Seasonal influenza

Reporting on 2014 data retrieved from TESSy* on 10 September 2015

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Key facts

- Influenza activity started in week 50/2014 and lasted until week 20/2015, as in the previous season.
- Compared with the previous season, nine EU/EEA countries reported higher peak ILI rates in primary care.
- In almost all countries, the season was dominated by influenza A(H3N2) viruses.
- Influenza B virus circulation increased following the decline of influenza A virus circulation.
- Antigenic and genetic drift of influenza A(H3N2) virus concurred with low vaccine effectiveness.
- A very low number of the influenza A viruses showed evidence of reduced susceptibility to neuraminidase inhibitors.
- Almost 50% of all ICU cases were 65 years or older, mainly infected by A(H3N2); during the previous season,
which was dominated by A(H1N1)pdm09, this age group represented one third of all ICU cases.
- Among 14 European countries reporting to EuroMOMO, significant excess winter mortality from all causes – concomitant with influenza activity – was observed among persons aged 65 years and above.
- Overall, the 2014–2015 influenza season was severe compared to previous years.

Methods

Click here for a detailed description of the methods used to produce this annual report.

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

Influenza surveillance is based on weekly data reported by sentinel general practitioners (in some countries also other physicians, such as paediatricians) and national influenza reference laboratories from week 40 to week 20 the following year. Data are sent to The European Surveillance System (TESSy) database at ECDC.

These data include:

1. The aggregate number of influenza-like illness (ILI) and/or acute respiratory infection (ARI) cases seen by sentinel physicians† (Annex 1). Each country also reports denominator data (population covered by sentinel surveillance) to enable calculation of weekly ILI and ARI consultation rates.

2. Three qualitative indicators of influenza activity: intensity, geographic spread and trend. Intensity, ranging from low to very high, is an indicator of the level of influenza activity. Geographic 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.

3. 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 (Annex 1). Overall positivity rates of sentinel

* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

† ILI and a denominator were reported by Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Estonia, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, and the UK. ARI and a denominator were reported by Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Germany, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Romania, Slovak Republic, Slovenia, and the UK.

specimens are used to estimate the influenza activity [1, 2], and an arbitrary 10% cut-off point is considered to indicate the seasonal epidemic.

4. Aggregate antigenic and genetic characterisation and disaggregate antiviral susceptibility data for a subset of influenza viruses detected both in sentinel and non-sentinel specimens (Annex 1).

5. Case-based hospital data reported by a subset of countries on a voluntary basis: Finland, France, Ireland, Romania, Slovakia, Spain, Sweden, and the UK (Annex 1).

Since the 2014–2015 season, influenza surveillance is jointly coordinated by ECDC and WHO Regional Office for Europe. The population under surveillance includes the 53 countries of the WHO European Region and results are disseminated through a joint bulletin (www.FlunewsEurope.org). For the purpose of this report, data from 30 EU/EEA countries are presented. Archived weekly data of the 2014–2015 season are available at http://www.flunewseurope.org/Archives. This report also uses data from the EuroMOMO project, which monitors weekly mortality data in Europe.

Epidemiology

Sentinel surveillance

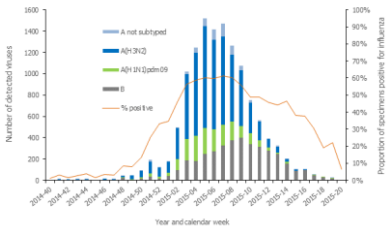
The proportion of sentinel specimens testing positive for influenza virus crossed the 10% threshold in week 50/2014, reached its highest level between week 5/2015 and 8/2015 – with a maximum of 61% in week 7/2015 – and returned to baseline level in week 20/2015 (Figure 1). In week 7/2015, ten countries reported high or very high influenza intensity, the highest number of countries for the season.

Compared to the previous season, peak ILI rates were higher in Austria, Cyprus, Czech Republic, Greece, Hungary, Iceland, Latvia, the Netherlands and Spain.

Young patients (0–4 and 5–14 years) were the most affected in the majority of countries reporting ILI/ARI by age group. However, in the UK, particularly in Scotland and Wales, ILI rates of young adults and the elderly (15–64 and ≥ 65 years) were higher than in children and adolescents.

