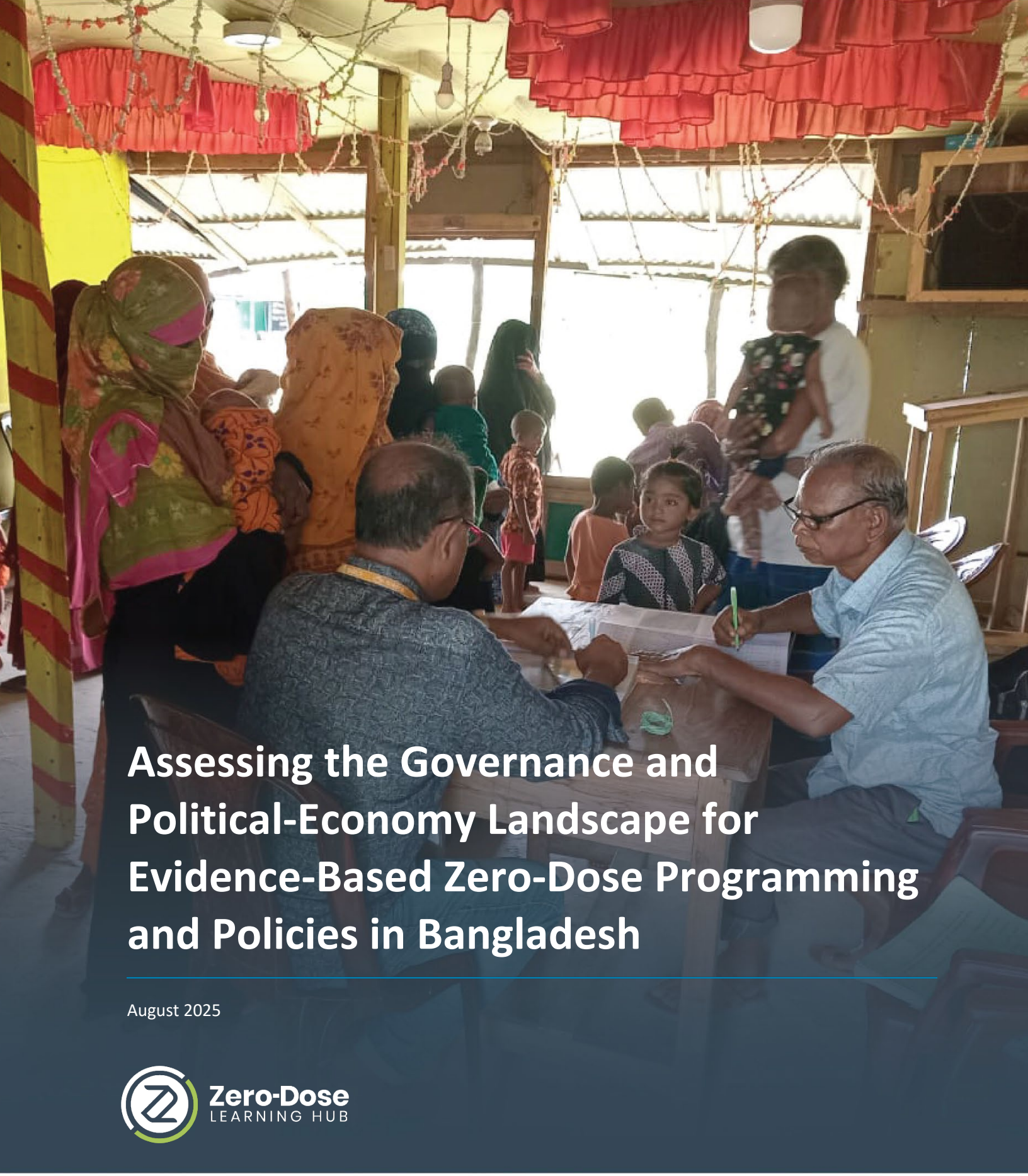

Assessing the Governance and Political-Economy Landscape for Evidence-Based Zero-Dose Programming and Policies in Bangladesh

August 2025

Zero-Dose LEARNING HUB

Gavi The Vaccine Alliance

JSI

IIHMR DELHI

THE GENEVA LEARNING FOUNDATION

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GAVI ZERO-DOSE LEARNING HUB
Funded by Gavi, the Zero-Dose Learning Hub (ZDLH) serves as the global learning partner and is led by JSI Research & Training Institute, Inc. with two consortium partners, The Geneva Learning Foundation and the International Institute of Health Management Research. Together, the consortium enables sharing and learning across four Country Learning Hubs in Bangladesh, Mali, Nigeria, and Uganda to advance the uptake of evidence by synthesizing and disseminating key learnings. The ZDLH also focuses on improving immunization equity and reducing the number of zero-dose and under-immunized children globally by facilitating high-quality evidence generation and uptake.

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ACRONYMS

BDHS	Bangladesh Demographic and Health Survey
CLH	Country Learning Hub
DGHS	Directorate General of Health Services
DEPB	District Evidence-Based Planning and Budgeting
DTP	diphtheria-tetanus-pertussis-containing vaccine
EPI	Expanded Programme on Immunization
GIS	Geographic Information System
HDSS	Health and Demographic Surveillance Systems
HMIS	Health Management Information System
HNPSIP	Health, Nutrition and Population Strategic Investment Plan
icddr,b	International Centre for Diarrhoeal Disease Research, Bangladesh
IIHMR	International Institute of Health Management Research, Delhi
IPC	interpersonal communication
IR	implementation research
IRB	Institutional Review Board
IRMMA	Identify-Reach-Monitor-Measure-Advocate
JSI	JSI Research & Training Institute, Inc.
KII	key informant interview
LGD	Local Government Division
LMIC	low- and middle-income countries
MCs	missed communities
MIS	Management Information System
MoHFW	Ministry of Health and Family Welfare
MoLGRDC	Ministry of Local Government, Rural Development and Cooperatives
NGO	non-governmental organization
NITAG	National Immunization Technical Advisory Group
PEA	Political Economy Analysis
UHC	Upazila Health Complexes

UHFWC	Union Health and Family Welfare Centers
UI	under-immunized
UNICEF	United Nations Children's Fund
VLMIS	Vaccine and Logistics Management Information System
WHO	World Health Organization
ZD	zero-dose
ZDLH	Zero-Dose Learning Hub

Contents

1. INTRODUCTION

1.1 Gavi's 5.0 Strategy: A Paradigm Shift Towards Universal Immunization and Inclusive Health Care Access

Gavi, the Vaccine Alliance's 5.0 Strategy[1] (2020–2025) represents the latest evolution in the organization's approach to global immunization, emphasizing the fundamental goal of ensuring universal access to vaccination for all individuals worldwide. This strategic framework is grounded in the principle of inclusivity, reflecting a commitment to leave no one behind in the pursuit of equitable health care. Within this comprehensive strategy, a pivotal focus is placed on addressing three critical challenges: zero-dose (ZD) children, under-immunized (UI) children, and missed communities (MCs).

Gavi defines ZD children[2] as those who have not received the first dose of diphtheria, tetanus, and pertussis containing vaccine (DTP1) by the end of their first year of life. UI[2] children are defined as those who have not received a third dose of DTP-containing vaccine (DTP3) by the end of their first year of life. MCs[2] encompass population groups facing multiple deprivations, including systematic constraints on their access to immunization and other essential health services. These deprivations may include socio-economic inequities, such as gender-related barriers. Notably, the presence of ZD individuals and populations or disease outbreaks often serves as signals for identifying MCs, given their intrinsic interconnection.

By addressing ZD and UI children and reaching MCs, Gavi's 5.0 Strategy aims to achieve comprehensive coverage, ensuring that the protective umbrella of vaccines extends to every individual.[1] This comprehensive approach aligns with the broader global health agenda of reaching Sustainable Development Goal 3, which targets good health and well-being for all at all ages.[3] Gavi recognizes that true success in immunization programs requires not only increasing overall coverage rates but also specifically targeting and tailoring interventions to those who have been left behind, whether at the individual or community level.[4]

1.2 Overview of IRMMA and the ZDLH Project

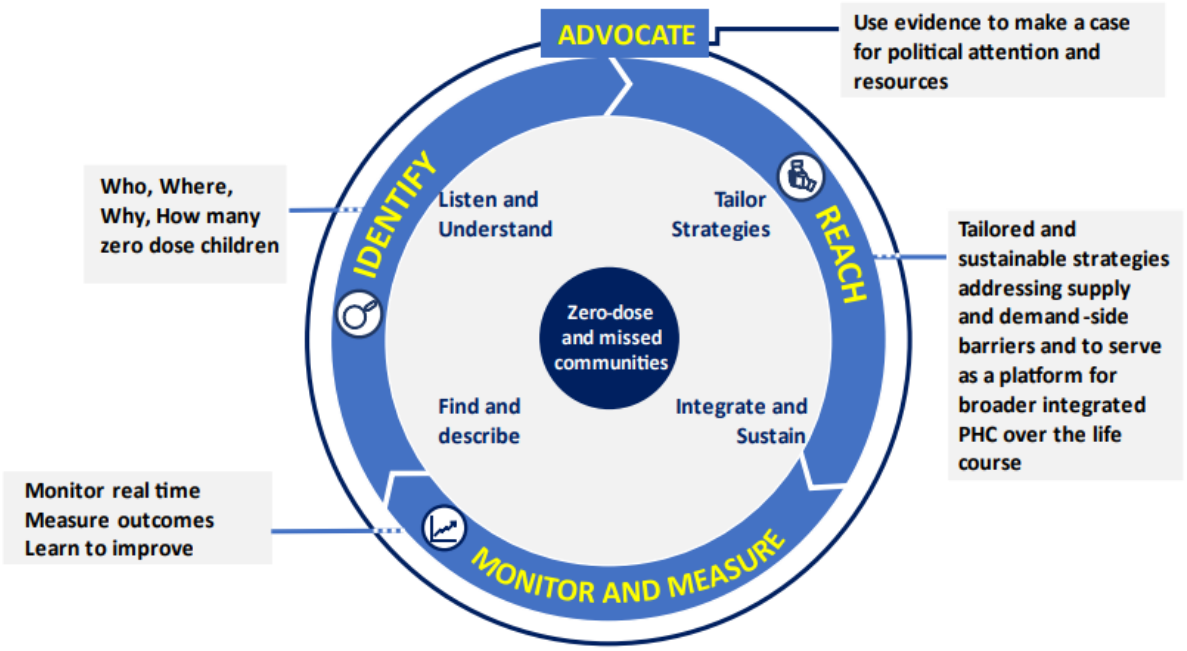
Efforts to design evidence-based immunization interventions often face complex challenges, particularly in low- and middle-income countries (LMICs). To address these, Gavi introduced the Identify-Reach-Monitor-Measure-Advocate (IRMMA) framework[5]—a comprehensive strategic model aimed at improving immunization outcomes through data-driven decision-making (Figure 1). The Gavi-funded Zero-Dose Learning Hub (ZDLH) is a global initiative dedicated to generating evidence and learning on

[1] Gavi, The Vaccine Alliance. 2019. *Gavi Phase V Strategy* (2021–2025). Accessed May 30, 2025. https://www.gavi.org/our-alliance/strategy/phase-5-2021-2025.
[2] Gavi, The Vaccine Alliance. 2021. *Zero-Dose Analysis Card*. https://www.gavi.org/sites/default/files/support/Gavi_Zero-dose_AnalysisCard.pdf.
[3] United Nations. 2022. *The Sustainable Development Goals Report 2022*. https://unstats.un.org/sdgs/report/2022/.
[4] Gavi, The Vaccine Alliance. 2025. *Reaching Zero-Dose Children*. Accessed May 30, 2025. https://www.gavi.org/our-alliance/strategy/phase-5-2021-2025/equity-goal/zero-dose-children-missed-communities.
[5] Gavi, The Vaccine Alliance. (2021). *Guidance on Use of Gavi Support to Reach Zero-Dose Children and Missed Communities*. https://irp.cdn-website.com/44236788/files/uploaded/Gavi_Zero-dose_FundingGuidelines.pdf.

strategies for identifying and reaching ZD and UI children in LMICs. Country Learning Hubs (CLH) in four locations (Bangladesh, Mali, Nigeria, and Uganda) are tasked with operationalizing the IRMMA framework through implementation research (IR) to assess the effectiveness of different interventions tailored to ZD contexts in each country. In Bangladesh, the CLH is led by icddr,b in collaboration with Jhpiego and RedOrange Communications.

The Bangladesh CLH functions as a national platform for knowledge generation, capacity building, and policy engagement, working closely with the Government of Bangladesh and a range of development and non-governmental stakeholders. Its core objective is to apply the IRMMA framework to identify immunization gaps, prioritize underserved populations, and implement tailored interventions. Through research and coordinated action, the CLH seeks to strengthen immunization systems and ensure that no child is left behind, especially those who have yet to receive any routine vaccinations.

