



**World Health  
Organization**

REGIONAL OFFICE FOR **Europe**

**Strengthening National  
Surveillance Systems  
towards Measles and Rubella  
Elimination in the WHO  
European Region**

**Meeting Report**

**Bonn, Germany  
8-9 December 2011**

## Executive summary

Since the introduction of vaccines against measles and rubella in national immunizations programmes the incidence of these diseases in the European Region of the World Health Organization (WHO European Region) has declined sharply and substantial progress has been made towards the goal of eliminating measles and rubella. However, there are still a number of challenges in surveillance and immunization that can threaten the achievement of the 2015 elimination goal.

In 2010 and 2011 more countries are reporting a higher measles incidence compared to previous years, sometimes with nationwide outbreaks. Surveillance confirms that this is attributed to the presence of pools of unimmunized individuals, mostly among adolescents and adults. A similar challenge exists with rubella and the risk of congenital rubella syndrome (CRS) is present in countries where women of childbearing age are unimmunized. These unvaccinated and under-vaccinated cohorts, together with population groups that are questioning rationale for immunization, need tailored approaches to improve vaccination coverage.

Case-based surveillance of measles, rubella and CRS, including laboratory testing of all suspected cases in elimination stage, is critical for timely detection of cases and implementation of control measures. It is also critical for defining of susceptible persons and population, and developing adequate immunization policies and strategies. Moreover, high quality surveillance is essential for documenting the interruption of endemic measles and rubella.

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## List of Abbreviations

CISID	Centralized Information System for Infectious Disease
ECDC	European Centre for Disease Prevention and Control
EPIS	Epidemic Intelligence Information System
EMMO	European Measles Monitoring report
EU	European Union
EUVAC.NET	European surveillance network for vaccine-preventable diseases
EUVAC-Net	European surveillance network for vaccine-preventable diseases (under ECDC)
JRF	WHO/UNICEF Joint Reporting Form
MeaNs	Measles Nucleotide Surveillance
MCV	Measles-containing vaccine
MR LabNet	Measles-Rubella Laboratory Network
MS	Member State
MMR	Measles, mumps and rubella
NIS	New independent states of the former Soviet Union
RVC	Regional verification commission
SAGE	Strategic Advisory Group of Experts on Immunization
TESSy	The European surveillance system
WHO	World Health Organization

## Meeting introduction and opening

World Health Organization Regional Office for Europe, with support from the Robert Koch Institute and the German Federal Ministry of Health, held the meeting *Strengthening National Surveillance Systems towards Measles and Rubella Elimination in the World Health Organization European Region* (WHO European Region), at the United Nations building in Bonn, Germany, on 8-9 December 2011.

The meeting was intended for National Managers for Vaccine-Preventable Diseases Surveillance and national experts responsible for measles, rubella and congenital rubella syndrome (CRS) surveillance from all Member States (MS) of the WHO European Region.

The objectives of the meeting were to:

- Review status of measles, rubella and CRS surveillance in the Region,
- Present the WHO European Region's guidelines for measles, rubella and CRS surveillance, with special emphasis on the importance of integrated epidemiological and laboratory activities in surveillance,
- Describe the regional elimination process and documentation required by MS for regional verification,
- Share experiences and best practices in disease surveillance and outbreaks response among countries in the region.

The outcomes and deliverables of the meeting were to:

- Achieve a common understanding and commitment for the implementation of priority strategies to strengthen surveillance capacities by strengthening epidemiological and laboratory cooperation in MS and WHO European Region on the process of measles and rubella elimination,
- Increase technical capacities of national counterparts, through exchange of knowledge and new information, to strengthen and/or develop surveillance systems in the line with the regional recommendations,
- Identify best practices among the countries in the Region.

Dr. Rebecca Martin, a.i. Programme Manager of the Vaccine Preventable Diseases and Immunization programme, Division of Communicable Diseases at the WHO European Region, welcomed the national representatives and guests. The Regional Office was pleased to organize this meeting at the WHO premises in Germany. Dr Martin especially acknowledged the German Federal Ministry of Health, for their commitment to the measles and rubella elimination goal and political support for the organization of the meeting. She also acknowledged the Robert Koch Institut for their efforts to control measles outbreaks and their dedication to strengthen elimination activities in Germany and in the Region. With her opening statements, she reiterated the commitment of the Regional Office to eliminate measles and rubella in the region, noting that the knowledge and means to prevent and control outbreaks is available. She stressed that the elimination plan has, as its foundation, a successful vaccination programme but that it also required high quality surveillance. She emphasized the important role that each country and their health systems at all levels have from elimination of diseases in the WHO European Region.

Professor Reinhard Burger, President of the Robert Koch Institut, acknowledged the challenges that Germany still faces with regards to measles as the country ranks amongst European countries with the highest incidences. In addition, Germany lacked a case-based surveillance system for rubella. He announced that rubella is expected to become a notifiable disease in Germany in 2012. Professor Burger voiced the Robert Koch Institute's observations of an increasing proportion of older

individuals being affected by measles and with measles outbreaks emerging in schools, and among anthroposophic and Roma communities. While endemic circulation of measles in Germany has been interrupted the pool of unvaccinated individuals still remains large. Germany is a major exporter of measles, but it is also prone to import the disease. Professor Burger acknowledged the challenge in eliminating measles and rubella and added that it can only be achieved by close collaboration of all stakeholders.

Dr. Franz-Josef Bindet, Deputy Director General of German Federal Ministry of Health, also acknowledged the goal of elimination of measles and rubella by 2015 as a challenge. To address these challenges more efforts are being made in Germany such as the passing of a bill making rubella a notifiable disease and the introduction of free measles vaccination for adults. He also stressed the need of intensifying discussions with anthroposophic communities that are resistant to be vaccinated and for vaccination campaigns to cover immunity gaps.

# **SESSION 1: Measles, Rubella and Congenital Rubella Syndrome – an overview and surveillance**

## **Global overview**

Substantial progress has been achieved in terms of declining measles incidence and measles-related deaths worldwide. Measles elimination has already been achieved in the United States of America in 2000 and in the WHO Region of the Americas in 2002. In the same year the WHO European Region developed and implemented a strategic plan to eliminate measles by 2010.

In November 2010, Strategic Advisory Group of Experts on Immunization (SAGE) declared that measles can and should be eradicated globally. The vision of the measles and rubella global strategic plan 2011-2020 is to achieve a world without measles, rubella and CRS. The global goals are >95% reduction of measles mortality by end of 2015 (comparing to 2000 mortality) and achieving measles elimination in at least five of six WHO regions by end of 2020.

## **Regional overview**

Overall, significant progress has been achieved in the European Region towards better control of measles but the rate of progress is levelling off, as high incidence rates and several outbreaks were reported in several European countries since 2009. Figure 1a shows the incidence of measles per million inhabitants in the WHO European Region in 2010 with the increase in incidence in most countries in 2011 as shown in figure 1b.

Measles virus transmission has resulted in several outbreaks among the general population and particular groups across Europe. Majority of importations were reported to be from another European country, while others were reported as importations from other WHO regions. Measles was also exported to countries outside the WHO European Region, such as Canada, United States of America, Japan and Australia.

