



SERUM INSTITUTE OF INDIA PVT. LTD.

Cyrus Poonawalla Group

**Prasen Adya**

Measles, Rubella &  
Measles, Mumps, Rubella

# Measles, Mumps, Rubella

- Vaccine Preventable Diseases.
- MCV part of EPI since 1974. \*
- Prior to 1974, 90 % individuals were infected with Measles before the age of 10 years ! \*
- 2011 : Recommendation by WHO to include Rubella.
- 2013 : GAVI announced its support for large scale catch up campaigns with MR vaccine.

\* [MSF, The Right Shot 2nd Edition January 2015](#)

# The Incidence

- Almost 20 mio people are affected by Measles every year.
- 2015 : 134200 reported cases of Measles deaths : 315 children killed by Measles complications every day!
- 100-1000 cases of Mumps per 100000 population.\*
- > 100000 children are born every year with CRS.\*

It costs < \$2 to vaccinate a child against  
Measles & Rubella

\* MSF, The Right Shot 2nd Edition January 2015

# Measles

- Highly contagious viral illness.
- First described in the 7th century.
- Near universal infection of childhood in pre vaccination era.
- Frequent and often fatal in developing areas.

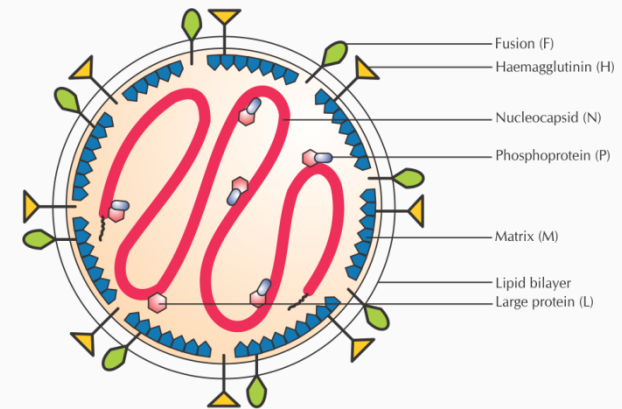


Figure : Schematic diagram of the measles virus

**One child sick from Measles = Monthly  
Ethiopian family income**



## Adults at Risk of Measles

- Mass migration.
- College students.
- International travellers.
- Health-care personnel.

**Causative factor for Measles  
Transmission in today's era!**

# Recent Measles Outbreaks

Year	Region
2014-15	Increased no. of reported Measles cases. 33 % : African Region (AFR). 18 % : Eastern Mediterranean Region (EMR). 83 % : European Region (EUR) *.
Mid 2016	Japan, USA, Australia
June / July 2016	Malaysia / Yemen
End 2016	Romania
January 2017	S. Africa
February 2017	Conakry, Guinea

