

# Report of the Fourth Joint WHO Regional Office for Europe/ECDC Meeting on Influenza Surveillance

Vienna, Austria, 11–13 June 2014

## **Abstract**

The fourth joint WHO European Regional Office for Europe and ECDC meeting on influenza surveillance brought together over 100 national influenza focal points, along with representatives of reference laboratories, international agencies and other organizations involved in disease surveillance in WHO European Region and European Union/European Economic Area Member States. Meeting participants discussed national and regional developments in influenza surveillance, ongoing vaccine effectiveness and coverage assessments, national vaccination policy trends and responses to recent zoonotic influenza outbreaks. Two parallel working groups then reviewed the epidemiological and virological aspects of influenza surveillance. Poster sessions were also hosted highlighting a range of influenza-related topics with a strong country-level focus.

### **Keywords**

Influenza  
Influenza surveillance  
Influenza vaccine  
Outbreaks and pandemics  
Influenza epidemiology  
Influenza virology

### **© World Health Organization 2014**

All rights reserved. The Regional Office for Europe of the World Health Organization welcomes requests for permission to reproduce or translate its publications, in part or in full.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either express or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use. The views expressed by authors, editors, or expert groups do not necessarily represent the decisions or the stated policy of the World Health Organization.

# CONTENTS

Meeting scope and objectives	<b>1</b>
Summary of key points	<b>1</b>
Opening session	<b>3</b>
1. Influenza surveillance	<b>4</b>
2. Influenza vaccines	<b>7</b>
3. Influenza outbreaks and pandemic preparedness	<b>9</b>
4. Outcomes of the Epidemiology Working Group	<b>11</b>
5. Outcomes of the Virology Working Group	<b>13</b>
Meeting evaluation	<b>15</b>
Annex 1: List of participants	<b>17</b>
Annex 2: Meeting agenda	<b>22</b>
Annex 3: Poster sessions	<b>25</b>

## **Meeting scope and objectives**

Since 2011 the WHO Regional Office for Europe (WHO/Europe) and the European Centre for Disease Prevention and Control (ECDC) have organized joint annual meetings to discuss the epidemiological and virological aspects of influenza surveillance and related issues. During 11–13 June 2014 the fourth joint WHO/Europe and ECDC meeting on influenza surveillance was held in Vienna, Austria, and was attended by more than 100 national influenza focal points as designated by national health authorities, along with representatives of reference laboratories, international agencies and other organizations involved in disease surveillance in WHO European Region and European Union/European Economic Area (EU/EEA) Member States (Annex 1).

The meeting agenda (Annex 2) focused on new developments in influenza surveillance at the country and regional level, on ongoing initiatives to assess vaccine effectiveness and coverage, on selected examples of national vaccination policy trends and on the responses mounted against recent zoonotic influenza outbreaks. A significant section of the meeting was then devoted to the activities of two parallel working groups on the epidemiological and virological aspects of influenza surveillance. In addition to plenary and working group presentations and discussions in all the above areas, two poster sessions were hosted at which a wide range of influenza-related topics with a strong country-level focus was highlighted (Annex 3).

Simultaneous Russian/English translation was provided throughout the meeting.

## **Summary of key points**

### **Joint WHO/Europe and ECDC influenza bulletin**

- Efforts to strengthen collaboration and coordination between WHO/Europe and ECDC were highly welcomed and will be the key to avoiding unnecessary duplication and overlap of efforts in influenza surveillance and response efforts.
- The upcoming WHO/Europe and ECDC joint influenza bulletin represents an important and practical advance in achieving greater coordination of efforts.

### **Severe disease surveillance and burden of disease**

- Regional-level severe influenza disease surveillance remains highly problematic due to large variations in national surveillance systems, populations covered and case definitions used. Although the analysis of pooled ICU data from different countries could potentially allow for regional monitoring of severe influenza disease, a number of issues would need to be addressed. Given the high potential feasibility in many countries of alternative approaches such as monitoring fatal paediatric cases, pilot studies might usefully be undertaken in this area.
- Agreement should be reached on the minimum dataset needed to determine the risk factors associated with severe disease, and on the best denominator (catchment population) for assessing the incidence of severe respiratory disease.

- Accurately measuring the burden of influenza disease is a key requirement for improving understanding of influenza epidemiology, informing planning and public health decision-making and driving national vaccination policies. Challenges in establishing national systems for estimating burden were however highlighted by many country representatives.
- Despite limitations in current methodologies, estimating global and national influenza-related mortality can be vitally important in supporting decision-making processes and advocating for prevention efforts. Monitoring will be needed however to ensure the transparency of estimation methodologies. Establishing the required capacities in many countries will require a process of supportive engagement by WHO and other international agencies with national authorities, more-detailed information on the methodologies used and some degree of pre-existing capacity.

### **Sentinel and non-sentinel surveillance**

- Sentinel surveillance systems remain the primary source of information on circulating influenza viruses, due in part to their stability and comparability across countries. Such systems are considered to provide more-reliable and representative data compared to non-sentinel surveillance.
- Sentinel and non-sentinel data should not be pooled due to differences in sampling strategies. In addition, meaningfully collating non-sentinel data at the regional level would be complicated by wide variations both in the data sources used and populations sampled in different countries. As a result, supranational non-sentinel data analysis requires a process of harmonization to be undertaken.

### **Virological surveillance**

- In relation to the currently defined objectives of virological influenza surveillance, meeting participants reiterated the need to focus on the global requirement for virus characterization data for vaccine virus selection and development. In addition, further research into the genetic markers for both potential disease severity and the emergence of antiviral resistance could lead to strengthened virological surveillance.
- Despite the potentially increased workload and need for training support, a number of country representatives expressed interest in participating in the recent strain-based reporting initiative.
- In general, given the principal focus on PCR detection of the annual WHO EQAP, there will be a continued need for the specialized biannual regional ERLI-Net EQA programme.
- Current laboratory training options remain suitable for the needs of the network. Experience indicates that the use of twinning and group-training courses should continue, though the need to carefully select participants was strongly emphasized, particularly given the typically small number of spaces available.
- Regular or end-of-season self-appraisal of laboratory surveillance activities remains highly variable, with individual laboratories using their own approaches. Rather than

integrating any proposed guidance in this area into the current WHO/Europe NIC-Laboratory Assessment Tool there may be greater utility in a separate guidance tool.

- Improving the timeliness and representativeness of viruses shared remains a key aim, and improved guidance to laboratories is required in the selection of isolates for shipment, optimal shipment timing and frequency, and the current rules of the WHO Shipping Fund.
- The collection and reporting of influenza metadata continues to be reviewed and adapted to ensure that data that is not used is not collected and that the data collected can best inform action and priority-setting. However, before discarding the requirement for particular metadata, careful consideration should be given to the full range of its potential application.
- Clinical laboratories are the first line of defence against pandemics prior to NIC involvement, and need to be familiar with the algorithm in which all unsubtypeable influenza-positive viruses are promptly forwarded to the NIC and then to a WHOCC.

