Zero-Dose LEARNING HUB

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

October 2024

Gavi The Vaccine Alliance

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THE GENEVA LEARNING FOUNDATION

Gavi Zero-Dose Learning Hub (ZDLH)

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

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ACRONYMS

CHAI	Clinton Health Access Initiative
CLH	Country Learning Hub
DHT	district health team
DTP	diphtheria, tetanus, pertussis [vaccine]
EAF	Equity Accelerator Fund
eCHIS	electronic community health information system
EPI	Expanded Program on Immunization
HTH	house-to-house
IIHMR	International Institute of Health Management Research
IR	implementation research
IRMMA	Identify, Reach, Monitor, Measure, and Advocate
JSI	JSI Research & Training Institute, Inc.
MOH	Ministry of Health
NIRA	National Identification and Registration Authority
RE-AIM	reach, adoption, implementation, and maintenance
SPT	Smart Paper Technology
TA	technical assistance
UI	under-immunized
UNEPI	Uganda National Expanded Programme on Immunisation
VHT	village health team
WHO	World Health Organization
ZD	zero-dose
ZDLH	Zero-Dose Learning Hub

UGANDA COUNTRY LEARNING HUB

The Zero-Dose Learning Hub (ZDLH), established by Gavi, addresses immunization equity by generating data, evidence, new insights, and learning to better understand the factors influencing implementation and performance of approaches to identify and reach zero-dose (ZD) and under-immunized (UI) children and missed communities. The ZDLH consortium is led by JSI Research & Training Institute, Inc. (JSI), in collaboration with The Geneva Learning Foundation and the International Institute of Health Management Research (IIHMR). ZDLH works to address immunization equity through the generation of evidence and learning around effective methods and approaches for identifying and reaching ZD and UI children. Four Country Learning Hubs (CLHs) in Bangladesh, Mali, Nigeria, and Uganda generate and advance the uptake of research and evidence to improve immunization policy and programming, especially at subnational levels. In 2023, Gavi selected the Infectious Disease Research Collaboration as the country learning partner for Uganda, with partners PATH and Makerere University School of Public Health.

UGANDA LEARNING HUB LAUNCH

In March 2024, the Uganda Learning Hub was officially launched during a half-day event attended by stakeholders from both national and sub-national levels. The event featured representatives from the Ministry of Health (MOH), Uganda National Expanded Programme on Immunisation (UNEPI), World Health Organization (WHO), UNICEF, AFENET, Centers for Disease Control and Prevention (CDC), Living Goods, Makerere University, the Uganda Pediatric Association, Clinton Health Access Initiative (CHAI), National Medical Stores, Compassion International, and the United States Agency for International Development (USAID). Local representation included district health officers, Expanded Program on Immunization (EPI) focal persons, and biostatisticians from Wakiso, Mubende, and Kasese districts.

The launch provided an opportunity to present emerging findings of the Learning Hub, including the rapid assessment, data ecosystem mapping, learning agenda, and preliminary implementation research (IR) activities. The event culminated in a signing ceremony to mark the official commencement of the Learning Hub. The launch included a panel discussion on the theme "What can UNEPI and EPI stakeholders do to better identify, reach, monitor, and measure ZD and UI children in Uganda?" Panelists included representatives from UNICEF, UNEPI, and Wakiso and Mubende districts. Traditional and social media outlets covered the event. During the launch, several key strategies were discussed to:

- **Identify and Reach ZD and UI Children:** To address challenges of inaccurate denominators due to the aggregated nature of DHIS2 data, UNEPI was encouraged to leverage birth registration efforts by the National Identification and Registration Authority (NIRA). Supporting NIRA to collect birth registrations with unique IDs at both health facility and community levels could provide more accurate estimates for identifying ZD. Additionally, routine household-level immunization data collection was suggested to improve the accuracy of identifying ZD and UI children and to inform targeted interventions. Suggestions also highlighted bridging the gap between communities and the health system by motivating village health teams (VHTs) to connect ZD children with health facilities and adopting a bottom-up approach for planning and implementing interventions.

