Zero-Dose LEARNING HUB

Early learning from zero-dose practitioners in Bangladesh and Mali

Report on the first Gavi Zero-Dose Learning Hub inter-country peer exchange

GAVI GLOBAL IMMUNIZATION LEARNING PARTNER
AND SUPPORT TO LEARNING HUBS AGREEMENT REFERENCE: MEL 11578622

REPORT SUBMITTED BY
The Geneva Learning Foundation

https://doi.org/10.5281/zenodo.8333185

11 September, 2023

Gavi The Vaccine Alliance

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Suggested citation: The Geneva Learning Foundation. Early learning from zero-dose practitioners in Bangladesh and Mali: Report on the first Gavi Zero-Dose Learning Hub inter-country peer exchange . Geneva: Gavi Zero-Dose Learning Hub (ZDLH), 2023.
https://doi.org/10.5281/zenodo.8333185

Version 1.0 (11 September 2023).

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Acknowledgements: This report was developed by The Geneva Learning Foundation for the Gavi Zero-Dose Learning Hub (ZDLH). Writer and editor: Ian Jones. Report coordination: Jenny Sequeira. Immunization expertise: François Gasse, Charlotte Mbuh, Jenny Sequeira. Data analysis: Biostat Global. We thank the Bangladesh and Mali Country Learning Hubs for their input and contribution to the report. The full list of report individual Contributors is given in Annex 3.

EXECUTIVE SUMMARY

Reaching zero-dose and under-immunized children is one of the major themes of Gavi 5.0 as well as the Immunization Agenda 2030 (IA2030). In 2021, 18.2 million children globally did not receive a single dose of diphtheria, tetanus, and pertussis (DTP) vaccine (the zero-dose), and many more did not complete their full infant vaccination schedule (the under-immunized).

The **Zero-Dose Learning Hub (ZDLH)** is a key initiative in Gavi's drive to reduce the numbers of zero-dose and under-immunized children, by strengthening its learning agenda. Focusing on four countries with varying immunization zero-dose challenges – **Bangladesh**, **Mali**, **Nigeria,** and **Uganda** – the ZDLH initiative aims to take a learning-based approach to the identification of zero-dose children and under-served populations and reaching those who are missing out.

In May 2023, the ZDLH initiative, hosted by its Learning Innovation Unit (LIU), held its first inter-country peer learning exchange, **"ZDLH-X"**, focused on zero-dose and under-immunized children and missed-community challenges in Bangladesh and Mali. The key aim was to provide an opportunity for national and (mainly) sub-national practitioners from the two countries to share their experiences and learn from each other, and to strengthen networking within and across countries.

AT A GLANCE...

- The first ZDLH-X event engaged nearly 2000 practitioners, mostly from the district and facility level and directly involved in zero-dose work.
- These sub-national practitioners submitted nearly 500 zero-dose experiences.
- 84% of participants from Bangladesh and Mali agreed that the event changed them as a professional.
- Zero-dose practitioners from 84 other countries participated, demonstrating strong demand for this type of online peer learning
- A draft conceptual framework has been developed to extract insights being shared by practitioners.
- More detailed case studies have been developed to explore local innovations in practice and success stories, for dissemination and discussion across the wider network.
- A second ZDLH-X is being organized for practitioners from Nigeria and Uganda to generate additional data, with follow-up events planned to build momentum and support knowledge translation.

Practitioners from Bangladesh, Mali and other low- and middle-income countries were sent email invitations to register for this online discussion event. During the registration process, they had the opportunity to share their experiences of identifying and reaching zero-dose/under-immunized children and missed communities. At the event, selected participants from Bangladesh and Mali presented brief summaries of their work and results, and responded to queries and similar experiences from other practitioners, with global experts giving feedback as "guides on the side".

The direct practitioner-to-practitioner interaction during the event was an important distinction from typical webinars, where participants passively experience presentations from subject matter experts or national leaders. The intent here was to encourage as many direct sub-national interactions as possible, with facilitators and subject matter experts playing a background role and clarifying technical standards when needed.

After the event, a **post-event questionnaire** gathered information about participants' learning from the event, what they gained from it, and how it might affect their future practice. This also provided an opportunity for participants to submit additional examples of their activities relating to zero-dose/under-immunized children and missed communities. This report summarizes pre-, during, and post- event information with a focus on how it can be of use globally, but to Bangladesh and Mali immunization practitioners in particular.

A total of 1964 practitioners registered for the event, from 84 countries, with 89 percent of registrants working directly on zero-dose challenges. Practitioners shared **492 case studies** during the registration process. 562 participants (69 per cent working at the sub-national level) joined the live event, with 20 participants from Bangladesh, 53 from Mali and 489 from other countries.

During registration, practitioners were asked for information about themselves and their local contexts. This provided insights into the most important **zero-dose/under-immunized children challenges** faced by practitioners, including **cultural beliefs or misconceptions** affecting demand, **geographic barriers** hindering access to hard-to-reach populations, **inadequate awareness** of immunization in communities, and the impact of **conflict and insecurity** on service delivery and access.

This learning exchange focused on the "**identify**" and "**reach**" aspects of Gavi's IRMMA framework (Identify, Reach, Monitor, Measure, Advocate). A wide range of strategies have been adopted to **identify and reach** zero-dose/under-immunized children and missed communities, addressing both **supply-side and demand-side barriers**. The experiences shared emphasized several key themes, including:

- **Triangulating across multiple data sources** to identify zero-dose children and missed communities.
- **Engaging closely with communities** to **understand barriers and co-develop solutions**, including through use of human-centred design approaches.
- Working with **influential community members**, including religious/traditional leaders.
- Being **opportunistic**, imaginative, and working with key community actors to address the challenges associated with insecurity and conflict.
- Developing **partnerships with communities**, so that there is a strong sense of **community ownership** and involvement in efforts to protect community health.

When participants were surveyed on the value of the event, feedback was positive, with 84 per cent of respondents from Bangladesh and Mali saying that it changed them as a professional and 69 per cent agreeing that the event helped their professional practice.

DATA RELATING TO BANGLADESH AND MALI

Contributions from **Bangladesh** (25 participants, eight responses to pre-event questionnaire and seven submissions to post-event questionnaire) highlighted the following points:

- Most important zero-dose populations: **limited or inconsistent access to healthcare providers** (7), **inadequate immunization awareness.**
- Most promising practices to reach zero-dose children: **implementation of electronic immunization registries and real-time data monitoring** (5), **missed opportunities for vaccination** (3), **engaging with private/NGO providers** (3), **community engagement approaches** (3).
- One case study – use of **rapid convenience monitoring** in Chattogram City (Annex 2).

Contributions from **Mali** (80 participants, 42 responses to pre-event questionnaire and 26 submissions to post-event questionnaire) highlighted the following points:

- Most important zero-dose populations: **conflict settings/internally displaced persons (IDPs)** (27), **seasonal or transient populations** (20), **isolated due to geographic constraints** (19).
- Most promising practices to reach zero-dose children: **community engagement approaches** (15), **utilizing community health workers and volunteers** (12), and **community outreach and mobilization** (10).
- Two case studies – zero-dose children in **urban areas** and in **conflict-affected areas** (Annex 2).

BENEFITS TO BANGLADESH AND MALI

The information generated in this project provides ZDLH Country Learning Hub (CLH) organizers with key insights into the key challenges and priorities of practitioners within their countries. This complements information on practitioners' use of zero-dose platforms summarized in an accompanying report, as well as country-specific information from CLH assessments.

The experiences shared, plus the detailed case studies, provide practitioners with insights from fellow practitioners that may be directly relevant to their settings. The ideas discussed are potentially applicable within their own settings.

POST-EVENT FOLLOW-UP

Following the event, **questions posed by participants** have been collated and answered by global experts or those presenting their experiences (Annex 1). In addition, follow-up with participants has led to the development of a series of **case studies** summarizing and examining in more detail experiences shared from Bangladesh and Mali (Annex 2).

The event provided an opportunity for national and subnational staff to share their experience, challenges, and successes. Rapidly capturing key learning from these contributions will be a valuable complement to other ZDLH activities that are more formally investigating zero-dose-related policy, strategy, and activities within national immunization programmes.

LESSONS LEARNED

The ZDLH-X event demonstrated the value of cross-country peer learning events, which a majority of participants found professionally helpful. The information gathered has provided

key insights into the nature of zero-dose challenges and similarities and differences between the two focus countries.

NEXT STEPS

- *Case studies capturing key learning (Annex 2) will be shared across the network.*
- *A draft conceptual model (page 19) will be further developed to organize the learning acquired from practitioners following the second ZDLH-X event.*
- *Outputs will be shared with the Gavi communications team as source material for public-facing segmented communication.*
- *Content specific to Bangladesh and Mali will be shared with each respective country learning hub (CLH) for in-country dissemination and use.*
- *A second ZDLH-X event for practitioners from Nigeria and Uganda is planned for September 2023, and will build on the themes that emerged from this first event.*

KEY FINDINGS AND RECOMMENDATIONS

KEY FINDINGS	RECOMMENDATIONS
1. The first ZDLH-X event engaged nearly 2000 practitioners with a majority from district and facility level, directly involved in zero-dose work	▪ Continue to build on and expand cross-learning opportunities and sharing of zero-dose implementation experiences at the next ZDLH-X event ▪ Support CLHs to nurture and grow sub-national networks, especially in target districts and linked to CLH objectives ▪ Investigate strategies to include non-participants in order to broaden the experience base and knowledge exchange, as part of a larger effort to build greater impact in peer-to-peer learning approaches
2. Immunization practitioners shared nearly 500 zero-dose-related experiences and more than 600 learning insights	▪ Extract insights from the experiences shared and develop case studies to help answer Gavi and CLH learning questions (completed: Annex 2) ▪ Following the second ZDLH-X event, refine the draft conceptual framework developed to extract insights being shared by practitioners ▪ "Give back" new knowledge or fresh insights to zero-dose practitioners at all levels, not only Gavi and national level staff ▪ Develop simple, rapid method to tailor outputs for relevant Gavi and country channels (including communications, internal and external stakeholders) ▪ Disseminate case studies exploring local innovations across a wider network, and use them as part of a larger effort to strengthen a learning culture with zero-dose practitioners
3. 84% of participants from Bangladesh and Mali agreed that the event changed them as a professional	▪ Study and document peer learning model in ZDLH context through learning-to-action case study (planned through the ZDLH Monitoring, Evaluation, and Learning component) ▪ Support more explicitly the development of sub-national learning networks that include follow-up approaches and promote knowledge translation/evidence use, as part of CLH collaboration
4. Zero-dose practitioners from 84 other countries participated, demonstrating strong demand for this type of online peer-to-peer learning	▪ Continue open access approach to zero-dose practitioner demand beyond CLH countries, and explore with Gavi and ZDLH partners practical ways to respond to global demand across many countries as part of the project's "global good" agenda
5. Learning Innovation Unit peer exchange approach based on learning science successfully mobilized sub-national staff for a global learning initiative	▪ Review possible use cases where CLHs could translate peer exchange approaches to further their learning hub objectives, with support from the ZDLH's Learning Innovation Unit.

