

UGANDA LEARNING HUB FOR IMMUNISATION EQUITY

Report on a rapid
assessment of the zero-dose
situation in Uganda



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CITATION

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Uganda Learning Hub for
Immunisation Equity Team

Report on a rapid assessment of the zero-dose situation in Uganda

Uganda Learning Hub for
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Abbreviations

CSO	Civil Society Organisations
DHIS2	District Health Information System II
DHT	District Health Team
DPT	Diphtheria Pertussis and Tetanus
EAF	Equity Accelerator Fund
EPI	Expanded Program on Immunisation
HSS3	Health Systems Strengthening
IHME	Institute of Health Metrics and Evaluation
KIIs	Key Informant Interviews
LH	Learning Hub
MoH	Ministry of Health
OPD	Outpatient Department
OPM	Office of the Prime Minister
REC	Reach Every Child
RED	Reach Every District
TBAs	Traditional Birth Attendants
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic Health Survey
UNHCR	United Nations High Commissioner for Refugees
UI	Under-immunized
UIC	Under-Immunized Child
UNICEF	United Nations Children's Fund
WHO	World Health Organisation
ZD	Zero dose
ZDC	Zero-Dose Children

Executive Summary

Introduction:

The Uganda National Expanded Program on Immunisation (UNEPI) has made great strides in improving immunisation coverage over the last 20 years. Despite these efforts, challenges on reaching every child with vaccines remain, as reflected by the observed increase in the numbers of zero dose children (ZDC); defined as children who missed DPT1 vaccine between 2020 and 2023 (from 77,992 ZDC in 2020 to 109,338 ZDC in 2023). To characterize and understand the challenges of reaching the ZDC, under-immunised children (UIC) and missed communities, the Uganda Learning Hub for immunisation equity conducted a rapid assessment between August 2023 and March 2024 in three districts with high burden of ZDC (Wakiso, Mubende, and Kasese) in Uganda.

Methods:

The rapid assessment was conducted through 1) a desk review; 2) secondary data analysis of DHIS2 and data collected as part of house-to-house registration of children by Village Health Teams (VHTs) with support from UNICEF; 3) key informant interviews (KIIs) with VHTs, local leaders and health workers in communities within the three focus districts; 4) in-depth interviews (IDIs) with primary caregivers of the zero dose (ZD)/Under Immunized (UI) children in the selected communities; 5) discussions and meetings with district, health facility and community stakeholders. At the district level, communities to participate in the rapid assessment were selected in consultation with district stakeholders (District Health Teams (DHTs), health workers, VHTs, and were based on RED/REC categorisation of sub-counties and health facilities as well as the availability of equity reference groups (ERGs). The selected communities included: i) urban communities (Kasokoso and Kiganda villages in Namugongo sub-county, Wakiso district); ii) island/fishing community (Gulwe and Kyanjazi villages in Bussi sub-county, Wakiso district); iii) community at the national border (Kamukumbi village in Isango sub-county, Kasese district); iv) mountainous area (Bikunya village in Karambi sub-county, Kasese district) and v) underserved community (Kiranduzi, Lugalama and Bujaala villages in Kiruuma sub-county, Mubende district).

Findings

Table 1: Summary of the key findings from the rapid assessment

Section	Findings
Number of ZD and UI children at national level	<ol style="list-style-type: none">1. There are multiple definitions of ZD and UI children being used by UNEPI and the different partners in Uganda.2. Overall, ZD and UI children in 2023 were estimated at 109,338 and 195,684 in Uganda respectively.3. Analysis of DHIS2 data shows that the number of ZDC has increased by 40% between 2020 and 2023 (from 77,992 in 2020 to 109,338 in 2023).4. The burden of UIC has however decreased by 27% in the same period (from 267,859 to 195,684).5. Mubende, Wakiso, and Kasese districts had the highest number of ZDC in 2022 ranking 1st 2nd and 3rd respectively across all districts in Uganda.
Number and proportion of ZD and UI children in the learning hub districts	<p>From analysis of DHIS2 data:</p> <ol style="list-style-type: none">1. The number of ZDC in 2023 were estimated at 3,600 in Mubende district, 25,000 in Wakiso district and 900 in Kasese district.2. Between 2020 and 2023, ZDC increased by 4% in Wakiso and by 27% in Kasese districts and decreased by 41% in Mubende.3. Wakiso and Mubende districts had an increase in UIC between 2020 to 2022 and decreased in 2023. Kasese district had an increase in the number of UIC from 2021 and 2023.4. There were significant variations in the methodology used to estimate ZD and UI children (definitions and denominators) across the districts and the different data sources.5. A trends analysis of the number of ZD and UI children at the subcounty level from 2020 to 2023 shows that there was a general increase in ZD and UI in Bussi, Namugongo and Isango while Karambi and Kiruuma showed a sharp decrease in ZD and UI in 2023. Reasons for the observed trends are not clear and require further exploration. <p>House-to-house registration data in Wakiso district:</p> <ol style="list-style-type: none">1. Analysis of the data from this registration show that 19.5% (588/3013) of the registered children aged 6-52 weeks were zero dose.

