

Summary

Week 16/2019 (15–21 April 2019)

- Of 43 countries reporting on geographic spread, only 4 reported widespread activity. Specimens collected from individuals presenting with ILI or ARI to sentinel primary health care sites yielded an influenza virus positivity rate of 17%, a further decrease for the sixth week in a row. The majority of influenza positive viruses was reported by a few countries.
- For week 16/2019, all countries reporting ILI or ARI thresholds reported activity below baseline levels, indicating that the influenza season is nearing its conclusion.
- Influenza type A viruses dominated with more A(H3N2) than A(H1N1)pdm09 viruses being detected among sentinel and non-sentinel source specimens. Very few influenza B viruses were detected.
- Of the subset of specimens from patients with severe acute respiratory infection (SARI) collected in week 16/2019 that were tested for influenza viruses, 6% were positive and almost all viruses detected were type A.
- Pooled data from 23 Member States and areas reporting to the [EuroMOMO](#) project indicated that all-cause mortality remained at levels expected for this time of year.

2018–2019 season overview

- Influenza activity in the European Region, based on sentinel sampling, reached a positivity rate of 10% in week 49/2018, exceeded 50% between weeks 3/2019 and 7/2019, and peaked in week 5/2019.
- Both influenza A virus subtypes have circulated, with co-circulation in some countries, while others reported dominance of either A(H1N1)pdm09 or A(H3N2) viruses.
- Among hospitalized influenza virus-infected patients admitted to ICU wards, 99% were infected with type A viruses, and of those subtyped, 67% were A(H1N1)pdm09. Among influenza virus-infected patients admitted to other wards, 99% were infected with type A viruses, with 56% of those subtyped being A(H1N1)pdm09.
- Of the patient specimens from SARI surveillance that tested positive for influenza virus, 99% were type A viruses, with 79% of those subtyped being A(H1N1)pdm09.
- A summary of regional activity from October 2018 to February 2019 was published in *Eurosurveillance* and can be found [here](#).

- Current influenza vaccines tend to work better against influenza A(H1N1)pdm09 and influenza B viruses than against influenza A(H3N2) viruses. For more detail, see the [Vaccine effectiveness](#) section.
- WHO has published [recommendations](#) for the composition of influenza vaccines to be used in the 2019–2020 northern hemisphere season. The recommendation was that both type B lineage viruses remain unchanged, while the A(H1N1)pdm09 and A(H3N2) viruses were updated.
- The vast majority of circulating viruses in the European Region were susceptible to neuraminidase inhibitors supporting use of antiviral treatment according to national guidelines.

Primary care data

Syndromic surveillance data

For week 16/2019, of the 32 Member States reporting influenza-like illness (ILI) thresholds, none reported ILI activity above baseline levels.

Of the 18 Member States reporting acute respiratory infection (ARI) thresholds, none reported activity above baseline levels.

Influenza activity

For week 16/2019, of 43 Member States and areas reporting on intensity, 18 reported baseline and 25 reported low intensity. (Fig. 1).

Of 43 Member States and areas reporting on geographic spread, 6 reported no activity, 24 reported sporadic, 5 reported local, 4 reported regional and 4 reported widespread activity (Fig. 2).