- **Monitor and Measure:** In order to improve monitoring and measurement of ZD and UI children, UNEPI was encouraged to support health workers in analyzing and using data for decision-making. Triangulating data from various sources, such as research surveys, and integrating logistics management information system data with DHIS2 were recommended to enhance target population estimation.
- **Advocate**: One strategy discussed to promote advocacy for ZD and UI children focused on UNEPI's engagement of political and local leaders by regularly ranking and disseminating district health performance. This approach aims to improve immunization coverage by raising awareness and generating support at various levels.

LEARNING AGENDA

The Uganda Learning Hub developed its learning agenda through consultations with key stakeholders, including health workers, district officials, and community leaders, to gather qualitative insights and identify major challenges and gaps in immunization services. The team supplemented this information with selected health facility assessments to observe operational issues firsthand and understand the practical challenges faced in vaccine delivery and management. The Learning Hub carried out a household survey in their targeted subdistrict areas to measure immunization coverage, vaccine supply issues, and community engagement, providing a broader perspective on the service landscape. Additionally, the Learning Hub reviewed existing literature and reports to contextualize their findings and identify areas needing further exploration. In April 2024, the Learning Hub convened a group of UNEPI stakeholders (pillar heads from service delivery, vaccine supply chain and logistics, communication and advocacy, program management and finance and surveillance, monitoring and evaluation) for a workshop to review, validate, and finalize the learning agenda. The identified learning priorities were categorized under the key components of the EPI (i.e., service delivery; vaccines supply chain and logistics; communication and advocacy; program management and finance; and surveillance, monitoring and evaluation). Key learning priorities include:

- **Service Delivery:** Learning priorities include understanding who ZD and UI children are, where they live, and how many there are in Uganda. Additional priorities include understanding the effectiveness of proposed Equity Accelerator Fund (EAF) interventions and the use of Reaching Every District/Reaching Every Child strategies and improving supportive supervision to better identify and reach ZD and UI children.
- **Vaccine Supply Chain and Logistics:** Challenges in this area include inadequate last-mile delivery, insufficient transport facilities, and ineffective communication from the national level about stockouts. Learning priorities include evaluating the effectiveness of last-mile delivery initiatives, equipping health workers to manage vaccines, engaging stakeholders to address distribution challenges, and improving real-time communication regarding supply stockouts. Synchronizing demand with supply and improving visibility of vaccines at health facilities are also priorities.
- **Communication and Advocacy:** Learning priorities include assessing the effectiveness of community mobilization approaches in reaching ZD and UI children. Addressing gender-related barriers to immunization and evaluating the involvement of district health teams (DHT) and political leaders in demand generation are also important. Improving communication messaging and understanding why some children are not immunized are key areas of focus to enhance immunization uptake.

- **Program Management and Finance:** Challenges in this area include managing the increased workload from new vaccine introductions without additional human resources and dealing with staffing shortages at health facilities. Learning priorities include identifying methods to engage stakeholders more effectively and use review meetings to allocate resources and monitor immunization services. Strengthening community dialogues to address performance issues and better managing immunization sessions at health facilities are also priorities.
- **Surveillance, Monitoring, and Evaluation:** The learning agenda underscores the need to improve data collection and use, address deficiencies in reporting tools, and enhance data ecosystems. Key priorities include evaluating the cost-effectiveness of EAF interventions, improving the availability and use of reporting tools, enhancing data use at district and facility levels, and streamlining data capture in the private sector. Improving the estimation of denominators and the effectiveness of existing data capture systems are also priorities.

ZDLH TECHNICAL ASSISTANCE

During the period January–June 2024, JSI, as the global learning partner, continued to provide technical assistance (TA), collaborate, and co-create with the Uganda Learning Hub. JSI engaged in regular meetings with the Uganda Learning Hub and Gavi to assess progress and identify areas for TA, focusing on the IR theory of change and knowledge translation. In addition, JSI reviewed and provided feedback on several key reports, including the learning agenda report, rapid assessment report, systems landscape report, and community survey baseline report. Discussions with the Uganda Learning Hub team revealed the need for further support on the theory of change, with plans for additional assistance.

