



MEASLES AND RUBELLA ELIMINATION SUSTAINABILITY PLAN



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Sustainability of Measles, Rubella, Congenital Rubella Syndrome (CRS) elimination initiative - Sri Lanka

Background

The country fully achieved measles and rubella elimination plan 2017-2020. The target of eliminating endogenous measles elimination achieved in 2019, one year ahead of the target year and the endogenous rubella elimination achieved in 2020.

Measles is a highly infectious viral disease responsible for a high degree of morbidity and mortality among children including complications of pneumonia (1-6%), diarrhoea (8%), Otitis Media (7-9%), subacute sclerosing panencephalitis (SSPE) (1 per 100,000 cases), Keratitis and Corneal scarring are common with Vitamin A deficiency.

Fatal cases of measles are now rarely reported in Sri Lanka after successful implementation of the National Immunization Programme, including 2 doses of measles, mumps and rubella (MMR) vaccination at 9 months and 3 years of age.

The measles vaccine was first introduced into the National Immunization Programme in Sri Lanka in 1984. Since then, morbidity and mortality of measles were reduced remarkably but outbreaks have been experienced in 1999-2000 and 2013-2015. An imported outbreak among selected adults have been identified in 2017 which was successfully controlled with high population immunity.

Considering the requirement to enhance the population level immunity, 2nd dose of measles containing vaccine has been introduced with the measles, rubella (MR) vaccine in 2001. In 2011, MMR vaccine was introduced in 2 doses at the age of 1 year and at the age of 3 years, replacing measles (9 months) and MR (3 years) vaccines. But, considering the morbidity patterns and sero survey evidence during the measles outbreak situation in 2013-2015, the Advisory Committee on Communicable Diseases (ACCD) has decided to re-schedule the MMR 1st dose at 9 months of age, continuing the 2nd dose at 3 years.

Rubella is a mild disease affecting children and adults. However, rubella in pregnant women is important as the virus is transmitted to the foetus across the placental barrier, sometimes with significant teratogenic effects. Rubella vaccine was introduced into the National Immunization Programme in 1996, targeting all reproductive age females of 11- 44 years, with the objective of preventing congenital rubella syndrome (CRS). This was carried out as a school-based programme by giving rubella vaccine to all children aged 11-15 years, and vaccinating the rest at the community clinics. Number of measles and CRS cases have markedly reduced and surveillance of measles, rubella and CRS was strengthened in 2005-2010 under the plan of 'intensification of the surveillance and Laboratory confirmation' that was made laboratory confirmation services available for all suspected cases of Measles, Rubella and CRS from there to date.

Sustainability of measles, rubella, CRS Elimination in line with Immunization Agenda 2030

In par with the Regional and Global Measles, and Rubella/CRS elimination strategic plans, and in line with strategies of Immunization Agenda 2030 (IA 2030), Sri Lanka has set the goal of sustaining achieved Measles and Rubella/CRS elimination till 2030 and beyond, until the global measles and rubella/CRS elimination targets are achieved.

Vision: Sri Lanka is free from measles, rubella and CRS

Goal: To achieve and sustain measles, rubella and CRS free status in Sri Lanka

Objectives: To sustain zero endogenous transmission of measles, rubella and CRS in Sri Lanka and identify and contain possible imported outbreaks, not exceeding the endogenous transmission up to 1 year.

Sustainability of elimination targets:

- Zero endogenous measles transmission till 2030 and beyond
- Zero endogenous rubella transmission till 2030 and beyond
- Sustain zero CRS case/ 100,000 live births till 2030 and beyond

Main strategies of sustaining elimination:

- Maintain high level of population immunity by providing two doses of measles and rubella containing vaccines with high vaccination coverage at all levels, to prevent measles and rubella virus transmission
- Strengthened highly sensitive disease surveillance including laboratory confirmation of all suspected cases of measles, rubella, CRS cases (case-based investigation), for early detection of imported outbreaks
- Strengthen country preparedness for outbreak prevention and response : contain outbreaks early
- Adequate patient care management to prevent the transmission and mortality
- Perform research to generate evidence for cost effective implementation strategies for sustaining measles , rubella, CRS elimination status

Sustaining population Immunity:

Following targets of administrative coverage are expected to achieve and maintain, in order to sustain population level immunity to prevent measles and rubella transmission from imported cases.

