

## RISK ASSESSMENT

# Seasonal influenza 2015–2016 in the EU/EEA countries

February 2016

## Executive summary

- The season started in EU/EEA countries in week 52/2015, with the Netherlands reporting regional spread, while Sweden reported widespread activity. The positivity rate of sentinel specimens had been above the 10% threshold for the second consecutive week in nine countries.
- High ILI/ARI rates in primary care services were reported by an increasing number of countries and are expected to increase in countries with currently low rates.
- Type A viruses, in particular A(H1N1)pdm09, are more prevalent than type B viruses in the majority of countries. However, B viruses could emerge later and become dominant by the end of the season.
- There are strong indications from some EU/EEA countries that the A(H1N1)pdm09 virus is responsible for the hospitalisation of a large number of severe cases, especially in intensive care units, with severe outcomes in risk groups and otherwise healthy young adults. A similar pattern of severity is likely to be observed in other EU countries as the season progresses.
- There is a high prevalence of influenza B virus of the Victoria lineage (B/Victoria/2/87); this lineage is likely to circulate or co-circulate later.
- The composition of influenza vaccines in the southern hemisphere in 2015 and in the northern hemisphere in 2015–2016 were identical; estimates of vaccine effectiveness in New Zealand are encouraging, with an overall effectiveness against hospitalisations of 50%. The dominant A(H1N1)pdm09 virus is antigenically similar to the vaccine strain.
- Compared with the southern hemisphere, a higher proportion of B/Victoria viruses are being detected in Europe. The B/Victoria lineage is not included in the trivalent inactivated influenza vaccine, which is the most widely used vaccine in Europe. This may contribute to a reduced overall vaccine effectiveness of the trivalent vaccine.

## Scope and objectives

This risk assessment covers the 2015–2016 influenza season in the European Union and European Economic Area (EU/EEA). The main objectives of this assessment are:

- to provide an early description of the epidemiological pattern of seasonal influenza in the first affected countries;

- to identify particularly affected populations and estimate the possible impact on primary and secondary healthcare services;
- to anticipate the progression of influenza activity and the possible impact on susceptible populations for the rest of the season;
- to assess the implications of influenza vaccine effectiveness and susceptibility to antiviral drugs during this season for public health management;
- to suggest scientific and public health advice on measures to be taken to reduce the burden of seasonal influenza in 2016.

## Methodology

This risk assessment is based on three data sources:

- Clinical, epidemiological and virological data from primary care and hospital surveillance, routinely collected and reported by public health institutes and national influenza centres to ECDC through the European Influenza Surveillance Network (EISN) [1] and the European Reference Laboratory Network for Human Influenza (ERLI-Net).
- A questionnaire (see Annex) designed to assess the interim impact of influenza. Focal points in EU/EEA countries returned the completed questionnaire to ECDC when one of the following criteria was met:
  - medium intensity or widespread geographic activity reported for at least two consecutive weeks
  - $\geq 10\%$  of all sentinel specimens reported as influenza-positive, with at least 10 specimens tested
  - reports of severe influenza cases
  - reports of unusual events.
- Other information such as peer-reviewed literature, serological surveys, data gathered through ECDC epidemic intelligence and results from the following public health projects: European Monitoring of Excess Mortality for Public Health Action (EuroMOMO) and Vaccine European New Integrated Collaboration Effort (VENICE).

## Source and type of request

ECDC internal decision for a planned risk assessment and a request from the Directorate General for Health and Food Safety received on 29 January.

## Consulted experts

ECDC: C. Adlhoch, J. Beauté, M. Catchpole, D. Coulombier, E. Broberg, P. Penttinen, R. Snacken, P. Zucs

External experts: I. Bonmarin, C. Brown, S.H. Hauge, O. Hungnes, A. Larrauri, J. McMenamin, R. Pebody, A. Reuß, S. Tsiodras and W. van der Hoek. Declarations of interest have been received from every expert involved. They have been reviewed by ECDC and none are considered to represent a conflict of interest.

Respondents to the questionnaire:

A.S. Carnahan, L. Domegan, S.H. Hauge, O. Hungnes, A. Larrauri, R. Liausediene, A. Meijer, J. O'Donnell, R. Pebody, G. Spala, W. van der Hoek, N. Ikonen, O. Lyytikäinen.

