

Summary

Week 48/2022 (28 November – 4 December 2022)

- The percentage of all sentinel primary care specimens from patients presenting with ILI or ARI symptoms that tested positive for an influenza virus remained above the epidemic threshold (10%) and increased to 20% from 15% in the previous week.
- Influenza activity is increasing across the Region with 14 countries reporting regional or widespread activity with medium to very-high intensity.
- Germany, Greece, Kyrgyzstan, Uzbekistan, and Italy reported seasonal influenza activity above 40% positivity in sentinel primary care.
- Both influenza type A and type B viruses were detected with A(H3) viruses being dominant in sentinel and, for the first time this season, A(H1)pdm09 viruses were dominant in non-sentinel surveillance systems.
- Hospitalized patients with confirmed influenza virus infection were reported from ICU wards, other wards and SARI surveillance. Infections with type B viruses were reported from countries in the eastern part of the Region while mainly A(H3) detections were reported in the western part of the Region and EU/EEA countries but with increasing numbers of A(H1)pdm09 virus detections. When comparing the different influenza type distributions by system, it is important to consider that different sets of countries report to each system.

2022-2023 season overview

- The seasonal epidemic activity threshold of 10% positivity in sentinel specimens was first crossed in week 45/2022.
- Influenza activity continues to increase across the Region with an earlier seasonal activity than in pre-COVID-19-pandemic seasons.
- Countries are experiencing a mixed virus situation with mainly type B virus circulation in the eastern part of the Region while A(H3) virus circulation dominates in the western part of the Region and in EU/EEA countries.
- Overall, influenza A(H3) viruses have dominated across most surveillance systems with recent increase and dominance of A(H1)pdm09 viruses in non-sentinel specimens.

Other news

- RSV is another respiratory virus that causes acute disease, often severe, mainly amongst young infants and the elderly. High levels of RSV have been circulating across the Region since week 40/2022, but overall positivity amongst patients in

primary care with acute respiratory illness decreased to 11.6% in week 48/2022, from 16% in week 47/2022.

For more information about the SARS-CoV-2 situation in the WHO European Region visit:

WHO website: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

ECDC website: <https://www.ecdc.europa.eu/en/novel-coronavirus-china>

Qualitative indicators

For week 48/2022, of 39 countries and areas reporting on intensity of influenza activity, 11 reported baseline-intensity (across the Region), 16 reported low-intensity (across the Region), 9 reported medium-intensity (across the Region), 2 reported high-intensity (Austria and Malta) and 1 reported very high-intensity (Russian Federation) (Fig. 1).

Of 39 countries and areas reporting on geographic spread of influenza viruses, 3 reported no activity (Azerbaijan, Bulgaria and Kosovo (in accordance with UN Security Council Resolution 1244 (1999))), 16 reported sporadic spread (across the Region), 6 reported local spread (Belarus, Georgia, Ireland, Lithuania, Malta and United Kingdom (Northern Ireland)), 4 reported regional spread (Kyrgyzstan, Norway, Republic of Moldova and Sweden) and 10 reported widespread activity (eastern, northern and western areas) (Fig. 2).

