NATIONAL STRATEGIC PLAN FOR ACHIEVING AND SUSTAINING MEASLES AND RUBELLA ELIMINATION IN INDIA
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<tr>
<td>AEFI</td>
<td>adverse event following immunization</td>
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<tr>
<td>AFP</td>
<td>acute flaccid paralysis</td>
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<tr>
<td>cMYP</td>
<td>comprehensive multi-year plan</td>
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<td>CRS</td>
<td>congenital rubella syndrome</td>
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<td>GPEI</td>
<td>Global Polio Eradication Initiative</td>
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<td>HRA</td>
<td>high-risk area</td>
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<td>ICMR</td>
<td>Indian Council of Medical Research</td>
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<td>IDSP</td>
<td>Integrated Disease Surveillance Programme</td>
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<td>IEAG-MR</td>
<td>India Expert Advisory Group on Measles–Rubella</td>
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<td>IgG</td>
<td>immunoglobulin G</td>
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<td>IgM</td>
<td>immunoglobulin M</td>
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<td>IHIP</td>
<td>Integrated Health Information Platform</td>
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<td>ITAG</td>
<td>Immunization Technical Advisory Group</td>
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<td>MCV</td>
<td>measles-containing vaccine</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>MeaNS</td>
<td>measles nucleotide surveillance</td>
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<td>MR</td>
<td>measles and rubella</td>
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<td>MR-SIA</td>
<td>measles and rubella supplementary immunization activity</td>
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<td>MRCV</td>
<td>measles and rubella containing vaccine</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>NCDC</td>
<td>National Centre for Disease Control</td>
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<td>NIHFW</td>
<td>National Institute of Health &amp; Family Welfare</td>
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<td>NTAGI</td>
<td>National Technical Advisory Group on Immunization</td>
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<td>NVC</td>
<td>National Verification Committee</td>
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<td>RCV</td>
<td>rubella containing vaccine</td>
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<td>RubeNS</td>
<td>rubella nucleotide surveillance</td>
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<td>RVC</td>
<td>Regional Verification Commission</td>
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<td>SDG</td>
<td>Sustainable Development Goal</td>
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<td>SEA</td>
<td>South-East Asia</td>
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<td>SEA-RVC</td>
<td>South-East Asia Regional Verification Commission</td>
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<td>SIA</td>
<td>supplementary immunization activity</td>
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<td>SOP</td>
<td>standard operating procedure</td>
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<td>Td</td>
<td>tetanus, diphtheria (vaccine)</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<td>US CDC</td>
<td>United States Centers for Disease Control and Prevention</td>
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<td>UT</td>
<td>union territory</td>
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<td>WHO</td>
<td>World Health Organization</td>
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EXECUTIVE SUMMARY

Measles is one of the world’s most contagious diseases, with an increased risk of severe complications or death for children less than five years of age. Rubella infection occurring during early pregnancy may result in congenital rubella syndrome (CRS). Both measles and rubella are preventable and can be eliminated through vaccination. Building on the investments and lessons learned from polio eradication, India has made substantial efforts toward measles and rubella elimination. To further strengthen these efforts, this National Strategic Plan for Achieving and Sustaining Measles and Rubella Elimination in India has been developed.

This National Strategic Plan aligns with recommendations by the National Technical Advisory Group on Immunization (NTAGI), the National Verification Committee and the India Expert Advisory Group for Measles–Rubella (IEAG-MR). The development of this plan was informed by the Government of India (GoI)’s Universal Immunization Programme Comprehensive Multi-Year Plan 2018–2022, the South-East Asia Regional Vaccine Action Plan (SEARVAP) and the Strategic Plan for Measles and Rubella Elimination in the South-East Asia Region, 2020–2024.

In alignment with the World Health Organization (WHO) South-East Asia (SEA) Region’s goal of measles and rubella elimination by 2023 (Resolution SEA/RC72/R3), this National Strategic Plan establishes a new goal on rubella elimination. Along with the following goals, strategic objectives and key milestones, several process and outcome indicators have also been identified to monitor progress.

GOAL

Achieve and maintain elimination of measles and rubella with interruption of the transmission of indigenous measles and rubella viruses in all states and districts of India.

Strategic Objectives

- Achieve and maintain high population immunity with at least 95% vaccination coverage by providing two doses of measles and rubella containing vaccines within all areas of each district through routine and/or supplementary immunization.
- Develop and sustain a sensitive and timely case-based measles, rubella and CRS surveillance system that fulfills recommended surveillance performance indicators.
- Maintain an accredited measles and rubella laboratory network that supports every state.
- Ensure adequate outbreak preparedness and respond rapidly to measles and rubella outbreaks.
- Strengthen support and linkages to achieve the above strategies which include:
  - planning and progress monitoring
  - advocacy, social mobilization and communication
  - identifying and utilizing synergistic linkages of integrated programme efforts
  - research and development.
Guiding principles
The strategy was based on the following guiding principles:
- sustainability
- RI and health systems strengthening
- equity
- leveraging partnerships.

Key milestones
Step 1:
- a. Complete the wide age-range Measles and Rubella Supplementary Immunization Activity (MR-SIA) campaign in all states.
- b. Enhance MR surveillance sensitivity by completing the transition from outbreak-based to case-based surveillance in all states.
- c. Revise outbreak preparedness and response protocol and implement the same nationwide.
- d. Revise MR surveillance guidelines in alignment with global and regional guidelines on measles and rubella surveillance.
- e. Implement strategies to improve surveillance sensitivity throughout the country including:
  - increasing the number and frequency of active case searches in health facilities
  - expansion of the MR-AFP surveillance network
  - strengthening of surveillance through orientation of reporting sites
  - increasing surveillance sensitivity through capacity-building of front-line health workers for early detection and response to a case or an outbreak
  - identification and sensitization of potential informers (faith healers, temple sites and others) to increase surveillance sensitivity
  - enhance engagement and sensitization of professional societies
  - greater coordination with Integrated Disease Surveillance Programme (IDSP) through district weekly review meetings.
- f. Build capacity of government officials and NPSP field officers through implementation of a comprehensive training package for updated MR surveillance and RI strengthening. Roll out this training nationwide.
- g. Pilot MR surveillance data collection through Integrated Health Information Platform (IHIP).
- h. Expand the WHO and Indian Council of Medical Research (ICMR) supported MR Laboratory Network from 13 to 19 laboratories.
- i. Identify district public health laboratories through IDSP for future integration.
- j. Identify high-risk areas based on surveillance and demographic information and use the same to prioritize sub-district interventions.
- k. Use MRCV2 coverage and drop-out rate from MRCV1 to MRCV2 as monitoring indicators, both nationally and subnationally.

Step 2:
- a. Develop subnational plans/strategies for measles and rubella elimination.
- b. Conduct MR surveillance reviews in select high-risk states or states with poor surveillance quality.
- c. Expand the MR laboratory network by 10 laboratories, for a total of a proposed 29 laboratories.
- d. District public health laboratories will begin to be integrated into the MR laboratory network.
e. Expand CRS sentinel surveillance, including the proposed “rubella screening” to 15 sites. Explore the feasibility of introducing national case-based CRS surveillance.

f. Depending on outcome of pilot of IHIP, expand MR surveillance through IHIP to additional states.

g. Conduct an evaluation of acute fever and rash surveillance in the three states where such surveillance has been implemented. This evaluation will assess surveillance sensitivity and programme performance following the transition to acute fever and rash surveillance.

h. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.

i. Identify districts which have not achieved 95% MRCV2 (if any) and prepare district-specific plan of action to address identified gaps.

j. Provide need-based additional support to districts with low immunization coverage, vaccine hesitancy, or large VPD outbreaks to achieve 95% MRCV2 coverage. Priority will be placed on areas such as North-East states and aspirational districts with poor performance and low availability of resources.

k. Identify missed opportunities for vaccination through RI monitoring; implement targeted interventions to address identified gaps.