#### **Vaccine uptake and effectiveness**

- Through their respective networks of collaborating experts, both VENICE and I-MOVE will continue to work to promote and share knowledge and best practices in their respective areas of monitoring seasonal influenza vaccination coverage and vaccine effectiveness. However, in the face of growing economic constraints, consideration may increasingly need to be given to the sustainability and funding of such important regional-level initiatives.

#### **Outbreaks and pandemic preparedness**

- Outbreaks caused by zoonotic influenza viruses highlight the vital importance of effective national, regional and global influenza surveillance and response activities. The introduction of initiatives such as the European Joint Procurement Agreement for pandemic influenza vaccines could greatly improve regional preparedness and response to cross-border threats.

#### **Alternative surveillance systems**

- Alternative influenza surveillance approaches can provide both additional and confirmatory epidemiological information at primary health care level, and potentially revolutionize national influenza surveillance. Consideration will need to be given however to the cultural and other factors which greatly determine, for example, the extent to which people search and interact with web-based resources as a response to illness.

### **Opening session**

Dr Pamela Rendi-Wagner, Director-General and Chief Medical Officer for Public Health and Medical Affairs at the Federal Ministry of Health, Austria welcomed meeting participants to Vienna. The holding of such joint meetings was part of a welcome process of collaboration between WHO and ECDC that will be key to avoiding unnecessary duplication and

redundancy of efforts, including in the reporting of influenza activity and virological data in the Region. Following its establishment in 2005, and subsequent full participation in existing influenza surveillance and reporting networks, the contribution made by ECDC and partner agencies has proved very helpful in informing national decision-making in this area. Although the 2013–14 influenza season in Austria was mild, and only just passed the epidemic threshold, constant alertness and continual improvements to national and regional surveillance systems remain vital. Moreover, the detection of multiple zoonotic influenza cases in 2013 in China caused by A(H7N9), A(H9N2) and A(H10N8) viruses highlights not only the value of functional detection systems but also the need for vigilance and collaboration in relation to influenza and other emerging respiratory pathogens with pandemic potential.

Participants were welcomed on behalf of WHO/Europe by Dr Caroline Brown and on behalf of ECDC by Dr Pasi Penttinen. Both speakers emphasized the importance of the planned launch in October 2014 of a WHO/Europe and ECDC joint influenza bulletin which represented an important culmination of collaborative efforts to streamline and optimize resources. Influenza causes a high burden of respiratory disease, and following the 2009 A(H1N1) pandemic the importance of effective and efficient surveillance and reporting systems to respond to the diverse nature of influenza viruses had increasingly become clear. This joint meeting was an important forum, not only for discussing key issues such as epidemiological and virological surveillance, vaccine development and national immunization policies but also for networking, stimulating collaboration and strengthening connections within the European influenza community.

A range of presentations was then given to illustrate trends and new developments in national and regional influenza surveillance, and to touch upon some of the key themes and meeting topics to be discussed in more detail in subsequent sessions. This report summarizes the plenary and working group discussions held on influenza surveillance, vaccine use and outbreak response, along with the outcomes of two parallel epidemiology and virology working groups.

## **1. Influenza surveillance**

To improve understanding of national influenza surveillance systems, strengthen coordination of WHO/Europe and ECDC activities, and provide guidance on the optimal content and structuring of the upcoming joint WHO/Europe and ECDC bulletin, meeting participants discussed a number of key aspects of influenza surveillance. Discussion group objectives included determining the best approaches for monitoring and reporting severe disease cases; for collating and interpreting non-sentinel surveillance data; and for better understanding the objectives, representativeness and optimal presentation of virus-characterization data.

### **Severe disease surveillance**

Despite the introduction of hospital surveillance in most WHO European Region Member States, regional-level severe influenza disease surveillance in Europe remains problematic due to large variations in national surveillance systems, populations covered and case definitions used. Recent surveys and evaluations carried out by both WHO/Europe and ECDC indicate that despite standardization efforts the persistent high diversity of

surveillance systems and approaches for assessing respiratory disease in the Region continues to have implications for the broader monitoring of severe influenza.

Analysis of pooled data obtained exclusively in intensive care units (ICUs) across different countries could potentially improve the monitoring of severe influenza disease in the Region, especially as this is likely to represent a better proxy for severity compared to cases admitted to all wards. However, meeting participants highlighted a number of issues that would need to be considered. A distinction was drawn between the use of pooled ICU data to identify the underlying risk factors for severe influenza disease outcomes and its use in efforts to estimate disease severity. Discerning trends across countries would also require a more refined pooling approach that went beyond simple aggregation. Other considerations included the different settings in which intensive care is provided, the use of varying case definitions and testing strategies, the complete lack of data on category of hospitalization in some countries, limited laboratory-testing capacities and the typically restricted ceiling capacities of ICUs.

Further group discussion centred on the very different situations in individual countries, for example in terms of the proportion of severe cases admitted to an ICU, potential biases such as stage of illness in risk-factor evaluations and the degree of automation of record-keeping. In light of such realities, no clear consensus emerged on the likely current utility or feasibility of pooling ICU data across the Region. Alternative approaches to the Region-wide monitoring of severe disease, for example based on the monitoring of paediatric fatal cases, may be more feasible as many countries already collect and report such data. However, the need for laboratory confirmation of fatal influenza cases raises issues of feasibility and timeliness of reporting in some countries. Nevertheless, given the high potential feasibility of alternative approaches in many countries, a pilot study might usefully be undertaken.

Collecting appropriate denominator data was recognized as a key aspect of determining the magnitude and burden of severe influenza disease. Such data allow for meaningful comparisons to be made over time and between seasons, and for the interpretation of national data in regional and global contexts. There was broad agreement that the best denominator for assessing the incidence of severe respiratory disease was catchment population, particularly where timely all-cause hospital or ICU admission data were not routinely available, or where unrelated fluctuations in weekly hospital admissions occurred. It was recognized however that calculating catchment populations was very difficult in some countries, with complications arising, for example, in very large cities or popular tourist destinations. In some countries, particularly non-EU/EEA countries, admission data for hospital wards participating in surveillance are often more easily available and less biased. There may be some benefit in conducting retrospective analyses in selected settings comparing the rates obtained using both denominators.

Individual countries also reported variations in the demographic and other data collected to estimate specific risk factors for severe influenza disease in line with national priorities. However, there was some consensus that any minimum dataset should include indications of age and sex; presence of (specified) underlying disease or condition (such as pregnancy or obesity); vaccination status (trivalent/quadrivalent); and causative virus (sub)type. Furthermore, the vaccination status of a newborn's mother; travel history in cases of new and/or pandemic viruses; antiviral treatment history; and outcome (including ICU admittance and/or death) might usefully be added in some situations.

### **Sentinel and non-sentinel surveillance**



Virological data are generated using two main types of surveillance systems in the European Region – sentinel and non-sentinel. In the case of sentinel systems virus sampling is performed on a systematic and representative basis among patients meeting a standard case definition (ILI or ARI) in selected primary health care facilities. In non-sentinel surveillance systems (sometimes referred to as “universal surveillance”) respiratory samples are typically collected when convenient. As outlined in WHO guidelines ([http://www.who.int/influenza/resources/documents/WHO\\_Epidemiological\\_Influenza\\_Surveillance\\_Standards\\_2014.pdf](http://www.who.int/influenza/resources/documents/WHO_Epidemiological_Influenza_Surveillance_Standards_2014.pdf)) sentinel surveillance systems are the key element in influenza surveillance and are able to promptly detect circulating viruses. The larger numbers of subtyped viruses reported in sentinel systems also allow for greater precision in estimating patterns of virus circulation. Furthermore, viruses causing milder disease (such as influenza B viruses) are more likely to be detected in specimens collected systematically in primary health care facilities than in convenience-based sampling approaches.

