

# Meeting Report

## Second Meeting of the Regional Verification Commission for Measles Elimination and Workshop on Verification of Measles Elimination



18–22 March 2013  
Manila, Philippines



Participants of the Workshop on Verification of Measles Elimination  
20–22 March 2013, Manila, Philippines



Participants of the Second Meeting of the  
Regional Verification Commission for Measles Elimination  
18–19 March 2013, Manila, Philippines

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**REPORT**

**SECOND MEETING OF THE  
REGIONAL VERIFICATION COMMISSION FOR MEASLES ELIMINATION AND  
WORKSHOP ON VERIFICATION OF MEASLES ELIMINATION**

Convened by:

WORLD HEALTH ORGANIZATION  
REGIONAL OFFICE FOR THE WESTERN PACIFIC

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#### NOTE

The views expressed in this report are those of the participants in the Second Meeting of the Regional Verification Commission for Measles Elimination and Workshop on Verification of Measles Elimination held from 18 to 22 March 2013, and do not necessarily reflect the policies of the World Health Organization.

This report has been prepared by the World Health Organization Regional Office for the Western Pacific for governments of Member States in the Region and for the participants in the Second Meeting of the Regional Verification Commission for Measles Elimination and Workshop on Verification of Measles Elimination held from 18 to 22 March 2013, Manila, Philippines.

## SUMMARY

The Second Meeting of the Regional Verification Commission (RVC) for Measles Elimination was held in Manila, Philippines, from 18 to 19 March 2013, and was immediately followed by the Workshop on Verification of Measles Elimination from 20 to 22 March 2013.

The main purpose of the Second RVC meeting was to finalize the Guidelines on Verification of Measles Elimination in the Western Pacific Region, and to prepare presentations to orient the chairpersons of national verification committees (NVCs) in the workshop that followed. The RVC reviewed the progress in the Region and then discussed in detail the verification principles, structure, process, criteria and lines of evidence. There was a series of presentations on the three verification criteria and five lines of evidence for verification, which resulted in much useful discussion. The RVC was careful to point out that individual lines of evidence should be evaluated together to assess if verification criteria have been met; a line of evidence should not be considered alone or separately. In addition, the RVC discussed how countries will be expected to provide documentation toward measles elimination in the form of an annual progress report from each NVC to the RVC. It was agreed that this topic would be presented to the NVC chairpersons. Eventually, for regional verification of elimination, all countries will be expected to show evidence to confirm the absence of endemic measles transmission for at least 36 consecutive months.

The Workshop on Verification of Measles Elimination was aimed at providing orientation on the Guidelines on Verification of Measles Elimination to NVC chairpersons, national immunization programme (NIP) managers, and measles surveillance focal points. In addition, the workshop provided training on how to respond to the challenges faced in measles elimination, as expressed in the new Measles Elimination Field Guide. After achieving consensus on the verification process during the RVC meeting, the RVC presented the process to the workshop participants. The Field Guide was presented in detail by members of the Secretariat. The participants welcomed the guidance contained in the Field Guide on various practical solutions to close immunity gaps, enhance outbreak preparedness and response, and close surveillance gaps. The Field Guide will also be used as a source of standard definitions, surveillance and laboratory indicators.

A very useful contribution to the meeting was made by the Chinese Center for Disease Control and Prevention, who shared China's experience in pilot testing the provincial measles verification report and gave an example of the report from Guizhou Province. The results of their experience were most enlightening for the workshop participants.

The two meetings concluded with action points for WHO, the countries and the RVC. An annual progress report will be expected to be submitted to the RVC from each of the NVCs annually. Some countries will be ready in 2012 to submit evidence consistent with measles elimination. Other countries still have measles transmission and are encouraged to close immunity gaps, while all countries should be prepared to take rapid action in response to new measles outbreaks.

## LIST OF ACRONYMS

CDC	Centers for Disease Control and Prevention
CRS	Congenital rubella syndrome
EPI	Expanded Programme on Immunization
GSL	Global Specialized Laboratory
MCV1	First dose of measles-containing vaccine
MCV2	Second dose of measles-containing vaccine
MR	Measles and rubella
NIP	National Immunization Programme
NVC	National Verification Committee
RC	Regional Committee
RRL	Regional Reference Laboratory
RVC	Regional Verification Commission
SAGE	Strategic Advisory Group of Experts
SIA	Supplementary Immunization Activity
SRVC	Subregional Verification Committee for the Pacific island countries and areas
TAG	Technical Advisory Group on Immunization and Vaccine-Preventable Diseases in the Western Pacific Region
WHO	World Health Organization
WPR	Western Pacific Region

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## 1. INTRODUCTION

The Second Meeting of the Regional Verification Commission (RVC) for Measles Elimination was held in Manila, Philippines, from 18 to 19 March 2013, and was immediately followed by the Workshop on Verification of Measles Elimination, from 20 to 22 March 2013. The Second RVC meeting was organized to finalize the Guidelines on Verification of Measles Elimination in the Western Pacific Region. The workshop was organized to provide orientation for national counterparts on both the regional verification guidelines and the Measles Elimination Field Guide and to assist countries in implementing and adapting the new guidelines in accordance with their local situations.

### 1.1 Objectives

The objectives of the Second Meeting of the Regional Verification Commission for Measles Elimination were:

- (1) to build on the existing consensus and finalize the Guidelines on Verification of Measles Elimination in the Western Pacific Region;
- (2) to provide practical guidance and develop a template for verification documentation, as part of the regional verification guidelines; and
- (3) to prepare for the orientation of national verification committee (NVC) chairpersons on:
  - (a) Guidelines on Verification of Measles Elimination in the Western Pacific Region;
  - (b) preparation for national documentation for verifying measles elimination; and
  - (c) preparations for the Workshop on Verification of Measles Elimination.

The objectives of the Workshop on Verification of Measles Elimination were:

- (1) to accelerate the progress towards achieving, sustaining and verifying measles elimination at country and regional levels;
- (2) to provide orientation on the Guidelines on Verification of Measles Elimination in the Western Pacific Region;
- (3) to provide guidance on the preparation of national progress/verification reports on measles elimination; and
- (4) to provide training on adapting and implementing the new Measles Elimination Field Guide.

## 1.2 Organization

The participants of the Second Meeting of the Regional Verification Commission (RVC) for Measles Elimination (18–19 March 2013) included 12 of the 14 members of the RVC, and 26 members of staff from WHO country offices, the WHO Regional Office for the Western Pacific and WHO Headquarters. The participants of the Workshop on Verification of Measles Elimination (20–22 March 2013) included 12 of the 14 members of the RVC, 39 national officers from 15 countries and areas, 26 members of staff from WHO country offices, the WHO Regional Office for the Western Pacific and WHO Headquarters. The timetables of the meeting and workshop are provided in Annex 1 and the lists of participants in Annex 2.

