24-26 October 2016, Copenhagen, Denmark

# Fifth Meeting of the European Regional Verification Commission for Measles and Rubella Elimination (RVC)

World Health Organization
REGIONAL OFFICE FOR Europe

**Abstract**

The European Regional Verification Commission for Measles and Rubella Elimination (RVC) met for the fifth time on 24-26 October 2016 in Copenhagen, Denmark. The 8-member panel evaluated 51 national annual status updates for 2015 and other documentation submitted by national verification committees. The RVC concluded that, by the end of 2015, 37 Member States provided evidence to demonstrate that endemic transmission of measles was interrupted. Of these, 24 have eliminated endemic transmission for at least 36 months. Endemic rubella transmission was interrupted in 35 Member States, of which 24 have eliminated endemic rubella. Twenty-one Member States provided evidence for the elimination of both measles and rubella.

Keywords

Immunization Programs
Disease Eradication
Measles - prevention and control
Rubella - prevention and control
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**Contents**

Abbreviations ..... 4
Executive summary ..... 5
Background ..... 6
Scope and purpose of the meeting ..... 6
Introduction and opening remarks ..... 7
Status of measles and rubella elimination: global and regional update ..... 7
Overview of the ASU submission and review process ..... 9
Update on measles elimination and verification activities in the WHO Western Pacific Region (WPR) 11
Review of submitted reports and updates ..... 12
Conclusions and recommendations ..... 13
Annex 1. Results of the RVC review of reports and documents submitted by NVCs ..... 17
Annex 2. Status of measles and rubella elimination in countries of the WHO European Region ..... 21
Annex 3: List of participants ..... 72

**Abbreviations**

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|---|---|
| ASU | Annual Status Update |
| CISID | Centralized Information System for Infectious Diseases |
| CRS | congenital rubella syndrome |
| DEC | Division of Health Emergencies and Communicable Diseases |
| EIW | European Immunization Week |
| ESR | Elimination Status Report |
| ETAGE | European Technical Advisory Group of Experts on Immunization |
| EVAP | European Vaccine Action Plan |
| M&RI | The Measles & Rubella Initiative |
| MCV | measles-containing vaccine |
| MeaNS | measles nucleotide surveillance database |
| MR | measles and rubella (vaccine) |
| MRCV | measles- and rubella-containing vaccine |
| MRCV1 | first dose MRCV |
| MRCV2 | second dose MRCV |
| MMR | measles, mumps and rubella (vaccine) |
| MMR1 | first dose MMR |
| MMR2 | second dose MMR |
| NVC | National Verification Committee for Measles and Rubella Elimination |
| RubeNS | rubella nucleotide surveillance database |
| RVC | European Regional Verification Commission for Measles and Rubella Elimination |
| RVC Secretariat | Staff of Vaccine-preventable diseases & immunization programme (VPI) of WHO Regional Office for Europe |
| SIA | supplementary immunization activity |
| VPI | Vaccine-preventable diseases & immunization programme of the WHO Regional Office for Europe (RVC Secretariat) |
| WPR | WHO Western Pacific Region |

**Executive summary**

The European Regional Verification Commission for Measles and Rubella Elimination (RVC) is an independent panel of experts established by the WHO Regional Office for Europe (Regional Office) to evaluate the status of measles and rubella in the 53 Member States of the WHO European Region. The RVC met for the fifth time on 24-26 October 2016 in Copenhagen, Denmark to evaluate annual status updates (ASUs) submitted by 51 Member States. Following the exchange of communications with the three Members States that had not initiated the verification process by the RVC's 2015 meeting (Albania, Monaco and San Marino), the RVC was pleased to note that Albania had established a National Verification Committee (NVC) in 2016 and submitted ASUs for 2013, 2014 and 2015. Discussions with representatives of Monaco and San Marino during the 66th Session of the WHO Regional Committee for Europe raised the potential for exploring a modified approach for verification of measles and rubella elimination in small countries in the absence of a NVC.

The RVC concluded that based on reports submitted, at the end of 2015, endemic measles transmission had been interrupted in 37 of the 53 Member States (70%) and endemic rubella transmission had been interrupted in 35 Member States (66%). The RVC was unable to review the measles and rubella status of 2 Member States (Monaco and San Marino). Twenty- four Member States (45%) provided evidence to demonstrate the elimination of endemic transmission of measles for at least 36 months, and 24 (45%) for the elimination of endemic rubella. Twenty-one Member States (40%) provided evidence for the elimination of both measles and rubella. A further 13 Member States (25%) provided evidence for the interruption of measles transmission for a period of less than 36 months, and 11 Member States (21%) provided evidence for interruption of rubella transmission for the same period. Two Member States (Austria and the Russian Federation) provided evidence that endemic measles transmission was interrupted during 2015; evidence of interruption for a full 12 months or longer is expected in the ASU for 2016.

Fourteen Member States (26%) were considered by the RVC to remain endemic for measles transmission, and 16 (30%) were considered to remain endemic for rubella transmission. Fourteen Member States (26%) were considered to remain endemic for both measles and rubella.

The RVC noted once again that despite some improvement, rubella and congenital rubella syndrome (CRS) surveillance remains suboptimal; many countries continue to find it a challenge and in some countries rubella is still not a notifiable disease. Although most Member States are now reporting genomic sequence data on measles virus detections to the measles nucleotide surveillance database (MeaNS), the amount of data on rubella isolates reported to the rubella nucleotide surveillance database (RubeNS) remains very low. The importance of genomic sequence data will continue to rise as the elimination requires attaining high-quality surveillance to confirm the origin of every case and chain of virus transmission.

The RVC endorsed a 2017 calendar of activities proposed by the RVC Secretariat, and approved its proposal to advance the date of RVC meetings to earlier in the calendar year, preferably before the summer break. The RVC proposed conducting more country missions in 2017 and strengthening communications with the NVCs, either on a one-to-one basis or through NVC participation at RVC

meetings, and opted to hold the next RVC meeting in a geographical location which would facilitate communication with NVCs of measles or rubella endemic Member States. The RVC also established an ad-hoc working group, comprised of existing RVC members, to review the RVC decision-making process, develop proposals for its improvement and provide a decision-making algorithm for reviewing measles and rubella elimination status of countries.

**Background**

The RVC was established by the Regional Office in 2012 as an independent expert body with the mission to evaluate the documentation submitted by NVCs of Member States, in order to verify the elimination of measles and rubella in the Region. The vaccine-preventable diseases and immunization programme (VPI) of the Regional Office serves as the RVC Secretariat.

The RVC holds annual meetings to determine the status of measles and rubella elimination in the WHO European Region based on reports and additional documents prepared and submitted by the NVCs. These reports include information on measles and rubella epidemiology, molecular epidemiology, the analysis of population immunity and immunization programme performance, the quality of surveillance, and changes that may have occurred since the last report together with additional information submitted by the NVC to support its statement on measles and rubella elimination status.

**Scope and purpose of the meeting**

Based on its review of reports and statements submitted by the NVCs, the RVC at its fifth meeting on 24-26 October 2016 evaluated the status of the endemic transmission of measles and rubella during 2015 in Member States of the WHO European Region and decided upon the elimination status of each country.

The objectives of the meeting were:

- to inform the RVC on current epidemiology of measles and rubella in the European Region and VPI activities towards measles and rubella elimination, as well as global developments on measles and rubella control and elimination;
- to review the NVCs' ASUs for 2015, late-submitted reports for previous years and all other documentation that NVCs provided to document the absence of measles and rubella endemic transmission in their countries;
- to define the status of transmission of measles and rubella in each Member State and in the Region in 2015;
- to declare the diseases' elimination where achieved and declare the status of measles and rubella in the European Region in respect to the 2015 elimination targets;
- to initiate preparation of the RVC's measles and rubella elimination status report for 2015;
- to plan verification activities in 2017 and beyond, considering the role of the RVC in advocating for continuation of elimination efforts at national and Regional levels;

- to assess RVC working procedures and verification process requirements.

**Introduction and opening remarks**

Participants were welcomed on behalf of the WHO Regional Director by Dr Nedret Emiroglu, Director, Division of Health Emergencies and Communicable Diseases (DEC). Dr Robert Linkins was welcomed as a new member of the RVC.

Concern over remaining measles and rubella endemicity in major countries in the Region and particularly countries in its western part was raised during the most recent Regional Committee meeting, and the requirement for greater political commitment to elimination discussed. Evidence suggests that the WHO elimination strategy (of considering the elimination status of Member States on a country-by-country basis) is having a positive effect, but measles and rubella elimination needs to be placed higher on the political agenda in several Member States.

Mr Robb Butler, Programme Manager of VPI, welcomed participants on behalf of the VPI team. The WHO Region of the Americas is to be congratulated on achieving regional verification of elimination, an accomplishment that validates the strategic approach and provides positive encouragement to the other WHO regions to follow suit. While the elimination strategy has been proved effective, implementation continues to place significant pressure on resources available to WHO and to the RVC Secretariat. As the verification process matures in the European Region, and practices and functions become embedded within the elimination verification process, resources can be targeted on the remaining endemic countries and more attention focussed on the greatest challenges to achieving regional elimination.

**Status of measles and rubella elimination: global and regional update**

*Global update*

A high level of measles control is being maintained globally with over a million measles-related deaths averted each year. The WHO Region of the Americas has now achieved measles elimination, but large outbreaks continue to occur in other WHO regions and progress has slowed. There has been little change in the global measles case load since 2009, with 254 000 cases reported in 2015; and immunization coverage with the first dose of measles-containing vaccines (MCV1) has plateaued at approximately 84 to 85%. Only 119 Member States (61%) reported MCV1 coverage of ≥90% in 2015. On a positive note, immunization coverage with the second dose of measles-containing vaccines (MCV2) has increased steadily reaching 61% in 2015 with 160 Member States (82%) now having introduced a second dose of measles-containing vaccines into their vaccine schedules. The Global Measles and Rubella Strategic Plan, 2012 – 2020 set the ambitious goal of achieving measles and rubella elimination in at least five WHO regions by 2020. Recent years have seen a slowing of progress, and no region except the Americas has yet achieved its 2015 milestones.

Rubella elimination has been verified in the Americas and there has been a gradual increase in global rubella vaccination coverage. Global coverage with rubella-containing vaccines remains low at approximately 46%. One reason for the low global coverage remains that 47 WHO Member States, mainly in sub-Saharan Africa and the south-east Asian regions, have yet to introduce rubella vaccine.

The Measles and Rubella Initiative (M&RI) midterm review in 2016 recognized the continuing challenge of lack of ownership of the elimination effort by many Member States and the apparent frailty of global political will to meet the elimination targets. The review recommended focussing efforts on achieving high-quality case-based, laboratory-supported surveillance for measles and rubella, and implementing effective CRS surveillance in all countries. The review underscored the need to strengthen immunization systems and implement a 2-dose vaccination strategy in all countries to increase population immunity. Findings of the midterm review will be used to define and develop the way forward for the M&RI.

*European regional update*

While regional coverage with MRCV1 has been maintained above 90% for more than 15 years, large numbers of cases and large outbreaks continue to occur each year. In 2015, 30 762 cases of measles were reported in the Region, with almost 18 000 cases reported from Kyrgyzstan alone. Of the 10 630 measles cases with data on age, 43% were 20 years and older – a pattern that has been observed in recent years. Outbreaks of rubella have also continued, with 2368 cases reported in 2015, of which 2029 (86%) were reported from Poland. It is of concern that many reported rubella cases continue to be classified on a clinical basis alone, without laboratory confirmation, making interpretation of the true epidemiological situation difficult.

The laboratory segment of surveillance has been improved in the Region, as most Member States are now reporting data on measles virus detections in a standard format. But the level of reporting on rubella genomic sequence data remains low and overall surveillance sensitivity in many countries remains a major concern. It has been noted that the 18 Member States endemic for measles at the end of 2015 contain approximately two-thirds of the regional population, and that 9 endemic countries are members of the European Union.

**Discussion**

The RVC is concerned that European countries' measles surveillance sensitivity data continue to be incomplete in the monthly global surveillance summaries disseminated by WHO headquarters. It is noteworthy that in the WHO global maps disseminated most of the European countries show no data, but that many lower- and middle-income countries in other regions are able to demonstrate adequate surveillance sensitivity.

