Zero-Dose LEARNING HUB

Gavi's Zero-Dose Learning Hub IRMMA Aligned Interventions: Semiannual Update — Bangladesh

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Gavi The Vaccine Alliance

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Gavi Zero-Dose Learning Hub (ZDLH)

Funded by Gavi, the Zero-Dose Learning Hub (ZDLH) serves as the global learning partner and is led by JSI Research & Training Institute, Inc. (JSI) with two consortium partners, The Geneva Learning Foundation (TGLF) and the International Institute of Health Management Research (IIHMR). Together, the consortium enables sharing and learning across four Country Learning Hubs (CLHs) 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 (ZD) and under-immunized (UI) children globally by facilitating high-quality evidence generation and uptake.

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ACRONYMS

AHO	assistant health officer
CHCP	Community Health Care Provider
CLH	Country Learning Hub
CS	civil surgeon
DGHS	Directorate General of Health Services
DNCC	Dhaka North City Corporation
EPI	Expanded Programme on Immunization
FDMN	Forcibly Displaced Myanmar Nationals
HA	health assistant
HPV	human papillomavirus
icddr,b	International Centre for Diarrheal Disease Research, Bangladesh
IIHMR	International Institute of Health Management Research
IR	implementation research
IRMMA	Identify, Reach, Monitor, Measure, Advocate
JSI	JSI Research & Training Institute, Inc.
KT	knowledge translation
MIS	management information system
MOHFW	Ministry of Health and Family Welfare
NGO	non-governmental organization
PCV	pneumococcal conjugate vaccine
Q4	quarter four
RI	routine immunization
RRRC	Refugee Relief and Repatriation Commissioner
UI	under-immunized
UH&FPO	upazila health and family planning officer
UNICEF	United Nations Children's Fund
WHO	World Health Organization
ZD	zero-dose
ZDLH	Zero-Dose Learning Hub

EXECUTIVE SUMMARY

From July to December 2024, the Bangladesh Country Learning Hub (CLH), led by the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b), with partners Jhpiego and RedOrange Communications, advanced their primary scope of work of ongoing implementation research (IR) to monitor and assess strategies focused on identifying and reaching zero-dose (ZD) and under-immunized (UI) children across six sub-national sites in Bangladesh. The Learning Hub has provided technical support to adapt context-specific interventions implemented by the Expanded Programme on Immunization (EPI), such as evening immunization sessions in urban slum areas; crash programs in rural, hard-to-reach areas; digital tracking tools like the e-screening checklist; and interpersonal communication strategies. While evening immunization sessions improved access for working caregivers in Dhaka North City Corporation (DNCC), overall implementation was affected by vaccine shortages, workforce gaps, political unrest, and technical limitations that constrained the use of digital tools.

The Learning Hub also conducted a mixed-methods study to identify ZD and UI children and better understand barriers to immunization among Forcibly Displaced Myanmar Nationals (FDMN) and adjacent host communities in the Ukhiya and Teknaf sub-districts (upazilas) of Cox's Bazar and in Bhasan Char of Noakhali district. The study methods include a household survey, which revealed low ZD prevalence (0.5 percent FDMN, 0.2 percent host) but higher UI among FDMN children (12.5 percent) compared to those in host communities (5.8 percent). Reported barriers included child illness, fear of side effects, movement restrictions, and incomplete immunization records. FDMN respondents primarily accessed immunization services through nongovernmental organization (NGO) services, while host community caregivers utilized government facilities. The Learning Hub also conducted a social mapping exercise in FDMN camps in Cox's Bazaar and Noakhali to better understand the social structures within the FDMN populations, availability of health services, and stakeholders active within the camps. This approach of combining social mapping and surveys, which will be complemented with additional qualitative interviews, provided a preliminary understanding of immunization gaps and challenges in long-term displacement settings in Bangladesh.

