MOMENTUM Routine Immunization Transformation and Equity

Zero-dose Children Definitions and Measurement

February 14, 2024
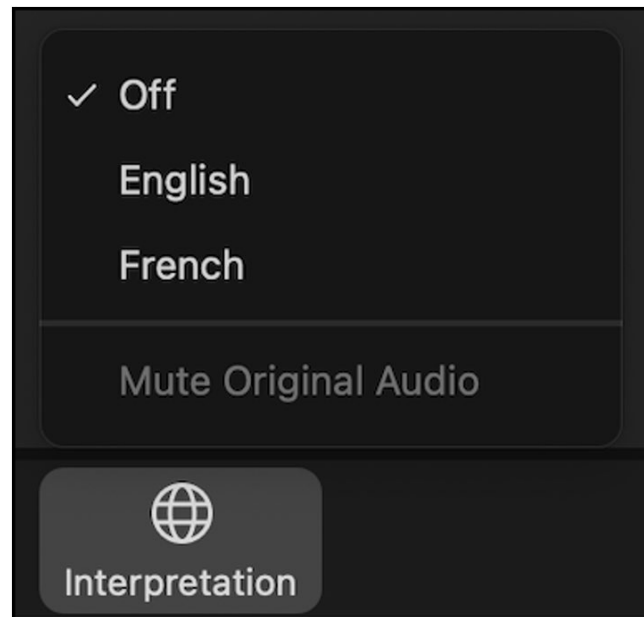
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Introductions

Learning Series Host

Guest Speakers

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Agenda

- MOMENTUM Routine Immunization Transformation and Equity Project

- Overview of the zero-dose child (ZDC) toolkit and learning exchange series

- Introduction to official ZDC definitions and link to the Big Catch-Up

- Methods and experiences from Mozambique, Bangladesh, and DRC

- 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: 6 years
Country programs: 18

ZDC toolkit and learning exchange series

Background and purpose of ZDC toolkit

- Need for a one-stop-shop of resources to **identify**, **reach**, **monitor**, **measure**, and **advocate** for zero-dose and underimmunized children.

- Many tools and guidance documents exist. The forthcoming ZDC Toolkit aims to pull them together in a user-friendly way.

- Toolkit is linked & complimentary to already available manuals and guides.

Multi-method approach to refining the toolkit

Learning Exchanges

Different topics related to zero-dose and under-immunized children; goal is to get user feedback and experiences to inform the toolkit; build demand, knowledge, skills for the methods/approaches outlined in the toolkit.

Design Collaborative

5-10 countries; provide input into design and content.

Field Test

Location: Nigeria; Conduct interviews; Actual tool use and user feedback.

Zero-Dose Operational Definitions

Why Focus on Zero Dose?

First, zero-dose signals the importance of equity in immunization

- The idea behind this is that at all levels, we actively seek out zero-dose children and missed communities

Second, focusing on the completely unvaccinated is a good strategy to improve overall coverage

- 10% of children are completely unvaccinated, only 5% drop out before DTP3/MCV1
- Priority countries tend to have a zero-dose (access) issue

What is the Definition of Zero Dose Children?

For the purpose of the IA2030 and Gavi 5.0, zero-dose children are those that **didn't receive** any vaccination through **routine services** by the age of one year old

- For any reason, including hard to reach, left-outs, opt-outs…
- The operational measurement is lack of DTP-1 (Target population – DTP1)
- The definition excludes any campaign doses, as it aims to signal access to routine services

Known Challenges

- The IA2030 definition was intended for global and perhaps regional monitoring
- The definition implies an annual birth cohort, or looking at trends year on year (excellent for WUENIC and IA2030 monitoring)

It was not intended for:

- Real-time / point-in-time measurement
- Identification of who is zero dose
- Real-time monitoring or evaluation of intervention effectiveness in reaching zero dose children

Poll Question: What does zero-dose mean to you, or how do you define it?