Figure 1. Using ZD Strategy to Strengthen Equitable Primary Health Care across the Life Course[6]



[6] Gavi, The Vaccine Alliance. 2021. *Guidance on Use of Gavi Support to Reach Zero-Dose Children and Missed Communities*. https://irp.cdn-website.com/44236788/files/uploaded/Gavi_Zero-dose_FundingGuidelines.pdf.

1.3 Overview of ZD in Bangladesh: Unravelling Complex Challenges

Since its inception in 1979, Bangladesh's Expanded Programme on Immunization (EPI) has made remarkable progress, raising vaccine coverage from below 2 percent in 1985 to 83.9 percent by 2019.[7] The country's immunization system is often cited as a global model, backed by robust infrastructure and proactive outreach strategies that have successfully reached diverse and hard-to-reach populations.[8]

Despite these achievements, significant challenges persist, particularly for ZD and UI children and MCs. These vulnerable groups are often situated at the intersection of social, economic, geographic, and systemic barriers that limit access to routine immunization services.[9,10]

The socio-economic context is a key driver of immunization inequities. Families facing poverty, unstable employment, and limited education often struggle to prioritize preventive health care. [8,11] Low levels of health literacy further hinder awareness about vaccination schedules and their importance.[12] Moreover, gender dynamics, especially constraints faced by working mothers, can limit timely access to vaccination services.[13]

Geographical disparities compound these issues. Remote rural areas, urban slums, and other hard-to-reach regions often experience inadequate health infrastructure and workforce shortages.[14,15] For instance, the north-eastern division of Sylhet reports lower full immunization coverage (85.9 percent) compared to other regions like Rajshahi (93.1 percent), Khulna (92.3 percent), and Dhaka (89.6 percent), indicating the need for geographically tailored approaches.[16]

Cultural norms and gender-related barriers further influence health-seeking behaviors; often deterring caregivers, particularly women, from accessing immunization services.[17,18] These overlapping factors contribute to the persistence of ZD children, as well as UI children, who fail to complete the full schedule.[19]

The pentavalent vaccine, which protects against DTP, Hepatitis B, and Haemophilus influenzae type b (Hib), is foundational to preventing life-threatening childhood diseases. According to Bangladesh's

[7] UNICEF Bangladesh. 2021. *Leaving No Child Behind: Scaling Up Investment in Immunization to Protect Against Diseases*. United Nations Children's Fund. https://www.unicef.org/bangladesh/media/5271/file/Immunization%20Advocacy%20Brief%20final.pdf.

[8] World Health Organization. n.d. "Immunization in Bangladesh." Accessed June 2, 2025. https://www.who.int/bangladesh/health-topics/immunization.

[9] Johri, Mira, Sunil Rajpal, and S. V. Subramanian. 2021. "Progress in Reaching Unvaccinated (Zero-Dose) Children in India, 1992–2016: A Multilevel, Geospatial Analysis of Repeated Cross-Sectional Surveys." *The Lancet Global Health* 9 (12): e1697–e1706. https://doi.org/10.1016/S2214-109X(21)00349-1.

[10] Ali, Huda A. et al. 2022. "Vaccine Equity in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis." International Journal for Equity in Health 21 (1): 82. https://doi.org/10.1186/s12939-022-01678-5.

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[15] Khan, Ashraful Islam et al. 2019. "Post-Vaccination Campaign Coverage Evaluation of Oral Cholera Vaccine, Oral Polio Vaccine and Measles-Rubella Vaccine among Forcibly Displaced Myanmar Nationals in Bangladesh." *Human Vaccines & Immunotherapeutics* 15 (12): 2882–2886. https://doi.org/10.1080/21645515.2019.1616502.

[16] National Institute of Population Research and Training (NIPORT), and ICF. 2019. *Bangladesh Demographic and Health Survey 2017-18: Key Indicators.* https://dhsprogram.com/pubs/pdf/PR104/PR104.pdf.

[17] Sen, Kanchan Kumar, Shahnaz Nilima, Fatima-Tuz Zahura, and Wasimul Bari. 2023. "Do Education and Living Standard Matter in Breaking Barriers to Healthcare Access among Women in Bangladesh?" *BMC Public Health* 23 (1): 1431. https://doi.org/10.1186/s12889-023-16346-8.

[18] Uddin, Jasim, Haribondhu Sarma, Tajul I. Bari, and Tracey P. Koehlmoos. 2013. "Introduction of New Vaccines: Decision-Making Process in Bangladesh." *Journal of Health, Population and Nutrition* 31 (2): 211–217. https://doi.org/10.3329/jhpn.v31i2.16385.

[19] National Institute of Population Research and Training (NIPORT), and ICF. 2019. *Bangladesh Demographic and Health Survey 2017-18: Key Indicators*. NIPORT, and ICF. https://dhsprogram.com/pubs/pdf/PR104/PR104.pdf.

immunization schedule, full vaccination status includes Bacillus Calmette-Guérin, polio (excluding the birth dose), pentavalent, and measles-rubella vaccines.[20]

While Bangladesh has made important strides toward expanding overall coverage, reaching the "last mile" remains a pressing challenge.[21] Addressing this requires a multi-layered, context-specific strategy that tackles the underlying barriers to access—such as resource limitations, social inequities, and geographic isolation—and supports targeted interventions for ZD and UI children and MCs.

1.4 Purpose of the Political Economy Analysis

The success of Gavi 5.0's goals—particularly reaching ZD, UI, and MCs—depends heavily on the political and economic context in which immunization programs operate.[22] This political economy analysis (PEA) aims to explore how governance structures, stakeholder dynamics, decision-making processes, and resource allocation influence the generation and use of evidence for immunization in Bangladesh.[21]

The PEA serves as a strategic tool to uncover how political priorities, institutional capabilities, and power relations shape the design and implementation of immunization efforts.[23,24] Rather than focusing solely on technical barriers, it highlights the deeper political and economic factors that either facilitate or hinder progress. By examining these dynamics, the analysis provides critical insights to inform data-driven policies and more responsive programmatic strategies.

The overarching aim of this study is to understand how political and economic factors affect the generation, flow, and use of evidence in shaping immunization policies and programs targeting ZD, UI, and MC populations in Bangladesh. Specifically, the analysis seeks to:

1. Assess the structural and regulatory frameworks and institutional dynamics at national and sub-national levels that influence how evidence is generated and used;
2. Identify accomplishments and gaps in evidence generation and use, including both operational support and outcomes related to ZD/UI/MC programming;
3. Examine the roles of formal and informal decision-making processes involving multi-level, multi-sectoral stakeholders in shaping immunization priorities;
4. And explore the feasibility of introducing tailored policy interventions that improve the generation and use of evidence to advance equitable immunization at both national and local levels.

In applying a problem-driven PEA framework,[25] this study focuses on identifying bottlenecks and opportunities in governance, decision-making, and institutional coordination that directly impact efforts to identify and reach ZD children. The analysis offers actionable recommendations that align with

[20] Boulton, Matthew L., Bradley F. Carlson, Laura E. Power, and Abram L. Wagner. 2018. "Socioeconomic Factors Associated with Full Childhood Vaccination in Bangladesh, 2014." *International Journal of Infectious Diseases* 69: 35–40. https://doi.org/10.1016/j.ijid.2018.01.035.

[21] Gavi Zero-Dose Learning Hub. 2023. *Bangladesh Zero-Dose Landscape.* https://zdlh.gavi.org/sites/default/files/2023-07/Zero-Dose%20Learning%20Hub_Bangladesh%20Landscape_July_28_2023_FINAL.pdf.

[22] Gauri, Varun, and Peyvand Khaleghian. 2002. "Immunization in Developing Countries: Its Political and Organizational Determinants." *World Development* 30 (12): 2109–2132. https://doi.org/10.1016/S0305-750X(02)00151-1.

[23] Adamu, Abdu A., Tene-Alima Essoh, Rabiu I. Jalo, and Charles S. Wiysonge. 2023. "Toward Political Economy of Sustainable Financing for Immunization in the World Health Organization African Region through a Systems Thinking Lens." *International Journal of Infectious Diseases* 136: 158–161. https://doi.org/10.1016/j.ijid.2023.09.017.

[24] Kuwawenaruwa, August, Henry Mollel, John M. Machonchoryo, Federica Margini, Jennie Jaribu, and Peter Binyaruka. 2023. "A Political Economy Analysis of Strengthening Health Information System in Tanzania." *BMC Medical Informatics and Decision Making* 23 (1): 245. https://doi.org/10.1186/s12911-023-02319-9.

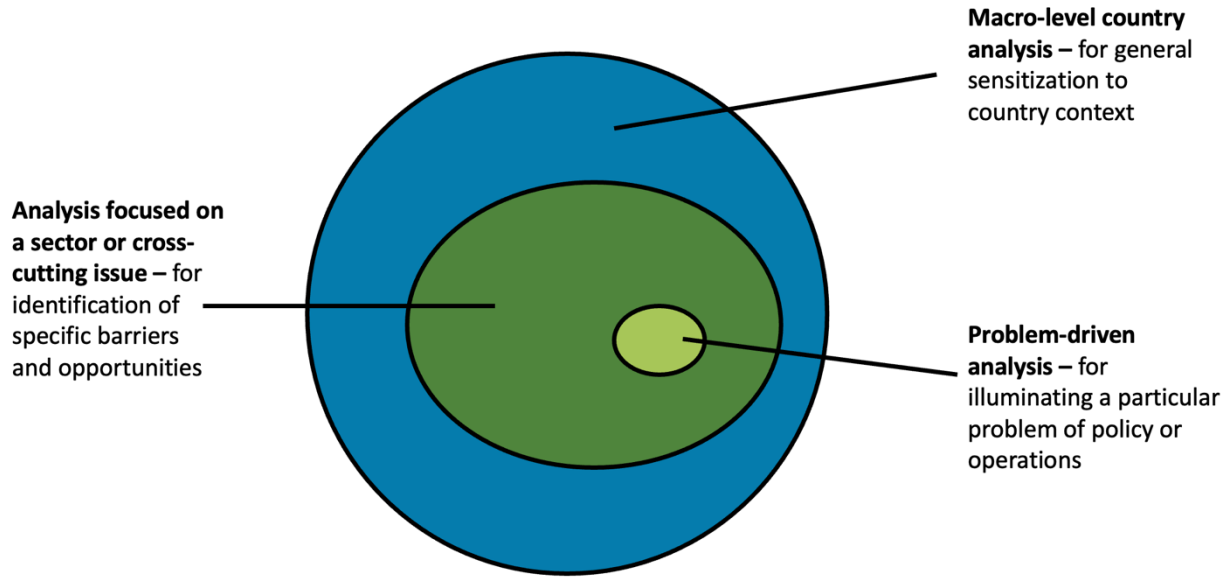
[25] Mcloughlin, C. (2014). Political Economy Analysis: Topic Guide (2nd Ed.) Birmingham, UK: GSDRC, University of Birmingham.

Bangladesh's evolving health priorities and support the development of a resilient, evidence-informed immunization system.

1.5 Theoretical Framework

The PEA offers a valuable lens for the Bangladesh CLH, government institutions, and immunization partners to understand the governance, institutional, and decision-making dynamics shaping immunization outcomes. This study employs a problem-driven PEA framework[25] (Figure 2) to investigate both macro-level influences and sector-specific challenges related to the generation and use of evidence in reaching ZD children.