INTRODUCTION

In 2022, Gavi launched its **Zero-Dose Learning Hub (ZDLH)** initiative, as part of its programme of activities to reduce the numbers of zero-dose and under-immunized children. The ZDLH initiative aims to capture key evidence on the success of country-led work to identify and reach zero-dose and under-immunized children and missed communities. Gavi's Global Learning Partners are JSI, which leads the consortium, together with The Geneva Learning Foundation (TGLF) and the International Institute of Health Management Research (IIHMR), Delhi, India.

Gavi's work on zero-dose children and missed communities is rooted in its IRMMA framework (Identify, Reach, Monitor, Measure, Advocate). Within each of the Learning Hub countries (Bangladesh, Mali, Nigeria, Uganda), the goal of the ZDLH initiative is to identify successful approaches across these areas, to support their wider testing and adoption.

The ZDLH initiative includes an extensive programme of work on the activities of **national immunization programmes** within individual countries, to generate new evidence about the effectiveness of current strategies and attempts to scale up effective initiatives, as well as translation of evidence into practice (knowledge translation) to build the capacity of practitioners at all levels to continuously apply the IRMMA framework. Alongside these activities, the ZDLH initiative includes a stream of work led by the Learning Innovation Unit (LIU) managed by TGLF. It aims to **leverage the practical experience and successes of frontline practitioners** working at all levels of national immunization programmes. This workstream will also provide a valuable channel of information from frontline practitioners to managers and senior leaders, to inform decision-making. In addition, it will generate insights into how the IRMMA framework is being implemented by practitioners within countries, informing development of IRMMA-related guidance.

This strand of work complements the more formal research activities, rapidly generating **authentic insights from large numbers of sub-national practitioners** who are adapting and experimenting with sustainable approaches to identify and reach zero-dose children and missed communities in their local contexts. This work can also be a source of data about

challenges and solutions as well as an intervention itself to translate strategy and policy into implementation. The strengths of this peer learning approach include the rare opportunity for those working on practical challenges on the frontline to share their challenges, experiences, and successes directly with peers facing similar situations, helping to establish networks both within and between countries for exchange of information and for mutual support.

Key questions from the ZDLH perspective include:

- How can we foster **dialogue and inquiry** about zero-dose/missed community challenges, opportunities and lessons learned among immunization staff?
- How can we encourage immunization staff to **collaborate** on zero-dose and under-immunized challenges, opportunities and lessons learned across boundaries of system levels and hierarchy?
- How can we establish systems to **capture and share** learning about zero-dose/under-immunized challenges and opportunities without additional burden for immunization staff?
- How can we help immunization staff **continuously scan the environment with their communities,** and **use local information** to improve immunization services and reach zero-dose/under-immunized children and missed communities?
- How can **immunization leaders** champion and support learning to optimize efforts to reach zero-dose children and missed groups at all levels?
- How can the insights and experiences of frontline practitioners inform national and global priority-setting and programmatic practice?=

NATURE OF THE ZDLH-X EVENT

On 31 May 2023, the ZDLH initiative held its first **inter-country online peer learning exchange**, focusing on two of the four ZDLH countries – **Bangladesh and Mali**. Activities before, during, and after the event provided an opportunity for immunization practitioners from the two focus countries, and a wide range of other low- and middle-income countries, to share their experience of identifying and improving coverage among zero-dose, under-immunized and missed communities.

The event, organized by the Learning Innovation Unit managed by TGLF, followed the well-established methodology used by TGLF in its other peer learning programmes. This is based on a continuum of learning, rather than just a one-off, incorporating the sharing of experience

before the event as well as post-event feedback on what was learned. Existing networks of TGLF alumni in Bangladesh and Mali met on a weekly basis to help co-create the event concept, and were then key to dissemination among sub-national practitioners.

In advance of the meeting, practitioners were invited to share **case studies** summarizing their efforts to identify and reach zero-dose, under-immunized and missed communities. At the event itself, a selection of practitioners provided a **brief verbal summary** of their experiences—such as identifying and reaching zero-dose and under-immunized children in 1) urban areas (using Rapid Convenience Monitoring in Bangladesh, and an Urban Immunization Strategy in Mali) and 2) conflict-affected areas using festivals and other community gatherings, as well as mobile services with IDPs (Mali). In addition, **global experts** acted as "guides on the side", drawing out key themes from the presentations and probing further into the experiences described.

Since connection issues can be a challenge for potential participants in some locations, **asynchronous participation** was the primary mode of learning:

- Before the event, participants contributed their experience by answering the **pre-event questionnaire**.
- Those who were unable to watch the event could catch up by watching the recording on their preferred social media platform (e.g., YouTube, LinkedIn, Facebook) or listen to it as an audio podcast.
- The **post-event questionnaire** then provided an opportunity for reflection, a key step to consolidate learning in a participant's own context.

Local solutions for connectivity were also found. For example, one team in Mali organized a **"watch party"** so that those with limited bandwidth could physically meet and participate. TGLF encouraged contacts in both Bangladesh and Mali to organize watch parties in locations where sub-national staff might experience connectivity challenges, and will encourage organization of watch parties for the second event. If **country learning hubs** are able to encourage watch parties in the geographies they are focusing on, this could also help link health workers in those locations with other sub-national health practitioners.

In addition, in locations where there are **gender-related barriers** to connecting to online platforms, watch parties may be able to address some elements of such barriers. However,

organizing more systematic watch parties would likely require focused support from country learning hubs and in-country partners.

Extensive guidance was provided to potential participants to shape their experience-sharing. This was rooted in Gavi's IRMMA framework, with a particular focus on "Identify" and "Reach". Participants were advised to focus on the actions they have taken to **understand their local zero-dose/under-immunized children challenges** – which groups are affected and why – and the **steps that have been taken to sustainably improve coverage** in light of this preparatory groundwork, particularly novel actions or well-executed routine work.

As well as verbal experience-sharing, participants made prolific use of the meeting platform's "chat" function to leave comments and raise queries, with only minimal prompting. Those participating asynchronously on social media platforms could also leave comments.

Experience-sharing events are completely different from conventional webinars. They engage participants as **active contributors** not as passive recipients. This is consistent with evidence from learning science that knowledge transmission is necessary but insufficient to lead to change. Importantly, **the event itself is only one element of the overall learning experience**. Through the registration process, participants are encouraged to reflect on and communicate their key challenges and activities, and the post-event questionnaire provides a further opportunity for sharing of experience.

Indeed, a key function of the event is to **familiarize participants with what may be a new way of learning**, one that contrasts with the traditional hierarchical top-down training most will have experienced to date. By sharing experiences around the shared goal of identifying, reaching, and vaccinating zero-dose and under-immunized children, the event **catalyses interest and enthusiasm for turning learning into action**. Evidence from learning science[1] has shown that this is especially important when tackling complex problems such as reaching zero-dose and under-immunized children. Materials disseminated after the event, and the ability for participants to share their learning, enable this new mode of peer learning to continue.

[1] Watkins, K.E., Sandmann, L.R., Dailey, C.A., Li, B., Yang, S.-E., Galen, R.S., Sadki, R., 2022. Accelerating problem-solving capacities of sub-national public health professionals: an evaluation of a digital immunization training intervention. BMC Health Serv Res 22, 736. https://doi.org/10.1186/s12913-022-08138-4

Connectivity issues are a common challenge at these kinds of peer learning events. While these may inevitably disrupt some aspects of participation, asynchronous participation provides an alternative way to experience the event, albeit without the dynamic interactions of the original proceedings. In addition, some participants made the effort to travel to another area where internet coverage is stable. Moreover, connectivity challenges do not prevent participants from benefiting from the other aspects of the peer learning experience before and after the event.

ATTENDANCE AND PARTICIPATION

A total of 1964 practitioners registered for the event, from 84 countries; 89 per cent of registrants work directly on zero-dose challenges and 61 percent work at the sub-national level. Registrants shared 492 experiences during the registration process.

The event itself was attended by 562 unique participants (69% working at the sub-national level), including 20 from Bangladesh, 53 from Mali and 489 from 86 other countries. As of 7 September 2023, the YouTube recording of the event had received a further 978 views, providing a "long tail" of engagement. The level of feedback was high, with 667 post-event questionnaires received by 28 June 2023, including from participants who watched the recording.

LIMITATIONS

- The relatively small number of participants from Bangladesh, particularly at subnational levels, makes it difficult to draw firm conclusions about findings from this country. The limited number of participants may be due to competing priorities, including that the day of the event coincided with a government reporting deadline, hierarchical norms (despite formal national EPI endorsement), social norms (health workers not used to being asked to share their experience), or other factors.
- As with all such events, connectivity challenges can make it difficult for some participants to contribute, especially during live events.
- There is limited scope at live events to go into the details of experiences shared (although post-event follow-up can enable some information gaps to be filled and more complete case studies developed).

PERCEPTIONS OF PRIORITY ISSUES

When registering, participants were asked to select the issues that were most relevant to their zero-dose/missed communities. Participants could select multiple issues but were not asked to rank them. Across all respondents, **demand-related barriers** featured highly, alongside **geographic challenges** and the impact of **insecurity and conflict**:

- Cultural beliefs or misconceptions 211
- Geographic isolation 196
- Inadequate awareness of immunization 187
- Conflict settings and internally displaced people 141
- Limited or inconsistent access to providers 130
- Lack of transportation 111
- Limited healthcare infrastructure 110
- Nomadic communities 107
- Poverty 106
- Seasonal or transient populations 101

For **Bangladesh**, limited or inconsistent access to providers and inadequate awareness of immunization were seen as particularly important (42 responses). For **Mali** (172 responses), conflict settings, seasonal or transient populations, and geographic isolation were seen as the most significant issues.

A very wide range of strategies have been adopted to reach zero-dose and missed communities. The most commonly referenced were:

- Utilizing community health workers and volunteers 52
- Community engagement, particularly with religious/community leaders 51
- Community outreach and mobilization 44
- Involving religious and community leaders in advocacy 42
- Catch-up campaigns for missed age groups 38
- Supplementary immunization activities 34
- Training and capacity building for providers 33
- Periodic intensification of routine immunization 29
- Strengthening routine immunization 28
- Health education and awareness raising 28

Responses from registrants in Mali were broadly similar to those across the full sample above. For Bangladesh, implementation of **electronic immunization registries** and **real-time data monitoring** was a particularly high priority (although numbers are small).