Figure 1. Intensity of influenza activity in the European Region, week 48/2022

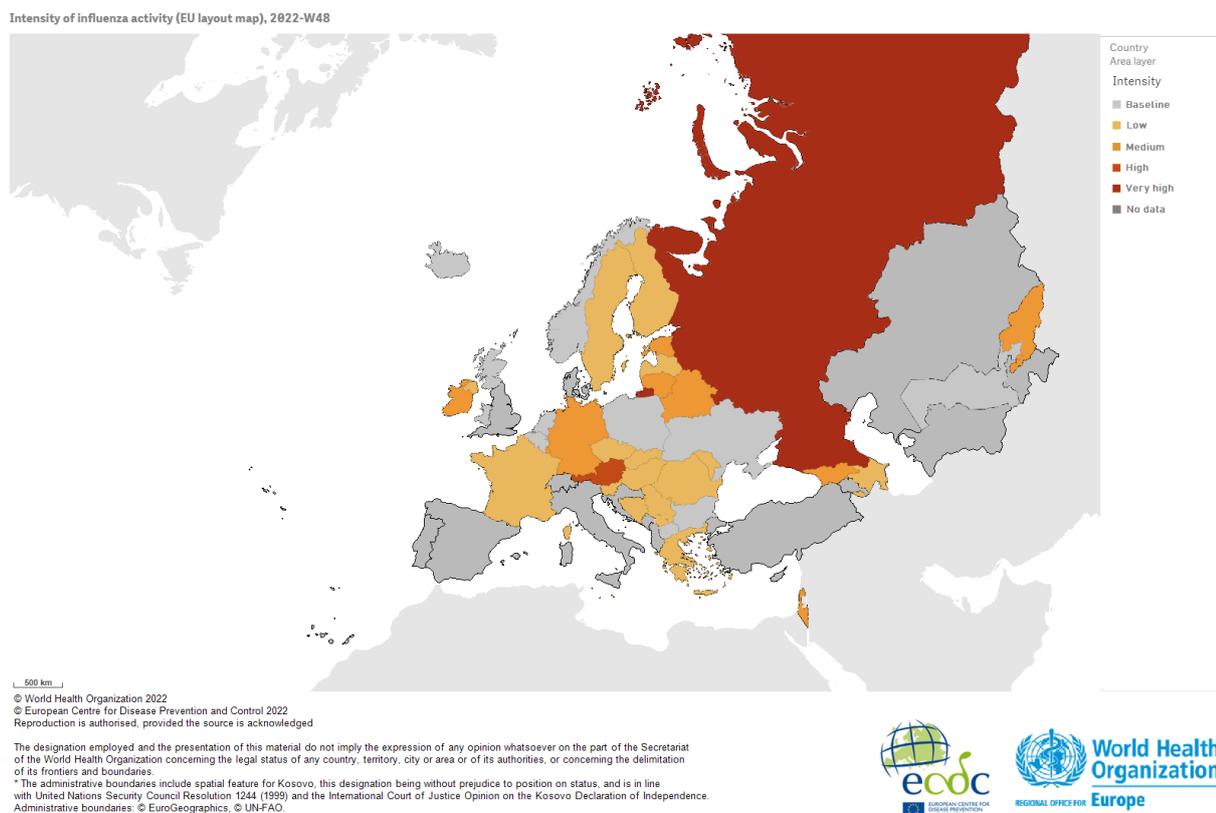
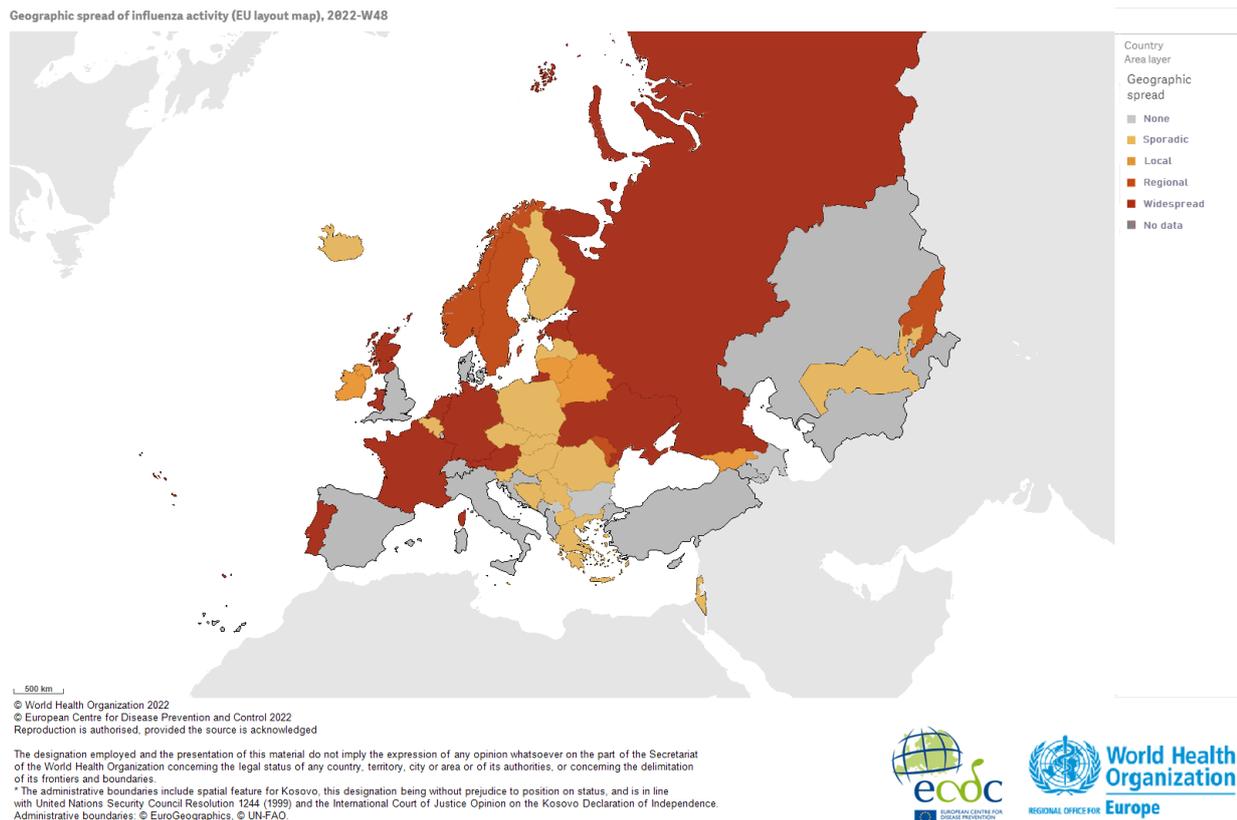


Figure 2. Geographic spread of influenza viruses in the European Region, week 48/2022



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

Please note:

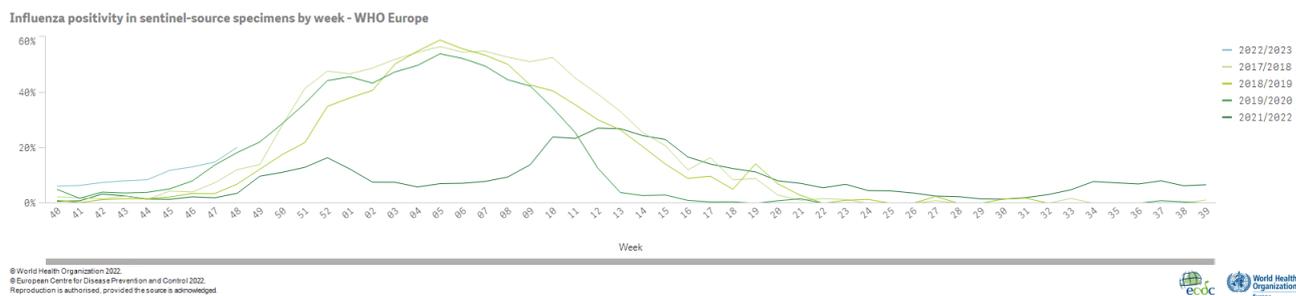
Assessment of the intensity of activity indicator includes consideration of ILI or ARI rates. These ILI or ARI rates might be driven by respiratory infections caused by viruses other than influenza, including SARS-CoV-2 and RSV, leading to observed increases in the absence of influenza virus detections.

Assessment of intensity and geographic spread indicators includes consideration of sentinel and non-sentinel influenza virus detection data. Non-sentinel influenza virus detections, often higher, might translate into reporting of elevated geographic spread even in the absence of sentinel detections.

Influenza positivity

For the European Region, influenza virus positivity in sentinel primary care specimens increased from 15% in the previous week to 20% in week 48/2022. Seasonal activity above the epidemic threshold, which is set at 10%, started in week 45/2022. This is an earlier influenza epidemic start than in the four previous seasons: ranging from week 47 (2019/20 season) to 49 (2021/22 season) (Fig. 3).

Figure 3. Influenza virus positivity in sentinel-source specimens by week, WHO European Region, 2022/2023 and 4 recent seasons



External data sources

Mortality monitoring:

EuroMOMO estimates of all-cause mortality for the participating European countries, the full report can be found here: <https://www.euromomo.eu/>

Please refer to the EuroMOMO website for a cautionary note relating to interpretation of these data.

Primary care data

Syndromic surveillance data

Of the countries and areas in which thresholds for ILI activity are defined, countries in eastern (n=4; Azerbaijan, Georgia, Kyrgyzstan and Russian Federation), northern (n=4; Estonia, Ireland, Latvia and Lithuania), southern (n=3; Greece, Israel and Serbia) and western (n=6; Austria, Belgium, Hungary, Luxembourg, Poland and Switzerland) areas of the European Region reported activity above baseline levels.

Of the countries and areas in which thresholds for ARI activity are defined, countries in eastern (n=4; Belarus, Kyrgyzstan, Russian Federation and Uzbekistan), northern (n=3; Estonia, Latvia and Lithuania), southern (n=1; Bulgaria) and western (n=2; Czechia and Slovakia) areas of the European Region reported activity above baseline levels.

Please note:

Assessment of the syndromic surveillance data of ILI or ARI rates might be driven by respiratory infections with viruses other than influenza, including SARS-CoV-2 and RSV, leading to observed increases in the absence of influenza virus detections. The thresholds mentioned are related to the Moving Epidemic Method (MEM) method and based on historic ILI/ARI data.

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

For week 48/2022, 705 (20%) of 3 490 sentinel specimens tested positive for an influenza virus; 93% were type A and 7% were type B. Of 575 subtyped A viruses, 92.5% were A(H3) and 7.5% A(H1)pdm09. All 12 type B viruses ascribed to a lineage were B/Victoria (Fig. 4 and Table 1).

Of 27 countries and areas across the Region that each tested at least 10 sentinel specimens in week 48/2022, 16 reported positivity rates of influenza virus detections above 10% (median 25%; range 11% - 50%): Germany (50%), Greece (46%), Kyrgyzstan (46%), Uzbekistan (44%), Italy (40%), Slovakia (37%), France (26%), Estonia (26%),

Poland (25%), Belgium (22%), Republic of Moldova (18%), Spain (18%), Netherlands (17%), Luxembourg (15%), Czechia (11%) and Ukraine (11%).

For the season to date, 3 030 (12%) of 25 886 sentinel specimens tested positive for an influenza virus. More influenza type A (n=2 739, 90%) than type B (n=291, 10%) viruses have been detected. Of 2 411 subtyped A viruses, 2 112 (88%) were A(H3) and 328 (12%) were A(H1)pdm09. All 128 influenza type B viruses ascribed to a lineage were B/Victoria (56% of type B viruses were reported without a lineage) (Fig. 4 and Table 1).

Details of the distribution of viruses detected in non-sentinel-source specimens are presented in the **virus characteristics** section.

