Uganda Learning Hub for Immunisation Equity

IDENTIFYING THE ZERO DOSE CHILD: INSIGHTS FROM THE UNICEF-SUPPORTED HOUSE TO HOUSE REGISTRATION OF CHILDREN BY VILLAGE HEALTH TEAMS IN UGANDA

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PATH

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EXECUTIVE SUMMARY

Background

With support from the ELMA Vaccines and Immunisation Foundation, UNICEF provides zero dose (ZD) support to strengthen the Expanded Program on Immunisation (EPI's) capacity to identify ZD children and support targeted demand and awareness creation. In 2023, UNICEF prioritised Wakiso, Kamuli, Kampala, and Mukono districts to implement key interventions. For this evaluation, the Uganda Learning Hub (LH) focused on UNICEFs first objective: "Strengthen micro planning as a follow-up system to identify and immunise ZD and UI children in urban/high-density population areas." Under this objective, the LH evaluated UNICEF's support for Village Health Teams (VHTs) to register children and their immunisation status and to conduct defaulter tracing of ZD and UI children in Kamuli and Wakiso districts in 2023 to inform the planned scale-up of the ZD support to other districts, implementation of the interventions proposed under the Equity Accelerator Fund (EAF) and the ongoing drafting of the national zero dose guidelines.

Objectives

The LH sought to assess the implementation of the UNICEF-supported house-to-house registration of children by VHTs in 2023 in Wakiso and Kamuli districts. Specifically, we aimed to i) estimate the number and the proportion of ZDC and UI children identified and vaccinated through the HTH registration, ii) assess the reach, adoption, implementation, and maintenance of the HTH registration, and iii) identify and document the challenges and enablers to implementation.

Methods

This was a cross-sectional study which involved both quantitative and qualitative approaches. Quantitative methods included analysing secondary data from the house-to-house registration, while qualitative methods involved conducting key informant interviews and in-depth interviews with health workers and caregivers. We used the Reach, Effectiveness, Adoption, Implementation, and Maintenance (REAIM) framework to guide development of data collection tools and data analysis.

Quantitative analysis: To estimate the number and proportion of ZD and UIC identified and vaccinated through the HTH registration, we conducted secondary data analysis of the house-to-house registration data from Kamuli and Wakiso District. The analysis was based on the health worker's definition of ZDC (i.e. children aged 6-52 weeks who have not received the first dose of Diphtheria

Pertussis and Tetanus (DPT) containing vaccine). Data was analysed using STATA18.5 SE—Standard Edition. Frequencies and proportions were generated for ZD and UI children at village, sub-county, and district levels.

Qualitative data collection and analysis: Interviews were conducted in four sub-counties with high numbers of ZD children based on the house-to-house registration data (Nangabo, Bweyogerere, Nabweru, and Kyengera Town Council sub-counties). We conducted 13 in-depth interviews (IDIs) with caregivers of ZDC from the villages with the highest number of ZDC in the selected sub-counties. Additionally, we conducted 17 Key informant interviews (KIIs), including four (4) with health workers at the health facilities serving the selected sub-counties, five (5) with VHTs from the selected villages, five (5) with VHT coordinators at health subdistrict level, two (2) with DHT and one (1) with UNICEF. Data was analysed using QSR Nvivo 14 qualitative software based on preconceived themes and sub-themes from the interview guides.

Findings

Evaluation findings are summarised below using the Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) framework.

Reach

The house-to-house registration had suboptimal reach. According to the secondary data, the house-to-house registration exercise was conducted in 82% (22/27) of the subcounties in Wakiso district, and 73% (16/22) of the sub-counties in Kamuli district. Based on qualitative interviews with VHTs and district officials, not all eligible children were registered by VHTs. The suboptimal reach of the registration was due to two main factors: (i) VHTs avoided registering children from resistant families for safety reasons and did not include children without health cards, and (ii) some villages were left out because they lacked VHT representation during the planning and implementation phases. These reasons reflect inadequate planning for the registration.

Effectiveness:

House-to-house registration can identify ZD and UI children at the household level; however, its effectiveness is unclear. The HTH registration data identified 2243 ZDC and 2491 UIC in Wakiso and Kamuli districts. Wakiso district had 589 ZDC and 818 UIC, while Kamuli had 1654 ZDC and 1668 UIC. Comparing Gavi estimates (generated from IHME models and WorldPop population projection data) with these findings, the HTH registration identified approximately 36.3% of the estimated zero-dose children in Wakiso district and exceeded the estimated number in Kamuli district, reaching 123%. Different data capture systems estimate the

zero-dose burden differently, mainly by the nature and source of the data used in the estimation, especially for the denominator. The alignment of Gavi and UNICEF estimates suggests that these may be more reliable for planning and decision-making. The disparities underscore the importance of harmonising data collection and reporting methods across platforms to identify zero-dose children accurately. Additionally, frequent data triangulation exercises are needed to address unreliable denominators. The house-to-house registration exercise, if done well, can accurately map out children, allowing for more targeted interventions to reach these children and reduce the risk of vaccine-preventable diseases, especially in underserved communities.

Despite the identification of ZD children, it is unclear whether all children were reached with vaccination to ascertain the intervention's effectiveness. However, 62% (8/13) of the caregivers interviewed had taken their children for vaccination at a health facility or an outreach point following the house-to-house registration. This shows that the HTH registration increased awareness about having a ZD child and prompted caregivers to get immunisation services. The other four caregivers had not taken their children for vaccination at the time of data collection, citing competing priorities, rude health workers, and a lack of money to pay for transport to and from the health facility.

Adoption

District, health facility, and community stakeholders generally accepted the HTH registration. The DHT wanted to triangulate the house-to-house registration data with that from DHIS2 to verify the existence of ZDC. Some health workers reported utilising the information to inform their efforts in reaching ZDC. VHTs showed a strong commitment to their roles, highlighting their dedication to community health. Despite this, some caregivers were resistant to VHTs during the registration exercise. This was partly attributed to inadequate social mobilisation at the community level.

Implementation

The house-to-house registration intervention was not fully implemented as planned due to challenges before, during, and after implementation. Inadequate training of VHTs led to poor data quality, including missing and incorrect entries. During registration, delays in submitting registers and the overwhelming data analysis burden on health workers slowed the identification of zero-dose and under-immunized children. Limited supervision further affected data quality, while the short registration period (three days) restricted thorough coverage. Due to mistrust in immunisation activities and lack of sensitisation, caregiver resistance hindered participation.

Additionally, some VHTs were physically unfit for the task, and certain villages lacked VHT representation, leaving some children unregistered. After registration, transport constraints delayed data submission, and the sheer volume of poor-quality data made manual processing difficult for health workers. The complexity of data analysis further challenged both VHTs and health workers, limiting the intervention's overall effectiveness. Addressing these barriers requires a multi-pronged approach that includes adequate funding, better training and supervision, tailored planning, and community engagement. These improvements are essential for successfully implementing HTH registration and similar initiatives.

Despite these challenges, house-to-house registration was enabled by the presence of UNICEF consultants to guide and facilitate the process and high acceptance levels by district and community-level players. VHTs played a crucial role in the success of the HTH registration. Their strong social ties within the community fostered trust among caregivers, encouraging participation. Further, some VHT coordinators took the initiative to mobilise resources, ensuring the smooth execution of the registration process. VHTs also applied skills gained from other programs, such as Integrated Community Case Management, to enhance the implementation.

Maintenance (sustainability) of the HTH registration:

The HTH registration was largely designed and implemented within existing health system structures for programmatic sustainability. However, the oversight role was undertaken by a consultant, which may not be sustainable without donor funding. A more sustainable option would be to integrate the oversight role within the existing health system.

Unintended consequences of the HTH registration

The House-to-House (HTH) registration had unintended consequences, both positive and negative. On the positive side, the registration functioned as an intervention by significantly increasing awareness of the existence of ZDC. This awareness prompted caregivers to seek immunisation, while VHTs played a crucial role in referring mothers to the nearest health facility ahead of planned outreaches. The success of the registration exercise in identifying ZDC demonstrated its effectiveness, leading to its adoption by other departments within the Ministry of Health and various EPI partners. UNEPI implemented HTH registration during the recently completed Big Catch-Up campaign in November 2024. Furthermore, the HTH registration strengthened the health system by enhancing collaboration at both district and community levels, fostering better coordination among healthcare providers and key community structures, including VHTs, political leaders, and opinion leaders.

However, the initiative also had some negative effects. One major challenge was the increased workload for VHTs without appropriate rewards or incentives, which may have impacted their motivation and overall effectiveness. Further, there was a growing fear within the community regarding having a child with ZD. This fear extended even to the VHTs, potentially leading to stigma or reluctance in identifying and addressing cases. While the HTH initiative brought valuable insights and improvements, addressing these challenges is crucial for its sustainability and long-term success.

CONCLUSION:

The HTH by VHTs identifies zero-dose and under-immunised children in the communities. However, suboptimal reach, implementation challenges, and inadequate planning limited its effectiveness. The lack of verification mechanisms and data quality issues further complicated its impact assessment. To foster timely identification of ZD and UIC, data analysis must be conducted promptly. The house-to-house registration was primarily designed and largely implemented within existing health system structures, which suggests potential programmatic sustainability. However, given that the HTH registration depends on voluntary VHT engagement and some aspects of HTH were donor-funded, the financial sustainability is unclear.

RECOMMENDATIONS

1. The Ministry of Health/UNEPI and partners should develop, document and share a detailed implementation plan with all stakeholders to ensure a uniform understanding of the intervention and its objectives. This plan should ensure comprehensive training, adequate implementation time for registration and data analysis, and include measures to address and anticipate contextual factors that could impact implementation.

2. The Ministry of Health/UNEPI and partners should engage stakeholders from the community (including caregivers), health facility and district levels through the planning and implementation processes.

3. The Ministry of Health/UNEPI and partners should ensure sufficient financial, human, and logistical resources are available to implement house-to-house registration. Funding allocation should be tailored to contextual factors like geographic location, terrain, and urban/rural settings.

4. The Ministry of Health/UNEPI and partners should consider adopting an efficient data capture system to enable timely analysis and utilisation of house-to-house registration data. The system should comprehensively address all the steps of the data lifecycle, including data collection, quality assurance, and analysis.

5. The Ministry of Health/UNEPI and partners should ensure thorough community mobilisation and sensitisation are conducted before the exercise to enhance the acceptability of the intervention.

6. The Ministry of Health/UNEPI needs to address and design appropriate strategies to register children without cards and children from resistant homes.

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Acronyms and Abbreviations

DHIS2	District Health Information System II
DHT	District Health Team
DPT	Diphtheria Pertussis and Tetanus
EAF	Equity Accelerator Fund
ELMA	The ELMA foundation
EPI	Expanded Program on Immunisation
HE	Health Educator
HIA	Health Information Assistant
HSD	Health Sub-District
HTH	House to House
ICCM	Integrated Community Case Management
IDI	In-depth Interview
JSI	John Snow Inc.
KIIs	Key Informant Interviews
LC	Local Council
MEL	Measurement, Evaluation and Learning
MoH	Ministry of Health
REAIM	Reach, Effectiveness, Adoption, Implementation and Maintenance
SPH REC	School of Public Health Higher Degrees Research and Ethics Committee
UI	Under Immunised
UIC	Under Immunised Child
ULH	Uganda Learning Hub
UNCST	Uganda National Council for Science and Technology
UNICEF	United Nations Children's Fund
VC	VHT Coordinator
VHT	Village Health Team
WHO	World Health Organisation
ZD	Zero Dose
ZDC	Zero-Dose Children

1.0 Background

Since 2021, UNICEF has supported Zero Dose (ZD) in four districts: Kampala, Kamuli, Mukono, and Wakiso. These districts were selected based on their large numbers of i) unimmunised children (74,732 in 2020), ii) frequent measles outbreaks, and iii) representation of urban, peri-urban, and rural settings. These four districts were also estimated to have 71% of the national burden of ZD children. The main purpose of UNICEF's support is to strengthen the Expanded Program on Immunisation (EPI's) capacity to identify ZD children and support targeted demand and awareness creation.