The Learning Hub's structured approach to evidence use has led to progress in policy and planning. ZD and UI children are now a standing agenda item in monthly EPI meetings at the district and sub-district levels. Based on IR findings, civil surgeons (CS) at the district level and assistant health officers (AHOs) at the zonal level recommended expanding digital tools, crash programs, and evening sessions to additional areas. The Learning Hub continues working with government and development partners to sustain momentum, address operational challenges, and support integrating promising interventions into national and subnational immunization planning.

KEY LEARNINGS AND RECOMMENDATIONS

IDENTIFY: UNDERSTANDING THE ZERO-DOSE BURDEN

Key Learnings

- **IR findings demonstrated the value of the e-screening checklist and additional adjustments to improve its adoption.** In the IR sites, the e-screening checklist, used by vaccinators as well as health service providers not directly involved in child vaccination, has helped identify ZD and UI children. However, technical issues have hindered the full adoption of the checklist, including software performance and limited digital literacy among health assistants. Additional training and troubleshooting are needed to increase consistent use of the tool.
- **The social mapping and household survey conducted in FDMN camps and adjacent host communities identified clusters of ZD and UI children.** Preliminary findings located ZD and UI populations in FDMN and nearby host communities, providing insights into population distribution, access barriers, and service availability. Qualitative interviews with caregivers and other stakeholders are underway to provide context for the mapping and survey findings. Additionally, a validation workshop is planned to integrate findings from the social mapping, household surveys, and qualitative assessments, ensuring that multiple data sources are aligned to refine ZD and UI identification and reach strategies.

Recommendations

- **Address technical challenges with the e-screening application to ensure full use among health workers.** Software updates and technical troubleshooting have already been provided in five IR areas, and additional training sessions are planned to improve further uptake.
- **Ensure that all ZD and UI children identified through e-screening receive timely vaccination.** Local stakeholders in sub-national committee meetings emphasized that all children identified through e-screening should be vaccinated as early as possible, ideally within one month. To operationalize this, icddr,b monitoring officers have begun sharing lists of identified children with upazila health and family planning officers (UH&FPOs). In some sites, outreach teams and facility-based providers were mobilized for follow-up. Continued improvement will require regular coordination meetings, timely data sharing, and clear assignment of follow-up responsibilities at the upazila and ward levels.
- **Expand and integrate multiple data sources to refine the identification of missed communities in a displacement context.** The Learning Hub's mixed-methods approach, combining social mapping, household surveys, and qualitative interviews (to be completed in 2025), identified ZD and UI pockets among FDMN and host communities, while also generating insights into barriers related to geography, service availability, and demand-side hesitancy. This multifaceted approach to data collection, analysis, and validation enabled a deeper understanding of population distribution and context-specific access, particularly in settings affected by displacement, migration, or limited infrastructure. A forthcoming validation workshop aims to further align and synthesize findings from these complementary data sources, and the approach

offers a promising model for identifying and characterizing missed populations in other countries and contexts.

