National Update on Measles and Rubella Elimination

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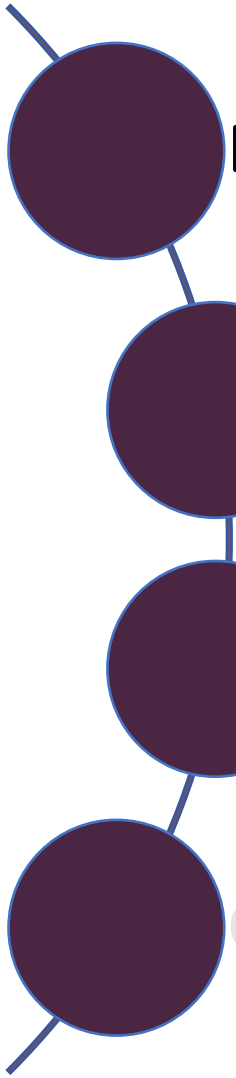
Measles and Rubella Elimination

Presentation Outline

- Basics on Measles and Rubella
- Basics on MR Elimination
- Strategies for achieving MR Elimination
- Current status towards achieving MR Elimination

Presentation Outline



Basics on Measles and Rubella

Basics on MR Elimination

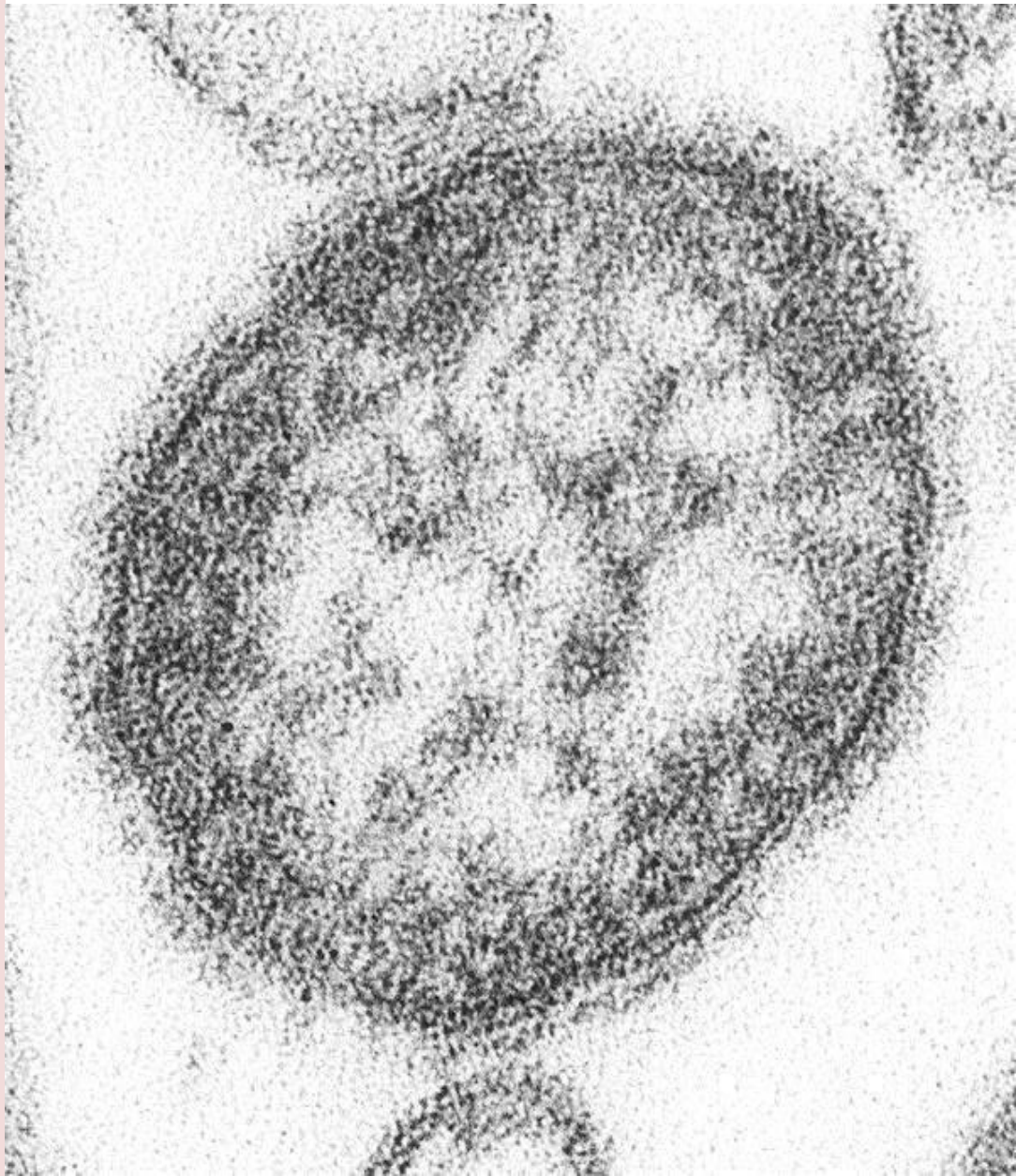
Strategies for achieving MR Elimination

Current status towards achieving MR Elimination

Measles is a “tracer” of strength of the immunisation System. When immunisation coverage is low, measles is the fastest vaccine preventable disease to return

Measles virus

- RNA virus (100-200 nm)
  - Family: Paramyxoviridae.
  - Genus: Morbillivirus
- **Humans are the only reservoirs**
- Invades and multiplies in the respiratory tract
- Spreads by airborne transmission via respiratory secretions or aerosols



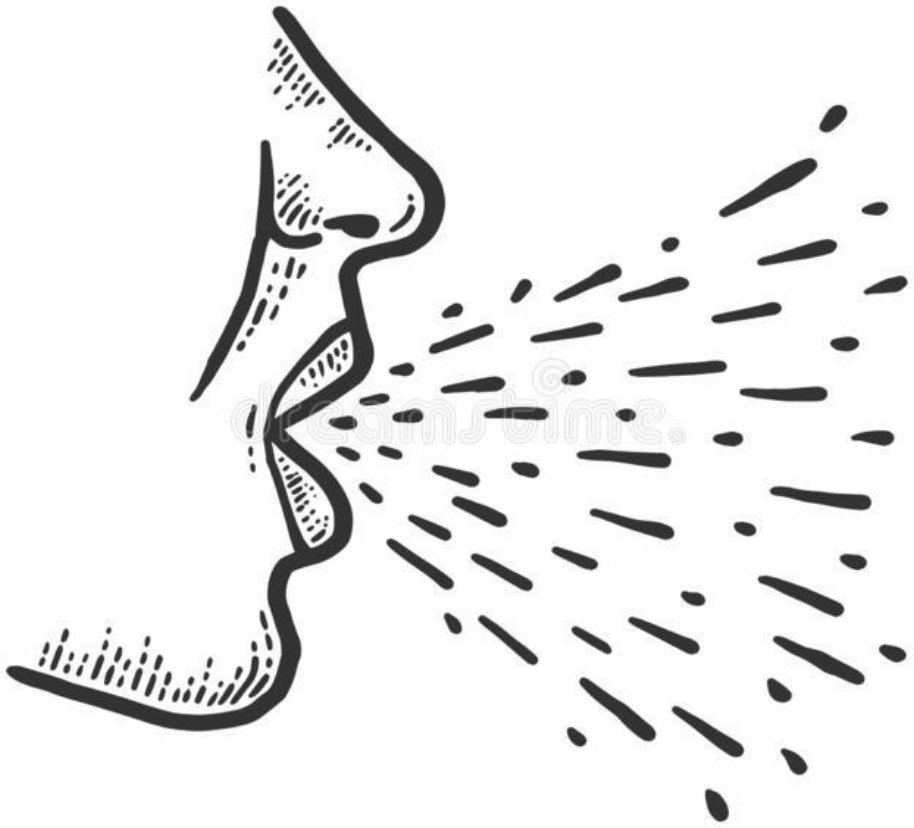
Measles disease

- An acute disease
  - Caused by measles virus
  - Highly infectious: everyone exposed gets the disease if not immune
  - Mortality highest in children < 2 yrs and in adults

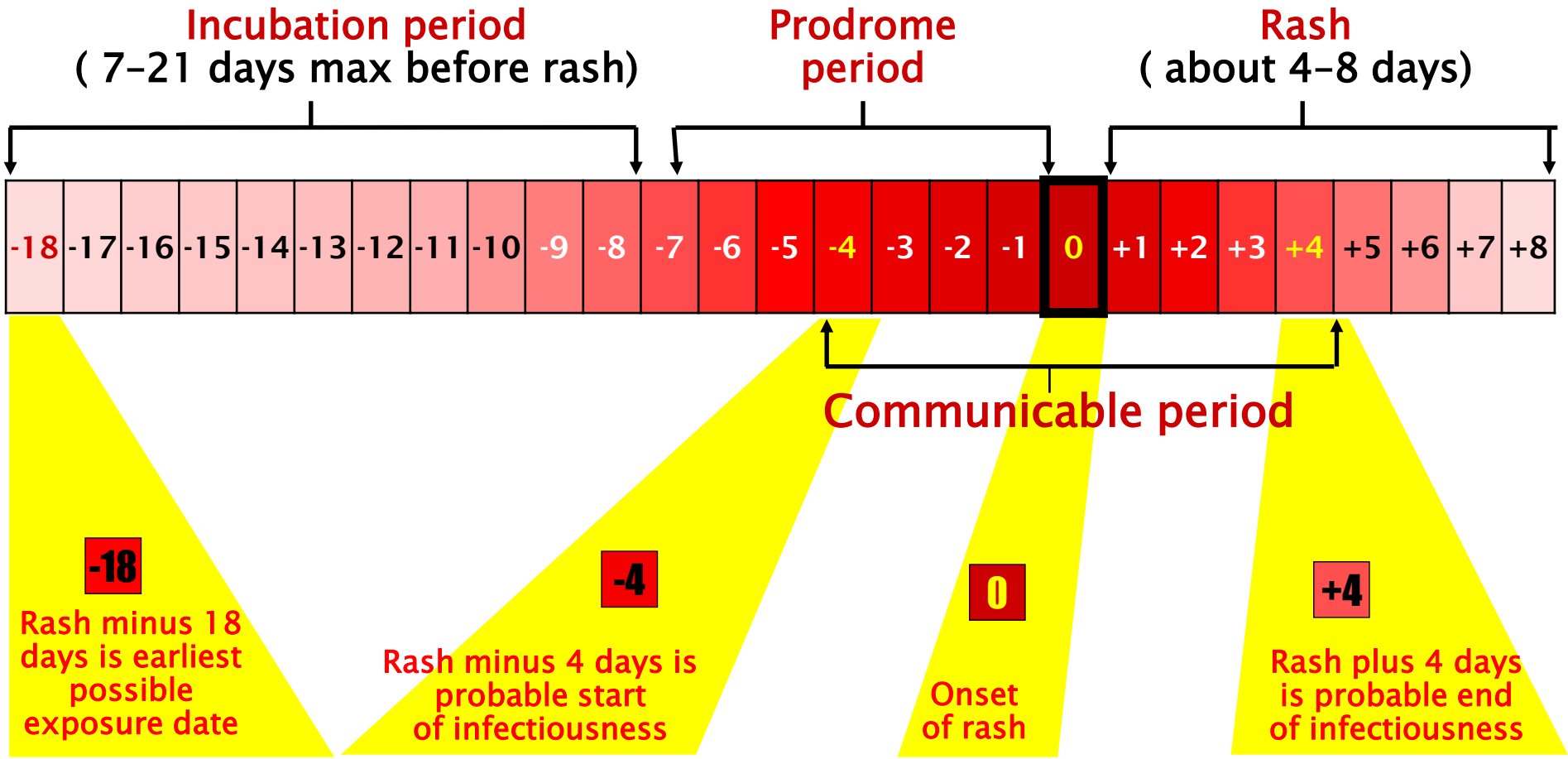
- Classic manifestations:
  - Fever
  - Maculopapular rash
  - The 3 Cs:
    - Cough,
    - Coryza (runny nose),
    - Conjunctivitis (red eyes)

Transmission

- Droplet infection
- Portal of entry- respiratory tract or conjunctivae
- Face to face contact not necessary
- **Virus is viable in suspended air even 1 2 hour after patient leaves the room**
- Secondary spread can occur from airplanes, hospitals, clinics



Clinical course of measles



Maculo-papular rash

World Health Organization India

Measles mortality: due to complications

Corneal scarring causing blindness

Vitamin A deficiency

Encephalitis

Older children, adults

≈ 0.1% of cases

Chronic disability

Pneumonia & diarrhea

Diarrhea common in developing countries

Pneumonia ~ 5-10% of cases, usually bacterial

Complications (Rubella/CRS)

Rubella

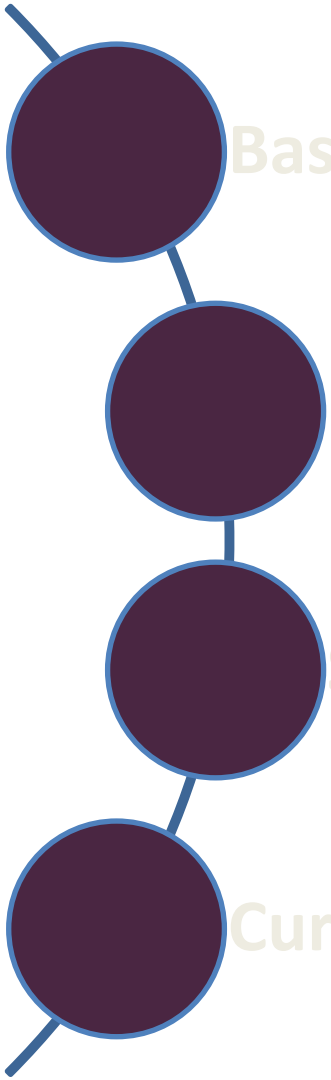
- lymphadenopathy
- Arthritis
  - ✓ Children: rare
  - ✓ Adult female up to 70%
- Thrombocytopenic purpura
  - ✓ 1/3000 cases
- Encephalitis
  - ✓ 1/6,000 cases
- **CRS is the most potential complication**
  - 90% chance if infected during 1st trimester of pregnancy)

Congenital Rubella Syndrome (CRS)

- **Hearing Impairment**
- **Cataracts / Glaucoma**
- **Heart defects (PDA)**
- Microcephaly
- Developmental Delay
- Mental retardation
- Hematological disorder
- Liver and spleen damage

Congenital Rubella Syndrome

Presentation Outline



Basics on Measles and Rubella

Basics on MR Elimination

Strategies for achieving MR Elimination

Current status towards achieving MR Elimination

Definition of Measles and Rubella Elimination

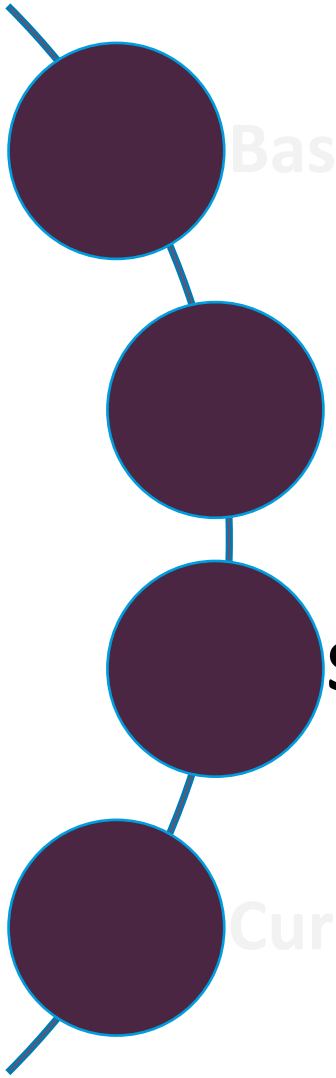
Measles elimination: Defined as the absence of endemic measles transmission in a defined geographical area > 12 months. It is verified after it has been sustained for at least 36 months in the presence of a high-quality surveillance system.