Key objectives of the UNICEF ZD support were:

1. Strengthen microplanning as a follow-up system to identify and immunise ZD and under-immunised children (UI) in urban/high-density population areas in the four focus districts (Kampala, Kamuli, Mukono, Wakiso).

2. Support district vaccine stores and health facilities in delivering optimal immunisation services to the target population in the four focus districts by addressing issues related to the distribution and management of vaccine supplies.

3. Implementing the urban immunisation communication plan and sensitisation of the Family Connect program in the four focus districts will improve the knowledge and priority of immunisation services among parents/caregivers.

4. Strengthen data reporting and quality in national and community health information systems to improve coordination, planning, implementation, and advocacy for immunisation services.

For this evaluation, the Learning Hub (LH) focused on UNICEFs first objective: "Strengthen micro planning as a follow-up system to identify and immunise ZD and UI children in urban/high-density population areas." Under this objective, we evaluated UNICEF's support for VHTs to i) register children and their immunisation status and ii) conduct defaulter tracing of ZD and UI children.

Rationale for evaluation: UNICEF's support was designed to identify and reach ZD and UI children. The Uganda Learning Hub for Immunisation Equity (LH) evaluated the implementation of the UNICEF-supported House to House (HTH) registration in Kamuli and Wakiso districts in 2023 to inform the i) planned scale-up of the ZD support to other districts, ii) implementation of the interventions proposed under the Equity Accelerator Fund (EAF) and iii) the ongoing drafting of the national zero dose guidelines.

1.1 Objectives of the evaluation

General objective: To assess the implementation of the UNICEF-supported House-to-House registration of children by VHTs in 2023 in Wakiso and Kamuli districts.

Specific Objectives.

1. To estimate the number and the proportion of ZD and UI children identified and vaccinated through the HTH registration in Wakiso and Kamuli districts in 2023..
2. To assess the reach, adoption, implementation, and maintenance of the HTH registration in Wakiso district in 2023
3. To identify and document the challeng es and enablers of the implementation of the HTH registration in Wakiso district in 2023.

2.0 Methods

2.1 Who is a zero dose and under immunised child?

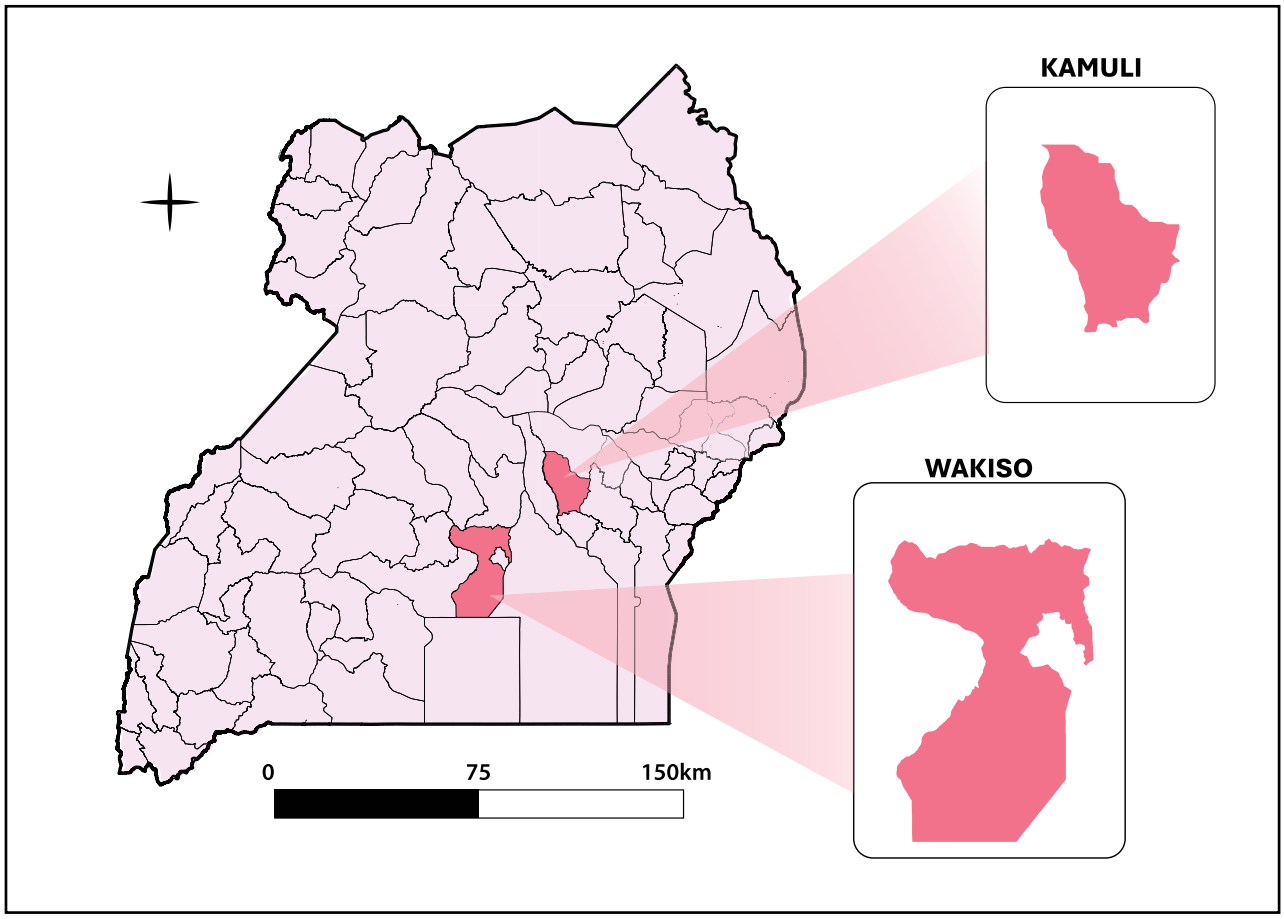
In this evaluation, we adopted the definition of ZDC used by health workers for the UNICEF support i.e. children aged 6-52 weeks who have not received the first dose of Diphtheria Pertussis and Tetanus (DPT) containing vaccine. Also, UIC refers to children aged 6-52 weeks who have received DPT1 but have not received DPT3.

2.2 Study design and data collection methods

The evaluation utilised a cross-sectional study design with qualitative and quantitative approaches. The evaluation was conducted through 1) a document review; 2) secondary data analysis of DHIS2 and data collected as part of HTH registration of children by Village Health Teams (VHTs) with support from UNICEF from Wakiso and Kamuli districts; 3) key informant interviews (KIIs) with VHTs, district health team members and health workers in Wakiso district; 4) in-depth interviews (IDIs) with primary caregivers of the ZD/UI children in the selected communities in Wakiso district. These methods are summarised in Table 2.

2.2 Study sites for the evaluation

Figure 1: Map of Uganda showing Wakiso and Kamuli districts.



Wakiso and Kamuli districts were purposively selected because this is where the technical support was provided. Document review and secondary data analysis were conducted for both districts. Qualitative interviews (KIIs and IDIs) were conducted only in the Wakiso district. Based on the HTH registration data, we selected four sub-counties with a high prevalence of ZDC. At the sub-county level, we selected the villages with the highest number of ZDC and the health facilities that served the selected villages, as shown in Table 2. The VHTs facilitated visits to the identified communities, where we identified caregivers of ZD/unimmunised (UI) children and the health facilities serving these communities.

Figure 2: Map of Wakiso district showing sub-counties for the qualitative data collection.

Study sites for qualitative data collection in Wakiso district

Table 1 shows the sub-counties in Wakiso district where qualitative data collection was conducted.

Table 1: Study sites for qualitative data collection in Wakiso district

Sub-county		Village		Health facility
Name	**Identified ZDC (Nov-Dec 2023)**	**Name**	**Identified ZDC (Nov-Dec 2023)**	**Name**
Nangabo	127	Kyankima	16	Kasangati HC IV
Bweyogerere	92	Kireku	92	-
Nabweru	66	Nkokonjeru	28	Kawanda HC IV
Kyengera Town Council	63	Manja	18	Nsangi HC III
		Namagoma B	8	Nakitokolo HC II

Table 2 summarises the evaluation methods, purpose and data sources utilised during the evaluation.

Table 2: Evaluation methods

Method	Purpose	Data source	District
Document review	To understand the planned activities for ZD support, their implementation progress, achievements, and challenges. Additionally, to gather insights into the locations of ZD and UI communities, identify missed communities, assess the number or proportion of ZD and UI children, and examine the known barriers to effective immunisation.	EPI planning documents, Demographic and Health Survey reports, Equity assessment reports, UNICEF consultant reports, and research reports	Wakiso & Kamuli districts
Secondary data analysis	To estimate the number of ZD and UI children and their location.	HTH registration data from VHTs under UNICEF support	Wakiso & Kamuli districts
IDIs	To explore perceptions, vulnerabilities, and challenges related to non- and under-vaccination.	Caregivers of ZD and UIC aged 4.5 to 23 months	Wakiso district
KIIs	To understand the implementation process, enablers and challenges of the HTH registration.	VHTs, health workers, VHT coordinators (VC), district health team members, health workers, and UNICEF.	Wakiso district and national level

Abbreviations: *EPI, Expanded Programme on Immunisation; IDI, in-depth interview; KII, key informant interview; UIC, under-immunised children; UNICEF, United Nations Children's Fund; VHT, village health team; ZDC, zero-dose children.*

2.3 Evaluation of implementation outcomes

We used the reach, effectiveness, adoption, implementation, and maintenance (REAIM)1 framework to conduct the evaluation and present findings. This framework aligns with the objectives as it was designed to help evaluate interventions and public health programs. Definitions of implementation outcomes are shown in Table 3.

[1] Gaglio, B., Shoup, J.A. and Glasgow, R.E., 2013. The RE-AIM framework: a systematic review of use over time. *American journal of public health*, *103*(6), pp.e38-e46.

Table 3: Definitions of implementation outcomes (Reach, Effectiveness, Adoption, Implementation and Maintenance (sustainability)

Implementation outcome	Definition
Reach	Geographical coverage of the activity i.e., sub-counties, health facilities, and villages engaged in the intervention.
Adoption	The stakeholders' perceptions of acceptability (i.e., VHTs, Health workers, consultants, caregivers, and DHT) and willingness to take part in the intervention.
Implementation	Was the activity implemented as planned? What were the facilitators and barriers to implementation? (Interventions stakeholder' fidelity and adaptation to the various elements of ZDC support)
Maintenance (sustainability)	The institutionalisation of the intervention in the health system (i.e. the extent to which interventions have been integrated into the routine work of the district)

We also summarised the key activities evaluated under each activity and how they were expected to reduce the number of ZD and UI children (Table 1, Annex 1).

2.4 Quantitative data collection and analysis

The analysis aimed to estimate the number and proportion of ZD and UI children identified through HTH registration. The HTH registration data was collected in October to December 2023 in Wakiso district, and from May to October 2023 in Kamuli district. Quantitative data analysis was performed using STATA, with frequencies and proportions of ZDC generated for different levels (i.e. district, sub-county, and village levels).