ZDC en RDC : Définition et implications

Presentation Map

Definition of ZD in DRC

Process and operationalization

Definition challenges during implementation

Measurement of ZD indicators

I. Definitions used in the DRC

- **Routine vaccination** :

  - **Zero dose**: Any child who has not received any dose of vaccines (BCG as a measure).

  - **Operational definition**: any child aged **at least 6 weeks** who has not received a dose of **DTP-HepB-Hib 1.**

- **Additional vaccination activity (AVS**)

Basic principle: any child who has never received the antigen targeted by the campaign = ZD

- **Polio**: any child who has never received a dose of OPV (0 - 11 months and 12 - 59 months)
- **Measles**: any child who has never received a dose of MCV (0 - 59 months)
- **Yellow fever**: anyone aged 9 months to 60 years who has never received a dose of yellow fever vaccine.

Question to the child's mother or carer: **has the child already received at least one dose of vaccine as a right thigh injection (MCV) and two oral drops (OPV)?**

II. Process and operationalization

Consultation on global strategic directions for immunization

↓

Adapting to the national context

↓

Development of policy/standards/technical sheets

↓

Validation by the CCIA Technical and strategic

Stakeholders

Experts from EPI management and partners

Stakeholders

Authorities of the Ministry of Public Health and Representatives of EPI partners

Operationalization

Translation of the SG Directive into operational instructions by the DPSs, training and dissemination

Stakeholders

DPS and health zones

III. Challenges

1. **Information availability and collection tools**
2. **Shortcomings in the training process :**
   ✓Understanding the ZD identification tool by age group
   ✓Distinction between routine EPI ZDs and SIA ZDs by antigen
   ✓Filling in the zero-dose survey form
3. **Feedback from zero-dose survey forms**
4. **Use of zero-dose survey sheets**
5. **Small-scale use of ZD survey forms on ODK with geolocation**

IV. ZD indicator measurements

Indicators in use

- Number of ZDs identified (administrative data)
- Number of ZDs recovered (administrative data)
- Number of children aged 12-59 months vaccinated against penta1 (administrative & survey)
- Penta 1 vaccination coverage (administrative & survey)

Using ZD indicators

- Targeting interventions at the most decentralized level (catch-up plan, systematic EPI reinforcement during SIAs)
- Measure progress in terms of ZD reduction

THANK YOU FOR YOUR ATTENTION

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MERCI DE VOTRE ATTENTION

Vacciner c'est aimer, vacciner c'est protéger

MINISTÈRE DE LA SANTÉ PUBLIQUE, HYGIÈNE ET PRÉVENTION

Zero-Dose: Contextualization, concept, prioritization, and monitoring in Mozambique

PRESENTATION CONTENT

- Contextualization

- Definition

- Methods of Estimating or Calculating ZD Children

- Strategies for identifying or reaching ZD children

ZERO-DOSE??

CONTEXTUALIZATION

CONTEXTUALIZATION

✓ Many **investments and progress** in immunization but the performance of the EPI is always measured based on children reached (**coverage** in relation to targets).

✓ However, for many years coverage (even adjusted) remains stagnant.

✓ The **quality of data** and imprecise **denominators** have discredited the reported coverage.

✓ Millions of children around the world continue not to receive any vaccination intervention and this is justified by the growing number of susceptible populations and the emergence of outbreaks of vaccine-preventable diseases.

CONTEXTUALIZATION

✔ As a result of extensive consultancy, in June 2019, Gavi approved a new five-year strategy ("Gavi 5.0") with the vision of " **Leaving no one behind with immunization** " and the mission of saving lives and protecting people's health , increasing the equitable and sustainable use of vaccines.

✔ A central focus of the strategy is to reach " **Zero Dose** " children and lost communities, with the principle of equity

DEFINITIONS AND CALCULATION

DEFINITIONS

❖ Children with **Zero Dose -** are those who have not received any routine vaccination since birth. For operational purposes, Gavi defines " **Zero Dose children** " as children who have not received the first dose of the Pentavalent1 vaccine (DPT-HepB+Hib1)

❖ " **Lost or unserved communities** " are communities with zero-dose or under-immunized children.