Rubella elimination: Defined as the absence of endemic rubella virus transmission in a defined geographical area for >12 months and the absence of CRS cases associated with endemic transmission. It is verified after it has been sustained for at least 36 months in the presence of a well-performing surveillance system

Measles Rubella Elimination
Regional Scorecard on Verification of Elimination, Dec 2023

WHO Region (No. Member States)	**Regional Verification Commissions Established**	**Elimination Achieved**	
		No. of MS (areas)	% of MS
Africa (n=47)	**Yes**	0	0
Americas (n=35)	**Yes**	Measles: 32 **Rubella: 35**	91% **100%**
Eastern Mediterranean (21)	**Yes**	Measles: 4 Rubella: 4	19% 19%
Europe (n=53)	**Yes**	Measles: 33 Rubella: 48	62% 91%
South-East Asia (n=11)	**Yes**	Measles: 5 Rubella :5	45% 45%
Western Pacific (n=27)	**Yes**	Measles: 6 Rubella: 5	22% 19%
TOTAL (n=194)		**Measles: 80 (41%)** **Rubella: 97 (50%)**	

Presentation Outline



Basics on Measles and Rubella

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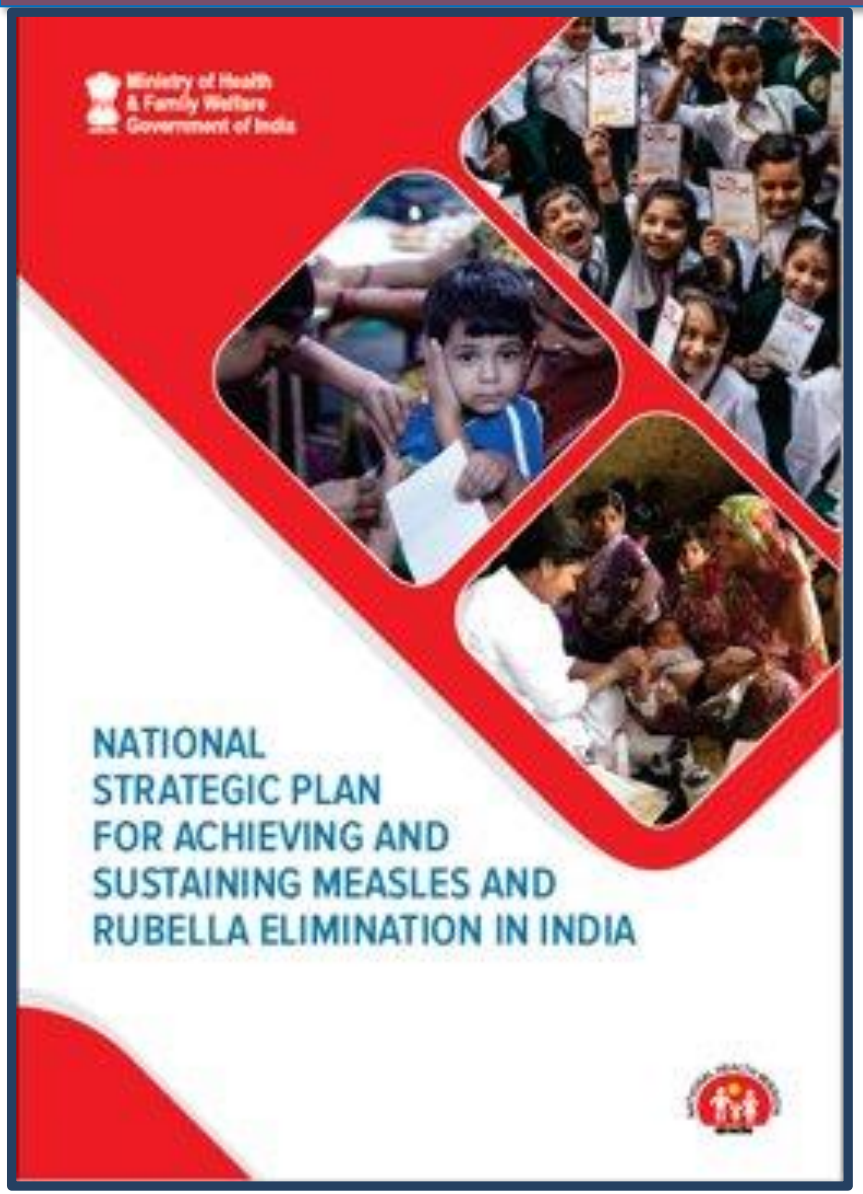
Strategic Objectives to Achieve Measles and Rubella Elimination



95% coverage with two doses of MRCV

Sensitive Case-based MR Surveillance

Immunization

Surveillance

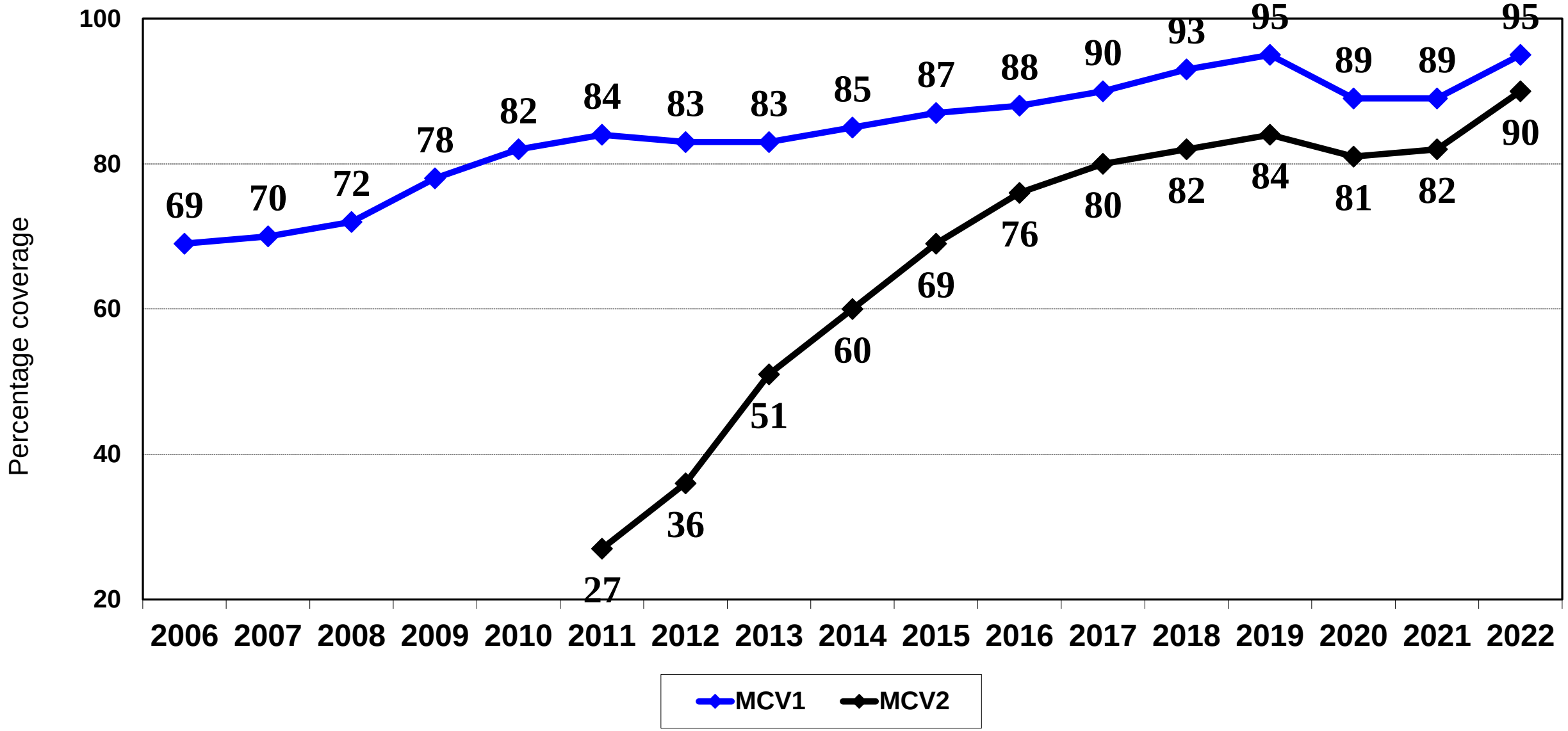
Laboratory Network

Support & Linkages

Accredited MR Laboratory Network

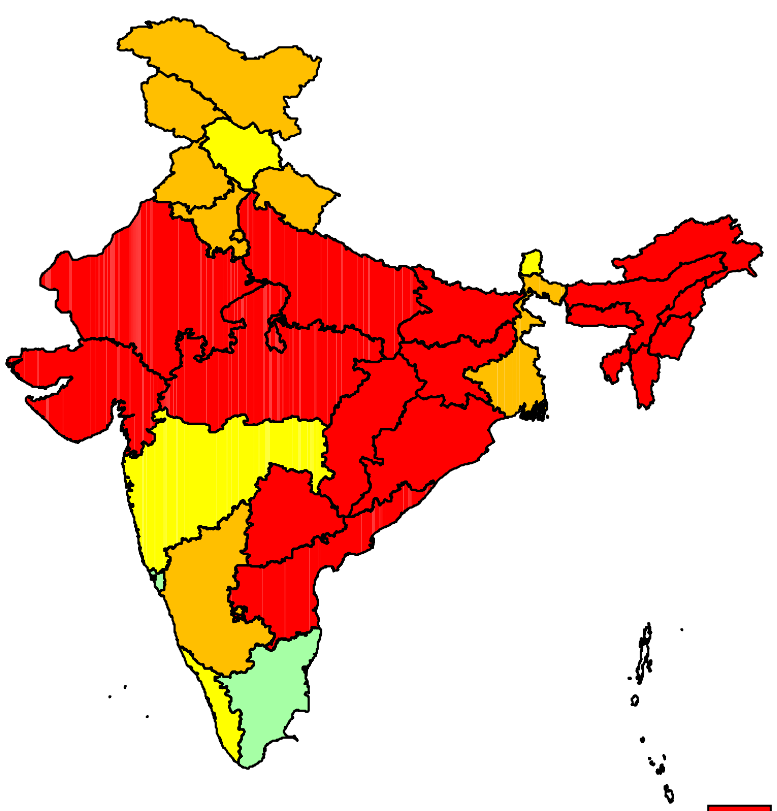
- Rapid response to measles and rubella outbreaks
- Ensure linkages with SDGs and other integrated programs

MCV1 and MCV2 Coverage – India (WUENIC Estimates)



