

Guidance to Increasing Population Immunity Against Measles and Rubella

Presentation prepared by:
Susan Reef, Ty Kraniak, Jennifer Harris, Alan Ou
Global Immunization Division, CDC

In Collaboration with the SAGE MR Working Group and WHO Regional MR
Focal Points

Presentation Outline

- ▶ Purpose, Guiding Principles, and Structure of the Document
- ▶ Steps 1 - 4
- ▶ Additional Items
- ▶ Draft Recommendations for SAGE Endorsement

Purpose of the document

- ▶ Provide guidance on identification of MR immunity gaps and strategies to increase population immunity
 - ▶ For use by endemic and non-endemic countries, regional offices, NVCs & RVCs
- ▶ Does not address surveillance or detailed activities for strengthening RI
 - ▶ Covered in other documents
- ▶ Should be used in conjunction with regional guidance (where available)

Guiding Principles

- ▶ Intended for immunization programs in all countries
- ▶ Take a Continuous Quality Improvement (CQI) approach
- ▶ Critical review of all available data is needed to identify immunity gaps
- ▶ Strengthening RI is the primary strategy for increasing population immunity
- ▶ Campaigns are needed (as rescue measures) where RI for two doses of measles and rubella-containing vaccines is sub-optimal and to address specific immunity gaps
- ▶ During the time period following campaigns, activities must be quickly prioritized to strengthening RI systems

Continuous Quality Improvement Framework

- Circular nature places emphasis on constant assessment

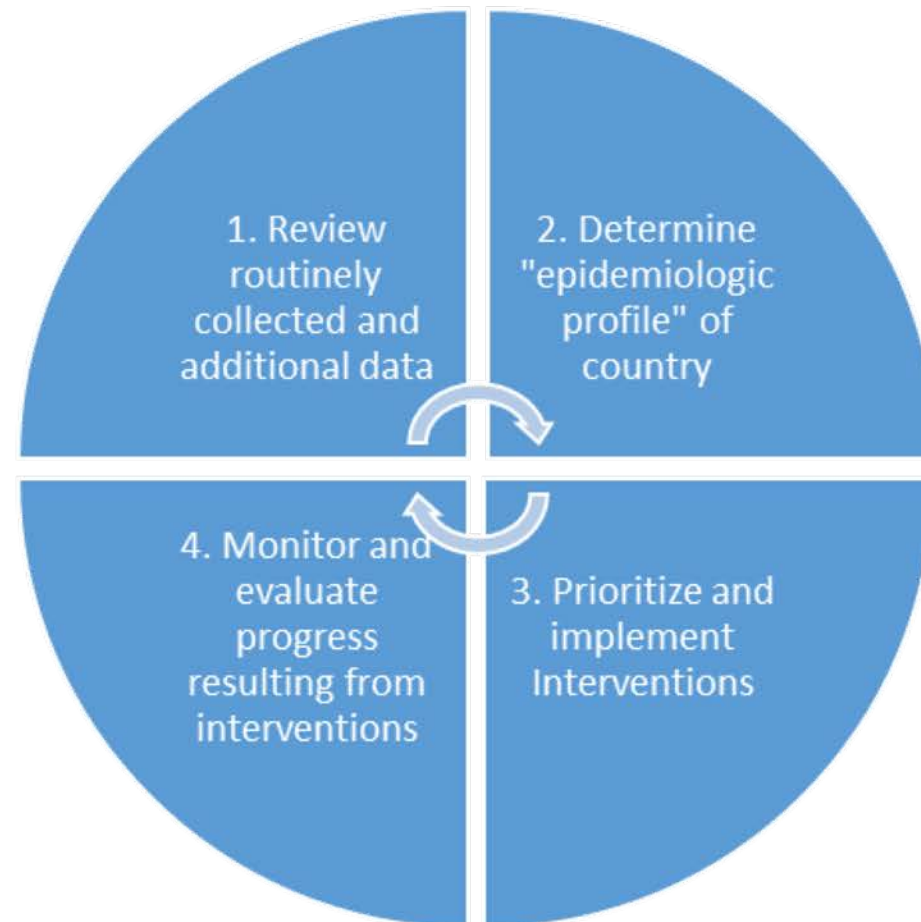


Table 1: Core Strategies for Achieving Elimination-Standard Immunity against Measles and Rubella

