

# MOMENTUM Routine Immunization Transformation and Equity

Using Data Triangulation to Identify Zero-dose Children

August 31, 2023



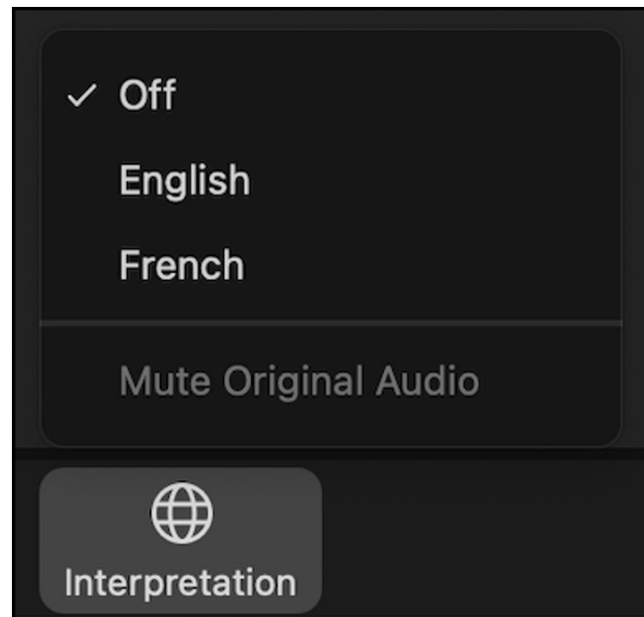
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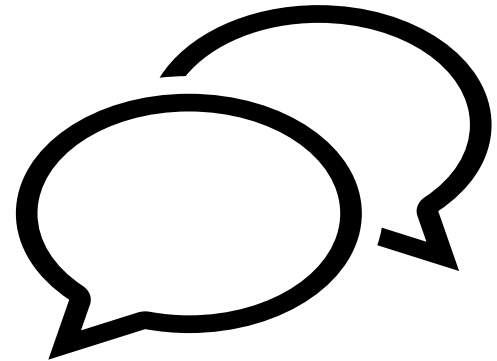
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# Introductions

## Learning Series Host



**Chilunga Puta**

Senior Immunization Data Advisor,  
MOMENTUM Routine Immunization  
Transformation and Equity

## Presenters



**Dr. Carolina Danovaro**

Medical Epidemiologist, Immunization  
Analysis and Insights Team, WHO



**Dr. Ana Morice Trejos**

Medical Epidemiologist  
and Pediatrician

## Guest Speakers



**Dr. Rajendra Bohara**  
Team Leader - IVD, WHO



**Angela Montesanti Porter**  
Epidemiologist, Global  
Immunization Division, US CDC

# Agenda

- MOMENTUM Routine Immunization Transformation and Equity Project
- Overview of the zero-dose child (ZDC) toolkit and learning exchange series
- Introduction to using data triangulation to identify ZDC
- Discussion / Q&A

# Our project

MOMENTUM Routine Immunization Transformation and Equity envisions a world in which **all people eligible for immunization**, from infancy throughout the life-course, and particularly underserved, marginalized, and vulnerable populations, are regularly **reached with high-quality vaccination services** and use them to protect their children and themselves against vaccine-preventable diseases.

Award Date: July 27, 2020  
Period of Performance: 5 years  
Country programs: 18





SECTION 01

# ZDC toolkit and learning exchange series

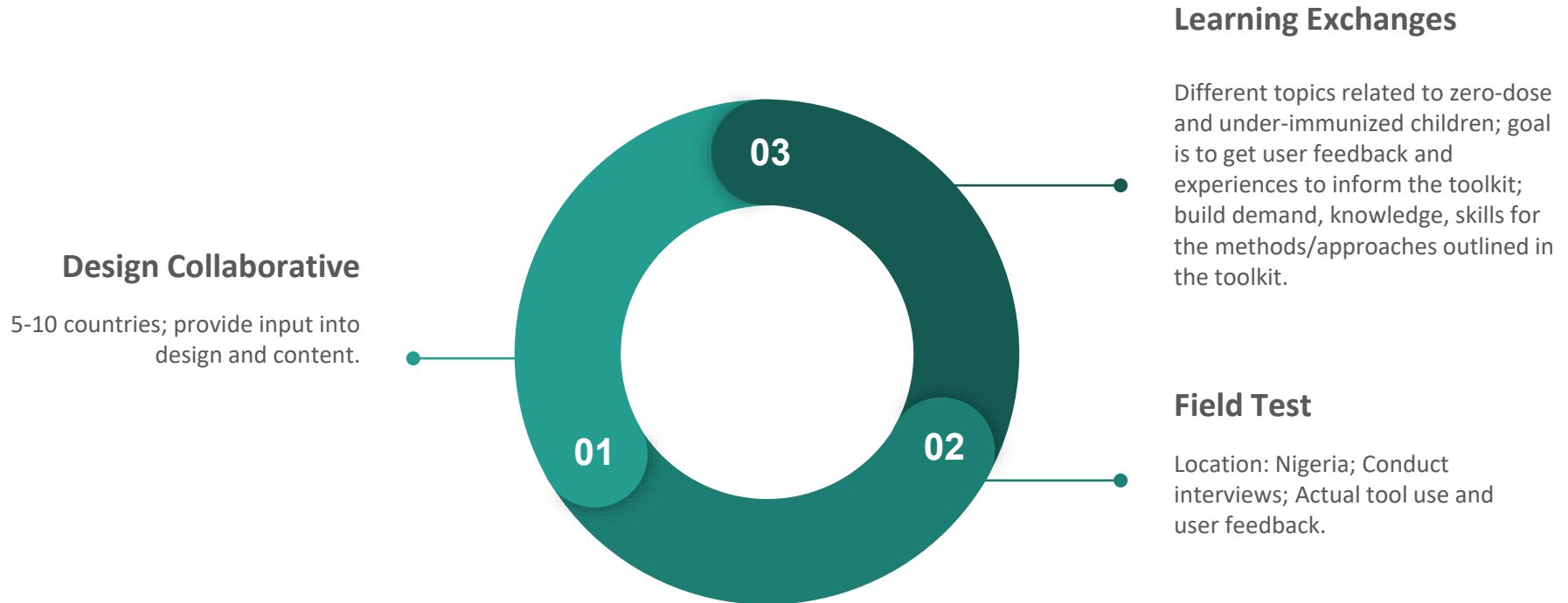
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# Background and purpose of ZDC toolkit

- Limitations of current administrative data systems in accurately quantifying and localizing ZDC are recognized especially in LIC and LMIC.
- WHO has generated a draft toolkit that provides an integrated approach to identify non or unvaccinated communities and zero-dose and under-immunized children by using decision making criteria and combined tools to decide if, when, where, and how to go to the field to conduct rapid convenience assessments or targeted probabilistic surveys and take actions to reach, vaccinate, and follow up on non and under immunized communities.
- Toolkit is linked & complimentary to already available manuals and guides.



# Multi-method approach to refining the toolkit





SECTION 02

Today's Topic:  
Using Data Triangulation to Identify Zero-dose Children

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WHO draft guidance on *triangulating data* to define if, where, when, and how to conduct **targeted field assessments** to identify and reach non- and under-vaccinated communities and children

**IA2030 GOAL:** To reduce the number of zero-dose children by 25% by 2025, and by 50% by 2030



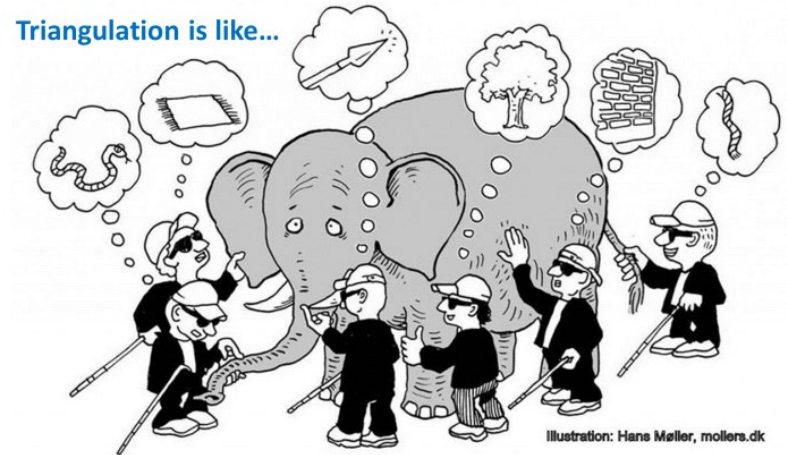
# TOPICS

1. What is data triangulation?
2. How triangulated analysis can be used to identify ZDC and under-immunized communities?
3. Interpreting results for taking actions - including *if, where, when, and how to conduct **targeted field assessments***

