WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

New Delhi, India, 14–15 March 2019
WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

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Acronyms

CRS  congenital rubella syndrome
DALY  disability-adjusted life-year
EPI  Expanded Programme on Immunization
Gavi  Gavi, the vaccine alliance
IEAG-MR  India Expert Advisory Group for measles and rubella
IgM  Immunoglobulin M
ITAG  Immunization Technical Advisory Group
IVD  Immunizations and Vaccine Development
M&RI  Measles and Rubella Initiative
MCV1  first dose of measles-containing vaccine
MCV2  second dose of measles-containing vaccine
MR  measles–rubella
MRCV1  first dose of measles and rubella containing vaccine
MRCV2  second dose of measles and rubella containing vaccine
NITAG  National Immunization Technical Advisory Group
NVC  National Verification Committee
ORI  outbreak response immunization
QGIS  Quantum Geographic Information System
RC  Regional Committee
RCV  rubella-containing vaccine
RD  Regional Director
RI  routine immunization
RVC  Regional Verification Commission
SEA  South-East Asia
SEA-RVC  South-East Asia Regional Verification Commission
SIA  supplemental immunization activity
WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

<table>
<thead>
<tr>
<th>Acronym</th>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<tr>
<td>US CDC</td>
<td>United States Centres for Disease Control and Prevention</td>
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<tr>
<td>VPD</td>
<td>vaccine-preventable disease</td>
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<tr>
<td>WHA</td>
<td>World health Assembly</td>
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WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

Executive summary

In September 2013, at the Sixty-sixth session of the World Health Organization (WHO) Regional Committee for South-East Asia, the 11 Member States of the WHO South-East Asia (SEA) Region adopted the goal of measles elimination and rubella/congenital rubella syndrome (CRS) control by 2020. As of August 2018, the South-East Asia Regional Verification Commission (SEA-RVC) for Measles Elimination and Rubella/CRS Control certified that Bhutan, Democratic People’s Republic of Korea, Maldives and Timor-Leste had achieved measles elimination. In addition, Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka and Timor-Leste were certified to have controlled rubella/CRS.

Despite these successes, the 2017 Midterm Review of the “Strategic plan for measles elimination and rubella and congenital rubella syndrome control in the South-East Asia Region 2014–2020” concluded that the measles elimination and rubella/CRS control programme was not on track to reach the regional goal of measles elimination and rubella/CRS control by 2020. This sentiment was also echoed by the Regional Immunization Technical Advisory Group meeting held in Delhi in 2018. Similarly, the third meeting of the SEA-RVC, after careful review of progress towards measles elimination and rubella and CRS control in all the Member States, recommended that the Region should adopt the goal of rubella elimination and should realign the measles elimination target with that for the rubella elimination goal.

Thus, considering the recommendation of the Midterm Review in 2017, the sentiment of the WHO SEA Region Immunization Technical Advisory Group (SEAR-ITAG) in 2018 and the recommendation of the SEA-RVC in its third meeting in 2018, WHO Regional Office for South-East Asia conducted a high-level consultation with Member States with the following objectives:

➢ to arrive at a common understanding of the feasibility of (and a target date for) rubella elimination in WHO SEA Region;
➢ to reach a conclusion on adopting a rubella elimination goal and harmonization of the goal of measles elimination with that of rubella elimination;
➢ to conduct a discussion on the strategic plan “Achieving and sustaining measles, rubella and congenital rubella syndrome
elimination in the WHO SEA Region – strategic plan 2020–2024” prior to its finalization.

The meeting was attended by 77 people, including donors, partners and United Nations (UN) agencies. Country teams from all 11 Member States attended. Each country team comprised of a senior official from the ministry of health, national Expanded Programme on Immunization (EPI) programme manager, chair or representative from the national immunization technical advisory group or equivalent, representatives from professional bodies and national verification committees, United Nations Children’s Fund (UNICEF) country office EPI focal point and WHO Country office EPI focal point or equivalent.

Two technical documents – “Establishing a rubella/congenital rubella syndrome elimination goal and aligning measles and rubella elimination goals in the WHO South-East Asia Region” and “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the WHO South-East Asia Region – strategic plan 2020-2024” were shared prior to the meeting and were presented in the meeting for discussion and inputs from the countries. Country teams had a series of group discussions within the respective teams to evaluate these documents.

Conclusions

At the end of the meeting, representatives from Member States, technical experts and professional bodies agreed on adopting the rubella elimination goal with interruption of rubella transmission by 2023 and harmonizing the goal of measles elimination to this new date. Timor-Leste requested some time for additional in-country discussions and reverted back to the Secretariat thereafter with their concurrence to adopt the goal. Country teams identified country-specific challenges that might hinder progress towards achieving their goals. The teams reviewed the draft strategy “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the South-East Asia Region – strategic plan, 2020–2024”, agreed on the overall content and provided specific comments to be addressed for incorporation in the document.
Way forward

The country teams agreed that WHO Regional Office for South-East Asia would incorporate the inputs provided for the position paper “Establishing a rubella/congenital rubella syndrome elimination goal and aligning measles and rubella elimination goals in the WHO South-East Asia Region” and for the measles and rubella elimination strategy “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the WHO South-East Asia Region – strategic plan 2020–2024” and share these with Member States, country teams and partners prior to release of the finalized documents by 30 June 2019.

The meeting also agreed to present the new proposed goal for measles and rubella as well as the Regional Strategic Plan at the following meetings:

- Tenth Meeting of the SEAR-ITAG (scheduled for July 2019) for consideration and endorsement;
- Regional Committee Meeting in September 2019 for consideration and adoption as a resolution.
1. **Background**

At the Sixty-sixth session of the World Health Organization (WHO) Regional Committee for South-East Asia held in September 2013, the 11 Member States of the WHO South-East Asia (SEA) Region adopted the goal of measles elimination and rubella/congenital rubella syndrome (CRS) control by 2020. Following implementation of the regional strategic plan to achieve this goal, significant progress has been made. As of December 2018, all SEA Region Member States had introduced the first and second doses of measles-containing vaccine (MCV1 and MCV2) in their routine immunization (RI) schedules, and 10 countries had introduced rubella-containing vaccine (RCV) as a combined vaccine, given either with MCV1 or MCV2 or with both, through RI. Following the widespread use of the combined vaccine, incidences of both measles and rubella have declined substantially. In August 2018, the South-East Asia Regional Verification Commission (SEA-RVC) for Measles elimination and rubella/CRS control certified that Bhutan, Democratic People’s Republic of Korea, Maldives and Timor-Leste had achieved measles elimination. In addition, Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka and Timor-Leste were certified to have controlled rubella/CRS.

Despite these successes, the 2017 Midterm Review of the “Strategic plan for measles elimination and rubella and congenital rubella syndrome control in the South-East Asia Region 2014–2020” concluded that the measles elimination and rubella/CRS control programme was not on track to reach the regional goal of measles elimination and rubella/CRS control by 2020. The Midterm Review made several recommendations to strengthen efforts, including strongly recommending that SEA Region Member States consider adopting a regional rubella/CRS elimination goal concurrent with the existing regional measles elimination goal. This goal would leverage the momentum and political will of measles elimination to eliminate rubella, the leading cause of vaccine-preventable birth defects. In addition, this new added focus would accelerate the drive for measles elimination while maximizing available financial, technical and logistical resources. This sentiment was also echoed by the Regional Immunization Technical Advisory Group meeting in Delhi in 2018.

Similarly, the Third meeting of the SEA-RVC, after careful review of progress towards measles elimination and rubella and CRS control in all the
Member States, recommended that the Region should adopt the goal of rubella elimination and should realign the measles elimination target with that for the rubella elimination goal.

Thus, considering the recommendation of the Midterm Review in 2017, the sentiment of the SEAR-ITAG in 2018 and the recommendation of the SEA-RVC in its Third meeting in 2018, WHO Regional Office for South-East Asia conducted a high-level consultation with Member States on the feasibility of adopting the goal of rubella elimination and harmonizing the goal of measles elimination to rubella elimination.

2. Objectives of the meeting

The overall objective of the meeting was to have a high-level consultation with Member States of WHO SEA Region and partners/stakeholders on revising the current regional goal of measles elimination and rubella/CRS control by 2020.

The specific objectives of the meeting were to:

- have a common understanding of the feasibility of (and a target date for) rubella elimination in WHO SEA Region;
- reach a conclusion on adopting a rubella elimination goal and harmonization of the goal of measles elimination with that of rubella elimination;
- have a discussion on the strategic plan “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the WHO South-East Asia Region – strategic plan 2020–2024” prior to finalization.

3. Organization of the meeting

The meeting was spread over two days. The opening session was followed by four key sessions to discuss the various aspects of feasibility of rubella elimination and updating the goal of measles elimination. The meeting was opened by the Director (acting incumbent [a.i.]) Family, Gender and Life Course (FGL) from the Regional Office, who also delivered the message on behalf of the Regional Director for WHO SEA Region.
The meeting was attended by 77 people (list of participants given at Annex 3) to include donors, partners and United Nations (UN) agencies. Country teams from all 11 Member States attended. Each country team comprised of a senior official from the ministry of health, national Expanded Programme on Immunization (EPI) programme manager, chair or representative from national immunization technical advisory group or equivalent, representatives from professional bodies and national verification committees, United Nations Children’s Fund (UNICEF) country office EPI focal point and WHO country office EPI focal point or equivalent.

The first session set the tone of the meeting by providing global and regional updates on the progress towards measles elimination and rubella/CRS control. A presentation was made on the findings from the midterm review of the WHO South East Asia regional strategy for measles elimination and rubella/CRS Control 2014–2020 (document available at https://apps.who.int/iris/handle/10665/279993).

The second session was dedicated to a discussion on the feasibility of rubella elimination and harmonizing the goal of measles elimination with rubella elimination based on a position paper (Annex 4). This position paper was shared two weeks prior to the meeting. Following presentation of the position paper, all countries made interventions and provided their perspectives after group work involving discussion within the respective country teams.

The third session was dedicated to a discussion on the proposed strategic plan for measles and rubella elimination in WHO SEA Region for the period 2020–2024. Following the presentation, countries discussed the strategies as group work within the respective country teams and provided collective country perspective and responses.

The fourth and the final session was for a discussion on the key conclusions and recommendations from the meeting and the way forward.

The agenda of the meeting is attached as Annex 1.
4. Feasibility of rubella elimination and harmonizing the goal of measles elimination

4.1 Presentation

The key areas for rubella elimination were discussed among Member States, donors, partners and professional organizations.

Feasibility of rubella elimination

WHO Regional Office for South-East Asia presented a position paper on the feasibility of rubella elimination and reviewed the various aspects of feasibility.

Rubella and CRS are both caused by the rubella virus, a togavirus with humans as the only known host. The lack of any non-human reservoir makes the rubella virus a target for elimination and eventual eradication. Thus, rubella elimination was presented to be biologically feasible.

Elimination of rubella and CRS were considered as technically feasible, as the rubella virus is a genetically stable virus with a low mutation rate. A single safe and acceptable vaccine is available, which is effective for all genotypes. Given at the age of 9 months, it induces long-term (likely lifelong) seroprotection in >95% of infants and a herd immunity can be achieved by population vaccination coverage of 83–95%. The International Task Force for Disease Eradication (ITFE) has repeatedly noted that eradication of rubella and CRS is technically feasible and has reaffirmed the same in its 2015 meeting.

Programmatic feasibility of rubella elimination was also presented. Elimination of rubella and CRS in the Region of the Americas (all 35 countries), along with 37 countries in the European Region and 5 in the Western Pacific Region through the proven strategies have clearly demonstrated the programmatic feasibility of rubella/CRS elimination. It was also presented that countries in the Region have demonstrated that global strategies can be well implemented in this Region. Several countries have demonstrated that coverage of more than 85% can be achieved with one dose of RCV to achieve herd immunity. Experience from the past on major immunization initiatives including smallpox eradication, polio eradication, measles elimination and maternal and neonatal tetanus elimination has shown that implementation of such globally proven strategies is feasible in
the Region and that Member States have always risen to the global challenge and successfully contributed to the overall global public health achievements. The Region has shown a “can-do “attitude with a wealth of experience.

**Public health impact of rubella elimination**

It was presented that rubella elimination would have significant public health impact and could eliminate the leading cause of vaccine-preventable birth defects, i.e. CRS. This is important because WHO SEA Region bears the highest burden of CRS incidence – approximately 105 000 cases at an estimated 121 cases per 100 000 live births (2010 estimate). This will lead to tremendous cost saving, as the need for lifelong care for children born with CRS would no longer be needed. Cost per CRS case varies approximately between US$ 11 300 for low-income countries to US$ 934 000 for high-income countries. Similarly, there would be savings in disability-adjusted life-years (DALYs), as the estimated DALY loss associated with CRS ranges from 18.7 years for high-income countries to 28 years for low-income countries. Besides, the estimated mortality due to CRS is found to be around 20–33%, which could easily be prevented.

**Programmatic implications**

It was presented that if the goal of rubella elimination was adopted, the political commitment required to eliminate rubella would provide an invigorating boost to the measles elimination programme as well. In addition to utilizing a combined measles/rubella vaccine, both programmes use similar vaccination and surveillance strategies.

**Financial implications**

It was brought out that additional financial resources would be needed for both measles and rubella elimination in the Region. The Midterm Review conducted in 2017 has already noted a financial deficit of US$ 1.3 per live birth which is needed to optimally implement the current strategies.

Although estimates of the incremental cost benefits of moving from a rubella/CRS control goal to an elimination goal are not known, copious evidence exists to show the cost saving benefit of eliminating CRS. The expected DALY loss for a case of measles or rubella disease is generally at least 100 times the loss per vaccine dose.
**Estimated time needed to interrupt rubella transmission in WHO SEA Region**

All 11 SEAR countries are expected to complete nationwide introduction of RCV in RI s and catch up supplemental immunization activities (SIAs) by the end of 2019. All countries are expected to implement nationwide acute fever and rash surveillance with the regional capacity to perform molecular epidemiology by 2020–2021. Given the need to strengthen RI and surveillance, an additional 2–3 years will be necessary to fully implement all strategies required to achieve rubella elimination. Placing a goal of interrupting endemic rubella virus transmission by 2023, with subsequent verification of elimination after 36 months, appears feasible and appropriate.

**Feasibility of harmonizing the goal of measles elimination with rubella elimination**

The Midterm Review conducted in 2017 explicitly pointed out that while significant progress has been made, the effort to eliminate measles by 2020 was off track because of sub-optimal implementation of the strategies. This was due to low commitment, and consequently a lower financial envelope than what was required to accelerate implementation of these strategies. In response to the Midterm Review conclusions and recommendations, countries of the SEA Region have initiated several initiatives to effectively implement the strategies and accelerate progress. Analytical modelling using the WHO Measles Strategic Planning Tool 2.0 (MSP) indicates the 2023 target to interrupt endemic measles virus transmission in SEA Region is feasible (Table 1). This can be further verified after 36 months, in 2026.

*Table 1: Expected dates for achieving zero measles cases – modelling exercise using the WHO MSP 2.0 tool*

<table>
<thead>
<tr>
<th>Ser. No.</th>
<th>Member State</th>
<th>Expected year for achieving zero indigenous measles cases</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Bangladesh</td>
<td>2020</td>
</tr>
<tr>
<td>2</td>
<td>Bhutan</td>
<td>Already achieved</td>
</tr>
<tr>
<td>3</td>
<td>Democratic People’s Republic of Korea</td>
<td>Already achieved</td>
</tr>
<tr>
<td>4</td>
<td>India</td>
<td>2023</td>
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<table>
<thead>
<tr>
<th></th>
<th>Country</th>
<th>Year</th>
</tr>
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<tr>
<td>5</td>
<td>Indonesia</td>
<td>2023</td>
</tr>
<tr>
<td>6</td>
<td>Maldives</td>
<td>Already achieved</td>
</tr>
<tr>
<td>7</td>
<td>Myanmar</td>
<td>2023</td>
</tr>
<tr>
<td>8</td>
<td>Nepal</td>
<td>2020</td>
</tr>
<tr>
<td>9</td>
<td>Sri Lanka</td>
<td>Already achieved</td>
</tr>
<tr>
<td>10</td>
<td>Thailand</td>
<td>2022</td>
</tr>
<tr>
<td>11</td>
<td>Timor-Leste</td>
<td>Already achieved</td>
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The analysis was conducted with the following assumptions: (i) current trends in RI coverage will be sustained; (ii) ongoing and planned SIAs will achieve ≥95% uniform coverage at both national and subnational level; and (iii) measles-rubella (MR) case-based surveillance will achieve performance indicator targets.

It is important to note that the MSP tool indicated that India, Indonesia and Myanmar will need to strengthen their RIs with a coverage improvement rate (CIR) of 50% per year and conduct follow-up SIAs during 2020–2022 for the age group 9 months to 5 years in areas with coverage <95% for both measles doses to achieve the elimination target. Myanmar and Thailand will also have to target older age groups of 20–40 years to close the identified population immunity gap and stop the transmission of measles virus, in addition to the planned SIA in 2019.

**Key challenges to achieving rubella elimination**

The Midterm Review identified a number of challenges to achieving the 2020 goal. These hold true for the rubella elimination goal as well.

Some of the key challenges are as under:

- Increasing vaccine hesitancy to measles and RCV in selected populations of the Region, compounded by the lack of a standardized advocacy and communication strategy acts as a detriment to the programme.
- Vulnerable populations including the immunity gap in the adult population, challenging urban areas with high population densities, increased global travel, potential emergency situations and other yet undiscovered barriers.
4.2 Discussions

Following the presentation, the country teams were asked to conduct group work among themselves, and respond back on the following four areas in the plenary:

➢ Provide their country’s perspective to the proposal of adopting the rubella elimination goal with interruption of rubella transmission by 2023 and harmonizing the goal of measles elimination to this new date.