ZERO DOSE CALCULATION IN MOZAMBIQUE

✓ **Zero Dose** is estimated or calculated based on the number of children <12 months of age who have been vaccinated subtracted from the number of children administered penta1, in the same time interval.

✓ **CALCULATION FORMULAS:**

1. **Zero Dose Number (#)**

$$\textbf{Zero Dose} = BCG - Penta1$$

2. **Zero Dose Percentage (%)**

$$\textbf{\% Zero Dose} = \frac{BCG - Penta1}{BCG} x100$$

IDENTIFICATION AND OUTREACH STRATEGIES

IDENTIFICATION STRATEGIES

✓ **Use of RED/REC record book**, whether from a fixed post or mobile brigade to identify zero dose children

✓ Triangulate data from record books with DHIS2

✓ Training of Community Focal Points – for the implementation of RED/REC, registration of demographic events (births), absent children, Zero-dose, etc, in the community .

✓ Implementation of the active search plan for defaulter children

STRATEGIES TO REACH ZERO DOSE

✓ Use of RED/REC planning meetings, community meetings with focal points to monitor RED/REC implementation and discuss challenges

✓ Prioritization of communities for mobile brigades based on number of zero dose children

✓ Integration of essential services in mobile brigades

✓ Interpersonal communication and communication for demand generation

✓ Monitoring Zero-Dose Progress

THANKS FOR YOUR ATTENTION

Identifying zero-dose and under-immunized children in Bangladesh: Methods and experiences

Background

- 81% of children now receive routine vaccines in low income countries
- However, nearly 10 million of 72.5 million Gavi targeted children do not receive a single vaccine shot every year
- In Bangladesh, vaccination coverage is 80-84% over the past decade
- Recently Gavi and the Global Immunization Agenda 2030 have intensified their emphasis on equity to reach Zero-Dose (ZD) and under-immunized children
- Gavi introduces five-year strategy 5.0 within the **Identify, Reach, Monitor, Measure, and Advocate (IRMMA)** framework for reaching ZD children and missed communities
- To support this, we are working on "Gavi country learning hub" to implement above activities using IRMMA framework in Bangladesh
- The ZD learning hub in Bangladesh has been working in collaboration with the government and other EPI stakeholders

Objectives

- To identify the location of ZD and under immunized children, and why they are zero-dose (not covered today)

- To inform the context specific intervention(s) for the planned implementation research (IR)

Operational definitions of ZD by Gavi

Zero dose (ZD) children	Children who missed first dose of DTP vaccine
Under vaccinated children	Children who missed third dose of DTP vaccine
Missed community	Areas with high ZD and under-immunized children

Operational definition of ZDC in Bangladesh

- **Pentavalent** vaccine, which is aligned with the globally recognized "DTP", provides immunization against Diphtheria, Pertussis, Hepatitis B (HepB), Haemophilus influenza B (HiB) and Tetanus

- A child was considered to be a **zero-dose child (ZDC)** if s/he had missed the 1st dose of pentavalent vaccine i.e. s/he had not received any dose of pentavalent vaccine

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How ZDC definition was developed?

- In Bangladesh, the first dose of pentavalent (DTP) is given to a child at 42 days. Subsequently, the second and third doses are given at 28 days interval

- It is essential for a child to receive all three doses of the pentavalent vaccine by the age of 3.5 months (98 days)

- Therefore, the age limit was set at 4.5 to 23 months, that enabled the detection of clear delays in receiving penta-1 vaccine for at least 12 weeks

- If a child missed the 1st dose of pentavalent vaccine within the age of 4.5 months, then s/he was considered as zero-dose child

Methods

- A rapid assessment was conducted during December 2022 to May 2023

- **Sites (ZD priority areas):** Haor (wetlands), Hilly (mountainous), Coastal, Char (sand or silt land surrounded by water), Plain land & Urban slum (City Corporations (CCs))