Fig. 1. Intensity in the European Region, week 16/2019

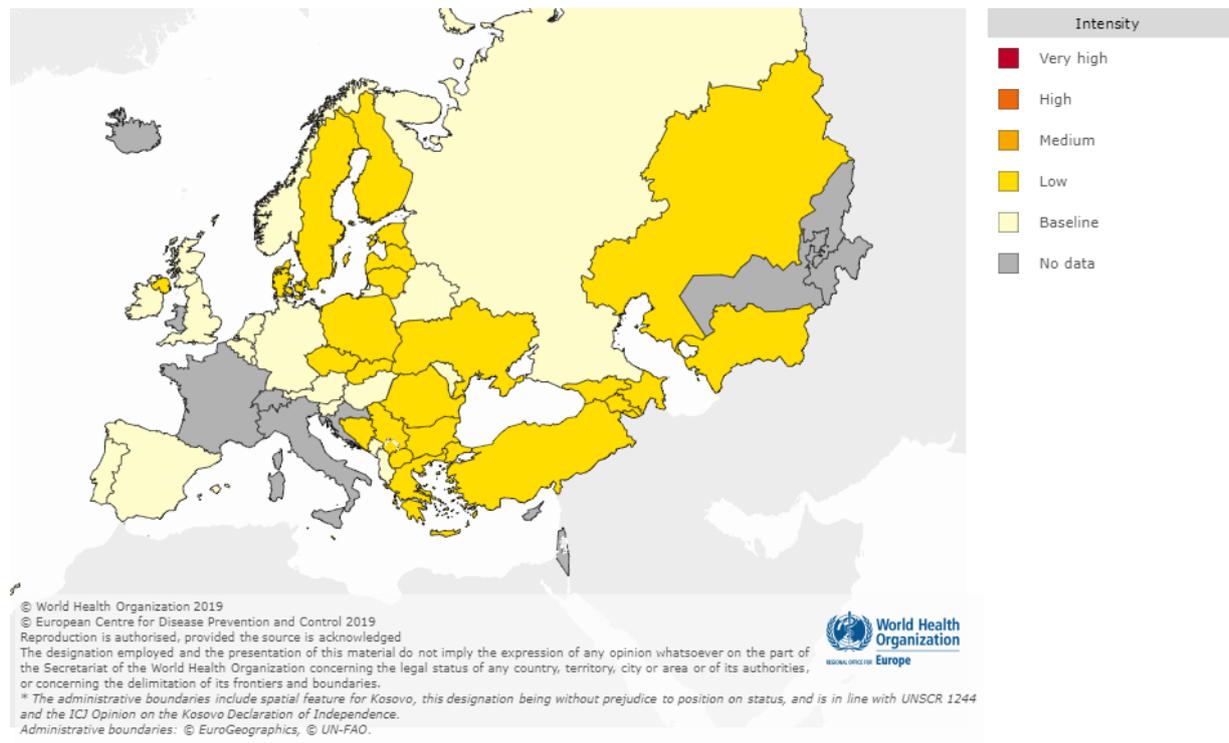
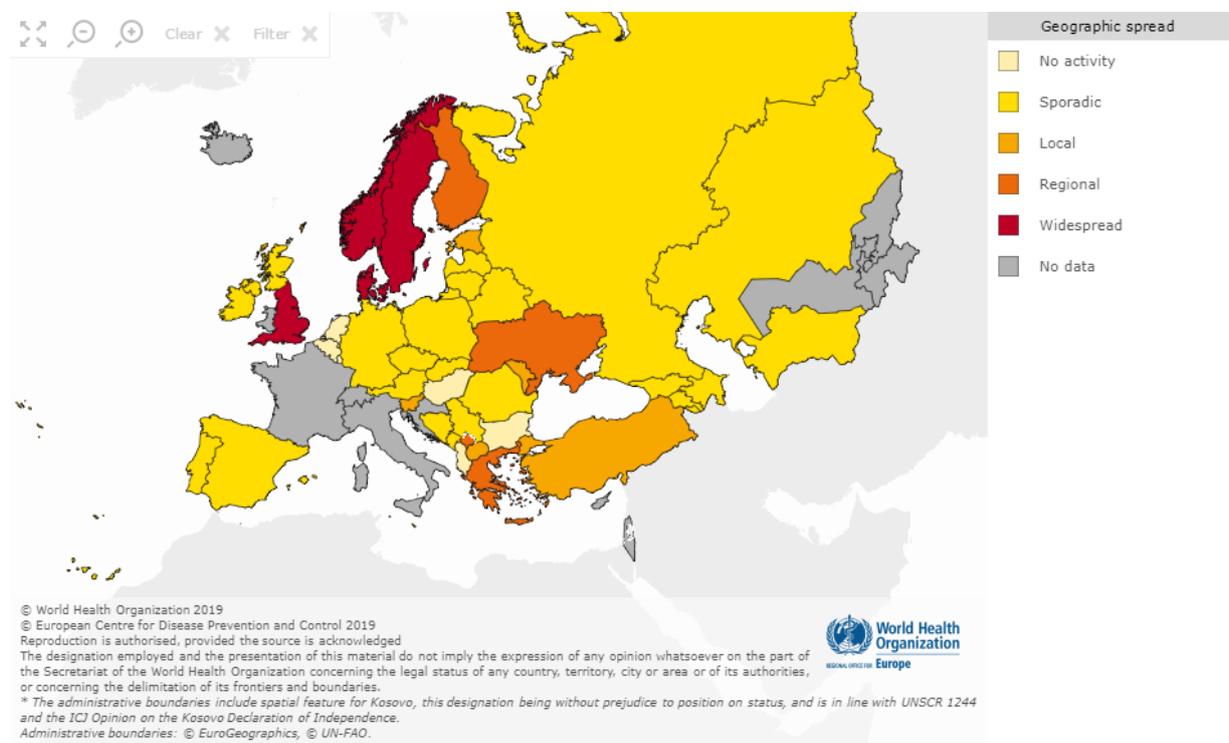