REACH: ENSURING ACCESS TO IMMUNIZATION SERVICES

Key Learnings

- **Evening EPI sessions have improved access for working mothers.** In DNCC, the Learning Hub worked with sub-national EPI committees to assess session effectiveness, leading to expanded evening sessions in additional wards. In quarter four (Q4) 2024, 26 evening sessions were conducted and 308 children were vaccinated, reinforcing the value of extended sessions in urban immunization strategies.
- **Crash programs in hard-to-reach areas have reached more children, but vaccine shortages and budget constraints limit full implementation.** In Saghata Upazila, seven crash programs were conducted in Q4, vaccinating 140 children, including four ZD and 45 UI children. However, vaccine shortages and budget constraints prevented the implementation of three additional crash programs.
- **Community engagement played a role in improving outreach.** In Hatiya Upazila, 57 children (including 21 ZD and 23 UI children) were vaccinated during crash programs in Ghasier Char, with community leaders actively engaged in mobilization efforts.
- **Community engagement has increased caregiver participation, but misinformation persists.** CHCPs conducted courtyard meetings and interpersonal communication sessions to provide health education to caregivers. In Hatiya Upazila, 300 pregnant women received child immunization counseling through community health workers.
- **Political unrest impacted implementation.** National political unrest significantly impacted the implementation of CLH research activities and EPI initiatives. The unrest caused staff turnover and shortages from the upazila level to the national level. For example, in Nalitabari, the delayed recruitment of health assistants (HAs) impacted vaccination coverage. As a result, the Learning Hub prompted EPI to plan and implement mitigation efforts, including 23 additional sessions in Nalitabari and 12 crash programs in Kawkhali. Political unrest also led to the cancellation of planned outreach and crash sessions across the study areas.
- **Competing government priorities disrupted implementation.** The government-led human papillomavirus (HPV) vaccination campaign increased the workload of vaccinators and shortened the duration of routine EPI sessions. It also limited the Learning Hub's ability to carry out planned activities, particularly regular community engagement and interpersonal communication efforts, which rely on the support of government HAs and community health care providers (CHCPs). In Nalitabari, a separate "Reaching Every Mother and Newborn" campaign affected service delivery, with only 17 of 25 planned EPI additional sessions completed.
- **An ongoing vaccine shortage is threatening coverage levels.** National shortages of the pentavalent and pneumococcal conjugate vaccine (PCV) are likely contributing to the prevalence of ZD and UI children and the decreases in overall coverage.

Recommendations

- **Expand evening EPI sessions to more urban locations to increase access for working caregivers.** The DNCC's sub-national committee recommended scaling up evening sessions to prioritize zones with high ZD and UI prevalence. To scale this approach, sustained collaboration with local health authorities is needed to integrate evening sessions into microplans and ensure adequate budget to support human resources. In DNCC, evening sessions were coordinated with NGO staff, and session timing was adjusted with approval from zonal EPI managers. Future implementation may require EPI to formalize work schedule adjustments, authorize after-hours service delivery, and explore incentive structures to support health worker participation in evening shifts.
- **Ensure a consistent vaccine supply to sustain crash programs in hard-to-reach areas.** The vaccine supply issue was raised in national and sub-national monitoring committee meetings, in which committee members agreed to prioritize supply for hard-to-reach areas. Continued coordination with EPI headquarters is needed to strengthen forecasting and ensure the timely distribution of vaccines. In parallel, addressing budget constraints for transportation and logistics—also cited by upazila teams—will be essential for operationalizing crash programs in underserved areas.
- **Strengthen community engagement and interpersonal communication efforts to combat vaccine misinformation and hesitancy.** The sub-national committee recommended expanding community engagement activities, including more courtyard sessions and interpersonal communication efforts in high ZD areas. However, implementation has been constrained by limited staff availability, competing government campaigns, and operational disruptions, highlighting the need for additional resources and support to scale up these efforts effectively.
- **Political unrest and competing health campaigns affected intervention timelines.** Intensifying immunization efforts during times of relative calm and when movement is allowed helps address immunization gaps that may occur during times of unrest. Additionally, strengthening coordination between immunization programs and other health campaigns and formalizing contingency plans at the sub-national level could help mitigate disruptions to future outreach efforts.

MONITOR AND MEASURE: IMPROVING DATA SYSTEMS AND TRACKING IMMUNIZATION COVERAGE

Key Learnings

- **Joint monitoring between the Ministry of Health and Family Welfare (MOHFW) and CLH officers has improved tracking.** Field-level supervisors from MOHFW and monitoring officers from the Learning Hub conducted joint field visits in IR areas to monitor intervention progress and data collection quality. Monthly upazila-level meetings provided a platform for reviewing findings and addressing data collection challenges.