Figure 4. Influenza virus positivity and detections by type, subtype/lineage – sentinel sources, WHO European Region, season 2022/2023

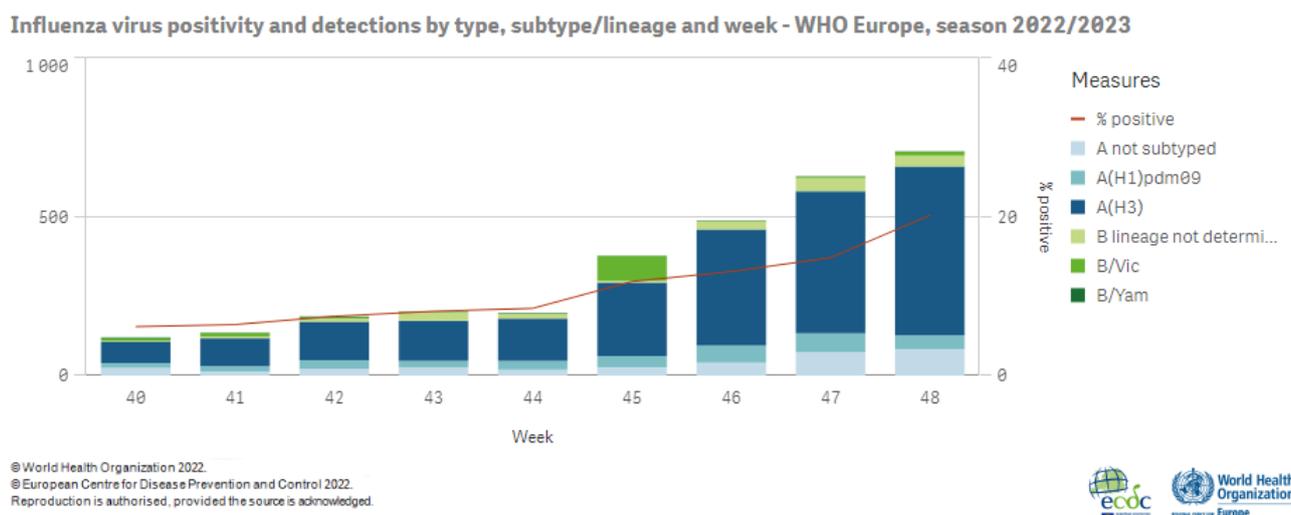


Table 1. Influenza virus detections in sentinel source specimens by type and subtype for week 48/2022 and cumulatively for the season

Sentinel Virus type and subtype	Current Week (48)		Season 2022-2023	
	Number	% ^a	Number	% ^a
Influenza A	659	93	2 739	90
A(H1)pdm09	43	7.5	299	12.4
A(H3)	532	92.5	2 112	87.6
A not subtyped	84	-	328	-
Influenza B	46	7	291	10
B/Victoria lineage	12	100	128	100
B/Yamagata lineage	0	-	0	0
Unknown lineage	34	-	163	-
Total detections (total tested)	705 (3 490)	20	3 030 (25 886)	12

^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.

External data sources

InfluenzaNet collects weekly data on symptoms in the general community from different participating countries across the EU/EEA. Please refer to the website for additional information for week 48/2022.

Hospital surveillance

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, or other wards, or 2) severe acute respiratory infections (SARI).

Laboratory-confirmed hospitalized cases

1.1) Hospitalized laboratory-confirmed influenza cases - Intensive care units (ICUs)

For week 48/2022, 3 laboratory-confirmed influenza cases were reported from ICU wards (in Czechia and Sweden). Only influenza A viruses (n=3) were detected. One was subtyped as A(H3) (Fig. 5 and 6).

Since week 40/2022, more influenza type A (n=87, 91%) than type B (n=9, 9%) viruses were detected (from Czechia, Ireland, Sweden and United Kingdom (England; from week 40 through week 42 only)). Of 11 subtyped influenza A viruses, 6 were A(H1)pdm09 and 5 were A(H3). No influenza B viruses were ascribed to a lineage. Of 23 cases with known age, 11 were 65 years and older, 9 were 15-64 years old, 2 were 0-4 years old and 1 was 5-14 years old.

Figure 5. Number of laboratory-confirmed hospitalized influenza cases in intensive care units (ICU) by week of reporting, WHO European Region, season 2022/2023

*one country did not report after week 42

Number of laboratory-confirmed hospitalized cases in intensive care units by week of reporting - WHO Europe, season 2022/2023

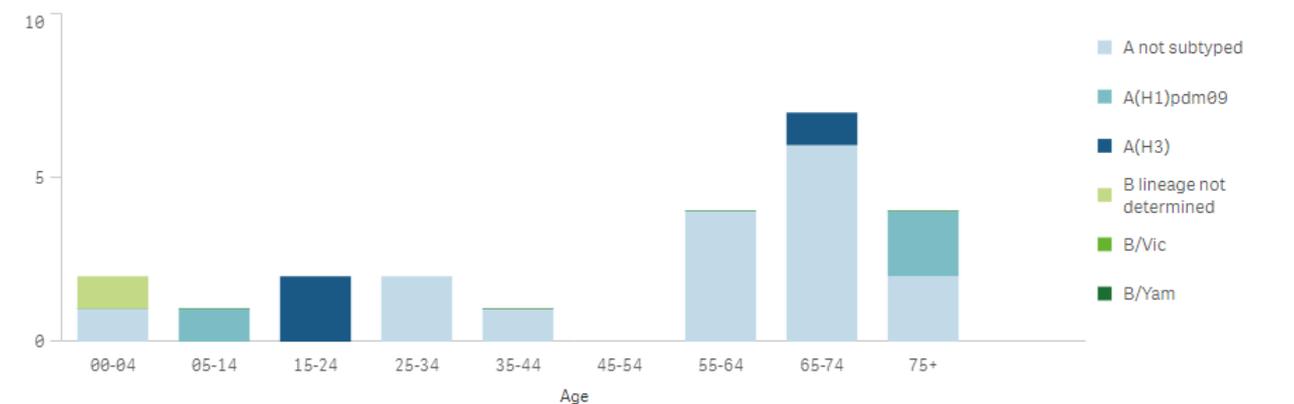


© World Health Organization 2022
© European Centre for Disease Prevention and Control 2022.
Reproduction is authorised, provided the source is acknowledged.