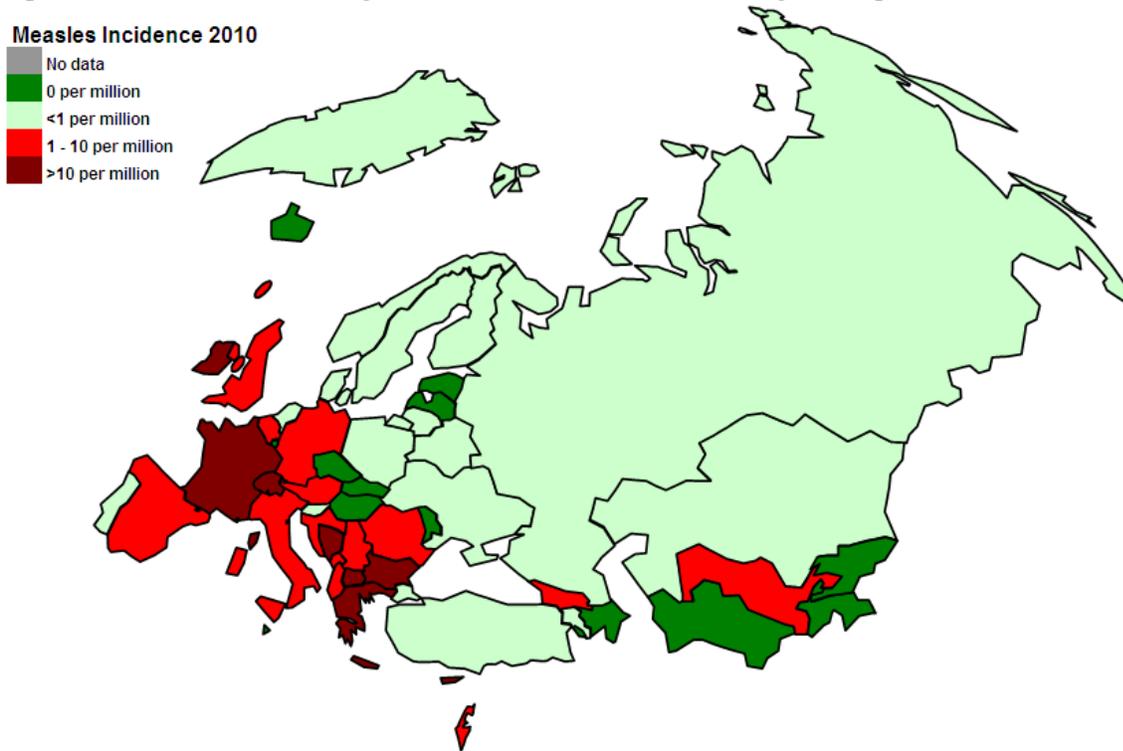
In the period 2008-2011, rubella outbreaks were reported in several countries including Austria, Bosnia and Herzegovina, Kyrgyzstan, Poland, the Russian Federation and Ukraine. Figure 2 shows the incidence of rubella per million inhabitants in 2010 with >10 reported cases per million inhabitants in four countries, Bosnia and Herzegovina, Georgia, Poland and Romania. It also shows that rubella surveillance data are missing for a number of countries.

Reported national immunization coverage is overall high across the WHO European Region. However, there still remains pockets of low coverage (<95%) among both the general population and marginalized groups. There are also susceptible adolescents and adults, and many remain unvaccinated or delay being vaccinated (especially with the second dose). At the same time there is an increasing momentum of vaccine refusals.

## **Elimination definition and strategies**

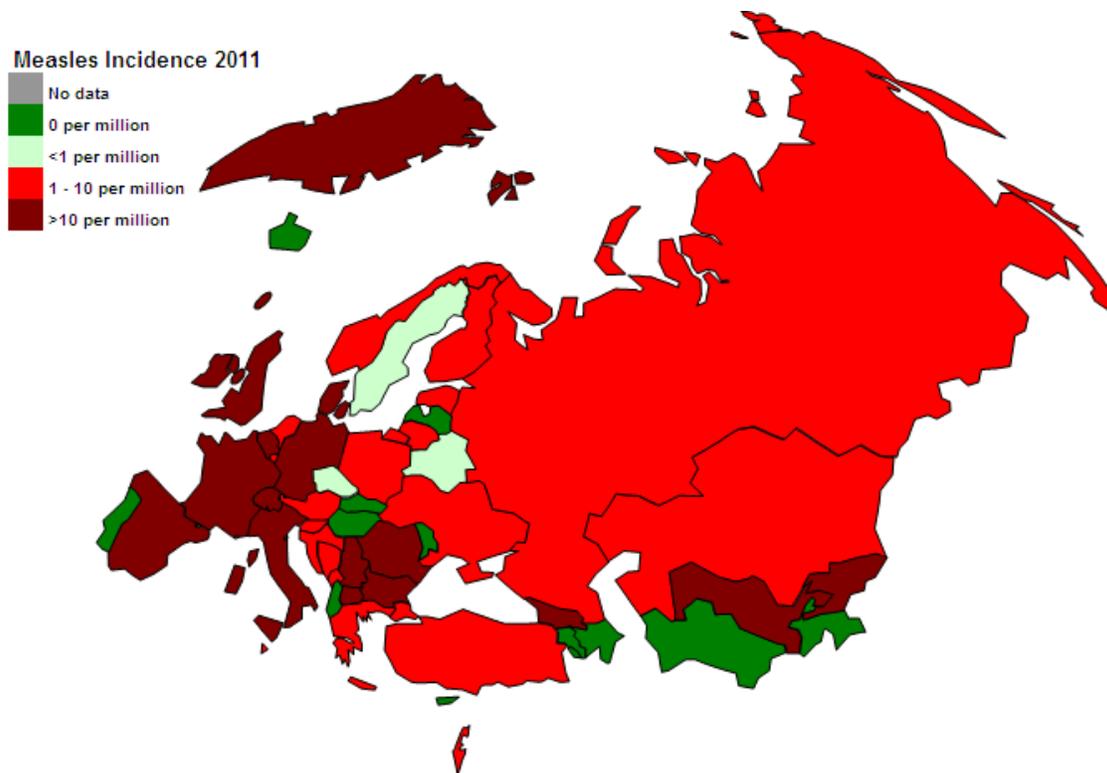
The elimination of measles and rubella is defined as the absence of endemic measles transmission in a defined geographic area (e.g. region) for  $\geq 12$  months in the presence of a well-performing surveillance system. Small outbreaks may still occur following importation, but sustained circulation of the virus following importation ends naturally without intervention, usually after a limited number of generations of disease transmission. The WHO European Region identified four key strategies with the objective of eliminating measles and rubella as outlined in table 1.

**Figure 1a.** Measles incidence (per million inhabitants) WHO European Region, 2010



Data source: WHO/UNICEF JRF 2010

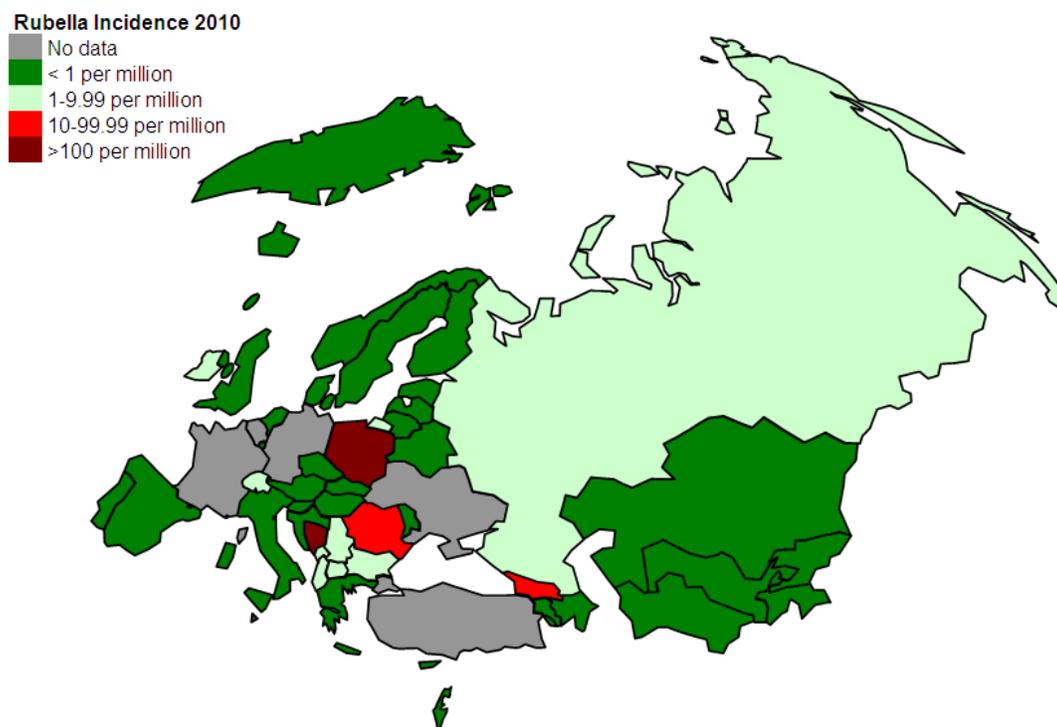
**Figure 1b.** Measles incidence (per million inhabitants) WHO European Region, 2011\*



\*Data as of 1<sup>st</sup> December 2011;

Data source: monthly measles and rubella reporting to the WHO Regional Office for Europe