Although the regional shift in proportion of measles cases among adolescents and adults is real, it is difficult to estimate the true impact of disease as sensitivity of reporting is different for different age groups. With the increased focus and priority placed on improving the quality of surveillance it should be possible to more effectively determine the epidemiological impact and role of infection in adolescents and adults.

**Overview of the ASU submission and review process**

Evaluation of the process used by the RVC Secretariat to finalize the fourth RVC meeting report and prepare letters to countries informing them of their status has resulted in the drafting of proposed standard operating procedures (SOPs) for improving and simplifying the process. The proposed changes to procedures will be tested during finalization of the fifth RVC meeting report and preparation of letters to countries.

Further modifications of the NVC reporting form were made after the fourth RVC meeting, and these are reflected in the submitted ASUs. The RVC Secretariat also increased the level of follow-up with countries on preparing and submitting their reports, with additional focus on the quality of reports submitted. To aid the RVC in their assessment of country documentation, the RVC SharePoint facility has been maintained and updated and all RVC members are encouraged to make of use this.

Communication with Member States that had not initiated the verification process by the end of 2015 (Albania, Monaco and San Marino) resulted in the establishment of an NVC in Albania, and subsequent submission of ASUs for 2013, 2014 and 2015, and high-level discussions with Monaco and San Marino. A meeting between the chair of the RVC and representatives of Monaco and San Marino during the 66th Session of the WHO Regional Committee for Europe on 12 September 2016 raised the potential for developing a modified approach to verification of measles and rubella elimination in small countries in the absence of a NVC.

Prior to the fifth RVC meeting, ASUs for 2015 were received from all 51 NVCs, with Albania also submitting ASUs for 2013 and 2014, and with Bosnia and Herzegovina officially approving the ASU 2015 after the meeting. Two countries with NVCs (Albania and Italy) have still not submitted elimination Status Reports (ESR) for 2010-2012, and a number others have failed to submit ASUs for 2013 or 2014, or to re-submit ASUs for years requested by the RVC. A country-by-country assessment of provided documentation on elimination status may be needed to determine if pursuing countries to submit missing reports is rational, relevant and needed.

Submitted statements from several of the NVCs are of a very high quality, with all relevant information provided, indicating a dedicated approach to the process. Others are vague and lack any firm indication of involvement in the verification process. Whilst the standard of ASUs was generally high, the same challenges with regard to completeness and quality of data in the reports were encountered as in previous years. Several ASUs included incomplete or partial information, laboratory activities and results, miscalculations and the inadequate presentation of data on surveillance indicators. Several Member States continue to use alternative surveillance indicators, different to those requested for the report, without providing adequate explanation of the indicators used or how they should be used to assess quality of surveillance. Most ASUs included data on estimated vaccination coverage levels but several failed to provide details on how the coverage was estimated or how the data used for the estimate was derived.

*Endemic countries profiles*

The RVC Secretariat held a consultation workshop involving technical staff from the United States Centers for Disease Control and Prevention (CDC) and the European Centre for Disease Prevention and Control (ECDC) on 29-30 August 2016, to assess and analyse measles- and rubella-epidemiology-related data of endemic countries in the Region. The analysis was based on information provided in the annual reports from 2012 to 2015, monthly surveillance data provided to WHO and information reported through the WHO/UNICEF Joint Reporting Form (JRF). The objectives were to prioritize and determine potential interventions to achieve elimination in the endemic countries, and at same time to test the draft global measles-rubella country categorization tool for assessing Member States. The quality and performance of surveillance systems, vaccination coverage and population immunity were reviewed against standard requirements and indicators for measles and rubella elimination. The assessment also included review of activities conducted at national level to promote and support measles and rubella elimination.

A focused approach with development of technical profiles of each endemic country is expected to foster outlining and implementing of tailored country-specific and inter-country interventions, prioritizing countries for support and promoting intercountry cooperation. The VPI team will finalize technical country profiles and use this analysis to address identified issues in coordination with Member States' and partners' activities.

*Laboratory information on genotyping*

Based on RVC recommendations and experience gained in past meetings, and using additional functionalities developed in WHO Measles Nucleotide Surveillance online database (MeaNS) by the WHO Global Specialized Laboratory in London (Public Health England), the VPI team developed a set of background laboratory documents to support the preparatory work of the RVC and RVC Secretariat. Laboratory results are critical for confirming or discarding suspected cases; and laboratories conduct genotyping with molecular sequencing of detected viruses, providing information for key surveillance indicators: rate of laboratory investigation, rate of discarded cases and viral detection. WHO reference laboratories are requested to report their genotyping data to MeaNS and RubeNS.

Most Member States conduct laboratory testing of suspected measles cases, and 37 report that all of their laboratory results originate from WHO-accredited laboratories or from laboratories of demonstrated proficiency. However, for many countries the evidence for laboratory proficiency is not sufficiently documented in the ASU. Seven Member States did not conduct laboratory testing of suspected rubella cases. Of the 46 countries that test for rubella, 32 report results originating from WHO-accredited laboratories or from laboratories of approved proficiency. Evidence supporting the proficient nature of the latter is often not provided. A significant proportion of reported laboratory tests for rubella continue to originate from routine screening programmes (such as ante-natal screening) rather than from suspected rubella cases.

Most Member States (84%) reporting laboratory-confirmed measles cases also report measles genotyping results, but only 29% of Member States reporting laboratory-confirmed rubella cases reported rubella genotyping results. The rate of laboratory investigation and viral detection vary widely

between countries, as does the level of linkage between epidemiological and laboratory data that facilitates full characterization of chains of transmission. Viral strain distribution, as reported to MeaNS and to RubeNS, does not generally correlate well with epidemiologically recognized disease incidence, and the representativeness of laboratory results varies from country to country. For these reasons, information on genotype distribution should be interpreted only within the broader context of surveillance performance.

**Discussion**

The RVC endorsed the approaches taken to streamline the verification process and focus attention on providing greater technical support to the remaining endemic countries through the development of technical country profiles, and encouraged the RVC Secretariat to continue with this process. The RVC also appreciated the efforts taken by the NVCs in gathering, collating and presenting detailed laboratory information appropriate to the verification process and for providing a clear and concise explanation of the strengths and weaknesses of the molecular epidemiological data.

Previous RVC recommendations have consistently emphasized the need to improve surveillance and provide evidence of high-quality surveillance. Better documentation by Member States of their surveillance systems is needed. The RVC strongly believes that adequate surveillance sensitivity is the critical indicator providing confidence to verify interruption and/or elimination.

As surveillance is such a critical element of the verification decision-making, the RVC Secretariat should consider mechanisms to assist high-priority Member States in improving case-based surveillance sensitivity, particularly reporting confirmed and discarded cases.

An ad-hoc working group, comprised of existing RVC members, was established to review the RVC decision-making process, to develop proposals for its improvement and to suggest an algorithm for decision-making. The working group should be provided with technical support from the RVC Secretariat and should report its conclusions and recommendations back to the RVC in January 2017.

**Update on measles elimination and verification activities in the WHO Western Pacific Region (WPR)**

The RVC is grateful to Professor David Durrheim, Chair of the Western Pacific Regional Measles Verification Commission, for his availability and willingness to join the RVC meeting online and to provide an update on the situation with measles elimination in the WHO Western Pacific Region (WPR).

WPR is very diverse, encompassing 15 Member States, 1 administrative region (Hong Kong) and 1 sub-regional grouping (Pacific Island Countries). There are 14 currently serving members of the WPR RVC, permitting each member to focus attention on a relatively small number of countries/groups, and allowing a thorough country review process that makes use of both primary and secondary reviewers.

The WPR RVC is currently trialling an abbreviated report format for Member States and recognized entities that are considered to have eliminated measles and rubella. The modified reporting requirements include combining surveillance indicators for measles and rubella, combining virus genotyping data into a single table rather than as separate outbreaks and sporadic cases, including

descriptions of CRS surveillance and a line listing of CRS cases with final case classification, and including a checklist of factors considered to demonstrate programme sustainability.

RVC meetings are routinely hosted by Member States that have recently achieved elimination status, and the meetings are used not only to review technical data but as opportunities for celebration of achievements and advocacy.

**Review of submitted reports and updates**

In line with the *Eliminating measles and rubella: framework for the verification process in the WHO European Region*[1], the RVC members were invited to make their judgments in accordance with the definition of elimination provided in the framework document. ASU and other documents from Member States were available to RVC members at the designated SharePoint site before the meeting for review. At the meeting each RVC member presented data on his or her own group of allocated countries by major components (disease epidemiology; surveillance performance; population immunity as well as any supplemental information available) for RVC joint discussion and conclusion. Conclusions on the measles and rubella status by Member State for 2015 are provided in Annex 1, together with a regional summary of measles and rubella status for 2015 and elimination status by Member State. Specific comments on the conclusions for each country are provided in Annex 2.

[1] *Eliminating measles and rubella: framework for the verification process in the WHO European Region*. The Regional Office for Europe of the World Health Organization, 2014. Available online at http://www.euro.who.int/__data/assets/pdf_file/0009/247356/Eliminating-measles-and-rubella-Framework-for-the-verification-process-in-the-WHO-European-Region.pdf

**Conclusions and recommendations**

The RVC greatly appreciates the continued personal interest, support and advocacy from the Regional Director and senior staff of the WHO Regional Office for Europe toward achieving measles and rubella elimination.

The opportunity to hold a conference call with the chair of the WHO Western Pacific Regional Measles Verification Commission during the meeting was also greatly appreciated. Given the similarities in the nature and extent of the challenges the two Commissions face, the RVC believes that sharing experiences and practices can be of mutual benefit.

Meeting with the chair of the Scandinavian verification committee (SVC) and Danish technical counterparts to discuss verification issues and challenges pertinent to Denmark was also greatly appreciated by the RVC. The meeting underscored the importance of face-to-face meetings with country representatives in order for the RVC to have a broader understanding of challenges in Member States, but also for Member States to gain a better understanding of the verification requirements and RVC process.

RVC appreciates the Secretariat for continuous partnership with ECDC and inviting them as observers at the annual meetings, and appreciates ECDC's participation to promote and support efforts towards achieving the measles and rubella elimination goal.

Following communications with the three Members States that had not initiated the verification process by 2015 – Albania, Monaco and San Marino, the RVC was pleased to see that Albania has now established a national verification committee (NVC) and submitted annual status updates (ASU) for 2013, 2014 and 2015. A meeting between the RVC chair and representatives of Monaco and San Marino during the 66$^{th}$ Session of the WHO Regional Committee for Europe in September 2016 raised the potential for exploring a modified approach for verification of measles and rubella elimination in small countries without an NVC.

In advance of the RVC meeting, ASUs for 2015 were received from all 51 Member States that have initiated the verification process and established NVCs. Forty-one ASUs were received in advance of the agreed deadline for receipt. As in previous years, reports from several Member States either failed to provide the requested information on the quality of surveillance indicators, or the information provided was incomplete or incorrectly calculated. The method of calculation for the discard rate, an indicator of the sensitivity of surveillance, continues to be challenging for some countries. Despite requests from the RVC, some NVCs have continued to use alternative self-developed surveillance indicators that are incompatible with those requested in the report, or are of uncertain value to assess surveillance quality. The RVC noted that in several ASUs the requested information on vaccine coverage has not been provided, or the information is outdated or difficult to interpret due to insufficient information on sources of data and methods used to estimate coverage, making it impossible to realistically assess population immunity.

The RVC concluded that based on reports submitted, at the of end 2015, there were 37 out of the total 53 Member States in the European Region (70%) in which endemic measles transmission had been interrupted and 35 Member States (66%) in which endemic rubella transmission had been interrupted.

The RVC was unable to review the measles and rubella status of two Member States – Monaco and San Marino.

Determining the elimination status for measles and rubella on a country-by-country basis, 24 Member States (45%) have provided evidence to demonstrate the elimination of endemic transmission of measles for at least 36 months, and 24 (45%) for the elimination of endemic rubella. Twenty-one Member States (40%) provided evidence for the elimination of both measles and rubella. A further 13 Member States (25%) have provided evidence for the interruption of measles transmission for a period of less than 36 months, and 11 Member States (21%) have provided evidence for interruption of rubella transmission for the same period. Two Member States (Austria and the Russian Federation) have provided evidence that endemic measles transmission was interrupted during 2015 and evidence of interruption for 12 months or longer is expected in the ASU for 2016.

