged 65 years or older.

Season overview

- Influenza activity started early this season compared to previous seasons.
- Week 46/2016 is the earliest week that the overall influenza-positivity rate in sentinel specimens reached 10% since the emergence of A(H1N1)pdm09 viruses in the 2009 season; during the last 6 seasons this occurred between weeks 48 and 51.
- Since week 40/2016, influenza A viruses have predominated, accounting for 96% of all sentinel detections; the great majority (99%) of subtyped influenza A viruses from sentinel sites has been A(H3N2).
- In an influenza season in which A(H3N2) viruses predominate, elderly populations might be expected to be most severely affected. Indeed, confirmed cases of influenza A infection reported from hospitals have predominantly been in adults aged over 65 years.
- So far, circulating A(H3N2) viruses are antigenically similar to the vaccine strain. While about two-thirds of the A(H3N2) viruses genetically characterized belong to a new genetic subclade (3C.2a1), those that have been antigenically characterized are similar to the vaccine strain (clade 3C.2a).
- Early monitoring of vaccine effectiveness in Finland and Sweden suggests levels of effectiveness similar to estimates from annual multi-country studies between the 2011–2012 and 2014–2015 seasons with 26% (95% CI 22% to 30%) and 24% (95% CI 11% to 34%) vaccine effectiveness, respectively, in persons aged 65 years and older. Given suboptimal vaccination coverage, 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.
- No reduced susceptibility to NAIs has been observed among the viruses tested.
- A risk assessment on seasonal influenza in EU/EEA countries was published by ECDC on 24 December 2016 and was updated on 25 January 2017. The above description is in line with the findings of these assessments.

Primary care data

Influenza activity

Influenza activity in week 3/2017 was at variable levels across the region and was similar to the previous week: Hungary reported very high intensity, and 5, 26 and 11 countries or regions reported high, medium and low intensity, respectively (Fig. 1). Of the 42 countries or regions reporting any geographic spread of influenza, the great majority (n=29) reported widespread activity similar to the previous week. Other countries reported regional (n=8), sporadic (n=4) or local activity (n=1) (Fig. 2).The percentage of influenza virus detections among sentinel specimens was 49%, similar to that in the previous week (46%).