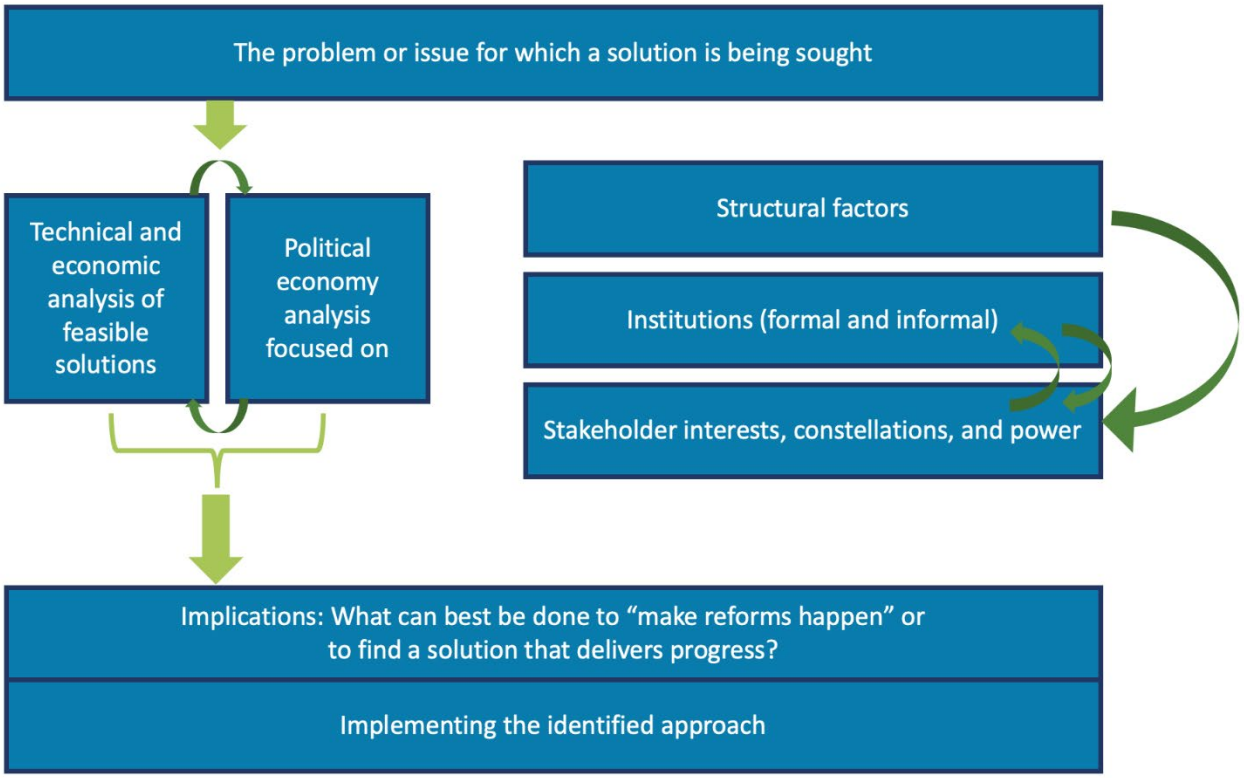
Figure 2. Levels of PEA[25]



At the macro level, the analysis considers broad political and economic structures that affect vaccination coverage, including national governance arrangements, financing priorities, and overarching health policies. This level sets the stage for understanding how high-level decisions and systemic constraints shape immunization delivery and data ecosystems. At the sectoral level, the focus shifts to operational realities—specifically, the barriers and enablers within the health system that influence evidence uptake and policy implementation. This includes examining stakeholder roles, institutional capacity, regulatory frameworks, and power dynamics. The goal is not only to identify obstacles but also to highlight strategic entry points for reform and investment.

As illustrated in Figure 3, the problem-driven PEA framework is designed to work backward from observed challenges—such as the persistence of ZD and UI children—to uncover the structural, institutional, and behavioral factors driving them. It also assesses the potential for change, identifying where political support, capacity, and incentives align to create feasible pathways for action.

Figure 3. Layers and Key Concepts of Problem-Driven PEA[26]



In Bangladesh, the immunization landscape is shaped by a complex and often hierarchical bureaucracy, where decision-making is largely top-down and strongly influenced by political priorities.[27] With this context in mind, the present study intends to use the problem-driven PEA framework to reveal crucial insights into political and institutional dynamics, decision-making mechanisms, and the allocation of resources specifically related to evidence generation and use for decision-making for immunization programming, particularly around ZD populations. For the purposes of the PEA, **political dynamics** refer to how government leadership, party agendas, and high-level political will shape health sector priorities—including the visibility, funding, and urgency given to immunization initiatives. For example, strong endorsement from national leaders can mobilize resources quickly or sustain program momentum during crises, as seen during the COVID-19 pandemic.[18,28] **Institutional dynamics** involve the roles, mandates, and interactions among different ministries, agencies, and partners, such as the Ministry of Health and Family Welfare (MoHFW), Directorate General of Health Services (DGHS), the Ministry of Local Government (for urban immunization), and international actors like Gavi, World Health Organization (WHO), and United Nations Children's Fund (UNICEF). Coordination challenges across these actors can result in fragmented service delivery, duplications, or gaps—especially in urban areas or for mobile populations.

[26] Fritz, Verena, Brian Levy, and Rachel Ort, eds. 2014. *Problem-Driven Political Economy Analysis*: The World Bank's Experience. Directions in Development: Public Sector Governance. Washington, DC: World Bank Group. https://documents1.worldbank.org/curated/en/147811468171250430/pdf/Problem-driven-political-economy-analysis-the-World-Banks-experience.pdf.

[27] Chowdhury, A, O.H. Chowdhury, and S. Islam. 1998. "Political Commitment of Immunization Programme in Bangladesh." https://dspace.bracu.ac.bd:8443/xmlui/handle/10361/13465.

[28] Haider, Mohammad Sabbir, Sitaporn Youngkong, Montarat Thavorncharoensap, and Praveen Thokala. 2022. "Priority Setting of Vaccine Introduction in Bangladesh: A Multicriteria Decision Analysis Study." *BMJ Open* 12 (2): e054219. https://doi.org/10.1136/bmjopen-2021-054219.

Decision-making mechanisms refer to both formal structures (such as national immunization technical committees or budgetary review processes) and informal practices (such as personal networks, political bargaining, or administrative discretion) that determine how priorities are set and actions are taken. These mechanisms influence which data are considered credible, how quickly policies adapt to new evidence, and who is included in critical planning processes. Finally, **resource allocation** encompasses how financial, human, and logistical resources are distributed across regions and programs. This includes decisions about funding streams, staff deployment, cold chain support, and investments in data systems like DHIS2 or the e-Tracker. Misalignment between needs and resources—often due to outdated data, bureaucratic bottlenecks, or donor-driven priorities—can undermine the effectiveness of even well-designed immunization programs.

By applying this problem-driven PEA framework, the study aims to unpack these layers of complexity and generate actionable insights. These findings can help stakeholders strengthen evidence generation, improve coordination across actors, and ensure that data meaningfully informs the design and implementation of policies that reach ZD and UI children and MCs.

2. Data and Methods

2.1 Study Design

This study used a qualitative, cross-sectional design[29] to explore the political and economic factors influencing the generation and use of evidence in ZD, UI, and MC immunization programming in Bangladesh. A qualitative exploratory approach[30,31] was selected to allow for in-depth understanding of stakeholder perspectives, institutional processes, and governance mechanisms, particularly those that are not easily captured through quantitative methods.

The primary method of data collection was key informant interviews (KIIs) [32] with stakeholders across national, sub-national, and community levels during February–March 2024. This was complemented by a validation workshop with immunization stakeholders in February 2025,[33,34] where initial findings and recommendations were discussed to ensure alignment with on-the-ground realities and stakeholder experiences.

[29] Wang, Xiaofeng, and Zhenshun Cheng. 2020. "Cross-Sectional Studies." *Chest* 158 (1): S65–S71. https://doi.org/10.1016/j.chest.2020.03.012.
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2.1.1 Study area and participants

The study was conducted in two purposively selected districts in Bangladesh: Dhaka (Dhaka Division) and Sherpur (Mymensingh Division). These locations were chosen to reflect variation in development levels and to ensure the inclusion of stakeholders operating in both urban and rural contexts. Participants included a diverse group of stakeholders actively involved in immunization efforts, including government officials (national and sub-national), development partners (e.g., Gavi, WHO, UNICEF), technical and implementing partners (e.g., PATH), local non-governmental organizations (NGOs), and community-level health service providers.

This multi-sectoral selection enabled a comprehensive view of governance, implementation, and evidence use across the immunization landscape.

2.1.2 Sampling strategy

A purposive sampling approach was employed to ensure representation from key organizations and institutions engaged in immunization. A total of 21 key informants were interviewed between February and March 2024. These informants were selected based on their roles in policy formulation, program implementation, data management, and service delivery related to immunization.

Efforts were made to include voices from both national-level decision-makers and sub-national implementers, as well as those from the public sector, private sector, and NGOs. Table 1 outlines the distribution of participants by sector and designation.

Table 1. Key Informants Targeted for the Study

Level or type of stakeholder	Organization	Designation	Number of interviews
Government	MOHFW	Joint Secretary (PH), Health Service Division	1
	DGHS	Director and Line Director, MNC&AH Programme Manager-EPI, Deputy Programme Manager-EPI (Field service)	3
	Institute of Epidemiology, Disease Control and Research	Director	1
	Sub-national	Civil Surgeon, Upazila Health and Family Planning Officer, District EPI Superintendent, Health Inspector, Medical Officer (Disease Control), Medical Technologist (EPI)	6
City Corporation (Government)	Dhaka North City Corporation	Chief Health Officer, Assistant Health Officer, EPI Supervisor	3
Sub-national Technical Partner	WHO	Surveillance and Immunization Medical Officer	1
Technical Partner	WHO	Team Leader, National Programme Officer-Immunization	2
	UNICEF	Health Specialist (Immunization)	1
	PATH	Senior Programme Officer	1
Funder	Gavi, the Vaccine Alliance	Vice Chair of Gavi CSO Steering Committee	1
Local NGO	NGO	Clinic Manager	1
Total			**21**

2.1.3 Data collection

Data were collected through semi-structured interviews using tailored interview protocols (see Annex 1). Separate KII guides were developed for different categories of stakeholders, including government actors, international agencies, and NGOs. These instruments were informed by a review of the literature and aligned with the study's objectives.

The tools were developed by the research team and refined through multiple rounds of internal discussion to ensure relevance and clarity. However, due to logistical constraints, the instruments were not pilot tested prior to use in this study.

The data collection instruments explored a broad range of themes to capture the complexity of immunization governance and decision-making in Bangladesh. Questions addressed institutional roles and responsibilities as well as stakeholders' engagement in evidence generation and use. They also delved into the structural and regulatory landscape—including national and sub-national governance arrangements, policy expectations, and organizational hierarchies. Additional areas of inquiry focused on health system infrastructure, functional and technical support mechanisms, and programmatic outcomes related specifically to reaching ZD and UI children and MCs.

To better understand the decision-making environment, the instruments included probes into both formal mechanisms (e.g., protocols, committee decisions, budgeting processes) and informal dynamics (e.g., local negotiations, political influences). Questions also assessed the feasibility of behavioral and operational changes by identifying barriers encountered during implementation and gauging stakeholder perspectives on sustainability and scalability. Finally, the guides included targeted items on current efforts and challenges in evidence generation, including the use of digital tools, data quality issues, and gaps in identifying ZD populations.

All interviews were conducted in-person by two trained public health professionals in Bangladesh. With participants' consent, interviews were audio-recorded and subsequently transcribed for analysis.

2.1.4 Data analysis

Thematic analysis was conducted using Braun and Clarke's framework,[35] enabling systematic identification of recurring themes and patterns relevant to the study's objectives. After transcription, each interview transcript was independently coded by two members of the research team to enhance inter-coder reliability and minimize bias. Discrepancies in coding were discussed and resolved collaboratively to ensure consistency and accuracy.

The analysis process began with careful familiarization with the transcripts, followed by initial coding based on both deductive categories aligned with the study's objectives and inductive insights that emerged from the data itself. These codes were then grouped into broader themes, with particular attention to areas such as evidence generation, data use, governance mechanisms, and barriers to identifying and reaching ZD, UI, and MC populations. The team engaged in a continuous review and refinement of themes, comparing perspectives across stakeholder types and geographic contexts.

To support systematic analysis and ensure traceability in the data analysis, coding and theme development were managed using Taguette, an open-source qualitative data analysis software. The final themes provided a structured understanding of the political and institutional landscape influencing immunization programming in Bangladesh, including both enabling factors and operational gaps.[36]

[35] Braun, Virginia, and Victoria Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3 (2): 77–101. https://doi.org/10.1191/1478088706qp063oa.

[36] Knowledge Bank. 2018. "The CAQDAS: Software for Qualitative Analysis." https://www.mvorganizing.org/the-caqdas-software-for-qualitative-analysis/.

2.1.5 Ethics and consent

Ethical considerations were central to this study's design and implementation. Participants were provided with detailed information about the study's objectives and methodology and were required to give informed consent prior to participation (see Annex 2). Confidentiality and anonymity were maintained throughout the research process. Data were stored securely and accessed only by authorized team members. Ethical approval was obtained from:

- The International Institute of Health Management Research (IIHMR), New Delhi, Approval ID: Institutional Review Board (IRB)/2023-2024/02 (dated 10.05.2023)
- The icddr,b IRB, Bangladesh, Approval ID: PR-23129 (dated 14.11.2023)

The study adhered to ethical principles of respect for persons, beneficence, and justice, ensuring voluntary participation and the right to withdraw at any stage without penalty.

3. Results

Interview findings are presented based on the thematic areas aligned with the objectives of the study.