Fig. 2. Geographic spread in the European Region, week 16/2019



For interactive maps of influenza intensity and geographic spread, see the [Flu News Europe website](#).

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

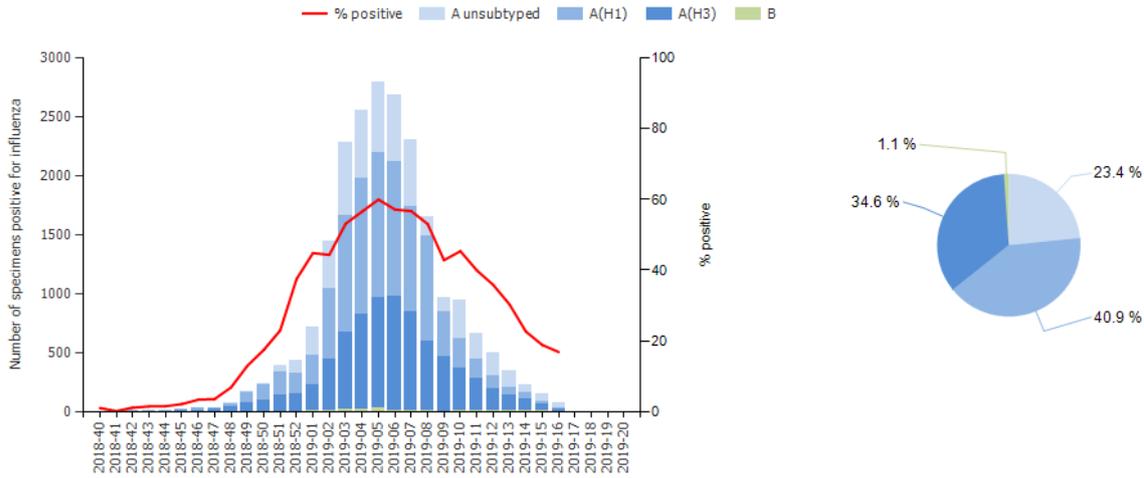
For week 16/2019, 72 (17%) of 429 sentinel specimens tested positive for an influenza virus; all were type A. Of 31 subtyped A viruses, 19% were A(H1N1)pdm09 and 81% A(H3N2) (Fig. 3 and Table 1). However, 51 of the 72 influenza positive specimens were reported from a single country; data from all other Member States indicate a percent positivity of 6.6%.

Of 8 Member States or areas across the region that each tested at least 10 sentinel specimens in week 16/2019, 3 reported a rate of influenza virus detections above 10% and the vast majority of influenza positive detections came from these 3 countries.

For the season to date, almost all viruses detected were influenza type A (99%) with type B accounting for only 1% of detections. Of subtyped A viruses, 54% were A(H1N1)pdm09 and 46% were A(H3N2). Of 62 influenza type B viruses ascribed to a lineage, 84% were B/Yamagata (74% of type B viruses were reported without a lineage) (Fig. 3 and Table 1).

Details of the distribution of viruses detected in non-sentinel-source specimens can be found in the [Virus characteristics](#) section.

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



^a Pie chart shows cumulative data for this period.