2.5 Qualitative data collection, selection of respondents and analysis

Data collection and selection of respondents:

Interviews were conducted in four sub-counties with high numbers of ZD children based on the HTH registration data (Nangabo, Bweyogerere, Nabweru, and Kyengera Town Council sub-counties). We conducted 13 in-depth interviews (IDIs) with caregivers of ZDC from the villages with the highest number of ZDC in the selected sub-counties. Additionally, we conducted 17 Key informant interviews (KIIs), including four (4) with health workers at the health facilities serving the selected sub-counties, five (5) with VHTs from the selected villages, five (5) with VHT coordinators at health subdistrict level, two (2) with DHT and one (1) with UNICEF. Respondents were purposively selected from the study communities using a line list of children and caregivers of ZD and UI children generated from the HTH registration data. The interviews were administered using a topic guide, which facilitated probing for further details on topics relevant to the research questions to gain narratives from the participants. With consent from the participants, all interviews were recorded using a digital voice recorder, and the interviewer took notes.

Analysis:

Qualitative data was recorded in both English and Luganda (the local language), and transcribed in English. Transcripts were then reviewed and checked against original audio recordings to ensure translation accuracy. The transcribed data was uploaded to QSR 14 Nvivo software. Transcripts from KIIs and IDIs were analysed using a coding scheme developed from pre-defined themes and subthemes. The lead social scientist conducted the coding independently and then discussed it with the core study team during systhesis and report writing. Interview findings were presented as paragraphs of descriptive narratives supported by participant quotes where necessary to convey key messages.

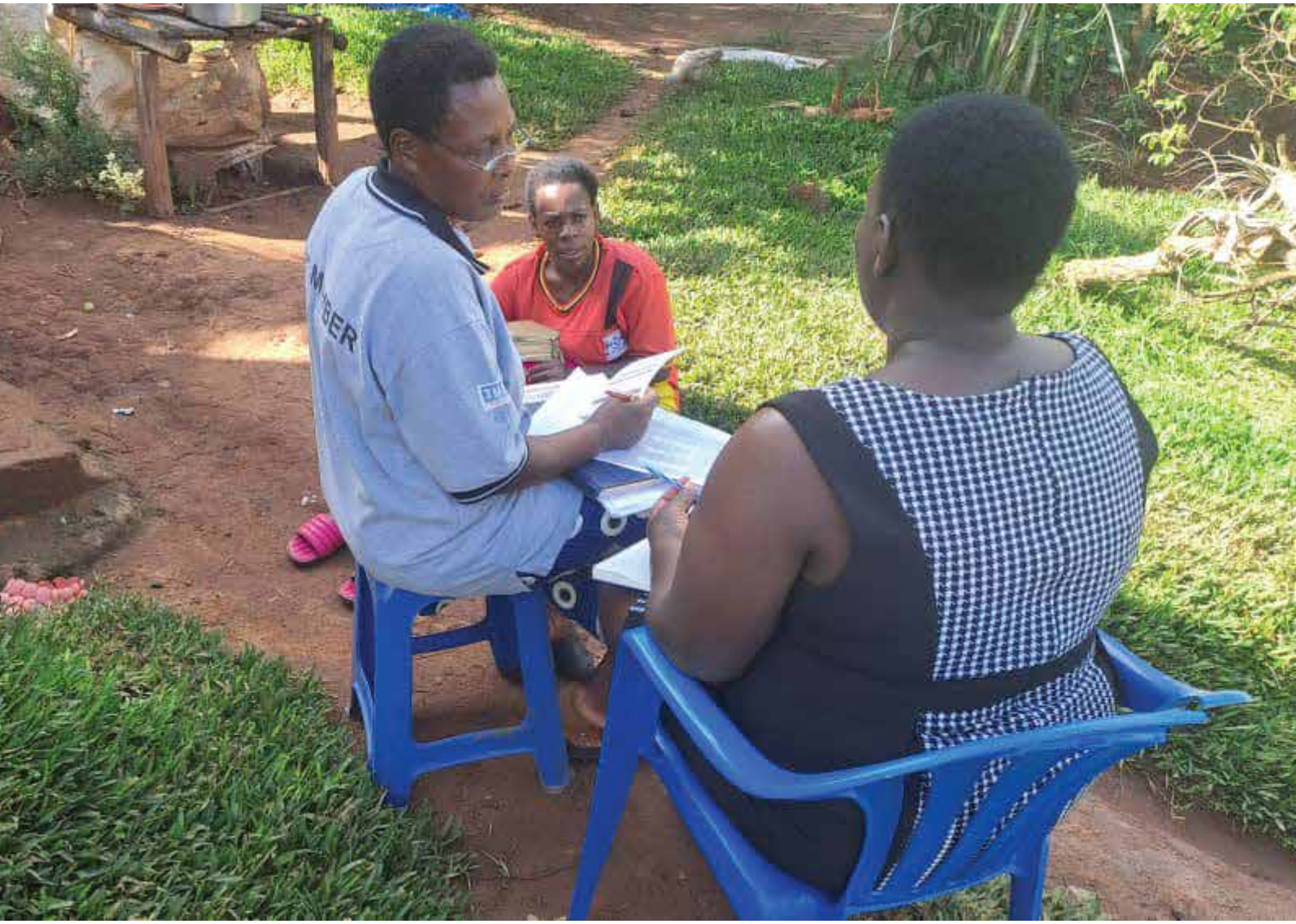
We conducted a root cause analysis to identify causal factors underpinning a chain of events. Root cause analyses are commonly used to identify the underlying reasons behind challenges and successes. In this study, the research team reviewed transcripts, discussed emerging themes and sub-themes, and identified major challenges encountered during implementation. These challenges were then framed as problem statements to guide further analysis.

Relevant data from interviews, observations, and document reviews were triangulated to trace the sequence of events, with the process led by the social scientist. Fishbone diagrams were created to systematically explore and visualise the potential causes of the identified challenges. These diagrams were finalised through consensus among the entire study team and are presented in detail in the findings section.

2.6 Ethical considerations

Approval was sought from the Makerere University School of Public Health Higher Degrees Research and Ethics Committee (SPH REC) and the Uganda National Council for Science and Technology (UNCST). Administrative clearance was sought from the Ministry of Health and Wakiso district offices. Voluntary written informed consent was sought from respondents before interviews. To ensure confidentiality, all data, including respondents' names, titles, and contact information, were secured in a lockable cabin and only accessible to the study team. Quotes

[2]Rooney JJ, Heuvel LNV. Root cause analysis for beginners. Qual Prog. 2004;37(7):45–56.



3.0 FINDINGS

In this section, we present findings using the REAIM framework.

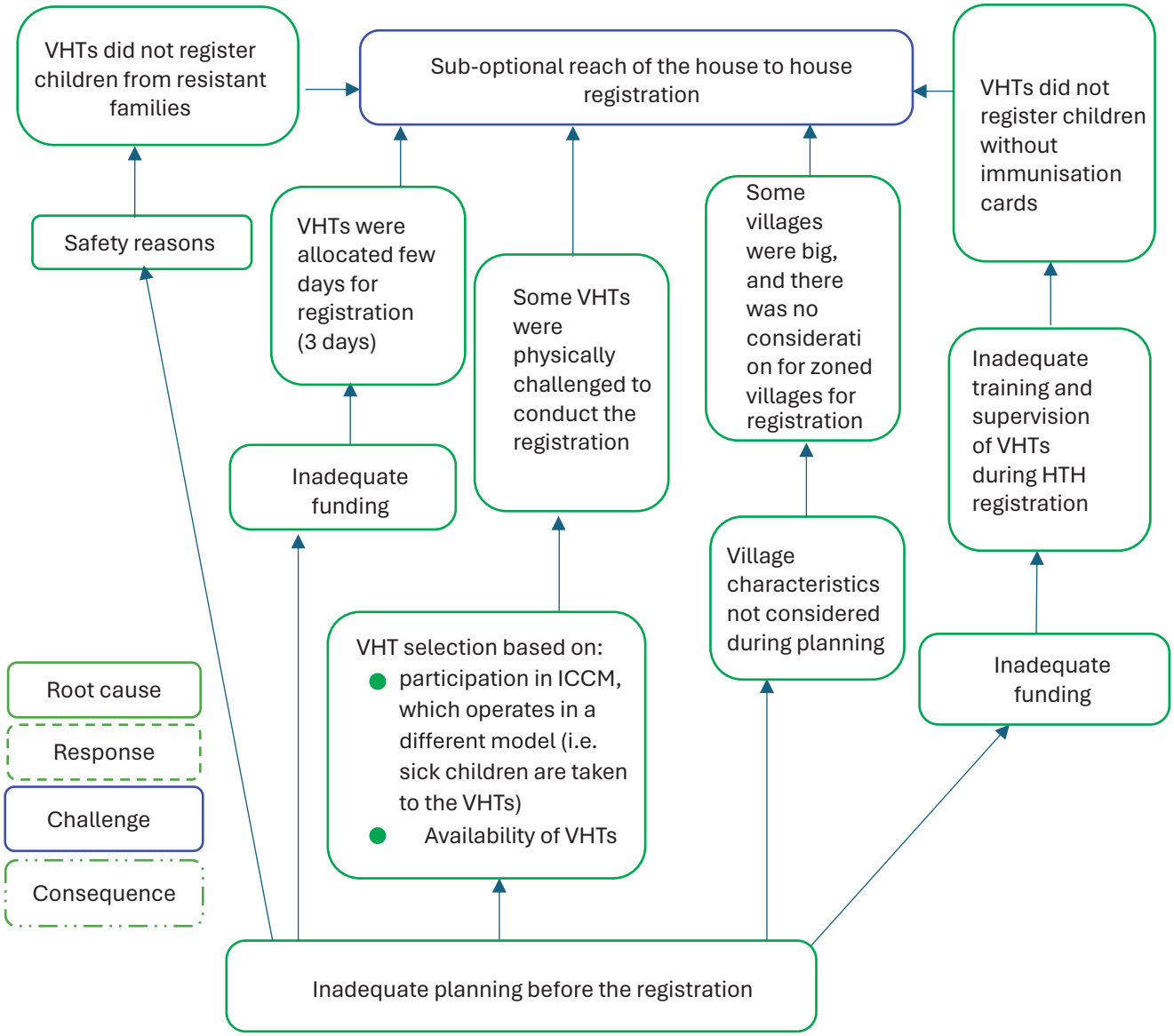
3.1 Reach

Finding

The house-to-house registration had suboptimal reach. According to the secondary data, the house-to-house registration exercise was conducted in 82% (22/27) of the subcounties in Wakiso district, and 73% (16/22) of the sub-counties in Kamuli district. Qualitative interviews with VHTs and district officials validated these findings. The suboptimal reach of the registration was due to two main factors: i) some villages were left out because they lacked VHT representation during the planning and implementation phases, and (i) VHTs avoided registering children from resistant families for safety reasons and did not include children without health cards. These reasons reflect inadequate planning for the registration.

According to secondary data, in Wakiso district, the HTH registration exercise was conducted in 82% (22/27) of the subcounties in Wakiso district, and 73% (16/22) of the sub-counties in Kamuli district

Figure 3: Root cause analysis for the sub-optimal reach of the House to House registration in Wakiso district



There was sub sub-optimal reach of the HTH registration activity, which was due to the following;

a) **VHTs did not register children from resistant families for safety reasons.** In addition, they did not register children without cards because they did not know how to navigate their registration, which was attributed to inadequate training of the VHTs.

