Global Status of Measles and Rubella Elimination Activities

Pediatric Societies and Immunization Partners Workshop

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Geneva, Switzerland

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WHO HQ, IVB/EPI
Measles and Rubella

89,000 measles deaths in 2016 (estimated)

100,000 babies born with congenital rubella syndrome each year (estimated)
Fifth-leading cause of death among children <5 years of age, worldwide in 2000
Measles vaccine 0.27 USD
Measles-Rubella vaccine 0.58 USD
1. Biological feasibility
2. Programmatic feasibility
3. Vaccine market analysis
4. Impact on health systems
5. Economic analysis
6. Risk analysis for post-measles era
7. Global context and political feasibility

2010 Evaluation of Feasibility of Measles Eradication

SAGE

Global Consultation meeting (2010)

Recommend global measles goal

WHA set global measles goal
Measles and Rubella Targets

Global: World Health Assembly, 2010

By 2015:

- MCV1 coverage ≥ 90% national and 80% in every district
- Measles reported incidence <5 cases/million
- Measles mortality reduction of 95% vs. 2000

Regional elimination (GVAP, 2012):

By 2015:

- Elimination of measles in 4 WHO Regions
- Elimination of rubella in 2 WHO Regions

By 2020:

- Elimination of measles & rubella in 5 WHO Regions
Measles Global Annual Reported Cases and MCV1* and MCV2** Coverage, 1980–2016

Measles Initiative launched, 2001

85%

64%

132,137

*MCV1 coverage: first dose of measles-containing vaccine as estimated by WHO and UNICEF.
*MCV2 coverage estimates are only available from 2000 when global data collection started, however some countries introduced MCV2 earlier

Source: WHO /IVB database, 2017. 194 member states
Global Milestone #1: 90% MCV1 Vaccination Coverage in Every Country

- **Global MCV1 = 85%**
- 123 (63%) countries have >90% coverage with 1st dose of MCV
- 44 (23%) with MCV1 coverage ≥ 90% national and ≥ 80% in every district

Immunization coverage with 1st dose of measles containing vaccines in infants, 2016
Global Milestone #2: Measles Incidence <5 cases/million

Based on data received 2018-02 and covering the period between 2017-01 and 2017-12 - Incidence: Number of cases / population* * 100,000 - * World population prospects, 2017 revision - ** Countries with the highest number of cases for the period - *** Countries with the highest incidence rates (excluding those already listed in the table above)
Global Milestone #3
95% Reduction in Measles Deaths

Measles Deaths, by Year 2000-2016

Estimated deaths by Region, 2016

- AFR: 43%
- AMR: 42%
- EMR: 13%
- SEAR: 13%
- WPR: 13%

Measles deaths down 84%!

20.4 million deaths prevented from 2000-2016 by measles vaccination
# Regional Scorecard on Verification of Elimination, Oct. 2017

<table>
<thead>
<tr>
<th>WHO Region (No. Member States)</th>
<th>Regional Verification Commissions Established</th>
<th>Elimination Achieved</th>
<th>No. of MS (areas)</th>
<th>% of MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas (n=35)</td>
<td>Yes</td>
<td>Measles: 35</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rubella: 35</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Europe (n=53)</td>
<td>Yes</td>
<td>Measles: 33</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rubella: 33</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Western Pacific (n=27)</td>
<td>Yes</td>
<td>Measles: 6 (2)</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rubella: 2</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Eastern Mediterranean (21)</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>South-East Asia (n=11)</td>
<td>Yes</td>
<td>Measles: 2</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Africa (n=47)</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>TOTAL (n=194)</td>
<td></td>
<td>Measles: 76 (39%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rubella: 70 (36%)</td>
<td></td>
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</tbody>
</table>

EUR: 7 (13%) additional countries interrupted measles transmission for >12 m but <36 m. 4 (7.5%) additional countries interrupted rubella transmission for >12 m but <36 m.
Measles Elimination Status

Data source: WHO, as of 31 March 2018
Map production Immunization Vaccines and Biologicals (IVB), World Health Organization