# What is Data Triangulation?

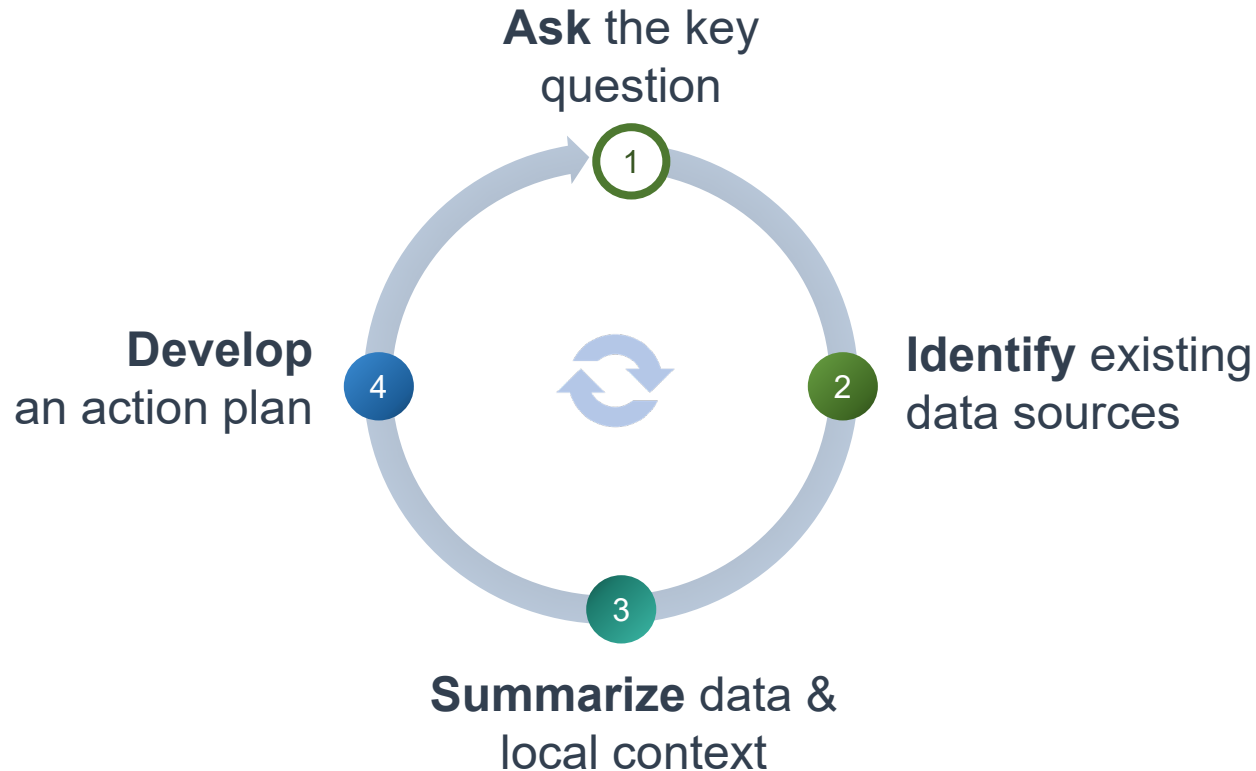
**Definition:** Synthesis of existing data from two or more sources to address relevant questions for program planning and decision-making

- Even in absence of perfect data, public health practice has long recognized that **combining many pieces of weaker evidence can form strong basis for improved decision-making.**
- **Critical thinking** is required to ask key questions, interpret data and turn data into information for action.

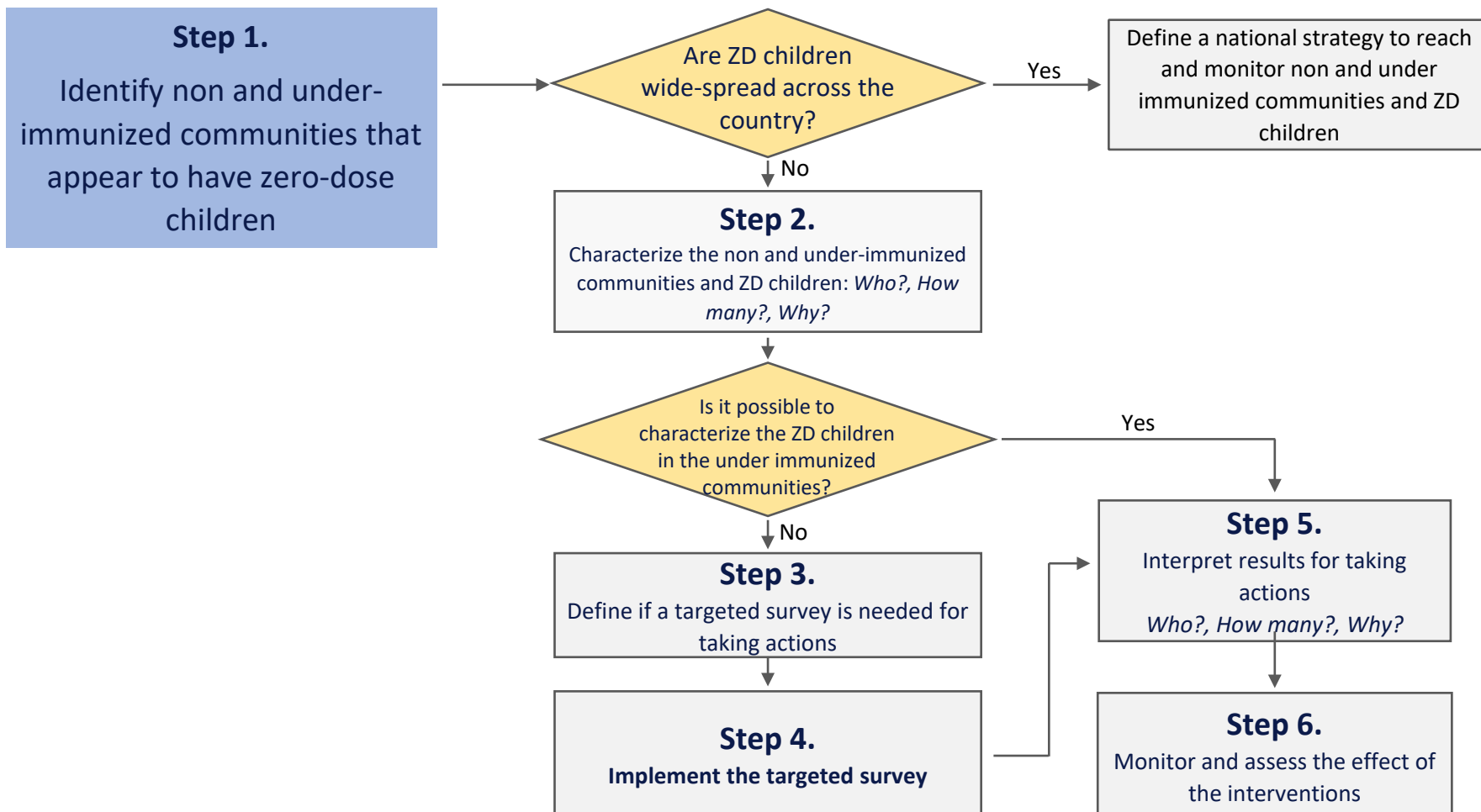


Source: General Triangulation Guidance. <https://www.technet-21.org/en/knowledge-hub/main/6617-1-general-triangulation-guidance-national-level>