Figure 6. Distribution of influenza virus types, subtypes/lineages by age group in intensive care units (ICU), WHO European Region, season 2022/2023

Distribution of virus types, subtypes/lineages by age group in intensive care units (ICU) - WHO Europe, season 2022/2023



© World Health Organization 2022.
 © European Centre for Disease Prevention and Control 2022.
 Reproduction is authorised, provided the source is acknowledged.



1.2) Hospitalized laboratory-confirmed influenza cases – other wards

For week 48/2022, 54 laboratory-confirmed influenza cases were reported from other wards (in Czechia and Ireland). Influenza type A viruses (98%) were detected more frequently than influenza type B viruses (2%). Only one influenza type A virus was assigned to a subtype, and it was A(H3) (Fig. 7 and 8).

Since week 40/2022, 447 influenza type A viruses and 22 influenza type B viruses were detected in Czechia and Ireland. Of 21 subtyped influenza A viruses, 71% (n=15) were A(H1)pdm09 and 29% (n=6) A(H3). The 469 cases with known age fell in 4 age groups: 166 were 65 years and older, 158 were 15-64 years old, 75 were 5-14 years old and 70 were 0-4 years old.

Figure 7. Number of laboratory-confirmed hospitalized influenza cases in wards other than intensive care units (non-ICU) by week of reporting, WHO European Region, season 2022/2023

Number of laboratory-confirmed hospitalized cases in wards other than intensive care units (non-ICU) by week of reporting - WHO Europe, season 2022/2023

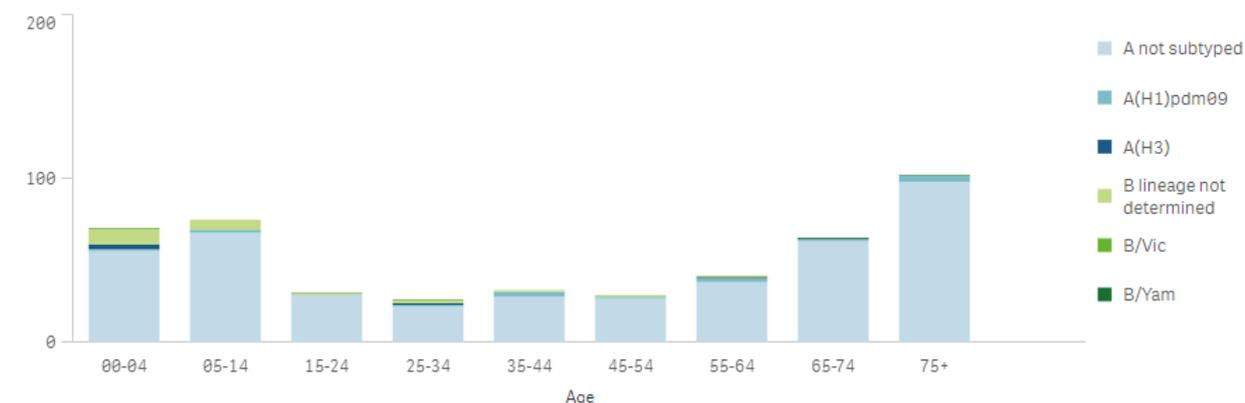


© World Health Organization 2022.
 © European Centre for Disease Prevention and Control 2022.
 Reproduction is authorised, provided the source is acknowledged.



Figure 8. Distribution of influenza virus types, subtypes/lineages by age group in wards other than intensive care units (non-ICU), WHO European Region, season 2022/2023

Distribution of virus types, subtypes/lineages by age group in wards other than intensive care units (non-ICU) - WHO Europe...



© World Health Organization 2022.
 © European Centre for Disease Prevention and Control 2022.
 Reproduction is authorised, provided the source is acknowledged.



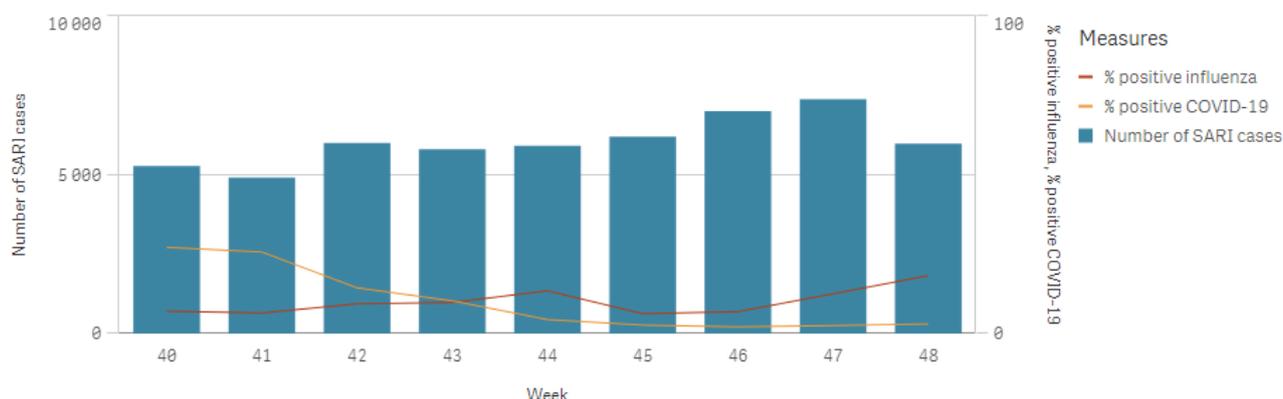
Severe acute respiratory infection (SARI)-based hospital surveillance