ADDITIONAL RESOURCES

- Uganda Zero-Dose Landscape
- ZDLH Semiannual Update (May 2024) (July–December 2023)
- ZDLH Semiannual Update (October 2023) (January–June 2023)
- Early Learning from Zero-Dose Practitioners in Nigeria and Uganda: Gavi ZDLH Inter-Country Peer Exchange (ZDLH-X2)

IDENTIFY

The Uganda Learning Hub previously conducted a ZD rapid assessment, as described in Gavi's Zero-Dose Learning Hub IRMMA Aligned Interventions: Semiannual Update (May 2024).

During the current reporting period, the Learning Hub completed data collection for the baseline targeted community survey in three high-burden communities within Mubende district: Kiruuma (an underserved community), Kigando (a pastoralist community), and Butoloogo (a hard-to-reach community due to topography). The survey defined ZD children as those aged 12 to 23 months who had not received any dose of the diphtheria, tetanus, pertussis (DTP) vaccine, and the sample included interviews with caregivers of 1,358 children aged 4.5 to 23 months. The age cohort of 4.5–11 months was included in the survey to measure timeliness of vaccination.

The baseline survey report is currently in draft, and more details will be provided in the next semiannual report. Preliminary findings suggest that the overall ZD burden was 12.7 percent, with the underserved community (Kiruuma subcounty) having the highest burden at 17.9 percent, followed by the pastoral community (Kigando subcounty) at 15.9 percent, and the hard-to-reach/hilly community (Butoloogo subcounty) at 4.9 percent. Factors contributing to being ZD included residing in an underserved community, being born at home or with a traditional birth attendant, and having no siblings. For UI children, defined as those aged 12 to 23 months who had received DPT1 but not DPT3, the overall burden was 7.1 percent. Kigando had the highest UI burden at 9.6 percent, followed by Butoloogo at 6.4 percent, and Kiruuma at 5 percent. Untimely immunization, defined as children aged 4.5 to 11 months who had not received a single dose of DPT, showed an overall burden of 27.5 percent. Kigando had the highest prevalence of untimely immunization at 38 percent, followed by Kiruuma at 33.6 percent, and Butoloogo at 12.3 percent. Variations in ZD and UI burden were evident between communities, with higher ZD compared to UI, indicating prolonged, fixed challenges accessing immunization services. Additional findings, interpretations, and recommendations will be included in forthcoming reporting.

EMERGING LESSONS: IDENTIFY

The rapid assessment report summarizes the assessment conducted by the Uganda Learning Hub between August 2023 and March 2024, which revealed several critical lessons regarding identifying and reaching ZD and UI children, as well as challenges in data capture and service delivery. Learn more: Report on a Rapid Assessment of the Zero-Dose Situation in Uganda.

In June 2024, the Learning Hub conducted national and subnational dissemination meetings to share preliminary findings and gather feedback from stakeholders, including political leaders, health workers, and community representatives. Emerging recommendations include:

- **Standardize definitions for ZD and UI children:** Different UNEPI partners use different definitions for ZD children, leading to inconsistencies and conflicting estimates at national and subnational levels. Develop and implement a unified definition for ZD and UI children to ensure consistent reporting and data comparability.

Table 1: Definitions used during the HTH registration of children under UNICEF support

Definition	Description
ZD children	Community definition: Children **below five years** who have not received any antigen
	Definition used by health workers: Children aged **6–52 weeks** who have not received DPT1
UI children	Children **14-52 weeks** who have not received DPT3