Fourteen Member States (26%) were considered by the RVC to remain endemic for measles transmission, and 16 (30%) considered to remain endemic for rubella transmission. Fourteen Member States (26%) were considered to remain endemic for both measles and rubella. Given the rate of progress being made in the Region, the RVC applauded the Secretariat's efforts to begin focusing attention on the remaining measles and rubella endemic countries. The RVC acknowledged the value of the comprehensive desk review of measles and rubella endemic countries conducted by the Secretariat in August 2016 to drafting basic factsheet/countries profiles in order to identify challenges and prioritise activities in 2017. This exercise allowed mapping of needs, listing possible interventions to achieve elimination and permitted recognition of similarities for inter-country or subregional interventions. The RVC also supported the Secretariat's decision to create technical coordinators for measles and rubella elimination and verification activities in endemic countries in order to more effectively target Regional Office resources, sustain coordination and provide technical support. The RVC anticipate that the results of this approach could be reviewed at next meeting in 2017.

With regard to the quality of measles and rubella surveillance conducted in the Region, the RVC noted once again that despite some improvements, rubella and congenital rubella syndrome (CRS) surveillance remains suboptimal; many countries continue to find it a challenge and in three countries rubella is still not a notifiable disease with comprehensive nationwide surveillance system. Although most Member States are now reporting genomic sequence data on measles virus detections to MeaNS, the amount of data on rubella isolates reported to RubeNS remains very low. The importance of genomic sequence data, the ability to distinguish between imported and endemic viruses and to detect and document chains of transmission, including cross-border chains of transmission, will increase in importance as more Member States achieve interruption and the focus moves towards sustaining high quality surveillance with the detection, classification and documentation of every case.

The RVC endorsed the calendar of activities in 2017 proposed by the Secretariat, and approved the proposal to advance the date of the RVC meetings to earlier in the year, preferably before the summer break. The RVC also supported further endeavours to establish cooperation between NVCs. The RVC appreciated an initiative proposed by the NVCs of German-speaking countries, to hold a joint meeting in January 2017 with support provided by the Secretariat. The RVC proposed conducting more country missions in 2017 and strengthening communications with the NVCs either on a one-to-one basis or

through NVC participation at RVC meetings, and opted to hold the next RVC meeting in a geographical location which would facilitate communication with NVCs of measles and/or rubella endemic Member States. The RVC also established an ad-hoc working group, comprised of existing RVC members, to review the RVC decision-making process and develop proposals to improve it. The working group should be provided with technical support from the Secretariat to report back to the RVC in January 2017.

**Recommendations**

- To NVCs:
    - Preparation of high quality reports requires the active collaboration of the NVC with national health agencies and experts to collect, collate and analyse the information necessary for completion of the ASU. NVCs should make every effort to provide an explanation for missing, incomplete or alternative information in the ASU and provide supporting documentation where possible. Recognizing and appreciating the high level of commitment to provide high quality reports, the RVC urges all NVCs to become fully involved in the validation process and ensure that comprehensive high quality reports are provided;
    - NVCs that continue to use surveillance performance indicators other than those recommended by WHO should provide clear definitions for these indicators and explain how they are used to demonstrate the quality of measles and rubella surveillance;
    - NVCs are urged to ensure that all available information on current vaccine coverage at national and sub-national levels is provided in the ASU, as an assessment of population immunity to measles and rubella is an important component of the verification process. This information should include the source of data and methodology used to estimate coverage.
- To Member States:
    - The RVC would kindly remind the national health authorities of their role in ensuring that adequate information and documentation on imported and import-related cases, including available epidemiological information and details on the geographical source of the importation, is provided in their ASU.
    - The RVC urges Member States to fully implement the immunization and surveillance strategies and activities recommended to achieve the European Vaccine Action Plan 2015–2020 (EVAP) goals and objectives, and to follow the Strategic Advisory Group of Experts (SAGE) on Immunization and the European Technical Advisory Group of Experts on Immunization (ETAGE) recommendations on immunization practices, including vaccine position paper and outbreak response guidelines on immunization programme modifications to address populations <12 months of age, and make unimmunized individuals eligible to receive measles and rubella vaccines, irrespective of age.
    - The RVC urges Member States to ensure the presence of high quality rubella surveillance with laboratory confirmation and genotyping of all positive specimens through the WHO-accredited Regional Measles and Rubella Laboratory Network;
    - National authorities are urged to verify the performance and, if necessary, to strengthen the capacity of their surveillance systems in order:
        - to harmonize epidemiologic and laboratory surveillance data through a comprehensive and integrated surveillance and reporting system;
        - to link genomic sequence data unequivocally to the measles and rubella case investigation data;

        - to report discarded cases of measles, rubella and CRS as a population based indicator of surveillance sensitivity.
- To the Secretariat
    - The RVC encourages the WHO Secretariat to urgently develop an alternative method for verification of measles and rubella elimination in the absence of NVCs in Monaco and San Marino, and follow up with national authorities to obtain comprehensive information on measles and rubella elimination status for review by the RVC with an update on progress in 2017.
    - Recognizing the importance and value of developing endemic countries profiles, the RVC endorses proposals for continuation of these activities and encourages implementation of the proposed allocation of countries to responsible technical coordinators from the Secretariat.
    - The RVC endorses the proposed change in the verification process activities calendar and the RVC annual meeting date to earlier in the year in 2017, and agrees to cooperate fully to make this transition as soon as possible.

The RVC invites the Secretariat to continue activities on developing modified, abbreviated reporting requirements for documenting maintenance of elimination in previously verified countries, and consider that experience of other WHO regions in these activities may be useful.

**Annex 1. Results of the RVC review of reports and documents submitted by NVCs**

**Table 1. RVC conclusions on measles and rubella elimination status in Member States in 2015**

| Country | Measles elimination status, 2015 | Rubella elimination status, 2015 |
|---|---|---|
| Albania | **Eliminated** | **Eliminated** |
| Andorra | **Eliminated** | **Eliminated** |
| Armenia | **Eliminated** | **Eliminated** |
| Austria | **Interrupted*** | **Interrupted 12 months** |
| Azerbaijan | **Eliminated** | **Eliminated** |
| Belarus | **Eliminated** | **Eliminated** |
| Belgium | **Endemic** | **Endemic** |
| Bosnia and Herzegovina | **Endemic** | **Endemic** |
| Bulgaria | **Eliminated** | **Endemic** |
| Croatia | **Interrupted 24 months** | **Interrupted 24 months** |
| Cyprus | **Eliminated** | **Eliminated** |
| Czech Republic | **Eliminated** | **Eliminated** |
| Denmark | **Interrupted 24 months** | **Endemic** |
| Estonia | **Eliminated** | **Eliminated** |
| Finland | **Eliminated** | **Eliminated** |
| France | **Endemic** | **Endemic** |
| Georgia | **Endemic** | **Endemic** |
| Germany | **Endemic** | **Endemic** |

| | | |
|---|---|---|
| Greece | **Interrupted 24 months** | **Interrupted 24 months** |
| Hungary | **Eliminated** | **Eliminated** |
| Iceland | **Interrupted 24 months** | **Interrupted 24 months** |
| Ireland | **Interrupted 12 months** | **Eliminated** |
| Israel | **Eliminated** | **Eliminated** |
| Italy | **Endemic** | **Endemic** |
| Kazakhstan | **Endemic** | **Endemic** |
| Kyrgyzstan | **Endemic** | **Endemic** |
| Latvia | **Eliminated** | **Eliminated** |
| Lithuania | **Interrupted 24 months** | **Interrupted 24 months** |
| Luxembourg | **Eliminated** | **Eliminated** |
| Malta | **Eliminated** | **Eliminated** |
| Monaco | ***Verification process not initiated*** | ***Verification process not initiated*** |
| Montenegro | **Interrupted 24 months** | **Interrupted 24 months** |
| Netherlands | **Eliminated** | **Eliminated** |
| Norway | **Eliminated** | **Eliminated** |
| Poland | **Endemic** | **Endemic** |
| Portugal | **Eliminated** | **Eliminated** |
| Republic of Moldova | **Eliminated** | **Interrupted 24 months** |
| Romania | **Endemic** | **Endemic** |

| | | |
|---|---|---|
| Russian Federation | **Interrupted*** | **Interrupted 12 months** |
| San Marino | ***Verification process not initiated*** | ***Verification process not initiated*** |
| Serbia | **Endemic** | **Endemic** |
| Slovakia | **Eliminated** | **Eliminated** |
| Slovenia | **Eliminated** | **Eliminated** |
| Spain | **Interrupted 24 months** | **Eliminated** |
| Sweden | **Eliminated** | **Interrupted 24 months** |
| Switzerland | **Endemic** | **Endemic** |
| Tajikistan | **Eliminated** | **Eliminated** |
| The former Yugoslav Republic of Macedonia | **Interrupted 12 months** | **Interrupted 24 months** |
| Turkey | **Endemic** | **Endemic** |
| Turkmenistan | **Eliminated** | **Eliminated** |
| Ukraine | **Endemic** | **Endemic** |
| United Kingdom of Great Britain and Northern Ireland | **Interrupted 24 months** | **Eliminated** |
| Uzbekistan | **Interrupted 24 months** | **Interrupted 24 months** |

* Interruption of endemic measles virus transmission has been achieved in Austria and the Russian Federation in August/September 2015.
NVC ASU 2016 data will be used by RVC to reassess the status and period of interrupted endemic transmission.

**Table 2. Number of Member States of the WHO European Region by measles and rubella elimination status 2015**

| Country status | Measles | Rubella |
|---|---|---|
| Eliminated | **24 (45%)** | **24 (45%)** |
| Interrupted 24 months | **9 (17%)** | **9 (17%)** |
| Interrupted 12 months and Interrupted* | **4 (8%)** | **2 (4%)** |
| Endemic | **14 (26%)** | **16 (30%)** |
| No verification process | **2 (4%)** | **2 (4%)** |
| Total | **53** | **53** |

## Annex 2. Status of measles and rubella elimination in countries of the WHO European Region

**Albania:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Verification process was not initiated. |
| Epidemiology | Zero confirmed measles and rubella cases were reported in 2015. |
| Surveillance performance | All suspected cases were tested for both measles and rubella; 7 measles and 3 rubella cases discarded. |
| Population immunity | Albania reported consistently high coverage with MRCV: MRCV1 coverage was 97.1% and MRCV2 coverage was 97.8% in 2015. Explanation of coverage calculation methodology was not provided. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC commends Albania on the establishment of the NVC and appreciates receipt of reports covering previous years. Based on all reports received, there is no evidence for transmission of endemic measles and rubella for at least the past 3 years. The quality of reports provided, however, could be improved and the RVC looks forward to receiving a higher quality report, including more detailed documentation in the required format, in 2017. The RVC would appreciate receiving greater detail on the methodology used for estimating vaccination coverage. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Andorra:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero confirmed measles, rubella or CRS cases were reported. |
| Surveillance performance | Difficult to assess surveillance performance as no data provided. |
| Population immunity | Reported routine immunization coverage with MRCV1 was 95% and with MRCV2 was 88%. |
| Supplementary information | No high-risk population groups. |
| Specific comments to country | The RVC appreciates the efforts made by the NVC in providing the report and urges additional activities to ensure that MRCV2 coverage remains high. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Armenia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Measles incidence was 11.3/million population, a 3-fold increase compared to 2014. All 33 lab-confirmed cases were classified as not endemic. D8 genotype was detected. Cases occurred nationwide among all age groups over a 5-month period. Most cases were unvaccinated.<br>Zero confirmed rubella and CRS cases were reported. |
| Surveillance performance | All suspected cases are tested both for measles and rubella IgM. Surveillance sensitivity calculations are difficult to interpret due to inconsistent data in the ASU. Classification of measles cases is mostly based on epidemiologic analysis. Genotyping data are not provided in the ASU, but available in MeaNS. |
| Population immunity | Reported MRCV1 and MRCV2 coverage remains >95%. Coverage calculation for MRCV2 is not adequately explained. |
| Supplementary information | The country has conducted the following activities: promotion of immunization among parents; involvement of community leaders in immunization activities; training of health care workers; immunization of unimmunized and adults before travel abroad (target population and coverage not provided). |
| Specific comments to country | The RVC requests clarification on the numerator and denominator used to calculate MRCV2 coverage and updated, detailed information on definitions and standard operating procedures used for CRS surveillance.<br>RVC recommends inclusion of measles genotyping data in future ASUs. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Austria:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 33.5/million population, with 309 cases and 40 outbreaks reported. Most cases were among unvaccinated or persons with unknown immunization status, in all ages. Measles genotypes D8 (different variants) was isolated.<br>Rubella incidence was 0.1/per million population, without rubella genotype isolation.<br>Zero confirmed CRS cases were reported. |
| Surveillance performance | High percentage of measles cases (23%) was classified as clinically compatible. There is discrepancy in the numbers of measles and rubella suspected cases and the number of laboratory-investigated cases. Some surveillance indicators are self-defined and some indicate suboptimal quality of surveillance. Satisfactory rate of viral detection for measles but no genotype information for rubella were provided. |
| Population immunity | Reported MRCV1 was >95% and MRCV2 coverage was 89%, based on vaccination records and vaccine sales data.<br>Subpopulations and different groups with suboptimal immunity are recognized. |
| Supplementary information | The country has conducted the following activities: catch-up vaccinations targeting 15 000 – 30 000 adults (no coverage data); campaign during EIW to raise health care workers' awareness on measles immunization; promotion of MR elimination in population. |
| Specific comments to country | The RVC requests clarification from the NVC on the number of suspected cases laboratory tested for both measles and rubella and reported to the national electronic epidemiological reporting system.<br>The RVC urges activities to improve the quality of measles and rubella surveillance by increasing sensitivity, increasing the rate of laboratory investigation of suspected cases, in-depth analysis of sporadic cases and chains of transmissions, and better documentation to confirm absence of endemic transmission. |
| RVC conclusion for 2015 | **Measles interrupted (2016 data will be used by the RVC to reassess the status and period of interrupted endemic transmission). Rubella interrupted for 12 months.** |

