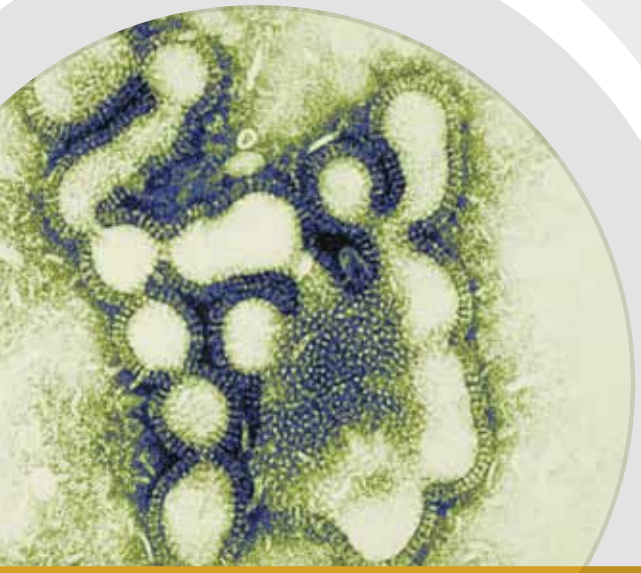

TECHNICAL REPORT

Seasonal influenza vaccination and antiviral use in EU/EEA Member States

Overview of vaccine recommendations for 2017–2018 and vaccination coverage rates for 2015–2016 and 2016–2017 influenza seasons

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This report was commissioned by the European Centre for Disease Prevention and Control (ECDC), coordinated by Suzanne Cotter, (Health Protection Surveillance Centre, Ireland), Kari Johansen and Svetla Tsolova (both ECDC); and produced by Jolita Mereckiene

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Note
This report is based on data from a seasonal influenza vaccination survey for the 2015–16, 2016–17 and 2017-18 influenza seasons in EU/EEA countries. The survey was conducted by the Vaccine European New Integrated Collaboration Effort III (VENICE), in collaboration with the European Centre for Disease Prevention and Control (ECDC).

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Suggested citation: European Centre for Disease Prevention and Control. Seasonal influenza vaccination and antiviral use in EU/EEA Member States – Overview of vaccine recommendations for 2017–2018 and vaccination coverage rates for 2015–2016 and 2016–2017 influenza seasons. Stockholm: ECDC; 2018.

Stockholm, November 2018

ISBN 978-92-9498-296-4
DOI 10.2900/721517
Catalogue number TQ-07-18-097-EN-N

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Abbreviations

HCW	Healthcare worker
NAP	National action plan
NITAG	National Immunisation Technical Advisory Group
IIV3	trivalent inactivated influenza vaccine
IIV4	quadrivalent inactivated vaccine
ILI	influenza-like illness
LAIV4	quadrivalent live attenuated vaccine
VENICE	Vaccine European New Integrated Collaboration Effort
CINECA	Consortium at the University of Bologna, Italy
GP	General practitioner
VCR	Vaccination coverage rates

Summary

In the European Union (EU) and European Economic Area (EEA) Member States with a temperate climate influenza disease occurs as regular annual winter epidemics. The annual epidemics, which are associated with significant morbidity and mortality, vary in size and affected age group depending on the dominant circulating influenza viruses. Severe illness and complications are more common in certain risk groups, such as those with chronic medical conditions (e.g. cardiovascular, respiratory, renal and hepatic diseases, diabetes mellitus, immunosuppression due to disease or treatment, obesity, children and teenagers on long-term aspirin therapy) and individuals aged 65 years and above. The main public health intervention to prevent influenza disease and its complications is vaccination, complimented by use of antivirals as prophylaxis for some groups of vulnerable individuals not able to respond to vaccination. To protect such vulnerable individuals and reduce transmission, vaccination is also recommended for healthcare workers (HCWs). Traditionally, updated seasonal vaccines contain three influenza strains selected by the World Health Organization (WHO) in a trivalent inactivated influenza vaccine (IIV3). Recent vaccine developments have resulted in quadrivalent inactivated (IIV4) and live attenuated (LAIV4) vaccines containing two influenza A strains (from H1N1 and H3N2 subtypes) and two influenza B strains (from Yamagata and Victoria lineages) becoming available in more and more Member States. In addition, adjuvanted and high-dose vaccines are increasingly accessible and vaccines based on newer technologies are expected to become available on the EU/EEA market in the near future.

A survey was circulated in January 2018 to provide an update on seasonal influenza immunisation policies in 2017–18 and obtain vaccination coverage rates in EU/EEA Member States for the 2015–16, 2016–17 and 2017-18 (if available) influenza seasons. In addition, the survey mapped methods of monitoring vaccination coverage, vaccine dose number procured, payment mechanisms for vaccine and vaccine administration, vaccine products recommended by population groups and complementary antiviral use for treatment or prophylaxis in vaccinated and unvaccinated individuals. Experts in each Member State entered data directly online. A total of 31 Member States were invited to participate in the survey and 30 responded. Austria did not respond to the survey. The United Kingdom provided data separately for England, Northern Ireland, Scotland and Wales.

Of 30 responding Member States, all recommended seasonal influenza vaccination for older age groups, albeit with different age thresholds. Twenty-two of them had influenza vaccine recommendations for those aged ≥65 years. Hungary, Germany, Greece, Iceland and the Netherlands recommended vaccination for those aged ≥60 years; Slovakia recommended vaccination for those aged ≥59 years and in Malta and Poland vaccine was recommended for those aged ≥55 years.

Six Member States recommended vaccination for children/adolescents <18 years of age: in the United Kingdom-Northern Ireland and United Kingdom-Scotland vaccine was recommended for children aged 2 to 11 years; in England for those aged 2 to 7 years and in Wales for those aged 2 to 8 years; in Latvia and Slovenia for children aged ≥6 months to 2 years; in Finland for children ≥6 months and up to 3 years; in Malta for children between 6 months and 5 years, and in Slovakia for children aged ≥6 months to 12 years.

Of 30 responding Member States, 29 recommended influenza vaccinations for HCWs; 23 of these had recommendations in place to vaccinate all HCWs; five recommended vaccination only for certain HCWs. In Scotland, vaccine was offered to all HCWs, while England and Wales recommended that HCWs in direct contact with patients should be vaccinated. In Northern Ireland the Department of Health recommends vaccine for HCWs having direct contact with patients although hospitals may choose to offer the vaccine to all of their staff.

All Member States recommended that people whose immune systems are suppressed due to diseases or treatment, metabolic disorders, chronic pulmonary, cardiovascular and renal diseases should receive influenza vaccination. Twenty-eight Member States recommended that those infected with HIV should be vaccinated and twenty-six recommended that people with liver disease should be vaccinated. Twenty Member States had recommendations in place to vaccinate those who are morbidly obese and fifteen Member States recommended vaccination for people taking aspirin on a long-term basis (children <18 years of age).

Of 30 responding Member States, 28 recommended vaccination of pregnant women. Nineteen Member States recommended vaccination for all pregnant women; three recommended vaccination of pregnant women in the second and third trimester of pregnancy only, and two recommended vaccination only for pregnant women with chronic medical conditions. In four Member States vaccination was recommended for all healthy pregnant women in the second and third trimesters of pregnancy and women with chronic medical conditions were recommended vaccination during the first trimester of pregnancy.

Vaccination coverage rates in 2016–17, which were measured through an analysis of administrative data or estimated by survey methods, were known in 19 Member States (Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom) for older target populations and ranged from 2.0% to 72.8% (median 47.1%). The coverage among HCWs was known in 12 Member States (Belgium, Estonia, Greece, Hungary, Ireland, Italy,

Lithuania, Norway, Portugal, Romania, Spain, and the United Kingdom) and ranged from 15.6% to 63.2% (median 30.2%). The coverage for those with chronic medical conditions was provided by seven Member States (Czech Republic, France, Ireland, the Netherlands, Norway, Portugal, and the United Kingdom) and ranged from 15.7% to 57.1% (median 44.9%). The coverage for pregnant women was known in nine Member States (Belgium, Finland, Hungary, Ireland, Italy, Lithuania, Romania, Slovenia, and the United Kingdom) and ranged from 0.5% to 58.6%, (median 25.0%). Five Member States were able to report vaccination coverage rates for residents of long-term care facilities (93.5% in Ireland, 81% in Portugal, 46.7% in Romania, 70.5% in Slovakia, and 49.7% in United Kingdom-Wales).

The predominant payment mechanism for influenza vaccinations[i], as reported by Member States, was through national health services (or equivalent) for those population groups for whom seasonal influenza vaccine was recommended (children, adolescents, older adults, those with chronic medical conditions, pregnant women, HCWs and members of closed communities).

The most common vaccine used for targeted population groups in 2017–18 was trivalent inactivated (non adjuvanted) influenza vaccine (IIV3), which was used in 27 out of 30 EU/EEA countries, with Estonia and Hungary as the exceptions. In addition to IIV3, 13 countries also used quadrivalent inactivated (non adjuvanted) influenza vaccine (IIV4). Estonia used only quadrivalent inactivated (non adjuvanted) influenza vaccine (IIV4) used quadrivalent inactivated (non adjuvanted) influenza vaccine (IIV4) in adults. Inactivated (adjuvanted) trivalent influenza vaccine (aIIV3) was used in Germany (MF59), Hungary (aluminium phosphate),Italy (MF59), Liechtenstein (MF59) and Spain (MF59). Quadrivalent live attenuated (non-adjuvanted) nasal vaccine (LAIV4) was used for children in Finland, Germany, Norway, Sweden and the United Kingdom [England, Northern Ireland, Scotland and Wales]. Of the 30 EU/EEA Member States that responded, 18 provided data on the number of seasonal influenza vaccine doses purchased, distributed or used.

Treatment of in-patients with antivirals was recommended in 20 Member States for severe complicated influenza-like illness (ILI) and in 18 Member States for progressive ILI. Out-patient treatment was recommended for those <5 years and those ≥65 years of age in eight and 15 Member States, respectively. Eleven Member States had treatment recommendations for individuals with chronic medical conditions, nine for pregnant women and also for residents in long-term care facilities.

Eleven and seven Member States recommended chemoprophylaxis in influenza outbreak situations for unvaccinated residents of long-term care facilities and unvaccinated HCWs, respectively. Post-exposure chemoprophylaxis was recommended for unvaccinated close contacts of at-risk individuals (five Member States) and HCWs (three Member States).

In conclusion, the results of this survey indicate that most Member States have clear recommendations on which population groups should receive seasonal influenza vaccine - i.e. those with chronic medical conditions, pregnant women, older age groups, and HCWs. However, there was a notable discrepancy between having recommendations and being able to monitor and report vaccination coverage among all risk and target groups, particularly among those with chronic medical conditions and pregnant women. In fact, less than a quarter of EU/EEA Member States are able to do so. Just under half of the Member States were able to report on vaccination coverage for HCWs.

Although there has been widespread consensus for many years that older age groups should be vaccinated, only one Member State almost reached the EU target of 75% in the 2015–2016 and 2016–17 influenza seasons. As the ability to monitor vaccination coverage is a key component of any vaccination programme, all Member States may need to reconsider their approach in order to collect more comprehensive and accurate information on vaccination coverage for all targeted population groups. Member States that do not monitor vaccination coverage among older age groups are encouraged to implement age- and target group-specific coverage/monitoring systems in accordance with national recommendations to enable them to track their progress in reaching recommended groups and/or identifying obstacles to achieving national and EU targets.

This survey demonstrates the major change in the use of seasonal influenza vaccines from trivalent to quadrivalent inactivated vaccines. The predominant vaccine product used in almost all countries during the 2017–18 influenza season was trivalent inactivated vaccine, followed by the quadrivalent inactivated vaccine, which was used by approximately one third of countries. The use of adjuvanted inactivated vaccines in older age groups is starting to spread in Member States as well as the use of live attenuated vaccines in children, either through target group or universal immunisation programmes.

Most countries recommend antiviral use for treatment of influenza; however recommendations on antiviral use for prophylaxis of influenza are not common among Member States. One third of Member States have not developed a policy on the use of influenza antivirals.

i 'Vaccination' means both cost factors: the vaccine itself and the administration of the vaccine.

Introduction

Influenza is a contagious viral respiratory infection, which typically occurs as an epidemic during the winter months in the northern hemisphere. Although the illness caused by influenza is often self-limiting, it can have considerable impact on an individual's daily life. At a population level, large numbers of cases with mild to moderate illness increase demands on health services and decrease productivity in the workforce, with associated economic cost and social disruption [1–5]. Approximately 30% of the communicable disease burden is due to influenza [6]. Each season, tens of thousands are hospitalised due to complications and thousands of patients are admitted to intensive care across the EU/EEA [7,8]. The number of people affected varies from year to year, making it hard to predict the annual impact including demands on health services, overall economic impact or annual number of deaths. ECDC estimates that on average nearly 40 000 people die prematurely each year from influenza in EU/EEA countries [9].

Vaccination remains the most effective public health intervention to mitigate and prevent seasonal influenza [10]. EU/EEA policy on influenza vaccination is to protect people at higher risk of severe disease and complications, either directly through vaccination, or indirectly by vaccinating subgroups (e.g. HCWs or children) that are likely to infect those at higher risk of influenza, as emphasised in the 2009 Council recommendation [11]. In 2012, the WHO Strategic Advisory Group of Experts on immunisation (SAGE) extended their recommendation to include pregnant women and added that the expansion of programmes for children under five years, and children under two years in particular, should be considered due to the high burden of disease and transmission from this age group [12]. Hence, the vaccination policy in several Member States has been extended to introduce universal vaccination of children of different age groups – e.g. in Finland and the United Kingdom. The aim of the universal programmes for children is to lower the public health impact of influenza by providing direct protection to children, helping to prevent a large number of influenza cases in children and providing indirect protection by lowering influenza transmission from children to other children, adults and those in the clinical risk groups of any age. In addition, this will help reduce cases of severe influenza and influenza-related deaths in older adults and people with clinical risk factors [13,14].

The primary indicator of success in implementation of vaccination programmes is a high vaccination coverage rate (VCR) - i.e. the proportion of targeted populations who have been vaccinated. In December 2009, the European Council unanimously recommended that influenza vaccination coverage in all at-risk groups should reach 75% in all EU countries by the 2014–15 influenza season [11]. Risk groups were defined in accordance with guidance from ECDC and World Health Organization: 'older' individuals (often defined as those aged ≥65 years) and people of all ages ≥6 months with chronic medical conditions [15,16]. Due to observed suboptimal vaccine effectiveness of the trivalent inactivated seasonal influenza vaccines [17–19] in recent years, significant research efforts have resulted in a broader range of seasonal influenza vaccines and vaccination strategies. Studies are currently being undertaken to assess whether they offer improved impact.

The 2009 EU Council recommendation (hereinafter Council Recommendation) encouraged Member States to adopt and implement national, regional or local action plans or policies to improve seasonal influenza VCR (including for HCWs) and to measure coverage in all risk groups. Countries were also encouraged to report on a voluntary basis to the European Commission on the implementation of the recommendation. ECDC-supported VENICE surveys have been identified as being an effective way of doing this. These surveys offer an established mechanism to monitor implementation, with several surveys already conducted before and after the Council Recommendation was issued [11].

Aim and objectives

The aim of this survey was to update information on seasonal influenza immunisation policies for the 2017–18 influenza season in EU/EEA Member States and collect vaccination coverage rates for the 2015–16 and 2016–17 influenza seasons and, if available, 2017–18 in order to see whether the EU target of 75% was being met in all at-risk or targeted groups.

Specific objectives

- Identify policy recommendations for the 2017–18 seasonal influenza vaccination for different targeted groups, based on age, medical risk, and profession;
- Obtain the 2015–16, 2016–17 and 2017–18 (if available at the time of survey) influenza vaccination coverage rates for the above groups;
- Obtain information on national vaccine procurement and distribution of seasonal influenza vaccines, payment mechanisms used for seasonal influenza vaccination and vaccine products available and recommended by population groups during the 2017–18 season;
- Identify policy recommendations for the 2017–18 season for the use of antiviral agents in the treatment and prophylaxis of influenza.

Methodology

Study design

The survey was carried out via a web-based platform with protected access restricted to appointed experts from all EU/EEA Member States. This survey was a collaborative study conducted by ECDC, the Vaccine European New Integrated Collaboration Effort (VENICE) Project and the EU/EEA Member States. At present, 28 EU (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Spain, Slovakia, Slovenia, Sweden and the United Kingdom) and three EEA (Iceland, Norway, and Liechtenstein) Member States participate in VENICE.

Data collection

A standardised questionnaire, using predominantly close-ended questions, was completed in January 2018. The questionnaire was grouped into thematic sections to make it easier to complete. Each section could be completed separately. Information was sought on population groups recommended for influenza vaccination (age, occupation, chronic medical conditions or social situation) and the method used to monitor vaccination coverage. Information was also sought on recent vaccination coverage in specific population groups, payment mechanisms for vaccine and administration, and vaccination settings. Information was also collected on antiviral agents used and recommended by EU/EEA Member States during the season. In this report, we summarise collected data on seasonal influenza vaccine recommendations, reported VCR, payment mechanisms, and use of vaccine products and antivirals.

Pilot testing

In order to assess if questions were understandable, acceptable and consistent throughout all sections, the questionnaire was pilot-tested in December 2017 by leading VENICE project partners. After the pilot testing, the questionnaire was reviewed and amended, taking on board comments from the partners.

Data handling

The finalised electronic questionnaire was uploaded to the VENICE website in January 2018 and open for input from all participating countries (http://venice.cineca.org). The questionnaire was completed by appointed experts from VENICE participating countries. Non-responding Member States were followed up individually. The data were analysed in March–April 2018, and a final report was completed in September 2018.

Data analysis

A descriptive analysis was carried out, summarising data by calculating frequencies or proportions of responses by EU/EEA Member States and population groups targeted for seasonal influenza vaccination. VCRs were calculated as proportions – the number of vaccinated individuals (numerator) divided by the total number of individuals in the population groups targeted for vaccination (denominator).