## 1.3 Opening remarks

The Second Meeting of the Regional Verification Commission for Measles Elimination was opened by the Acting Regional Director, Dr Han Tieru, who gave the opening remarks on behalf of the Regional Director, Dr Shin Young-soo. Dr Han welcomed the members of the Regional Verification Commission for Measles Elimination and the Chairperson of the Subregional Committee for the Certification of Poliomyelitis Eradication in the Pacific island countries and areas. He reminded the participants of the many important steps and consultations leading up to the meeting, which should serve to finalize the guidelines for measles elimination in the Region. He stated that the meeting and the workshop that followed would help sharpen the tools and refine the approach that would be used to finally rid the Region of measles.

The Workshop on Verification of Measles Elimination was opened by Dr Shin Young-soo, WHO Regional Director for the Western Pacific. Dr Shin welcomed the chairpersons of the national verification committees, the Regional Verification Commission and the Chairperson of the Subregional Committee for the Certification of Poliomyelitis Eradication in the Pacific island countries and areas, together with the WHO partners present. He reminded participants that measles cases had decreased by 55% from 2011 to 2012, after an 86% reduction from 2008 to 2011. Furthermore, of the 37 countries and areas in the Region, 33 may have already interrupted endemic measles transmission and 27 may be ready to initiate the verification process because they have been free of endemic measles for more than three years. During its sixty-third session in September 2012, the Regional Committee for the Western Pacific endorsed a resolution calling for interruption in endemic measles transmission as soon as possible and for Member States to intensify their efforts to overcome remaining and emerging challenges. To turn the resolution into action, the technical unit at the Regional Office developed the Measles Elimination Field Guide. The Field Guide provide national immunization programmes with practical strategies and proven approaches and highlight three essential areas to ensure success: to close immunity gaps; to rapidly respond to outbreaks; and to strengthen surveillance to identify every child affected with measles, not just those in health facilities, but even those in the community. The Regional Verification Commission will provide guidance in verifying measles elimination by country and eventually for the whole Region.

## 1.4 Appointment of Chairperson, Vice-Chairperson and Rapporteur

Dr David Durrheim, Professor of Public Health at the University of Newcastle District, New Zealand, was nominated as Chairperson, Dr Hiroshi Yoshikura, Adviser, Department of Food Safety, Ministry of Health, Labour and Welfare, Japan, as Vice-Chairperson, and Dr Maria Capeding, Head, Department of Microbiology of the Research Institute for Tropical Medicine, Philippines, as Rapporteur for both the meeting and the workshop.

## 2. PROCEEDINGS

### 2.1 Second Meeting of the Regional Verification Commission for Measles Elimination

#### 2.1.1 Meeting objectives

Dr Durrheim complimented the Secretariat for working extremely hard to achieve the progress made on the Guidelines on Verification of Measles Elimination. He mentioned the RVC's important role in keeping progress toward measles elimination on track.

He briefly mentioned the objectives of the meeting: to refine the Guidelines on Verification of Measles Elimination in the Western Pacific Region to provide a standard guideline that countries can adapt, and to provide orientation to NVC Chairpersons.

Moreover, at the end of the meeting, aside from finalizing the Guidelines on Verification of Measles Elimination in the Western Pacific Region, the RVC was expected to provide good, crisp and informative presentations to the NVCs.

#### 2.1.2 Global and regional update on measles and rubella

Dr Sergey Diorditsa, Team Leader, Expanded Programme on Immunization, WHO Regional Office for the Western Pacific, provided a global and regional update on measles and rubella. Globally and regionally, remarkable progress is being made in measles elimination and control of rubella/CRS. At the global level, the number of reported measles cases decreased from 800 000 cases in 2000 to 300 000 cases in 2011, and the WHO Region of the Americas has already eliminated measles. The number of cases decreased in the African Region from 2000 to 2008 but there was a relative resurgence in 2009 until 2011. The Western Pacific Region is on the edge of achieving elimination, with only 5.9 cases per million population in 2012 compared with 81.6 per million in 2008, a 93% reduction over the five-year period.

Nearly 100% of the countries in the American and European Regions are now using rubella vaccine, while the Western Pacific Region is making steady progress in its introduction. Only six countries in the Western Pacific Region had not yet introduced rubella-containing vaccine in 2011 (Cambodia, the Lao People's Democratic Republic, Papua New Guinea, Solomon Islands, Vanuatu and Viet Nam). In 2011, the Lao People's Democratic Republic conducted a measles rubella campaign, and Solomon Islands did so in 2012. Both countries are introducing rubella-containing vaccine in their routine immunization programmes in 2013. Three countries are scheduled to conduct measles and rubella (MR) campaigns in 2013 (Cambodia, Vanuatu and Viet Nam) and Papua New Guinea is currently conducting rubella and congenital rubella syndrome (CRS) burden-of-disease studies.

The decreasing trend in measles cases in the Western Pacific is due to the concerted efforts made throughout the Region. In 2005, the Region set 2012 as the target year to eliminate measles and that date was re-affirmed in 2010 and 2012 through Regional Committee resolutions.

The Region has made exemplary progress in vaccination coverage. In 2011, the Western Pacific Region, along with the European Region and the Region of the Americas exceeded the 95% target for national coverage with the first dose of measles-containing vaccine. While the target for coverage for two doses of measles-containing vaccine is increasing, however, the Region has yet to reach the target of  $\geq 95\%$ . Globally, there was a scaling up of vaccination

activities during measles supplementary immunization activities from 1999 to 2011 due to the commitment and support of national governments and partners.

Surveillance is improving steadily in the Region, but challenges still remain in addressing case-detection rates below national levels and the proportion of cases that are clinically confirmed without laboratory testing.

### 2.1.3 Global framework for verifying elimination of measles and rubella

Dr Peter Strebel, Group Leader, Expanded Programme on Immunization, Department of Immunization, Vaccines and Biologicals, WHO Headquarters, presented an overview of the global framework for verifying elimination of measles and rubella. The global framework comprises basic principles, a standard set of definitions, case classifications, essential criteria, surveillance indicators and lines of evidence for verification of measles and rubella elimination. The framework provides global standards for monitoring progress towards and documenting achievement of elimination. It was designed for settings where the aim is to interrupt transmission of both measles and rubella, and the revisions to all the elements are tailored to that context. In settings where elimination is not the target and measles and/or rubella are still endemic, different definitions and indicators may be appropriate.

Several approaches were taken to develop the framework. A subgroup of the Strategic Advisory Group of Experts (SAGE) Working Group on Measles and Rubella, which included representatives from the WHO Regional Offices in Europe, the Eastern Mediterranean, the Americas and the Western Pacific, was convened and developed a standard set of definitions, basic principles, essential criteria and lines of evidence for verification of measles and rubella/CRS elimination. The definitions and criteria were based on the Pan American Health Organization (PAHO) experience and these were adapted according to the experiences of other Regions. These developments were presented and discussed at the meeting of the SAGE Working Group on Measles and Rubella on 20 September 2012, endorsed by SAGE in November 2012, and published in the *Weekly Epidemiological Record* in March 2013.