- **E-tracking and e-supervision tools are improving data accuracy, but inconsistent adoption remains a challenge.** The e-supervision checklist and e-tracking system facilitated real-time immunization tracking and improved data reporting by health supervisors in IR areas. However, inconsistent use, technical issues, and low digital literacy among frontline health workers remain barriers.
- **Collaborative efforts between the Learning Hub, EPI, Management Information System (MIS) of Directorate General of Health Services (DGHS), and Jhpiego have laid the groundwork for developing a ZD Dashboard within DHIS2 to improve routine tracking and visualization of ZD data**. The Learning Hub is supporting the development of a ZD Dashboard within the DHIS2 platform in collaboration with EPI, the MIS of DGHS, and Jhpiego to enhance data visualization and guide decision-making. A concept note for the dashboard has been drafted and will be shared for approval, and an upcoming co-creation workshop will focus on reviewing the ZD Data Improvement Plan and operationalizing the dashboard. Additionally, the Learning Hub has conducted a rolling review of DHIS2 data (2023), which was shared with EPI and other stakeholders.

Recommendations

- **Enhance training and supervision to ensure all health workers consistently use digital tracking tools**. A one-day refresher training is planned in six IR areas to reinforce MOHFW field staff skills and address adoption barriers. Additionally, supervisors are now expected to complete at least four e-supervision checklists per month during EPI session monitoring visits. Ensuring regular field supervision, monitoring compliance with tool use, and reinforcing digital skills through follow-up training will be key to sustaining accurate data capture and reporting.
- **Improve data validation processes in DHIS2 to address inconsistencies in reported immunization coverage.** The Learning Hub is facilitating discussions with MOHFW, MIS, and Jhpiego to refine immunization data quality tracking. A follow-up co-creation workshop in early 2025 will focus on data validation improvements.
- **Finalize and operationalize the planned ZD Dashboard within DHIS2 to support real-time decision-making.** The upcoming co-creation workshop will focus on designing and operationalizing the dashboard, integrating it into DHIS2, and aligning stakeholders around routine use in monthly data review meetings.

ADVOCATE: STRENGTHENING POLICY AND STAKEHOLDER ENGAGEMENT

Key Learnings

- **ZD and UI discussions have been formally integrated into routine immunization (RI) meetings.** The Learning Hub played a direct role in facilitating the inclusion of ZD and UI discussions at the sub-district and district levels by presenting findings during sub-national committee meetings. As a result, these discussions are now a standing agenda item in monthly RI meetings at upazila, district, and city corporation levels.

- **District and zonal level managers have proposed scaling up successful interventions.** The Learning Hub's research findings influenced two managers (CS and AHO) to propose the expansion of key interventions, including crash programs, evening EPI sessions, and e-tracking tools, in additional upazilas. These recommendations were discussed in sub-national committee meetings where district-level managers reviewed intervention results and identified priority areas for scale-up.
- **Political unrest throughout the country resulted in staffing changes that have impacted the implementation of the CLH research activities.** Frequent turnover among EPI and other government officials at various levels affected the CLH's ability to implement and assess programs. Monitoring committee meetings to discuss implementation were delayed, and chairpeople were replaced, sometimes multiple times within a short span.

Recommendations

- **Maintain ZD and UI discussions as a standing agenda item at all levels of immunization planning.** The sub-national committees recommended continued discussions on ZD and UI children during monthly RI meetings at the upazila, district, and city corporation levels. Continuing to present updated data, intervention results, and local action plans during RI and monitoring committee meetings will help track progress, guide operational decisions, and sustain momentum.
- **Advocate for additional funding and resources to expand successful ZD interventions in new geographic areas.** Two district-level managers, including the Sunamganj CS, proposed scaling up crash programs, evening EPI sessions, and e-tracking tools in additional upazilas based on Learning Hub findings. Discussions during sub-national committee meetings emphasized that expansion requires coordinated planning with EPI leadership, integration of new sessions into microplans, sufficient vaccine supply, and potentially additional human resources such as NGO or para-professional staff to supplement delivery in areas with workforce gaps.
- **Maintain regular engagement with new leadership to support continued progress.** Political instability has led to frequent turnover of key government counterparts, delaying monitoring committee meetings and affecting continuity. The Learning Hub has adapted by briefing newly appointed officials and maintaining routine communication to keep stakeholders informed and engaged. Continued flexibility and targeted messaging will ensure that new leaders are aligned on implementation goals and prepared to support intervention scale-up.