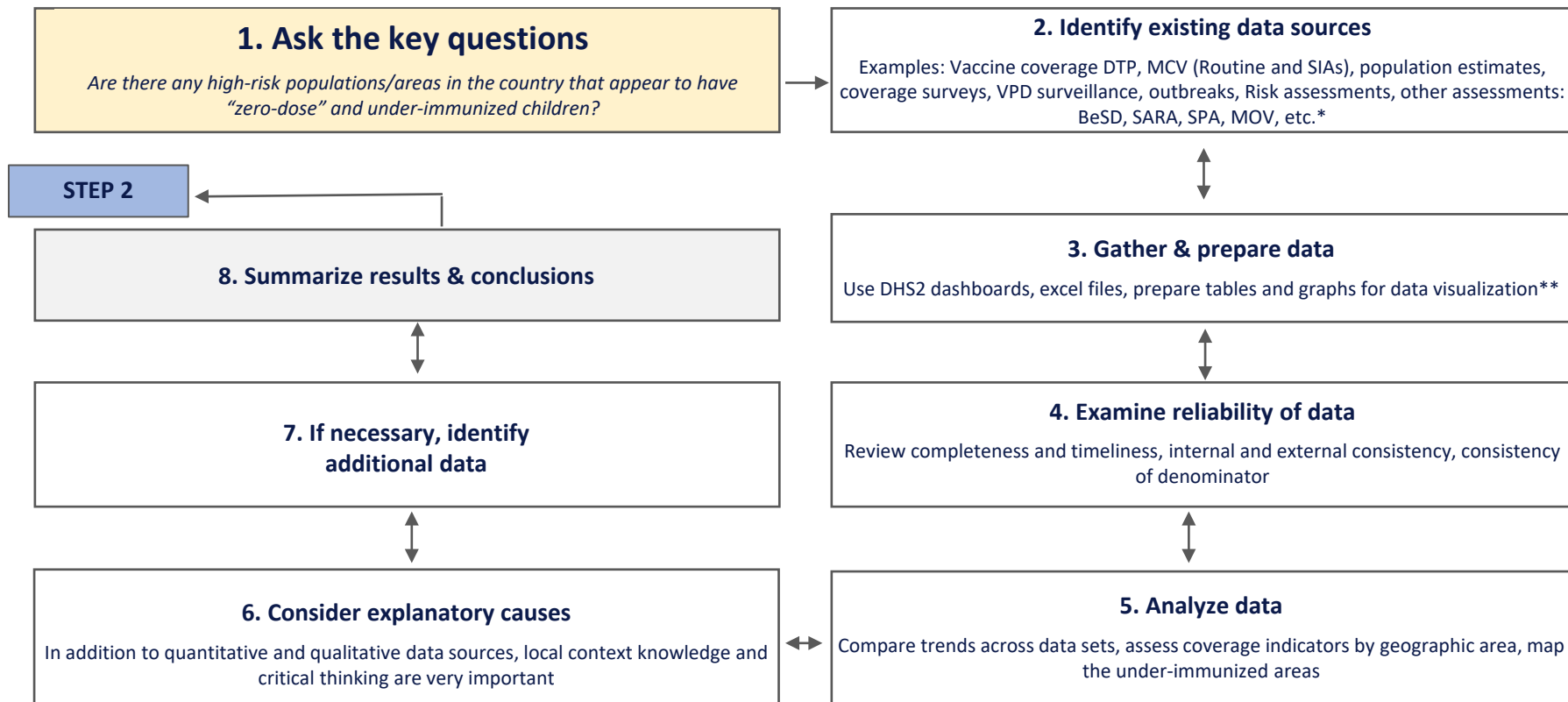
# Triangulation is a 4-Step Process



# Triangulation is the first step to identify ZD and under-immunized children/communities



# Triangulated analysis is used to determine if ZD appear to be wide spread at national level of in clusters or pockets of non and under immunized communities



\* Behavioral and Social Drivers of Vaccination (BeSD), Service Availability and Readiness Assessment (SARA), Service Provision Assessment (SPA), Miss Opportunity of Vaccination (MOV)

\*\* Guidance on data visualization: <https://apps.who.int/iris/bitstream/handle/10665/342568/WHO-EURO-2021-1998-41753-57181-eng.pdf?sequence=1&isAllowed=y>



# 1. Ask the key questions

*Are there any **high-risk populations or groups** in the country that appear to have “zero-dose” and under-immunized children?*

- 1. Who and where** are zero-dose, under-immunized, and missed children in their respective communities?
- 2. How many** zero-dose children do you estimate in each community / area?
- 3. Why** have zero-dose and under-immunized children not been vaccinated?
  - The answer may be different for ZD compared to under-vaccinated, and it may vary depending on the local context

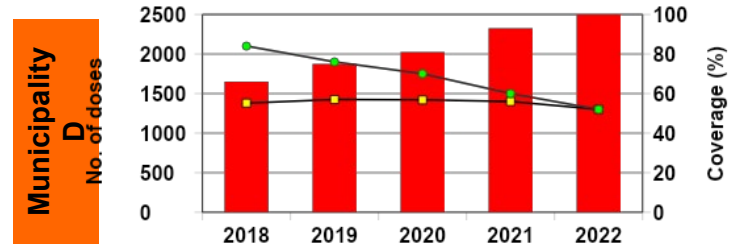
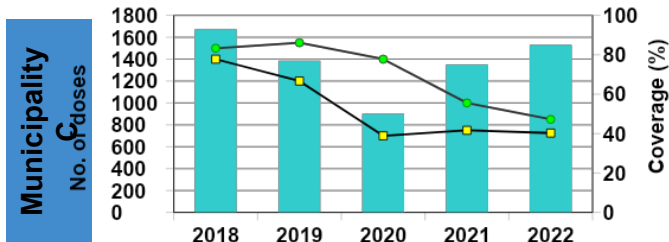
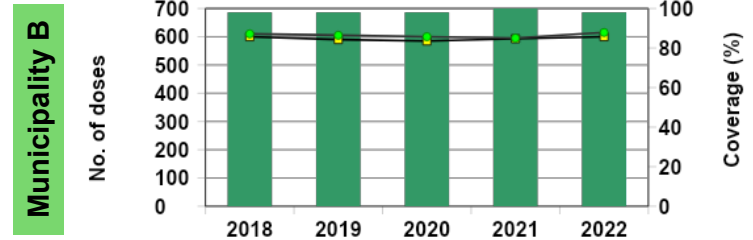
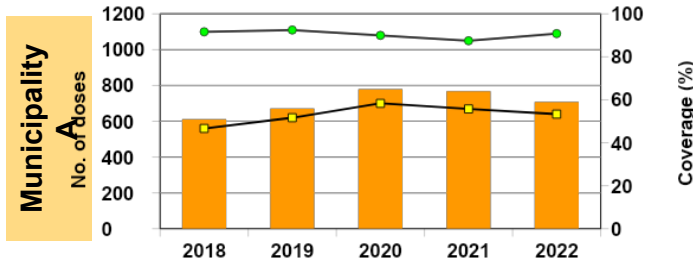
## 2. Identify existing data sources

Data sources	Strengths	Limitations
<b>Administrative vaccination coverage</b>	<ul style="list-style-type: none"> <li>○ Availability of monthly data</li> <li>○ Available for all levels</li> </ul>	<ul style="list-style-type: none"> <li>○ Data quality issues: numerators, denominators</li> <li>○ Overestimated compared to survey</li> </ul>
<b>Vaccination coverage survey</b>	<ul style="list-style-type: none"> <li>○ More reliable than administrative</li> </ul>	<ul style="list-style-type: none"> <li>○ Surveys are infrequent</li> <li>○ EPI coverage survey didn't calculate 95% confidence interval</li> </ul>
<b>WUENIC</b>	<ul style="list-style-type: none"> <li>○ Incorporates triangulation</li> </ul>	<ul style="list-style-type: none"> <li>○ Only calculated once per year</li> </ul>
<b>SIA administrative data</b>	<ul style="list-style-type: none"> <li>○ Available for all levels</li> </ul>	<ul style="list-style-type: none"> <li>○ Overestimated compared to survey</li> </ul>
<b>Case-based surveillance</b>	<ul style="list-style-type: none"> <li>○ Detailed data with age, vaccination status, lab confirmation</li> <li>○ Improved over last 5 years</li> </ul>	<ul style="list-style-type: none"> <li>○ Suboptimal specimen collection &amp; testing rate in some districts/years</li> <li>○ Reporting in CBS &lt; reporting in aggregate surveillance system</li> </ul>
<b>GRID3 (Geo-Referenced Infrastructure and Demographic Data for Development)</b> <a href="https://grid3.org/about-us">https://grid3.org/about-us</a>	<ul style="list-style-type: none"> <li>○ Provides geospatial data on population, settlements, infrastructure, and boundaries.</li> </ul>	<ul style="list-style-type: none"> <li>○ Quality and availability of geo-reference data depend on each country</li> </ul>
<b>Outbreak investigation</b>	<ul style="list-style-type: none"> <li>○ Outbreaks can evidence problems on data quality of vaccination coverage</li> </ul>	<ul style="list-style-type: none"> <li>○ It depends on the quality and how sensitive is the surveillance system, ideally case-based with laboratory confirmation and it is more useful when disease incidence is high</li> </ul>

# Example: DPT1 vaccination coverage (%), by municipality and by year, Country X, 2008-2012

Why do some municipalities have consistently low coverage (A) consistently high coverage (B), fluctuate (C), or progressively increase (D)?

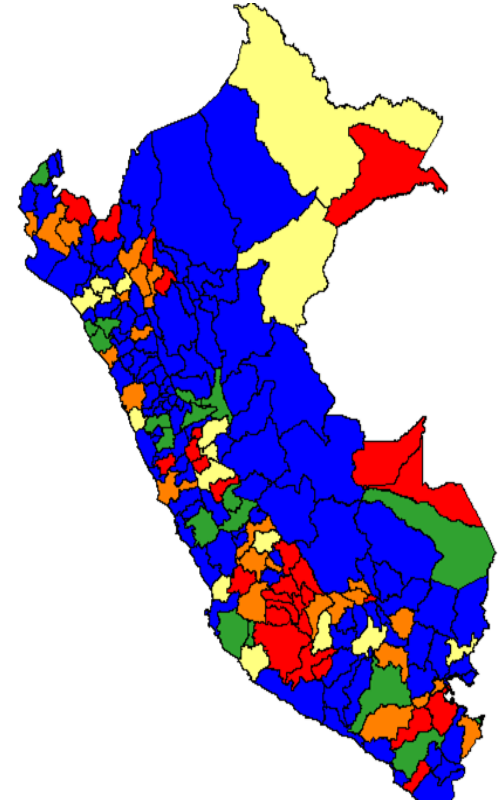
Are the changes in coverage the result of variations in the numerator or the denominator?



### 3. Summary data and local context

#### Can we answer - *Who and Where are the ZD and under-immunized children?*

- Where are the under immunized communities / areas?
- What characteristics do the areas with higher prevalence of ZDC have in common?
- Do un and under-vaccinated persons belong to any specific/special sub-populations? *Rural, slums, migrants or nomadic populations, refugees, ethnic minorities, religious closed communities?*
- How many and what proportion of ZD children you anticipate targeting in those communities/ areas
- What do we get using alternate denominators or survey data, is it similar?