- **Study population:**
  - Caregivers of children aged 4.5 months (4 months 15 days) to 23 months
    - ✓ 4.5 months for zero dose measurement was considered for providing provision of one month extended time if the child missed scheduled 3rd dose of pentavalent
  - Policymakers, program managers and service providers

Process followed for ZD identification

Initial identification of ZD
- Consultation with EPI stakeholders through meetings (briefing session, inception meeting, monitoring committee meeting)
- Secondary data analysis (CES 2019; DHIS2 2022)

Verification of DHIS2 data
- Field visit to collect monthly EPI report (hardcopy)

Re-analysis for ZD area identification
- Ranking of ZD sub-district by geo-locations from DHIS2 (2022)
- Identification of districts with two high ZD sub-district and identification of CCs with two high ZD wards for LQAS

Confirmation of missed communities
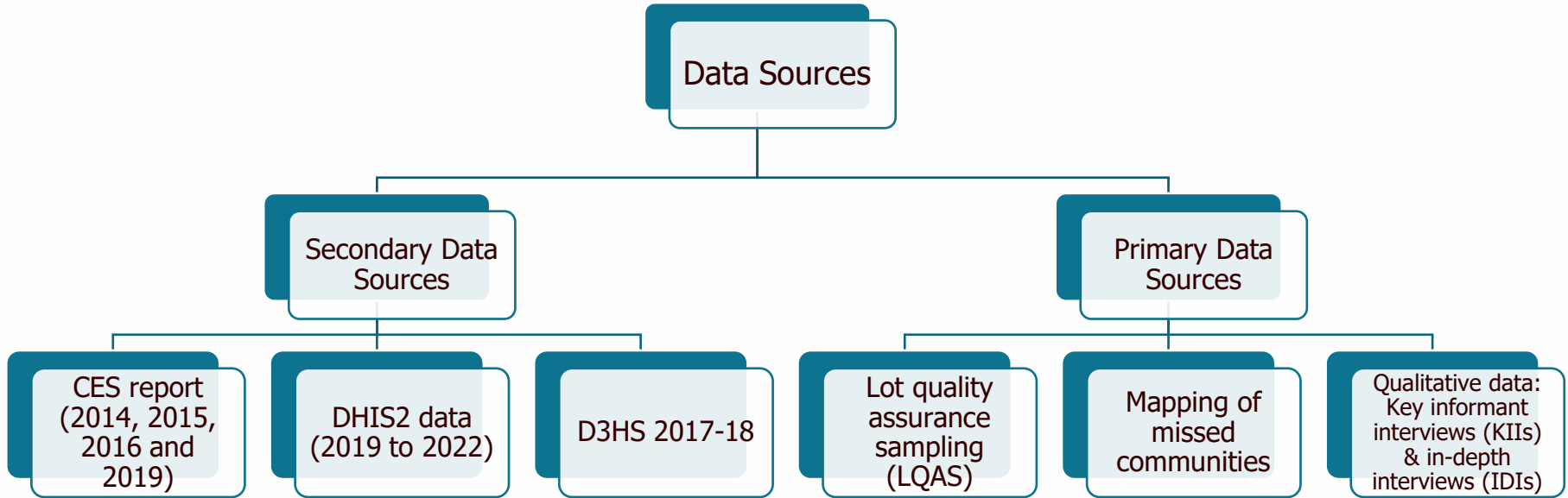- Collection and analysis of LQAS data

Identification of socio-economic determinant for ZD and UI
- Use of BDHS 2017-18 data

Identification of demand and supply side factors
- Qualitative data collection: KIIs and IDIs

Data sources

Data Sources

Secondary Data Sources

Primary Data Sources

CES report (2014, 2015, 2016 and 2019)

DHIS2 data (2019 to 2022)

D3HS 2017-18

Lot quality assurance sampling (LQAS)

Mapping of missed communities

Qualitative data: Key informant interviews (KIIs) & in-depth interviews (IDIs)