**Figure 2.** Rubella incidence (per million inhabitants) WHO European Region, 2010



Data source: WHO/UNICEF JRF 2010

**Table 1.** Key strategies for measles and rubella elimination

Strategies	Comments
1. Achieving and maintaining $\geq 95\%$ vaccination coverage with two doses of measles vaccine and one dose of rubella vaccine through routine immunization services.	Data obtained from the WHO/UNICEF Joint Report Form (JRF) for 2010 indicated that a number of countries reported coverage for the first dose of a measles-containing vaccine below 95%. Austria, Ukraine and Azerbaijan reported $< 80\%$ coverage. For the second dose, even more countries reported coverage $< 95\%$ while some countries did not submit coverage data. Pockets of low coverage and missing data were also recorded at sub-national levels. Tailored approaches need to be created to ensure that under-vaccinated groups and individuals are vaccinated through routine immunization. These include amongst others, marginalized groups, certain religious and philosophical groups, health care workers, mobile individuals, unregistered individuals and urban affluent.
2. Providing additional opportunities for measles and rubella immunization in susceptible populations.	Through measles and rubella supplementary immunization activities, 57 million persons were vaccinated in the period 2000-2010 across the WHO European Region, mostly in the newly independent states (NIS) countries. Same as for the routine immunization, a proactive tailored approach is required for supplemental immunization activities among susceptible populations. For example, alternative (non-traditional) vaccine delivery points should be identified, like increased use of private health care sector in immunization or providing immunization services at the workplace.
3. Strengthening measles, rubella and CRS surveillance that include rigorous case investigation and laboratory confirmation of suspected measles cases.	High-quality data are needed to allow monitoring, response and feedback. Timeliness and completeness of reporting surveillance data to national and regional levels needs to be improved to the required $\geq 80\%$ .
4. Improving information on the benefits and risks of immunization.	Relevant evidence-based information on benefits and risks of immunization should be available to both public and health care professionals through vaccine safety websites, social media and as part of the activities of the annual European Immunization Week.

## Renewed commitment

Prior to 2010, it had been estimated that over 50% of MS with about 70% of the population in the WHO European Region would not have achieved measles elimination by end 2010. At the same time outbreaks were emerging in countries that had been measles free for a number of years. Therefore, at the 60<sup>th</sup> Regional Committee of the WHO Regional Office for Europe in September 2010, all 53 MS adopted a resolution to renew commitment and set 2015 as a new target date for eliminating measles and rubella, while sustaining efforts to maintain the polio-free status of the region. Table 2 summarises the measures to be taken by MS and the Regional Office in adopting this resolution.

**Table 2.** Measures to be taken by the WHO Regional Office for Europe and Member States in adopting the resolution renewing commitment to the elimination of measles and rubella by 2015

### WHO Regional Office for Europe

To provide leadership and strategic directions

To provide technical guidance to MS

To work with MS on addressing vulnerable groups and improve immunization coverage

### Member States

To commit and give the measles and rubella elimination goals high priority

To ensure required resources

To strengthen routine immunization

- focus on pockets with low coverage
- European Immunization Week

To strengthen relevant health systems components

To strengthen surveillance systems in line with the International Health Regulations for measles, rubella and poliomyelitis.

## Surveillance Guidelines

Strengthening surveillance is an important strategy of the measles and rubella elimination plan. This requires rigorous investigation and laboratory confirmation of suspected cases and outbreaks. Disease surveillance systems should be synchronized with the surveillance of other related parameters, such as immunization coverage and adverse effects. A surveillance system is considered of good quality if it can collect, collate and analyse complete case-based data in a timely manner, and create operational information for implementing adequate and timely response measures. An intrinsic part of an effective surveillance system includes adequate feedback through bulletins, reports and other means of communications.

In the process of investigating cases close cooperation between clinicians, epidemiologist and laboratories is required from local to sub-national to national levels. Closer cooperation is also needed between epidemiologists and the health authorities to avoid mismatch between data from the JRF and monthly reporting forms, as these are not always complete and at times give quite different estimates of disease burden.

The collection of surveillance data in case-based format allows for a comprehensive investigation and analyses. For each case a unique number (so-called EPID number) is assigned. This should include the country code + district code + date + case number. Case-based data should include demographic details, clinical data, travel history, vaccination status, pregnancy status, source of infection and other relevant information.

It is important to note that a case definition for surveillance may not serve the purpose for clinically diagnosing cases and their medical management. It is also necessary to note that for the purposes of

measles and rubella elimination the Regional Office does not recommend syndromic surveillance of cases with rash and fever.

For monitoring and evaluation purposes WHO has established performance indicators for reporting from every level of the surveillance system (table 3). These surveillance indicators are important also to demonstrate elimination of measles and rubella. Only high-quality surveillance systems can allow documenting and verifying elimination. The current document on surveillance guidelines for measles, rubella and CRS in the WHO European Region is presently being revised before making it available on the website of the Regional Office.

**Table 3.** Surveillance performance indicators and targets for countries with an elimination goal (update 2012)

Indicator	Description	Target WHO Europe
<b>Timeliness of reporting to national units and to Regional Office</b>	The number of measles and rubella reports received at the national level/at the Regional Office from countries by the 25th day of the following month	≥80% of countries submit reports promptly for all months
<b>Completeness of reporting to national units and to Regional Office</b>	The number of measles and rubella reports received at the national level/at the Regional Office WHO,	≥80% of countries submit reports
<b>Laboratory confirmation rate</b>	The number of cases with adequate specimens collected and tested in a proficient laboratory	Specimens collected and tested from ≥80% of suspected measles/rubella cases
<b>Rate of discarded cases</b>	The rate of suspected measles or rubella cases that have been investigated and discarded as non-measles or non-rubella cases using laboratory testing in a proficient laboratory and/or epidemiological linkage to another confirmed disease	≥2 discarded measles/rubella cases reported annually per 100,000 population nationwide and in ≥80% of sub-national administrative units (e.g. at the province level or its administrative equivalent)
<b>Chains of transmission/ outbreaks with virus genotype data</b>	The number of measles or rubella chains of transmission/outbreaks with genotype information	Samples adequate for virus detection collected and tested from ≥80% of laboratory-confirmed outbreaks
<b>Origin of infection identified</b>	The number of measles or rubella cases for which an origin of infection is identified (e.g. imported, import-related, or endemic),	>80% cases with origin of infection identified
<b>Timeliness of investigation</b>	The number of suspected measles or rubella cases with an adequate investigation initiated within ≤48 hours of notification	≥80% of all reported suspected measles/rubella cases have had an adequate investigation initiated within 48 hours of notification

### **The role of laboratories in measles and rubella surveillance towards elimination**

As the incidence of measles and rubella declines and their elimination approaches, laboratory investigation of reported suspected cases becomes increasingly important. Fast and reliable laboratory testing is critical for timely public health interventions, such as ring vaccinations. Beside surveillance, comprehensive diagnostic laboratory testing is important for cases which can have severe medical implications, e.g. rubella in pregnancy.

When disease incidence has decreased and elimination approached, ≥80% of reported suspected cases should be laboratory confirmed. However, there are a number of challenges in attaining this required level as laboratory results on suspected cases and results particularly from private laboratories may

not always be reported. There are also difficulties in obtaining clinical specimens for testing and in linking laboratory data with epidemiological data. Some of these challenges can be overcome by using alternative clinical specimens such as dried blood spots and oral fluid and by strengthening links between the laboratory and epidemiological data.

With the use of molecular typing and characterization techniques, laboratory diagnosis also allows monitoring of progress towards elimination. Such molecular tests have proven to be an important tool for understanding measles and rubella transmission pathways. Its usefulness has been recently shown by following the circulation measles virus genotype D4 across Western Europe. Molecular surveillance plays a particularly important role during the end-stage of elimination by allowing an understanding of the geographic distribution of virus genotypes, identify chains of transmission, monitor the effectiveness of control activities, identify reservoirs sustaining virus transmission and provide evidence that elimination has been achieved (determination of endemic versus imported viruses).