Step 3:

a. Based on epidemiological assessment, consider follow-up supplementary immunization in areas with high immunity gaps and sustained measles and rubella transmission.

b. Based on the outcome of the evaluation of acute fever and rash surveillance, and under the guidance of the IEAG-MR, expand acute fever and rash surveillance for measles and rubella to additional states.

c. Interrupt indigenous measles and rubella transmission in as many subnational areas as possible.

d. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.

Step 4:

a. Develop a post-elimination sustainability plan.

b. Interrupt transmission of indigenous measles and rubella in as many subnational areas as possible.

c. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.

Step 5:

a. Interrupt indigenous measles and rubella transmission in India.

b. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.

Step 6:

Maintain the interruption of transmission of measles and rubella in India.
1. INTRODUCTION AND BACKGROUND

Since adopting the goal of measles elimination and rubella control by 2020 in September 2013, India has made progress towards measles elimination and rubella/congenital rubella syndrome (CRS) control. Coverage with the first dose of measles and rubella containing vaccine (MRCV1) in 2018–2019 was 85%, and coverage of the second dose of measles and rubella containing vaccine (MRCV2) was reported at 71% during the same time period (source: HMIS [https://nrhm-mis.nic.in, accessed 1 June 2019]).

Since December 2014, India has held three India Expert Advisory Group on Measles and Rubella (IEAG-MR) meetings to review the progress towards achieving the goal of measles elimination and rubella control. The Third IEAG-MR was held in February 2019 and noted with cautious optimism that India has made progress towards elimination, noting in particular a high level of political and administrative commitment. However, the IEAG-MR noted that targets were off track due to suboptimal implementation of elimination strategies.

In addition, in September 2019, the World Health Organization (WHO) South-East Asia (SEA) Region established a goal to achieve measles and rubella elimination by 2023 (Resolution SEA/RC72/7). In alignment with the conclusions of the Third IEAG-MR and the Region’s measles and rubella elimination goal, this National Strategic Plan for Achieving and Sustaining Measles and Rubella Elimination in India includes a new goal on rubella elimination and outlines strategies to address key challenges faced during the implementation of the current strategy. Along with the goals, strategic objectives, guiding principles and key milestones, several processes and outcome indicators have also been identified to monitor progress.
In 1985, India introduced the first dose of measles-containing vaccine (MCV1) in the routine immunization (RI) programme and introduced a second dose of measles containing vaccine (MCV2) into the RI schedule in 2010. Rubella-containing vaccine (RCV) was introduced in RI as MRCV1 and MRCV2 in 2017. In 2018–2019, India achieved an MRCV1 coverage of 85% and an MRCV2 coverage of 71% (Fig. 1) (source: HMIS [https://nrhm-mis.nic.in, accessed 1 June 2019]).

**Figure 1: MRCV1 and MRCV2 coverage, India 2018-19*, HMIS**

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<tr>
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<th>% MRCV1</th>
<th>% MRCV2</th>
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<td>&gt;=95%</td>
<td>85%</td>
<td>71%</td>
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<td>60% to 80%</td>
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<td>40% to 60%</td>
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<td>&lt;=40%</td>
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<td>Data not available</td>
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*as of June 2019

Source: HMIS (https://nrhm-mis.nic.in, accessed 1 June 2019)

In addition to providing two doses of MRCV in RI, India implemented a wide age-range measles and rubella supplementary immunization activity (MR-SIA) catch-up campaign beginning in 2017. As of December 2019, all states/union territories (UTs) in India, with the exception of two states, have completed the campaign; more than 324 million children have been vaccinated. In states covered in the early phases of the campaign, there was a reduction in the reported number of cases of measles and rubella following the campaign.

To accelerate progress in RI, the GoI started Mission Indradhanush in 2015 and Intensified Mission Indradhanush in 2017. In 2018, the GoI launched Gram Swaraj Abhiyan (GSA) and Extended GSA, which includes immunization as one of the flagship schemes. Since 2015, a total of 554 districts have been covered in six phases of these initiatives. In total, 33.9 million children and 8.72 million pregnant women have been vaccinated (Source: GoI Ministry of Health and Family Welfare [MoHFW] website).
In addition, these initiatives strengthened immunization systems through meticulous microplanning, training of 500 000 health workers and enhanced community engagement and monitoring.

Since 2005, India has worked to increase the sensitivity of measles and rubella surveillance. Surveillance for measles and rubella has undergone significant modifications, transitioning from outbreak-based surveillance to modified case-based surveillance. By December 2019, all states in the country moved to modified case-based surveillance. In addition, three states have initiated fever and rash surveillance. Even as these efforts are being implemented, India is not yet meeting the elimination standard target for non-measles non-rubella discard rate. In states with case-based surveillance, the reported non-measles non-rubella discard rate for 2018 was 0.6 per 100 000 population against a target of ≥2 per 100 000 population.

Along with the expansion of case-based surveillance for measles and rubella, India has also significantly expanded the laboratory network to support surveillance needs. The Measles Rubella (MR) laboratory network expanded from 13 laboratories in 2017 to 19 laboratories in 2019 (Fig. 3).
For better geographical representation of MR laboratories in the country, plans are in place to enrol 10 additional laboratories in the network. To maintain the functional quality of the network laboratories, a 10-step scheme for enrolment, induction and attaining proficiency by new laboratories has been developed.

All laboratories in the network have successfully achieved the targets of monitoring indicators for quality assurance. This is based on the assumption that each laboratory of the network can perform at least 3000 serological tests per year, meet the present indicators, and have adequate capacity to handle the workload of case-based surveillance. The optimum capacity of MR laboratory network-India is thus to handle 57,000 serum samples on an annual basis. This reflects that the current MR laboratory network-India with its expansion plan is adequate to handle the increasing workload of case-based MR surveillance.
3. KEY ISSUES AND CHALLENGES

The following key issues and challenges were highlighted during the Third IEAG-MR, and have been addressed in the current strategic plan.

Immunization
- Pockets of low immunity with MRCV1 and MRCV2, especially at subnational levels.
- Consistent use of monitoring dropouts from MRCV1 to MRCV2.
- MR SIAs have not been fully utilized to strengthen RI.

Surveillance
- The sensitivity of case-based surveillance is suboptimal. The non-measles non-rubella discard rate is below global standards at both the national and subnational levels.
- A large number of measles and rubella cases are not investigated; this provides an incomplete picture of disease epidemiology. There has been slow progress in switching from outbreak-based to case-based surveillance throughout the country.
- Private sector engagement is suboptimal and there are no current policies or strategies to involve the private sector in immunization and surveillance for measles and rubella.
- CRS surveillance is limited to newborns and does not include tracking suspected mothers.

Laboratory
- Due to budgetary constraints and a global shortage of diagnostic kits, laboratories may not achieve the target timeliness indicator for reporting results to the programme.

Linkages
- National and subnational strategies and plans of action for measles and rubella elimination have not yet been developed.
- Outbreak preparedness and response plan for measles and rubella has not been recently updated.
- A communication strategy to address various issues related to advocacy, social mobilization and demand generation is yet to be developed.
- India does not have well identified criteria, lines of evidence and tools to measure progress towards measles and rubella elimination at the subnational level.
4. GOAL AND STRATEGIC OBJECTIVES AND GUIDING PRINCIPLES

GOAL
Achieve and maintain elimination of measles and rubella with interruption of the transmission of indigenous measles and rubella viruses in all states and districts of India.