In terms of the **themes of the experiences shared**, **community engagement** was by far the most popular option selected from a pre-specified menu, followed by **improving the planning or delivery of services** and **use of data**:

- Community: how to better involve caregivers, community leaders and other community members 104
- Services: How immunization services are planned, organized or provided 57
- Data: How data are used to plan and monitor services 41
- Equity: Reaching mobile, nomadic or displaced populations 39
- Leadership or management of services 36
- Partnerships: How to better involve community-based organizations 28
- Vaccine hesitancy 28

NEXT STEPS

- *Further analysis will be carried out to integrate and compare data across countries following a second ZDLH-X meeting.*

EXPERIENCES SHARED BEFORE THE EVENT

The experiences submitted highlighted how immunization practitioners are **working to solve** key **zero-dose challenges** in different settings:

IDENTIFYING AFFECTED POPULATIONS: RAPID CONVENIENCE ASSESSMENTS

- Combining multiple methods of **desk analysis** and **community engagement** to identify a diversity of zero-dose, under-immunized and missed communities in Chattogram City in Bangladesh.

IMPROVING REACH IN URBAN AREAS

- Engaging with **mothers** and **fathers** in the community to identify and reach zero-dose and under-immunized children in the city of Sikasso, Mali.
- Using **micro-planning** to minimize missed opportunities for vaccination and **strengthening routine immunization** to improve coverage among under-served populations in Chattogram City.

IMPROVING REACH IN REMOTE RURAL POPULATIONS

- Engaging with **community/religious leaders** and **community health groups/councils** to identify zero-dose and under-immunized children within remote rural communities in Mali.
- **Triangulating multiple data sources** to map under-served remote rural communities in Bangladesh, and adopting a multi-faceted strategy to enhance service provision and demand within communities.
- Building **capacity for data use** and **human-centred local innovation** to address context-specific challenges in remote rural communities in Bangladesh.

REACHING INSECURE AND CONFLICT-AFFECTED AREAS

- Taking advantage of **women's days**, **festivals,** and **weddings** to organize catch-up activities in Mali, in close collaboration with community contacts.
- Using **mobile clinics** to reach internally displaced people affected by conflict.
- **Tracking usage data** to identify gaps in coverage and to decide on the **positioning of outposts** offering immunization and other health services.

ENGAGING WITH NOMADIC POPULATIONS

- Strengthening community engagement and engaging with **community chiefs** of nomadic communities to ensure stronger prioritization of immunization in Mali.

WORKING WITH COMMUNITIES TO IMPROVE SERVICES AND STRENGTHEN COMMUNITY OWNERSHIP

- Applying **human-centred design** to improve access when services are disrupted and **community reviews** to discuss and decide on approaches.

ADDRESSING GENDER-RELATED BARRIERS

- Using **women's networks** to identify zero-dose and under-immunized children in urban centres of Mali.
- Incorporating **gender-responsive service-delivery models** as part of a multifaceted strategy to reach zero-dose and under-immunized children in rural Bangladesh.
- Working with **women's associations** on organization of immunization activities at a large community festival in a rural and conflict-affected area of Mali.

PROMOTING NATIONAL CATCH-UP ACTIVITIES

- Building on World Immunization Week to undertake coordinated special catch-up activities in Bangladesh, which reached almost three million unimmunized or under-immunized children between 2020 and 2022.

Following the event, a subset of participants were contacted and more detailed case studies developed (Annex 2).

NEXT STEPS:

- *Country-specific case studies will be shared with the two Country Learning Hubs for in-country use.*
- *Experiences shared by practitioners will be circulated among participants and potentially made more widely available on the web.*

QUESTIONS AND ANSWERS (Q&A)

During the event, the online platform's "chat" function was well used by participations, who asked questions relating to the case studies presented or about zero-dose challenges more generally. In several cases, the presenters were able to answer queries or provide further details of their work.

Some participants also posted comments about their own experiences. The latter can also be of value – as illustrated by the contribution from a participant from Sierra Leone who discussed his experience of liaising with rebel leaders in order to reach conflict-affected areas.

Other questions included queries about the definition of terms, such as zero-dose children, under-vaccinated children, and insufficiently vaccinated children. Other issues raised included:

- Sources of funding related to zero-dose children and missed communities.
- Application of digital social networks in community sensitization.
- Strategies for addressing hesitancy and use of communication tools in target populations.
- Leveraging COVID-19 vaccination to access hard-to-reach groups.
- Reaching people displaced by conflict and insecurity.
- Understanding the contributions made by civil society organizations (CSOs).
- Assessing the impact of COVID-19-related vaccine hesitancy on routine vaccination and catch-up efforts.
- Reaching communities in areas controlled by armed insurgents.

Following the event, global experts with extensive field experience and the participants sharing experiences provided responses to the queries raised (Annex 2).

NEXT STEPS:

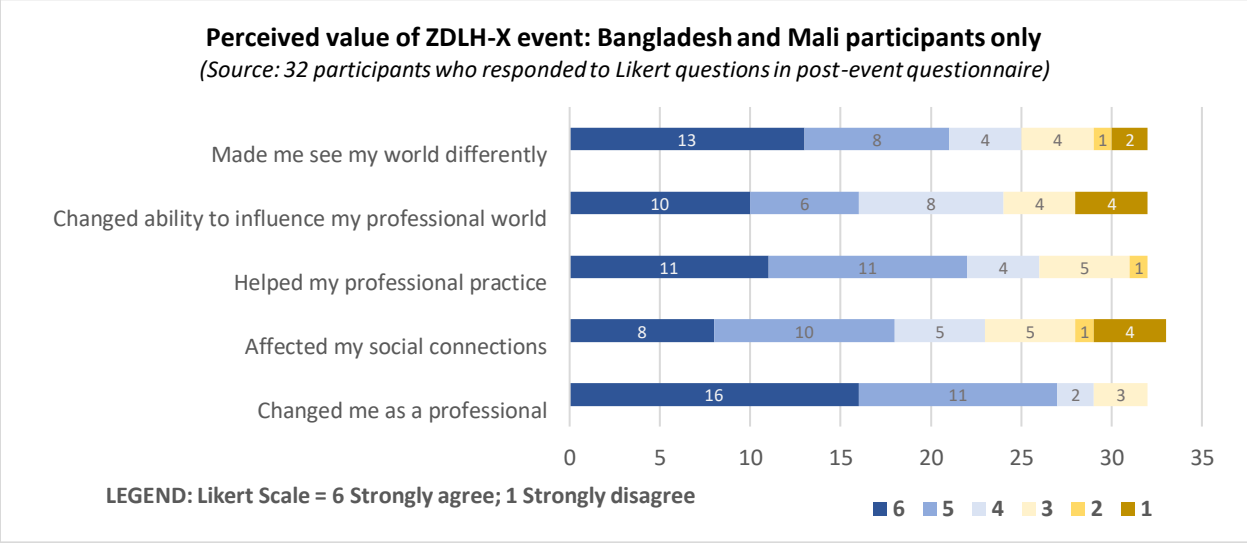
- *Answers to queries will be shared with contributors and are included in Annex 2.*

POST-EVENT QUESTIONNAIRE

After the event, a questionnaire with standardized, evidence-based questions was shared with all participants, to gather feedback on the perceived value of the event, areas that had proved most useful, and additional zero-dose experiences.

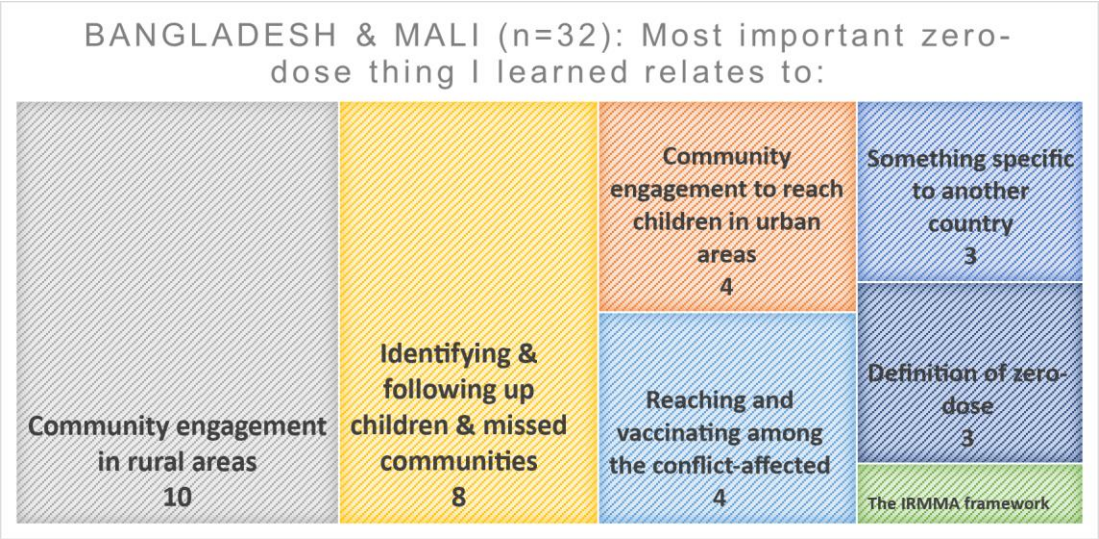
PERCEIVED VALUE OF THE EVENT

For participants from Bangladesh and Mali, 27 out of 32 (84 per cent) strongly agreed or agreed that the event changed them as a professional and 22 out of 32 (69 per cent) strongly agreed or agreed that the event helped their professional practice.



For all categories except "social connections", scores were higher than the TGLF benchmark for these standardized, evidence-based questions. (TGLF's peer learning programme typically includes specific activities to support social connections, such as networking and feedback sessions; these were not included in ZDLH-X1, likely explaining the lower score in the social connections category.)

Across the two countries, participants found a diverse range of topics of most interest and most useful to them.