ECDC is very grateful for the expert input from the persons above. All experts were consulted as individuals on the basis of their expert knowledge and experience rather than as representatives of their institutions or countries. It should also be noted that responsibility for the content of this risk assessment rests with ECDC rather than with these individuals.

## Situation in the temperate countries of the northern hemisphere (weeks 40/2015 to 3/2016)

In the countries of central and eastern Europe\* that participate in EISN and ERLI-Net disease surveillance [1], the proportion of sentinel specimens positive for influenza in week 52/2015 had been over 10% for two consecutive weeks, indicating that the influenza season had started. In week 3/2016, ILI rates in Israel and Turkey had not peaked yet, but were higher compared with the same time during the previous seasons. During week 3/2016, 14 countries reported virus detections in sentinel specimens. Eighty-two percent of the positive specimens were A viruses and 18% were B viruses. Of the A viruses subtyped, 77% were A(H1N1)pdm09 and 23% A(H3N2). Of the B viruses ascribed to a lineage, 86% were B/Victoria lineage and 14% were B/Yamagata. Hospitalised severe acute respiratory infections (SARI) were reported by 11 countries. From week 40/2015, 1 167 (32%) of 3 653 tested specimens were positive for influenza; 1 004 (86%) were A viruses and 163 (14%) were B viruses. Almost all (99%) subtyped A viruses were A(H1N1)pdm09.

In Canada, during week 3/2016, the proportion of specimens positive for influenza virus increased to 12% in primary care. Seventy-one percent of specimens positive for influenza were type A viruses and 28% B viruses. Of all A viruses subtyped, 79% were A(H1N1)pdm09 viruses and 21% A(H3N2) viruses. All characterised A viruses were similar to the corresponding component of the trivalent vaccine. Only one third of B viruses ascribed to a lineage were similar to the B/Yamagata strain included in the more widely used trivalent vaccine. Two thirds of the B viruses were similar to the B/Victoria strain included in both trivalent and quadrivalent vaccines [2].

In the USA, in week 3/2016, the proportion of visits for ILI in four of 10 US regions was above the region-specific baseline. The proportion of specimens positive for influenza virus is increasing (28%). Since week 40/2015, 64% of the typed viruses were type A and 36% were type B. Of all A viruses subtyped, 56% were A(H1N1)pdm09. Of all B viruses ascribed to a lineage, 78% were B/Yamagata while 22% were B/Victoria.

The circulating B/Yamagata and B/Victoria lineage viruses are antigenically similar to the components of the trivalent and quadrivalent 2015–2016 vaccines. The vast majority (99%) of A(H3N2) viruses characterised by haemagglutination inhibition in the US by 22 January 2016 were similar to the vaccine strain. In 122 US cities, an excess mortality due to pneumonia and influenza was reported for week 2/2016, but not for week 3/2016, which maybe due to delayed registrations [3].

In China, influenza activity is still increasing. Since the start of the season, 67% of viruses were type A and 33% were type B. Of all A viruses, 62% were A(H1N1)pdm09 and 38% A(H3N2). Of all B viruses ascribed to a lineage, both B/Victoria and B/Yamagata circulated equally.

In Japan, influenza activity is low, with a higher proportion of A(H1N1)pdm09 (79%) compared with A(H3N2) (21%) and a higher proportion of B/Victoria (59%) compared to B/Yamagata (41%) [4].

---

\* Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Georgia, Israel, Kazakhstan, Kyrgyzstan, Montenegro, Moldova, Russian Federation, Serbia, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan.

## Situation in the countries of the southern hemisphere (January–October 2015)

During the past winter season in the southern hemisphere, influenza A(H3N2) virus was predominant in South America, especially in its tropical parts. In Chile, A(H1N1)pdm09 was more prevalent, while in Colombia both A subtypes were co-dominant. Influenza B viruses circulated less widely across South America, with most of the B viruses ascribed to B/Yamagata.

In South Africa, 46% of the detected influenza viruses were A(H1N1)pdm09, 37% were A(H3N2), and 17% were B viruses.