** data as on 26 Jun 2023*

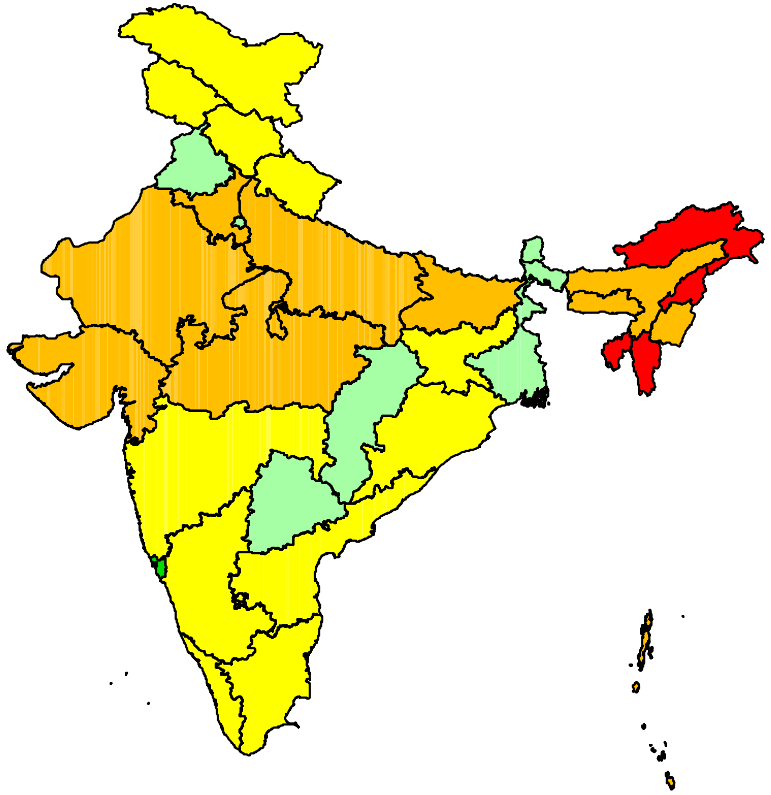
MCV1 Coverage, NFHS-3 to NFHS-5 Survey



59%

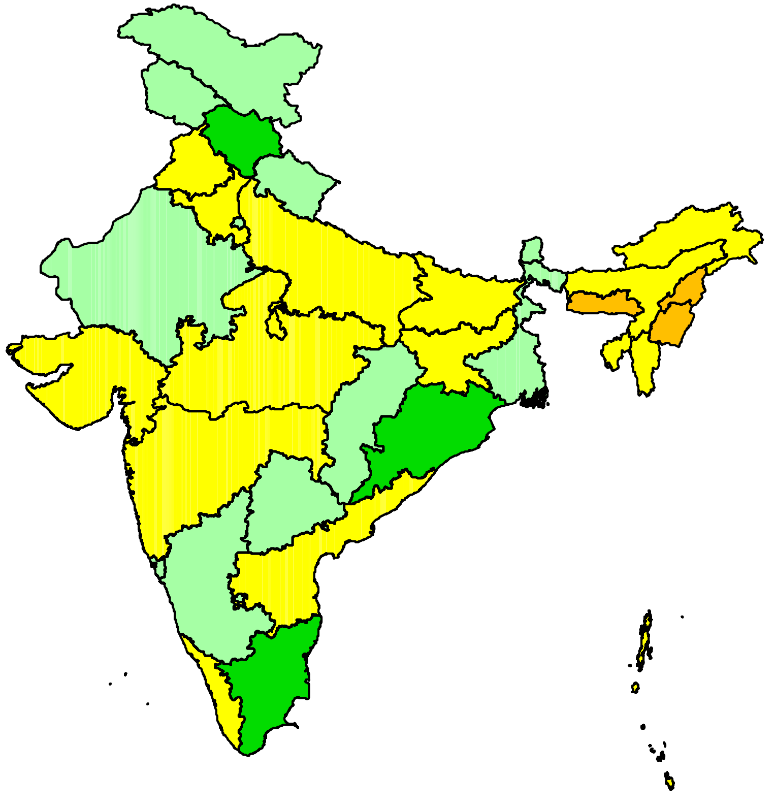
NFHS-3, 2005-06

< 70%
70% to 80%
80% to 90%
90% to 95%
≥ 95%



81%

NFHS-4, 2015-16



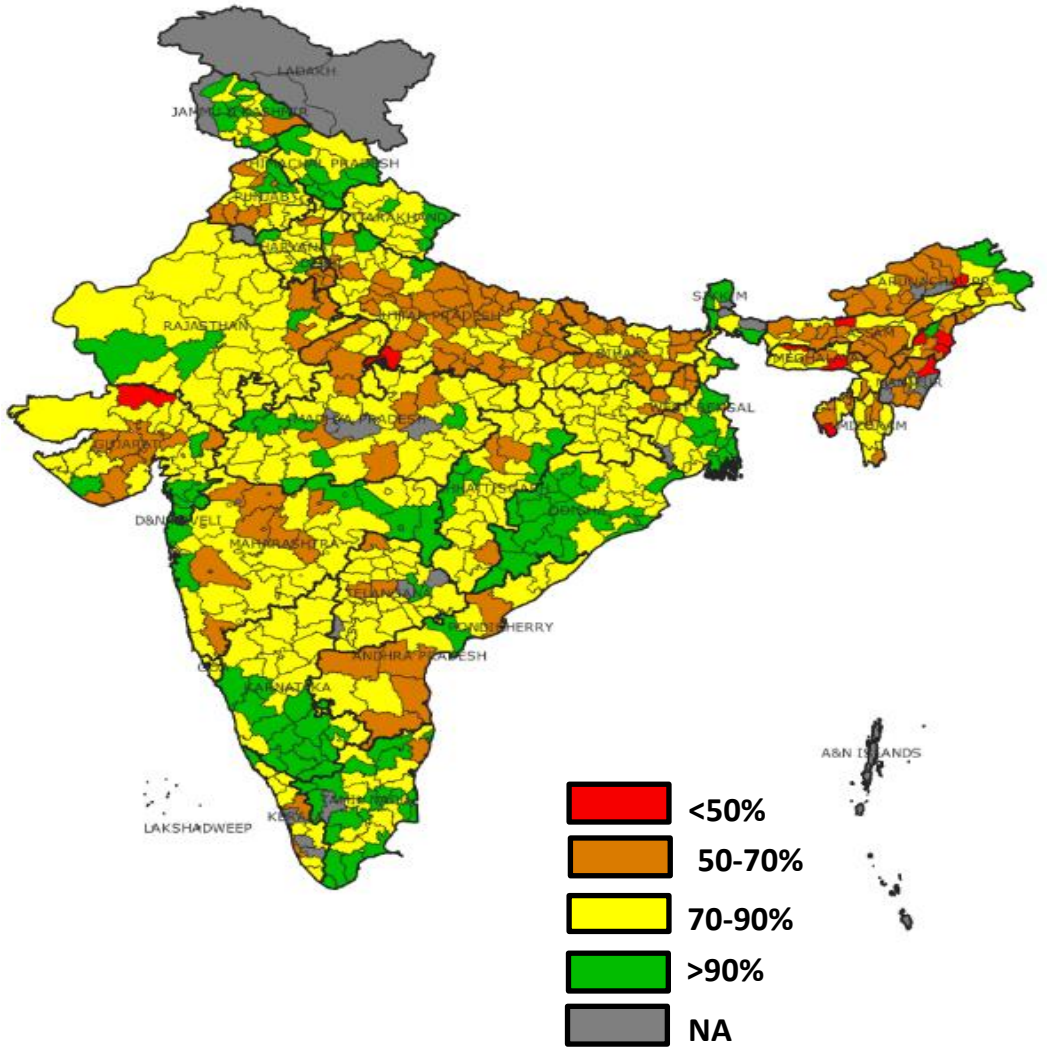
88%

NFHS-5, 2019-21

Interdistrict Variations in Immunization Coverage

District wise data of NFHS-5, shows:

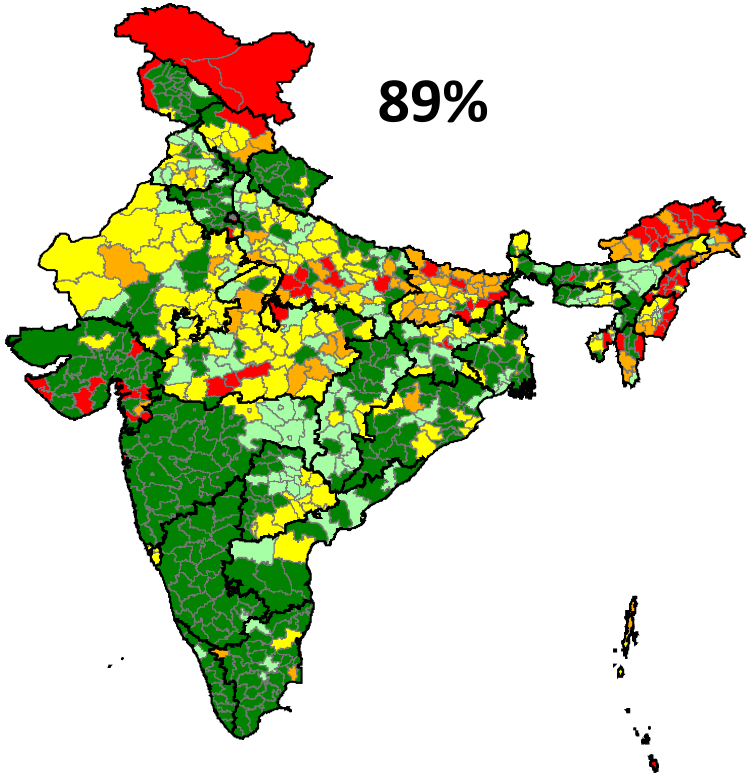
- Around 125 districts have FIC > 90%,
- But around 383 districts still have FIC<70%.
- Of these 383 districts, 12 districts have FIC< 50%.
- It is also noteworthy that 10 out of 12 districts having FIC less than 50% belong to the north-east region.



NFHS-5 – Districts FIC %

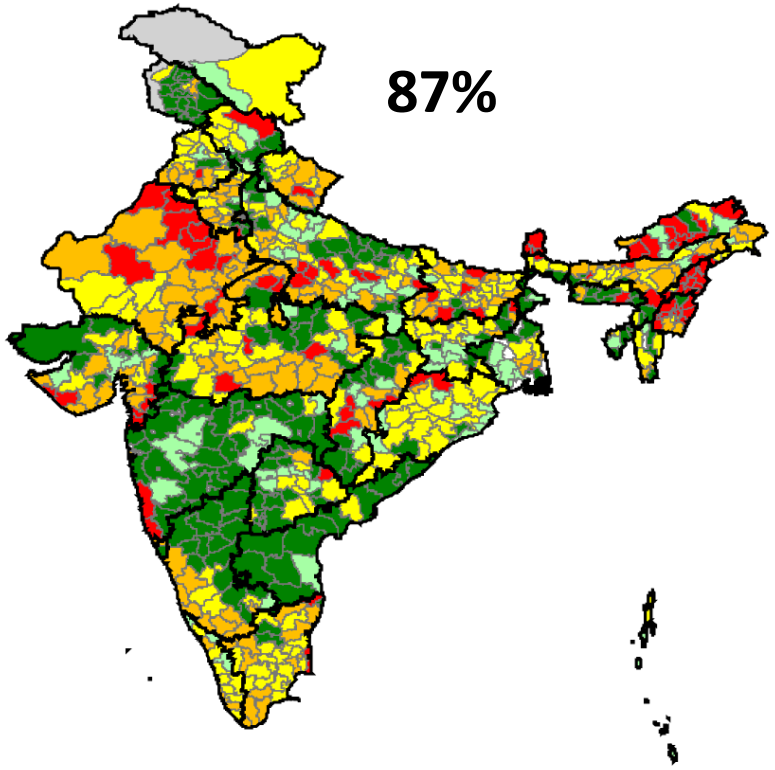
Administrative MRCV1 Coverage by District

Apr 20 – Mar 21



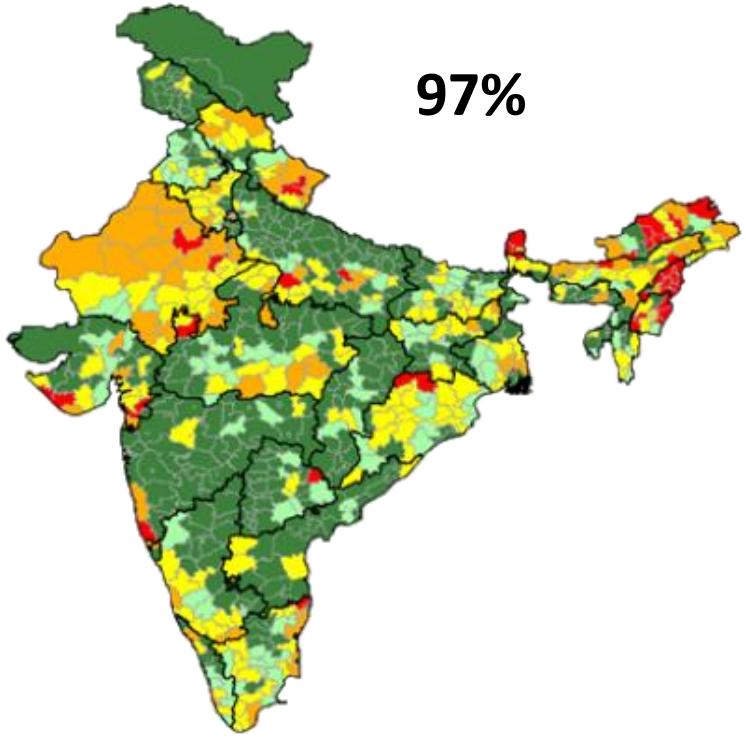
≥ 95% coverage:
346 districts (47%)

Apr 21 – Mar 22



≥ 95% coverage:
237 districts (32%)

Apr 22 – Mar 23

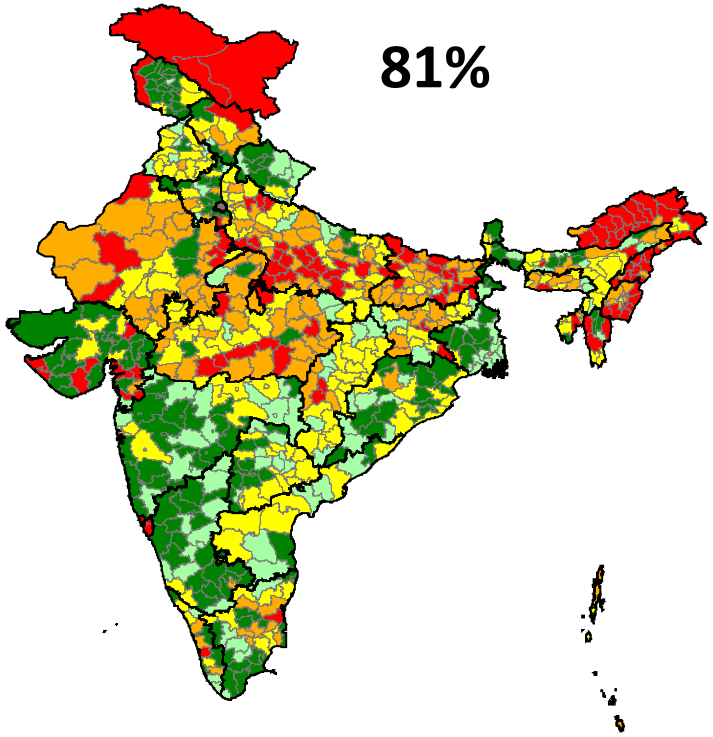


≥ 95% coverage:
369 districts (46%)