- **Leverage VHTs:** Strengthen and support the role of VHTs, who are crucial for identifying ZD and UI children. Ensure VHTs are equipped with tools and training to effectively locate and register children, especially those from households resistant to immunization. VHTs are often familiar with households that oppose immunization and better understand the local context and reasons why people oppose vaccines.
- **Enhance data collection systems:** Improve data collection tools and methods to cover all children, including those not seen at health facilities, ensuring comprehensive and accurate data on immunization coverage. The current data capture systems, including DHIS2, do not collect community-level data (which include children not seen or registered at facilities). This results in an inaccurate estimation of the ZD and UI burden. Effective identification of these children requires a digital system that integrates community-level data and supports real-time updates.
- **Evaluate sustainability of VHT identification model:** Conduct research to assess the effectiveness and sustainability of the voluntary VHT model for identifying ZD children. Develop strategies to ensure that house-to-house (HTH) registration remains a viable, long-term solution.
- **Leverage existing registries:** Use the NIRA and other partner support programs to track ZD and UI children. These agencies maintain registries that may capture children who are registered at birth but do not receive immunizations and are therefore not included in health service-related systems.
- **Improve infrastructure and access:** Explore the establishment or upgrading of static immunization sites in underserved areas to enhance accessibility. Evaluate the effectiveness of current interventions, including HTH registration, and make necessary adjustments to improve reach and impact.
- **Implement EAF interventions in undocumented areas:** Consider implementing EAF interventions in communities that are currently undocumented as “high risk” by UNEPI. This includes communities at national and district borders, mining areas, underserved regions, and those with significant immigrant populations.
- **Improve integration with existing structures:** Explore how community structures, such as parish chiefs, health assistants, and community development officers, can be better used to identify and reach ZD children. Increase efforts to sensitize non-biological parent caretakers, such as grandparents, to improve awareness and ensure that children under their care receive necessary immunizations. Use communication channels, including radio airtime from the District Resident Commissioner, for community sensitization on immunization programs to help raise awareness and foster community engagement.

- **Address health worker shortages:** Advocate for increased recruitment, enhanced training, and revised policies to address health worker shortages. Ensuring adequate staffing at health facilities can improve service delivery and reduce the burden on existing staff. The underlying causes of poor health worker attitudes, which the rapid assessment identified as a barrier to immunization, are not well understood and should be the focus of future inquiry.

REACH

LEARNING HUB IMPLEMENTATION RESEARCH

Evaluation of Activities Supported by the EAF

As of August 2024, Uganda EAF funding through Gavi had been dispersed to the country and was with the Ministry of Finance for processing. As a result, it is not yet available to the MOH, and the start date for implementation is unclear. UNEPI has prioritized EAF activities for the first year (2024–2025), and some implementing partners have started identifying sub-grantees. However, UNEPI faces several competing priorities that may impact the implementation of EAF activities, in addition to the funds disbursement timeline. These include the WHO's Big Catch-Up initiative activities (scheduled to begin in November 2024), ongoing responses to measles and polio outbreaks, a planned yellow fever campaign in February 2025, and the introduction of a malaria vaccine in April 2025. These simultaneous activities could potentially affect the focus and resources available for EAF interventions. Observations from the EAF planning meetings highlighted the need for greater clarity on the extent of sub-national stakeholder involvement in the planning process.

The Big Catch-Up activities, noted earlier, to be conducted by UNEPI nationwide are set to begin in November 2024. Initially, this will be funded with the remaining balance from a previous yellow fever campaign and COVID-19 Vaccine Deliver Support (CDS) 3, the third window of Gavi support under COVID-19 vaccine delivery support. The Big Catch-Up aims to reach a total of 297,687 ZD children; 676,712 UI children; 1,542,560 children with measles and rubella (MR2); 236,661 girls aged 10 years with HPV; and 4,389,835 women of child bearing age (15–49 years) with the tetanus-diphtheria vaccine, a booster shot that protects against tetanus and diphtheria. Key planned activities for the Catch-Up campaign include:

- HTH registration of children aged below five years by one mobilizer per village to identify and locate ZD and UI children. Information about the identified target children will be used to update the EPI facility microplan.
- A post-based strategy will be deployed in communities and schools to vaccinate eligible children and women.
- Vaccination teams will be allocated to villages to offer immunization services. One health worker and one mobilizer will constitute a vaccination team.

The country has been preparing for EAF implementation for a number of months and the Learning Hub, in particular, has demonstrated agility in the face of delays by adapting their research plans to conduct a study of an existing initiative to identify and reach ZD children that will inform future scale-up efforts through the EAF as well as activities planned for the Big Catch-Up. The Learning Hub's work includes an evaluation of a UNICEF ZD intervention in two districts. The results of this assessment will be useful in refining and scaling up this intervention under the EAF, showcasing the Hub's ability to pivot effectively in response to funding challenges. The Learning Hub conducted a process evaluation and drafted a theory of change designed for complex systems characterized by high uncertainty and numerous interacting components. It emphasizes the need for mobilization and engagement of stakeholders prior

to implementing specific interventions like HTH registration and targeted outreach. The overarching goal set forth by UNEPI in the full portfolio planning application is to reduce ZD children to 1.5 percent by the end of 2025, with key assumptions including intervention acceptance by the target audience, availability of EAF funding, alignment with the ZD agenda, and a stable public health situation.