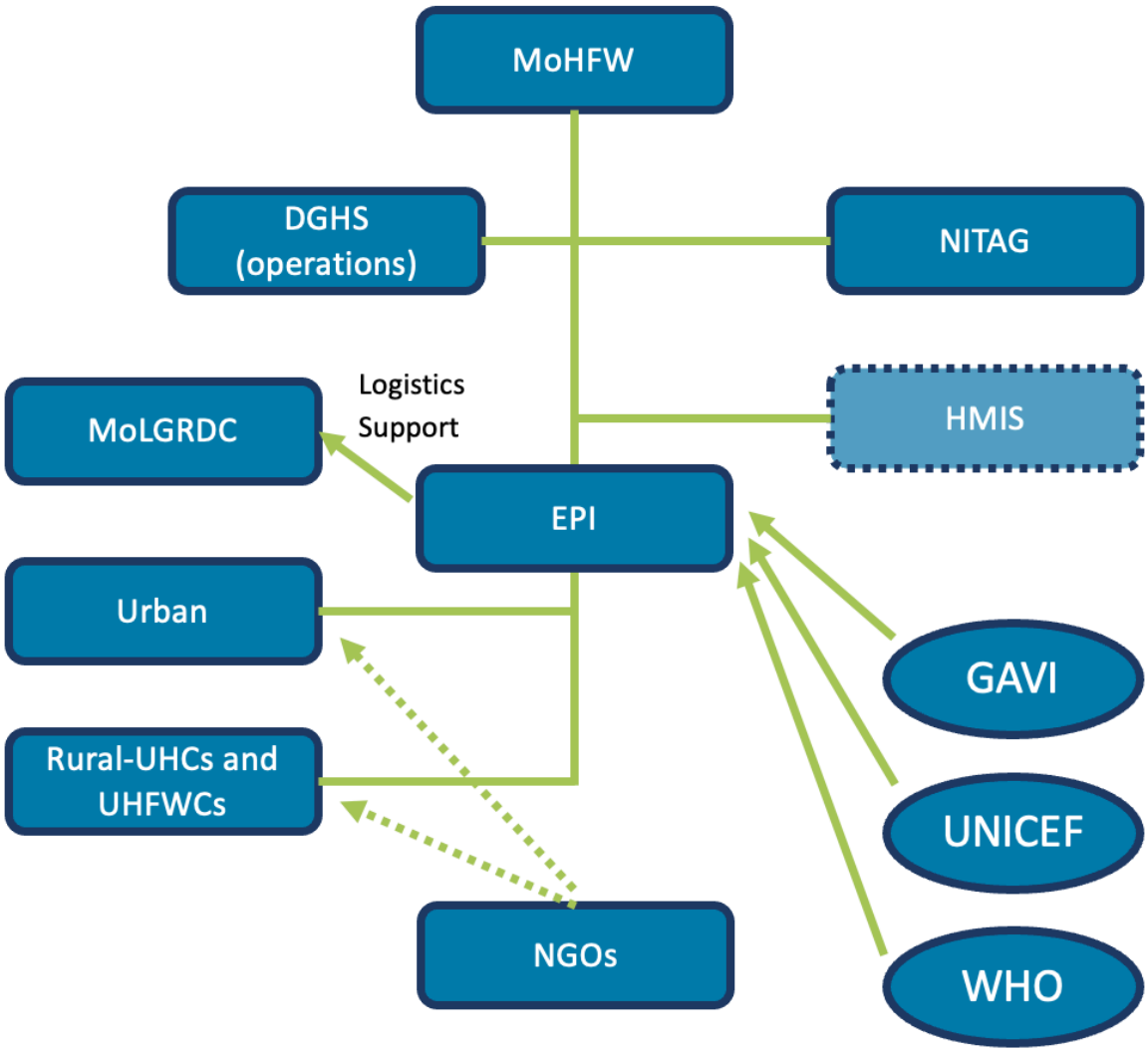
3.1 Objective 1

To examine existing structural features, regulatory frameworks, and institutional dynamics at the national and sub-national levels that influence generation and use of evidence to inform policies and programming for ZD/UI/MCs in Bangladesh.

3.1.1 The organized framework of immunization services in Bangladesh

Bangladesh's immunization system operates within a structured and nationally coordinated public health framework (see Figure 4). At the center of this framework is the MoHFW, which is responsible for setting national health policy, managing health sector priorities, and overseeing all public health programs, including immunization. Within the MoHFW, the DGHS is the primary agency responsible for implementing immunization services. This includes planning and executing vaccination campaigns, managing the procurement and distribution of vaccines, and overseeing the delivery of services across rural health infrastructure.

Figure 4. Administrative setup of immunization services in Bangladesh



The EPI, launched in 1979, is the operational backbone of the immunization system. It provides a nationally standardized vaccine schedule and ensures coverage for a range of vaccine-preventable diseases. The EPI plays a central role in both strategic planning and service delivery, working across a broad network of public health facilities—from urban health centres to rural dispensaries, including Upazila Health Complexes (UHCs) and Union Health and Family Welfare Centres (UHFWCs). In urban settings, the immunization program is jointly managed by the Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC) and city corporations, often in partnership with local NGOs. These NGOs support service delivery, particularly in hard-to-reach and underserved communities, by deploying vaccinators and outreach staff to extend the reach of public services.

International partnerships have played a critical role in strengthening Bangladesh's immunization system. Gavi has been instrumental in financing vaccine procurement for over 20 infectious diseases and helping Bangladesh introduce new vaccines, including those for rotavirus and pneumococcal infections, while continuing to support routine immunization for diseases like measles, polio, and diphtheria. Meanwhile, WHO and UNICEF provide vital technical assistance in areas such as cold chain management, vaccine safety monitoring, and the design of strategies to reach UI and ZD populations.

A key component underpinning Bangladesh's immunization system is its regulatory landscape, which refers to the policies, protocols, institutional mandates, and accountability mechanisms that govern how immunization is planned, funded, monitored, and delivered. While overarching policy frameworks exist—such as national immunization strategies and health investment plans—gaps remain in ensuring effective coordination, enforceability, and alignment of responsibilities across key institutions. This is particularly evident in the urban immunization context, where overlapping mandates between the MoHFW and the MoLGRDC often result in fragmented service delivery, inconsistent oversight, and duplication of effort. These regulatory ambiguities, combined with limited coordination among implementing partners and donor-funded NGOs, create programmatic blind spots, especially in urban slums and among mobile or underserved populations. Despite substantial contributions from domestic institutions and international partners, the broader system continues to struggle with ensuring coherence across ministries and sectors, particularly in high-need or hard-to-reach areas. The interplay of governance fragmentation, unclear regulatory authority, and resource constraints hinders the system's ability to adapt responsively and equitably to local immunization needs.

"We do face a little challenge when it comes to urban immunization. We provide the vaccines but the services are being given by the city corporation and Municipality. In that case there are some problems and we are trying for better coordination and involvement and for that UNICEF also provides extra staff to lower the gap in between. Our ministry is trying to coordinate with the local government to solve the issues." ***(Respondent ID: PEA-06)***

To support evidence-based policymaking, Bangladesh has also established the National Immunization Technical Advisory Group (NITAG), which provides guidance on vaccine introduction and immunization strategies. While NITAG plays a vital role in translating evidence into policy recommendations, its ability

to influence implementation on the ground is constrained by the broader structural and regulatory fragmentation noted above.

3.1.2 Sub-national structures and institutional dynamics

At the sub-national level, immunization services in Bangladesh are delivered primarily through UHCs and UHFWCs, which serve as the operational arms of the EPI in rural areas. In urban settings, service delivery is managed through city corporations under the MoLGRDC, often in collaboration with local NGOs. While these structures provide the foundation for local implementation, several institutional and operational challenges affect their effectiveness.

First, resource constraints—especially for community-level health workers and volunteers—pose a significant barrier to effective outreach. Community Health Volunteers, outreach workers, and frontline health staff are essential to identifying and reaching ZD and UI children, particularly in hard-to-reach areas. However, they often operate under conditions of severe understaffing, irregular payment, limited training, and insufficient logistical support. Many rely on temporary donor funding or NGO-backed incentives, creating a fragile foundation for sustainable service delivery. Without consistent support, these workers face overwhelming workloads and lack the tools needed to track and follow up with children who fall outside the formal health system.

"One of the biggest constraints is that there are about 21 staff for immunization in the south city corporation. Five of them are EPI superintendents and the rest 16 are vaccinators. They have to cover a huge area. Mostly, they are paid through NGOs and rest salaries are paid by ADB. These funds have been working since the early 2000's but I know this fund is coming to an end this June." ***(Respondent ID: PEA-04)***

Second, there is a disconnect between sub-national realities and national decision-making due to weak integration of local data into planning processes. While local health workers and facilities often generate valuable insights through household visits, micro-planning, and outreach sessions, this information is rarely captured in real-time or systematically shared with national authorities. Bangladesh's Health Management Information System (HMIS), the primary mechanism for tracking immunization coverage, has significant limitations as data from hard-to-reach and underserved areas are often delayed, incomplete, or insufficiently disaggregated, especially regarding ZD and UI populations. This compromises the ability of both national and sub-national actors to generate actionable insights, monitor program effectiveness, or adapt strategies in real time. As a result, critical decisions at the national level are often made based on aggregated or outdated data, leaving the specific challenges of ZD children and MCs unaddressed.

"Data improvement is one of our biggest challenges of our program. We have to do many exercises to improve the quality of the data. We can see that in the coverage report we get from the field findings, we can observe some discrepancies as all the data is hand written and as you may know there is loss of data quality in case of handwritten data. [....] National EPI is going through a transitioning phase in terms of data quality. We have been using handwritten reports for a long time and everyone wants digitalization and innovation in this regard now. [...] We are using different tools which are not harmonizing with the workers and their activities yet. We are getting support through the national EPI and they don't discourage these sorts of innovations. We are also receiving support for MIS. These tools that are being developed, we are facing many challenges with these tools. [...] We have been told by the government that the MIS is the main source of the data. Government wants to use the tools that are compatible with the MIS. We want to make it such that this practice will be beneficial for the program. It has already been decided by the government. We need concurrence between National EPI and MIS to digitalize our data collection methods." ***(Respondent ID: PEA-14)***

Third, the system remains highly centralized, with top-down decision-making that often overlooks local complexities. Policies and programmatic directives are typically developed at the national level and disseminated downward with limited space for local adaptation or input. Sub-national actors—such as district health officers, EPI supervisors, or local government health officials—rarely have the autonomy or authority to modify strategies based on local epidemiological patterns, demographic changes, or logistical constraints. This lack of flexibility leads to misaligned priorities and inefficient use of resources on the ground, particularly in areas with high mobility, social marginalization, or poor infrastructure.

"We can work on the local government commitments. The commitments mainly need to be strong at the central level but if I talk about the implementation level, the local political leaders have a big role to play. It is not only the political leaders, we also have to focus on the religious leaders and prominent figures of those areas. These people are able to circulate information and create awareness and increase participation for such programs. The main reason as to why we need to work on the root level is to engage the community people. Community engagement and community awareness is very important. If we could make a team with local political leaders, community volunteers, religious leaders, and other prominent figures, they can better track and follow up on people who have had newborn children or people who need vaccination. It is very important to decentralize these programs and empower the local people to actively be a part of this program." ***(Respondent ID: PEA-09)***

Together, these dynamics contribute to a system where local efforts are vital but undervalued and where national strategies are ambitious but insufficiently grounded in the realities of the communities they aim to serve. Addressing these issues requires deliberate investments in human resources, data integration, and decision-making autonomy at sub-national levels to ensure that immunization programs are responsive, equitable, and sustainable.

3.1.3 Institutional dynamics

Institutional dynamics, particularly the interactions between government agencies, international organizations, and civil society, also significantly affect the generation and use of evidence. In Bangladesh, the EPI program works closely with NGOs and international partners, which provide essential support for data collection, capacity building, and program implementation. Moreover, the health system in Bangladesh is characterized by a strong central authority, which often leads to a hierarchical decision-making process that does not always incorporate sub-national or grassroots-level input. This top-down approach can hinder the effective translation of local evidence into national policies, particularly for issues like ZD, which often require localized interventions tailored to specific community contexts.

Summary of Findings

Finding 1: The health system in Bangladesh is characterized by a strong central authority. The EPI, led by the MoHFW, plays a key role in immunization policy and decision making, supported by international partners like Gavi, WHO, and UNICEF.

Finding 2: Bangladesh's HMIS faces limitations in providing real-time and comprehensive data, particularly in hard-to-reach regions and sub-national areas, hindering the use of those data in evidence-based decision-making at higher levels.

Finding 3: Sub-national institutions—such as UHCs, UHFWCs, and NGOs—play a vital role in program implementation. However, they face challenges due to limited resources and a lack of integration with national data systems, resulting in inefficiencies and gaps in identifying and reaching ZD children and MCs. This gap is often filled by community health workers and NGOs working at the sub-national level that tend to operate independently due to the absence of frameworks in regulating the funding for and roles in service delivery.

Finding 4: Institutional coordination across government agencies, partners, and NGOs remains inconsistent. A top-down decision-making structure, fragmented accountability, and the absence of formal mechanisms for integrating local perspectives hinder the alignment of national strategies with on-the-ground realities, particularly for ZD/UI/MC populations.

3.2 Objective 2

To conduct an assessment of accomplishments and gaps in evidence generation and use within the governance and political economy landscape, considering (i) organizational, infrastructural, and functional assistance and (ii) outcomes pertaining to ZD/UI/MC policies and programming in Bangladesh.