Section	Findings
Location of zero-dose and under-immunised children in learning hub districts.	<ol style="list-style-type: none"> DHIS2 data shows that the sub-counties that have persistently had high ZDC numbers in the target districts are; Kasambya, Kiruuma and Southern division in Mubende district; Namugongo division, Wakiso and Kyengera Town Council in Wakiso district; and Bwera, Isango and Lake Katwe in Kasese district. The house-to-house registration in Wakiso district shows that in November and December 2023; i) the sub-counties with the highest numbers of ZDC were Bweyogerere division, Nabweru division and Kyengera Town Council. Only the finding of Kyengera Town Council in the house-to-house survey is in agreement with findings from the DHIS2. Some households that had ZDC also had other children that were ZD/UI suggesting clustering of ZDC or UIC.
Barriers to immunisation	<p>Findings from caregivers with zero-dose children</p> <ol style="list-style-type: none"> Limited physical access to immunisation services (long distances to health facilities, few/irregular outreaches), ii) Inadequate client-centred services (long waiting time at health facilities, poor health workers' attitude and costs incurred to access immunisation services (transportation, payment for cards, bribery) Fear of adverse events following immunisation Limited spousal support for immunisation (financial and emotional) Several myths and misconceptions about immunisation (religious beliefs, mistrust in vaccines & cultural beliefs) Home births (use of traditional birth attendants) Caregivers' competing priorities (household chores, gardening, community events, and jobs). <p>Findings from local leaders (VHTs, health workers, local leaders)</p> <ol style="list-style-type: none"> Despite the government ban on Traditional Birth Attendants (TBAs), they still offer delivery services in some communities. TBAs often don't refer the mothers to immunisation services for fear of being reprimanded. The immunisation program relies on DHIS2, which does not capture data at the community level. This limits the health workers' capacity to track an individual's vaccination status and follow up defaulters. The existing paper-based data capture HMIS has the following limitations: limited quality (timeliness, completeness, accuracy), inadequate staffing to process the data, and less digitalised. The electronic Health Information System (eCHIS) captures information at the community level; however, its feasibility and sustainability are unclear.

Learnings

Table 2: Learnings from the rapid assessment

IRMA framework components	Learnings
Identify	<div><div>1. There are different definitions of ZDC among UNEPI partners at national and subnational levels, which leads to conflicting data on ZDC.</div><div>2. VHTs are key players in the identification of ZD and UI children at community level.</div><div>3. House-to-house registration by VHTs identifies ZDC in the communities. However, it is unclear whether all children identified during the registration exercise are reached with immunisation.</div><div>4. Identifying ZDC, UIC, and missed communities requires a data capture system that collects data at the community level and facilitates real-time data use at all levels.</div><div>5. The zero-dose burden is a moving target that requires routine assessments to align interventions as the situation changes. The health system must be adaptable to changing situations to reach ZDC.</div><div>6. Some households that had ZDC also had other children that were zero dose and/or under-immunised, suggesting clustering of ZD or UI children.</div></div>
Reach	<div><div>1. Some barriers to uptake of immunisation services differ by context and therefore require tailored approaches to address them.</div><div>2. Caregivers have limited awareness about other vaccine-preventable diseases beyond the commonly known ones, such as measles and polio.</div><div>3. Despite the government ban on TBAs, they still offer delivery services in some communities. Children delivered by TBAs are often not referred for immunisation services which increases their likelihood of being ZD.</div><div>4. There are emerging high-risk communities that are not documented by UNEPI. These include communities at national and district borders, mining areas, underserved areas, and those that have immigrants.</div></div>

IRMA framework components

Learnings

Monitor and Measure

1. Reliance on government administrative data (UBOS and DHIS2) is not adequate to identify and monitor ZDC, because it focuses on individuals who access services through health facilities, missing out on those who remain in communities. ZDC can better be identified through the triangulation of both qualitative and quantitative data at the community level.
2. Unreliable denominators used at district and national levels lead to overestimation or underestimation of the zero-dose burden in Uganda.
3. There is no standard way of estimating target populations at the district and catchment populations at the health facility level.
4. The district-level data may be unreliable because they are estimated based on the district's catchment areas of health facilities. However, the catchment areas overlap and may lead to multiple counts of the same population.

