Meeting report

6th WHO Regional Office for Europe & European Centre for Disease Prevention and Control Joint European Influenza Surveillance Meeting

6–8 June 2018

Copenhagen, Denmark

Acknowledgements

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Abbreviations

CD	Case definition
BCoDE	Burden of Communicable Disease in Europe
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EFSA	European Food Safety Authority
EISN	European Influenza Surveillance Network
EU	European Union
EURL	European Union Reference Laboratory
euroMOMO	European Monitoring of Excess Mortality for Public Health Action
GDPR	General Data Protection Regulation
GISAID	Global Initiative of Sharing All Influenza Data
GISRS	Global Influenza Surveillance and Response Network
ICU	Intensive care units
ILI	Influenza-like illness
IHR	International Health Regulations
IZSV	Instituto Zooprofilattico Sperimentale delle Venezie
MEM	Moving Epidemic Method
MERS	Middle East Respiratory Syndrome
MS	Member State
NGS	Next-Generation Sequencing technology
NIC	National Influenza Center
NHS	National Health Service
PIP	Pandemic Influenza Preparedness
PISA	Pandemic Influenza Severity Assessment
RESCEU	REspiratory Syncytial virus Consortium in EUrope
RSV	Respiratory syncytial virus
SARI	Severe Acute Respiratory Infection
SARS	Severe Acute Respiratory Syndrome
SECID	Southeast European Center For Surveillance And Control Of Infectious Diseases
SSI	Statens Serum Institute
TESSy	The European Surveillance System
United Kingdom	United Kingdom of Great Britain and Northern Ireland
VE	Vaccine effectiveness
WGS	Whole Genome Sequencing
WHO	World Health Organization

Executive summary

From 6-8 June 2018, the 6th WHO Regional Office for Europe and the European Centre for Disease Prevention and Control (ECDC) Joint European Influenza Surveillance Meeting was held at the WHO Regional Office for Europe in Copenhagen, Denmark.

The 2018 influenza meeting commemorated the centenary of the 1918 influenza pandemic, the most severe pandemic ever recorded. As such, the meeting was a timely reminder of the importance of the European Region-wide influenza network that celebrates its 10th anniversary also this year.

The European influenza network is part of the WHO Global Influenza and Response System (GISRS), the oldest WHO network, and is a critical resource for global health. Forty eight of the 53 Member States of the WHO European Region and EU/EEA countries regularly report epidemiological and virological influenza surveillance data to ECDC and the WHO Regional Office for Europe from primary care, 26 (49%) report hospital surveillance data and 48 (91%) regularly share influenza viruses with WHO.

The network reflected on the fourth successful season of the joint ECDC-WHO Regional Office for Europe influenza bulletin Flu News Europe, which, as the single point of influenza epidemiologic and laboratory surveillance data in the region, provides real-time data for situation awareness, and discussed further improvements. Based on data reported to Flu News Europe, the 2017/2018 influenza season in the WHO European Region was dominated by influenza B, Yamagata lineage viruses. Influenza viruses circulated at high levels for a longer period than in recent seasons and may have contributed to the severity seen this season, particularly hospitalizations in older people due to influenza B lineage viruses (Yamagata) that was not included in trivalent vaccines. Some countries recommended a switch from trivalent to quadrivalent vaccines that contain both influenza B lineage viruses to ensure broader protection. For countries with limited resources, this might result in less available doses, due to the higher price of quadrivalent vaccines. However, considering the overall costs for the health care sector, quadrivalent vaccines may also prove cost-effective.

The meeting reflected on the decline in uptake of seasonal influenza vaccine seen in a number of countries in the Region since the 2009 pandemic. Access to influenza vaccines remains low in lower-resourced countries. Not only is this of serious concern for the protection of vulnerable groups against seasonal influenza, but also for pandemic preparedness as the production of pandemic vaccines is closely linked to seasonal vaccine use.

During a panel discussion on pandemic preparedness, the need for all countries to revise their national pandemic preparedness plans after the 2009 pandemic was emphasized. So far, only 16, or less than one in three, European countries have revised their pandemic plans. The meeting therefore served as a reminder for the remaining countries to contribute to health security by ensuring they have up to date pandemic preparedness plans developed according to international standards.

Communicating with the media on issues relating to seasonal influenza, including but not limited to vaccination, is an ongoing challenge. While messages need to be tailored to season-specific challenges, similar topics come up each year and WHO agreed to convene a working group to develop talking points ready for the upcoming 2018-2019 season.

The meeting included a special session organized by the Statens Serum Institute (SSI) of the hosting country. Denmark has pioneered advances in influenza surveillance by using electronic health registries to link patient data on treatment and outcomes with laboratory results and vaccine use.

SSI coordinates the ECDC-funded project European Monitoring of Excess Mortality for Public Health Action (EuroMOMO), which monitors weekly mortality data in the Region, an important marker for the severity of the influenza season. The meeting provided an opportunity to introduce EuroMOMO to new countries interested in sharing their data for rapid analysis, supported by the WHO Regional Office for Europe.

The European Food Safety Authority (EFSA) covered the "One Health" aspect of influenza by presenting an overview of the current situation on avian influenza in birds and humans in and outside of Europe. Such an overview is produced and published on a quarterly basis as a collaborative effort between EFSA, ECDC and the European Union Reference Laboratory for Avian Influenza.

Session topics and discussion points

The following sections provide a short background and outline of the main discussion points that were raised during the different sessions of the Meeting (click here for the full programme). Presentations for which consent to sharing was granted, as well as slides displayed on screens during breaks, can be accessed and downloaded in a portable document format (pdf) here.

Session 1: Opening remarks and welcome

Overview of presentations

Presentations of session 1 can be accessed here.

Presentation title	Presenter and affiliation
Words of welcome and opening speech	Nedret Emiroglu, Director, Division of Communicable Diseases and Health Security,WHO Regional Office for Europe
Opening remarks from the Statens Serum Institute	Tyra Grove Krause, Statens Serum Institute, Denmark
Introduction to the WHO Regional Office for Europe & ECDC Joint Annual European Influenza Meeting 2018	Caroline Brown, WHO Regional Office for Europe & Pasi Penttinen, European Centre for Disease Prevention and Control
Interactive quiz on influenza	Caroline Brown, WHO Regional Office for Europe & Pasi Penttinen, European Centre for Disease Prevention and Control
Keynote: Centennial reflections on the 1918 influenza pandemic: Insights and remaining puzzles	Lone Simonsen, Roskilde University, Denmark

The meeting was opened and the participants welcomed by Dr. Nedret Emiroglu, Director of Programme Management at the WHO Regional Office for Europe who emphasized that this was a special edition of the Regional influenza meeting as it marked the centenary of the 1918 pandemic, 10 years since the launch of the European Region influenza network in collaboration with ECDC and two years since the launch of the WHO Health Emergencies program. In addition, hosting of the meeting by the Ministry of Health Denmark and the special session organized by Statens Serum Institute was highly appreciated. The joint ECDC-WHO Regional Office for Europe influenza bulletin continues to be a hallmark of the successful collaboration in the Region between Member States, ECDC and WHO and the network makes a crucial contribution to regional and global surveillance as well as informing national influenza prevention and control programs. That the influenza network in the European Region is effective, productive and able to rapidly adapt to changes was illustrated by the fact that since its inception in 2014, 151 Flu News Europe bulletins have been published in English and in Russian. Moreover, 48/53 Member States shared seasonal influenza viruses with WHO compared with 36/53 in 2008 and 26/53 MS reported data from hospital surveillance in 2018 compared with 0/53 in 2008.

The Regional Influenza Network is thus a critical resource for global health, especially during an emergency such as an influenza pandemic or pandemic due to another respiratory pathogen such as Severe Acute Respiratory Syndrome (SARS) or Middle East Respiratory Syndrome (MERS). Expert input from the network will inform WHO's response that will be led through the new Health Emergencies program. Moving forward, the network will contribute to WHO's vision for the next five years: the 13th General Programme of Work affirms our Director General's vision of a safer world in synergy with stronger health systems and Universal Health Coverage with clear linkages to the International Health Regulations (2005) (IHR) and the five year action plan for health preparedness and response. The global influenza strategy is under development and will be finalized by the end of this year. The strategy describes the need for all Member States to revise their pandemic preparedness plans based on lessons learned from the 2009 pandemic and updated WHO guidance. Currently, only 16/53 MS in the WHO European Region have revised their plans. Support will be provided, among others, through the Pandemic Influenza Preparedness (PIP) Framework, which is already providing significant support to five countries in the Caucasus and Central Asia. Recently, the National Influenza Centres (NIC) in Armenia and Montenegro achieved WHO recognition and became full members of the Global Influenza Surveillance and Response System (GISRS), bringing the number of countries in the Region that have a WHO-recognized NIC to 43/53.

The first keynote lecture of the meeting by Prof. Lone Simonsen emphasized that the so-called signature features of pandemics have implications for pandemic policies and plans to respond to future pandemics. Past pandemics have been characterized by a shift in the virus subtype, shifts of the highest death rates to younger populations, successive pandemic waves, higher transmissibility than that of seasonal influenza, and differences in impact in different geographic regions. The shift in mortality toward younger age groups was the most striking characteristic of the 1918-1919 pandemic (mean age of death 27) and a similar shift was seen in 2009 (mean age of death 37). However, apart from the subtype shift, this and other characteristics are not frequently considered in response plans and this should be a focus of attention.

Session 2: Observations from the 2017/18 season and outlook on the upcoming season

Overview of presentations

Presentations of session 2 can be accessed here.