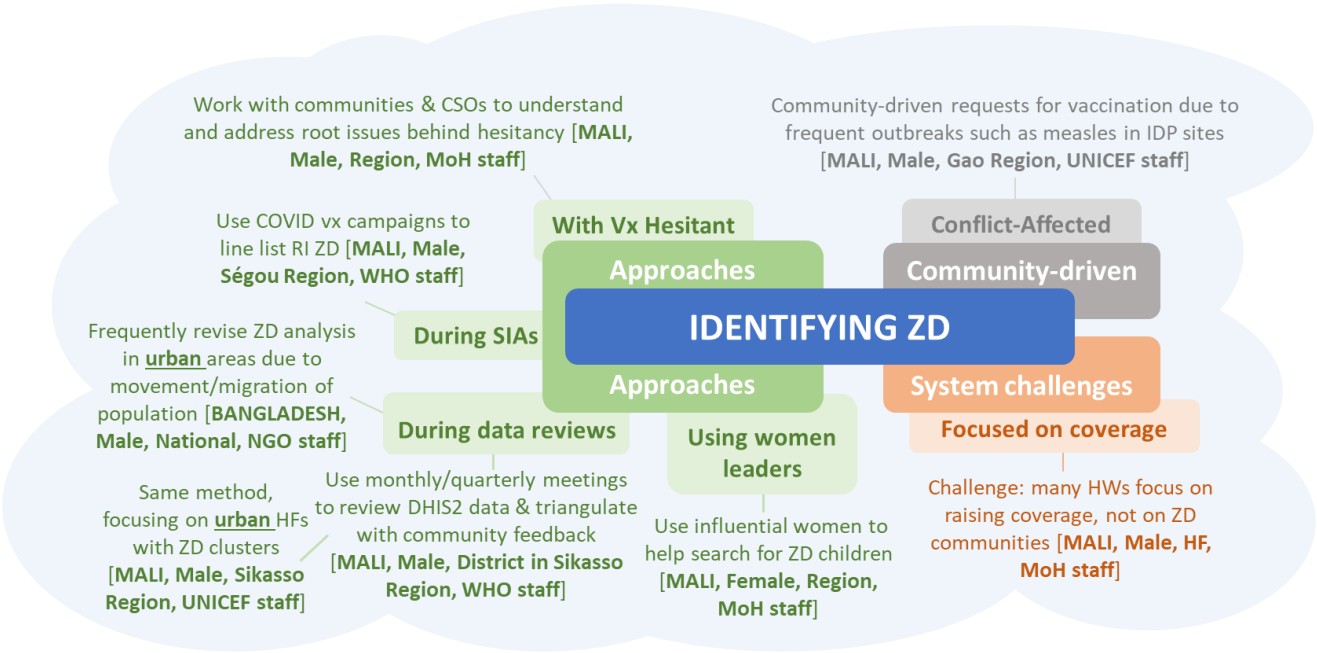
The event was of wider value to immunization practitioners working in low- and middle-income countries. An analysis of post-event questionnaire data from **195 anglophone participants** indicates that:

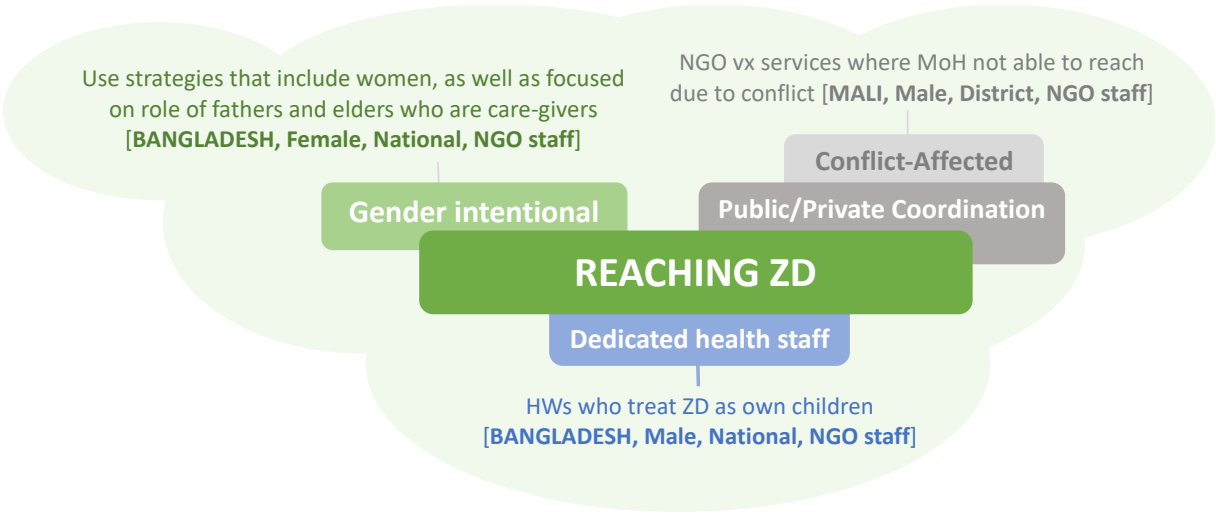
- 100% learned something new.
- 100% learned something they will apply in their work.
- 100% said they would invite colleagues to further events.
- **100% said their commitment to zero-dose challenges was strengthened.**

NEXT STEPS:

- *Further analysis will be carried out to integrate and compare data across countries, following the second ZDLH-X meeting.*

The experiences shared through the post-evaluation questionnaire provided additional insights into "identify" and "reach" activities. An initial attempt has been made to develop a conceptual framework from the in-depth case studies to capture and organize these experiences, and will be further refined after the second ZDLH-X event in September 2023:





NEXT STEPS:

- *Information on activities will be integrated from pre-event contributions.*
- *The integrated conceptual model for capturing and organizing information related to identifying and reaching zero-dose and children and missed communities will be refined following the second ZDLH-X event in September 2023.*

ZDLH COUNTRIES

The main focus of the ZDLH-X event was on Mali and Bangladesh. Information relating to these countries is collated here.

BANGLADESH

- 25 participants, 8 responses to pre-event questionnaire
- Pre-event respondents were particularly likely to be involved in **management** (45% vs 25% total sample) and **partnering with an immunization team** (45% vs 19%), and less likely to have a role in **supervision** (27% vs 51%).
- Most important zero-dose populations: **limited or inconsistent access to healthcare providers** (7), **inadequate immunization awareness** (5).
- Most promising practices to reach zero-dose children: **implementation of electronic immunization registries and real-time data monitoring** (5), **missed opportunities for vaccination** (3), **engaging with private/NGO providers** (3), **community engagement approaches** (3).
- Seven submissions to the post-event questionnaire
    - two female, five male
    - five national, one district, one health facility
    - Most important learning related to **community engagement to reach children in urban areas** (but seven submissions referred to six different areas).
- One case study – use of **rapid convenience monitoring** in Chattogram City (Annex 2).

MALI

- 80 participants, 42 responses to pre-event questionnaire
- Pre-event respondents were particularly likely to be involved in **coordination** (41% vs 32% total sample) and **service provision** (26% vs 18%) and less likely to be **partnering with an immunization team** (4% vs 19%).
- Most important zero-dose populations: **conflict settings/IPDs** (27), **seasonal or transient populations** (20), **isolated due to geographic constraints** (19).
- Most promising practices to reach zero-dose children: **community engagement approaches** (15), **utilizing community health workers and volunteers** (12), **community outreach and mobilization** (10).

- 26 submissions to the post-event questionnaire
    - five female, 21 male
    - six national, nine region, seven district, four health facility
    - Most important learning related to **community engagement in rural areas** (8/26) and **identifying and following up children and missed communities** (7/26)
- Two case studies – zero-dose children in **urban areas** and in **conflict-affected areas** (Annex 2).

CONCLUSIONS

The full ZDLH-X process – spanning preparation, attendance at the event itself and reflective follow-up – aims to support and empower practitioners, particularly those working at the subnational level. It is not just enabling them to share experiences and learn from each other, but also kick-starting the process of putting ideas into practice at their local level.

The ZDLH-X event helped to connect a global community of immunization practitioners with an active interest in equity and reaching the most underserved communities. While the focus was on Mali and Bangladesh, many of the experiences shared are of relevance to practitioners in a wide range of low- and middle-income countries. High participation by practitioners from other countries may be indicative of latent demand for such learning opportunities.

The event re-emphasized the **multiple factors that can lead to low coverage within communities** and incomplete vaccination of children. The most common relate to **beliefs and misconceptions** affecting demand, **geographic remoteness**, **population mobility**, **social exclusion,** and the impact of **insecurity and conflict**. How these and other factors interact to affect coverage levels depends strongly on **local context**, but multiple general principles and several specific actions were highlighted at the event that will be of widespread relevance to efforts to address inequities in coverage.

KEY NEXT STEPS...

- A second ZDLH-X event will be organized to enable practitioners from Nigeria and Uganda to engage with each other and colleagues from other LMICs.
- The draft conceptual framework will be refined after the second ZDLH-X event to provide a way to organize contributions, to ensure easier access to materials, and to create a picture of the key areas of zero-dose activity to align activities at global, regional and national levels.
- Successive ZDLH-X events will build on the lessons shared, promising practices, and conceptual framework refined from previous sessions.

In terms of **identification** of zero-dose children and missed communities, several contributors highlighted the importance of **triangulating multiple sources of data** to determine where underserved communities are present or individual children are being missed. As the final goal is to reach all infants (or other target

groups), data recording must ultimately come down to the **individual level**. In some countries, **electronic registry systems** hold great promise in this area but for many others paper-based reporting remains the norm.

At this level of granularity, **engaging with communities** becomes essential as community members are those who hold most information about the make-up of their local communities. In many settings, **service delivery is a partnership** between health service providers and communities, with the latter not being passive recipients of services but **sharing responsibility for protecting community health**. **Community health workers or other volunteers** are seen as a crucial bridge between communities and providers.

In terms of reaching under-immunized populations, the importance of **comprehensive micro-planning** with an equity lens was stressed. However, **population movements** – such as internal displacement due to conflict, migration into urban centres, or nomadic populations – can be a major challenge to effective micro-planning. Again, **strengthening community links** and **empowering communities** can begin to address these challenges.

Both **supply-side** and **demand-side** challenges were discussed, emphasizing the need for microplanning to consider both these aspects of service delivery. Working with **community leaders** and **building trust** with communities can be important strategies for dealing with **hesitancy**. Ensuring services are **accessible to households** is equally important, which can be addressed by consultation with communities on how and where services should be delivered. **Human-centred design** is one strategy being adopted to understand and address gaps in coverage.

Possible approaches include some combination of **engagement with men**, who may be key decision-makers in households, with **women**, who may have key formal or informal social connections that can be leveraged, and **people of influence** in communities, including elders and religious and political leaders.

Reaching zero-dose children and missed communities is one of the most difficult challenges facing immunization programmes, and gets progressively harder as the number of under-immunized children falls. Achieving progress will not be easy, and each country, region, district, and facility will need to work hard to locate zero-dose children and missed communities,

identify the reasons why services are not being accessed, and to create sustainable programmes to reach them in the future.

Each country, region, district, and facility will need to develop **tailored plans** that reflect their local contexts, but they can also draw inspiration from the experience of others who are addressing and overcoming similar challenges.