➢ What are the key challenges that the country is likely to face to achieve this goal?

➢ What will be required to overcome these challenges?

➢ Inputs to the content of the document.

Bangladesh

Bangladesh confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible and supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. However, the country may face challenges to achieve and maintain at least 95% uniform coverage for both doses of MR vaccine at all levels (currently, about 70% districts have achieved >95% coverage) including identifying and addressing pockets of low coverage areas (urban slums, ethnic communities, refugees, etc). Challenges may also be faced due to limited funding, human resources constraints, expansion of laboratories to include the private sector and introduction of acute fever and rash surveillance with inclusion of the private sector in the surveillance network. The country, however, feels that all these can be resolved with continued high-level political and programmatic commitment and involvement of professional organizations. Continued support will also be required for strengthening RI; close supervision and monitoring to achieve uniform coverage; developing a budgeted strategy and implementation plan for addressing low coverage areas; and funding support for introduction of fever and rash surveillance, lab expansion, capacity building and programme implementation.

Bhutan

Bhutan confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible, and supported adoption of the rubella
elimination goal and harmonizing the measles elimination goal with rubella elimination. However, the country faces challenges to reach some of the unenched populations through RI services, and detect cases in these populations. The country has experienced delay in sample collection and shipment that may delay any response that is required as per the elimination standard. There is concern also at the country’s response capacity in case of large-scale outbreaks. There are plans to overcome these challenges by developing elimination and post-elimination strategic plans and making an investment case to the government and potential donors, including strategies to address all the challenges and monitoring their effective implementation. Bhutan feels that point of care testing devices would be of great help in addressing issues of sample collection and transportation.

**Democratic People’s Republic of Korea**

Democratic People’s Republic of Korea confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible and supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. The country has planned introduction of RCV in RI following a wide age range catch up SIA that will help to close the immunity gaps for rubella. However, the country faces some challenges – it need strengthening of laboratory capacity, and there is a need to develop strategies to prevent cross-border importation, especially from the border areas with China.

**India**

India confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible. It supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. This was based on the recommendations made by the India Expert Advisory Group for Measles and Rubella (IEAG-MR), which is mandated to review the programme and make recommendations to the Government of India. In its third meeting, the IEAG-MR noted that the strategies required for measles elimination were also likely to result in rubella elimination. IEAG-MR strongly recommends that India adopt the goal of rubella elimination along with the current goal of measles elimination. The country team also highlighted the key challenges faced: surveillance to provide a clear picture of disease burden, which included the fact that case-based surveillance for fever and rash has been implemented only in one state as of now; the non-measles non-rubella discard rate was still very low; and the CRS surveillance was still in the initial stages of expansion. Major challenges also exist with RI coverage
with the first and second doses of measles and rubella containing vaccine (MRCV1 and MRCV2) that are below 95%, compounded by a constrained health workforce in terms of both quantity and capacity. The country team also flagged the issue that as a Gavi, the Vaccine Alliance (Gavi) graduating country, there will be a huge impact on the health sector strengthening funding. India has plans to accelerate the implementation of the recommendations made by IEAG-MR, which encompass key strategies to overcome the challenges and help accelerate progress.

**Indonesia**

Indonesia confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible. It supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination, and requested inclusion of CRS elimination also in the goal. The country team reiterated that the goal of rubella/CRS elimination by 2023 was quite rational and achievable, as long as strong commitment and political will was demonstrated in the country and the Region as a whole. The team felt that this target should be the priority of the midterm agenda on health development. Indonesia plans to have elimination verified in phases and is in the process of developing a national strategy and plan of action for the same based on a sub-national risk assessment that was conducted by the country. The country is facing a significant challenge in achieving high vaccination coverage at all subnational levels. This is especially due to religious reasons that create hesitancy in accepting rubella vaccine, compounded by low concern and commitment of some local governments. There are also challenges related to expansion of case-based fever and rash surveillance rapidly all over the country that is limited by local capacity, and adequate and timely response to outbreaks due to limited resources. Sustainability, need to rapidly expand the laboratory network to support surveillance and quality of vaccines were the other concerns raised. The country team expressed that a high level of advocacy and commitment could make the goals achievable as it would result in sufficient allocation of resources and funding through the planning and budgeting process at national and local levels. This will help to not only strengthen capacity but also to accelerate performance on both immunization and surveillance fronts.
**Maldives**

Maldives confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible, and supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. The country team brought out the challenge faced with the large numbers of migrant and tourist populations that bring the possibility of virus importation to the country. Challenges were also being faced with the surveillance system, especially with including the private sector to report within the surveillance network, and collection and transportation of samples, especially throat swabs from rural areas. The country team also noted with caution the increasing trend of vaccine hesitancy in some population groups and felt that some research followed by a tailored communication strategy was needed to address these issues in a timely manner.

**Myanmar**

Myanmar confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible and supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. Challenges included low sensitivity of surveillance with non-measles, non-rubella discard rate at 1.03, which was much below the target rate with only 29% townships achieving the target rate of 2 per 100,000 population. The private sector is not involved with surveillance, and there are only three sentinel sites for CRS surveillance. Immunity gap for measles and rubella persists mostly in urban communities, unrest areas and satellite townships. There is a need to review the outbreak response immunization (ORI) policy and ensure resource allocation for ORI, and ensure cross-border collaboration for immunization and surveillance activities. Plans to address these issues have been developed with capacity-building at subnational level for vaccine-preventable disease (VPD) surveillance, strengthen the surveillance system in the private sector, expand CRS surveillance and coordinate with eye hospitals. To address issues related to immunization, Quantum Geographic Information System (QGIS)-based Red microplanning has been initiated, which also includes working with ethnic health organizations for unreachable populations. Planning has also been done for optimization of hospital-based immunization activities, vaccination of healthcare workers and conducting high quality national MR SIA with >95% coverage at all sub-national levels.
**Nepal**

Nepal confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible, and supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. The major challenge has been the transition of the country from a unitary state to a federal governance structure. This has resulted in lack of clarity on roles and responsibilities for programming, reporting, monitoring and technical support. Though these are transient issues, they need to be addressed urgently. Maintaining the surveillance network will be a challenge unless there is a successful polio transition plan, as the current surveillance network is dependent on the findings of the polio transition plan. There is also a need to optimize the sensitivity of the surveillance system to meet the key surveillance performance indicators at all subnational levels, as well as to enhance linkages with the private sector service providers for both immunization and surveillance. The upcoming SIA is a huge opportunity to close the backlog immunity gap as well as to use the platform to strengthen RI. There is a need to ensure a very high quality of the upcoming MR SIA. The country team also highlighted that 72% of the confirmed measles cases reported in 2018 were from 12 districts of two provinces. Programme prioritization will be the key to getting the maximum benefits of the programme in the shortest time. Overcoming these challenges would require high-level advocacy and coordination at federal and subnational levels to build a national consensus on the measles and rubella elimination goal. There is a need to develop specific and prioritized action plans including plans for low-performing provinces with high measles burden for the following: (i) to improve RI, and more specifically MRCV2 coverage; (ii) for activities to strengthen partnership with the private and non-formal sectors for immunization and surveillance; and (iii) for ensuring high-level national and international technical assistance as required. Nepal also expressed that predictable funding and technical support similar to that provided by the Global Polio Eradication Initiative (GPEI) will be required to accelerate progress on measles and rubella elimination goals.

**Sri Lanka**

Sri Lanka confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible, and supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. While the country had a robust surveillance system for measles
and rubella, there were challenges in meeting the surveillance performance indicators, which was not due to lack of sensitivity but due to the design of the surveillance system. This was elaborated upon by the country team. The country also faced challenges in investigating cases that are immunoglobulin M (IgM) positive but present no other evidence of disease or community level transmission, and are probably false positive. There were also challenges with importations and vaccination of the migrant population, which the country was looking at to further strategize on dealing with these issues.

**Thailand**

Thailand confirmed that interruption of transmission of both measles and rubella virus by 2023 was feasible, and supported adoption of the rubella elimination goal and harmonizing the measles elimination goal with rubella elimination. Despite having a strong public health system, the country faced challenges in moving towards a fever and rash surveillance as it would increase the programme load, and also due to difficulty in convincing clinical practitioners to report all cases of fever and rash. The country plans to overcome these challenges by a phased expansion of the surveillance system and laying down a definition of suspected cases of measles based on local epidemiology. The country also plans for a disease burden study for CRS. Immunization programme coverage was another challenge, with concerns about creeping vaccine hesitancy as well as with vaccine supply and the price of MRCV. It was planned to overcome a number of these issues mostly through policy advocacy, by ensuring high-level political and programmatic commitment as well as conducting activities to generate demand for vaccination. There are also plans to improve the quality of reporting systems and develop new user-friendly reporting tools.

**Timor Leste**

Timor Leste had eliminated measles and controlled rubella by 2018 and felt that measles elimination and rubella control could be maintained by combined RI and SIAs. However, the country had doubts on the feasibility of interruption of transmission of rubella by 2023 as a high immunity gap may still exist for rubella among both men and women over 20 years of age as on that date and a deeper understanding of the epidemiology of rubella in Timor-Leste was required, including a sero-survey. The team expressed that achieving and maintaining over 95% MRCV1 and MRCV2 coverage for RI by 2023 and beyond was a challenge. The EPI also needed continuous
technical assistance for the foreseeable future to maintain the gains of EPI achievements; and without technical assistance of WHO, maintaining laboratory technical capacity and quality would be a challenge. The team also strongly expressed that national authorities attending and committing to elimination and eradication at World Health Assembly (WHA) and Regional Committee (RC) meetings should be properly briefed on resource needs at country level and commitment for resource mobilization.

Timor-Leste requested time for additional in-country discussions and reverted back to the Secretariat two weeks after the end of the meeting following such discussion with their concurrence to adopt the goal.

**Bill and Melinda Gates Foundation**

The representative from Bill and Melinda Gates Foundation (BMGF) said that they were supportive of the proposed new SEA regional goals and were cautiously optimistic. BMGF was sceptical about having a CRS elimination goal. The representative mentioned the need for better RI coverage, conducting better vaccination campaigns and having better surveillance supported by better tools and partnerships to achieve the goal. He also pointed out that while we learnt from the polio experience, the context here was different and needed to be considered, since vaccine is injectable, and no house-to-house vaccination can be done. The social media boom has added to the complexity.

The representative mentioned six key drivers for the measles and rubella programme that needed to be considered in the strategy:

- High and homogenous coverage of MCV2 at subnational level
- Proportion of zero-dose children reached with campaigns
- Migration – both internal and external
- Birth rates
- Maternal antibody protection level in children under 9 months of age
- Role of adults in transmission.

**United Nations Children’s Fund**

The United Nations Children’s Fund (UNICEF) Regional Office teams from South Asia and East Asia Pacific also agreed on the feasibility of measles and rubella elimination. The UNICEF teams further requested Member States to
take the opportunity of the measles and rubella elimination platform to support their entire immunization systems. UNICEF identified the need to better understand vaccine hesitancy and work more on demand generation. They expressed that to ensure progress, countries needed to map out TA vaccine needs at the subnational level along with partners, and make best use of local resources.

**US Centers for Disease Control and Prevention**

US Centers for Disease Control and Prevention (CDC) expressed that rubella elimination was feasible in the Region. CDC expressed the need to deal with rubella outbreaks as aggressively as measles outbreaks and extended commitment for continuous technical support to help accelerate progress similar to that in the past. CDC also requested countries to be vigilant and anticipate stockouts at all levels.

**Measles and Rubella Initiative**

Measles and Rubella Initiative (M&RI) congratulated all Member States on taking this step forward to discuss the having of a rubella elimination goal and reaffirmed commitment to continued support for the cause in the Region. M&RI also informed that there were opportunities for countries to avail outbreak response funds from M&RI through WHO Regional Offices irrespective of their Gavi eligibility status, and that the operational costs of MR SIA from Gavi could be diverted to strengthen RI, as RI is the backbone of the elimination effort.

The revised position paper with incorporation of all the inputs from countries and partners is attached at Annex 4.

5. **Strategic plan for measles and rubella elimination 2020–2024**

5.1 **Presentation**

The areas of the strategic plan “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the South-East Asia Region – strategic plan 2024” that were presented in the meeting are discussed in succeeding paras.
**Goal and strategic objectives**

The proposed goal was to achieve the interruption of transmission of the measles and rubella viruses in all countries of the SEA Region by 2023 and sustain the status beyond this date.
The proposed strategic objectives are enumerated below.

➢ Achieve and maintain at least 95% population immunity by providing vaccination coverage with two doses of measles and RCV in each district of each country in the Region through routine and/or supplementary immunization.

➢ Develop and sustain a sensitive and timely case-based measles, rubella and CRS surveillance system in each country in the Region that fulfils the recommended surveillance performance indicators.

➢ Develop and maintain a proficient measles and rubella laboratory network that supports every country or area in the Region.

➢ Ensure adequate outbreak preparedness and rapid response to measles and rubella outbreaks.

➢ Strengthen support and linkages to achieve the above strategies to include:
  - planning and monitoring of progress;
  - advocacy, social mobilization and communication;
  - identifying and utilizing synergistic linkages of integrated programme efforts; and
  - research and development.

**Guiding principles**

➢ Country ownership and sustainability
➢ RI and health systems strengthening
➢ Equity
➢ Leveraging on partnerships
Proposed key milestones

Year-wise key milestones were proposed as below.

By the end of 2020

➢ All countries will have updated their national plan of action or equivalent document to align with the updated Regional Strategy 2020–2024.
➢ All countries will have conducted a nation-wide wide age-range measles and rubella vaccination campaign.
➢ All countries will have introduced at least one dose of RCV in the RI programme.
➢ The Regional Verification Commission will have developed or updated criteria and lines of evidence for verification of both measles and rubella elimination.
➢ At least five countries will have been verified for measles and rubella elimination.

By the end of 2021

➢ All countries will have developed or updated their sub-national plan of action or equivalent document.
➢ Two large countries, India and Indonesia, will have conducted follow-up supplementary immunization in selected sub-national areas with high immunity gap and sustained measles and rubella transmission.
➢ All countries will have established nationwide acute fever and rash surveillance for measles and rubella.
➢ All five countries will have maintained measles and rubella elimination status. Another two countries and selected subnational areas of large countries will have interrupted indigenous measles and rubella transmission.

By the end of 2022

➢ All countries will have developed a post-elimination sustainability plan along with an outbreak preparedness and response plan.
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➢ All countries will have highly sensitive nationwide acute fever and rash surveillance for measles and rubella at both national and subnational levels.

➢ Additional selected subnational areas of large countries will have interrupted transmission of indigenous measles and rubella.

By the end of 2023

➢ Measles and rubella transmission will have been interrupted in the entire WHO South-East Asia Region.

➢ Seven countries will have been verified for measles and rubella elimination.

By the end of 2024

➢ All 11 countries will have sustained the interruption of transmission of indigenous measles and rubella for at least a 12-month period.

➢ A strategic plan to verify and sustain measles and rubella transmission in the WHO SEA Region would have been developed for the period 2025–2030.

Monitoring mechanism

The primary responsibility of monitoring will remain with the programme, where partners and stakeholders will have a supporting role. The Regional Immunization Technical Advisory Group (ITAG) at the Regional level and the National Immunization Technical Advisory Group (NITAG) or its equivalent would serve as the independent oversight bodies for measles and rubella elimination. Several key processes and impact indicators would be monitored periodically. These are mentioned in the document.

Verification process

The Regional Verification Commission will have the sole function of verification of progress made against the lines of evidence and the key criteria as mentioned in the Guidelines for Verification. The national verification committees will have the role of reviewing the programme and providing lines of evidence required for verification to the Regional Verification Commission. It was proposed to consider verification of subnational areas for
measles and rubella elimination in large countries like India and Indonesia. There is also a need to update the current regional guidelines 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.

**Challenges to implementing the strategy**

The following areas were presented as the key expected challenges to implement the strategy. Countries are required to consider these during development of national strategies.

- Financial risk
- High population density and highly mobile populations including peri-urban slums
- Suboptimal immunization systems and inaccurate reporting of vaccination coverage at subnational level
- Vaccine hesitancy
- Emergencies
- Laboratory quality management
- Private and non-formal sectors.

**Others**

The costing of the strategy was not presented and was left to be dealt with after agreement on the strategies and milestones, as these have implications on costing.

The roles and responsibilities of governments, partners and civil society were also mentioned.

**5.2 Discussion**

Following the presentation, country teams were asked to discuss the following four areas related to the strategic plan and report back to the plenary:

- Provide country perspectives to the proposed new strategic plan for 2020–2024.
- Bring out key areas yet to be addressed in the strategic document that need attention.
➢ What will be required to translate the strategies to each country context?
➢ Any other inputs to the content of the document.