Presentation title	Presenter & affiliation
Atypical 2017/2018 influenza season in France	Sibylle Bernard-Stoecklin, Santé publique France, France
The 2017/18 flu season in The Netherlands with B/Yamagata dominance and the detection of a seasonal A(H1N2) reassortant virus	Adam Meijer, National Institute for Public Health and the Environment, the Netherlands
Perspectives on influenza B lineages and emerging variants	Olav Hungnes, Norwegian Institute of Public Health, Norway
Current influenza season in the Russian Federation: late onset	Andrey Komissarov, Smorodintsev Research Institute of Influenza, Russian Federation
Interesting aspects of the 2017/2018 influenza season in Uzbekistan	Ravshan Rakhimov, Institute of Virology, Uzbekistan
Characteristics of the 2017/18 influenza season in the European Region and planned Flu News Europe developments	Piers Mook, WHO Regional Office for Europe
Influenza Vaccine Composition 2018-2019- A review of the results and updates	John McCauley, WHO Collaborating Centre for Reference and Research on Influenza, The Francis Crick Institute, United Kingdom of Great Britain and Northern Ireland

Background

The 2017/2018 influenza season in the WHO European Region was dominated by influenza B, Yamagata lineage viruses. Based on data reported on the regional influenza surveillance platform Flu News Europe, influenza viruses circulated at high levels between weeks 52/2017 and 12/2018 (based on increased proportions - 40% and above - of sentinel specimens testing positive for influenza viruses); this is longer than in recent seasons and may have contributed to the severity seen this season.

While low in numbers, characterized A(H3N2) viruses fell mainly in clade 3C.2a (58%) and subclade 3C.2a1 (40%), while 48% of B/Victoria lineage viruses fell in a subclade of clade 1A viruses that are antigenically distinct from the 2017–2018 season trivalent vaccine component. Emergence of variant influenza B/Victoria lineage which had a two-amino acid deletion in the HA protein (162 and 163) was antigenically and genetically distinct from the vaccine strain was observed and accounted for 45% of B/Victoria lineage viruses characterized. The majority of severe cases were due to influenza type B virus infection and occurred mostly in persons older than 15 years of age. Mortality from all causes has now returned to levels expected for this time of year in all participating countries and regions that report to EuroMOMO. Interim results from 5 European studies indicate 25% to 52% vaccine effectiveness against any influenza. Different patterns of dominant influenza virus types and A subtypes were observed

between the countries of the Region and experiences of a selected number of countries were presented in this session.

Discussion points

- Participants noted the relatively good vaccine effectiveness (VE) given the predominant circulation of B/Yamagata-lineage viruses that were not included in the trivalent vaccine.
- The predominance of influenza B/Yamagata lineage in the European Region's season prompted discussion on which viruses were circulating during the 2017 southern hemisphere season and whether more extensive use of quadrivalent vaccines would have reduced the severity of the season. The 2017 influenza season in Australia (June-September 2017) was considered to be a bad season with both influenza A(H3N2) and B viruses circulating. Overall VE estimates from Australia were low, particularly for H3N2 viruses. VE for B viruses was moderate but they used a quadrivalent vaccine and had mostly B/Yamagata circulating. It is hard to make direct comparisons, as VE estimates will be influenced by sample size, changes in the virus, and natural immunity.
- There was interest from the network in Flu News Europe about including additional data/analyses, such as looking for ways to incorporate intensity and duration of the season and reporting of influenza B virus detections by Victoria and Yamagata lineage. These issues will be taken forward by the working group on qualitative indicators reported to Flu News Europe (intensity, geographic spread and dominant virus).
- The majority of influenza vaccines are still produced in eggs. However, influenza viruses grown in eggs, in particular A(H3N2) viruses, can undergo changes, so-called egg adaptations, which may result in vaccines antigenically different to the viruses they were derived from as well as from circulating influenza viruses. This in turn can lead to reduced effectiveness of the vaccine. It will be important to generate data on VE against cell-based vaccines and compare with VE from vaccines produced in eggs.

Session 3: Developments in surveillance – looking to the future

Overview of presentations

Presentations of session 3 can be accessed here.

Presentation title	Presenter and affiliation
Influenza season 2017/2018 in Germany – challenges to assess severity from different data sources and use of a new visualization tool	Silke Buda, Robert Koch Institute, Germany
Survey of diagnostic testing for influenza and other respiratory viruses in microbiology laboratories in Ireland	Joan O'Donnell, Health Protection Surveillance Centre, Ireland
Evaluation of sentinel influenza surveillance in the former Yugoslav Republic of Macedonia, 2016/2017 and 2017/2018	Golubinka Bosevska, Institute of Public Health, the former Yugoslav Republic of Macedonia
The use of online data to monitor influenza activity in the Netherlands: the FluTrends project	John Paget, Netherlands Institute for Health Services Research, the Netherlands
Nosocomial influenza: recognition of the impact of spread of influenza in hospital settings	Maria Zambon, Public Health England, United Kingdom of Great Britain and Northern Ireland
EFSA activities on avian influenza	Frank Verdonck, European Food Safety Agency (EFSA) *(via Webex)*
Performance of the Moving Epidemic Method to assess influenza severity	Tomás Vega Alonso, Health Department, Regional Government of Castilla y León, Spain

Background

Session 3 speakers discussed a high pressure on health care on all levels during 2017/18 (e.g. number of cases in the general population, hospitalizations, and outbreaks in health care facilities). To assess the impact of the season, different countries use indicators as well as prediction tools in various electronic formats that they consider to make publicly available.

Surveillance systems and laboratory testing practices in different countries were evaluated. In Ireland, the number of hospital laboratories testing for multiple respiratory pathogens has increased between 2011/12 to 2015/16, which resulted in an increase over time in the overall number of detections making it difficult to compare data across seasons. Moreover, influenza A virus subtyping is lacking. Similarly, Norway observed an increase of other pathogens related to the increased use of multiplex testing. A now-casting investigation compared influenza-like illness (ILI) with Wikipedia page views and google trends with good overall correlation. The System might be influenced by media awareness, but overall is considered a good way of making real-time predictions by other means than the usual surveillance methods (primary health care and hospital-based surveillance).

As of 1 January 2019, Instituto Zooprofilattico Sperimentale delle Venezie (IZSV) in Padua, Italy has been assigned as new avian influenza EU reference laboratory responsible for

virological surveillance and the European Food Safety Authority (EFSA) will take over the lead for the epidemiological part of avian influenza surveillance in the EU-EEA countries. Work with Member States is ongoing to improve reporting of avian influenza outbreaks in EU/EEA to be included in annual reports, but also in the quarterly joint ECDC/EFSA/EURL surveillance reports.

Discussion points

- Harmonization for the reporting of indicators in the European Surveillance System (TESSy) and Pandemic Influenza Severity Assessment (PISA) at WHO is needed. The moving epidemic method (MEM) has proven to be useful for a severity assessment that refers to transmissibility, impact and seriousness. However, historical data is needed to compare with, followed by the development of baseline and intensity thresholds with high data quality as prerequisite for each type of parameter.
- Regular evaluations of surveillance systems are necessary to ensure quality data are produced to meet the objectives of surveillance, identify gaps and needs, and adjust the system if necessary.
- Nosocomial transmission patterns are difficult to discern and whole genome sequencing (WGS) helps to better understand transmission patterns, affected wards, units and other health care facilities. However, detection speed is critical for the management of nosocomial outbreaks when several different introductions into different wards occur.

Session 4: Burden of seasonal influenza

Overview of presentations

Presentations of session 4 can be accessed here.

Presentation title	Presenter & affiliation
Overview of the 2017/2018 influenza season in Ireland – comparison to recent seasons	Lisa Domegan, Health Service Executive-Health Protection Surveillance Centre, Ireland
High influenza morbidity in the summer of 2017: implications for influenza vaccine efficiency	Michal Mandelboim, Sheba Medical Center, Israel
Estimation of hospitalizations averted by vaccination, season 2016/2017 and 2017/2018	Marit de Lange, National Institute for Public Health and the Environment (RIVM), the Netherlands
Influenza B: low intensity season with impact on mortality	Ana Paula Rodrigues, National Institute of Health Doctor Ricardo Jorge, Portugal
Influenza disease burden	Julia Fitzner, WHO headquarters
Influenza B and disease severity	Sonja Olsen, WHO Regional Office for Europe
Burden of influenza in the WHO European Region	Louise Lansbury, WHO Collaborating Centre for Pandemic and Epidemic Diseases, University of Nottingham, United Kingdom of Great Britain and Northern Ireland
10-years anniversary of the EuroMOMO network	Kåre Mølbak, Statens Serum Institute, Denmark

Background

Establishing country-specific burden of disease estimates for influenza is important for countries to make evidence-based decisions on funding for, and implementation of, interventions, such as vaccination. These estimates can also be used over time to evaluate the impact of interventions. This session highlighted data from country and regional activities to estimate the burden of medically-attended influenza and influenza-associated mortality in the European Region. One common theme was the challenge to obtain high quality surveillance data that can be used to not only make robust country estimates, but to also make comparisons across sentinel sites within a country and between countries. More work on this area needs to be done in the Region as well as globally.

Discussion points

- The rapid fire country presentations highlighted the differences between countries in the 2017/18 influenza season, including the frequency of influenza B virus infections, and the challenges assessing burden and severity.
- There was discussion on disease severity and how to compare from year-to-year and across sentinel sites within a country, as well as between countries. Participants suggested that the region should consider ways to compare relative parameters so

that data are comparable. For example, when assessing severity, hospitalizations and mortality, they may show differences between seasons, but mortality in the intensive care unit may be a better relative parameter, since it may be less affected by health utilization patterns. The Pandemic Influenza Severity Assessment (PISA) is a tool to help countries standardize the approach to classifying severity, and its use in more countries should be encouraged.

- There are ongoing global efforts to estimate burden of disease, using both mortality and hospitalization data. The challenge is that estimates are either not available or not valid in countries where data (vital statistics or denominator data) are difficult to get. An incomplete geographic representation may bias global estimates.
- One way to improve data quality and comparability for mortality estimates is to expand participation of European Member States in EuroMOMO. EuroMOMO is a simple way to monitor all-cause mortality, and is critical for the region for situational awareness and pandemic preparedness. It is funded by ECDC through 2020, and WHO and ECDC are working with Member States to expand country participation.
- A retrospective literature review of disease burden estimates in the WHO European Region by the WHO Collaborating Centre for pandemic and epidemic research at the University of Nottingham, United Kingdom of Great Britain and Northern Ireland, will provide some baseline data.
- More Member States should work to use their surveillance data to establish burden using the WHO Manual for Estimating Disease Burden Associated with Seasonal Influenza or other relevant methodologies such as the Burden of Communicable Disease in Europe (BCoDE) toolkit.
- Given the predominance of influenza B virus in the 2017/18 season in Europe, perhaps more could be done to measure and characterize disease burden, as it is now recognized to be of equal severity as influenza A virus infection, and in some risk groups such as young children, may even be of greater severity.