Table 1. Influenza virus detections in sentinel-source specimens by type and subtype, week 16/2019 and cumulatively

Virus type and subtype	Current Week		Season 2018–2019	
	Number	% ^a	Number	% ^a
Influenza A	72	100.0	21 490	98.9
A(H1N1)pdm09	6	19.4	8 882	54.1
A(H3N2)	25	80.6	7 525	45.9
A not subtyped	41	-	5 083	-
Influenza B	0	0	237	1.1
B/Victoria lineage	0	-	10	16.1
B/Yamagata lineage	0	-	52	83.9
Unknown lineage	0	-	175	-
Total detections (total tested)	72 (429)	16.8	21 727 (53 402)	40.7

^aFor 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

A subset of Member States and areas monitors severe disease related to influenza virus infection by surveillance of 1) hospitalized laboratory-confirmed influenza cases in ICUs (12 Member States or areas), or other wards (8 Member States or areas), or 2) severe acute respiratory infection (SARI; 17 Member States or areas).

1.1) Hospitalized laboratory-confirmed influenza cases – ICUs

Of the laboratory-confirmed influenza cases reported in ICUs for week 16/2019 (n=32), almost all were influenza type A viruses (n=31, 97%), with only one influenza type B virus detected.

Since week 40/2018, almost all viruses detected were influenza type A (n=7 144, 99%). Only 1% were type B (n=58). Of 3 192 subtyped influenza A viruses, 67% were A(H1N1)pdm09 and 33% were A(H3N2). No influenza B viruses were ascribed to a lineage. Of 4 018 cases with known age, 47% were 65 years and older and 45% were 15-64 years old.

1.2) Hospitalized laboratory-confirmed influenza cases – other wards

Among laboratory-confirmed influenza cases reported in wards other than ICUs for week 16/2019 (n=30), almost all were influenza type A viruses (n=29, 97%) with only 1 type B virus reported.

Since week 40/2018, almost all viruses detected have been influenza type A (n=9 643, 99%). Only 1% were type B (n=68). Of 3 844 subtyped influenza A viruses, 56% were A(H1N1)pdm09 and 44% were A(H3N2). Of 2 influenza B viruses ascribed to a lineage, 1 was B/Yamagata and 1 was B/Victoria. Of 9 711 cases with known age, 46% were 65 years and older and 32% were 15-64 years old.

2. SARI surveillance

For week 16/2019, 946 SARI cases were reported by 13 Member States or areas. Of these cases, 161 specimens were tested for influenza viruses and 9 (6%) tested positive. Of these, influenza type A viruses (n=7: 78%) were detected more frequently than influenza type B viruses (n=2: 22%).

Of 39 080 SARI cases reported since week 40/2018, 38 985 had a recorded age and, of these, 57% were 0-4 years old and 24% were 15-64 years old. For SARI cases testing positive for influenza virus since week 40/2018 (n=2 818), type A viruses have been predominating (99%). Of the 2 524 influenza type A infected cases for which subtyping was performed, 79% were infected by A(H1N1)pdm09 viruses and 21% were infected by A(H3N2) viruses. 1 type B virus ascribed to a lineage was B/Yamagata.

Mortality monitoring

For week 16/2019, the [EuroMOMO](#) project received data from 23 countries or areas that were included in pooled analyses. The pooled estimates indicated that all-cause mortality was within expected ranges.

Virus characteristics

Details of the distribution of viruses detected in sentinel-source specimens can be found in the [Primary care data](#) section.

Viruses detected in non-sentinel source specimens

For week 16/2019, 1 284 specimens from non-sentinel sources (such as hospitals, schools, primary care facilities not involved in sentinel surveillance, or nursing homes and other institutions) tested positive for an influenza virus; 97% were type A and 3% were type B. Of 272 A viruses subtyped, 32% were A(H1N1)pdm09 and 68% were A(H3N2) (Table 2).

For the season to date, the vast majority of detected viruses have been influenza type A (99%). Of A viruses subtyped, 59% were A(H1N1)pdm09 and 41% were A(H3N2). Of 50 influenza type B viruses ascribed to a lineage, 48% were B/Yamagata (97% of type B viruses were reported without a lineage) (Table 2).