- Administrative coverage of MMR vaccine 1st dose, at national and subnational levels (district, and MOH levels) to maintain $\geq 95\%$

- Administrative coverage of MMR vaccine 2nd dose, at national and subnational levels (district, and MOH levels) to maintain $\geq 95\%$

In case of administrative coverage is not reliable or having any concerns of data quality due to any reason, the priority areas for field level coverage survey should be conducted for validation, before developing population level immunity gaps.

In implementation of MMR vaccination through National Immunization Programme (NIP), the national, district and Medical Officer of Health (MOH) area plans stipulate the following for specific strategies:

- Always consider the clinic centre as the service provision point is located at equitable access to draining public health midwife (PHM) areas.
- At each level, lower units achieving MMR 1 and MMR 2 coverage $\geq 95\%$ should be $\geq 80\%$
- There should not be drop out from MMR 1 to MMR 2 and in case if there is drop out it should be $<1\%$
- There should not be drop out from Pentavalent 3/OPV3 to MMR 1 and in case if there is drop out it should be $<1\%$
- All newborns under case of each PHM, needs to be tracked and should complete both MMR 1 and 2 to ensure no zero dose children for measles and they are adequately protected
- Ensure a high-quality laboratory contribution to surveillance through accredited laboratories that are able to conduct timely and accurate testing of samples to confirm or discard suspected measles cases and detect measles virus for genotyping and molecular analysis.
- There should not be disadvantaged populations left behind based on any emergencies and crisis situations. The MMR vaccination through NIP should consider as the priority and should complete vaccination for not to create any immunity gaps.
- There should not be any under-served children in high-risk conditions such as urban slums, migrant workers, new settlements, IDP camps in emergencies or any other. The PHM or MOH area succumb for such conditions should be closely monitored to ensure achieving high vaccination coverage through community based, people centered, innovative strategies.
- Overseas born children returned to reside in country should be thoroughly assessed for their up to date vaccination status and ensure appropriate vaccination for measles and rubella
- Continuous supportive supervisions should be continued to ensure sustaining high vaccination coverage
- Monitoring and evaluation data should be utilized for data driven, evidence based decisions for further strengthening of the vaccination programme

Strengthened surveillance for early detection of imported or import related outbreaks, case management and rapid response:

- Full implementation of sensitive case definition of “fever, maculopapular rash” for suspected measles and rubella and implementation of laboratory testing of such patients while allowing confirmation for other fever-rash diseases.

- All suspected cases need to be notified at the earliest before confirmation to the Epidemiology Unit, Ministry of Health and MOH of the patient's residence for appropriate actions
- Implementation of high-quality case-based surveillance
- Ensure timely detection and reporting of measles-rubella cases throughout the country in uniform manner including routine surveillance, active surveillance through zero reporting and field level case detection
- All suspected cases are adequately investigated with laboratory testing (measles rubella IgM and virus detection samples)
- Virus isolation and sequencing of all positive case/s to detect origin of importation
- Even a single lab confirmed case to be considered as an outbreak and activate rapid response for the outbreak in preventing further spread
- Identify all imported and import related cases among contacts to the index patient and contacts from the index case
- Assess immunization status of contacts at the earliest for appropriate vaccination decisions
- Appropriate outbreak response immunization, based on the surveillance data and vaccination data, to be implemented as minimal or large scale, depending on the data driven evidence of circulation, as decided by subject specialists based on the magnitude and extent of the outbreak
- National and subnational risk assessment and immunity gap identification as required
- Regular monitoring and reviewing of surveillance data with systematic feedback mechanism for further improvement.
- Any suspected patient presented with fever and maculopapular rash should be assessed for travel overseas for contact history overseas and to identify their up-to-date vaccination status
- Confirmed measles rubella cases need to be isolated to prevent further transmission, contacts to be assessed for their risk of contraction with appropriate actions, and need to be managed properly for prevention of mortality
- In community detected cases should refer for adequate specialized care for prevention of complications and mortality