KEY FINDINGS AND RECOMMENDATIONS

KEY FINDINGS	RECOMMENDATIONS
1. The first ZDLH-X event engaged nearly 2000 practitioners with a majority from district and facility level, directly involved in zero-dose work	▪ Continue to build on and expand cross-learning opportunities and sharing of zero-dose implementation experiences at the next ZDLH-X event ▪ Support CLHs to nurture and grow sub-national networks, especially in target districts and linked to CLH objectives ▪ Investigate strategies to include non-participants in order to broaden the experience base and knowledge exchange, as part of a larger effort to build greater impact in peer-to-peer learning approaches
2. Immunization practitioners shared nearly 500 zero-dose-related experiences and more than 600 learning insights	▪ Extract insights from the experiences shared and develop case studies to help answer Gavi and CLH learning questions (completed: Annex 2) ▪ Following the second ZDLH-X event, refine the draft conceptual framework developed to extract insights being shared by practitioners ▪ "Give back" new knowledge or fresh insights to zero-dose practitioners at all levels, not only Gavi and national level staff ▪ Develop simple, rapid method to tailor outputs for relevant Gavi and country channels (including communications, internal and external stakeholders) ▪ Disseminate case studies exploring local innovations across a wider network, and use them as part of a larger effort to strengthen a learning culture with zero-dose practitioners
3. 84% of participants from Bangladesh and Mali agreed that the event changed them as a professional	▪ Study and document peer learning model in ZDLH context through learning-to-action case study (planned through the ZDLH Monitoring, Evaluation, and Learning component) ▪ Support more explicitly the development of sub-national learning networks that include follow-up approaches and promote knowledge translation/evidence use, as part of CLH collaboration
4. Zero-dose practitioners from 84 other countries participated, demonstrating strong demand for this type of online peer-to-peer learning	▪ Continue open access approach to zero-dose practitioner demand beyond CLH countries, and explore with Gavi and ZDLH partners practical ways to respond to global demand across many countries as part of the project's "global good" agenda
5. Learning Innovation Unit peer exchange approach based on learning science successfully mobilized sub-national staff for a global learning initiative	▪ Review possible use cases where CLHs could translate peer exchange approaches to further their learning hub objectives, with support from the ZDLH's Learning Innovation Unit.

ANNEX 1: FREQUENTLY ASKED QUESTIONS… AND SOME ANSWERS

Answers to questions raised during the 31 May 2023 ZDLH-X event between Bangladesh and Mali. Participants had the opportunity to post questions during the event itself or when watching a recording. Answers were generated by immunization specialists familiar with LMIC settings and, when appropriate, by the individuals who contributed during the experience-sharing event.

This generative process, in which responses elaborated in response to specific knowledge needs, is an example of *knowledge translation (i.e. turning learning into action)*. It illustrates one way in which learning can be connected to practitioner needs as they consider what they need to know in order to take action.

GENERAL QUESTIONS

1. **Can you clarify the definitions and the differences between zero-dose children (ZDC), zero-dose pregnant women (ZDPW), under-immunized children, insufficiently vaccinated children, and zero-dose communities?**

   The most direct and simple answer, and according to Gavi's operational definition, is that ZDC are children who have not received a single dose of diphtheria, tetanus and pertussis-containing vaccine (DTP1), such as Penta1. However, for most purposes, ZD are children who have never been immunized, and the communities or groups they come from may face multiple vulnerabilities We can also include "ZDPW Td1", zero-dose pregnant women who have not received a dose of Td (tetanus–diphtheria) vaccine; both pregnant women and their to-be-born infant are therefore at risk of getting tetanus.

   "Under-immunized" or "under-vaccinated" children were traditionally called "defaulters". These are children who started but did not complete the number of doses required for each antigen according to the national immunization schedule. But they have received at minimum the first dose of Penta vaccine (Penta1). They may have missed out on any of the required subsequent doses (i.e. Penta 2, Penta 3) or measles- and rubella-containing

vaccine dose 1 (MR1) or dose 2 (MR2), or oral poliovirus vaccine/inactivated poliovirus vaccine (OPV/IPV) doses. Under-vaccinated children may sometimes be a far bigger issue than ZDC, and lead to a higher risk of outbreaks such as measles.

The term "zero-dose communities" refers to urban or rural communities where ZDC or ZDPW tend to cluster or accumulate for various reasons. It is important to understand these reasons, so efforts can be prioritized and specific priority areas defined for corrective measures. Such communities could be hard to reach or never reached due to health system constraints (e.g., lack of human resources, logistics, difficult terrain, limited funding) and isolation due to insecurity, or being part of nomadic settlements. Such communities may also be affected by vaccine hesitancy, often in urban areas or, even refusal for various reasons that need to be investigated.

It is important to assess if ZD communities and caregivers of ZDC face accessibility or utilization issues, or both. Care should also be taken not to label a whole community as ZD unless they truly are, as this label can lead to generalizing the issues in that community. The term "community" suggests that the group is organized around certain commonalities. In some cases, ZDC are marginalized because they are outside of a group (e.g. newly arrived urban poor who may be living on the streets or in construction zones, as opposed to urban poor who have settled in slum dwellings).

2. **How do the number of ZDC contribute to low-dose routine immunization in the context of limited resources? Would it be possible to learn more about your experience and the methods you used to assess the situation?**

The "absolute number" of ZDC Penta1 will not tell you how high or how low your Penta1 coverage is, as this depends upon the total number of targeted children in the area served by an immunization post, health centre, subcentre, or in a district, region or country.

If your Penta1 coverage is high (over 90% or 95%), then data should be triangulated to find pockets of ZD and under-immunized children. These children also likely miss out on other services such as malaria prevention, nutrition, etc., and integrated services or linkages to PHC may be needed. Even with high overall coverage, pockets of ZDC and/or under-immunized can lead to outbreaks of vaccine preventable diseases.

In some areas a high Penta1 coverage may be associated with a low Penta3 or MR coverage due to a major drop out between Penta1 and Penta3 or MR (over the 10% that WHO recommends as a maximum). And the absolute number of defaulters may be far higher than the number of ZDC, representing a bigger problem and a higher risk of outbreaks of vaccine-preventable disease such as measles or diphtheria. The number of defaulters may become your priority if the dropout rate is over 5–8%.

The maximum Penta3 coverage you can achieve is Penta1 coverage with zero defaulters. But Penta1 coverage can be low due to lack of access to immunization of certain communities or groups, automatically affecting Penta3 coverage. There are several steps you can take here:

- Review administrative reporting at different levels in urban and rural areas.
- Review the results of coverage surveys (whenever they occur), even if they are usually conducted only at national and subnational levels, to compare with administrative data (and especially if the coverage surveys have a high number of documented doses rather than recall/history).
- Map accessibility to immunization sites (fixed/static, outreach, mobile) in urban and rural areas and look at the distance between communities and immunization sites.
- Review operational indicators of a functional immunization system such as stock-out of vaccines, percentage of immunization sessions by fixed/static, outreach and mobile vs planned sessions.
- Map hard-to-reach or never-reached communities that are served only during supplementary immunization activities (SIAs) and not routine immunization.
- Confirm the results on localization of ZDC or defaulters, using a LQAS approach (lot quality assurance sampling; see Review of Lot Quality Assurance Sampling, Methodology and its Application in Public Health - PMC (nih.gov)), especially in urban areas.
- Conduct key informant interviews to localize ZDC and understand causes. These could be with:
    - Policymakers (health and non-health, especially those linked to local budgetary decision-making).

- Health workers dedicated to immunization services at national and sub-national levels.
- Programme managers.
- Caregivers of ZDC and ZDPW.
- Community leaders (males and females).

This assessment will help to find out the localization of ZDC and under-immunized children in hard-to-reach areas and urban slums, and shed light on contributory factors.

Countries sharing tools, methods and results with each other at each level will be very useful for practitioners. The ZDLH's Learning Innovation Unit will be collating stories, tools, methods and results shared by ZD practitioners into an open-access database ("ZD Ideas Engine") on the ZDLH website.

3. **What are some upcoming funding opportunities for CSOs to sustainably support the efforts to reduce the number of zero-dose children (ZDC) and zero-dose pregnant women (ZDPW)?**

   CSOs are very country and community specific. In supporting their role and efforts towards improving routine immunization coverage, SIA coverage and catch-up campaigns, resources have been made available by Gavi in its support of country multi-year plans and yearly plans (e.g., full portfolio planning, health system and immunization strengthening), catch-up campaign resources, equity accelerator funding (EAF), and COVID-19 vaccine operational resources. HSS (Health System Strengthening) grants are now required to dedicate at least 10% of their budgets to CSOs—although the number of local NGOs is still low. In-country donors and international NGOs may also have resources to support ZD-specific efforts (for example, see Gavi's ZD Immunization Project (ZIP) https://www.gavi.org/vaccineswork/zip-new-way-get-vaccines-zero-dose-children-some-worlds-toughest-regions).

4. **How can you overcome socio-cultural barriers in areas of conflict or humanitarian crisis?**

   Socio-cultural barriers in conflict areas need to be understood and addressed through a dialogue and consensus with local leaders on how to successfully deliver vaccines to the targeted populations.

A common barrier in some countries is the gender of vaccinators. Male vaccinators may not be authorized to vaccinate women outdoors or sometimes indoors. And in some areas, there are insufficient female workers able to inject vaccines. Some countries have been able to mobilize female vaccinators in neighbouring districts or in nursing schools. Others have decided to spread out the execution of outreach and mobile activities.

Some in conflict areas have managed to arrange a truce to allow access; others have recruited personnel from the opposition groups with roles and responsibilities to ensure smooth and safe operations.

QUESTIONS BASED ON MALI EXPERIENCES

With responses from Mali presenters.

5. **How do you ensure that once the ZDC and ZDPW have been reached they receive the subsequent doses of vaccines they need, as this is not clear in terms of strategy in one of the Mali presentations, especially in insecure areas?**

   "This is a critical question and a challenge in insecure areas where the "hit-and-run" approach is often a useful opportunistic strategy but hard to repeat and sustain, and most often requires external donor funds. All ZDC need to receive subsequent vaccine doses for all antigens and not join the defaulter group.

   If specific delivery strategies that have reduced the number of ZDC are not sustained, this may lead to new ZDC, as children are being born each month. A minimum of six contacts a year is usually needed to fully immunize an under-one child, and more contacts for life-course vaccination. There are often missed opportunities in vaccination, and this includes not linking "hit and run" or even SIA doses with routine strategies such that the dropout rate between ZDC Penta1 and Penta3 or MR increases.

   In Mali, we consider it critical to plan for long-term strategies, considering the challenges and opportunities, that could be sustained logistically and financially, which could be very area-specific – such as insecurity or hard-to-reach villages.

