Assessing the Feasibility of Measles Eradication

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World Health Organization
Overview

- Background
- Biological/technical feasibility
- Programmatic feasibility
- Vaccine market analysis
- Impact on health systems
- Economic analysis
- EB 2010 paper
- Next steps
Background

- May 2008 Executive Board of WHA
  - Request to assess feasibility of "global elimination of measles"

- April 2009 SAGE
  - "Global elimination of measles" = measles eradication
  - Both mean interruption of transmission worldwide

- May 2009 Executive Board of WHA
  - Report on status of global measles control
  - Request for report to EB in Jan 2010
Feasibility of Measles Eradication

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

Global Consultation meeting (2010)

Recommend global measles goal

WHA set global measles goal

SAGE
Biological/Technical Feasibility
"measles eradication is biologically feasible using tools that are currently available, as already demonstrated in the Americas, although implementation challenges remain in each of the remaining five regions" *

* WER, October 30, 2009
Programmatic feasibility

- Describes the current status and programmatic challenges in all regions.

- Regions held meetings/hired consultants and conducted detailed analysis of:
  - the strategies
  - progress
  - enabling factors
  - estimated costs incurred so far and projected costs (source of funds and sustainability)
  - challenges (& what needs to be in place)
  - feasibility of reaching regional goal by the target year/ country & for the region.
  - Estimated year for reaching the target or elimination by 2020(by country and for the region)
Regional Committee Meetings in Africa and SE Asia, September 2009

**African Region:**

"Towards elimination of measles in the African Region by 2020"

RC agreed to adopt actions for achieving elimination by 2020 (calling for a step-wise approach requiring the attainment of the 2012 pre-elimination target)

**SE Asian Region:**

Resolution to mobilize political, societal and financial support towards elimination of measles
Programmatic Feasibility - Summary

- AMRO: eliminated measles in 2002

- Important challenges for each of the regions.

- EMRO, AFRO, EURO, WPRO have elimination goals. Elimination feasible but time line differs for each region. All before 2020.

- SEARO RC will reconsider establishing an elimination goal by 2020 at its 63rd session in 2010.
Vaccine Market analysis

Project Objectives:

In the event of an eradication goal by 2020:

- Is the aggregate level of manufacturing capacity by vaccine type (M, MR, and MMR) sufficient to meet the expected demand?

- What are the risks associated with the manufacturing capacity?

- Identify potential supply strategies to ensure that a **sustainable** and **affordable** supply of pre-qualified vaccine will exist globally.
Vaccine Market analysis

- During 2010-2020 total MCV demand would increase from ~3.5 to ~4.2 billion)

- In aggregate, projected near-term M, MR, and MMR manufacturing capacity would be sufficient to meet this increase in demand.

- The concentration of manufacturing capacity represents a low to moderate risk.

- This risk can be mitigated through specific strategies (e.g. stockpiles or long-term supply contracts)

- Need to continually refine the demand forecast and rapidly communicate this with existing and potential manufacturers
Studies on Impact on Health Systems and Economic Analysis

2-Day Workshop on Methods (June 09):
- Meeting with SAGE and QUIVER Measles WG members, and PI's of studies
- Discuss study methodology and coordinate data sharing
- Criteria for country selection

QUIVER (October 2009)
- Review of mathematical models, economic and health systems study methods
Impact on Health Systems - Objectives

- Country context: describe health and immunization systems; assess level of integration of measles control/elimination activities into health systems.
- What might be the impact of measles eradication on health systems and routine immunization programmes?
- How can measles eradication activities be used to strengthen routine immunization and health systems?
- What specific actions would be needed to ensure a positive impact?
Economic Analysis- Objectives

- How much will it cost to eradicate measles?
- Is measles eradication C/E? Globally and for the 6 countries?
- How do eradication costs/CE compare to the costs/CE of achieving and sustaining the current global goal?
- How do eradication costs/CE compare to the costs/CE of achieving and sustaining an intermediate global goal of x% mortality reduction?
- What would be the impact if donor support declines and the poorest countries do not carry out follow-up SIAs from 2010?
- What impact do post eradication vaccination options have on the cost/CE of measles eradication?
- What impact could new technology have on the costs/CE of each level of control?
Eradication/mortality reduction scenarios for the economic analysis

Vaccine delivery options:
2-3 doses* according to country strategy (MCV1 + MCV2 + SIAs)

Vaccine delivery options:
1. Same as A*
2. 2 routine doses, no SIAs*
3. 1 routine dose and no SIAs*
4. 0 routine doses and no SIAs

*Assess role of new tech. vaccine (aerosol)
# Disease control targets

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<tr>
<th>Disease control target</th>
<th>Description and key programmatic assumptions to reach target</th>
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| 1. Current goal baseline                                 | - Represents current goal: 90% mortality reduction by 2013 compared to 2000  
- assume India completes catch-up by 2013                 |
| 2. No donor funding                                       | Same as above, except that GAVI eligible countries do not carry out follow up SIAs as of 2010.                                |
| 3. x% mortality reduction by 2015                         | - This is the level of control that is most cost-effective by 2015 or 2020.                                                   |
| 4. x% mortality reduction by 2020                         |                                                                                                                           |
| 5. Eradication by 2015                                    | - Model 3 post eradication vaccination options                                                                                |
| 6. Eradication by 2020                                    | - Allow at 3 years post-eradication certification period prior to changing vaccination strategies.                            |
| 7. Eradication by 2025                                    |                                                                                                                           |
Key Recommendations of QUIVER (Oct 09)

- **CEA:**
  - Empirical evidence is needed on cost function of expanding measles coverage
  - Six country CEA study cannot be extrapolated to global level.
  - A budget envelope could be given as global figure.