In general, all country teams agreed to the strategic plan document and asked the Regional Office to address the following issues in the document:

➢ Linkage and integration of the document with primary health care, Sustainable Development Goals and upcoming global documents GVAP 2.0 and Gavi 5.0
➢ Ensure the importance of “advocacy, social mobilization and communication” as a separate strategic objective and not a part of another objective
➢ Strategies to stop transmission and close the immunity gap in the 6–9 months age group
➢ Reaching the adult population and closing the immunity gap in adults
➢ Engaging the private sector for immunization and surveillance activities
➢ Mechanism and need for predictable funding and technical support, projected SIA plans, financial resource requirements, vaccine security and affordability
➢ Emphasis on the need for multi-year cohort analysis and planning of SIA based on epidemiology
➢ Reconsider subnational elimination and propose to include subnational interruption of transmission
➢ Mention of subnational strategies that need to be based on epidemiology. Countries can probably have various forms of surveillance in different stages within the country for some time, as some subnational areas may be close to elimination while others may still be endemic.
➢ Strategy on sero-survey as well as calculations on forecasting of test kits
➢ Cross-regional collaboration for surveillance and immunization activities
➢ Inclusion of indicators on
  - number of outbreaks responded to in time
- MRCV1 and MRCV2 dropout tracking at subnational level
- notification, e.g. notification within 2 weeks of rash
- CRS case detection within 3 months of birth.

➢ Section on post-elimination strategy and milestones for countries that have already eliminated measles and rubella including the need for political will and finances to prevent complacency from setting in.

Country teams were requested to provide additional inputs to the document by 30 April 2019 to the Regional Office for both the documents.

The revised strategic plan with incorporation of all the inputs from countries and partners is attached at Annex 5.

6. Conclusions and way forward

6.1 Conclusions

The key conclusions and way forward from the meeting was presented in the final plenary and agreed to by all.

➢ Representatives from Member States, technical experts and professional bodies agreed with the position paper on adopting the rubella elimination goal with interruption of rubella transmission by 2023 and harmonizing the goal of measles elimination to this new date as listed in Table 2. Timor-Leste requested additional time for in-country discussions and reverted back to the Secretariat after two weeks following this discussion with their concurrence to adopt the goal.
Table 2: *Country positions on achieving of the elimination goals*

<table>
<thead>
<tr>
<th>Country</th>
<th>Rubella elimination goal</th>
<th>Updated measles elimination goal</th>
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<tbody>
<tr>
<td>Bangladesh</td>
<td>Agree</td>
<td>Agree</td>
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<tr>
<td>Bhutan</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>India</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Agree in phases, add CRS</td>
<td>Agree</td>
</tr>
<tr>
<td>Maldives</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>Nepal</td>
<td>Agree</td>
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<tr>
<td>Sri Lanka</td>
<td>Agree</td>
<td>Agree</td>
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<tr>
<td>Thailand</td>
<td>Agree</td>
<td>Agree</td>
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<tr>
<td>Timor-Leste</td>
<td>Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

➢ Country teams have identified country-specific challenges that may hinder the progress towards achieving the goals. These include:

- financial risk;
- high population density and highly mobile populations including peri-urban slums;
- suboptimal immunization systems and inaccurate reporting of vaccination coverage at subnational level;
- vaccine security;
- vaccine hesitancy;
- emergencies;
- laboratory quality management; and
- private and non-formal sectors.

➢ Country teams have reviewed the draft strategy “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the South-East Asia Region – strategic plan 2020–2024” and have agreed on the overall content and provided specific comments to be addressed for incorporation in the document.

6.2 Way forward

➢ Incorporate the inputs provided to the position paper “Establishing a rubella/congenital rubella syndrome elimination goal and aligning measles and rubella elimination goals in the WHO South-East Asia Region” and the measles and rubella elimination strategy enunciated in the paper “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the WHO South-East Asia Region – strategic plan 2024”.

➢ Share with Member States, country teams and partners the finalized documents “Establishing a rubella/congenital rubella syndrome elimination goal and aligning measles and rubella elimination goals in the WHO South-East Asia Region” and “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the WHO South-East Asia Region – Strategic plan 2024” by 30 April 2019.

➢ Presentation of the new proposed goal for measles and rubella as well as the Regional Strategic Plan to:
  - Tenth Meeting of the SEAR-ITAG (July 2019) for their consideration and endorsement
  - Regional Committee Meeting in September 2019 for its consideration and adoption as a resolution.
# Annex 1

## Agenda

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<th>Remarks</th>
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<tr>
<td>– Welcome address</td>
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<tr>
<td>– Opening address by Regional Director presented by Director Family, Gender and Life Course (FGL) a.i.</td>
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<tr>
<td>– Objectives of the meeting by Immunization and Vaccine Development (IVD) team leader</td>
<td>WHO Regional Office for South-East Asia</td>
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<td>– Administrative announcements</td>
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<tr>
<td><strong>Session 1</strong></td>
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<tr>
<td>Presentation on the global status of measles, rubella and CRS</td>
<td>WHO headquarters</td>
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<tr>
<td>Presentation on the status of measles, rubella and CRS in the SEA Region</td>
<td>WHO Regional Office for South-East Asia</td>
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<tr>
<td>Presentation on the findings from the midterm review of the WHO South-East Asia regional strategy for measles elimination and rubella/CRS Control, 2014–2020</td>
<td>Midterm review lead</td>
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<td><strong>Session 2</strong></td>
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<tr>
<td>Presentation on the feasibility of rubella elimination and harmonizing the goal of measles elimination with rubella elimination – position paper</td>
<td>WHO Regional Office for South-East Asia</td>
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<td>Team reviews: country team reviews and discussion on the position papers</td>
<td>Country teams</td>
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<tr>
<td><strong>Day 2</strong></td>
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<tr>
<td>Country interventions – commentary on the position papers</td>
<td>Country teams</td>
</tr>
<tr>
<td>Day and activity</td>
<td>Remarks</td>
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<td><strong>Session 3</strong></td>
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<td>Presentation on proposed strategic plan for measles and rubella elimination in WHO South-East Asia Region</td>
<td>WHO Regional Office for South-East Asia</td>
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<tr>
<td>Team reviews: Country team reviews and discussion on the draft strategic document</td>
<td>Country teams</td>
</tr>
<tr>
<td>Country interventions: commentary on the draft strategy</td>
<td>Country teams</td>
</tr>
<tr>
<td><strong>Session 4</strong></td>
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<tr>
<td>Key conclusions and recommendations from the meeting and way forward</td>
<td>WHO Regional Office for South-East Asia</td>
</tr>
<tr>
<td>Closing address</td>
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Annex 2

Regional Director’s opening message

Opening message by Dr Poonam Khetrapal Singh, Regional Director, WHO SEA Region (delivered by Director FGL a.i.)

Senior officials from the Ministry of Health, Surveillance and National Immunization, programme managers and officers from Member States, colleagues from professional organizations, academia, chairs and members of national immunization technical advisory groups, members from national verification committees and the Regional Verification Commission for Measles Elimination and Rubella Control, colleagues from WHO headquarters, representatives of partner agencies, ladies and gentlemen,

Good morning! It is my pleasure to be with you at this high-level consultation on adopting the revised goal of measles and rubella elimination, which WHO is hosting here in New Delhi.

Although our Regional Director, Dr Poonam Khetrapal Singh, would have very much liked to attend this important meeting, she is unable to do so due to a prior commitment. I therefore take great pleasure in delivering this message on her behalf.

The Regional Director is keen to recall that in September 2013, at the Sixty-sixth meeting of the Regional Committee, our Region’s Member States unanimously adopted the goal of eliminating measles and controlling rubella and CRS by 2020. That goal was set after a similar consultation with Member States where the feasibility of achieving the goal was reviewed.

Dr Khetrapal Singh says that in 2014 she made the decision to make measles elimination and rubella/CRS control one of the Region’s flagship priorities. Since then its pursuit has gathered critical momentum.

The Regional Director notes the drive, and energy to achieve it, is palpable at both the subnational and local levels, whether while talking to district-level administrators or to volunteer immunizers. She says it is also palpable at the highest levels of power and influence, whether engaging with ministers of health or political dignitaries from across the Region.
It is clear that each one of our Member States has made impressive efforts to implement our Region’s Strategic Plan and is making strong progress. As a result, in 2018 the South-East Asia Regional Verification Commission for Measles Elimination and Rubella/CRS Control certified that Bhutan, Democratic People’s Republic of Korea, Maldives and Timor-Leste had achieved measles elimination. They also certified that Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka and Timor-Leste had controlled rubella/CRS.

Dr Khetrapal Singh emphasizes the ground-breaking significance of these achievements. This is all the more so as children in all countries in the Region now have access to two doses of MCV, and by the end of 2019 will also have access to RCV. Case-based surveillance for measles and rubella has meanwhile been established in all countries and is supported by a network of more than 50 proficient laboratories. As a result, we have been able to reduce measles-related mortality by 75% since the turn of the millennium, and in the last four years we have seen a 23% reduction in measles-related mortality. We have also averted an estimated 6.6 million measles-related deaths since 2000.

The Regional Director says that in late 2017, a midterm review of the Strategic plan for measles elimination and rubella and congenital rubella syndrome Control in the South-East Asia Region 2014–2020 reviewed the progress towards each of its objectives and the improvements that were needed to be made to reach the 2020 goals.

The review explicitly mentioned that significant progress had been made in demonstrating the capacity of the Region to deliver on the goal, but that the progress made was inadequate. It very clearly acknowledged that the Region was not on track to meet the 2020 goals of measles elimination and rubella/CRS control due to suboptimal implementation of key strategies.

The review confirmed that the goal of elimination is programmatically feasible but that clear steps should be taken for accelerated progress, with several recommendations made accordingly.

In this context, we are here today to brainstorm and discuss four core questions:

➢ First, is rubella elimination feasible? If so, should the Region adopt the goal of rubella elimination and what would be a technically and programmatically feasible timeline?
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➢ Second, should the Region revise the goal of measles elimination by 2020? If so, what would be a more appropriate date?
➢ Third, should the timelines to achieve the goal for measles and rubella elimination be harmonized?
➢ And fourth, what should be the strategies to achieve the new goals we propose through this meeting?

These are by no means easy questions, but they are of fundamental importance to our quest to protect everyone in our Region against measles and rubella.

At last year’s World Health Assembly, WHO along with its Member States agreed to the Thirteenth 5-Year General Programme of Work, or GPW. In outlining the Organization’s agenda and its plan to accelerate progress towards the SDGs, the GPW highlighted three strategic priorities: to promote health, keep the world safe and serve the vulnerable. These priorities have corresponding targets, known as the “triple billion” targets. These are, by 2023:

➢ for one billion more people to benefit from universal health coverage;
➢ for one billion more people to have better protection from health emergencies; and
➢ for one billion more people to enjoy better health and well-being.

The Regional Director is quick to note the ambitious nature of these goals, but also the opportunity it gives our Region to drive significant progress. She also notes that measles cases are indicative of the strength of immunization systems and the health systems they are part of.

She emphasizes that our Region’s own priorities, including those related to measles and rubella/CRS, are well aligned with broader global targets. In acknowledging that fact, she nevertheless requests this expert audience to consider an additional set of questions that reflect the Region’s broader mission, though they are nevertheless pertinent to the present discussions.

➢ First, in what ways can we safeguard and sustain our achievements? How can countries that have been free of
measles maintain their elimination status and the high-level resolve required to do so?

➢ Second, in what ways can we accelerate progress? How can countries that are close to achieving the 2020 goals implement game-changing strategies to achieve measles-free and rubella-controlled status?

➢ And third, how can we harness the full power of innovation in aid to our efforts? Indeed, what programmatic, technological and operational innovations could we leverage to achieve our goals on time?

Distinguished delegates, the Regional Director is pleased that you are gathered today to affirm our regional and global commitments and the targets and goals that are part of them. As you know, we have many strengths, but we also have vulnerabilities, from gaps in immunization to inadequate surveillance and resource allocations.

Dr Khetrapal Singh is certain that this eminent group of experts will examine the issues you have gathered to address with the same rigour you have always demonstrated.

The Regional Director looks forward very much to your actionable feedback and guidance on how best we can move forward and to the report of your deliberations and the recommendations it contains.

I echo that sentiment and wish you a productive and engaging meeting.

Thank you.
Annex 3

List of participants

Ministry of Health and National Technical Advisory Group on Immunization

**Bhutan**

Dr Karma Lhazeen  
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Mr Karchung  
District Health Officer  
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WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

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Health Protection Agency
Ministry of Health
Male, Maldives
Dr Fathimath Nazla Rafeeq
Medical Officer, Health Protection Agency
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IVD, Department of Family Health, Gender and Life Course
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Annex 4

Position paper on feasibility of rubella elimination and harmonizing the goal of measles elimination with rubella elimination
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Acronyms

CIR coverage improvement rate
DALY disability-adjusted life-year
EPI Expanded Programme on Immunization
Gavi Gavi, the Vaccine Alliance
GPEI Global Polio Eradication Initiative
GVAP Global Vaccine Action Plan
MR measles–rubella
RCV rubella-containing vaccine
Ro basic reproduction number
RVC Regional Verification Commission
SEA South-East Asia
SEA-RVC South-East Asia Regional Verification Commission
WHO World Health Organization
1. Background

In September 2013, at the Sixty-sixth session of the World Health Organization (WHO) Regional Committee for South-East Asia, the 11 Member States of the WHO South-East Asia (SEA) Region adopted the goal of measles elimination\(^a\) and rubella/congenital rubella syndrome (CRS) control\(^b\) by 2020.\(^1\) Following implementation of the regional strategic plan to achieve this goal, significant progress has been made. As of December 2018, all SEA Region Member States had introduced the first and second doses of measles-containing vaccine (MCV1 and MCV2) in their routine immunization (RI) schedule, and 10 countries had introduced rubella-containing vaccine (RCV) as a combined vaccine given either with MCV1 or MCV2 or both, through RI. Following the widespread use of the combined vaccine, incidence of both measles and rubella has substantially declined. In August 2018, the South-East Asia Regional Verification Commission (SEA-RVC) for Measles Elimination and Rubella/CRS Control certified that Bhutan, Democratic People’s Republic of Korea, Maldives and Timor-Leste had achieved measles elimination. In addition, Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka and Timor-Leste were certified to have controlled rubella/CRS.\(^2\)

Despite these successes, the 2017 Midterm Review of the Strategic Plan for Measles Elimination and Rubella and Congenital Rubella Syndrome Control in the South-East Asia Region 2014–2020 concluded that measles elimination and rubella/CRS control programme was not on track to reach the regional goal of measles elimination and rubella/CRS control by 2020.\(^3\) This was primarily due to the fact that robust and effective implementation of the specific strategies was limited by country-level governance, lack of national political will and global impetus, all of which were reflected in insufficient allocation of resources. In 2017, estimated regional coverage with MCV1 was 87%, MCV2 coverage was 77%,\(^4\) measles and rubella case-based

---

\(^a\) Elimination is defined as the absence of endemic measles transmission in a defined geographical area, e.g. region or country for ≥12 months in the presence of a well-performing surveillance system. However, verification of measles elimination takes place after 36 months of interrupted endemic measles virus transmission.

\(^b\) Control is defined as a 95% reduction of rubella and CRS cases as compared with the 2008 baseline nationally and for the Region.
surveillance was not optimally implemented in all Member States, genotypic surveillance data was limited and financial resources were insufficient. Nonetheless, political and administrative commitments remained high in most Member States. The Midterm Review of 2017 made several recommendations to strengthen efforts, including strongly recommending that SEA Region Member States consider adopting a regional rubella/CRS elimination goal concurrent with the existing regional measles elimination goal. This goal was expected to leverage the momentum and political will for measles elimination to eliminate rubella, the leading cause of vaccine-preventable birth defects. Moreover, elimination strategies are fully integrated, including use of a combined measles–rubella (MR) vaccine, and a common case definition of rash and fever illness for case-based surveillance. In addition, this new added focus would accelerate the drive for measles elimination while maximizing available financial, technical and logistical resources. This sentiment was also echoed by the Regional Immunization Technical Advisory Group meeting in Delhi in 2018. Furthermore, elimination of both measles and rubella provides an opportunity to leverage existing community health systems to improve the RI programme, providing equitable, universal health care for all children in the Region.

The purpose of this document is to demonstrate the feasibility of elimination of rubella/CRS and describe the potential impact of rubella/CRS elimination in the SEA Region. This information is intended to help shape the proposal to establish a goal for rubella/CRS elimination and to align measles and rubella elimination goals in the Region for presentation at the Seventy-second session of the WHO Regional Committee for South-East Asia in September 2019.

2. Current status of measles and rubella elimination

2.1 Global

In 2012, the World Health Assembly endorsed the Global Vaccine Action Plan (GVAP) with the objective of eliminating measles in four of the six WHO regions by 2015 and in five regions by 2020. Countries in all six WHO regions have adopted goals for measles elimination by 2020 or earlier, and three Regions have adopted rubella elimination goals. There has been substantial progress toward both measles and rubella elimination worldwide (Table 1).
Table 1: Global measles and rubella elimination status – December 2018

<table>
<thead>
<tr>
<th>WHO Region (no. countries)</th>
<th>Elimination Achieved of Dec 2018</th>
<th>No. of countries</th>
<th>% of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas (n=35)</td>
<td>Measles: 34 Rubella: 35</td>
<td></td>
<td>97% 100%</td>
</tr>
<tr>
<td>Europe (n=53)</td>
<td>Measles: 37 Rubella: 37</td>
<td></td>
<td>70% 70%</td>
</tr>
<tr>
<td>Western Pacific (n=27)</td>
<td>Measles: 7 Rubella: 4</td>
<td></td>
<td>26% 15%</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South-East Asia (n=11)</td>
<td>Measles: 4</td>
<td></td>
<td>36%</td>
</tr>
<tr>
<td>Africa (n=47)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>Measles: 81/194 Rubella: 76/194</td>
<td></td>
<td>42% 39%</td>
</tr>
</tbody>
</table>

During 2000–2017, estimated MCV1 coverage increased globally from 72% to 85%. Annual reported measles incidence decreased by 83% from 145 to 25 cases per million population, with a decrease in annual estimated measles deaths of 80% from 545,174 to 109,638. During this period, measles vaccination prevented an estimated 21.1 million deaths. In 2017, global MCV2 coverage was 67%. Progress has also been seen in rubella elimination. During 2000–2016, reported rubella cases decreased globally from 670,894 to 22,361. Estimated CRS cases decreased from 119,000 in 1996 to 105,000 in 2010 (the most recent year for which estimates are available). In 2017, global rubella vaccination coverage was 52%, with rubella having been introduced in 162 (84%) of 194 countries worldwide.