>=95%
90% to 95%
80% to 90%
70% to 80%
<70%

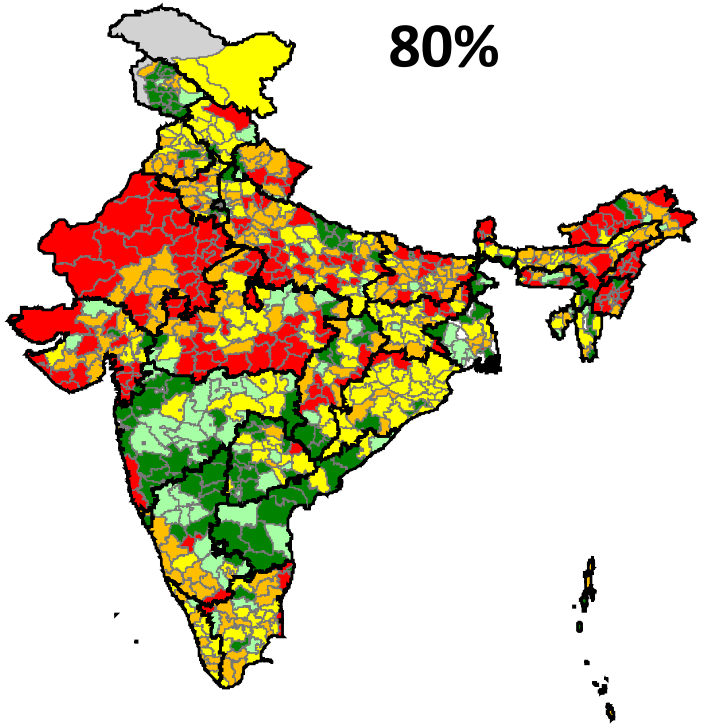
Administrative MRCV2 Coverage by District

Apr 20 – Mar 21



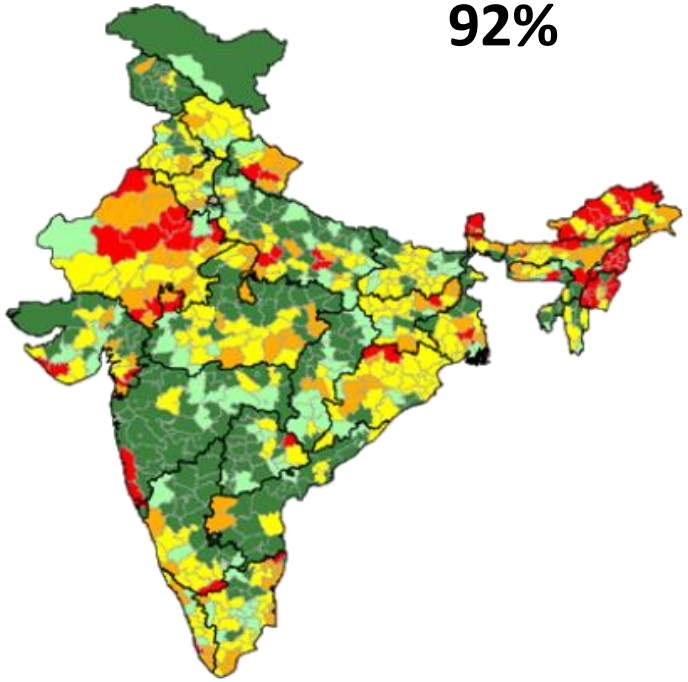
≥ 95% coverage:
187 districts (25%)

Apr 21 – Mar 22

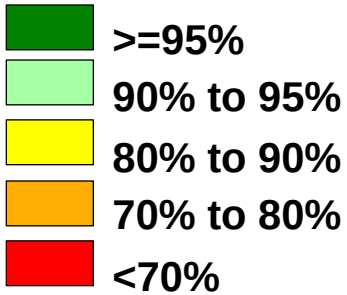


≥ 95% coverage:
158 districts (21%)

Apr 22 – Mar 23

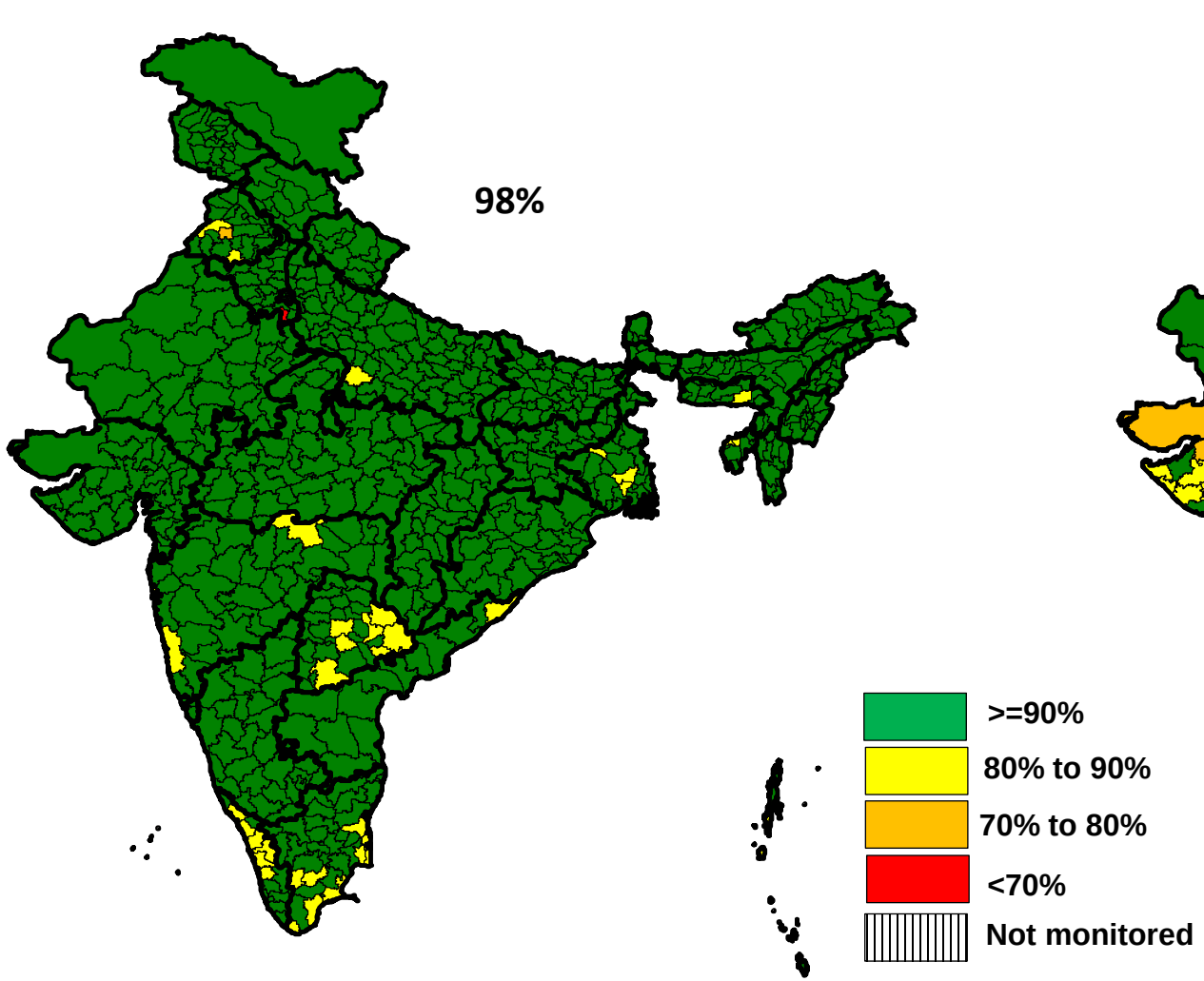


≥ 95% coverage:
277 districts (35%)



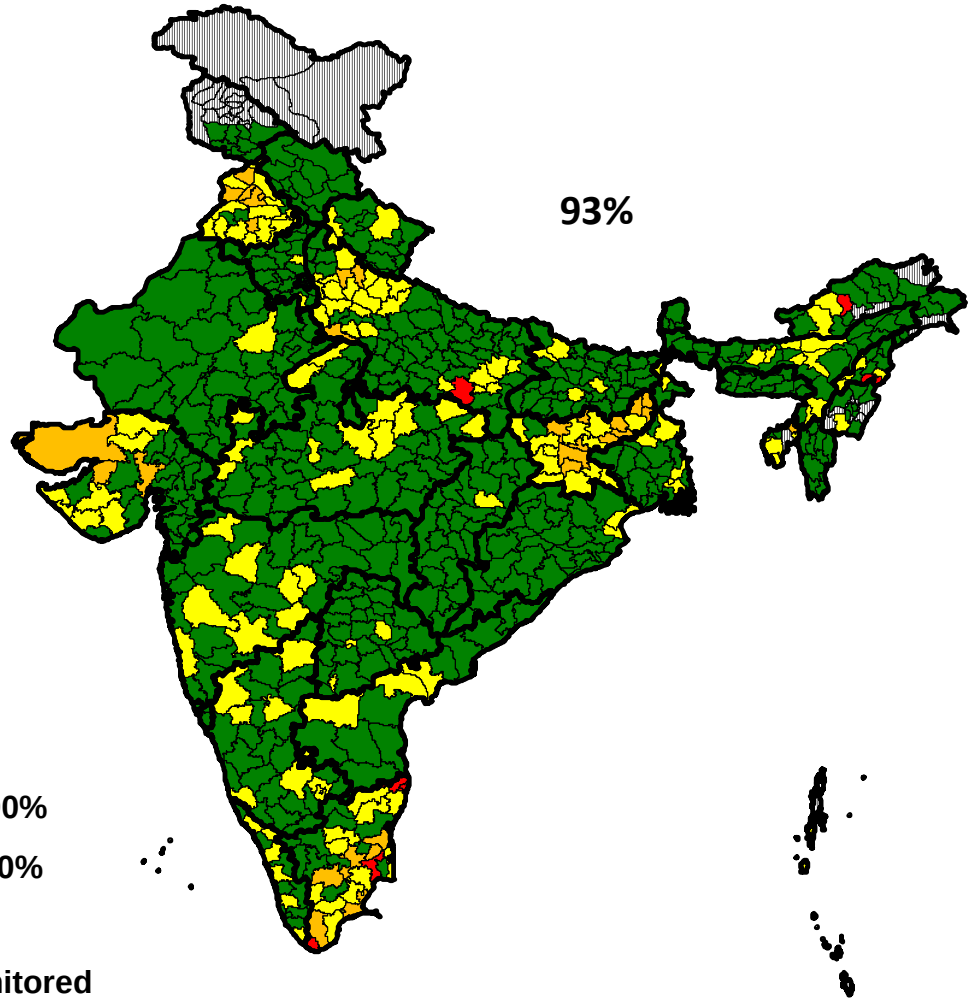
MR Campaign Coverage, India, 2017-2023

Administrative Coverage (%)



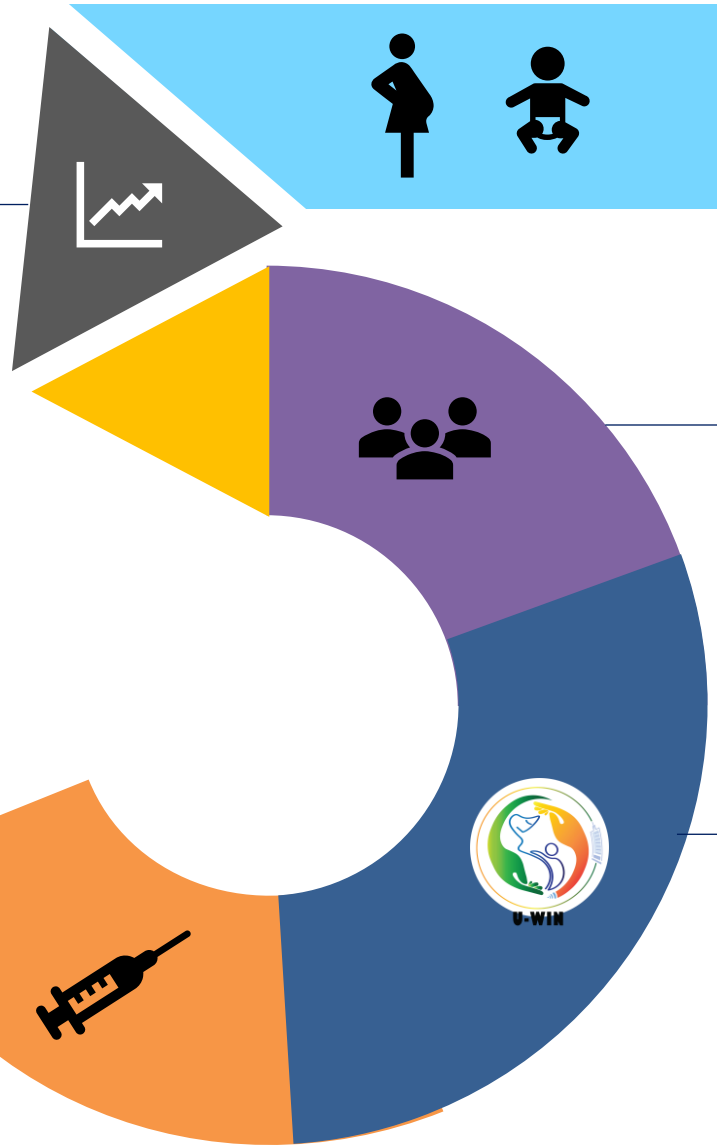
~ 347 million children vaccinated

Rapid Convenient Monitoring (%)



~ 4.11 million children monitored

IMI 2023 - The Big step towards MR Elimination



01

All children **up to 5 years** of age and pregnant women to get **due doses of vaccination**