LQAS: Household selection process

District / CC
- Secondary data analysis [CES and DHIS2]

Sub-district/ Zone
- Secondary data analysis [DHIS2]

Union and Ward
- Consultation with service providers and review of monthly EPI report

Cluster
- Identified two clusters with high ZD and UI children from selected ward in each sub-district for LQAS

Household
- Interviewed 28 caregivers from each cluster
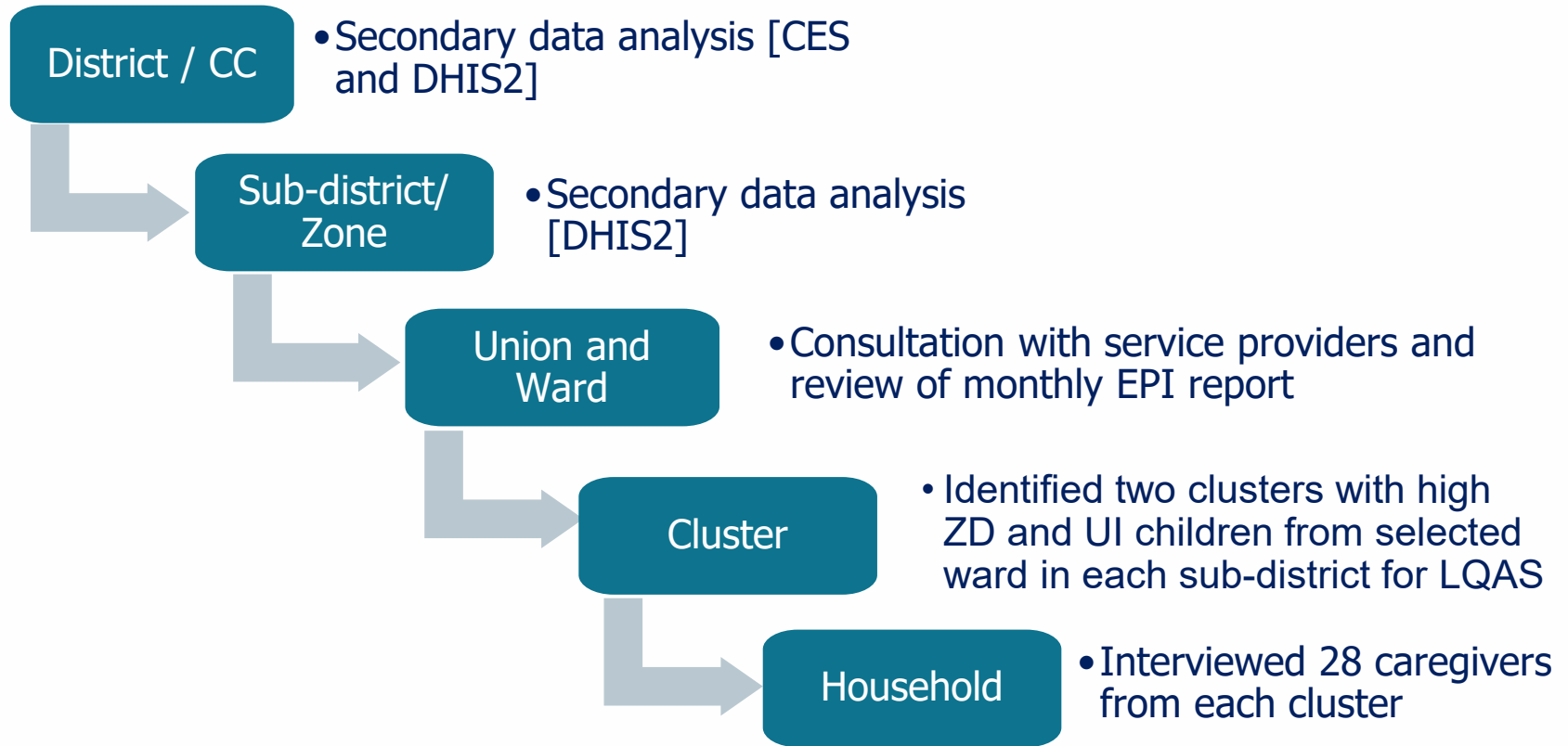
Analysis