Within countries, there are also large discrepancies in the number of samples tested under each type of system which may distort reported seasonal trends. Overall, sentinel surveillance systems are regarded as the primary source of reliable and representative data on circulating influenza viruses compared to non-sentinel surveillance where specimens originate from a wider range of settings (for example, general practices, hospitals, ICUs and outbreak investigations) and where a standard specimen-collection protocol is often not used.

Nonetheless, the vast majority of viruses detected in the Region come from non-sentinel sources and such surveillance in hospitals can also lead to the generation and improved sharing of information on viruses causing severe disease, which may not be available from sentinel sites. Furthermore, non-sentinel approaches are widely used, often provide comprehensive coverage and allow for the timely provision of specimens early in the season. Non-sentinel surveillance approaches can also be helpful in monitoring, from a country perspective, the emergence of antiviral resistance. Non-sentinel data on circulating viruses, preferably presented by country as a data source distinct from sentinel system data, could also potentially be helpful to neighbouring countries.

There was broad recognition however that meaningfully collating non-sentinel data at the regional level is complicated by wide variations both in the data sources used and populations sampled in different countries. As a result, any attempt at supranational non-sentinel data analysis would be challenging, with sentinel surveillance approaches providing a more valuable, stable, reliable and comparable system across countries due to the more-representative and systematic sampling approaches used. In order to compare non-sentinel data across different countries, a process of harmonization would first be needed.

### **Virus characterization data and molecular surveillance**

Antigenic and genetic characterization data on circulating influenza viruses are produced either directly by National Influenza Centres (NICs) or by WHO Collaborating Centres (WHOCCs) working with viruses forwarded by the NICs. Monitoring and analysing such data are core activities of the WHO Global Influenza Surveillance and Response System (GISRS) and provide the foundation for a broad range of influenza surveillance and response activities. In terms of the objectives of molecular surveillance of influenza in EU/EEA and neighbouring countries, meeting participants reiterated the need to focus on the global requirement for characterization data in the vaccine virus selection and development process. It was felt that the current weekly analysis of antiviral susceptibility data should continue, and should include national-level data generated by the WHOCC London reported to the

ECDC European Surveillance System (TESSy) and ECDC monthly virology reports produced to cover both TESSy and WHOCC data. Focused research into the genetic markers for both disease severity and the emergence of antiviral resistance could potentially lead to the identification of relevant single nucleotide polymorphisms (SNPs). The detection of these SNPs by polymerase chain reaction (PCR) assays could then be incorporated into routine surveillance activities.

There was general consensus that the reporting of virus characterization data should continue to be on a weekly basis (by date of sample collection). Potentially helpful outputs of the upcoming WHO/Europe and ECDC joint influenza bulletin included aggregated pie charts of antigenic and genetic characterization data, more-detailed monthly analyses, the possibility of comparing national trends with those in neighbouring countries and comparisons of characterization data obtained by NICs and WHOCCs.

Despite reservations concerning potentially increased workloads, a number of country representatives expressed interest in participating in the ECDC strain-based reporting initiative launched during the 2013–14 influenza season. The advantages of such reporting were widely acknowledged, particularly the ability to integrate genetic and antigenic characterization data, antiviral resistance data and clinical information on one virus into a single file. A common theme however was that data reporting was not necessarily performed by virologists, thus limiting the technical ability of countries to implement new reporting approaches. It was suggested that on-site country visits by TESSy personnel to provide initial information technology support might help to overcome this and other commonly experienced difficulties likely to be associated with automating the reporting process. Other potential enhancements included data sharing between GISAID and TESSy to avoid the duplication of reporting processes, and clarification of the acceptable values and formatting of requested metadata. In terms of output frequency, it was felt that weekly strain-based analysis could be misleading and that the objectives of the approach needed to be better defined before the optimal frequency of outputs could be determined.

## **2. Influenza vaccines**

### **Vaccine coverage and effectiveness**

Ongoing surveys by the Vaccine European New Integrated Collaboration Effort (VENICE) project continued to highlight discrepancies between regional and global vaccination recommendations and actual seasonal influenza vaccination coverage in Europe. Such discrepancies were particularly acute among clinical at-risk groups, health care workers and pregnant women, with some countries failing to monitor vaccination coverage among older age groups. Despite almost universal influenza vaccination recommendations for all these groups in EU/EEA countries, surveys covering the previous five influenza seasons indicated lagging rates of coverage among the elderly in almost all countries, with no increase in coverage and a failure to meet EU targets. Among clinical at-risk groups and health care workers only one third of countries were found to collect data with reported coverage varying widely, while only seven countries monitored seasonal influenza vaccine coverage among pregnant women. Survey limitations included the use of incomplete vaccination coverage data, and the difficulties inherent in comparing data generated by different national methodologies. In addition, for clinical at-risk groups it is often difficult to accurately

estimate both denominators and numerators, while population surveys in countries rely upon a wide range of interview techniques and methodologies.

The Influenza Monitoring Vaccine Effectiveness (I-MOVE) project started in 2007 and continues to generate information on influenza vaccine effectiveness (VE) by age and virus (sub)type in Europe through a multicentre study involving EU countries and partner agencies. Meeting participants were updated on trends and developments in this area over the period 2008–2014, with data continuing to indicate sub-optimal levels of VE in certain years and among certain age groups. The importance of waning immunity over time during the course of an influenza season, of the role of repeat vaccinations in previous seasons and of prior natural immunity on annual VE estimates continue to be matters of debate.

Illustrative VE findings for recent influenza seasons were presented, including Global Influenza Vaccine Effectiveness (GIVE) data for all age groups collated by I-MOVE and partner agencies and provided to WHO by sub(type). This data was intended to highlight low VE associated with specific subtypes or with specific vaccine types or brands to support WHO decision-making on the composition of vaccines for upcoming seasons and to re-enforce the need for alternative prevention and control measures where VE is low. Data was also presented on early- and late-season estimated VE, highlighting clear differences in the pattern of VE over the course of different seasons. Currently unresolved issues include determining the utility of VE data in complementing antigenic and other laboratory data as part of the process of determining vaccine composition, and the best way of reconciling these two types of data.

Monitoring both seasonal influenza vaccination coverage and vaccine effectiveness remain vital undertakings in light of the potential for severe influenza disease and deaths, large economic impacts and the financial and other pressures placed on health and social care services. Through their respective networks of collaborating experts, which include both WHO/Europe and ECDC, both VENICE and I-MOVE will continue to work to promote and share knowledge and best practices in this area. However, in the face of growing economic constraints, increasing consideration may need to be given to sustainability and funding issues.