During the period, 28 177 sentinel specimens were tested, and 12 798 (45%) were positive for influenza. Of the positive specimens, 8 950 (70%) were type A and 3 848 (30%) were type B. Of 8 351 A viruses subtyped, 6 529 (78%) were A(H3N2) and 1 822 (22%) were A(H1N1)pdm09 virus. Of 1 215 influenza B viruses ascribed to lineage, 1 191 (98%) were B(Yamagata) and 24 (2%) were B(Victoria). A(H3N2) virus dominated the season until past its peak. The circulation of B virus increased from early 2015 onward. From week 11/2015, influenza B virus became dominant in most countries.

Figure 1. Weekly proportion of sentinel specimens positive for influenza virus and number of detections by type and subtype, EU/EEA, 2014–2015



Characterisations and antiviral susceptibility

All A(H1N1)pdm09 viruses characterised antigenically and genetically were similar to the components of the influenza vaccine recommended for the 2014–2015 season [3].

Of the 1 017 influenza A(H3N2) viruses antigenically characterised, 743 (73%) were dissimilar to the vaccine virus (A/Texas/50/2012). In addition, 53 A(H3N2) viruses were not attributable to any category. Of 1 225 A(H3N2) viruses genetically characterised, 823 (67%) fell in genetic groups with antigenic properties dissimilar to the vaccine virus.

The main circulating lineage of B viruses was Yamagata. Of the 461 influenza B (Yamagata) lineage viruses genetically characterised and attributed to a clade, 99% were dissimilar to the vaccine virus (B/Massachusetts/2/2012) and close to B/Phuket//3073/2013 virus. Also, one B (Yamagata) lineage virus was not attributed to a clade. Similarly, 83% of the 874 B (Yamagata) lineage viruses attributed to a category were antigenically dissimilar to the vaccine strain. Additionally, 37 B/(Yamagata-lineage) viruses were not attributed to a category.

Phenotypic and genotypic testing for neuraminidase inhibitors was conducted on 2 956 and 2 932 circulating viruses for oseltamivir and zanamivir respectively. Ten viruses, five A(H3N2) and five A(H1N1), showed evidence of reduced susceptibility to oseltamivir or zanamivir.

Hospitalisations due to influenza

Eight countries reported a total of 5 835 laboratory-confirmed hospitalised influenza cases during the 2014–2015 influenza season, with France, Spain and the UK accounting for 4 484 (76%) of all cases (Table 1). The level of care was known for 2 710 patients (from a total of four countries), of whom 23% were admitted to an intensive care unit.

Table 1. Number of hospitalised laboratory-confirmed influenza cases by season, country and level of care, eight EU countries, 2014–2015

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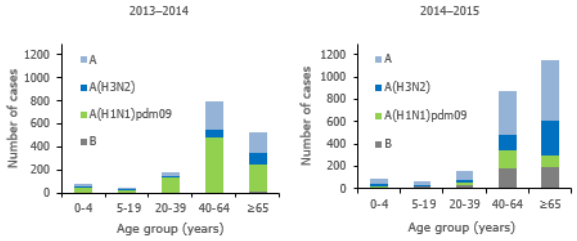
Country	2014–2015			
	General care	ICU	Unknown	Total
Finland		33		33
France		1 549		1 549
Ireland	922	43		965
Romania	107	45		152
Slovakia	17	7	1	25
Spain	1 048	521	154	1 723
Sweden		176		176
UK		1 212		1 212
Total	**2 094**	**3 586**	**155**	**5 835**

In 2014–2015, 80% of influenza cases reported from ICUs were infected with influenza type A and 20% with type B. Of influenza A viruses subtyped, 35% were influenza A(H1N1)pdm09 and 65% were A(H3N2). In 2013–2014, A(H1N1)pdm09 virus predominated among ICU cases with known subtype, while type B was virtually absent.

Of all ICU cases, 49% were 65 years or older in 2014–2015 while in 2013–2014, this age group represented 32% (Figure 2).

Figure 2. Number of cases admitted to selected intensive care units by (sub-)types and age groups; Finland, France, Ireland, Romania, Slovakia, Spain, Sweden and the United Kingdom, 2013–2014 and 2014–2015



All-cause excess mortality

In 15 European countries that report mortality data to the EuroMOMO project, an excess winter mortality rate of 231.3 per 100 000 above the seasonal baseline was observed. This excess was noted for more than 11 consecutive weeks and was the highest of the last five winter seasons. The observed excess coincided with influenza activity as determined by the weekly proportion of influenza-positive sentinel specimens reported to ECDC [4, 5]. This excess roughly corresponds to 217 000 deaths among the 94 million elderly citizens (65 years of age or older) of the 28 EU Member States.