**Azerbaijan:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero confirmed measles, rubella or CRS cases were reported. |
| Surveillance performance | Surveillance sensitivity calculations are difficult to interpret due to inconsistent data in the ASU.<br>Measles and rubella surveillance sensitivity is inadequate (<2/100 000). |
| Population immunity | Reported MRCV1 and MRCV2 coverage remains >95%. It is unclear whether an adequate denominator was used for the MRCV2 coverage calculation (should be children 72–83 months of age, not <6 years of age). |
| Supplementary information | An updated CRS surveillance system was initiated in December 2015.<br>Mop-up MR SIAs have been conducted, targeting >11 000 adult citizens who periodically live and work abroad, and have achieved 95% coverage. |
| Specific comments to country | RVC congratulates Azerbaijan for strengthening CRS surveillance. The RVC requests clarification on the denominator used to calculate MRCV2 coverage and urges strengthening of surveillance in order to raise sensitivity (≥2/100 000). |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Belarus:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Reported measles incidence was <0.1/million population. Genotyping data (B3) were used for classification of cases. One rubella case was reported, classified by genotyping as imported, and no CRS cases were reported. |
| Surveillance performance | Surveillance sensitivity is adequate with a very high rate of discarded cases. Rash and fever surveillance is in place in all 7 provinces. Discarded measles cases are tested for rubella IgM. |
| Population immunity | Reported routine immunization coverage with both MRCV1 and MRCV2 is ≥99%. It is unclear how the denominator used for MRCV2 coverage calculation is defined. |
| Supplementary information | The national system monitors immunization and coverage among refugees/migrants. |
| Specific comments to country | RVC requests clarification on the denominator used to calculate MRCV2 coverage. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Belgium:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Reported measles incidence was 3.6/million population (Brussels 3.4, Flanders 0.9, Wallonia 8.6). 46 cases were confirmed in all 3 provinces in all age groups throughout the year, most of them in Wallonia. Cases occurred among unvaccinated. No nationwide comprehensive rubella surveillance has been established. Zero CRS cases were reported. |
| Surveillance performance | Measles surveillance sensitivity is inadequate (<2/100 000).<br>Some data on rubella are available based on screening of pregnant women. CRS is subject to mandatory notification only in Wallonia, not in Brussels and Flanders. |
| Population immunity | Reported national MRCV1 coverage was 96%, based on annual coverage survey data. MRCV2 coverage is available only from a 2012 coverage survey (Brussels 76%, Flanders 93%, and Wallonia 76%). Results of a new survey are pending. |
| Supplementary information | In April 2016, the Committee for the Elimination of Measles and Rubella (CMER) recommended against establishing a national rubella surveillance system. An MR seroprevalence study was conducted in 2015, the results of which are currently being analysed and will be published shortly.<br>A variety of activities was conducted at subnational level (e.g. dedicated mobile teams to access Traveller/Roma communities, vaccination of asylum seekers born since 1970 at registration centres). |
| Specific comments to country | The RVC urges strengthening of measles surveillance in order to raise sensitivity to the level considered adequate (≥2/100,000) to demonstrate elimination, and establishment of a national integrated routine mechanism for vaccination coverage calculation for all vaccine doses.<br>The RVC continues to call for implementation of WHO resolutions and guidelines recommending establishment of national rubella and CRS surveillance. |
| RVC conclusion for 2015 | Measles endemic. Rubella endemic. |

**Bosnia and Herzegovina:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Country reported 4666 measles cases and 12 rubella cases. Reported measles incidence per million population by entities was 172.1 (the Republika Srpska) and 718.4 (Federation of Bosnia and Herzegovina). Reported rubella incidence per million population by entity was 0.3 (the Republika Srpska) and 3.42 (Federation of Bosnia and Herzegovina). Cases were reported in all age groups. |
| Surveillance performance | Surveillance indicators failed to meet requirements or may have been incorrectly calculated. Measles/rubella surveillance sensitivity is unclear. No data were provided on representativeness of reporting discarded cases. |
| Population immunity | Reported coverage with MRCV1 was 85%, 82.8% and 73% for the Republika Srpska, Federation of Bosnia and Herzegovina and Brcko District respectively; coverage with MRCV2 was 87.6%, 88.2% and 69% respectively. |
| Supplementary information | High vaccine hesitancy and low-performing areas throughout the country. No SIA or other risk mitigation activities were conducted. |
| Specific comments to country | The RVC commends the NVC and health authorities for gathering the data and providing a report under the complex circumstances encountered.<br>The RVC looks forward to receiving a report including more comprehensive data at its next meeting, including improved rates of viral detection. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Bulgaria:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella endemic. |
| Epidemiology | Reported rubella incidence was 0.7/million population, with clinically compatible endemic cases reported, all from one region and among unvaccinated or with one dose of vaccine. Zero confirmed measles cases were reported (with 10 discarded), and zero CRS cases were reported. |
| Surveillance performance | Measles and rubella surveillance sensitivity is unacceptably low (0.1/100 000 for measles and 0.2/100 000 for rubella). No information provided on rubella genotyping. Data suggest that discarded measles cases are not tested for rubella IgM. Inconsistent data on laboratories provided in tables. |
| Population immunity | Reported routine immunization coverage shows a declining trend compared to 2014 (for 2015: MRCV1 – 92%, MRCV2 – 87%). MRCV1 coverage is <90% in 9 of 28 regions; MRCV2 coverage is <90% in 16 of 28 regions. |
| Supplementary information | No information provided. |
| Specific comments to country | RVC urges strengthening of surveillance in order to raise sensitivity (≥2/100 000) and ensure rubella viral detection, and urges efforts and measures to reverse the decline in MRCV coverage at national and subnational levels. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella endemic.** |

**Croatia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 12 months. |
| Epidemiology | Measles incidence was 47.43/million population, with 219 cases among all age groups in period January to June, considered as outbreak and with D8 genotype isolated. Outbreak report was not provided.<br>Zero confirmed rubella and CRS cases were reported. |
| Surveillance performance | There is discrepancy in the numbers of measles and rubella suspected cases and the number of laboratory investigated cases. Rate of discarded cases laboratory investigations and viral detection are suboptimal or calculated incorrectly. No data on rubella surveillance provided. |
| Population immunity | Reported MRCV1 coverage was marginally below 95%, and MRCV2 coverage was >95%, based on administrative annual reports. The MRCV1 or MRCV2 coverage was <90% in four regions. Roma were recognized as a population with suboptimal coverage (estimated size of 17 000, with approximated 50% coverage). |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC requests that the NVC provide clarification of the discrepancy between numbers of measles and rubella suspected and laboratory-investigated cases.<br>More comprehensive ASU with more information on rubella and CRS surveillance, and supplemental information about outbreaks would be appreciated for more precise and in-depth review of the elimination status. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella interrupted 24 months.** |

**Cyprus:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero confirmed measles, rubella or CRS cases were reported. Two suspected rubella cases are pending classification. |
| Surveillance performance | Surveillance sensitivity indicators appear adequate but results from the rubella in pregnancy screening programme are merged with measles and rubella surveillance results and used for calculations. |
| Population immunity | Reported MRCV1 and MRCV2 coverage was <95% in targeted cohorts; however through systematic catch-up activities, coverage with both doses eventually reaches >95% for all birth cohorts (delay in routine immunization). Systematic catch-up immunization interventions are conducted in the 1st and 6th class in primary schools and 3rd class in secondary public schools. System for collecting routine immunization coverage data does not cover all children in the country (private schools are excluded). |
| Supplementary information | CRS-specific investigations conducted on electronic hospital discharge diagnosis records found no missed CRS cases. |
| Specific comments to country | The RVC requests that the NVC of Cyprus exclude the screening programmes' laboratory testing results from disease surveillance quality calculations in the ASU. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Czech Republic:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Measles incidence was 0.57/million population, with 17 suspected cases pending final classification. One small outbreak reported. D8 genotype was isolated in sporadic case.<br>Zero confirmed rubella and CRS cases were reported. |
| Surveillance performance | Surveillance indicators failed to meet most requirements (low rate of discarded cases, viral detection and origin of infection). Rubella surveillance performance and sensitivity is unclear, in absence of suspected cases. |
| Population immunity | Reported MRCV1 and MRCV2 coverage for 2014 was >95%. The coverage survey data for 2015 were not yet available. No population or territories with suboptimal coverage. |
| Supplementary information | National seroprevalence study carried out in 2013 indicates potential susceptibility in population 30-44 years of age. |
| Specific comments to country | The RVC requests from NVC more complete and elaborated information in the ASU, with attention on clarification on the pending suspected measles cases and clarification on the rubella surveillance and its sensitivity.<br>As presented, the quality of measles and rubella surveillance is suboptimal (missing the target of ≥2/100 000 rate of discarded cases for measles and rubella) to classify measles cases by origin and to provide genotyping data for ≥80% measles chains of transmission.<br>The RVC also requests information on estimated immunization coverage in 2015. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Denmark:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella endemic. |
| Epidemiology | Reported rubella incidence was 1.4/million population. Cases occurred in all age groups in 2 provinces over a 4-month period, and were mostly unvaccinated. They were all classified as imported or import-related. No nationwide comprehensive rubella surveillance has been established. Zero CRS cases were reported. |
| Surveillance performance | Measles surveillance is still passive and non-compulsory. Timeliness and completeness of reporting are not monitored (no "zero" reporting), and sensitivity is suboptimal (0.53/100 000). Inconsistent data in the ASU make surveillance sensitivity calculations difficult to interpret. Reporting is mandatory only for cases of rubella during pregnancy and for CRS cases. |
| Population immunity | Reported routine immunization coverage with MRCV1 is 91% and with MRCV2 is 78%. MRCV1 coverage is <90% in 10 regions; MRCV2 coverage is <72% in 11 regions. |
| Supplementary information | To review rubella epidemiology, 2 nationwide rubella serology databases were reviewed (8330 rubella IgM and/or IgG test results from 1870 patients). This revealed 5 rubella IgM positive cases, all with evidence of recent MMR vaccination and no symptoms.<br>Direct reporting of vaccine doses delivered was established in November 2015.<br>The country is planning to establish obligatory suspected measles notification by telephone by the end of 2016. Introduction of rubella surveillance is pending establishment of legal regulations. |
| Specific comments to country | The RVC urges strengthening of surveillance to raise sensitivity (≥2/100 000) and measures to increase MRCV coverage at national and subnational levels (especially with MRCV2).<br>The RVC continues to call for implementation of WHO resolutions and guidelines recommending establishment of national rubella and CRS surveillance. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella endemic.** |