- **Impact on health systems:**
  - Methodology accepted with minor modifications

- **Ad Hoc QUIVER measles eradication working group to follow up on above issues**
Global Eradication of Measles
EB Paper

- Progress towards the current global goal.
- Global requirements for measles eradication
- Feasibility and requirements for achieving regional measles elimination.
- Conclusion:
  - Measles eradication is a worthy PH goal which can be achieved.
  - routine immunization systems must be strengthened as an essential building block for achieving and maintaining regional goals.
  - A global target for 2015 is proposed as a milestone towards ME:
    • Achieve >90% coverage with MCV1 nationally and >80% in every district
    • Reduce annual measles incidence (<5 per million) and mortality (>95%)
Next Key Steps and Timeline

- Jan 2010: Present report of progress to the EB
- May 2010: 2015 goal set at WHA??
- Sept/Oct 2010: Global consultation meeting
- Oct 2010: Report to the SAGE
- Jan 2011: Jan EB- depends on outcome of Jan 2010 EB??
- May 2011: WHA- depends on outcome of Jan 2010 EB??
Summary

- Measles eradication is biologically/technically feasible
- There is enough vaccine to meet the projected demand
- Eradication is programmatically feasible by 2020
  - India?
- A 2015 goal is a possibility
- Impact on health systems and economic analysis:
  - methods discussed by QUIVER and SAGE working groups and recommendations made
  - Studies will be completed by July 2010
Acknowledgements

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- BMGF
Extra Slides
Risk analysis for post-measles Era

What transmission risks would exist in a post eradication era?

- Carry out an analysis of risks of measles virus introduction from lab accidents, vaccine manufacturing, bioterrorism etc.
- Assess options for vaccination.
- Assess containment policies in a post-measles era.
Global context and political feasibility

- Lessons learnt from the regional measles elimination efforts/other public health eradication/elimination efforts

- Potential sources of funds needed
  - advocacy and broad consultation needed to address funding crisis

- Political will (country perspectives, – Regional Committees of AFR and SEAR, partners)

- Need to build true alliance/synergies with other programmes going forward
Programmatic Feasibility
Elimination is feasible: goal reached within 8 years (2002) (2008 incidence 0.35 per million)

Key enabling factors:
- Clearly defined strategy
- High political and financial commitment at all levels
- partnerships
- Programme management: (quality SIAs and cov monitoring)
- The adoption of a rubella/CRS elimination goal in 2003 (targeting adolescents and adults)
AFRO achieved the global 90% mortality reduction goal in 2006.

At 59th Session of the RC (Sep 2009) AFRO adopted a regional elimination goal by 2020.

Key challenges:

– sustaining political commitment and country ownership,
– financial support
– investment in strengthening immunization systems
10/11 countries achieved the 90% global mortality reduction goal.

Key challenges:
- Large birth cohorts
- Polio endemic in India
- Specific research needs
- Sustaining political commitment and country ownership
- AEFI

Likely date for achievement of 90% mortality reduction is 2013.

In Sep 2009, RC decided it will reconsider establishing an elimination goal by 2020 at its 63rd session in 2010.
Considerable progress
- 90% mortality reduction goal achieved 3 years early (2007)
- 18 countries have either reached or are close to elimination.

Key challenges:
- Conflict and Insecurity
- Polio a competing priority
- Stagnating routine coverage

Elimination in the region can be achieved by 2020 given periods of tranquility
**EURO**

- **Considerable progress**
  - 29/53 countries eliminated measles

- **Key challenges:**
  - Resurgence in Western Europe, declining routine coverage
  - Public and political complacency
    - measles not perceived as a serious health threat.
  - Increased advocacy of anti immunization groups
  - Public distrust of immunization and fear of AEFI.

- Region will likely be able to eliminate measles by 2015
Considerable progress
  - 90% mortality reduction goal achieved
  - 25/37 countries/areas likely eliminated/nearly eliminated measles

Key challenges:
  - Political commitments at the highest level have yet to be realized
  - 97% of measles cases in 2008 in China and Japan
  - Surveillance needs to be strengthened inc virus genotype identification
  - Measles cases among adults
  - Need for continued SIAs

If planned strategies in China and Japan are implemented effectively, Region can achieve elimination by 2012 (if not by 2015)
Criteria for country selection

1. Recent measles SIA
2. Variety of MCV1 coverage levels (60-80%, 81-90%, >90%)
3. Geographic representation
4. Administration of routine MCV2 (at least 1 country)
5. Income levels (low, lower middle, upper middle income)
6. Variety of population sizes
7. Existing in-country collaborators

Exclusion criteria:
- small countries (<5 m population),
- countries with security concerns
- countries with recent studies on disease elimination
Countries for data collection

- Economic analysis
  - Uganda

- Health systems impact
  - Cameroon (lower middle income,

- All studies
  - Brazil
  - Vietnam
  - Bangladesh
  - Tajikistan
  - Ethiopia
Measles eradication is biologically feasible (properties of the virus and disease)

- Humans are the only host
- Life-long immunity after natural infection
- Only one serotype
- Genetically stable

Challenges:
- Highly infectious (>93-95% population immunity needed)
- Population growth and density, migration and international travel
- HIV epidemic
Measles eradication is technically feasible (properties of tools for control)

- Measles vaccines are safe and effective
- Vaccines provide long-term protection against all known genotypes
- Accurate diagnostic tests
- Current vaccines have eliminated measles in the Americas

Challenges:
- Vaccine needs cold chain and sterile injection
- Not effective in early infancy
- 2 doses needed