A well-established measles-rubella laboratory network (MR LabNet) has been developed, coordinated and funded by the WHO to meet the objective of the elimination goal by providing complete and reliable laboratory data. To reach this objective MR LabNet is committed to ensure the use of standard operational procedures throughout the MR LabNet network and to provide standard reference materials and reagents. It also undertakes quality assurance and annual accreditation reviews including proficiency and confirmatory testing. Regular meetings are held to strengthen communication within the network. In line with MR LabNet's activities the Health Protection Agency (HPA) of the UK in collaboration with WHO has developed a WHO global genotype database for measles called Measles Nucleotide Surveillance (MeaNS). Until the date of the meeting almost 12,000 viruses with genotypes have been submitted. MeaNS allows the identification of the transmission patterns of the viruses and comparison of viral sequences in a timely manner. For sequencing techniques, it has been recognised that genotyping based on NP 450 may not be sufficient and the sequence may need to be expanded.

Great improvements have been achieved in the field of laboratory diagnosis of measles and rubella cases in the Region. To sustain this development laboratory-surveillance activities particularly molecular surveillance need adequate resources. To meet the elimination goal specimen collection for laboratory testing and especially for genotyping needs to be improved. There is also the need to link case-based surveillance data with laboratory data but also to improve the communication between national reference laboratories and regional reference laboratories.

## **SESSION 2: Surveillance for measles and outbreaks in the WHO European Region**

### **Presentations from selected countries**

#### *Russian Federation*

Progress has been reported in the Russian Federation with a decline in the number of measles cases. By 2010, the Russian Federation operates an effective surveillance system including observation of all suspected measles cases. On 1<sup>st</sup> January 2011, an evaluation commission in the Russian Federation confirmed the country endemic measles-free except in five territories/regions (Amur region, Krasnoyarsk region, Republic of Buryatia, Moscow city, Chukotka region). Before 2007, the predominant strain in the Russian Federation was D6. This was considered an endemic strain in the Russian Federation. The currently circulating strain is identified as an imported D4 strain.

A number of shortcomings have been recognized in the preventive and outbreak control measures. They include: the late clinical diagnosis and consequent late patient isolation; delayed initiation of outbreak control measures; delayed immunization of contact persons; non-compliance with “cold-chain requirements and ineffective advocacy work with the public.

#### *Slovenia*

In Slovenia the occurrence of measles was substantially reduced after the introduction of measles vaccination. According to the Infectious Diseases Act, a case of measles (even a suspected case) has to be reported within three to six hours to the regional Institute of Public Health, responsible for public health interventions and from there immediately to the National Institute of Public Health (NIPH) where data are collected and analysed. In 2005, the European Union case definition for measles was widely publicised and general practitioners and paediatricians were actively encouraged to confirm every possible case of measles (rash fever) with appropriate laboratory diagnosis. The highest reported incidence rate of 407 per 100,000 inhabitants in 1967 was followed by a declining trend, the size of epidemics decreased and inter-epidemic periods lengthened. The last case (indigenous) was reported in 1999. After ten years of being measles free, Slovenia experienced a cluster with secondary transmission. The index case, a resident of Ireland, was hospitalised on the day after his arrival to Slovenia and diagnosed with measles two days later. After his discharge, two cases of measles were notified, a hospital staff member and a visitor to the clinic, suggesting transmission in a hospital setting. In 2011, up to the date of this meeting, 22 measles cases were reported including six imported cases with the majority of cases (81%, n=18) in the 30-49 year age group. Three different genotypes were identified: D4, D8 and B3. In conclusion, measles in Slovenia in 2011 has been characterized by few cases, a diversity of genotypes and high proportion of imported cases.

#### *Switzerland*

In Switzerland the health care system is highly decentralised. Outbreak control measures fall under the cantonal authorities while the surveillance activities are a responsibility of both cantons and the federation (national). In 1986 a sentinel surveillance system was established for measles. However, in 2007, it was abandoned because the sensitivity of the system became insufficient with decreasing measles incidence.

Since 1999, physicians are obliged to notify the cantonal officers of health within seven days of any patient with a fever and a rash accompanied by at least one of the following three symptoms: cough, rhinitis or conjunctivitis. Laboratories must notify the cantonal officers of health and the Federal Office of Public Health (FOPH) within seven days of any confirmed measles case, whatever the test used. In 2006 the official reporting time was shortened to one day. These initial rapid alerts allow the cantonal physician to launch investigation and control measures. The physician later completes notification including more details. The cantonal officers of health send a copy of all notifications made by physicians to the FOPH.

The surveillance system for measles is judged to work fairly well, however, there are still a number of challenges that need to be addressed. Sensitivity and timeliness of reporting can be improved by encouraging physicians to quickly report cases fulfilling the clinical criteria even for those with pending or laboratory negative results. Cantonal health officers have to systematically obtain data on laboratory confirmation in suspected cases, to actively seek new cases and to implement systematic outbreak control measures. All notifications and additional information should be forwarded to FOPH. The specificity of the surveillance system also needs to be improved. Physicians are encouraged to test every suspected case. Physicians are also requested to improve completeness of reporting by including details on source of infection (imported, import-related, indigenous) and on clinical symptoms necessary for case classification.

To reinforce collaboration between FOPH and cantons it would be desirable to have online secured access of the FOPH central database to cantonal health officers. Although several scientific articles on surveillance activities and results at cantonal and federal level have been published, the provision of feedback from the federal level is limited. Feedback with adequate information on surveillance activities is important not only to demonstrate the epidemiological situation but it also encourages notification and vaccination activity.

### *Germany*

The healthcare system in Germany is also decentralized among its 16 Federal States and 413 districts, each with their own District Health Office. Clinically suspected measles cases as well as laboratory confirmed cases of measles are reported to the District Health Offices. The District Health Offices evaluate the information according to the case definition for measles, contacts the patients for further information, and enters case-based data into the electronic reporting system. Data are then forwarded to the State health department which in turn submit the data to the Robert-Koch Institut (RKI). The institute is responsible for producing the Weekly Epidemiological Bulletin. Laboratory testing of suspected measles is mostly offered and carried out in a decentralised fashion by private laboratories. However, the National Reference Laboratory for Measles, Mumps and Rubella at RKI plays a major role particularly in genotyping of measles viruses.

The current two-dose measles vaccination schedule is recommended by the national commission for immunization – STIKO, and has been in place since 2001. The first dose is recommended at age 11 to 14 months and the second dose at age 15 to 23 months. Vaccination is voluntary and is mainly done by private physicians. Vaccination is free of charge for all STIKO-recommended vaccines with payment effected through health insurances. Although, the national vaccination coverage is increasing there are still pockets of susceptible individuals particularly among adolescents, some immigrant groups, and in anthroposophic communities.

Since 2006, Germany has experienced numerous outbreaks particularly in the south-western Federal States. For the first 10 months of 2011, 1,576 cases of measles were reported across the country with an overall national incidence of 1.9 per 100,000 inhabitants. The larger outbreaks occurred in the Federal States of Baden-Württemberg and Bavaria. The mean incidence per 100,000 inhabitants among western Federal States was 2.2 while among Eastern Federal States it was reported at 0.4. The age-pattern of measles cases is shifting to the older ages.

During an outbreak in an asylum seeker shelter, it has been shown that mass vaccination is cheaper and more effective way to control outbreaks when compared to strategies with serological testing followed by selective vaccination of sero-negative individuals. Mathematical modelling of a large school outbreak showed that in institutional settings with high vaccination coverage prolonged outbreaks can occur and mass vaccination might be still effective when being delayed for some days or even few weeks.

Increased efforts in Germany to reach the elimination goal include a recommendation for measles vaccination since July 2010 with one vaccine dose for adult persons born after 1970 who were

unvaccinated, had received only one vaccine dose to whose vaccination status was unknown, which can be regarded as an individual-based catch-up. At the same time increased efforts are being made to improve vaccine uptake by media campaigns and communication activities to target populations. However, since routine vaccination coverage in young children exceeded 95% in recent years and highlighted by the age-distribution of measles cases, the key to success will be the closure of immunization gaps in older children, adolescents and young adults in Germany. Therefore, school-based vaccination campaigns especially in the south-western Federal States are necessary in Germany, accompanied by more concerted communication activities on a national level advocating for individual-based catch-up vaccination in adolescents and young adults.

### **Panel discussion on measles outbreaks in the WHO European Region**

Investigations of measles outbreaks in the WHO European Region revealed that the majority of cases were unimmunized or under-immunized. There are numerous reasons for not being immunized and many different circumstances for the accumulation of susceptible individuals in the population.