Map of qualitative indicators in the European Region

Fig. 1. Intensity in the European Region, week 3/2017

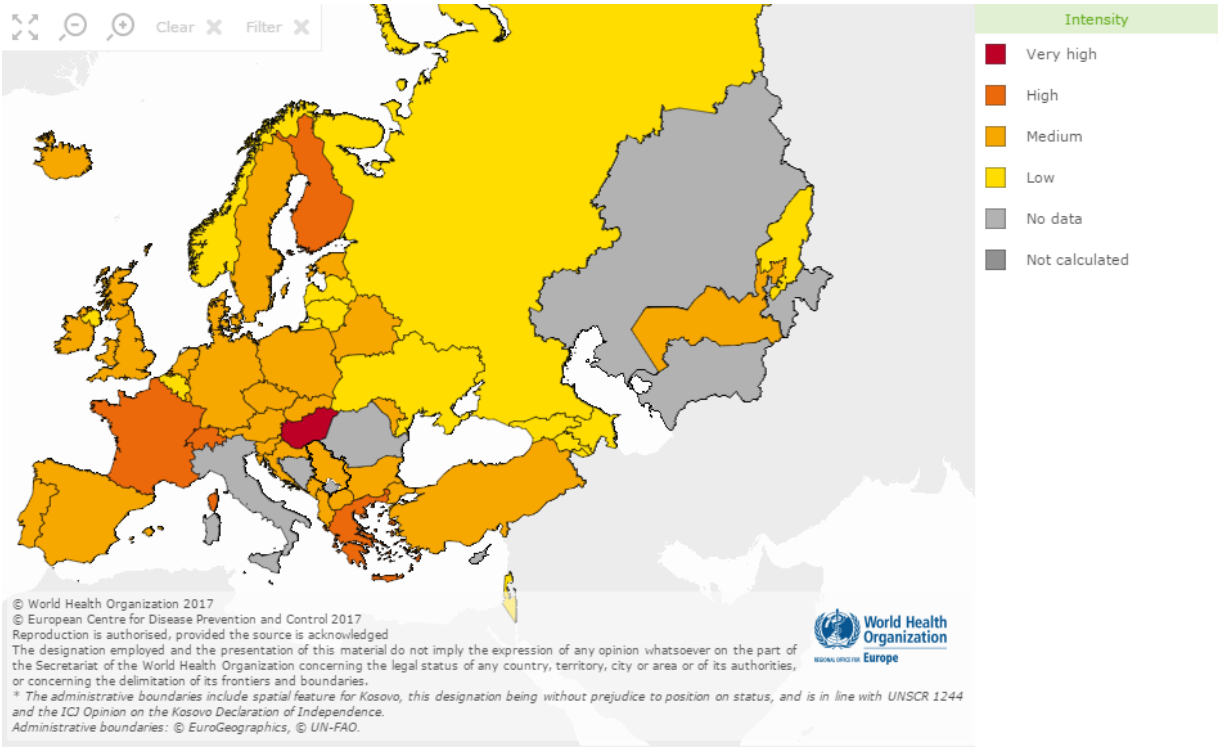
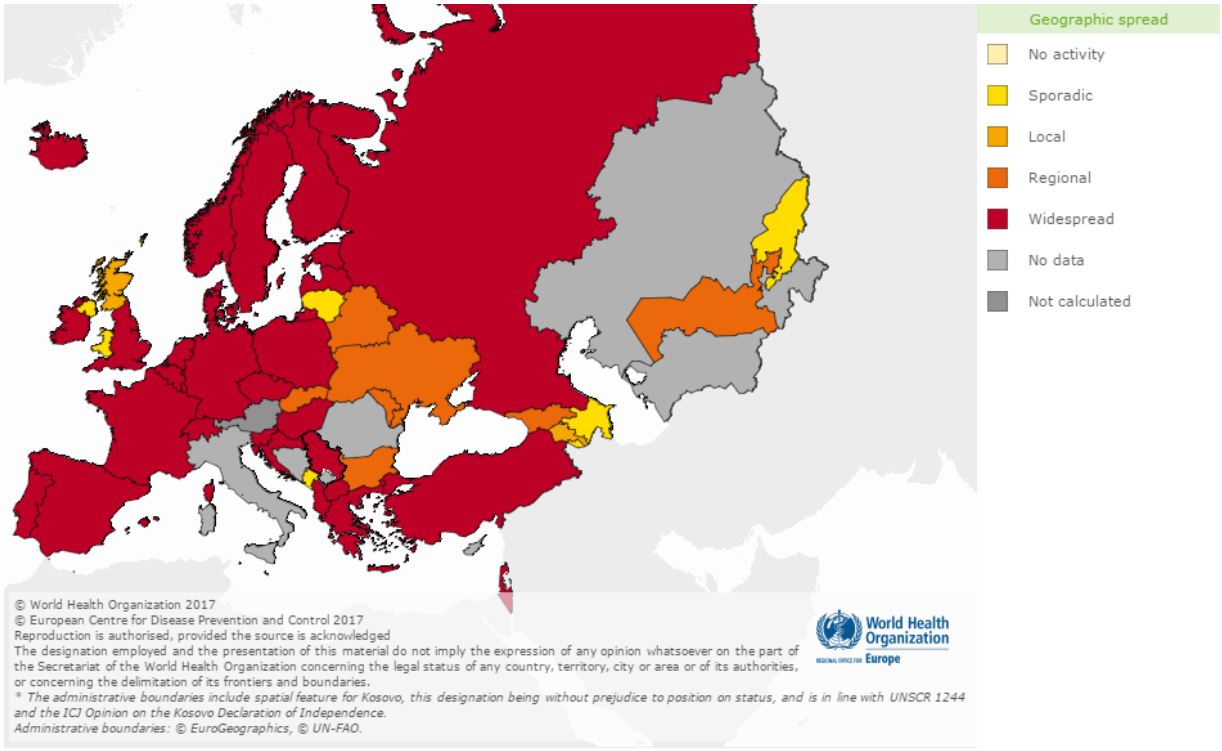


Fig. 2. Geographic spread in the European Region, week 3/2017



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 3/2017, 1 681 of 3 428 (49%) sentinel specimens tested positive for influenza viruses (Table 1). Of these, 97% were type A and 3% were type B. The great majority (>98%) of subtyped influenza A viruses were A(H3N2). The lineage of 27 influenza B viruses was determined of which 16 fell in B/Yamagata and 11 in B/Victoria lineages. Of 32 countries across the region that each tested at least 10 sentinel specimens, 26 reported proportions of influenza virus detections above 30% (median 55%, range 32% to 89%).

Similar cumulative distributions of types and subtypes have been observed since week 40/2016: of all typed viruses, 96% were type A, with 99% of those subtyped being A(H3N2) (Fig. 3, Table 1). Of the 215 influenza B viruses which have been ascribed a lineage, 144 (67%) were of the B/Victoria lineage and 71 (33%) were of the B/Yamagata lineage.