Dr Strebel pointed out two considerations: (1) the framework focuses only on monitoring progress towards elimination of measles and rubella; and (2) it is directed towards countries that are in the elimination phase and are trying to interrupt endemic transmission. It does not cover definitions and surveillance indicators for determining the elimination of CRS.

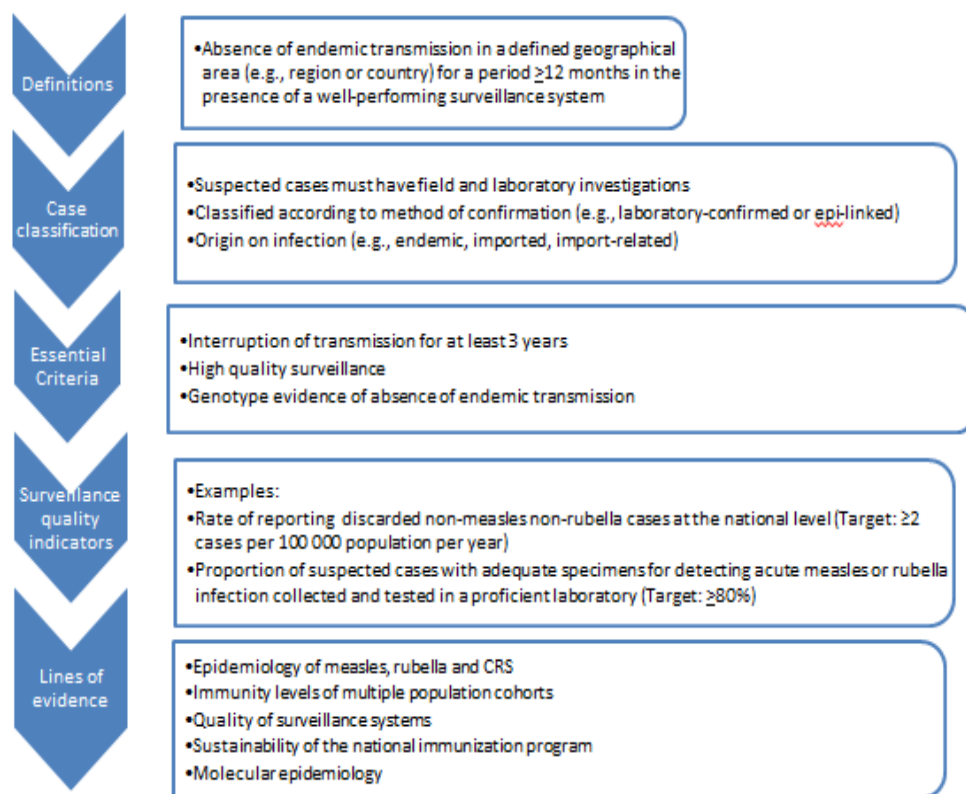
#### 2.1.3.1 Principles and processes for verifying measles elimination:

- **National verification committees** should be established as soon as a regional elimination target has been established in order to ensure a process to annually review progress towards elimination.
  - A national verification committee does not have the authority to verify elimination; its role is to help countries (and areas) document progress towards elimination by gathering, analysing and validating national data, and submitting it to the Regional Verification Commission.
- **The Regional Verification Commission** should conduct an annual review to determine progress towards measles and/or rubella elimination in individual countries.

- Verification of elimination for the Region as a whole is possible when all countries and areas are able to document interruption of endemic virus transmission for a period of >36 months.
- **Independent process**
  - Members of the Commission should be independent from those who are involved in programme delivery. Conflicts of interest should be declared.
  - The Commission should be multidisciplinary, with participants from the laboratory, epidemiology, paediatrics and public health.
- **Need for data at subnational levels**
  - Disaggregated data should be available at district or administrative levels with populations of approximately <500 000.
  - There is a need to consider marginalized/migrant and remote communities and border areas that may have poor access to health care.