The collected VCRs for the 2015–16 and 2016–17 influenza seasons were compared. This report also presents data on vaccination recommendations, number of vaccine doses ordered and used in countries with national procurement, payment mechanisms, and use of vaccine products and antivirals for influenza season 2017–18. In 2015–16 and 2016-17 only partial information was collected via VENICE surveys and this included vaccination coverage rates. Therefore, data on recommendations and antiviral use were compared with the data collected for season 2014–15, the season for which the previous survey was conducted.

The analysis of the information relating to payment mechanisms for different targeted population groups was difficult because a majority of countries reported multiple options (vaccine or administration payment mechanisms varied substantially, even within countries). The data presented in this report therefore reflect the diversity of payment options.

Data for the United Kingdom were provided separately for England, Northern Ireland, Scotland and Wales. Data on VCRs are presented and interpreted separately for each of the four countries within the United Kingdom.

Data validation

A draft report containing preliminary data was circulated among the national experts who had completed the questionnaire. Experts were asked to validate their data and make changes as necessary. In addition, during the validation process, VCR was collected, if available in Member States for the latest influenza season 2017–18.

Results

Response rate

Of 31 EU/EEA Member States invited to participate, 30 responded to the survey. Austria did not provide data.

Seasonal influenza vaccine recommendations

Influenza vaccine policy

For season 2017–18, all 30 responding EU/EEA Member States indicated that they had implemented national seasonal influenza vaccine recommendations (e.g. recommendations and guidelines for age groups, risk groups and target groups).

Availability of national action plans

The Council Recommendation of the European Union encourages Member States to adopt and implement national, regional or local action plans or policies, as appropriate. At the time of the survey, one Member State indicated that a national action plan (NAP) to improve vaccination coverage for seasonal influenza vaccination, as recommended by the Council Recommendation, had been adopted; seven Member States reported that they had updated their plans in accordance with the Council Recommendation; 17 Member States reported that although an NAP was not formally developed, they did have vaccination policies in place. In addition, four Member States reported that an NAP was under development. In the United Kingdom–England and United Kingdom–Scotland, an NAP had been adopted to increase uptake; in the United Kingdom–Wales, an existing plan had been updated in accordance with the Council Recommendation and in the United Kingdom–Northern Ireland, where no vaccination plan is available, a corresponding policy is in place (Annex 1, Table 3).

All EU/EEA Member States, except Germany and Greece, indicated, that recommendations are issued by national authorities (public health or Ministry of Health); in Germany and Greece such recommendations are issued by the respective National Immunisation Technical Advisory Group (NITAG).

Age groups recommended for influenza vaccination

During the 2017–18 influenza season, six of the 30 responding EU/EEA Member States recommended seasonal influenza vaccination to healthy children or adolescents (Finland, Latvia, Malta, Slovakia, Slovenia and the United Kingdom) (Table 1, Annex 2, Maps 3 and 4). All responding Member States issued recommendations to vaccinate older age groups. However, the exact age at which children, adolescents and older individuals were recommended influenza vaccine differed between the EU/EEA Member States (Table 1, Annex 2, Maps 3 and 4). In comparison with the last VENICE survey (for the influenza season 2014–15) United Kingdom-England and United Kingdom-Wales had raised the age of children recommended for influenza vaccine from two to seven and two to eight years (inclusive), respectively.

In Malta all age groups ≥6 months of age were recommended influenza vaccination for the 2017–18 season, while only children and older age groups were recommended in 2014–15. Another change observed is that Hungary lowered the age at which older individuals are recommended vaccine from ≥65 to ≥60 years.

Table 1. Member States recommending seasonal influenza vaccination for children, adolescents and adults, 2017–18 influenza season

Country	Age groups: children								Age groups: adults (years)					
	≥6–24* months	≥6–36 months	≥6–59 months	≥2–7 years	≥2–8 years	≥2–11 years	≥6 months–12 yrs	≥6 months –<18 yrs	≥18–64	≥50	≥55	≥59	≥60	≥65
Belgium[a]										R				R
Bulgaria														R
Croatia														R
Cyprus														R
Czech Republic														R
Denmark														R
Estonia[b]														R
Finland		R												R
France														R
Germany													R	
Greece													R	
Hungary [c]													R	
Iceland													R	
Ireland[d]										R				R
Italy														R
Latvia	R													R
Liechtenstein														R
Lithuania														R
Luxembourg														R
Malta[b]			R								R			
Netherlands													R	
Norway														R
Poland[b]											R			
Portugal[e]														R
Romania														R
Slovakia							R					R		
Slovenia	R													R
Spain[f]														R
Sweden														R
UK–England[g]				R										R
UK–Northern Ireland						R								R
UK–Scotland[h]						R								R
UK–Wales[h]					R									R

Source: National seasonal influenza vaccination survey, January 2018
**: up to and including children aged 24 months*
a: The guidelines recommend vaccination for those ≥65 years of age. This age group takes first priority group for receiving influenza vaccine; the guidelines also mention explicitly that the vaccine is useful for healthy persons aged 50 and older.
b: In Estonia, Malta and Poland vaccination against seasonal influenza is recommended for all population groups aged six months or older.
c: In 2014–15 adults aged 60 years and over were recommended instead of 65 years and over.
d: The National Immunisation Technical Advisory Group (NITAG) recommends vaccination for all people aged ≥50 years, but the national influenza programme specifies ≥65 years.
e: Vaccination is recommended for >60 years but is only free of charge for those aged >=65 years.
f The recommendation at the national level is for those aged ≥65 years; however some regions recommend vaccination for all people aged 60 years and older.
g: In 2015–16, vaccination was recommended for all two-to-six-year-old children; in 2016–17, seven-year-olds were added to this group.
h Since 2014-15, 4-year-olds have been added. Removal of school year 7 (11 years) and phased addition of school years 1-4 (5 to 8 years). Since 2015–16, inclusion of school years 3–4 (7 and 8 years old).
R: recommended. 'Recommended' is defined as the existence of a written recommendation in an official policy document stating that a particular population group should receive seasonal influenza vaccine.

Chronic medical conditions

During the 2017–18 influenza season, all 30 Member States participating in the survey recommended seasonal influenza vaccination for patients with treatment-induced and/or disease-induced immunosuppression, metabolic disorders, chronic pulmonary, cardiovascular and renal diseases. Twenty-eight Member States recommended that those infected with HIV should be vaccinated and twenty-six Member States recommended that people with liver disease should be vaccinated. Twenty Member States had recommendations in place for vaccination of the morbidly obese and fifteen Member States recommended vaccination for people using aspirin on a long-term basis (children <18 years of age) (Figure 1, Annex 3, Table 4).

The EU/EEA Member States reported some changes in recommendations for clinical risk groups since the 2015–16 season. The United Kingdom (England, Northern Ireland, Scotland and Wales) added the recommendation to vaccinate those with neurological conditions and morbid obesity, defined as body mass index >= 40kg/m2, to the list of clinical risk groups. In addition, the United Kingdom-Wales also added a recommendation for those aged ≥6 months–64 years with asplenia or dysfunction of the spleen. In Sweden, risk groups were clarified and reorganised and some were grouped as 'conditions that compromise respiratory function'.

Figure 1. Proportion of EU/EEA Member States recommending seasonal influenza vaccine by chronic medical condition, 2014–15 and 2017–18 influenza seasons

Source: National seasonal influenza vaccination survey, January 2018
**: respiratory (pulmonary) diseases, e.g. chronic obstructive pulmonary disease, cystic fibrosis and asthma.*
***: cardiovascular diseases, e.g. congenital heart disease, congestive heart failure and coronary artery disease, except hypertension.*
****: chronic neurological diseases or neuromuscular conditions, including disorders of the brain, spinal cord, peripheral nerve, and muscle such as cerebral palsy, epilepsy (seizure disorders), stroke, intellectual disability (mental retardation), moderate to severe developmental delay, muscular dystrophy or spinal cord injury.*
*****: morbid obesity defined as having body mass index of ≥40kg/m².*

Vaccination and pregnancy

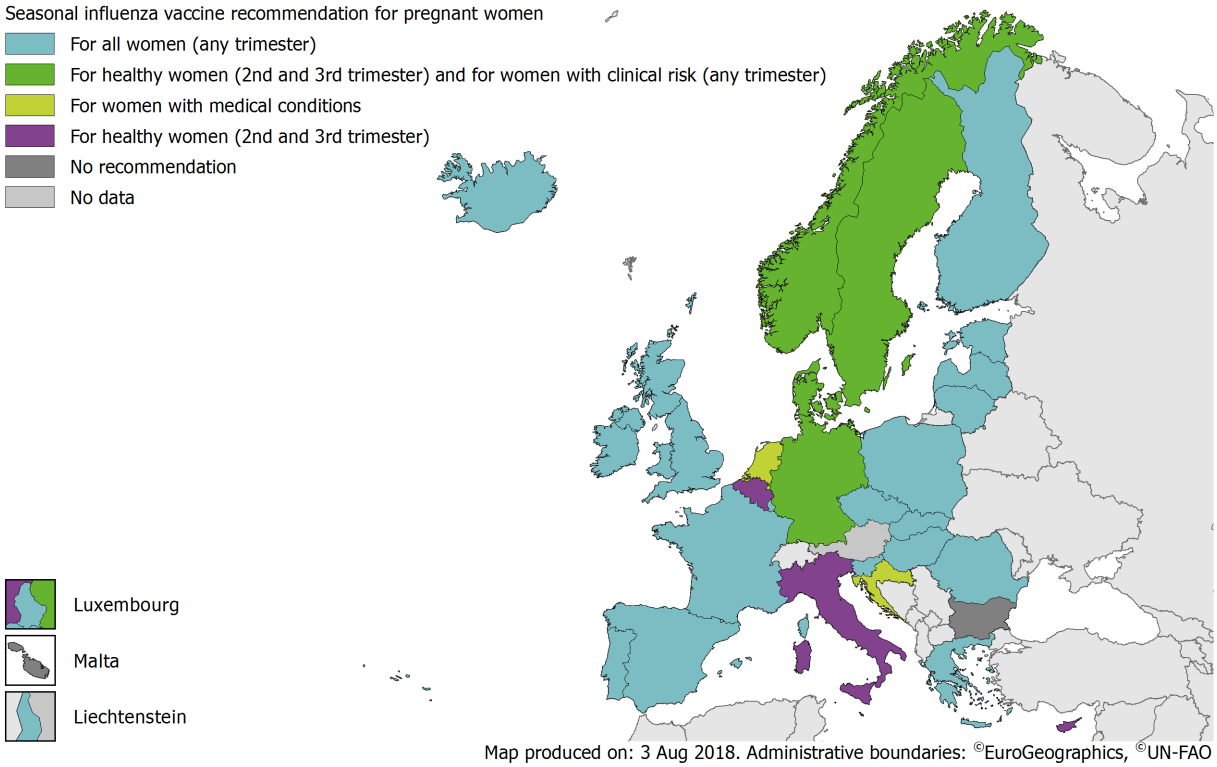
In the 2017–18 influenza season, 28 of 30 responding EU/EEA Member States indicated that influenza vaccination was recommended for pregnant women. Nineteen countries recommended vaccination for all pregnant women; three countries had recommendations to vaccinate pregnant women in the second and third trimester of pregnancy (Cyprus, Belgium, and Italy) and two countries (Croatia and the Netherlands) recommended vaccination only for pregnant women with chronic medical conditions. In four Member States (Germany, Norway, Denmark and Sweden) vaccination was recommended for all healthy pregnant women in the second and third trimesters of pregnancy while women with chronic medical conditions were also recommended vaccination during the first trimester of pregnancy. Bulgaria and Malta have not issued recommendations for vaccination of pregnant women. Malta does not officially recommend influenza vaccination for pregnant women and although it encourages pregnant women to get vaccinated, it does not offer to cover the costs.

Five Member States indicated that vaccine is recommended in the postpartum period (within six weeks of delivery) for those women with medical/clinical risk indications who did not receive seasonal influenza vaccination during pregnancy.

The most common place of vaccination for pregnant women, indicated by 26 EU/EEA Member States, was the surgery of a general practitioner or family doctor. Maternity out-patient clinics and antenatal clinics were indicated by eight and six EU/EEA Member States, respectively.

Updated vaccine recommendations were reported by Luxembourg and Malta. In Luxembourg, vaccination recommendation was expanded to all pregnant women whereas previously it was only recommended for pregnant women in the second and third trimester of pregnancy. In Malta, vaccine was recommended for all individuals ≥6 months of age including pregnant and post-partum women.

Map 1. EU/EEA Member States recommending seasonal influenza vaccine for pregnant women, 2017–18 influenza season



Map produced on: 3 Aug 2018. Administrative boundaries: ©EuroGeographics, ©UN-FAO
Source: National seasonal influenza vaccination survey, January 2018

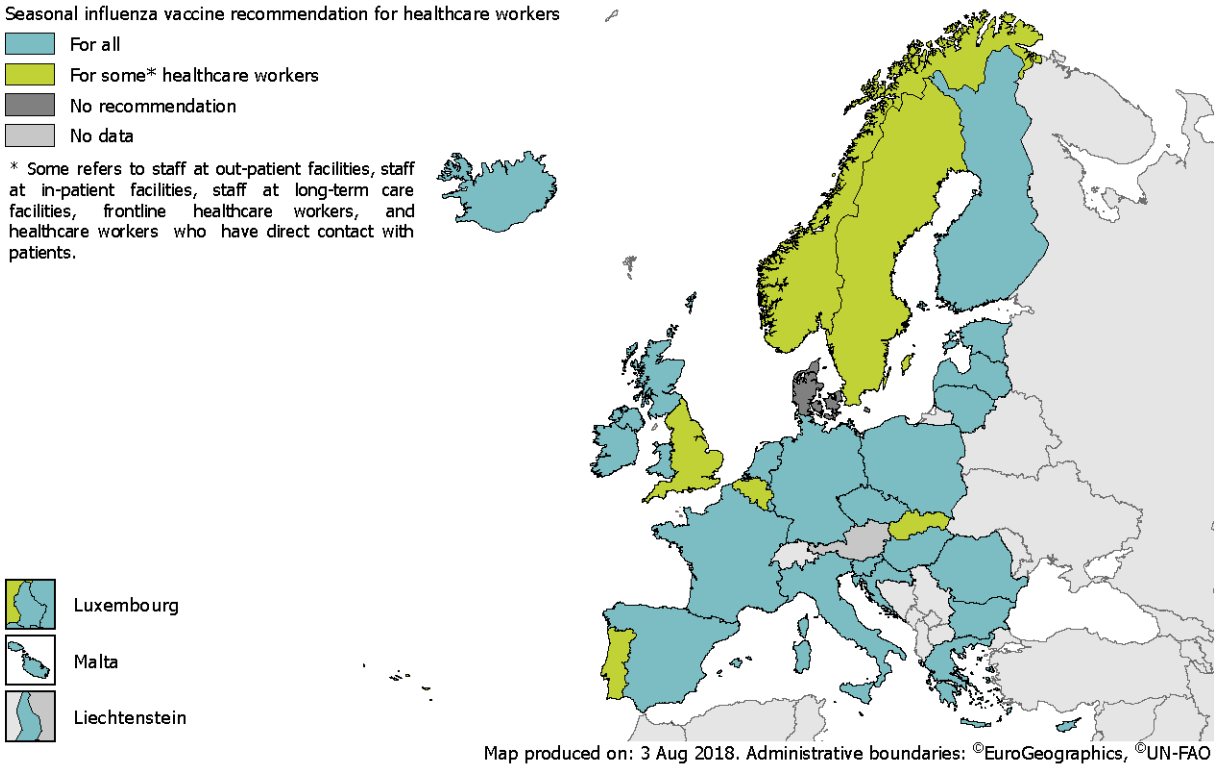
Occupational groups

Healthcare workers

In the 2017–18 influenza season, 29 of 30 responding EU/EEA Member States recommended vaccination for HCWs. Twenty-three of them reported that influenza immunisation was recommended for all HCWs; five Member States (Belgium, Norway, Portugal, Slovakia and Sweden) recommended vaccination for some HCWs (e.g. those working in out-patient, in-patient and long-term care departments). Within the United Kingdom recommendations varied: in Scotland vaccination was recommended for all HCWs; in England vaccination was recommended only for frontline HCWs or those HCWs who have direct contact with patients; in Northern Ireland and Wales vaccination was officially recommended for frontline HCWs or those HCWs who have direct contact with patients but vaccine was offered to all HCWs (Map 2). Although there is no national recommendation to vaccinate HCWs in Denmark, most regions and municipalities offer vaccinations to HCWs free of charge. In Sweden, vaccination was only recommended for staff caring for severely immunocompromised persons. In Slovakia, vaccination was recommended for HCWs in close contact with patients or the foci of infection.

In all Member States that responded, the vaccination of HCWs is voluntary which, in this document, is defined as individual free will when deciding on seasonal influenza vaccination and there is also no penalty for not getting the vaccine.