Session 5: RSV surveillance and communicating with the media on influenza

Overview of presentations

Presentations of session 5 can be accessed here.

Presentation title	Presenter & affiliation
WHO global RSV surveillance based on GISRS – an update	Siddhivinayak Hirve, WHO headquarters
RSV surveillance: Experience of WHO pilot England, 2017/18	Richard Pebody, Public Health England, United Kingdom of Great Britain and Northern Ireland
Experience on RSV surveillance in the Russian Federation	Andrey Komissarov, Smorodintsev Research Institute of Influenza, Russian Federation
Current practices for RSV surveillance across EU/EEA Member States, 2017	Thea Kølsen Fischer, Statens Serum Institute, Denmark
Panel discussion: Working with the media to communicate influenza related messages	***Moderator:*** Cristiana Salvi, WHO Regional Office for Europe ***Panel members:*** Dumitru Capmari, National Centre of Public Health, Republic of Moldova Tyra Grove Krause, Statens Serum Institute, Denmark

5a. RSV surveillance

Background

A three-year (2016 to 2018) global WHO project to pilot a strategy to leverage capacities of 14 national influenza surveillance systems to test for RSV without interfering with ILI/SARI surveillance is drawing to a close. The pilot found that (i) seasonal patterns of RSV generally coincided with winter or rainy seasons and overlapped with influenza activity, though more years of data may be needed to understand the patterns, (ii) age group RSV detection rates as found in these pilot sites were consistent with the published literature, and (iii) case definitions that included cough and wheezing and excluded fever were better predictors of RSV.

Discussion points

- Following the completion of the WHO global RSV surveillance pilot, there is a possibility for the work on RSV surveillance to expand beyond those countries involved in the pilot to date. Expansion should be guided by country plans to introduce vaccine, and the need for local data to guide decision making. In addition there needs to be a clear summary of the implications of any changes on influenza surveillance.

- Concerns were raised around the necessary effort required to change behavior of clinicians with revised case definitions for influenza-like illness (ILI) and severe acute respiratory infections (SARI), excluding fever. It was reported that approximately 50% of RSV cases would be missed if fever was not excluded from these case definitions. A multiplier could be estimated and applied to account for missed cases if no changes to the case definitions are made. The intention of surveillance is not to enumerate all RSV cases.
- Discussions around the need for standardizing a genotyping system for RSV concluded that it is potentially a good idea, as different systems are used in different countries but that phylogenetic analysis of more strains is first needed.
- There was discussion of the RSV consortium in Europe's (RESCEU) activities around mapping RSV surveillance capacities by Member States and it was suggested that to better reflect the risk groups for RSV, the 3-month or younger age group should be further stratified.

5b. Communicating with the media on influenza

The slides with key points for media interviews were requested and can be accessed here.

Background

Communicating with the media on issues relating to influenza, including but not limited to vaccination, is an ongoing challenge with messaging having to be tailored to season-specific challenges. Understanding concepts with regards to communicating with the media, and in the context of other channels of disseminating messages, is key to effectively delivering messages to and promoting action by the target audience.

Discussion points

- Participants requested similar sessions to be included in future meetings.
- It would be useful to develop talking points on influenza for the network to use during the influenza season. This will be taken forward by a working group formed from members of the network, the WHO Regional Office for Europe and ECDC.

Session 6: Perspectives from the National Influenza Centre, Statens Serum Institute, Denmark, anno 2018

Overview of presentations

Presentations of session 6 can be accessed here.

Presentation title	Presenter & affiliation
Strategy, implementation, and impact: from pandemic planning to virological surveillance	Thea Kølsen Fischer, Statens Serum Institute, Denmark
New technologies and approaches in the virological surveillance system in Denmark	Ramona Trebbien, Statens Serum Institute, Denmark
From active reporting to data capture, 2008-2018	Tyra Grove Krause, Statens Serum Institute, Denmark
Effectiveness of maternal influenza vaccination in Denmark	Ditte Mølgaard-Nielsen, Statens Serum Institut, Denmark
Duration of seasonal influenza vaccine effectiveness against inpatient influenza A(H1N1)pdm09and A(H3N2) in the elderly	Hanne-Dorthe Emborg, Statens Serum Institut, Denmark

Background

Session 6 was hosted by the Statens Serum Institute. As part of the Danish Ministry of Health, the Statens Serum Institute is responsible for preparedness against infectious diseases in Denmark by conducting disease surveillance and providing specialized diagnostics. This session highlighted ongoing research efforts and experiences using modern technologies, e.g. whole genome sequencing and electronic health records which allows linking of data across the different components of the influenza surveillance system.

Discussion points

- It was pointed out that SSI welcomes guest virologists and PhD researchers to join their department for specific projects. SSI also runs wet and dry workshops on Next Generation Sequencing within ECDC's twinning project
- Under the umbrella of One Health, Denmark will integrate preparedness activities against human and animal diseases by merging human and veterinary laboratories into one joint diagnostic laboratory. As part of a consortium with the Faculty of Veterinary Medicine of the University of Copenhagen, SSI will also cover veterinary responsibilities in the future.
- It was mentioned that the SSI has bioinformatics capacities that are integrated in the microbiology department (bacteriology & virology).
- In Denmark every person is assigned a personal identifier at birth, which is used to link different Danish databases and registries. These databases extract data from various systems and it was pointed out that having communications standards and

standard interfaces of the different systems in place facilitates data linkage, including for influenza surveillance purposes.

- The General Data Protection Regulation (GDPR) that entered into force at the end of May 2018 does not hamper surveillance activities, as no informed consent is needed for surveillance purposes according to Danish legislation.
- A study on the duration of seasonal influenza vaccine effectiveness against inpatient influenza A(H1N1)pdm09 and A(H3N2) in the elderly in 2015/16 and 2016/17 seasons found that VE effectiveness against A(H1N1)pdm09 remained relatively stable or declined slightly over time following vaccination, whereas VE against influenza B could not be assessed due to limited circulation in the countries [DNK, ESP (1 province), FIN] and seasons studied. It was noted that the test-negative- and cohort-design resulted in similar VE estimates.
- When discussing results of maternal influenza vaccination in Denmark, it was pointed out that sensitivity analyses for hospitalized influenza cases were performed but had too little power to determine VE in pregnant women. The Danish VE estimates in pregnant women fell within the ranges of results reported in other studies. It was discussed that the likely explanation for the relatively large difference between the VEs of mothers and their infants could be due to the low number of vaccinated cases. It was noted, that in this study only the inactivated trivalent vaccine was used as it was the only vaccine licensed for pregnant women during the study period (2010-2016). Pregnant women that were seen in both primary and secondary care were included in the study.

Session 7: Parallel breakaway sessions

7a. Epidemiology

Overview of presentations

Presentations of the epidemiology breakaway session can be accessed here.

Presentation title	Presenter & affiliation
The influenza season 2017/2018 in Austria, and results from a pilot of a surveillance system for Severe Acute Respiratory Infections (SARI) in Austrian intensive care units	Elisabeth Kanitz, Austrian Agency for Health and Food Safety, Austria
Intensive care unit surveillance of confirmed influenza infections in Italy: results from the 2017/2018 season	Caterina Rizzo, Antonino Bella and Maria Rita Castrucci, National Institute of Health, Italy
Severe influenza surveillance	Emmanuel Robesyn, European Centre for Disease Prevention and Control
Severity of the 2017/2018 influenza season in Romania	Odette Popovici, National Institute of Public Health, Romania
Impact of influenza on the health care system (and what we can do)	Richard Pebody, Public Health England, United Kingdom of Great Britain and Northern Ireland
Draft EU case definitions for influenza, SARS and MERS	Emmanuel Robesyn, European Centre for Disease Prevention and Control

Background

There are increasing demands to improve on severe disease surveillance and we encourage countries to work on these systems, which allow for better estimation of healthcare and disease burden, as well as impact of countermeasures. In order to improve the usefulness of severe disease surveillance, 11 European Union (EU) Member States reporting intensive care unit (ICU)-admitted influenza cases agreed in September 2017 to pilot denominator data submission. Two options for presentation of data were considered and proposed: Notification rate (cases/ 1 million population) or proportion of laboratory-confirmed hospitalized cases admitted to ICU. Several countries had submitted data and draft presentation options from a display on ECDC's Surveillance Atlas for Infectious Diseases were presented.

Discussion points

- From country presentations it was clear that there are increasing demands to improve severe disease surveillance and countries were encouraged to work on these systems,

which allow for better estimation of healthcare and disease burden, as well as impact of countermeasures.

- ECDC is planning a scientific meeting with ISIRV on 16-18 January 2019 in Stockholm to open dialogue between public health, academic and research groups on severe influenza disease.
- Comparing data on influenza hospitalizations between countries is difficult without having a good understanding of the context and other factors (health care structure, case definitions etc.) and therefore there are limitations to the interpretation of pooled data on Flu News Europe.
- Country examples from Austria, Italy and Romania demonstrate that hospital-based systems for influenza surveillance (sentinel severe acute respiratory infections (SARI) and/or reporting of lab confirmed cases in ICU and other wards) is feasible and considered useful at national level for decisions related to influenza prevention and control. The presented examples demonstrated that electronic reporting has major advantages over paper-based reporting. Assessing underascertainment and underreporting of cases as well as setting denominators (eg. the catchment population) is difficult in some countries.
- Interventions in the working group suggested strongly moving from absolute number to rates of severity data on the FluNewsEurope presentation, and concerns were raised about the side-to-side presentation of tabulated data from highly varying systems. A proposal was made to develop a qualitative indicator for data on hospitalized cases or other methods to assess the severity level (e.g. MEM) in place of these tabulated data. A request for having a harmonised approach and support for estimating catchment populations was also made.
- The country example from United Kingdom highlighted the impact of the severe season on the health care system. In the United Kingdom, following an alert from the severe A(H3N2) dominated 2017 season in Australia, the following response strategy was used:
    - Establishment of "winter rooms"
    - Weekly influenza teleconferences
    - The National Health Service (NHS) enhanced activity reports (hospital and ICU)
    - Daily influenza surveillance (syndromic) and internet-based surveillance to inform health service management
    - Real-time modelling work for short term predictions of case numbers
    - Demands for information based on surveillance increasing every year
- Short-term modelling was considered a very promising approach to guide response and using the moving epidemic method (MEM) to predict peak activity has been shown to be useful in this regard in Scotland.
- Case definitions (CD) for diseases under surveillance in EU are now defined in implementing acts after decision in the "comitology committee" (EU decision 1082). The committee has invited ECDC to propose revision of the influenza, SARS and MERS

case definitions. A proposal of these CD's was reviewed. The main intention is to harmonize these case definitions with the WHO case definitions. It was noted that the proposed clinical CD for influenza does not include history of fever, while the WHO CD does. In a similar fashion it was noted that the proposed CD for MERS does not include "mild" cases, while the WHO case definition includes them. A query was made on whether "area experiencing MERS" can be specified at a subnational level? A request to see the proposed case definitions side-by-side with the WHO case definitions was made, and ECDC agreed to prepare a final draft for consultation with network over coming weeks, before proposing to European Commission.