Regional verification commissions (RVCs) for measles and rubella have been established in all six WHO Regions. In 2018, 81 (42%) of 194 countries were verified as having achieved measles elimination and 76 (39%) were verified as having achieved rubella elimination. The RVCs in the African and

* Information based on personal communication with WHO headquarters measles and rubella team.
the Eastern Mediterranean Regions have recently been established and have not reviewed any national reports as of January 2019. Therefore, no countries were verified as having achieved measles or rubella elimination in those regions.

However, with this progress have come setbacks. Since 2016, measles incidence has increased globally. In addition, large measles outbreaks resulted in re-established endemic measles transmission in Venezuela, removing the elimination status of the entire Region of the Americas. Measles resurgence in Europe has also probably led to re-establishment of endemic measles in some European countries.5

2.2 South-East Asia Region

The SEA-RVC has verified Bhutan, Democratic People’s Republic of Korea, Maldives, and Timor-Leste as having eliminated endemic measles. Measles incidence decreased from 59 to 15 cases per million population between 2000 and 2017, with an estimated 75% decrease in measles deaths. In 2017, regional MCV1 coverage was stagnant at 87% (remaining between 84 and 87% since 2013), while MCV2 coverage was 77% and has steadily increased from 58% in 2013 (Fig. 1).6,10

Fig. 1: Estimated coverage with the first MCV1 and MCV2 and reported measles cases – WHO SEA Region 2003–2017
No countries in the Region have been evaluated for elimination of endemic rubella, as there is no current regional goal for rubella/CRS elimination. The SEA-RVC has instead evaluated countries for control of rubella and CRS, defined as a 95% reduction of rubella and CRS cases compared with the 2008 baseline, nationally and regionally. Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka and Timor-Leste were all found to have controlled rubella and CRS in 2018. Regionally, the SEA Region has not yet met its rubella/CRS control goal of a 95% decrease in cases compared to the 2008 baseline. During 2010–2017, there was a 73% reduction in reported regional rubella incidence,\(^{(11)}\) from 8.6 to 2.3 cases per million population. There were 3854 reported rubella cases in the Region in 2018.\(^{(4),(8)}\) Regional rubella-containing vaccine (RCV) 1 coverage was 21% in 2017. (Fig. 2).\(^{(4)}\) However, India and Indonesia are in the process of introducing RCV through catch-up supplemental immunization activities (SIAs) and inclusion in the national immunization schedules, which will probably increase regional RCV coverage, decrease regional rubella incidence and bring the SEA Region closer toward its goal of rubella/CRS control. With all SEA Region countries expected to introduce RCV by 2019, the Region is in a position to advance toward rubella/CRS elimination at a rapid pace (Table 2). In fact, several countries may already have achieved rubella/CRS elimination.

Table 2: Year of RCV introduction and cohort years protected as of 2018, by country – WHO SEA Region

<table>
<thead>
<tr>
<th>Country</th>
<th>Year RCV introduced</th>
<th>Birth cohort years protected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>2014: F+M 9m–14yr</td>
<td>F+M: 2000–2018</td>
</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td>Not applicable</td>
<td>None</td>
</tr>
</tbody>
</table>
WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

<table>
<thead>
<tr>
<th>Country</th>
<th>Year RCV introduced</th>
<th>Birth cohort years protected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timor-Leste</td>
<td>2015: F+M 6m–14yr</td>
<td>F+M: 2001–2018</td>
</tr>
</tbody>
</table>

F – female; M – male; RCV – rubella-containing vaccine; m – months; yr – years

**Fig. 2:** Estimated coverage with the first dose of rubella-containing vaccine and reported rubella cases – WHO SEA Region 2003–2017
Measles and rubella incidence by country is shown in Table 3.

Table 3: Reported measles and rubella cases per 1 million population* † by country – WHO SEA Region 2013 and 2017§

<table>
<thead>
<tr>
<th>Country</th>
<th>Measles incidence per million population</th>
<th>Rubella incidence per million population</th>
<th>Measles incidence per million population</th>
<th>Rubella incidence per million population</th>
<th>% change in measles incidence per million population</th>
<th>% change in rubella incidence per million population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>30.60</td>
<td>19.71</td>
<td>22.00</td>
<td>1.80</td>
<td>-28%</td>
<td>-91%</td>
</tr>
<tr>
<td>Bhutan¶</td>
<td>0</td>
<td>8.19</td>
<td>100.00</td>
<td>11.50</td>
<td>-</td>
<td>40%</td>
</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>India</td>
<td>44.00</td>
<td>2.96</td>
<td>9.00</td>
<td>2.10</td>
<td>-80%</td>
<td>-29%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>114.40</td>
<td>9.48</td>
<td>5.85</td>
<td>3.54</td>
<td>-95%</td>
<td>-63%</td>
</tr>
<tr>
<td>Maldives¶</td>
<td>267.30</td>
<td>0</td>
<td>2.95</td>
<td>2.95</td>
<td>-99%</td>
<td>295%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>15.60</td>
<td>0.37</td>
<td>24.80</td>
<td>1.15</td>
<td>59%</td>
<td>211%</td>
</tr>
<tr>
<td>Nepal</td>
<td>537.80</td>
<td>27.71</td>
<td>3.50</td>
<td>0.70</td>
<td>-99%</td>
<td>-97%</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>3.40</td>
<td>1.17</td>
<td>0.05</td>
<td>0.05</td>
<td>-99%</td>
<td>-96%</td>
</tr>
<tr>
<td>Thailand</td>
<td>71.80</td>
<td>8.31</td>
<td>29.89</td>
<td>0.63</td>
<td>-58%</td>
<td>-92%</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>110.60</td>
<td>0</td>
<td>4.60</td>
<td>0</td>
<td>-100%</td>
<td>-</td>
</tr>
<tr>
<td>Region</td>
<td>58.90</td>
<td>5.6</td>
<td>15</td>
<td>2.3</td>
<td>-75%</td>
<td>-59%</td>
</tr>
</tbody>
</table>

* Measles and rubella incidence are calculated based on the reported cases and population by Member States through WHO/UNICEF joint reporting forms
† Data from WHO/UNICEF joint reporting forms for the year. Joint reporting form is submitted to WHO and UNICEF by Member States with the official immunization data and reports the number of measles and rubella cases in the country for the year
§ Data available at http://www.who.int/immunization/monitoring_surveillance/data/subject/en
¶ Cases reported by Bhutan and Maldives for 2017 are all reported as imported cases

All countries in the Region have introduced some form of laboratory-supported case-based surveillance for measles and rubella and are regularly reporting on key indicators since 2015. The surveillance system is supported
by a network of 50 WHO accredited proficient laboratories across the Region. The surveillance performance indicators as reported for 2017 and 2018 are given in Table 4. The sensitivity of the surveillance system is measured using the rate of non-measles non-rubella cases for suspected measles cases per 100 000 population as a proxy indicator, where the surveillance system is considered sensitive if the rate of non-measles non-rubella cases is >2 per 100 000 population. Further guidance on achieving a sensitive surveillance system through changes in the case definition to fever and rash can be found in the regional surveillance guidelines for measles and rubella.

Table 4: Two key performance indicators for MR case-based surveillance – WHO SEA Region 2017 and 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Discard rate of non-measles non-rubella cases per 100 000 population (Target: ≥2 per 100 000)</th>
<th>Percent sub-national units* reporting discard rate of ≥2 non-measles non-rubella cases per 100 000 population (Target: ≥80% per 100 000)</th>
<th>% of suspected cases with specimens collected within 28 days of rash onset</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017</td>
<td>2018</td>
<td>2017</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>2.37</td>
<td>2.46</td>
<td>75%</td>
</tr>
<tr>
<td>Bhutan</td>
<td>21.47</td>
<td>38.98</td>
<td>100%</td>
</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td>2.10</td>
<td>2.28</td>
<td>83%</td>
</tr>
<tr>
<td>India</td>
<td>0.21</td>
<td>0.46</td>
<td>5%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.14</td>
<td>0.77</td>
<td>ND</td>
</tr>
<tr>
<td>Maldives</td>
<td>17.26</td>
<td>7.42</td>
<td>100%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.68</td>
<td>1.03</td>
<td>14%</td>
</tr>
<tr>
<td>Nepal</td>
<td>2.60</td>
<td>3.93</td>
<td>55%</td>
</tr>
<tr>
<td>Sri Lanka†</td>
<td>0.89</td>
<td>0.75</td>
<td>23%</td>
</tr>
<tr>
<td>Thailand</td>
<td>1.32</td>
<td>3.30</td>
<td>ND</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>10.07</td>
<td>11.02</td>
<td>100%</td>
</tr>
<tr>
<td>Region</td>
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<td>0.87</td>
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* For Bhutan, Maldives and Timor-Leste, the subnational units are epidemiological blocks with population size of more than 100 000. For the other countries, the subnational units are districts or their equivalents
† Sri Lanka has separate surveillance systems for non-measles non-rubella cases of fever and rash, which are not reported to the MR surveillance system, resulting in low non-measles non-rubella discard rates
3. **Feasibility of rubella elimination**

The feasibility and benefits of achieving measles and rubella elimination have been long established. In 2012, the Measles and Rubella Initiative (M&RI), a global partnership established in 2001 by five core partners – the American Red Cross, US Centers for Disease Control and Prevention (CDC), the United Nations Foundation, United Nations Children’s Fund (UNICEF) and WHO, launched the Global Measles and Rubella Strategic Plan 2012–2020, with goals aligned to the GVAP. Full implementation of the recommended strategies along with substantial investments in strengthening health systems and achieving equitable access to vaccination services will lead to the achievement of regional measles and rubella elimination goals and the eventual goal of global measles and rubella elimination.

3.1 **Biological feasibility**

Rubella is caused by the rubella virus, a togavirus with humans as the only known host.\(^{(12)}\) The lack of any non-human reservoir makes the rubella virus a target for elimination and eventual eradication.

3.2 **Technical feasibility**

- Highly effective, safe and acceptable vaccines are available for rubella.
- Rubella virus is a genetically stable virus with a low mutation rate; a single vaccine is effective for all genotypes.
- One dose of RCV at 9 months of age induces sero-protection in \(\geq 95\%\) of infants. Persistence of rubella vaccine-induced immunity is long-term, and likely to be lifelong.\(^{(13)}\)
- The basic reproduction number (Ro)\(^d\) for rubella is 5–6 which translates to a required herd immunity of 83–85% in the population to stop transmission of rubella virus. Achieving high (\(\geq 90\%\)) vaccination coverage to achieve herd immunity is technically feasible.\(^{(13)}\) It is important to note that the rubella Ro is considerably lower than measles Ro (9–18); therefore, since the vaccine used for elimination strategies is a combined MR

\(^d\) Basic reproduction number is the expected number of secondary cases attributed to a single case introduced into a totally susceptible population
vaccine, it is likely that herd immunity for rubella elimination will be achieved prior to that for measles elimination.

➢ At least six countries in the Region have demonstrated that this level of coverage and a resultant >95% decrease in rubella/CRS cases (compared to 2008 baseline) can be achieved.\(^{(4)}\)

➢ Laboratory confirmation is possible through a simple, cost-effective serological test that all countries in the Region are currently performing.

➢ When outbreaks occur, experience from Brazil shows that a major rubella epidemic can be controlled, and sustainable rubella/CRS elimination achieved primarily with a single nationwide campaign targeting both sexes and with high coverage of RI.\(^{(2)}\)

➢ Beyond elimination, the International Task Force for Disease Eradication (ITFDE) has repeatedly noted that eradication of rubella and CRS is technically feasible.\(^{(14)}\) The ITFDE reaffirmed in its meeting in 2015 that it firmly believes that both measles and rubella eradication are technically feasible, but the very high contagiousness of measles is the biggest challenge to success, and measles and rubella eradication would require a sustained global commitment and a clear accountability framework such as what exists for the Global Polio Eradication Initiative (GPEI).

3.3 Programmatic feasibility

The Global Measles and Rubella Strategic Plan 2012–2020\(^{(15)}\) lays out clear strategies for achieving measles and rubella elimination:

➢ Achieve and maintain high levels of population immunity by providing high vaccination coverage with two doses of MCV and RCV through routine and/or supplementary immunization activities.

➢ Monitor disease using effective surveillance and evaluate programmatic efforts to ensure progress.

➢ Develop and maintain outbreak preparedness; respond rapidly to outbreaks and manage cases.
WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

➢ Communicate and engage to build public confidence and demand for immunization.

➢ Perform the research and development needed to support cost-effective operations and improve vaccination and diagnostic tools.

These are proven strategies and elimination of rubella and CRS in the Region of the Americas (all 35 countries), along with 37 countries in the European Region and five in the Western Pacific Region through the above strategies have clearly demonstrated programmatic feasibility of rubella/CRS elimination.

These strategies were used to establish four objectives for the Region in the Strategic Plan for Measles Elimination and Rubella and Congenital Rubella Syndrome Control in the South-East Asia Region 2014–2020 (16):

1. Achieve and maintain at least 95% population immunity against measles and rubella within each district of each country in the Region through routine and/or supplementary immunization.

2. Develop and sustain a sensitive and timely case-based measles and rubella surveillance system and CRS surveillance in each country in the Region that fulfills recommended surveillance performance indicators.

3. Develop and maintain an accredited measles and rubella laboratory network that supports every country or area in the Region.

4. Strengthen support and linkages to achieve the above three strategic objectives.

The Midterm Review of the Strategic Plan for Measles Elimination and Rubella and Congenital Rubella Syndrome Control in the South-East Asia Region 2014–2020 conducted in 2017 reviewed progress towards each of these objectives and improvements that needed to be made to reach the 2020 goals. (3) The review explicitly mentioned that significant progress had been made demonstrating the capacity of the Region to deliver on the goal. Since then, six countries have been verified as having controlled rubella, which means a 95% reduction in rubella incidence compared to 2010. Of the remaining countries, rubella incidence is very low and strategies to control rubella are already being implemented.

All countries have introduced or will have completed introduction of RCV into RI by the end of 2019 following a large-scale nationwide catch-up.
vaccination campaign. At least six countries have achieved high (≥90%) coverage for RCV required for herd immunity, though sub-national variations may occur.

Elimination standard surveillance of rubella is functional in at least seven countries of the Region. A well-functioning surveillance network for acute flaccid paralysis (AFP) is being used in all countries as a base to expand the fever and rash surveillance that is an essential strategy for rubella elimination.

As part of the WHO Global Measles and Rubella Laboratory Network, a well-established regional network of over 50 measles- and rubella-proficient laboratories exists in SEA Region with capability for serology, genetic sequencing and molecular epidemiology. In addition, the regional reference laboratory can provide support for issues unique to countries at or near elimination, such as false positive identification.

Experience from the past on major immunization initiatives, including smallpox eradication, polio eradication, measles elimination and maternal and neonatal tetanus elimination shows that SEA Region Member States have always risen to the global challenge and successfully contributed to the overall global public health achievements. The Region has shown a “can-do” attitude and a wealth of experience.

3.4 Logistic feasibility

All 11 countries in the Region have been using MCV in the routine Expanded Programme on Immunization (EPI) programme for more than three decades. Rubella vaccine is already being co-administered as MR/measles, mumps and rubella (MMR) vaccine in 10 out of 11 countries of the Region. The last country to introduce RCV, Democratic People’s Republic of Korea, is expected to complete introduction of MR in RI before the end of 2019. Once all Member States of the Region complete introduction of RCV, there should be no additional logistical burden for vaccines and cold chains. There is currently no anticipated strain on vaccine supply for the Region.

The elimination of measles in Bhutan, Democratic People’s Republic of Korea, Maldives and Timor-Leste have proven that the Region has the logistical feasibility needed to eliminate rubella/CRS, as the elimination programme will utilize the same logistics, including a combined MR vaccine and an integrated case-based fever and rash surveillance programme needed to meet the rubella elimination goal.
4. Impact of rubella/CRS elimination in SEA Region

4.1 Public health impact

A rubella elimination goal in SEA Region will eliminate the leading cause of vaccine-preventable birth defects, utilizing the opportunity of measles elimination activities. The Region bears the highest burden of CRS incidence per 100,000 live births of any WHO Region, with approximately 105,000 cases at an estimated 121 cases per 100,000 live births (2010 estimate).\(^9\) In addition to avoiding the significant health consequences and disabilities associated with CRS, there would be a tremendous cost saving as the need for lifelong care for children born with CRS would no longer be needed.

Improved implementation of elimination strategies by countries and their partners will focus efforts on increasing vaccination coverage with substantial and sustained additional investments in health systems, strengthening surveillance systems and using surveillance data to drive programmatic actions. These efforts will have broad benefits for public health programmes.