**Estonia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Measles incidence was 3/million population, all 4 cases classified as imported or import-related. D8 genotype was isolated.<br>Zero confirmed rubella and CRS cases were reported. |
| Surveillance performance | Measles surveillance sensitivity is adequate (rate of discarded cases is 3.1/100 000) but rubella surveillance sensitivity is suboptimal (rate of discarded cases is <2/100 000). |
| Population immunity | Reported MRCV1 and MRCV2 coverage was marginally below 95%. The MRCV2 coverage among 14 year olds was <90% in two counties. No subpopulation with suboptimal coverage identified. |
| Supplementary information | The country has conducted the following activities: education of health care workers – immunization providers: education on and promotion of immunization among parents; implementation of different channels for reminding parents on immunization schedule/appointments. |
| Specific comments to country | The RVC commends the NVC and national public health system for responding positively to previous RVC comments and recommendations.<br>The RVC would like to remind the national system of WHO requirements for reporting of measles genotype information to MeaNS. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Finland:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated |
| Epidemiology | Measles incidence was 0.182/million population, with 2 reported cases (imported and of unknown origin). Rubella incidence was 0.729/million population, with 5 reported cases (4 import-related).<br>Single imported CRS case was reported. |
| Surveillance performance | High rate of discarded cases, surveillance appears to be adequate. |
| Population immunity | Reported MRCV1 coverage was 95.4%; MRCV2 coverage was 94.8%. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC commends the NVC on the quality of the report submitted but notes that further details on the immunization status and origin of measles cases would be appreciated. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**France:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 5.7/million population. An outbreak with 230 cases was reported in Alsace. Measles genotypes D8 (most common), D4, B3 and A were isolated. Cases reported in all age groups.<br>With existing rubella in pregnancy and CRI/CRS surveillance, one CRS case and two CRI were reported. Rubella genotype 1E was isolated. |
| Surveillance performance | Suboptimal rates of laboratory investigations for measles.<br>No nationwide comprehensive rubella surveillance has been established.<br>There is discrepancy in the numbers provided in different segments of the ASU. |
| Population immunity | Reported MRCV1 coverage was around 90%, and MRCV2 coverage was <80%, based on administrative data for 2014 (not for 2015). A vaccine coverage survey of 2 year olds documented suboptimal coverage (MRCV1 was 89.6% and MRCV2 was 66.0%) but a coverage survey of 10 year olds documented better coverage (MRCV1 coverage was 97.8% and MRCV2 coverage was 93.5%). |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC cannot evaluate rubella elimination status until nationwide rubella surveillance is established.<br>The RVC requests the NVC to provide clarification of the discrepancy between numbers of measles and rubella suspected and laboratory investigated cases, and at the same time urges improvement in measles surveillance, specifically by increasing the rate of laboratory confirmation of measles cases conducted by WHO-accredited or proficient laboratories.<br>The RVC is concerned with consistently suboptimal coverage with both MRCV doses in the routine immunization programme and urges further actions that would increase coverage, especially with MRCV2. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Georgia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic |
| Epidemiology | Measles incidence was 115.5/million population. Rubella incidence was 26.8/million population. Cases reported among all age groups and throughout all territories. |
| Surveillance performance | Quality of surveillance appears to be adequate. |
| Population immunity | Reported MRCV1 coverage was 96.1% and MRCV2 coverage was 90.9%; 27 territories reported coverage <90%. |
| Supplementary information | Country conducted nationwide mop-up for 2-13 year old population with coverage of 11.4% and SIA targeting 14-29 year old population with coverage of 82.5%. Georgia conducted a survey with preliminary data indicating 91-97% coverage with MRCV1 and 70-89% coverage with MRCV2 in major cities. |
| Specific comments to country | The RVC recognizes the efforts that have been made towards achieving measles and rubella elimination and looks forward to receiving confirmation in the 2017 ASU that these efforts have been effective.<br>The RVC is concerned that 83% of measles cases either have no history of immunization or unknown immunization status and urges efforts to increase vaccination coverage at all administrative levels. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Germany:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 29.8/million population, with 2464 cases and 224 outbreaks reported. The highest incidence was in children ≤ 2 years old, but 37% of cases were among adults 20 years and older. Measles genotypes D8 (most common), B3 and D9 were isolated.<br>Rubella incidence was 1.1/million population, with 89 cases in all age groups. Rubella genotype 2B was isolated.<br>Zero confirmed CRS cases were reported. |
| Surveillance performance | Quality of surveillance cannot be assessed because no or insufficient information was provided on performance of measles, rubella and CRS surveillance (number of suspected cases of measles and rubella not available; rate of discarded rubella cases not available; most of reported rubella cases were only clinically compatible). Information on molecular epidemiology of sporadic measles cases (not part of an outbreak) is incomplete. |
| Population immunity | Based on administrative data and on nationwide school entrance examination for 4-7 year olds in 2014 (not for 2015), reported MCV1/RCV1 coverage was ≥95%, and MCV2/RCV2 coverage was marginally below 95%.<br>Reviewing coverage information for cohort generated from country-wide health insurance claims data, MRCV1 coverage was 95.5-98.3% and MRCV2 coverage was 71.3-88.8% for children aged 24, 36 and 48 months in 2014.<br>Vaccination recommendations for asylum seekers and refugees developed and implemented in federal states. No coverage data available. |
| Supplementary information | Immunity study was conducted in one federal state in 2014-2015, among asylum seekers 12 years and older: measles seropositivity was 60-90%, higher in older age groups but different depending on a person's country of origin.<br>The country has conducted the following activities at national and subnational levels: campaign against vaccine hesitancy; media and information campaigns promoting MR vaccinations, some targeting specific population sub-groups; events during EIW. |
| Specific comments to country | The RVC commends Germany and the NVC for efforts made in recent years aiming at higher population immunity.<br>The RVC also urges further improvement in the quality of measles and rubella surveillance, including the rate of viral detection. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Greece:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 12 months. |
| Epidemiology | One clinically compatible measles case reported as imported (laboratory investigation and genotyping not conducted).<br>Zero confirmed rubella and CRS cases reported. |
| Surveillance performance | Reliability of the surveillance performance indicators and the sensitivity of the surveillance system are questioned, because all of 251 suspected measles and 633 suspected rubella cases were discarded without testing at WHO-accredited or proficient laboratories and no data was provided on the representativeness of reporting discarded measles and rubella cases. |
| Population immunity | Reported routine immunization coverage with MRCV1 is 97.3%, based on national immunization coverage study conducted in 2013 on 2-3 year old children attending preschools. No information for coverage with MRCV2 was provided. No national vaccination registry system exists.<br>Supplementary immunization activities were conducted in 2015 by NGOs targeting immigrants, refugees and residents without national social security, but no coverage results are available. |
| Supplementary information | Special arrangements were made for uninsured children to be vaccinated free of charge. A recommendation was made by the MoH for vaccination of undocumented immigrant/refugee children and young adults. |
| Specific comments to country | The RVC commends Greece for its efforts made in 2015 to eliminate measles and rubella.<br>The RVC urges activities to improve the quality of measles and rubella surveillance by ensuring that all suspected measles, rubella and CRS cases are reported through the mandatory notification system, and by ensuring that specimens from suspected cases are collected and submitted to WHO-accredited/proficient laboratories for investigation and genotyping. The RVC also urges activities to improve documentation of vaccine coverage with timely estimates, and consideration of establishing a national vaccination registry.<br>Development of a National Plan of Action for measles and rubella elimination should be considered for further systematic strengthening of elimination efforts. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella interrupted 24 months.** |

**Hungary:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | No confirmed measles or rubella cases were reported.<br>2 suspected measles and 3 suspected rubella cases were discarded. |
| Surveillance performance | Surveillance sensitivity is low. |
| Population immunity | Reported routine immunization coverage with both MRCV1 and MRCV2 coverage is 99% and has remained high for the last 20 years. Coverage estimates are based on administrative reports from health visitors of children 24-36 months, and school nurses after campaigns among children at grade 6. No high-risk populations were identified. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC commends Hungary for sustaining extremely high levels of population immunity and urges strengthening measles and rubella surveillance to the level considered adequate (≥2/100 000) for documentation of elimination. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Iceland:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 12 months. |
| Epidemiology | No measles, rubella and CRS cases were reported. |
| Surveillance performance | No surveillance indicators presented. WHO-accredited laboratory tested 39 measles and 91 rubella cases, while no suspected cases reported. |
| Population immunity | Reported coverage with MRCV1 was 90% among 1-3 year olds and with MRCV2 was 94% among 10 year olds, based on the national vaccination registry and national statistics. No territories with <90% coverage and no high-risk populations presented. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC urges strengthening of measles and rubella surveillance in order to raise its specificity and sensitivity to the level adequate for documentation of elimination. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella interrupted 24 months.** |

**Ireland:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella eliminated. |
| Epidemiology | Measles incidence was 0.2/million population. One laboratory-confirmed import-related case and one imported case with genotype D8 were identified. Rubella incidence was 0.4/million population with two clinically compatible rubella cases. Zero CRS cases were reported. |
| Surveillance performance | Improvement of the quality of measles and rubella surveillance, with an increased capacity to identify and report suspected and discarded cases. Rates of discarded cases for measles and rubella are suboptimal (1.5 and 0.4 per 100 000 population respectively). |
| Population immunity | Reported MRCV1 coverage was 93%, and MRCV2 coverage was 91.3-91.8%. MRCV1 coverage <90% reported in one 2$^{nd}$ sub-national administrative level, and MRCV2 coverage <90% in 10 others. Unknown coverage among high-risk population groups (Irish travellers, Roma, refugees and migrants). 2014 study estimated 42% coverage in Roma community served by two clinics in the Dublin area. |
| Supplementary information | Work continues in developing a national immunization database. Improved data validation relating to de-notification of cases not meeting case definition and/or negative results. Closer linkage with national reference laboratory on genotyping of cases. |
| Specific comments to country | The RVC commends Ireland for its efforts made in 2015 to reach the measles and rubella elimination goal and to develop a national immunization database.<br>The RVC would appreciate further efforts and actions to achieve and maintain ≥95% coverage with two doses of MRCV in all administrative levels and to improve the reporting of coverage data. The RVC would also appreciate improving the quality and sensitivity of measles and rubella surveillance by increasing the rate of discarded cases (to ≥2/100 000), improving the representativeness of reporting discarded cases of measles and rubella, and ensuring better linkage between laboratory and epidemiological data. |
| RVC conclusion for 2015 | **Measles interrupted for 12 months. Rubella eliminated.** |