3.2.1 Political economy landscape

Several national policy and strategy documents relevant to immunization exist, such as the Bangladesh 8th Five-Year Plan (2020–25), which sets forth future immunization targets. These targets include achieving a 98 percent vaccination coverage rate for all basic vaccines by 2025 and 100 percent childhood vaccination coverage by 2030. The plan also outlines priority interventions for child health, emphasizing routine immunization and disease surveillance alongside supplementary immunization activities like national immunization days and measles/tetanus campaigns. Other notable national strategies and policies include the Health, Nutrition and Population Strategic Investment Plan (HNPSIP), National Urban Health Strategy, National Health Policy, and the National Immunization Strategy of Bangladesh. Another important commitment related to immunization is the Ending Preventable Child Deaths by 2030: Bangladesh Call for Action, declared in 2013 as a follow-up to the UNICEF Child Survival Call for Action. This commitment aims to reduce the under-five mortality rate to 20 deaths per 1,000 live births by 2030, with the introduction of new vaccines listed as one of the seven strategic interventions to achieve this target.

3.2.2 Sources of data to monitor coverage

Bangladesh relies on a range of data sources to monitor immunization coverage and inform policy decisions. These include routine administrative data systems like DHIS2, as well as periodic household surveys such as the Bangladesh Demographic and Health Survey (BDHS), Health and Demographic Surveillance Systems (HDSS),[37] and EPI Coverage Evaluation Surveys.

"All the information comes in MIS and DHIS tools. We all have access to DHIS2. Anyone from our ministry can log in there and see the information. We also have things like Coverage surveys and Data quality surveys." ***(Respondent ID: PEA-06)***

While these sources have enabled progress in measuring overall immunization trends, they fall short in supporting targeted strategies for reaching ZD and UI children. A recent data landscape assessment conducted by icddr,b revealed persistent limitations in tracking ZD populations.[38] Notably, national dashboards, such as the Routine Health Information Dashboard, do not consolidate or report ZD-specific estimates, making it difficult for policymakers and program managers to visualize the scope or geographic distribution of missed children. Monitoring tools currently in use lack standardized indicators or processes for identifying and tracking ZD children over time. A further challenge lies in the weak integration between routine health data and accurate population-level denominators. In many cases, coverage rates are calculated without reliable data on the size and characteristics of the catchment population, leading to either overestimated or underestimated performance metrics. This disconnect is particularly problematic in areas with high population mobility, informal settlements, or limited civil

[37] icddr,b. *Health and Demographic Surveillance Systems*. https://www.icddrb.org/health-and-demographic-surveillance-systems.
[38] Yunus, S., P. Singh, C. Morgan, T. Wahed, and Md. Jasim Uddin. 2023. "Review of Information Systems Related to Routine Tracking of Zero-Dose Children in Bangladesh." [Under review].

registration systems. In addition, Bangladesh lacks a national name-based tracking system, which restricts the ability to monitor a child's immunization journey over time or to follow up with those who have missed doses. This limitation disproportionately affects mobile and urban poor populations, who are more likely to drop out of the immunization schedule without being flagged for follow-up.

"Using administrative data is very tricky. We have a lot of problems with the denominator here in Bangladesh like other countries. If you look 2022, currently Bangladesh has vaccinated 3.9-4 million children but if you see the census its 2.9 million, now it is 3 million children. How do you correlate these? Census is government data, but microplanning is 4.1 million, so there is lot of problem with denominator. We are trying to do data triangulation, from various sources, we are looking at microplanning, what they are using for family planning, measles cases, proxy indicator for some of the measles coverage among children but all these are not very straight forward." ***(Respondent ID: PEA-10)***

Typical large-scale survey data, such as that from the BDHS, offer valuable insights but do not provide granular, real-time information needed for targeted sub-national planning. These surveys are not designed to produce data on ZD populations, and their long intervals between rounds limit their usefulness for programmatic course correction. Moreover, current data systems provide little visibility into the demand-side drivers of ZD and UI—such as caregiver knowledge, gender-related barriers, or perceptions of service quality—which are crucial for designing contextually relevant interventions. Together, these gaps point to an urgent need for enhanced data integration, development of ZD-specific monitoring tools, and greater sub-national capacity for evidence generation and use. Without such investments, Bangladesh's immunization program risks continuing with a one-size-fits-all model, unable to strategically reach the children and communities who need it most.

Summary of Findings

Finding 1: Bangladesh's national policy frameworks demonstrate strong political commitment to immunization, with ambitious targets articulated in core planning documents such as the 8th Five-Year Plan and the HNPSIP.

Finding 2: Existing data systems, including DHIS2 and national surveys, support high-level monitoring but are poorly suited to identifying and tracking ZD and UI children, particularly at the sub-national level. Key gaps include the absence of ZD-specific indicators, unreliable population denominators, weak interoperability between routine and survey data, and the lack of name-based or real-time tracking mechanisms.

Finding 3: The absence of dedicated tools and systems for identifying and tracking ZD and UI children, combined with weak availability of disaggregated, real-time data at the local level, limits the ability of sub-national actors to use evidence for adaptive programming. Critical insights related to caregiver behavior, service access barriers, and geographic immunization gaps are often missing or underused in current data systems. As a result, decisions are frequently made based on incomplete information, hindering efforts to tailor interventions to the specific needs of the most underserved communities.

Finding 4: Strengthening data systems to provide ZD- and UI-specific information at EPI and partner fora and sub-national data on coverage and demand are essential to improve evidence-based decision-making and ensure equitable immunization programs.

3.3 Objective 3

To examine formal and informal decision-making processes related to generation and use of evidence for ZD/UI/MCs, including multi-level and multi-sectoral stakeholder involvement, and how these processes influence immunization policies and outcomes for ZD/UI/MCs.

3.3.1 Governance for immunization programming

From a governance perspective, the MoHFW serves as the apex body responsible for formulating national health policies, strategies, and guidelines—including those related to immunization and broader public health priorities. In close collaboration with key development partners such as WHO, UNICEF, and Gavi, the MoHFW oversees the procurement of vaccines, the development of national immunization strategies, and efforts to strengthen the overall health system infrastructure. Within this governance framework, the DGHS acts as the principal implementing agency for health service delivery under the MoHFW. The DGHS is tasked with the planning, execution, monitoring, and evaluation of immunization programs across the country, playing a central role in ensuring national coverage.

However, the implementation model differs by geographic setting. In urban areas, immunization is managed by the Local Government Division (LGD) under the MoLGRDC, in collaboration with DGHS and supported by local NGOs. In contrast, rural immunization programs are directly implemented by DGHS under the MoHFW. This dual arrangement reflects an effort to tailor governance to context-specific needs, but it also introduces challenges related to coordination, consistency, and accountability across different jurisdictions.

"Two ministries collaborate in this effort: the Ministry of Health and Family Welfare and the Ministry of Local Government. Urban areas fall under the jurisdiction of the Ministry of Local Government, while rural areas are overseen by the Ministry of Health and Family Welfare. Within urban areas, there are 12 city corporations, each operating with its own mechanisms. The hierarchy and leadership in urban areas function independently, lacking a standardized operational framework, which presents a significant challenge. There is an opportunity for the national EPI to enhance its monitoring and leadership in urban areas, mirroring the successful approaches implemented in rural regions." ***(Respondent ID: PEA-14)***

However, the dual governance structure in urban areas—with immunization responsibilities split between the DGHS, including the EPI, and LGDs—creates significant challenges in coordination, focus, and resource allocation. While the MoHFW prioritizes immunization through the national EPI framework, local government bodies often concentrate on other urban priorities such as mosquito control, sanitation, and vital registration. As a result, immunization activities in urban settings frequently suffer from limited institutional support and inadequate resourcing. This division of responsibilities leads to fragmented planning, parallel programmatic efforts, and missed opportunities for synergy between actors. Urban vaccination drives are often underfunded and inconsistently implemented, despite the commitment of many officials at both national and local levels. Moreover, bureaucratic barriers, institutional silos, and unclear lines of accountability further constrain the effective delivery of services. These structural issues significantly limit the system's capacity to proactively identify and reach ZD and UI children in densely populated urban environments.

"There are two ministries that work here, one is health and the other is local government. Urban projects are under the local government ministry. Local government ministry is more focused on mosquito control, vital registration with vaccination drives, and other related programs. I won't say that they don't have commitment towards this cause, they do have commitment, but it may not be as extensive. One of the biggest constraints is that they have about 21 staff for immunization in the South City Corporation. Five of them are EPI superintendents and the rest 16 are vaccinators. They have to cover a huge area. Mostly, they are paid through NGOs and rest salaries are paid by ADB. These funds have been working since the early 2000s but I know this fund is coming to an end very soon." ***(Respondent ID: PEA-04)***

Respondents consistently highlighted the critical shortage of human resources, particularly in urban areas, as a major barrier to identifying and reaching ZD and UI children. The combination of limited staffing and large, complex coverage areas, often including highly mobile and transient populations, makes it difficult to meet vaccination targets and ensure that every eligible child is reached.

"The main challenge we face is the scarcity of manpower. The constraint is such that I have to get one field worker [health worker or vaccinator] to do the job of two workers. The field workers have to overwork themselves to accomplish their activities. We do face this challenge." (Respondent ID: PEA-07)

Mobility is one of the unique challenges for immunization in Bangladesh's urban settings. Many children live in informal settlements or belong to migrant families moving either from rural regions or within city boundaries. This high mobility complicates efforts to track children's immunization status and conduct follow-up, increasing the likelihood that they will remain unvaccinated. Additionally, the daily routines of caregivers, particularly working mothers in urban slums, often prevent them from accessing services during standard clinic hours, contributing to missed opportunities for vaccination.

These challenges are compounded by a shortage of health care staff, including vaccinators, which constrains the ability to conduct regular outreach and follow-up. In many urban areas, the immunization workforce relies heavily on NGOs for staffing and operational support. While this partnership has helped extend coverage, it also raises concerns about long-term sustainability, particularly if external funding diminishes. The dependence on NGO-supported personnel leaves the system vulnerable to service disruptions and makes it difficult to institutionalize routine outreach to ZD and UI children.

3.3.2 Fund and resource allocation

"In our urban areas, there are more missing communities and UI children due to the significant migration of urban residents compared to rural areas. Additionally, there is a limitation in the way our government addresses this issue, as urban health falls under the LGD. They have their own ongoing activities, and although they work in close coordination with EPI, it would be beneficial to have greater integration in this matter." ***(Respondent ID: PEA-05)***

Respondents underscored the critical importance of external funding, particularly from Gavi, in sustaining Bangladesh's national immunization programs. Gavi's contributions have been central in financing vaccination campaigns, strengthening program delivery, and expanding coverage. Several respondents expressed appreciation for Gavi's direct collaboration with the government, which has enabled the provision of essential resources for vaccine procurement, training, and operational activities. In addition to Gavi, key stakeholders such as UNICEF, WHO, and the EPI play vital roles in supporting the immunization landscape by offering financial support, technical assistance, and strategic guidance.

"Gavi is offering valuable support for all our immunization efforts. We appreciate the collaborative efforts of WHO and UNICEF as well. We are immensely thankful to Gavi for their significant contribution to Bangladesh's immunization campaign. Gavi is addressing almost the entire financial aspect of the immunization drive in Bangladesh." ***(Respondent ID: PEA-04)***

Despite these robust partnerships, challenges in budget allocation and fund disbursement persist. One recurrent issue relates to the procurement timeline for vaccines. While vaccine procurement receives consistent financial prioritization, respondents noted a mismatch between fiscal planning and operational timelines. Budget allocations are typically finalized in July, yet procurement processes do not begin until November, and vaccines often do not arrive until February of the following year. This delay limits program responsiveness and complicates planning at sub-national levels.

"At the ministry meeting, they noticed that while budget allocations often cut funding for training seminars, money for vaccine procurement is consistently maintained. However, vaccine procurement happens in the calendar year, but the financial transactions occur in the following fiscal year. Budget allocations are finalized in July, but vaccine procurement starts in November, with we have to wait till February to get vaccines. Hence, we need to request vaccines earlier and make payments later." ***(Respondent ID: PEA-06)***

In contrast, training budgets are often reduced**,** compromising the capacity-building efforts essential for program quality and reach. This misalignment between priorities and budget execution undermines the overall effectiveness of immunization delivery.

*"The budget challenge may arise later because Bangladesh is transitioning to a low-middle-income status this year. Gavi started withdrawing our funds in 2022 as part of its transition process, aligning with Bangladesh's accelerated transition. We have until 2029 to manage this transition, after which health care financing will become solely the country's responsibility from 2030 onward." (****Respondent ID: PEA-14****)*

A second major concern relates to financial sustainability, particularly in light of Bangladesh's transition out of Gavi eligibility. The country is currently in the acceleration phase of Gavi support, with full graduation expected by 2029. After this point, Bangladesh will no longer receive new funding from Gavi, highlighting the urgency of developing a domestic financing strategy. Several respondents emphasized

the need for robust advocacy to increase national budget allocations and ensure a smooth funding transition.