STRATEGIC OBJECTIVES
- Achieve and maintain high population immunity with at least 95% vaccination coverage by providing two doses of MRCV within all areas of each district through routine and/or supplementary immunization.
- Develop and sustain a sensitive and timely case-based measles, rubella and CRS surveillance system that fulfils recommended surveillance performance indicators.
- Maintain an accredited MR laboratory network that supports every state.
- Ensure adequate outbreak preparedness and respond rapidly to measles and rubella outbreaks.
- Strengthen support and linkages to achieve the above strategies which includes:
  - planning and progress monitoring;
  - advocacy, social mobilization and communication;
  - identification and utilization of synergistic linkages of integrated programme efforts, research and development.

GUIDING PRINCIPLES
1. Sustainability
   India has committed to the MR elimination goal and has assumed the primary responsibility of achieving it. Towards this end, health sector plans will fully integrate the national immunization programme plans and align with comprehensive multi-year plans (cMYPs) for immunization.

2. Routine immunization and health systems strengthening
   RI is the key to achieving the goal of elimination. Providing measles and rubella vaccination through high quality RI systems ensures high-level population immunity against measles and rubella and offers an opportunity to strengthen India’s health system. A child’s visits to receive MRCV represent key opportunities to monitor the vaccination and health status of the child, administer any missed or booster vaccine doses and provide vitamin A and other preventive interventions, as appropriate. SIAs can, and should, help strengthen RI and health systems. Additionally, surveillance data should be used to identify immunity gaps and guide programme decisions. To achieve measles and rubella elimination, India is committed to providing the resources necessary to strengthen immunization systems, including high-quality RI programmes and SIAs, social and behavioural change communication systems and strategies, disease surveillance, programme monitoring and an integrated laboratory network.
3. **Equity**
India is committed to ensuring all children are fully vaccinated, and equity in health-service delivery is a key tenet of the immunization programme. All people in India, regardless of economic or social condition, race, gender, religion, age or political belief should benefit from vaccination and protection against measles and rubella.

4. **Leveraging partnerships**
To achieve measles and rubella elimination, the GoI, in-country partners and civil society will need to work collaboratively. The strength of each partner, including donors, the private sector, academic institutions, professional bodies and religious institutions will need to be leveraged to achieve the common goal of measles and rubella elimination.
5. KEY ACTIONS TO ACHIEVE STRATEGIC OBJECTIVES

Strategic objective 1
Achieve and maintain high population immunity with at least 95% vaccination coverage by providing two doses of MRCVs within all areas of each district through routine and/or supplementary immunization.

Key actions
1. Ensure an appropriate policy and programmatic framework is in place to provide MRCV1 and MRCV2 through RI.
   a) Maintain the two-dose schedule of MR vaccine. Ensure that all children receive MRCV2 by 24 months of age and that missed doses are provided up to 5 years of age, with two doses given 4 weeks apart.
   b) Ensure MRCV2 is included in the definition of a completely immunized child.
   c) Use MRCV2 coverage and drop-out rate from MRCV1 to MRCV2 as monitoring indicators, both nationally and subnationally.
2. Strengthen RI systems.
   a) Continue to promote the updating of micro-plans in every district for both routine and supplemental immunization service delivery.
   b) Ensure State Task Force for Immunization (STFI) and District Task Force for Immunization (DTFI) meetings are conducted on a regular basis, and provide strategic directions to focus on areas needing attention.
   c) Use data available through the surveillance system for immunization strengthening activities and targeted deployment of resources.
   d) Provide appropriate basic training and regular in-service training for front-line health workers. Communication skills, including risk communication should form part of this training.
   e) Ensure vaccine, immunization and injection safety, which require safe and potent vaccines, safe injection practices (including prevention of reusable syringes) and proper waste disposal. Surveillance and response to adverse events following immunization (AEFIs), including a causality assessment for AEFIs should be able to identify and correct programme errors and ensure programme credibility to the public.
   f) Use communication and social mobilization strategies to increase community demand for vaccination.
   g) Use immunization monitoring data to assess factors relating to missed opportunities for vaccination and implement targeted interventions to ensure optimal utilization of immunization services.
   h) Use culturally appropriate community engagement strategies in areas with low coverage and areas with vaccine hesitancy.
   i) Continuously monitor and evaluate the RI programme, including assessment of data quality for both surveillance and immunization at every level.
j) Identify problems in a timely manner and provide feedback to staff and local partners on performance, obstacles and opportunities for improvement.

k) Maintain high quality vaccine management systems (such as Electronic Vaccine Intelligence Network [eVIN]) to ensure vaccine availability and security. Accurate demand forecasting, appropriate vaccine vial size and calculation of appropriate wastage rates for vaccines, injection equipment, supplies and the cold chain at district and state levels is critical for providing uninterrupted immunization services and avoiding preventable spoilage and unnecessary wastage of vaccines.

l) Consider use of modelling to help identify immunity gaps.

3. Prioritize and intensify RI in high risk areas.
   a) Conduct risk prioritization of districts and states based on immunization coverage and the available surveillance and immunization data to strengthen RI, guide optimal use of resources and strengthen health systems.
   b) Identify and map areas at high risk for MR outbreaks and intensify RI activities in these areas.
   c) Revalidate and reprioritize the existing 400 000 high-risk areas (HRAs) by collecting information on potential risks. Include areas with low coverage due to geographic, demographic, ethnic and other operational challenges.
   d) Utilize Mission Indradhanush as an opportunity to strengthen RI.

4. Establish and maintain high population immunity among children under 2 years of age.
   a) Ensure all children are given opportunities for receiving two doses of MRCV by their second birthday through the routine vaccination programme.
   b) Utilize opportunity of periodic intensification of RI (PIRI)/Mission Indradhanush in areas to improve MRCV1 and MRCV2 coverages.

5. Establish and maintain high population immunity among preschool-age children (under 5 years of age).
   a) Ensure children are receiving missed routine dose of MRCV2 up to 5 years of age.
   b) Promote vaccination history checks at entry to day cares/preschools/kindergartens and encourage requirement for vaccination for those who missed the routine dose of MRCV2.
   c) Reduce missed opportunities for vaccination by utilizing every visit to the doctor as an opportunity for a vaccination check.
   d) Under guidance of the IEAG-MR, and based on the epidemiology of measles and rubella, consider follow-up SIAs.

6. Establish and maintain high vaccination coverage among school-going age children (5 to 15 years of age).
   Identify opportunities to align with strategies to increase tetanus, diphtheria (Td) vaccine coverage among children who have missed MRCV doses.

7. Establish and maintain high population immunity among the adult population.
   a) Under guidance of the IEAG-MR, and based on the epidemiology of measles and rubella, consider conducting selective MRCV SIAs for high-risk adult groups, e.g. refugees, migrants to urban slums and seasonal workers.
   b) Based on epidemiology, consider conducting special communications and immunization strategies tailored for high-risk groups, e.g. ethnic minority groups, migrants, religious objectors, nomads and remote areas identified by analysis of data from surveillance and outbreak investigations.
8. Ensure coordination at the state and district level for all immunization strengthening activities, especially for HRA prioritization and missed opportunities for vaccination.