4.2 Programmatic implications

As noted by the SEA-RVC on rubella, efforts to eliminate measles would be greatly benefitted if SEA Region were to adopt a rubella elimination target.\(^2\) In addition to utilizing a combined MR vaccine, both programmes use similar vaccination and surveillance strategies. The political commitment required to eliminate rubella would provide a boost to invigorate the measles elimination programme. As the Midterm Review noted, it is unlikely that measles elimination will be achieved by 2020.\(^3\) However, the push to eliminate rubella may provide the shift in gear needed to eliminate measles. Programmatic improvements recommended by the Midterm Review include strengthening surveillance using a broader acute fever and rash surveillance to increase the surveillance system’s sensitivity to detect rubella cases. In addition, strong CRS surveillance required to monitor progress toward a rubella elimination goal will benefit women’s health by increasing prevention and control of other causes of birth defects.\(^2\)
The high level of measles and rubella accelerated control that has already been attained has significantly reduced deaths from measles and cases of CRS, which is a major accomplishment. However, a paradigm shift will be needed to eliminate measles and rubella. Elimination will require a much more demanding enterprise than the current effort, which has suffered from insufficient resources and wavering political commitment.\(^{(14)}\)

### 4.3 Financial implications

As noted in the Midterm Review, the overall financial envelope for the measles elimination and rubella control programme was much lower than proposed and is likely to be a major challenge for achieving the 2020 target.\(^{(3)}\)

Although estimates of the incremental cost benefits of moving from a rubella/CRS control goal to an elimination goal are not known, copious evidence exists to show the cost saving benefit of eliminating CRS. A systematic review of health economic analyses of measles and rubella immunization interventions found 67 studies demonstrating the large economic benefits associated with preventing measles and rubella infections using vaccines, and the benefit of combining measles and rubella vaccines.\(^{(17)}\)

A systematic review looking at the value of rubella vaccination found 27 studies demonstrating that rubella vaccination programmes are highly cost effective, with the cost of a CRS case management (treatment and disability support) estimated between US$ 4200 and 57,000 per case in middle-income countries and up to US$ 140,000 over a lifetime in high-income countries (all at 2012 US dollar values).\(^{(18)}\) The expected disability-adjusted life-year (DALY) loss for a case of measles or rubella disease is generally at least 100 times the loss per vaccine dose.\(^{(18)}\)

However, additional financial resources, including clear year-wise financial commitments from both Member States and partners, will be needed for both measles and rubella elimination in the Region. The Midterm Review\(^{(3)}\) conducted in 2017 already noted a financial deficit of US$ 1.3 per live birth to optimally implement the current strategies.
5. **Estimated time needed to achieve rubella elimination in SEA Region**

All 11 SEA Region Member States are expected to complete nationwide introduction of RCV in RIs and catch-up SIAs by the end of 2019. All countries are expected to implement nationwide acute fever and rash surveillance with the capacity to perform molecular epidemiology by 2021. Given the need to strengthen RI and surveillance, an additional 1–2 years will be necessary to implement all strategies outlined above to achieve elimination. Placing a goal of interrupting endemic rubella virus transmission by 2023, with subsequent verification of elimination after 36 months without endemic transmission in the presence of a high-quality surveillance system by the SEA-RVC for measles elimination and rubella/CRS control, as per the regional framework for verification of measles and rubella elimination, appears feasible and appropriate. \(^{(2)}\)

Given the Midterm Review’s finding that the Region is unlikely to achieve measles elimination by 2020, it would be preferable for the measles elimination target to be synchronized with the rubella elimination target. Moving the measles elimination target date back to interrupting endemic virus transmission in 2023 would best utilize resources and optimize efficiency in the verification process. \(^{(2)}\)

6. **Is it feasible to achieve measles elimination along with rubella elimination by 2023?**

A regional consultation on measles in 2009\(^{(19)}\) concluded that measles elimination is possible, and in 2013, the Sixty-sixth session of the WHO Regional Committee for South-East Asia adopted the goal of measles elimination and rubella/CRS control by 2020.\(^{(1)}\) However, the Midterm Review conducted in 2017 explicitly mentioned that while significant progress has been made, the effort to eliminate measles and control rubella by 2020 was not on track. The Midterm Review identified the key reasons thus: “robust and effective implementation of the specific strategies have been limited by country-level governance, national political will and global impetus, all of which are reflected in insufficient allocation of resources. The overall financial envelope for the MR elimination programme was much lower than proposed and is likely to be a major challenge in achieving the
2020 target. The programme has gathered momentum, but the challenge is particularly substantial for two of the largest Member States – India and Indonesia.”

In response to the Midterm Review conclusions and recommendations, SEA Region countries have initiated several initiatives to effectively implement the strategies and accelerate progress. Analytical modelling using the WHO Measles Strategic Planning Tool 2.0 indicates the 2023 target to achieve measles and rubella elimination in SEA Region is feasible (Table 5).

The analysis was conducted using assumptions that current trends in RI coverage are sustained, SIAs achieved ≥95% uniform coverage at both national and subnational level, and MR case-based surveillance achieved performance indicator targets.

**Table 5: Expected dates for zero measles cases in countries – modelling exercise using WHO MSP 2.0 tool**

<table>
<thead>
<tr>
<th>Ser. No.</th>
<th>Member States</th>
<th>Expected year for zero indigenous measles</th>
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<tbody>
<tr>
<td>1</td>
<td>Bangladesh</td>
<td>2020</td>
</tr>
<tr>
<td>2</td>
<td>Bhutan</td>
<td>Already achieved in 2016</td>
</tr>
<tr>
<td>3</td>
<td>Democratic People’s Republic of Korea</td>
<td>Already achieved in 2017</td>
</tr>
<tr>
<td>4</td>
<td>India</td>
<td>2023</td>
</tr>
<tr>
<td>5</td>
<td>Indonesia</td>
<td>2023</td>
</tr>
<tr>
<td>6</td>
<td>Maldives</td>
<td>Already achieved in 2016</td>
</tr>
<tr>
<td>7</td>
<td>Myanmar</td>
<td>2023</td>
</tr>
<tr>
<td>8</td>
<td>Nepal</td>
<td>2020</td>
</tr>
<tr>
<td>9</td>
<td>Sri Lanka</td>
<td>2019</td>
</tr>
<tr>
<td>10</td>
<td>Thailand</td>
<td>2022</td>
</tr>
<tr>
<td>11</td>
<td>Timor-Leste</td>
<td>Already achieved in 2017</td>
</tr>
</tbody>
</table>

It is important to note that the MSP tool indicated that India, Indonesia and Myanmar will need to strengthen RIs with a coverage improvement rate (CIR\textsuperscript{f}) of 50% per year and conduct follow-up SIAs during 2020–2022 for the age group 9 months–5 years in areas with coverage <95% for both measles doses to achieve the elimination target. Myanmar and Thailand will also have to target older age groups of 20–40 years to close the identified population immunity gap and stop the transmission of measles virus. While targeting older age groups and adults is challenging, examples are plentiful from Pan American Health Organization (PAHO), where speed-up campaigns in adults were successfully used to stop transmission.

7. **Challenges to achieving measles and rubella elimination in SEA Region**

There are many challenges to overcome before the SEA Region can achieve rubella elimination as well as measles elimination. Although the Midterm Review\textsuperscript{3} found good political and administrative commitments from most Member States at national level, there is a need for increased advocacy and communication strategies to further MR elimination efforts.\textsuperscript{3} This includes advocating for greater country ownership of and investment in the MR elimination programme. A commitment for increased advocacy from the regional office is assured, as measles and rubella elimination is a flagship programme for the Region. In addition, high-level commitment from national paediatric associations have been obtained. Careful consideration of a communication plan is needed, including tailored efforts for conflict/mass movement situations and cross-border collaboration.

In addition to countries contributing towards their own MR elimination programme, financing inadequacies require urgent attention. There will be a significant cost to sustain the gains made and increased cost to accelerate elimination, including making programmatic changes (such as expanding surveillance to include all rash and fever cases, incorporating private clinics into the surveillance system, and responding to outbreaks that will improve surveillance and RI. In addition, five GPEI supported countries in the Region

\textsuperscript{f} In MSP tool, the coverage improvement rate (CIR) is calculated in terms of the incremental decrease each year in the difference between the previous year’s coverage and the maximum routine coverage expected. E.g. If maximum routine coverage expected was 95% and the actual coverage was 88%, the coverage gap is 7%. So, a 50% CIR means that 50% of the gap i.e. 3.5% increase in routine coverage is expected next year.
(Bangladesh, India, Indonesia, Myanmar and Nepal) will lose polio-related funding and require a transition of assets to the measles and rubella elimination efforts.

Increased funding may need to be sourced from donors, such as Gavi, the Vaccine Alliance (Gavi) and Centers for Disease Control and Prevention (CDC), who have shown support for the revised MR regional elimination goals. Due to the lack of a global goal for measles and rubella elimination and the prolonged polio eradication efforts, donor fatigue has been witnessed and may negatively impact outside funding of the measles and rubella elimination programme. Aside from donor fatigue, there may be fatigue on the part of policy-makers, EPI staff and community members who have realized that the current measles elimination target is unlikely to be met on time. A well-thought-out communication strategy directed towards these donors, partners and stakeholders is essential to demonstrate the push rubella elimination can give to the measles elimination programme.

Vaccine security in the current context of only one single source for the manufacturing of MR vaccine will have to be thought of to ensure that vaccine supply is adequate, timely and as per the pre-qualification standards.

Other critical challenges include achieving and maintaining at least 95% uniform coverage for both doses of MR vaccine at all levels (currently, about 70% districts have achieved >95% coverage) including identifying and addressing pockets of low coverage areas (urban slums, ethnic communities, migrants, refugees, etc.) that can be overcome by a high level of commitment and programmatic oversight at subnational level — both politically and programmatically.

Most SEA Region countries have conducted or are in the process of conducting a wide age-range MR campaign for both sexes with high reported coverage. These campaigns will have to be evaluated to ensure that the coverage for RCV is more than what is required for achieving herd immunity (>90%). This is to ensure that there is no age shifting in rubella cases, or paradoxical effects of rubella vaccination in the form of increased number of CRS cases. In addition, multidimensional diagnostics of past MR SIAs should be undertaken to ensure that lessons learnt from these can be used to improve future SIAs as well as outbreak response immunization. Further guidance can be found in the document “Achieving and sustaining measles, rubella and congenital rubella syndrome elimination in the South-East Asia Region – strategic plan 2020–2024”.

Decreased demand for vaccine with the perception that measles or rubella are mild diseases, and loss of confidence in vaccines are other pitfalls that must also be overcome with robust communication and social mobilization policy and efforts. Increasing vaccine hesitancy to measles and RCV in selected populations of the Region, compounded by the lack of a standardized advocacy and communication strategy acts as a detriment to the programme. All aspects of service delivery must be examined with the goal of demand generation.

Expanding fever and rash surveillance is another challenge noted by Member States that will require rapid increase in laboratory capacity to perform serology, virology and special tests as per the accreditation standards, as well as having immediate and significant investment to enhance the sensitivity of the surveillance programme through various programmatic interventions, including preparedness and capacity to respond to outbreaks.

Increasing private sector presence and the need to ensure their involvement and active engagement is another challenge that needs to be adequately addressed.

Finally, although the SEA Region does not face the same degree of insecurity as some other WHO Regions, there are vulnerable populations, challenging urban areas with high population densities, increased global travel, potential emergency situations, the need for cross-border collaboration and other yet undiscovered barriers. Clearly, these difficulties can be overcome, as evidenced by the recent polio-free certification of SEA Region.

8. **Way forward**

The Midterm Review, SEA-RVC, Regional Immunization Technical Advisory Group and the Global Measles and Rubella Strategic Plan 2012–2020 recommended the Region put forth a proposal to eliminate rubella and CRS before the Regional Committee in September 2019. The target date for interruption of endemic rubella transmission is proposed to be 2023. To maximize available resources, the regional measles elimination goal should align with the rubella elimination goal. Therefore, target date for interruption of endemic measles virus transmission should also be moved to 2023.
WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination

9. References


WHO South-East Asia regional high-level consultation on adopting the revised goal of measles and rubella elimination


Annex 5

Proposed strategic plan for measles and rubella elimination in WHO South-East Asia Region 2020–2024
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**Acronyms**

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<th>Definition</th>
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<tr>
<td>AEFI</td>
<td>adverse event following immunization</td>
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<tr>
<td>CRS</td>
<td>congenital rubella syndrome</td>
</tr>
<tr>
<td>EPI</td>
<td>Expanded Programme On Immunization</td>
</tr>
<tr>
<td>Gavi</td>
<td>Gavi, the Vaccine Alliance</td>
</tr>
<tr>
<td>GPW</td>
<td>General Programme of Work</td>
</tr>
<tr>
<td>IgM</td>
<td>immunoglobulin M</td>
</tr>
<tr>
<td>ITAG</td>
<td>Immunization Technical Advisory Group</td>
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<tr>
<td>M&amp;RI</td>
<td>Measles and Rubella Initiative</td>
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<tr>
<td>MCV</td>
<td>measles-containing vaccine</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MR</td>
<td>measles–rubella</td>
</tr>
<tr>
<td>MRCV</td>
<td>measles and rubella-containing vaccine</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
</tr>
<tr>
<td>NITAG</td>
<td>national immunization technical advisory group</td>
</tr>
<tr>
<td>NMRL</td>
<td>national measles and rubella laboratory</td>
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<tr>
<td>NVC</td>
<td>national verification committee</td>
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<tr>
<td>ORI</td>
<td>outbreak response immunization</td>
</tr>
<tr>
<td>RCV</td>
<td>rubella-containing vaccine</td>
</tr>
<tr>
<td>REC</td>
<td>reach every child</td>
</tr>
<tr>
<td>RED</td>
<td>reach every district</td>
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<tr>
<td>RI</td>
<td>routine immunization</td>
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<tr>
<td>RRL</td>
<td>Regional Reference Lab</td>
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<td>gMRVC</td>
<td>Regional Verification Commission</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
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<td>SEA</td>
<td>South-East Asia</td>
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>SEA-RVC</td>
<td>South-East Asia Regional Verification Commission</td>
</tr>
<tr>
<td>SIA</td>
<td>supplementary immunization activity</td>
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<tr>
<td>SO</td>
<td>strategic objective</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>US CDC</td>
<td>United States Centers for Disease Control</td>
</tr>
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<td>WHO</td>
<td>World Health Organization</td>
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Executive summary

In 2013, the Sixty-sixth meeting of the Regional Committee for South-East Asia adopted the Regional goal of measles elimination and rubella control by 2020. To provide impetus to progress towards this goal, in 2014 the Regional Director announced measles elimination and rubella control by 2020 as one of the flagship priorities for the Region. To ensure adequate technical guidance to accelerate progress towards the goal, the Regional Strategic Plan for Measles Elimination and Rubella Control in the South-East Asia Region 2014–2020 was developed.

A midterm review of progress towards achieving the regional goal by 2020 was conducted in 2017, which noted with cautious optimism that significant progress had been made across Member States, the elimination campaign had gathered critical momentum and the national governments and subnational units were committed to the regional goal. However, it highlighted that the targets were not on track, due to suboptimal implementation of the strategies. Considering the conclusions of the midterm review of measles and rubella, a high-level consultation was planned with all Member States and partners to revise the goal for measles elimination, establish a new goal for rubella elimination and develop strategies to combat challenges faced during the implementation of the current strategy. Based on the consultation with the partners and Member States, a new strategic plan for measles and rubella elimination has been developed at the regional level, to be subsequently adopted and/or adapted by the Member States.

The goals, strategic objectives, guiding principles and key milestones are enumerated below. Several processes 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 countries and areas of the South-East Asia Region by 2023.
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 of each country in the Region through routine and/or supplementary immunization.

➢ Develop and sustain a sensitive and timely case-based measles, rubella and congenital rubella syndrome surveillance system in each country in the Region that fulfils recommended surveillance performance indicators.

➢ Develop and maintain an accredited measles and rubella laboratory network that supports every country or area in the Region.

➢ 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
  - identifying and utilizing synergistic linkages of integrated programme efforts
  - research and development.

Guiding principles

The strategy was based on the following guiding principles:

➢ Country ownership and sustainability
➢ RI and health systems strengthening
➢ Equity
➢ Leveraging on partnerships.
Key milestones

By the end of 2020

➢ All countries will have updated their national plan of action or equivalent document to align with the updated Regional Strategy 2020–2024.
➢ At least five countries will have been verified for measles elimination and interruption of rubella transmission for at least 12 months.

By the end of 2021

➢ Two large countries – India and Indonesia – will have conducted follow-up supplementary immunization in selected sub-national areas with high immunity gap and sustained measles and rubella transmission.
➢ All countries will have established nationwide acute fever and rash surveillance for measles and rubella.
➢ All five countries which had been verified by the end of 2020 will have maintained their indigenous measles elimination and interrupted indigenous rubella transmission status. Another two countries and selected subnational areas of large countries will have interrupted indigenous measles and rubella transmission.

By the end of 2022

➢ All countries will have developed a post-elimination sustainability plan along with an outbreak preparedness and response plan.
➢ All five countries will have maintained their measles and rubella elimination status. An additional two countries will have been verified for measles and rubella elimination. Additional selected subnational areas of large countries will have interrupted transmission of indigenous measles and rubella.

By the end of 2023

➢ Measles and rubella transmission will have been interrupted in the entire WHO South-East Asia Region.
Seven countries will have been verified for measles and rubella elimination and the remaining four countries will have interrupted indigenous measles and rubella transmission.