Program	Target (as applicable)
2 doses of MRCV through RI	95% nationally and sub-nationally
National follow-up campaigns and sub-national campaigns where appropriate	Nationwide* until coverage with 2 doses MRCV is $\geq 90-95\%$ for 3 years
Missed opportunities for vaccination (MOV) strategy	
School entry checks	
Vaccinate health workers	
Vaccinate immigrants/refugees/travelers and other high-risk groups	
High quality outbreak response immunization	
*Guidance on appropriate use of sub-national campaigns is under development	

Structure of the document

Four step process:

- ▶ Step 1: Review available data to understand MR epidemiology
 - ▶ Step 2: Determine “epidemiologic profile” of the country
 - ▶ Step 3: Identify, prioritize and implement interventions
 - ▶ Step 4: Assess outcomes resulting from interventions
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- ▶ Final document will have country examples

Step 1: Review
available data
sources to understand
epidemiology and
immunity gaps

Data sources to review / analyze

- ▶ Routinely Available Data:
 - ▶ Surveillance
 - ▶ Historical Coverage Data
 - ▶ Potentially available data:
 - ▶ Coverage surveys
 - ▶ Outbreak Investigation Reports
 - ▶ Serosurveys
 - ▶ Modeling Studies
 - ▶ Tools/methodologies to analyze existing data sources:
 - ▶ Data Triangulation
 - ▶ Risk Assessment Tool
 - ▶ WHO MSP Tool
 - ▶ Mathematical Modeling
-
- Consider national and subnational level data
 - Document provides basic description, strengths, and weaknesses of each type of data and tool/methodology (main text and annexes)

Step 2: Determine the country's "Epidemiologic Profile" and specific immunity gaps

Epidemiologic Profiles - Example

General Characteristics of Countries with this Epidemiologic Profile

Overall Epidemiologic Profile	Disease Burden	Population Immunity	Immunization Programme Capacity	Capacity to Conduct Outbreak Investigations	Recommendations for Immunization System Priorities
<p>Low disease incidence with infrequent outbreaks, high population immunity, strong program capacity and outbreak investigations.</p> <p>Can include endemic and non-endemic countries</p> <p>Incidence may be very low during honeymoon period.¹</p>	<p>Low incidence of disease</p> <p>Infrequent outbreaks, temporally and geographically-limited</p> <p>Cases predominantly in children too young to be immunized and/or adolescents /adults</p>	<p>High population immunity, but may have gaps.</p> <p>During honeymoon period, susceptible individuals will accumulate rapidly if routine immunization weak</p>	<p>Consistent high coverage (e.g. $\geq 90\%$) with 2 doses MRCV.²</p> <p>Highly sensitive case-based surveillance system.</p> <p>Demonstrated capacity to conduct high-quality campaigns and timely ORI.</p>	<p>Outbreak investigations well conducted including source identification and documenting the end of transmission.</p> <p>Investigations provide information on immunity gaps in the population and actions are taken to close gaps.</p>	<p>See next slide.</p>

^[1]When there are low amounts of cases following a campaign due to a spike in increased population immunity (especially following a wide-age range SIA)

^[2] The 90% is not a prescriptive cut-off. It is estimation signaling a strong coverage; there may be fluctuation with this figure. Countries may have various inconsistencies and may not fit directly into one of the categories.

Table 2: Description of “Epidemiologic Profiles”

- ▶ Help countries understand where they lie on the epidemiological spectrum of MR elimination
- ▶ Countries may fit into different table rows for different metrics
- ▶ Consider impact of:
 - ▶ Population size and density
 - ▶ Size of birth cohorts
- ▶ Not meant to be definitive classification system

Recommendations for Immunization System Priorities - 1

For countries with infrequent outbreaks, high population immunity and strong program/outbreak investigation capacity:

- ▶ Increase or sustain coverage with two routine doses of MRCV to $\geq 95\%$.
- ▶ Actively look for age-specific, sub-population and/or geographic immunity gaps and address them so that outbreaks are averted.
- ▶ Conduct targeted interventions as needed to fill identified immunity gaps; may be sub-national or population-specific.
- ▶ Rapidly investigate and contain outbreaks that occur.
- ▶ Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

Recommendations Immunization System Priorities - 2

For countries with periodic outbreaks, inadequate immunity in some populations, and moderate program/outbreak investigation capacity:

- ▶ Increase quality of routine immunization services with aim to decrease reliance on campaigns.
- ▶ Conduct high quality campaigns with a focus on reaching those unreached through the RI system. Determine inter-campaign intervals and targeted age group by epidemiologic analysis and population susceptibility analyses.
- ▶ If high quality data are available to allow accurate subnational analysis, campaigns may be targeted based on the epidemiological profile of the sub-national areas concerned*.
- ▶ Implement specific strategies to fill known immunity gaps (e.g. HCWs, migrants, subpopulations).
- ▶ Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.
- ▶ Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