In Australia, 61% of detected viruses were type B and 39% were type A, 78% of which were A(H3N2) viruses. Higher proportions of B/Yamagata viruses compared with B/Victoria lineage viruses were reported in the early part of the season, switching from July to higher proportions of B/Victoria for the rest of the season [5].

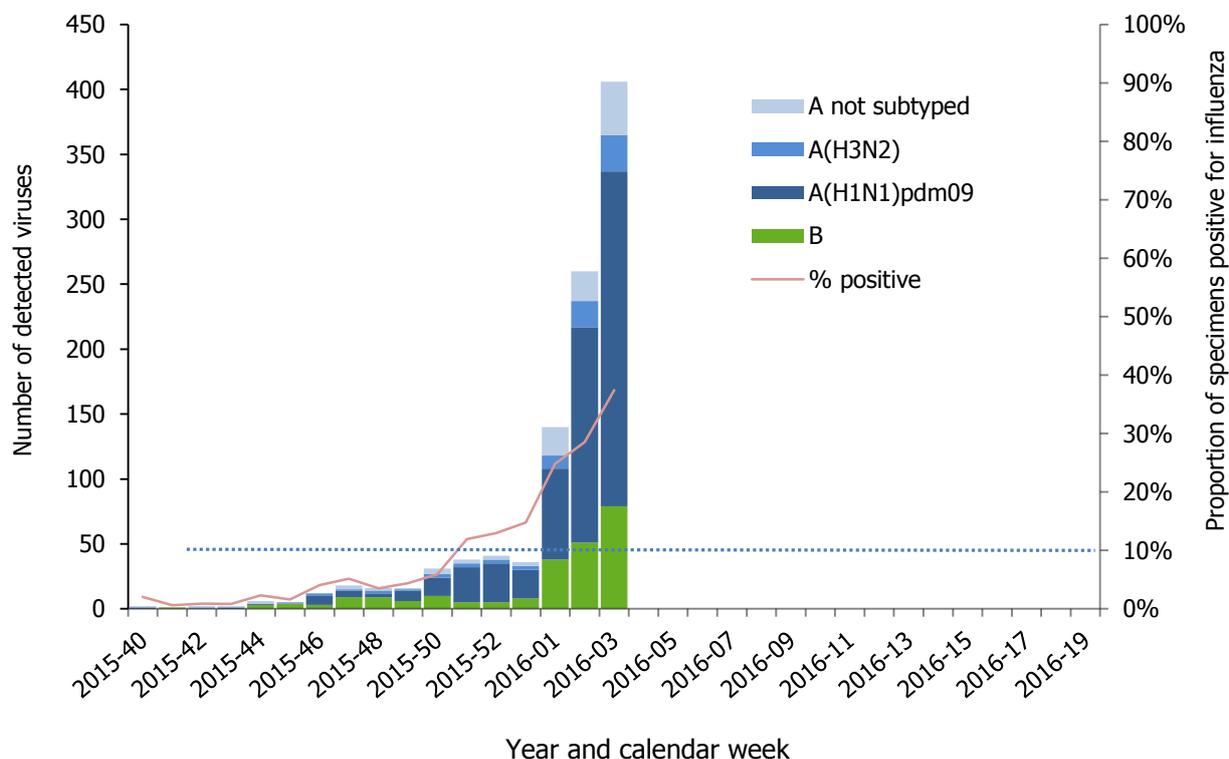
In New Zealand, the season was dominated by A(H3N2) and B viruses. B/Yamagata and B/Victoria circulated in equal proportions.

Late increases in the proportions of circulating B/Victoria/2/87-lineage viruses resulted in the addition of this strain to the trivalent vaccine for the recommended 2016 southern hemisphere composition [6].

## Epidemiology in primary healthcare services, EU/EEA

Influenza activity in the EU/EEA started in week 51/2015, with the Netherlands reporting medium intensity and regional spread, while Sweden reported widespread geographical activity. In addition, nine countries reported specimens positive for influenza in primary care settings, with an overall proportion of 11% of all sentinel specimens positive for influenza. During week 52/2015, the threshold of 10% positivity for Europe was exceeded for the second consecutive week and reached 17%, with 14 countries reporting positive sentinel specimens. This indicated that the influenza epidemic had started in some countries in Europe (Figure 1). Timing of the start of influenza activity was similar to the previous season.