BANGLADESH COUNTRY LEARNING HUB

The Zero-Dose Learning Hub (ZDLH), established by Gavi, addresses immunization equity by generating data, evidence, new insights, and learning to better understand the factors influencing implementation and performance of approaches to identify and reach zero-dose (ZD) and under-immunized (UI) children and missed communities. The ZDLH consortium is led by JSI Research & Training Institute, Inc. (JSI), in collaboration with The Geneva Learning Foundation and International Institute of Health Management Research (IIHMR). ZDLH works to address immunization equity through evidence and learning of effective methods and approaches for identifying and reaching ZD and UI children. Four Learning Hubs in Bangladesh, Mali, Nigeria, and Uganda generate and advance the uptake of research and evidence to improve immunization policy and programming, especially at subnational levels. The Bangladesh Learning Hub is led by the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b) with partners Jhpiego and RedOrange Communications.

This semiannual update for the Gavi Board and other stakeholders highlights the ZDLH consortium's efforts to generate and share evidence for a deeper understanding of the factors that affect the implementation and performance of strategies to identify and reach ZD and UI children and missed communities. It synthesizes findings, challenges, and recommendations across Gavi's Identify, Reach, Monitor, Measure, and Advocate (IRMMA) framework emerging from the Learning Hubs.

ZDLH TECHNICAL ASSISTANCE

During the period of July–December 2024, JSI, as the global learning partner, continued to provide technical assistance, collaborate, and co-create with the Bangladesh CLH. As part of its support for the Political Economy Assessment, JSI reviewed and incorporated feedback on the first draft before submitting it to icddr,b for further review. The team worked closely with IIHMR to refine the assessment and prepare a version for Gavi. After integrating feedback from both Gavi and icddr,b, JSI finalized the draft in preparation for a validation workshop where Bangladeshi stakeholders provided input for the final version. Additionally, JSI provided in-depth technical feedback on icddr,b's new research scope on ZD and UI children among FDMN. This included reviewing interview tools, social mapping reports, and research methodologies to ensure ethical research practices with refugee populations. JSI also participated in meetings with icddr,b and Gavi to align on research design and implementation strategies for the FDMN study.

Additional Resources

- Identifying the Zero-dose and Under-immunized Children in Bangladesh: Approaches and Experiences (October 2024)
- Prevalence of and Factors Associated with Zero-dose and Under-immunized Children in Selected Areas of Bangladesh: Findings from Lot Quality Assurance Sampling Survey (August 2024)
- Gavi's Zero-Dose Learning Hub IRMMA Aligned Interventions: Semiannual Update—Bangladesh (October 2024)

- Gavi's Zero-Dose Learning Hub IRMMA Aligned Interventions: Semiannual Update—Bangladesh (May 2024)
- Country Learning Hub for Immunization Equity in Bangladesh: Findings from Rapid Assessment (December 2023)

IMPLEMENTATION RESEARCH AND ASSESSMENTS

IMPLEMENTATION RESEARCH

The Learning Hub is conducting mixed-methods IR across six study areas to evaluate and refine interventions to increase immunization coverage among ZD and UI children. The research focuses on testing innovative service delivery approaches within the existing health system, including:

- E-screening checklists for systematic identification of ZD and UI children
- Modified EPI session schedules (crash programs, evening sessions, and additional sessions)
- Enhanced community engagement strategies
- Digital tracking tools such as the EPI e-tracker

The evidence and learning from this research will inform policy adjustments, resource allocation, and intervention scale-up to strengthen immunization equity in Bangladesh.