7b. Virology

Overview of presentations

Presentations of the virology breakaway session can be accessed here.

Presentation title	Presenter & affiliation
A robust method to identify viral respiratory virus infection in clinical samples using next-generation sequencing (NGS)	Michal Mandelboim, Sheba Medical Center, Israel
Application of NGS for the investigation of for genetic markers in zoonotic viruses associated with pandemic potential	Elena Gavrilova, Vector State Research Center of Virology and Biotechnology, Russian Federation
INSaFLU as an influenza-specific bioinformatics free web-based suite to analyse NGS data	Vítor Borges, National Institute of Health Doutor Ricardo Jorge, Portugal
Emerging and variant influenza viruses	Steve Lindstrom, Centers for Disease Control and Prevention, United States of America

Background

Influenza viruses are among the most unpredictable pathogens that threaten human health as they infect many animal species and evolve continuously through antigenic drift and shift. Therefore, there is a continuous need to maintain and develop new surveillance capacities for the detection and characterization of influenza viruses, both seasonal as well as emerging zoonotic viruses (such as A(H7N9) and variant influenza A viruses [such as A(H1N1)v, A(H1N2)v, and A(H3N2)v]. For these reasons, WHO and ECDC together with the WHO Collaborating Centre for Reference and Research on Influenza, Francis Crick Institute, London, support a range of capacity building activities for National Influenza Centres (NIC) including training, EQA and twinning between NICs

Discussion points

- A considerable proportion (>50%) of laboratories in the WHO European Region are using Next-Generation Sequencing technology (NGS) in influenza surveillance and many labs are in a process of developing NGS pipelines. Because of the cost, laboratories are batching specimens (2-4 runs per season) which might result in delaying important information related to viral virulence, pathogenicity and reassortment.
- Different NGS platforms were discussed regarding user experience, price and simplicity. The running cost of NGS became cheaper compared to previous years, additionally some laboratories use the nanopore NGS sequencing technology where a strand of DNA is passed through a nanopore and the current is changed as the bases pass through the pore in different combinations. This technology is less laborious and reduces the time of library preparation.
- Some laboratories are using Sanger's sequencing for the first specimens in the season and then switch to processing batches of specimens using the NGS. Sanger sequencing is also used for ad hoc special cases which require thorough investigation.
- The WHO Collaborating Centre for Reference and Research on Influenza, The Francis Crick Institute performs NGS for all received specimens and/or isolates and timely uploads sequences to the Global Initiative of Sharing All Influenza Data (GISAID) for phylogenetic analyses.
- The open-source web-based InsaFLU tool developed by the National Institute of Health in Portugal was presented as a tool for managing and analyses of NGS data. InsaFLU potentiates the operationalization of an enhanced and harmonized whole-genome-based surveillance of influenza virus.
- The preparedness of laboratories to detect emerging and variant influenza viruses was discussed; most of the laboratories in the WHO European Region do not perform targeted screening of specimens collected through sentinel surveillance for emerging and variant influenza viruses, however for unsubtypable viruses, an algorithm is in place in most of the laboratories that enables detection of emerging influenza viruses.
- There is a need to enhance the awareness about detection of variant influenza viruses as they constitute a new influenza virus infecting humans, which may have pandemic potential. These viruses may be misidentified as seasonal influenza viruses using current subtyping PCR assays produced by WHO Collaborating Centres for reference and research on influenza to detect influenza A(H1N1)pdm09 and influenza A(H3N2) viruses. The broader use of sequencing methods should enable easier identification of these viruses.
- Quality control panels are needed to assess the quality of sequencing methods as well as assays detecting emerging and variant influenza viruses.
- The WHO Collaborating Centre at Crick Worldwide Influenza Centre requested that viruses/clinical specimens should be sent in a timely manner to be characterized in time for the biannual WHO consultation on the composition of influenza virus vaccines

in February and September of each year; additionally, sequences should be uploaded by laboratories to GISAID as early as possible.

- Some laboratories are already not able to share original patients' specimens because of their country interpretation of new EU legislation, the General Data Protection Regulation (GDPR), as the human genome can be considered personal data. Guidance from the influenza preparedness point of view should be provided to the network.

Session 8: Influenza vaccination in the European Region

Overview of presentations

Presentations of session 8 can be accessed here.

Presentation title	Presenter & affiliation
Influenza vaccination policies and coverage in countries of the WHO European Region 2008-2016	Pernille Jorgensen, WHO Regional Office for Europe
Expansion of the influenza vaccination programme in Kyrgyzstan	Baktygul Ismailova, Ministry of Health, Kyrgyzstan
I-MOVE/I-MOVE+ primary care multicentre case control study, 2017-18 – nearly end-of-season pooled analysis	Esther Kissling, EpiConcept, France
Influenza vaccine effectiveness season 2017/18, Finland – Register linkage study	Hanna Nohynek, National Institute for Health and Welfare, Finland
Panel discussion • Quadrivalent versus trivalent influenza vaccines – is it worth the switch?	***Moderator:*** Silvia Bino, Institute of Public Health of Albania ***Panel members:*** Jan Kyncl, National Institute of Public Health, Czech Republic Martin Friede, WHO headquarters *(via Webex)* Tyra Grove Krause, Statens Serum Institute, Denmark Hanna Nohynek, National Institute for Health and Welfare, Finland Esther Kissling, EpiConcept, France Richard Pebody, Public Health England, United Kingdom of Great Britain and Northern Ireland

Background

Annual vaccination is the most effective means of reducing influenza-related morbidity and mortality. Yet, effectiveness of influenza vaccines depends on a number of factors including age and health status of the person vaccinated, vaccine type, and importantly on the match between the influenza virus strains included in the vaccine and those circulating during the season. In a number of seasons in recent years, influenza B virus strains included in trivalent vaccines have not matched the circulating B strains calling for discussions on the need to switch to quadrivalent vaccines.

Discussion points

- Although an increasing number of Member States are using seasonal influenza vaccines in Europe, there are large differences in programme implementation across the Region with very low number of doses available in lower-middle income countries. Moreover, several high-income countries have reported declining vaccination uptake in recent years.
- Given the high number of influenza B/ Yamagata cases in the 2017/2018 season, including a substantial number of hospitalizations, discussions focused on whether countries should switch from trivalent vaccines (which contained a B/Victoria strain in the 2017/2018 Northern hemisphere vaccine) to quadrivalent vaccines.
- While most countries currently use trivalent vaccines, there was a general agreement on the need to assess the cost-benefit of switching from trivalent to quadrivalent vaccines in national immunisation programmes. Very recently some high-income countries in the Region have made recommendations to replace trivalent vaccines with quadrivalent vaccines on the basis that these could provide a broader public health benefit and are likely to be cost-effective.
- In view of the burden of disease caused by influenza B viruses in the past season and the challenges to predict which influenza viruses will be circulating in the upcoming season, a switch to quadrivalent vaccines would seem compelling. Moreover, it was remarked during discussions that some manufacturers in any case will produce only quadrivalent vaccines in the future.
- In countries with limited budgets, replacement of trivalent with quadrivalent vaccines, however, may come at the expense of reduced number of doses procured due to the higher cost of quadrivalent vaccines. A better understanding of the burden and severity of influenza B viruses and the level role of cross protection conferred between the currently circulating B lineages (Yamagata and Victoria) may be warranted to inform a decision to switch to quadrivalent vaccines.

Session 9: The Centenary of the 1918 influenza pandemic and 50 years on from the 1968 influenza pandemic

Overview of presentations

Presentations of session 9 can be accessed here.

Presentation title	Presenter & affiliation
Moderated discussion: Reflections from the network – how well prepared are we for the next pandemic?	***Moderator***: Lone Simonsen ***Panel members:*** John McCauley, WHO Collaborating Centre for Reference and Research on Influenza, The Francis Crick Institute, United Kingdom of Great Britain and Northern Ireland Julia Fitzner, WHO headquarters Dorit Nitzan, WHO Regional Office for Europe Gurbangul Ovliyakulova, Ministry of Health/Medical Industry of Turkmenistan Svetla Tsolova, European Centre for Disease Prevention and Control Maria Zambon, Public Health England, United Kingdom of Great Britain and Northern Ireland
The societal impact of the 1918 influenza pandemic	Mathias Mølbak Ingholt, Roskilde University, Denmark
Keynote: Forecasting epidemics	John Edmunds, London School of Hygiene and Tropical Medicine, United Kingdom of Great Britain and Northern Ireland
Keynote: A century of pandemics since 1918 H1N1: are we prepared?	Tim Uyeki, Centers for Disease Control and Prevention, United States of America

Background

The 1918 pandemic caused an estimated 50 million deaths. Due to the availability of influenza vaccines, establishment of surveillance and the Global Influenza Surveillance and Response System (GISRS), improvements in public health and clinical management of severe cases, and pandemic preparedness planning, the world is much better prepared to respond to the next pandemic. However, challenges remain: many countries still lack the capacity to conduct surveillance, there is a need for more effective therapeutics and better vaccines that can be manufactured faster, as well as improving access to clinical care for all severe patients and particularly in fragile settings. Countries must also be prepared to preserve essential health and other services in a pandemic and should be aware of the possible long-term societal and economic impact of influenza pandemics. Although modelling can inform policy-makers' and

clinicians' decisions, data from current surveillance may be insufficient for effective real-time pandemic forecasting using mechanistic models and other sources of data will be needed, such as estimates of the proportion of susceptible individuals in a population based on serology, and how this is changing, understanding of the reporting pyramid through community surveillance and contact pattern data. WHO and European guidance on pandemic preparedness has been recently updated.[1]

Discussion points

Against this backdrop, a panel of experts reflected on how well prepared we are for the next pandemic:

- We are probably closer to the next influenza pandemic than we are to the last one. However, we cannot predict when the next pandemic will occur and how severe it will be. We must prepare for an influenza pandemic that will probably be very different to past pandemics.
- The panelists considered that we are not well prepared to deal with a threat similar to SARS and we should enhance our efforts.
- WHO guidance, implementation of the Pandemic Influenza Severity Assessment (PISA) for seasonal influenza and country readiness will be essential in order to conduct early assessments of severity in a pandemic.
- Countries must consider as part of pandemic planning how they will obtain access to the pandemic vaccine. Donations under the Pandemic Influenza Preparedness Framework currently amount to 405 million doses to be provided in real-time to WHO, who will ensure they are received by countries that have the highest need.
- WHO now has a fully functional emergency operations platform which will manage the response to the next pandemic, based on expert input from the European Region influenza network, GISRS and other experts.