Table 2. Influenza virus detections in non-sentinel source specimens by type and subtype, week 16/2019 and cumulatively

Virus type and subtype	Current Week		Season 2018–2019	
	Number	% ^a	Number	% ^a
Influenza A	1 242	96.7	178 292	99.1
A(H1N1)pdm09	88	32.4	34 940	58.7
A(H3N2)	184	67.6	24 552	41.3
A not subtyped	970	-	118 800	-
Influenza B	42	3.3	1 676	0.9
B/Victoria lineage	0	-	26	52.0
B/Yamagata lineage	0	-	24	48.0
Unknown lineage	42	-	1 626	-
Total detections (total tested)	1 284 (10 526)	-	179 968 (748 787)	-

^a For 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 and antigenic characterization

Genetic characterization of influenza viruses is routinely performed to understand how similar currently circulating influenza viruses are to the viruses used in influenza vaccines for an ongoing season.

Since week 40/2018, genetic characterizations of 3 525 viruses have been reported by the network laboratories.

Of the genetically characterized viruses, 1 732 were A(H1)pdm09 viruses belonging to the A/Michigan/45/2015 (6B.1) clade with a further 3 attributed to a subgroup not listed; 1 743 were A(H3) viruses, with 1 145 belonging to the A/Alsace/1746/2018 (3C.2a1b) subgroup, 66 to the A/Switzerland/8060/2017 (3C.2a2) subclade, 32 to the A/Cote d'Ivoire/544/2016 (3C.2a3) subclade, 57 to the A/Singapore-16-0019/2016 (3C.2a1) subclade, 9 to the A/Greece/4/2017 (3C.2a1a), 4 to the A/Hong Kong/4801/2014 (3C.2a) clade, 423 to the A/England/538/2018 (3C.3a) clade and 7 attributed to a subgroup not listed.

Of the 47 genetically characterized influenza B viruses, 24 were B/Yamagata viruses belonging to the B/Phuket/3073/2013 clade (clade 3). All 23 B/Victoria viruses characterized belonged to clade 1A (represented by B/Brisbane/60/2008); but of these, 5 fell in a subclade with a two amino acid deletion in HA (1A.Δ2; represented by B/Colorado/06/2017) and 13 fell in a subclade with a three amino acid deletion in HA (1A.Δ3; represented by B/Hong Kong/269/2017) (Table 3).

Table 3. Viruses attributed to genetic groups, cumulative for weeks 40/2018–16/2019

Phylogenetic group	Number of viruses
A(H1)pdm09 group 6B.1 representative A/Michigan/45/2015 ^a	1 732
A(H1)pdm09 attributed to recognised group in the guidance but not listed here	3
A(H3) clade 3C.2a1b representative A/Alsace/1746/2018 subgroup	1 145
A(H3) clade 3C.2a2 representative A/Switzerland/8060/2017 subgroup ^b	66
A(H3) clade 3C.2a3 representative A/Cote d'Ivoire/544/2016 subgroup	32
A(H3) clade 3C.3a representative A/England/538/2018 subgroup	423
A(H3) clade 3c.2a1 representative A/Singapore/INFIMH-16-0019/2016 subgroup ^d	57
A(H3) clade 3c.2a representative A/Hong Kong/4801/2014 subgroup	4
A(H3) attributed to recognized group in current guidance but not listed here	7
A(H3) clade 3C.2a1a representative A/Greece/4/2017 subgroup	9
B(Vic)-lineage clade 1A representative B/Brisbane/60/2008	5
B(Vic)-lineage clade 1A representative B/Colorado/06/2017 ^a	5
B(Vic)-lineage clade 1A representative B/Hong Kong/269/2017	13
B(Yam)-lineage clade representative B/Phuket/3073/2013 ^c	24

^a Vaccine component for 2018–2019 northern hemisphere and 2019 southern hemisphere seasons.

^b Vaccine component for 2019 southern hemisphere season.

^c Vaccine component of quadrivalent vaccines for use in 2018–2019 northern hemisphere and 2019 southern hemisphere seasons.

^d Vaccine component for 2018-2019 northern hemisphere season

A [report](#) detailing influenza virus characterization data conducted in March 2019 by the WHO Collaborating Centre, London (the Francis Crick Institute), on influenza positive specimens received from EU/EEA countries was published by the European Centre for Disease Prevention and Control. A summary is given below.