# Can we answer: Why have ZD and under-immunized children not been vaccinated?

## Hard to reach?

- Geography barriers (distance, terrain)
- Transient or nomadic movement
- Immunization services: availability, supplies, readiness, discrimination,
- War or conflict
- Legal restrictions

AND?

OR?

## Hard to vaccinate?

- Distrust
- Religious beliefs
- Lack of awareness
- Poverty or low socioeconomic status
- Lack of time
- Gender-based discrimination

- What is the relative importance/weight of each barrier in each community?

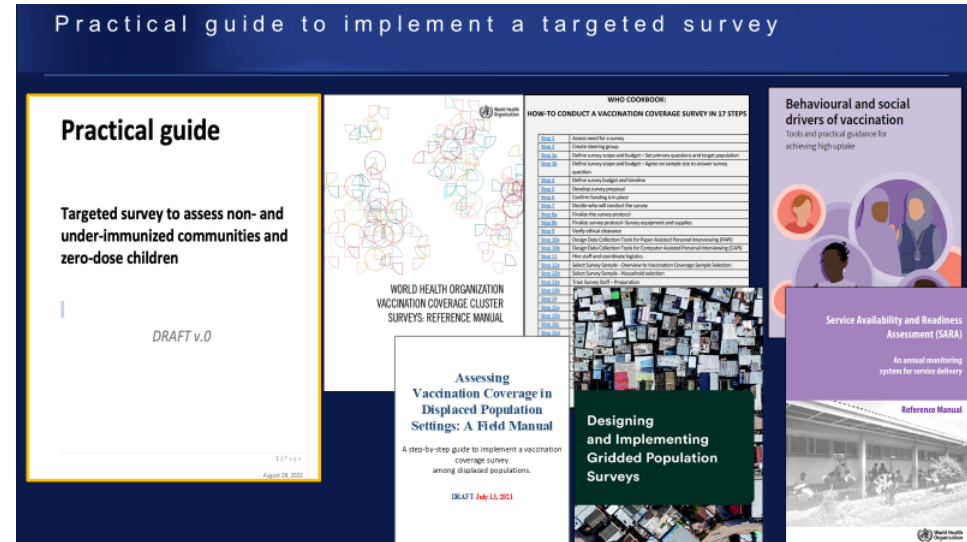
- What are the **demand-related barriers** (e.g., confidence in vaccine benefits, family referral and/or recommendations, service quality) that prevent zero-dose and under-immunised children from being vaccinated?
- What social, cultural, political, or gender-related barriers might they or their families face to accessing services?
- How do the reasons differ by urban, remote rural, and fragile settings or by geography/community?
- What are the **barriers relating to the supply of immunisation services** (e.g. distance to the health facility, low frequency of immunisation sessions, frequent stock-outs, and long waiting time) that prevent zero-dose and under-immunised children from being vaccinated?

# Targeted surveys and other field assessments

1. Household assessments
  - Vaccination coverage surveys
  - Lot quality assurance sampling
  - Rapid convenience monitoring
  - Serology testing

Paired with:

2. Facility assessments
3. Both including **Behavioral and Social Drivers (BeSD)** questions



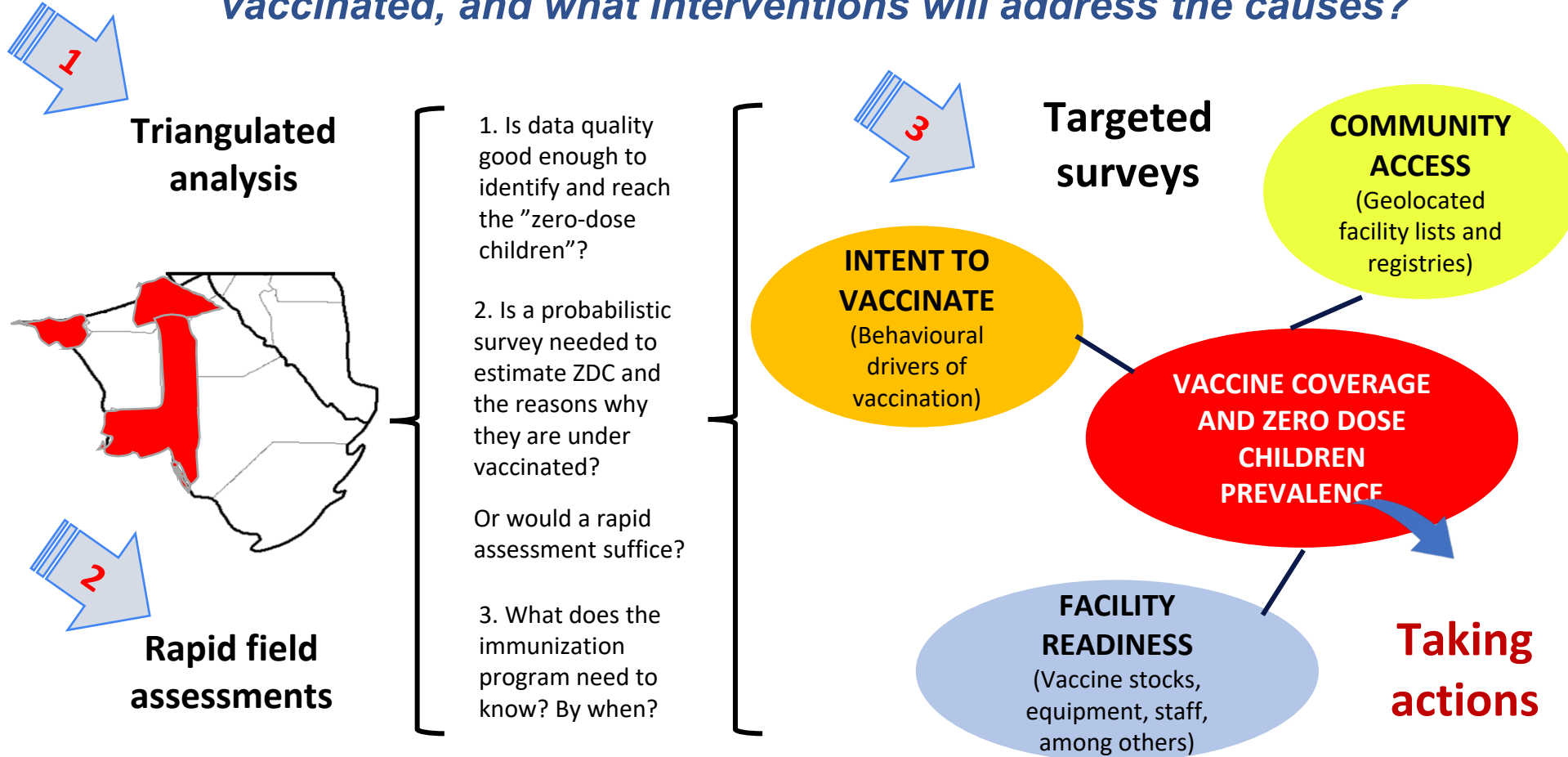
BeSD: <https://demandhub.org/behavioral-and-social-drivers-of-vaccination-besd/>

## 4. Interpret results for taking actions

**Purpose:** To implement vaccination activities based on data analysis and interpretation to reach and vaccinate non and under immunized communities to achieve “zero-dose children” reduction goals

<p>Would changes in those barriers improve coverage of those non and under immunised communities?</p>	<ul style="list-style-type: none"><li>• What would be the impact of those interventions on those barriers?</li><li>• Has the barrier already been addressed by other programme interventions that appear to be working to improve coverage and equity?</li><li>• Are there other key barriers that are having a greater impact on coverage and equity?</li></ul>
<p>What interventions are needed to reduce zero dose children prevalence and under immunized children?</p>	<ul style="list-style-type: none"><li>• How feasible is it to undertake those interventions?</li><li>• What resources are needed in the short, mid and long term?</li><li>• How can we ensure that that the impact of interventions will be sustainable?</li></ul>

# Summary of the approach to answer: *Why are ZD children under vaccinated, and what interventions will address the causes?*





# Activities to identify and reach non- and under-vaccinated communities

31 August 2023, Bangladesh



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# Background

- Bangladesh continues to maintain high immunization coverage. The reported immunization coverage rates, as well as the coverage estimates provided by WHO and UNICEF, have consistently remained above 90% for over a decade. Additionally, more than 83% of children under 12 months of age receive full immunization.
- Despite the strong performance of the immunization program, progress remains uneven, posing a challenge in ensuring comprehensive coverage for all children across diverse socioeconomic groups and geographical regions especially persisting concern regarding urban areas.
- To address the challenges posed by the COVID-19 pandemic and ensure the immunization of every child, Bangladesh organized catch-up vaccination drives nationwide as part of the World Immunization Week celebrations in 2021, 2022, and 2023. These efforts resulted in reaching approximately 2 million children with all the necessary antigens.