> *"Because immunisation does not happen in these homes, you reach a time and say; 'why I am I bothering myself, even if I reach there they will refuse'. They are like don't tell us unless you want us to hate you ... basically, it's the words that chase you first."* ***(Village Health Team member)***
>
> *"We have homes in a [planned housing] estate. For that one, the residents completely refused. I think they think they are big or belong to a different class, so we don't know their health status. For them, they don't accept anything from the government."* ***(Village Health Team member)***

"I did not register them because they did not have cards and I didn't know what to do for them. ***" (Village Health Team member)"***

"It was hard to capture children without cards because when you look at the tool itself, it requires you to know when the child had received a particular antigen... so if for example you came, there's no parent whose child is, for example, 6 months minimum and can track that my child received DPT1 at this date, we can't trust that. So, it was mainly children with a vaccination card, or if they could accept to be taken as children who haven't received any antigen, then we captured the preliminary information. ***(District Health Team member)***

"

The plan was for VHTs to have a one-day training session, considering that they had had comprehensive training on their role at recruitment. All coordinators, including all VHTs, reported that VHTs did not receive comprehensive training but instead received an orientation.

"

"It wasn't training; it was at the facility for about fifteen minutes. There was no signing, no what ... that is what happened. That is not training to me. For training, we must sign, we have to take breakfast, and we have to eat lunch. ***" (Village Health Team member)***

"The orientation was done at the health facility level, so if you take Kyengera that means there was a meeting at Kyengera health centre III, a meeting at Nsangi Nakitokolo Health Centre II, a meeting at Nsangi Health Center III, and then a meeting at Kasenge health centre II - Those sub meetings of different lower-level facilities had to happen. It took just a few hours. The VHT supervisors took them through the child health registration book and explained how they were expected to fill them out. ***" (District Health Team member)***

"

Additionally, VHTs reported that they were not supervised during the HTH registration. Some of the VHT coordinators who were meant to supervise reported that they had not conducted supervision at all. In contrast, others attempted to follow through with visits and phone calls.

"

"Yes, I did supervise, but I did not reach out to all of them. I conducted supervision by making phone calls; that's what I did. Trying to call to find out that everyone is there, and on some
occasions, I would go to the community to find out whether they are there, whether they are working. ***" (Village Health Team member)***

"

At planning, the DHT was facilitated to conduct the training; however, supervision was not budgeted. It was assumed that DHT would incorporate the supervision activity into their routine work activities.

b) Inadequate consideration of village characteristics during planning. Considering the budgetary implications and previous activities, the DHT planned to engage only one VHT per village for the HTH registration activity. However, some villages are subdivided into zones, each served by its own VHT. Therefore, children in some zones were not registered.

> *"I did not reach all areas; we are 4 VHTs, and I registered only my area. The village is divided into four zones and for them, they didn't register."* ***(Village Health Team member)***

During planning, parish coordinators selected suitable and available VHTs from their jurisdiction. This selection was intended to utilise the existing VHT structure leveraging on staff capability. The parish
coordinators selected VHTs who were implementing the ICCM programme because of the perception that they were familiar with engaging with caregivers of children under 5 years. However, this did not consider the geographical area of some of the villages and how long VHTs were required to register all households thoroughly.

> *"We have the active VHTs involved in other programs like ICCM, and then among these, they selected one to represent the village among them. So, if Wakiso has 720 villages, then we*
> *expected 720 VHTs to support and implement these activities."* ***(UNICEF, Official)***

The reasons for the sub-optimal reach of the HTH registration in Wakiso district reflect the inadequate planning for the activity.

3.2 Effectiveness:

3.2.1 Number of zero dose children identified in Wakiso and Kamuli districts

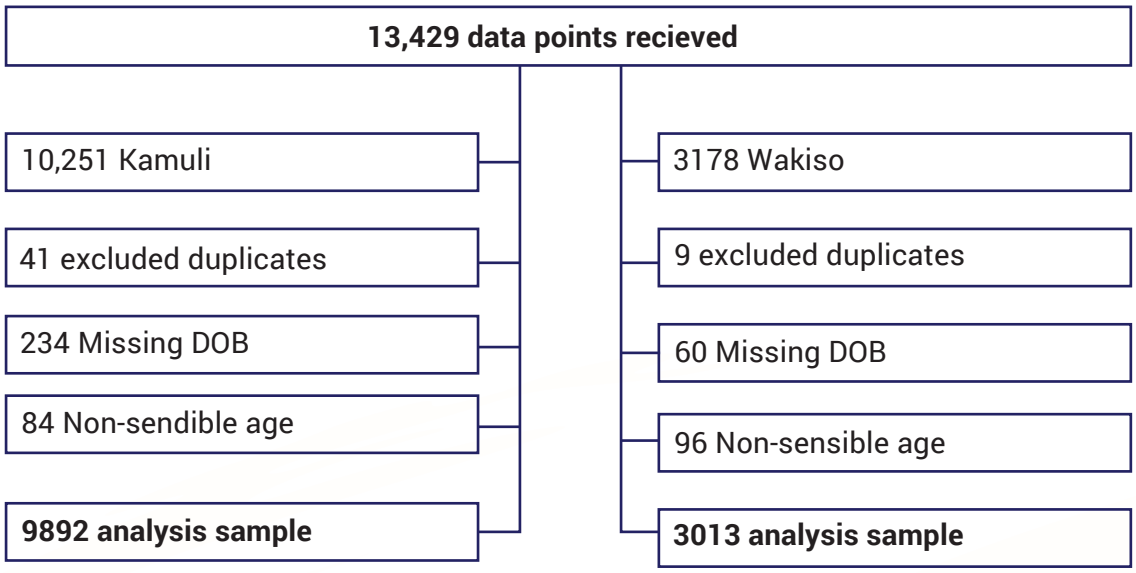
Finding:

House-to-house registration can identify ZD and UI children at the household level however, its effectiveness in reaching ZDC is unclear. The HTH registration data identified a total of 2243 ZDC and 2491 UIC in Wakiso and Kamuli districts. Wakiso district had 589 ZDC and 818 UIC, while Kamuli had 1654 ZDC and 1673 UIC. Comparing IHME ZD estimates with these findings, the HTH registration identified approximately 36.3% of the estimated zero-dose children in Wakiso district and exceeded the estimated number in Kamuli district, reaching 123%.Despite the identification of ZD children, it is unclear whether all children were reached with vaccination to ascertain the intervention's effectiveness. However, 62% (8/13) of the caregivers interviewed had taken their children for vaccination at a health facility or an outreach point following the house-to-house registration. The other four caregivers had not taken their children for vaccination at the time of data collection, citing competing priorities, rude health workers, and a lack of money to pay for transport to and from the health facility.

At the time of analysis, the dataset contained information from 82% (22/27) of the sub-counties in the Wakiso district and 73% (16/22) of the sub-counties in the Kamuli district.

The HTH registration data received had 13,429 data points from Kamuli and Wakiso; however, due to data quality issues, only 9,892 data points in Kamuli and 3,013 data points in Wakiso were analysed. (Figure 4). The denominator was the total number of children registered through the HTH exercise.

Figure 4: Derivation of analysis sample for the house-to-house registration data for Wakiso and Kamuli districts.



The HTH registration identified ZD and UI children at the community and health facility levels. At the community level, VHTs were supposed to identify ZDC using the definition of "a child who has not received any vaccine". Some VHTs reported verbally referring caregivers of ZD and UIC to health facilities for immunisation services. At the health facility level, using the health worker definition "a child aged 6 – 52 weeks who has not received any dose of DPT 1", health workers were supposed to analyse the HTH registration data from each village in their catchment area and generate line lists of ZD and UIC. Based on the line lists, health workers were to work with VHTs to develop strategies to reach the identified ZD and UIC.

Figure 5 below shows the number of ZD and UI children identified from the analysis of the HTH registration data from Wakiso and Kamuli districts. A total of 2243 ZDC and 2491 UIC were identified in both districts.

Figure 5: Number of zero dose and under-immunised children (6 - 52 weeks) identified from analysis of House to House registration data in Wakiso and Kamuli districts (2023).

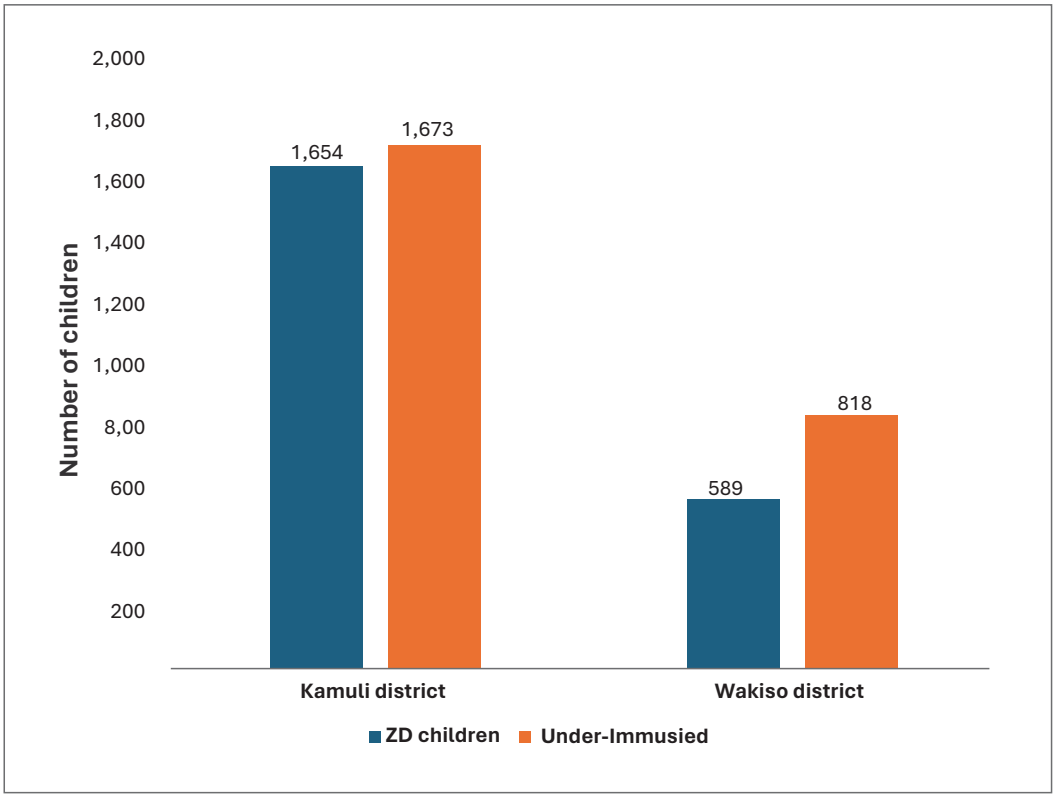
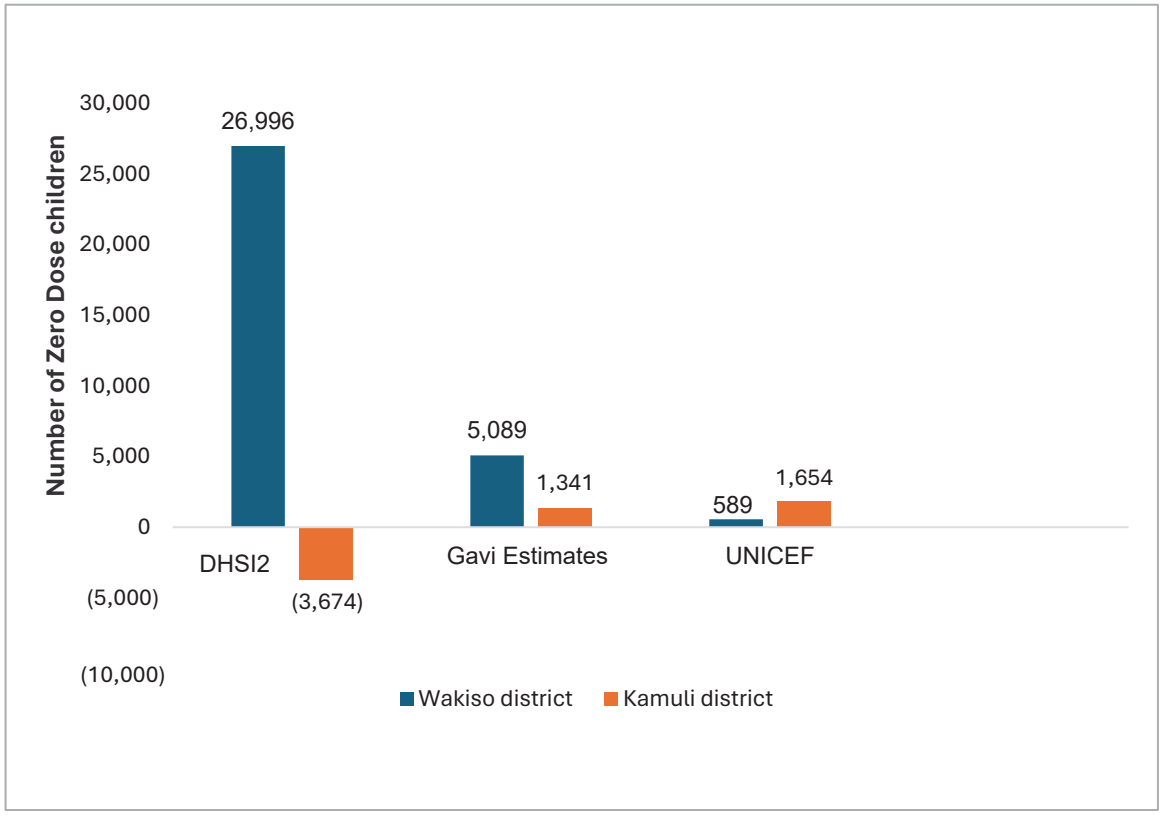