**By the end of 2024**

All 11 countries will have maintained the interruption of transmission of measles and rubella and will be verified for measles and rubella elimination by 2026.
1. **Background**

As of December 2018, the South-East Asia (SEA) Region is home to one fourth of the global population and bears around 25% of global burden of reported measles cases and 31% of the global burden for reported rubella cases. Three of the 15 high-burden countries for measles (India #1, Indonesia #11 and Thailand #14) and rubella (India #2, Indonesia #3 and Bangladesh #14) are in the SEA Region.\(^7\)

Measles elimination and rubella control is unswervingly linked to the 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 Sustainable Development Goal (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 Millennium Development Goal (MDG) 4. The Thirteenth World Health Organization (WHO) General Programme of Work (GPW) 2019–2023 that targets 1 billion more people with coverage of essential health services (pillar B1) includes increased coverage of the second dose of measles-containing vaccine (MCV2) to 90% (indicator number 38) which eventually leads to closing the immunity gap for measles and rubella and measles elimination and rubella/congenital rubella syndrome (CRS) control.

In 2013, the Sixty-sixth meeting of the Regional Committee for South East Asia adopted the Regional goal of measles elimination and rubella control by 2020. In 2014, to provide impetus to the progress towards this goal, the Regional Director announced measles elimination and rubella control by 2020 as one of her flagship priorities for the Region. To ensure adequate technical guidance to accelerate progress towards the goal, the Strategic plan for measles elimination and rubella control in the South-East Asia Region, 2014–20 was developed with the following strategic objectives (SOs):

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\(^7\) [https://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_monthlydata/en/](https://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_monthlydata/en/), accessed 5 May 2019
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- **SO1** – Achieve and maintain at least 95% vaccination coverage with two doses of measles- and rubella-containing vaccine (MRCV) within each district of each country in the Region through routine and/or supplementary immunization.
- **SO2** – Develop and sustain a sensitive and timely case-based measles and rubella surveillance system and CRS surveillance in each country in the Region that fulfils recommended surveillance performance indicators.
- **SO3** – Develop and maintain an accredited measles and rubella laboratory network that supports every country for measles elimination and rubella/CRS control.
- **SO4** – Strengthen support and linkages to achieve the objectives of:
  - advocacy, social mobilization and communication
  - outbreak preparedness and response
  - measles in an emergency setting
  - research and development.

Significant progress has been made towards measles elimination and rubella/CRS control. Five countries in the Region – Bhutan, Democratic People’s Republic of Korea, Maldives, Sri Lanka and Timor-Leste were verified to have interrupted transmission of endemic measles for more than 12 months and maintained this status in 2019. Six countries of the Region - Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka and Timor-Leste were verified as having controlled rubella and CRS in 2018.

A midterm review of progress towards achieving the regional goal by 2020 and to assess the quality of implementation of the strategies laid out in the Strategic plan for measles elimination and rubella/control in the South-East Asia Region, 2014–2020 was conducted in 2017 to provide recommendations on how the strategies and principles should be refined to accelerate progress towards the regional goal. In its report, the midterm review has noted with cautious optimism that significant progress has been made across Member States, the elimination campaign has gathered critical momentum and the national governments and subnational units are committed to this regional goal. However, it highlighted that the targets were off track due to suboptimal implementation of the strategies. Considering the conclusions of the midterm review, a high-level consultation was planned.
with all Member States and partners to revise the goal for measles elimination, establish a new goal on rubella elimination and develop strategies to combat challenges faced during the implementation of the current strategy. Based on the consultation with the partners and Member States, a new Strategic plan for measles and rubella elimination has been developed at the regional level, to be subsequently adopted and/or adapted by the Member States.

2. Status of measles and rubella in WHO South-East Asia Region

Five countries in the Region – Bhutan, Democratic People’s Republic of Korea, Maldives, Sri Lanka and Timor-Leste have been verified to have interrupted transmission of endemic measles for more than 12 months, and have maintained this status in 2019. Six countries of the Region – Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka and Timor-Leste were verified as having controlled rubella and CRS in 2018.

A 75% reduction in mortality due to measles was reported in 2017 as compared to 2000. The reduction in mortality was substantial during the period 2014 to 2017 (23%). Coverage with the first dose of measles and rubella containing vaccine (MRCV1) in 2017 was 87% compared to 63% in 2000. Six out of 11 SEA Region countries reported more than 95% coverage for MRCV1 in 2017. Similarly, the coverage of second dose of measles and rubella containing vaccine (MRCV2) was reported at 77% as compared to 65% in 2014 and 27% in 2000. Approximately half a billion children were reached through measles and rubella supplementary immunization activities (SIAs) during 2014–2018, mostly in India and Indonesia.

As at the end of 2018, all 11 countries were administering two doses of MCV in routine immunization (RI) and 10 countries had already introduced rubella-containing vaccine (RCV). Case-based surveillance for measles and rubella has been initiated in all countries in alignment with the regional guidelines, with India and Indonesia expected to complete the nationwide expansion by end of 2019. CRS surveillance has been initiated in all 11 countries, either as sentinel surveillance or as part of the case-based surveillance system.

All countries in the Region now have at least one proficient national laboratory to support measles and rubella case-based surveillance. The
measles–rubella (MR) laboratory network has expanded from 23 laboratories in 2013 to 50 in 2018, with 41 laboratories accredited as proficient for measles and rubella testing. Nine new laboratories that were included in the network during 2018 – six in India and three in Indonesia are in the process of capacity-building.

All 11 countries have well-functioning national verification committees that are independently assessing the programme’s progress and reporting annually to the WHO South-East Asia Regional Verification Commission (SEA-RVC) for measles elimination and rubella/CRS control.

3. **Key Issues and challenges to be addressed**

The following key issues and challenges were encountered during the implementation of the Strategic plan for measles elimination and rubella/CRS control in South-East Asia, 2014–2020 and have hence been addressed in the current strategy.

3.1 **Immunization**

- Low MRCV1 and MRCV2 immunization during RI, especially at subnational level. Most SIAs did not achieve 95% coverage in all subnational units. Some countries and areas with reported high coverage of MRCV1, MRCV2 and MRCV SIAs at the national level were nevertheless affected by large-scale measles outbreaks.
- Slow progress of immunization, resulting in reduced transmission and immunity gap in the adolescent and adult population. This in turn results in outbreaks in these age groups. This makes elimination costlier, involving closing immunity gaps in these older age groups.
- Policy barriers exist that prevent vaccination of missed children beyond 2 years or lack of screening of children during pre-school or school entry.
- Current programmatic framework does not include MRCV2 in the definition of a fully immunized child and MRVC2 is not considered while monitoring drop-out rates for immunization.
MR SIAs provide huge opportunities to strengthen RI; however, this platform provided by MR SIA has not been optimally utilized to strengthen RI.

### 3.2 Surveillance

- Countries with high incidence of measles and rubella are reluctant to rapidly move towards establishing acute fever and rash surveillance. This is mostly due to lack of guidance on when countries should conduct such transition, and fear of overwhelming the laboratory with increased specimens to be tested.
- The sensitivity of case-based surveillance was suboptimal and large numbers of cases are not reported, giving an incomplete picture of the disease epidemiology.
- CRS surveillance is limited to newborns and does not include tracking suspected mothers.
- Private sector engagement is virtually absent or suboptimal and there are no current policies or strategies to involve the private sector for immunization and surveillance for measles and rubella.

### 3.3 Laboratory

- Quality assurance of the ever-increasing network of laboratories in the measles and rubella laboratory network was a huge issue. No clear guidance exists on the role and responsibilities of laboratories at various levels.
- Specimens for virology were not regularly collected and genotypic information was not uploaded in the global nucleotide surveillance database.
- Laboratories in the countries lack the capacity to conduct special tests including molecular epidemiology and must depend either on the Regional Reference Laboratory (RRL) or Global Specialized Laboratories (GSL).
- Non involvement of private laboratories in the MR laboratory network.
3.4 Linkages

➢ Several countries have not yet developed any national and/or subnational strategy and plan of action for measles elimination and rubella/CRS control, although they have introduced RCV into the national immunization programmes.

➢ Outbreak preparedness and response plan for measles and rubella either did not exist in the countries or were not recently updated.

➢ Communication strategy to tackle various issues related to advocacy, social mobilization and demand generation were yet to be developed.

➢ The SEA-RVC did not have well identified criteria, lines of evidence or tools to measure progress towards measles elimination and rubella/CRS control at the subnational level.

4. Goals, strategic objectives and guiding principles

4.1 Goal

Achieve and maintain elimination of measles and rubella with interruption of the transmission of indigenous measles and rubella viruses in all countries and areas of the SEA Region by 2023.

4.2 Strategic objectives

➢ Achieve and maintain high population immunity with at least 95% vaccination coverage by providing two doses of MRCVs in all areas of each district of each country in the Region through routine and/or supplementary immunization.

➢ Develop and sustain a sensitive and timely case-based measles, rubella and CRS surveillance system in each country in the Region that fulfils recommended surveillance performance indicators.

➢ Develop and maintain an accredited measles and rubella laboratory network that supports every country or area in the Region.
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➢ 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
  - identifying and utilizing synergistic linkages of integrated programme efforts
  - research and development.

4.3 Guiding principles

Country ownership and sustainability

It is essential for the country leadership to commit to the goal and assume the primary responsibility to achieve these. Health sector plans should fully integrate the national immunization programme plans and align with comprehensive multi-year plans for immunization (cMYPs).

RI and health systems strengthening

RI is the backbone for ensuring high level population immunity against measles and rubella and achieving the elimination goal. Providing measles and rubella vaccination through RI systems offers an opportunity to strengthen health systems. Measles and rubella vaccination visits often represent the last routine contact between a child and the health system for preventive care and serves as a key opportunity to monitor the vaccination and health status of the child, administer any missed or booster vaccine doses, distribute long-lasting insecticide-treated bed nets (LLINs) and provide vitamin A and other preventive interventions, as appropriate. SIAs can and should help strengthen RI and health systems. A guide book has been developed by WHO Regional Office for South-East Asia on key areas of intervention to be considered during MR SIAs to strengthen RI.

Each country should thus take responsibility for providing the resources necessary to strengthen immunization systems, including high-quality RI programmes and SIAs, disease surveillance, programme monitoring and an integrated laboratory network.
Equity

The goal of vaccinating all children ensures equity in health-service delivery, as countries develop their own RI and health systems. All people, without distinction of gender, race, religion, age, political belief or economic or social condition should benefit from disease-prevention programmes, and vaccination and protection against measles and rubella. Furthermore, elimination of both measles and rubella provides an opportunity to leverage existing community health systems to provide equitable, universal health care for all children in the Region.

Leveraging partnerships

National governments, in-country partners and civil societies will have to work together in tandem towards achieving the goal including financial and technical self-reliance. Partnerships should include donors, the private sector, academic institutions, professional bodies and religious institutions. Strength of each partner should be harnessed and leveraged upon to achieve the common goal.

5. Key actions to achieve strategic objectives

Strategic and tactical approaches to achieve measles and rubella elimination incorporate principles contained in several global guidance documents including the Global strategic plan for measles and rubella elimination, 2012–2020, Global immunization vision and strategy (GIVS), Global framework for immunization monitoring and surveillance (GFIMS), WHO position papers on measles and rubella vaccines, WHO guidelines on monitoring progress towards measles elimination, the Global vaccine action plan (GVAP) and others.

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

Ensure appropriate policy and programmatic framework is in place to provide MCV1 and MCV2 through RI

(1) Optimize the 2-dose schedule of MR vaccine, ensuring that all children receive MRCV2 by 24 months of age and missed doses are provided
up to 5 years of age, with the two doses given 4 weeks apart. Recommendations for optimal routine MCV1 and MCV2 schedules are included in the WHO measles position paper (2009).

(2) Ensure that MRCV2 is also included in the definition of a fully-immunized child.

(3) MRCV2 coverage should be used as a monitoring indicator and drop-out rate measured against MRCV1 and MRCV2.

Strengthen RI systems

(1) Promote development of micro-plans in every district and below, where applicable, for both routine and supplementary immunization service delivery, following the “reaching every district” strategy to ensure high coverage and equity.

(2) Strengthen vaccine management systems 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, provincial and national levels is critical for providing uninterrupted immunization services and avoiding preventable spoilage and unnecessary wastage of vaccines.

(3) Appropriate basic training and regular in-service training for vaccinators and other involved health workers including communication skills (new technologies, risk communication, etc.)

(4) Improve vaccine, immunization and injection safety, which requires safe and potent vaccines, safe injection practices (including prevention of reusable syringes) and proper waste disposal. Vaccines should be procured from manufacturers that meet internationally recognized standards. 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. This should be a key component of every national plan of action. Auto-disable (AD) syringes and safe disposal of used needles and syringes should be ensured.

(5) Increase community demand through tailored communication strategies and examination of all factors relating to service delivery including vaccine hesitancy. This should be planned and conducted
regularly and at every level to ensure optimal utilization of immunization services.

(6) Advocacy to decision-makers should be promoted by the Regional Office, mobilizing high-level advocacy along with the assistance of partner organizations and civil societies, including pediatric associations.

(7) Culturally appropriate communication strategies with tailored efforts for conflict/mass movement situations and cross-border collaborations.

(8) Programme monitoring and evaluation, including assessments of data quality for both surveillance and immunization at every level to identify problems in a timely manner, so that adjustments and/or feedback may be provided to staff and local partners on performance, obstacles and opportunities for improvement.

(9) Consider use of modeling to help identify immunity gaps.

Establish and maintain high population immunity among children under 2 years of age

(1) Ensure all children are given opportunities for receiving two doses of MRCV by their second birthday by the routine vaccination programme or high-risk group SIA or during the national immunization week or through enhanced “reaching every district to reach every child” (RED/REC) strategies.

(2) Conduct periodic intensification of routine immunization (PIRI) in areas with MCV2 coverage is consistently below 95% in RI and SIA.

(3) Consider including infants >6 months of age who are not yet eligible for MRCV in SIA in countries with high levels of ongoing transmission.

(4) Consider checking the number of zero-dose children reached through SIA.

Establish and maintain high population immunity among pre-school-age children (under 5 years of age)

(1) Extend the age of receiving missed routine dose of MRCV2 up to at least 5 years of age.

(2) Promote vaccination history checks at entry to day care/preschool/kindergarten and encourage requirement of vaccination for those who missed the routine dose of MRCV2.
(3) Utilize every visit to the doctor as an opportunity for a vaccination check.

(4) Conduct follow-up SIAs in the population group when the proportion of children susceptible in the age group up to 5 years of age becomes equal to the size of the birth cohort for that population group, considering the birth rate/speed with which susceptible children accumulate.

Establish and maintain high vaccination coverage among children of school-going age children (5 to 15 years of age)

(1) Promote vaccination history checks at entry to school stage and encourage requirement for vaccination for those who missed the routine dose of MRCV1 and MRCV2. School-based vaccination camps can be set up during the school admission seasons to provide vaccination services to missed children.

(2) Periodically conduct selective MRCV SIAs for missed school children, utilizing the epidemiology to decide the age range of the SIAs.

(3) Conduct MRCV outbreak response immunization (ORI) during measles–rubella outbreaks in the school as part of ORI.

Establish and maintain high population immunity among the adult population

(1) Promote vaccination history checks at entry to colleges, universities and jobs, e.g. students, health workers, factory workers, transportation and hospitality workers, military personnel, police and others, at entry to colleges, universities and jobs and encourage vaccination for those with no documented history of vaccination with MRCV.

(2) Promote vaccination with MRCV for targeted adult groups living or working in communal settings, e.g. students, health workers, factory workers, transportation and hospitality workers, military personnel, police and others, at entry to colleges, universities and workplaces. This requires engagement with relevant sectors such as education, occupational health, military, regulatory authorities for labour, social security, transportation, etc. in collaborative activities for prevention of measles and rubella outbreaks among young adults or in any workplace or confined setting.
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goal of measles and rubella elimination

(3) Conduct selective MRCV SIAs for high-risk adult groups to include refugees, migrants to urban slums and seasonal workers. Develop and conduct special communications and immunization strategies tailored for high-risk groups such as ethnic minority groups, migrants, religious objectors, nomads and remote areas identified by analysis of data from surveillance and outbreak investigations.

(4) For countries that have eliminated measles and rubella, promote immunization requirements before international travel from/to endemic countries.

(5) Conduct operational research to identify the role adults play in transmission in the Region.

Strategic objective 2: Develop and sustain a sensitive and timely case-based measles, rubella and CRS surveillance system in each country in the Region that fulfils recommended surveillance performance indicators.

Ensure that sensitive case-based acute fever and rash surveillance for measles and rubella is expanded nationwide in all countries

(1) Countries and areas with reported incidence of measles and rubella of <5 per million population should establish acute fever and rash surveillance for measles and rubella in line with the Regional guide for surveillance of measles and rubella.

(2) Ensure sufficient capacity at all health facilities including private health facilities and health centres for prompt detection and reporting of all cases of acute fever and rash.

(3) Ensure sufficient capacity at national and all subnational levels for prompt and adequate investigation of acute fever and rash cases, management and analysis of data. Ensure all case investigations include use of a common unique identifier to link laboratory and epidemiological data.

(4) Ensure active case search is conducted regularly by the surveillance team at subnational level through review of health facility records to identify cases of fever and rash similar to that conducted for AFP surveillance.

(5) Investigation of acute fever and rash should include sample collection for both serology and virology for measles and rubella. Ensure sufficient
capacity at provincial and district levels for collecting adequate and appropriate specimens for both serological and virological tests on first contact with suspected cases. Ensure collection of appropriate clinical specimens for obtaining genotype information from each chain of transmission.

(6) Programme should secure adequate operational resources to ensure timely collection and transport of specimens for case confirmation, virus detection and molecular epidemiology.

(7) Ensure investigation of measles and rubella cases, both sporadic and outbreak, is able to classify cases as: (i) imported or import-related (as identified by molecular epidemiology and/or traditional epidemiological linkages); and (ii) preventable or non-preventable.