As well as vaccinating at festivals, we took opportunities with other large meetings to vaccinate many people. We organized mobile clinics to get to many of the targeted population, like the Burka areas (for those familiar with Mali). A major opportunity is when many people come for these meetings or go to a particular village on market days.

We agree that follow-up strategies are key. In Mali, we were able to do a second vaccination delivery programme to reach those people who didn't come to the first festivals.

We also decided to link delivery of immunization services with other activities carried out by malaria, malnutrition and other programmes. They represent opportunities not to be missed.

We had a well-developed programme before that was working well in reaching and immunizing underserved communities, especially rural and remote communities. So, we actually used the existing immunization system with its human resources to help do follow-up immunization activities. Follow-up integration into other programmes was welcomed by the vaccination programme at the regional, district and health facility levels. But we kept a focus on rural zones.

This integrated approach was provided to those rural communities already involved and engaged to contribute to advocacy to follow up on additional vaccine doses needed. Their engagement meant that afterwards they did their own kind of follow up, which we supported. Community health workers started to do a follow-up and identify subsequent vaccine doses for all children in need.

Each time we came, they showed us a list of those children who had received doses during the festivals, and so we knew the subsequent doses needed.

Those who couldn't come to the actual festival were line-listed, to enable us to do the follow-up with them. In these areas, we did mobile clinic events in particular villages. Lots of people from smaller villages came to the mobile clinic events.

We are trying to ensure the sustainability of this activity over time, but it remains challenging."

6. **How can ZDC and ZDPW be identified in displaced populations? How can they be easily located? Do we have methods and statistics to assess distribution and localization of displaced populations and children of these population?**

   "In Mali, districts know the sites where internally displaced persons (IDPs) are found and the people considered as special populations. The numbers of people by age group are known in these sites and the lists are constantly updated as new people join the sites. Each IDP site has a leader who is constantly in touch with health authorities and is responsible for the updates. In collaboration with some NGOs that support IDPs, district health services organize outreach in these sites where they offer a minimum package of healthcare activities—such as consultations, antenatal care, nutrition and Immunization. They also take advantage of these visits to identify and catch-up zero-dose and under-immunized/defaulter children and pregnant women."

7. **How did you manage the logistical issues for the population of 21 villages coming to your health facility at once? You needed sites, food, security, human resources, cold chain etc. How does one deal with all these issues?**

   "To address the huge logistical needs of this campaign, we sent a proposal to decision-makers at district, provincial and regional levels to present what was required for this initiative to succeed.

   Everyone that could help supported the implementation by providing one thing or another. Some supported by providing refrigerators that were transported to Bamba to enable us to increase the cold chain capacity to store the vaccines. We also received and used icepacks with isotherm boxes to make sure that vaccines were properly stored.

   And then once we were actually doing the vaccinations, the festival organizers provided a lot of food at Bougu. Consequently, every family came to Bamba. All of the parents, grandparents, cousins, and even their friends were very honoured, they actually welcomed them with a warm welcome. This kind of community link really helped. And so, the families helped a lot with the logistical organization."

8. **How were the immunization sessions organized? Did the people go to the vaccination sites or did the vaccinators go to the people?**

   "Vaccination sites were set up on the festival grounds with the help of community health

workers and parents. Caregivers were directed towards these sites where their children could receive their vaccine doses."

9. **How did you assess the contribution of the civil society organizations involved and its impact?**

"Data-collection tools used during campaigns in Mali carry information on the contributions of community health committees, councils/political leaders as well as civil society organizations (CSOs). Whatever support was received from CSOs appeared in daily reports that health facility directors send to the district at the end of each day. Their support could include rental of motorbikes to transport vaccination teams, acquisition of ice packs, payment of stipends to community volunteers, etc. Their support is costed and at the end of the campaign included in the report.

Assessing and monitoring the impact of each partner's support is not easy, as the success was the result of a collective partnership of efforts.

We can report the number of ZDC immunized with Penta1, the number of Penta2 and Penta3 and other vaccine doses administered but we are unable to measure the reduction in ZDC Penta1.

It is difficult to compare the results of two coverage surveys for Penta1 over two consecutive years in the absence of an accurate denominator, i.e. the population size targeted. But coverage surveys have a level of uncertainty that can hide some progress made.

Demonstrating an increase in absolute number of Penta1 doses administered over a similar period this year and the previous could be evidence of progress, provided that reporting is accurate and that the same child did not receive two doses of Penta1 in the absence of records.

LQAS may demonstrate an expected Penta1 coverage over 90% and rapid coverage assessment during or after intervention may also help if feasible and well-conducted."

10. **What strategy and communication tools were used to make reluctant parents agree to travel to a distant point to vaccinate their children? Was there a particular strategy used by the community relays?**

    "We involved community leaders and stakeholders early in the planning phase. We worked with community health workers and women's groups to sensitize parents and caregivers on the importance of vaccination especially on the risk of outbreaks of measles or polio in the absence of vaccination."

11. **What are the main reasons for ZDC and under-vaccination/defaulters in your area? Accessibility due to insecurity? Shortage of vaccines? Vaccine hesitation due to antivax propaganda?**

    "The major reason was religious belief. The vaccines were in sufficient quantity to cover all the region and well stored in a reliable cold chain. There was no insecurity issue."

12. **What form of motivation was given to the community relays for their work? Or did they carry out this work free of charge and on a voluntary basis?**

    "Community relays are volunteers that work out of their love for their communities without any remuneration during routine immunization activities. However, during campaigns and SIAs there are some partners who choose to finance relay activities by paying them a daily stipend (*per diem*)."

13. **How can we reach zero-dose children leveraging on COVID-19 vaccination outreaches and resources? What are the approaches that can be helpful for catch up efforts from COVID-19 integration?**

    "In Mali, with WHO support, a community response system has been put in place for COVID-19 testing and vaccination in all the regions. Teams are deployed to the communities not only for COVID-19 outreach but also to identify and reach ZDC and defaulters. These teams are made of five people, including two people responsible for interpersonal communication in households (including the search for zero-dose and incompletely vaccinated children in households), one screening agent and two vaccinators (COVID-19 and routine immunization).

All zero-dose/under-immunized/defaulter children identified are immediately administered the vaccines they need and are referred to the nearest health facility for subsequent doses.

In addition to filling the vaccination register with information on the child, an information form is also filled that contains the address and contact details of the parents who are called to be reminded of the vaccination schedule. If they do not show up on the appointed day, a community relay is sent to the house of the child to enquire. If the mother/caregiver has travelled with the child, they are called and advised to take the child with their vaccination card to the nearest health facility where they are for the child to receive their doses."

14. **How can children living beyond government lines in areas held by rebels be reached and vaccinated?**

"In case of war and crises, healthcare workers are neutral and are responsible for the health of people from all factions. Health/vaccination teams are able to take the risk, to go to villages under rebel control to carry out vaccination and other health services.

They are usually known by the motor bikes offered by UNICEF and WHO, and their vaccine carriers. However, at rebel checkpoints their IDs are still checked to ensure that they are not military in disguise. One thing that has greatly helped in Mali is that the government allows vaccinators, matrons and midwives to be recruited by Community Health Committees and handed over to a Community Health Centre. This means that vaccinators who go out for outreach are known by the community and that includes the rebels themselves. In spite of this, the situation is not risk-free, but health workers have the means of calling the military anonymously if they feel that their lives are in danger."

15. **What is the level of involvement of chiefs and leaders? How did you mobilize them and maintain their commitment? What were the main communication methods or tools used?**

"There is a strong involvement of the community in healthcare services in Mali and this includes immunization. Community leaders (traditional, religious and political) are involved in the planning of health activities at the beginning of every year. They are also involved in the evaluation of the previous year's activities. Throughout the year, they are

involved in the running of health centre activities through the Community Health Committee, which meets on a monthly basis. This committee is made of delegates who are elected by community members to represent their interests in health issues. In the case of vaccination services (both routine and SIAs), their involvement is at every stage from planning, execution, monitoring, and coverage achievement reports.

During SIAs, communication activities begin two weeks to one month before the campaign. During this time, Community Health Committee members inform traditional, religious and other leaders, in churches and palaces. The health service also organizes meetings with community leaders and other stakeholders to get their engagement. Women's groups are also engaged to support in the sensitization of their members and other women in the villages on the importance of having their children vaccinated.

Methods and tools used prior to and during the campaign include:

- Town criers.
- Door-to-door sensitization.
- Public announcements in market places and churches.
- Community radio."

16. **How do you communicate on immunization in your region? What communication tools helped you reach/sensitize missed communities? Is vaccine misinformation present in your region?**

"Because of the outbreaks and other health problems that people face, especially with the reduced access to healthcare and immunization services in security-compromised areas, we do not really have the problem of misinformation in our region.

People have noticed that, when immunization services were frequent and regular, there were no outbreaks and now they are witnessing the resurgence of outbreaks. For this reason, they want to be protected against vaccine-preventable diseases."

17. **I would like to know if during your investigations, you tried to see if the COVID-19 pandemic contributed to vaccination refusals for children and women?**

"It is important to investigate this potential risk. If we did not identify and investigate the issues and causes of potential refusals, we would not been able to implement the needed corrective measures.

If it is perceptions that come from rumours and misconceptions during COVID that lead to vaccination failures, then we should act on them. If we don't, we will always fail.

The COVID-19 pandemic did not really contribute to vaccination refusals, but there was an increase in vaccine hesitancy.

We addressed vaccine hesitancy by raising awareness on the importance of immunization using illustrated charts until we regained their trust. This awareness-raising is done in the presence of a highly influential member of the community. There were also particular cases that involved negotiations with the hesitant parties involving understanding the reasons for their hesitancy and responding to them."

18. **How can digital social media help to combat misinformation and reach communities that are often missed by traditional immunization strategies?**

"Digital social media can play a significant role in combating misinformation and reaching communities that are often missed by traditional immunization strategies. The most popular social media platforms that are used to combat misinformation and promote vaccine uptake include Facebook, WhatsApp, Twitter, Instagram, YouTube and LinkedIn. At community level, community members have access to WhatsApp and Facebook and these media have been leveraged during campaigns to fight disinformation. The COVID-19 pandemic ushered a wave of misinformation and disinformation on vaccines and vaccination and this was mainly through social media.

There are a number of ways in which these media can be used to increase vaccine uptake:

- Use of social media to disseminate accurate information on the benefits, safety, and effectiveness of vaccines. By creating informative and engaging content, they can counter misinformation and ensure accurate information reaches a wider audience.