### 2.1.3.2 Conceptual framework

Figure 1. Conceptual framework for verifying measles elimination



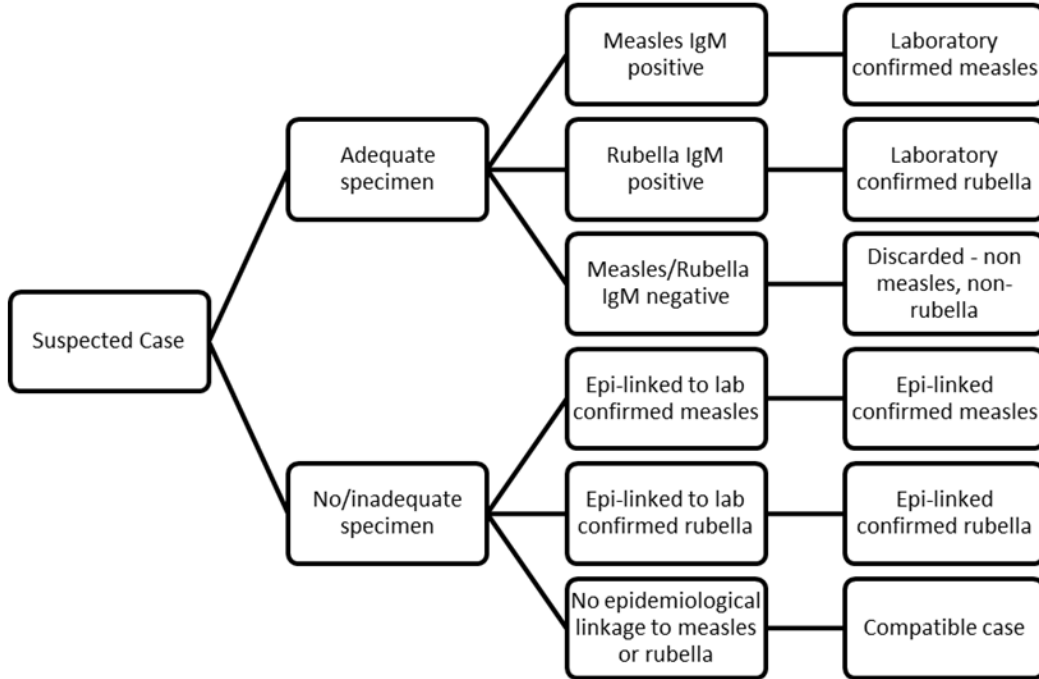
### 2.1.3.3 Definitions

Word or phrase	Definition
<b>Measles or rubella eradication</b>	Worldwide interruption of measles or rubella virus transmission in the presence of a surveillance system that has been verified to be performing well.
<b>Measles elimination</b>	The absence of endemic measles transmission in a defined geographical area (e.g. region or country) for $\geq 12$ months in the presence of a well performing surveillance system. Note: Verification of measles elimination takes place after 36 months of interrupted measles virus transmission.
<b>Rubella elimination</b>	The absence of endemic rubella virus transmission in a defined geographical area (e.g., region or country) for $\geq 12$ months and the absence of CRS cases associated with endemic transmission in the presence of a well performing surveillance system. Note: There may be a lag (up to nine months) in occurrence of CRS cases after interruption of rubella virus transmission has occurred. Evidence of the absence of rubella transmission from CRS cases is needed because CRS cases excrete rubella virus for up to 12 months after birth. Note: Verification of rubella elimination takes place after 36 months of interrupted rubella virus transmission.
<b>Endemic measles or rubella virus transmission</b>	The existence of continuous transmission of indigenous or imported measles virus or rubella virus that persists for $\geq 12$ months in any defined geographical area.
<b>Endemic measles or rubella case</b>	Laboratory or epidemiologically-linked confirmed cases of measles virus or rubella virus that persist for $\geq 12$ months in any defined geographical area.
<b>Endemic measles or rubella case</b>	Laboratory or epidemiologically-linked confirmed cases of measles or rubella resulting from endemic transmission of measles or rubella virus.
<b>Re-establishment of endemic transmission</b>	Occurs when epidemiological and laboratory evidence indicates the presence of a chain of transmission of a virus strain that continues uninterrupted for $\geq 12$ months in a defined geographical area (region or country) where measles or rubella had been previously eliminated. Note: A measles or rubella virus strain is determined by sequencing the WHO standard 450nt region of the N gene for measles and the 739nt of the E1 gene for rubella.
<b>Measles or rubella outbreak in an elimination setting</b>	A single laboratory-confirmed case.
<b>Suspected case of measles or rubella</b>	A patient in whom a health care worker suspects measles or rubella infection or a patient with fever and maculopapular (non-vesicular) rash.
<b>Laboratory-confirmed measles case or rubella case</b>	A suspected case of measles or rubella that has been confirmed by a proficient laboratory. Note: A proficient laboratory is one that is WHO-accredited and/or has an established quality assurance programme with oversight by a WHO-accredited laboratory.

Word or phrase	Definition
Epidemiologically-linked confirmed measles or rubella case	A suspected case of measles or rubella that has not been confirmed by a laboratory but that was geographically and temporally related with dates of rash onset occurring between 7 and 21 days apart for measles or 12-23 days for rubella to a laboratory-confirmed case or (in the event of a chain of transmission) to another epidemiologically confirmed measles case.
Clinically-compatible measles case	A case with fever and maculopapular (non-vesicular) rash and one of cough, coryza, or conjunctivitis but for which no adequate clinical specimen was taken and which has not been linked epidemiologically to a laboratory-confirmed case of measles or another laboratory-confirmed communicable disease.
Clinically-compatible rubella case	A case with maculopapular (non-vesicular) rash and fever (if measured) and one of arthritis/arthralgia or lymphadenopathy but for which no adequate clinical specimen was taken and which has not been linked epidemiologically to a laboratory-confirmed case of rubella or another laboratory-confirmed communicable disease.
Non-measles non-rubella discarded case	A suspected case that has been investigated and discarded as a <b>non-measles and non-rubella case</b> using (a) laboratory testing in a proficient laboratory or (b) epidemiological linkage to a laboratory-confirmed outbreak of another communicable disease that is neither measles nor rubella.
Measles vaccine-associated illness	<p>A suspected case that meets all five of the following criteria: (1) the patient had a rash illness, with or without fever, but did not have a cough or other respiratory symptoms related to the rash; (2) the rash began 7–14 days after vaccination with a measles-containing vaccine; (3) the blood specimen, which was positive for measles IgM, was collected 8–56 days after vaccination; (4) thorough field investigation did not identify any secondary cases; and (5) field and laboratory investigations failed to identify other causes.</p> <p>Alternatively, a suspected case from whom virus was isolated and found on genotyping to be a vaccine strain.</p>
Imported measles or rubella case	<p>A case exposed outside the region or country during the <b>7–21 days for measles or 12–23 days for rubella</b> prior to rash onset and supported by epidemiological or virological evidence, or both.</p> <p>Note: For cases that were outside the region or country for only a part of the 7-21-day interval (12-23 day interval for rubella) prior to rash onset, additional evidence, including a thorough investigation of contacts of the case, is needed to exclude a local source of infection.</p>
Importation-related measles or rubella case	<p>A locally acquired infection occurring as part of a chain of transmission originating from an imported case as supported by epidemiological or virological evidence, or both.</p> <p>Note: If transmission of measles or rubella cases related to importation persists for <math>\geq 12</math> months, cases are no longer considered to be import-related, they are endemic.</p>

#### 2.1.3.4 Case classification

Figure 2. Flow chart for measles case classification



#### 2.1.3.5 Essential criteria

The following criteria are necessary for verification of measles and rubella elimination at the regional level:

- (1) absence of endemic transmission of measles for a period of >36 months;
- (2) high quality surveillance; and
- (3) genotyping evidence supporting interruption of endemic transmission.

However, genotyping evidence is not an absolute requirement for determining whether elimination has been achieved at country level.



2.1.3.6 Surveillance indicators

Indicator	Description
<b>Timeliness of reporting</b>	<p>Proportion of surveillance units reporting to the national level on time (Target: &gt;80%).</p> <p>Proportion of countries reporting to their WHO Regional Office on time (Target: 100%).</p> <p>Proportion of Regions reporting to WHO Headquarters on time (Target: 100%).</p> <p>Note: At each level, reports should be received on or before the requested date.</p>
<b>Reporting rate of discarded non-measles non-rubella cases</b>	<p>Reporting rate of discarded non-measles non-rubella cases at the national level (Target: <math>\geq 2</math> cases per 100 000 population per year).</p>
<b>Representativeness of reporting</b>	<p>Proportion of subnational administrative units (e.g., at the province level or its administrative equivalent) reporting at least two discarded non-measles non-rubella cases per 100 000 population (Target: &gt;80%).</p> <p>Note: If the administrative unit has a population &lt;100 000, then the rate should be calculated by combining data over multiple years to achieve a population of <math>\geq 100</math> 000 person years.</p>
<b>Laboratory confirmation</b>	<p>Proportion of suspected cases with adequate specimens for detecting acute measles or rubella infection collected and tested in a proficient laboratory (Target: &gt;80%).</p> <p>Note: Any suspected cases of measles that are not tested by a laboratory and are (1) confirmed as measles by epidemiological linkage or (2) discarded as non-measles by epidemiological linkage to another laboratory-confirmed communicable disease case should be excluded from the denominator of suspected cases.</p> <p>Note: Adequate specimens are: a blood sample by venepuncture in a sterile tube with a volume of 5 ml for older children and adults and 1 ml for infants and younger children; dried blood sample, at least three fully filled circles on filter paper collection device; oral fluid, sponge collection device should be rubbed along the gum until the device is thoroughly wet (this usually takes one minute). Adequate samples for serology are those collected within 28 days of rash onset.</p>
<b>Viral detection</b>	<p>Proportion of laboratory-confirmed chains of transmission with samples adequate for detecting measles or rubella virus collected and tested in an accredited laboratory (Target: <math>\geq 80\%</math>).</p> <p>The numerator is the number of chains of transmission for which adequate samples have been submitted for viral detection and the denominator is the number of chains of transmission identified.</p> <p>Note: Where possible, samples should be collected from 5–10 cases early in a chain of transmission and every 2-3 months thereafter if transmission continues. For virus isolation, adequate throat or urine samples are those collected within 5 days after rash onset. For virus detection using molecular techniques, adequate throat samples are those collected up to 14 days after rash onset, and adequate oral fluid samples are those collected up to 21 days after rash onset.</p>