Quantitative data:

How prevalence of ZD was measured

Secondary data:

- Subtracted the coverage of penta-1 vaccine from 100 to determine the prevalence of zero-dose

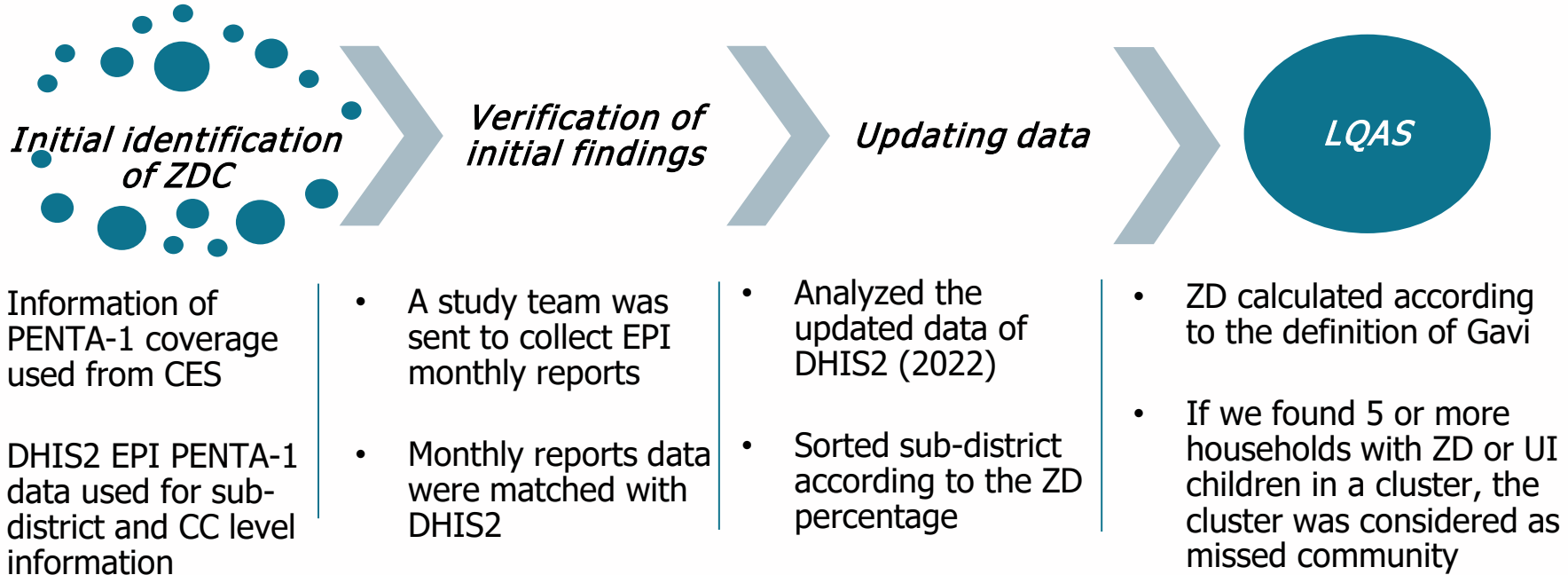$$prevalence\ of\ ZD = (100 - coverage\ of\ Penta1\ vaccine)\%$$

Primary data:
- Denominator: Number of children aged 4.5 to 23 months

- Numerator: Number of children aged 4.5 to 23 months who did not receive penta-1 vaccine

$$prevalence\ of\ ZD = \frac{Number\ of\ children\ did\ not\ receive\ Penta1}{Total\ number\ of\ children\ in\ the\ sample} \times 100\%$$

Analysis (cont.)