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[1] Pandemic Influenza Risk Management: A WHO guide to inform and harmonize national and international pandemic preparedness and response. Geneva: World Health Organization; 2017. http://www.who.int/influenza/preparedness/pandemic/influenza_risk_management_update2017/en/

European Centre for Disease Prevention and Control. Guide to revision of national pandemic influenza preparedness plans - Lessons learned from the 2009 A(H1N1) pandemic. Stockholm: ECDC; 2017. https://ecdc.europa.eu/en/publications-data/guide-revision-national-pandemic-influenza-preparedness-plans-lessons-learned

Action points

Surveillance & epidemiology breakaway session

- The following changes to Flu News Europe will be considered:
  - Replace absolute number of ICU-admitted lab-confirmed cases with rates in the FluNewsEurope bulletin figures, for MS where this is appropriate
  - Remove tables with data by country and develop qualitative indicator to assess severity as per PISA impact indicators, which could be defined using approaches including MEM
- Harmonization for the reporting of indicators in the European Surveillance System (TESSy) and Pandemic Influenza Severity Assessment (PISA) at WHO is needed.
- As highlighted by the presentation of the former Yugoslavic Republic of Macedonia, regular evaluations of national surveillance systems are necessary to ensure quality data are produced to meet the objectives of surveillance, identify gaps and needs, and adjust the system if necessary.
- ECDC will provide an overview of proposed ECDC case definitions and WHO case definitions side-by-side and consult with the EU/EEA countries before proposing changes to the European Commission.

Burden

- To improve burden of disease estimates using mortality and hospitalization data, data quality needs to be improved.
- One way to improve data quality and comparability for mortality estimates is to expand participation of European Member States in EuroMOMO.
- The use of the Pandemic Influenza Severity Assessment (PISA) tool should be promoted in more countries to help standardize the approach to classifying severity.
- More Member States should work to use their surveillance data to establish burden using the WHO Manual for Estimating Disease Burden Associated with Seasonal Influenza or other relevant methodologies such as the Burden of Communicable Disease in Europe (BCoDE) toolkit

Vaccination

- In line with discussions at the working group of the Strategic Advisory Group of Experts (SAGE) on Immunization in July 2018, an improved understanding of the burden and severity of influenza B viruses and the role of cross protection conferred between the currently circulating B lineages (Yamagata and Victoria) is needed to inform a decision to switch to quadrivalent vaccines.

Virology breakaway session

- Quality control panels are needed to assess the quality of sequencing methods as well as assays detecting emerging and variant influenza viruses
- Enhance the awareness about detection of variant influenza viruses and further strengthen surveillance for emerging and variant influenza viruses.

RSV

- Based on discussions of the RSV consortium in Europe's (RESCEU) it was suggested that the 3-month or younger age group should be further stratified to better reflect the risk groups for RSV.
- Standardizing a genotyping system for RSV would be beneficial, as different systems are used in different countries but phylogenetic analysis of more strains is first needed.

Other

- Training on communicating with the media will be included in future network meetings when possible.
- Talking points on influenza vaccination and other seasonal influenza related issues will be developed and shared with the network ready for the upcoming 2018/2019 influenza season.
- ECDC will provide guidance and/or a forum for discussion related to the impact on surveillance of the EU general data protection regulation (GDPR) before the upcoming 2018-2019 influenza season.
- The possible implications of the increasing use of point of care tests on influenza surveillance needs to be explored by the network.
- ECDC offers ERLI-Net wet lab trainings.
- ECDC will hold an influenza meeting for EU/EEA countries in Stockholm on 12-14 June, 2019.
- WHO and ECDC will continue to support countries to revise their national pandemic influenza preparedness plans by providing guidance, conducting simulation exercises and holding country and intercountry workshops.

Summary of evaluation results

In total, 155 participants were invited to fill in the evaluation form to which 101 responded (response rate 65%). Participants were highly satisfied with the extent to which the meeting objectives were covered and the quality and usefulness of the meeting for influenza surveillance was regarded as excellent (see appendix A for objectives). The top three of the most useful of the nine sessions included in the programme (see appendix B) were:

1. Session 2: Observations from the 2017/2018 influenza season and outlook on the upcoming season
2. Session 7 – Parallel breakaway sessions (epidemiology and virology combined)
3. Session 5b – Communication on influenza with the media

The vast majority of participants (90%) were satisfied with the proportions of time allocated to plenary versus other sessions. Similarly, 84% were satisfied with the proportions of time allocated to the parallel breakaway session versus the overall programme. About a fifth of participants rated discussion time during the parallel breakaway sessions and in general as insufficient. Those unsatisfied suggested alternative proportions.

Administrative organization and the meeting venue and facilities were rated as excellent. Almost 90% rated the 2.5-day duration of the meeting as just right.

Some participants provided input on which topics were not or insufficiently covered and provided additional feedback that will help improving future meetings.

The results of the evaluation will be taken into account when organizing the next meeting.

Detailed evaluation results are shown in appendix C.

Appendix

A. Scope and purpose

WHO Regional Office for Europe and European Centre for Disease Prevention and Control Joint Annual European Influenza Surveillance Meeting
Copenhagen, Denmark
6-8 June, 2018

Scope and purpose

Scope
The WHO Regional Office for Europe (WHO/Europe) and the European Centre for Disease Prevention and Control (ECDC) coordinate surveillance activities related to the prevention and control of influenza in the WHO European Region. Since 2011, the two institutions have jointly organized annual meetings focused on epidemiological and virological aspects of influenza surveillance, seasonal influenza vaccination and the global situation regarding outbreaks of avian influenza and other emerging respiratory pathogens[1]. This is the sixth joint ECDC and Regional Office annual meeting for the 53 Member States of the WHO European Region influenza network.

Purpose
The aim of the meeting is to discuss technical and operational issues related to influenza surveillance, seasonal influenza vaccination programs, and risk assessment and outbreak response. Topics for this meeting will be derived from work that was prioritized during previous Annual Meetings. Progress in the implementation of new surveillance systems as well as strengths of existing systems will be discussed in the light of their contribution to Flu News Europe and to influenza season risk assessments.[2] In addition, this years' meeting will reflect on two significant events: the centenary of the 1918 pandemic and the first decade of the WHO European Region influenza network that was launched in 2008. Lastly, this meeting includes a session that has been developed in collaboration with the Statens Serum Institute, Copenhagen, in acknowledgement of the hosting of this meeting by Denmark.

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[1] http://www.euro.who.int/en/health-topics/communicable-diseases/influenza/surveillance-and-lab-network/surveillance-meetings

[2] Risk assessment for seasonal influenza, EU/EEA, 2017–2018. 20 December 2017.

https://ecdc.europa.eu/en/publications-data/risk-assessment-seasonal-influenza-eueea-2017-2018

Objectives
The main objectives of the meeting are to:

- Discuss the impact of previous influenza pandemics and discuss preparedness for future pandemics;
- Review developments in influenza surveillance in the WHO European Region during the past decade and anticipate future developments;
- Provide an overview of the 2017/2018 influenza season, with respect to epidemiology, virology, vaccination and burden of disease, and discuss opportunities and challenges related to influenza surveillance for the upcoming 2018/2019 influenza season;
- Present new developments with respect to the joint ECDC-WHO/Europe Flu News Europe bulletin;
- Agree on the proposal to revise EU case definitions related to influenza and other respiratory viruses;
- Provide an overview of the global situation regarding influenza as well as global surveillance developments;
- Maintain and strengthen collaboration and information sharing among network members.

Working methods and translation
Plenary sessions and group work. The meeting language will be English with simultaneous interpretation into Russian.

Target audience
National focal points for epidemiological and virological surveillance designated by national health authorities, reference laboratory representatives and involved international institutions.