Evaluation of UNICEF ZD Support

Pilot Evaluation

The Learning Hub has initiated a pilot evaluation of UNICEF's ZD support in advance of EAF IR activities. The goal of UNICEF's ZD support in Uganda is to bolster the EPI's ability to identify ZD children and to enhance targeted demand and awareness efforts. The Learning Hub's IR focuses on assessing the implementation of UNICEF's ZD support from 2022–2024 in Wakiso and Kamuli districts to:

1. Evaluate the reach, adoption, implementation, and maintenance (RE-AIM framework) of UNICEF's ZD support in Wakiso and Kamuli districts from 2022–2024.
2. Estimate the number and proportion of ZD and UI children identified and reached through HTH registration and defaulter tracing supported by UNICEF.
3. Identify and document the challenges and enablers in implementing UNICEF's ZD support.

Findings

Evaluation findings highlight the need for improved community-based mechanisms to help identify and reach ZD children in Uganda. Findings also suggest that the HTH registration of ZD children by VHTs is both feasible and generally accepted by caregivers. However, the implementation has not reached its full potential due to insufficient training for VHTs and inadequate time allocated for community sensitization and registration efforts. Additionally, the lack of child vaccination cards hampers accurate registration, limiting the ability to track and support ZD children effectively. Defaulter tracking will remain inadequate until more is done to assist caregivers in overcoming significant barriers to access, such as fear of domestic violence and transportation costs. The intervention is also not necessarily sustainable, as it currently relies of financial support for VHTs and ongoing assistance provided by UNICEF. Key recommendations include developing a detailed implementation plan, engaging all relevant stakeholders for community buy-in, and providing comprehensive training and resources for VHTs. Enhanced community sensitization, particularly addressing demand-side barriers, will also be vital for increasing vaccination uptake and sustaining efforts to reach ZD and UI children.

The initial analysis of HTH registration data identified 2,240 ZD children across both districts. The team then examined health subdistrict line lists, which, if completed correctly, should reflect the same number of ZD children as identified in the HTH registration. Some health facilities had line lists to facilitate the follow-up of registered children for vaccination by health workers; however, only one health subdistrict, Kasangati, had a complete line list of ZD children from the datasets provided. As a result, the current vaccination status of these potential ZD children remains unclear due to inadequate documentation at the health facilities. Of the 13 caregivers who participated in in-depth individual interviews, eight reported taking their children for vaccination at health facilities, and one did so at an outreach point following registration. However, four caregivers did not vaccinate their children, citing reasons such as fear of domestic violence, lack of money for transport, and unhelpful behavior from

health workers. These findings indicate that identification, alone, is not sufficient for addressing the barriers to reaching ZD children, which also need to be considered.

The evaluation used the RE-AIM framework to assess the effectiveness, feasibility, and scalability of these approaches:

- **Reach:** The efficacy of the intervention's reach component was variable, largely due to missing data. The UNICEF registration datasets covered 52 percent of the subcounties in Wakiso and 73 percent of those in Kamuli district. It remains unclear if households were registered in all subcounties, if datasets were missing, or the registration process was not implemented. VHTs reported challenges in registering all eligible households within their villages due to several factors: the three-day data collection period was insufficient for the number of households; some children lacked registration cards for a number of reasons, preventing their inclusion; and financial constraints limited VHTs' ability to register entire villages, especially those subdivided into multiple zones. The intervention only engaged one VHT per village, and, as a result, some zones were not registered.
- **Adoption:** The personal information provided in the datasets indicate that caregivers were generally positive about the HTH registration process. Their willingness to participate was largely due to the trust communities have in the VHTs, who are familiar figures in the community. Despite this, some caregivers were resistant, citing reasons such as fatigue from a high volume of government programs and immunization campaigns, including the introduction of new vaccines and multiple vaccination drives. There was also a noted lack of community sensitization about the HTH registration, which contributed to some of the resistance.
- **Implementation:** The UNICEF proposal outlined a broad plan for activity implementation, but lacked a detailed plan or guiding document for execution by all key stakeholders. To address this gap, the Learning Hub conducted extensive consultations with UNICEF to clarify the planned activities and their implementation, leading to the creation of an outcome map for evaluating implementation. VHTs reported receiving an orientation only rather than comprehensive training for the HTH registration due to inadequate funding. Additionally, they did not register children from all eligible households in their villages for several reasons (see **Reach**), and they were not supervised. VHT coordinators confirmed this, also citing insufficient funding as the cause.
- **Maintenance:** Some DHTs, health workers, and VHTs expressed a commitment to continuing child registration using primary health care funds. However, others indicated that without financial support, VHTs are unwilling to continue HTH registration. Additionally, several DHT members noted that sustaining the registration activities would be challenging if UNICEF support ceases due to the high costs involved.

