SURVEILLANCE REPORT

Seasonal influenza 2019-2020

Annual Epidemiological Report

Key facts

- Influenza activity started in week 45/2019 and returned to baseline levels in week 13/2020, earlier than previous seasons.
- Influenza viruses circulated at high levels between weeks 52/2019 and 10/2020 (based on increased proportions (40% and above) of sentinel specimens testing positive for influenza viruses). This is comparable to previous seasons.
- Similar proportions of influenza A(H1)pdm09, A(H3) and B/Victoria were detected throughout the season. B/Victoria lineage viruses have greatly outnumbered those of the B/Yamagata lineage.
- Different patterns of dominant type and A subtypes were observed among the countries. Early on, circulation of A(H3) was higher and later in the season increased proportions of A(H1)pdmp9 and B/Victoria viruses were observed.
- Characterised A(H3) viruses fell mainly in clades 3C.3a and 3C.2a1b, A(H1)pdm09 viruses fell mainly in clade 6B.1A5A, while the majority of B/Victoria lineage viruses fell in the Δ162-164 triple deletion subgroup .
- The majority of severe cases reported this season were due to influenza virus type A infection and these mostly occurred in persons older than 40 years.
- The majority of deceased hospitalised influenza patients were 65 years and older and had influenza A virus infection.
- During the period of high influenza virus circulation in early January and February, a slight excess mortality from all causes was observed, possibly related to influenza, while later in the season the excess mortality was driven by COVID-19.
- The vast majority of influenza viruses tested were susceptible to neuraminidase inhibitors.
- A moderately good vaccine effectiveness was observed, which was higher for type B and A(H1)pdm09 viruses.

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Stockholm, August 2020

Methods

For a detailed description of methods used to produce this report, please refer to the Methods chapter [1].

An overview of the national surveillance systems is available online [2].

Additional data on influenza are accessible from ECDC's online Surveillance atlas of infectious diseases [3].

The surveillance of influenza in EU/EEA countries is carried out by the European Influenza Surveillance Network (EISN), coordinated by the European Centre for Disease Prevention and Control (ECDC).

EU/EEA influenza surveillance is based on weekly data reported to ECDC by sentinel general practitioners (in some countries also other physicians, such as paediatricians) and national influenza reference laboratories from week 40 to week 20 of the following year.

Surveillance data include:

- Qualitative indicators of influenza activity, namely intensity, geographical spread and trend. Intensity, ranging from low activity (i.e. no activity or activity at baseline level) to very high, is an indicator of the level of influenza activity. Geographical spread, ranging from no activity to widespread, refers to the number of affected areas in a given country. Trend – increasing, stable or decreasing – compares the level of ILI/ARI sentinel consultations with the previous week.
- The aggregate number of influenza-like illness (ILI) and/or acute respiratory infection (ARI) cases seen by sentinel physicians[1] [2]. Each country also reports denominator data (population covered by sentinel surveillance) to enable calculation of weekly ILI and ARI consultation rates.
- The aggregate number of sentinel specimens obtained from a systematic sample of ILI/ARI patients and testing positive for influenza, by type, A subtype and B lineage [2]. Overall positivity rates of sentinel specimens are used to estimate the start, duration and end of influenza activity; a 10% threshold is used to indicate the start of the seasonal epidemic.
- Antigenic and genetic characterisation and strain-based antiviral susceptibility data for a subset of influenza viruses detected in sentinel and non-sentinel specimens [2].
- Case-based hospital data reported by a subset of countries on a voluntary basis[2], including demographic, clinical and virological data [2].

Since the 2014–2015 season, influenza surveillance in the 53 countries of the WHO European Region has been jointly coordinated by ECDC and the WHO Regional Office for Europe. Results are disseminated through a joint weekly bulletin (www.FlunewsEurope.org) [4]

This report presents data from EU/EEA countries and the EuroMOMO project [5] which monitors weekly all-cause excess mortality in Europe. Archived weekly data from October 2014 onwards are available from: http://www.flunewseurope.org/Archives [4].

Seasonal data in this report, covering the period from week 40/2019 to 20/2020, were extracted from the database during week 25/2020.