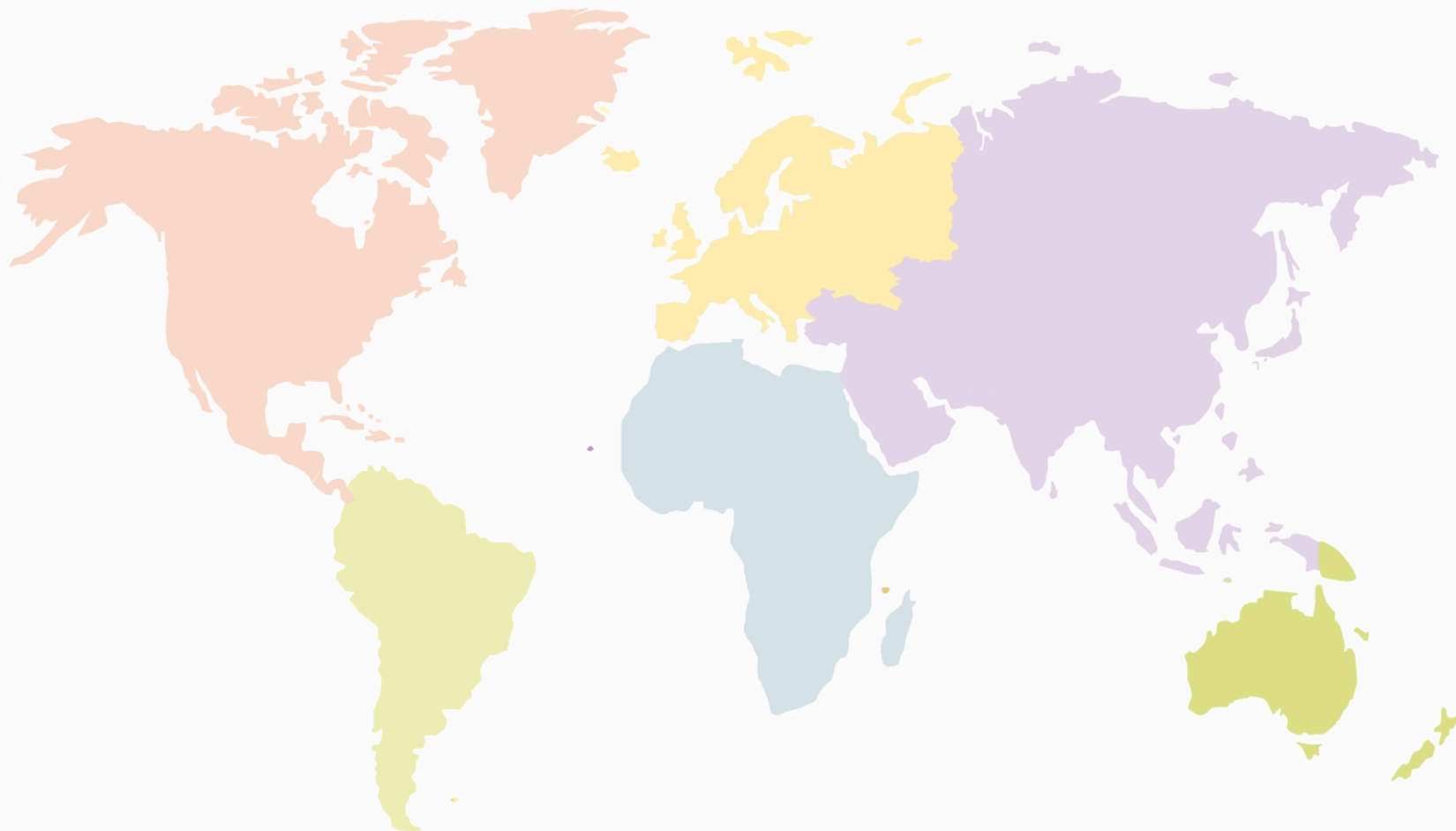
Also reported : Vietnam, The Philippines, China.

\* : [Minal K. Patel et al Progress toward regional Measles Elimination – worldwide, 2000-2015 weekly/Nov 11, 2016/65\(44\);1228-1233](#)

# Recent Mumps Outbreaks

Region	Year
United Kingdom	2014
USA	2016-17
Moldova	2008
Iraq	2015-16
Palestine	2014-15
Belgium	2012
Australia	2015

There is need for **Immunisation** in the  
**Developing Countries,**  
as well as for the **Developed Countries**



# Measles & Rubella Initiative

- Launched in 2001.
- By the American Red Cross, United Nations Foundation, U.S. Center for Disease Control and Prevention, UNICEF and World Health Organization.
- Measles & Rubella Initiative first aimed to make a difference in Africa.
- Since then the American Red Cross and its Measles & Rubella Initiative partners have helped to vaccinate more than one billion children in more than 80 developing countries, making significant gains in the global effort to stop the disease.

**Gavi's support for Rubella is a Game Changer in the control of a disease that causes serious, life-long disabilities in infants.**



# WHO SAGE Recommendations

- Countries to use a Rubella containing combination vaccine such as MR or MMR, as a First dose MCV.
- Countries that introduce MR or MMR combination vaccines in routine immunisation should carry out one-time catch-up campaigns to reach all children between 9 to 15 years of age.
- Countries should switch to the same combination vaccines (MR or MMR) for both routine doses.



# THE SUCCESS STORY

# Rubella Elimination in the America's

- 1993 : PAHO adopted a resolution for elimination of Rubella & CRS in the Americas by 2010.
- PAHO developed a strategy to introduce MR vaccine into routine immunisation programs of all countries for children aged 12 mos & reaching > 95 % coverage.
- 1998 to 2005 : Vaccination campaigns were carried out in Chile, Brazil, Costa Rica, Honduras, Ecuador & El Salvador.
- Another 18 countries were added in subsequent years.