During the panel session, representatives from Kyrgyzstan, France, Romania, Spain and Uzbekistan shared their findings and experiences in controlling measles outbreaks. Participants from other MS learnt about how to identify potential risks of outbreaks and about successful practices. Following their presentations, the participants discussed issues in common and challenges in preventing and controlling measles outbreaks, and other relevant interventions.

Adequately functioning national surveillance systems and immunization programmes should be able to map segments of the population that were not vaccinated against measles through routine services. Individuals who did not benefit from the introduction of routine or supplementary immunization, and who have no history of contracting measles, remain susceptible. These consist mostly of young adults. In a few outbreaks the index case was an unimmunized adult traveller, introducing the measles virus in the home country upon returning from a country endemic for measles or with an ongoing outbreak.

Routine immunization is very often delayed and immunization coverage, especially with the second dose of measles-containing vaccines, is declining in many MS. In addition, data on the size of the birth cohorts targeted for routine immunization is not always accurate. Therefore, certain groups of susceptible individuals may not be accounted for by national registers - with a consequence that immunization coverage is overestimated. Other groups of the population remain susceptible because they were not immunized due to interruptions of healthcare delivery resulting from civil unrest (riots, political instability, and armed conflicts). Regular monitoring of routine coverage at sub-national levels assists in identification of unimmunized. This, followed by supplemental immunization activities (SIA), should be capable of closing immunity gaps in the population.

Schools are commonplace for measles outbreaks due to the accumulation of susceptible individuals from different birth cohorts and close interaction among peers. MS should consider implementing SIAs among school-age children and adolescents. School entry immunization requirements are an option. However, some MS have questioned this measure, as it is considered to conflict with the basic right to education.

Outbreaks of measles also emerged in health care institutions, among both patients and health care workers. Some MS have different voluntary or mandatory requirements for health care workers to be immunized against a range of vaccine-preventable diseases. In addition, the immunization status of health care workers has to be regularly assessed and monitored. Preventing and controlling hospital-acquired infection is essential to protect vulnerable patients and health care workers.

Countries in transition are reforming health care systems, with changes in health insurance coverage, delivery of primary health care, immunization services and surveillance activities. In some MS, segments of the population are not recognized by the health system, or have diminished access to immunization services. All MS should therefore ensure that any reforms do not adversely affect availability of vaccines and accessibility to immunization services.

Outbreaks are reported among members of different specific subgroups. Many religious and philosophic groups refuse vaccination as part of their belief system or particular lifestyle. Outbreaks among ethnic minorities and migrants. Main factors for were mostly related to poor knowledge and low awareness, and compromised accessibility to immunization services. Countries noted that the

number of parents who are sceptical and/or unmotivated to vaccinate their children, is increasing. Some segments of the population opt for homeopathic and alternative medicine, avoiding vaccination. Specific and tailored approaches have to be established to address the variety of anti-vaccine and vaccine-sceptic groups, to understand the reasons for not immunizing and to develop the most appropriate and convenient methods to deliver immunization. In some cases, non-governmental organizations, leaders and mediators from minority groups have proven useful in re-establishing contact with the health care system. In any case, partnerships with other governmental and private agencies, institutions and organizations, as well as with civil society, are beneficial and therefore should be forged.

Immunization as an outbreak control measure was well accepted in most outbreaks. Outbreak communications can increase the risk perception of unimmunized and were used as an opportunity to build demand for vaccines. Although some MS stressed that organizing mass campaigns was challenging within their legal and social structures, mass immunization campaigns remain the most effective kind of SIA in countries where they are systematically organized.

### **Development of the WHO Regional Office for Europe outbreak guidelines**

The prompt investigation of outbreaks is essential to control and thereby limit transmission of diseases. There are different definitions of the term ‘outbreak’ used in the WHO European Region. However, generally, the term ‘outbreak’ is used when the number of cases observed is greater than the number normally expected in a given geographic area and a given period of time. Outbreak investigations allow for the identification of the source of infection, timely medical care of cases and follow up of contacts to limit further cases. In the course of an outbreak investigation the surveillance system and policy may need modification to ensure continuous data collection on variables such as age and immunization status of cases, thereby enabling identification of at-risk population sub-groups. To complete the investigation process the best response measures and lessons learnt should also be documented.

#### *Measles*

In countries committed to reach the goal of measles elimination, every single case should be investigated. Notification of two or more cases related in time and place should be considered as an outbreak for investigation. In 2010 and 2011, several outbreaks of measles were reported across the European region mostly in the western part. They ranged considerably in size from involving just a few cases to a nationwide level. They were generally characterized by the commencement of disease among adolescents and young adults later spreading to children and infants. Some outbreaks involved specific population sub-groups spreading to the general community. Nosocomial transmission was also common, with cases notified among healthcare workers. Most cases involved in outbreaks were unvaccinated, under-vaccinated, or their immunization status was unknown. The predominant cause of outbreaks was a genotype D4 measles virus with reported exportation to other regions of the world including the Americas, Australia and Japan. The MR Labnet was often the first source to verify the occurrence of an outbreak to the Regional Office. Although the notification of measles outbreaks through the official the WHO Regional Office for Europe outbreak reporting form has improved, outbreaks are still under-reported and become evident at international or even national level only when they are reported in scientific publications and detected in the media.

#### *Rubella*

Between 2007 and 2011, outbreaks of rubella have also been reported in a few countries. Most cases involved unvaccinated young adults and adolescents. In some counties incidence of rubella differed significantly by sex reflecting the previous immunization policies and vaccination schedules that initially targeted adolescent females only when the rubella vaccination programmes were initiated. Issues related to the low quality of routine surveillance equally influenced the investigation of rubella outbreaks leading to a sub-optimum response to control the outbreaks. In addition, there was also insufficient information on local rubella virus genotypes in the Region.

*Role of the WHO Regional Office for Europe*

The role of the Regional Office in the control of outbreaks is to assist the affected countries by providing technical support and advice, and to facilitate vaccine supply. It also verifies the information on outbreaks from unofficial sources by requesting official reports and shares official information with public/interested organizations.

The Regional Office is currently developing measles and rubella outbreak guidelines. The document, which is planned to be finalized in 2012, acknowledges that outbreaks of measles and rubella may still occur in elimination phase (due to the accumulation of susceptible individuals) but circulation of the virus following importation should end naturally without intervention, usually after a limited number of generations of disease transmission. Nevertheless, thorough investigation of the initial cases should lead to immediate implementation of control measures to limit disease transmission and contain the outbreak. The large outbreaks that recently occurred in the region clearly demonstrate immunity gaps in the population. The guidelines will address the diversity of issues related to outbreak control and options to solve them.

## **SESSION 3: Surveillance and Verification of the Elimination**

### **Reporting of measles and rubella surveillance data**

Measles and rubella monthly surveillance data from 24 countries are directly submitted to the Regional Office and its Centralized Information System for Infectious Disease (CISID). Twenty-nine countries that are part of ECDC's new network EUVAC-Net report monthly data to The European Surveillance System (TESSy) and these data are transferred to the CISID/the Regional Office with same regularity.

In 2011, measles data was provided by most countries (n=40) in case-based format while 11 countries provided aggregate data. Two countries did not supply any data. For rubella, 28 countries provided case-based data, 10 countries provided aggregate data and 15 countries did not supply any data.

Outbreaks of measles and rubella can be reported online through a CISID outbreak investigation form or offline via an excel sheet. Measles and rubella laboratory data in aggregate format can be report online via a MR laboratory form to CISID.

Feedback on reported data is disseminated in a number of formats including monthly data summary tables, monthly WHO Epidemiological Briefs, quarterly European Immunization Monitor. Data can also be extracted in several formats at any time through the CISID website itself. Another source of measles and rubella data is through the annual collection of data through the WHO/UNICEF JRF. Data collected through JRF are used for publications, time series presentation of disease and vaccination coverage and immunization system monitoring.

### **Reporting requirements**

To fulfil the timeliness requirements measles and rubella surveillance data of every month should be reported by the 25<sup>th</sup> day of the following month. More efforts are needed to improve both timeliness and completeness to reach a minimum of 80% at regional level. By 2012, all 53 MS are to report measles-case based data and by 2013, rubella case-based data. Moreover, it is expected that all 53 MS report MCV1 and MCV2 at sub-national level and CRS cases through the WHO/UNICEF JRF. Discarded cases are to be reported and in 2012 such data should be captured by TESSy for 29 EUVAC-Net's countries.