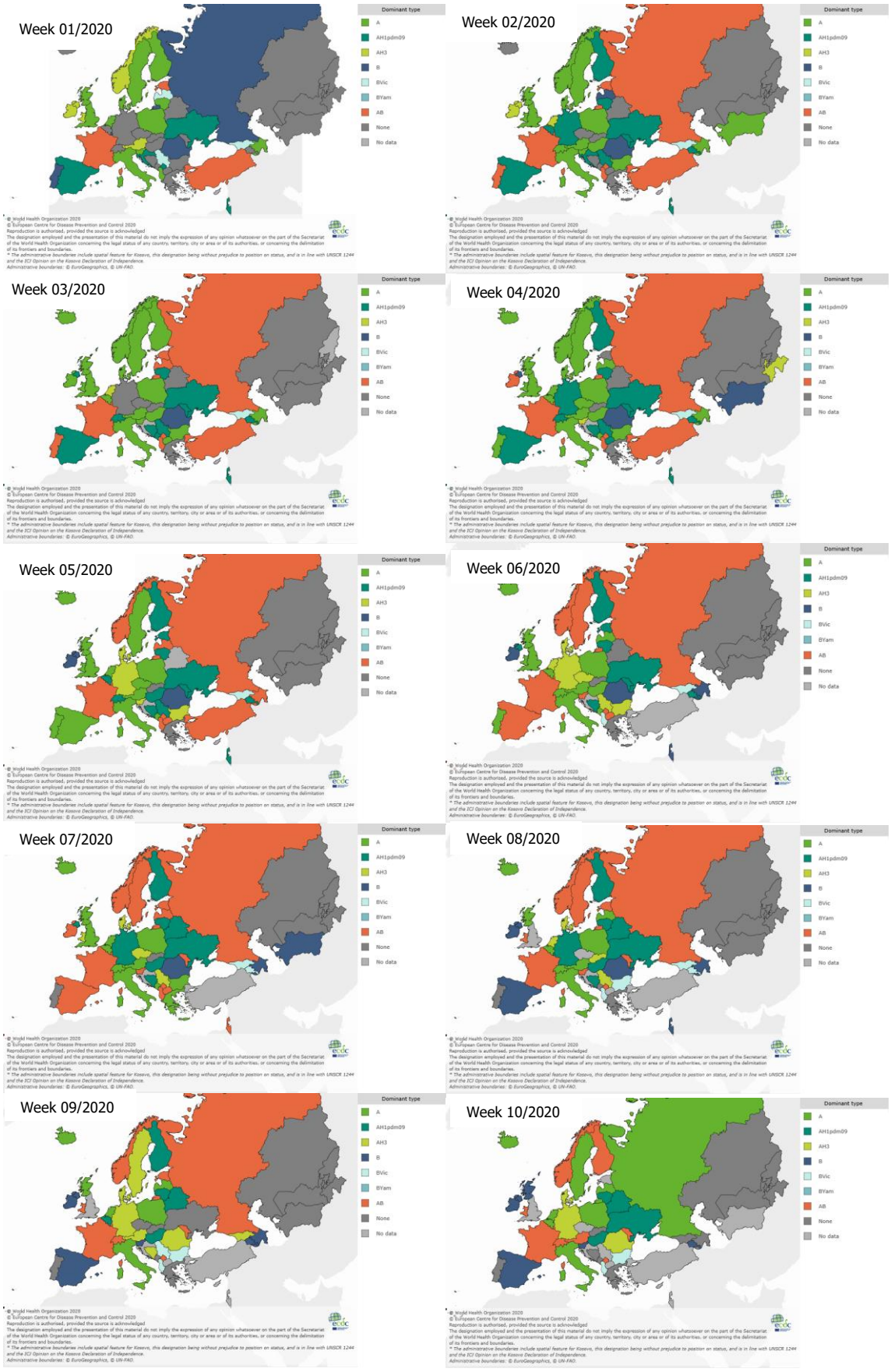
Sentinel surveillance

Overall, a higher proportion of type A viruses than type B viruses was detected, both in sentinel and non-sentinel sources, with a lower proportion of type B viruses and a substantially higher number of unsubtyped type A viruses detected in non-sentinel sources. Of the type A detections from sentinel sources, A(H1)pdm09 viruses and A(H3) viruses were at comparable levels with slightly more A(H1)pdm09 viruses, while in non-sentinel sources more A(H3) viruses were reported than A(H1)pdm09 viruses.