Figure 6 below compares the estimated number of zero-dose children in Wakiso and Kamuli districts based on data from DHIS2, UNICEF and Gavi (generated from IHME models and WorldPop population projection data). DHIS2 estimates show that Wakiso district has a significantly higher number of zero-dose children, with 26,996 reported. In contrast, Kamuli district has a negative estimate of -3,674, indicating a potential discrepancy or error in the data for this district. Gavi estimates show that Wakiso district has 5,089 zero-dose children, while Kamuli district has 1,341. These figures are notably lower than DHIS2 estimates for Wakiso and fall within a more realistic range. When comparing Gavi estimates to the number of children identified through the house-to-house (HTH) registration exercise, 11.6% of the estimated zero-dose children in Wakiso district were identified, while 123% of the estimated zero-dose children in Kamuli district were identified.

Figure 6: Comparison of the number of zero dose children from other data sources



The bar chart summarises the number of zerodose childen reported by DHIS2 and Gavi in 2023. The figures from UNICEF are the number of zero-dose children who were identified during the house-to-house registration exercise in 2022. This comparison underscores the the discrepancies in data sources.

Disaggregation by age

In both Wakiso and Kamuli, most zero-dose children were aged between 26 and 52 weeks, accounting for 244 (41.4%) in Wakiso and 833 (50.4%) in Kamuli (Table 5). Similarly, the majority of under-immunized children identified in both districts were within the same age range, with 1,075 (64.3%) in Wakiso and 454 (55.5%) in Kamuli (Table 6). The high number of children between 26-52 weeks implies that the HTH registration has the capacity to link systematically missed children for immunisation and other health care services.

Table 5: Zero Dose children disaggregated by age

Characteristic	Category	Zero dose children	
		No (N=10662)	Yes (N=2243)
KAMULI DISTRICT			
Age in weeks	Overall	N=8238	N=1654
	Below 6 weeks	217 (2.6)	0(0.0)
	6-10 weeks	96 (1.2)	218 (13.2)
	>10-26 weeks	869 (10.5)	603 (36.5)
	>26-52 weeks	2209 (26.8)	833 (50.4)
	>52 weeks	4847 (58.8)	0 (0.0)
WAKISO DISTRICT			
Age in weeks	Overall	N=2424	N=589
	Below 6 weeks	267 (11.0)	0(0.0)
	6-10 weeks	112 (4.6)	133 (22.6)
	>10-26 weeks	693 (28.6)	212 (36.0)
	>26-52 weeks	941 (38.8)	244 (41.4)
	>52 weeks	411 (17.0)	0 (0.0)

Table 6: Under immunised children disaggregated by age

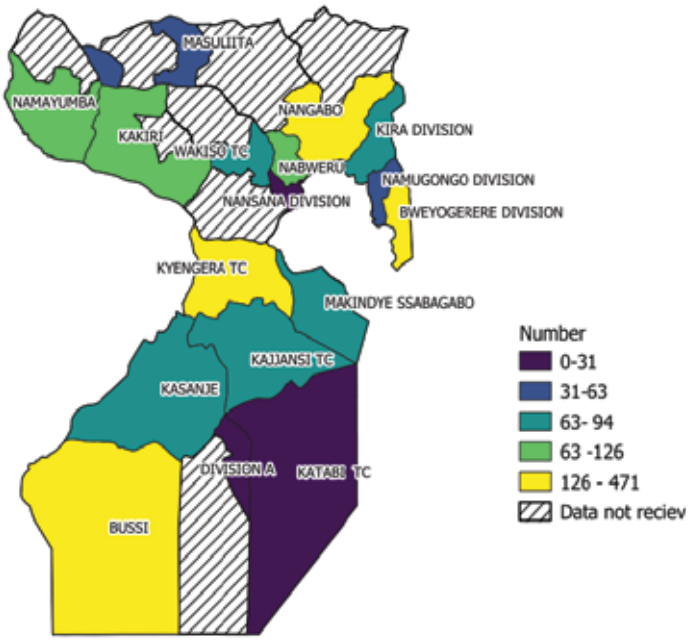
Characteristic	Category	Under Immunized Child	
		No (N=10414)	Yes (N=2491)
KAMULI DISTRICT			
Age in weeks	Overall	N=8219	N=1673
	Below 6 weeks	217 (2.6)	0 (0.0)
	6-10 weeks	314 (3.8)	0 (0.0)
	>10-26 weeks	874 (10.6)	598 (35.7)
	>26-52 weeks	1967 (23.9)	1075 (64.3)
	>52 weeks	4847 (59.0)	0 (0.0)
WAKISO DISTRICT			
Age in weeks	Overall	N=2295	N=818
	Below 6 weeks	267 (12.2)	0(0.0)
	6-10 weeks	245 (11.2)	0(0.0)
	>10-26 weeks	541 (24.6)	364 (44.5)
	>26-52 weeks	731 (33.3)	454 (55.5)
	>52 weeks	411 (18.7)	0 (0.0)

3.2.2 Location of ZD children in Wakiso and Kamuli districts

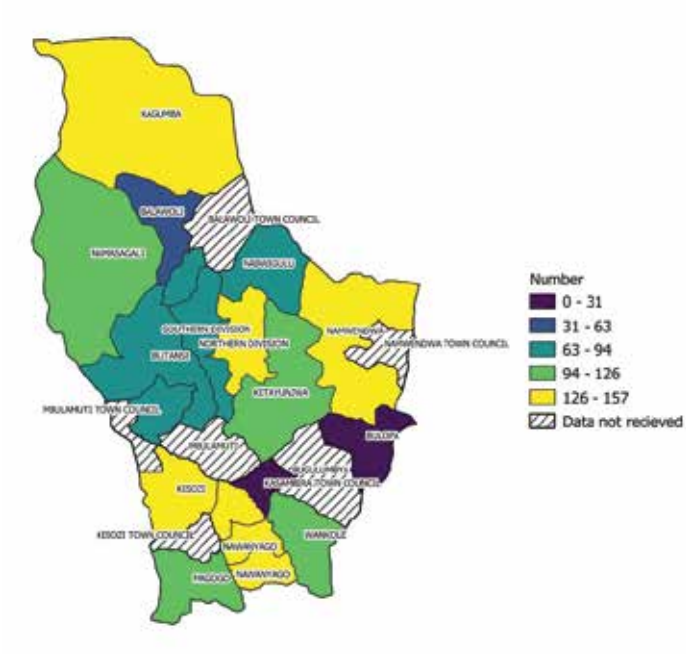
Analysis of data from the HTH registration of children in Wakiso district shows that Kyengera Town Council, Bussi (Island), Nangabo and Bweyogerere sub-counties (urban settlements) in Wakiso district had the highest numbers and proportions3 of ZDC (Figure 7a, &c). In Kamuli district, Kagumba, Kisozi, Namwendwa, Southern division, Northern division, and Nawanyago sub-counties had the highest numbers and proportions of ZDC (Figure 7b, &7d). Figure 1 in the annexes shows the proportions of ZDC identified in Wakiso and Kamuli districts.

Figure 7: Location, number, and proportion of zero dose of children identified from the analysis of the House to House registration data in Wakiso and Kamuli districts

7a. Number of ZDC in Wakiso district

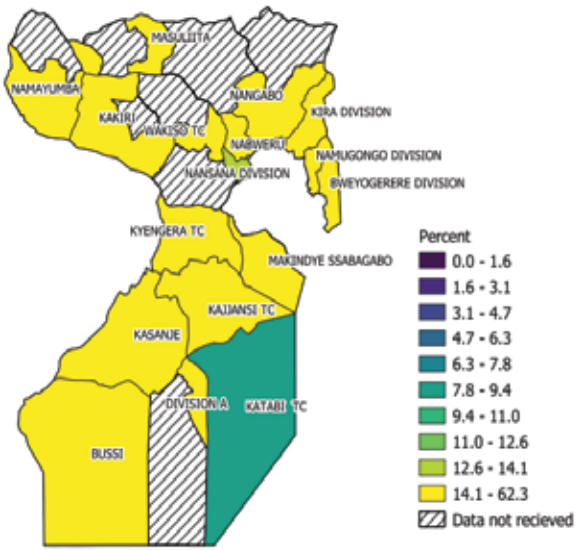


7b. Number of ZDC in Kamuli district

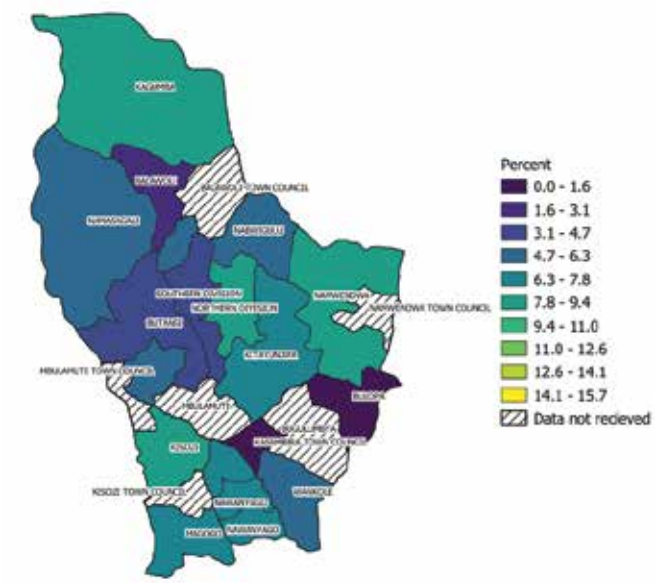


[3] The denominator was the total number of children registered through the HTH exercise.

7c. Proportion of ZDC in Wakiso district



7d. Proportion of ZDC in Kamuli district



The figure shows the location (number) of ZD children identified through the HTH registration exercise in Kamuli and Wakiso districts using the health facility definition. The health facility definition includes all children aged 6-52 weeks who have not received DPT1. Figures 5a and 5b show the number and proportion of ZD children in Wakiso identified in each sub-counties while Figures 5c and 5d show the number and proportion of ZD children identified in Kamuli district.

Were all ZD children vaccinated?