### **Role of ECDC in relation to measles and rubella**

ECDC supports the measles and rubella elimination goal by 2015. Its activities include the collection of surveillance data through nominated surveillance contact points (epidemiologists and microbiologists experts) from 29 countries participating in the new EUVAC-Net network through TESSy. Surveillance data is then submitted to the WHO Regional Office for Europe on a monthly basis. ECDC also provides timely feedback to MS on data quality with the aim of strengthening national surveillance systems. Since September 2011, ECDC publishes the European Measles Monitoring (EMMO) report - a monthly measles update combining indicator-based and event-based surveillance in one bulletin. Surveillance data is also used to monitor outbreaks and to examine historical trends, as well as conduct geo-spatial analysis in order to detect high risk areas.

A real-time web-based commutation called Epidemic Intelligence Information System (EPIS) has recently been developed to create a common platform for reporting outbreaks and to facilitate technical discussion on epidemiology and microbiology by exchanging information in a secure site.

An advocacy video on measles elimination in Europe has recently been launched and be found on the webpage: <http://ecdc.europa.eu/en/healthtopics/measles/Pages/index.aspx>. The main aim of the video

is to raise awareness about the measles resurgence in European Union (EU) by advocating for increasing the vaccination coverage and reaching the 95% WHO immunisation target.

Another activity carried out in the last two years was the mapping of the laboratory capacities in participating countries to improve diagnosis of measles. The information provided on the laboratory performance can support the WHO long-term project in strengthening laboratory capacities.

ECDC plans to allow the entry of data on discarded cases in TESSy in 2012. EMMO reports will also include more in-depth analyses such as age-distribution, importation and vaccination status of cases. It plans to provide periodical feedback to MS on data quality.

TESSy automated outputs are to be made available on the ECDC website. Measles and rubella annual report 2011 is to be issued in early 2012. Other planned activities include mapping of measles and rubella surveillance systems in the EU, publication of quarterly surveillance report on rubella starting in March 2012 and to develop strategies for establishing CRS surveillance in EU.

### **Verification process for measles and rubella elimination**

The WHO Regional Office for Europe plans to establish a Regional Verification Commission (RVC) early in 2012. The commission will analyse supporting documents on annual programmatic activities, results of elimination strategies and epidemiological evidence of interruption of transmission. The latter includes the evaluation of data allowing close monitoring of virus circulation and outbreaks of each disease over a defined period of time. At the same time MS will be requested to establish a National Verification Commissions.

The framework for implementing the verification process was finalized in 2011. It is based on an ongoing assessment of supporting evidence on population immunity, disease epidemiology, and quality of surveillance and sustainability of the national immunization programme. The process will measure progress using a set of performance indicators and markers and the process would be verified by an external independent panel of experts. The essential criteria for documenting verification are twofold. The first is to demonstrate the interruption of endemic measles and rubella viruses in all MS in the presence of high-quality surveillance and secondly, to demonstrate a minimum of 95% of all cohorts protected against measles and rubella.

From 2012, the review and evaluation of annual national reports will continue in each MS for at least three years after the RVC confirms that, according to established criteria, endemic measles and rubella transmission have been interrupted in all MS the WHO European Region. Only then the regional elimination can be declared.

## **SESSION 4: Rubella and CRS surveillance**

### **Rubella in Member States of the WHO European Region**

Since 2000, several European countries have reported large numbers of rubella cases. The largest outbreaks occurred in Poland, Italy, Romania, Bosnia and Herzegovina and Austria. Outbreaks have also been described among particular sub groups, such as immigrant communities in Spain and a religious community in the Netherlands.

To assess rubella and CRS surveillance in the region, information about existing surveillance systems and data for period 2000–08 were collected from 32 countries, previously part of the European surveillance network for vaccine-preventable diseases (EUVAC.NET)\*. Of these 32 countries, 28 countries had a mandatory notification system for rubella covering total population. Passive routine surveillance existed during the whole period in 24 countries and four countries established surveillance more recently (Luxembourg in 2004, Turkey in 2005, Austria in 2007 and Switzerland in 2008).

During the study period, these 28 countries reported 21,475 rubella cases of which 1.5% (n=317) were laboratory-confirmed. Most cases (n=21,075; 98%) were reported from Poland, Italy and Romania. The median incidence per million inhabitants declined from 7.2 in 2000 to 0.3 in 2008. Ten countries reported zero rubella cases and five others reported an incidence of <1 per million inhabitants.

Of the four remaining countries, two conducted surveillance in selected populations. In Denmark, only cases of rubella during pregnancy and congenital rubella infection were notifiable. France has a voluntary laboratory-based reporting system for rubella among pregnant women and newborns. Germany conducted surveillance for rubella at the regional level in only five of its 16 Federal States. Belgium had no surveillance system for rubella. In 2012, Germany will introduce statutory notification of rubella and France is considering establishing such a system.

For 2000–08, 25 countries provided data on CRS reported through a passive mandatory surveillance system; one country (United Kingdom) had an active surveillance system which monitored congenital rubella infections in newborns and followed up all laboratory-confirmed cases in pregnancy and newborns; remaining six countries had a different type of surveillance or no surveillance systems during the study period. Few countries changed surveillance systems in recent years. Ireland conducted CRS surveillance based on voluntary reporting systems until it became statutory notifiable in 2004, and surveillance of CRS in the Netherlands began in the same year. CRS became statutory notifiable in Italy in 2005. France relied on long-established voluntary laboratory-based reporting of congenital infections in newborns. Belgium established CRS sentinel surveillance in 2007. Austria has not yet established CRS surveillance but plans to do so in the future. During 2000–08, a total of 140 CRS cases were reported. In 2008, 20 CRS cases were reported from five countries.

The overall decline in rubella incidence and increase in the number of countries conducting rubella surveillance through a mandatory notification system suggests progress is being made toward the goal of rubella elimination in Europe. However, in a few countries with high rubella incidence the risk for CRS still exists. For example, data from Italy for 2008, suggest that those aged 15–19 years remained the most susceptible age-group. This is of particular concern, given that 26% (n=669) of cases in this age-group were females in the child-bearing age.

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\* EUVAC.NET involved the participation of 32 countries: 27 EU member states (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom) together with Croatia, Iceland, Norway, Switzerland, and Turkey.

More efforts are still required particularly in high incidence countries, to achieve and maintain the required high vaccination coverage and high-quality surveillance of rubella and CRS.

### **Regional surveillance for congenital rubella syndrome**

Prevention of CRS is the major reason for implementing rubella immunization programs. Pre-natal infection with rubella virus, particularly in the first trimester, can have serious consequences for fetus and newborn. WHO recommends standard approaches to surveillance for rubella virus infections include surveillance for clinical rubella disease (integrated with measles surveillance) and CRS surveillance. Other, supplementary approaches to assessing congenital rubella infections include retrospective assessment of CRS burden, follow-up of exposed pregnant women, surveillance using rubella-in-pregnancy registries, and congenital rubella assessments from other sources or special surveys, including retrospective search for cases. These additional approaches supplement but do not replace surveillance for rubella and CRS, which should be implemented by all MS. Guidance on CRS surveillance is included in the current measles-rubella surveillance guidelines of the Regional Office. Although CRS surveillance does not capture the entire spectrum of outcomes of rubella in pregnancy, it allows detection of infants with clinically apparent manifestations as well as standardization for reporting and comparison purposes.

CRS surveillance provides information on CRS incidence in a standardized manner allowing comparisons across countries, and over time to monitor the impact of rubella immunization programs and help with documentation and verification of rubella virus elimination. Early CRS case identification is important for timely health care interventions, to reduce health consequences of specific defects and to prevent further rubella virus spread.

As mentioned, a region-wide survey of rubella and CRS surveillance practices conducted in 2008 by the WHO Regional Office for Europe and EUVAC.NET, 38 MS reported having nationwide CRS surveillance in place. During 2005-2010, 82 CRS cases were reported from 17 countries, 32 countries reported zero cases, and no reports were received from four countries of the WHO European Region. However, these data are difficult to interpret as the procedures and quality of CRS surveillance in the Region varies.