For week 48/2022, 4 480 SARI cases were reported by 17 countries or areas (Belarus, Belgium, Bosnia and Herzegovina, Georgia, Germany, Ireland, Kyrgyzstan, Lithuania, Malta, Republic of Moldova, Romania, Russian Federation, Serbia, Spain, Ukraine, Uzbekistan and Kosovo (in accordance with Security Council resolution 1244 (1999))). Of 362 specimens tested for influenza viruses, 18% (n=66) were positive (Fig. 9). Of these, influenza type A viruses (n=46, 70%) were detected more frequently than influenza type B viruses (n=20, 30%) with mainly A(H1)pdm09 and B viruses being reported from countries in the eastern part of the Region. The highest positivity rates for influenza virus detections were reported by Kyrgyzstan (28%), Uzbekistan (20%), Malta (19%), Russian Federation (16%) and Ukraine (12%).

For the season, 41 761 SARI cases were reported by 24 countries or areas (Albania, Armenia, Belarus, Belgium, Bosnia and Herzegovina, Croatia, Georgia, Germany, Ireland, Kazakhstan, Kyrgyzstan, Lithuania, Malta, Montenegro, North Macedonia, Republic of Moldova, Romania, Russian Federation, Serbia, Spain, Türkiye, Ukraine, Uzbekistan and Kosovo (in accordance with Security Council resolution 1244 (1999))). For SARI cases testing positive for influenza virus since week 40/2022, type B viruses have been the most common (n=415; 73%), mainly from countries in the eastern part of the Region. Of the 157 cases infected with influenza A, subtyping was performed for 132 viruses: 89 (67%) were A(H1)pdm09 viruses and 43 (33%) were A(H3) viruses. Of those influenza B viruses ascribed to a lineage (n=143; 73%), all were B/Victoria (Fig. 10).

Figure 9. Number of severe acute respiratory infection (SARI) cases (bar) and positivity for influenza virus and SARS-CoV-2 (line) by week, WHO European Region, season 2022/2023

Number of severe acute respiratory infection (SARI) cases (bar) and positivity for influenza and COVID-19 (line) by week of r...

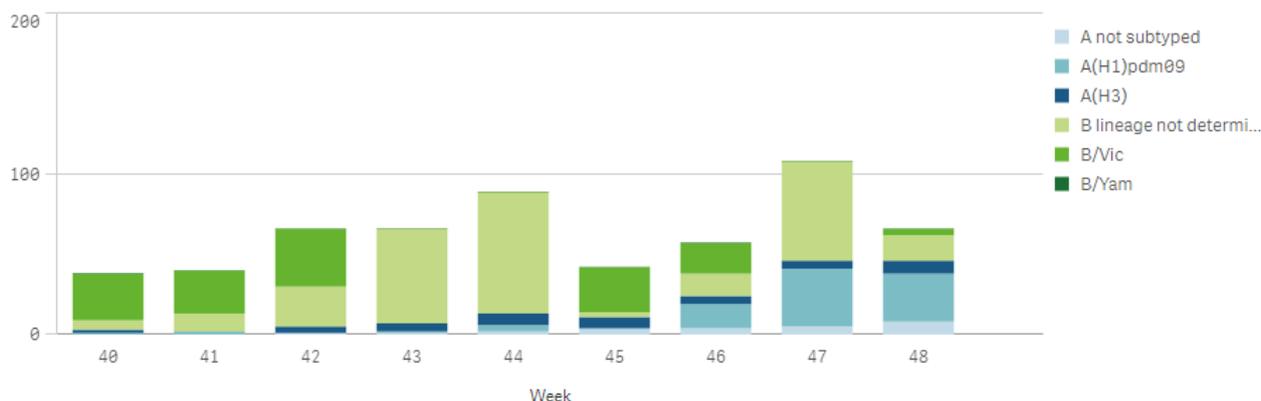


© World Health Organization 2022.
 © European Centre for Disease Prevention and Control 2022.
 Reproduction is authorised, provided the source is acknowledged.



Figure 10. Influenza virus detections by type, subtype/lineage from severe acute respiratory infection (SARI) cases, WHO European Region, season 2022/2023

Influenza detections by virus type, subtype/lineage from severe acute respiratory infection (SARI) surveillance in hospitals - ...



© World Health Organization 2022.
 © European Centre for Disease Prevention and Control 2022.
 Reproduction is authorised, provided the source is acknowledged.



Virus characteristics

Details of the distribution of viruses detected in sentinel-source specimens can be found in the **Primary care data** section.