Different patterns of dominant type and A subtype were observed across the countries and over time (Figure 1). Only Greece, Luxemburg and Slovenia reported weeks with high intensity of influenza circulation and only a few countries reported high intensity during the 2019–20 season (Table 1).

[1] ILI and a denominator were reported by Austria, Belgium, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and United Kingdom. ARI and a denominator were reported by Belgium, Bulgaria, Cyprus, the Czech Republic, Estonia, Finland, Germany, Latvia, Lithuania, Luxemburg, the Netherlands, Romania, Slovakia, Slovenia and United Kingdom.

Figure 1. Dominant (>60%) virus type, subtype or lineage, European Region, weeks 01/2020–10/2020



In week 45/2019, the weekly percentage of sentinel specimens positive for influenza crossed the 10% threshold signalling the beginning of the seasonal epidemic, similar to the season 2015–16 which started earlier than usual (Figure 2 and 3). The overall percentage of positive specimens peaked at week 5/2020 and returned to baseline levels in week 13/2020, earlier than previously observed. Influenza positivity shows a biphasic curve with a dip in the first two weeks of 2020. The first increase was driven by A(H3), while from week 02/2020, A(H1)pm09 was the most reported virus together with an increase in type B virus circulation which occurred slightly later (Figure 4). During the 2019–2020 season, 33 056 specimens from sentinel primary care providers were tested, which is comparable to the previous season's total (n=28 701); 11 978 (36%) were positive for influenza virus, a lower proportion than in the previous season (42%). Of the positive specimens, 7 884 (66%) were type A, and 4 094 (34%) were type B. Of 7 358 A viruses subtyped, 3 787 (51%) were A(H1)pdm09 viruses and 3 571 (49%) were A(H3) viruses. Of 1 849 influenza B viruses ascribed to a lineage, 1 826 (99%) were B/Victoria and 23 (1%) were B/Yamagata viruses.

Figure 2. Weekly proportion of sentinel specimens positive for influenza virus and number of detections by virus type, subtype/lineage and week of reporting, EU/EEA, 2019–2020

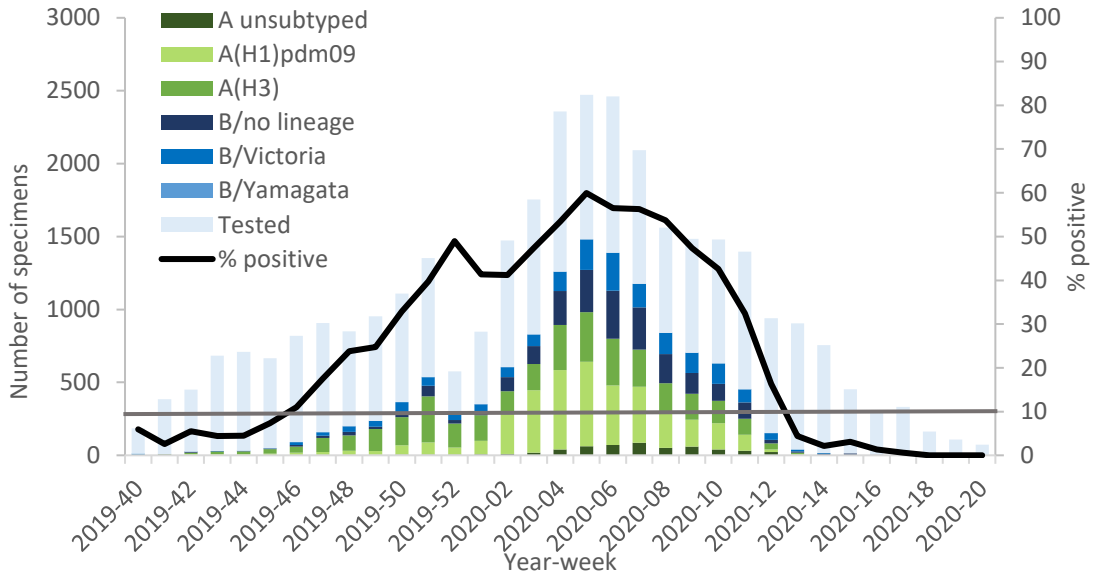


Figure 3. Weekly proportion of sentinel specimens positive for influenza virus by season and week of reporting, EU/EEA, 2015/16–2019/2020