There was no provision to verify the vaccination of children to ascertain the effectiveness of the intervention due to a lack of proper documentation at the health facilities. However, of the 13 caregivers we interviewed, eight had taken their children for vaccination at a health facility and one at an outreach point following registration. Four (4) caregivers had not taken their children for vaccination yet due to competing priorities of caregivers, ii) rude health workers, and iii) a lack of money to pay for transport to and from the health facility.

> *"I will not give excuses that there is something that stopped me; it was just laziness, but I eventually made it right."* ***(Caregiver)***

> *"The health workers are tough; a health worker was tough on me when I was pregnant. Now I fear taking this child to that health facility for immunisation."* ***(Caregiver)***

> *"At times, money has not yet come for transport. Then you get to find out that the time you would have gone to the health facility has passed, and it is not that you do not want your child to get immunised."* ***(Caregiver)***

3.3 Adoption of the House to House registration

Finding

District, health facility, and community stakeholders generally accepted the HTH registration. The DHT wanted to triangulate the HTH registration data with that from DHIS2 to verify the existence of ZDC. Some health workers reported having utilised the information to inform their efforts in reaching ZDC. Despite challenges faced during the registration, VHTs showed a strong commitment to their roles, highlighting their dedication to community health. Caregivers generally reported that they accepted the HTH registration because VHTs were known to them and as such, were trusted. Despite this, some caregivers resisted the VHTs during the registration exercise due to several factors: lack of child health cards, mistrust in immunisation activites, inaccessibility of gated households, and some caregivers did not trust the intentions of the registration. These reasons are partly attributed to the inadequate social mobilisation at the community level.

There was a general acceptance of the HTH registration by stakeholders at the district, health facility, and community levels. The DHT was receptive to the HTH registration and was driven by the need for data on ZD and UI children. They also wanted to triangulate the HTH registration data with that from DHIS2 as verification methods for the existence of ZD children.

> *"The DHT was okay and even the sub-county, they were okay because they also needed to have that data to triangulate with DHIS2 and to see where we lie... if the ZD children were there or they were not there."* ***(UNICEF)***

The health workers were generally receptive to the HTH registration as it enabled them to understand immunisation performance at the village level.

> *"The health workers were fine with the registration because we task them during the immunisation performance review meetings to tell us what is failing them to perform. What could be the challenges? Are the ZD children there or not?"* ***(UNICEF)***

Some health workers reported that they utilised the information to make decisions on the identification and reach of ZDC.

> *"We look through the books and see those who have defaulted then they are given calls or they are just reminded physically to receive the immunisation service. But mostly, they are just physically reminded and given specific days when we will be available."* ***(Health worker)***

The VHTs were receptive to the HTH registration. Despite challenges faced during the registration, VHTs showed a strong commitment to their roles and advocated for financial recognition for work done, highlighting their dedication to community health.

> *"VHTs, I may say maybe 70% were receptive but others were not because some of them thought they were doing a lot of work for free. They are volunteering and they are not receiving a lot."* ***(UNICEF official)***

The community generally accepted the HTH registration, given that most caregivers agreed to provide their children with immunisation information, as reflected by the data. Some caregivers reported that they received the HTH registration because VHTs were known to them and, as such, were trusted.

> *The community accepted it because they could give the details. Household owners agreed to give their records, meaning they were interested.* ***(Health worker)***

However, respondents reported that some caregivers refused to participate in the HTH registration because i) they didn't have child health cards, ii) they mistrust immunisation and its activities [some caregivers were suspicious of registration intentions]. The resistance was attributed to the lack of sensitisation before the registration.

> *"I did not register children who did not have cards. I didn't know what to do for them because it is the card I would look at and register you. I used to tell them to return to the hospital if you missed it."* ***(Village Health Team member)***

> *"Some say, 'For me, I don't want government things, I don't even want to listen to government things.' They tell me that they got tired of the government."* ***(Village Health Team member)***

> *"It is necessary that you first inform us because, truthfully, the VHT just got to me abruptly when I didn't even know where I had kept the child health cards; I took a lot of time looking for them, plus the information as I could not remember some. So I got pushed to look for them because I was giving him the wrong information."* ***(Caregiver)***

The plan for resistant caregivers was to involve DTH and Local council officials (LCs). for the challenge to be solved locally through persuasion and advising parents to leave child health cards with caretakers. VHTs reported that they employed a polite approach to registration rather than a coercive one.

> *"At planning, we had the VHTs to inform the local authorities in their area if there was a challenge. They would liaise with the LCs to see how to work out that issue. It could be solved locally and not depend on the district. We wanted to empower the loca take charge of the health of their people. The approach was persuasive, and sometimes parents were asked to leave the child's health card at home with the maid or someone so that information could be captured."* ***(UNICEF, official)***
>
> *"We report to the ADHO MCH at the district but sometimes they have not yet worked on it."* ***(Village Health Team member)***
>
> *"They told us if someone resists you call the chairman, but I used to talk to them politely so that the next day you go back, and they accept."* ***(Village Health Team member)***

3.4 Implementation

Finding

The house-to-house registration was not fully implemented as planned due to some challenges, including i) caregiver resistance, ii) insufficient funding and planning, iii) inadequate training and supervision of VHTs, and iv) poor-quality data collected by VHTs. These challenges were exacerbated by insufficient supervision during implementation, primarily due to budget constraints. The main enablers for implementation were: i) the presence of UNICEF consultants to guide the process, ii) high levels of acceptance at the district and community levels, iii) VHTs' good social relations with the community, iv) the mobilisation of additional resources to support implementation and v) VHTs' leveraging of skills gained from implementing other programs.

The house-to-house registration intervention was not fully implemented as planned, as evidenced by several gaps across the Reach, Effectiveness, Adoption, Implementation and Maintenace domains.

Reach

The house-to-house (HTH) registration had suboptimal coverage. Key limitations included the exclusion of children from resistant families and those without health cards, as well as missed villages due to inadequate VHT representation. These gaps indicate that the intervention did not reach all eligible children as intended.

Effectiveness

While the registration successfully identified ZDC and UIC, its overall effectiveness remains unclear. Only 11.6% of the estimated ZDC were identified in Wakiso, and although Kamuli exceeded the estimate (123%), it is uncertain whether all identified children were vaccinated. The finding that 38% of caregivers had not taken their children for vaccination due to logistical and systemic barriers suggests that the intervention did not fully achieve its intended health outcomes.

Adoption

The intervention was generally accepted by district and community stakeholders, with some health workers using the data for planning. However, resistance from caregivers due to mistrust and inadequate social mobilization indicates that adoption was not universal, affecting implementation fidelity.

Implementation

Several barriers hindered full implementation, including:

1. Some caregivers refused to participate in the HTH registration for various reasons, including a lack of child health cards, mistrust in immunisaiton activities, and suspicion about the intentions of the registration exercise.

2. Insufficient training and supervision of Village Health Teams (VHTs) both before and during the implementation phase.

3. Limited funding, which restricted the duration of implementation and supervision. As a result, VHTs were allocated only three days for registration, which was inadequate.

4. Inadequate supervision during implementation, largely due to insufficient budgetary support for the activity.

5. Poor planning that failed to account for village characteristics. For example, some villages are divided into smaller zones, each with its own VHT, but only one VHT was engaged for HTH registration. Additionally, some villages were too large for a single VHT to register all households within the allocated time.

6. Challenges in data entry and analysis, including poor-quality data collected by VHTs. Issues such as illegible handwriting, incomplete entries, and inaccurate data were largely attributed to the lack of comprehensive training.

7. Delays in data processing, as health workers were overwhelmed by the volume of data to analyse. Moreover, VHTs were slow to submit completed registers to health facilities

8. Challenges with identifying ZD and UIC at the health facility level due to delayed analysis of the HTH registration data. Data analysis was a prerequisite to the identification of ZD and UI children at the community level. Identification of ZD and UIC using the HTH registration data was delayed due to: i) Delayed submission of registers to health facilities by VHTs and, ii) Health workers were overwhelmed by a large amount of data to manually analyse and generate line lists. Despite UNCEF's intervention, data entry and analysis, were still delayed due to: i) the large amount of data that required processing and, ii) the sub-optimal quality of data collected. It is unclear whether all the identified ZD and UIC were vaccinated due to lack of proper documentation at the health facilities.

a)**Identification of ZDC and UI children**

The identification of ZD and UI children was done at the community and health facility levels.

i) Community level

During registration VHTs were supposed to identify ZDC using the definition of "a child who has not received any vaccine". Some VHTs reported having verbally referred caregivers of ZD and UIC to health facilities for immunisation services.

> *"I referred one caregiver during registration and when I met her on the way another day, I asked her if she had taken back the child for immunisation as I had told her. She said, 'VHT, I went back but it was not a visit at her home like we did while registering but I asked her when I met her".* ***(VHT, Wakiso district)***

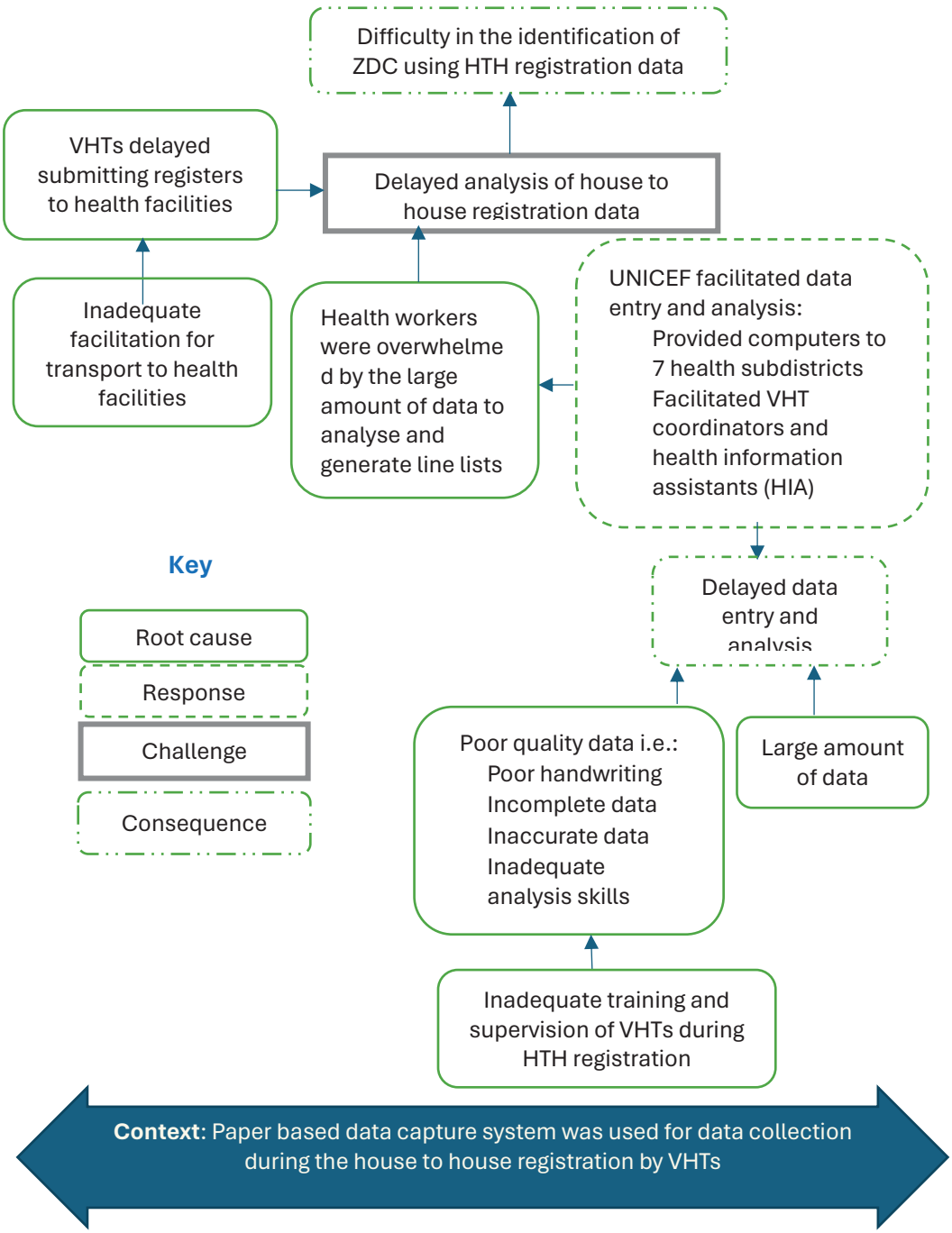
ii) Health facility level

Using the health worker definition "a child aged 6 – 52 weeks who has not received any dose of DPT 1", health workers were supposed to analyse the HTH registration data from each village in their catchment area and generate line lists of ZD and UIC. Based on the line lists, health workers should work with VHTs to develop strategies to reach the identified ZD and UIC. Our findings show that there were challenges with identifying ZD and UIC at the health facility level due

to delayed analysis of the HTH registration data. Data analysis was a prerequisite to the identification of ZD and UI children at the community level.