- Use of social media influencers and trusted voices with a large following to endorse and promote vaccination campaigns has proven to be helpful in some contexts.
- Social media can be used for precise messages targeting specific demographics including communities that are vaccine hesitant or often missed by traditional communication strategies. This targeted approach ensures that information about vaccines is delivered to those who need it the most.
- Social media can also be used to share real stories and testimonies of vaccine users or of people who have been the victim of vaccine-preventable diseases. To increase COVID-19 vaccine uptake, many people posted videos/photos of themselves receiving the vaccine on social media and this helped to encourage others to accept the vaccine."

ANNEX 2: CASE STUDIES

Contributions suitable for case studies were first identified by reviewing pre-event zero-dose experiences shared in an open process (anyone can contribute) by over 500 practitioners who chose to share these experiences (intrinsic motivation). They were selected on the basis of Gavi's priority learning questions and finalized through dialogue between their contributors and global experts.

Md Sorwer Alam. Case study 1: Use of Rapid Convenience Monitoring (RCM) to identify and reach zero-dose and under-immunized children in Chattogram City Corporation in Bangladesh

GENERAL BACKGROUND ON RCM

Rapid convenience monitoring (RCM) or assessment (RCA) is a tool that has traditionally been used for supervision and monitoring of immunization campaigns across many countries. A good reference document on how to use RCM/RCA tools can be found in WHO AFRO's Mid-Level Managers course for supplementary immunization, module 13 (9789290233848-eng.pdf (who.int).

The following example from Bangladesh was highlighted during the ZDLH-X1 event, and reflects feedback from a key participant on how they are using RCM to address zero-dose and under-immunized children challenges. Examples such as this one are useful in illustrating how immunization campaign tools and techniques can be applied to address zero-dose challenges (although in-depth information on the financial and human resource implications of regularly using RCM was not avaliable).

HOW CHATTOGRAM CITY APPLIES RCM TO ADDRESS ZERO-DOSE AND UNDER-IMMUNIZED CHILDREN CHALLENGES

"Bangladesh is known for its robust Expanded Programme on Immunization (EPI), with remarkable strides having been made in improving immunization coverage over the past few decades. A crucial component of the programme is the use of RCM, a method that allows for rapid and reliable identification of under-immunized and zero-dose children and communities. RCM is a field-based monitoring technique that is used in our areas to quickly

and reliably identify pockets of under-immunized and zero-dose children in a community. Unlike surveys, RCM does not seek to generate statistically representative data, but rather provides rapid feedback on the performance of immunization services in specific areas, enabling immediate corrective action.

HOW WE CONDUCT RAPID CONVENIENCE MONITORING (RCM)

Targeted RCM: RCM is conducted in a purposive manner, focusing on high-risk and hard-to-reach areas identified through risk assessment and data analysis.

Use of KoboCollect: The open-source tool KoboCollect is used to record the findings from the RCM. The tool operates on smartphones and can work without on-site internet connectivity. The data collected are uploaded once the phone has internet access.

Questionnaire: A pre-set questionnaire is included in the KoboCollect app. It collects comprehensive data on factors such as the child's and care-giver's vaccination status, socioeconomic condition of the parents, educational status of the mother, place of birth, antenatal care visit status, reasons for zero-dose or partial immunization, and the type of place for RCM.

Child Selection and Assessment: Each RCM involves an evaluation of one child under 2 years old per household (preferring the elder one). The houses are selected randomly, targeting every alternate household with children under 2 years old. Each RCM takes about 10 minutes to conduct and record.

Data Analysis and Response: Data from the RCM is analysed and visualized in real time on a PowerBi dashboard. Prompt action is taken for zero-dose, missed communities, and under-immunized children, and the data are shared with the government for corrective action.

IMPLEMENTATION AND IMPACT

RCM is conducted regularly, with at least 20 children assessed per month. Beyond routine checks, it is also performed for each suspected case of measles, measles outbreak, acute flaccid paralysis, or neonatal tetanus.

A recent RCM exercise in Bangladesh took four days to complete, targeting high risk/hard to reach locations, and covered 128 upazillas (equivalent to a district sub-unit), as well as all 12 City Corporations. A total of 213 2nd line supervisors (MOH doctors) were involved.

The RCM approach has proven extremely useful, especially in urban areas where the large denominator and limited interpersonal communication present challenges. RCM provides a community overview of immunization status, helping to identify under-immunized children due to factors like population migration, inconvenient session timing, absence of caregiver, and sickness of the child.

RESOURCES AND REPLICABILITY

RCM implementation is cost-effective, as KoboCollect is an open-source application. The main resources required are development of the tool and human resources capable of using a smartphone for data collection. Additional costs depend on country context, cost of internet and devices, and whether or not any partner is already supporting surveillance officers to help conduct these exercises (e.g., in Bangladesh, WHO currently supports Surveillance and Immunization Medical Officers who conduct RCM on a routine basis).

There is a call for wider use of the RCM approach in Bangladesh, especially with government support. Greater coverage and data generation would undoubtedly lead to the identification of many more zero-dose children, missed communities, and under-immunized children."

Even though KoboCollect is an open-source application, and resources are required for the development of the tool, it would be useful to know what additional costs should be considered to regularly implement RCM (e.g., transport/fuel, time of health staff).

Dr Fantamady Camara. Case study 2: Identification of zero-dose children in urban areas in Sikasso region, Mali

GENERAL BACKGROUND ON URBAN IMMUNIZATION

As middle- and lower-income countries became increasingly urbanized, the immunization community began developing strategies and tools specifically intended for addressing urban challenges (e.g. 'Immunization in urban areas: Issues and strategies' (1994); 'Immunization, urbanization and slums - a systematic review of factors and interventions' (2017); Urban Immunization Toolkit (2018); 'Improving equity in urban immunization in low- and middle-income countries: A qualitative document review (2023). Participants in ZDLH-X1 often mentioned larger population urban challenges or results related to under-immunized versus zero-dose children; this may be because the challenges of the under-immunized are indeed bigger issues in many geographies, or in some areas zero-dose issues may not yet have been fully explored.

The ZDLH-X1 event highlighted a number of strategies being used by participants to address the growing challenge of urban zero-dose and under-immunized children and marginalized groups. It is important to understand not only what the guidelines, tools, and recommendations are for an issue, but also how these are being applied in the real world and in different contexts. This Mali example provides details of how global guidance from the Urban Immunization Toolkit was put into practice in Sikasso Region.

HOW SIKASSO REGION IN MALI IS USING AN URBAN IMMUNIZATION STRATEGY

Sikasso is the third-largest administrative region in Mali and consists of 10 health districts. One of the key public health challenges in this region was a high number of zero-dose and under-immunized children, mostly originating from 11 urban community health centres (CHCs) in the district of Sikasso. In response to this, an urban immunization strategy (UIS) was adopted to boost immunization coverage and equity.

Our UIS consists of a set of strategies implemented in 11 shortlisted CHCs in the city of Sikasso to reduce the number of zero-dose and under-immunized children (not vaccinated with Penta3).

For implementation, we used the UIS toolkit, which was developed to combat inequitable vaccine coverage in the urban context and has been available since September 2018 (Urban-immunization-toolkit_final-1563547313.pdf (linkedimmunisation.org)).

In 2017, with the support of UNICEF, Mali began implementing the RED/REC (Reach Every District/Reach Every Child) or equity in immunization approach. Initially, priority districts were selected according to criteria, the most important of which was the number of Penta3 unimmunized children.

There were 11 of these priority districts throughout the country, including three in the Sikasso region, Bougouni, Koutiala and Yorosso, and they are implementing the REC approach. In 2019, the approach was extended to 12 new districts, including two in the Sikasso region – Sikasso and Kolondièba. The approach benefits from the support of one of UNICEF/Gavi's immunization technical assistants based in Sikasso.

In line with National Immunization Center (NIC, the national MoH EPI team) recommendations, starting in 2018, monthly EPI data analysis and epidemiological surveillance sessions have been held regularly in some of the region's health districts. Following these sessions, it was found that in the Sikasso health district, which at the time had 45 health areas, the majority of the district's under-vaccinated children came from the 11 CHCs in the town of Sikasso according to DVD-MT and later DHIS-2 data. The UIS was therefore implemented to improve immunization coverage for children in these health areas. The strategy's activities began with the setting up of a core team that drew up an action plan including a situational analysis that identified the bottlenecks/obstacles to children's non-completion of the immunization schedule, and the adoption of strategies for tracking down zero-dose and under-vaccinated children.

METHODOLOGY

The UIS Toolkit was utilized, outlining a set of strategies aimed at combating inequitable vaccine coverage in the urban context. The implementation followed several steps:

1. **Situational analysis**: This involved collecting and reviewing health facility and household data, including immunization registers and reports. The team also conducted interviews with providers and users to understand the reasons for incomplete immunizations, using tools such as the 'Reach Every Child' tool (AGE: Analysis of bottlenecks and micro-plan

template). Focus groups were also organized with parents, and household surveys were undertaken with the KoboCollect tool (an open source app). The district held monthly sessions to analyse vaccination and epidemiological surveillance data.

- ***How did this analysis take place?***
  As described above, after the training of the women's groups, the research activities began with the provision of the list of incompletely vaccinated children (from the compilation of vaccination registers and schedule sheets) to group members. They went door-to-door to identify and register these children. A district monitoring mission supported by our partners (UNICEF and WHO) made it possible to count the children caught up in the same registers, which gave the 652 children recovered and 12 zero-dose children by the groups.

- ***Who was involved?***
  All the actors:
  - Technical: Management executives, district, community health centre (Technical Director and vaccinator agent); partners (UNICEF staff and WHO consultant).
  - Members of community health committees (Associations Santé Communautaire).
  - Local councillors.
  - Platform members.

- ***How did it go?***
  - Elaboration of terms of reference for the supervision of group activities.
  - Visit to community health centres:
    - Interview with platform members.
    - Document review with verification of the list of children caught up in the registers, exchanges with technicians and certain members of community health associations, setting up of reference coupons.
    - Drafting of a mission report.
    - Presentation of findings to the data review.

2. **Outreach and Education**: 330 members from local women's groups were trained on the UIS, forming a key part of the approach. They were selected based on their proximity to the children's area/neighbourhood, or their familiarity with the parents. The trained

members were then sent door-to-door to identify zero-dose and under-vaccinated children, and to raise awareness about the importance of vaccination among parents.

The women's groups (platforms) were trained using the training manual for members of child survival support platforms, covering the search for lost children but also the promotion of essential family practices. There are 330 in total – 30 members per health area. Selection was based on groups already supporting centres in health promotion activities. Indeed, some areas already have women's health service user committees, whose members are the groups that have been trained. In other areas where there are no women's health service user committees, the choice of group members was made in agreement with the community health committee.