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.
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24 countries still lack rubella vaccine

Countries with rubella vaccine in the national immunization programme

* Includes partial introduction

<table>
<thead>
<tr>
<th>2018</th>
<th>Not Available, Not Introduced/No Plans (24 countries or 12%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Data source: WHO/IVB Database, as of 15 May 2018
Map production Immunization Vaccines and Biologicals (IVB), World Health Organization

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Measles and Rubella Targets

Global: World Health Assembly, 2010

By 2015:

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Measles elimination goals set by member states of all regions; rubella by 2 regions

63% with MCV1 ≥ 90%
23% with MCV1 ≥ 90% and ≥ 80% in every district
36 cases / million
84% reduction

20.4 million deaths prevented since 2000 by measles vaccination

1 region (PAHO)
1 region (PAHO)
Measles Case Distribution by Month and WHO Region (2014-2018)

2014: 292,925
2015: 251,327
2016: 186,684
2017: 138,719

- Based on data received 2018-03 - Data Source: IVB Database - This is surveillance data, hence for the last month, the data may be incomplete.
- Note: India started submitting monthly measles data from 2014 onwards.
Reported Measles Cases by Region 2014-2017

Source: monthly reporting to WHO
Key Regional Achievements

- One Region achieved and sustained measles & rubella elimination (AMR).
- 12 AFR countries near elimination* and an additional 14 on track for the 2020 goal.
- High level of control achieved in 7 EMR countries, of which, Bahrain, Oman and Palestine are ready to verify elimination.
- High coverage with 2 doses of MCVs (AMR/EUR/WPR).
- Three regions with all countries having introduced RCV (AMR/EUR/WPR).
- India and Indonesia introducing rubella vaccine in 2017-2018 (>470 million targeted through SIAs).
- In 2017, reported measles cases at all-time low in AFR/SEAR/WPR
- RVC established in all 6 Regions. With three regions verifying rubella elimination (AMR/EUR/WPR).

*Algeria, Burkina, Cape Verde, Rwanda, Eritrea, Gambia, Ghana, Mauritius, Senegal, Seychelles, Sao Tome, Zimbabwe
Key Regional Challenges (1)

• Gaps in population immunity due to:
  o Weak and fragile health systems in many countries (AFR/EMR)
  o Civil unrest, famine, active conflict (EMR)
  o Vaccine hesitancy (EUR)
  o Declining maternal antibody levels

• Susceptible persons distributed across increasingly wide age groups, making eventual elimination more expensive & more technically difficult (EUR/WPR).
• Outbreaks affecting adolescent and adults, migrants, religious groups (EUR/WPR)
• Infants <1 year old affected by measles (EUR/WPR).
Key Regional Challenges (2)

- Maintaining elimination in the face of ongoing Venezuela outbreak PAHO and resurgence in EUR
- No target for rubella / CRS elimination (AFR/EMR/SEAR)
- No target date for rubella elimination (WPR)
- Low commitment to elimination in some member states
- Inadequate resources to fully implement recommended strategies:
  - Inadequate resources for wide age-range campaigns to address population immunity gaps
  - Steadily declining resources through M&R Initiative
  - Lack of resources for surveillance (AFR/EMR/SEAR)
  - Polio transition (AFR/EMR/SEAR)
Major reason: failure to vaccinate

Age and Vaccination Status of Confirmed* Measles Cases, 2010-2014 (n=356,632)

- 2/3 of all cases are children who should have been vaccinated;
- Most had <2 doses

*Lab-confirmed or epi-linked.
Distribution of Measles Cases by Age and Country, PAHO, 2011-2018

Sources: Surveillance country reports sent to the Immunization Unit of PAHO/WHO. *Data as of epidemiological week 18, 2018
Strengthening of Routine Immunization

• RI is critical for achieving MR elimination goals:
  – ≥ 95% coverage with 2 doses of MCV is needed
  – Central theme for M&R Initiative Strategic Plan (2012-2020) and ongoing activities
  – 2/3 of measles cases averted through RI (J. Inf Dis. 204, 2011)