02

Reduce Immunity gap especially for **measles and rubella**

03

Reaching out to underserved communities – **'Jan Bhagidari'**

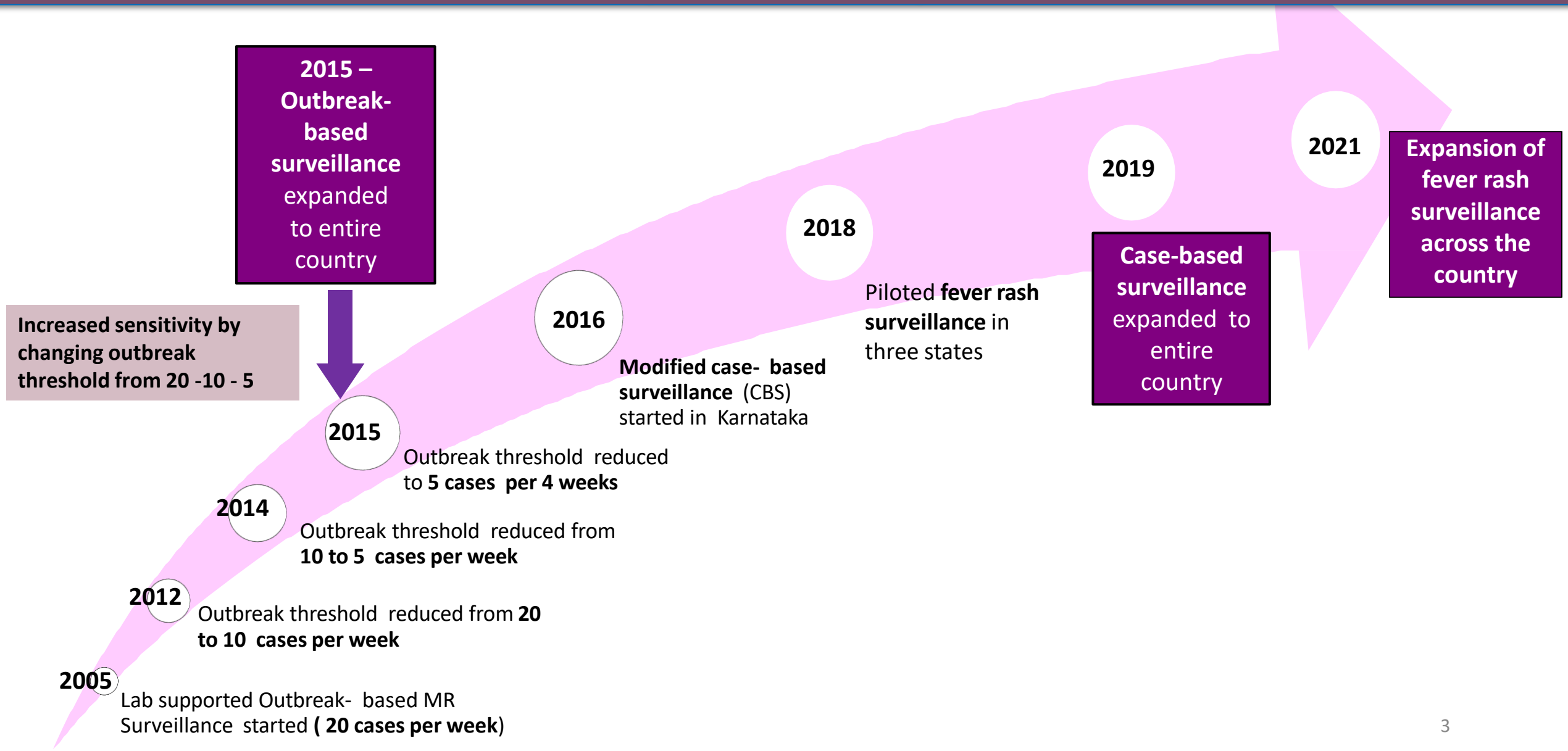
04

Digitalization of paper based recording & reporting- **U-WIN**

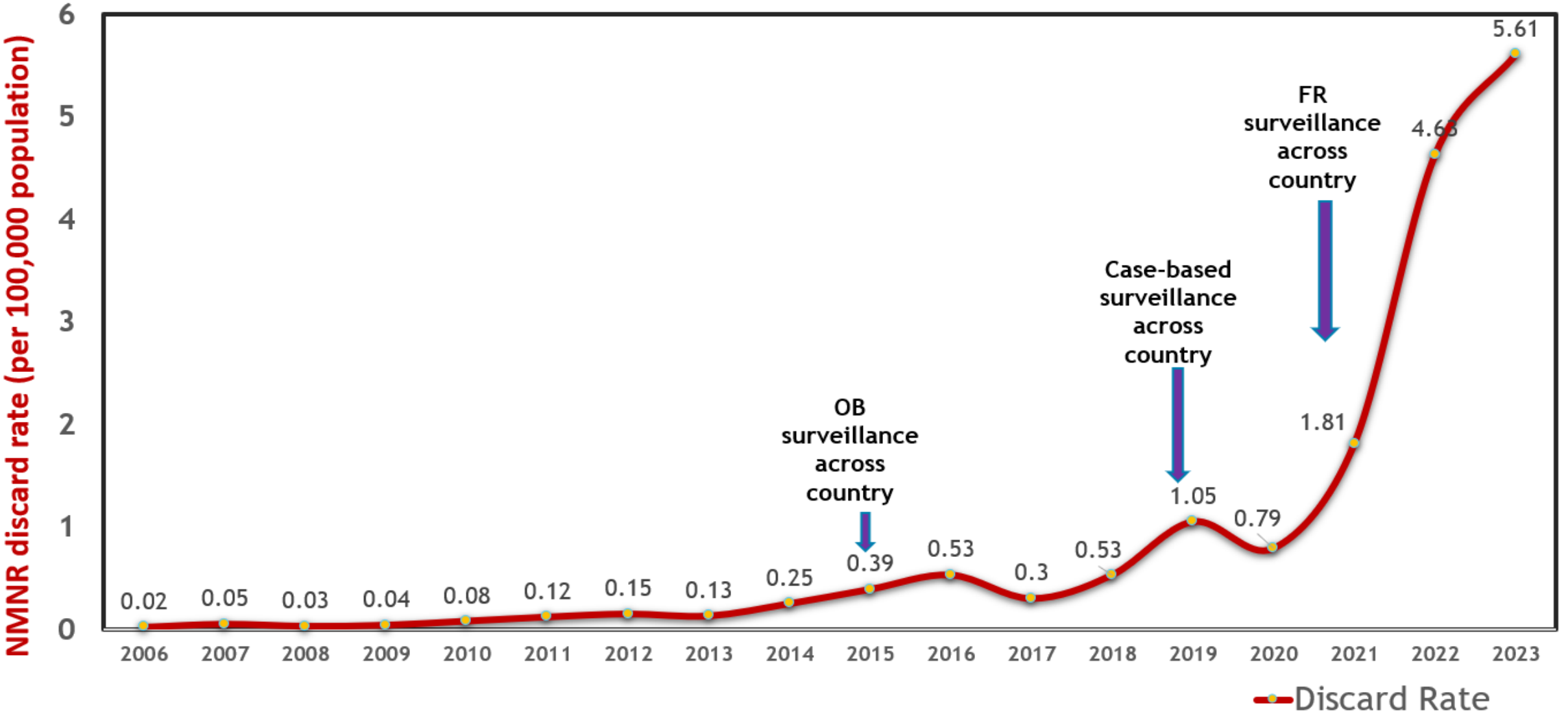
05

Improving the coverage of **newer vaccines**

Increasing Sensitivity of MR Surveillance in India (2005-2021)