**Figure 1. Weekly proportion of sentinel specimens positive for influenza virus and number of detections by type and subtype, EU/EEA, 2015–2016**



In week 3/2016, 38% of sentinel specimens from 21 countries were positive for influenza, and in almost all countries, ILI/ARI rates were increasing.

According to data collected up to week 3/2016 through the seasonal risk assessment questionnaire from eleven EU/EEA Member States (England and Scotland (United Kingdom), Finland, France, Germany, Greece, Ireland, Lithuania, the Netherlands, Norway, Spain and Sweden), pressures on primary care due to respiratory illness were the same or less than in previous seasons, except for Finland and Ireland where influenza activity was higher in younger age groups and those aged 15–64 years. Localised outbreaks in schools, healthcare facilities and long-stay care facilities or centres for asylum seekers were reported in Germany, Ireland, the Netherlands and Norway. A(H1N1)pdm09 and B viruses, both B/Yamagata and B/Victoria, were reported as causative viruses.

## Epidemiology in secondary healthcare services – seven EU countries

Among the seven countries reporting weekly hospitalised influenza cases, four (Finland, France, Sweden and the United Kingdom) reported laboratory-confirmed influenza cases in intensive care units (ICUs) while three countries (Ireland, Romania and Spain) reported hospitalised cases in both ICUs and regular wards\*.

Of 596 patients admitted to ICUs since week 50/2015, 570 (96%) were infected by type A viruses and 4% by B viruses. Of all A viruses subtyped, 94% were A(H1N1)pdm09 while 6% were A(H3N2) viruses. Overall, the proportion of A viruses in ICU was much higher than in primary care (96% vs. 74%). Of 201 ICU patients with known age, 61% were 15–64 years old, 32% were 65 years and older, and 3% each were in the age groups 0–4 and 5–14 years†. Of the 95 ICU cases who were screened for underlying medical conditions, 49 (52%) had no conditions. Of 132 ICU cases with known vaccination status, 17 (13%) were vaccinated.

Compared with ICU cases, patients in regular wards had a higher percentage of reported B virus infection (33% of 298 patients); the proportion of young children (0–4 years) was also higher (25% vs. 3%) in regular wards. These differences might partly be reflective of the catchment populations of the respective hospitals and wards included in the surveillance programmes.

According to responses to the risk assessment questionnaire, the pressure on secondary healthcare services was less intense than in the previous season in France, the Netherlands, England and Scotland (United Kingdom), the same as in the previous season in Lithuania and Spain, and higher in Finland, Greece, Ireland, Norway and Sweden.

In Spain, hospitalised patients were younger (median age 52 years) than in 2014–2015 (median age 69 years), and a higher number – statistically not significant – has been admitted to ICU. In Greece, the mean age of patients admitted to ICU was 55 years, with almost all cases infected by A(H1N1)pdm09. One third of ICU cases in Greece had no underlying conditions. In Sweden, as of week 3/2016, 66 patients had been admitted to ICUs during the season, and an unusually high need for extracorporeal membrane oxygenation (ECMO) has been reported through informal channels. The use of ECMO is also mentioned by Portugal, Ireland and Scotland (United Kingdom). In the latter country, while the number of patients admitted to ICU is lower compared to previous seasons, a higher mortality rate (35%) has been observed in middle-aged adults.

## Virology

### Circulating viruses from sentinel sources

From week 40/2015 to week 3/2016, influenza viruses were detected in 1 356 (15%) of 9 209 sentinel specimens: 1 003 (74%) were positive for influenza type A virus and 353 (26%) for type B virus. Of the type A viruses, 809 (81%) were subtyped as A(H1N1)pdm09, 106 (10%) as A(H3N2), and 88 (9%) remained untyped. Of B viruses ascribed to a lineage, 102 (94%) were B/Victoria lineage and 7 (6%) were B/Yamagata.

Influenza A viruses were dominant (> 60% of tested sentinel viruses) in almost all EU/EEA countries except for Belgium, France, Italy and Luxembourg where B viruses predominated, and in the Czech Republic, Estonia and Ireland where A and B viruses were co-dominant (each between 40% and 60%).