Key Findings

- **E-screening checklist for identifying ZD and UI children:** The e-screening checklist has proven effective in identifying ZD and UI children at health facilities and during outreach. In Q4 2024, 513 ZD and UI children were identified using the checklist, with 366 (71 percent) receiving vaccinations. However, limited digital literacy among health assistants, network limitations, and technical challenges with the application have led to inconsistent use of the checklist.
- **Modified EPI session schedule (crash programs and evening and additional sessions):** Evening EPI sessions in urban slums successfully increased vaccination access for working mothers. Through the 26 sessions conducted in DNCC, 308 children were vaccinated in Q4 2024, up from 234 children vaccinated through 22 evening sessions during the previous quarter. This progress prompted plans for expansion to additional urban wards. Crash programs in hard-to-reach areas (e.g., Hatiya, Dowarabazar, Saghata) have enabled immunization of children previously missed; however, widespread shortages of pentavalent, PCV, inactivated polio, measles rubella, oral polio, and other vaccines limited intervention implementation in five of the six implementation areas. In Nalitabari, EPI sessions were expanded from two to four days per week to accommodate increased demand. However, due to political unrest, some planned EPI sessions were delayed or canceled.
- **Community engagement and demand generation:** Sub-national committee meetings identified the need for stronger interpersonal communication and advocacy with local leaders to combat vaccine hesitancy. Advocacy meetings with community leaders and health education sessions through NGOs have effectively mobilized caregivers but require continued efforts. While core messages have remained consistent, delivery approaches like courtyard meetings and interpersonal communication sessions were intensified and locally adapted to increase caregiver awareness and address practical barriers.

- **Challenges and areas for improvement:**
  - Vaccine shortages continue to impact immunization outreach efforts in several districts.
  - Insufficient budget allocation at the upazila level, particularly for crash programs and transportation to hard-to-reach areas, has limited the implementation of planned sessions and the expansion of successful interventions.
  - Workforce shortages (particularly in remote areas with vacant vaccinator posts) have slowed the rollout of crash programs and additional EPI sessions, requiring stopgap measures such as deploying nurses and EPI technicians to help deliver vaccines.
  - Political instability nationally, particularly from July to August 2024, resulted in limitations in movement, frequent administrative changes under the interim government, disrupted planned EPI sessions and community meetings, and delayed key stakeholder workshops.
  - Political unrest at the local level following national instability also resulted in disruptions. In one case, two local political groups disputed ownership of a location operating as a vaccine clinic. EPI was called to mediate the dispute and explain the importance of maintaining the site to administer vaccines.
- **Stakeholder response and programmatic actions:**
  - MOHFW, World Health Organization (WHO), and United Nations Children's Fund (UNICEF) are working to ensure vaccine availability to sustain crash programs in hard-to-reach areas. The issue was raised at the national monitoring committee meeting, where the chair confirmed the issue is being addressed. Sub-national committees also prioritized vaccine supply for hard-to-reach areas, and WHO helped cover transportation costs for crash programs in Hatiya.
  - Sub-district and district-level managers have incorporated ZD and UI data reviews and discussions into monthly EPI meetings, demonstrating uptake of Learning Hub recommendations.
  - One CS and one AHO have proposed scaling up successful interventions to additional upazilas, with further discussions planned in upcoming sub-national committee meetings.
  - A second co-creation workshop, originally planned for 2024, was postponed due to competing government priorities and political instability. It is expected to be held in early 2025. The workshop will focus on reviewing and tracking progress on the ZD Data Improvement Plan, prioritizing follow-up activities identified in the first workshop, and advancing the development of the ZD Dashboard using dummy data. Participants will also review the Learning Hub's overall progress and discuss next steps for integrating the dashboard into DHIS2, pending EPI approval.