NMNR Discard Rate (per 100,000 population), India, 2006 – 2023*



Global Standard is NMNR of ≥ 2 per 100,000 population

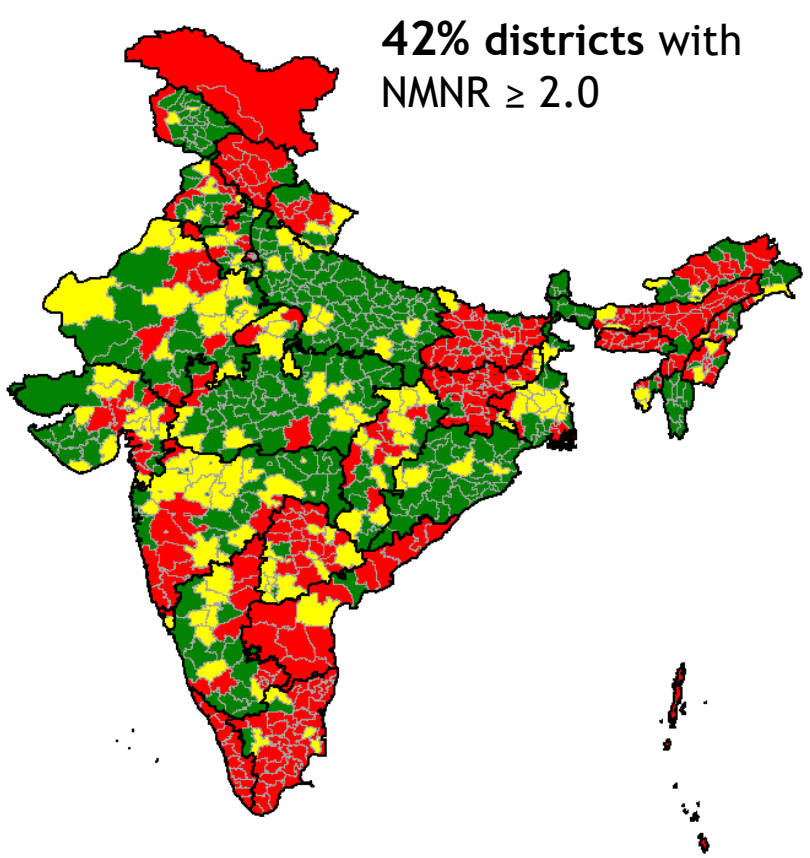
As on 10 Jan 2023

Non-Measles Non-Rubella (NMNR) Discard Rate*

2021

13 states/UTs with NMNR ≥ 2.0

42% districts with NMNR ≥ 2.0

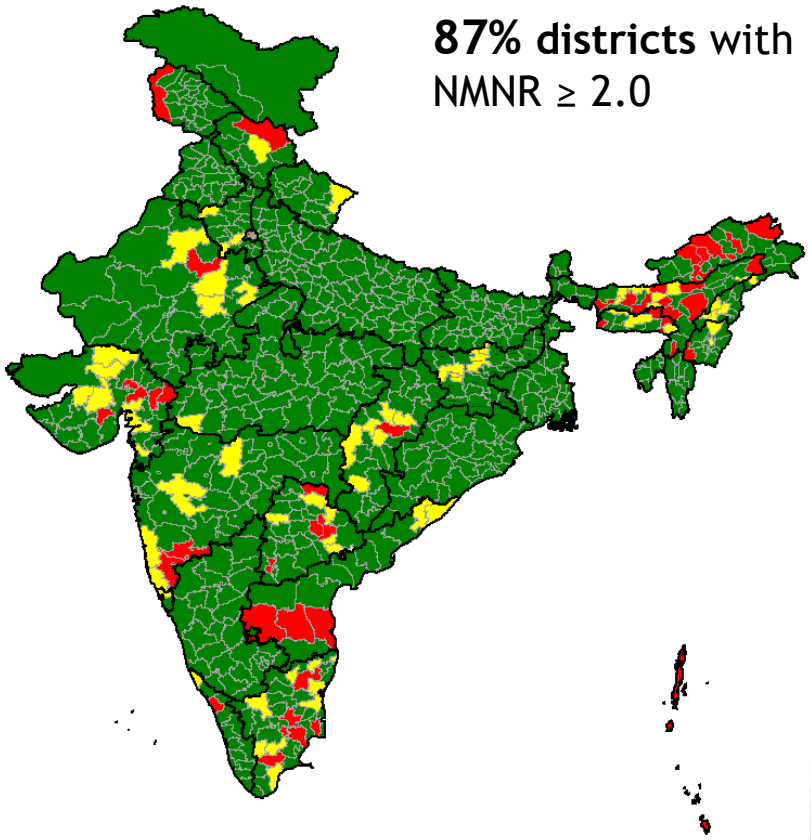


NMNR discard rate = 1.80

2022

34 states/UTs with NMNR ≥ 2.0

87% districts with NMNR ≥ 2.0

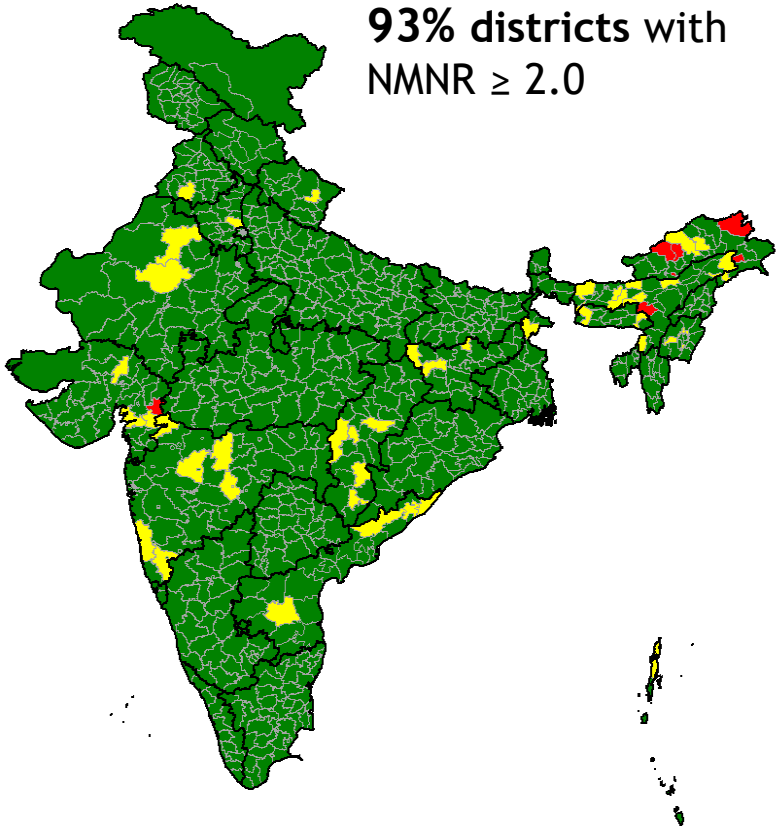


NMNR discard rate = 4.67

2023*

36 states/UTs with NMNR ≥ 2.0

93% districts with NMNR ≥ 2.0

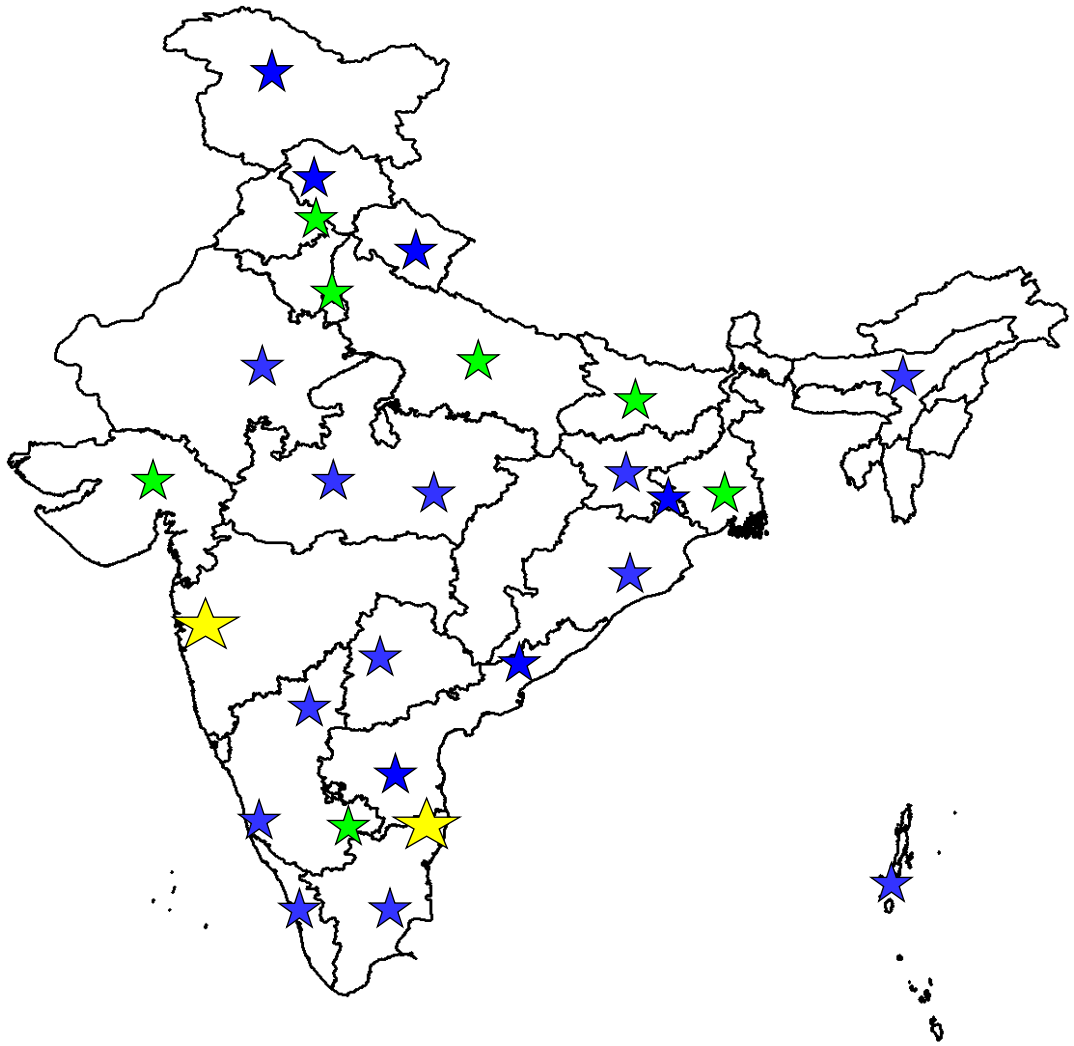


NMNR discard rate = 5.61

<1 | 1-2 | >2

*as on 10 Jan 2024

MR laboratory network (MRLN), India

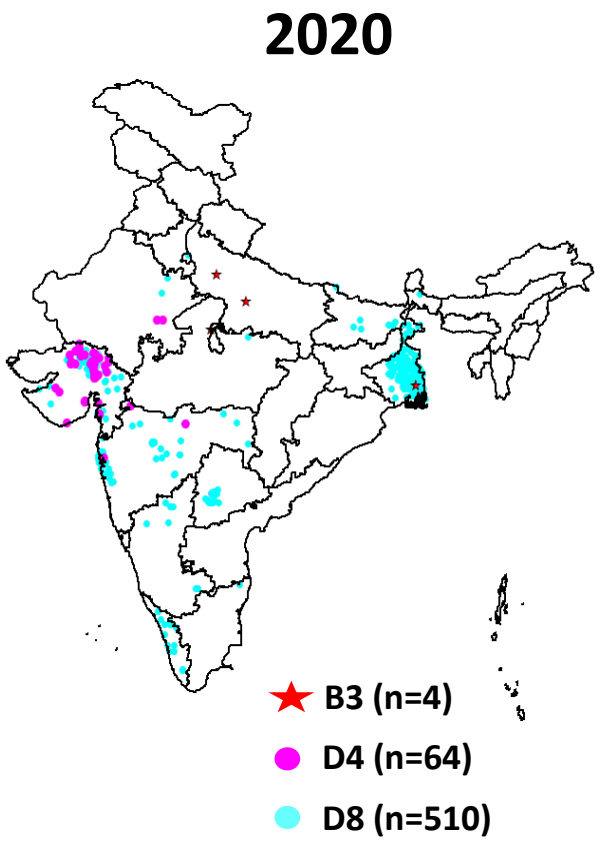


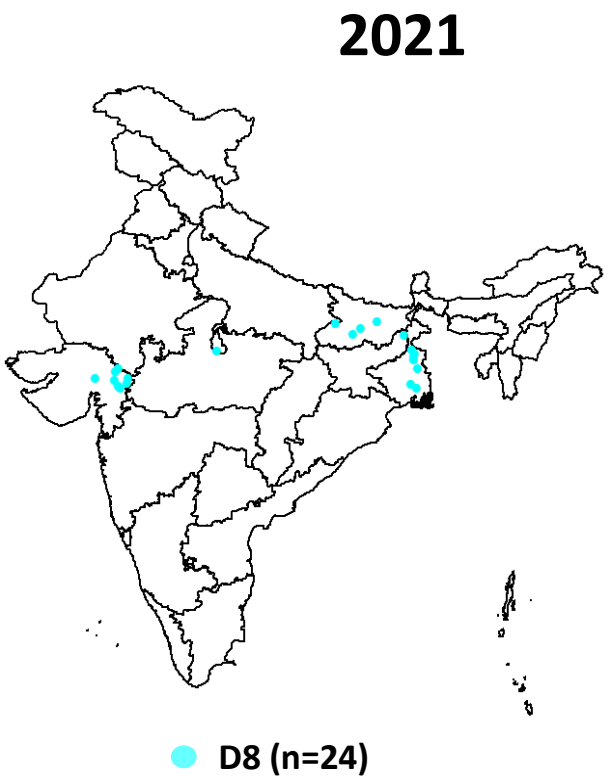
MRLN, India: 27

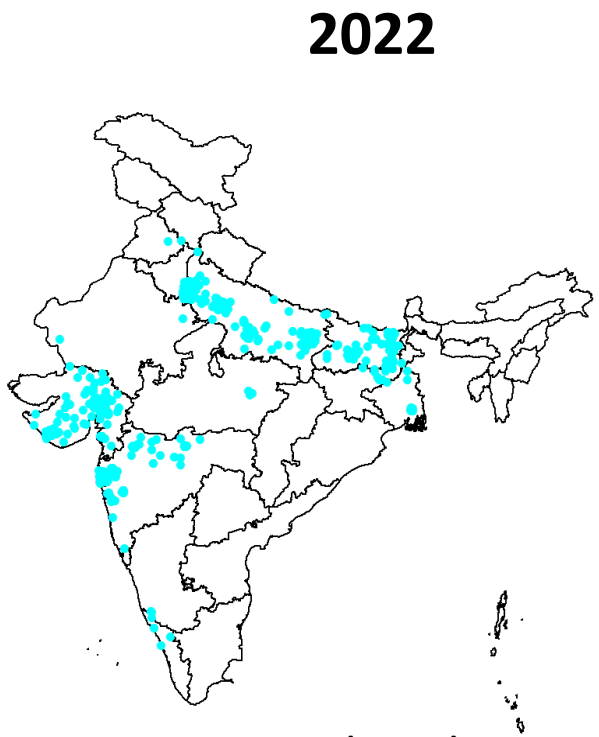
- **Reference laboratory = 2**
- **National Laboratories = 7**
- **Sub National Laboratories = 18**

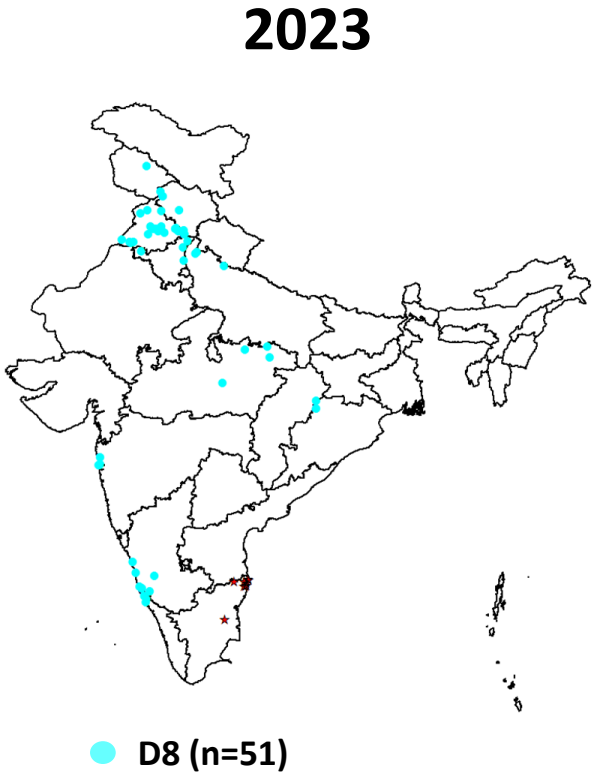
**as on 10 Jan 2024*

Measles Virus Genotypes, India, 2020 – 2023*





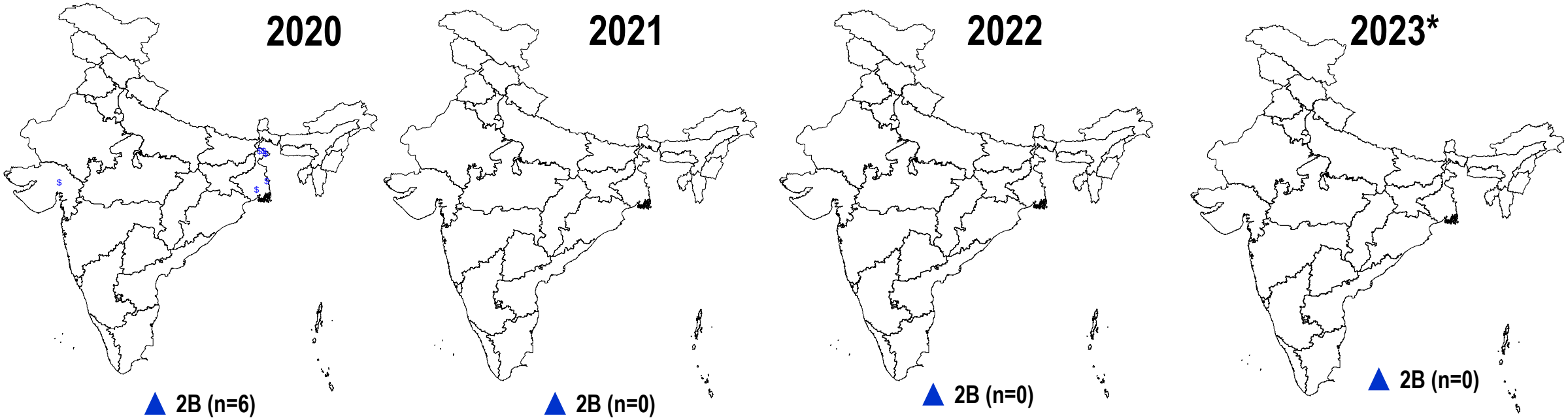




Genotype	2015	2016	2017	2018	2019	2020	2021	2022	2023
B3	5	4			2	4			9
D4	23	14	16	2	6	64			
D8									

As on 7 Nov 2023

Rubella Genotypes, India, 2020 – 2023*

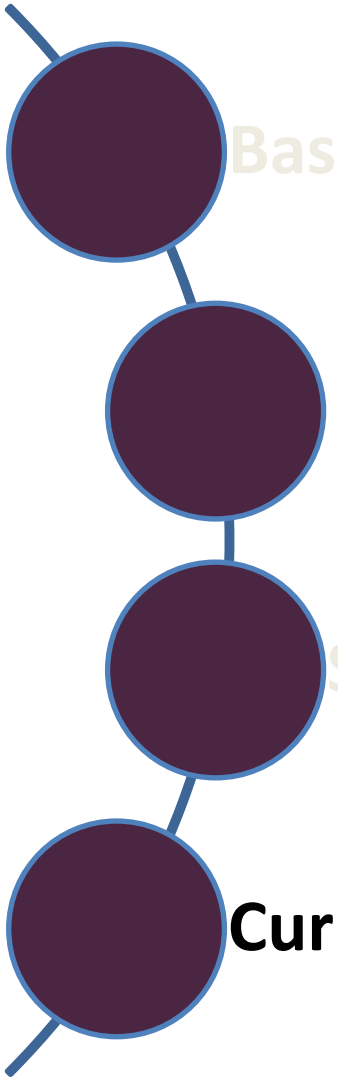


Last Rubella positive genotype in molecular testing detected in Dakshin Dinajpur district of West Bengal on 18Feb 2020.