The majority of CHCs distribute the list of children lost to follow-up among group members, either according to the proximity of their homes to the children's area/neighbourhood, or according to their acquaintance with the parents. Parents' telephone numbers and vouchers for referring children to vaccination services are given to group members. They generally go door-to-door to look for children, and run awareness-raising sessions at women's gatherings and in places such as markets. They also have reference coupons that are given to the mothers of children who missed a vaccine to attend vaccination sessions. In this way, they were able to catch up with 652 under-vaccinated children and recover six zero-dose children.

The first data review took place on 19–20 June 2023, in the presence of members of the regional directorate, district, the management bodies of the CHCs (ASACO), representatives of the technical directors of the centres, vaccinators, and some members of the platforms. It enabled us to identify some best catch-up practices.

- ***How did you decide to use women's groups to help you identify children who had not received any doses of vaccine, and what process do they use during their home visits to find them?***

  The decision to use women's groups was based on experience gained elsewhere, especially with women leaders in the Bamako district, and we drew a lot of inspiration from that. We also consulted other regions where platforms contribute to

immunization, such as Koulikoro, with whom we organized an experience-sharing meeting to capitalize on their experience.

The women work in pairs, going door-to-door, organizing talks and raising awareness in places where women gather.

- ***Do women's groups receive benefits or daily allowances?***
  The work is initially voluntary, but in the forecast and taking into account the Bamako experience, a lump sum of 2000 CFA francs motivation is provided per member and per outing. Each member is expected to make three outings a month, either to pick up children where they have a list, or to conduct educational talks. Since the start-up, the lack of funds has meant that these incentives cannot be paid as planned.

- ***Is this Gavi-funded approach being used in other parts of the country?***
  Yes, UIS is also being implemented in the Bamako district and the Ségou, Mopti and Kayes regions.

- ***How long has this approach been implemented in your region?***
  In the Sikasso district, we started the process in 2019, but the use of women's groups only really began at the end of 2022.

RESULTS

These women's groups made home visits and managed to catch-up 652 under-immunized and six zero-dose children who had previously been identified as incompletely vaccinated from the review of vaccination registers.

CHALLENGES

Implementing this strategy also highlighted several challenges. For instance, the groups faced difficulties with the size of the area to be covered, the mobility of mothers with their children, incorrect phone numbers, and the occasional reluctance of women to meet with members of women's groups. Ensuring proper training, motivation, and identification of platform members was critical to overcome these obstacles.

LESSONS LEARNED

Implementing the UIS in Sikasso offered valuable insights for future applications:

1. The selection of group members is crucial and should take into account factors such as the size of the area to be covered and the need for training.
2. Providing financial motivation and ensuring systematic provision of a list of under-immunized children to group members can improve the efficiency of the strategy.
3. Challenges such as incorrect phone numbers and movement of mothers with their children need to be factored into the implementation of the UIS.

What advice would you give to anyone wishing to use the same approach in another country and in their urban area?

You should avoid or take into account:

- The choice of platform members (the best way is for members to look after the children in their sectors/neighbourhoods).
- The size of the area to be covered by platform members.
- Proper training of platform members.
- Identify members (visibility kit).
- Mothers moving with their children (change of residence).
- The existence of incorrect telephone numbers for mothers with children.
- Women's reluctance to meet with members of women's groups.
- Motivating platform members.
- Systematic provision of a list of under- immunized children.

CONCLUSION

Despite the challenges, our Urban Immunization Strategy has shown promise in reaching under-immunized children in the Sikasso region, Mali. As this approach continues with the financial support of UNICEF and Gavi funds, it offers hope for the future and a model for other regions and countries facing similar challenges.

Fousseyni Dembele. Case study 3: Identifying and reaching ZD and under-immunized children in conflict areas in Mali

GENERAL BACKGROUND ON IMMUNIZATION IN CONFLICT-AFFECTED AND FRAGILE CONTEXTS

Zero-dose children often come from marginalized groups– many of whom are impacted by conflict or are based in fragile environments. Gavi's support to countries includes a focus on those zero-dose children. For more information, see: Fragility, emergencies and displaced populations policy (gavi.org).

FOUSSEYNI DEMBELE: COMMUNITIES FACING ARMED CONFLICT AND IN CAMPS FOR THE INTERNALLY DISPLACED

Experience 1: Armed conflict

- **Where are zero-dose children located?** We live in a conflict zone with the presence of different armed terrorists and rebel groups. In these areas, some health care workers have abandoned their posts because of the insecurity. Many health care facilities have been closed or even ransacked by the terrorists. The people who live there are almost left behind. These populations have no resources to move to a functional centre. The places are very far from functional health facilities. The mothers of the children do not have the resources or the power of decision to go to a centre to vaccinate their children. This population does not consider vaccination a priority because they lack information on the benefits of vaccination for their families and the community.
- **Problem:** Addressing access to healthcare services, equity-related issues including gender barriers, outreach to mobile, nomadic, or displaced populations, and urban–rural disparities.
- **Challenge:** Insecurity makes it difficult to update the health map for micro-planning. This does not allow the mapping of the missing communities, nor the elaboration of the list of the zero-dose children, which relies on the support of the relays and community health agents. Access is difficult, there is a lack of information, and the vaccines are far from the population because some refrigerators are not working. Fixed, outreach and mobile strategies are rarely used.
- **Strategy to reach zero-dose and under-immunized children:** We take advantage of days like women's days or festivals and weddings to organize catch-up activities in these

communities. Before the catch-up activities, relays and community health workers are mobilized to list the zero-dose children and sensitize caregivers ahead of that day. We work with women's associations for the proper organization of the activities.

- **Success story:** The community of Bamba in the health district of Bourem organized a big festival with more than 21 villages. We joined the organizing committee to organize catch-up activities. From the first meeting, we made an appeal by showing the vaccination data and coverage for Penta1 and Penta3 as well as MCV1 and the consequences of the weak coverage (outbreaks) to all the stakeholders, while showing them the opportunities to improve this coverage.

  We worked with the media, relays, the women's associations, the community health workers, and the community leaders for the organization and the sensitization. On the day of the festival, we had a high-volume vaccination site on the festival grounds. This activity was successful because others did the same thing for their festivals.

- ***Tell us more about the process you follow to list zero-dose children. Do people go house to house? Do you have another method? Is there a cost, and if so, who covers those costs?***
  - Community health workers are local people. They know all the households.
  - We have a list of households in each locality. Using this list, community health workers and relays go from household to household under the supervision of advisors, women's leaders and religious leaders.
  - Children are also classified according to their vaccination status. Vaccination status is often determined on the basis of vaccination history.
  - This activity of counting unimmunized or under-immunized children is left to the political-administrative authorities, religious leaders and NGOs, as part of their advocacy to mobilize the community during the catch-up period.
  - We use fixed sites such as village chiefs, centres and women's leaders to take account of missing households.
  - Town criers are there to spread the message of enumeration.
  - There is no specific cost for this activity, as it is part of the tasks of the relays and community health workers, who are remunerated every month.

- During the catch-up period, they are part of the vaccination team, either as mobilizers or vaccinators. They are paid in addition to their monthly salary.

- ***What do women's associations do to help organize the event?***
  Women's associations take part in all stages of the event. They hold meetings to raise women's awareness of the need to stay at home during the enumeration period, and discuss with mothers and babysitters the best times for the survey. They advocate for the importance of the activity. They encourage women relays and community health workers to ensure the quality of the de-cluttering activity, which will guarantee the success of the catch-up activity. The women's associations tell us about the obstacles (agreement of the heads of household, timing). We also work with the men to tell them about the women's problems, so that they can contribute to the success of the activity.

Experience 2: Camps for internally displaced people

At a site for internally displaced people in Gao, the religious and customary authorities asked me for a working session. At the beginning of the meeting, the religious leader asked me the question, "why are there still epidemics of measles in the camps for displaced people?" The second question was the following: "Doctor, I am afraid that the native population will hunt us if we do not find a solution to this situation." I explained that the main cause of the epidemic outbreak is the low coverage of vaccination, in particular of measles. He confirmed to me that, for a few months, the vaccinators have not set foot in their locality. I assured them that the solution to their problem was to vaccinate all children and pregnant women. He asked me how. It is enough to organize a period of intensification of vaccination activities to catch up with all the children and pregnant women. After restitution to the community, the authorities have proposed a period. This is how we implemented this pilot intervention by the community.

- ***Who is responsible for vaccinating this community (NGO? Ministry of Health?)?***
  - We work with the Ministry of Health (district, health unit (community health centres).
  - The NGOs are responsible for implementation, in conjunction with the technical partner (Ministry of Health). UNICEF provides funding and supervises the activity.
  - NGOs run the mobile clinic.

- The Ministry of Health and the NGO in charge of internally displaced persons in Gao, concerned about the health of the entire population and of IDPs (internally displaced persons) in particular, have set up a catch-up steering committee, and have taken on this request to organize catch-up vaccination sessions in IDP sites.
- The committee's stakeholders are the political and administrative authorities of the IDP sites, representatives of NGOs and other partners involved in coordination and micro-planning.
- The main reason for the non-immunization or under- immunization of this population was the armed conflicts that created insecurity, leaving this population to fend for itself.
- It is very important to work with the population for the success of any intervention.

ANNEX 3: ZERO-DOSE PRACTITIONERS WHO SHARED THEIR EXPERIENCE AND LEARNING FOR ZDLH-X 1

Valuing the sharing of experience

Before, during, and after a ZDLH-X event, we ask participants tell us who they are and what they do when they share their experience. We want to recognize and honor everyone who contributes an idea, story or experience, whether or not their story is shared publicly. For each contribution, we may share the details (such as gender, job category, professional affiliation, country, health system level) that help others better situate a story.

We ask participants to choose whether or not they wish for their name to be shared publicly.

We do this primarily because it may help colleagues facing similar challenges. It may also help the Gavi Zero-Dose Learning Hub (ZDLH) partners better understand practitioner situations, challenges, and needs.

We also ask questions after ZDLH-X to understand what participants are learning, so that we can share lessons learned and insights with everyone. Some of the questions help understand the value created through participation in ZDLH-X. Participants confirm that they understand their contribution, or an edited version of it, may be selected for publication. If so, it will be available online for everyone.

In addition to sharing your contributions publicly, we may use experiences shared by ZDLH-X participants for research, learning, evaluation, communication and advocacy, or any other purpose consistent with the ZDLH mission. We also use the information to keep in touch with participants.

Contributors who shared their zero-dose experience before the ZDLH-X 1 event

Note that some Contributors requested that their names remain confidential and/or did not wish for their contributions to be used for research, learning, evaluation, communication, and advocacy. The following names are listed as per Contributors' submissions.

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