Map 2. EU/EEA Member States recommending seasonal influenza vaccine for healthcare workers, 2017–18 influenza season



Map produced on: 3 Aug 2018. Administrative boundaries: ©EuroGeographics, ©UN-FAO
Source: National seasonal influenza vaccination survey, January 2018

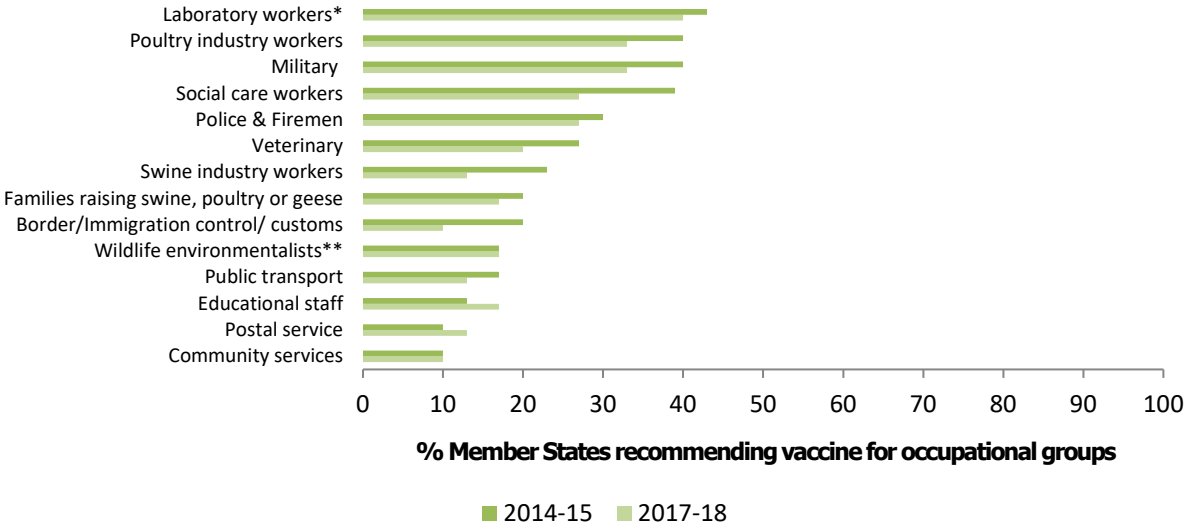
Other occupations

In the 2017–18 influenza season, 22 of the 30 responding EU/EEA Member States recommended seasonal influenza vaccination for at least one other specified occupational group. Vaccination was not recommended for any occupational groups (except HCWs) in Belgium, Czech Republic, Denmark, Iceland, Latvia, Lithuania, the Netherlands or Romania. In the United Kingdom-England, the United Kingdom-Northern Ireland and United Kingdom-Wales vaccine was recommended to all social care workers although in the United Kingdom– Scotland the recommendation was that only those social care workers who are in direct contact with patients/service users should be vaccinated by their employer as part of an occupational health programme.

Influenza vaccination was recommended for military service personnel and poultry industry workers in 11 and 10 EU/EEA Member States respectively, for staff working in laboratories (e.g. in the non-medical academic or environmental sector) in 12, for police and firefighters in eight and for veterinary service workers in six. Five EU/EEA Member States recommended the vaccination of teachers and other educational staff (Figure 2, Annex 3, Table 5).

A change in vaccination recommendations was reported from Belgium, Greece, Portugal and Spain. Since the 2016–17 season, vaccination is no longer recommended for poultry and swine industry workers in Belgium. In Greece a recommendation to vaccinate poultry industry workers was added; in Portugal a recommendation to vaccinate educational staff was introduced (only for kindergarten and crèche). In Spain from the 2017–18 season onwards vaccination was recommended for workers directly exposed to poultry or pigs on farms or to wild birds.

Figure 2. Proportion EU/EEA Member States recommending seasonal influenza vaccination by occupational group, 2014–15 and 2017–18 influenza seasons



Source: National seasonal influenza vaccination survey, January 2018.
**: laboratory workers or staff working in laboratories in the non-medical academic or environmental sectors*
***: wildlife environmentalists: workers who work with birds, e.g. bird ringing or bird banding.*

Population groups in closed communities

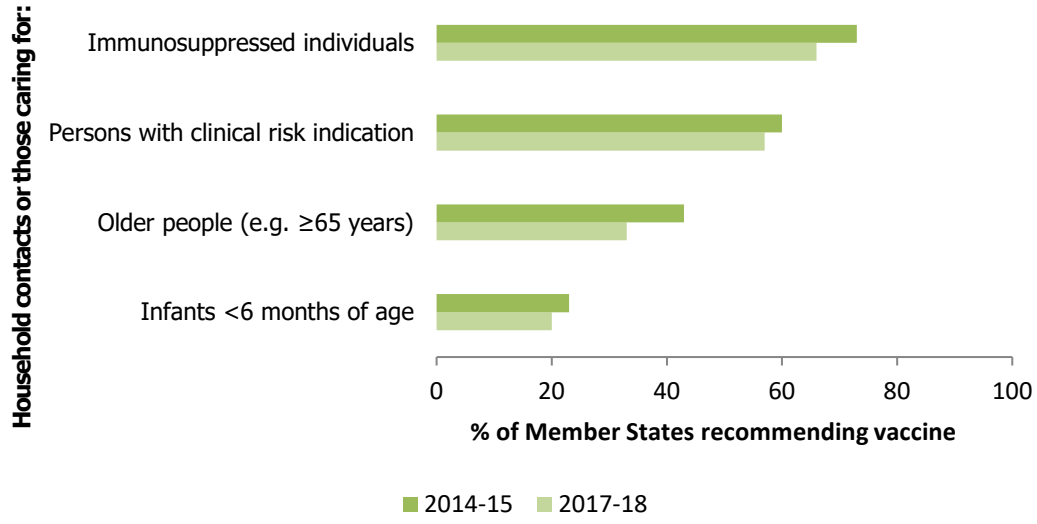
In the 2017–18 influenza season, 27 of the 30 EU/EEA Member States that responded (all but Denmark, Latvia and Sweden) recommended vaccination for residents of long-term care facilities. Estonia, Malta, Poland and United Kingdom-England recommended the vaccination of prisoners. Vaccination for children in day-care centres was recommended in Bulgaria, Estonia, Malta, Poland and United Kingdom-Scotland (only for those aged 2–11 years as part of the childhood programme).

Household contacts or caretakers

In the 2017–18 influenza season, household contacts of infants under six months of age were recommended influenza vaccination in six Member States (Belgium, Estonia, Finland, Greece, Liechtenstein, Poland), while 20 EU/EEA Member States recommended that contacts of immunosuppressed individuals should be vaccinated. Vaccination was recommended for contacts of those with chronic medical conditions in 17 EU/EEA Member States (in the United Kingdom, only Northern Ireland and Wales recommended vaccination for the main carer of this risk group). Vaccination was recommended for household contacts of older population groups in ten EU/EEA Member States (in the United Kingdom, only Northern Ireland and Wales recommended vaccination for the main carer of older population groups) (Figure 3).

Household contacts or those taking care of infants aged under six months with chronic medical conditions were recommended influenza vaccine in France and Portugal. Those taking care of infants and toddlers < 2 years of age were recommended vaccination in Luxembourg.

Figure 3. Proportion EU/EEA Member States recommending seasonal influenza vaccine for household contacts or caretakers of those at risk of influenza 2014–15 and 2017–18 influenza seasons



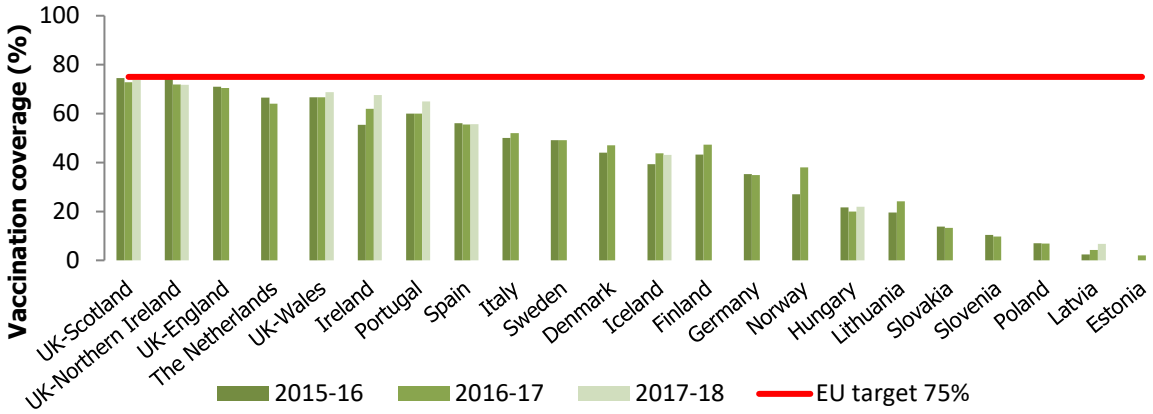
Source: National seasonal influenza vaccination survey, January 2018.

Vaccination coverage rates

Older age groups

Influenza vaccination coverage rates (VCRs) among 'older age groups' (as defined in accordance with EU/EEA Member State recommendations - e.g. ≥55, ≥59, ≥60 or ≥65 years of age) for influenza seasons 2015–16, 2016–17 and 2017-18 were reported by 19 EU/EEA Member States (Figure 4, Annex 4, Table 6). VCRs varied from 2% to 72.8% in 2016–17, with 47.1% median VCR for this season. The highest VCRs were reported by the United Kingdom, which almost achieved the EU target of 75% (in the United Kingdom–England, the United Kingdom–Northern Ireland and United Kingdom–Scotland). Although vaccination is recommended for older age groups in all responding EU/EEA Member States, eleven Member States were not able to provide VCRs for older age groups for the given seasons (Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France, Greece, Malta, Liechtenstein, Luxembourg and Romania). In Belgium, the VCR is estimated within five year intervals by means of a National Health Interview Survey (based on self-reporting); the most recent surveys were held in 2013 and 2018.

Figure 4. Seasonal influenza vaccination coverage rates in older age groups, 19 EU/EEA Member States, influenza seasons 2015–2016; 2016–2017 and, if available, 2017–2018*



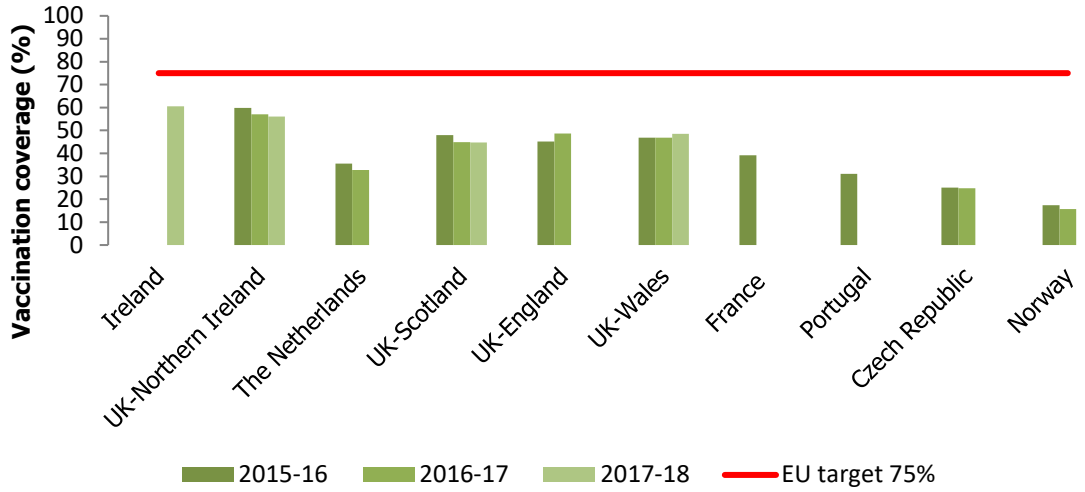
Source: National seasonal influenza vaccination survey, January 2018.
**: data for UK displayed by respective country (England, Northern Ireland, Scotland, Wales).*

Individuals with chronic medical conditions

Influenza VCRs among individuals with chronic medical conditions for influenza seasons 2015–16, 2016–17 and 2017-18 were reported by seven Member States and ranged from 15.7% to 57.1% (2016–17), with 44.9% median VCR for this season (Figure 5, Annex 4, Table 6).

The highest VCRs for people which chronic medical conditions were reported by Ireland and United Kingdom–Northern Ireland. The remaining 23 Member States were not able to report VCRs for individuals with chronic medical conditions for the given seasons.

Figure 5. Seasonal influenza vaccination coverage rates among individuals with chronic medical conditions, seven EU/EEA Member States, influenza seasons: 2015–2016, 2016–2017 and, if available, 2017–2018*

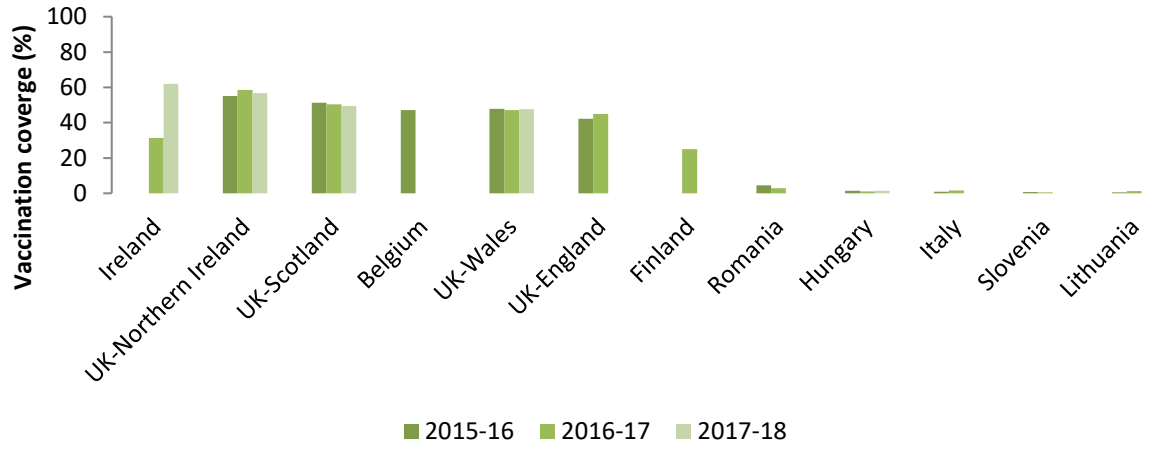


Source: National seasonal influenza vaccination survey, January 2018.
**: data for UK is displayed by respective country (England, Northern Ireland, Scotland, Wales).*

Pregnant women

Influenza VCRs for pregnant women for season 2015–16, 2016–17, 2017-18 were reported by nine Member States (Figure 6, Annex 4, Table 6). VCR ranged from 0.5% to 58.6% in 2016–17; with 25% the median VCR for this season. The remaining 19 of 28 Member States where vaccine is recommended to this specific population group reported that vaccination coverage in the group was not monitored. The highest VCRs were in the United Kingdom and varied from 44.9% in England to 58.6% in Northern Ireland (2016–17). Ireland reported high VCR, 62% for 2017–18 influenza season.

Figure 6. Seasonal influenza vaccination coverage rates for pregnant women in nine EU/EEA Member States, influenza seasons (2015–2016; 2016–2017; 2017–2018)*

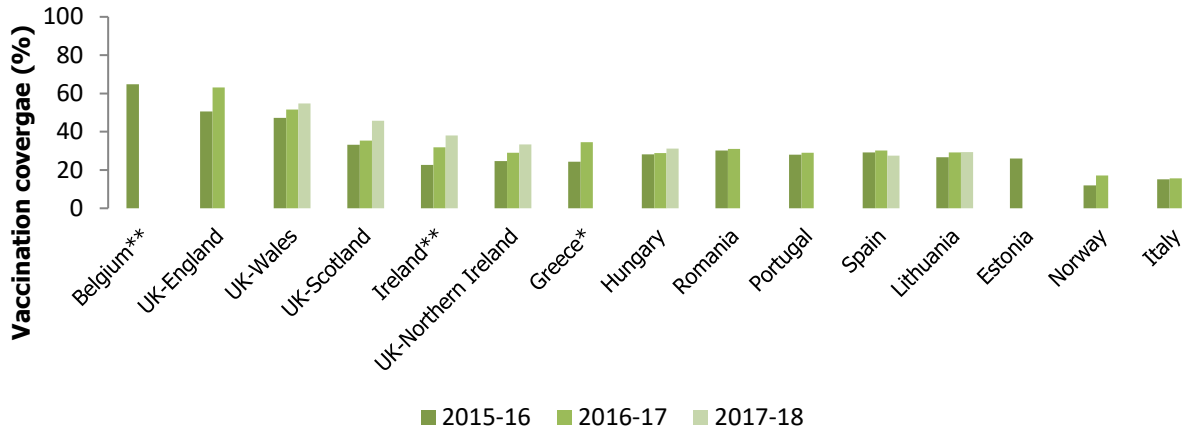


Source: National seasonal influenza vaccination survey, January 2018
**: Data for UK is displayed by respective country (England, Northern Ireland, Scotland, Wales)*

Healthcare workers

Influenza VCRs for the 2015–16, 2016–17 and 2017-18 seasons were provided by 12 Member States (Figure 7, Annex 4, Table 6), ranging from 15.6% to 63.2%. The median VCR in 2016–17 was 30.2%. The highest VCRs were reported by the Belgium, United Kingdom-England and United Kingdom-Wales (2016–17). The VCR increased in Greece, Ireland and the United Kingdom when the two or three seasons were compared. In addition, three Member States (Belgium, Ireland and Portugal) reported VCRs among HCWs working in long-term healthcare settings (55.9% (2015–16), 28.1% and 25% (2016–17), respectively).

Figure 7. Seasonal influenza vaccination coverage rates among healthcare workers in 12 EU/EEA Member States, influenza seasons: 2015–2016; 2016–2017; 2017–2018



Source: National seasonal influenza vaccination survey, January 2018.
**: healthcare workers in out-patient healthcare settings.*
***: healthcare workers from in-patient healthcare settings (acute hospitals only).*

Residents of long-term care facilities

Influenza VCRs for residents of long-term care facilities for the 2016–17 influenza season were provided by five Member States: Ireland, Portugal, Romania, Slovakia and United Kingdom-Wales. The reported VCRs were 93.5%, 81%, 46.7%, 70.5% and 49.7%, respectively (Annex 4, Table 6).

Payment mechanisms for vaccines and vaccine administration

The EU/EEA Member States reported that the predominant payment mechanism for influenza vaccination was through the national health services or a combination of several mechanisms for those population groups recommended seasonal influenza vaccine (children and adolescents (n=6 Member States), adults (n=30 Member States), those with chronic medical conditions (n=30 Member States), pregnant women (n=28 Member States), HCWs (n=29 Member States), and members of closed communities (n=27 Member States)). Approximately 20% of the EU/EEA Member States had national insurance schemes which funded vaccination programmes for targeted population groups. In addition, from 3% to 23% of the Member States per vaccine targeted group reported that vaccinations had to be paid out-of-pocket. For all occupational groups, including HCWs, the predominant payment mechanism for vaccination was through the employer and a combination of several payment mechanisms. In some Member States, vaccination was funded by regional health services (Figures 8 and 9, Annex 5, Table 7).