Measles and Rubella vaccination (MMR vaccination)

- All eligible children who have completed the age of 9 months and the age of 3 years are to be vaccinated with MMR vaccine according to the current National Immunization schedule in Sri Lanka
- Required to achieve and maintain above 95% coverage in each of the two doses of MMR vaccine at the national, district and Medical Officer of Health (MOH) and Public Health Midwife (PHM) area levels
- If any child is found unvaccinated / missed for measles or rubella at any age (above 3 year), vaccinate with two doses of MMR with minimum of 6-8 weeks interval
- Any child above 9 months, vaccinate at the earliest with MMR 1 and continue with the 2nd dose at 3 years or 6-8 years whichever is appropriate
- Ensure all women in the reproductive age are protected with at least one rubella containing vaccine (RCV)
- Ensure that all women are protected/vaccinated for rubella at the time the Public Health Midwife (PHM) includes them in the Eligible Couple Register or at the earliest contact
- If any pregnant woman is found unvaccinated or with doubtful vaccination against rubella (and if the family has not been completed for reproduction) she should be vaccinated with RVC after delivery, to prevent a future CRS case
- Once MMR (10 dose) vial is planned to open in the scheduled immunization clinic session and if the number of children planned for the day is less than the number in the opened vials for the day, plan and take necessary measures to vaccinate adults (up to 45 year) who are without proper history of measles and rubella vaccination using the remaining MMR doses for the day without discarding (after screen for contraindications and AEFI)

Surveillance Case definitions

- **Surveillance case definition of measles and rubella**

Any person with “**Fever and Maculopapular (i.e. non vesicular) rash**” should be notified as either suspected measles or rubella case based on the clinical judgment of the treating clinicians / health care personnel

- **Surveillance case definition of CRS**

Any infant with: maternal history of Rubella infection and / or with signs and symptoms from following categories

- cataract, congenital glaucoma, pigmentary retinopathy, congenital heart disease (PDA/peripheral pulmonary artery stenosis/VSD), Loss of hearing
- Purpura, splenomegaly, microcephaly, mental retardation, meningo-encephalitis, radiolucent bone disease, jaundice (within 24 hours of delivery)
- or
- Laboratory data consistent with Congenital Rubella Infection (Rubella IgM positive or Rubella virus isolated)

Measles, Rubella, CRS case reporting

All suspected “measles and rubella” patients with “fever and maculopapular rash” should be notified by all medical officers who are treating the patient at first contact of the patient.

All fever and maculopapular rash patients investigated for other fever-rash diseases should be additionally tested for measles and rubella to ensure early detection of measles and rubella cases and properly exclude before late in preventing further transmission.

All other health care staff including field health staff, who meet with a patient of “fever and maculopapular rash” are required to inform to the immediate contact health authority for proper notification.

All hospitals where specialist paediatricians and / or physicians are available, are sentinel site hospitals for active surveillance for Measles/Rubella/CRS and weekly zero reporting.

- All suspected Measles and Rubella patients should be notified to the Epidemiology Unit through the updated ‘Suspected Measles / Rubella Patient Information Form’ (EPID/151/2/2015, Blue Form) [Annexure 1] filled by the Clinician/Medical Officer who is treating the patient at first patient contact.
- The routine notification should to be sent to the Medical Officer of Health (MOH) of the patient’s residential area (Notification of Communicable Diseases: Health-544, Annexure 2) for all suspected cases of Measles, Rubella, CRS
- All suspected CRS cases need to be reported to the Epidemiology Unit immediately by phone/fax/e-mail and special investigation form (EPID/DS/CRS/2013) [Annexure 3] is required to be properly completed by the clinician/medical officer who is treating the patient at the health institution and to be sent to the Epidemiology Unit.
- All infection control nursing officers (ICNO) at the sentinel site hospitals are expected to maintain Measles/Rubella and CRS registers (Format: Annexure 4 and 5). The infection

control nurses are also expected to visit medical, paediatric, obstetric, cardiology, ophthalmology and ENT wards regularly for detection of cases (all Measles, Rubella, CRS), actively look for cases and notify promptly to the Epidemiology Unit.