**Strategic objective 2**

**Develop and sustain a sensitive and timely case-based measles, rubella and CRS surveillance system that fulfils recommended surveillance performance indicators.**

**Key actions**

1. Ensure sensitive case-based surveillance for measles and rubella in all states.
   a) Complete nationwide transition to modified case-based surveillance. Conduct state- and district-level workshops as part of modified case-based surveillance training.
   b) Ensure sufficient capacity at national and all subnational levels for prompt and adequate investigation of suspect cases, management and analysis of data. Ensure all case investigations include use of a common unique identifier to link laboratory and epidemiologic data.
   c) The Surveillance Medical Officer (SMO), District Immunization Officer (DIO), the Nodal Officer, the Medical Officer in Charge (MOIC) and the District Surveillance Officer (DSO) should increase the number and frequency of active case searches for suspect cases in health facilities in the reporting network.
   d) Expand the surveillance reporting network to increase reporting of suspect measles cases. Consider government facilities that are visited by suspect cases for inclusion in the network.
   e) Orient/re-orient all reporting sites within the government health system to the requirements and procedures for reporting suspect cases for all age groups.
   f) Systematically engage and sensitize the private health sector and professional societies (including the Indian Medical Association, the Indian Academy of Paediatrics and the Indian Systems of Medicine) to report suspect cases. Engage other professional bodies, including from the education sector, to report cases from schools and other community level informants.
   g) Strengthen passive surveillance through engagement of faith healers, temple sites and any other private health facilities with potential to report suspected measles cases.
   h) Sensitize frontline workers (auxiliary nurse midwives [ANMs]/accredited social health activists [ASHAs]/anganwadi workers [AWWs]) by providing standardized information on the early detection and reporting of suspect cases.
   i) Ensure sufficient capacity of both HR and logistics at state and district levels for collecting adequate and appropriate specimens for both serological and virological tests. Ensure collection of appropriate clinical specimens for obtaining genotype information from each chain of transmission.
   j) Ensure adequate operational resources to ensure timely collection and transport of specimens for case confirmation, virus detection and molecular epidemiology.
   k) Ensure that the investigation of measles and rubella cases is able to classify cases as preventable or non-preventable.
   l) Improve linkage of MR surveillance with existing surveillance networks, specifically the Integrated Disease Surveillance Programme (IDSP). Initiate and/or reinforce district weekly review meetings between the CMO, DIO, IDSP, and World Health Organization (WHO) to facilitate reporting and investigation of all suspect cases.
   m) Provide regular monitoring, supervision and feedback on surveillance data and performance to all levels of the system to ensure quality of surveillance, including data quality.
   n) Revise MR surveillance guidelines in line with global and regional guidance; include an outbreak response protocol with root cause analysis.
Conduct training workshops at the national, regional and district levels to sensitize surveillance officers (government and partners) on MR elimination goals and strengthening of MR surveillance and RI.

2. Conduct an evaluation of acute fever and rash surveillance in the three states where acute fever and rash surveillance has been implemented. This evaluation will assess surveillance sensitivity and programme performance following the transition to acute fever and rash surveillance. The findings of this evaluation will be presented to the IEAG-MR, and depending on their guidance, consider expanding acute fever and rash surveillance for measles and rubella to additional states.

3. Expand sentinel site surveillance for CRS.
   a) Explore mechanisms for rolling out sensitive case-based surveillance for CRS throughout the country.
   b) Ensure adequate linkages between sentinel and case-based surveillance for CRS and mechanisms for using CRS surveillance data for programmatic actions.
   c) Ensure adequate capacity at the sentinel sites to perform CRS surveillance in line with the Regional CRS Surveillance Guide.
   d) Ensure that the laboratories are well equipped to support CRS surveillance and perform tests as per the WHO protocol on suspected CRS case investigation.
   e) Provide regular monitoring, supervision and feedback on surveillance data and performance to all sentinel sites for CRS surveillance to ensure quality of surveillance including data quality.

4. Pilot MR surveillance data collection through Integrated Health Information Platform (IHIP). Following evaluation of pilot, consider expansion throughout the country.

5. Ensure cross-border/region collaboration to strengthen surveillance.
   Establish linkages between India and neighbouring countries to support cross-border surveillance, particularly in cases of mass population movement.

**Strategic objective 3**

**Maintain an accredited measles and rubella laboratory network that supports every area in the country.**

**Key actions**

1. Ensure expansion of the MR laboratory network in collaboration with the Viral Research Diagnostic Laboratory (VRDL) network of the Department of Health Research (DHR), Indian Council of Medical Research (ICMR) and the IDSP laboratory network. The MR laboratory network of India has plans to expand to ensure a geographically widespread presence to meet the needs of the MR surveillance programme.

2. All laboratories should be assessed (on-site or desk review) on an annual basis for quality performance to ensure maintenance of their WHO accredited or proficient status.

3. Ensure maintenance of at least two WHO accredited national reference laboratories to provide hands-on training and technical support to subnational laboratories.

4. Ensure at least 80% of the laboratories in the network are able to perform molecular epidemiology for measles and rubella.

5. Ensure access to adequate laboratory equipment and sufficient supply of consumables (including testing kits).

6. Ensure that the national reference laboratories have the capacity and ability to perform special tests for measles and rubella, e.g. avidity, immunoglobulin G (IgG) on paired sera and plaque reduction neutralization test to help classify cases of measles and rubella where regular serology and virology are not able to establish a case classification.
Ensure laboratories regularly submit genotype and sequence data to measles and rubella nucleotide surveillance databases (MeaNS and RubeNS).

**Strategic objective 4**

Ensure adequate outbreak preparedness and respond rapidly to measles and rubella outbreaks.

**Key actions**

1. Ensure an outbreak preparedness and response plan is in place for large measles and rubella outbreaks for early detection and timely response.
   a) Update a national plan for outbreak response in line with global and regional surveillance guidelines that includes root cause analysis, emergency response infrastructure, standard operating procedures (SOPs) and contingency planning.
   b) Ensure these plans are adequately disseminated to all levels of the health system.
   c) Ensure adequate capacity exists in the states to rapidly respond to measles and rubella outbreaks.
   d) Ensure contingency funds for outbreak investigation are available with a mechanism for prompt disbursement of the funds when an outbreak is suspected.

2. Conduct prompt and thorough outbreak investigations and response.
   a) Ensure protocols and training materials for public health response and outbreak investigations are updated in line with global and regional surveillance guidelines to include critical data to be collected, criteria for laboratory confirmation, guidelines for analysis, interpretation of analysis results and presentation of the data.
   b) Ensure that investigations of measles and rubella cases during large outbreak investigations are followed by a root-cause analysis of the outbreak.
   c) During outbreak response, ensure that RI and health system strengthening activities are implemented based on root-cause analysis to prevent future outbreaks. Intensify RI in the outbreak area.

3. Develop subnational strategies for outbreak response, based on the varying levels of measles and rubella epidemiology across states. As recommended by the Third IEAG-MR, identify states with low measles and rubella incidence, or where transmission has stopped, for implementation of intensive strategies towards measles elimination.
   a) In these low-incidence states, develop outbreak response protocols in line with global and regional guidelines for outbreak response in elimination settings.
   b) In these low-incidence states, implement infection prevention and control measures to prevent nosocomial transmission during outbreaks.
      • Ensure that all health-care associated cases are promptly investigated, including contact tracing with appropriate post-exposure measles prophylaxis to exposed patients, family members and health workers.
      • Develop public messages on the isolation of suspected cases and care of uncomplicated cases at home.
      • Encourage vaccination of all health workers.

4. Ensure all states have the capacity to provide appropriate clinical management of suspected measles, rubella and CRS cases.
   a) Ensure case management protocols for measles, rubella and CRS are provided to the states.
b) Conduct regular training to ensure all health staff who could be involved in the case management on a day-to-day basis are familiar with the case management protocols.

c) Ensure pregnant women who are suspected cases are listed on a pregnancy registry for follow up to rule out CRS.