Quantitative data (cont.):

Analytical approach for identification of ZDC

Initial identification of ZDC	Verification of initial findings	Updating data	LQAS
• Information of PENTA-1 coverage used from CES • DHIS2 EPI PENTA-1 data used for sub-district and CC level information	• A study team was sent to collect EPI monthly reports • Monthly reports data were matched with DHIS2	• Analyzed the updated data of DHIS2 (2022) • Sorted sub-district according to the ZD percentage	• ZD calculated according to the definition of Gavi • If we found 5 or more households with ZD or UI children in a cluster, the cluster was considered as missed community

Analysis (cont.)

Qualitative:

- Framework approach

- Verbatim transcription

- Incorporation of field notes & interviewers' observations

- Data were systematically coded, synthesized and interpreted

Key Findings: Identified areas for IR

District	Sub-district	EPI Cluster	Total	ZD	UI	Decision Value≥5	Primary selection
Gaibandha	Saghata	Cluster-1 (Dighulkandi)	28	2	10	Accept	Intervention
		Cluster-2 (South Dighulkandi)	28	1	5	Accept	
	Fulchhari	Cluster-1 (Khatimari)	28	2	8	Accept	Comparison
		Cluster-2 (Kutub Member)	28	0	5	Accept	
Chapai nawabganj	Shibganj	Cluster-1 (Shibnarayanpur)	28	0	2	Reject	Dropped
		Cluster-2 (Pakan School)	28	0	1	Reject	
	Sadar	Cluster-1 (Nimgachi Kazipara)	5	0	0	Undecisive	Dropped
Sherpur	Nalitabari	Cluster-1 (Paikka Tala)	28	0	5	Accept	Intervention
		Cluster-2 (Training Center)	28	0	7	Accept	
	Sreebardi	Cluster-1 (Chukchuki)	28	0	5	Accept	Comparison
		Cluster-2 (Khatiadanga)	28	0	7	Accept	
Sunamganj	Dowarabazar	Cluster-1 (Vobanipur)	28	4	19	Accept	Intervention
		Cluster-2 (Purapara)	28	6	3	Accept	
	Jamalganj	Cluster-1 (Alipur)	28	0	5	Accept	Comparison
		Cluster-2 (Harinkandi)	28	1	5	Accept	
Noakhali	Hatiya	Cluster-1 (Saddam House)	28	3	6	Accept	Intervention
		Cluster-2 (Mirpoka)	28	2	4	Accept	
	Subarnachar	Cluster-1 (Soudagor Bari)	28	5	1	Accept	Comparison
		Cluster-2 (Chorlokkhi)	28	3	3	Accept	
Rangamati	Sadar	Cluster-1 (Duluchori)	8	0	0	Undecisive	Restriction on mobility from local government authority
		Cluster-2 (Moddho Manikchori)	8	0	0	Undecisive	
		Cluster-3 (Islampur)	28	0	4	Reject	
		Cluster-4 (Jaillapara)	16	0	1	Undecisive	
		Cluster-5 (Katachori)	16	0	0	Undecisive	
		Cluster-6 (Shariatpur)	2	0	1	Undecisive	
	Naniarchar	Cluster-1 (Egarlachra)	4	0	0	Undecisive	
Dhaka	DNCC	Cluster-1 (Zone-05 Ward-26)	28	5	12	Accept	Intervention
		Cluster-2 (Zone-05 Ward-30)	28	5	11	Accept	Comparison
		Total	504	39	122		

Prevalence of ZD and UI : ZD-7.7% and UI-24.0%

Challenges related to ZDC definition

- Denominator issue in DHIS2

- ZD definition differs from the definition of existing EPI

Recommendations for identifying ZDC

- Use of DHIS2 data is useful for initial identification of ZD areas. So measures should be taken to improve quality of administrative data

- Denominator issue needs to solve for obtaining exact performance

- National surveys (e.g. CES, DHS) should provide micro-level, such as-sub-district /zone level information

- LQAS survey can be widely used for identification and verification of missed communities

Thank You

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Gavi, the Vaccine Alliance

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Canada

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Panel Discussion / Q&A

Evaluation

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