Indicator	Description
<b>Adequacy of investigation</b>	<p>Proportion of all suspected measles and rubella cases that have had an adequate investigation initiated within 48 hours of notification (Target: aim for 80%).</p> <p>The numerator is the number of suspected cases of measles or rubella for which an adequate investigation was initiated within 48 hours of notification and the denominator is the total number of suspected measles and rubella cases.</p> <p>Note: An adequate investigation includes collection of all the following data elements from each suspected measles and rubella case: name or identifiers, place of residence, place of infection (at least to district level), age (or date of birth), sex, date of rash onset, date of specimen collection, measles-rubella vaccination status, date of last MR vaccination, date of notification, date of investigation and travel history.</p> <p>Note: Some variables may not be required for cases that are confirmed as measles by epidemiological linkage (e.g., date of specimen collection).</p>
<b>Timeliness of specimen transport</b>	Proportion of specimens received at the laboratory within 5 days (Target: >80%).
<b>Timeliness of reporting laboratory results</b>	Proportion of results reported by the laboratory within 4 days of receiving the specimen (Target: >80%).

#### 2.1.3.7 Lines of evidence:

- Detailed **epidemiology of measles, rubella and CRS** and description of the epidemiology, including programmatic changes.
- **Population immunity** presented as a birth cohort analysis, with the addition of evidence related to any marginalized and migrant groups per birth cohort.
- Quality of **laboratory and epidemiological surveillance systems** for measles, rubella and CRS (see indicators).
- **Sustainability** of the national immunization programme and resources for mass campaigns in order to sustain elimination.
- Evidence from circulating **genotypes** that measles and rubella virus transmission is interrupted.

#### 2.1.3.8 Final assessment of elimination

The interruption of endemic transmission is not based on any single indicator. The individual lines of evidence should not be considered alone, but should be evaluated together to establish the case for elimination. The process of correlating and integrating the evidence from the various sources of information will allow countries to determine whether the available data are valid, complete, representative and consistent.

#### 2.1.4 Summary of progress towards developing regional verification mechanisms

Dr Wang Xiaojun, Medical Officer, Expanded Programme on Immunization, WHO Regional Office for the Western Pacific, shared and summarized progress towards developing regional verification mechanisms. The following 10 milestone steps have been taken in recent years in developing the regional verification process for measles elimination, with extensive consultations with Member States and partners:

- (1) Technical Consultation on Verification of Measles Elimination in the Western Pacific Region in June 2010. The objective of that meeting was to reach consensus on the verification process and criteria. The meeting reviewed experiences in certifying polio eradication and verifying measles elimination in the Region of the Americas and the European Region. Recommendations were shared at the Technical Advisory Group on Immunization and Vaccine-Preventable Diseases in the Western Pacific Region (TAG).
- (2) Nineteenth Meeting of the Technical Advisory Group on Immunization and Vaccine Preventable Diseases in the Western Pacific Region in August 2010. The meeting provided a venue to consult with Member States and gain input from TAG members. The TAG concurred with the recommendation from the June 2010 consultation meeting and requested that, after establishment of the RVC, more concrete procedures and guidelines on verifying measles elimination be developed. The TAG recommended discussing verification during the next session of the Regional Committee for the Western Pacific.
- (3) Sixty-first session of the Regional Committee for the Western Pacific in October 2010. The Regional Committee endorsed resolution WPR/RC61.R7, which has two components: the Committee (1) requested the Regional Director for the Western Pacific to establish a regional verification mechanism that includes principles, process, function, structure, criteria, and lines of evidence; and (2) urged each Member State to establish an independent national verification process for measles elimination following the establishment of standardized regional verification mechanisms.
- (4) Twentieth TAG meeting in August 2011. In the meeting, TAG members urged the WHO Regional Director for the Western Pacific to form an independent Regional Verification Commission in accordance with the resolution adopted at the sixty-first session of the Regional Committee in 2010 and, once formed, urged the RVC to develop processes for verification of measles elimination, including guidelines and criteria.
- (5) Establishment of the RVC in January 2012. The Regional Director requested Member States to nominate members of the RVC. RVC members were selected by the Senior Management Team in the WHO Regional Office for the Western Pacific and appointed by the Regional Director.
- (6) Inaugural Meeting of the RVC in April 2012. The meeting reviewed and agreed on the regional verification mechanisms. A consensus was reached on the draft regional verification guidelines for measles elimination. The RVC recommended piloting the documentation process in selected provinces in China, and urged Member States to establish national verification committees, and WHO to assist the RVC in providing orientation to NVCs at the appropriate time.
- (7) Consultation on Measles Elimination and Hepatitis B Control in April 2012. At that consultation, feedback included the following: (1) to allow flexibility in terms of the independence of NVC members from the RVC; (2) to make verification guidelines

understandable for countries; (3) to provide the guidelines to countries as soon as possible; (4) to provide practical guidance on the documentation process; and (5) to provide good orientation to NVCs and national programme staff.

(8) Twenty-first TAG meeting in August 2012. At that meeting, the TAG acknowledged the good progress made in the Region towards establishing the regional verification mechanisms for measles elimination, including criteria, indicators, structure and processes.

(9) Sixty-third session of the Regional Committee for the Western Pacific in September 2012. The Regional Committee endorsed resolution WPR/RC63.R5, urging Member States to establish national verification committees that will develop regular progress reports for submission to the RVC.

(10) Second Meeting of RVC in March 2013. This is the sixth round of consultations with Member States on the draft Guidelines on Verification of Measles Elimination in the Western Pacific Region.

In conclusion, the development of the regional verification mechanism for measles elimination has undergone careful and comprehensive consultation with Member States, TAG members, and the Regional Committee.

#### 2.1.5 Verification principles, process, criteria and lines of evidence

Dr Sergey Diorditsa provided updates on the verification principles, process, criteria and lines of evidence.

##### 2.1.5.1 Principles for the RVC

- The RVC will verify elimination independently for all countries/areas and eventually for the Region as a whole. An absence of endemic measles transmission for at least 36 months for country and regional elimination is required.
- The documentation will address three criteria, supported by five lines of evidence.
- The documentation process should be standardized to guide preparation work at both country and regional levels.
- Alternative or complementary evidence may be required.
- Field assessments by RVC or NVC members may be required.
- The RVC will determine if countries/areas, the Pacific subregion and the Region have eliminated measles.
- The NVC will ensure that annual progress or verification reports are prepared and submitted to the RVC.
- The 21 Pacific island countries and areas will have a subregional verification committee and will be verified as one epidemiological block.
- For countries with large populations (e.g. China), the NVC may wish to assess the status of measles elimination at the second administrative level (e.g. province).