*Guidance on appropriate use of sub-national campaigns is under development

Recommendations Immunization System Priorities - 3

For countries with frequent outbreaks, inadequate population immunity, and limited program/outbreak investigation capacity:

- ▶ Assess existing routine immunization system; develop and implement comprehensive plan to address shortcomings.
- ▶ Identify and address issues with quality of campaigns to ensure zero dose and under vaccinated children are reached.
- ▶ Conduct high quality campaigns with inter-campaign intervals and targeted age group determined by epidemiologic analysis.
- ▶ Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.
- ▶ Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

Recommendations Immunization System Priorities - 4

Applicable to rubella only: For countries that have not yet introduced RCV:

- ▶ Set up basic structure for rubella elimination through wide-age range introductory campaign and introduction of two doses of RCV into routine immunization services.

Step 3: Identify,
prioritize and
implement
interventions based on
epidemiologic profile
and specific immunity
gaps

Considerations for prioritization of activities

- ▶ Country context
- ▶ Effectiveness of interventions in addressing identified issue/gaps
- ▶ Feasibility of conducting a high quality interventions:
 - ▶ Programmatic capacity
 - ▶ Availability of needed resources (human and financial)
- ▶ Size of the population, population movements, and migration

Identify, prioritize and implement interventions based on *epidemiologic profile*

Document provides activities derived from recommendations just presented. Example for countries with *infrequent outbreaks, high population immunity and strong program/outbreak investigation capacity*:

<u>Long Term Strategies To Raise Population Immunity</u>	<u>Short term and Immediate Approaches to Address Immunity Gaps</u>
<p>Increase/sustain 2 dose MRCV coverage to $\geq 95\%$ in all districts/areas</p> <p>Establish vaccination of HCWs if not in place</p> <p>Extend school entry checks to other education settings e.g., high school, university, or college</p> <p>Develop innovative strategies for migrants/travelers</p> <p>Gain political support and strengthen MR surveillance</p>	<p>Targeted activities may be needed for specific immunity gaps</p>

Identify, prioritize and implement interventions based on *specific immunity gaps*

Example for gap identified in children age 1 to 5:

Gap	Long Term Strategies	Immediate Approaches
Age 1 to 5	<ul style="list-style-type: none">- Identify and address underlying cause- Strengthen routine MRCV1/2 programs- Remove maximum age limits for MRCV1/2- Implement entry checks for daycares and similar institutions.- Implement MOV strategies- Enhance social mobilization, advocacy and communication to increase demand- Ensure that MRCV2 is included in Fully Immunized Child (FIC) estimates- Monitor and address MRCV1/2 coverage gap	<ul style="list-style-type: none">- Campaigns (nationally/sub-nationally; consider school/daycare-based)

Step 4: Assess
outcomes resulting
from interventions

Assess outcomes resulting from interventions

- ▶ Monitor and evaluate interventions
- ▶ Consider: Does sufficient data exist to evaluate the program effectively?
 - ▶ Is additional data needed?
 - ▶ What kind of data, and what is the best way to collect it?
- ▶ Review challenges and ways to address them

Additional Items

Algorithm

24

*Shows steps 1 & 2
in algorithm format

Preliminary step: Assess all available data (see Annex A) which can include: surveillance; historical and WUENIC vaccination coverage; recent sero or coverage surveys and outbreak investigations. Examine data to identify overall population immunity and identify specific gaps. Consider the quality of these data when following the algorithm below.

Which of the following describes the general epidemiology of measles/rubella transmission in your country?

Low incidence; Irregular, infrequent outbreaks, strong program capacity and outbreak investigations

Medium disease incidence with periodic outbreaks, inadequate immunity in some populations, and moderate program/outbreak investigation capacity

High disease incidence with frequent outbreaks, inadequate population immunity, and limited program/outbreak investigation capacity

-Increase or sustain coverage with two routine doses of MRCV at least 95%.

-Actively look for age-specific, sub-population and/or geographic immunity gaps and address them so that outbreaks are averted.

-Conduct campaigns as needed to fill identified immunity gaps; may be sub-national or population-specific.

-Rapidly investigate and contain outbreaks that occur.

-Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

For additional interventions:
-See Table 1
-See Table 3
-Interventions under Step 3

-Increase quality of routine immunization services with aim to decrease reliance on campaigns.

-Conduct high quality campaigns with a focus on reaching those unreached through the RI system. Determine inter-campaign intervals and targeted age group by epidemiologic analysis and population susceptibility analyses.