Recommendations

Near term:

1. UNEPI should harmonise the definition of zero-dose children at national and subnational levels to allow uniform understanding and reporting. The definition of ZDC varies across stakeholders in Uganda, and this lack of standardisation may lead to conflicting data on ZDC.
2. The Ministry of Health should extend delivery services to communities to reduce deliveries at home/by TBAs.
3. UNEPI should support existing structures (health workers, VHTs, and local, cultural, and religious institutions) to enhance and promote sensitisation at the community level to address vaccine hesitancy and its underlying causes (fear of AEFIs, myths and misconceptions, rumors).
4. UNEPI should enhance communications to address gender-related barriers to immunisation uptake.
5. UNEPI should consider implementing EAF interventions in high-risk communities that are currently not documented. These include communities at national and district borders, mining areas, underserved areas, and those that have immigrants.
6. address vaccine hesitancy and its underlying causes (fear of AEFIs, myths and misconceptions, rumours).
7. UNEPI should enhance communications to address gender-related barriers to immunisation uptake.
8. UNEPI should consider implementing EAF interventions in high-risk communities that are currently not documented. These include communities at national & district borders, mining areas, underserved areas and those that have immigrants.

Medium term:

1. UNEPI could consider leveraging the efforts of existing child registration bodies to identify and track ZDC, UIC, and missed communities. These bodies include NIRA and ongoing partner support programmes such as the Integrated Community Case Management programme, antenatal clinics, and school-based programmes
2. There is a need to evaluate the effectiveness and sustainability of the existing interventions to identify and reach ZD and UI children, including house-to-house registration.
3. UNEPI should consider the provision of static sites in underserved areas and upgrade existing health facilities to higher service-delivery levels.
4. There is a need to explore the underlying causes of poor health worker attitudes

1.0 INTRODUCTION



1.0 Introduction

Over the last 20 years, the Uganda National Expanded Program on Immunisation (UNEPI) has made great strides in improving immunisation coverage through the expanded immunisation service delivery nationally, resulting in significant improvements in coverage. With support from Gavi, the Vaccine Alliance, the vaccination package in the country has increased over the last decade from six to fourteen vaccines (Annex 1). Despite the efforts to increase vaccination coverage in Uganda, many children are missing out on these lifesaving vaccinations. According to the annual health sector report 2022/2023 (1), coverage for the first dose of the Diphtheria, Pertussis and Tetanus-containing vaccine (DPT1) coverage declined by 4% from 91% in 2021/2022 to 87% in 2022/2023 (1)(1), far below the national target of 96%. In 2021, estimates from the District Health Information System 2 (DHIS2) data indicated that nearly 90,000 children had not received any routine vaccine in 2021 (DHIS2). Moreover, there are major variations in immunisation uptake between districts in rural and urban areas.

While some evidence exists regarding country-specific challenges to attaining adequate immunisation coverage, there is an urgent need for further investigation into who, where, why, and how many Zero Dose Children (ZD), Under-Immunised (UI) children, and missed communities exist to inform the design and implementation of context-specific interventions. According to the immunisation equity assessment conducted by UNICEF in 2017, missed communities (urban poor settlements, migrant communities, ethnic minority communities, some religious sects, upcoming town settlements, fishing communities, refugee communities, mountainous area communities, and remote, rural, hard-to-reach island communities) were characterised as high-risk or underserved (2). Missed communities often have higher numbers of ZD and UI children, are potential epicentres of disease outbreaks and are often faced with multiple deprivations and vulnerabilities, including lack of services, socio-economic inequities, and gender-related barriers. Consequently, reaching these children

means reaching the communities in which they reside. Furthermore, limited access to immunisation services and disruptions in health care delivery associated with the COVID-19 pandemic and associated interventions, including the lockdowns, worsened the process of reaching these children. Understanding where these children reside, why they are missing immunisation and crafting context-specific solutions to address the gaps in the system are essential steps to making sure that immunisation services reach these children.