5. Ensure implementation of appropriate communication strategies in the identified geographies during outbreak response.
   a) Ensure that a communication plan is part of the outbreak response plan.
   b) Ensure training of frontline workers on communication during an outbreak.
   c) Ensure the materials with key MR messages are available and appropriately targeted to various audiences.
   d) Proactively engage with the media with accurate and timely information.
   e) Involve identified civil society organizations/key influencers to support social mobilization during an outbreak.

**Strategic objective 5**

**Strengthen support and linkages to achieve the above strategies.**

**Key actions**

1. Programme management, planning and progress monitoring
   a) Develop subnational plans and strategies for measles and rubella elimination considering the subnational differences in the measles and rubella epidemiology in India.
   b) Conduct regular analysis and review to monitor progress at national as well as state and district levels of the epidemiology of measles, rubella and CRS cases, outbreaks and chains of transmission. This should be done using multiple complementary data sources, including coverage data, linked laboratory and epidemiological data from MR surveillance and genotyping data to minimize the gaps in each individual data source.
   c) Conduct periodic review of implementation of the IEAG-MR recommendations.
   d) Assess progress towards measles and rubella elimination with participation of government, South-East Asia Regional Verification Commission (SEA-RVC), WHO and other partners.
   e) Ensure adequate vaccines, ancillaries and laboratory test kits and supplies are available through regularly forecasting exercise and incorporating them in the procurement plans of the government and partner support.

2. Advocacy, social mobilization and communication
   To achieve 95% coverage with MRCV2, India must implement well-designed communication strategies that are directly linked to programme goals. Social mobilization and communication efforts should address social norms and cultural beliefs and include both traditional media channels and proven innovative techniques.
   a) Integrate advocacy, social mobilization and communication with increased focus on increasing MRCV coverage into RI plans to address the requirements for reaching measles and rubella elimination goals.
   b) Social mobilization and communication efforts should aim to foster community ownership and demand for immunization.
   c) Develop and implement special strategies to address vaccine refusal or vaccine hesitancy. Special attention should be paid to language or cultural barriers among minority populations and immigrant, refugee, mobile or other marginalized or socioeconomically disadvantaged population groups.
d) Consider the involvement of representatives from ministries of education, defence, and labour as well from individual schools and universities, military installations and factories to help organize special immunization initiatives for their staff and identify and report suspected measles and rubella cases.

e) Advocate with decision-makers, political leaders, health-care professionals (including those in the private sector), teachers, religious leaders, professional associations to explain the benefits of immunization and invite their active participation in achieving measles and rubella elimination goals.

f) Establish partnerships with social media and nongovernmental organizations (NGOs) and disseminate knowledge and awareness on measles, rubella, CRS and the importance of their prevention by vaccination through media, including radio, TV and social media networks. Engage national and regional celebrities to promote key messages on MR elimination.

g) Strengthen the advocacy functions of the National Verification Committee (NVC) to raise awareness of and commitment to measles and rubella elimination, targeting high-ranking health officials, health professionals, partners and political leaders through multiple channels, such as national health conferences, scientific seminars, media and personal networks.

3. Identify and utilize synergistic linkages of integrated programme efforts. Measles and rubella elimination should have linkages with other child survival interventions to maximize the benefit of investments.

a) Linkages with polio eradication initiative. The strategies for measles and rubella elimination should build on and be linked to the principles of polio eradication. As the endgame strategy for polio eradication and the transition planning gains importance, new opportunities for linkages with measles and rubella elimination should be leveraged.

b) Linkages with new vaccines introduction. There may be opportunities for linkages to support measles and rubella elimination when India introduces new vaccines like Td, pneumococcal conjugate vaccine (PCV), rotavirus vaccine and others. Combination of planning and intervention of public health interventions can be resource sparing.

c) Linkages with other proven child survival interventions, IDSP and IHIP. Maternal and child health programmes, nutritional support programmes including vitamin A supplementation, pandemics, avian and seasonal influenza initiatives, malaria prevention and others all have mutual interest in effective delivery systems, surveillance and data management. In addition, there are opportunities to leverage linkages with other disease surveillance programmes such as IDSP and data management platforms such as IHIP. With limited financial resources, collaboration with other programmes is likely to be necessary to achieve complementary programme objectives and may promote programme synergies.

d) Linkages with laboratory network in private sectors that are generating information on measles rubella immunoglobulin M (IgM) assays. Enzyme immunoassay (EIA) for MR IgM are routine diagnostic tests in some of the laboratories in the private and public sectors. A pilot study may help assess the potential of incorporating the information generated in these laboratories into the national programme.

e) Linkages with Sustainable Development Goals (SDGs). Measles and rubella/CRS elimination links clearly with SDG 3, ensuring good health and well-being as one of the most cost-effective ways to meet the goal. Measles and rubella elimination is unwaveringly linked to Health Target 3.2 on child mortality as well as to Target 3.8 on universal access to safe, effective, quality and affordable vaccines for all under the SDG 3 for Health. This goal has an overall impact on child survival and development and thus has an indirect impact on SDG 1 for poverty, SDG 2 for food security and nutrition, SDG 4 for education, SDG 5 for gender equality and SDG 8 for economic growth and employment. It is also a continuation of the unfinished agenda of MDG 4.

4. Research and development

Research priorities should be identified by the GoI and technical advisory bodies to help define effective strategies and interventions to accelerate progress towards measles and rubella elimination.
6. VERIFICATION PROCESS

SEA-RVC was established in 2016. The Commission has developed a framework for verification of measles elimination and rubella/CRS control which includes five lines of evidence and three criteria.

**Lines of evidence**

1. A detailed description of the epidemiology of measles and rubella since the introduction of measles and rubella vaccine in the national immunization programme
2. Genotyping and molecular evidence that measles and rubella virus transmission has been interrupted
3. Epidemiological surveillance and laboratory performance quality
4. High population immunity
5. Sustainability of elimination and the national immunization programme.

**Criteria**

1. Documentation of the interruption of endemic measles or rubella virus transmission for a period of at least 36 months from the last-known endemic case
2. The presence of a high-quality surveillance system that is sensitive and specific enough to detect imported and import-related cases
3. Genotyping and molecular evidence that supports the interruption of endemic transmission for verification. The SEA-RVC currently conducts verification of countries and not of subnational areas within the countries.

SEA-RVC and WHO will update the current regional guide on verification of measles elimination and rubella/CRS control adding criteria and lines of evidence for rubella elimination and updating the criteria for measles elimination as per the new global guidelines. SEA-RVC may consider verification of subnational areas for interruption of transmission of measles and rubella in large countries. SEA-RVC and WHO will support India’s NVC in developing an annual National Verification Committee (NVC) report documenting progress towards and status of both measles and rubella elimination, using updated regional guidelines on verification of measles elimination with additional criteria and lines of evidence for rubella elimination and reporting for subnational verification.
7. MILESTONES AND MONITORING PROGRESS

Each of the committees below will monitor and review the surveillance and immunization data on measles and rubella cases and trends, in light of the measles and rubella elimination and goals.

1) The IEAG-MR will meet annually to provide guidance for meeting the measles and rubella elimination objectives.

2) NVC for Measles and Rubella/CRS Elimination will meet annually to review national progress and advise the Ministry of Health and Family Welfare (MoHFW), National Immunization Programme and surveillance units on verification requirements. The NVC will liaise with the Regional Verification Commission (RVC) on behalf of India and will:
   a. compile and review information monitoring progress toward measles and rubella elimination;
   b. assess data quality and validate analyses and assessments;
   c. supervise annual progress reports to the RVC, proposing additional analyses or alternatives if data is insufficient or inconsistent.