With the exception of Slovenia where A(H3N2) predominated, A(H1N1)pdm09 virus was the dominant type A virus in all countries that reported more than one detection, and B/Victoria was more prevalent among B viruses in all countries with more than one B virus ascribed to a lineage.

---

\* Some countries report all hospitalised cases or cases admitted to ICU, others only supply data from a number of sentinel hospitals.

† In some countries, paediatric wards and ICUs might not be included in data reported to ECDC.

## Circulating viruses from non-sentinel sources

Overall, 7% of specimens from non-sentinel sources tested positive between week 40/2015 and week 3/2016. Ninety-three percent of A viruses subtyped were A(H1N1)pdm09 and 68% of B viruses ascribed to a lineage were B/Victoria.

## Antigenic and genetic characteristics

From week 40/2015 to week 3/2016, 278 viruses were antigenically characterised, while 291 were characterised genetically. Most of these viruses were A(H1N1)pdm09, A(H3N2) and B viruses with properties similar to the viruses recommended for inclusion in trivalent (including a virus representative of the influenza B Yamagata lineage) and quadrivalent (including a virus representative of the influenza B Yamagata lineage and a virus representative of the influenza B Victoria lineage) vaccines recommended by WHO for 2015–2016 [7].

All A(H1N1)pdm09 viruses genetically characterised fell within the 6B subgroup. A new genetic subcluster of viruses within the 6B subgroup has emerged, and an increasing proportion of viruses fell within this new subcluster. The latter is antigenically similar to the vaccine virus strain A/California/7/2009, despite certain (S162N and I216T) amino acid substitutions in the haemagglutinin gene. Circulating A(H1N1)pdm09 variants belonging to clade 6B were reported by Finland, Norway, the Netherlands and Sweden through the questionnaire.

A(H3N2) viruses continued to be difficult to characterise antigenically. Based on the genetic analysis, they fell mainly within the subgroups 3C.2a and 3C.3a, which are antigenically cross-reactive. The vaccine virus is the A/Switzerland/9715293/2013 from subgroup 3C.3a. The B/Victoria-lineage viruses have been circulating more prevalently than the B/Yamagata-lineage viruses in EU/EEA countries this season. The trivalent vaccine for the northern hemisphere includes B/Yamagata virus. Only the quadrivalent vaccines also include a B/Victoria component.

## Susceptibility to antiviral drugs

Since week 40/2015, 383 A(H1N1)pdm09, 48 A(H3N2) and 29 type B viruses have been tested for neuraminidase inhibitor susceptibility. Two A(H1N1)pdm09 viruses showed highly reduced inhibition by oseltamivir associated with NA-H275Y amino acid substitution; the others showed no molecular or phenotypic evidence of reduced inhibition by neuraminidase inhibitors.

## Seroepidemiology

From the annual sero-survey performed in Norway, there is indication of considerable cross-reactivity between the two drifted H3 virus groups (3C.2a and 3C.3a). This may be relevant when assessing whether the 3C.3a vaccine strain A/Switzerland/9715293/2014 provides clinically significant protection against 3C.2a viruses, the H3 group most commonly seen this winter.

For A(H1N1)pdm09 viruses, immunity against the original 2009 virus and a more recent strain (clade 6B) that has predominated since 2013, was similar in all age groups except in the elderly who showed less immunity against the more recent strain. This may possibly suggest that some antigenic features of the A(H1N1)pdm09 virus have started to change and that pre-existing immunity, which the elderly have benefitted from against the original pandemic strain, may be weaker against the current A(H1N1)pdm09 viruses. It should be noted that this has not yet translated into clearly increased incidence of A(H1N1)pdm09 infection in the elderly.

## Influenza vaccine

### Vaccination coverage and availability

From the latest report of the joint ECDC/VENICE III project (2012–2013), vaccination coverage varies widely across EU/EEA countries and met the target of 75% in the older population only in the Netherlands and the United Kingdom (Northern Ireland and Scotland) [8].