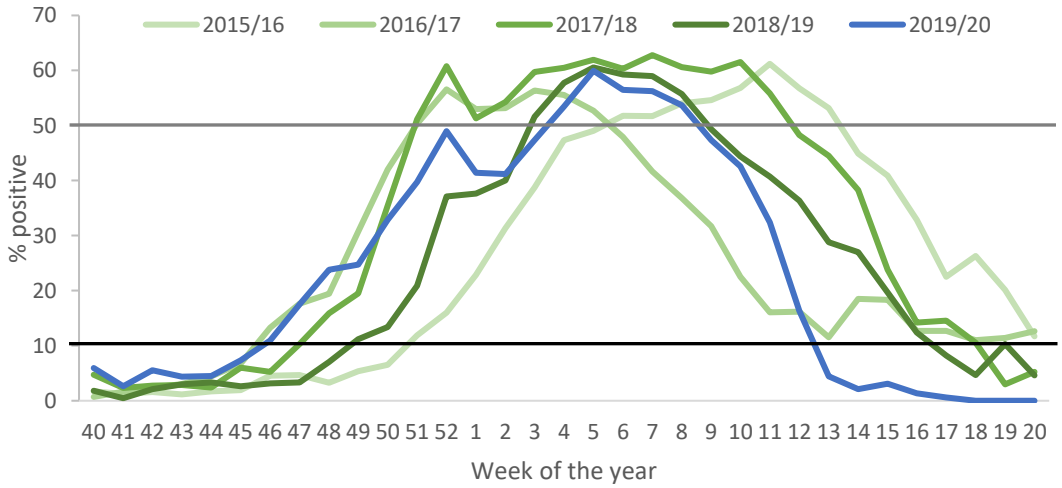


Figure 4. Number of detections by virus type, subtype/lineage and week of reporting, EU/EEA, 2019–2020