CRS surveillance is a prospective sentinel site surveillance focused on infants (<1 year of age) who have most common clinical manifestations of CRS with laboratory testing of identified cases suggestive of CRS. Laboratory criteria for CRS surveillance include detection of rubella IgM antibodies, sustained rubella IgG antibody level on >2 occasions between 6 and 12 months of age in the absence of rubella vaccination, and/or detection of rubella virus by culture or RT-PCR in appropriate clinical specimens from the infant. CRS case classification is based on the presence of clinical manifestations and results of laboratory work-up and includes laboratory confirmed, epidemiologically linked, clinical and discarded categories.

When establishing CRS surveillance, the goal should be to capture all infants with suspected CRS. Initially, a sentinel site surveillance involving major healthcare institutions should be in place. After successful pilot testing in a few sites, the system can be expanded to include other providers and sites with adequate coordination and periodic evaluations. Surveillance should be focused on secondary and tertiary level facilities as they are the ones most likely to see patients with CRS and to avoid overwhelming primary health care providers. The focus should be on identification of infants with cataracts, heart defects, hearing impairment usually seen at secondary and tertiary care facilities and specialty care centres.

Procedure should include identification of suspected cases and prompt collection of biological specimens along with detailed clinical, exposure and immunization data both for the infant and the mother, and case reporting to regional and national levels. Case classification should be done at the

national level and national data on cases should be reported to the Regional Office annually via WHO/UNICEF JRF. Ensuring regular feedback to stakeholders is the final component of the process.

In summary, CRS is the most serious clinical consequence of rubella virus infection and CRS surveillance represents important tool for monitoring the impact of rubella immunization programs and for documentation and verification of elimination. It is considered gold standard for congenital rubella surveillance during the elimination era and should be established and strengthened in all MS of the WHO European Region in a timely manner considering the WHO European Region commitment to the 2015 goal for rubella elimination, as re-affirmed at the 60<sup>th</sup> Regional Committee in 2010.

### **Rubella/CRS Surveillance in France**

Rubella vaccination was introduced in France in 1970 as a selective strategy for pre-adolescent girls. In 1976, a laboratory-based surveillance network – Rénarub, was established with the objective to collate national data on cases of rubella occurring during pregnancy and congenital rubella. The network is the principle source of information on the epidemiology of rubella in France. It allows the evaluation of the impact of vaccination policy and prevention measures.

The Rénarub network unites the clinical diagnostic laboratories carrying out anti-rubella IgM serology. Information is gathered at two levels:

- From the microbiologists who receive a half-yearly request to report rubella infections diagnosed in pregnant women or newborn infants
- From family doctors, gynaecologists, obstetricians, and paediatricians who provide by questionnaire demographic, laboratory, and clinical information on the infected woman, newborn, or fetus.

Participation with the network is voluntary. The information gathered does not include follow up of live births from infected mothers.

France added universal rubella vaccination for young children into the immunisation schedule first as measles-rubella vaccination in 1983, and later in 1986, as the measles, mumps, and rubella (MMR) vaccination. A second dose of MMR was introduced in the schedule in 1996, mainly as a catch-up for measles vaccination primary failures, in the context of the measles elimination objective.

In 2005, a national plan for the elimination of measles and congenital rubella was established. The current recommendations include vaccination with the first dose of MMR at 12 months of age, a second dose of MMR before 24 months of age (with a minimum interval of one month between the two doses). The plan also recommends catch-up vaccination with two doses for those born in 1980 and later. It also recommends rubella vaccination for women born before 1980 who were not vaccinated against rubella. Non-immune women of childbearing age should also be vaccinated. In addition, pre-nuptial and anti-natal rubella testing are mandatory.

Rubella is not a notifiable disease in France. Surveillance of rubella infections during pregnancy and of CRS has been carried out since 1976, based on the Rénarub network of laboratories, both private and public, performing rubella IgM testing. By 2010, about 300 (98%) laboratories participated in the network. For each diagnosis of rubella infection during pregnancy or in a product of pregnancy termination or at birth, the clinician in charge (usually a gynaecologist or a paediatrician) is asked to complete a questionnaire which includes demographic, biological and clinical data on the woman and/or either the foetus or the newborn.

Although the current set up for surveillance of rubella in women and CRI has been long-established and functions well with high participation rates of virologists and clinicians the system suffers from

shortcomings in relation to the goal of eliminating rubella and preventing CRS. The systems only operates on a voluntary basis and does not capture CRS cases detected after birth. In addition, the network management is time consuming because the low incidence leads to a high proportion of IgM positive cases that are not considered as rubella infection (false positive). Therefore improved surveillance including the establishment mandatory notification system is being considered for all rubella cases in the general population, for maternal and congenital infections detected during pregnancy, for CRS cases and for congenital rubella infections detected at or after birth. In addition a national reference centre for maternal and congenital infections involving a network of laboratories to complement epidemiological surveillance has been nominated for 2012-2015.

### **Rubella/CRS Surveillance in the UK**

The rubella vaccine was first offered to schoolgirls in the United Kingdom in 1970, with ante-natal testing and post-partum vaccination for susceptible women of child-bearing age introduced during the 1970s. Mass vaccination with MMR of children aged 12-15 months was introduced in 1988 with the aim of eliminating all three diseases. High coverage was soon obtained among teenage girls and less than 3% of pregnant women were susceptible. In 1994, all schoolchildren were offered combined measles and rubella vaccine in a national catch-up campaign to avert a predicted measles epidemic and to reduce the number of rubella-susceptible young men who could facilitate transmission of rubella. After this, the schoolgirl programme was discontinued, and a second dose of MMR was introduced for all four year olds in 1996.

Post-partum vaccination of susceptible women identified through ante-natal testing continues. A rubella immunity test is still routinely offered to all pregnant women, usually at their first antenatal visit, and acceptance is high. This ante-natal screening programme is monitored through the National Antenatal Infections Screening Monitoring Committee (NAISM).

Rubella was made a notifiable disease in 1988, and is monitored through clinical and laboratory reports. Surveillance of rubella in England, Scotland and Wales is carried out through a combination of methods providing data on clinical and laboratory-confirmed cases of rubella and congenital rubella, rubella susceptibility in population sub-groups, and rubella-associated terminations and on uptake of vaccine. These data are reported mainly to the Health Protection Agency (HPA) and Scottish Centre for Infection and Environmental Health (SCIEH), and the National Congenital Rubella Surveillance Programme (NCRSP) at the Institute of Child Health. The surveillance of rubella in England and Wales is further enhanced through the use of oral fluid testing for rubella.

These measures to prevent and control rubella resulted in a dramatic decline in congenital rubella births and in terminations after rubella disease/contact. Reported cases of CRS markedly declined from about 50 a year in the period 1971-75 to just over 20 a year in the period 1986-90, and rubella-associated terminations from an average of 750 to 50 a year, respectively. Since 1990, the number of congenital rubella births has declined further except for a small increase in CRS cases associated with the last reported rubella outbreak in 1996. That year most of the rubella cases were young adult males who were unvaccinated or did not benefit from the campaign due to their age. Rubella infection is now exceedingly rare in the UK (six cases reported in 2011). CRS is also rare with 17 cases of congenital rubella births since 1997. One case of congenital rubella infection was reported for 2011.

## **CONCLUSION**

The overall decline in measles and rubella incidence in the WHO European Region are notable achievements toward the goal of measles and rubella elimination in Europe. Nonetheless, the continual emergence of outbreaks and persistently high incidence of measles in some European countries have indicated suboptimum vaccination coverage. In the case of rubella the incidence remains high in just a few countries, which are therefore still at the risk for CRS. At the same time, the quality and accuracy of data on rubella and CRS needs to be improved particularly in countries with suboptimum or no surveillance system in place.

Strengthening surveillance systems is a key strategy in the measles and rubella elimination plan. This requires rigorous investigation and laboratory confirmation of suspected cases and outbreaks. Enhanced surveillance using measles and rubella virus genotyping and characterisation techniques is also important to ascertain transmission chains and to assess country-specific risk. Such tools are essential in documenting the interruption of endemic measles transmission as countries approach the elimination of measles. Disease surveillance systems should be synchronized with the surveillance of other related parameters, such as immunization coverage and adverse effects following immunization. A surveillance system is considered of adequate if it can collect, collate and analyse complete data in a timely manner, and create operational information for implementing adequate and timely response measures. An intrinsic part of an effective surveillance system includes adequate feedback through bulletins, reports and other means of communications.