Adults (older population)

Overall, 21 Member State reported having a single payment mechanism for vaccine in place, while in nine Member States several payment mechanisms were available (e.g. the national health services, out-of-pocket, and employer).

In 12 of the 30 EU/EEA Member States that recommend seasonal influenza vaccination for older people (aged >50, >55, >59, ≥60 or ≥65 years, depending on national recommendations), vaccine costs were covered by the national health services; in six Member States, the national insurance schemes covered the costs. Vaccine administration was covered by the national health services (nine Member States) or the national insurance schemes (five Member States). In two Member State, vaccine costs paid by the person vaccinated were not reimbursed, and three Member States reported that those receiving vaccination also needed to pay out-of-pocket for vaccine administration (Figures 8 and 9, Annex 5, Table 7).

Children and adolescents

Of the six EU/EEA Member States that recommended vaccination to children and adolescents, four paid for the vaccine and three for the vaccine administration (through the national health services). In one Member State vaccine and vaccine administration costs were both covered by the national insurance scheme. A second Member States reported that the person vaccinated had to pay for the vaccine and its administration out-of-pocket, while another reported that vaccine administration was covered by the regional health service (Figures 8 and 9, Annex 5, Table 7).

Chronic medical conditions

Twenty-two of the 30 EU/EEA Member States that recommend vaccination of people with chronic medical conditions reported a single payment mechanism for vaccine, while the remaining eight Member States used a combination of several payment mechanisms.

Vaccine for chronic medical conditions was funded by the national health services (12 EU/EEA Member States) and the national insurance scheme (six Member States); in three Member States those vaccinated had to pay for the vaccine. Vaccine administration was funded by the national health services (eight Member States) and the national insurance schemes (five Member States); four Member States reported that those vaccinated had to pay for vaccine administration. In one country vaccine and its administration was funded by the regional health service (Figures 8 and 9, Annex 5, Table 7). In Latvia there had been changes to the system for children in the clinical risk group up to 18 years and since 1 November 2014 the cost of vaccine was 100% funded by the national health service.

Pregnant women

Overall, 18 of 28 EU/EEA Member States recommending vaccine for pregnant women reported having a single payment mechanism, while nine had several payment mechanisms in place for pregnant women. One EU/EEA Member State did not provide data for payment mechanism for pregnant women.

The national health services paid for vaccines for pregnant women in 10 EU/EEA Member States. Administration of the vaccine for this target group was covered by the national health services in seven Member States. In two Member States, those vaccinated had to pay for the vaccine themselves. In three Member States, the person vaccinated was also required to pay for vaccine administration (Figures 8 and 9, Annex 5, Table 7).

Healthcare workers

For HCWs, 19 of the 29 EU/EEA Member States that had recommendations to vaccinate HCWs reported having a single payment mechanism in place; nine Member States combined several payment mechanisms. One Member State did not provide data. Although vaccination of HCWs is not nationally recommended in Denmark, vaccination is available free of charge for all HCWs and paid for by the employer.

With regard to HCWs, the national health services paid for the vaccine in eight countries, while five countries paid for the administration. Employers paid for the vaccine and its administration in nine Member States (Figures 8 and 9, Annex 5, Table 7).

Figure 8. Payment mechanisms for vaccine in population groups recommended for seasonal influenza vaccination, 2017–18 influenza season

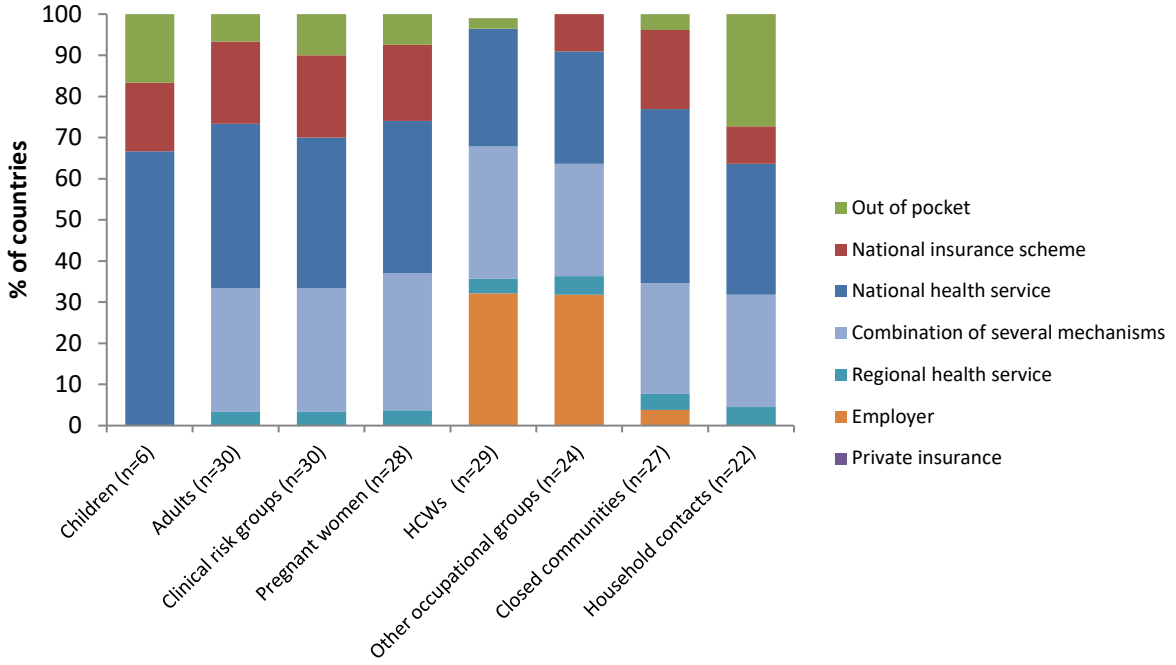
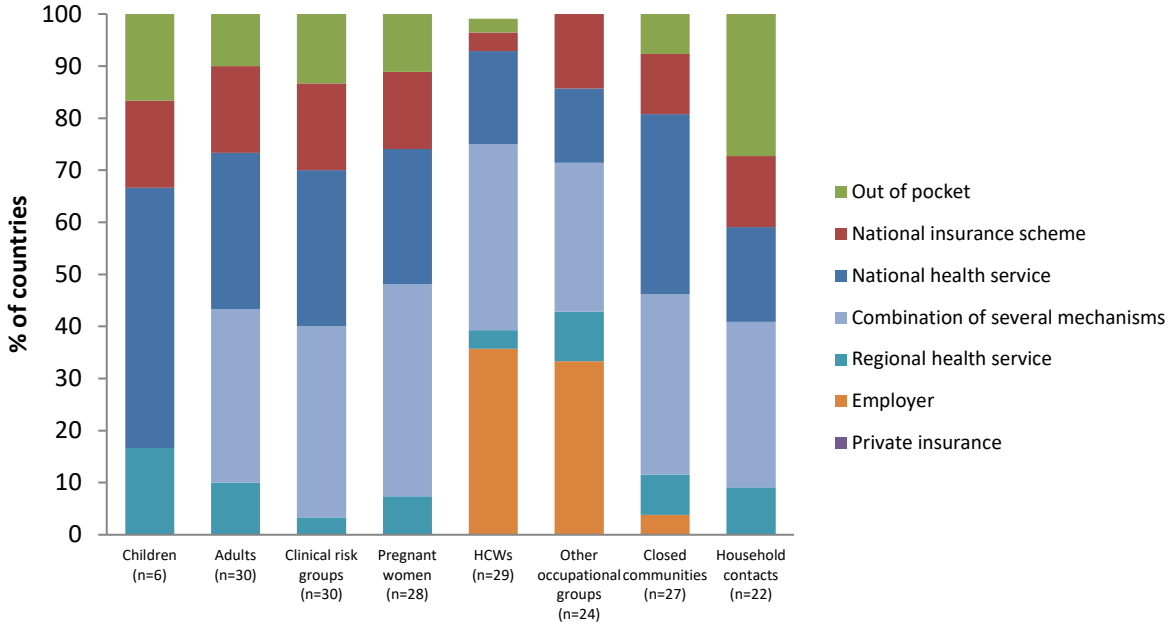


Figure 9. Payment mechanisms for vaccine administration for population groups recommended for seasonal influenza vaccine, 2017–18 influenza season



Source: National seasonal influenza vaccination survey, January 2018.
National health insurance: scheme in which a premium is paid into an insurance fund, which entitles payers to a range of health services. If no premiums are received, services may be reduced or cancelled.
National Health Service: publicly funded healthcare system
Out-of-pocket: costs paid for by the person being vaccinated which are not reimbursable.
Other payment mechanism: paid for if administered in pharmacies or at other authorised venues
No Member State reported having only private insurance as payment mechanism; this payment mechanism is combined with others.
Figures 8–9: data on payment mechanisms were not provided by one country for pregnant women and one for closed communities. Two countries did not provide data for vaccine and three countries did not provide data for vaccine administration in relation to other occupational groups.

Vaccine use by country and different population groups

Of 30 responding EU/EEA Member States 18 were able to provide data on purchased, distributed or used number of doses of seasonal influenza vaccine (Annex 6, Table 8). Those countries that do not procure through the public sector at national level were unable to respond.

The most common vaccine used for vaccine-targeted population groups in 2017–18 was trivalent, non-adjuvanted inactivated influenza vaccine (IIV3), which was used in the majority of the EU/EEA countries, with the exception of Estonia, Hungary and United Kingdom-England. In addition to IIV3, quadrivalent, non-adjuvanted inactivated influenza vaccine (IIV4) was used in the following 13 Member States: Belgium, Bulgaria, Czech Republic, Germany, Greece, Italy, Latvia, Liechtenstein, Luxemburg, Slovenia, Sweden, Poland, United Kingdom [England, Northern Ireland, Scotland, Wales]. Estonia used only IIV4. Trivalent, adjuvanted inactivated influenza vaccine (aIIV3) was used in five countries: Germany (MF59), Hungary (aluminium phosphate), Italy (MF59), Liechtenstein (MF59) and Spain (MF59). Quadrivalent, live attenuated nasal vaccine (LAIV4) was used in five Member States: Finland, Germany, Norway, Sweden and the United Kingdom [England, Northern Ireland, Scotland, and Wales]. Detailed information by product and targeted population group by country is presented in Annex 6, Table 9.

Use of antiviral agents for treatment and prophylaxis of influenza

All responding EU/EEA Member States reported that neuraminidase inhibitors were recommended for use in their countries.The availability of unlicensed/unauthorised antiviral medicines for individual patient treatment (in the context of an approved research protocol or as the clinical responsibility of the prescribing physician) in the countries is presented in Table 2.

Table 2. Unlicensed/unauthorised antiviral medicines available for compassionate use (emergency/experimental treatment/research) by countries, 2017–18 influenza season

Antiviral medicines	Countries
None of these available	Belgium, Bulgaria, Cyprus, Estonia, Finland, Germany, Hungary, Iceland, Lithuania, Luxemburg, Malta, the Netherlands, Poland, Romania, Slovakia, UK– Northern Ireland
Zanamivir aqueous solution (IV*)	Denmark, France, Greece, Ireland, Italy, Latvia, Liechtenstein, Portugal, Sweden, United Kingdom-England, United Kingdom-Scotland, Slovenia
Peramivir (IV*)	Czech Republic, United Kingdom-England, United Kingdom-Scotland
Ribavirin (IV*)	United Kingdom-England, Slovenia, United Kingdom-Scotland
Favipiravir (per os)	United Kingdom-England, United Kingdom-Scotland
Lanamivir (inhalation)	United Kingdom-England, United Kingdom-Scotland
Ribavirin (per os)	Norway
No information available	Croatia, Spain, United Kingdom-Wales

Source: National seasonal influenza vaccination survey, January 2018.

Sixteen EU/EEA Member States (Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, the UK–England, the UK–Northern Ireland, the UK–Scotland and the UK–Wales) reported having an antiviral resistance surveillance system in place. Laboratory-confirmed cases of antiviral resistance are notified to public health authorities in Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Norway, Spain, Sweden, the UK–England, the UK–Northern Ireland, the UK–Scotland and the UK–Wales. In the remaining countries, antiviral resistance is reported to national medicine/regulatory agencies and/or public health authorities. Clinicians responsible for treating the individual patient are also notified in the following countries: Denmark, France, Germany, Greece, Ireland, Norway, Poland, Portugal, Spain, Sweden, the UK–England, the UK–Northern Ireland, the UK–Scotland and the UK–Wales).

All 30 EU/EEA Member States reported that antiviral agents can only be purchased/obtained at the individual level in pharmacies/hospitals if prescribed by a doctor or other medical prescriber.

Specific recommendations regarding when to start using antiviral agents during the influenza season (e.g. when ILI rates are above a certain threshold (low, medium, high) which indicate the likelihood that influenza is circulating in the community were given/used by the following five countries: Denmark, Estonia, Ireland, Malta, the UK–England,

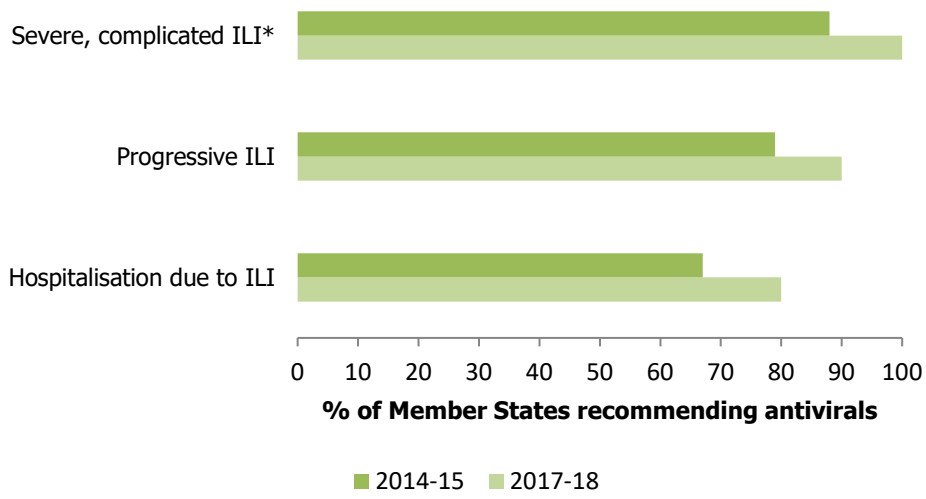
the UK–Northern Ireland, the UK–Scotland and the UK–Wales. The Moving Epidemic Method provided by ECDC is used to calculate the threshold in Estonia, Ireland and the United Kingdom-England, the United Kingdom-Northern Ireland, the UK–Scotland and the UK–Wales. Other unspecified methods were indicated by Denmark and Malta. The remaining 15 countries (Bulgaria, Cyprus, the Czech Republic, Finland, France, Greece, Hungary, Italy, Liechtenstein, the Netherlands, Norway, Portugal, Romania, Slovenia and Sweden) do not have recommendations regarding when to start using antiviral agents during the influenza season.

Recommendations and/or guidelines (policy documents) on antiviral use were available in 20 Member States (Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Liechtenstein, Malta, Netherlands, Norway, Portugal, Romania, Slovenia, Sweden and the UK). Ten Member States did not have such policy recommendations: Belgium, Croatia, Germany, Iceland, Latvia, Lithuania, Luxemburg, Poland, Slovakia and Spain. These guidelines are revised and updated on an annual basis in the following six Member States: Estonia, Finland, Ireland, Italy, Malta, the UK–England, the UK–Northern Ireland and the UK–Scotland. In Hungary guidelines are updated every three years; and in the remaining Member States (Bulgaria, Cyprus, the Czech Republic, Denmark, France, Greece, Liechtenstein, the Netherlands, Norway, Portugal, Romania, Slovenia, Sweden and the UK–Wales) there is no specific requirement as to when/how often these documents should be updated.

Treatment

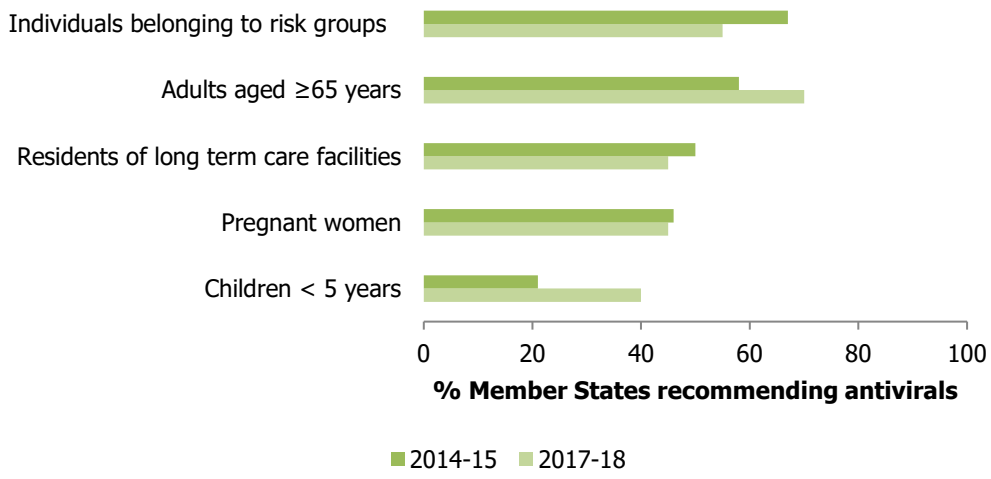
For the 2017-18 season, twenty EU/EEA Member States recommended antiviral agents for inpatients who require treatment for severe complicated ILI. A total of 18 Member States recommended antivirals for patients with progressive ILI. Antiviral agents were also recommended for the treatment of outpatients who are at a higher risk of influenza complications as a result of age and/or underlying medical conditions: children <5 years of age (eight Member States); adults aged ≥65 years (15 Member States), individuals belonging to risk groups (11 Member States), severe immunosuppression (15 Member States), pregnant women (nine Member States), and residents of nursing homes and other long-term-care facilities (nine Member States). More Member States recommended use of antiviral agents when compared to the 2014–15 influenza season (Figures 10 and 11; Annex 7: Table 10).