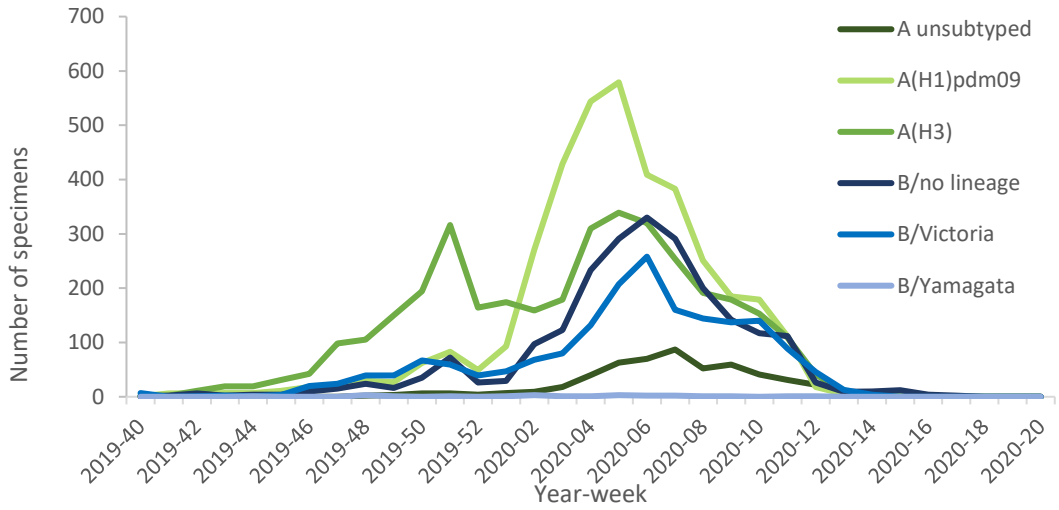


Table 1. Influenza intensity and trend by week 2019/40–2020/20

Country	2019-W40	2019-W41	2019-W42	2019-W43	2019-W44	2019-W45	2019-W46	2019-W47	2019-W48	2019-W49	2019-W50	2019-W51	2019-W52	2020-W01	2020-W02	2020-W03	2020-W04	2020-W05	2020-W06	2020-W07	2020-W08	2020-W09	2020-W10	2020-W11	2020-W12	2020-W13	2020-W14	2020-W15	2020-W16	2020-W17	2020-W18	2020-W19	2020-W20
Austria	=	=	=	=	=	=	=	+	-	+	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-						
Belgium	=	=	=	=	=	=	=	=	=	=	=	=		=	+	+	+	+	=	-	-	-	+	+	+	-	=	-	=	=	=	=	=
Bulgaria	=	=	=	=	=	+	=	+	+	=	=	=	=	=	+	+	+	+	-	-	-	+	+	-	-	-	-	-		-	=	=	=
Croatia	=	=	=	=	=	=	=	=	=	=	=	=	=	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	
Cyprus																																	
Czechia	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	+	+	+	-	-	-	-	-	-	=	=	=	=	=	=	=	=
Denmark	=	=	=	=	=	=	=	=	=	=	+	+	+	=	=	=	+	=	=	=	=	=	=	=		+	=	=	-	=	-	=	=
England	=	=	=	=	=	=	=	+	+		+			-	-	-	-	=	=	-													
Estonia	+	=	=	=	=	=	=	=	+	=	=	+	+	+	=	=	+	+	+	+	+	-	=	-	-	+	=	-	-	-	-	=	-
Finland	=	=	=	=	=	+	=	=	=	=	+	+	=	=	=	+	=	=		+			=	-	-	-			-	=		=	
France	=	=	=	=	=	=	=	=	=	=	+	+	+	+	+	+	+	+	+	+	-	-	-	=									
Germany	=	=	=	=	=	=	=	=	=	=	=	=	=	=	+	=	+	+	+	=	-	=	+	=	-	-	-	=	=	=	=	=	=
Greece	=	=	=	=	=	=	=	=	=	=	=	=	=	+	+	+	+	+	=	-	-	-	-	-	-	-	-	-	=	=	=	=	=
Hungary	=	=	=	=	=	=	=	=	=	=	=	=		=	=	=	+	+	+	+	=	=	-	-	-	-		=	=	=	=	=	=
Iceland	=	=	=		=	=	=	=	=		+	=	=	=	=	+	+	+	+	+													
Ireland	=	=	=	=	=	=	=	+	+	+	+	+	=	=	-	-	-	-	-	-	-	-	=	+	+	+	-	-	-	-	=	-	=
Italy			=	=	=	=	=	=	=	=	=	=	=	=	+	+	+	+	=	-	-	-	-	-	-	-	-	=	=	=	=			
Latvia		+	+	=	=	+	+	+	+	+	+	+	-	=	+	-	+	-	-	-	-	-	-	-	-	-	-	=	=	=	=	-	=
Lithuania	=	=	=	=	-	=	=	=	+	=	=	-	-	+	+	+	+	+	+	-	-	+	+	-	+	-	-	-	-	-	-	-	=
Luxembourg		=	=	=	=	=	=	=	=	=	+	+	=	=	+	+	+	+	+	=	-	=	-	+	-	+		-	-	=	=	=	=
Malta	=	=	=	=	=	=	=	+	+	=	+	+	+	+	+	+	+	-	+	-	-	=	-	-	-	-	-	=	=	-	=	-	=
Netherlands	=	=	=	=	=	=	=	=	=	=	=	=	=	=	+	=	=	+	+	=	-	=	+	+	=	=	-	-	=	=	=	=	=