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

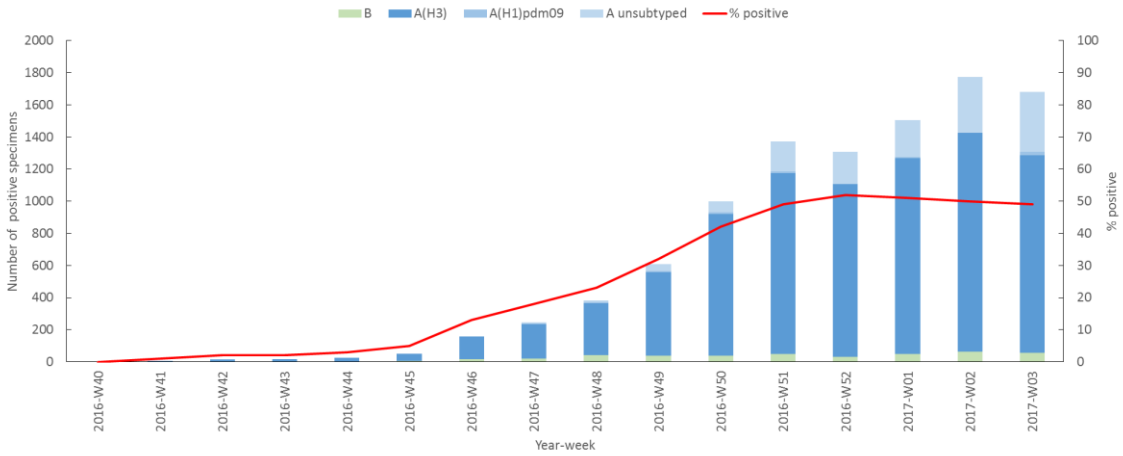


Table 1. Influenza virus detections in sentinel-source specimens by type and subtype, week 3/2017 and cumulatively

	Number of detections	
Virus type and subtype	**Current Week**	**Season 2016-2017**
Influenza A	**1 625**	**9 731**
A(H1N1)pdm09	22	72
A(H3N2)	1 231	8 183
A not subtyped	372	1 476
Influenza B	**56**	**416**
B/Victoria lineage	11	144
B/Yamagata lineage	16	71
Unknown lineage	29	201
Total detections (total tested)	**1 681 (3 428)**	**10 147 (28 307)**

Severity

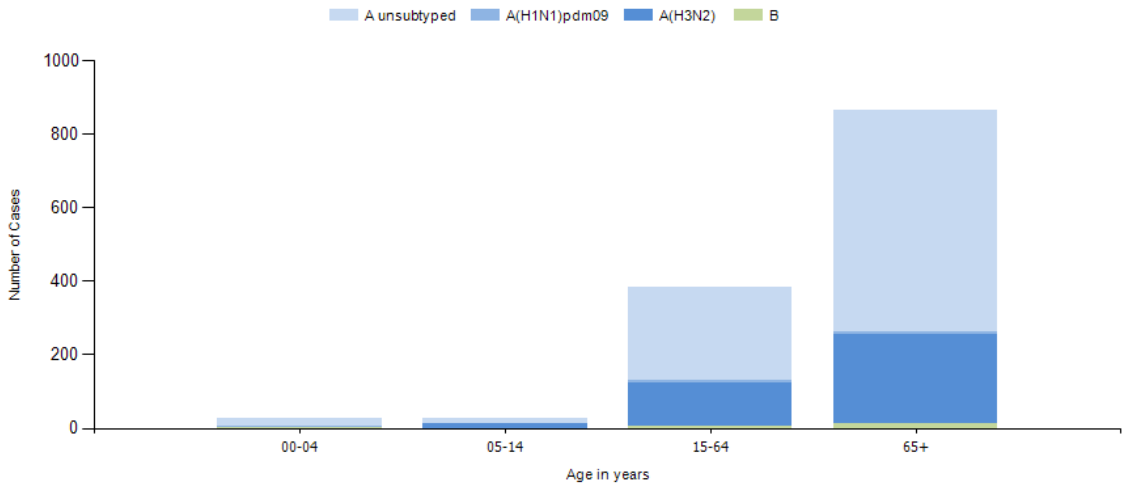
For week 3/2017, of the 15 countries that conduct sentinel surveillance on severe acute respiratory infection (SARI), 11 reported data and 8 of the 9 countries that conduct surveillance on hospitalized laboratory-confirmed influenza cases reported data.