Non-sentinel virologic data

For week 48/2022, 4 545 of 51 917 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; 4 374 (96%) were type A and 171 (4%) were type B. Of 1 937 subtyped A viruses, 1 271 (66%) were A(H1)pdm09 and 666 (34%) were A(H3). All 7 type B viruses ascribed to a lineage were B/Victoria (Fig. 11 and Table 2).

For the season to date, more influenza type A (n=20 275, 93%) than type B (n=1 432, 7%) viruses have been detected. Of 7 431 subtyped A viruses, 4 208 (57%) were A(H3) and 3 223 (43%) were A(H1)pdm09. All 193 influenza type B viruses ascribed to a lineage

were B/Victoria (89% of type B viruses were reported without a lineage) (Fig. 11 and Table 2).

Figure 11. Influenza detections by type, subtype/lineage and week, non-sentinel sources, WHO European Region, season 2022/2023

Influenza virus detections by type, subtype/lineage and week - WHO Europe, season 2022/2023

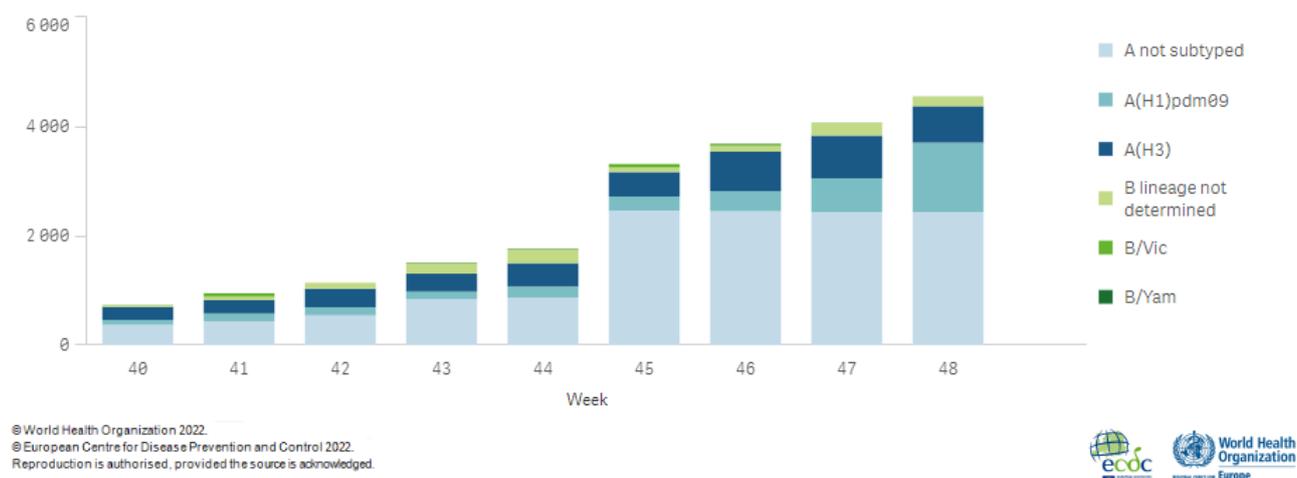


Table 2. Influenza virus detections in non-sentinel-source specimens by type and subtype, week 48/2022 and cumulatively for the season

Non-sentinel Virus type and subtype	Current Week (48)		Season 2022-2023	
	Number	% ^a	Number	% ^a
Influenza A	4 374	96	20 275	93
A(H1)pdm09	1 271	65.6	3 223	43.4
A(H3)	666	34.4	4 208	56.6
A not subtyped	2 437	-	12 844	-
Influenza B	171	4	1 432	7
B/Victoria lineage	7	100	193	100
B/Yamagata lineage	0	0	0	0
Unknown lineage	164	-	1 239	-
Total detections (total tested)	4 545 (51 917)	NA	21 707 (469 885)	NA

^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 characterization

Of the 130 genetically characterized A(H1)pdm09 viruses up to week 48/2022, 129 were attributed to clade 6B.1A.5a.2 of which 80 (62%) were represented by AH1/Norway/25089/2022, 48 (37%) were represented by AH1/Sydney/5/2021 and 1 (1%) was represented by AH1/Victoria/2570/2019., One (1%) was a clade 6B.1A.5a.1 virus represented by AH1/Guangdong-Maonan/SWL1536/2019.

Among the 144 A(H3) viruses characterized up to week 48/2022, 138 were attributed to clade 3C.2a1b.2a.2: 64 represented by AH3/Slovenia/8720/2020, 63 represented by AH3/Bangladesh/4005/2020 and 11 represented by AH3/Darwin/9/2021. 6 viruses were not attributed to a subgroup.

Up to week 48/2022, 28 B/Victoria viruses were characterized, of which 16 (57%) were clade V1A.3a.2 represented by B/Austria/1359417/2021 and 12 (43%) were not attributed to a subgroup.