Country	2019-W40	2019-W41	2019-W42	2019-W43	2019-W44	2019-W45	2019-W46	2019-W47	2019-W48	2019-W49	2019-W50	2019-W51	2019-W52	2020-W01	2020-W02	2020-W03	2020-W04	2020-W05	2020-W06	2020-W07	2020-W08	2020-W09	2020-W10	2020-W11	2020-W12	2020-W13	2020-W14	2020-W15	2020-W16	2020-W17	2020-W18	2020-W19	2020-W20
Northern Ireland	=	=	=	=	=	=	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	=	=	=	+	-	-	-	-	-	-	-	-
Norway	=	=	=	=	=	=	=	=	=	=	=	=	+	+	=	=	=	=	+	+	=	=	=	-	-	-	-	-	=	=	=	=	=
Poland	=	+	=	=	=	+	=	+	=	+	+	=	=	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	=	=	=	=
Portugal	=	=	=	=	=	=	=	+	+	+	+	+	+	-	=	+	=	=	=	=	-	=	=	=	=	=	=	=	=	=	=	=	=
Romania	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	+	=	=	=	=	=	-	-	-	-	-	-		-	-	-	
Scotland	=	=	=	=	=	=	+	+	+	=	+	=	-	-	+	-	-	+	-	+	-	-	+	=	-	=	=	=	=	=	=	=	=
Slovakia	=	=	=	=	=	=	=	=	=	=	=	=	=	+	+	=	=	+	=	=	=	=	=	=	-	-	=	=	=	=	=	=	=
Slovenia	=	=	=	=	=	=	=	=	=	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	=	=	=	=
Spain	=	=	=	=	=	=	=	=	=	=	=	=	=	+	+	+	+	+	-	-	-	-	-	-	-	=	=	=	=	=	=	=	=
Sweden	=	=	=	=	=	=	=	=	=	+	+	+	=	=	=	=	+	+	+	+	=	+	+	-	-	-	-	-	=	=	=	=	=
Wales	=	=	=	=	=	=	=	=	+	=	+	+	+	-	-	-	-	=	-	-	-	=	=	+	=	-	=	=	=	=	=	-	=

Baseline
Low
Medium
High
Very High
Unknown (no information available)

\+ Increasing
= Stable
\- Decreasing

Hospitalisations due to influenza

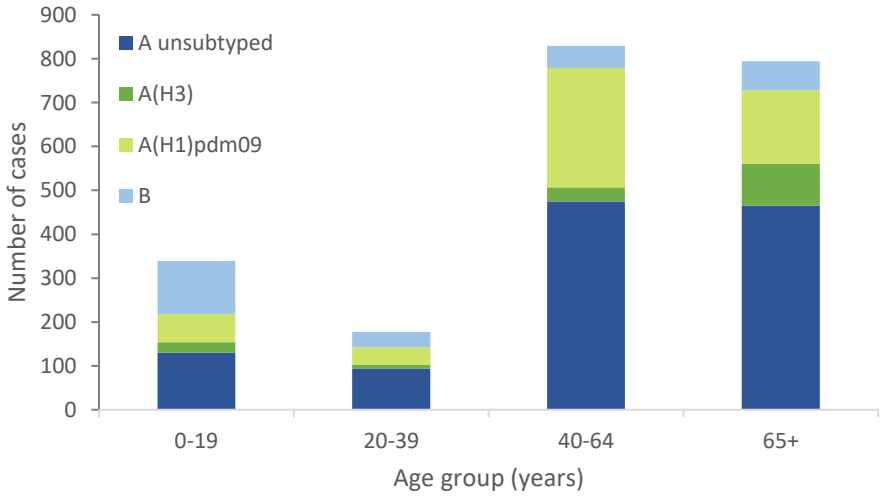
Nine countries reported a total of 10 705 laboratory-confirmed hospitalised influenza cases during the 2019–2020 influenza season. The majority of cases (87%) were due to influenza type A viruses.

In laboratory-confirmed influenza cases in ICU (n=3 954), influenza virus type A viruses were detected in 90% and type B in 10% of all cases. Compared to the previous season, there was only half the number (3 954 vs. 7 339) of ICU cases with laboratory confirmed influenza reported in 2019–20. The UK reported 46% (1 815) of the cases followed by France with 22% (881) and Spain reporting 19% (748) of all cases in ICU. The majority of severe cases occurred in persons above the age of 40 years, with slightly more being 40–64 years old and having influenza A virus infection (Figure 5). The majority of influenza A viruses were reported without subtype and of the subtyped type A viruses more influenza A(H1)pdm09 infections were reported than A(H3) (2 201 vs. 1 159). Proportions of A(H1)pdm09 were higher in people aged 40-64 years, while A(H3) was reported more in people 65 years and older (Figure 6).