Of 911 SARI cases reported (a drop from 1 424 for the previous week), 244 were tested for influenza virus and 95 (39%) were positive: 79 A(H3N2), 1 A(H1N1)pdm09 and 15 influenza type B viruses were detected. Since week 40/2016, 19 656 SARI cases have been reported from 15 countries with 5 508 tested for influenza virus, of which 1 917 (35%) were positive: 1 658 (86%) were type A and 259 (14%) type B viruses. Of the influenza A viruses, 1 566 (94.5%) were A(H3N2), 1 (0.1%) was A(H1N1)pdm09 and 91 (5.5%) were unsubtyped.

Of countries that conduct surveillance on hospitalized laboratory-confirmed influenza cases in intensive care units (ICU) or other wards, the Czech Republic, France, Ireland, Spain, Sweden and the United Kingdom reported a total of 167 cases (104 were type A not subtyped, 49 were A(H3N2), 12 were A(H1N1)pdm09 and 2 were type B) admitted to ICU in week 3/2017, an increase from 145 cases in the previous week. From other wards, 147 cases were reported in week 3/2017 (a decrease from 240 cases in the previous week) by the Czech Republic, Ireland, Romania, Spain and Sweden (95 were type A not subtyped, 49 were A(H3N2) and 3 was type B).

Since week 40/2016, the Czech Republic, Ireland, Romania and Spain have reported 1 992 laboratory-confirmed influenza cases admitted to non-ICU wards; 1 225 infected with unsubtyped A virus, 752 with A(H3N2), 3 with A(H1N1)pdm09 and 12 with type B influenza viruses. In total, the Czech Republic, Finland, France, Ireland, Romania, Spain, Sweden and the United Kingdom have reported 1 935 cases admitted to ICU; 1 206 infected with unsubtyped influenza A virus, 604 with A(H3N2), 88 with A(H1N1)pdm09 and 37 with type B influenza viruses.

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



Since the start of the season, most of the hospitalized laboratory-confirmed influenza cases reported have occurred in people aged 65 years or older. Information on patient age and influenza virus (sub)type was available for 1 390 cases admitted to ICU; the majority (67%) of cases (n=925) were aged ≥65 years, 404 (29%) were aged 15–64 years and 61 (4%) were aged under 15 years. A(H3N2) viruses predominated and accounted for 437 cases, 97% of the subtyped influenza A viruses in cases admitted to ICUs. 362 fatal cases have

been reported, 217 from ICUs and 145 from other wards (151 A(H3N2), 206 type A not subtyped, and 5 type B) with 297 (82%) being in patients aged ≥65 years.

Mortality monitoring

Data from 18 countries or regions reporting to the EuroMOMO project were received this week and included in the pooled analyses of excess all-cause mortality.

Many participating countries, across the European region, have witnessed substantial increases in all-cause excess mortality among the elderly in the past 4 to 5 weeks, notably some in Southern Europe including France, Greece, Italy, Portugal and Spain. Most likely, this is mainly due to the circulation of influenza A(H3N2) virus.

Virus characteristics

Viruses detected in non-sentinel-source specimens

For week 3/2017, 8 356 specimens from non-sentinel sources (such as hospitals, schools, non-sentinel primary care facilities, nursing homes and other institutions) tested positive for influenza viruses (Table 2). Of these, 96% were type A (with 99% of the subtyped viruses being A(H3N2)), and 4% type B.

Similar cumulative distributions of types (97% type A and 3% type B influenza viruses) and subtypes as seen in sentinel detections have been observed since week 40/2016 with A(H3N2) viruses being dominant throughout Europe (Table 2). For the majority of viruses, no subtype or lineage was determined; however, for those that were, 99% of the subtyped influenza A viruses were A(H3N2), while of 264 type B viruses ascribed to a lineage, 64% were B/Yamagata lineage and 36% were B/Victoria lineage, which differs from sentinel detections where B/Victoria lineage viruses have dominated so far this season. The difference is mainly driven by the proportions of influenza B lineage detections in sentinel specimens in Kyrgyzstan (B/Victoria lineage predominant) and detections among non-sentinel specimens in Estonia and Norway (B/Yamagata lineage predominant).