Discussion

The start and duration of the influenza season was similar to previous seasons (week 50/2014 to week 20/2015), but higher sentinel ILI consultation rates were observed in nine EU countries compared with the previous season.

Influenza A(H3N2) viruses predominated in almost all reporting countries, followed by an increasing dominance of B viruses when the circulation of A(H3N2) viruses declined. Both virus types were detected in severe hospitalised influenza cases. Almost half of all ICU cases were 65 years of age or older, as opposed to the previous season which was dominated by A(H1N1)pdm09 (one third of ICU cases).

In addition to a significant increase in ICU-admissions, a particularly high excess all-cause excess mortality in the elderly, concomitant with influenza activity, was reported to EuroMOMO. Therefore, overall, the 2014–2015 season was severe compared with the mild 2013–2014 season.

Due to the mismatch between vaccine and circulating strains, estimates of vaccine effectiveness – especially against A(H3N2) and B(Yamagata) viruses – were low [6, 7].

A negligible number of influenza A viruses showed a reduced susceptibility to neuraminidase inhibitors.

The characterisation data and the subsequent low estimates of vaccine effectiveness caused WHO to change the recommended composition of the 2015–2016 vaccine [8].

Public health conclusions

Based on the past season, several public health conclusions can be drawn:

The continuous antigenic and genetic monitoring and central reporting of viruses confirmed the drift of A(H3N2) viruses away from the vaccine virus. A low vaccine effectiveness due to a vaccine mismatch was anticipated at the start of the season and was rapidly confirmed by mid-season results published in peer-reviewed journals [6, 7, 9, 10]. Such early estimates of vaccine effectiveness enabled timely communication of the importance of antiviral treatment and prophylaxis in particular target groups, and preparedness for pressures within the healthcare sector.

In primary care settings, the peak ILI rates in outpatients were higher in nine countries than in previous seasons. An excess mortality from all causes associated with influenza activity was observed in 14 countries, suggesting that the season had been severe. However, this assessment is hampered by the fact that the data are not well suited for comparisons between countries. Future assessments of severity would benefit from further harmonisation of reporting. Also in need of harmonisation are the criteria used to determine the severity level of an influenza season.

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Additional information

ECDC Surveillance Atlas of Infectious Diseases

Seasonal influenza: latest surveillance data

Previous reports

Season 2013–2014
http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List=4f55ad51-4aed-4d32-b960-af70113dbb90&ID=1134

Season 2012–2013
http://ecdc.europa.eu/en/publications/Publications/Respiratory-tract-infections-annual-epidemiological-report-2014.pdf

Season 2011–2012
http://ecdc.europa.eu/en/publications/Publications/annual-epidemiological-report-2013.pdf

Season 2010–2011
http://ecdc.europa.eu/en/publications/Publications/Annual-Epidemiological-Report-2012.pdf

Season 2009–2010
http://ecdc.europa.eu/en/publications/Publications/1111_SUR_Annual_Epidemiological_Report_on_Communicable_Diseases_in_Europe.pdf

Season 2008–2009
http://ecdc.europa.eu/en/publications/Publications/1011_SUR_Annual_Epidemiological_Report_on_Communicable_Diseases_in_Europe.pdf

Season 2007–2008
http://ecdc.europa.eu/en/publications/Publications/0910_SUR_Annual_Epidemiological_Report_on_Communicable_Diseases_in_Europe.pdf

Season 2006–2007
http://ecdc.europa.eu/en/publications/Publications/0812_SUR_Annual_Epidemiological_Report_2008.pdf

Season 2005–2006
http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=2940

Season 2004–2005
http://ecdc.europa.eu/en/publications/Publications/0706_SUR_Annual_Epidemiological_Report_2007.pdf

Risk assessment – Seasonal influenza in the EU/EEA countries, 2014–2015, Jan 2015
http://ecdc.europa.eu/en/publications/Publications/seasonal-influenza-risk-assessment.pdf

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http://ecdc.europa.eu/en/publications/Publications/influenza-virus-characterisation-june-2015.pdf

ECDC. Seasonal influenza vaccination in Europe – 2015
http://ecdc.europa.eu/en/publications/Publications/Seasonal-influenza-vaccination-Europe-2012-13.pdf

Annex. Surveillance systems overview

Table: Surveillance systems overview, 2014–2015

Download Excel version (clinical and virological data, laboratory-confirmed hospitalised influenza cases, antiviral resistance)