HOUSEHOLD SURVEY WITH FORCIBLY DISPLACED MYANMAR NATIONALS (FDMN) AND HOST COMMUNITIES

In early 2024, the Learning Hub initiated a mixed-methods study to measure the prevalence and drivers of ZD and UI among FDMN and nearby host communities in Cox's Bazar and Noakhali districts near the capital city, Dhaka. The study includes a household survey, a social mapping exercise, and qualitative

interviews with a range of respondents, including caregivers and other community stakeholders. During this reporting period, the Learning Hub conducted the household survey in selected FDMN camps and adjacent host communities from October to December 2024. This survey aimed to:

- Assess vaccination coverage among FDMN in camps and adjacent host communities
- Identify ZD and UI children
- Understand how the unique lived experiences of migrants and refugees affect barriers to immunization and service delivery offerings

A total of 6,026 households were sampled, including 4,470 FDMN caregivers and 1,556 caregivers from host communities. The survey focused on children aged 4.5 to 23 months, with data collected across two age cohorts: 4.5 to 11 months and 12 to 23 months. Households within FDMN communities with children ages 2–11 years were also surveyed to explore immunization coverage and barriers among caregivers of children eligible for immunization before, during, and after migration to Bangladesh.

Before the household survey, a social mapping exercise was conducted to identify geographic clusters with high numbers of ZD and UI children within FDMN camps. This mapping provided insights into population distribution, access to immunization services, and mobility barriers. These findings helped refine the survey design and ensure data collection focused on areas with the greatest need.

Survey findings are preliminary, as data cleaning and analysis are ongoing, and the Learning Hub plans to triangulate findings with data collected through caregiver and other stakeholder interviews. Additionally, stakeholder discussions with MOHFW, WHO, UNICEF, and the Refugee Relief and Repatriation Commissioner (RRRC) are underway to explore ways to improve service accessibility and vaccination tracking. Once a draft of the findings is complete, a validation workshop will be held with stakeholders to integrate findings from social mapping, household surveys, and qualitative assessments. Findings from the social mapping and household survey will be used to develop tailored immunization strategies to address both demand- and supply-side challenges.

Preliminary Findings

- **Identification of ZD and UI children:** Survey findings confirmed persistent immunization gaps in both FDMN and host communities. However, the prevalence of ZD and UI children in both communities was similar to, or lower than, the prevalence of ZD and UI found in other areas of Bangladesh. See Table 1 below.

Table 1. Preliminary FDMN Survey Findings

Indicator	FDMN Communities	Host Communities
Zero-dose prevalence	0.5%	0.2%
Under-immunized prevalence	12.5%	5.8%
Valid full vaccination coverage	74.8%	82.6%
Common reason for missed vaccinations	Child illness (63%)	Child illness (60%)
Primary source of vaccination	NGO-run services	Government

- **Poor quality of data on immunization cards affects coverage estimates in FDMN camps:** During the household survey, caregivers were asked to present EPI cards to verify their children's vaccination status. Caregivers for more than 98 percent of children ages 4–23 months were able to present vaccination cards. However, the Learning Hub noted that many cards contained incomplete and/or illogical data (i.e., a vaccination date pre-dating the child's birth date, the date of a third dose of an antigen preceding the second dose, etc.) particularly among cards in the FDMN camps. The poor data quality likely affected the survey estimates of immunization coverage in the camps, and also has important implications for documentation and the ability of immunization providers to accurately track and identify ZD and UI children in the camps.
- **Higher number of invalid doses in FDMN camps:** The review of immunization cards also found that, particularly in FDMN camps, doses had been administered outside of the period designated by EPI (i.e., doses administered at 11 days of age instead of at or after 42 days of age; antigens that are normally administered together provided at different times; and doses administered outside of the suggested age window). This finding suggests that FDMN children may have received invalid doses that may not offer the same level of protection against infectious diseases, potentially making them more vulnerable to infection.
- **Limited mobility among FDMN:** Movement restrictions within camps affect access to vaccination services. Many caregivers reported difficulties accessing RI services, and service availability was inconsistent across different camps and host community health facilities.
- **Vaccine hesitancy and misinformation:** Lack of awareness and misinformation among caregivers contribute to vaccine hesitancy in both communities.
- **Shortages of vaccinators and logistical constraints:** Shortages of vaccinators and logistical constraints impacted service delivery, exacerbated by disrupted recruitment processes and delayed salaries for CHCPs.