A(H1N1)pdm09 viruses

The great majority (103/105) of A(H1N1)pdm09 viruses characterized were antigenically similar to the vaccine virus for use in the 2018–2019 northern hemisphere (A/Michigan/45/2015, clade 6B.1) and fell in subclade 6B.1A. Within this subclade, there has been increasing genetic diversity of the HA genes with several emerging genetic subgroups. Of the 304 test viruses characterized genetically, 273 carried the HA1 amino acid substitution of S183P.

A(H3N2) viruses

Antigenic characterization of A(H3N2) viruses remains technically difficult. Since the previous report published in February 2019, only 46 A(H3N2) viruses have had a sufficient HA titre to allow antigenic characterization by haemagglutination inhibition (HI) assay. By HI assay, all viruses belonging to subgroups within clades 3C.2a and 3C.3a were poorly recognized by antisera raised against egg-propagated A/Singapore/INFIMH-16-0019/2016, the current vaccine virus.

B/Victoria viruses

Only 1 B/Victoria lineage virus has been tested by HI since the February 2019 report. This virus was antigenically similar to a virus of Asian origin with a three amino acid deletion in HA1 (Δ 162-164, 1A. Δ 3).

B/Yamagata viruses

Only 3 B/Yamagata lineage viruses have been characterized antigenically since the February report. All 3 had HA genes that fell into clade 3 and encoded 2 HAI amino acid substitutions not present in the virus recommended for inclusion in quadrivalent vaccines for the current and subsequent northern hemisphere influenza seasons, B/Phuket/3073/2013. However, all 3 remained antigenically similar to the vaccine virus.

Vaccine composition

The recommended composition of the trivalent influenza vaccine for the current northern hemisphere 2018–2019 season included an A/Michigan/45/2015 (H1N1)pdm09-like virus, an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus and a B/Colorado/06/2017-like virus (B/Victoria lineage). For quadrivalent vaccines, a B/Phuket/3073/2013-like virus (B/Yamagata lineage) was recommended. The full report can be found [here](#).

On 21 February 2019, WHO published recommendations for the components of influenza vaccines for use in the 2019–2020 northern hemisphere influenza season, and on 21 March it was finalized. Vaccines should 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 of the B/Victoria/2/87-lineage.

The full report and “Frequently Asked Questions” are available for the 21 February decision and the 21 March addendum on the [WHO website](#).

Vaccine effectiveness

Current influenza vaccines tend to work better against influenza A(H1N1)pdm09 and influenza B viruses than against influenza A(H3N2) viruses. Preliminary vaccine effectiveness estimates continue to support the use of vaccines. Early data suggest that vaccines are moderately effective, with estimates varying depending on the population studied and the proportions of circulating influenza A virus subtypes. See data from [a European study \(6 countries\)](#), [Canada](#), [Finland](#), [Hong Kong \(China\)](#), [Sweden](#), and the [United States of America](#).

Antiviral susceptibility testing

Neuraminidase inhibitor susceptibility was assessed for 2 321 viruses with collection dates since week 40/2018 [1 395 A(H1N1)pdm09, 896 A(H3N2), and 30 type B]. 8 A(H1N1)pdm09 viruses carried amino acid substitution H275Y in NA indicative of highly reduced inhibition (HRI) by oseltamivir and 3 of them were confirmed by phenotypic testing. 1 type B virus showed evidence of RI by oseltamivir and zanamivir.

This weekly update was prepared by an editorial team at the European Centre for Disease Prevention and Control (Cornelia Adlhoch, Angeliki Melidou, Pasi Penttinen, Phillip Zucs and Emmanuel Robesyn) and the WHO Regional Office for Europe (Caroline Brown, Sonja Olsen, Dmitriy Pereyaslov, Hannah Segaloff and Tamara Meerhoff, Temporary Advisor to WHO). It was reviewed by country experts (Iris Hasibra [Hatibi], Institute of Public Health, Albania; Joan O'Donnell, Health Protection Surveillance Centre, Ireland) and by experts from the network (Adam Meijer, National Institute for Public Health and the Environment (RIVM), the Netherlands; Rod Daniels and John McCauley, WHO Collaborating Centre for Reference and Research on Influenza, Francis Crick Institute, United Kingdom).

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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