More efforts are still required particularly in high incidence countries, not only to achieve and maintain the required high vaccination coverage but also to conduct high-quality surveillance of measles, rubella and congenital rubella syndrome including laboratory testing of all suspected cases as stipulated in the WHO Regional Office for Europe elimination plan.

## **RECOMMENDATIONS**

Through the shared experiences from both the WHO European Region and national levels this meeting underpins the need for countries to strengthen surveillance of measles, rubella and congenital rubella syndrome to attain the elimination goal by 2015. The recommendations to improve surveillance of measles and rubella should complement other efforts to strengthen the vaccination strategy for both diseases.

High-quality data on these diseases is necessary for monitoring, response and feedback purposes. This entails timely acquisition and reporting of case-based data at local and national levels. In the case investigation process it is crucial that clinical, epidemiological and laboratory data are interlinked. This necessitates routine communication between clinicians, epidemiologists and laboratory personnel from local to national levels. Improved surveillance of congenital rubella syndrome is also required by all countries. Comprehensive and active surveillance including monitoring congenital rubella infections in infants and long-term follow up of all laboratory-confirmed cases in pregnancy and newborns is desirable.

Feedback to the reporting bodies should likewise be disseminated in a timely manner at all levels thereby encouraging participation and involvement. Sharing such data is important as is sharing of lessons learnt in the process of investigating cases, and preventing and controlling outbreaks. Such information is considered important evidence to advocate for immunization. At European level, the Regional Office should consider establishing a platform where countries could exchange such key documents and information.

The WHO Regional Office for Europe surveillance guidelines for measles and rubella elimination will be updated in 2012. They should serve as a foundation to implement the surveillance strategy and should form an intrinsic part of any national plan of action for measles and rubella elimination. The

Regional Office will use standardized indicators to monitor progress towards the elimination goal. The surveillance guidelines outline the necessary performance indicators including testing of at least 80% of suspected measles and rubella cases.

International travel and mass gatherings increase the risk of measles transmission worldwide. In 2012, two major sport events will be hosted in Europe and are expected to attract thousands of international visitors. These are the UEFA European Cup championship in Ukraine and Poland and the Olympic games in UK. Such international mass gathering events require an increased sensitivity of surveillance and reporting but also improved efforts to vaccinate in good time travellers planning to attend these events.

Closer collaboration between the Regional Office and ECDC as a major stakeholder is required to monitor the quality of the data submitted, but also to share experiences, identify areas for research and complement efforts to attain the elimination goal. The WHO European Region and ECDC will support MS according to their mandates and capacities, and with regular communication and meetings.

The process of verifying measles and rubella elimination is planned to commence in early 2012. The Regional Office will establish a regional verification commission and all MS will be asked to establish national verification committees. MS will then be requested to provide the relevant routine supporting documents on annual programmatic activities and results of elimination strategies and to include sufficient epidemiological evidence of interruption of transmission supplemented by genotyping and sequencing data for both diseases.

By virtue of the elimination plan for measles and rubella, these diseases are of great public health significance and therefore they deserve not only sustainable funding but also the political will to reach the elimination goal. As experts in the field, we should also maintain our own commitment and advocate more intensely with our colleagues, peers and political leaders for our countries and Europe to reach the elimination goal by 2015.

## ANNEX 1 – PROGRAMME

**Thursday, 08 December**

09:00-10:00	Registration	
10.00-10:20	Welcome by WHO European Region Objectives of the Meeting	Rebecca Martin, WHO Regional Office for Europe - Copenhagen  Michal Krzyzanowski, WHO Regional Office for Europe - Bonn
	Welcome by the Robert Koch Institute, Berlin	Reinhard Burger, Robert Koch Institute, Germany
	Welcome by the Ministry of Health of Germany	Franz-Josef Bindert, Federal Ministry of Health, Germany
<p><b>Session 1: Measles, Rubella and Congenital Rubella Syndrome – an overview and surveillance</b></p> <p>Chair: Nino Khetsuriani</p>		
10:20-10:40	Global Overview	Robert Tyrrell Perry, WHO Headquarters, Geneva
10:40-11.00	Regional Overview	Rebecca Martin, WHO Regional Office for Europe
11:00-11:20	<i>Coffee Break</i>	
11:20-11:40	Regional Measles, Rubella and Congenital Rubella Syndrome Surveillance Guidelines	Dragan Jankovic, WHO Regional Office for Europe
11:55-12:30	The role of laboratories in the measles-rubella elimination program	Mick Mulders, WHO Regional Office for Europe
	The role of laboratories in measles and rubella surveillance towards elimination	Claude Muller, Regional Reference Laboratory for measles and rubella, Luxemburg
12.30-13.00	<i>Discussion</i>	
13.00-14:00	<i>Lunch</i>	

<b>Session 2: Surveillance for measles and outbreaks in the European Region</b>		
Chair: Kevin Brown		
14:00-14:20	Implementation of the national measles eradication program and improving measles and rubella surveillance in the Russian Federation	Albina Melnikova, Rospotrebnadzor, Russian Federation
14:20-14:40	Measles Surveillance and Control in Slovenia	Marta Vitek Grgič, Public health institute of Republic Slovenia, Slovenia
14:40-15:00	Surveillance of measles in Switzerland: Facts and challenges	Jean-Luc Richard, Public Health Directorate, Switzerland
15:00-15:20	Measles surveillance and results from recent outbreak investigations in Germany	Ole Wichmann, Robert Koch Institute, Germany
15:20-15:40	<i>Discussion</i>	
15:40-16:00	<i>Coffee Break</i>	
16:00-16:15	Outbreaks in WHO European Region and development of Regional guidelines	Dragan Jankovic, WHO Regional Office for Europe
16:15-17:45	<p><u>Panel presentation:</u> Measles outbreaks in the WHO European Region – specificities in countries</p> <p><i>Moderator: Dragan Jankovic</i></p> <p><i>Panelists:</i></p> <p><i>Kyrgyzstan – Olga Safonova, RCI</i></p> <p><i>France - Isabelle Parent, InVS</i></p> <p><i>Romania - Aurora Stanescu, PHI</i></p> <p><i>Spain - Aurora Limia, PHI</i></p> <p><i>Uzbekistan – Dilarum Tursunova, Ministry of Health</i></p> <p><i>Discussion</i></p>	
17:45-18:00	Discussion and Closing of the day	
<b>19:00 Reception in the Bonn City Hall</b>		

## **Friday, 09 December**

<b>Session 3: Surveillance and Verification of the Elimination</b>		
<b>Chair:</b>		
09:00-09:20	CISID – Regional Surveillance Database	Ajay Goel, WHO Regional Office for Europe
09:20-09:40	The ECDC plans in supporting strengthening measles and rubella surveillance in Member States of the European Union	Lucia Pastore Celentano, ECDC
09:40-10:00	Surveillance indicators for measles and rubella elimination and framework for elimination verification	Sergei Deshevoi, WHO Regional Office for Europe
10.00-11.00	<i>Discussion</i>	
11.00-11:30	<i>Coffee Break</i>	
<b>Session 4: Rubella and CRS surveillance</b>		
<b>Chair: Rebecca Martin</b>		
11:30-11:45	Rubella in the European Region	Mark Muscat
11:45-12:05	Developing of the Regional CRS Surveillance guidelines	Nino Khetsuriani, US CDC
12:05-12:25	Example of national rubella surveillance or Establishing Rubella/CRS Surveillance	Isabelle Parent du Châtelet, Institut de Veille Sanitaire, France
12:25-12:45	Example of national rubella surveillance or Establishing Rubella/CRS Surveillance	Kevin Brown, Health Protection Agency, United Kingdom
12:45-13:15	<i>Discussion</i>	
13:15-14:30	<i>Lunch</i>	
<i>Lunch session</i> 14:15-14:30	National computerized surveillance data base – example of MRSM	Ara Tadevosyan, Consultant
14:30-15:30	<i>Panel discussion: Main messages of the meeting - the way forward</i> <i>Moderator: Rebecca Martin</i> Measles surveillance Rubella surveillance CRS surveillance Outbreaks Surveillance	
15:30-16:00	<i>Closing of the Meeting</i>	

## ANNEX 2 – LIST OF PARTICIPANTS

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