Discussions are also underway regarding the establishment of a domestic vaccine manufacturing unit, which, in the long term, could help reduce procurement costs and improve supply chain autonomy. However, respondents noted that such an initiative would require significant time and investment to meet international standards and is unlikely to provide a short-term solution to funding challenges. More pressingly, the country's "Gavi Transitional Plan," intended to serve as the national Immunization Financing Roadmap, remains in development. As of now, the plan has not been finalized. A key stakeholder meeting is scheduled for 2025, during which EPI partners will discuss plans for a workshop to finalize the roadmap. The workshop will be chaired by the Joint Secretary of the MoHFW. Once complete, the plan is expected to articulate a comprehensive transition strategy, including a robust investment case and coordination framework involving major partners such as Gavi, WHO, UNICEF, and the World Bank. Until then, however, critical uncertainties remain regarding financial sustainability and the scale of domestic budget commitments required to maintain immunization program gains beyond Gavi support.

3.3.3 Human resource allocation

Respondents highlighted multiple dimensions of human resource management as critical to the success of immunization efforts—from the recruitment of frontline workers to the timely payment of salaries. These workforce elements are central to the identification of and outreach to ZD and UI children. However, persistent personnel shortages were identified as a major barrier, especially in urban areas, where high population density, mobility, and socioeconomic disparities compound implementation challenges.

"The primary challenge we encounter is the shortage of manpower. The limitation is so severe that I must assign one field worker to perform the duties of two. As a result, field workers are compelled to overextend themselves to complete their tasks. This challenge is indeed a reality for us." ***(Respondent ID: PEA-07)***

City Corporations in particular struggle to maintain an adequate workforce of field workers and vaccinators, resulting in overburdened staff and reduced operational capacity. These workforce limitations disproportionately affect floating populations, slum dwellers, and other marginalized urban groups, where door-to-door campaigns and interpersonal communication (IPC) are essential to improving coverage. Without sufficient personnel, such targeted outreach becomes difficult to sustain. Respondents also pointed to limited budget allocations for immunization campaigns, which constrain both recruitment and retention of qualified personnel. In addition, bureaucratic delays and administrative red tape further hinder efforts to fill vacant positions, leaving critical gaps unaddressed for extended periods. These delays weaken the ability of local health authorities to respond promptly to ZD challenges on the ground.

"At the first-line supervisor level, there is approximately a 40 percent vacancy. Cold chain technician vacancies stand at around 53 percent. This situation put pressure on the existing workforce leading to overwork and consequently declining in work quality. Additionally, IPC, which is the backbone of the EPI program, is hardly there due to the shortage of staff." ***(Respondent ID: PEA-12)***

A key operational challenge in Bangladesh's urban slums is the unavailability of mothers during daytime hours, as many work as daily wage earners and cannot accompany their children to vaccination sites. A respondent noted that the EPI has attempted to address this issue by organizing evening immunization sessions once a week.

While this innovation shows promise, its sustainability is constrained by the absence of a formal mechanism to incentivize or compensate staff for their after-hours work. One respondent suggested that the District Evidence-Based Planning and Budgeting (DEPB) initiative could be leveraged to provide programmatic support to incentivize staff. DEPB includes organizing workshops in hard-to-reach areas to strengthen planning and ensure year-round management of the EPI. Expanding the scope of DEPB to include performance-based incentives or flexible budgeting for frontline activities, for instance, could enhance staff motivation and help sustain targeted efforts like evening immunization sessions.

3.3.4 Role of different stakeholders

Various stakeholders coordinate with the EPI including government bodies, Gavi, WHO, UNICEF, PATH, and icddr,b as well as some NGOs such as Urban Health Care, Nari Maitree, and Shurjer Hashi. The collaboration among stakeholders is generally positive, with a focus on increasing immunization coverage. While stakeholders work in coordination, power dynamics are influenced by the government's central role in policymaking and decision-making.

"No one can power dominate the government and no one does so. Also, we don't allow it either. Everyone wants to keep their own position. No matter who does it, it's still a government program. We don't allow the development partner to get the upper hand in our country. They don't want it either. They are very cooperative with us too." ***(Respondent ID: PEA-06)***

Stakeholders like Gavi, UNICEF, and WHO play a supporting role by providing funds, technical assistance, and human resources, with the EPI maintaining authority over program direction. Respondents emphasized the importance of these partnerships and expressed appreciation for the spirit of mutual respect and cooperation.

*"There are no issues of influence here; the partners are always very cooperative and supportive of the government. When issues arise, we sit down with our partners and resolve them together. The partners typically support the changes that occur during program implementation. So, it's a blessing that we have such excellent partners." (**Respondent ID: PEA-08)***

To facilitate alignment, regular coordination mechanisms—such as bi-weekly calls between Gavi, WHO, UNICEF, and government officials—help ensure transparency, troubleshoot operational issues, and maintain momentum in programming. Nonetheless, some respondents pointed to opportunities for stronger inclusion of the private sector and more intentional recognition of its role in supporting immunization delivery, particularly in urban areas.

Despite strong partnerships at the policy level, challenges persist in grassroots implementation. One concern raised was the financial burden placed on caregivers by some smaller NGOs operating at the community level. Although vaccines are officially provided free of charge by the government, a few NGOs and private clinics reportedly levy informal service fees which discourages caregivers, particularly mothers in low-income settings, from bringing their children for immunization.

Summary of Findings

Finding 1: A related concern is the increasing use of private sector health providers for childhood vaccinations. While these facilities help fill service gaps, they operate with minimal oversight, and no regulatory mechanisms exist to control the fees charged for vaccination services. This lack of price regulation can result in prohibitively high costs, further discouraging caregivers from seeking timely immunization, especially those from marginalized communities.

3.4 Objective 4

To explore the feasibility and effectiveness of customized policy interventions, with the aim of enhancing evidence generation and use for advancing policies on ZD/UI/MCs at both national and sub-national levels.

Summary of Findings

Finding 1: The MoHFW serves as the apex body responsible for formulating health policies, strategies, and guidelines related to immunization and broader public health initiatives. In partnership with development actors such as WHO, UNICEF, and Gavi, the ministry oversees vaccine procurement, immunization strategy development, and broader health system strengthening.

Finding 2: The DGHS, under the MoHFW, is the lead agency responsible for implementing immunization and other health services. It plays a critical role in the planning, execution, monitoring, and evaluation of vaccination programs across the country.

Finding 3: A dual governance structure between urban and rural areas contributes to fragmentation in immunization service delivery. In urban settings, implementation is split between the LGD and the DGHS, resulting in overlapping mandates, coordination challenges, and gaps in resource allocation. These issues are compounded by the presence of mobile populations, limited human resources, and fragmented data systems. While the MoHFW prioritizes immunization, local governments often focus on other urban priorities—such as sanitation and vector control—leading to under-supported and inconsistently implemented vaccination activities, particularly in urban slums and informal settlements.

Finding 4: External partners including Gavi, WHO, and UNICEF have provided essential financial, technical, and operational support to Bangladesh's EPI. However, the planned transition from Gavi support by 2029 and the heavy reliance on NGO-led service delivery at the sub-national level pose significant risks to program sustainability, particularly for reaching ZD and UI children.

Finding 5: A misalignment between budget cycles and vaccine procurement timelines creates vulnerabilities in vaccine availability. Delays in procurement and disbursement of funds result in supply chain disruptions and impact the timely delivery of services.

Finding 6: Respondents highlighted persistent challenges in human resource capacity and management, including workforce shortages and delays in salary payments. These issues directly impact frontline motivation and hinder the ability to effectively identify and reach ZD and UI children—especially in urban areas, where population density, migration, and socioeconomic vulnerability create additional barriers.

Finding 7: One key barrier to urban immunization is the daytime unavailability of mothers, many of whom work as daily wage earners. Evening immunization sessions have been introduced once a week as a pro-equity measure, allowing greater access for working caregivers. While respondents commended this initiative, they stressed the need for incentives or compensation mechanisms to sustain health worker engagement in after-hours service delivery.

3.4.1 Political context

Respondents shared valuable insights into the political and governance landscape surrounding immunization programming in Bangladesh, particularly as it relates to identifying and reaching ZD, UI, and MC populations. A consistent theme was the strong political commitment to immunization at the highest levels of government that has helped sustain and expand coverage, even under challenging circumstances. For example, stakeholders cited unwavering support from top leadership, including the Prime Minister, as instrumental in keeping routine immunization programs on track during the COVID-19 pandemic.

"Immunization is the most successful public health program in Bangladesh, and we have been receiving the highest level of political support for it from the honourable Prime Minister. Due to this, during COVID-19, routine EPI had suffered around the world, but not in Bangladesh. Though there was an initial drop during the first two quarters, it was fully recovered by mid-May 2020 because of orders from the Prime Minister stating that whatever needs to be done, routine EPI cannot be stalled due to COVID-19." ***(Respondent ID: PEA-12)***

The Bangladesh Parliamentary Forum on Health and Wellbeing was noted as an important platform for high-level policy dialogue and advocacy. By engaging parliamentarians directly, the initiative has created space for informed input and stronger alignment between legislative priorities and immunization goals. Respondents credited this engagement with policy advancements, such as the expansion of immunization coverage and the introduction of new vaccines.

"The Bangladesh Parliamentary Forum on Health and Wellbeing serves as a platform for high-level policy discussions and advocacy efforts. Engaging political leaders in these discussions can amplify our message and drive positive change in the health sector. Over the past few years, our engagement with parliamentarians has proven to be highly effective and appreciated by the government. This engagement has led to tangible results, such as the expansion of immunization coverage and the introduction of new vaccines." ***(Respondent ID: PEA-13)***

At the sub-national level, respondents described strong working relationships with local political stakeholders, including ward councillors, commissioners, secretaries, and religious leaders. These connections were viewed as critical in mobilizing community support, creating a favorable environment for immunization activities, and reaching ZD and UI children. The ability to meet internal targets and maintain accountability was frequently linked to the strength of these local connections.

"Political commitment in terms of immunization coverage was commendable. The government aimed to make the EPI successful, and they implemented it spectacularly. Such dedication and achievement set the stage for even greater success in the future." ***(Respondent ID: PEA-11)***

"We maintain effective communication channels with ward councillors, commissioners, secretaries, and other prominent figures in the areas where we operate. This ensures grassroots support for our immunization efforts, including for ZD or MC children receiving vaccines. We encounter no political obstacles while working in these areas." ***(Respondent ID: PEA-01)***

3.4.2 Data generation and access

Respondents generally noted that Bangladesh's immunization data systems have significantly improved in recent years, largely due to the implementation of DHIS2. Prior to this, data collection was paper-based, relying on monthly manual reports from health workers. These reports were often delayed, prone to inaccuracies, and susceptible to manipulation. The introduction of DHIS2 has digitized the process, enabling real-time data entry, improved accuracy, and quicker access to updated information. As a result, data collection has become more streamlined, session gaps have been minimized, and records from multiple vaccination sessions are now consolidated into a centralized platform.

"We have an excellent real-time data management system called DHIS2. We retrieve data from there, analyze and interpret it, and implement it at the policy and program levels. We primarily obtain our data from there." ***(Respondent ID: PEA-12)***

In its current form, the DHIS2 platform primarily captures aggregate-level data, allowing for cumulative service coverage to be tracked at the district level. This data is instrumental in identifying programmatic gaps and assessing overall immunization performance. In addition to DHIS2, periodic national surveys such as the Coverage Evaluation Surveys and BDHS provide robust, complementary measures of immunization rates and socio-demographic determinants of coverage. The HDSS, maintained by icddr,b, offer longitudinal, community-based data that deepen understanding of immunization trends, population mobility, and localized barriers to vaccines access over time. Rapid Convenience Assessments, while not probability based, are also used to highlight potential service gaps and guide immediate programmatic responses.

One of the most promising innovations highlighted by respondents is the e-Tracker system—a digital tool developed by development partners and piloted as an extension of DHIS2. Health workers can enter vaccination data in real time during immunization sessions, significantly improving the ability to track individual children. Each child is assigned a unique identification number, which allows for consistent tracking of vaccination history, even if the child moves across districts. The system also features SMS

reminders to both caregivers and health providers, alerting them about upcoming vaccinations and missed appointments. Respondents reported that the e-Tracker has enhanced their ability to identify and follow up with UI children, helping to reduce dropouts and improve immunization equity. While the e-Tracker useful for identifying UI children already in the system, it cannot identify ZD children or MCs because they are not captured in the routine data system.