3) The NTAGI will meet annually and ad hoc to review progress against the agreed indicators for each state and provide advice on issues and the way forward.

MILESTONES

In addition to the agreed targets and indicators, the following operational milestones will be monitored.

Step 1:
   a. Complete the wide-age range Measles and Rubella Supplementary Immunization campaign (MR-SIA) in all states.
   b. Enhance MR surveillance sensitivity by completing the transition from outbreak-based to case-based surveillance in all states.
   c. Revise outbreak preparedness and response protocol and implement nationwide.
   d. Revise MR surveillance guidelines in alignment with global and regional guidelines on measles and rubella surveillance.
   e. Implement strategies to improve surveillance sensitivity throughout the country including:
      • increase the number and frequency of active case searches in health facilities
      • expansion of the MR-AFP surveillance network
      • strengthening of surveillance through orientation of reporting sites
      • increase surveillance sensitivity through capacity building of front line health workers for early detection and response to a case or an outbreak
      • identification and sensitization of potential informers (faith healers and temple sites and others) to increase surveillance sensitivity
      • enhance engagement and sensitization of professional societies
• greater coordination with Integrated Disease Surveillance Programme (IDSP) through weekly review meetings
f. Build capacity of government officials and NPSP field officers through implementation of a comprehensive training package for updated MR surveillance and RI strengthening. Roll out this training nationwide.
g. Pilot MR surveillance data collection through IHIP.
h. Expand the WHO and ICMR-supported MR laboratory network from 13 to 19 laboratories.
i. Identify district public health laboratories under IDSP for future integration.
j. Identify HRAs based on surveillance and demographic information and use this to prioritize sub-district interventions.
k. Use MRCV2 coverage and drop-out rate from MRCV1 to MRCV2 as monitoring indicators, both nationally and subnationally.

Step 2:
a. Develop subnational plans/strategies for measles and rubella elimination.
b. Conduct MR surveillance reviews in select high-risk states or states with poor surveillance quality.
c. Expand the MR laboratory network by 10 laboratories, for a total of 29 laboratories.
d. District public health laboratories will begin to be integrated into the MR laboratory network.
e. Expand CRS sentinel surveillance, including the proposed “rubella screening”, to 15 sites. Explore feasibility of introducing national case-based CRS surveillance.
f. Depending on outcome of pilot of IHIP, expand MR surveillance through IHIP to additional states.
g. Conduct an evaluation of acute fever and rash surveillance in the three states where such surveillance has been implemented. This evaluation will assess surveillance sensitivity and programme performance following the transition to acute fever and rash surveillance.
h. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.
i. Identify districts which have not achieved 95% MRCV2 (if any) and prepare district-specific plans of action to address identified gaps.
j. Provide need-based additional support to districts with low immunization coverage, vaccine hesitancy, or large VPD outbreaks to achieve 95% MRCV2 coverage. Priority will be placed on areas such as North-East states and aspirational districts with poor performance and low availability of resources.
k. Identify missed opportunities for vaccination through RI monitoring; implement targeted interventions to address identified gaps.

Step 3:
a. Based on epidemiological assessment, consider follow-up supplementary immunization in areas with high immunity gaps and sustained measles and rubella transmission.
b. Based on the outcome of the evaluation of acute fever and rash surveillance, and under the guidance of the IEAG-MR, expand acute fever and rash surveillance for measles and rubella to additional states.
c. Interrupt indigenous measles and rubella transmission in as many subnational areas as possible.
d. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.

Step 4:
a. Develop a post-elimination sustainability plan.
b. Interrupt transmission of indigenous measles and rubella in as many subnational areas as possible.
c. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.

**Step 5:**
a. Interrupt indigenous measles and rubella transmission in India.
b. Convene IEAG-MR meetings to assess progress and make recommendations to achieve MR elimination.

**Step 6:**
Maintain the interruption of transmission of measles and rubella in India.

**MONITORING PROGRESS**
Several key process and impact indicators will be monitored periodically (given in Annex 1). The major output and outcome indicators to be monitored regularly are given below.

1. Number and proportion of states/UTs with zero indigenous measles and rubella cases for last 12 months.
2. Number and proportion of states/UTs with measles incidence less than five cases per million population.
3. Number and proportion of states/UTs with coverage levels of second dose MRCV >95% at the state level and in all districts.
4. Number of estimated measles deaths, the percentage reduction since 2000, and number of deaths averted through vaccination.
5. Number of estimated CRS cases, the percentage reduction since 2016, and number of cases averted through vaccination.
6. Number and proportion of states/UTs with non-measles non-rubella discard rate of \( \geq 2 \) per 100 000 population.
7. Number and proportion of states with access to at least one proficient measles and rubella laboratory that can perform molecular epidemiology.
8. Number of genotypes of measles and rubella that have been detected over time, by state.
Measles, rubella and CRS elimination strategies have been successful in the WHO Region of the Americas and in several countries in other WHO regions including in the South-East Asia Region. However, these strategies may not perform the same way in all countries, and experiences of the Global Polio Eradication Initiative (GPEI) reveal the importance of identifying, anticipating and addressing barriers to effective implementation of disease-control strategies. Resource limitations represent a major constraint. The following are five key challenges to implementing this strategic plan and potential solutions to address them.

1. **Financial risk**
   Sufficient predictable and sustainable funds are a cornerstone to building a strong health system, delivering effective RI and achieving the goals of measles and rubella elimination. National and state governments will have to step up and demonstrate commitment towards the programme and work with global/regional partners and stakeholders to ensure sufficient predictable funding for the programme. Immunization partners will have to seek to accelerate global and regional resource mobilization and advocacy efforts, communicate measles elimination success stories and emphasize the potential risks of losing the gains achieved to date.

2. **High population density and highly mobile populations including migrants, refugees and peri-urban slums**

   In settings with high population density and along migration routes (including air travel and during mass gatherings), the highly infectious nature of measles makes control and elimination very challenging. There is a need for operational research activities that provide evidence-based strategies to address the challenges posed by highly dense populations and populations with high levels of movement within and between countries. Efforts will be required to develop communication tools and strategies required to reach migrants and isolated populations, including groups that typically do not interact with national health systems. In addition, cross-border and cross-regional collaboration will be critical for timely notification and response to imported cases.

3. **Weak immunization systems and inaccurate reporting of vaccination coverage at subnational level**

   The highly infectious nature of measles and the high rate of clinical disease with infection make measles outbreaks one of the first indicators of programme weakness. Strengthening RI systems is critical to attain measles and rubella elimination and to sustain any gains made. There is a need to strengthen RI systems by documenting and disseminating the experiences and outcomes of implementing “best practices” in conducting RI and SIAs. State- or district-specific routine system strengthening activities, regular data validation (data quality assessments and surveys) and greater accuracy of coverage data at subnational levels is required, particularly in areas with relatively weak health systems. Furthermore, activities such as
Universal Immunization Programme (UIP) reviews and Post Introduction Evaluations of new vaccines represent key opportunities to review measles and rubella vaccination performance and the system components of the UIP. Typically, with the participation of external partners, these activities generate high-level national and international attention. Linking the outcomes and recommendations of the reviews to the multiyear planning process will lead to more systematic follow up, which increases the chances of securing financial resources to implement actions to strengthen immunization systems.

4. **Vaccine security**

Vaccine security will have to be well thought out. Vaccine supply must be adequate, timely and as per the pre-qualification standards. Timely forecasting and managing adequate lead time for the manufacturer for vaccines required for large campaigns and any outbreak response immunization activities will have to be conducted regularly.