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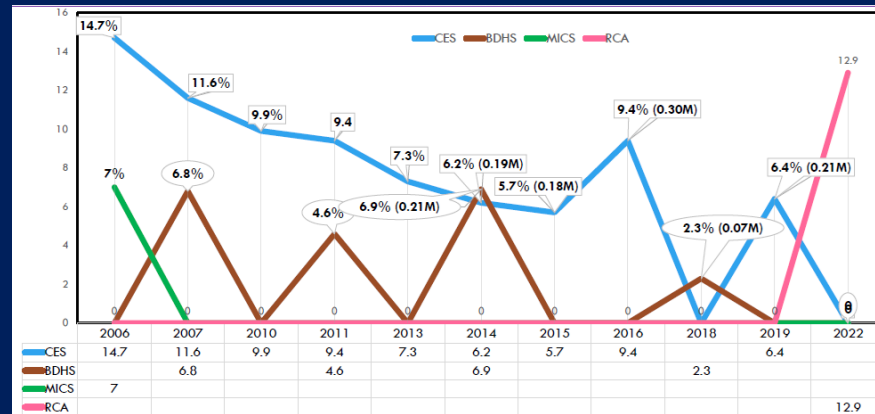
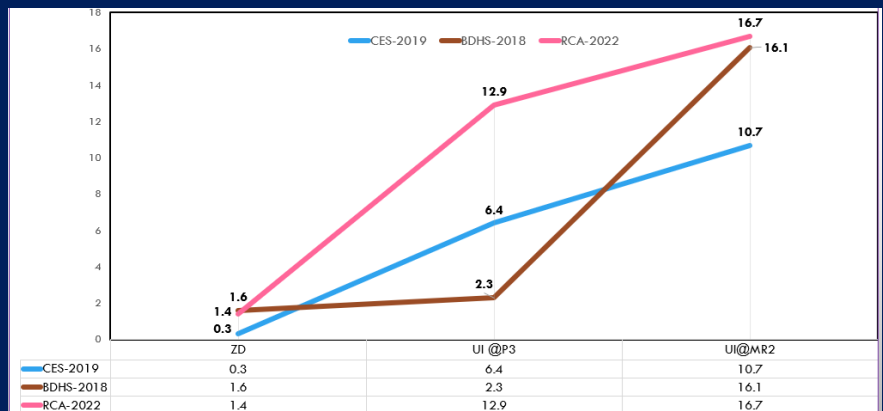
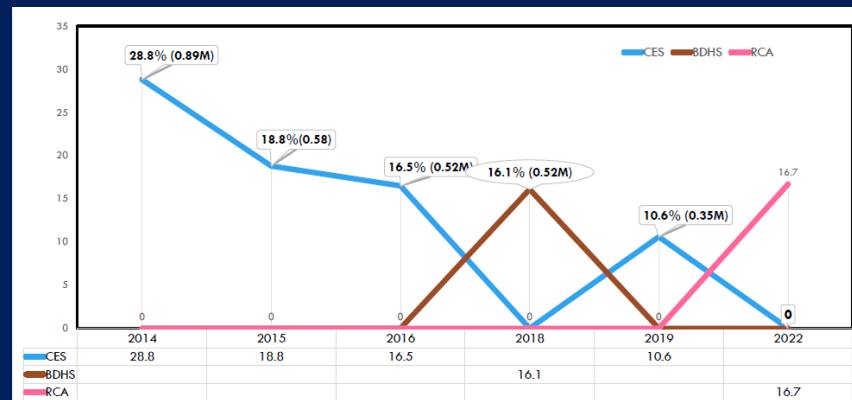
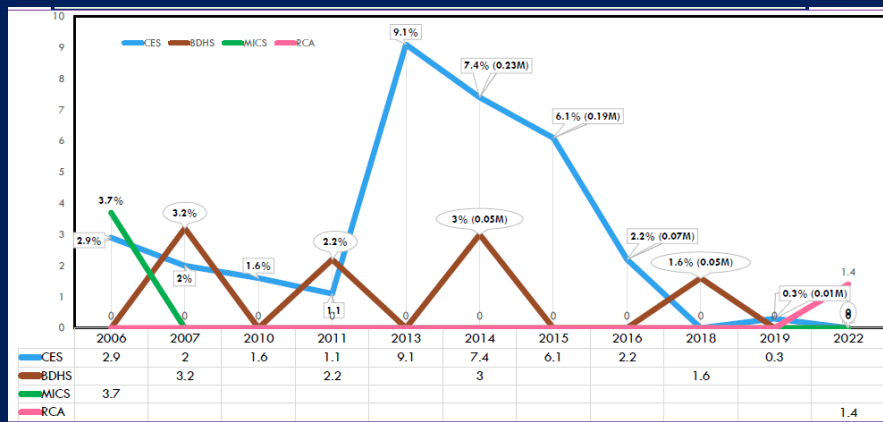
# Identification of ZD and under-immunized children and communities

Where ? Who?

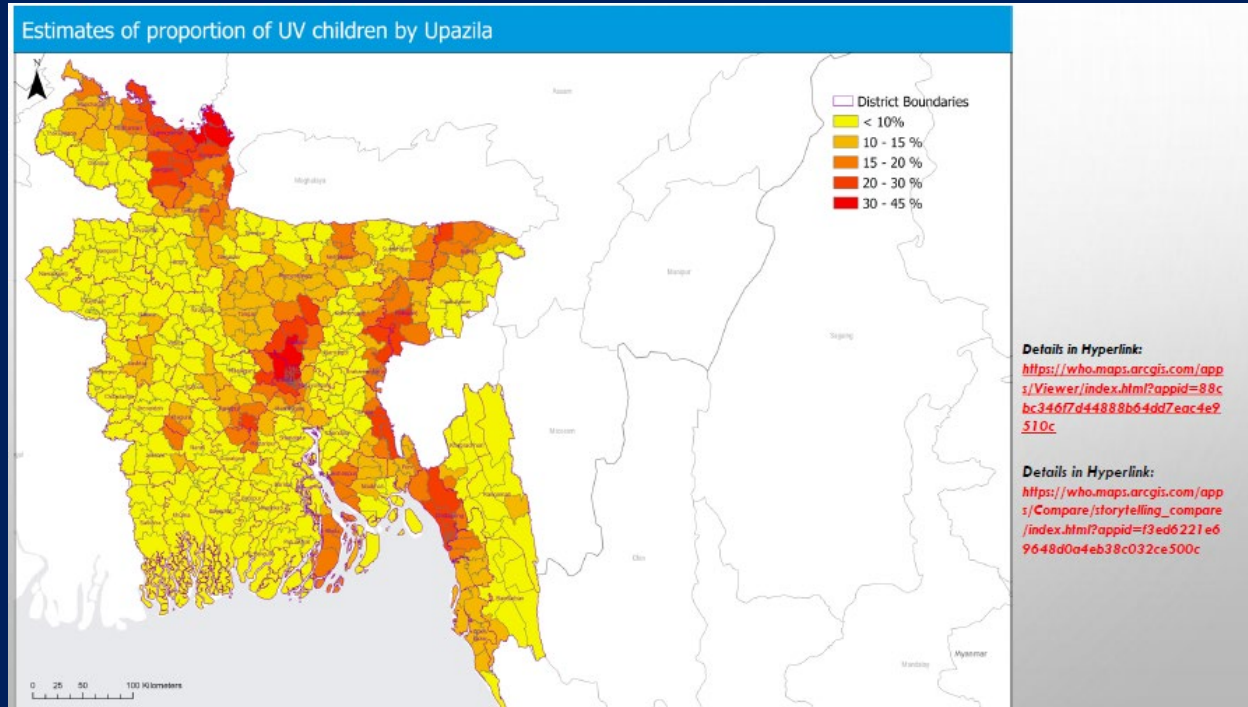
Use of integrated approach, data triangulation, innovative tools to identify and reach ZD and under immunized children/communities

- Chor, Haor, urban slum, geographically hard to reach areas
- Relation with PHC – delivery, ANC, Td vaccination
- How to identify – Rapid Convenient Assessment (RCA), house-to-house monitoring, GIS, data triangulation

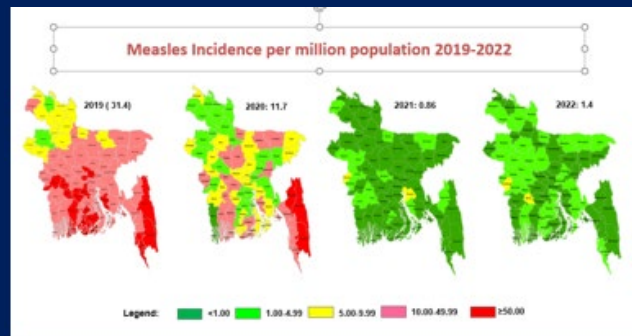
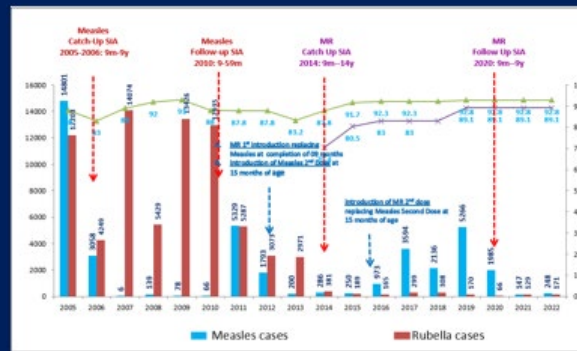
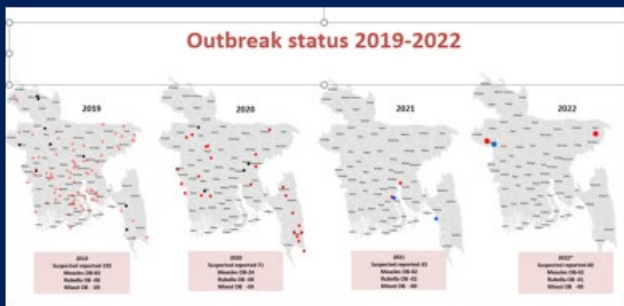
# Coverage & Equity: Zero-dose and under immunized children