Table 2. Influenza viruses detected in non-sentinel-source specimens, by virus (sub)type, week 3/2017 and cumulatively

	Number of detections	
Virus type and subtype	**Current Week**	**Season 2016-2017**
Influenza A	**8 008**	**58 641**
A(H1N1)pdm09	41	165
A(H3N2)	3 025	20 960
A not subtyped	4 942	37 516
Influenza B	**348**	**1 688**
B/Victoria lineage	14	95
B/Yamagata lineage	20	169
Unknown lineage	314	1424
Total detections (total tested)	**8 356 (29 417*)**	**60 329 (292 386*)**

* Not all countries have a true non-sentinel testing denominator and these figures are likely to be an underestimate.

Genetic characterization

For specimens collected since week 40/2016, genetic characterization of 855 viruses has been reported (Table 3). Among A(H3N2) viruses, 251 fall in the vaccine component clade (3C.2a), and 551 in a subclade of clade 3C.2a viruses (3C.2a1) defined by N171K, often with N121K, amino acid substitutions in the haemagglutinin. Viruses in these 2 clades are antigenically similar, though the 3C.2a1 clade is evolving rapidly with emergence of numerous virus clusters defined by additional amino acid substitutions in haemagglutinin of which the impact on antigenic characteristics is not clear yet.

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

Phylogenetic group	Number of viruses
A(H1N1)pdm09 A/Michigan/45/2015 (clade 6B.1)[b]	5
A(H1N1)pdm09 A/South Africa/3626/2013 (subgroup 6B)	2
A(H3N2) A/Hong Kong/4801/2014 (clade 3C.2a)[a,b]	251
A(H3N2) A/Bolzano/7/2016 (clade 3C.2a1)	551
A(H3N2) A/Switzerland/9715293/2013 (clade 3C.3a)	4
B/Brisbane/60/2008 (Victoria lineage clade 1A)[a,b]	14
B/Phuket/3073/2013 (Yamagata lineage clade 3)[c]	28

[a] Vaccine component for Northern Hemisphere 2016–2017 season
[b] Vaccine component for Southern Hemisphere 2017 season
[c] Vaccine component of quadrivalent vaccines for both northern and southern hemisphere

The ECDC summary report for September 2016 provides detailed genetic and antigenic analyses of viruses collected between January and June 2016.

The recommended composition of trivalent influenza vaccines for the 2016–2017 season in the northern hemisphere is 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 is recommended. The recommended influenza A(H1N1)pdm09 component of the 2017 southern hemisphere influenza vaccine is an A/Michigan/48/2015 (H1N1)pdm09-like virus, the first update since A(H1N1)pdm09 viruses emerged in 2009.

Early monitoring of vaccine effectiveness in Finland and Sweden suggests levels of effectiveness similar to estimates from annual multi-country studies between the 2011–2012 and 2014–2015 seasons with 26% (95% CI 22% to 30%) and 24% (95% CI 11% to 34%) vaccine effectiveness, respectively, in persons aged 65 years and older. Given the partial effectiveness of influenza vaccines, rapid use of neuraminidase inhibitors for laboratory-confirmed or probable cases of influenza infection should be considered for vaccinated and non-vaccinated at-risk patients.

Antiviral susceptibility testing

Neuraminidase inhibitor susceptibility has been assessed for 512 viruses (488 A(H3N2), 8 A(H1N1)pdm09 and 16 type B) with collection dates since week 40/2016. None showed evidence of reduced inhibition (Table 4).

Table 4. Antiviral susceptibility (combined phenotypic and genotypic susceptibility information) by influenza virus type and subtype, cumulative for weeks 40/2016–3/2017

Subtype	Oseltamivir					Zanamivir				
	Viruses tested	RI	HRI	RI+HRI	RI+HRI%	Viruses tested	RI	HRI	RI+HRI	RI+HRI%
A(H1)pdm09	8	0	0	0	0.0%	7	0	0	0	0.0%
A(H3)	488	0	0	0	0.0%	476	0	0	0	0.0%
B	16	0	0	0	0.0%	16	0	0	0	0.0%

For phenotypic analysis, reduced inhibition, RI, was defined as 10 to 100-fold above normal inhibition and highly reduced inhibition, HRI as >100-fold above normal inhibition for influenza A viruses, and 5 to 50-fold and >50-fold for influenza B viruses, respectively. For genotypic analysis, the summary table of neuraminidase amino acid substitutions associated with RI by neuraminidase inhibitors published by WHO was used (http://www.who.int/influenza/gisrs_laboratory/antiviral_susceptibility/nai_overview/en/).

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Maps and commentary do not represent a statement on the legal or border status of the countries and territories shown.

All data are up to date on the day of publication. Past this date, however, published data should not be used for longitudinal comparisons, as countries retrospectively update their databases.

The WHO Regional Office for Europe is responsible for the accuracy of the Russian translation.

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