Figure 10. Proportion of EU/EEA Member States recommending antiviral agents for the treatment of in-patients with suspected or laboratory-confirmed influenza#, influenza seasons: 2014–2015; 2017–2018



Source: National seasonal influenza vaccination survey, January 2018.
#: For seasons 2014–15 and 2017–18, responses were received by 24 and 20 Member States respectively as having recommendations on antiviral use.
** ILI: influenza-like illness.*

Figure 11. Proportion of EU/EEA Member States recommending antiviral agents for the treatment of out-patients with suspected or laboratory-confirmed influenza, influenza seasons*; 2014–2015; 2017–2018



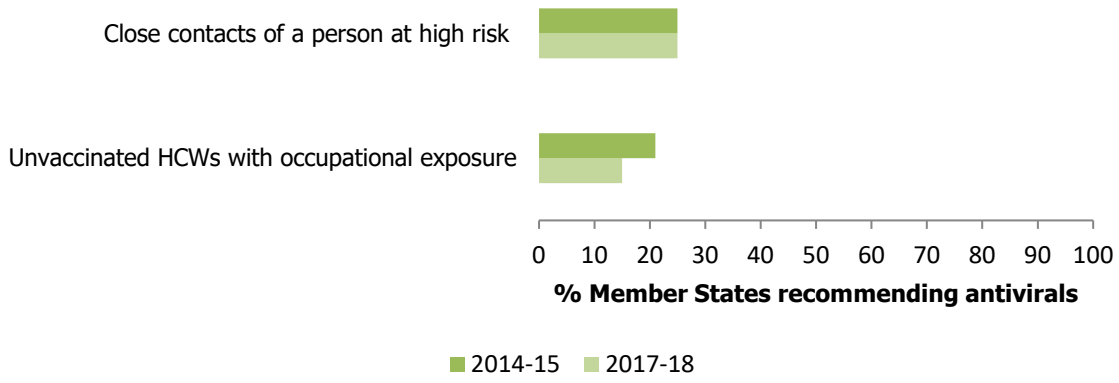
Source: National seasonal influenza vaccination survey, January 2018.

**: For season 2014–15, 24 Member States responded. For 2017–18, 20 Member States responded.*

Post-exposure prophylaxis

For unvaccinated family members or other unvaccinated close contacts of people at greater risk of influenza complications, antiviral agents are recommended in five Member States (Cyprus, Finland, France, Ireland, UK). For unvaccinated HCWs with occupational exposure, antiviral agents are recommended in three Member States (Finland, Ireland, Slovenia) (Figure 12, Annex 7: Table 11).

Figure 12. Proportion of EU/EEA Member States recommending antiviral agents for post-exposure prophylaxis following exposure to suspected or laboratory-confirmed influenza, influenza seasons*: 2014–2015; 2017–2018

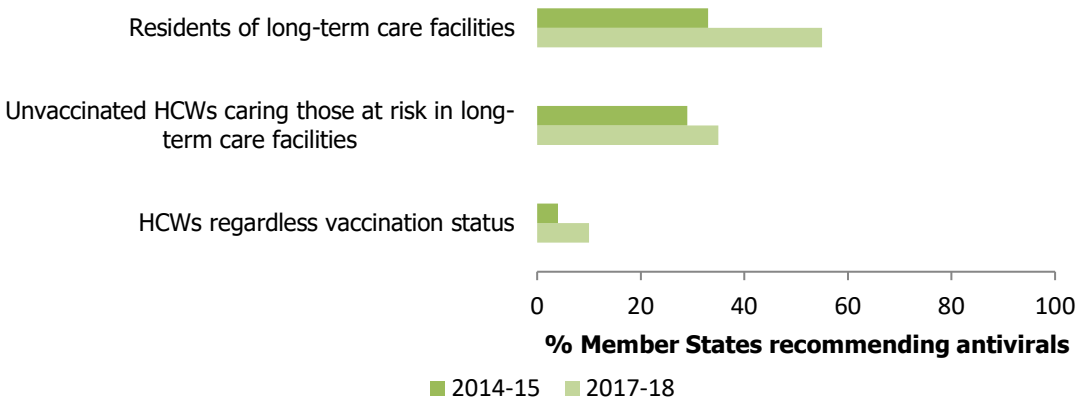


Source: National seasonal influenza vaccination survey, January 2018.
**: For season 2014–15, 24 Member States responded. For season 2017–18, 20 Member States responded.*

Prophylaxis in case of influenza outbreaks

Antiviral agents are recommended in 11 of 20 EU/EEA Member States for residents of long-term-care facilities or immunocompromised people in care facilities. For unvaccinated healthcare staff who provide care to persons at high risk of complications in long-term care facilities or who care for immunocompromised patients, antiviral agents are recommended in seven of 20 EU/EEA Member States. Two Member States recommend antivirals for all healthcare staff, regardless of vaccine effectiveness or influenza vaccination status (Figure 13, Annex 7, Table 11).

Figure 13. Proportion of EU/EEA Member States recommending antiviral agents for prophylaxis following exposure to suspected or laboratory-confirmed influenza during outbreaks, influenza seasons 2014–2015; 2017–2018



Source: National seasonal influenza vaccination survey, January 2018.
For season 2014–15, a total of 24 Member States responded; for 2017–18, a total of 20 Member States responded.

Strengths

Since 2008, VENICE has conducted annual surveys to follow up changes and identify compliance with the 2009 Council recommendation to achieve the European Union goal of 75% vaccination coverage in older age and risk groups by 2014–15. ECDC-supported VENICE surveys have been identified as the most effective way of monitoring implementation of the Council recommendation, particularly since several surveys were already conducted before the Council Recommendation was issued.

The strength of this network is that all stakeholders have been maintaining it for many years and throughout that period data have been collected using the same methodology.

Limitations

However, there are some limitations to this survey. Comparison of vaccination coverage data is difficult because EU/EEA Member States use different methods for estimating coverage. Even within a given Member State, comparisons between years may be difficult if methods (administrative vs survey) or response rates differ from year to year. In 2017–18, only four EU/EEA Member States reported use of immunisation registries covering the whole population (Denmark, Finland, Norway and Sweden).

Moreover, the way in which Member States enumerate the denominator data (numbers of those eligible for vaccination) is often difficult to determine, especially when it comes to less specific groups, such as people with chronic medical conditions or HCWs.

Most EU/EEA Member States report difficulties in estimating denominator data in relation to the numbers of individuals with chronic medical conditions. This reflects a lack of information systems (disease registers) or other standardised methodologies for collecting these data. Data linkage to health outcome data and immunisation registers could overcome this limitation.

There are also limitations related to verifying the number of vaccinated people (numerator data) because countries may choose to use data from administrative records, immunisation registries or surveys and these, in turn, have their own limitations.

VCRs were collected as proportions (the number of vaccinated individuals (numerator) divided by the number of individuals in each population group targeted for vaccination (denominator), calculated in each EU/EEA Member State responding to the survey.

Some countries reported using population surveys to estimate the number of individuals at risk. Again, it has been difficult to compare the number of individuals at risk between countries because of the wide range of methodologies (e.g. household surveys, mail, face-to-face interviews, telephone interviews).

The reasons for low or high vaccination coverage in EU/EEA countries were beyond the scope of this survey.

Conclusions

The VENICE network surveys are supported by ECDC and the participating EU/EEA Member States. The standardised data collected through these surveys ensures the ongoing monitoring of progress towards the implementation of internationally accepted recommendations and goals in relation to seasonal influenza vaccination in the EU/EEA Member States.

Official policy and recommendations for seasonal influenza vaccination

- The results of this survey show that although not all Member States have a formal national action plan to improve vaccination coverage for seasonal influenza, most countries have policies in place that comply with the 2009 EU Council Recommendation on seasonal influenza vaccination.
- Recommendations on seasonal influenza vaccination for targeted or at-risk groups are standard in most countries. Targeted or at-risk groups typically include the older population, people with chronic medical conditions, pregnant women, healthcare workers, and residents of long-term care facilities. Recommendations in most countries broadly comply with the 2009 Council Recommendation and the 2012 WHO SAGE recommendations. Six of the Member States also target children and some have universal programmes for all children of specific age groups (Finland and the United Kingdom).
- In 2017–18, there were no major changes in the number of Member States that recommended certain older age groups for influenza vaccine compared to the previous influenza seasons. There were no substantive changes in recommendations for healthy children compared to 2014–15, except that UK England and Wales have expanded their paediatric programme to include more age groups and this is being introduced on a step-wise basis.
- Some changes in recommendations were seen in the categories for underlying medical conditions and pregnant women. Changes in recommendations for clinical risk groups were reported by the following Member States: United Kingdom-England, United Kingdom-Scotland, United Kingdom-Northern Ireland and United Kingdom-Wales added the recommendation to vaccinate those with neurological diseases and morbid obesity in 2015–16. In addition, United Kingdom-Wales also added a recommendation that those aged between 6 months and 64 years with asplenia or dysfunction of the spleen should be vaccinated. In Sweden, risk groups were clarified and reorganised, with some grouped under 'conditions that compromise respiratory function'. Updated vaccine recommendations for pregnant women were reported by Luxembourg and Malta. In Luxembourg, vaccine recommendation was expanded to cover all pregnant women whereas previously it was only recommended that pregnant women in the second and third pregnancy trimester should be vaccinated. In Malta, vaccine was recommended for all individuals ≥6 months of age, including pregnant and post-partum women.
- With the exception of HCWs, vaccination of occupational groups is not common in EU/EEA Member States: only around one third of the responding countries recommend influenza vaccine for occupational groups other than HCWs.

Vaccination coverage rates during the 2015–16, 2016–17, 2017-18 influenza seasons

- VCRs vary widely across groups recommended for influenza vaccination in EU/EEA Member States. Fewer countries provided VCR data than in previous surveys for vaccine-targeted population groups.
- Although all Member States surveyed recommend vaccination for older people and 19 Member States reported vaccination coverage for this group, none of the countries met the targeted coverage of 75%. The 75% target was almost achieved by the UK. Eleven Member States were not able to provide VCRs for older population groups (in the previous survey only five countries were not able to do so). In many countries VCRs are declining or remain stable.
- Although seasonal influenza vaccine is recommended in all EU/EEA Member States for those with chronic medical conditions (e.g. pulmonary diseases, cardiovascular diseases, renal diseases, metabolic disorders and immunosuppression due to disease or treatment), VCRs for this population group were only available for approximately one quarter of the Member States (n=7). VCRs in this group were considerably lower than among the older population groups in most Member States. VCRs did not meet the EU target, except for Ireland and United Kingdom–Northern Ireland.
- VCRs among HCWs were only available from 12 of the 29 Member States that recommend vaccine for this population group. VCRs for HCWs varied greatly in 2016–17 - e.g. UK– England (63.2%) and Italy (15.6%). In Greece, Ireland, Norway, Romania, and United Kingdom [England, Northern Ireland, Scotland and Wales], VCRs for 2016–17 were higher than in the previous season (2015–16). In the remaining Member States, VCRs were low, and even lower for HCWs than for other targeted population groups. Vaccination coverage data for staff working in long-term care facilities were available from three Member States (Belgium, Ireland, and Portugal) and were as low as among other HCWs, except for Belgium, where uptake was moderate in this population group.

- The five Member States that provided VCRs for residents of long-term care facilities reported moderate (46.7%) to high (93.5%) coverage rates.
- Although vaccination was recommended for pregnant women in 28 of the EU/ EEA countries that responded, only nine of these reported vaccination coverage for this group; VCRs varied widely between these countries.
- The results of this survey have shown that achieving high VCR for those who are at risk of developing severe complications due to influenza infection remains a serious public health challenge.

Vaccine use by country and different population groups

- Data on number of seasonal influenza vaccines purchased, distributed or used for the 2017–18 season was available from 18 EU/EEA Member States while data on payment schemes was available in accordance with recommendations as follows: children and adolescents (6 Member States), adults (30 Member States), those with chronic medical conditions (30 Member States), pregnant women (28 Member States), HCWs (29 Member States), and members of closed communities (27 Member States). A mix of payment methods was applied: by national or regional health service, national insurance scheme, private insurance, employer or out of pocket.
- Vaccine products by country and population group vary significantly among EU/EEA Member States with many more products available on the EU/EEA market overall and authorised or more suitable for particular age, target or risk groups. The survey identified a major change in the use of seasonal influenza vaccines from trivalent to quadrivalent inactivated vaccines. The predominant vaccine product used in almost all countries in 2017–18 influenza season was trivalent inactivated vaccine, followed by approximately one third of countries which additionally used the quadrivalent inactivated vaccine, adjuvanted trivalent inactivated vaccine and live quadrivalent attenuated vaccine.

Use of antiviral agents for treatment and prophylaxis during 2017–18 influenza season

- While two thirds of Member States have recommendations/guidelines (policy document) on antiviral use in their country), one third do not.
- Most EU/EEA Member States recommend antivirals for influenza treatment but only a few countries recommend post- or pre-exposure prophylaxis for individuals that cannot be vaccinated.

Way forward

- Annual EU/EEA surveys on seasonal influenza vaccination policies and coverage are useful to monitor trends in vaccination policies across the region, provided that surveys use consistent methods - e.g. the same questions, to ensure comparability. Additionally, conducting a survey also serves as an incentive for Member States to evaluate and improve their vaccination programmes.
- Member States that do not monitor vaccination coverage among older age groups are encouraged to implement age-group-specific coverage/monitoring systems in accordance with national recommendations to enable them to track their progress or identify obstacles to achieving national and EU targets.
- Countries that do not yet have a seasonal influenza vaccination action plan to achieve higher seasonal influenza VCRs (as per 2009 EU Council Recommendation) are encouraged to develop and adopt such a plan, document or policy.
- In order to assess the performance of national influenza vaccination programmes, countries should consider expanding their influenza vaccination coverage monitoring systems to those target groups for whom vaccination is most commonly recommended (older people, people with chronic medical conditions, pregnant women, and HCWs) as part of life-course vaccination programmes ensuring protection against vaccine-preventable disease. Collection and reporting of numerator and denominator data for age, target and risk groups should be encouraged. Data on coverage, collected on an annual basis at the end of each influenza season, could be used to identify gaps and challenges in national vaccination campaigns and programmes.
- This survey demonstrates that VCRs need to be improved in all targeted groups: older people, people with chronic medical conditions, pregnant women, and HCWs. Only a few EU/EEA Member States come close to the 75% target which is unfortunate, given the large burden of moderate to severe influenza disease leading to hospitalisations and sequelae. Tools to improve VCR should therefore be explored.
- Public health authorities should consider encouraging healthcare workers to be vaccinated to protect the vulnerable groups they care for and themselves. Communication campaigns on influenza and influenza vaccines, directed specifically at these population groups, could increase coverage.
- Public health authorities should also consider encouraging healthcare workers to recommend seasonal influenza vaccination to people in the target groups. Communication campaigns on influenza and influenza vaccines directed specifically at these population groups could increase coverage.
- Adequate and sustainable funding of vaccination programmes is a critical factor for achieving higher vaccination coverage rates.
- More work is needed to explore how recommendations (at all levels) can be effectively translated into higher VCRs. Research should try to identify the reasons why some countries achieve a 75% vaccination coverage rate and others do not.
- Monitoring of combination strategies for vaccinating children and older individuals, such as the one in the UK where children are vaccinated not only to protect themselves but also to reduce transmission of influenza overall in the society.
- VCRs could be compared at European level by means of annual population-based surveys which use the same or very similar methods. Immunisation information systems are needed and should be encouraged in all EU/EEA Member States, ideally to have the possibility of linking with other health-outcome databases.
- Consideration should be given to whether keeping track of vaccine recommendations and available vaccine brands and formulations and monitoring their use in different age, target and risk groups as well as monitoring the availability and use of antivirals should become an integral part of influenza surveillance in EU/EEA Member States.