**Pan American  
Health  
Organization**



REGIONAL OFFICE FOR THE

**World Health  
Organization**  
**Americas**



# Rubella Eliminated in the America's

- The campaigns had a huge impact on Measles as well as preventing the re-establishment of endemic Measles virus transmission in the region.
- Consistent supply was ensured by a DCVMN member.
- PAHO extended a special award to Serum Institute of India.



**America's Rubella  
Free!**

## America's Rubella Free

- Vaccination effort led to eradication of Rubella in the Americas, 10 months before target.
- **The Rubella & CRS initiative will have saved an estimated US\$ 3 bio by preventing >112500 CRS cases in Latin America and the Caribbean.**
- The MR initiative launched a new Global Measles & Rubella Strategic Plan in 2012 – Reduction of global Measles deaths by at least 95 %.

# Measles Elimination in the America's

- Large outbreaks reported between 2011 & 2015 : Brazil, Ecuador.
- Efforts started in 1994. Campaign lasted 22 years.
- IEC reviewed evidence on Measles elimination presented by all countries of the region between 2015 & August 2016.
- 27 September 2016 : IEC announced that Measles had been eliminated from Americas. [Ref.: www.eurosurveillance.org](http://www.eurosurveillance.org), P1, 29 Sept 2016

**America's Measles & Rubella Free**

# Measles Elimination in S. Korea

- Measles, endemic in S. Korea. **1965** : MCV became available in S. Korea.
- **1983** : Measles, Mumps and Rubella (MMR) vaccine : added to national immunization program.
- **2000–01** : Measles epidemic : 55000 reported cases.
- **2001** : 5-year National Measles Elimination Plan.
- **2006** : Interruption of indigenous measles transmission achieved : S. Korea, first country in the World Health Organization's (WHO) WPR : declare measles eliminated.

## Other Campaigns

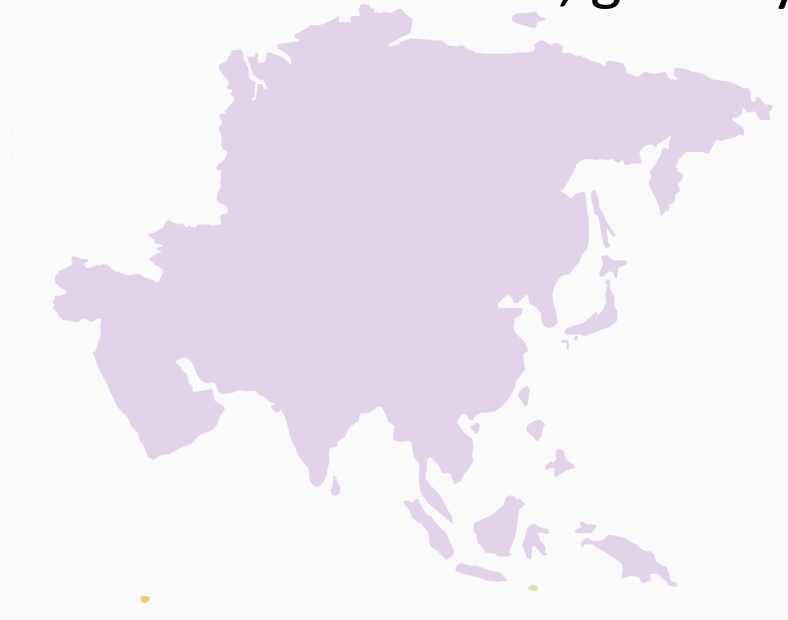
- 2003 : Iranian campaign : World's largest vaccination operation. Measles and Rubella (MR) vaccine was administered to more than 33 million people aged between 5 and 25 years, in less than one month : Decline in measles incidence due to the vaccination. Ref.  
[: Bahman Pourabbas et al Efficacy of measles and rubella vaccination one year after the nationwide campaign in Shiraz, Iran; International Journal of Infectious Diseases \(2008\) 12, 43—46.](#)
- In Albania, the incidence of Measles and Rubella infections significantly dropped after the mass immunization campaigns of MR vaccine.