B. Programme

See next page

6th Joint WHO Regional Office for Europe & European Centre for Disease Prevention and Control Annual European Influenza Surveillance Meeting 2018

Provisional Programme

Wednesday, 6 June		
08:30-9:00	**Registration**	
09:00-10:20	**Session 1: Opening remarks and welcome**	***Chair:*** *Tyra Grove Krause, Statens Serum Institute, Denmark*
9:00-9:10	Words of welcome and opening speech	Nedret Emiroglu, Director, Division of Communicable Diseases and Health Security,WHO Regional Office for Europe
9:10-9:15	Opening remarks from the Statens Serum Institute	Tyra Grove Krause, Statens Serum Institute, Denmark
9:15-9:25	Introduction to the WHO Regional Office for Europe & ECDC Joint Annual European Influenza Meeting 2018	Caroline Brown, WHO Regional Office for Europe & Pasi Penttinen, European Centre for Disease Prevention and Control
9:25-9:40	Interactive quiz on influenza	Caroline Brown, WHO Regional Office for Europe & Pasi Penttinen, European Centre for Disease Prevention and Control
9:40-10:20	**Keynote:** Centennial reflections on the 1918 influenza pandemic: Insights and remaining puzzles	Lone Simonsen, Roskilde University, Denmark
10:20-10:30	**Group photo**	
10:30-11:00	**Coffee break**	
11:00-12:30	**Session 2: Observations from the 2017/2018 influenza season and outlook on the upcoming season**	***Chairs:*** *Bruno Lina, National Influenza Centre (South Region) Institut Pasteur, France & Abdulakhad Safarov, WHO Country Office, Tajikistan*
11:00-11:40	**Country experiences**	**5-minute rapid-fire presentations**

	Atypical 2017/2018 influenza season in France	Sibylle Bernard-Stoecklin, Santé publique France, France
	The 2017/18 flu season in The Netherlands with B/Yamagata dominance and the detection of a seasonal A(H1N2) reassortant virus	Adam Meijer, National Institute for Public Health and the Environment, the Netherlands
	Perspectives on influenza B lineages and emerging variants	Olav Hungnes, Norwegian Institute of Public Health, Norway
	Current influenza season in the Russian Federation: late onset	Andrey Komissarov, Smorodintsev Research Institute of Influenza, Russian Federation
	Interesting aspects of the 2017/2018 influenza season in Uzbekistan	Ravshan Rakhimov, Institute of Virology, Uzbekistan
11:40-12:00	Characteristics of the 2017/18 influenza season in the European Region and planned Flu News Europe developments	Piers Mook, WHO Regional Office for Europe
12:00-12:30	Influenza Vaccine Composition 2018-2019- A review of the results and updates	John McCauley, WHO Collaborating Centre for Reference and Research on Influenza, The Francis Crick Institute, United Kingdom of Great Britain and Northern Ireland
12:30-13:30	**Lunch**	
13:30-15:00	**Session 3: Developments in surveillance – looking to the future**	***Chairs:*** *Vladimir Mikic, Institute of Public Health, Former Yugoslav Republic of Macedonia & Tamano Safarova, Ministry of Health and Social Protection of the Population, Tajikistan*
13:30-14:30	**Country experiences**	**5-minute rapid-fire presentations**
	Influenza season 2017/2018 in Germany – challenges to assess severity from different data sources and use of a new visualization tool	Silke Buda, Robert Koch Institute, Germany
	Survey of diagnostic testing for influenza and other respiratory viruses in microbiology laboratories in Ireland	Joan O'Donnell, Health Protection Surveillance Centre, Ireland
	Evaluation of sentinel influenza surveillance in the former Yugoslav Republic of Macedonia, 2016/2017 and 2017/2018	Golubinka Bosevska, Institute of Public Health, the former Yugoslav Republic of Macedonia
	The use of online data to monitor influenza activity in the Netherlands: the FluTrends project	John Paget, Netherlands Institute for Health Services Research, the Netherlands

	Nosocomial influenza: recognition of the impact of spread of influenza in hospital settings	Maria Zambon, Public Health England, United Kingdom of Great Britain and Northern Ireland
14:30-14:45	EFSA activities on avian influenza	Frank Verdonck, European Food Safety Agency (EFSA) *(via Webex)*
14:45-15:00	Performance of the Moving Epidemic Method to assess influenza severity	Tomás Vega Alonso, Health Department, Regional Government of Castilla y León, Spain
15:00-15:30	**Coffee break**	
15:30-17:00	**Session 4: Burden of seasonal influenza**	***Chairs:*** *Dragana Dimitrijevic, Institute of Public Health of Serbia, Serbia & Baktygul Ismailova, Ministry of Health, Kyrgyzstan*
15:30-16:00	**Country experiences**	**5-minute rapid-fire presentations**
	Overview of the 2017/2018 influenza season in Ireland – comparison to recent seasons	Lisa Domegan, Health Service Executive-Health Protection Surveillance Centre, Ireland
	High influenza morbidity in the summer of 2017: implications for influenza vaccine efficiency	Michal Mandelboim, Sheba Medical Center, Israel
	Estimation of hospitalizations averted by vaccination, season 2016/2017 and 2017/2018	Marit de Lange, National Institute for Public Health and the Environment (RIVM), the Netherlands
	Influenza B: low intensity season with impact on mortality	Ana Paula Rodrigues, National Institute of Health Doctor Ricardo Jorge, Portugal
16:00-16:15	Influenza disease burden	Julia Fitzner, WHO headquarters
16:15-16:30	Influenza B and disease severity	Sonja Olsen, WHO Regional Office for Europe
16:30-16:45	Burden of influenza in the WHO European Region	Louise Lansbury, WHO Collaborating Centre for Pandemic and Epidemic Diseases, University of Nottingham, United Kingdom of Great Britain and Northern Ireland
16:45-17:00	10-years anniversary of the EuroMOMO network	Kåre Mølbak, Statens Serum Institute, Denmark
18:00	**Formal dinner**	

Thursday, 7 June		
08:30-09:00	**Registration**	
09:00-10:30	**Session 5: RSV surveillance and communicating with the media on influenza**	***Chairs:*** *Thea Kølsen Fischer, Statens Serum Institute, Denmark & Andrey Komissarov, Smorodintsev Research Institute of Influenza, Russian Federation*
9:00-9:15	WHO global RSV surveillance based on GISRS – an update	Siddhivinayak Hirve, WHO headquarters
9:15-9:25	RSV surveillance: Experience of WHO pilot England, 2017/18	Richard Pebody, Public Health England, United Kingdom of Great Britain and Northern Ireland
9:25-9:35	Experience on RSV surveillance in the Russian Federation	Andrey Komissarov, Smorodintsev Research Institute of Influenza, Russian Federation
9:35-9:45	Current practices for RSV surveillance across EU/EEA Member States, 2017	Thea Kølsen Fischer, Statens Serum Institute, Denmark
9:45-10:30	**Panel discussion:** Working with the media to communicate influenza related messages	***Moderator:*** Cristiana Salvi, WHO Regional Office for Europe ***Panel members:*** Dumitru Capmari, National Centre of Public Health, Republic of Moldova Tyra Grove Krause, Statens Serum Institute, Denmark
10:30-11:00	**Coffee break**	
11:00-12:30	**Session 6: Perspectives from the National Influenza Centre, Statens Serum Institute, Denmark, anno 2018**	***Invited session hosted by the Statens Serum Institute, Denmark*** ***Chairs:*** *Amparo Larrauri, The Carlos III Health Institute, Spain & Kaliya Kasymbekova, WHO Country Office Kyrgyzstan*
11:00-11:15	Strategy, implementation, and impact: from pandemic planning to virological surveillance	Thea Kølsen Fischer, Statens Serum Institute, Denmark

11:15-11:30	New technologies and approaches in the virological surveillance system in Denmark	Ramona Trebbien, Statens Serum Institute, Denmark
11:30-11:45	From active reporting to data capture, 2008-2018	Tyra Grove Krause, Statens Serum Institute, Denmark
11:45-12:00	Effectiveness of maternal influenza vaccination in Denmark	Ditte Mølgaard-Nielsen, Statens Serum Institut, Denmark
12:00-12:15	Duration of seasonal influenza vaccine effectiveness against inpatient influenza A(H1N1)pdm09and A(H3N2) in the elderly	Hanne-Dorthe Emborg, Statens Serum Institut, Denmark
12:30-13:30	**Lunch**	
13:30-15:30	**Session 7: Parallel breakaway sessions** *(see separate background document for details)*	
	Epidemiology ***Chairs:*** *Wim van der Hoek, National Institute for Public Health and the Environment (RIVM), the Netherlands & Liana Torosyan, Ministry of Health, Armenia* *Location: Auditorium 3* *Presentations:* • The influenza season 2017/2018 in Austria, and results from a pilot of a surveillance system for Severe Acute Respiratory Infections (SARI) in Austrian intensive care units Elisabeth Kanitz, Austrian Agency for Health and Food Safety, Austria • Intensive care unit surveillance of confirmed	**Virology** ***Chairs:*** *Katarina Prosenc, National Laboratory for Health, Environment and Food, Slovenia & Andrey Komissarov, Smorodintsev Research Institute of Influenza, Russian Federation* *Location: Auditorium 2* *Presentations:* • A robust method to identify viral respiratory virus infection in clinical samples using next-generation sequencing (NGS) Michal Mandelboim, Sheba Medical Center, Israel • Application of NGS for the investigation of for genetic markers in zoonotic viruses associated with pandemic

	influenza infections in Italy: results from the 2017/2018 season Caterina Rizzo, Antonino Bella and Maria Rita Castrucci, National Institute of Health, Italy • Severe influenza surveillance Emmanuel Robesyn, European Centre for Disease Prevention and Control • Severity of the 2017/2018 influenza season in Romania Odette Popovici, National Institute of Public Health, Romania • Impact of influenza on the health care system (and what we can do) Richard Pebody, Public Health England,, United Kingdom of Great Britain and Northern Ireland • Draft EU case definitions for influenza, SARS and MERS Emmanuel Robesyn, European Centre for Disease Prevention and Control	potential Elena Gavrilova, Vector State Research Center of Virology and Biotechnology, Russian Federation • INSaFLU as an influenza-specific bioinformatics free web-based suite to analyse NGS data Vítor Borges, National Institute of Health Doutor Ricardo Jorge, Portugal • Emerging and variant influenza viruses Steve Lindstrom, Centers for Disease Control and Prevention, United States of America
15:30-16:00	**Coffee break**	
16:00-17:30	**Session 8: Influenza vaccination in the European Region**	***Chairs**: Silvia Bino, Institute of Public Health, Albania & Richard Pebody, Public Health England, United Kingdom of Great Britain and Northern Ireland*
16:00-16:10	Influenza vaccination policies and coverage in countries of the WHO European Region 2008-2016	Pernille Jorgensen, WHO Regional Office for Europe