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Annex 1. Availability of national action plans

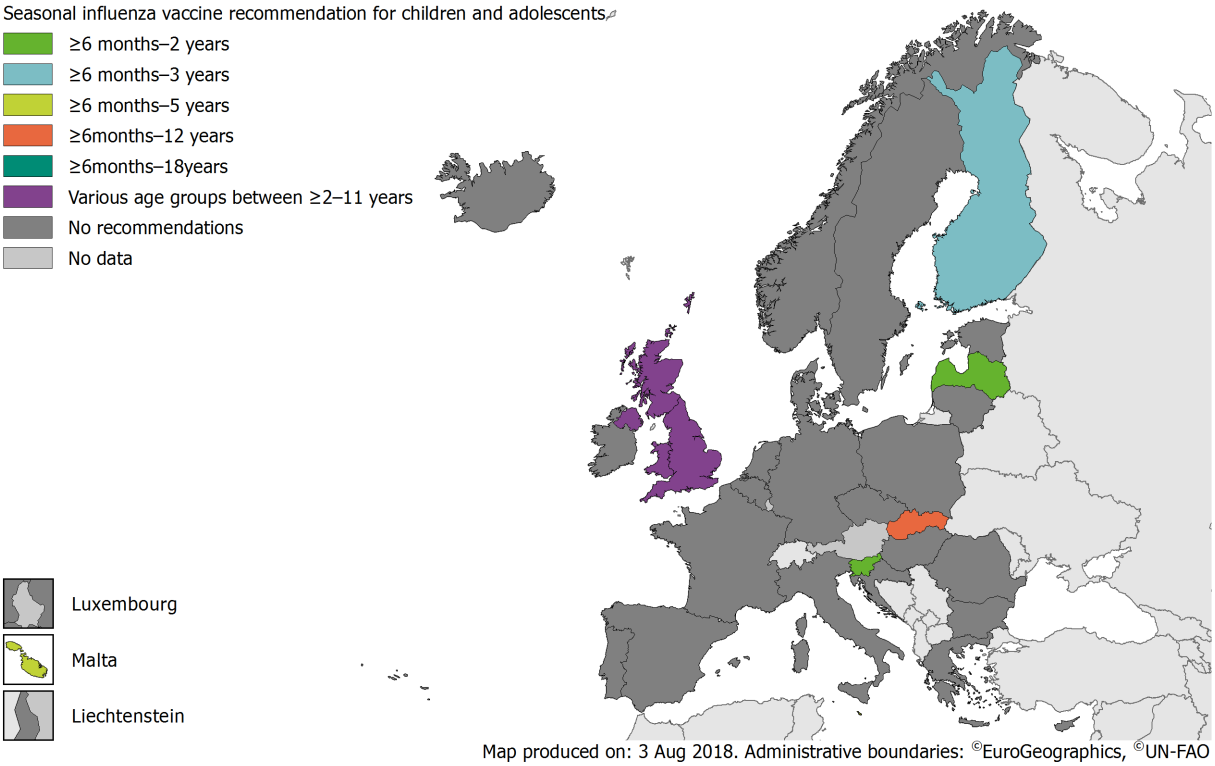
Table 3. Availability of national action plan to improve vaccination coverage for seasonal influenza in the EU/EEA, 2017–18 influenza season

Availability	Member States
Yes, plan was adopted	Iceland, United Kingdom–England, United Kingdom-Scotland
Yes, plan was developed previously and updated according to the 2009 Council Recommendation	Czech Republic, Ireland, Italy, Lithuania, Netherlands*, Poland, Portugal, United Kingdom-Wales
A plan was not developed, but a respective policy is in place	Belgium, Croatia, Denmark, France, Germany, Greece, Hungary, Latvia, Liechtenstein, Luxemburg, Malta, Norway, Romania, Slovakia, Spain, Sweden, United Kingdom-Northern Ireland
Plan is under development	Bulgaria, Cyprus, Estonia, Finland, Slovenia

Source: National seasonal influenza vaccination survey, January 2018.
**: national action plan prepared by the Netherlands not primarily intended to improve vaccination coverage.*

Annex 2. Recommendations for children, adolescents and adults

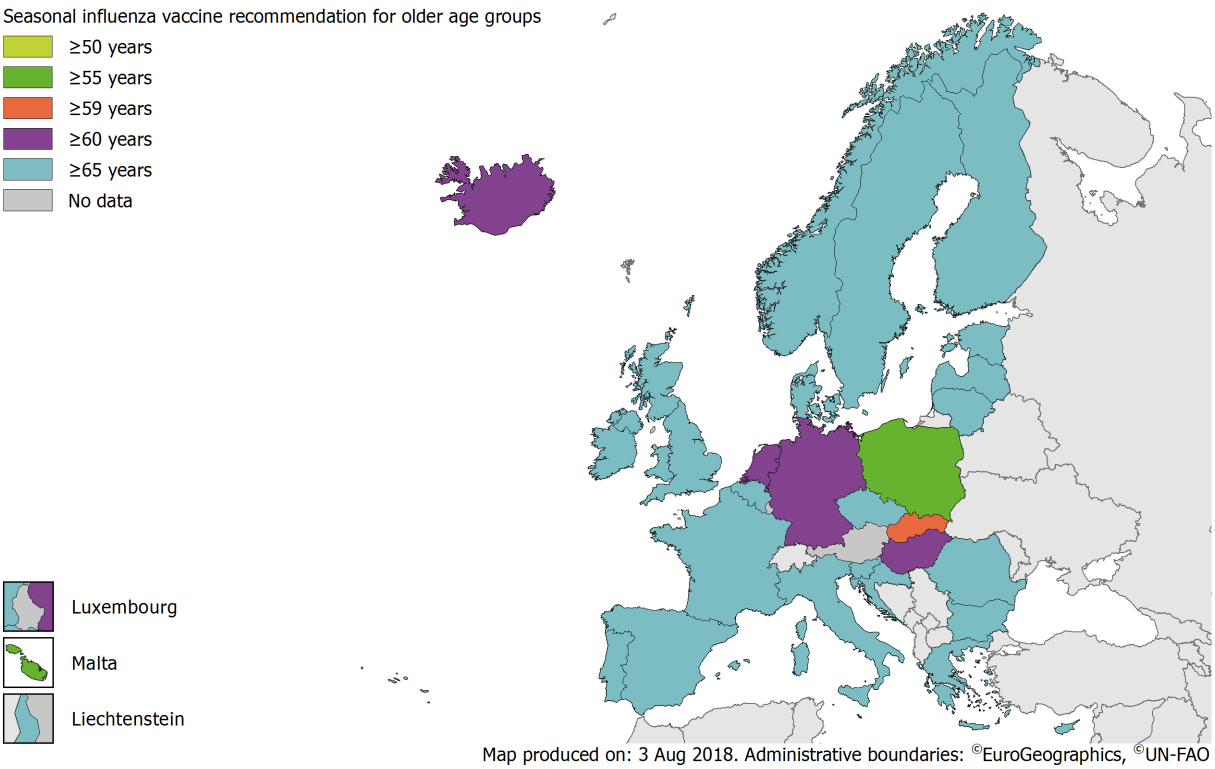
Map 3. Member States recommending seasonal influenza vaccine for children and adolescents, 2017–2018 influenza season



Map produced on: 3 Aug 2018. Administrative boundaries: ©EuroGeographics, ©UN-FAO
Source: National seasonal influenza vaccination survey, January 2018

In Cyprus, no recommendation.
UK recommendations for vaccination age: England ≥2-7 years; Northern Ireland and Scotland 2–11 years; Wales 2–8 years.

Map 4. Member States recommending seasonal influenza vaccine for older age groups, 2017–18 influenza season



Map produced on: 3 Aug 2018. Administrative boundaries: ©EuroGeographics, ©UN-FAO
Source: National seasonal influenza vaccination survey, January 2018

In Ireland, the National Immunization Technical Advisory Group (NITAG) recommends vaccine for people ≥50 years of age but the programme focuses only on people ≥65 years.

The Belgian guidelines recommend vaccine for people ≥65 years of age. This age group belongs to the first priority group for receiving the influenza vaccine; the guidelines also mention explicitly that the vaccine is also useful for healthy persons aged 50 years and older.

The recommendation in Spain is for people ≥65 years of age; however some regions recommend vaccination for those ≥60 years of age.

In Estonia and Malta, vaccination against seasonal influenza is recommended for all population groups six months or older.

In Portugal, influenza vaccine is recommended and free for those aged ≥65 years; for those aged ≥60 years vaccine is recommended but not free of charge.

Annex 3. Recommendations for specific groups

Table 4. Influenza vaccine recommendations for people with chronic medical conditions, EU/EEA Member States, 2017–18 influenza season

Country	Chronic pulmonary	Chronic neurological[b]	Cardio–vascular[c]	Renal	Hepatic	Haematological[d]	Metabolic[e]	Immunosuppression[f]	HIV/AIDS	Compromised respiratory function[g]	Long-term aspirin use[h]	Morbid obesity[i]
Belgium	R	R	R	R	R	R	R	R	R	R	R	R
Bulgaria	R	NR	R	R	R	R	R	R	R	NR	NR	NR
Croatia	R	R	R	R	R	R	R	R	R	R	R	R
Cyprus	R	R	R	R	R	R	R	R	R	R	R	R
Czech Republic	R	R	R	R	R	NR	R	R	R	R	NR	NR
Denmark	R	R	R	R	R	R	R	R	R	R	NR	R
Estonia	R	R	R	R	R	R	R	R	R	R	R	R
Finland	R	R	R	R	R	R	R	R	R	R	R	R
France	R	R	R	R	R	R	R	R	R	R	NR	R
Germany	R	R	R	R	R	R	R	R	R	R	NR	NR
Greece	R	R	R	R	NR	R	R	R	R	R	R	R
Hungary	R	R	R	R	R	R	R	R	NR	R	R	R
Iceland	R	NR	R	R	R	NR	R	R	R	R	R	NR
Ireland	R	R	R	R	R	R	R	R	R	R	R	R
Italy	R	R	R	R	R	R	R	R	R	R	R	R
Latvia	R	NR	R	R	NR	NR	R	R	R	NR	R	NR
Liechtenstein	R	R	R	R	R	R	R	R	R	NR	NR	R
Lithuania	R	NR	R	R	R	R	R	R	R	R	NR	NR
Luxembourg	R	R	R	R	NR	R	R	R	R	R	R	NR
Malta	R	R	R	R	R	R	R	R	R	R	NR	NR
Netherlands[j]	R	NR	R	R	NR	NR	R	R	R	R	NR	NR
Norway	R	R	R	R	R	NR	R	R	R	NR	NR	R
Poland	R	R	R	R	R	R	R	R	R	R	R	R
Portugal	R	R	R	R	R	R	R	R	R	R	R	R
Romania	R	R	R	R	R	R	R	R	R	NR	NR	R
Slovakia	R	NR	R	R	R	R	R	R	NR	R	NR	NR
Slovenia	R	R	R	R	R	R	R	R	R	R	NR	R
Spain	R	R	R	R	R	R	R	R	R	R	R	R
Sweden	R	R	R	R	R	R	R	R	R	R	NR	R
United Kingdom–England	R	R	R	R	R	R	R	R	R	NR	NR	R
United Kingdom–Northern Ireland	R	R	R	R	R	R	R	R	R	R	NR	R
United Kingdom–Scotland	R	R	R	R	R	R	R	R	R	NR	NR	R
United Kingdom–Wales	R	R	R	R	R	R	R	R	R	NR	NR	R

Source: National seasonal influenza vaccination survey, January 2018.
R: recommended, i.e. a specific recommendation in an official policy document
NR: no recommendation - i.e. the lack of a specific recommendation in an official policy document
a: respiratory (pulmonary) diseases, e.g. chronic obstructive pulmonary disease, cystic fibrosis, asthma
b: chronic neurological diseases or neuromuscular conditions - e.g. disorders of the brain, spinal cord, peripheral nerve and muscle such as cerebral palsy, epilepsy (seizure disorders), stroke, intellectual disability (mental retardation), moderate-to-severe developmental delay, muscular dystrophy, or spinal cord injury
c: cardiovascular diseases such as congenital heart disease, congestive heart failure and coronary artery disease except hypertension
d: haematological disorders such as sickle cell disease
e: metabolic disorders such as inherited metabolic disorders and mitochondrial disorders including diabetes mellitus
f: immunosuppression due to disease or treatment including asplenia/splenic dysfunction and organ transplant, but other than HIV/AIDS
g: any condition that can compromise respiratory function
h: long-term aspirin use in children up to 18 years
i: morbid obesity defined as having a body mass index (BMI) of over >40kg/m².
In Belgium, Portugal and Italy, vaccination is recommended for people with a BMI of over 30kg/m².
In Belgium, vaccination is recommended for people with a BMI of over 35kg/m²
j: Health Council of the Netherlands. Fighting the flu. The Hague: Health Council of the Netherlands, 2014; publication no. 2014/16.

Table 5. Influenza vaccine recommendations for various occupational sectors (other than HCWs), EU/EEA Member States, 2017–18 influenza season

Country	Police, firefighters	Military personnel	Border/ immigration control, customs	Veterinary sector	Public transportation	Educational staff	Community services	Postal service	Poultry industry workers	Swine industry workers	Families raising pigs or poultry	Social workers, social care workers	Laboratory staff working in non-medical sectors	Wildlife environmentalists
Belgium	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bulgaria	R	R	NR	NR	R[a]	NR	NR	NR	NR	NR	NR	R	NR	NR
Croatia	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	NR
Cyprus	NR	NR	NR	R	NR	NR	NR	NR	R	R	NR	NR	NR	NR
Czech Republic	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Denmark	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Estonia	R	R	R	R	NR	NR	R	R	R	R	R	R	R	R
Finland	NR	R	NR	NR	NR	NR	NR	R	NR	NR	NR	R	R	NR
France	NR	NR	NR	NR	R[b]	NR	NR	NR	NR	NR	NR	NR	NR	NR
Germany	NR	R	NR	NR	NR	NR	NR	NR	R	NR	NR	NR	R	R
Greece	NR	R	NR	NR	NR	NR	NR	NR	R	NR	NR	NR	R	NR
Hungary	NR	NR	NR	NR	NR	NR	NR	NR	R	NR	NR	R	NR	NR
Iceland	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ireland	NR	NR	NR	R	NR	NR	NR	NR	R	R	R	NR	R	R
Italy	R	R	NR	R	NR	NR	R	R	R	R	R	NR	R	R
Latvia	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Liechtenstein[c]	NR	NR	NR	NR	NR	R[d]	NR	NR	NR	NR	NR	NR	R	NR
Lithuania	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Luxembourg	NR	NR	NR	NR	R	R[e]	NR	NR	NR	NR	NR	R	NR	NR
Malta	R	R	R	R	NR	NR	NR	NR	R	NR	NR	R	R	NR
Netherlands[g]	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Norway	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	NR	NR	NR
Poland	R	R	R	NR	R	R[e]	R	R	NR	NR	NR	R	NR	NR
Portugal[h]	R	NR	NR	NR	NR	R[d]	NR	NR	NR	NR	NR	NR	NR	NR
Romania	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Slovakia	NR	R	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	R
Slovenia	R	R	NR	R	NR	R [e]	NR	NR	R	NR	NR	NR	R	NR
Spain	R	R	NR	NR	NR	NR	NR	NR	R	R	R	NR	NR	NR
Sweden	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R[a]	NR
UK–England	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	NR	NR
UK–Northern Ireland	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	NR	NR
UK–Scotland	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R[f]	NR	NR
UK–Wales	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	NR	NR

Source: National seasonal influenza vaccination survey, January 2018.
Public transportation (e.g. ground, rail, air, marine)
Educational staff, e.g. primary/secondary schools, preschool centres, nursery schools, crèches/child care
Community services (energy, electricity, water)
Laboratory staff working in laboratories in the non-medical academic or environmental sectors
Wildlife environmentalists (workers who work with birds, e.g. bird ringing or bird banding)

Recommended, i.e. a specific recommendation in an official policy document
a: recommended for some personnel groups
b: crew members of airlines and cruises lines, tour guides
c: people who want to minimise their risk of contracting influenza
d: educational staff at Kindergarten and crèches/child care all educational staff
f: only social care workers who are in direct contact with patients/service users should be vaccinated by their employer as part of an occupational health programme
g: for target groups influenza vaccination; Health Council of the Netherlands. Fighting the flu. The Hague: Health Council of the Netherlands, 2014; publication no. 2014/16.
h: only firefighters that have functions similar to HCW such as ambulance drivers.

Annex 4. Vaccination coverage rates and method of monitoring by countries

Table 6. Seasonal influenza vaccination coverage rates for targeted population groups by method of monitoring, EU/EEA Member States, 2015–16, 2016–17 and 2017-18 influenza seasons

Member States	Measured/estimated vaccination coverage rates (%)								
	2015–16 influenza season			2016–17 influenza season			2017–18 influenza season		
	Administrative method[ii]	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry
Entire population									
Czech Republic	4.8	-	-	4.7	-	-	-	-	-
Estonia	1.6	-	-	2.6	-	-			
Slovenia	3.2	-	-	3	-	-			
Slovakia	4.5	-	-	4.4	-	-			
Lithuania	7.3	-	-	8.4	-	-			
Latvia	0.62	-	-	1.1	-	-	2.0	-	-
Poland	3.4			3.3					
Romania	3.2			2.5			5.2		
All children and adolescents									
≥6months–24 months									
Latvia	0.21	-	-	0.47	-	-	0.65	-	-
≥6 months–36 months									
Finland[a]	-	-	24.2	-	-	31.8			
≥6 months–48 months									
Poland	0.47	-	-	0.6	-	-			
2-6 year-olds									
UK– England	41.8	-	-	-	-	-			
2-7 year-olds									
UK–England	-	-	-	46.7	-	-			
≥25-60 months (2–4-year-olds)									
UK–Northern Ireland	50.5	-	-	52.6	-	-	50.6		
UK–Scotland	57.1	-	-	59.0	-	-	56.9%		
UK–Wales	56.1	-	-	59.7	-	-			
5–11-year-olds									
UK–Scotland	71.5	-	-	73.0	-	-	72.2%		
≥5–14-year-olds									
Poland	0.86	-	-	0.94	-	-			
≥6 months–15 years									
Slovakia	1.1	-	-	1.2	-	-			
All adults									
≥50 years of age									
Belgium	-		-	-	-	-			
≥55 years of age									
Malta		-	-		-	-			
≥59 years of age									
Slovakia	13.8	-	-	13.3	-	-			
≥60 years									
Germany	35.3		-	34.8	-	-			

ii Administrative method: reported routine immunisation data, i.e. registry system of doses administered.