"The e-Tracker is a great innovation as it tracks vaccination dates and sends SMS notifications, reminding individuals when their vaccines are due. Additionally, it monitors those who fail to show up for their vaccine appointments. Utilizing the e-Tracker makes it much easier to follow and track vaccination schedules." ***(Respondent ID: PEA-04)***

"We also get benefits after using the e-Tracker in certain area, which allows us to easily document when a child receives a vaccine or misses one. This has helped us significantly reduce the number of missed vaccinations. Previously, if someone travelled outside their district, they would need to carry their card and could face obstacles to receive a vaccine. Now, they can simply visit a center where they migrated, provide their unique ID, and receive the vaccination, as all data is now centralized." ***(Respondent ID: PEA-07)***

Microplanning—typically conducted annually—is another critical component of data generation and access for identifying ZD and UI children and MCs in Bangladesh. This process involves frontline health workers, such as health assistants and vaccinators, conducting door-to-door visits to map households and identify children eligible for immunization. These visits allow health workers to update population data**,** identify children previously missed**,** and estimate local target populations more accurately. Based on this mapping, health workers develop area-specific microplans that include detailed strategies for delivering vaccines through fixed-site, outreach, and mobile sessions. Monthly DHIS2 reports, when cross-referenced with microplanning data, provide critical insights into service coverage, dropouts, and unmet needs at the local level. Respondents highlighted that digital microplanning has significantly enhanced immunization efforts in Bangladesh. It not only enables more accurate targeting of hard-to-reach populations but also supports evidence-based decision-making by offering a clear picture of vaccination gaps and eligible children across different geographic areas.

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*"Each upazila creates its own microplan. The individual working within the ward is responsible for identifying the number of children and pregnant women. Based on this data, they create a microplan and set targets for the next year." (****Respondent ID: PEA-08)***

"One more important aspect is our World Immunization Week, which is very helpful to us as we try to vaccinate nationwide for a whole week each year. We search for zero-dose and under-immunized children in every ward. When we do the microplan by visiting houses and setting targets, we try to identify if there are any children in the household within the age range for vaccines who haven't received the EPI vaccine. We then bring them into the mainstream vaccination program." ***(Respondent ID: PEA-08)***

In addition to routine microplanning, special campaigns such as World Immunization Week offer targeted opportunities to reach children missed by routine services. During this annual event, health workers intensify efforts to systematically identify and vaccinate ZD and UI children, often through house-to-house visits in each ward. These campaigns leverage existing microplans and local data to set catch-up targets, reinforcing routine systems while helping to close coverage gaps. Typically, such catch-up efforts focus on children under two years of age, aligning with the national immunization schedule. However, in response to disruptions caused by the COVID-19 pandemic, some campaigns have been expanded to include older children, especially for vaccines like measles, to address wider immunity gaps. Respondents note that this proactive, campaign-based approach is instrumental in ensuring that missed children are integrated back into the immunization schedule and not left behind.

3.4.3 Challenges in data generation

Most respondents acknowledged persistent challenges with denominator accuracy when using DHIS2 data for immunization planning. This issue significantly affects the effectiveness of vaccination programs in Bangladesh, particularly in estimating the population eligible for the first dose. Discrepancies in population data often result in either overestimation or underestimation of coverage rates. Denominators are typically based on census-derived projections**,** which may not reflect the current population reality, as evident in reports from several facilities showing coverage rates exceeding 100 percent.

"There is a significant denominator issue regarding the first dose of vaccines. Since we need to purchase vaccines from other countries, we rely heavily on supply from Gavi. However, there is a discrepancy between the amount of vaccine Gavi provides and the amount the government actually needs to meet its immunization targets." ***(Respondent ID: PEA-07)***

"At least until 2018, vaccine purchases were based on data from microplans. Issues such as stock outs, zero-dose instances, and vaccine insufficiency in the field were not prevalent before 2019. However, after 2019, Gavi decided to stop relying on microplan data for vaccine procurement. Instead, they now use projections based on the 2011 census data." ***(Respondent ID: PEA-12)***

Since 2019, Gavi has moved away from relying on microplan estimates and instead adopted projections from the 2011 census for vaccine supply planning. While this initially helped manage supply shortages, the delayed release of data from the 2022 census—which took over two years to finalize—created a critical gap in accurate population estimation. These inconsistencies between census projections and microplan data continue to exacerbate the denominator issue, posing risks of vaccine stockouts and inefficiencies in reaching ZD children.

3.4.4 Data use to inform immunization policy and programming

Many respondents noted that there are no dedicated tools, protocols, or strategies specifically designed to identify and reach ZD children in Bangladesh. Instead, health workers rely on general guidance provided by the EPI, which focuses on routine vaccine distribution and standard service delivery. While these protocols support overall immunization efforts, they are not tailored to the unique challenges associated with locating and reaching ZD children. As a result, ZD identification is largely opportunistic—dependent on the extent to which existing systems like microplanning can accommodate this group. Given that ZD children comprise a relatively small proportion of the total population in Bangladesh, there has not yet been a concentrated push to develop specialized guidelines, data systems, or training modules for their targeted identification and follow-up.

"We don't have a specific protocol to address zero-doses in such a manner. We have individual guidelines such as EPI, Vaccine SOP, and logistics management. However, we do have instructions to handle zero-doses." ***(Respondent ID: PEA-08)***

One respondent acknowledged the gap and underscored the need for a more structured and deliberate approach to ensure the identification and reach of ZD children:

"In the case of zero-dose [children], I am uncertain if there is any specific module or program dedicated to addressing them. However, discussions on this topic are ongoing, and efforts are consistently made to integrate them into our programs. Research reports suggest that approximately 2 percent of the population falls under the zero-dose category. It's crucial for us to develop a module on how to locate and engage with these individuals." ***(Respondent ID: PEA-04)***

Finally, several technological innovations are being piloted in select districts to enhance data-driven immunization planning and monitoring. These include a Geographic Information System (GIS)-based online microplanning tool and systems for real-time reporting, both introduced on a pilot basis. Other notable interventions include the eVLMIS (Vaccine and Logistics Management Information System) platform, which uses blockchain technology for real-time vaccine logistics management; the Open Smart Registration Platform (OpenSRP), deployed under the Management Information System (MIS); and TrueCaver, a geospatial mapping tool used on a small scale to validate immunization data and monitor real-time vaccine coverage. While these innovations offer promising improvements in data accuracy and transparency, their uptake remains limited. Respondents cited several barriers, including insufficient digital skills among health workers**,** limited motivation to adopt new tools, and technical constraints such as poor internet connectivity, especially in remote or underserved areas. These challenges must be addressed to fully harness the potential of digital solutions for improving immunization equity and reaching ZD children.

Summary of Findings

Finding 1: Bangladesh has made significant strides in data generation and access for immunization through the implementation of DHIS2. The transition from manual, paper-based reporting to digital data entry has reduced errors and delays, enabling real-time access to updated information. DHIS2 has streamlined data collection processes, improved data quality, and provided valuable aggregate data for assessing immunization coverage and program performance at the district level—key to identifying and reaching ZD/UI/MCs.

Finding 2: The integration of the e-Tracking system with DHIS2 has further enhanced real-time data entry during immunization sessions, supporting up-to-date record keeping and accurate tracking of children's vaccination histories across geographic locations. SMS reminders to parents and providers assist in monitoring coverage and flagging UI children.

Finding 3: Strong microplanning and IPC, particularly in rural areas, have contributed to improving the precision and reach of immunization services. These efforts have been instrumental in identifying and reaching ZD and UI children and in tailoring delivery strategies to local population needs.

Finding 4: World Immunization Week and other catch-up campaigns provide a critical opportunity to identify and reach ZD children and MCs. During these campaigns, health care workers adopt a proactive, door-to-door strategy to systematically locate and integrate children who have been missed by routine services. The initiative plays a vital role in supporting broader immunization goals and ensuring no child is left behind.

Finding 5: Persistent denominator challenges remain a major barrier to effective immunization planning. Discrepancies in population estimates hinder accurate assessments of coverage, often resulting in over- or underestimation. Since 2019, reliance on projections from the 2011 census instead of microplanning data has contributed to these gaps, which have been further exacerbated by delays in finalizing the 2022 census and inconsistencies in ZD estimations and vaccine supply planning.

Finding 6: There are currently no specific guidelines or tools dedicated to identifying and reaching ZD children. In the absence of tailored protocols, health workers rely on general EPI guidance focused on routine immunization. Given the relatively small proportion of ZD children in the overall population, there has been limited emphasis on dedicated training or programming, with most efforts focused on integrating ZD children into routine immunization services as opportunities arise.

4. CONCLUSIONS AND RECOMMENDATIONS

The PEA analysis highlights Bangladesh's strong political commitment to immunization, backed by a well-established rural health delivery system and a clearly defined governance structure involving multiple stakeholders. The EPI leads national efforts, with the government demonstrating openness to technological innovations and strategic initiatives aimed at reaching ZD children. The presence of a skilled workforce, dedicated observances like World Immunization Week, and the continuation of routine immunization activities even during the COVID-19 pandemic underscore this sustained commitment.

Microplanning has emerged as a critical enabler of program reach, especially in settings with poor infrastructure, low awareness, or limited service access. Health workers develop localized microplans that establish vaccination targets and guide delivery strategies. These plans are increasingly integrated with DHIS2 and GIS tools, helping to map outreach sites and ensure no household with eligible children is left out. Additionally, strong engagement with NGOs and community-based networks helps bridge service delivery gaps at the sub-national level, particularly in identifying and reaching ZD and UI children. However, the full potential of these partnerships remains constrained by limited policy support and dependence on external funding.

As Bangladesh transitions from a low-income to a middle-income country, shifts in donor financing are expected to place greater responsibility on the government to sustain immunization investments. Challenges also persist in financial coordination across stakeholders, leading to disruptions in vaccine supply and resource allocation. In urban areas—particularly among children of working mothers in informal settlements—barriers to access continue to undermine coverage. Moreover, competing health priorities, such as maternal health, vector control, and sanitation, often divert attention and resources away from immunization, weakening service continuity.

Administrative bottlenecks, such as lengthy recruitment processes and bureaucratic delays, hinder timely staffing and outreach. Workforce shortages are further compounded by limited digital literacy and capacity to adopt new tools, constraining efforts to identify and follow up with ZD and UI children and MCs.

In light of these findings, the following recommendations are proposed:

1. **Recommendations for improving coordination between stakeholders**
    - **Establish a joint task force for urban immunization governance**. A dedicated joint task force between the DGHS and the MoLGRDC should be established to streamline coordination around vaccine procurement, logistics, and resource allocation. Improved collaboration through regular meetings, shared minutes, and follow-up action reports will strengthen alignment among stakeholders and enhance the efficiency of urban immunization delivery. *(Recommendation to the government)*
    - **Harmonize guidelines and minimize bureaucratic barriers**. Develop and enforce clear, standardized protocols and administrative procedures to reduce bureaucratic delays and ensure coordinated action—especially regarding data collection and use across regulatory bodies.

Stronger alignment between urban and rural health departments is also essential to ensure consistency in service delivery, eliminate duplication of efforts, and close gaps in immunization coverage. *(Recommendation to the government)*

- **Clarify accountability for implementing partners**. Implementing partners, including NGOs and the private sector, should be held accountable for achieving immunization targets and supported with clear policy directives, adequate funding, and monitoring mechanisms. To promote equity, NGOs must be prohibited from charging for services that are intended to be provided free of cost under government immunization programs. *(Recommendation to the government and implementing partners)*

2. **Recommendations for addressing the shortage of human resources**
    - **Streamline recruitment and offer competitive incentives**. The government should address persistent human resource shortages by simplifying administrative procedures for recruitment and deployment and by offering competitive salaries and incentives to attract and retain qualified personnel, particularly in underserved urban areas. *(Recommendation to the government)*
    - **Develop a transitional human resource strategy in partnership with NGOs**. Given that much of the existing health workforce is diverted to other high-priority domains, the government should work collaboratively with NGOs and development partners to develop a transitional staffing plan. This strategy should ensure continuity in immunization services, particularly in the context of shifting donor support, by leveraging NGO capacity while planning for long-term government absorption of key roles. *(Recommendation to the government, implementing partners, and Gavi)*

3. **Recommendations to streamline resource mobilization and fund allocation**
    - **Establish a dedicated immunization budget line and integrate incentive mechanisms**. A dedicated budget line for immunization should be established within the current financial year to ensure timely vaccine procurement and uninterrupted supply. In parallel, integrated financial systems should include provisions for compensating frontline health workers, particularly for their roles in identifying and vaccinating ZD children and managing logistics during outreach and catch-up activities. *(Recommendation to the government, implementing partners, and Gavi)*
    - **Plan for a post-Gavi financial transition**. As Bangladesh transitions to middle-income status, it is critical to develop a robust, long-term financial planning framework to manage the gradual phase-out of Gavi support post-2029. This should include stronger collaboration with NGOs and the private sector to ensure the continued provision of free vaccines. A comprehensive policy framework is needed to guide this transition and safeguard equitable immunization coverage. *(Recommendation to the government, implementing partners, and Gavi)*