According to the seasonal risk assessment questionnaire, the vaccination coverage for the 2015–2016 season was slightly lower than in the previous season in England and Scotland (United Kingdom), roughly the same in Norway and Sweden, and slightly higher in the general population in Finland and Ireland.

### Vaccine effectiveness

The composition of the 2015 southern hemisphere influenza vaccine was identical to the 2015–2016 vaccine being currently used in the northern hemisphere:

- A/California/7/2009 (H1N1)pdm09-like virus
- A/Switzerland/9715293/2013 (H3N2)-like virus
- B/Phuket/3073/2013 (Yamagata)-like virus.

For the quadrivalent vaccine, in addition to the abovementioned strains, it was recommended that B/Brisbane/60/2008-like virus should be added.

Early estimates of influenza vaccine effectiveness in New Zealand were published in December 2015 [9]. The adjusted estimate was 36% (95% CI 11–54%) effectiveness in preventing visits to primary care. Vaccine effectiveness was highest in older age groups: 50% in those 6 months to 17 years of age, 27% in those 18–64 years of age, and 67% in those aged ≥ 65 years, but confidence intervals were wide. Overall, with A(H3N2) and B viruses mainly circulating, the adjusted vaccine effectiveness against severe hospitalised cases was 50%.

A recent report from Taiwan mentions low reactivity of some A(H1N1)pdm09 isolates to the component of the 2015–2016 influenza vaccine virus, A/California/7/2009 [10].

## Mortality

Excess mortality from all causes observed recently, particularly in Northern Ireland (United Kingdom), the Netherlands and Portugal, is difficult to interpret because adjustments for delayed registrations to better estimate actual numbers may be imprecise [11]. Several media reports from eastern Europe suggest that fatal cases of influenza were mainly due to influenza A(H1N1)pdm09.

## Risk assessment for the remainder of the influenza season (as of week 3/2016)

- Based on the situation in the first affected EU/EAA countries and elsewhere, high ILI/ARI rates with similar intensity in primary care services are expected to be observed in countries where rates are still at low levels.
- Type A viruses are highly likely to be more prevalent than B viruses in most countries, but B viruses could emerge and become dominant later in the season.
- Among A viruses, A(H1N1)pdm09 appears likely to dominate. Influenza A(H3N2) viruses have been detected at low levels in all EU/EAA countries to date this season.
- There are strong indications in some EU/EAA countries that A(H1N1)pdm09 virus is responsible for a large number of severe hospitalised cases of influenza, particularly in intensive care units, with severe outcomes in risk groups but also in otherwise healthy young adults.
- High or increasing prevalence of B/Victoria/2/87 virus has been observed; this virus is likely to co-circulate or dominate later this season.
- Because the compositions of the southern hemisphere influenza vaccine in 2015 and the northern hemisphere influenza vaccine in 2015–2016 are identical, the estimate from New Zealand of 50% vaccine effectiveness against hospitalisations is encouraging. The higher proportion of B/Victoria viruses in Europe, however, which are not included in the trivalent inactivated vaccine, may lower the overall influenza vaccine effectiveness. It is also uncertain, if the newly circulating subgroup of A(H1N1) virus – which is antigenically similar but genetically distinct from the vaccine strain – might compromise vaccine effectiveness against this strain.
- In addition, compared to the southern hemisphere, a higher proportion of B/Victoria viruses (which are not included in the trivalent inactivated vaccine, the most widely used vaccine in Europe) may also contribute to a lower overall influenza vaccine effectiveness.

## ECDC's scientific and public health advice

### Simple protective measures

Self-isolation, hand-washing and good respiratory hygiene/cough etiquette are effective and simple measures to be recommended to reduce transmission and to protect individuals against infection. However, strict compliance to these measures is difficult to implement.

### Vaccination

Vaccination remains the best documented and most effective preventive measure against influenza. Circulating A(H1N1)pdm09 viruses have not been shown to be distinct from the vaccine strain. The A(H3N2) component of the vaccine should give cross-reactivity to the 3C.2a viruses circulating in the majority of countries. However, the

majority of circulating B viruses belong to the lineage B/Victoria which is distinct from the vaccine strain B/Yamagata-lineage virus in the trivalent vaccine, which is the most widely used vaccine in Europe.