Member States	Measured/estimated vaccination coverage rates (%)								
	2015–16 influenza season			2016–17 influenza season			2017–18 influenza season		
	Administrative method[ii]	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry
Iceland	39.3	-	-	43.7	-	-	43.1		
The Netherlands	60.0	-	-	57.5	-	-			
Hungary	21.6	-	-	19.9	-	-	21.9		
≥65 years									
Denmark	-	-	44	-	-	47			
Estonia	-	-	-	2	-	-			
Finland	-	-	43.2	-	-	47.3			
France		-	-		-	-			
Ireland	55.4	-	-	62 (if we use the updated PCRS data)	64.5 (omnibus survey)	-	67.6 (PCRS data as of 7/5/2018)	64.9 (omnibus survey)	-
Italy	50	-	-	52	-	-			
Latvia	2.4	-	-	4.3	-	-	6.7	-	-
Lithuania	19.5	-	-	24.1	-	-			
Netherlands	66.5	-	-	64.1	-	-			
Norway	-	27	23.8	-	38	26.9			
Poland	6.97	-	-	6.87	-	-	-	-	-
Portugal	60 (adm and survey)		-	-60 (adm and survey)	-	-	65 (adm and survey)		
Slovenia	10.4	-	-	9.8	-	-			
Spain	56.1	-	-	55.5	-	-	55.7 (provisional data)	-	-
Sweden	-		49.1	-		49.1			
UK–England	71.0	-	-	70.5	-	-			
UK–Northern Ireland	74.4	-	-	71.9	-	-	71.8		
UK–Scotland	74.5	-	-	72.8	-	-	73.7% (provisional data)		
UK– Wales	66.6	-	-	66.7	-	-	68.8		
≥18 years of age									
Sweden	-	-	14	-	-	13.7			
≥18-64 years									
Sweden	-	-	2	-	-	2			
≥15-64 years of age									
Poland	1.37	-	-	1.45	-	-			
Chronic medical conditions									
≥6 months-64 years of age									
France	39.1	-			-	-			
Norway	-	17.4			15.7				
Czech Republic	25.0	-	-	24.8	-	-	-	-	-
Portugal	-	31	-	-	-	-			
UK–England	45.1	-	-	48.6	-	-			
UK–Northern Ireland	59.9	-	-	57.1	-	-	56.0		
UK–Scotland	48	-	-	44.9	-	-	44.8%		
UK–Wales	46.8	-	-	46.9	-	-	48.5		
Other age groups									
Ireland								60.5% omnibus	

Member States	Measured/estimated vaccination coverage rates (%)								
	2015–16 influenza season			2016–17 influenza season			2017–18 influenza season		
	Administrative method[ii]	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry
								survey (18-64 years)	
Netherlands	35.5 (6 months–59 years)	-	-	32.7 (6 months–59 years)	-	-			
Norway	-	43.5 (≥65–79years)	-	-	55.4 (≥65–79 years)	-			
Pregnant women									
Belgium	-	47.2[b]	-	-	-	-			
Finland			24			25			
Hungary	1.43	-	-	1.01	-	-	1.47		
Ireland	-	-	-	-	31.3	-		62% omnibus survey	
Italy	0.9	-	-	1.7	-	-			
Lithuania	0.6	-	-	1.2	-	-	2.2		
Romania	4.5	-	-	2.9	-	-	NA		
Slovenia	0.8	-	-	0.5	-	-	-	-	-
UK– England	42.3	-	-	44.9	-	-			
UK– Northern Ireland	55.1	-	-	58.6	-	-	56.7		
UK– Scotland	51.2	-	-	50.3	-	-	49.4%		
UK– Wales[c]	47.8	75.6	-	47.2	76.8	-	47.6	72.7	
Healthy pregnant women									
UK–Scotland	49.9	-	-	49.3	-	-	48.1%		
UK–Wales							46.0		
Pregnant women with clinical risk									
UK–Scotland	61.5	-	-	58.0	-	-	61.8%		
UK–Wales							61.7		
All healthcare workers									
Estonia	26	-	-	-	-	-			
Hungary	28.1	-	-	28.1	-	-	31.2		
Ireland		-	-		-	-	-	-	-
Italy	15.1			15.6					
Poland		-	-		-	-			
Portugal	28	-	-	29	-	-			
Lithuania	26.7	-	-	29.1	-	-	29.3		
Norway	-	11.9	-	-	17.1	-			
Romania	30.2	-	-	31	-	-	34		
Spain	29.1	-	-	30.2	-	-	27.5 (provisional data)	-	-
Slovenia		-	-		-				
UK–England	50.6	-	-	63.2	-	-			
UK–Northern Ireland	24.6	-	-	29	-	-	33.4		
UK–Scotland	33.2		-	35.3		-	45.7%		
UK–Wales	47.3	-	-	51.5	-	-	54.7		
Outpatient healthcare settings									
Estonia	39								

Member States	Measured/estimated vaccination coverage rates (%)								
	2015–16 influenza season			2016–17 influenza season			2017–18 influenza season		
	Administrative method[ii]	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry	Administrative method	Survey method	Immunisation registry
Greece	24.3			34.5					
Portugal	45	-	-	44	-	-			
UK–England	58.8	-	-	60.6		-			
Inpatient healthcare settings									
Belgium	64.8 [d]								
Estonia	24								
Greece	10.9	-	-	18	-	-			
Ireland	22.6 (combination of several methods)	-	-	31.9 (combination of several methods)	-	-	38.1% mid-season	57.3% Omnibus survey	-
Portugal	24	-	-	25	-	-			
UK–England	49.7	-	-	64.6	-	-			
HCWs in long-term healthcare facilities									
Belgium		55.9 [d]							
Ireland	24.4 (combination of several methods)	-	-	28.1 (combination of several methods)	-	-	32.1% mid-season	-	-
Portugal	19	-	-	19	-	-			
Residents of long-term care facilities									
Ireland	90.7 (combination of several methods)	-	-	93.5 (combination of several methods)	-	-	89.5% mid-season	-	-
Portugal	75	-	-	81	-	-			
Slovakia	72.1			70.5					
Romania	69.1			46.7			NA		
UK–Wales	51.9	-	-	49.7	65	-	52.9		

Source: National seasonal influenza vaccination survey, January 2018.
[a]: vaccinated with at least one dose
[b]: In 2015, Flemish Regional authorities commissioned a vaccination coverage study for seasonal flu vaccination among pregnant women: Laenen J, Roelants M, Devlieger R, Vandermeulen C. Influenza and pertussis vaccination coverage in pregnant women. Vaccine 2015 Apr 27;33(18):2125-31.
[c]: Collecting data by using read codes (the standard clinical terminology system used in general practice) is considered to be problematic; data collected through surveys (conducted when giving birth) offer a better estimate.
[d]: In 2016, Flemish Regional authorities commissioned a study on the motivations of healthcare workers for seasonal flu vaccination: http://www.zorg-en-gezondheid.be/sites/default/files/atoms/files/Studie%20over%20de%20motivatie%20van%20gezondheidspersoneel%20over%20griepvaccinatie%20%282016%29.pdf.
Portugal: Nursing homes residents: 2015/2016: residents 92%; staff 25%. 2016/2017: residents 91%; staff 25%.

Annex 5. Payment mechanisms for vaccine and vaccine administration

Table 7. Payment mechanisms for vaccine/vaccine administration for population groups recommended seasonal influenza vaccine, 2017–18 influenza season

Payment scheme	National health service	National insurance scheme	Regional health service	Out of pocket	Private insurance	Employer	Combination of several mechanisms
Children and adolescents (n=6)							
For vaccine itself	Latvia, Malta, Finland, United Kingdom–England, United Kingdom–Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Slovakia		Slovenia			
For vaccine administration	Latvia, Malta, United Kingdom–England, United Kingdom–Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Slovakia	Finland	Slovenia			
Older population (e.g. aged ≥60, or ≥65) (n=30)							
For vaccine itself	Cyprus, Croatia, Denmark, Italy, Ireland, Iceland, Latvia, Hungary, Finland, Malta, Netherlands, Portugal, Romania, United Kingdom– England, United Kingdom– Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Belgium, Czech Republic, France, Luxembourg, Germany, Greece, Slovakia, Slovenia	Spain, Sweden	Belgium, Bulgaria, Cyprus, Estonia, Latvia, Norway, Poland, Lithuania, Liechtenstein, Sweden	Cyprus, Germany, Liechtenstein, Poland	Belgium, Estonia, Germany, Lithuania, Liechtenstein, Poland	Belgium, Cyprus, Estonia, Latvia, Germany, Lithuania, Liechtenstein, Poland, Sweden

For vaccine administration	Cyprus, Denmark, Italy, Latvia, Malta, Hungary, Iceland, Ireland, Poland, Portugal, Romania, Netherlands, United Kingdom–England, United Kingdom–Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Belgium, Croatia, Czech Republic, France, Luxembourg, Germany, Greece, Slovakia	Finland, Iceland, Spain, Sweden	Belgium, Bulgaria, Cyprus, Latvia, Iceland, Ireland, Luxembourg, Norway, Lithuania, Liechtenstein, Slovenia, Sweden	Cyprus, Luxembourg, Germany, Liechtenstein, Poland	Belgium, Germany, Lithuania, Liechtenstein, Ireland	Belgium, Cyprus, Luxembourg, Germany, Lithuania, Liechtenstein, Sweden, Iceland, Poland, Ireland
Clinical risk groups (n=30)							
For vaccine itself	Cyprus, Croatia, Denmark, Italy, Latvia, Lithuania, Malta, Finland, Hungary, Iceland, Ireland, Netherlands, Portugal, Romania, United Kingdom–England, United Kingdom–Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Belgium, France, Germany, Greece, Slovakia, Luxembourg, Slovenia, Romania, Czech Republic	Spain, Sweden	Cyprus, Belgium, Bulgaria, Estonia, Norway, Liechtenstein, Poland, Sweden	Cyprus, Germany, Liechtenstein, Poland	Belgium, Finland, Poland	Cyprus, Belgium, Finland, Romania, Germany, Liechtenstein, Poland, Sweden
For vaccine administration	Cyprus, Denmark, Iceland, Italy, Latvia, Lithuania, Netherlands, Malta, Hungary, Ireland, Poland, Portugal, Romania, United Kingdom–England, United Kingdom–Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Belgium, Croatia, France, Germany, Greece, Slovakia, Luxembourg, Romania, Czech Republic	Finland, Iceland, Spain, Sweden	Cyprus, Belgium, Bulgaria, Estonia, Iceland, Ireland, Latvia, Luxembourg, Slovenia, Norway, Liechtenstein, Sweden	Cyprus, Luxembourg, Germany, Liechtenstein, Poland	Ireland, Finland	Cyprus, Belgium, Iceland, Ireland, Liechtenstein, Finland, Germany, Luxembourg, Poland, Romania, Sweden, Portugal (when in pharmacies or private sector can be paid)
Pregnant women (n=28)							
For vaccine itself	Cyprus, Croatia, Finland, Iceland, Ireland, Latvia, Portugal, Romania, Denmark, Italy, Lithuania, Netherlands, Hungary, United Kingdom–England, United Kingdom–Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Belgium, France, Greece, Slovakia, Germany, Luxembourg, Romania, Slovenia	Spain, Sweden	Czech Republic, Cyprus, Belgium, Latvia, Liechtenstein, Poland, Norway, Sweden	Cyprus, Germany, Liechtenstein, Poland	Finland, Poland	Cyprus, Belgium, Finland, Latvia, Liechtenstein, Germany, Poland, Romania, Sweden

For vaccine administration	Cyprus, Ireland, Norway, Portugal, Romania, Denmark, Italy, Lithuania, Netherlands, Poland, Hungary, United Kingdom– England, United Kingdom– Northern Ireland, United Kingdom– Scotland, United Kingdom–Wales	Belgium, Croatia, France, Greece, Slovakia, Germany, Luxembourg, Romania	Finland, Iceland, Spain, Sweden	Czech Republic, Cyprus, Belgium, Ireland, Latvia, Liechtenstein, Luxembourg, Norway, Slovenia, Sweden	Cyprus, Germany, Liechtenstein, Luxembourg, Poland	Finland, Ireland	Cyprus, Belgium, Finland, Germany, Ireland, Liechtenstein, Luxembourg, Norway, Poland, Romania, Sweden
Data not available: EE							
HCWs (n=29)							
For vaccine itself	Cyprus, Croatia, Italy, Lithuania, Malta, Finland, France, Greece, Hungary, Iceland, Ireland, Romania, United Kingdom– England, United Kingdom– Northern Ireland, United Kingdom– Scotland, United Kingdom–Wales	Belgium, France, Greece, Romania	Spain	Cyprus, Belgium, Bulgaria, Czech Republic, Latvia, Poland	Cyprus, Poland,	Belgium, Bulgaria, Estonia, Germany, Liechtenstein, Norway, Netherlands, Portugal, Slovakia, Slovenia, Finland, France, Latvia, Poland, Sweden, United Kingdom–Northern Ireland	Cyprus, Belgium, Bulgaria, France, Finland, Greece, Latvia, Poland, Romania, United Kingdom– Northern Ireland,
For vaccine administration	Cyprus, Italy, Lithuania, Malta, France, Greece, Hungary, Ireland, Poland, Romania, United Kingdom–England, United Kingdom–Northern Ireland, United Kingdom–Scotland, United Kingdom–Wales	Croatia, Belgium, France, Greece, Romania	Finland, Greece, Iceland, Spain	Cyprus, Belgium, Bulgaria, Czech Republic, Ireland, Latvia	Cyprus, Poland	Belgium, Bulgaria, Estonia, Germany, Iceland, Liechtenstein, Norway, Netherlands, Portugal, Slovakia, Slovenia, Sweden, Finland, France	Cyprus, Belgium, Bulgaria, France, Finland, Greece, Iceland, Ireland, Poland, Romania
Data not available: LU							
Other occupational groups (n=24)							
For vaccine itself	Cyprus, Croatia, Finland, Ireland, Italy, Malta, Netherlands, Portugal, United Kingdom– England	Belgium, France, Greece	Spain	Cyprus, Belgium, Bulgaria, Estonia, Poland	Cyprus, Poland	Belgium, Bulgaria, Estonia, Netherlands, Poland, Portugal, Slovakia, Slovenia, Sweden, Liechtenstein, Norway, Germany, United Kingdom– Wales, United Kingdom– Northern Ireland , United Kingdom-Scotland*	Cyprus, Belgium, Bulgaria, Estonia, Netherlands, Poland, Portugal

For vaccine administration	Cyprus, Ireland, Italy, Malta, Netherlands, Poland, Portugal, United Kingdom– England	Belgium, Croatia, France, Greece	Finland, Spain	Cyprus, Belgium, Bulgaria, Ireland	Cyprus, Poland	Belgium, Bulgaria, Ireland, Netherlands, Slovakia, Slovenia, Sweden Liechtenstein, Norway, Germany, United Kingdom–Northern Ireland , United Kingdom–Wales, United Kingdom-Scotland[a]	Cyprus, Belgium, Bulgaria, Ireland, Netherlands, Poland
Data not available: Estonia for vaccine administration; Hungary, Luxembourg and Sweden for vaccine and administration. Not applicable: Czech Republic, Denmark, Iceland, Latvia, Lithuania, Romania							
Household contacts (n=22)							
For vaccine itself	Cyprus, Croatia, Denmark, Italy, Ireland, Finland, Romania, United Kingdom-England, United Kingdom-Northern Ireland, United Kingdom-Scotland, United Kingdom-Wales, Portugal	France, Greece, Germany, Romania	Spain, Sweden	Cyprus, Belgium, Bulgaria, Czech Republic, Estonia, Liechtenstein, Netherlands, Norway, Poland, Sweden	Cyprus, Germany, Liechtenstein, Poland	Poland	Cyprus, Germany, Liechtenstein, Poland, Romania, Sweden
For vaccine administration	Cyprus, Denmark, Italy, Ireland, Romania, United Kingdom-England, United Kingdom-Northern Ireland, United Kingdom-Scotland, United Kingdom-Wales, Poland, Portugal	Croatia, Greece, France, Germany, Romania	Finland, Spain, Sweden	Cyprus, Belgium, Bulgaria, Czech Republic, Estonia, Ireland, Liechtenstein, Netherlands, Norway, Sweden	Cyprus, Germany, Liechtenstein, Poland	Ireland, Poland	Cyprus, , Germany, Ireland, Liechtenstein, Poland, Romania, Sweden
Not applicable: Hungary, Iceland, Latvia, Lithuania, Luxembourg, Malta, Slovakia, Slovenia							
Populations living/working/staying in closed communities (including residents of long term care facilities (n=27)							
For vaccine itself	Cyprus, Bulgaria, Finland, Hungary, Iceland, Ireland, Romania, United Kingdom-England, United Kingdom-Northern Ireland, United Kingdom-Scotland, United Kingdom-Wales, Malta, Netherlands, Lithuania, Italy, Portugal, Croatia	Belgium, Czech Republic, France, Germany, Romania, Greece, Slovakia, Slovenia	Belgium, Spain	Cyprus, Belgium, Bulgaria, Estonia, Liechtenstein, Poland	Cyprus, Germany, Liechtenstein, Poland	Norway (residential care), Poland	Cyprus, Belgium, Bulgaria, Germany, Liechtenstein, Poland Romania

For vaccine administration	Cyprus, Bulgaria, France, Hungary, Iceland, Ireland, Poland, Romania, United Kingdom-England, United Kingdom-Northern Ireland, United Kingdom-Scotland, United Kingdom-Wales, Malta, Netherlands, Lithuania, Italy, Portugal, Croatia	Belgium, Czech Republic, France, Germany, Romania, Greece, Slovakia	Belgium, Finland, Spain	Cyprus, Belgium, Bulgaria, Estonia, Ireland, Liechtenstein, Slovenia	Cyprus, Germany, Liechtenstein, Poland	Norway (residential care), Ireland	Cyprus, Belgium, Bulgaria, Germany, France, Ireland, Liechtenstein, Poland, Romania
Data not available: Luxembourg. Not applicable: Denmark, Latvia, Sweden							

Source: National seasonal influenza vaccination survey, January 2018
Highlighted countries indicated having several payment mechanisms for vaccine targeted population groups.
a: Only social care workers who are in direct contact with patients/service users should be vaccinated by their employer as part of an occupational health programme.

Annex 6. Vaccine procurement

Table 8. Number of doses purchased, distributed and used for population groups recommended seasonal influenza vaccine, 2015-16 and 2016–17 influenza season

Country	Purchased	Distributed	Used	Purchased	Distributed	Used
	2015-16			2016-17		
Denmark	594 000	NA	594 726	747 700	NA	693 146
Estonia	32 900	32683	20 579	50 060	50 097	39 071
Finland	1 700 000	1 500 000	1 500 000	1 800 000	1 600 000	1 600 000
Hungary	1 300 000	1 300 000	749 390	1 300 000	1 234 500	694 155
Iceland	65 000	61 700	NA	70 000	68 720	NA
Ireland	790 000	774 590	NA	850 000	841 569	NA
Italy	NA	NA	8 451 878	NA	NA	9 166 099
Latvia	31 800	22 802	12 315	47 594	45 467	23 540
Lithuania	95 280	95 280	95 087	110 000	110 000	109 877
Luxemburg	NA	43 855	NA	NA	54 486	NA
Malta	80 000	70 000	63 668	80 000	75 000	70 754
Netherlands	3 331 920	3 325 400	3 187 946	3 263 090	3 259 370	3 083 000
Norway	501 140	423 440	406 074	500 000	454 890	440 890
Portugal	1 223 624	1 223 624	NA	1 233 171	1 233 171	NA
Romania	642 810	642 810	636 755	500 000	500 000	499 650
Slovakia	NA	260 273	244 429	NA	269 952	238 592
Slovenia	115 600	87 463	66 646	90 500	86 743	62 830
UK–Scotland	NA	1 741 837	1 561 296	1 901 020	1 881 712	1 551 055

Source: National seasonal influenza vaccination survey, January 2018.
Not available (NA): Belgium, Bulgaria, Cyprus, France, Germany, Greece, Liechtenstein, Spain, Sweden, UK–England, UK–Northern Ireland and UK–Wales.
Purchased: number of doses purchased by public sector/state
Distributed: number of doses distributed to the health facilities, which perform vaccination for those whom vaccine is recommended
Used: number of doses actually used in health facilities where vaccine purchased by public sector was distributed.