KNOWLEDGE TRANSLATION

Knowledge translation (KT)—the systematic process of moving research into policy and practice—is central to the Learning Hub's approach. The Bangladesh Learning Hub applied KT principles to collaborate with stakeholders to turn research evidence into concrete immunization solutions. Each stage of the KT process—dissemination, transmission, acquisition, application, and impact—played a critical role in translating evidence-based interventions, such as the e-screening checklist and evening immunization sessions, into tangible improvements in immunization services in Bangladesh.

Dissemination: Sharing Evidence to Drive Change	The Learning Hub disseminated research findings to stakeholders, including policymakers, health officials, and frontline workers. Knowledge products—such as research briefs, infographics, blog posts, social media content, and advocacy materials—highlighted immunization gaps and interventions, including evening EPI sessions, crash programs, and the e-screening checklist piloted in multiple upazilas. The Bangladesh Learning Hub website provided a central platform for sharing up-to-date research findings and advocacy resources, facilitating access to critical immunization evidence.
Transmission: Tailoring Evidence for Decision-Makers	The Learning Hub tailored research findings for decision-makers through targeted policy dialogues, structured sub-national committee meetings, and routine EPI planning discussions. Detailed findings from household surveys among FDMN and host communities were presented to stakeholders, including MOHFW, WHO, UNICEF, and the RRRC, documenting immunization coverage gaps and barriers faced by these populations. Additionally, meetings with Jhpiego, MOHFW, and management information system teams addressed strategies for improving the quality of immunization data in DHIS2, informing planned refinements to ZD and UI tracking processes.
Acquisition: Stakeholder Engagement and Commitment	Government officials and frontline health workers recognized the importance of Learning Hub interventions and strategized operational improvements. In sub-national committee meetings, government representatives committed to ensuring timely vaccination for children identified through the e-screening checklist. Health inspectors committed to directly sharing lists of identified children with UH&FPOs to facilitate prompt vaccination follow-up. To overcome operational challenges such as limited digital literacy, UH&FPOs pledged to conduct refresher training sessions for frontline health workers, and icddr,b delivered training sessions for newly recruited government and NGO personnel in Dowarabazar and DNCC.
Application: Implementing Research-Based Solutions	In response to the Learning Hub's IR findings, the e-screening checklist was introduced across multiple upazilas, enhancing identification and follow-up of ZD and UI children. Additionally, research highlighted barriers faced by working mothers in urban slums who could not attend daytime EPI sessions due to work obligations. In collaboration with sub-national EPI teams, the Learning Hub introduced evening immunization sessions in DNCC, offering caregivers more flexible vaccination hours. Community engagement activities complemented these interventions, including advocacy meetings, courtyard sessions, and interpersonal communication strategies aimed at reducing caregiver hesitancy and increasing vaccination uptake.
Impact: Institutionalizing Evidence-Based Practices and Strengthening Immunization in Bangladesh	Evidence of the impact of the Learning Hub's KT efforts includes the expansion of evening immunization sessions to additional urban wards within DNCC, increasing clinic accessibility for working caregivers. Additionally, ZD and UI tracking was institutionalized as a standing agenda item in monthly RI meetings at district and upazila levels, ensuring sustained prioritization of immunization. Successful piloting of the e-screening checklist prompted stakeholder recommendations for its broader adoption in additional upazilas, reflecting a commitment to scaling evidence-based interventions. Additionally, the Learning Hub provided data and facilitated discussions to help stakeholders decide how to best implement these

	interventions, further ensuring that the evidence guided program decisions. Furthermore, structured advocacy efforts involving local leaders, union parishad members, religious leaders, teachers, and NGO community workers helped reinforce community-level mobilization and vaccine uptake.

While documented challenges persist—including vaccine hesitancy, logistical constraints, vaccine stock-outs, and workforce shortages—the Learning Hub's structured KT approach informed both short- and long-term policy and practice improvements in Bangladesh.

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