-If high quality data is available to allow accurate subnational analysis, campaigns may be targeted based on the epidemiological profile of the sub-national areas concerned.

-Implement specific strategies to fill known immunity gaps (e.g. HCWs, migrants, subpopulations).

-Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.

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-See Table 1
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-Assess existing routine immunization system; develop and implement comprehensive plan to address shortcomings.

-Identify and address issues with quality of campaigns to ensure zero dose and under vaccinated children are reached.

-Conduct high quality campaigns with inter-campaign intervals and targeted age group determined by epidemiologic analysis.

-Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.

-Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

For additional interventions:
-See Table 1
-See Table 3
-Interventions under Step 3

Country examples

- ▶ Triangulate real data from several countries
- ▶ Provide envisioned classification, identified gaps, and list of effective interventions
- ▶ Work with:
 - ▶ WHO Regional Focal Points
 - ▶ Country staff
 - ▶ CDC staff developing data triangulation guidelines

Draft Recommendations for SAGE Endorsement

Guiding Principles

- ▶ Intended for immunization programs in all countries
- ▶ Take a Continuous Quality Improvement (CQI) approach
- ▶ Critical review of all available data is needed to identify immunity gaps
- ▶ Strengthening RI is the primary strategy for increasing population immunity
- ▶ Campaigns are needed (as rescue measures) where RI for two doses of measles and rubella-containing vaccines is sub-optimal and to address specific immunity gaps.
- ▶ During the time period following campaigns, activities must be quickly prioritized to strengthening RI systems.

Immunization System Priorities - 1

For countries with infrequent outbreaks, high population immunity and strong program/outbreak investigation capacity:

- ▶ Increase or sustain coverage with two routine doses of MRCV to $\geq 95\%$.
- ▶ Actively look for age-specific, sub-population and/or geographic immunity gaps and address them so that outbreaks are averted.
- ▶ Conduct targeted interventions as needed to fill identified immunity gaps; may be sub-national or population-specific.
- ▶ Rapidly investigate and contain outbreaks that occur.
- ▶ Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

Immunization System Priorities - 2

For countries with periodic outbreaks, inadequate immunity in some populations, and moderate program/outbreak investigation capacity:

- ▶ Increase quality of routine immunization services with aim to decrease reliance on campaigns.
- ▶ Conduct high quality campaigns with a focus on reaching those unreached through the RI system. Determine inter-campaign intervals and targeted age group by epidemiologic analysis and population susceptibility analyses.
- ▶ If high quality data are available to allow accurate subnational analysis, campaigns may be targeted based on the epidemiological profile of the sub-national areas concerned*.
- ▶ Implement specific strategies to fill known immunity gaps (e.g. HCWs, migrants, subpopulations).
- ▶ Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.
- ▶ Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

*Guidance on appropriate use of sub-national campaigns is under development

Immunization System Priorities - 3

For countries with frequent outbreaks, inadequate population immunity, and limited program/outbreak investigation capacity:

- ▶ Assess existing routine immunization system; develop and implement comprehensive plan to address shortcomings.
- ▶ Identify and address issues with quality of campaigns to ensure zero dose and under vaccinated children are reached.
- ▶ Conduct high quality campaigns with inter-campaign intervals and targeted age group determined by epidemiologic analysis.
- ▶ Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.
- ▶ Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.

Immunization System Priorities - 4

Applicable to rubella only: For countries that have not yet introduce RCV:

- ▶ Set up basic structure for rubella elimination through wide-age range introductory campaign and introduction of two doses of RCV into routine immunization services.

Acknowledgements

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THANK YOU!

Questions to SAGE

- ▶ Does SAGE agree with the overall approach of this guidance document?
- ▶ Does SAGE agree with the guiding principles for countries to adopt when addressing population immunity gaps?
- ▶ Does SAGE agree with the over arching recommendations for each of the four epidemiological profiles (slides 28-31)?
- ▶ What are the SAGE recommendations for the next steps?