### **National-level perspectives on childhood vaccination**

Trivalent influenza vaccine for children 6–35 months of age was added to the national vaccination programme in Finland in 2007. Since 2012, coverage estimates have been calculated through the National Vaccination Register which continuously collects vaccination records from health centres. Prior to the 2009 A(H1N1) pandemic, coverage ranged seasonally between 21.6% and 43.2% but had fallen to 15.9% in 2013–14. With the sole exception of unexplained low effectiveness against influenza B viruses based on a very small number of cases, VE levels have remained satisfactory (70.0% against all influenza in 2013–14). Efforts to increase coverage will require far more effective communication campaigns highlighting the benefits of influenza vaccination to motivate parents to have their children vaccinated.

In 2012 it was recommended that the long-standing selective influenza vaccine programme for the elderly, people with underlying health conditions, pregnant women and those with weakened immune systems in the United Kingdom be extended to offer live attenuated influenza vaccine (LAIV) annually to all children aged 2–16 years. Such a programme is considered to be potentially highly cost effective as it could provide both direct protection by

lowering the impact of influenza on children and indirect protection by lowering virus transmission to other children, adults and those in clinical at-risk groups. Despite low levels of influenza activity in the roll-out season 2013–14, outcome data from a range of surveillance schemes demonstrated consistent, though non-statistically significant, decreases in disease incidence, and a reduction in severe outcomes among younger age groups. Although no serious adverse events were reported, concerns were raised by a number of religious groups in relation to the use of porcine gelatin as a vaccine component. Observed overall high uptake of the programme in the initial pilot phase indicated the utility of the school, community pharmacy and primary health care sites selected as delivery settings. Work is now under way to establish and pilot surveillance systems to monitor the new childhood LAIV programme, measure vaccine uptake and effectiveness, and make preliminary estimations of the direct and indirect impact of the programme. Ongoing surveillance will be required as the programme is rolled out to additional age groups and geographical areas in 2014/15.

Since 2001 a range of specific groups at high risk of influenza sequelae or influenza infection have been included in the national vaccination policies of Belarus. However, this did not include children, with the result that only an estimated 9–11% of the total child population was being immunized against influenza. Such vaccination coverage was unlikely to significantly impact on the course of influenza epidemics or reduce annual influenza incidence among children, particularly given the high level of influenza transmission believed to occur among pre-school- and school-age children. In order to address this situation an epidemiological survey was conducted in 2004 to evaluate the influence of specific, nonspecific and combined influenza prevention measures on influenza and acute respiratory infection (ARI) incidence in child facilities. Children aged 0–6 years were followed up by medical staff during the entire influenza season after being provided with a range of preventive interventions, including vaccination. The use of such measures significantly decreased the rates of influenza and ARI, with the use of combined measures associated with a four-fold decrease in the number of children becoming ill. In 2008 an evaluation of the efficiency and effectiveness of the current influenza vaccination strategy among children at four pre-school facilities found significant differences in the absolute risk for influenza among vaccinated and non-vaccinated individuals, with influenza vaccination helping to prevent not only acute influenza cases but also resulting complications. As a result of these and other efforts, influenza immunization coverage among those aged 6 months to 17 years in Belarus had risen to 44% by 2013.

During group discussion the issue of growing parental resistance to childhood influenza vaccinations was raised. It was felt that one reason for this was widespread misunderstanding and under-estimation of disease burden. In order to better communicate the benefits of influenza vaccines there is a need for better burden of disease and VE data. In addition, following the association between a specific pandemic A(H1N1)pdm09 vaccine and narcolepsy, the systematic collation and clear communication of safety data will be vital.

### **3. Influenza outbreaks and pandemic preparedness**

During the 2009 A(H1N1) pandemic a number of weaknesses had been highlighted in vaccine-procurement procedures in European countries. As a result, the European Commission had been formally requested to initiate the introduction of a common approach based upon the joint procurement of medical countermeasures, particularly pandemic

influenza vaccines. Meeting participants were informed that such an approach was intended to greatly improve preparedness for all cross-border threats to health that could be mitigated by medical countermeasures. Following European Commission approval in April 2014 the agreement was scheduled to enter into force in June 2014 following ratification by signatory Member States. The agreement is included as Article 5 of Decision No 1082/2013/EU on serious cross-border threats to health.

The joint procurement approach should be coordinated with WHO, particularly with regard to donations of pandemic vaccines to countries through the Pandemic influenza preparedness Framework ([http://www.who.int/influenza/resources/pip\\_framework/en/](http://www.who.int/influenza/resources/pip_framework/en/)). During a future pandemic, WHO will advise vaccine manufacturers on which virus strains to include in a pandemic vaccine and on the optimum timing of the switch to pandemic vaccine production in accordance with recent WHO interim guidance ([http://www.who.int/influenza/preparedness/pandemic/GIP\\_PandemicInfluenzaRiskManagementInterimGuidance\\_2013.pdf](http://www.who.int/influenza/preparedness/pandemic/GIP_PandemicInfluenzaRiskManagementInterimGuidance_2013.pdf)). During discussion, it was highlighted that despite the cessation of influenza vaccine production by some manufacturers, the ongoing commitment of major manufacturers to seasonal influenza vaccine production should ensure the maintaining of influenza vaccine production capacity.

Illustrative presentations were then given on the characteristics of the avian influenza A(H7N9) epidemic in humans and birds in China since 2013 and of an outbreak of avian influenza A(H7N7) in Italy in 2013. In China, exposure to poultry or live bird markets was identified as the primary risk factor for human infection with A(H7N9), and despite limited clustering in families no evidence of sustainable human-to-human transmission had been found. Efforts were ongoing to identify the precise transmission routes and mechanisms involved and the role played by weather conditions and other variables in the emergence and seasonality of cases. Such efforts had included the sampling of 50 000 wild birds with only a single sample proving positive. In addition to efforts to maintain and improve influenza surveillance and case investigation, future intentions included further application of the WHO-OFFLU “One Health” approach to influenza at the human-animal interface, allied to policy developments to drive a process of upgrading the Chinese poultry industry. In Italy, a range of outbreak investigation and management activities had rapidly been put in place following the start of the A(H7N7) outbreak in 2013. During the outbreak, conjunctivitis was observed to be the prevailing symptom in primary cases, with no evidence found of human-to-human transmission. The cleansing, culling and other control measures implemented effectively reduced the risk of transmission, though a small number of cases did occur among control workers highlighting the need for stringent precautions. An ongoing seroepidemiological study of individuals who met specified inclusion criteria was under way to measure the prevalence of infection among exposed workers, identify the risk factors for human infection according to type and length of exposure, measure the prevalence of specific antibodies among close contacts of confirmed cases and quantify the proportion of asymptomatic and/or sub-clinical infections. It was noted that 61% of the serological study participants were seasonal workers from other countries highlighting the often highly mobile nature of the agricultural workforce.

Clinical laboratories often represent the first line of defence against emerging infections including pandemics, even prior to NIC involvement. Such laboratories therefore need to be familiar with the algorithm in which all suspect influenza-positive viruses, including those for which the subtype cannot be determined in laboratories that perform subtyping, are promptly forwarded to an NIC and then to a WHOCC. In addition, the crucial role of clinical judgment

and thorough anamnesis in promptly identifying potentially zoonotic influenza cases must continue to be emphasized. Issues of comparability between laboratories in terms of the equipment and reagents used, and the availability of human and other resources, were raised during discussion. It was clarified that all laboratories used real-time PCR approaches providing at least a baseline for assuming comparability.