In laboratory-confirmed influenza cases reported from non-ICU wards (n=6 676, excluding hospitalised cases where hospital ward was unknown), the majority of viruses detected were type A viruses (85%), with only 15% type B viruses. Among the influenza A detections, A(H1)pdm09 accounted for a slightly higher proportion of cases in patients 40–64 years of age. Higher proportions of type B viruses were detected in the youngest age group up to 19 years old.

Of 8 650 hospitalised patients with laboratory-confirmed influenza, 665 were reported to have died, 614 (92%) due to influenza type A (356 A unsubtyped, 188 A(H1)pdm09, 70 A(H3)) and 51 (8%) due to type B virus infection. The majority (71%) were 65 years and older.

Figure 5. Number of laboratory-confirmed influenza cases admitted to ICU, by (sub)type and age-group; nine EU countries (season 2019–2020; n=2 139)



Virus characterisations

All 975 A(H1)pdm09 viruses attributed to a clade were in the A/Brisbane/02/2018 vaccine component clade (6B.1); the majority (904) belonged to subclade 6B.1A5A.

Among 1 047 influenza A(H3) viruses attributed to a clade, 560 were in the vaccine virus component clade 3C.3a represented by A/Kansas/14/2017, 342 in subclade 3C.2a1b represented by A/South Australia/34/2019 with viruses defined by T131K, 64 in subclade 3C.2a1b defined by T135K represented by A/La Rioja/2202/2018 and 81 in subclade 3C.2a1b represented by A/Hong Kong/2675/2019, also defined by T135K.

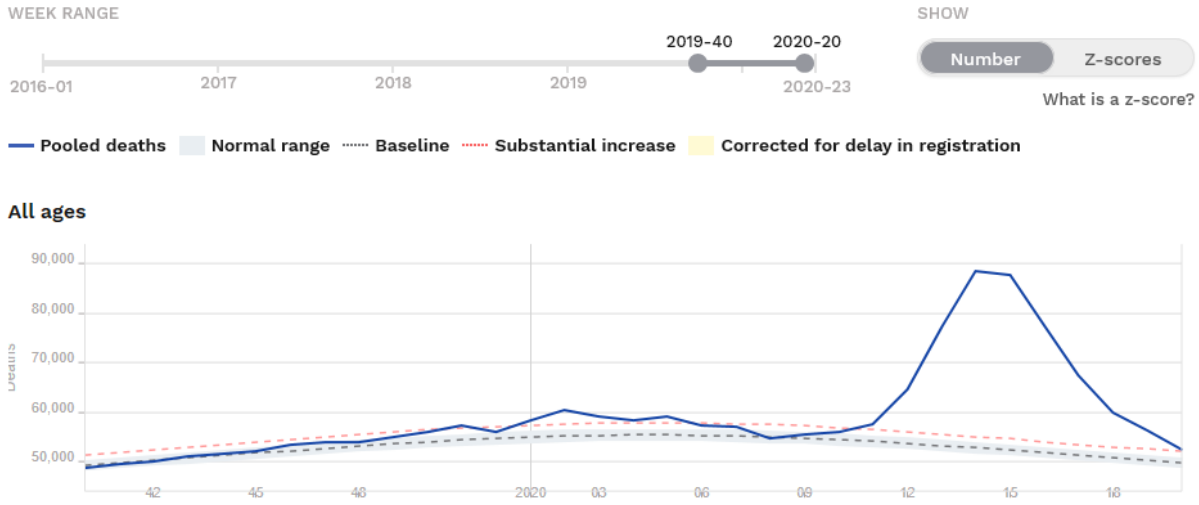
Of 654 B/Victoria lineage clade 1A viruses, 19 belonged to a clade represented by B/Colorado/06/2017 which carries HA1 double amino acid deletion, Δ162-163 and the rest belonged to a clade that carries a triple amino acid deletion in HA1, Δ162-164. Of those five belonged to a subgroup represented by B/Hong Kong/269/2017 and 630 to a subgroup represented by B/Washington/02/2019. All 26 B/Yamagata lineage viruses that were attributed to a clade belonged to clade 3, represented by B/Phuket/3073/2013.