Currently, none of the EU Member States achieve the 75% target of vaccination coverage for the elderly and the risk groups. EU Member States should consider strengthening the implementation of influenza vaccination programmes. For this season, where still available and offered, vaccination programmes should specifically strengthen efforts to reach the working-age adults in the risk groups.

## Antivirals

Early treatment and post-exposure prophylaxis with antivirals (neuraminidase inhibitors) can assist in protecting the elderly and people in risk groups against serious influenza illness. The circulating viruses analysed so far show susceptibility to the antiviral drugs oseltamivir and zanamivir. As advised during previous seasons, physicians should always consider early treatment (i.e. within 48 hours of symptom onset for oseltamivir and 36 hours for zanamivir) or post-exposure prophylaxis with neuraminidase inhibitors when treating influenza-infected patients and exposed individuals who belong to risk groups.

ECDC will publish an expert opinion on the efficacy and effectiveness of neuraminidase inhibitors for public consultation in early February.

## Surveillance

Surveillance of severe cases should be implemented in countries where such monitoring does not exist. This would facilitate timely public health assessment to communicate and inform the public as well as clinicians about the situation. ECDC strongly encourages more EU Member States to report ICU-admitted, laboratory-confirmed influenza cases to the European Surveillance System (TESSy) in a timely fashion in order to facilitate the assessment of the severity of the season.

## Conclusions

- The influenza season started in week 52/2015 in EU/EAA countries, the same week as in the 2014/2015 season.
- ILI/ARI rates are increasing in primary care in almost all countries.
- Influenza A(H1N1)pdm09 virus is dominant in most countries, with influenza B also circulating. A switch between these two types, with B dominating, is possible later in the season.
- In some EU/EAA countries, A(H1N1)pdm09 virus is responsible for hospitalisations, particularly in intensive care units, with severe outcomes in young adults without any underlying medical conditions and in risk groups.
- High or increasing prevalence of B/Victoria/2/87 lineage viruses could also be associated with hospitalised severe cases now or later this season.
- The vaccine effectiveness of the trivalent influenza vaccine, the most widely used influenza vaccine in Europe, is expected to be lower than in the 2015 season in New Zealand because of the higher prevalence of B/Victoria virus in Europe, a virus which is not included in the trivalent vaccine. In addition, the increasing emergence of a new genetic subgroup of A/H1N1 virus may reduce influenza vaccine effectiveness.

## References

1. European Centre for Disease Prevention and Control and WHO Regional Office for Europe. Flu News Europe. [Internet]. 2016 [cited 2016 Feb 2]. Available from: <http://flunewseurope.org/>
2. Government of Canada. FluWatch report. [Internet]. 2016 [cited 2016 Feb 2]. Available from: <http://healthycanadians.gc.ca/publications/diseases-conditions-maladies-affections/fluwatch-2015-2016-03-surveillance-influenza/index-eng.php>
3. Centers for Disease Control and Prevention. Situation Update: Summary of Weekly FluView Report. [Internet]. 2016 [cited 2016 Feb 2]. Available from: <http://www.cdc.gov/flu/weekly/summary.htm>
4. World Health Organization. WHO FluNet. [Internet]. 2016 [cited 2016 Feb 2]. Available from: [www.who.int/flunet](http://www.who.int/flunet)
5. Barr IG, Vijaykrishna D, Sullivan SG. Differential age susceptibility to Influenza B/Victoria lineage viruses in the 2015 Australian influenza season. *Euro Surveill*. 2016;21(4)
6. World Health Organization. Weekly Epidemiological Record (WER). South America 2015. 27 November 2015, vol. 90, 48. Available from: <http://www.who.int/entity/wer/2015/wer9048.pdf>
7. World Health Organization. WHO recommendations on the composition of influenza virus vaccines. [Internet]. 2016 [cited 2016 Feb 2]. Available from: <http://www.who.int/influenza/vaccines/virus/recommendations/en/>
8. European Centre for Disease Prevention and Control. Seasonal influenza vaccination in Europe – Overview of vaccination recommendations and coverage rates in the EU Member States for the 2012–13 influenza season. Stockholm: ECDC; 2015. Available from: <http://www.ecdc.europa.eu/en/publications/Publications/Seasonal-influenza-vaccination-Europe-2012-13.pdf>
9. Bissielo A, Pierse N, Huang Q, Thompson M, Kelly H, Mishin H et al. Effectiveness of seasonal influenza vaccine in preventing primary care visits and hospitalisation in Auckland, New Zealand in 2015: interim estimates. *EuroSurveill* 2016;21(1)
10. Taiwan CDC. Taiwan Influenza Express. 2016, week 3 (2016/1/17–2016/1/23). Available from: <http://www.cdc.gov.tw/english/info.aspx?treeid=00ed75d6c887bb27&nowtreeid=9da60c21712d45c4&tid=7BA2265A9214A66E>
11. EuroMOMO. Mortality monitoring in Europe. European mortality bulletin, week 4–2016 [Internet]. 2016 [cited 2016 Feb 2]. Available from: <http://www.euromomo.eu/>