(8) Conduct intersectoral advocacy, programme communications and social mobilization activities to promote prompt detection and reporting of all cases of acute fever and rash for all age groups. This includes systematically engaging the private health sector, such as national or regional associations of health-care providers, other professional bodies, education sector to report cases from schools and other community level informants.

(9) Improve linkage of acute fever and rash surveillance with existing surveillance networks, e.g. early warning alert and response network; integrated disease surveillance programme; disease-specific surveillance programmes such as for dengue, zika, chikungunya, malaria, etc.

(10) 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.

Ensure sensitive case-based surveillance for CRS is established and rolled out all over the country

(1) Establish and eventually expand sentinel site surveillance for CRS. The number of sentinel sites for CRS surveillance depends on the country size, epidemiology of the disease and capacity of hospitals at subnational hospitals to perform as sentinel sites for CRS surveillance.

(2) Ensure adequate capacity at the sentinel sites to perform CRS surveillance in line with the Regional CRS surveillance guide.
(3) Ensure that the laboratories are well equipped to support CRS surveillance and perform tests as per the WHO protocol on suspected CRS case investigation.

(4) 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.

**Ensure cross-border/region collaboration to strengthen surveillance**

(1) Establish linkages between countries to support cross-border surveillance, particularly in cases of mass population movement.

(2) Establish linkages with neighboring WHO Regions to support cross-regional surveillance to ensure prompt notification and coordination for imported cases.

**Strategic objective 3: Develop and maintain an accredited measles and rubella laboratory network that supports every country or area in the Region**

(1) Ensure every country has at least one WHO accredited proficient national measles and rubella laboratory (NMRL) to support measles, rubella and CRS surveillance. In large countries, ensure that every first subnational level has one proficient measles and rubella laboratory to support case-based surveillance for measles and rubella.

(2) Ensure at least one laboratory in the measles and rubella laboratory network in each country is able to perform molecular epidemiology for measles and rubella.

(3) Ensure access to adequate laboratory equipment and sufficient supply of consumables (including testing kits), as well as budget for operational and shipping costs to NMRL, where applicable.

(4) Establish a management review committee at the regional level to periodically review and ensure quality of laboratories through a documented accreditation process in the measles and rubella laboratory network. In countries with measles and rubella laboratory networks within the country, the NMRLs are expected to conduct the external quality assessment programme for subnational laboratories and monitor their performance to ensure quality and timeliness of testing.
(5) Ensure that the RRL for measles and rubella provides support to national and subnational laboratories to build capacity and strengthen the quality assurance system for serology and virology for measles and rubella.

(6) Ensure that the RRL has the capacity and is able to support countries to perform special tests for measles and rubella, e.g. avidity, pared 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.

(7) Ensure that NMRLs regularly share data with the WHO Regional Office for South-East Asia and submit genotype and sequence data to measles and rubella nucleotide surveillance databases (MeaNS and RubeNS).

(8) RRL and MNRLs to collaborate with WHO in monitoring and providing feedback on timeliness and completeness of reporting to the WHO Regional Office for South-East Asia.

(9) In countries with large number of private and other non-government laboratories, NMRLs where applicable should make efforts to include these laboratories in the measles and rubella laboratory network, provided they are under some form of accreditation process (ISO, ISA, CILA, MSCB, etc.). If the private laboratories are not included in the measles and rubella network, NMRLs should make efforts to ensure that these private laboratories report the results of tests they perform for measles and rubella to the concerned authority in the country.

**Strategic objective 4: Ensure adequate outbreak preparedness and respond rapidly to measles and rubella outbreaks**

Ensure every country has an outbreak preparedness and response plan in place for large measles and rubella outbreaks to respond in a timely manner in line with the Regional measles and rubella surveillance guide for WHO South-East Asia Region.

(1) Develop or update a national plan for outbreak response in line with the Regional measles and rubella surveillance guide for WHO South-East Asia Region that includes emergency response infrastructure (including delineation of incident response hierarchy, subgroups, their responsibilities and pre-identified roles, and rapid response teams); standard operating procedures (SOPs) (including procedures for
response activation, information management and flow, and response deactivation); and contingency planning (including surge capacity).

(2) Ensure that these plans are adequately disseminated to all levels of the health system.

(3) Ensure that adequate capacity exists in the country at both national and appropriate subnational levels to rapidly respond to measles and rubella outbreaks.

(4) Ensure that contingency funds for outbreak investigation are available at the national level with mechanisms for prompt disbursement of the funds to the provincial or district levels when an outbreak is suspected.

Conduct prompt and thorough outbreak investigations

(1) In countries and areas where the incidence of measles and rubella is less than 5 per million population, every single confirmed case of measles and rubella is considered as an outbreak, and a public health response should be initiated as per the measles and rubella surveillance guide for WHO South-East Asia Region. When the chain of transmission includes 10 or more cases, it should be treated as a large outbreak and procedures to respond to large outbreaks should be followed as per the WHO measles and rubella surveillance guide.

(2) Ensure protocols and training materials for public health response and outbreak investigations are updated or developed in line with the measles and rubella surveillance guide for WHO South-East Asia Region, to include critical data to be collected, criteria for laboratory confirmation, guidelines for analysis, interpretation of analysis results and presentation of the data.

(3) Ensure that investigations of measles and rubella cases during outbreak investigations are able to classify cases as: (i) endemic, imported or import-related; and (ii) previously vaccinated or not vaccinated, followed by a root-cause analysis of the outbreak.

Conduct outbreak response immunization

(1) ORI should be conducted regularly in countries and areas within countries with reported incidence of <5 per million population.

(2) Conduct timely ORI, targeting appropriate geographical areas and birth cohorts as per the local epidemiology as identified after the investigation of the outbreak.
(3) Ensure that all households, community and health-care contacts without history of vaccination or illness are detected and provided with MRCV. Wherever possible, provide Vitamin A supplementary dose along with MRCV in children aged 6 months to 5 years during outbreak response as well as two doses of Vitamin A 1 day apart to all cases of measles as part of clinical case management.

(4) Conduct a non-selective MRCV SIA when the above activity: (i) does not stop transmission; or (ii) multiple communities are affected by outbreaks. The catchment areas should be at least equivalent to the second administrative unit or more as indicated by the epidemiological investigation of the outbreak.

(5) Consider supplementary vaccine doses for unvaccinated children 6 months of age and older who are not yet age-eligible for the first dose of MRCV in the national immunization programme.

(6) Consider supplementary vaccine doses for postpartum mothers, their families and caregivers for newborns to protect infants aged <6 months and to reduce case fatality during outbreaks.

(7) Consider increasing vaccine stockpile to ensure adequate supplies for ORI.

(8) Other than the outbreak response, ensure that RI and health systems strengthening activities are implemented based on root-cause analysis to prevent future outbreaks.

Ensure that all health facilities have the capacity to provide appropriate clinical management of suspected measles, rubella and CRS cases

(1) Develop national case management protocols for measles, rubella and CRS and ensure that all health facilities are provided with the national case management protocols in line with the measles and rubella surveillance guide for WHO South-East Asia Region.

(2) Conduct regular training to ensure that all health staff who could be involved in the case management on a day-to-day basis are familiar with the case management protocols.

(3) Ensure that pregnant women who are suspected cases are listed on a pregnancy registry for follow up to rule out CRS.
Ensure that mechanisms are in place to ensure that nosocomial transmission of measles and rubella is prevented during outbreaks

(1) Develop or update national guidelines for preventing the nosocomial transmission of measles and rubella viruses, including infection from CRS cases. Guidelines should include appropriate triage, patient placement and airborne isolation precautions.

(2) Ensure all health facilities are provided with the national guidelines and that their capacity is sufficient to ensure that the protocol can be followed.

(3) 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.

(4) Develop public messages on the isolation of suspected cases and care of uncomplicated cases at home.

(5) Ensure that all health workers are immune to measles and rubella by, vaccination of health workers.

(6) Consider furloughing all health-care workers who have suspected or confirmed measles or rubella from the first day of symptoms until 4 days after rash onset. Furlough all susceptible (non-immune) health-care workers who have been exposed to a suspected or confirmed measles or rubella case, from 5 days till 21 days following exposure, regardless of symptoms and post-exposure prophylaxis.

**Strategic objective 5: Strengthen support and linkages to achieve the above strategies**

Programme management, planning, and progress monitoring

(1) Update the national strategies and plans of action for measles and rubella elimination in line with the regional strategy.

(2) Develop subnational plans and strategies for measles and rubella elimination in countries with large populations, considering the subnational differences in the measles and rubella epidemiology in these countries.

(3) Conduct regular analyses and reviews to monitor progress at national as well as subnational level of the epidemiology of measles, rubella and CRS cases, outbreaks and chains of transmission using multiple complementary data sources, including coverage data, linked
laboratory and epidemiologic data from integrated acute fever and rash surveillance and genotyping data, to minimize the gaps in each individual data source. Existing tools such as the WHO programmatic risk assessment tool for measles may be useful to help in synthesizing data to identify high-risk districts and generate summary results that can be used for advocacy, resource mobilization and prioritization of programmatic activities.

(4) Conduct periodic national reviews on progress towards measles and rubella elimination in countries with endemic or prolonged transmission with participation of SEA-RVC, WHO and other international partners.

(5) Ensure that adequate vaccines, ancillaries and laboratory test kits and supplies are available through regular forecasting exercises and incorporate them in the procurement plans of the government and partner support.

Advocacy, social mobilization and communication
Achieving 95% coverage with measles and rubella vaccine needs well-conceived and professionally implemented communication strategies linked to programme goals. Social mobilization and communication efforts should aim at fostering community ownership and demand for immunization. People’s awareness on child rights for immunization, vaccine safety and benefits will promote public participation and vaccine acceptance. Social mobilization and communication efforts should address social norms and cultural beliefs, and include the traditional media channels and proven new techniques.

Key actions proposed are:

(1) Budgeted national plans for advocacy, social mobilization and communication should be prepared to address the needs for measles and rubella elimination.

(2) Develop and implement special strategies addressing vaccine refusal/hesitancy and language or cultural barriers among minority populations and immigrants, refugees and mobile or other marginalised or socioeconomically disadvantaged population groups.

(3) National and subnational coordination and advisory bodies for measles and rubella elimination should be formed that include government, non-government, bilateral and international partners. Members of
existing interagency coordinating committees and immunization coordination committees would be logical members of such coordination and advisory bodies.

(4) Representatives from ministries of education, defence and labour as well from individual schools and universities, military installations and factories are all logical partners interested in measles and rubella elimination. They can help organize special immunization initiatives for their staff and identify and report suspected measles and rubella cases.

(5) Advocacy with decision-makers, political leaders, health-care professionals (including those in the private sector), teachers, religious leaders and professional associations to explain the benefits of immunization and invite them for their active participation in the programme.

(6) Training of community leaders in basic health information, including immunization.

(7) Information campaigns having evidence-based messages on measles and rubella to address community needs.

(8) 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 social media, including radio, TV and social media networks. Wherever possible, monitor early signs of rumours and vaccine hesitancy by regular screening of social media before and during SIAs, and take appropriate actions. Regularly monitor use of communication interventions using simple checklists to ensure effective implementation of the communication interventions.

(9) Strengthen the advocacy functions of Regional Verification Commission (RVC) and national verification committees (NVCs) in raising 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.

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.
(1) 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 end-game strategy for polio eradication and transition planning gain importance, new opportunities for linkages with measles and rubella elimination may emerge and should be leveraged upon.

(2) Linkages with new vaccines introduction: There may be opportunities for linkages when countries introduce new vaccines like human papillomavirus (HPV) vaccines, meningitis vaccine and others. Combination of planning and intervention of public health interventions can be resource sparing.

(3) Linkages with other proven child survival interventions: Maternal and child health programmes like integrated management of childhood illness (IMCI), nutritional support programmes including vitamin A supplementation, pandemic, avian and seasonal influenza initiatives, malaria prevention and others all have mutual interest in effective delivery systems, surveillance and data management. With limited financial resources, collaboration with other programmes is likely to be necessary to achieve complementary programme objectives and may promote programme synergies.

(4) Linkages with 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 elimination and rubella control is unswervingly linked to the health target 3.2 on child mortality as well as to the 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, SGD 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.

Research and development

Research helps define effective strategies and tactical interventions to achieve the measles elimination and rubella/CRS control goals. Research priorities should be identified jointly with national programmes and technical advisory bodies to hone the programme. Research priorities should include operational research that can help shape the programme to accelerate progress towards measles and rubella elimination, one example of which is implementation of easy to use point of care testing for measles and rubella.
6. **Verification process**

SEA-RVC for measles elimination and rubella/CRS control 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.

### 6.1 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 was interrupted
3. Epidemiological surveillance and laboratory performance quality
4. High population immunity
5. Sustainability of elimination and the national immunization programme

### 6.2 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 have to 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 should also consider verification of subnational areas for interruption of transmission of measles and rubella in large
countries like India and Indonesia. Guidelines on subnational verification of interruption of transmission should also be part of the revised guide.

➢ SEA-RVC and WHO will have to support NVCs in developing an annual 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.

➢ SEA-RVC and WHO will need to consider alternative evidence to be used in the verification process, including sero-surveys in countries where population gaps may not be immediately evident, with need for clear guidance and policies on use of sero-surveys.

7. Milestones and monitoring progress

7.1 Milestones

The Regional Immunization Technical Advisory Group (ITAG) at the Region and the national immunization technical advisory group (NITAG) or its equivalent will serve as the oversight bodies for measles and rubella elimination. The ITAG and NITAGs will meet annually and ad hoc to review progress against the agreed indicators for each country and provide advice on issues and the way forward. The NVCs will have the role of reviewing the programme and providing lines of evidences required for verification to the RVC, which will have the role of verification of measles and rubella elimination in countries or areas of countries.

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

By the end of 2020

➢ All countries will have updated their national plan of action or equivalent document to align with the updated Regional strategy 2020–2024.
➢ All countries will have conducted a nationwide wide age-range measles and rubella vaccination campaign to close the immunity gap for the age group 9 months to 14 years.

➢ All countries in the Region will have an optimized 2-dose MRCV schedule in RI.

➢ At least five countries will have achieved 95% coverage for MRCV2 in more than 80% of the second subnational level (equivalent to district) in the country.

➢ All countries will have introduced at least one dose of RCV in the RI programme.

➢ All countries will have established a nationwide laboratory-supported case-based surveillance for measles and rubella.

➢ All countries will have adequate laboratory network to support serological and virological tests for fever and rash surveillance.

➢ The RVC will have developed or updated criteria and lines of evidence for verification of both measles and rubella elimination.

➢ At least five countries will have been verified for measles elimination and interruption of rubella transmission for at least 12 months.

By the end of 2021

➢ All countries will have developed or updated their subnational plan of action or equivalent document.

➢ At least five countries will have achieved 95% coverage for MRCV2 in more than 95% of the second subnational level (equivalent to district) in the country.

➢ Two large countries, India and Indonesia, will have conducted follow-up supplementary immunization in selected subnational areas with high immunity gap and sustained measles and rubella transmission.

➢ All countries will have established nationwide acute fever and rash surveillance for measles and rubella.

➢ All large countries will have at least one WHO proficient measles and rubella laboratory at national level with the
capacity to conduct special tests as per the surveillance guide and facilitate molecular epidemiology for measles and rubella.

➢ All countries will have undergone a comprehensive surveillance and immunization review with focus on measles and rubella, including data quality.

➢ All five countries will have maintained indigenous measles elimination and interrupted indigenous rubella transmission status. Another two countries and selected subnational areas of large countries will have interrupted indigenous measles and rubella transmission.

**By the end of 2022**

➢ All countries will have developed a post-elimination sustainability plan along with an outbreak preparedness and response plan.

➢ At least seven countries will have achieved 95% coverage for MRCV2 in more than 95% of the second subnational level (equivalent to district) in the country and four countries will have achieved 95% coverage for MRCV2 in at least 80% of the second subnational level (equivalent to district).

➢ All countries will have highly sensitive nationwide acute fever and rash surveillance for measles and rubella with non-measles non-rubella discard rate of >2 per 100,000 population.

➢ All five countries would have maintained their measles and rubella elimination status. An additional two countries will have been verified for measles and rubella elimination. Additional selected subnational areas of large countries will have interrupted transmission of indigenous measles and rubella.

**By the end of 2023**

➢ At least nine countries will have achieved 95% coverage for MRCV2 in more than 95% of the second subnational level (equivalent to district) in the country, and two countries will have achieved 95% coverage for MRCV2 in at least 80% of the second subnational level (equivalent to district).

➢ Measles and rubella transmission will have been interrupted in the entire WHO Region of South-East Asia. Seven countries will
have been verified for measles and rubella elimination and the remaining four countries will have interrupted indigenous measles and rubella transmission.

_by the end of 2024_

- All 11 countries will have achieved 95% coverage for MRCV2 in more than 95% of the second subnational level (equivalent to district).
- All 11 countries will have sustained the interruption of transmission of indigenous measles and rubella for >12 months.
- A Regional post-elimination sustainability plan for the next 5 years will have been developed and adopted by all countries.
- A plan to verify the entire Region as measles and rubella eliminated by 2026 will be developed and executed.