Genotype	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
▲ 2B										

*data as on 10 Jan 2024

Presentation Outline



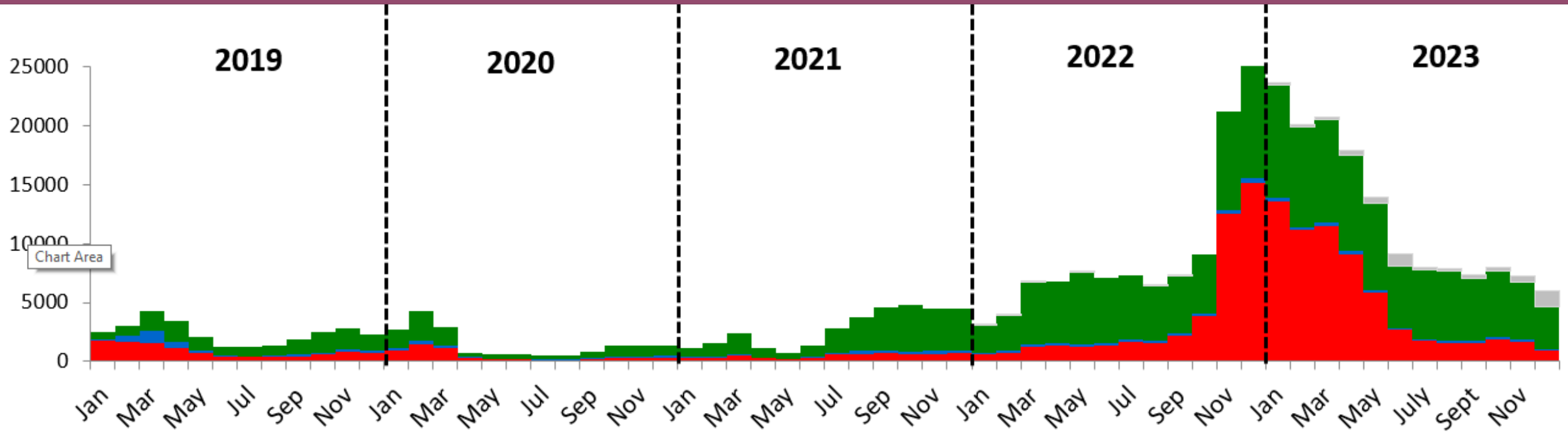
Basics on Measles and Rubella

Basics on MR Elimination

Strategies for achieving MR Elimination

Current status towards achieving MR Elimination

Epi-curve of Suspected Cases by Case Classification, India,2019-23*



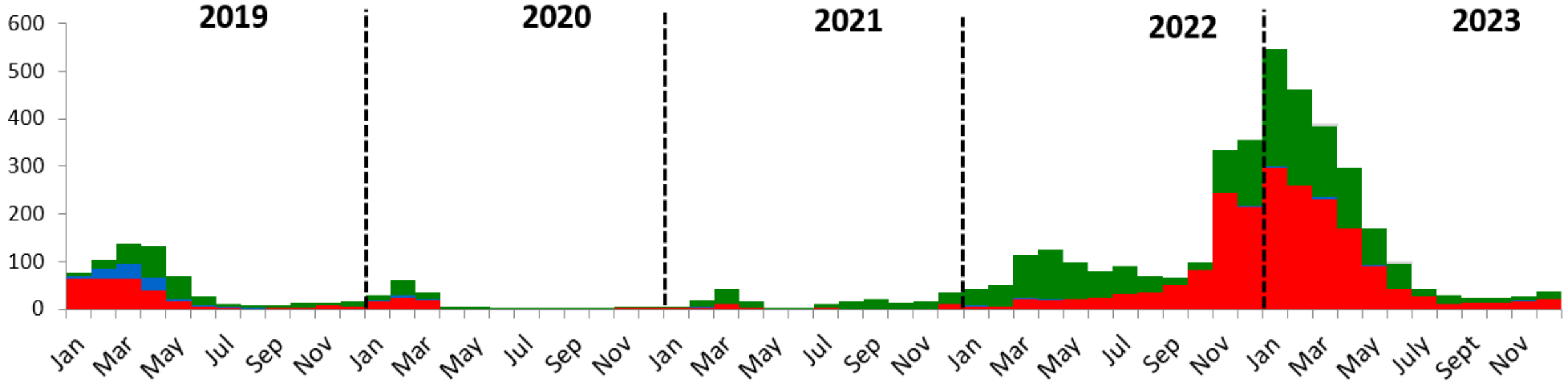
	2019	2020	2021	2022	2023
Suspected Cases	28686	17952	33379	111790	150449
Measles	37%	31%	18%	39%	42%
Rubella	12%	8%	5%	2.2%	1.8%
Negative	51%	61%	77%	59%	52%
NMNR Rate	1.05	0.79	1.80	4.63	5.61

Rubella cases include lab-confirmed rubella+ epi-linked rubella

Measles cases include lab-confirmed measles + epi-linked measles + clinically compatible cases

*data as on 10 Jan 2024

Epi-curve of Investigated Outbreaks by OB Classification, India, 2019-23*



	2019	2020	2021	2022	2023
Investigated OB	637	167	208	1534	2214
Measles OB	43%	39%	17%	48%	54%
Rubella OB	15%	10%	2%	1%	0.5%
Negative OB	39%	50%	80%	49%	42%
NMNR Rate	1.05	0.79	1.80	4.63	5.54

As on 31 Dec 2023

Root Cause Analysis for Large Measles Outbreaks

In close coordination with MR program, EIS/ AEP officers are conducting root cause analyses for large measles outbreaks

World Health Organization India

CDC

Measles Outbreak Investigation, Hajipur-bhatolla Village, Bulandshahr District, India–2022

Dr Bharat Dubey
Applied Epidemiology Programme Officer, WHO

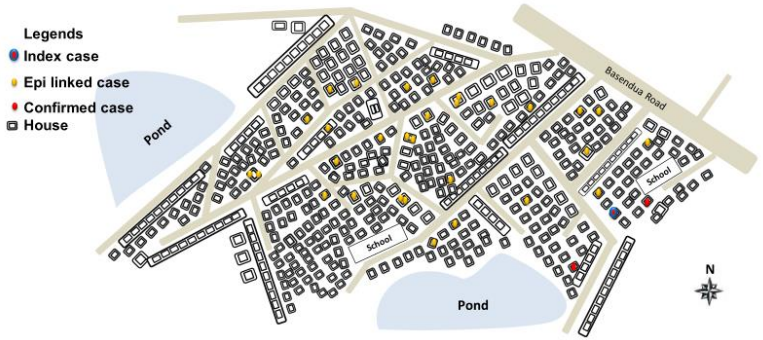
Root Cause Analysis

- Surveillance gaps:
  - Non-measles non-rubella (NMNR) discard rate
  - Bulandshahr district and block for 2019-2022*
- Outbreak response gaps
  - Time between outbreak flagging to preliminary search (<72 hours)
  - Days between orientation of field teams and detailed investigation
  - Days between laboratory confirmation and immunization intensification session
  - Interviewed field teams: simplicity and acceptability of data collection tool

Root Cause Analysis

- Immunization gaps
  - Bulandshahr district and block
    - Administrative measles containing vaccine (MCV) coverage status, 2019-21
    - Reasons for missed vaccination of children, 2019-2021
  - Hajipur-bhatolla
    - Administrative coverage MCV status, 2020-21
    - Survey of children between 9-59 months for MCV status
    - Routine immunization (RI) micro-plan, sessions held and vaccine availability
    - Manpower status

Distribution of Measles Cases, Hajipur-bhatolla, 2022 (n=33) Week 12



Public Health Actions

- Vitamin A administered to all measles cases
- Case follow-up and screening of school children by health department
- Advocacy for vaccination and surveillance
- 8 special MCV vaccination sessions for missed children up to 5 years
- MCV coverage increased from 27% to 98%


Advocacy meeting


Interpersonal communication


Vaccination session

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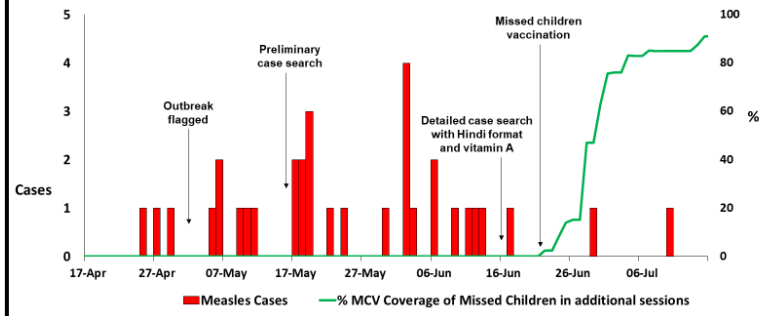
Measles Cases Reporting and MCV Coverage of Missed Children up to 5 years, Hajipur-bhatola



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EIS: Epidemic Intelligence Service; AEP – Applied Epidemiology Programme

Public Health Response

West Bengal MR Campaign: > 2.2 crore children from 9m to 15 yrs vaccinated

Delhi MR Campaign: > 11 lakh children from 9m to 5 yrs vaccinated

Jharkhand MR Campaign: > 45 lakh children from 9m to 15 yrs vaccinated in Nine Districts

सरकार खसरा और रूबेला उन्मूलन के लक्ष्य को प्राप्त करने के लिए प्रतिबद्ध: जी. अनुपमा

स्वास्थ्य विभाग की अतिरिक्त मुख्य सचिव ने खसरा उन्मूलन लक्ष्य को लेकर की समीक्षा बैठक

सिविल सर्जन नवनियोजित सदस्यों के माध्यम से करें जागरूक

Haryana MR Campaign: > 4.7 lakh children from 9m to 15 yrs vaccinated in Two District

Outbreak Response Immunization:

- > 7.7 lakh unvaccinated /under vaccinated children for MRCV identified and vaccinated till 5yrs of age
- > 6 lakh children given one additional dose of MRCV (age group decided by local epidemiology)
- Nearly 80% outbreak areas have conducted ORI

Special Immunization Weeks

- 21 states have conducted SIWs

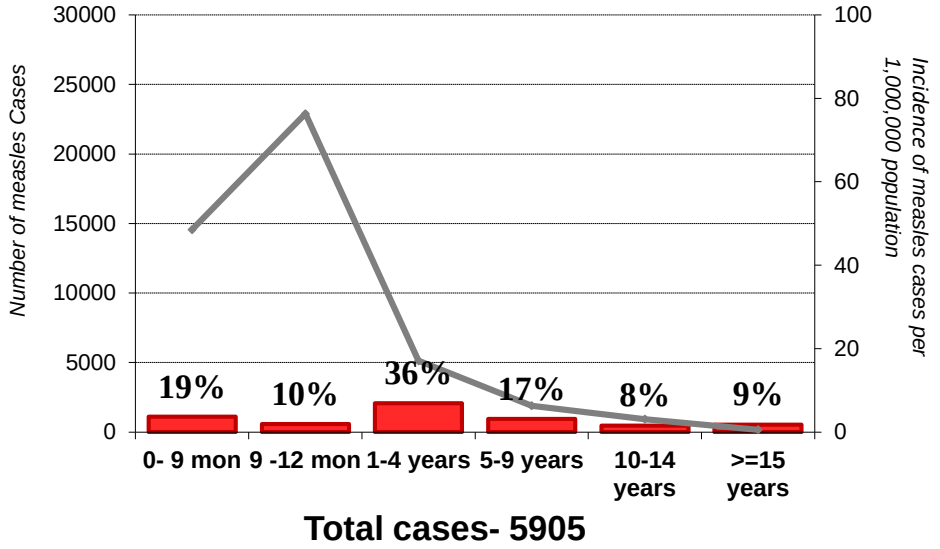
Vitamin A Supplementation given in 99% of outbreak areas

Root cause analysis done for > 81% lab confirmed OB.
Key findings from Root Cause Analysis include:

1. Vaccine Hesitancy/Refusal Areas (Bihar, Maharashtra, UP)
2. Issues in service delivery (UP, Bihar)
3. Operational gap, poor due listing (Jharkhand)
4. Migration (Maharashtra, Jharkhand, UP)
5. Irrational workload on ANM, Vacant Subcenter (Jharkhand)
6. Awareness Gap / Mobilization issue (Bihar, UP, Jharkhand)

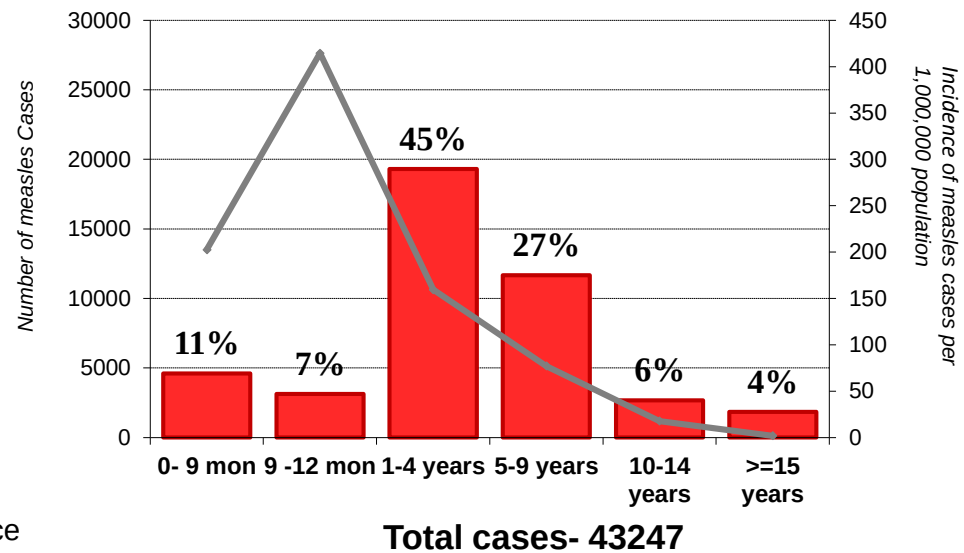
Age Distribution of Measles Cases, India, 2021 – 2023*