5. **Low demand/Vaccine hesitancy**

When individuals no longer see cases of a previously common disease, they begin to believe the vaccine is no longer required. This misperception becomes an even greater problem if messages about AEFIs are amplified in the media while ignoring the benefits of vaccination. Currently, pockets of resistance to immunization, especially to MRCV exist in some areas of the country. This has resulted largely from the efforts of anti-vaccine groups, from highly publicized but completely discredited vaccine safety concerns, as well as concerns of some religious groups on the certification of the vaccine as religiously accepted by religious bodies.

Operational research is required on effective strategies to engage vulnerable and high-risk populations, addressing culture and belief systems and other factors that influence vaccine acceptance; on the effectiveness of immunization communication with parents and by health workers; and on determining the issues that need to be addressed to improve demand for measles and rubella immunization.

6. **Emergency settings**

Humanitarian crises resulting from armed conflicts or natural disasters adversely affect elimination efforts and cause population displacement, crowding, interruption of health services, reduced access to health facilities and increased risk of outbreaks, including cross-border transmission. Under the core commitments for children during emergencies, all children affected by humanitarian emergencies should receive a MR vaccination administered as soon as conditions allow access to affected communities.

Lessons learnt from the polio eradication initiative provide appropriate insights into the importance of planning synchronized cross-border SIAs, negotiating days of tranquility in areas with conflict and displaying flexibility in emergency situations.

7. **Laboratory**

Ensuring adequate funding and an uninterrupted supply of diagnostic kits to the MR Laboratory Network will be critical for reporting laboratory results to the programme in a timely manner. Central procurement and supply of kits and reagents ensures uniform quality of testing across the various laboratories in the network. Budget constraints and shortages of diagnostic kits may lead to delays in reporting results to the programme, impacting programme quality and delaying public health interventions at the field level. MR diagnostics by serology is a routine diagnostic test in many well-performing diagnostic centres, including in the private sector. It is not feasible to include all diagnostic laboratories in the country in the MR laboratory network. It is also not appropriate to ignore the information generated in these laboratories about measles and rubella laboratory confirmation. Therefore, a mechanism needs to be developed that will allow for incorporation of information generated in such diagnostic centres of the private sector into the surveillance system.
8. **Private and non-formal sector**

Increasing private sector presence and the need to ensure their involvement and active engagement is another challenge that needs to be adequately addressed. There is a need to have further study on the measles and rubella care-seeking behaviour, as available information suggests that most cases report to non-formal sector for the first time. Thus, strategies to actively engage non-formal and private sectors will have to be developed.

9. **Transition of polio assets**

In alignment with the Global Polio Eradication Initiative (GPEI) Strategic Plan, transition is underway for India’s polio programme. In 2014, GoI began working with polio partners, including WHO and United Nations Children’s Fund (UNICEF), to transition public health assets and capabilities developed for polio eradication—including immunization and communication strategies, human resources, laboratory capacity, disease surveillance and accountability mechanisms—to government programmes and other health activities. India’s transition framework aims to secure polio assets to support health goals in line with national priorities, including strengthening disease surveillance, increasing RI coverage and achieving measles and rubella elimination. This continued support will be critical to achieve measles and rubella elimination goals.
9. ROLES AND RESPONSIBILITIES

Measles and rubella elimination will require efforts from all sectors.

**GoI**

The GoI will bear responsibility for measles and rubella elimination, and must engage in sustainable national planning, funding and advocacy to protect their citizens from devastating but preventable diseases. To achieve the goal of measles and rubella elimination, the GoI will need to ensure that measles and rubella elimination is a priority focus in the health sector and is a well-funded national and subnational strategy. The GoI should periodically review and monitor progress and ensure timely corrective actions are taken to achieve the goal.

**Other immunization partners in the country**

Immunization partners include nongovernmental organizations (e.g. Lions International, Rotary International), national institutes (e.g. National Centre for Disease Control [NCDC] and National Institute for Health and Family Welfare [NIHFW]), research organizations (e.g. INCLEN), civil society (e.g. CORE), professional bodies (e.g. Indian Medical Association, Indian Academy of Paediatrics), international bodies (e.g. Bill and Melinda Gates Foundation, JSI, US Centers for Disease Control and Prevention [CDC]), vaccine manufacturers, and foundations and researchers, among others. Specifically, ICMR will play a critical role in supporting the expansion of sentinel site surveillance for CRS and support for the MR laboratory network. These partners should support the GoI to effectively implement and monitor the strategic plans to achieve measles and rubella elimination. Partners should also play a positive influencer role to communicate and engage to build public confidence and demand for vaccination. Private sector partners could also support to strengthen reporting of measles and rubella cases to the surveillance programme.

**WHO, UNICEF, UNDP and technical partners**

WHO NPSP, UNICEF, United Nations Development Programme [UNDP] and technical partners (e.g. ITSU, United States Agency for International Development [USAID], IPE Global, CORE), will continue to provide technical assistance to the GoI in support of their efforts to eliminate measles and rubella, and sustain elimination thereafter. Specific assistance will be provided as needed to support RI and SIAs, as well as epidemiologic and laboratory surveillance through on-site visits, electronic communication, periodic training workshops and reviews or technical consultation meetings.

**Regional partners**

In addition, the WHO South-East Asia Regional Office, in collaboration with UNICEF will continue to provide technical assistance to India in support of India’s efforts to eliminate measles and rubella and sustain elimination thereafter. Specific assistance will be provided as needed to support RI strengthening and SIAs, and epidemiological and laboratory surveillance through on-site visits, electronic communication, periodic training workshops, reviews and technical consultation meetings. The WHO South-east Asia (SEA) Regional Office will coordinate regional epidemiological and laboratory surveillance data management to monitor regional and country-specific progress towards achieving and sustaining measles and rubella elimination and provide feedback to the GoI and partners as appropriate through electronic publications and direct correspondence. WHO SEA Regional Office, in collaboration with UNICEF, will conduct advocacy and resource mobilization efforts at the regional level. The regional Office will also convene the Immunization Technical Advisory Group (ITAG) and establish and convene meetings of the Regional Commission for verification of measles and rubella elimination.
## ANNEX-1: OTHER MONITORING INDICATORS

<table>
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<tr>
<th>Indicator</th>
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<tbody>
<tr>
<td><strong>Disease incidence</strong></td>
<td><strong>The numerator is the confirmed number of measles or rubella cases for the year; and the denominator is the population in which the cases occurred multiplied by 1 million. When the numerator is zero, the target incidence would be zero.</strong></td>
</tr>
<tr>
<td>(i) Annual incidence of confirmed measles cases</td>
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<tr>
<td>(ii) Annual incidence of confirmed rubella cases</td>
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</tr>
<tr>
<td>Proportion of surveillance units reporting measles and rubella data to the national level and on time (target: ≥80%)</td>
<td>The numerator is the number of surveillance units reporting on time; and the denominator is the total number of surveillance units in the country multiplied by 100. (Remember that each reporting unit will report 52 times a year).</td>
</tr>
<tr>
<td>Reporting rate of non-measles non-rubella cases at the national level (target: ≥2 per 100 000 population)</td>
<td>The numerator is the number of discarded non-measles non-rubella cases; and the denominator is the total population of the country multiplied by 100 000.</td>
</tr>
<tr>
<td>Proportion of second administrative level units reporting at least two non-measles non-rubella cases per 100 000 (target: ≥80% of second-level administrative units)</td>
<td>The numerator is the number of subnational units reporting at least two discarded non-measles non-rubella cases per 100 000; and the denominator is the total number of subnational units multiplied by 100. Note: If the administrative unit has a population &lt;100 000, the rate should be calculated by combining one or more epidemiological units to ensure population size is more than 100 000 OR by combining data over more than 1 year for a given administrative unit to achieve ≥ 100 000 person–years of observation.</td>
</tr>
<tr>
<td>Proportion of suspected cases with adequate investigation* (target: ≥80% of suspected cases)</td>
<td>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, multiplied by 100.</td>
</tr>
</tbody>
</table>