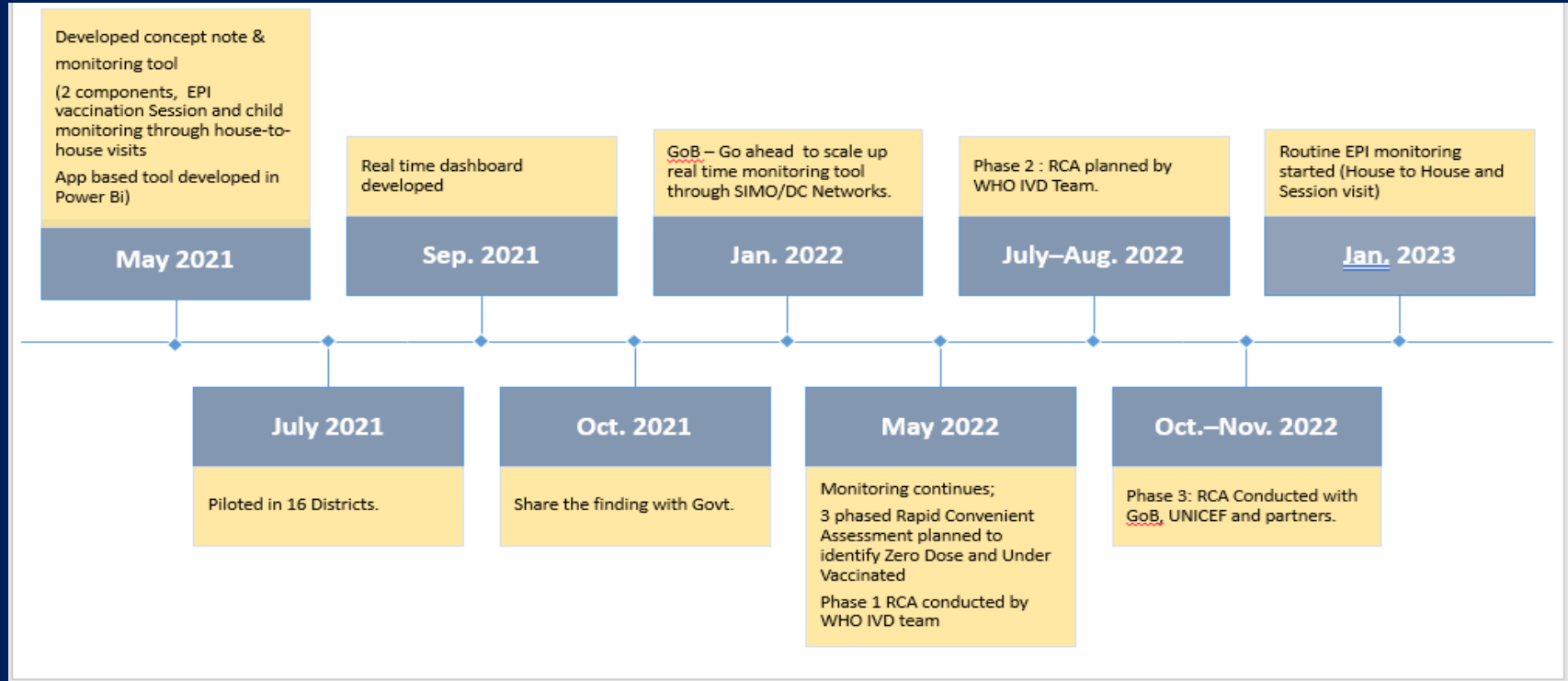
# Zero-dose and under-immunized children



# Triangulation of immunization data with disease surveillance

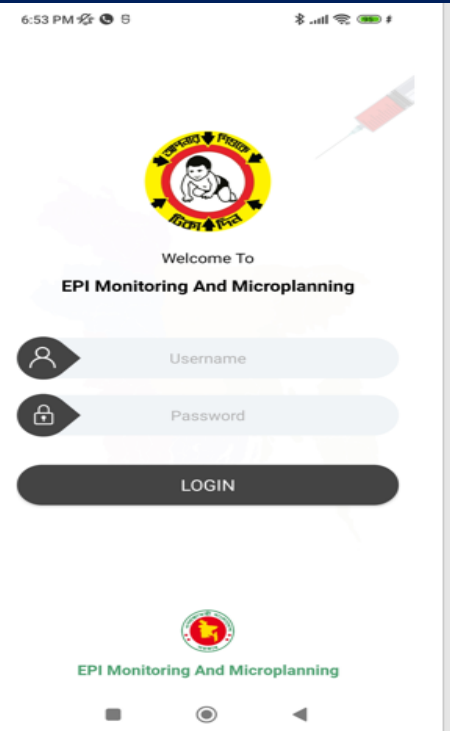


# Nationwide implementation of Rapid Convenient Assessment (RCA)



# Real-time Data Visualization Dashboard

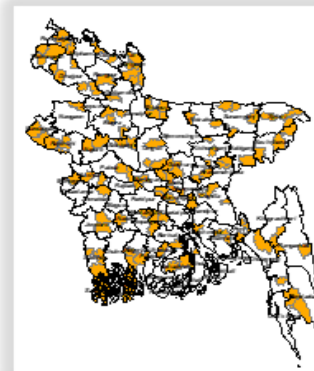
- Data collection Tool: Open-source platform
  - Data Visualization : Dashboard Developed in Power Bi Application
  - Dashboard Link :
    - [RCA/EPI House to House Monitoring](#)
- [RCA/EPI House to House Monitoring](#)





# Findings of Rapid Convenient Assessment, 2022

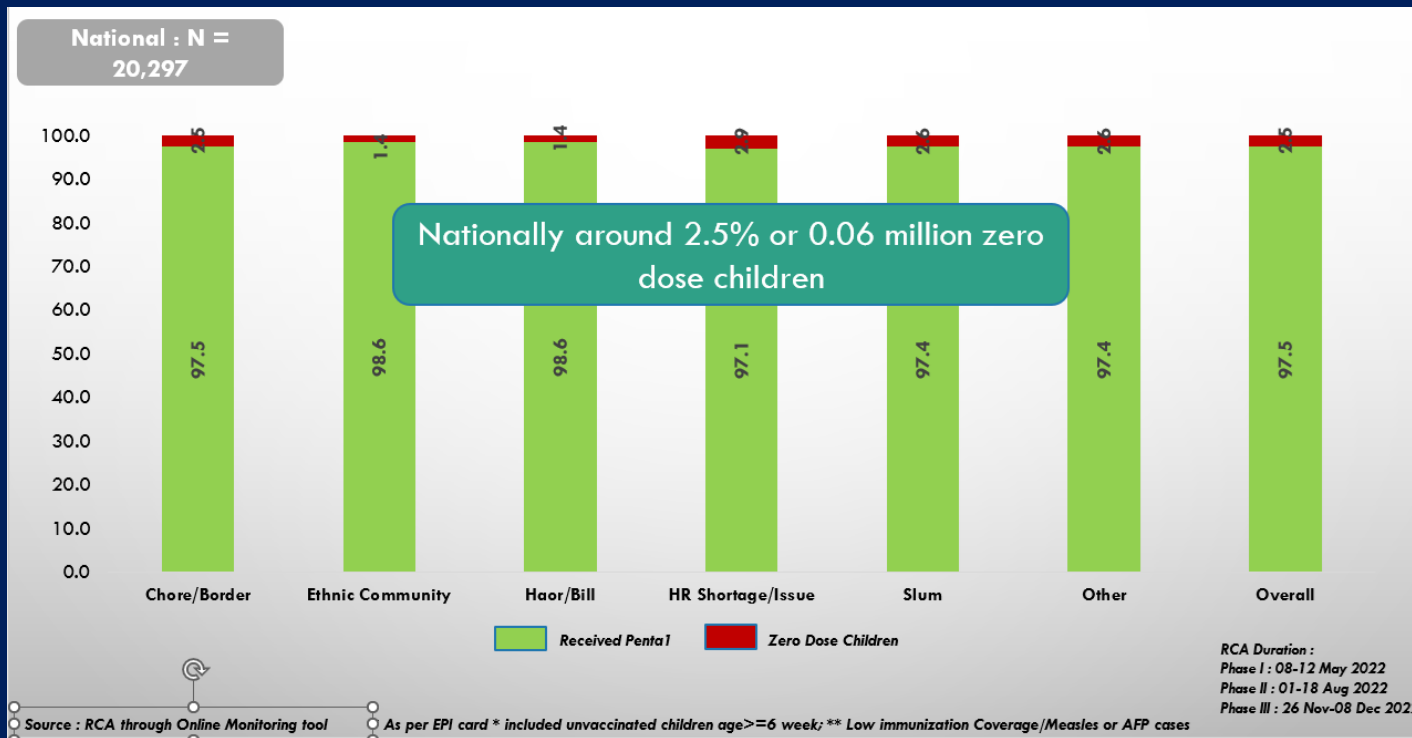
Total # of eligible Children Visited <b>24,104</b>	# of children from <b>Urban : 5,870 (31%)</b> <b>Rural : 18,235 (69%)</b>	Boy : Girl ratio is <b>12,578 (53%) :</b> <b>11,527 (47%)</b>
Unvaccinated Children (No vaccine dose) <b>1.4%</b>	Zero Dose Children* (Penta1) <b>1.7%</b>	Under Vaccinated Children* (Missed one/more schedule dose) <b>5.5%</b>
Received Vaccine at least BCG/Penta1 <b>98.3%</b>	Fully Immunized 12-23 Month considering MR1** <b>94.5%</b>	Fully Immunized by 18-23 Month including MR2*** <b>89.7%</b>