16:10-16:20	Expansion of the influenza vaccination programme in Kyrgyzstan	Baktygul Ismailova, Ministry of Health, Kyrgyzstan
16:20-16:35	I-MOVE/I-MOVE+ primary care multicentre case control study, 2017-18 – nearly end-of-season pooled analysis	Esther Kissling, EpiConcept, France
16:35-16:45	Influenza vaccine effectiveness season 2017/18, Finland – Register linkage study	Hanna Nohynek, National Institute for Health and Welfare, Finland
16:45-17:30	**Panel discussion** • Quadrivalent versus trivalent influenza vaccines – is it worth the switch?	***Moderator:*** Silvia Bino, Institute of Public Health of Albania ***Panel members:*** Jan Kyncl, National Institute of Public Health, Czech Republic Martin Friede, WHO headquarters *(via Webex)* Tyra Grove Krause, Statens Serum Institute, Denmark Hanna Nohynek, National Institute for Health and Welfare, Finland Esther Kissling, EpiConcept, France Richard Pebody, Public Health England, United Kingdom of Great Britain and Northern Ireland

Friday, 8 June		
08:30-09:00	**Registration**	
09:00-9:30	**Feedback on parallel breakaway sessions**	
09:30-11:30	**Session 9: The Centenary of the 1918 influenza pandemic and 50 years of the 1968 influenza pandemic**	***Chairs**: John McCauley, WHO Collaborating Centre for Reference and Research on Influenza, The Francis Crick Institute, United Kingdom of Great Britain and Northern Ireland & Gurbangul Ovliyakulova, Ministry of Health/Medical Industry of Turkmenistan*
9:30-10:00	**Moderated discussion:** Reflections from the network – how well prepared are we for the next pandemic?	***Moderator***: Lone Simonsen ***Panel members**:* John McCauley, WHO Collaborating Centre for Reference and Research on Influenza, The Francis Crick Institute, United Kingdom of Great Britain and Northern Ireland Julia Fitzner, WHO headquarters Dorit Nitzan, WHO Regional Office for Europe Gurbangul Ovliyakulova, Ministry of Health/Medical Industry of Turkmenistan Svetla Tsolova, European Centre for Disease Prevention and Control Maria Zambon, Public Health England, United Kingdom of Great Britain and Northern Ireland

10:00-10:20	The societal impact of the 1918 influenza pandemic	Mathias Mølbak Ingholt, Roskilde University, Denmark
10:20-10:40	**Coffee break**	
10:40-11:00	**Keynote**: Forecasting epidemics	John Edmunds, London School of Hygiene and Tropical Medicine, United Kingdom of Great Britain and Northern Ireland
11:00-11:30	**Keynote**: A century of pandemics since 1918 H1N1: are we prepared?	Tim Uyeki, Centers for Disease Control and Prevention, United States of America
11:30-11:45	**Closure of the meeting**	
11:45	**Take-away lunch bags**	

C. Evaluation results

After the meeting, participants were invited to fill in an online evaluation form. The form was provided in English and Russian languages and responses were anonymous.

Of the 155 participants that received the link, 101 responded (response rate: 65%); 85 participants filled in the English and 16 the Russian form, respectively. For the analyses, we combined results from both languages.

1. Objectives

Table 1a. Overview of results to which extent the listed meeting objectives were addressed. Answer options ranged from '1=Poor' to '5=Excellent'.

Item	Median	Geometric mean
Discuss the impact of previous influenza pandemics and discuss preparedness for future pandemics	4	4.2
Review developments in influenza surveillance in the WHO European Region during the past decade and anticipate future developments	4	4.1
Present new developments with respect to the joint ECDC-WHO/Europe Flu News Europe weekly influenza update	4	3.9
Agree on the proposal to revise EU case definitions related to influenza and other respiratory viruses	4	3.6
Provide an overview of the global situation regarding influenza as well as global surveillance developments	5	4.3

Table 1b. Overview of results to which extent the meeting succeeded in providing an overview of the 2017/2018 influenza season, with respect to the items listed below. Answer options ranged from '1=Poor' to '5=Excellent'.

Item	Median	Geometric mean
Epidemiology	5	4.5
Virology	5	4.3
Vaccination	4	4.1
Burden of disease	4	4.0
Discussing opportunities and challenges related to influenza surveillance for the upcoming 2018/2019 influenza season	4	3.8

2. Sessions

2.1. Most useful sessions

Table 2. Ranking of the three most useful sessions based on 101 responses

Rank	Session	n	%
1	Session 2 – Current influenza season	53	52.5
2	Session 7 – Parallel breakaway sessions (Epidemiology: n=32; Virology: n=18)	50	49.5
3	Session 5b – Communication on influenza with the media	40	36.6
4	Session 3 – Developments in surveillance	35	34.7
5	Session 4 – Burden of influenza	33	32.7
6	Session 8 – Vaccination in the European Region	26	25.7
7	Session 9 – Pandemic	24	23.8
8	Session 5a – RSV	18	17.8
9	Session 6 – Statens Serum Institute *(invited session)*	16	15.8
10	Session 1 – Opening and welcome	1	1
11	Feedback on breakaway sessions	0	0

2.2. Satisfaction with proportion of plenary versus other sessions

The proportions between plenary and other sessions (epidemiology and virology breakaway sessions, panel discussions, communication session, quiz etc.) were 71% and 29%, respectively.

Of the 98 participants that answered this question, 87 (89%) reported the proportions to be satisfactory. The 11 participants that were not satisfied suggested alternative proportions shown in table 4.

Table 4. Alternative suggested proportions of plenary and other sessions proposed by participants who were not satisfied

Plenary (%)	Other (%)	n
30	70	1
33	66	1
50	50	3
55	45	1
60	40	3
65	35	1
80	80 [sic]	1
	Total	11

2.3. Satisfaction with proportion of breakaway session compared to the overall programme

Of the 94 participants that answered this question, 79 (84%) were satisfied with 14% of the overall program having been dedicated to the breakaway sessions. The 15 participants that were not satisfied suggested alternative proportions shown in table 5.

Table 5. Alternative suggested proportions of breakaway and plenary sessions proposed by participants who were not satisfied

Breakaway (%)	Plenary (%)	n
20	[empty]	2
20	80	1
25	[empty]	1
25	75	1
25	50	1
28	72	1
30	50	2
30	70	1
40	60	2
50	[empty]	1
66	33	1
0	100	1
	Total	**15**

2.4. Breakaway session attendance and level of satisfaction with discussion time

Of the 96 participants that filled in this question, 49 attended the epidemiology and 47 the virology session.

Of those attending the epidemiology breakaway session, 10 (20%) found the discussion time insufficient. For the virology breakaway session, this proportion was comparable (21%).

2.5. Overview of topics that were not covered

Table 6. Topics suggested by participants that were not covered during the meeting. (The table displays original responses.)

Nr	Topic
1	All important topics were covered.
2	casedefinitons
3	discussion about network issues
4	No one that I interested
5	Impact of GDPR should have been more prominent. Guidance documents from ECDC required.
6	Antivirals
7	none
8	more virology
9	antigenic characterization (HI, MN)
10	Help/Support from ECDC/WHO for Labs to start NGS detection and characterization
11	Sustaining sytems over time
12	Very comprehensive coverage Thanks
13	clear future vision
14	GDPR and its effects on surveillance and sharing of information
15	The GDPR was not appropriately covered
16	How vaccine strains are chosen.

17	Future developments in the influenza surveillance network
18	challenges and solutions in laboratory analyses
19	Point of Care tests for Influenza
20	antigenic characterization of isolates
21	none
22	Не было таких тем (There were no such topics)*
23	Использование противовирусных препаратов (Use of antiviral drugs) *
24	новые противогриппозные химиопрепараты (new influenza drugs) *
25	проблемы резистентности к противогриппозным препаратам, методы изучения, перспективы (problems of resistance to influenza drugs, methods of study, prospects) *
26	Нет (No) *

* Unofficial translation

3. Meeting

Table 7. Overview of results rating usefulness and overall satisfaction. Answer options ranged from '1=Poor' to '5=Excellent'.

Item	Median	Geometric mean
Overall quality of the meeting	5	4.5
Usefulness of the meeting for influenza surveillance	5	4.5
Overall administrative organization	5	4.6
Overall meeting venue and facilities	5	4.5

3.2. Meeting length and satisfaction with overall discussion time

This year's meeting lasted 2.5 days. Of the 100 participants who answered this question, 5 rated it as 'too short', 88 as 'just right' and 7 as 'too long'; 78/99 participants stated that overall there was enough time for discussion.

4. Other feedback

Table 8. Overview of other feedback received by participants. (The table displays original responses.)

Nr	Topic
1	There was an administrative problem this year. The ticket for traveling was send too late and we did not have enough time to change the proposed flights.
2	I am very thankful for useful and informing meeting for me. All sessions was organized in the best way. Separate gratitude to all participants of virologic session during that useful information was got from different countries.
3	The screens were too small; better one great projection in front. The oxygen content of the air in the building could have been better (air hygiene).
4	It was a great meeting, well organized and awesome group of participants and speakers. Good to see eCDC and euroWHO working together on this.
5	It was very well organized meeting, thank you for all organizations and their organizers, and especially thanks for speakers!
6	a transport was organized for the mornings from the hotel to the venue, it would have

	been great, if also a transport would have been organized from the venue back to the hotel
7	Congrats on this excellent meeting! I really enjoyed the quality of the discussions and the diversity of topics. Great talks about the 1918 pandemics.
8	Great meeting. The lack of return transportation from meeting venue to hotel was a bit of a surprise – not a problem – but communication of this in advance would have been helpful. walking maps/bus routes for attendees returning to hotels would have assisted with avoiding a bit of confusion. looking forward to next year's meeting
9	Excellent meeting. Superbly organized with very comprehensive coverage of all flu and RSV related topics. Excellent venue and food. I felt it ran very well. If there is anything to improve it might be just a little more time for discussion and maybe just a little more time for interactive discussion. Overall though one of the best annual flu meetings which I have attended!!! Well done to all involved!!!
10	big ignorance of language preferences for seating. It was absolutely not acceptable. English screen was not visible from our seats and back seats were far and lhad only imited comfort (small desk, no microphone).
11	I did not attend the breakaway sessions
12	I need more information about quadrivalent vaccine effectiveness
13	General discussion time was ok, but sometimes no or very few time to really discuss which was a bit of a pity for some presenters. Often the same people had a question, more diversity would be better. Maybe more networking time and slightly shorter days with lectures would help. Venue was good but limited daylight, and coffee/tea/water preferred in glass (now paper and plastic cups)
14	I really enjoyed the meeting. The agenda was excellent. Gudron did an excellent job of keeping all presentations to time. The 3 minute presentations were a little too short, 5 minutes should be the minimum time for a presentation. I would like more time for discussion in the epidemiology breakaway group. Smaller groups might facilitate more discussion. Overall, well done on a good job.
15	I suggest to make clear objectives for the different sections, so we know what the outcome should be. For example, the discussion on case definition could have been more structured if we in advance were told that this was suppose to end in a Clear advice on Choice of case def. It is sometimes unclear what role the network meeting has when it comes to deciding/providing input on/advicing WHO and ECDC on subjects.
16	Thank you for the link to the presentations.
17	Would be interesting and useful to have an overview i.e more in-depth analysis of the existing methodology of seasonal influenza vaccine effectiveness taking into account specifics of the seasonal influenza epidemiology, vaccination strategies and vaccination coverage in particular country and how these are taken into account, especially when pooling data from different countries. Also, worth to discuss and do some brainstorming on some of the Cochrane reviews and perspectives such as http://community.cochrane.org/news/why-have-three-long-running-cochrane-reviews-influenza-vaccines-been-stabilised
18	I would like more parallel sessions for discussion.
19	The direction of information was mainly from countries to the WHO/ECDC. I would have appreciated more information in the other direction, i.e. from WHO/ECDC to the countries. What are the main topics and priorities you work on?