**Israel:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Measles incidence was 9.3/million population, with 80 reported cases. Four measles outbreaks reported following importation of viruses B3 (60 cases), D9 (two outbreaks, with 2 and 5 cases) and D8 (3 cases).<br>Rubella incidence was 0.12/million population.<br>Zero CRS cases were reported. |
| Surveillance performance | Timeliness and completeness of reporting was not monitored. No data provided on representativeness of reporting discarded cases and timeliness of investigation. In relation to measles there were several inconsistencies in the numbers presented in the different tables of the ASU report presenting difficulties in evaluating the surveillance sensitivity. |
| Population immunity | There is no data on routine immunization coverage with MRCV1 and MRCV2 for 2014 and 2015; routine immunization coverage for 2012 and 2013 is based on estimates only. |
| Supplementary information | None |
| Specific comments to country | The RVC noted a decline in the quality of ASU for 2015 and request from the NVC to provide missing information and to ensure a high quality reports in the future. The RVC emphasizes the importance of accurate and complete documentation of evidence and indicators requested in the ASU as part of the verification process.<br>The RVC would appreciate further efforts and actions to improve the quality of immunization coverage data, considering introduction of ongoing monitoring of the routine vaccination coverage. The RVC would also appreciate efforts to improve the sensitivity and quality of surveillance for measles and rubella, by documenting timeliness and completeness of reporting, improving the rate of discarded cases (to ≥2/100 000) and collecting data on the representativeness of reporting discarded cases. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Italy:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Reported measles incidence was 3.9/million population. Cases occurred in about half of Italy's 20 regions, throughout the year and mostly among adults older than 20 years (51%) and the unvaccinated. Several variants of B3, D8 and D4 genotypes were confirmed. Reported rubella incidence was 0.4/million population. Zero CRS cases were reported. |
| Surveillance performance | Measles surveillance sensitivity is unacceptably low (0.1/100 000 for measles and <0.1/100 000 for rubella were reported). A significant number of rubella cases was classified as clinically compatible and of unknown origin, and no information was provided on rubella genotyping. Only a small number of specimens/cases was investigated and confirmed by laboratories that are WHO-accredited or that have adequate proficiency, external quality assessment or accreditation status. |
| Population immunity | Reported routine immunization coverage shows a declining trend compared to 2014 (for 2015: MRCV1 – 85%, MRCV2 – 82%). Coverage has fallen every year since 2012. Significantly suboptimal coverage was reported at subnational level (some regions reported coverage <70% for MRCV1 or MRCV2). |
| Supplementary information | Vaccine refusal is increasing.<br>Several projects were initiated in 2015-2016, reflecting renewed national commitment to MR elimination, including improved public and professional education, surveillance performance, lab proficiency and support for under-performing regions.<br>A review of congenital defects reported in hospital discharge records conducted in 2015 revealed 6 cases (2 CRS, 3 CRI and one probable case) not previously reported.<br>Multiple regional initiatives were implemented to vaccinate refugees, migrants, Roma and other high-risk and under-immunized groups, but some coverage results were poor. |
| Specific comments to country | The RVC would appreciate a continued focus on strengthening of MR surveillance, in order to raise sensitivity to the level considered adequate (≥2/100,000) to demonstrate elimination and to ensure rubella viral detection. The RVC urges further measures to reverse the decline in MRCV coverage at national and subnational levels. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Kazakhstan:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 132.5/million population, with 2341 cases. Most cases (73.5%) were unvaccinated or had unknown vaccination status and among 15 years of age and older. Genotypes B3 and D8 were identified in 3 outbreaks. No detailed outbreak reports submitted.<br>Rubella incidence was 0.1/million population with two cases reported; one was laboratory-confirmed and one was a clinically compatible case. Zero CRS cases were reported. |
| Surveillance performance | Timeliness and completeness of reporting, timeliness of investigation and rates of laboratory investigations are adequate. Surveillance sensitivity is adequate for measles (>2/100 000), but not for rubella (<2/100 000). Suboptimal rates of the representativeness of reporting discarded cases. |
| Population immunity | Reported MRCV1 coverage is 99.0% and MRCV2 coverage is 98.4%, based on administrative data. No territories with immunity gaps.<br>SIA with mono-measles vaccine targeting population age 15-19 years old conducted and 881 443 (97% of target population) were immunized. |
| Supplementary information | Actions taken to improve immunization coverage: dynamic reporting of population number by territorial health institutions; activities to increase awareness and knowledge about immunizations, meetings with the representatives of religious organizations organized within the EIW. |
| Specific comments to country | The RVC appreciates the efforts of national public health system in conducting the SIA, and would appreciate if the NCV would provide the outbreak report explaining the susceptible population affected with measles in 2015.<br>The RVC urges strengthening of rubella surveillance in order to raise sensitivity to the level considered adequate (≥2/100 000) to demonstrate elimination, and to increase the representativeness of reporting discarded cases of both measles and rubella. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Kyrgyzstan:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 2985.6/million population due to a large outbreak with 17 779 cases in 2015 (continued from May 2014 until July 2015). Most cases (79%) were unvaccinated or had unknown vaccination status and were 1-29 years of age (66%). D8 genotype was identified.<br>Rubella incidence was 16.7/million population, with 100 reported cases. Only two cases were laboratory confirmed, and 46% of cases were reported in 15-29 year old persons. No information was provided on rubella genotyping.<br>Zero CRS cases were reported. |
| Surveillance performance | Large proportion of cases was classified as clinically compatible (80% for measles and 98% for rubella).<br>Surveillance sensitivity was adequate (>2/100 000) for measles and rubella. |
| Population immunity | Reported MRCV1 coverage was 99.0% and MRCV2 coverage was 95.6%, based on administrative data. No territories with coverage <90% were reported. |
| Supplementary information | Mass immunization campaign with MR vaccine was conducted in March-May 2015 targeting 2 045 518 persons 1-20 years of age. Coverage achieved was 96% and confirmed by independent monitoring. |
| Specific comments to country | The RVC commends Kyrgyzstan for its actions to curtail the measles outbreak with the successful mass immunization campaign with MR vaccine.<br>The RVC would urge better validation of reported immunization coverage, consideration of coverage surveys, and improvement of surveillance with better linkage of epidemiological and laboratory data in case investigation. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Latvia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero confirmed measles, rubella or CRS cases reported, with 19 suspected measles/rubella cases discarded. |
| Surveillance performance | Measles and rubella surveillance sensitivity is inadequate (<2/100 000); the rate of discarded cases in 2015 has declined compared with 2014: for measles from 2.1 to 0.4/100 000 population and for rubella from 1.0 to 0.6/100 000 population. |
| Population immunity | Reported MRCV1 coverage was 96.0% and MRCV2 coverage was 92.0%, based on administrative data, increasing in comparison to 2014. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC stresses to the NVC a need for more complete and elaborated information in the ASU. The accurate documentation of evidence and indicators requested in the ASU is a critical part of the verification process.<br>The RVC believes that urgent efforts and measures should be considered to improve surveillance sensitivity to standards required for elimination. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Lithuania:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 12 months. |
| Epidemiology | Reported measles incidence was 16.9/million population, with 49 local cases and one imported case. Most cases (61%) were 30 years and older. Three outbreaks were reported, the largest one with 30 cases in Kaunas and two smaller ones (one with three cases in Vilnius and one with four cases in Klaipeda). Genotype D8 was identified in one measles case but none of the chains of transmission were genotyped.<br>Zero rubella and CRS cases were reported. |
| Surveillance performance | Most measles cases were laboratory confirmed. Surveillance sensitivity based on rate of discarded cases (>2/100,000) is adequate. |
| Population immunity | Reported routine immunisation MRCV1 coverage was marginally below 95%, and MRCV2 coverage was just >90%. In three counties (Kaunas, Panevezys and Vilnius) MRCV1 was between 91.93%-94.02% and MRCV2 was just <90%. |
| Supplementary information | Requirements of measles and rubella vaccination for entry into preschool facilities were approved by MoH. Public health institutions provided with recommendations aimed at increasing vaccination coverage and strengthening surveillance. National Plan of Action for Measles and Rubella elimination is under development. |
| Specific comments to country | The RVC requests that the NVC provide more detailed and accurate documentation of evidence and indicators requested in the ASU, as this is a critical part of the verification process. More detailed information on outbreaks, including genotyping and linkage with imported cases is required. The NVC should also clarify discrepancies between the tables showing data on the epidemiology of measles and rubella and performance of measles and rubella surveillance.<br>The RVC urges activities on increasing, reaching and maintaining ≥95% coverage with both doses of MRCV in routine immunization and at all administrative levels. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella interrupted 24 months.** |

**Luxembourg:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero measles, rubella and CRS cases were reported. Two suspected measles cases discarded. |
| Surveillance performance | Performance indicators have been incorrectly calculated. Suspected measles cases were tested at a WHO-accredited laboratory. |
| Population immunity | Reported routine immunization MRCV1 coverage was 99%, and MRCV2 coverage was 85.6%, based on national coverage study from 2012. Catch-up vaccination of 798 refugees 14-35 years of age and 80 military recruits >18 years of age was conducted. |
| Supplementary information | CRS is notifiable by physicians, but there is no dedicated screening or surveillance. All refugees are invited for a medical visit and MMR vaccination is proposed, if relevant. |
| Specific comments to country | The RVC requests that the NVC provides more comprehensive ASU with more information on measles, rubella and CRS surveillance, and accurate information on routine immunization coverage, as accurate documentation and indicators requested in the ASU re critical part of the verification process. Surveillance performance indicators for both diseases need to be correctly calculated.<br>The RVC urges activities to improve the quality and sensitivity of measles, rubella and CRS surveillance by ensuring that all suspected cases are reported by health care providers and clinical specimens submitted for laboratory investigation and genotyping. The RVC also urges activities to improve documentation of vaccine coverage and increase availability of coverage data, as well as to increase, reach and maintain ≥95% coverage with both doses of MRCV. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Malta:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Reported measles incidence was 4.67/million population, with 2 confirmed measles cases. No genotyping data were provided. Zero rubella and CRS cases were reported. |
| Surveillance performance | Most surveillance indicators remain unknown. The CRS surveillance was on-going through the Congenital Anomaly Register and ID Control Unit. |
| Population immunity | Reported coverage with MRCV1 was 89.0% and with MRCV2 90.8%. |
| Supplementary information | Delayed reporting from the private sector. Reported hesitancy among parents towards giving MRCV1 before their children reach 3 years of age. Migrants younger than 10 years receive vaccination within 48 hours of arrival. |
| Specific comments to country | The RVC reminds the country of the need to reach and maintain >95% coverage with two doses of MRCV and urges improvement in the timeliness of vaccinations. The RVC also urges improvement in surveillance performance by ensuring better connection between laboratory and epidemiological data for cases, including the collection of specimens adequate for genotyping. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Montenegro:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 12 months. |
| Epidemiology | Reported measles incidence was 16.02/million population with 10 cases classified as import-related and 5 imported cases.<br>Zero rubella and CRS cases were reported. |
| Surveillance performance | Measles and rubella surveillance sensitivity is suboptimal (rate of discarded cases <2/100 000).<br>WHO-accredited and proficient laboratories were not involved in testing specimens. No genotyping data are available. |
| Population immunity | Reported routine immunization MRCV1 coverage has been steadily declining from 88% in 2013 to 64% in 2015. MRCV2 coverage has declined less and was marginally <95% in 2015. In 5 first administrative territories MRCV1coverage was <90% and in 10 territories it was <80%. |
| Supplementary information | Supplementary immunization activities with MMR targeted 1696 unimmunized Roma children 1-10 years of age and achieved 83.14% coverage. |
| Specific comments to country | The RVC urges activities to reach and maintain ≥95% coverage with both doses of MRCV in routine immunization and at all administrative levels. The RVC also recognizes a need to improve the quality and sensitivity of measles and rubella surveillance by increasing the rate of discarded cases to ≥2/100 000 and assuring that at least 80% of clinical specimens are tested by WHO-accredited/proficient laboratories and that positive specimens are submitted for genotyping. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella interrupted 24 months.** |