### 7.2 Monitoring progress

Several key processes and impact indicators will be monitored periodically (Annex 2). The major output and outcome indicators to be monitored regularly include the following:

- Number and proportion of countries with zero indigenous measles and rubella cases for the past 12 months
- Number and proportion of countries with measles incidence <5 cases per million population
- Number and proportion of countries with coverage levels of second dose MRCV >95% nationally and in all districts or equivalent second subnational administrative units
- Number of estimated measles deaths, the percentage reduction since 2000 and number of deaths averted through vaccination
- Number of estimated CRS cases, the percentage reduction since 2008 and number of cases averted through vaccination
- Number and proportion of countries with a sensitive acute fever and rash surveillance with non-measles non-rubella discard rate of ≥2 per 100 000 population.
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- Number and proportion of countries with at least one proficient measles and rubella laboratory that can perform molecular epidemiology
- Number of genotypes of measles and rubella that have been detected over time across countries
- Number and proportion of priority countries holding a measles–rubella surveillance review, ideally as part of a broader vaccine-preventable disease (VPD) surveillance review
- Number and proportion of countries with a functional NVC which meets at least twice a year.

8. Challenges to implementing the Strategic Plan

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. Comprehensive analyses of the feasibility of measles elimination by each Member State and discussions about enabling factors, barriers and lessons learnt led to the identification of the following key challenges to implementing this Strategic Plan and potential solutions to address them.

8.1 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. A midterm review of the Strategic plan for measles elimination and rubella/CRS control 2014–2020 highlighted that the programme has a shortfall of US$ 1.3 per live birth to achieve the 2020 goals. This gap will continue to increase as the programme gets closer to measles and rubella elimination in the Region. Thus, national and local governments will have to step up and demonstrate commitment towards the programme, and work with global/regional partners and stakeholders to ensure sufficient and predictable funding for the programme. WHO and other regional partners will have to seek to accelerate global and regional resource
mobilization and advocacy efforts, communicate the measles elimination success stories in countries, and emphasize the potential risks of losing the gains achieved to date. Measles and rubella elimination should be prepositioned as an indicator of immunization programme performance, and viewed in the context of the bigger primary health care (PHC) and universal health care (UHC) agenda. The immunization programme is an accelerator for PHC and UHC as the programme has a population reach that no other health services can match. Its infrastructure can be used as a platform to deliver PHC and as a springboard to UHC. This in turn contributes to, or enhances at least 14 out of the 17 SDGs. An in-depth budget analysis with resource requirements will guide these efforts.

8.2 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. In addition, 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.

8.3 Weak immunization systems and inaccurate reporting of vaccination coverage at subnational level

The high infectiousness 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 increase support to countries to strengthen RI systems by documenting and disseminating the experiences and outcomes of implementing best practices in conducting RIs and SIAs. Country-specific routine system strengthening activities, regular data validation (through data quality assessments and surveys) and greater accuracy of coverage data at
subnational levels is required, particularly in countries with relatively weak health systems. Furthermore, activities such as Expanded Programme on Immunization (EPI) reviews and post introduction evaluations, or new vaccines, represent key opportunities to review measles and rubella vaccination performance and the system components of the EPI programme. 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 multi-year planning process will lead to more systematic follow up, which increases the chances of securing financial resources to implement actions to strengthen immunization systems.

8.4 Low demand/vaccine hesitancy
When individuals no longer see cases of a previously common disease, they begin to believe that the vaccine no longer provides benefits. This misperception becomes an even greater problem if messages about AEFI s are amplified in the media while ignoring the benefits of vaccination. Currently, pockets of resistance to immunization, especially to measles and rubella combined vaccine, exist in some countries. 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, address culture and belief systems and other factors that influence vaccine acceptance; on the effectiveness of immunization communication with parents by health workers; and on determining the issues that need to be addressed to improve demand for measles and rubella immunization.

8.5 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 now 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.

8.6 Vaccine security
Vaccine security in the current context of only selected source for the manufacturing of MR vaccine will have to be well thought out, ensuring also that the vaccine supply is 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 ORI activities will have to be done.

8.7 Laboratory quality management
Expanding laboratory capacity and the laboratory network to support fever and rash surveillance is another challenge noted by Member States. This will require rapid increase in laboratory capacity to perform serology, virology and special tests as per the accreditation standards as well as have immediate and significant investment on the test kits and laboratory logistics. There is also a need to include private sector laboratories and ensure that these follow the laboratory quality assurance systems (LQAS). With expanding laboratory network, laboratory quality management, ensuring all laboratories are proficient and receive proficiency testing panel (PT panel) regularly will require special strategy at global level with direct involvement of respective country teams and support from the Global and Regional MR laboratory Network.

8.8 Private and non-formal sector
Increasing private sector presence and 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 the non-formal sector in the first instance. Hence, strategies to actively engage non-formal and private sectors will have to be developed. Some countries have binding obligations for private sectors to notify some diseases, but this does not apply uniformly across the Region.
9. **Roles and responsibilities**

Measles and rubella elimination will require efforts from all sectors and everyone has a role to play.

9.1 **National governments**

The tremendous progress made towards reducing measles deaths is a direct result of the dedication of national governments and immunization partners working together to achieve common goals. National governments bear the largest 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.

National governments should ensure that measles and rubella elimination is a priority programme in the health sector plan and well-funded national and that subnational strategies to achieve the goal of measles and rubella elimination exist. National governments should periodically review and monitor progress and ensure that timely corrective actions are taken to achieve the goal.

9.2 **Other immunization partners in the country**

These partners range from volunteers, NGOs, academia, civil societies, professional bodies (including medical and paediatric associations), international bodies, vaccine manufacturers, foundations and researchers, among others.

Partners should support the national and local government to effectively implement and monitor the strategic plans to achieve measles and rubella elimination. In-country 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.

9.3 **WHO and regional partners**

WHO Regional Office for South-East Asia and respective country offices, in collaboration with United Nations Children’s Fund (UNICEF) and technical partners, will continue to provide technical assistance to countries in support of their efforts to eliminate measles and rubella by 2023, and sustain elimination thereafter. Specific assistance will be provided as needed to
support RI and SIAs and epidemiological and laboratory surveillance through on-site visits, electronic communication, periodic training workshops, reviews and technical consultation meetings. The 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 Member States and partners as appropriate through electronic publications and direct correspondence. The Regional Office, in collaboration with UNICEF, will conduct advocacy and resource mobilization efforts at the regional level while country offices and national counterparts do so at the national level. The Regional Office will also convene the ITAG and establish and convene meetings of the Regional Commission for verification of measles and rubella elimination.

9.3 Global partners – Measles & Rubella Initiative

The Measles & Rubella Initiative (M&RI) has made a number of commitments at the global level for measles and rubella elimination. These are applicable to the WHO South-East Asia Region. In addition to financial support, M&RI will provide the following types of support to implement the strategy:

- Advocacy with countries and international partners to fully fund and implement the regional and national strategic plan in close collaboration with child survival initiatives.
- Technical support to governments and communities in priority countries:
  - to markedly improve coverage with MRCV1 and MRCV2, delivered through either RI or SIAs;
  - to document and share best practices in conducting measles SIAs and in using SIAs to strengthen routine vaccination;
  - to improve the quality of data used for monitoring and evaluating vaccine coverage and disease incidence; and
  - to expand and enhance the quality of measles and rubella surveillance and the laboratory network.
- Assistance to enable countries to respond rapidly to measles outbreaks, and advocacy for a special outbreak emergency fund.
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➢ Support to operational research needed to address the challenges and achieve the goals of the strategic plan.
➢ Communication of progress and challenges to measles and rubella elimination programme to all stakeholders.
➢ Close collaboration with eligible countries and partners, including Gavi, the Vaccine Alliance (Gavi) to facilitate country support through Gavi.

10. **Costing and funding methodology and assumptions**

Costing exercise is yet to be conducted and be done with support from health economist from HSD team or external source.
Annex 1

Definitions

Measles or rubella eradication: Worldwide interruption of measles or rubella virus transmission in the presence of a surveillance system that has been verified to be performing well.

Measles elimination: The absence of endemic measles transmission in a defined geographical area, e.g. region or country for ≥12 months in the presence of a well-performing surveillance system. However, verification of measles elimination takes place after 36 months of interrupted endemic measles virus transmission.

Rubella and CRS elimination: The absence of endemic rubella virus transmission in a defined geographical area, e.g. region or country for >12 months and the absence of CRS cases associated with endemic transmission in the presence of a well-performing surveillance system. However, verification takes place after 36 months of interrupted endemic virus transmission.

Rubella and CRS control: A 95% reduction of rubella and CRS cases as compared to the 2008 baseline, nationally and for the Region.

Endemic measles or rubella virus transmission: The existence of continuous transmission of indigenous or imported measles virus or rubella virus that persists for ≥12 months in any defined geographical area.

Re-establishment of endemic transmission: Occurs when epidemiological and laboratory evidence indicates the presence of a chain of transmission of a virus strain that continues uninterrupted for ≥12 months in a defined geographical area where measles or rubella had previously been eliminated.

Suspected case of measles or rubella: A patient in whom a health-care worker suspects measles or rubella infection, or a patient with acute fever and maculopapular (non-vesicular) rash.

Laboratory-confirmed measles or rubella case: A suspected case of measles or rubella that has been confirmed by a proficient laboratory.

Epidemiologically-linked confirmed measles or rubella case: A suspected case of measles or rubella that has not been confirmed by a
laboratory but was geographically and temporally related, with dates of rash onset occurring between 7 and 21 days apart for measles (and 12–23 days for rubella) to a laboratory-confirmed case; or in the event of a chain of transmission, to another epidemiologically-confirmed measles or rubella case.

**Clinically compatible measles case:** A case with fever and maculopapular (non-vesicular) rash and at least one of cough, coryza or conjunctivitis, for which no adequate clinical specimen was taken, and which has not been linked epidemiologically to a laboratory-confirmed case of measles or another laboratory-confirmed communicable disease.

**Clinically compatible rubella case:** A case with maculopapular (non-vesicular) rash and fever (if measured) and one of arthritis/arthralgia or lymphadenopathy, for which no adequate clinical specimen was taken, and which has not been linked epidemiologically to a laboratory-confirmed case of rubella or another laboratory-confirmed communicable disease.

**Suspected case of CRS:** An infant less than one 1 year of age in whom a health worker suspects CRS. A health worker should suspect CRS when an infant aged 0–11 months shows signs of heart disease and/or suspicion of hearing impairment and/or one or more of the following eye signs: white pupil (cataract), large eye ball (congenital glaucoma) or pigmentary retinopathy. A health worker should also suspect CRS when an infant’s mother has a history of suspected or confirmed rubella during pregnancy, even when the infant shows no signs of CRS.

**Clinically compatible CRS case:** A case with presence of ≥2 clinical features from group A or ≥1 feature from group A and ≥1 feature from group B:

- **Group A** – cataract(s), congenital glaucoma, congenital heart disease, hearing impairment, pigmentary retinopathy;
- **Group B** – purpura, splenomegaly, microcephaly, mental retardation, meningoencephalitis, radiolucent bone disease, jaundice with onset within 24 h after birth.

**Laboratory-confirmed CRS case:** An infant suspected of CRS who meets the laboratory criteria for CRS case confirmation.

**Congenital rubella infection (CRI):** An infant who does not have clinical signs of CRS but has a positive rubella-specific immunoglobulin M (IgM) test, which is classified as having CRI.
Non-measles, non-rubella discarded case: A suspected case that has been investigated and discarded as a non-measles and non-rubella case using: (a) laboratory testing in a proficient laboratory; or (b) epidemiological linkage to a laboratory-confirmed outbreak of another communicable disease that is neither measles nor rubella.

Measles vaccine-associated illness: A suspected case that meets all five of the following criteria: (i) the patient had a rash illness, with or without fever, but did not have cough or other respiratory symptoms related to the rash; (ii) the rash began 7–14 days after vaccination with a measles-containing vaccine; (iii) the blood specimen, which was positive for measles IgM, was collected 8–56 days after vaccination; (iv) thorough field investigation did not identify any secondary cases; and (v) field and laboratory investigations failed to identify other causes.

OR

a suspected case where virology is performed, and the genotyping result confirms vaccine strain.

Endemic measles or rubella case: A laboratory or epidemiologically-linked confirmed case of measles or rubella resulting from endemic transmission of measles or rubella virus.

Imported measles or rubella case: A case exposed to measles or rubella outside the Region or country during the 7–21 days (12–23 days for rubella) prior to rash onset and supported by epidemiological or virological evidence, or both. (Note: For cases that were outside the Region or country for only a part of the 7–21-day interval [or 12–23 days for rubella] prior to rash onset, additional evidence including a thorough investigation of contacts of the case is needed to exclude a local source of infection.)

Import-related measles or rubella case: A locally acquired infection occurring as part of a chain of transmission originating from an imported case as supported by epidemiological or biological evidence, or both. (Note: if transmission of measles cases related to importation persists for ≥12 months, cases are no longer considered to be import-related; they are considered to be endemic.)

Unknown source measles or rubella case: A confirmed case for which an epidemiological or virological link to importation or to endemic transmission cannot be established after a thorough investigation.
Catch-up MRCV SIA: It is a one-time campaign that targets children, generally up to the age of 15 years to ensure high population immunity, usually before the introduction of new vaccine.

Follow-up MRCV SIA: These are repeated campaigns conducted to close the immunity gaps that have resulted due to sub-optimal performance of RI, usually targeting younger age groups <5 years of age. The follow-up campaigns are usually repeated when the susceptible population reaches closer to the size of the birth cohort.

Speed-up MRCV SIA: It is a one-time campaign that targets older children, adolescents and adults (the age group of males and females to be vaccinated depends on which year the vaccine is introduced, the coverage of follow-up campaigns, epidemiology and fertility rates in the country).
## Annex 2

### Other monitoring indicators

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<tr>
<th>Indicator</th>
<th>Description</th>
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<tbody>
<tr>
<td>Disease incidence</td>
<td>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.</td>
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<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>
<td>Indicators for high quality of epidemiologic surveillance of measles and rubella</td>
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<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>
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<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>
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| 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) | 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 of <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
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<tbody>
<tr>
<td>Proportion of suspected cases with adequate investigation&lt;sup&gt;8&lt;/sup&gt; (target: ≥80% of suspected cases)</td>
<td>The numerator is the number of suspected cases of measles or rubella from which an adequate investigation was initiated within 48 h of notification; and the denominator is the total number of suspected measles and rubella cases, multiplied by 100.</td>
</tr>
<tr>
<td>Proportion of suspected cases with adequate specimen collection&lt;sup&gt;9&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&lt;sup&gt;9&lt;/sup&gt; 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</td>
<td>The numerator is the number of chains of transmission for which adequate samples</td>
</tr>
</tbody>
</table>

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<sup>8</sup> 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 down 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.

<sup>9</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.
or more confirmed measles cases) with adequate specimens for detecting measles virus collected and tested in an accredited laboratory (target: ≥80%)

have been submitted for viral detection; and
the denominator is the number of chains of transmission identified.

Note: Where possible, samples should be collected from at least 5–10 cases early in a chain of transmission and every 2–3 months thereafter, if transmission continues. For virus isolation, adequate throat or urine samples are those collected within 5 days after rash onset. For virus detection using molecular techniques, adequate throat samples are those collected up to 14 days after onset of rash, and adequate oral fluid samples are those collected up to 21 days after onset of rash.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting rate of suspected CRS cases at the national level</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 the numerator is zero, the target incidence would be zero.</td>
</tr>
<tr>
<td>Proportion of suspected CRS cases with adequate investigation</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</td>
</tr>
<tr>
<td>Indicator</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>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>
<td></td>
</tr>
<tr>
<td>Proportion of suspected cases with adequate specimen collection</td>
<td>The numerator is the number of suspected cases from whom adequate specimens(^{10}) for detecting CRS (IgM/immunoglobulin G [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>(target: $\geq 80%$ of suspected cases)</td>
<td></td>
</tr>
<tr>
<td>Proportion of confirmed cases with adequate specimen analysed for virus detection (target: $\geq 80%$ of confirmed cases)</td>
<td>The numerator is the number of lab-confirmed CRS cases for the year for whom adequate specimen was analyzed 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: $\geq 80%$ 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 (clinical compatible</td>
</tr>
</tbody>
</table>

\(^{10}\) Adequate specimens for serology are those collected within 12 months of age of the child that consist of $\geq 0.5$ ml serum.
### Indicators and suggested targets for laboratory performance

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of measles and rubella network laboratories that are WHO-accredited(^{11}) for serological and, if relevant, for virological testing (target: 100% of laboratories)</td>
<td>The numerator is the total number 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.</td>
</tr>
<tr>
<td>Completeness and timeliness of monthly reporting (including zero reporting) to the WHO Regional Office for specimens received for serological and virological testing (target: ≥ 80% of specimens received in the laboratory)</td>
<td>Proportion of specimens with serological results reported by the laboratory within 4 days of receiving the specimen (target: ≥80% of specimens received)</td>
</tr>
<tr>
<td>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)</td>
<td>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 specimens received for testing multiplied by 100 in the given year.</td>
</tr>
</tbody>
</table>

\(^{11}\) WHO measles laboratory accreditation criteria include (1) annual proficiency test results ≥ 90%; (2) at least 90% concordance of NML with RRL confirmatory testing; and (3) passing on-site inspection.
### Indicator | Description
--- | ---
 | the denominator is the total number of laboratories (government and private) that conduct measles diagnostic testing multiplied by 100 in the given year.
Proportion of virus detection and genotyping results (where appropriate) that are completed within 2 months of receipt of specimen (target: ≥80% of specimens received) | 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.
Annex 3

Costing details

Costing exercise is yet to be conducted and be done with support from health economist from HSD team or external source.
Annex 4

Reference reading

**Position papers**


**Disease epidemiology**


**Verification frameworks**


(8) Guidelines on verification of measles elimination in the 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