Figure 8 shows a root cause analysis for the delayed analysis of the HTH registration data in the Wakiso district.

Figure 8: Root cause analysis for delayed analysis of House to House registration data in Wakiso district (October 2023 to January 2024)



i) VHTs delayed submitting registers to health facilities. VHTs were expected to submit the HTH registers to their respective health facilities following registration. However, respondents reported that there were delays in submitting the registers to the health facilities due to inadequate funding for transportation of the VHTs.

> *"VHTs were expected to return the registers to the health facilities. So, they facilitated them with a 15,000 transport refund, but some VHTs come from far places where they use like 20,000 to get to the facility. So, giving them 15,000, some of them didn't turn up. Some did not even bring back the registers. Because they are like 'aaah health worker, that money is so little that they give us for the activity.' We registered for free, now you are giving us less than we spend on transport."* ***(District Health Team member)***

ii) Health workers were overwhelmed by the large amount of data to analyse and generate line lists manually. Health workers were expected to review the data in the HTH registers and identify ZD and UIC for follow-up. Our findings show that the amount of data collected was a lot for health workers to process in addition to their routine work.

> *Some VHTs did a good job recording all the required details in the registers, but this resulted in a lot of data. For example, in Kyengera I was meant to have one person who was meant to enter around 55 books in 3 days it is practically impossible."* ***(District Health Team member)***

> *"The data became too much for us. I think immunisation for sure is an organisation of its own at the health facility. You find that the department has become too bulky for you because of too much paperwork. Lots of papers with data on it."* ***(Health worker)***

In response to the overwhelming data, UNICEF provided a computer to seven out of the eight health subdistricts in Wakiso district. In addition, UNICEF facilitated a VHT coordinator and a health information assistant in each health subdistrict to undertake the data entry and analysis. Despite this intervention, data entry and analysis were delayed due to: i) the large amount of data and, ii) the data collected was of sub-optimal quality. The sub-optimal data quality was due to: i) poor handwriting of the VHTs, ii) incomplete data, iii) inaccurate data and iv) inadequate analysis skills.

> *Some of our VHT supervisors are not technical in data analysis. The entries of these particular beneficiaries made the task hard. It was real extracting from the hard copy onto the soft copy depending on the size of the village or how clear the entries were.* ***(District Health Team member)***

The inadequate data was contributed to by the inadequate training of VHTs before the registration and lack of supervision during the registration ***(see section 3.1 Reach of the House to House registration)***

Following data analysis, LH shared line lists of identified ZD and UIC with UNICEF. Some health facilities followed up, and the identified ZD and UIC were reached and documented, as shown in Figure 9.

Figure 9:An example of a line list from health facilities.

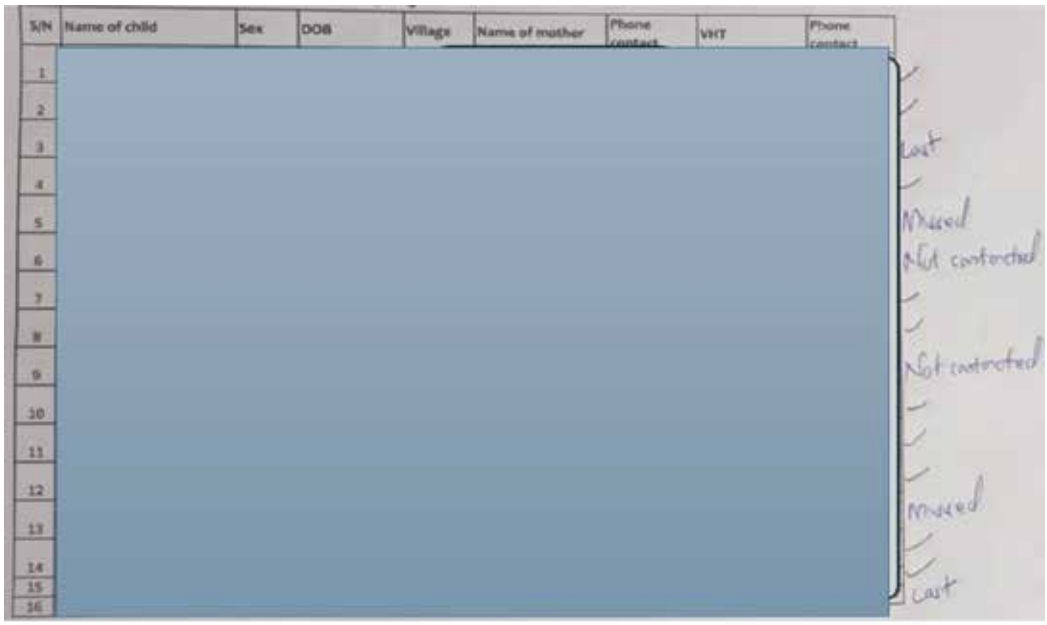


Figure 9 above presents an example of a line list used by health facilities to track ZDC during the HTH registration exercise. Following registration, key details such as the child's name, gender, date of birth (DOB), village, mother's name, phone contact, and the VHT responsible for registration were recorded. This list served as a vital tool for reaching out to households with ZD or UI children for vaccination. Some households were successfully contacted, as indicated by the tick marks on the right, while others were either lost to follow-up or missed during the exercise, as noted in the annotations on the right.

The observed success of the HTH registration in Wakiso district was attributed to the following enablers.

i) Good social relations: VHTs have good social relations in the community, which fosters trust among caregivers.

> *"The registration didn't make me feel bad because the VHT is someone who comes and explains to you the reason behind something and also tells you the good in it, and she is also our person." (**Caregiver**)*

ii) Mobilisation of additional resources to ensure the smooth execution of HTH registration amidst challenges of inadequate funding by some VHT coordinators. .

> *"I wasn't able to supervise well because I wasn't supported financially yet it wasn't part of my original plan to utilise my resources. At times, I purchased airtime to follow through with work on the ground." (**District Health Team member**)*

ii) VHTs leveraged skills obtained from working with other programs, such as Integrated Community Case Management (ICCM), to conduct the HTH registration.

> *"We have referral books. If I can escort, I write a letter for the one I referred. I tear out the paper and give it to the caregiver, and when they have completed immunisation, there's a part down below that they return to me. That is how to prove that they reached the hospital." (**Village Health Team member**)*

iv) Stakeholders, including district health teams, health workers, and community members, demonstrated high acceptance of the HTH registration. Health workers used the data to guide immunisation efforts, and VHTs displayed dedication to their roles despite facing resource constraints and operational challenges.

v) The presence of UNICEF consultants guided implementation.

3.5 Maintenance (Sustainability)

Finding

Finding: The financial sustainability of the HTH registration without UNICEF funding is unclear. While some stakeholders suggested the continuation of the HTH registration using PHC funds, others were skeptical of its continuation following the cessation of UNICEF funding. For programmatic sustainability, the HTH registration was largely designed and implemented within existing health system structures. However, the oversight role was undertaken by a consultant, which may not be sustainable without donor funding. A more sustainable option would be to integrate the oversight role within the existing health system.

Sustainability was assessed for the financial and programmatic continuation of the HTH registration following the cessation of UNICEF funding.

a) Financial sustainability

All implementing stakeholders recognised that the HTH is resource-intensive and largely hinged on donor funding, as such sustainability is unclear without UNICEF funding. Some stakeholders suggested that the HTH registration would be supported by PHC funding in the absence of UNICEF support, while others mentioned that it would be difficult to continue.

> *"I don't have morale now, I lost morale. If there is any facilitation, I am ready to go back to the field."* ***(Village Health Team member)***

> *"If UNICEF pulls out support, I don't think... I tell you the truth and everyone will tell you that we are so much into this thing of 'where do I benefit from?'."* ***(Health worker)***

> *"Most of our VHTs are first and foremost aged but also this one is kind of an urban setting and people are looking for something to meet the cost of their living. So, the voluntary bit of the VHTs, it's high time we stopped thinking VHTs being voluntary. The VHT may appear as a volunteer but when they are not doing the voluntary work."* ***(District Health Team member)***

> *"Definitely if there's no much facilitation that's when the activities will reduce. We shall integrate those that can fit into the routine easily like immunisation, meetings, and social mobilisation because an outreach can be done using any other funds. It's only child registration which a routine activity is not."* ***(District Health Team member)***

b) Programmatic sustainability

In order to foster sustainability, the HTH registration was largely designed and implemented within existing health system structures such as the VHTs, health workers, health educators, and DHT. District stakeholders were largely involved in the planning and implementation of the HTH registration. Their involvement was in the form of budgeting, recruitment of VHTs, and training.

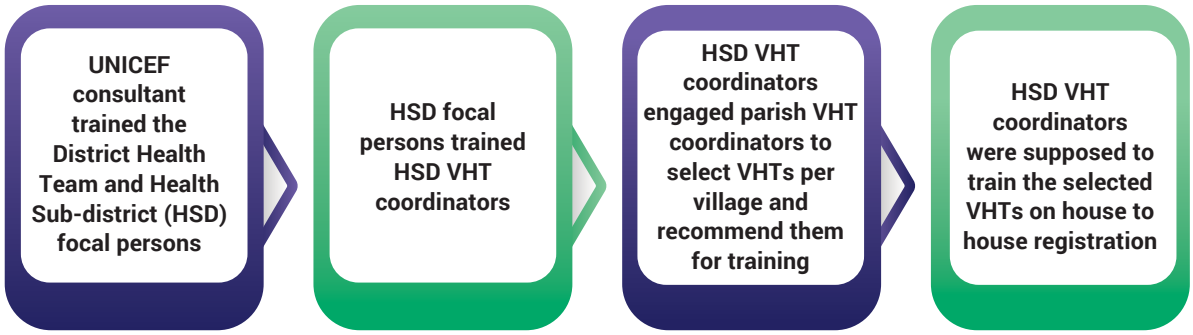
i) Budgeting for HTH registration

Funds from UNICEF were sent to the district's single treasury account. During planning, the DHT made decisions on allocating funds to several activities under HTH registration i.e. facilitation for training of stakeholders, transport refund, and supervision among others.

ii) Recruitment of VHTs and training on the HTH registration

Training of all stakeholders for implementation was planned for and largely conducted in a cascaded manner as shown in Figure 10.