## Annex. Questionnaire

### Questions for the 2015–2016 influenza season

(Please **highlight** the most appropriate answer/s and/or fill in the dotted sections.)

**Question 1:** Are current pressures on primary care due to respiratory illness different from the corresponding time after onset of the season in...

...2014–2015?    A. The same    B. More than in 2014–2015    C. Less than in 2014–2015.

...2013–2014?    A. The same    B. more than in 2013–2014    C. less than in 2013–2014.

No information.

Any further comments? ...

**Question 2:** Are you aware of marked geographic heterogeneity (more pressure in some part(s) of the country) than in previous seasons?

Yes

No

If yes, could you further specify? ...

**Question 3:** If influenza outbreaks/clusters are monitored:

The number of influenza outbreaks (or clusters) is...

A. ...the same    B. More than in 2014–2015    C. Less than in 2014–2015    D. Data not available

The number of influenza outbreaks (or clusters) in schools is...

A. ...the same    B. More than in 2014–2015    C. Less than in 2014–2015    D. Data not available

The number of influenza outbreaks (or clusters) in long-term care facilities is

A. ...the same    B. More than in 2014–2015    C. Less than in 2014–2015    D. Data not available

Please provide details on the affected groups (e.g. age group of school children, those with intellectual disabilities, the elderly, migrants/refugees, etc.) ...

**Question 4:** Which (sub-)types are mostly circulating in primary care? ...

To which clade/lineage do these viruses belong? ...

Has any variant strain been detected based on antigenic or genetic characterisation? ...

If yes, which clade/lineage? ...

Additional comments: ...

**Question 5:** Is the current pressure on secondary care (hospital admissions, intensive care units, deaths) due to influenza-related respiratory illness different from the pressure experienced during the corresponding time after onset of the season in...

...2014–2015?    A. Same    B. More than in 2014–2015    C. Less than in 2014–2015

...2013–2014?    A. Same    B. More than in 2013–2014    C. Less than in 2013–2014

No information.

Any further comments? ...

**Question 6:** Describe the age groups experiencing severe influenza disease compared to...

...2014–2015.    A. Same age    B. Older than in 2014–2015    C. Younger than in 2014–2015

...2013–2014.    A. Same age    B. Older than in 2013–2014    C. Younger than in 2013–2014

No information.

If there are differences, what are they? ...

**Question 7:** Which (sub-)types are mostly circulating in secondary care? ...

To which clade/lineage characterised viruses do these viruses belong? ...

Has any variant strain been detected based on antigenic or genetic characterisation?

If yes, which clade/lineage: ...

Additional comments: ...

**Question 8:** How many (%) of ICU admissions/deaths associated with influenza had been vaccinated?

%: ...

I do not know.

**Question 9:** Do you have any information on immunisation coverage for influenza in 2015–2016?

No

Yes

If yes: Is coverage higher or lower (compared to previous season): ...

**Question 10:** Are there any other features that you think deserve attention?

Clinical picture: ...

Detected viruses: ...

Vaccine/antivirals: ...

**Question 11:** Is it too early to answer all or any of the questions?

No

Yes

If yes, I will send an updated questionnaire later.

**Question 12:** Have you recently changed or updated your surveillance system?

Yes

No

If yes, please describe the change. ...

Further comments? ...