Laboratories are able to evaluate their proficiency in influenza virus detection and subtyping through participation in WHO and ECDC external quality assurance (EQA) schemes. The WHO External Quality Assessment Project for the Detection of Subtype Influenza A Viruses by PCR (EQAP) is a global project conducted jointly by WHO and the WHO H5 Reference Laboratory in China, Hong Kong SAR that aims to improve global laboratory capacity for the detection of both seasonal and avian influenza viruses using PCR. In 2013, 179 laboratories from 140 countries participated, including 61 laboratories from the European Region. In addition to the well-established inactivated influenza A and B viruses, the 2013 panel also incorporated genotypic testing for neuraminidase inhibitor susceptibility. The regional WHO EQA programme for influenza virus culturing and antiviral susceptibility testing is conducted jointly with the European Reference Laboratory Network for Human Influenza (ERLI-Net) for laboratories in EU/EEA Member States. The latest edition of the programme included detection by PCR and antigenic characterization, as well as the testing of neuraminidase susceptibility via genotypic or phenotypic methods. The ERLI-Net EQA programme both contributes to and records the progress made by NICs in the Region, indicating for example that rapid detection proficiency scores for participating laboratories increased from 69% in 2008 to 76% in 2010 and 80% in 2013.

Other independent EQA initiatives are also available and include commercially available proficiency testing panels to evaluate the ability of laboratories involved in influenza diagnostics to reliably detect and subtype avian influenza viruses. For example, Quality Control for Molecular Diagnostics (QCMD) external quality assessment panels were used in 33 countries (23 of which were in the European Region) involving a total of 251 laboratories. One panel was used to assess the detection of type A and type B human influenza viruses, with a zoonotic (avian) influenza virus specifically added for 2013. A second panel was used to assess the quality of subtyping of both human and zoonotic influenza viruses. Only 16 laboratories experienced any issues in detecting the A(H5N1) virus with nine failing to detect it at all. Of the 27 laboratories in 10 countries that performed subtyping, 25 correctly subtyped the H5 virus and 10 correctly subtyped the H7 virus. It would appear that the majority of diagnostic laboratories were capable of detecting avian influenza viruses using commercial and/or in-house developed tests. Most such laboratories had however only limited capability in subtyping avian influenza viruses, particularly H7 viruses.

## **4. Outcomes of the Epidemiology Working Group**

### **Estimating the burden of influenza in the European Region**

Accurately measuring the burden of influenza disease is a key requirement for improving understanding of influenza epidemiology, informing planning and public health decision-making and driving national vaccination policies. Discussions were held on which countries were performing burden estimations, monitoring influenza mortality or planning to do so, and on which methods were used or being considered. It was intended that this would be the start

of a process of identifying gaps in burden data needs and analysis, and determining how ECDC and WHO/Europe can best work to help address these.

Challenges in establishing national systems for estimating burden were highlighted by many country representatives. These included competing public health priorities and limited resources, particularly of personnel working solely in influenza; a lack of hospital and mortality data; and problems caused by a lack of electronic data systems or by their recent introduction. For many countries in the Region such issues were undermining the establishing of burden-estimation systems based upon internationally approved approaches. As a result, most countries reported a paucity of routine disease burden estimation and monitoring activities, with very few planning to conduct studies in this area. Despite widespread awareness of its potential value, the routine and regular collection of data, including on influenza mortality, was not considered feasible at present. Even if data were available it would be difficult to meaningfully compare the burden of influenza with that of other infections given its typically far greater incidence. Other potentially complicating factors highlighted included delays in data availability, data-privacy issues, the scarcity of data-reporting and processing staff, and the degree of representativeness of data. It may be that a process of formal communication between WHO and ministries of health would first be needed, for example to overcome the complex issues involved in collecting data across different sectors, including non-health-care sectors. Simple standardized WHO and other methodologies for estimating disease burden could also usefully be provided to countries.

In the Netherlands, the annual incidence of symptomatic infections had been derived by synthesizing available information on seasonal influenza and ILI from diverse sources. Combining all evidence sources within a coherent framework had resulted in the production of seasonal influenza burden assessments to guide vaccination policy. Recognized limitations included a dependency on the representativeness of the data sources used and the unknown extent of biases. For example, general practice consultation data are influenced by age-specific differential health-seeking behaviour, with the youngest and oldest age groups likely to be under-represented. During feedback discussion, it became apparent that, where conducted, different countries used widely different approaches to burden estimation.

### **Estimating influenza mortality**

Despite general understanding of the limitations of current methodologies there was overall acceptance of the need for global estimates of seasonal influenza mortality, and of the potential benefits of highlighting any discrepancies between reported national data and globally derived figures. However, ensuring the transparency of the estimation methodologies used would be a necessary aspect of efforts in this area. The complexities of estimating seasonal influenza mortality burden, for example among patients with underlying conditions, highlighted the limitations of the single cause-specific data typically reported in national statistics systems.

In Europe, further development of the European Mortality Monitoring (EuroMOMO) project for the timely monitoring of all-cause mortality in 22 European countries had resulted in the emergence of an integrated common model for estimating from deaths from all causes the influenza-related mortality in countries (FluMOMO). Discussions centred on the experiences of individual countries that currently participated in EuroMOMO. Recurring issues included the potentially high workload, sustainability issues caused by lack of funding and/or staff time, and the variable availability, representativeness and timeliness of national data. Nevertheless, Working Group discussions indicated that many countries were looking to

strengthen and expand national systems for mortality estimation and would be interested in conducting end-of-season analyses as part of FluMOMO. It was recognized that in practice this would require supportive communication and advocacy initiatives and other engagements by WHO and other international agencies with national authorities, more-detailed information on the methodologies used and some degree of pre-existing capacity.

### **Use of alternative influenza surveillance systems**

Historically, influenza surveillance has focused on the reporting of illness in patients presenting to primary care facilities or to hospitals. However, alternative surveillance approaches can provide both additional and confirmatory information and data, for example on missed or non-presenting cases. Such alternative systems can also access a larger proportion of the “pyramid” of cases and increase detection sensitivity early in an influenza epidemic. Working Group members were updated on the findings of a WHO/Europe combined literature review and analysis of surveys conducted in EU countries. The primary alternative system used was web-based reporting with many countries having more than one alternative system in place.

Discussions took place around the potential use and value of alternative systems, including of the inter-country Influenzanet established in 2003. In Sweden, longstanding non-traditional surveillance approaches have included the monitoring of work absenteeism, use of telephone interviews and automated logging and transfer of queries typed into an official health-related web site (“Webbsök”). Evaluation of the latter approach following seasons 2009–10 and 2013–14 indicated a high correlation with traditional laboratory-based and sentinel reporting, though with typically earlier peak weeks that may have been due to respiratory infections other than influenza. The advantages of this stable and low-cost approach included minimal effort with no need for health care staff reporting; automated transfer, analysis and presentation of data; timely estimates of ILI-activity levels approaching real-time and close to disease onset; and high degree of sensitivity and flexibility. Further complementary and country-wide web-based approaches based on the use of invited cohorts are being trailed in Sweden to find the optimum approach for broad ILI surveillance.