Table 3. Number of influenza viruses attributed to genetic groups, cumulative for the season, WHO European Region

Number of influenza viruses attributed to genetic groups, cumulative for the season - WHO Europe

Virus Type <input type="text"/>	Virus Subtype <input type="text"/>	Genetic charact... <input type="text"/>	Number of influenza viruses attributed to genetic groups 2022/2023
Total			302
Influenza A			274
A(H1)pdm09			130
A/Guangdong-Maonan/SWL1536/2019(H1N1)pdm09_6B.1A.5a.1			1
A/Norway/25089/2022(H1N1)pdm09_6B.1A.5a.2			80
A/Sydney/5/2021(H1N1)pdm09_6B.1A.5a.2			48
A/Victoria/2570/2019(H1N1)pdm09_6B.1A.5a.2			1
A(H3)			144
A(H3)_SubgroupNotListed *			6
A/Bangladesh/4005/2020(H3)_3C.2a1b.2a.2			63
A/Darwin/9/2021(H3)_3C.2a1b.2a.2			11
A/Slovenia/8720/2022(H3)_3C.2a1b.2a.2			64
Influenza B			28
B/Vic			28
B/Austria/1359417/2021(Victoria lineage_1A.3a.2)			16
BVic_SubgroupNotListed *			12

* No Clade: not attributed to a pre-defined clade and SubgroupNotListed: attributed to recognised group in current guidance but not listed here

© World Health Organization 2022.
© European Centre for Disease Prevention and Control 2022.
Reproduction is authorised, provided the source is acknowledged.



Currently, WHO's October virus characterization report is available and describes available data from circulating viruses for the 2022-2023 influenza season: type A influenza virus circulation dominated over type B, due mainly to A(H3) viruses. Vaccination remains the best protective measure for prevention of influenza.

Previously published influenza virus characterization reports are available on the ECDC website (up to September 2022) and the WHO website.

Antiviral susceptibility testing

Up to week 48/2022, 429 viruses were assessed for susceptibility to neuraminidase inhibitors (137 A(H3), 129 A(H1)pdm09 and 27 B viruses genotypically and 125 A(H3), 8 A(H1)pdm09 and 3 B viruses phenotypically), and 174 viruses were assessed for susceptibility to baloxavir marboxil (95 A(H3), 56 A(H1)pdm09 and 23 B viruses genotypically). Phenotypically and genotypically, no markers associated with reduced susceptibility were identified.

Vaccine

Results from a controlled, randomised trial in UK concluded that concomitant vaccination with one of two SARS-CoV-2 vaccines (ChAdOx1 or BNT162b2) plus an age-appropriate influenza vaccine raised no safety concerns and preserves **antibody responses** to both vaccines. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)02329-1/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02329-1/fulltext)

Available vaccines in Europe <https://www.ecdc.europa.eu/en/seasonal-influenza/prevention-and-control/vaccines/types-of-seasonal-influenza-vaccine>

Vaccine composition

On 25 February 2022, WHO published recommendations for the components of influenza vaccines for use in the 2022-2023 northern hemisphere influenza season:

The WHO recommends that quadrivalent vaccines for use in the 2022-2023 influenza season in the northern hemisphere contain the following:

Egg-based Vaccines

- an A/Victoria/2570/2019 (H1N1)pdm09-like virus;
- an A/Darwin/9/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus; and
- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

Cell culture- or recombinant-based Vaccines

- an A/Wisconsin/588/2019 (H1N1)pdm09-like virus;
- an A/Darwin/6/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus; and
- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

The WHO recommends that trivalent vaccines for use in the 2022-2023 influenza season in the northern hemisphere contain the following:

Egg-based vaccines

- an A/Victoria/2570/2019 (H1N1)pdm09-like virus;
- an A/Darwin/9/2021 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus.

Cell culture- or recombinant-based vaccines

- an A/Wisconsin/588/2019 (H1N1)pdm09-like virus;
- an A/Darwin/6/2021 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus

On 23 September 2022, WHO published recommendations for the components of influenza vaccines for use in the 2023 southern hemisphere influenza season:

Egg-based Vaccines

- an A/Sydney/5/2021 (H1N1)pdm09-like virus;
- an A/Darwin/9/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus; and
- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

Cell- or recombinant-based Vaccines

- an A/Sydney/5/2021 (H1N1)pdm09-like virus;
- an A/Darwin/6/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus; and
- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

It is recommended that **trivalent influenza vaccines** for use in the 2023 southern hemisphere influenza season contain the following:

Egg-based vaccines

- an A/Sydney/5/2021 (H1N1)pdm09-like virus;
- an A/Darwin/9/2021 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus.

Cell- or Recombinant-based vaccines

- an A/Sydney/5/2021 (H1N1)pdm09-like virus;
- an A/Darwin/6/2021 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus

The full report is published [here](#).

Acknowledgements

This weekly update was prepared by an editorial team at the European Centre for Disease Prevention and Control (Cornelia Adlhoch, Maja Vukovikj and Edoardo Colzani) and the WHO Regional Office for Europe (Margaux Meslé, Piers Mook and Richard Pebody). It was reviewed by experts from the network (Adam Meijer, National Institute for Public Health and the Environment (RIVM), the Netherlands); Rod Daniels 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.

Suggested citation: European Centre for Disease Prevention and Control/WHO Regional Office for Europe. Flu News Europe, Joint ECDC–WHO weekly influenza update, week 48/2022.

Tables and figures should be referenced:

European Centre for Disease Prevention and Control/WHO Regional Office for Europe. Flu News Europe, Joint ECDC–WHO weekly influenza update, week 48/2022.

© World Health Organization 2022

© European Centre for Disease Prevention and Control 2022

Reproduction is authorized, provided the source is acknowledged.