Extra Slides

Progression of the Guidance

- ▶ Based on discussion at the SAGE MR WG July meeting and subsequent teleconference, the following modifications were made:
 - ▶ Refinement of country epidemiologic profiles and recommendations for immunization system priorities
 - ▶ Development of guiding principles

Table 2: Epidemiological Profiles

Overall Epidemiologic Profile (summary of general characteristics in the next four columns)	General Characteristics of Countries with this Epidemiologic Profile (measles and rubella should be evaluated separately; countries may fall into different rows for different characteristics)				Recommendations for Immunization System Priorities
	Disease Burden	Population Immunity	Immunization Programme Capacity	Capacity to Conduct Outbreak Investigations	
<p>Medium disease incidence with periodic outbreaks, inadequate immunity in some populations, and moderate program/outbreak investigation capacity.</p> <p>Note that incidence may be very low in the honeymoon period.</p>	<p>Medium incidence of disease</p> <p>Periodic outbreaks that are responded to and contained.</p> <p>Majority of cases in children <15 years</p>	<p>Inadequate population immunity in children <5 years old; may have gaps in older age groups.</p> <p>Most older children have had opportunities for 2 MRCV doses through routine immunization and/or campaigns; most adults were either vaccinated or had prior infection.</p>	<p>Suboptimal MRCV1 coverage (e.g. 85 - 90%); MRCV2 may or may not be introduced. If introduced, coverage is likely suboptimal or lower.</p> <p>Sensitivity of case-based surveillance system may be sub-optimal and may vary across sub-national divisions.</p> <p>Campaigns may have sub-optimal quality, and/or may not have been conducted recently.</p>	<p>Outbreak investigations are conducted for the majority of outbreaks.</p> <p>Investigations provide additional information on immunity gaps which may or may not be addressed.</p>	<p>Increase quality of routine immunization services with aim to decrease reliance on campaigns.</p> <p>Conduct high quality campaigns with a focus on reaching those unreached through the RI system. Determine inter-campaign intervals and targeted age group by epidemiologic analysis and population susceptibility analyses.</p> <p>If high quality data are available to allow accurate subnational analysis, campaigns may be targeted based on the epidemiological profile of the sub-national areas concerned</p> <p>Implement specific strategies to fill known immunity gaps (e.g. HCWs, migrants, subpopulations).</p> <p>Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.</p> <p>Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.</p>

Table 2: Epidemiological Profiles

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	Disease Burden	Population Immunity	Immunization Programme Capacity	Capacity to Conduct Outbreak Investigations	
<p>High disease incidence with frequent outbreaks, inadequate population immunity, and limited program/outbreak investigation capacity.</p> <p>Note that incidence may be very low in the honeymoon period.</p>	<p>High incidence of disease</p> <p>On-going, endemic transmission and regular large-scale, long duration outbreaks even shortly after campaigns.</p> <p>Majority of cases in children <5 years (as adults were either vaccinated or had prior infection).</p>	<p>Inadequate immunity in multiple age groups, most significant gaps in children <5 years old.</p>	<p>Long standing low MRCV1* coverage (e.g. < 85%)</p> <p>MRCV2# not introduced or very low coverage.</p> <p>Case-based surveillance not implemented or inadequately sensitive.</p> <p>Quality of campaigns is inadequate and/or they have not been conducted in a timely manner.</p>	<p>Due to large-scale and frequent outbreaks, outbreak investigations are typically inadequate.</p> <p>The beginning and end of outbreaks may not be determined consistently.</p> <p>ORI may not be implemented in a timely manner (or at all)</p>	<p>Assess existing routine immunization system; develop and implement comprehensive plan to address shortcomings.</p> <p>Identify and address issues with quality of campaigns to ensure zero dose and under vaccinated children are reached.</p> <p>Conduct high quality campaigns with inter-campaign intervals and targeted age group determined by epidemiologic analysis.</p> <p>Increase outbreak response preparedness so that outbreaks can be rapidly detected, investigated and contained.</p> <p>Immediately after a campaign, rapid strengthening of RI with high coverage needs to be implemented and maintained to avoid later outbreaks.</p>

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	Disease Burden	Population Immunity	Immunization Programme Capacity	Capacity to Conduct Outbreak Investigations	
Applicable only for rubella in countries that have not yet introduced RCV. Pre-vaccine epidemiology: high incidence with outbreaks typically among children	Endemic rubella virus transmission. Highest burden typically among children aged 5-9 years.	All immunity due to natural infection.	RCV not yet introduced. Case-based rubella surveillance may or may not exist as part of a joint measles-rubella surveillance system. CRS surveillance may or may not be implemented.	Rubella outbreaks may or may not be detected and investigated.	Set up basic structure for rubella elimination through wide-age range introductory campaign and introduction of two doses of RCV into routine immunization services.

*Some countries may provide RCV through the private sector. This category concerns countries that have not introduced RCV nationally.

Annex A/B

- ▶ Data Sources for Estimating Immunity Gaps
- ▶ Data Tools for Analyzing Available Data Sources
 - ▶ Description
 - ▶ Strengths
 - ▶ Limitations
 - ▶ Best Use of Data Source to Estimate Immunity Gaps