It was highlighted that although such electronic and self-generating systems had significant potential advantages, finance and staffing resources, although lessened, would still be required. Nor would setting up new processes be necessarily straightforward in many settings. For example, previous pharmacy-based or internet-based approaches had not always proved to be sustainable. Issues such as high workload among general practitioners recruited to networks for incorporation into national systems would also need to be addressed, for example by streamlining data-entry processes to avoid duplication. Some countries still lacked good electronic management systems, with a reliance on manual reporting still common in some settings. In all countries, cultural and related factors greatly determined the degree to which people searched and interacted with web sites resources as a response to illness. In addition, given the limited or nonexistent capacity of internet-based and automatic data-extraction methods to permit the combining of epidemiological and virological data, parallel sentinel and non-sentinel surveillance systems would remain vitally important.



## **5. Outcomes of the Virology Working Group**

### **Laboratory quality and training**

Based on the results of the 2013/14 ERLI-Net EQA programme for virus detection and isolation conducted in collaboration with WHO/Europe, molecular detection capability was good across the European Region, with A(H7N9) Anhui-strain detected and typed by all laboratories, and subtyped by 90%. Five laboratories reported false-negative results. For virus isolation and culture activities four laboratories accounted for 11 of 16 reported false-negative results. The majority of laboratories (75%) performed antigenic virus characterization, though higher average scores were achieved using genetic characterization techniques. Virus characterization results were considered adequate and in line with an overall improved regional trend seen in recent years. When used, the phenotypic analysis of antiviral susceptibility was accurate. However, despite improvements, issues still remain with the interpretation and reporting of genotypic analysis results. In general, given the principal focus on PCR detection of the annual WHO EQAP, there will be a continued need for specialized biannual regional ERLI-Net EQA assessments for virus detection and culture.

In terms of corrective actions and follow-up, current training options remain suitable for the training needs of the network. Experience from the WHOCC London and other centres indicated that the use of twinning and group-training courses should continue, though the need to carefully select participants was strongly emphasized, particularly given the typically small number of spaces available. It was felt that the focus should remain on virus isolation, sequencing, bioinformatics and assay development and validation. Such training efforts were however only meaningful when corresponding national laboratory capacities were in place and funded. The need for support in the strengthening of in-country assay development and validation was reiterated as this would help to overcome a number of current problems with commercial and other kits. Current barriers to the development of in-house assays – and their implementation by other laboratories – included a lack of experienced staff and staff time, limited access to control materials and relatively high costs. Consideration should be given to the ways in which the European network could best support laboratories in addressing these and related training and other issues.

Although laboratories conducted regular and/or end-of-season appraisals of their surveillance activities this was not standardized, with individual laboratories using their own approaches. Rather than attempt to combine any proposed guidance development in this area with the current WHO/Europe NIC-Laboratory Assessment Tool it was felt that there was likely to be greater utility in the production of a separate guidance tool.

### **Sequencing**

Presentations were given on the broad range and content of support documents and other laboratory resources for molecular typing/subtyping and genetic characterization of A(H5N1), seasonal and zoonotic viruses currently available to the network through the ECDC extranet portal (<https://extranet.ecdc.europa.eu/EISN/>). Discussion took place on the degree to which such resources were sufficient and useful. It was highlighted that not all laboratories were able to access the extranet portal, and those that did often found it very difficult to navigate and to locate relevant information. Consideration should be given to addressing such concerns, especially given the high level of usefulness of such resources to NICs and other laboratories in analysing influenza virus genomes, checking for amino acid changes associated with reduced antiviral susceptibility and accessing sequencing and

bioinformatics training course materials. From the 2014–15 influenza season onward, and the advent of joint surveillance, access to the ECDC EISN extranet portal will be granted to all reporting countries.

### **Improving virus sharing**

Acknowledgement was given to all NICs and other laboratories sharing virus isolates and/or clinical specimens with WHOCC London and other WHOCCs as this remains a pivotal element in GISRS activities. However, issues continued to arise in relation to ensuring the timeliness of submitted viruses for use in the biannual WHO Vaccine Composition Meetings (VCMs). For example, of 540 specimens submitted to WHOCC London by 2 February 2013 only 180 (33%) could be antigenically characterized in time for the February 2013 VCM. This was due to the “grouped” arrival of many large packages, and the time needed to isolate viruses from clinical specimens. Identifying ways of further improving the timeliness and representativeness of viruses shared in future seasons remained a key aim. As part of this, improved guidance to laboratories was required in areas such as the selection of isolates for shipment, optimal shipment timing and frequency, and the current rules of the WHO Shipping Fund. The perception that this was limited to once a year encouraged the strategic delaying of virus sharing in some cases. Clarification was given that previously restrictive financial pressures had impacted upon the allowable frequency of shipping but that this was now back to twice a year, plus shipment of any unusual isolates. Practical advice might also be usefully developed on logistical issues such as shipping without dry ice and submitting customs clearance documents well in advance of dispatch. Opinion was divided on the likely utility of establishing a working group to guide and advise upon further efforts.

### **Metadata for the 2014–15 season**

Every season the collection and provision of influenza metadata needed to be reviewed and adapted if necessary to new developments. Data should not be collected if they are not used and data that is collected must inform action and priority-setting. The changes proposed for the 2014–15 season were discussed and efforts made to reach a consensus on the best way forward. Specific topics included the utility of respiratory syncytial virus (RSV) and influenza serology metadata, of influenza virus isolation variables and of additional variables in strain-based reporting. Following a trend of sharply decreasing completeness in the reporting of RSV and influenza serology variables a proposal to deactivate this requirement was broadly accepted. It was felt that such metadata was primarily of use for research purposes and retrospective diagnosis. Conversely, the importance of monitoring the number of virus isolates via TESSy or other platforms necessitated the use of influenza virus isolation variables – primarily the number of samples processed for use as a denominator – either in weekly or end-of-season reporting. In general, before discarding the requirement for particular metadata, careful consideration should be given to the full range of its potential application. Potentially useful variables to record in strain-based data reporting included source material (clinical specimen or virus isolate) and whether or not the virus had been sent to a WHOCC.

### **Meeting evaluation**

Of the approximately 125 meeting participants invited to complete the meeting evaluation questionnaire there were 99 respondents (79.2%). Inputs were invited in six categories covering a range of meeting content, organizational and duration aspects. The meeting was

very well received in general, with ratings of either “excellent” or “good” provided by almost 80% of respondents in terms of the overall meeting quality; by over 70% in terms of overall technical content; and by over 87% in terms of overall administrative organization. Almost 83% of respondents felt that the meeting duration had been “just right”. Suggestions for potential improvements included ensuring that sufficient time is set aside for working group discussion sessions, that the facilities used for such discussions are suitable and that the group facilitators, background documents and prepared questions provide clear and unambiguous support and guidance to the discussion process.