20	Allow more time for business-like approach discussing practical epi and vir subjects that are challenging in our day-to-day work. Make sure there is enough integration of the epi and lab components when discussion surveillance issues; the integrated approach is the strength of the network. Use of much larger screens for presentations. In the back details on the slides were hardly visible/readable.
21	A really well organized meeting, with a nice balance of participation. Use of Sli.do voting very good idea to gain immediate feedback
22	The meeting was overall very well organized and very informative for professionals involved in influenza surveillance. I learned a lot, but I would have liked more time dedicated to breakaway sessions in order to discuss specific problems. However, many things could still be clarified during conversation with colleagues in the breaks. Thank you for the efforts to organize this very successful meeting.
23	Thank you for the invitation and participation in the meeting
24	No
25	It seems to be impossible to og back to previous questionnaire pages from this final one, also it is here one lands when returning to the questionnaire. It would also be good to have an output of what ones feedback was.
26	No matter I attended the meeting during one day only, it has been extremely informative.
27	We needed more coffee (in the morning and after lunch)! Otherwise I think the meeting was lovely. You really did a good job on the weather as well. Thanks for a nice time!
28	Спасибо всем, кто готовил совещание и доклады. В целом очень много полезной информации, которую можно использовать для анализа и совершенствования эффективности страновой системы надзора за гриппом, а также при подготовке к очередному эпидемическому сезону и к пандемии.. Отличная возможность обменяться информацией и обсудить узкие вопросы со специалистами в области надзора за гриппом из разных стран. (Thanks to everyone who prepared the meeting and reports, in general there is a lot of useful information that can be used to analyse and improve the effectiveness of the country's system of influenza surveillance, as well as in preparation for the next epidemic season and the pandemic.. An excellent opportunity to exchange information and discuss specific issues with specialists in the field of influenza surveillance from different countries.) *
29	В этом году совещание было организовано более живо и были охвачены самые актуальные вопросы, спасибо! (This year the meeting was organized more vividly and the most pressing issues were covered, thank you!) *
30	Совещание было организовано и проведено на очень высоком научно-практическом уровне.(The meeting was organized and held at a very high scientific and practical level.) *
31	Хочется пожелать организаторам совещания дальнейших успехов в их нелегкой работе.(I would like to wish the organizers of the meeting further success in their hard work.) *
32	Нет (no) *

* Unofficial translation

D. List of participants

Country/organization	Family name	First name
Albania	Hasibra	Iris
	Simaku	Artan
Armenia	Sargsyan	Shushan
	Torosyan	Liana
Austria	Kanitz	Elisabeth
	Redlberger-Fritz	Monika
Azerbaijan	Abdullayeva	Nazakat
	Salimov	Oleg
Belarus	Gribkova	Natalia
	Karaban	Inna
Belgium	Barbezange	Cyril
	Bossuyt	Nathalie
	Thomas	Isabelle
Bosnia and Herzegovina	Rodić Vukmir	Nina
Bulgaria	Korsun	Neli
	Kurchatova	Anna
Croatia	Draženović	Vladimir
	Petrović	Goranka
Cyprus	Karagiannis	Christos
Czech Republic	Havlickova	Martina
	Kynčl	Jan
Denmark	Emborg	Hanne-Dorthe
	Glode Helmuth	Ida
	Grove Krause	Tyra
	Kjelsø	Charlotte
	Kølsen Fischer	Thea
	Mølbak	Kåre
	Mølbak Ingholt	Mathias
	Mølgaard-Nielsen	Ditte
	Nielsen	Jens
	Simonsen	Lone
	Skafte Vestergaard	Lasse
	Trebbien	Ramona
Estonia	Päll	Kaie
	Sadikova	Olga

Country/organization	Family name	First name
Finland	Ikonen	Niina
	Nohynek	Hanna
	Turunen	Topi
France	Behillil	Sylvie
	Bernard-Stoecklin	Sibylle
	Guerrisi	Caroline
	Lina	Bruno
Georgia	Machablishvili	Ann
	Tarkhan-Mouravi	Olgha
Germany	Buda	Silke
	Dürrwald	Ralf
Greece	Gkioula	Georgia
	Kossyvakis	Thanos
	Mentis	Andreas
Hungary	Molnár	Zsuzsanna
	Rózsa	Mónika
Iceland	Baldvinsdottir	Gudrun Erna
Ireland	Connell	Jeff
	Domegan	Lisa
	O'Donnell	Joan
Israel	Anis Osipov	Emilia
	Mandelboim	Michal
Italy	Bella	Antonino
	Castrucci	Maria Rita
	Rizzo	Caterina
Kazakhstan	Sagymbay	Altynay
	Sultanova	Meirim
Kyrgyzstan	Ismailova	Baktygul
Latvia	Nikiforova	Raina
	Pakarna	Gatis
Lithuania	Griškevičius	Algirdas
	Skrickienė	Asta
Luxembourg	Mossong	Joel
Malta	Barbara	Chris
	Decelis	Robert
Netherlands	de Lange	Marit
	Fouchier	Ron

Country/organization	Family name	First name
Norway	Bragstad	Karoline
	Hauge	Siri Helene
	Hungnes	Olav
Poland	Bogusz	Joanna
	Masny	Aleksander
Portugal	Borges	Vítor
	Rodrigues	Ana Paula
Republic of Moldova	Capmari	Dumitru
	Furtuna	Nicolae
Romania	Ivanciuc	Alina Elena
	Popovici	Odette
Russian Federation	Burtseva	Elena
	Frolova	Natalia
	Kostenko	Natalia
Serbia	Dimitrijevic	Dragana
	Filipović-Vignjević	Svetlana
Slovakia	Bakoss	Ivan
	Staroňová	Edita
Slovenia	Berginc	Nataša
	Prosenc	Katarina
	Sočan	Maja
Spain	Larrauri	Amparo
	Oliva	Jesús
	Pozo	Francisco
Sweden	Brytting	Mia
	Carnahan	AnnaSara
	Wiman	Åsa
Switzerland	Born	Rita
Tajikistan	Safarova	Tamanno
	Zakirova	Niginamo
The former Yugoslav Republic of Macedonia	Bosevska	Golubinka
	Mikik	Vladimir
Turkey	Altaş	Ayşe Başak
	Avci	Emine
Turkmenistan	Ashirova	Amansoltan
	Ovliyakulova	Gurbangul
Ukraine	Artemchuk	Oksana

Country/organization	Family name	First name
	Demchyshyna	Iryna
United Kingdom of Great Britain and Northern Ireland	McMenamin	James
	Pebody	Richard
	Zambon	Maria
Uzbekistan	Maksudkhodjaeva	Rano
	Rakhimov	Ravshan
Centers for Disease Control and Prevention	Kennedy	Pamela
	Lindstrom	Steve
	Uyeki	Timothy
European Food Safety Authority	Verdonck	Frank
FluNewsEurope Reviewer	Guiomar	Raquel
	Meijer	Adam
Smorodintsev Research Institute of Influenza	Komissarov	Andrey
Southeast European Center for Surveillance and Control of Infectious Diseases	Bino	Silvia
State Research Center of Virology and Biotechnology VECTOR	Gavrilova	Elena
European Centre for Disease Prevention and Control	Adlhoch	Cornelia
	Deckert	Brenna
	Melidou	Angeliki
	Penttinen	Pasi
	Tsolova	Svetla
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	Borysyuk	Halyna
	Brown	Caroline
	Emiroglu	Nedret
	Hagebro	Krystyna
	Hegermann-Lindencrone	Michala
	Jorgensen	Pernille
	Mook	Piers
	Nitzan	Dorit
	Olsen	Sonja
	Pereyaslov	Dmitriy
	Salvi	Cristiana
	Zwetyenga	Joanna

Country/organization	Family name	First name
WHO headquarters	Bergeri	Isabel
	Fitzner	Julia
	Hirve	Siddhivinayak Shriram
	Howell Friede	Martin
WHO Temporary Advisors	Belazi	Sara
	Daniels	Rod
	Edmunds	John
	Kissling	Esther
	Lansbury	Louise
	McCauley	John
	Meerhoff	Tamara
	Mironenko	Alla
	Paget	John
	Rose	Angie
	van der Hoek	Wim
	Vega Alonso	Tomás
WHO Country Office Armenia	Dolyan	Nune
WHO Country Office Kyrgyzstan	Kasymbekova	Kaliya
WHO Country Office Tajikistan	Safarov	Abdulakhad
WHO Country Office Turkmenistan	Myratdurdyyeva	Ayjeren
WHO Country Office Uzbekistan	Pashalishvili	Anna
WHO Observers	Kaçaniku-Gunga	Pranvera
	Rexhepi	Magbule
	Skrowny	Laila
WHO Consultants	Amante	Maria
	Atia	Ehab
	Freidl	Gudrun
	Johnston	Charles
	Nikisins	Sergejs
	Stolyarov	Kirill
Interpreters	Aleksinskaya	Olga
	Ilyukhin	Vladimir
	Nikolskaya	Anna
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