For more information on virus characterisations for EU/EEA countries, see the WHO Collaborating Centre London May 2020 report [6].

All-cause excess mortality

Pooled data from 24 EU/EEA countries reporting to the EuroMOMO project showed an excess mortality from all causes between the beginning of January and February 2020, coinciding with the period when influenza circulated at high levels (Figure 6) [5]. High excess all-cause mortality levels after week 11/2020 are mainly attributed to COVID-19.

Figure 6. Mortality from all causes by age groups, EuroMOMO, week 40/2019–week 20/2020



Source: www.euromomo.eu

Antiviral susceptibility and vaccine effectiveness

A very low level of antiviral resistance to neuraminidase inhibitors was detected (<1%). Of 1 789 influenza viruses tested for susceptibility to neuraminidase inhibitors: three A(H1N1)pdm09 viruses carried amino acid substitutions associated with reduced or highly reduced inhibition (HRI) by oseltamivir; an additional A(H1N1)pdm09 virus showed reduced inhibition (RI) by oseltamivir and zanamivir by phenotypic assays. One A(H3N2) virus carried an amino acid substitution associated with HRI by oseltamivir and RI by zanamivir.

Interim 2019–2020 influenza vaccine effectiveness (VE) estimates from the six European studies for all ages ranged from 29% to 61% against any influenza in the primary care setting and 35% to 60% in hospitalised older adults (aged 65 years and over) [7]. The VE point estimates against influenza A(H1N1)pdm09 (all ages, both settings) were 48% to 75%, and against influenza A(H3N2) they ranged from −58% to 57% (primary care) and −16% to 60% (hospital). Against influenza type B, VE for all ages was 62% to 83% (primary care only) [7-9].

Discussion

The influenza season 2019–2020 had an early onset with an overall shorter duration compared to previous seasons, which was influenced by the COVID-19 pandemic and the related lockdown and high impact on influenza monitoring structures in the countries (see Annex 4 of ECDC's tenth update of the rapid risk assessment [10]).

Different patterns of dominant type and subtype were observed across the countries. Influenza A(H1)pdm09, A(H3) and B/Victoria circulated, with more type A than type B viruses detected in hospitalised patients. ICU cases were mainly due to type A virus and occurred in people aged 40 years and older.

For type B viruses, B/Victoria lineage viruses greatly outnumbered those of the B/Yamagata lineage. A B/Victoria lineage virus was included in the trivalent and quadrivalent seasonal influenza vaccine, however, the vaccine virus included contained a double deletion while the majority of circulating viruses carried triple deletion mutations and were therefore antigenically distinct. Nevertheless, the estimates indicated 62–83% effectiveness of the vaccine against influenza B [7].

On 28 February 2020, WHO published recommendations for the components of influenza vaccines for use in the 2020–21 northern hemisphere influenza season [11]. It is recommended that the influenza B virus component of both trivalent vaccine types for use in the 2020–21 northern hemisphere influenza season should be a B/Washington/02/2019-like virus of the triple deletion subgroup of the B/Victoria-lineage (Clade 1A(Δ3)B); the A(H1N1)pdm09 component changed to A(H1N1)pdm09-like virus (Clade 6B.1A5A) and A(H3N2) to A(H3N2)-like virus (Clade 3C.2a1b+T135K-B).

Public health implications

Based on this 2019–2020 season overview, the following public health conclusions can be made:

- The COVID-19 pandemic probably had a high impact on influenza circulation from week 13 onwards when countries implemented strict lockdowns and issued recommendations to stay away from primary health care [10].
- Estimates showed 29–61% vaccine effectiveness against any influenza in primary care, with high effectiveness particularly for type B viruses. Influenza vaccination should continue to be recommended in accordance with national vaccination recommendations, as this remains the best preventive measure against influenza. In addition, appropriate use of neuraminidase inhibitors should be continued.
- The COVID-19 pandemic had implications on the numbers of characterised viruses; the total number of genetically characterised viruses during the 2019–2020 season was lower than previous seasons. Antigenic and genetic characterisation of viruses is essential for the selection of the most appropriate vaccine virus components.

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