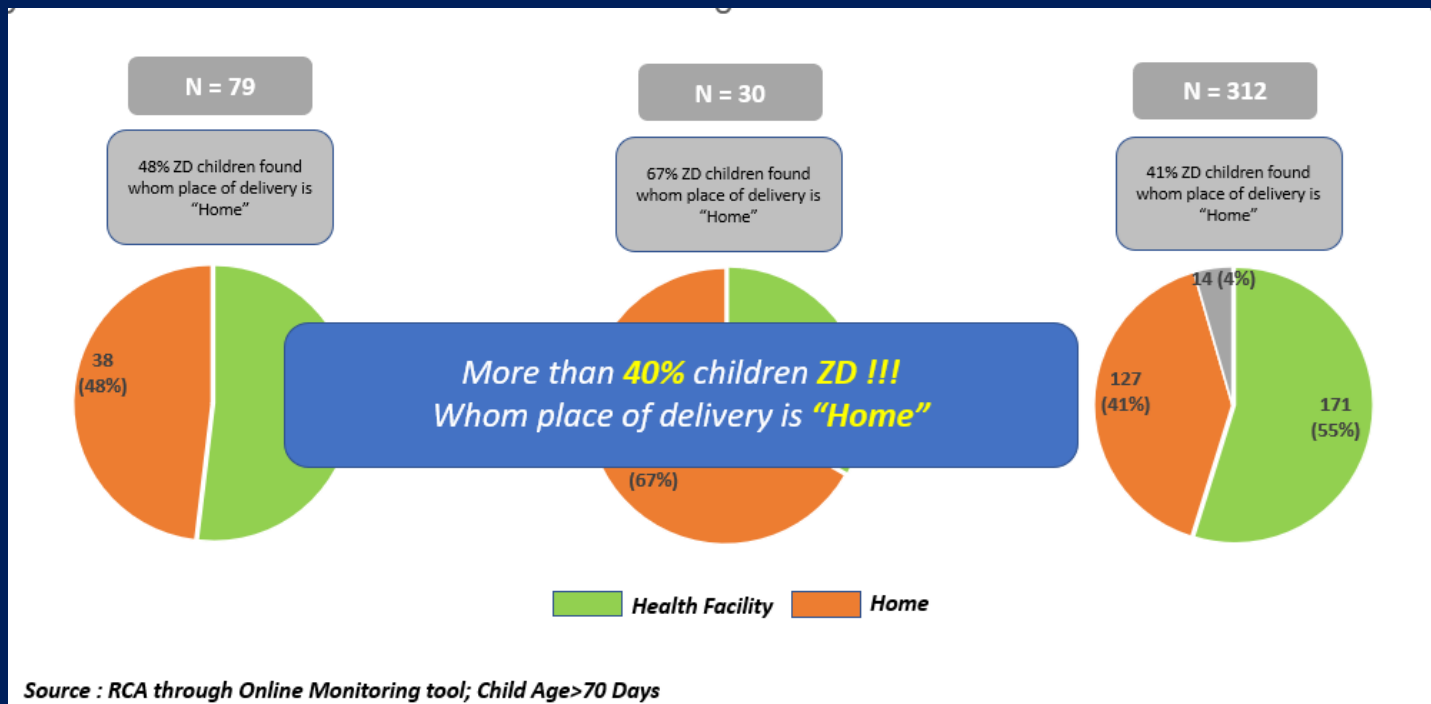
\* Child Age  $\geq 12$  Month; \*\* As per current age considered up to MR1; \*\*\* As per current age considered up to MR2

Source : RCA through Online Monitoring tool; \* Considered current vaccination schedule