Table 9. Vaccine products used for population groups recommended seasonal influenza vaccine, 2017–18 influenza season

Vaccines	Trivalent inactivated influenza vaccine (IIV3); non-adjuvanted			Quadrivalent inactivated influenza vaccine (IIV4); non-adjuvanted			Trivalent inactivated influenza vaccine (aIIV3); adjuvanted			Quadrivalent attenuated nasal vaccine (LAIV4); non-adjuvanted		
Country	IIV3	IIV3 products	IIV3 target groups	IIV4	IIV4 products	IIV4 target groups	aIIV3	aIIV3 products	aIIV3 target groups	LAIV4	LAIV4 products	LAIV4 target groups
Belgium	U	Mylan EPD	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long-stay care facilities;	U	GlaxoSmithKline; Sanofi Pasteur;	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long-stay care facilities;	NU	NA	NA	NU	NA	NA
Bulgaria	U	Abbott Healthcare	Those with medical condition/s; healthy adults; older adults (e.g. >60/65 years); healthcare workers;	U	Sanofi Pasteur;	Healthy adults	NU	NA	NA	NU	NA	NA
Croatia	U	Abbott Healthcare	Those with medical condition/s; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Cyprus	U	Abbott Healthcare	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Czech Republic	U	Abbott Healthcare; Sanofi Pasteur	Other target group: not specified, used for whole population	U	Sanofi Pasteur	Other target group: not specified, used for whole population	NU	NA	NA	NU	NA	NA
Denmark	U	Abbott Healthcare; Sanofi Pasteur;	Those with medical condition/s; older adults (e.g. >60/65 years);	NU	NA	NA	NU	NA	NA	NU	NA	NA
Estonia	NU	NA	NA	U	Sanofi Pasteur;	Children and adolescents; those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA
Finland	U	Abbott healthcare; Other manufacturer: AstraZeneca	Children and adolescents;	NU	NA	NA	NU	NA	NA	U	Astra Zeneca;	Other target group: 24-35 months
France	U	Sanofi Pasteur; Other manufacturer: Mylan and Pierre Fabre	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Germany	U	GlaxoSmithKline; Seqirus; Sanofi Pasteur; Other manufacturer: Mylan Healthcare	Children and adolescents; those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long-stay care facilities;	U	GlaxoSmithKline; Sanofi Pasteur;	Children and adolescents; those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); residents of long-stay care facilities;	U	Other manufacturer: Seqirus	Older adults (e.g. >60/65 years);	U	Astra Zeneca;	Children and adolescents (2-18yo);

Vaccines	Trivalent inactivated influenza vaccine (IIV3); non-adjuvanted			Quadrivalent inactivated influenza vaccine (IIV4); non-adjuvanted			Trivalent inactivated influenza vaccine (aIIV3); adjuvanted			Quadrivalent attenuated nasal vaccine (LAIV4); non-adjuvanted		
Country	IIV3	IIV3 products	IIV3 target groups	IIV4	IIV4 products	IIV4 target groups	aIIV3	aIIV3 products	aIIV3 target groups	LAIV4	LAIV4 products	LAIV4 target groups
Greece	U	Abbott healthcare; GlaxoSmithKline; Sanofi Pasteur;	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long-stay care facilities; other target group: as described previously	U	GlaxoSmithKline; Sanofi Pasteur;	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities; other target group: as described previously	NU	NA	NA	NU	NA	NA
Hungary	NU	NA	NA	NU	NA	NA	U	Omnivest (Aluminum phosphate gel);	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long-stay care facilities; other target group: children over 3 years and adolescents	NU	NA	NA
Iceland	U	Other manufacturer: BGP Products ApS; Mylan	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Ireland	U	Sanofi Pasteur	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities; other target group: anyone recommended flu vaccine, including occupational risk groups	NU	NA	NA	NU	NA	NA	NU	NA	NA
Italy	U	Abbott healthcare; GlaxoSmithKline; Seqirus; Sanofi Pasteur	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	U	GlaxoSmithKline; Sanofi Pasteur;	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	U	Seqirus;	Older adults (e.g. >60/65 years);	NU	NA	NA
Latvia	U	Abbott healthcare	Children and adolescents; those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	U	Sanofi Pasteur;	Children and adolescents; those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA

Vaccines	Trivalent inactivated influenza vaccine (IIV3); non-adjuvanted			Quadrivalent inactivated influenza vaccine (IIV4); non-adjuvanted			Trivalent inactivated influenza vaccine (aIIV3); adjuvanted			Quadrivalent attenuated nasal vaccine (LAIV4); non-adjuvanted		
Country	IIV3	IIV3 products	IIV3 target groups	IIV4	IIV4 products	IIV4 target groups	aIIV3	aIIV3 products	aIIV3 target groups	LAIV4	LAIV4 products	LAIV4 target groups
Liechtenstein	U	Other manufacturer: PaxVaxBerna	Children and adolescents; those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	U	GlaxoSmithKline;	Children and adolescents; those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	U	Other manufacturer: PaxVaxBerna	Those with medical condition/s; older adults (e.g. >60/65 years);	NU	NA	NA
Lithuania	U	Other manufacturer: Mylan	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare Workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Luxemburg	U	Abbott Healthcare; Sanofi Pasteur	Children and adolescents; those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long-stay care facilities;	U	GlaxoSmithKline; Sanofi Pasteur;	Children and adolescents; those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA
Malta	U	Sanofi Pasteur	Children and adolescents; those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Netherlands	U	Abbott Healthcare; Sanofi Pasteur	Those with medical condition/s; older adults (e.g. >60/65 years); residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Norway	U	Abbott Healthcare; Sanofi Pasteur	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities; other target group: close contact to immunosuppressed individuals and families raising swine and others in close contact with live swine.	NU	NA	NA	NU	NA	NA	U	Astra Zeneca;	Other target group: Children and adolescents 24 months - 18 years in clinical risk groups
Portugal	U	Abbott Healthcare; Sanofi Pasteur	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Romania	U	Abbott Healthcare	those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA	NU	NA	NA
Slovakia	U	Abbott Healthcare; Sanofi Pasteur	Children and adolescents; Those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years);	NU	NA	NA	NU	NA	NA	NU	NA	NA

Vaccines	Trivalent inactivated influenza vaccine (IIV3); non-adjuvanted			Quadrivalent inactivated influenza vaccine (IIV4); non-adjuvanted			Trivalent inactivated influenza vaccine (aIIV3); adjuvanted			Quadrivalent attenuated nasal vaccine (LAIV4); non-adjuvanted		
Country	IIV3	IIV3 products	IIV3 target groups	IIV4	IIV4 products	IIV4 target groups	aIIV3	aIIV3 products	aIIV3 target groups	LAIV4	LAIV4 products	LAIV4 target groups
			healthcare workers; residents of long stay care facilities;									
Slovenia	U	Sanofi Pasteur	Other target group: children under 3 years old	U	Sanofi Pasteur;	Children and adolescents; those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	NU	NA	NA
Spain	U	Abbott Healthcare; Seqirus	Children and adolescents; those with medical condition/s; healthy adults; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	U	Seqirus;	Older adults (e.g. >60/65 years);	NU	NA	NA
Sweden	U	GlaxoSmithKline; Sanofi Pasteur; Other manufacturer: BGP Products B.V.	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years);	U	GlaxoSmithKline; Other manufacturer: BGP Products B.V.	Other target group: IIV4, non-adjuvanted, was not used in any regional vaccination programs. No regions had time to procure it.	NU	NA	NA	U	AstraZeneca	Other target group: Children 24 months-17 years with medical/clinical risk and no contraindications.
Poland	U	Abbott Healthcare; GlaxoSmithKline	Children and adolescents;	U	Sanofi Pasteur;	Children and adolescents;	NU	NA	NA	NU	NA	NA
United Kingdom-England	U	NU	NA	U	GlaxoSmithKline; Sanofi Pasteur;	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	NU	NA	NA	U	AstraZeneca	Other target group: 2–8 years
United Kingdom-Northern Ireland	U	Seqirus; Sanofi Pasteur; Other manufacturer: BGP Products Ltd	Children and adolescents; those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	U	Sanofi Pasteur;	Other target group: 2yrs-11yrs	NU	NA	NA	U	AstraZeneca	Children and adolescents (2–18yo);
United Kingdom-Scotland	U	Seqirus; Sanofi Pasteur; Other manufacturer: Mylan(BGP) 'influvac'; Pfizer vaccine is marketed in UK under Seqirus.	Those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); healthcare workers; residents of long stay care facilities;	U	Sanofi Pasteur;	Other target group: Children 6 months to 18 years old whom are unsuitable for LAIV4 (including both contraindicated and unsuitability due to concerns over gelatine content, e.g. religious beliefs)	NU	NA	NA	U	AstraZeneca	Other target group: Recommended for all children aged 2-4 years and offered in GP setting and 5-11 years and offered in primary school setting.
United Kingdom-Wales	U	Abbott Healthcare; GlaxoSmithKline; Seqirus; Sanofi Pasteur	Children (aged 6m to <36 in a risk group) and adolescents (who are eligible but contraindicated to LAIV4); those with medical	U	GlaxoSmithKline; Sanofi Pasteur	Children (aged 6m to <36 in a risk group) and adolescents (who are eligible but	NU	NA	NA	U	AstraZeneca	Eligible children and adolescents (2–<18 years)

Vaccines	Trivalent inactivated influenza vaccine (IIV3); non-adjuvanted			Quadrivalent inactivated influenza vaccine (IIV4); non-adjuvanted			Trivalent inactivated influenza vaccine (aIIV3); adjuvanted			Quadrivalent attenuated nasal vaccine (LAIV4); non-adjuvanted		
Country	IIV3	IIV3 products	IIV3 target groups	IIV4	IIV4 products	IIV4 target groups	aIIV3	aIIV3 products	aIIV3 target groups	LAIV4	LAIV4 products	LAIV4 target groups
			condition; those with medical condition/s; pregnant women; older adults (e.g. >65 years and older); healthcare workers; residents of long stay care facilities; other target group: carers			contraindicated to LAIV4); those with medical condition; those with medical condition/s; pregnant women; older adults (e.g. >60/65 years); residents of long stay care facilities; other target group: carers						

Source: National seasonal influenza vaccination survey, January 2018
U: used
NU: uot used
NA: not applicable.

Annex 7. Use of antiviral agents for the treatment and prophylaxis of influenza

Table 10. Recommendations for treatment to suspected or laboratory-confirmed influenza, 2017–18 influenza season, EU/EEA countries

Population group	Countries recommending treatment/prophylaxis[a]
For inpatients who meet the following criteria:	
Severe, complicated* influenza-like illness	Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Ireland, Liechtenstein, Malta, the Netherlands, Norway, Romania, Slovenia, Sweden, Portugal, United Kingdom [England, Scotland, Wales, Northern Ireland]
Progressive influenza-like illness	Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Ireland, Liechtenstein, Malta, the Netherlands, Norway, Slovenia, Portugal, United Kingdom [England, Scotland, Wales, Northern Ireland]
People who require hospitalisation due to influenza-like illness	Bulgaria, Denmark, Estonia, Greece, Finland, France[b], Italy, Ireland, Liechtenstein, Malta, the Netherlands, Norway, Slovenia, Sweden, Portugal, United Kingdom [England, Scotland, Wales, Northern Ireland]
For outpatients at higher risk of influenza complications because of their age or underlying medical conditions**	
Children <6 months	Finland, Ireland, Portugal
Children <2 years	Bulgaria, Finland, Greece, Ireland, Portugal
Children <5 years	Bulgaria, Cyprus, Estonia, Finland, France, Greece, Malta, Portugal,
Adults aged ≥65 years	Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Greece, Ireland, Liechtenstein, Malta, the Netherlands, Norway, Portugal, Sweden, United Kingdom [England, Scotland, Wales, Northern Ireland]
Individuals belonging to risk groups (see footnote[c])	Denmark, Estonia, Finland, France, Greece, Ireland, Malta, Norway, Portugal, Sweden, United Kingdom [England, Scotland, Wales, Northern Ireland]
Severe immunosuppression (see footnote [d])	Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Greece, Ireland, Malta, the Netherlands, Norway, Portugal, Slovenia, Sweden, United Kingdom [England, Scotland, Wales, Northern Ireland]
Pregnant women	Denmark, Finland, France, Greece, Ireland, Norway, Portugal, Sweden, United Kingdom– Scotland, United Kingdom–Wales , United Kingdom– Northern Ireland
For postpartum women (within 6 weeks after delivery)	Denmark (up to 2 weeks after delivery), Finland, Ireland, Portugal (up to 15 days postpartum) and interruption of pregnancy (at any age gestational and up to 15 days post-interruption)), United Kingdom–Wales, United Kingdom–Northern Ireland
Residents of nursing homes and other long-term care facilities	Estonia, Finland, France, Greece, Ireland, Malta, the Netherlands, Norway, United Kingdom–England, United Kingdom– Northern Ireland, United Kingdom– Scotland

Table 11. Recommendations for prophylaxis following exposure to suspected or laboratory-confirmed influenza, 2017–18 influenza season, EU/EEA countries

Population group	Countries recommending treatment/prophylaxis[a]
Post-exposure prophylaxis	
For family or other close contacts of persons who are at higher risk for influenza complications	Cyprus, Finland, France, Ireland, the United Kingdom–Northern Ireland, United Kingdom–Scotland
Residents of residential care facility where outbreak is occurring	Finland, France, Ireland, Liechtenstein, Slovenia, the United Kingdom (England, Scotland, Wales, Northern Ireland)
For unvaccinated HCWs with occupational exposure	Finland, Ireland, Slovenia
Other	Sweden[e], Ireland[f], Netherlands[i], United Kingdom–Scotland[j], United Kingdom–Wales[k] Denmark[l]
Prophylaxis in case of outbreak	
For individuals in long-term care facilities/care for immunocompromised	Cyprus, Estonia, Finland, France, Greece, Ireland, the Netherlands, Portugal, Slovenia, Sweden, the United Kingdom (England, Scotland, Wales, Northern Ireland)

Population group	Countries recommending treatment/prophylaxis[a]
For unvaccinated healthcare staff who provide care to persons at high risk of complications in long-term care facilities/care for immunocompromised patients	Cyprus, Estonia, Finland, Greece, Ireland, the Netherlands, Slovenia
For healthcare staff whom influenza vaccine is contraindicated	Finland, Ireland, the Netherlands, Slovenia
For recently vaccinated healthcare staff up to 2 weeks following influenza vaccination	Ireland, the Netherlands
For all healthcare staff regardless of whether they received influenza vaccination	Ireland, the Netherlands
Other	Ireland[h], Portugal[g]

Source: National seasonal influenza vaccination survey, January 2018 (n=20).

**: complicated influenza requiring hospital admission and/or with symptoms and signs of lower respiratory tract infection (hypoxemia, dyspnoea, lung infiltrate), central nervous system involvement and/or significant exacerbation of an underlying medical condition*
***: uncomplicated influenza defined as influenza presenting with fever, coryza, generalised symptoms (headache, malaise, myalgia, arthralgia) and sometimes gastrointestinal symptoms, but without any features of complicated influenza*
[a]: recommended, i.e. a specific recommendation in an official policy document
[b]: hospitalised for another reason but with ILI symptoms
[c]: chronic pulmonary (including asthma) diseases, cardiovascular diseases (except hypertension alone), renal diseases, hepatic diseases, haematological diseases (including sickle cell disease), metabolic disorders (including diabetes mellitus), neurologic and neurodevelopment conditions (including disorders of the brain, spinal cord, peripheral nerve, and muscle such as cerebral palsy, epilepsy [seizure disorders], stroke, intellectual disability [mental retardation], moderate to severe developmental delay, muscular dystrophy, or spinal cord injury), people <19 years who receive long-term aspirin therapy, morbid obesity (i.e. BMI ≥40)
[d]:severe immunosuppression: (severe primary immunodeficiency; current or recent (within six months) chemotherapy or radiotherapy for malignancy; solid organ transplant recipients of immunosuppressive therapy; bone marrow transplant recipients currently receiving immunosuppressive treatment, or within 12 months of receiving immunosuppression; patients with current graft versus-host disease; patients currently receiving high dose systemic corticosteroids and for at least three months after treatment has stopped; HIV-infected patients with severe immunosuppression; patients currently or recently (within six months) on other types of highly immunosuppressive therapy or where the patients specialist regards them as severely immunosuppressed;
[e]: In Sweden, only as an exception under very special circumstances, for risk group patients who cannot be vaccinated but have had close contact with an influenza infected person.
[f]: In Ireland for most, instead of recommended it is to be considered (and is often recommended). In vaccinated HCWs, in an outbreak, if strain is different from vaccine strain anti-virals should be considered.
[g]: In Portugal, post exposure prophylaxis is not widely recommended. Only in an individual basis through doctor prescription or in outbreak situation in institutions (Health authority decision).
[h]: In Ireland, the national guidance indicates that post exposure should be considered for the above groups following risk assessment with public health.
[i]: In Netherlands, cullers and farm residents of avian influenza infected farm.
[j] In United Kingdom–Scotland influenza post-exposure prophylaxis recommended for unvaccinated HCWs with occupational exposure only if in clinical risk group
[k]: In United Kingdom–Wales for influenza post-exposure prophylaxis recommended among care-home residents in at-risk groups in specific outbreak situations.
[l]: In Denmark, under special circumstances prophylactic treatment of people with immunodeficiency after household exposure.

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