## **Annex 1: List of participants**

### **National representatives**

Participants from Albania, Bosnia and Herzegovina, Kosovo,<sup>1</sup> Montenegro, Serbia, the former Yugoslav Republic of Macedonia and Turkey were invited to this meeting with the financial assistance of the European Union under IPA/2011/282-291.

#### **Albania**

Iris Hatibi; Artan Simaku

#### **Armenia**

Shushan Sargsyan; Liana Torosyan

#### **Austria**

Peter Kreidl; Therese Popow-Kraupp; Pamela Rendi-Wagner; Irene Rückerl

#### **Azerbaijan**

Nazakat Abdullayeva; Nazifa Mursalova

#### **Belarus**

Natalia Gribkova; Ina Karaban

#### **Belgium**

Nathalie Bossuyt; Isabelle Thomas

#### **Bosnia and Herzegovina**

Semra Cavaljuga; Nina Rodić-Vukmir

#### **Bulgaria**

Mira Kojouharova; Neli Korsun

#### **China**

Tu Wenxiao

#### **Croatia**

Vladimir Drazenovic; Alan Medić

#### **Cyprus**

Maria Koliou

#### **Czech Republic**

Jan Kynčl

#### **Denmark**

Laura Espenhain; Lisbet Krause Knudsen; Ramona Trebbien

---

<sup>1</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

**Estonia**

Natalja Kuznetsova; Olga Sadikova

**Finland**

Niina Ikonen; Satu Murtopuro; Hanna Nohynek

**France**

Sylvie Behillil; Emmanuel Belchior; Vincent Enouf; Bruno Lina; Alain Moren

**Georgia**

Ann Machablishvili; Khatuna Zakhashvili

**Germany**

Barbara Biere; Silke Buda; Brunhilde Schweiger

**Greece**

Thanos Kossyvakis; Andreas Mentis; Georgia Spala

**Hungary**

Zsuzsanna Molnár; Mónika Rózsa

**Ireland**

Joan O'Donnell; Jolita Mereckiene; Allison Waters

**Israel**

Aharona Freedman; Michal Mandelboim

**Italy**

Antonino Bella; Maria Rita Castrucci; Caterina Rizzo

**Kazakhstan**

Aknur Mutaliyeva

**Kosovo<sup>2</sup>**

Xhevat Jakupi; Ariana Kalaveshi

**Kyrgyzstan**

Kaliya T Kasymbekova; Abdykadyr Zhoroyev

**Latvia**

Raina Nikiforova; Natalija Zamjatina

**Lithuania**

Giedrius Foktas; Algirdas Griškevičius

---

<sup>2</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

**Luxembourg**

Matthias Opp

**Malta**

Christopher Barbara; Tanya Melillo Fenech

**Montenegro**

Bozidarka Rakocevic; Zoran Vratnica

**Netherlands**

Geertje Donker; Adam Meijer; Wim Van Der Hoek

**Norway**

Siri Helene Hauge; Olav Hungnes; Ragnhild Tønnessen

**Poland**

Karolina Bednarska; Iwona Paradowska-Stankiewicz

**Portugal**

Raquel Guiomar

**Romania**

Gheorghe Necula; Rodica Popescu

**Republic of Moldova**

Radu Cojocaru; Constantin Spinu

**Republic of Slovakia**

Elena Ticha; Alexandra Zampachova

**Russian Federation**

Natalia Frolova; Elizaveta Smorodintseva

**Serbia**

Dragana Dimitrijevic; Slavica Rakic Adrovic

**Slovenia**

Nataša Berginc; Katarina Prosenc; Maja Sočan

**Spain**

Silvia Jiménez Jorge; Amparo Larrauri Cámara; Francisco Pozo

**Sweden**

Helena Dahl; Hélène Englund

**Switzerland**

Rita Born; Yves Thomas

**Tajikistan**

Samardin Aliev; Mahmadali Tabarov

**The Former Yugoslav Republic of Macedonia**  
Golubinka Bosevska; Zharko Karadjovski

**Turkey**  
Ayşe Başak Altaş; Meral Ciblak; Ahmet Özlü

**Turkmenistan**  
Amansoltan Ashirova; Gurbangul Ovliyakulova

**Ukraine**  
Tetiana Dykhanovska; Svitlana Ostashko

**United Kingdom of Great Britain and Northern Ireland**  
Matthew Donati; Ian Harrison; Richard Pebody

**Uzbekistan**  
Sultan Djemileva; Ravshan A Rakhimov

### **Temporary Advisers**

Lynnette Brammer; Elena Burtseva; Rod Daniels; John McCauley; Tamara Meerhoff; Anna Sominina; Jorine Vermaire

### **Consultants**

Ganna Bolokhovets; Marta Galinska; Cyril Martel

### **Representatives of other organizations**

**United States Centers for Disease Control and Prevention (CDC)**  
George Schmid; Stacey Spivey-Blackford

**Institute of Public Health**  
Silva Bino

**National Influenza Centre Kiev**  
Alla Mironenko

### **European Centre for Disease Prevention and Control**

Zero Akyol; Cornelia Adlhoch; Julien Beauté; Eeva Broberg; Gaëtan Guyodo; Encarna Gimenez; Kari Johansen; Luciana Muresan; Pasi Penttinen; Francesca Pesce; René Snacken

## **World Health Organization**

### **Headquarters**

Katelijn Vandemaele; Zhang Wenqing

### **Regional Office for Europe**

Anne-Marie Andersen; Caroline Sarah Brown; Cassandra Andreea Butu; Silviu Ciobanu; Diane Gross; Krystyna Hagebro; Michala Hegermann-Lindencrone; Pernille Jorgensen; Giorgi Kurtsikashvili; Anna Pashalishvili; Dmitriy Pereyaslov

### **Rapporteur**

Anthony L Waddell, United Kingdom of Great Britain and Northern Ireland

### **Interpreters**

Olga Aleksinskaya, Russian Federation; Galina Filatova, Russian Federation



## **Annex 2: Meeting agenda**

### **DAY ONE – Wednesday 11 June**

#### **1. WELCOME AND INTRODUCTION**

**Chair:** P Rendi-Wagner, Austria

09:00–09:15	Opening of the meeting	P Rendi-Wagner, Austria P Penttinen, ECDC C Brown, WHO/Europe
09:15–09:30	Influenza surveillance in Austria	T Popow-Kraupp, Austria
09:30–09:50	Season Report 2013–14	D Gross, WHO/Europe
09:50–10:10	WHOCC report: Antigenic analysis and vaccine strain selection	J McCauley, WHOCC NIMR
10:10–10:30	New ECDC and WHO/Europe joint bulletin (mock-up) and surveillance	J Beauté, ECDC
10:30–10:45	Discussion	

#### **2. PLENARY SESSION: INFLUENZA SURVEILLANCE**

**Chairs:** A Sominina, Russian Federation; Z. Molnár, Hungary

11:15–11:45	Influenza Virologic Surveillance Right Size Roadmap	L Brammer, US CDC
11:45–12:15	Review of Member States surveillance systems	P Jorgensen, WHO/Europe
	Evaluation of severe disease surveillance	J Beauté, ECDC
12:15–12:30	Discussion	