The final evaluation report outlined several planning and operational considerations for future implementation.

EMERGING LESSONS: REACH

The Learning Hub rapid assessment and UNICEF ZD evaluation revealed several critical lessons for reaching ZD and UI children:

- **Barriers to access:** Physical access to immunization services is hindered by long distances to health facilities and infrequent outreach services, impacting caregivers' ability to take children to obtain necessary vaccinations.
- **Lack of client-centered services:** Long waiting times, poor attitudes of health workers, and associated costs (e.g., transportation, vaccination cards) adversely affect service uptake.
- **Fears of side effects:** Fear of potential side effects from vaccinations discourages some caregivers from seeking immunization.
- **Limited support and misconceptions:** Limited financial and emotional support from spouses, coupled with prevalent myths and cultural beliefs about vaccines, impede immunization efforts.
- **Competing priorities:** Household chores and community events often interfere with caregivers' efforts to access immunization services.

To address these challenges, the assessments highlighted several actionable recommendations:

- **Enhance community sensitization:** Increase efforts to educate communities to counteract vaccine fatigue and clarify the registration process. Develop strategies for registering children without vaccination cards and engage families resistant to vaccination by combating myths and misconceptions through targeted communication strategies.
- **Strengthen VHT training and support:** Improve the training and supervision of VHTs to enhance the quality and effectiveness of the registration process and ensure that VHTs are adequately trained to sensitize resistant households about the benefits of vaccination. Ensure that VHTs are allocated sufficient funds and resources to support their efforts and establish comprehensive standard operating procedures to ensure consistency in the registration process.
- **Engagement with traditional birth attendants:** Despite government bans, TBAs still provide delivery services and may not refer mothers for immunization. Programming efforts should focus on leveraging community structures to identify children born at home/under TBAs and refer them for immunization services (at health facilities or through outreach services).

MONITOR AND MEASURE

The Learning Hub conducted a mapping of Uganda's immunization data capture systems to evaluate their effectiveness in identifying ZD and UI children. The study, described in Gavi's Zero-Dose Learning Hub IRMMA Aligned Interventions: Semiannual Update (May 2024), aimed to identify the different platforms in use, assess their relationship to ZD burden, and explore the associated challenges and opportunities. The main data capture platforms identified were DHIS2 (used nationwide at health facilities), Smart Paper Technology (SPT) in a pilot in 11 districts, and an electronic community health information system (eCHIS) in a pilot in 19 districts that captures HTH data. Additional systems include an HTH registration pilot by UNICEF in four districts and the Smart Health App and UGAVAX, which are not yet fully implemented. While DHIS2 and SPT estimate ZD using health facility records, e-CHIS provides higher ZD estimates because it uses HTH data. Differences in ZD estimates between e-CHIS and DHIS2 are attributed to varying denominators: e-CHIS uses the number of children registered, while DHIS2 uses the annual target population of children under one year based on census data. Discrepancies between SPT data and DHIS2 records suggest issues with data synchronization and quality. The final mapping results will be made available in the final report to be published in late 2024.