**MR vaccine was used extensively in mass immunization campaigns in various countries in Latin America, Southern Europe, Central Asia, East Asia and Western Asia**

# THE REALITY

## S. E. Asia Scenario\*

- Measles remains a significant cause of morbidity and mortality.
- **2012 : 122000** global measles deaths : **43 %** in the SE Asian region.
- **2010 : 103000** infants born with CRS, globally : **46 %** in the SE Asian region.



[\\*Strategic plan for Measles elimination and Rubella and CRS control in the SEA region 2014-2020](#)

## S. E. Asia Scenario

Used different strategies:

1. Routine childhood immunisation : 1 or 2 doses;
2. Selective vaccination among young adolescent & susceptible adult females;
3. Incorporating RCV's into Measles SIA's;
4. Different combinations of the abovementioned strategies.

Campaigns conducted /planned : **Thailand, Philippines, Indonesia, India.**



# Measles & Rubella Elimination

- Progressing slower than expected.
- Since 2010 global Measles incidence has decreased by 21 % from 50 cases per mio to 39.3 cases in 2015.
- Measles outbreak have occurred in numerous countries
  - sub-optimal immunisation coverage.
  - increased susceptibility in older age groups.

**45 Member States have not yet introduced  
Rubella vaccine!**

# Measles & Rubella Elimination

2015 Goal or Milestone	Evaluation (based on 2015 data)
Achieve > 95% reduction in estimated measles mortality compared to 2000	Reduction of 79%*
Reduce annual measles incidence to less than 5 cases/million & maintain that level	Global incidence of 36 per million
Achieve at least 90% MCV1 coverage nationally, and > 80% coverage in every district or equivalent administrative unit.	119 (61%) countries have MCV1 coverage > 90% at national level.
Achieve at least 95% coverage with M, MR or MMR during SIAs in every district.	Of 104 SIAs from 2013-2015, 52 (50%) had a reported coverage of $\geq 95\%$ . Only 19 conducted a post- SIA coverage survey; 9 (47%) reached $\geq 95\%$ national coverage.
Establish a rubella/CRS elimination goal in at least three additional WHO regions (i.e., in addition to the AMR and EUR that had established goals before 2012).	One additional region, WPR, has established a rubella elimination goal but no date is associated with It.
Establish a target date for the global eradication of measles.	No target date for global measles eradication established.

Source : [Midterm review of the Global Measles & Rubella strategic plan 2012-20](#)

## Current Status

- Tremendous progress made towards both Measles and Rubella Elimination since 2001. **Significant gains made during 2012 – 2015.**
- 23/194 WHO Member States introduced MCV2. **Global MCV2 coverage rose from 48% to 61%.**
- 17 countries introduced RCV in their schedule. **Global RCV coverage rose from 39% to 46%.**
- 4.25 million deaths estimated to have been averted during 2012 – 2014 relative to no vaccination.

**Neither Measles nor Rubella elimination on track to achieve ambitious goals laid out in the *Global Measles and Rubella Strategic Plan, 2012-2020*.**



**THE  
REQUIREMENT  
FOR  
CONSISTENT SUPPLIES of  
MCV CONTINUES WELL  
BEYOND 2020 !!!**

## MCV Current Manufacturers

- Serum Institute of India Pvt Ltd., India.
- P. T. Bio Farma, Indonesia.
- Crucell (exited from the market in 2012).\*
- GSK.
- Merck.
- Sanofi.

\* [MSF, The Right Shot 2nd Edition January 2015](#)

## UNICEF Demand

- Total MCV demand reached 318.8 mio doses (additional demand was due to large outbreak responses & targeting wider age groups).
- 2015 :

Doses	Vaccine
295 mio doses	Measles vaccine
131 mio doses	MR vaccine
15 mio doses	MMR vaccine

# DEMAND RISE

The demand has increased considerably from the year 2000 to 2011 and continues to grow.

**NEVER HAS THERE BEEN  
A SUPPLY CONSTRAINT**

# SUCCESS STORY

DCVMN members  
currently supply most of  
the Global Demand

**Remain  
committed for  
meeting up  
future demand**



# Supply Challenges

- Regulatory environment in certain countries.
- Country Registration a prerequisite for supplies.
- At times local clinical trials a prerequisite for granting registration.
- Audit by the country authorities.
- Country specific packaging.

**The solution could be consideration for WHO PQ**