*An adequate investigation includes at a minimum collection of all of the following data from each suspected case of measles: 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, vaccination status, date of last vaccination, date of notification and date of investigation (excluding cases that are either confirmed as measles by epidemiological linkage or discarded as non-measles by being epidemiologically linked to another laboratory-confirmed case of communicable disease or by epidemiological linkage to a case negative for measles IgM), and travel history.
<table>
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<tr>
<th>Indicator</th>
<th>Description</th>
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<tr>
<td>Proportion of suspected cases with adequate specimen collection&lt;sup&gt;b&lt;/sup&gt; (target: ≥80% of suspected cases, excluding epidemiologically linked cases)</td>
<td>The numerator is the number of suspected cases from whom adequate specimens for detecting measles or rubella were collected and tested and the denominator is the total number of suspected measles or rubella cases multiplied by 100. (Epidemiologically linked cases should be removed from the denominator).</td>
</tr>
<tr>
<td>Proportion of specimens received at the laboratory within 5 days of collection (target: ≥80%)</td>
<td>The numerator is the total number of specimens received in the laboratory within 5 days of collection and the denominator is the total number of specimens received by the laboratory multiplied by 100.</td>
</tr>
<tr>
<td>Proportion of laboratory-confirmed chains of transmission (defined as two or more confirmed measles cases) with specimens adequate for detecting measles virus collected and tested in an accredited laboratory (target: ≥80%)</td>
<td>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.</td>
</tr>
<tr>
<td>Reporting rate of suspected CRS cases at the national level (target: ≥1 per 10 000 live births)</td>
<td>The numerator is the number of suspected CRS cases for the year; and the denominator is the live birth cohort of the population in which the cases occurred multiplied by 10 000. When numerator is zero, the target incidence would be zero.</td>
</tr>
<tr>
<td>Proportion of suspected CRS cases with adequate investigation (target: ≥80% of suspected cases)</td>
<td>The numerator is the number of suspected CRS cases for which an adequate investigation was initiated after 3 months of age of the child and the denominator is the total number of suspected CRS cases multiplied by 100. Adequate investigation is defined as the collection of the following data points: name and/or identifier; place of residence; sex; date of birth; date of reporting; date of investigation; date of specimen collection; history of rash illness of mother; travel history of mother; vaccination history of mother; age of mother; clinical examinations for hearing impairment, cataract, congenital cardiac/heart defects and clinical outcome of the CRS case (alive or dead).</td>
</tr>
</tbody>
</table>

<sup>b</sup>Adequate specimens for serology are those collected within 28 days after rash onset that consist of ≥0.5 ml serum or ≥3 fully filled circles of dried blood on a filter paper, or oral fluid. For oral fluid samples, the sponge-collection device should be rubbed for about 1 minute along the gum until the device is thoroughly wet; epidemiologically linked cases should be excluded from the denominator.
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<tr>
<td>Proportion of suspected cases with adequate specimen collection (target: ≥80% of suspected cases)</td>
<td>The numerator is the number of suspected cases from whom adequate specimens for detecting CRS (IgM/IgG) were collected and tested and the denominator is the total number of suspected CRS cases multiplied by 100 (epidemiologically linked cases).</td>
</tr>
<tr>
<td>Proportion of confirmed cases with adequate specimen analyzed for virus detection (target: ≥80% of confirmed cases)</td>
<td>The numerator is the number of lab-confirmed CRS cases for the year for which adequate specimen was analysed for viral detection and the denominator is the total number of lab-confirmed CRS cases, multiplied by 100.</td>
</tr>
<tr>
<td>Proportion of lab-confirmed cases with at least two negative tests for virus detection after 3 months of age, with at least a 1-month interval between tests (target: ≥80% of confirmed cases)</td>
<td>The numerator is the number of lab-confirmed CRS cases with at least two negative tests for virus detection after 3 months of age, with at least a 1-month interval between tests for the year and the denominator is the total number of lab-confirmed CRS cases, multiplied by 100.</td>
</tr>
<tr>
<td>Proportion of confirmed CRS cases detected within 3 months of birth</td>
<td>The numerator is the number of confirmed CRS cases (clinically compatible and laboratory confirmed) detected within 3 months of birth and the denominator is the total number of lab-confirmed CRS cases, multiplied by 100.</td>
</tr>
<tr>
<td>Proportion of measles and rubella network laboratories that are WHO accredited(^1) for serological and, if relevant, for virological testing (target: 100% of laboratories)</td>
<td>The numerator is the total number of labs that are WHO accredited for virological and serological testing and the denominator is the total number of labs (private and public) testing for MR in the geographical region multiplied by 100 in the given year.</td>
</tr>
<tr>
<td>Completeness and timeliness of monthly reporting (including zero reporting) to the WHO Office for specimens received for serological and virological testing (target: ≥80% of specimens received in the laboratory)</td>
<td>The numerator is the total number that are complete reports of specimens received for testing submitted to the WHO office in a timely manner (i.e. monthly) and the denominator is the total number of expected monthly specimen testing reports in the country multiplied by 100, in the given year.</td>
</tr>
<tr>
<td>Proportion of specimens with serological results reported by the laboratory within 4 days of receiving the specimen (target: ≥80% of specimens received)</td>
<td>The numerator is the total number of specimens for which laboratory results were available within 4 days of receiving the specimen and the denominator is the total number of specimens received for testing multiplied by 100 in the given year.</td>
</tr>
</tbody>
</table>

\(^1\)Adequate specimens for serology are those collected within 12 months of age of the child that consist of ≥0.5 ml serum

\(^2\)WHO measles laboratory accreditation criteria include: (a) annual proficiency test results ≥90%; and (b) at least 90% concordance of NMRL with Regional Reference Lab confirmatory testing; and (3) passing on-site inspection.
<table>
<thead>
<tr>
<th>Proportion of laboratories (government and private) that conduct measles and rubella diagnostic testing that have adequate quality assurance mechanisms in place (target: 100% of laboratories)</th>
<th>The numerator is the total number of laboratories (government and private) that conduct measles diagnostic testing that have adequate quality assurance mechanisms in place and the denominator is the total number of laboratories (government and private) that conduct measles diagnostic testing multiplied by 100, in the given year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of virus detection and genotyping results (where appropriate) that are completed within 2 months of receipt of specimen (target: ≥80% of specimens received)</td>
<td>The numerator is the total number of virus detection and genotyping results (where appropriate) that are completed within 2 months of receipt of specimen and the denominator is the total number of specimens received for testing multiplied by 100, in the given year.</td>
</tr>
</tbody>
</table>
ANNEX-2: REFERENCE READINGS

POSITION PAPERS

DISEASE EPIDEMIOLOGY

VERIFICATION FRAMEWORKS
8) Guidelines on verification of measles elimination and rubella/congenital rubella syndrome control in the WHO South-East Asia Region. New Delhi: WHO Regional Office for South-East Asia Region; 2016.

STRATEGIC PLANS


REGIONAL COMMITTEE RESOLUTIONS


IMMUNIZATION


SURVEILLANCE


LABORATORY


MEETING REPORTS, OTHERS