# Findings of zero-dose children through RCA, 2022

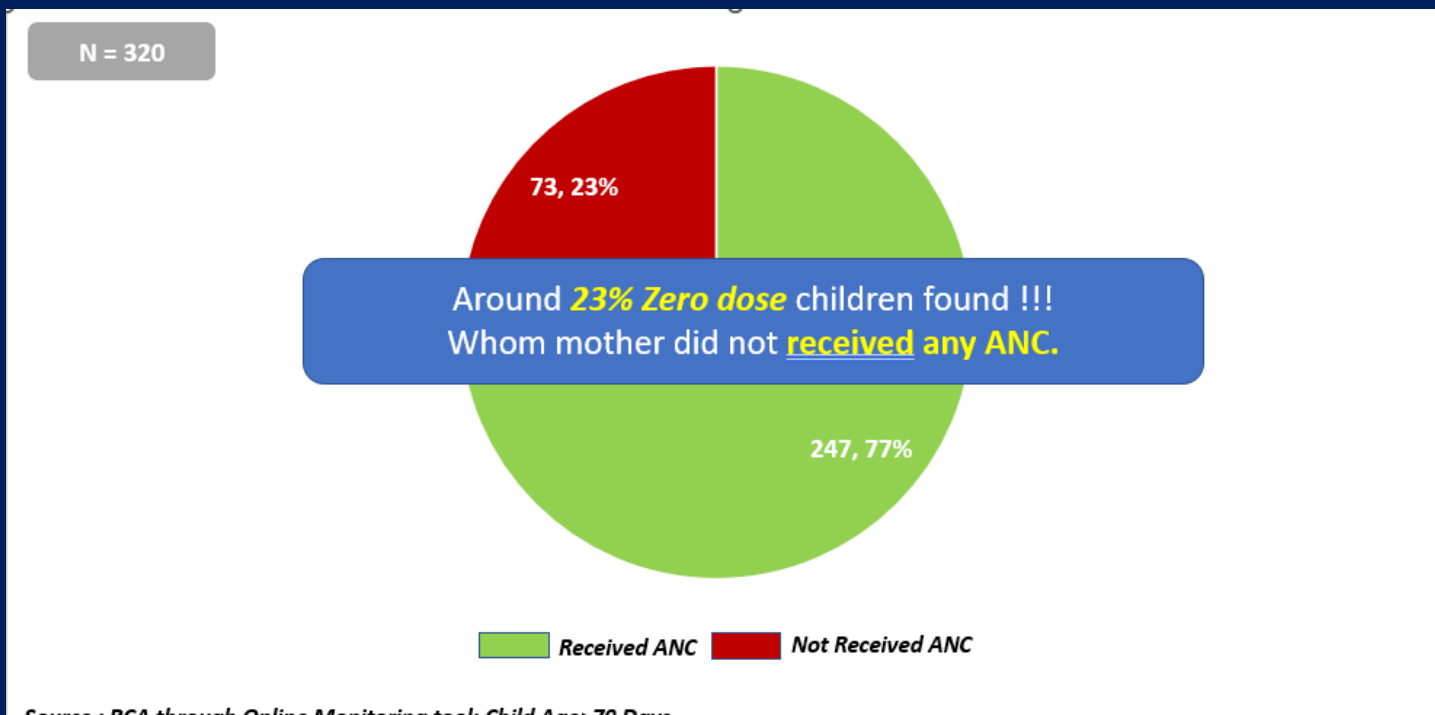


# Zero-dose children and place of delivery

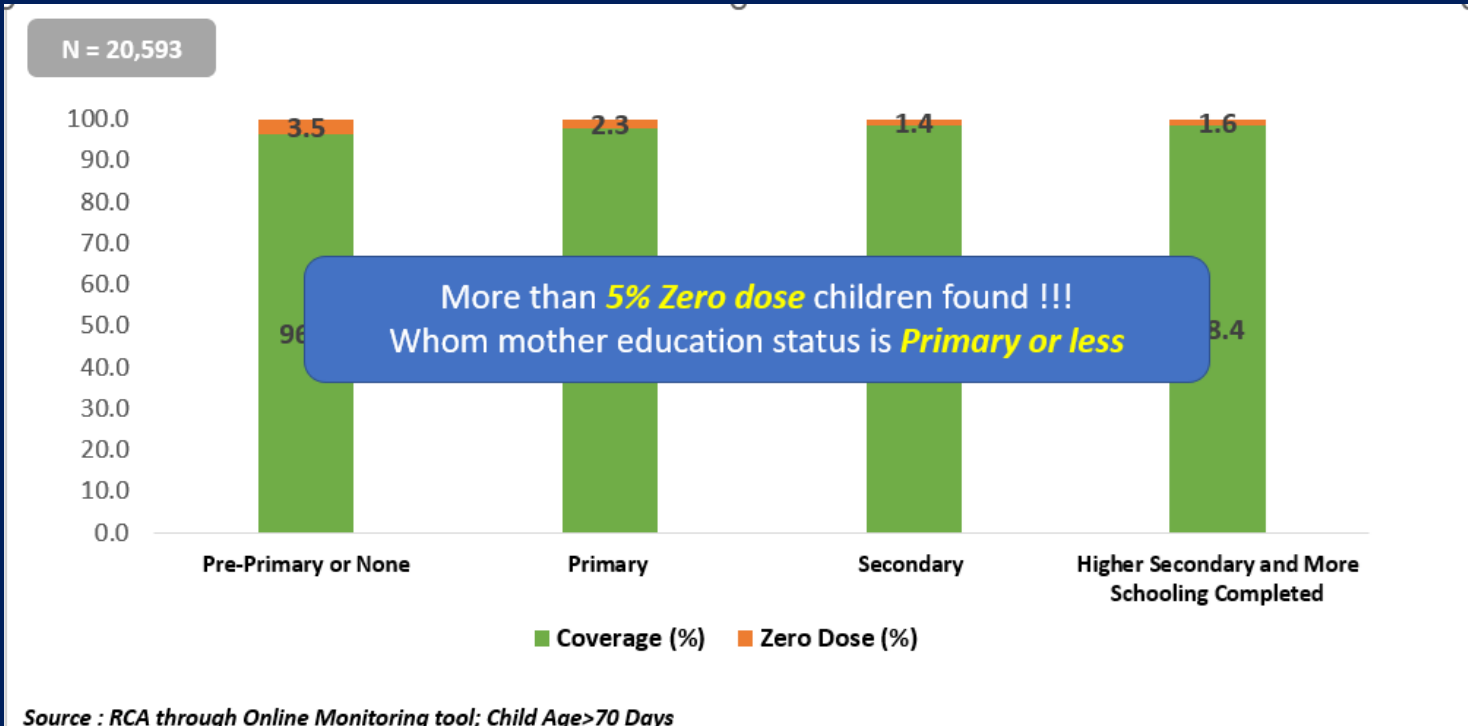


Source : RCA through Online Monitoring tool; Child Age > 70 Days

# Zero-dose children and status of ANC visit



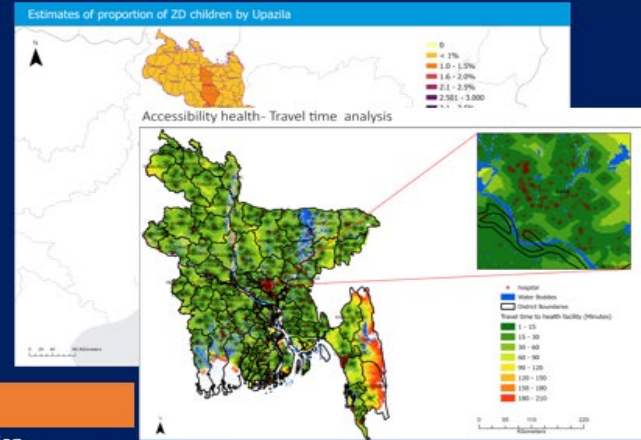
# Zero-dose children and Mother's education status



# GIS base Mapping and Microplanning

## Activities Undertaken on GIS :

- Capacity Building on GIS based Mapping and Microplanning to surveillance and government
- Piloting of GIS based micro planning in Siraigonj district & sadar upazila
- National level training on GIS Base Mapping and microplanning



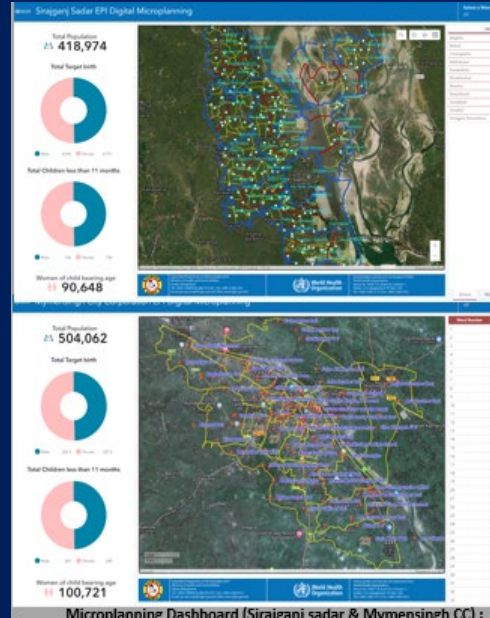
## Micro-planning exercise using satellite imagery

- 1 Scope & Planning**  
 Define the area of extent and the type of campaign
- 2 Basemap**  
 Collect & prepare basemap using satellite & contextual information
- 3 Workshop**  
 Run a workshop with the field supervisors identifying their existing team areas
- 4 Field validation**  
 Field validation on the digitized microplan boundaries for quality check and control
- 5 Mainstream**  
 Using digitized microplan boundaries

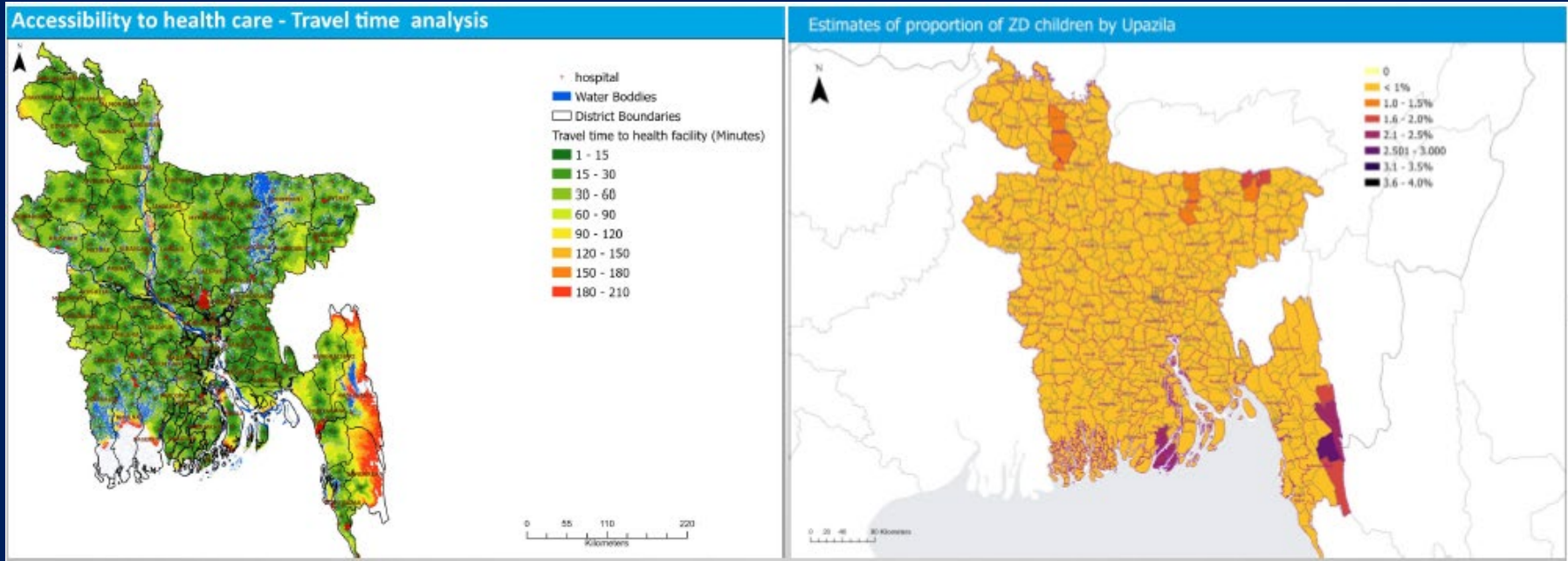
The row of images shows: 1. A satellite image of a rural area with a green overlay indicating a campaign area. 2. A satellite image with a map overlay showing the campaign area. 3. A group of people in a workshop setting, looking at a presentation. 4. A group of people in a field setting, looking at a map on the ground. 5. A map showing "Finger Marking Coverage by Cluster Kandahar City" with various colored markers and labels.

Source:

# GIS microplanning



# Zero-dose and under-immunized children





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# Conclusion

- Use of various methods, data triangulation and tools to identify ZD and under-immunized children/communities
- Vary from place to place
- Continue to refine the tools and technologies

# Poll Question

Panel Discussion / Q&A

# Evaluation

Please scan the QR code below to share your feedback on today's webinar.



# THANK YOU

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