##### 2.1.5.2 Process

- The RVC and NVC will review progress towards achieving and sustaining measles elimination on an annual basis, from 2013 onwards.
- Verification of measles elimination for different countries may proceed at different times.

- Verification for the Western Pacific Region will only become possible as a result of successful verification being accomplished for all countries and areas in the Western Pacific Region.

#### 2.1.5.3 Structure

There are two levels of external and independent expert bodies that will be involved in the verification process: the Regional Verification Commission, appointed by the Regional Director; and national and subregional verification committees.

National verification committees (NVCs) will be appointed by their respective ministries of health. For the Subregional Verification Committee (SRVC) for the Pacific island countries and areas, the Regional Director will appoint a Chairperson and members.

NVCs and the SRVC report to the RVC.

Figure 3: Organizational Structure of RVC, NVC and SRVC.



#### 2.1.5.4 RVC and SRVC/NVC membership qualities

The following qualities are recommended for SRVC/NVC members:

- Independence: NOT directly involved in the daily management and operations of the national immunization programme or national measles surveillance or laboratory;
- Expertise: Senior experts in the area of epidemiology, paediatrics, public health practice, virology or molecular biology; and
- SRVC and NVC members should commit to fulfilling their responsibilities independently, with the highest professional standards.

#### 2.1.5.5 RVC terms of reference

RVC members will:

- serve in an honorary capacity and verify the progress, achievement and maintenance of measles elimination, first by country/area/subregion and eventually for the Region as a whole;
- establish criteria and procedures required for the verification of measles elimination in the Western Pacific Region;
- contribute to the formulation and endorsement of guidelines on verification on measles elimination in the Western Pacific Region;
- provide guidance to national/subnational verification committees for measles elimination, and conduct field visits when needed;
- advise on various issues related to verifying measles elimination;

- monitor progress toward rubella control and eventual elimination; and
- advocate for measles elimination at the country and/or regional level.

#### 2.1.5.6 NVC/SRVC terms of reference

NVC/SRVC members will:

- advise their respective ministries of health on the requirements for verification of measles elimination;
- compile and analyse the information provided to monitor progress;
- assess if their country/area is ready to request verification (by the RVC);
- conduct field visits when indicated;
- guide the documentation process and propose feasible alternatives if standard verification data are not sufficient or consistent;
- monitor progress towards accelerated rubella control and congenital rubella syndrome prevention and, if established as a national goal, rubella elimination;
- provide programmatic guidance consistent with verification criteria and lines of evidence; and
- advocate for measles elimination.

#### 2.1.5.7 Verification criteria

- Documentation of the interruption of endemic measles virus transmission for a period of at least 36 months from the last known endemic case;
- in the presence of verification-standard surveillance; and
- genotyping evidence that supports interruption of endemic transmission.

#### 2.1.5.8 Lines of evidence

- A detailed description of the epidemiology of measles since the introduction of measles vaccine in the national immunization programme (NIP)
- Quality of epidemiological and laboratory surveillance systems
- Population immunity presented as a birth cohort analysis, with the addition of evidence related to any marginalized or migrant groups
- Sustainability of the national immunization programme, including resources for supplementary immunization activities (SIAs), where appropriate, in order to sustain elimination
- Genotyping evidence that supports interruption of measles virus transmission.

The following table summarizes the three verification criteria and five lines of evidence. It should be noted that individual lines of evidence should be evaluated together to assess if verification criteria have been met. They should not be considered alone or separately.

Table 1. Summary of verification criteria and five lines of evidence

Three verification criteria	Five lines of evidence
<p>1. Documentation of the interruption of endemic measles virus transmission for a period of at least 36 months from the last known endemic case;</p> <p>2. in the presence of verification-standard surveillance; and</p> <p>3. genotyping evidence that supports the interruption of endemic transmission.</p>	<p>1. A detailed description of the epidemiology of measles since the introduction of measles in the national immunization programme.</p> <p>2. Quality of epidemiological and laboratory surveillance systems for measles.</p> <p>3. Population immunity presented as a birth cohort analysis with the addition of evidence related to any underserved and marginalized groups.</p> <p>4. Sustainability of the national immunization programme, including the resources for mass campaigns, where appropriate, in order to sustain measles elimination.</p> <p>5. Genotyping evidence that supports interruption of measles virus transmission.</p>

As an outcome of extensive discussions and the dedicated work of the RVC members, the Guidelines on Verification of Measles Elimination in the Western Pacific Region were finalized during the meeting.

## 2.2 Workshop on Verification of Measles Elimination

### 2.2.1 Objectives and expected outcomes

The workshop objectives were presented by Dr Durrheim as aiming to provide orientation on the Guidelines on Verification of Measles Elimination in the Western Pacific Region, guidance on the preparation of national verification progress/reports on measles elimination, and training on adapting and implementing the new Measles Elimination Field Guide.

At the end of the workshop, all participants should have gained clear understanding of the regional mechanisms for verification of measles elimination and the requirements for national progress/verification reports on measles elimination, and a good understanding of the new Measles Elimination Field Guide.

### 2.2.2 Summary of progress towards developing regional verification mechanisms

Dr Wang Xiaojun, shared the regional progress towards measles elimination. In 2003, the WHO Regional Committee for the Western Pacific resolved to eliminate measles and to use activities for achieving elimination to strengthen routine immunization (WPR/RC54.R3). In 2005, the Regional Committee established 2012 as the target year for measles elimination (WPR/RC56.R8). In 2010, the Regional Committee reaffirmed the 2012 measles elimination goal, urged the Regional Director to establish regional verification mechanisms, and requested Member States to establish an independent national verification process for measles elimination following the establishment of standardized regional verification mechanisms (WPR/ RC61.R7).

Dr Wang also recalled the recent Regional Committee resolution, endorsed in September 2012 (WPR/RC63.R5), calling for intensification and focusing of efforts and acceleration of progress:

- (1) to interrupt endemic measles transmission as rapidly as possible;
- (2) to implement effective strategies to identify and reach all vulnerable, underserved communities;
- (3) to enhance systems and capacity for preparedness, rapid detection and response to measles outbreaks;
- (4) to improve the sensitivity and performance of surveillance;
- (5) to establish national verification committees, and submit regular progress reports; and
- (6) to further accelerate rubella control through integration of measles elimination and rubella control activities.

The Western Pacific Region has made remarkable progress towards measles elimination since establishing its measles elimination goal in 2003. Concerted efforts throughout the Region substantially reduced measles cases by 93% between 2008 and 2012, and measles incidence was 5.9 cases per million of population in 2012, a historic low. Epidemiological and virological surveillance data suggest that endemic measles virus transmission may have been already interrupted in as many as 33 countries and areas by the end of 2012. Most countries and areas that were once highly endemic for measles were reporting fewer cases in 2012, and many of those may have been imported or import-related. However, as of March 2013, endemic measles virus transmission still continues in a few countries in the Region.