Figure 10: Cascaded training for the Hose to House registration



Additionally, the UNICEF consultant oversaw the implementation of the HTH registration, which helped foster the implementation of the activity. The roles of the consultant were to; i) develop data collection tools (the HTH register and the tracking tool), ii) coordinate virtually with supervisors and health educators, iii) provide hands-on mentorship to the implementing teams, iv) monitor implementation, v) support data compilation and analysis, and vii) support line listing of the HTH exercise. However, engaging a consultant for the oversight role may not be sustainable without donor funding. A more sustainable option would be to integrate the oversight role within the existing health system.

4.0 Study limitations

The study also had some limitations. Quantitatively, this study could not verify the effectiveness of the HTH registration due to inadequate documentation. Further, the HTH registration data had quality challenges such as: i) missing data, and ii) inaccurate data (inconsistencies in dates), requiring certain assumptions that might have affected data accuracy. Also, qualitative data was only collected from Wakiso district. Given the contextual differences between districts, the findings may not be generalised to other districts where HTH registration was conducted.

Furthermore, qualitative data was purposively collected from sub-counties with high numbers of ZD children. This could introduce selection bias as the data collected may emphasise the unique factors with areas having a high number of ZD and may limit the generalizability. However, we triangulated the data (qualitatively and quantitatively) from different data sources to minimise bias. As such, insights shared in this report capture the various nuances at different levels. However, future studies could consider collecting data from more sub-counties, including those with low and moderate ZD populations, to ensure a more balanced understanding of the factors affecting immunisation coverage.

5.0 Discussion

In this study, we assessed the implementation of the UNICEF-supported house-to-house registration of children by VHTs in 2023 in Wakiso and Kamuli districts. We found that the HTH registration successfully identifies ZD and UI children at the household level. The comparison of the number of ZD children with other data sources (Gavi and DHIS2) underscored the contrast in estimates for both Wakiso and Kamuli districts. Estimates from DHIS2 showed that there might be data inconsistencies, partly due to data quality issues. Different data capture systems estimate the zero-dose burden differently, mainly by the nature and source of the data used in the estimation, especially for the denominator. The alignment of Gavi and UNICEF estimates suggests these may be more reliable for planning and decision-making. The disparities underscore the importance of harmonising data collection and reporting methods across platforms to identify zero-dose children accurately. Additionally, frequent data triangulation exercises are needed to address unreliable denominators. The house-to-house registration exercise, if done well, can accurately map out children, allowing for more targeted interventions to reach these children and reduce the risk of vaccine-preventable diseases, especially in underserved communities.

Despite the identification of ZD children, it is unclear whether all children were reached with vaccination to ascertain the intervention's effectiveness. Our interviews with caregivers revealed that more than half of the caregivers had taken their children for vaccination at the time of data collection. This shows that the HTH registration increased awareness about having a ZD child and prompted caregivers to get immunisation services. However, not all caregivers had taken their children for vaccination during data collection, citing competing priorities, rude health workers, and a lack of money to pay for transport to and from the health facility. These barriers to the uptake of immunisation services differ by context and, therefore, require tailored approaches to address them.

This was attributed to several implementation challenges. A key challenge was caregiver resistance, driven by a lack of child health cards, mistrust in immunisation activities, and suspicion about the intentions behind the registration. This underscores the need for thorough community mobilisation and sensitisation to foster trust and acceptance before implementation. Engaging caregivers early and addressing their concerns can enhance participation and minimise resistance. Another major issue was inadequate training and supervision of VHTs, which compromised data quality and efficiency. VHTs were not adequately prepared to handle the registration process, leading to incomplete, inaccurate, and poorly written data. Comprehensive and consistent training of VHTs is critical to ensuring high-quality data collection and equipping them to handle challenges in the field.

The limited budget also posed significant constraints, affecting the duration of the activity, the level of supervision, and the allocation of VHTs. Allocating only one VHT to large or zoned villages without considering the unique characteristics of each area resulted in incomplete registration within the short timeframe provided. Tailored planning that accounts for village size, terrain, and population distribution is essential to improve efficiency and coverage. Additionally, delays in data processing were a significant bottleneck. Health workers struggled to manage the large volumes of data, and the delayed submission of registers by VHTs further compounded the issue. Investing in efficient data capture and processing systems, such as digital tools, could reduce delays and improve data accuracy and timeliness. These challenges highlight the importance of comprehensive planning, resource allocation, and capacity building for effective implementation. Addressing these barriers requires a multi-pronged approach that includes adequate funding, better training and supervision, tailored planning, and community engagement. These improvements are essential for successfully implementing HTH registration and similar initiatives.

The HTH registration was designed within existing health system structures, offering the potential for programmatic sustainability. However, relying on voluntary VHT engagement and external funding for oversight raises concerns about long-term sustainability. Integrating the oversight role within the existing health system could enhance the intervention's sustainability while reducing dependence on donor funding.

Despite these challenges, the HTH registration benefited from VHTs' strong social connections, which fostered trust among caregivers and facilitated registration. Additionally, VHT coordinators demonstrated resourcefulness by mobilising additional resources to support implementation. VHTs also applied skills from previous programs, such as Integrated Community Case Management, to improve the registration process. Further, stakeholders, including district health teams, health workers, and community members, demonstrated high acceptance of the HTH registration. The willingness of stakeholders to adopt the intervention reflects its perceived relevance and value in addressing immunisation gaps.

Unintended consequences of the HTH registration

The House-to-House (HTH) registration had unintended consequences, both positive and negative. On the positive side, the registration functioned as an intervention by significantly increasing awareness of the existence of ZDC. This awareness prompted caregivers to seek immunisation, while VHTs played a crucial role in referring mothers to the nearest health facility ahead of planned outreaches. The success of the registration exercise in identifying ZDC demonstrated its effectiveness, leading to its adoption by other departments within the Ministry of Health and various EPI partners. UNEPI implemented HTH registration during the recently completed Big Catch-Up campaign in November 2024. Furthermore, the HTH registration strengthened the health system by enhancing collaboration at both district and community levels, fostering better coordination among healthcare providers and key community structures, including VHTs, political leaders, and opinion leaders.

However, the initiative also had some negative effects. One major challenge was the increased workload for VHTs without appropriate rewards or incentives, which may have impacted their motivation and overall effectiveness. Further, there was a growing fear within the community regarding having a child with ZD. This fear extended even to the VHTs, potentially leading to stigma or reluctance in identifying and addressing cases. While the HTH initiative brought valuable insights and improvements, addressing these challenges is crucial for its sustainability and long-term success.

6.0 Key considerations for implementation of future HTH registration

Below, we highlight key considerations for future implementation of the HTH registration.

During planning

1. Ensure that a proper implementation plan is developed, documented, and shared with all key stakeholders. This will foster a uniform understanding of the intervention, thus aiding the realisation of the desired objectives.

2. In order to ensure acceptability and smooth implementation of the HTH registration, it is important to engage all key stakeholders from the community to the district level, using a bottom-up approach. Key stakeholders include; caregivers, VHTs, local community leaders, health workers, the district health team, and political leaders.

3. Given that HTH is a resource-intensive activity, adequate funds should be secured to facilitate its implementation. To ensure equitable resource allocation, fund allocation should take into consideration contextual issues such as geographic location, terrain, urban/rural areas, etc.

4. House to house registration, requires an efficient data capture system to ensure timely analysis and use of the data. Planning should take into consideration all steps of data processing. Key questions to ask include: i) How is the data to be collected?, ii) What considerations should be made for children with child health cards and children from resistant families?, iii) What will be done to ensure good quality data?, iv) How will the data be analysed?, v) Who will analyse the data?' vi) How will the data be used?

5. Community mobilisation and sensitisation about the registration are important to foster the acceptability of the registration.

6. Key considerations for the selection of VHTs for registration include: i) the ability to read and write, and ii) physical fitness.

During implementation

1. Ensure adequate training and supervision of all key stakeholders, especially the VHTs.
2. Ensure that key stakeholders are adequately financially facilitated to conduct HTH registration.
3. Ensure timely data extraction, analysis, and use to inform action.
4. Ensure continuous community engagement to ensure acceptability.
5. Institute feedback mechanisms for learning and adapting.

7.0 Conclusion

The HTH registration by village health teams identifies zero-dose and under-immunised children in the communities. However, strategies need to be developed to register children without cards and children from resistant homes. To foster timely identification of ZD and UIC, data analysis must be conducted promptly. An inclusive, bottom-up approach to planning is key to ensuring the acceptability and smooth implementation of the HTH registration. The HTH registration was primarily designed and implemented within existing health system structures, which fostered programmatic sustainability. However, given that the HTH registration is hinged on the voluntary model of the VHT engagement and was donor-funded, it's financial sustainability is unclear.

8.0 Recommendations

1. The Ministry of Health/UNEPI and partners should develop, document and share a detailed implementation plan with all stakeholders to ensure a uniform understanding of the intervention and its objectives. This plan should ensure comprehensive training, adequate implementation time for registration and data analysis, and include measures to address and anticipate contextual factors that could impact implementation.

2. The Ministry of Health/UNEPI and partners should engage stakeholders from the community (including caregivers), health facility and district levels through the planning and implementation processes.

3. The Ministry of Health/UNEPI and partners should ensure sufficient financial, human, and logistical resources are available to implement house-to-house registration, with funding allocation tailored to contextual factors like geographic location, terrain, and urban/rural settings.

4. The Ministry of Health/UNEPI and partners should consider adopting an efficient data capture system to enable timely analysis and utilisation of house-to-house registration data. The data capture system should comprehensively address all the steps of data lifecycle, including data collection, quality assurance and analysis.

5. The Ministry of Health/UNEPI and partners should ensure thorough community mobilisation and sensitisation before the exercise to enhance the acceptability of the intervention.

6. To enhance the sustainability of community-based interventions, the Ministry of Health should consider institutionalising Village Health Teams (VHTs) or community health workers by providing them with a regular wage. This financial support would serve as a motivation, enabling them to dedicate their time effectively to engaging caregivers and delivering essential interventions, including immunisation.

Annexes

Table 1: Outcome map of the key activities that were evaluated.

To evaluate the HTH registration, the LH developed an outcome map of the intended activities, outputs and intended outcomes to be evaluated. This was developed in consultation with UNICEF.

Activities	Output	Intermediate Outcomes	Long term outcome
Activity 1: Support districts to update their Health Facility and community EPI+/MNCH micro plans with interventions that address under performance and coverage especially identified high- risk communities.			Reduction in the number of ZDC and UI
1.1 Training of stakeholders at district and lower levels on microplanning	- Number and proportion of health facilities with updated micro-plans. - Type of cadre of stakeholders trained/engaged in microplanning. -	- Identification of catchment areas for health facilities - Identification of areas with inequities - Reflection on previous performance to guide the areas of emphasis for resource allocation. - Guidance on resource mobilization and allocation. - Identification of the total population. - Performance monitoring and action. - Monitoring charts as a means of verification.	
Activity 2: Support VHTs to register children and their immunisation status			

2.1: Training of VHTs on the house-to-house registration under 1-year children, 2.2: implementation of house-to-house registration of under 1-year children	- Number and proportion of VHTs trained on the house-to-house registration. - Number and proportion of the households visited by VHTs for the house-to-house registration.	- Number of under 1-year children identified. - Number of ZD and UI identified. - Updated Village register of children and their Immunisation status.	
Activity 3: Support VHTs to conduct defaulter tracing of zero-dose and under-immunised children			
3.1: Training VHTs on defaulter tracing.	- Number and proportion of VHTs trained on defaulter tracing.	- Improved knowledge and understanding of how to conduct defaulter tracing.	
3.2 Identification of defaulters by VHTs and HWs using data from the house-to-house register.	- List of defaulters per village. - Documentation of activities done to trace defaulters.	- Number of identified ZDC immunised. - Linkage of defaulters to immunisation services	
3.3 Linkage of defaulters to immunisation services.			

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