2021



Total cases- 5905

2022

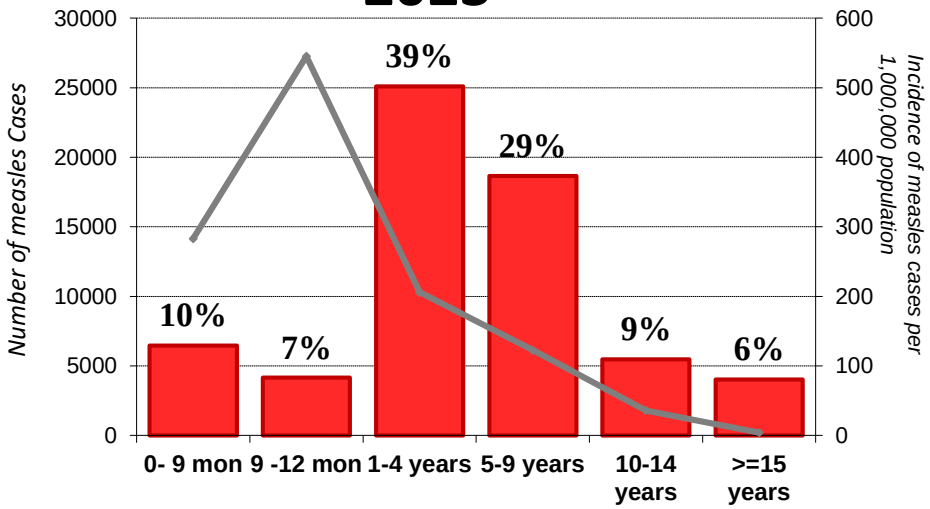


Total cases- 43247

Measles cases

Age-wise incidence

2023



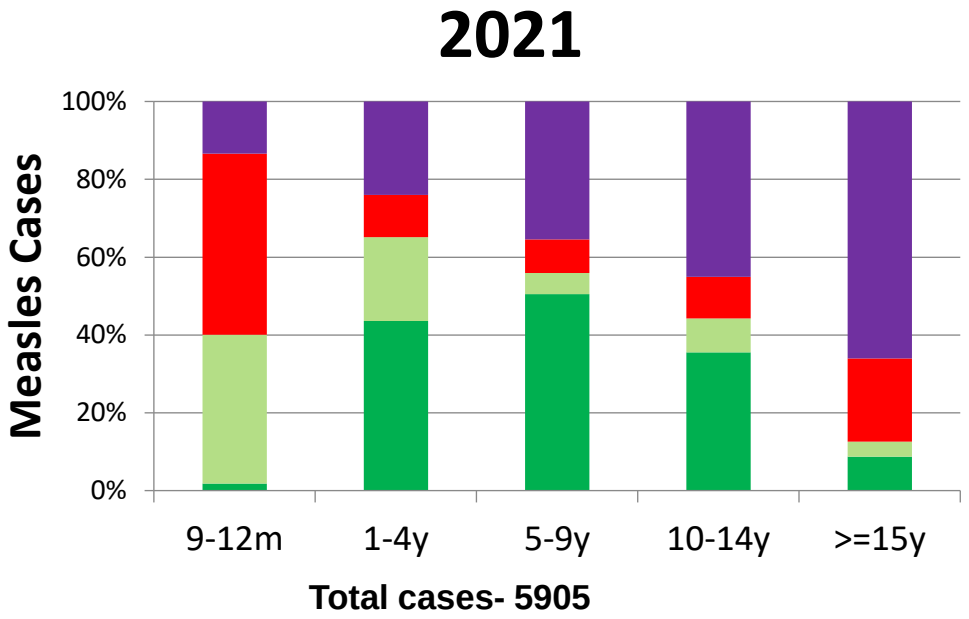
Total cases- 63882

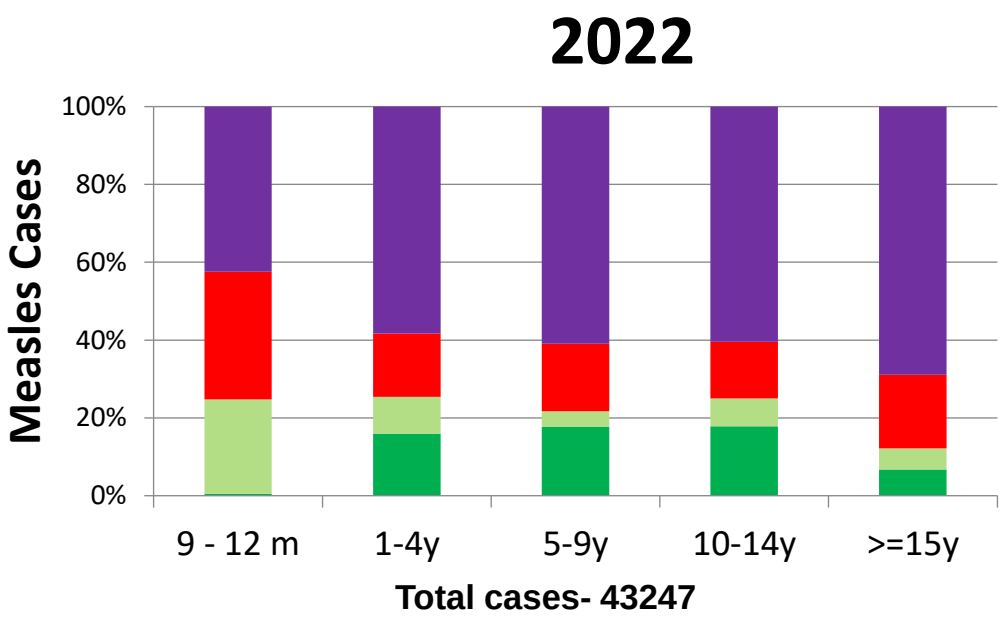
	2021	2022	2023
% of measles cases < 5 years	**65%**	**63%**	**56%**
% of measles cases < 10 years	**82%**	**90%**	**85%**
% of measles cases < 15 years	**91%**	**96%**	**94%**

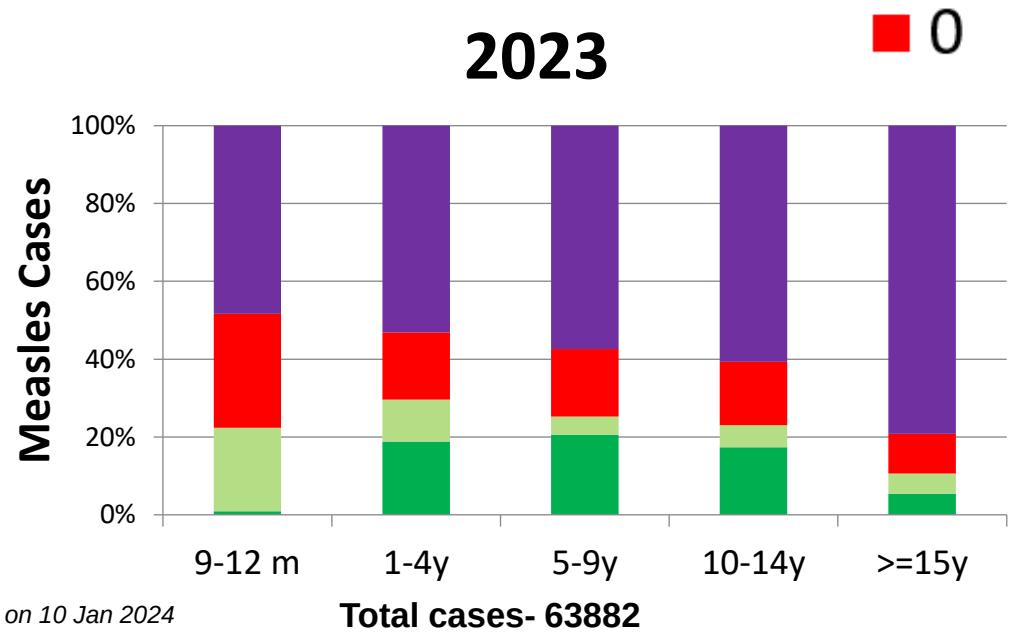
Measles cases include lab-confirmed + epi-linked + clinically compatible cases

**data as on 10 Jan 2024*

Vaccination Status of Measles Cases by Age, India, 2021 –2023*







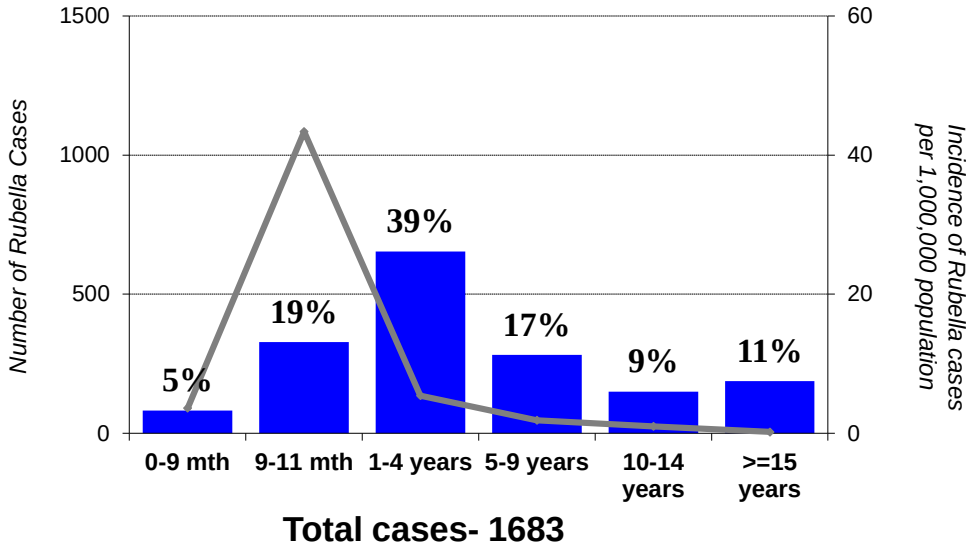
	2021	2022	2023*
% of measles cases with 0 or unknown measles doses in the age group of >=12 months	**47%**	**77%**	**74%**

Measles cases include lab-confirmed + epi-linked + clinically compatible cases

*data as on 10 Jan 2024

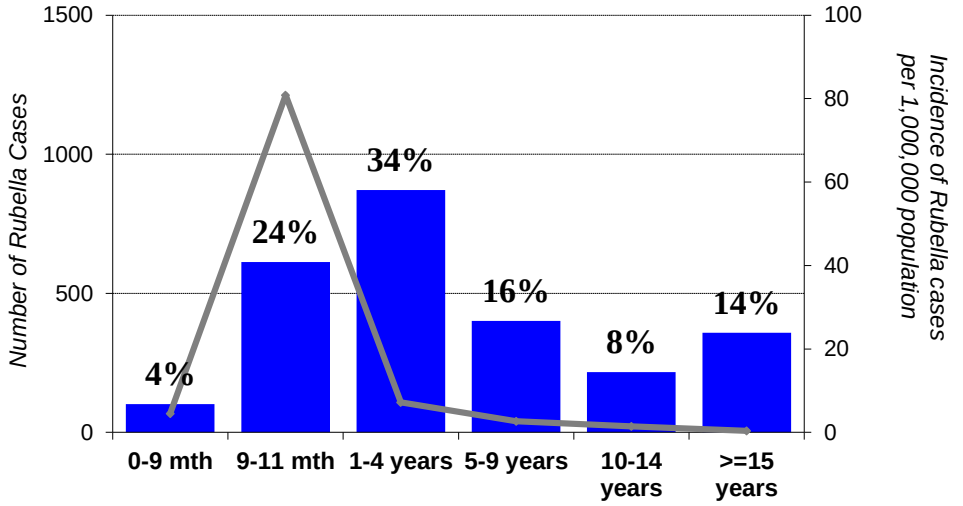
Age Distribution of Rubella Cases, India, 2021 – 2023*

2021



Total cases- 1683

2022

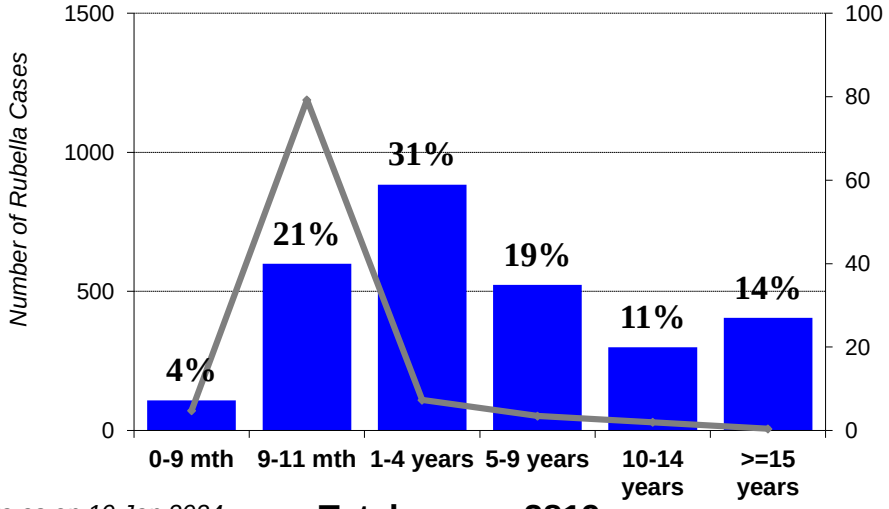


Total cases- 2561

Rubella cases

Age-wise incidence

2023



Total cases- 2819

*data as on 10 Jan 2024

	2021	2022	2023
% of Rubella cases < 5 years	63%	62%	56%
% of Rubella cases < 10 years	81%	78%	75%
% of Rubella cases < 15 years	89%	86%	86%

Rubella cases include lab-confirmed + Epi-linked rubella cases

MR Surveillance Videos

सत्यमेव जयते

Ministry of Health & Family Welfare
Government of India

Case-Based Surveillance for Measles and Rubella

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Ministry of Health & Family Welfare
Government of India

Public Health Response in the Community Post Detection of Suspected/Confirmed Measles and Rubella Cases/Outbreak

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Ministry of Health & Family Welfare
Government of India

Blood Sample Collection, Serum Separation, Sample Storage and Shipment

सत्यमेव जयते

Ministry of Health
& Family Welfare
Government of India

CASE INVESTIGATION FORM (CIF) FOR SUSPECTED MEASLES AND RUBELLA CASE

Towards a Measles & Rubella Free India

Thank you!