#### **3. WORKING GROUPS: INFLUENZA SURVEILLANCE**

13:30–13:45	Introduction to working groups	C Adlhoch, ECDC
13:45–15:30	1. Severe disease surveillance	A Larrauri, Spain; P. Jorgensen, WHO/Europe
	2. Sentinel and non-sentinel surveillance	C Adlhoch, ECDC

- |   |  |
|---|--|
| 3. Virus characterization data and molecular surveillance | E Broberg, ECDC; O Hungnes, Norway; C Martel, WHO/Europe |
|---|--|

#### **4. PLENARY SESSION: INFLUENZA VACCINES**

**Chairs:** S Hauge, Norway; A Freedman, Israel

- |             |  |  |
|-------------|--|--|
| 16:00–16:15 | Results on vaccine effectiveness                                     | A Moren, I-MOVE  |
| 16:15–16:30 | Update on regional policies and uptake of seasonal influenza vaccine | J Mereckienne, VENICE  |
| 16:30–17:15 | New developments in country vaccination programmes                   | H Nohynek, Finland; R Pebody, United Kingdom; I Karaban, Belarus |
| 17:15–17:30 | Discussion   |  |

### **DAY TWO – Thursday 12 June**

#### **5. PLENARY SESSION: INFLUENZA OUTBREAKS**

**Chairs:** J McCauley, WHOCC NIMR; S Bino, Albania

- |             |   |                           |
|-------------|---|---------------------------|
| 09:00–09:10 | Update on joint procurement of influenza vaccines (Audio/Video-linked presentation)                         | JL Sion, DG-SANCO         |
| 09:10–09:40 | A(H7N9) on the spot   | T Wenxiao, China CDC      |
| 09:40–09:50 | A(H7N7) in Italy, outbreak management and results of a sero-survey follow-up                                | C Rizzo, Italy            |
| 09:50–10:05 | Landscape of laboratories involved in influenza diagnostics: do we detect avian influenza viruses properly? | A Meijer, the Netherlands |
| 10:05–10:15 | Q & A discussion: preparedness, response  |                           |

#### **6. PARALLEL WORKING GROUPS AND POSTER SESSION**

- |             |                                |                     |
|-------------|--------------------------------|---------------------|
| 10:45–11:00 | Introduction to working groups | D Gross, WHO/Europe |
|-------------|--------------------------------|---------------------|

#### **EPIDEMIOLOGY WORKING GROUPS (Virology Poster Session)**

- |             |   |                        |
|-------------|---|------------------------|
| 11:00–13:00 | Global estimates of pandemic and seasonal influenza mortality | K van de Maele, WHO-HQ |
|-------------|---|------------------------|

FluMOMO	L Espenhain, Denmark
The burden of seasonal influenza: estimating incidence of symptomatic infections in the Netherlands	W van der Hoek, the Netherlands

VIROLOGY WORKING GROUPS (Epidemiology Poster Session)

14:00–14:15	Introduction to working groups	D Pereyaslov, WHO/Europe
14:15–15:30	Results of 2013/2014 ERLI-Net/Regional EQA	I Harrison, United Kingdom
	Barriers for implementation of molecular laboratory assays for emerging influenza viruses	D Pereyaslov, WHO/Europe
	New sequencing guidance	R Daniels, WHOCC, NIMR; O Hungnes, Norway

EPIDEMIOLOGY WORKING GROUPS

16:00–17.30	Alternative surveillance systems: national and international participation	H Englund, Sweden
-------------	--	-------------------

VIROLOGY WORKING GROUPS

16:00–17.30	How to improve virus sharing in the Region	C Brown, WHO/Europe; R Daniels, WHOCC NIMR
	Metadata preparations for 2014–15 season	E Broberg, ECDC

**DAY THREE – Friday 13 June**

**7. CONCLUSIONS, OUTCOMES AND MEETING CLOSURE**

**Chairs:** M Akcay Ciblak, Turkey; G Spala, Greece

09:00–10:00	Severe disease, sentinel and non-sentinel surveillance, characterization data and metadata season 2014–15
10:00–10:25	Burden of disease, mortality and alternative surveillance systems
10:25–10:50	Virology
10:50–11:00	Conclusions and meeting closure
11:30–17:00	ECDC ICT – TESSy training for new countries in relation to the joint bulletin

### Annex 3: Poster sessions

Two parallel poster sessions were held to highlight a broad range of national and regional activities and initiatives in the following areas of epidemiological and virological influenza surveillance:

#### Epidemiology

<b><u>Country</u></b>	<b><u>Title</u></b>	<b><u>Authors</u></b>
Norway	Norwegian Syndromic Surveillance System (NorSSS) – automated electronic surveillance of influenza like illness	SH Hauge; JM Gran; C Slorbak; I Cappelen
Azerbaijan	Sentinel surveillance of influenza in Azerbaijan, 2013–2014	N Mursalova
France	The number of flu death and flu-death avoided by the vaccine in France in the elderly	I Bonmarin; D Levy-Bruhl; B Emmanuel
Israel	Community Influenza-like-illness (ILI), emergency department visits and hospitalizations – a comparative analysis of seasonal influenza in Israel 2005–2013	A Glatman-Freedman; Z Kaufman; T Shohat
Poland	Alternative surveillance system in Poland	K Bednarska; M Nowak; K Tomczuk; E Hallmann-Szelińska; LB Brydak
Slovakia	Epidemiological and laboratory Surveillance in Slovakia	A Zampachova; E Ticha; J Mikas
Ukraine	Influenza and ARI during the current influenza season in Ukraine	T Dykhanovska
Republic of Moldova	Influenza, ARI and SARI Epidemiological surveillance system in The Republic of Moldova in 2013–2014 season, control and response measures	C Spinu; V Eder; R Cojocar; P Scoferts; I Spinu; A Donos; I Gostev
	Quantification of the intensity and trend indicator in EuroFlu – continuation of the pilot study in 2013–2014	T Meerhoff; P Jorgensen; T Vega Alonso; JE Lozano Alonso; C Brown; EuroFlu members

## **Virology**

<b><u>Country</u></b>	<b><u>Title</u></b>	<b><u>Authors</u></b>
Denmark	Decrease in successful influenza virus isolation associated with increased use of the eSwab sampling kit in Denmark	R Trebbien; B Andersen; TK Fischer
Finland	Surveillance of severe acute respiratory infections (SARI) in Finnish intensive care units, season 2013–2014	N Ikonen; S Murtopur; A Haveri; I Julkunen; C Savolainen-Kopra; O Lyytikäinen
Portugal	Genetic diversity of influenza A(H1)pdm09 viruses, detected in Portugal since the 2009 pandemic	P Pechirra; P Conde; P Cristovão; AC Maia; B Nunes; R Guiomar
Ukraine	The optimization the virus isolation methods in cell culture and use of the sequencing data for influenza forecasting in Ukraine	A Mironenko; O Onyshchenko; O Holubka; L Radchenko
Russia	Development of multicomponent influenza surveillance system in Russia to increase response capacity to annual epidemics and further pandemic events	AA Sominina; MP Grudinin; M Yu Eropkin; LS Karpova; EI Burtseva; MM Pisareva; AB Komissarov; NI Konovalova; DV Danilenko; EA Smorodintseva; KA Stolyarov; DK Lvov; OI Kiselev