- All suspected cases of Measles, Rubella/CRS presented to sentinel site hospitals should be included in the Weekly reporting form for AFP, Measles, Rubella cases from hospital (sentinel sites) – EPID/37/5/R2004 (Annexure 6), and should be completed for the week ending date of Friday and should be sent to the Chief Epidemiologist, Epidemiology Unit, Colombo with copy to the Regional Epidemiologist. This form should be sent even if no cases have been detected (“Nil” reporting) for the week. A total of 52 reports should be received from each site per year and the timeliness of the return needs to be maintained at 7 days to be received at the Epidemiology Unit. The performance rate of completeness and the timeliness of the return will be measured to maintain the surveillance performance.
- The patients identified in other health institutions including General Practitioners and private health care institutions, are required to be promptly notified to the relevant MOH (Notification of Communicable Disease, [Health 544] form or any other means of notification) and the laboratory confirmation should be carried out as instructed.
- The Medical Officer of Health of the Patients residence (in an institutional outbreak, the MOH of the institution belonged) has to proceed with the routine surveillance procedure, contact tracing and outbreak prevention for all notified or community detected Measles, Rubella, CRS cases and complete the special field investigation form for **all clinically confirmed measles or rubella cases** (irrespective of the laboratory confirmation or the availability of results).

Clinically confirmed measles case	Clinically confirmed rubella case
Fever and maculopapular rash patient with at least one of the following: <ul style="list-style-type: none"> • Cough • Coryza (i.e. runny nose) • Conjunctivitis (i.e. red eyes) 	Fever with maculopapular rash and arthralgia, arthritis, lymphadenopathy (usually suboccipital/ postauricular/ cervical) or conjunctivitis

- All clinically confirmed cases of Measles, Rubella and suspected CRS need to be completed with updated special investigation forms by the MOH ([EPID/DS/MEASLES/2007], [EPID/DS/RUBELLA.2007], [EPID/DS/CRS/2013]) (Annexure 7, 8 & 3) and duly completed forms should be sent to the Epidemiology unit as early as possible, maximum with 2 weeks delay from the date of the notification.
- If the notified/clinically confirmed measles/rubella case has not been tested for laboratory confirmation due to any reason by the health institution, the MOH should perform the

laboratory testing at the time of special field investigation as per instructions in the Epidemiology Unit letter No: EPID/151/2011 dated 20/09/2012.

- All Measles/Rubella cases detected at the community level by any of the public health staff, need to be adequately investigated, in accordance with the routine surveillance and special investigation procedure, with **laboratory testing procedure to complete case based investigation by the MOH.**

Laboratory investigations for suspected Measles/Rubella and CRS cases

- Two types of samples should be collected from all suspected measles and rubella cases

Sample for Virus isolation	Sample for detection of IgM (recent infection)
Nasal and throat swabs (in virus transport medium) preferably in the first 5 days of the onset of rash	2-3 ml blood sample preferably from 3 rd to 28 th day of the onset of rash