EMERGING LESSONS: MONITOR AND MEASURE

The preliminary draft of the data systems mapping exercise revealed several challenges in data capture related to measuring ZD and IU children:

- **Limitations of data systems:** Government administrative data sources (e.g., Uganda Bureau of Statistics and DHIS2) are inadequate for identifying and monitoring ZD. DHIS2 lacks individual-level data, while SPT is limited by geographical reach and logistical complexity. Although e-CHIS captures a broader range of essential health services, its limited geographical reach and lack of interoperability with DHIS2 are significant drawbacks. Finally, DHIS2 does not capture community-collected household registration data, limiting health workers' ability to track vaccination status and follow up with defaulters.
- **Challenges with paper-based systems:** Existing paper-based data capture systems suffer from poor quality, including issues with timeliness, completeness, and accuracy. Inadequate staffing and a lack of digitalization further exacerbate these problems.
- **Integrating and leveraging eCHIS:** While eCHIS captures community-collected household registration data, its feasibility and sustainability are not yet established. Improving data systems requires integrating and leveraging existing government data sources for better planning and delivery of immunization services.
- **Need for data triangulation:** Effective estimation of ZD and UI children requires triangulating data from various sources, including district and community-level stakeholders, to obtain a comprehensive picture of immunization coverage and gaps.

Preliminary lessons from the mapping exercise highlight how different data capture systems produce varying estimates of ZD and UI children due to differences in data sources and denominators. For example, facility-based systems may miss ZD and UI children who do not interact with the health system. Community-level data for estimates may provide a more reliable approach than national

population projections, which do not always account for local variations. The data capture system used is a significant factor in assessing the ZD and UI burden, but equity reference groups also play a crucial role in determining burden across different areas because they help define critical geographies for UNEPI service delivery.

Based on these preliminary findings, recommendations include MOH investment in a community-based information system integrated with technology to enhance data capacity and accuracy at the community level. UNEPI should conduct frequent data triangulation exercises using alternative sources like immunization coverage surveys and censuses to improve denominator estimates. Some of this data may come from the forthcoming national population census results or collected as part of the Big Catch-Up's nationwide HTH registration of children under five. While this data will be useful for more accurately estimating denominators, identifying ZD or UI children is just the beginning; further efforts are needed to track and ensure these children complete their immunization schedules. Developing a national tracking system that links birth registration with immunization records could help monitor child immunization status comprehensively. Finally, UNEPI should consider capacity-building initiatives for health workers to improve data collection, reporting, and real-time analysis and action.

ADVOCATE

STAKEHOLDER ENGAGEMENT METHODS

In June 2024, the Uganda Learning Hub held two dissemination meetings: a subnational level meeting in Mubende district with subnational stakeholders and a national level meeting in Kampala with ministry officials, international partners, and district representatives. Participants in the subnational level meeting included political and administrative district leaders, the DHT, health workers, VHTs, and subcounty chiefs from Kiruuma, Kigando and Butoloogo subcounties where the targeted community survey was conducted. Participants in the national level meeting included representatives from the MOH, the UNEPI core team, EPI partners (CHAI, AFENET, CDC, WHO, Living Goods, and UNICEF), and representatives from Wakiso and Mubende districts (including DHTs from both districts and political and administrative leaders from Mubende district). The purpose of both meetings was to share insights from the Learning Hub rapid assessment, targeted community survey, data ecosystem mapping, and evaluation of UNICEF's ZD technical support.

EMERGING LESSONS: ADVOCATE

The Learning Hub rapid assessment and the evaluation of UNICEF's ZD technical support revealed several lessons and recommendations that are informing advocacy efforts:

- **Explore and advocate for sustainable VHT support:** Adequately supported VHTs are essential for conducting HTH registration. The Uganda Learning Hub, UNICEF, and other local partners are using local dissemination activities to advocate with UNEPI for financial support mechanisms and community incentives to maintain the HTH registration process long-term. They are also using global dissemination activities, including reports, webinars, and other outlets to bring awareness to the need for support for registration activities to funders and global level agenda setters, who are in a unique position to guide and influence national priorities.
- **Target high-risk communities:** Emerging high-risk communities (e.g., border areas, mining regions, and underserved areas) need focused advocacy and outreach efforts to ensure they are included and prioritized in national immunization programs. The Uganda Learning Hub is using national and subnational dissemination opportunities to share findings with government stakeholders about these emerging communities where ZD children may be more likely to live and inform national and subnational targeting strategies. Additionally, through global dissemination opportunities, the Uganda Learning Hub is educating both funders and global agenda setters about the existence of ZD children in high-risk settings, which can help influence funding streams and national priorities.

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