**Netherlands:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Measles incidence was 0.4/million population, with three import-related and four imported cases, all laboratory confirmed. Genotyping data provided and evidence of absence of endemic transmission.<br>One imported case of rubella and zero CRS were reported. |
| Surveillance performance | Some performance indicators have been calculated incorrectly or not reported. Provided laboratory data were based on results from WHO-accredited laboratories, not including results of tests performed by proficient laboratories. |
| Population immunity | Reported MRCV1 and MRCV2 coverage remains around 95%. Orthodox protestants and students of anthroposophic schools are recognized as high-risk populations. One (out of 12) provinces and 34 (out of 390) municipalities reported <90% coverage for both MRCV doses. |
| Supplementary information | A new strategy implemented in response to a measles outbreak in 2013-2014, with targeted MMR vaccination of 6-14-month-old children in 29 municipalities, has been evaluated and found effective (achieving <90% coverage). |
| Specific comments to country | The RVC requests that the NVC provide a more comprehensive ASU with further information to demonstrate high-quality surveillance and with proper calculation of standard performance indicators as requested in the ASU form. Furthermore, data on laboratory investigation should summarize results obtained from both WHO-accredited and proficient laboratories.<br>The RVC also urges activities to reach and maintain ≥95% coverage with both doses of MRCV at all administrative levels. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Norway:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Measles incidence was 1.2/million population, with 6 reported cases. In addition, there were 8 imported cases. Two small measles outbreaks were reported, and D8 genotype confirmed in one of these. B3 and D8 genotypes were identified in six sporadic cases.<br>Zero rubella and CRS cases were reported. |
| Surveillance performance | Timeliness and completeness of reporting were not monitored.<br>All suspected cases were investigated by WHO-accredited laboratories. Surveillance sensitivity is inadequate (rate of discarded cases was 1.18/100 000 for measles and 0.76/100 000 for rubella). |
| Population immunity | Reported immunization coverage with both MRCV1 and MRCV2 was 95%. Four first-level administrative territories reported MRCV2 coverage of 89%. |
| Supplementary information | From 2015, public health nurses are to monitor whether children have been vaccinated with MRCV2 prior to 16 years of age. |
| Specific comments to country | The RVC urges activities to improve the quality and sensitivity of measles, rubella and CRS surveillance by increasing the rate of discarded cases to ≥2/100 000 and by collecting data and calculating representativeness of reporting of discarded cases. The RVC also urges activities to increase and maintain ≥95% coverage with both doses of MRCV at all administrative levels. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Poland:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Reported measles incidence was 1.27/million population, with 39 endemic cases. D8 genotype was detected in five of six small outbreaks, and together with H1 genotype among sporadic measles cases.<br>Rubella incidence decreased and was 52.6/million population, with 2026 reported cases. No information was provided on rubella genotyping.<br>Zero cases of CRS were reported. |
| Surveillance performance | Timeliness and completeness of reporting is high. Measles surveillance sensitivity is inadequate (rate of discarded cases <2/100 000). The quality of rubella surveillance could not be assessed because no information was provided. A high proportion of cases (33% for measles and 99% for rubella) were classified as clinically compatible. |
| Population immunity | Reported MRCV1 routine immunization coverage was 98.2% and MRCV2 coverage was 96.2%. |
| Supplementary information | Free of charge rubella laboratory testing introduced in 2015, with financial support from MoH. |
| Specific comments to country | The RVC commends Poland for its efforts made in 2015 in financially supporting laboratory testing of reported rubella cases.<br>The RVC stresses to the NVC a need for more complete and elaborated information in the ASU. The accurate documentation of evidence and provision of indicators as requested in the ASU are a critical part of the verification process.<br>The RVC believes that urgent efforts and measures should be considered to improve surveillance sensitivity to standards required for elimination. For rubella, that includes improving the rate of discarded cases (to ≥2/100 000), collecting data on the representativeness of reporting discarded cases and improving the rate of viral detection, as well as establishing an effective surveillance system for CRS. The RVC also urges for promoting the reporting and laboratory testing of suspected cases by health care providers and including private laboratories into the national surveillance network.<br>The RVC believes that development of a National Plan of Action for measles and rubella elimination should be considered for further systematic strengthening of elimination efforts. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Portugal:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero confirmed measles cases reported. Rubella incidence was 0.578/million population, with six clinically compatible rubella cases (unknown origin, among children 1-4 years with zero and one dose RCV) in four of seven administrative regions and without detected epidemiologic links. One imported CRS was reported, with genotype 2B. |
| Surveillance performance | Surveillance performance failed to meet requirements for major indicators (rates and representativeness of discarded cases, timeliness of investigation). All rubella cases are missing epidemiological and laboratory results for most adequate final classification. |
| Population immunity | Reported routine immunization MRCV1 coverage was >95%, based on administrative data from local vaccination registers. MRCV2 coverage assessment for birth cohorts 1997-2007 ranged between 95.5% and 97.7%, in slow decline for birth cohorts after 2001. |
| Supplementary information | Portugal has introduced a centralized IT surveillance system with real time online reporting (SINAVE). Active immunization registries reviews and calls for immunization in place; consultations on immunization needs for travellers; advocacy for and promotion of immunization in schools and with parents have been conducted. |
| Specific comments to country | RVC commends Portugal on introduction of real time online reporting and shares the conclusion of NVC that measles and rubella surveillance indicators need additional effort to improve.<br>The RVC urges for improvement of surveillance, and especially for laboratory investigation of rubella cases that will include molecular genotyping of confirmed cases, what is instrumental for the verification of interrupted transmission. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated** |

**Republic of Moldova:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 24 months. Rubella interrupted 12 months. |
| Epidemiology | Zero confirmed measles, rubella or CRS cases were reported. |
| Surveillance performance | Measles/rubella surveillance sensitivity is suboptimal with rate of discarded cases 1.06/100 000. Representativeness of reporting discarded cases was 60%, below the target of 80%. |
| Population immunity | Reported MRCV1 coverage was 89.7% and MRCV2 coverage was 94.6%, based on administrative reports from subnational level. MRCV1 coverage < 90% was reported in 24 out of 44 administrative territories (range 68.7-89.4%). |
| Supplementary information | No information provided. |
| Specific comments to country | Surveillance performance is difficult to interpret due to inconsistency of data in the ASU.<br>Suboptimal immunization coverage is concerning. The probable negative impact of anti-immunization advocacy in various religious groups and intensive internal migration on immunization coverage needs better analysis and description. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella interrupted 24 months.** |

**Romania:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Reported measles incidence was 0.3/million population and rubella incidence was 0.4/million population, with eight reported cases. Five CRS cases were reported. Rubella and CRS cases were not laboratory confirmed. |
| Surveillance performance | Timeliness and completeness of reporting is high but surveillance sensitivity is inadequate (<2/100 000). Weekly reporting of suspected measles and rubella including zero reporting initiated in February 2015. No information on genotyping provided in ASU. |
| Population immunity | Reported routine immunization coverage for MRCV1 was 85.8%, and for MRCV2 it was 69.4% among 5 years old and 64.4% among 7 years old, what is below recommended and also showing a declining in comparison to previous years. Since April 2015 second dose is shifted from 7 to 5 years of age, and both birth cohorts were targeted in 2015 and 2016. |
| Supplementary information | A study performed in 2015 has shown that population in 27 out of the 42 districts of Romania are at very high and high risk for measles and outbreaks. |
| Specific comments to country | The RVC urges for activities to stop the decline and increase routine immunization coverage with both doses of MRCV, reaching and maintaining ≥95% at all administrative levels.<br>The RVC also urges for improving the quality and sensitivity of surveillance, by increasing the rate of laboratory investigation and confirmation of measles, rubella and CRS, increasing the rate of discarded cases to ≥2/100 000, collecting data on the representativeness of reporting discarded cases and submitting positive specimens to WHO-accredited laboratories for genotyping. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Russian Federation:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic |
| Epidemiology | Measles incidence was 5.8/million population, with 843 confirmed cases. Rubella incidence was 0.2/million population, with 25 confirmed cases. One CRS case was reported. Genotyping data provides no evidence for ongoing transmission of previously endemic D8 (MVs/Republic of Komi.RUS/ 35.13) and D8 (MVs/Rostov on Don.RUS/47.13/2) after July 2015. |
| Surveillance performance | With the exception of measles viral detection (73.5%), all reported surveillance performance indicators meet or exceed targets. |
| Population immunity | Reported routine coverage with MCV1/RCV1 was 97.9%/97.8% and with MCV2/RCV2 was 97.3%/97.1%, based on administrative data from subnational levels. Mop-up and catch-up immunizations with one dose MCV or RCV are being implemented in various groups to improve population immunity. |
| Supplementary information | Monitoring of timeliness and completeness of control and response activities when measles cases/outbreaks are reported and continuous monitoring of surveillance performance. Comprehensive analysis of surveillance data conducted, connecting genotyping and epidemiological data. Development of country-based IT surveillance reporting system for measles and rubella. |
| Specific comments to country | The RVC commends national system for responding positively to previous RVC comments and for the quality of the work being undertaken. Molecular genotyping of measles and rubella viruses is instrumental for the verification of transmission chains, was conducted at high level, and should maintain priority. The RVC looks forward to confirmation of the status and period of interrupted measles endemic transmission in the 2016 ASU. |
| RVC conclusion for 2015 | **Measles interrupted (2016 data will be used by the RVC to reassess the status and period of interrupted endemic transmission). Rubella interrupted for 12 months.** |

**Serbia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 53.7/million population, predominantly among unvaccinated (43.1%) or those with unknown immunization status (45.2%). Genotyping data shows strong dominance of D8 Rostov on Don (n=83). Rubella incidence was 1.4/million population, with 10 cases for which no data on age or immunization status were provided.<br><br>Zero confirmed CRS cases were reported. |
| Surveillance performance | Two indicators of measles surveillance performance, representativeness of reporting discarded cases (44%) and viral detection (50%) are significantly suboptimal; despite rate of 2.23 discarded cases per 100 000 in outbreak year, measles surveillance sensitivity is inadequate. Nationwide comprehensive rubella surveillance was not yet established, and quality of rubella surveillance cannot be assessed because no information was provided on rubella surveillance indicators and on CRS surveillance. |
| Population immunity | Reported MRCV1 coverage was 84% and MRCV2 coverage was 87.5%, and 15 out of 25 administrative territories reported MRCV1 and MRCV2 less than 90%. Decreasing trend in coverage continued. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC commends national system in Serbia on the expansion of genotyping of confirmed measles cases but would like to stress that more comprehensive ASU with information on rubella and CRS surveillance, and supplemental information about outbreaks would be appreciated for more precise and in-depth review of the elimination status. The RVC notes apparent discrepancies in surveillance data provided and emphasizes the requirement to link information on suspected cases with results of laboratory investigations.<br><br>RVC urges further efforts and measures to be taken to reverse the decline in MRCV coverage at national and subnational levels, and consideration be given to conducting supplementary immunization activities to boost population immunity and prevent further outbreaks. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Slovakia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero confirmed measles, rubella or CRS cases were reported. |
| Surveillance performance | Difficult to interpret surveillance performance due to insufficient information provided. Only one suspected measles case tested negative for measles IgM. |
| Population immunity | Reported routine immunization coverage with MRCV1 was 95.2% and with MRCV2 was 97.6%, based on administrative reports from sub-national level. Coverage is in slow, steady decline since 2012. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC requests from NVC to provide more comprehensive ASU in future, which will include data about discarded suspected cases with results of laboratory investigations (line list) and routine immunization coverage data at subnational administrative level (coverage with MRCV1 and MRCV2 in children 10 years of age, for first or other sub-national administrative level). This would allow more precise and in-depth review of the elimination status.<br>The RVC would appreciate continued activities to sustain high routine vaccination coverage. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Slovenia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Eighteen measles cases were reported, with genotyping data showing dominance of D8 Rostov on Don virus variant. Most cases were associated with importation.<br>Zero cases of rubella and CRS reported. |
| Surveillance performance | Measles surveillance quality appears adequate. Low sensitivity of rubella surveillance. |
| Population immunity | Reported MRCV1 immunization coverage was 93.5% and MRCV2 coverage was 95.8%. The coverage indicators were lower in the capital and in anthroposophic schools. |
| Supplementary information | Endemic measles cases were last reported more than 15 years ago. No rubella cases were reported in the last 8 years. |
| Specific comments to country | The RVC commends Slovenia for providing excellent laboratory information. The RVC urges increasing of population immunity by further improving MRCV1 vaccination coverage and addressing known immunity gaps. The RVC believes that consideration should be given to implementation of additional approaches for strengthening the sensitivity of rubella surveillance. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**Spain:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 24 months. |
| Epidemiology | Measles incidence was 0.80/million population, with 37 cases and 4 small outbreaks. Majority of measles cases had either no (20) or unknown number (8) of MCV doses. Rubella incidence was 0.09/million population with 3 lab-confirmed cases. Zero CRS cases were reported. |
| Surveillance performance | Surveillance performance failed to meet requirements for major indicators; rate of discarded cases for measles was 0.17/100 000 population and for rubella it was 0.05/100 000 population. Representativeness of reporting discarded cases not stated. Measles chains of transmission and sporadic cases were adequately genotyped and reported to MeaNS database. One rubella case was genotyped as 2B but sequence not provided to RubeNS database. |
| Population immunity | Reported routine immunization coverage with MRCV1 was 96.1% and with MRCV2 was 94.2%, based on administrative data from subnational level. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC commends Spain for the well-performing laboratory segment of surveillance, with confirmation of cases that included molecular genotyping, and invites continuation of this good practice for documenting interrupted virus transmission.<br>The RVC invites further urgent actions to address immunity gaps in older age groups, health care workers and migrant workers and would appreciate information on these activities. The RVC believes that efforts should be made to harmonize regional methods of estimating vaccination coverage to produce a more coherent national coverage estimate. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella eliminated.** |