- A blood sample of 2-3ml for Measles /Rubella IgM should be collected from each suspected case of Measles, or Rubella from the 3rd day to 28th day of the onset of signs and symptoms, into a sterile, dry, screw capped container without any anti-coagulant.
- A blood sample for Rubella IgM or for TORCH screen (as for Toxoplasma, Rubella, Cytomegalovirus, Herpes simplex virus in screening for congenital abnormalities) should be taken from all suspected infants of CRS and from newborns in instances where the mother has declared a history of suspected/confirmed Rubella infection in any gestational age of pregnancy.
- If any pregnant woman who does not give a history of Rubella vaccination is identified in any Obstetric Unit, she is required to be tested for Rubella IgM (before or after delivery) to identify possible recent Rubella infection during gestational period. In case a positive result is obtained, the baby is required to be investigated on delivery and followed up for possible CRS.
- Once the blood sample has been collected, it should be labeled and left at room temperature for about 30 minutes for clot formation. The sample should be sent as early as possible to the Measles and Rubella, National Reference Laboratory, Medical Research Institute (MRI), Colombo with a properly completed specimen request form (Annexure 9 : “Specimen Request Form : Measles and Rubella, National Reference Laboratory, Medical Research Institute (MRI), Colombo). The sample should be transported in a cold box with ice cubes / ice packs to maintain cold temperature.
- If a facility to centrifuge is available, properly labelled separated serum should be sent to the MRI for Measles or Rubella IgM detection.

- The serum / clotted blood sample should be received at the laboratory within 48 hours of collection and if there is any delay of transport more than 6 hours the sample should be refrigerated until dispatch to prevent destruction of antibodies.
- Naso-pharyngeal aspirate, throat swab or gingival swab is collected within the first 5 days of the onset of symptoms for measles / rubella virus detection. Samples should be collected in to the container with virus transport medium (VTM) and labelled. Samples should be stored immediately at the refrigerator and transport in ice to maintain cold temperature with the completed specimen request form (annexure 9). Specimen collection containers (VTM + swabs) are provided. Contact infection control nursing officer (ICNO) of the hospital or Regional Epidemiologist of the district.

Measles, rubella outbreak response:

- Routine surveillance for outbreak detection and prevention after notification (initial Public health Inspector visit, field level investigation with Health H- 411 / H-411a, and MOH case based special form investigation including laboratory confirmation should be completed within 14 days of the onset of the rash)
- Even a single laboratory confirmed measles, or rubella case is detected, it should be considered as an outbreak and following measures should be taken
 - Immediate notification to the Epidemiology Unit/ National focal point for Measles Rubella Elimination Programme(Epidemiology Unit)/RDHS/ Provincial CCP/ Regional Epidemiologist
 - If any unvaccinated/ unprotected child (2 doses of MMR or adult (up to 45 years) in the household, take measures to provide MMR vaccination at earliest possible, preferably within 14-21 days of the onset of the index laboratory confirmed case
 - Screen 30-50 households or households of 1 km radius around the index household, to identify any unvaccinated children below 15 years: take measures to vaccinate if any
 - Exclusion of the continuation of the outbreak:
 - Follow up contacts for 2 incubation period cycles (minimum of 28 days)
 - identify all “fever and maculopapular rash” cases from the area and send samples for laboratory testing (include into the surveillance system)
 - Inform to Epidemiology Unit the action taken

Additional information

- Unprotected travellers to measles or rubella (with unknown history or unvaccinated for measles and not contracted measles or rubella disease),
 - travelling to an endemic country for any of these diseases, are advised to vaccinate/receive at least one MMR dose, with a minimum of 1 month before the travel date, from the nearest MOH office

- any unprotected traveller, returning from an endemic country, develops fever and rash within 14 to 21 days of the return should be considered as a possible imported case of measles or rubella and should be adequately investigated, to prevent community transmission
- Measles, Rubella vaccination and surveillance activities in disaster situations should be paid special attention, and should continue with routine immunization. Contact Measles, Rubella, CRS elimination programme at the Epidemiology Unit, Consultant CCP, Regional Epidemiologist, or the area MOH to assess the situation, and advise and actions for special vaccination campaigns and prevention of possible outbreaks
- Measles / Rubella outbreak prevention and response, specimen collection guidelines (including field level)[as per Epidemiology Unit letter No: EPID/151/2011 dated 20/09/2012], standard operation procedure (SOP) for specimen collection and transport, Accelerated measles, rubella, CRS elimination plan 2017-2020 are available in the website : <http://www.epid.gov.lk>, under disease information, Measles, Rubella, CRS elimination programme
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