4. **Recommendations to improve data quality and use**
    - **Use updated census data for planning and procurement**. To address persistent denominator challenges, it is essential to integrate data from the 2022 national census into immunization projections and vaccine procurement processes as early as possible. *(Recommendation to the government, technical partners, and Gavi)*
    - **Establish a multi-stakeholder working group on denominator accuracy**. Form a dedicated working group comprising representatives from relevant ministries, research institutions, and implementing partners to coordinate efforts to resolve discrepancies in population estimates and improve coverage calculations. *(Recommendation to the government, technical partners, and Gavi)*
    - **Strengthen innovation-driven data use and quality reviews**. Task the working group with leading routine data quality assessments and supporting the development and scaling of innovations—such as TrueCaver—to improve real-time tracking of ZD and UI children and MCs. These tools must be designed in consultation with frontline users to ensure relevance and usability. *(Recommendation to sub-national governments and technical/private partners)*
    - **Integrate updated population data into digital platforms**. Ensure mechanisms are in place to incorporate validated population estimates into DHIS2, e-Tracking, and other digital health platforms. This will enhance data accuracy, streamline monitoring, and support more effective planning. *(Recommendation to technical and private sector partners)*
    - **Triangulate multiple data sources for improved coverage estimates**. Encourage integration of diverse data sources—including annual DHIS2 analyses, ground-level microplanning data, and survey findings—to refine immunization dashboards and improve programmatic decisions. *(Recommendation to technical partners)*
    - **Facilitate data sharing from private providers**. Establish policy frameworks and incentive mechanisms to encourage the private sector providers to share immunization data for national monitoring and planning, ensuring a more comprehensive picture of coverage. *(Recommendation to the government and private sector stakeholders)*

5. **Recommendations for assessing the effectiveness of customized policy interventions to mitigate programmatic challenges**
    - **Develop guidelines and training for ZD Identification**. Create dedicated guidelines and training modules to equip health workers with the skills needed to identify and manage ZD children effectively. Capacity-building initiatives should also focus on improving data collection competencies among health care workers and community volunteers to enhance data accuracy at the grassroots level. *(Recommendation to national and sub-national governments and technical partners)*
    - **Enhance integration of microplanning data with DHIS2**. Strengthen the systematic integration of local microplanning data into DHIS2 to improve real-time monitoring and support evidence-based implementation strategies at both national and sub-national levels. *(Recommendation to national and sub-national governments and technical partners)*

- **Scale up digital tools for real-time monitoring**. Expand the e-Tracking system nationwide and ensure full integration with DHIS2 to enable real-time reporting and monitoring of immunization coverage. Leverage GIS-based tools to enhance geographic targeting and fill data gaps. Consider expanding the coverage of HDSS to better estimate and locate ZD populations. *(Recommendation to national and sub-national governments and technical partners)*
- **Establish systems for data validation across sources**. Develop robust mechanisms to cross-validate data from multiple sources**,** including digital platforms, survey data, and microplanning records, to ensure consistency and accuracy in immunization coverage estimates *(Recommendation to technical partners).*

Annex 1. Interview Guide

Governance and PEA of Evidence Generation and Uptake for IRMMA of ZD Children

		National Technical	National Implementation	Sub-national Technical	Sub-national Implementation	Agency Funding	Agency Technical	Agency Implementation
A	**Introduction** [Can read from consent form]							
1	Start with warm greeting, introduce yourself, Purpose of interview, emphasize importance of understanding politico-economy factor for decision making regarding data for IRMMA of ZD and under immunized children, assure confidentiality and inform the interviewee that their responses will be used for research purposes only.	□	□	□	□	□	□	□
B	**Demographic information**							
1	Name, Age, Occupation, Affiliation, year of experience in immunization division	□	□	□	□	□	□	□
C	**Background Questions**							
1	Role and Responsibilities	□	□	□	□	□	□	□
2	Can you tell me a little bit about what data or information you and others related officers collect and use to identifying ZD/UI/MC in Bangladesh?	□		□			□	
3	How you use it? [**Note:** probe on data used for reach, management, ML& E dissemination and advocacy]	□		□			□	

		National Technical	National Implementation	Sub-national Technical	Sub-national Implementation	Agency Funding	Agency Technical	Agency Implementation
4	What are some of the main achievements that have been made over the last 5 years regarding collection and use of data to inform ZD/UI/MC-related programming and policies? [**Note:** Data quality improvement, capacity & skills of service providers, motivating factors, non-financial incentives]	□		□		□	□	
5	How has the funding provided contributed to these achievements?					□		
6	What are some of the challenges you face in accessing and using existing data to inform ZD/UI/MC-related to policies? [**Note:** customize question to audience – if working on policies] [**Follow up:** What do you perceive to be the main reasons for these challenges?]		□		□	□		□
7	How can funding support overcome these challenges?					□		
8	Is there any other data than Bangladesh Demographic Health Survey which informs the current status of ZD/UI in all division/districts. **If No**, how government manage to study the ZD/UI situation of the population in those clusters?	□	□	□	□		□	□
9	What are the challenges you face in accessing and using existing data to inform ZD/UI/MC-related to programming?		□		□			□

		National Technical	National Implementation	Sub-national Technical	Sub-national Implementation	Agency Funding	Agency Technical	Agency Implementation
10	What do you perceive to be the main reasons for these challenges?		□		□			□
11	What are some of the challenges you face in collecting data to inform ZD/UI/MC-related programming and policies?	□						
12	What do you perceive to be the main reasons for these challenges? [**Note:** resource person availability, staff shortage, skill of frontline workers, budget for recruitment of such individual, data handling, analysis, and reporting]	□						
13	How do you think political and economic factors in (resource allocation, leadership, governance) contribute to the challenges you mentioned earlier for both data collection and use/uptake? [**Note:** if only answers about use or uptake, probe about collection challenges if applicable.]	□	□	□	□		□	□
14	Are there any specific policies, programs, guidelines, or protocols in place to guide or inform data collection and use for ZD/UI/MC? Can you please describe their elements briefly, particularly politico-economy domain in detail?		□					
15	How do you think political and economic interests influence the prioritization and allocation of resources for data collection and use for ZD/UI/MC policies and programming?		□					

		National Technical	National Implementation	Sub-national Technical	Sub-national Implementation	Agency Funding	Agency Technical	Agency Implementation
D	**Factors Influencing Political Economy**							
1	Are there any political interests or pressures that affect the allocation of resources that can be used to generate and use data on ZD/UI/MC in Bangladesh?		□		□	□		□
2	How do these political interests or pressures differ at the national and sub-national levels? Is there any sub-national organization working on local ZD/UI children? **If yes,** whether their contribution ever acknowledged at national level?				□	□		□
3	Have you ever experienced - political relationships or affiliations impact the generation or use of data related to ZD and UI children and MCs? [**Note:** what action/step were taken, whether data was collected for those pockets where ZD/UI/MC are proportionately higher other than BDHS]	□	□	□	□		□	□
4	Are there any economic considerations that affect the availability and accessibility of vaccines for children?		□		□	□		□
5	Can you provide any examples of instances where political or economic factors have hindered availability or collection of immunization data, leading to inequitable outcomes?	□		□		□	□	
E	**Stakeholders, Power Dynamics and Decision making**							
1	Who are the key stakeholders involved in all parts of the data cycle for childhood vaccination programs in	□	□	□	□	□	□	□

		National Technical	National Implementation	Sub-national Technical	Sub-national Implementation	Agency Funding	Agency Technical	Agency Implementation
	Bangladesh? [**Note:** Probe on data collection, processing, analysing and reporting and by national and sub-national levels and for special populations, like refugees, etc.]							
2	How do these stakeholders interact with each other in terms of decision-making and resource allocation? **[Note:** Probe on formal and informal decision-making structures]	□		□	□	□	□	□
3	Are there any power dynamics among these stakeholders that influence how data is collected and used? Can you explain them?	□	□	□	□	□	□	□
4	How do political shape the relationships between stakeholders and their influence over data collection and use for policies and programming related to ZD/UI/MC?	□	□	□	□	□	□	□
5	How do economic factors shape the relationships between stakeholders and their influence over data collection and use for policies and programming related to ZD/UI/MC?	□	□	□	□	□	□	□
F	**Recommendations for Improvement**							
1	Based on your analysis, what specific policy changes or interventions do you believe would help address the challenges mentioned above regarding data collection and use for targeting, reaching, monitoring, managing and advocating for ZD/UI and MCs?	□	□	□	□		□	□

		National Technical	National Implementation	Sub-national Technical	Sub-national Implementation	Agency Funding	Agency Technical	Agency Implementation
2	How can political and economic factors be better leveraged to ensure effective collection and use of data?	□	□	□	□		□	□
3	Are there any successful strategies or best practices from other contexts that could be adopted in Bangladesh as a whole and/or at the sub-national level to improve data collection and use practices? [**Note:** unique tracking or reminder system, strategy for hard-to-reach areas]	□	□	□	□	□	□	□
G	**Conclusion**							
1	Thank the interviewee for their valuable insights and participation in the interview.	□	□	□	□	□	□	□
2	Offer the interviewee an opportunity to add any additional comments or information they think is important.	□	□	□	□	□	□	□
3	Reiterate the importance of their contributions to the PEA express gratitude for their time.	□	□	□	□	□	□	□
4	Assure them that their responses will be used to inform a comprehensive understanding of the issue and potential solutions.	□	□	□	□	□	□	□

Annex 2. Consent Form

Title: Assessing the Governance and Political-Economy Landscape for Evidence-Based Zero Dose Programming and Policies in Bangladesh

Organization: International Centre for Diarrhoeal Diseases Research, Bangladesh (icddr,b) and International Institute of Health Management Research (IIHMR), New Delhi, India

Investigator's name:

Purpose of the research: You may know that the Government of Bangladesh and various non-government organizations are working assiduously in unison to make the EPI programme a success in the country. However, despite the efforts taken by different agencies, coverage remains low in rural hard-to-reach areas and at urban slums, especially among street population. Therefore, icddr,b and IIHMR in collaboration with MOHFW have taken an initiative to conduct a study to improve the child immunization coverage. The overall objective is to explore the relationship between political and economic factors in eliminating ZD in Bangladesh.

Why invited to participate in the study? Since you are involved with the immunization programme, we are inviting you to help us by participating in this study.

Methods and procedures: If you agree to participate, we will ask some questions about your understanding, perception and experience on ZD children in Bangladesh. You may involve other concerned resource person for providing necessary information. You may skip any questions that you do not feel comfortable answering. The interview will take about 50 minutes to conduct.

Risk and benefits: There are clearly least significant risks in participating in the study. We will collect the aforementioned information for which you will only need to spend some time. Even though the study may not benefit you directly, the information that we collect from you for this survey will have a broader impact, guiding the development of policies and programs related to reducing ZD vaccination as well as contribute to improving the EPI programme in Bangladesh and elsewhere.

Principle of compensation: You will not be compensated financially or in any way for the time that you spend participating in the study. However, if you become ill during the interview, we will ensure proper treatment at the nearest healthcare centre free of cost.

Privacy, anonymity and confidentiality: Information that you share with us will remain confidential, under lock and key. None other than the investigators of this research; possible study monitor, and any law-enforcing agency in the event of necessity would have access to the information. Any personal identifiable information will be processed under secured conditions with access to limited appropriate staff of that organization.

Data storage: Information received from you will be stored for up to three years which may be used for the purpose of reviewing the quality of research report or publication.

Future use of information: Information provided by you will be of great use to the government and private organizations in developing an effective mechanism for reducing ZD children in Bangladesh.

Right not to participate and withdraw: Your participation in this study is voluntary and the decision of your participation in this study will depend entirely on yourself. You have the right to withdraw yourself from the study at any time. Even if you do not agree to be a part of the study, or if you withdraw yourself from the study, you will still receive the same quality of services through icddr,b, or the government health centers.

If you agree to our proposal for enrolling you in our study, please put **(✔)** mark on appropriate box(es) of the following table and finally sign or put left thumb impression on the specified place for you.

I have read the participant's information sheet version ---------- dated ----------, have had the opportunity to ask question, discuss the study, and receive satisfactory answers.	Yes ☐ No ☐
I understand that I am free to leave the study without giving any reason.	Yes ☐ No ☐
I understand that the information I give is confidential.	Yes ☐ No ☐
I agree to my identifiable data being used for future ethically approved studies.	Yes ☐ No ☐
I agree to being contacted in the future for studies related to this research.	Yes ☐ No ☐
I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from the sponsor and by regulatory authorities, where it is relevant to my taking part in this research. I give my permission for those individuals to have access to my records.	Yes ☐ No ☐
I give my consent to take part in the study.	Yes ☐ No ☐
Signature or left thumb impression of participant	
Name of Participants	
Date	
Signature of the PI or his/her representative	
Date	

If you have any questions, you can ask me right now. If there is any further question related to the research, objection or complaint, please contact directly at the address below.

Purpose of contact	**Name and address**	**Address for communication**
For any question related to the study, or any problem	Md. Wazed Ali (Local coordinator or representative)	Address: icddr,b, Mohakhali, Dhaka-1212 Mobile No. 01731928926 (to be open 7/24 hours)
	Dr. Tasnuva Wahed (Principal Investigator)	Address: icddr,b, Mohakhali, Dhaka-1212 Mobile: 01705543252 (9:00 am to 5:00 pm)
To know the rights or benefits or to log any complain or dissatisfaction	M A Salam Khan (IRB Coordinator)	IRB Secretariat, Research Administration, icddr,b, Mohakhali, Dhaka-1212. Phone: (+88-02) 9827084 or Mobile: 01711428989

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