• Studies demonstrate that properly planned SIAs can strengthening RI (E.g.,):
  – Improve micro-planning, training and supervision of HCW
  – Improvement of CC, waste management system & injection-safety standards
  – strengthened AEFI surveillance

• MCV2 in the 2YL offers an ideal opportunity by:
  – fixing an immunization/health check contact during 2YL (e.g. growth monitoring, booster doses, Vit A)
  – catch-up vaccination for all missed vaccines

• Measles vaccination school entry checks can improve coverage of other VPDs.

• Measles outbreaks as an indicators of weak RI:
  – Measles is highly infectious and seeks out susceptibles; disease is highly visible,
  – Outbreaks identifies gaps in RI programs and population groups missed by RI.
Continued reliance on SIAs:
62 Measles-related Campaigns in 46 countries in 2016

16 of 62 SIAs integrated 1 or more other interventions

- Measles (30 campaigns in 17 countries)
- Measles and Rubella (26 campaigns in 23 countries)
- Measles, Mumps and Rubella (6 campaigns in 6 countries)
- No SIAs in 2016

136 million children reached:
- 32/62 (52%) attained 95% coverage
- 10/62 (16%) with coverage survey
- 7 surveys document >95% coverage

20/29 (69%) SIAs ≥ 95% administrative coverage
13/29 (45%) SIAs ≥ 95% survey coverage
Surveillance sensitivity reporting rate of measles and rubella (12 months, discarded cases* per 100,000 population)

Based on data received 2018-02 and covering the period between 2017-01 and 2017-12 - Target: >= 2 discarded cases* / 100,000 population** - *

Suspected cases investigated and discarded as non-measles non-rubella using laboratory testing and/or epidemiological linkage to another etiology **

World population prospects, 2017 revision
Challenge: Polio Transition

16 countries with largest polio assets

88% of estimated measles deaths occur in these countries

Most of the world’s rubella and CRS cases (100,000)

Polio field staff spend nearly 1/3 of their time working on RI & MR.

Critical for SIA quality and surveillance

Up to $77 million (70%) to replace polio funded support for annual needs for VPD/MR surveillance

Over 2500 polio-funded staff are supporting VPD/MR surveillance

RISKS:

- Polio virus transmission if reintroduced
- Resurgence of measles and rubella
New tools under development

**Diagnosis:** Point of care testing

**Vaccination:** Microarray patches (MAP)

100 MAP
Midterm Review of the Global Measles and Rubella Strategic Plan 2012 – 2020

W. A. Orenstein, MD
SAGE
Geneva, 19 October 2016
Global eradication goal

• It is premature to set a timeframe for measles eradication at this point
  – Determination should be made, not later than 2020, whether a formal global goal for measles eradication should be set with timeframes for achievement
    • 73rd WHA 2020 measles roadmap to eradication
  – In the meantime, all regions should work toward achieving the regional elimination goals.
Key MTR Recommendations

- Increase emphasis on surveillance
- Urgent need to **strengthen the collection and use of surveillance data**
- **Strengthening of RI systems is critical** to achieving regional elimination goals. Need to move from SIAs to **primary reliance on ongoing routine services**
- **Microarray patches (MAPs)** identified as potentially game changing advances to enhance the likelihood of reaching M/R goals.
- **Establish RVCs in all regions**
- Given the imminent reduction in polio eradication resources, which can have an adverse impact on both MR control/elimination efforts, a **focus on transition of polio resources is urgent** and needs to be a top priority
Role of Pediatric Societies?

• Advocacy for immunization
  – National authorities
  – Patients

• Use all clinical encounters to update immunization status

• Surveillance
  – Maintain high index of suspicion for measles and rubella
  – Report all suspected measles and rubella cases to national authorities, including confirmed and discarded cases
  – Promote sentinel CRS surveillance
Measles *anywhere* is measles *everywhere*!
Partnerships

Thank You