**Sweden:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella interrupted 12 months. |
| Epidemiology | Reported measles incidence was 1.4/million population, 5 outbreaks reported. All cases classified as imported.<br>Zero rubella and CRS cases were reported. |
| Surveillance performance | Surveillance sensitivity is adequate with a very high rate of discarded cases. Timeliness and completeness of reporting are 100%. |
| Population immunity | Reported routine immunization coverage with MRCV1 was 97.5%. No information provided on MRCV2 coverage due to change in methodology. However, the coverage historically exceeds 95%. |
| Supplementary information | Vaccine hesitancy is high among the immigrant and anthroposophic populations. |
| Specific comments to country | The RVC commends Sweden for actions taken to address immunity gaps in at-risk migrant populations. Information on the coverage achieved with MRCV2 would be greatly appreciated. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella interrupted 24 months.** |

**Switzerland:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 3.5/million population, with 35 confirmed cases affecting 12 cantons and including those in three recorded outbreaks between July and September. Most cases were >15 years old and unvaccinated (93%). Measles genotypes were D8, H1 and B3.<br>Rubella incidence was 0.36/million population, with 3 confirmed rubella cases. Genotyping for rubella was not conducted.<br>Zero confirmed CRS cases were reported. |
| Surveillance performance | Surveillance failed to meet requirements for most indicators (rate of discarded measles cases was 0.12/100 000 of population; representativeness of reporting discarded cases was 0%). Nationwide comprehensive rubella surveillance not yet fully established and only laboratory confirmed cases of clinical rubella are considered. Genotyping was conducted for 33% of measles cases and not for rubella cases. All measles and rubella laboratory results are from proficient labs. |
| Population immunity | Reported national routine immunization coverage was MCV1/RCV1:94.1%/93.9% and MCV2/RCV2: 89.2%/88.9%. Six cantons reported coverage of <90% for both doses. A telephone survey indicated that coverage with one dose is 97% and with at least two doses is 87.3% among adults 20–29 years of age. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC encourages Switzerland to focus on closing the immunity gaps, especially by increasing MRCV2 coverage. The RVC urges genotyping of ≥80% of rubella chains of transmission. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Tajikistan:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 24 months. Rubella interrupted 24 months. |
| Epidemiology | Measles incidence was 0.03/million population, with three confirmed imported measles cases. Rubella incidence was 0.01/million population, with one confirmed rubella case. 43 suspected cases investigated for both diseases.<br>Zero CRS cases were reported. |
| Surveillance performance | The rate of discarded cases for both measles and rubella is low (0.05/100 000) with questionable representativeness of discarded measles (67.0) and rubella cases (83.3). All tests are performed in the WHO accredited laboratory. The timeliness of reporting and investigation was 100%. The genotyping was not performed for either measles or rubella confirmed cases. |
| Population immunity | Reported administrative immunization coverage with MRCV1 was 97.0% and with MRCV2 was 94.1%. The reported coverage for MRCV2 dropped from 97.7% in the previous year. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC commends the national system for achievements.<br>The RVC emphasizes to the NVC that a more comprehensive ASU with more information on rubella and CRS surveillance is critical for precise and in-depth review of the elimination status. The RVC also noted that the Roma population is recognized as a high-risk group, and requests from the NVC more elaborated information on immunity gaps in this population and on any specific efforts made to address these gaps.<br>The RVC urges strengthening of CRS surveillance and establishment of a comprehensive nationwide system, to ensure confidence in the rubella elimination status. In addition, continued strengthening of measles and rubella surveillance to the level required for verification of disease elimination, including genotyping of ≥80% of measles and rubella chains of transmission is immediately needed. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated.** |

**The former Yugoslav Republic of Macedonia:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella interrupted for 12 months. |
| Epidemiology | Zero measles cases were reported, which is a dramatic decline in incidence (56.2/million population in 2014). Four suspected cases of measles were discarded. Zero rubella and CRS cases were reported. |
| Surveillance performance | The data submitted in the ASU does not present a clear picture of surveillance and its performance. The standard surveillance performance indicators were not presented. An alternate surveillance indicator (rate of cases tested negative for measles and rubella) was 0.82. |
| Population immunity | Reported administrative MRCV1 coverage was 88.8% and MCV2 coverage was 93.4%. Despite the high national reported coverage, 8 administrative territories had MRCV1 coverage < 90% and 2 administrative territories had <90% for both doses. No high risk population groups identified. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC requests from the NVC a clarification of the numerator and denominator used to calculate MRCV coverage. The RVC insists that a more comprehensive ASU with more information on rubella and congenital rubella syndrome (CRS) surveillance is critical for precise and in-depth review of the elimination status.<br>The RVC urges establishment of an integrated mechanism for calculation of the national immunization coverage. The RVC also urges improvement in performance and in reporting of measles, rubella and CRS surveillance data, as well as strengthening of the CRS surveillance system. |
| RVC conclusion for 2015 | **Measles interrupted for 12 months. Rubella interrupted for 24 months.** |

**Turkey:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Measles incidence was 3/million population with 342 confirmed cases. Eight outbreaks in two territories were reported. The measles genotypes B3 and D8 were identified; D8 has been endemic since 2013.<br>Rubella incidence was 0.2/million population with 16 cases. No genotype data were available for rubella.<br>Zero confirmed CRS cases were reported. |
| Surveillance performance | All maculopapular rash cases tested irrespective of fever. High quality surveillance for measles with high rate of discarded measles and rubella cases (3.9/100 000 population), although it is difficult to assess rubella surveillance performance with the data submitted in the ASU. |
| Population immunity | Reported national routine immunization MRCV1 coverage was 97% and MRCV2 coverage was 86%; 56 provinces had MRCV2 <90% and 4 provinces had both MRCV1 and MRCV2 <90%. |
| Supplementary information | National and subnational mop-ups and follow-ups in the Syrian refugee camps and kindergartens along with catch-up campaigns for military personnel and healthcare workers. MMR and polio vaccination were both offered in the refugees camps. |
| Specific comments to country | The RVC would request NVC's clarification of the numerator and denominator used to determine MRCV coverage.<br>The RVC urges that the quality of rubella surveillance be further improved and strengthened nationwide, including genotyping of ≥80% of rubella chains of transmission.<br>The RVC commends the national health system for immunization activities targeting the approximately three million Syrian refugees in the country. The RVC noted with concern suboptimal coverage with second dose of MRCV and the immunity gap in a substantial number of administrative territories, and urges activities to address these issues. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**Turkmenistan:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles eliminated. Rubella eliminated. |
| Epidemiology | Zero confirmed measles, rubella or CRS cases were reported. |
| Surveillance performance | All surveillance performance indicators met requirements in 2015. The rate of discarded cases for both measles and rubella was 6.3/100 000, with 377 suspected cases tested in the WHO-accredited laboratory and discarded. The investigation and reporting rates were 100%. |
| Population immunity | Reported national administrative immunization coverage is uniformly high (99.6% - 99.7%) for both doses of measles and rubella containing vaccine. |
| Supplementary information | No information provided. |
| Specific comments to country | The RVC commends Turkmenistan and NVC for their high level of commitment displayed, and the national health system for its accomplishments in the elimination of measles and rubella and for maintaining exemplary immunization coverage. |
| RVC conclusion for 2015 | **Measles eliminated. Rubella eliminated** |

**Ukraine:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles endemic. Rubella endemic. |
| Epidemiology | Reported measles incidence was 2.4/million population, with 105 cases identified in 15 regions throughout country/year. Reported rubella incidence is 5.8/million population, with cases identified in almost all but six regions. Genotyping not conducted. |
| Surveillance performance | Surveillance indicators failed to meet requirements or may have been incorrectly calculated, so surveillance sensitivity for both diseases is unclear. No data provided on representativeness of reporting discarded cases. |
| Population immunity | Reported routine immunization coverage with MRCV was 56% and with MRCV2 was 57%, based on administrative data and considered uncertain. Continuous and steep decline since 2009. |
| Supplementary information | Additional data from serological surveys in 2015 are provided but contain no specification regarding measles or rubella, and age of the population surveyed. |
| Specific comments to country | The RVC notes with concern that urgent action is required to raise measles and rubella immunization status in all age and population groups without documented immunity and firmly encourages consideration of supplementary immunization activities to close existing immunity gaps. Measles and rubella surveillance needs to be strengthened and better documented. Measles and rubella genotyping should be conducted. |
| RVC conclusion for 2015 | **Measles endemic. Rubella endemic.** |

**United Kingdom of Great Britain and Northern Ireland:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 24 months. |
| Epidemiology | Measles incidence was 1.08/million population, with 90 confirmed cases in 7 outbreaks. All the confirmed measles cases were unvaccinated. The identified genotypes were B3, D4, D8 and H1. Rubella incidence was 0.02/million population, with 3 reported cases. The identified rubella genotype was 2B.<br>2 CRS cases were reported, imported and import-related. |
| Surveillance performance | Most surveillance performance indicators for measles met requirements at country level. However rate of discarded measles cases was 0.9/100 000 and the rate of discarded rubella cases was 0.2/100 000 in Northern Ireland; rate of discarded rubella cases was 0.6/100 000 in Wales. Almost all measles, rubella and CRS cases were tested by WHO-accredited labs or proficient labs. The timeliness in investigation and reporting of the cases is 100%. |
| Population immunity | Reported routine immunization coverage with MRCV1 was 94.8% and with MRCV2 was 89.3%. Seven subnational administrative territories have MRCV2 coverage less than 90%. The national system has established electronic returns on immunization uptake for both MRCV doses by 5th birthday. |
| Supplementary information | Screening for rubella susceptibility of pregnant women ceased in England from 1 April 2016. |
| Specific comments to country | The RVC commends the United Kingdom and the NVC for achieving rubella elimination and sustaining interruption of endemic transmission of measles. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella eliminated.** |

**Uzbekistan:** Status of measles and rubella elimination in 2015

| Component | RVC comment |
|---|---|
| RVC conclusion for 2012-2014 | Measles interrupted 12 months. Rubella interrupted 12 months. |
| Epidemiology | Measles incidence was 0.07/million population, with 22 confirmed imported cases. The identified genotype lineage was D8 (MVI/Villupuram/IND/03.07).<br>Zero confirmed rubella and CRS cases were reported. |
| Surveillance performance | The rate of discarded measles case was 0.16/100 00 and of discarded rubella cases was 0.03/100 000. The timeliness in investigation and reporting of the cases was 100%. |
| Population immunity | Uniformly high reported national administrative immunization coverage for MRCV1/MRCV2 (99.9%), as in previous years. National mop-up campaign with MMR reached around 650 000 children under 2 years old (99.8%). |
| Supplementary information | Investigation for rubella of children < 1 month of age with congenital disorders has been initiated. |
| Specific comments to country | The RVC requests clarification of the numerator and denominator used to calculate MRCV coverage and urges establishment of an integrated mechanism for calculation of national immunization coverage. The RVC also urges improvement in the quality and reporting of measles, rubella and CRS surveillance. |
| RVC conclusion for 2015 | **Measles interrupted 24 months. Rubella interrupted 24 months.** |

**Annex 3: List of participants**

**RVC Members**

Dr Gunter M. Pfaff (Chair), Germany

Dr Robin Biellik, Switzerland

Dr Irja Davidkin, Finland

Professor Mira Kojouharova, Bulgaria

Dr Andrei Lobanov, Russian Federation

Dr José Ignacio Santos Preciado, Mexico

Dr John Simpson, United Kingdom of Great Britain and Northern Ireland

Dr Robert Linkins, United States of America

Professor Susanna Esposito, Italy (not able to attend)

**ECDC Representative**

Dr Sabrina Bacci

Dr Robert Whittaker

**Rapporteur**

Dr Raymond Sanders, United Kingdom of Great Britain and Northern Ireland

**WHO headquarters**

Dr Minal Patel

**WHO Regional Office for Europe**

Dr Nedret Emiroglu, Director, Division of Health Emergencies and Communicable Diseases

Mr Robb Butler, Programme Manager, Vaccine-preventable Diseases and Immunization

Dr Niyazi Cakmak

Dr Patrick O'Connor

Dr Sergei Deshevoi

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Dr Myriam Ben Mamou

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Dr Siddhartha Sankar Datta

Ms Malika Abdusalyamova

## The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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