Reported first dose measles-containing vaccine (MCV1) coverage has trended upward since 2003, reaching 96% in 2011. Thirty-three countries and areas have introduced a routine second dose measles-containing vaccine (MCV2) dose, with reported coverage of 91% in 2011. Wide age-range supplementary immunization activities (SIAs) have been used to close immunity gaps. Over 300 million children were vaccinated against measles during large-scale SIAs carried out from 2003 to 2012.

All countries and areas in the Western Pacific Region conduct case-based, laboratory-supported surveillance for measles, with intensive efforts to improve case-based surveillance in the Region beginning in 2007. From 2007 to 2012, the completeness of monthly reporting to the WHO Regional Office of the Western Pacific consistently increased, from 51% to 99%, and the timeliness of monthly reporting from 19% to 92%. In 2012, among the 34 countries and areas reporting suspected cases to the Regional Office, 2.4 suspected measles cases per 100 000 population were discarded as non-measles (target  $\geq 2.0$ ), and adequate blood specimens were collected from 91% of suspected measles cases (target  $\geq 80\%$ ), suggesting that, regionally, surveillance is sensitive in identifying and appropriately classifying suspected measles cases. However, not all countries have achieved the surveillance indicator targets. Among countries and areas submitting sufficient data to calculate the indicators, nine (64%) of 14 countries achieved the targeted discarded measles rate and 10 (83%) of 12 countries achieved the targeted adequate specimen collection rate. (Note: the 21 Pacific island countries and areas are considered as one epidemiological block.)

The Western Pacific Region measles and rubella laboratory network has grown to include a total of 383 laboratories, including one WHO global specialized laboratory (GSL) in Japan; three WHO regional reference laboratories (RRLs) in Australia, China and Hong Kong (China); 17 fully functional national measles-rubella laboratories including the GSL and RRLs; and, in China, 31 provincial and approximately 331 prefecture laboratories. In 2012, the laboratory



network (not including China) tested 18 550 specimens from 17 637 suspected measles and rubella cases.

### 2.2.3 Guidelines on Verification of Measles Elimination in the Western Pacific Region

The first day of the workshop provided an opportunity for the RVC members to present in detail the criteria and five lines of evidence that will be considered to determine whether a country has achieved measles elimination. The Guidelines on Verification of Measles Elimination in the Western Pacific Region were used for the orientation workshop.

### 2.2.4 Accelerating measles elimination in the Western Pacific: challenges and solutions

Dr Diorditsa presented a summary of the four main challenges facing measles elimination in the Western Pacific Region as follows:

- (1) **Interrupting and preventing measles transmission:** to interrupt all endemic measles virus transmission, and prevent future transmission, by closing immunity gaps.
- (2) **Outbreak preparedness and response:** to enhance capacity for preparedness, rapid detection and response to measles outbreaks.
- (3) **Ensuring highly sensitive surveillance:** to improve the sensitivity and performance of epidemiological surveillance and laboratory capacity.
- (4) **Preparing for verification of measles elimination:** to establish national verification committees.

The challenges mentioned above should be addressed by every country whether or not they have ongoing transmission of measles, since every country is still at risk from the consequences of importation.

The Measles Elimination Field Guide and the Guidelines on Verification of Measles Elimination in the Western Pacific Region were developed to provide solutions to these challenges.

### 2.2.5 Measles Elimination Field Guide

The Measles Elimination Field Guide (2013) was introduced at the workshop. This 2013 version builds upon the 2004 Field Guidelines for Measles Elimination and respond to the progress made since that time, including:

- rapid progress in national immunization programmes;
- new challenges, needing new, focused solutions and actions; and
- the need to increase equity and reach every community;

The 2013 Field Guide has been developed from experiences learnt in the field by immunization programmes in the Region. Several national immunization managers were closely involved in their development. The Field Guide provide methods for building on the good practices established in the Region since 2004 and operational guidance for all NIPs to interrupt measles transmission. The Field Guide is designed to be used by national immunization programme managers and to be adapted by countries to their local situations. There will be parts

that will not be relevant to some countries, and parts that may be relevant but need to be adapted. The WHO Regional Office for the Western Pacific encourages NIP managers to adapt and use those parts that meet their own national requirements. The Field Guide is neither a policy document nor a strategic or action plan.

Training on use of the Guide was conducted during the workshop, covering three key areas: closing immunity gaps, closing surveillance gaps and how to prepare and respond to a measles outbreak.

#### 2.2.6 Documentation for demonstrating progress towards and verifying measles elimination

Dr Ma Chao from the Chinese Centers for Disease Control and Prevention (China CDC) shared China's experience in pilot testing the provincial verification report. The piloting activity was based on the recommendation from the first RVC meeting in April 2012 that, for countries with large populations, such as China, NVCs may assess measles elimination by second-level administrative unit, in collaboration with the Ministry of Health of China and the WHO Country Office in China, when possible.

Three provinces (Shandong, Hainan and Guizhou) of China were selected to pilot test the verification report in collaboration with the China CDC and the WHO Country Office in China.

Several steps were undertaken to pilot the report. A workshop was held to introduce the principles of measles elimination verification and to provide general guidance to the provinces on the verification report. A review of the first draft of the provincial reports was then conducted in Hainan Province and the best way to finalize the document discussed. The outcome of that review was a standard template, including a detailed outline, title and subtitle, guidance on the content under each subtitle, and standard tables and figures to show data and analysis.

Dr Ma also shared an example of a report from Guizhou Province. The report consisted of an introduction about the province, measles epidemiology, surveillance and laboratory network, immunization and population immunity, sustainability of measles elimination and conclusions and recommendations.

It was noted that the template presented by Dr Ma was useful and helpful for provinces in preparing documentation. The process of documentation also benefits provinces in facilitating them to fully understand their own situation and plan next steps.

### 3. ACTION POINTS

#### 3.1 Action points for WHO

(1) After finalizing the Measles Elimination Field Guide, the WHO Regional Office for the Western Pacific should print and disseminate the document throughout the Region. The final version of the Field Guide will also be available electronically, and countries are encouraged to translate it and use it, with technical support from WHO when required.

(2) The WHO Regional Office for the Western Pacific and the WHO country offices should provide technical support for preparation of progress/verification reports when requested by countries.

(3) The WHO Regional Office for the Western Pacific should provide opportunities for countries and areas to regularly share their experiences in identifying immunity gaps and addressing them.

(4) WHO Headquarters should provide guidelines to countries wishing to conduct measles serosurveys as soon as possible.

(5) The Regional Director will be requested to establish the Subregional Verification Committee for the Pacific Island Countries and Areas.

(6) WHO, in collaboration with partners, should develop visual promotional material for hospital doctors to encourage reporting and investigation of measles.

### 3.2 Action points for countries

(1) Undertake risk assessment

All countries, whether or not they are reporting endemic measles cases, should undertake a thorough measles risk assessment. The risk assessment should include the identification of high-risk communities (including urban slum dwellers, migrant workers, refugees, minority groups, and those in rural, remote and new settlements) with measles immunity gaps where measles outbreaks or importations are more likely to occur.

(2) Close immunity gaps

Following risk assessment, countries should take focused action to close immunity gaps, especially in high-risk communities, by ensuring high levels of coverage with MCV1/MCV2. Where necessary, countries should develop microplans to extend service delivery to reach every community with measles and other expanded programme on immunization (EPI) vaccines, and plan focused supplementary immunization activities (SIAs) where indicated.

(3) Identify and close surveillance gaps

Countries should systematically review their surveillance performance indicators and identify programmatic gaps in the coverage and quality of measles surveillance.

Where necessary, countries and areas should focus attention on improving case detection and case investigation (aiming to include all 10 core variables), and should increase the proportion of suspected measles cases with adequate specimen collection to at least 80% and preferably as close to 100% as possible.

(4) Prepare to respond rapidly to measles cases/outbreaks

Since importation and re-establishment of measles transmission are still real possibilities in the Region, a single laboratory-confirmed measles case should be regarded as a measles outbreak and all countries should be prepared to respond rapidly to such outbreaks. This will include national advocacy and communication, and development of standard operating procedures in the event of an outbreak.

(5) Develop and submit annual progress reports on measles elimination

Every NVC is expected to submit their first progress report to the RVC by 1 October 2013. Countries may seek external technical support through WHO. For some countries, this will include evidence to confirm the absence of endemic transmission for at least 36 consecutive months.

3.3 Action points for RVC

(1) Finalize the RVC workplan.

The RVC is requested to finalize their workplan for future activities. This may include generating a list of countries that the RVC considers should be encouraged to submit evidence consistent with the absence of endemic measles transmission for at least 36 consecutive months, evidence of verification standard surveillance and supportive genotyping evidence.

(2) Review the annual progress report

The RVC should finalize its internal mechanism for reviewing country reports and providing feedback to countries on an annual basis.

(3) Verification guidelines

The RVC should finalize the verification guidelines and send them out to all RVC and NVC members.



SECOND MEETING OF THE REGIONAL VERIFICATION COMMISSION FOR MEASLES ELIMINATION  
Manila, Philippines, 18–19 March 2013

TIMETABLE

Time	Monday, 18 March 2013	Time	Tuesday, 19 March 2013
08:00–08:30	<b>REGISTRATION</b>	08:30–10:00	<b>10. Verification documentation</b>
08:30–09:15	Opening Session <ul style="list-style-type: none"> <li>• Opening remarks</li> <li>• Self-introduction</li> <li>• Election of officers (Chair, Vice-Chair, Rapporteur)</li> <li>• Administrative announcements</li> <li>• Group photo</li> </ul>		<ul style="list-style-type: none"> <li>• Proposed contents and format for documentation</li> <li>• Pilot experience in three provinces in China</li> <li>• Discussion of the sample report from one province in China</li> <li>• Technical support to countries</li> </ul>
09:15–09:25	<b>1. Meeting objectives</b>		
09:25–09:45	<b>2. Regional progress towards measles elimination and rubella control</b>		
09:45–10:15	<b>COFFEE BREAK</b>	10:00–10:30	<b>COFFEE BREAK</b>
10:15–10:45	<b>3. Global framework for verifying elimination of measles and rubella</b>	10:30–11:30	<b>11. Workplan of Regional Verification Commission</b>
10:45–11:00	<b>4. Summary of progress towards developing regional verification mechanisms</b>	11:30–12:00	<b>12. Next steps</b>
11:00–12:00	<b>5. Verification principles, process, criteria and lines of evidence</b>		
12:00–13:00	<b>LUNCH BREAK</b>	12:00–12:30	<b>LUNCH BREAK</b>
13:00–13:45	<b>6. Lines of evidence: Incidence, epidemiologic and virologic characteristics</b>	12:30–17:00	<b>13. Preparing for the Workshop on Verification of Measles Elimination</b>
13:45–14:30	<b>7. Lines of evidence: Surveillance and laboratory performance</b>		
14:30–15:00	<b>COFFEE BREAK</b>		
15:00–15:45	<b>8. Lines of evidence: High population immunity</b>		
15:45–16:30	<b>9. Lines of evidence: Sustainability</b>		

Annex 1

WORKSHOP ON VERIFICATION OF MEASLES ELIMINATION Manila, Philippines, 20–22 March 2013		TIMETABLE		19 March 2013 English only
Time	Wednesday, 20 March 2013	Thursday, 21 March 2013	Time	Friday, 22 March 2013
08:00–08:30	REGISTRATION		08:30–10:00	14. Outbreak preparedness and response <ul style="list-style-type: none"> <li>• Outbreak preparedness</li> <li>• Outbreak investigation</li> <li>• Outbreak response immunization</li> </ul>
08:30–09:00	Opening Session <ul style="list-style-type: none"> <li>• Opening remarks by the Regional Director</li> <li>• Self-introduction</li> <li>• Election of officers (Chair, Vice-Chair, Rapporteur)</li> <li>• Administrative announcements</li> </ul>	10. Accelerating measles elimination in the Western Pacific: Challenges and solutions		
09:00–09:45	GROUP PHOTO AND COFFEE BREAK		10:00–10:30	COFFEE BREAK
09:45–10:00	1. Meeting objectives	11. Closing immunity gaps <ul style="list-style-type: none"> <li>• Risk assessment</li> <li>• Micro planning</li> <li>• Prioritization</li> </ul>	10:30–12:20	15. Documentation for demonstrating progress towards and verifying measles elimination <ul style="list-style-type: none"> <li>• Sharing pilot experience</li> <li>• Main components</li> <li>• Developing a national action plan</li> </ul>
10:00–10:30	2. Regional progress towards measles elimination and rubella control	12. Closing surveillance gaps <ul style="list-style-type: none"> <li>• Addressing current surveillance issues</li> <li>• Surveillance indicators</li> <li>• Questions and answers</li> </ul>	12:20–12:40	16. Summary of action points
10:30–11:00	3. Global framework for verifying elimination of measles and rubella		12:40–13:00	17. Closing session
11:00–12:00	4. Principles, structure and process for verifying measles elimination in the Western Pacific Region		13:00–14:00	LUNCH BREAK
12:00–13:00	LUNCH BREAK		14:00–16:00	Side meetings
13:00–13:40	5. Lines of evidence: Epidemiology of measles	12. Closing surveillance gaps (continued) <ul style="list-style-type: none"> <li>• Sensitivity of surveillance</li> <li>• Adequate case investigation</li> <li>• Specimen collection and handling</li> <li>• Proper case classification</li> <li>• Defining endemic or imported</li> </ul>		
13:40–14:20	6. Lines of evidence: Quality of surveillance systems			
14:20–15:00	7. Lines of evidence: Population immunity			
15:00–15:30	COFFEE BREAK			
15:30–16:10	8. Lines of evidence: Sustainability	11. Polio Eradication: endgame strategy		
16:10–16:50	9. Lines of evidence: Supportive genotyping evidence			

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