Identifying and reaching ZD, UI children, and missed communities remains one of the most complex challenges in the pursuit of global immunization equity. Reaching ZDC with life-saving vaccines requires clear and accurate data about who they are and where they live. To help countries accelerate efforts to reach zero-dose children and missed communities, in December 2020, the Gavi Board approved the Equity Accelerator Funding (EAF) of US\$500 million for the 2021-2025 strategic period. This funding is available to countries that identify and develop tailored strategies to reach additional zero-dose children and missed communities. Uganda applied for the EAF funding in 2023 in which 52 districts and 7 cities were identified and prioritised to receive interventions to reduce the number of ZD and UI children.

Gavi instituted the Zero Dose Learning Hub as a key initiative to reduce the numbers of ZD and UI children by strengthening its learning agenda. The Zero-Dose Learning Hub initiative aims to take a learning-based approach to the identification of ZDC, UIC, and underserved populations and reach those who are missing out. The Zero-Dose Learning Hub operates country learning hubs in Bangladesh, Mali, Nigeria, and Uganda. As part of the implementation of the Learning Hub (LH), the Uganda Country Learning Hub conducted a rapid assessment from August 2023 to March 2024. Evidence generated from the rapid assessment will inform the rollout of the planned interventions (Annex 2) under the EAF platform.

2.0 Objectives of the Rapid Assessment

General objective: To understand who the ZDC, UIC, and missed communities are and the barriers to reaching them.

Specific objectives

1. To estimate the number of ZDC and UIC in Uganda.
2. To identify the geographic location of ZDC, UIC and missed communities in the LH study districts.
3. To understand the main barriers to immunisation uptake in selected communities with ZDC, UIC and missed communities in the LH study districts.



3.1 Definitions of zero dose, under-immunised children and missed communities.

The definition/calculation of the ZD burden is highly variable between UNEPI, districts, and partners. Table 3 shows the definitions of ZD, UI, and missed communities that we encountered at the different data capture points used in the rapid assessments.

Table 3: Definitions of zero dose and under-immunised children and missed communities.

Definition	Description
Zero-dose children	<p>UNEPI definition: ZDC are those children who have not received their first dose of DPT-containing vaccine. In this regard, UNEPI estimates ZDC as the difference between the under 1-year-old target population (surviving infants equivalent to 4.3% of the total population to be immunised every year) and the number of children immunised with DPT1 vaccine.</p> <p>LH survey definition: Children aged 12 to 23 months who have not received DPT1.</p> <p>UNICEF consultant definition: ZDC refers to children who have not received any vaccinations.</p>
Under-immunised children	<p>UNEPI definition: UIC are those children who have not received the third dose of DPT. This is calculated as the difference between the children immunised with the first dose of DPT (DPT1) and third dose of DPT (DPT3).</p> <p>LH survey definition: Children aged 12 to 23 months who have not received DPT3.</p> <p>UNICEF consultant definition: Under-vaccinated children refers to children who have received some, but not all, of their recommended schedule of vaccinations</p>
Missed communities	<p>Gavi definition: Missed communities are homes to clusters of ZDC and UIC. These communities often face multiple deprivations and vulnerabilities, including a lack of services, socio-economic inequities, and gender-related barriers.</p>

Abbreviations: DPT, diphtheria, pertussis, and tetanus; LH, Learning Hub; UIC, under-immunised children; UNEPI, Uganda National Expanded Programme on Immunisation; ZDC, zero-dose children.

In consultation with UNEPI and partners, the LH selected three districts to conduct the rapid assessment and implementation research (Table 4). These include Kasese, Mubende, and Wakiso districts. These districts were selected because 1) they have low DPT1 coverage, 2) they are targeted for interventions to address the zero-dose challenge under Gavi's EAF, 3) they have high numbers of ZDC based on DHIS2 and the Institute of Health Metrics and Evaluation data, and 4) they have communities that are considered to have immunisation inequities.

A map of Uganda with its district boundaries outlined in black. Three districts are highlighted in green: Kasese in the west, Mubende in the central-west, and Wakiso in the central-east. The Lake of Kyoga is visible in the north-central region, and Lake George is in the south. The names of the highlighted districts are printed in white capital letters within their respective green areas.

Table 4: Selected districts for the Learning Hub

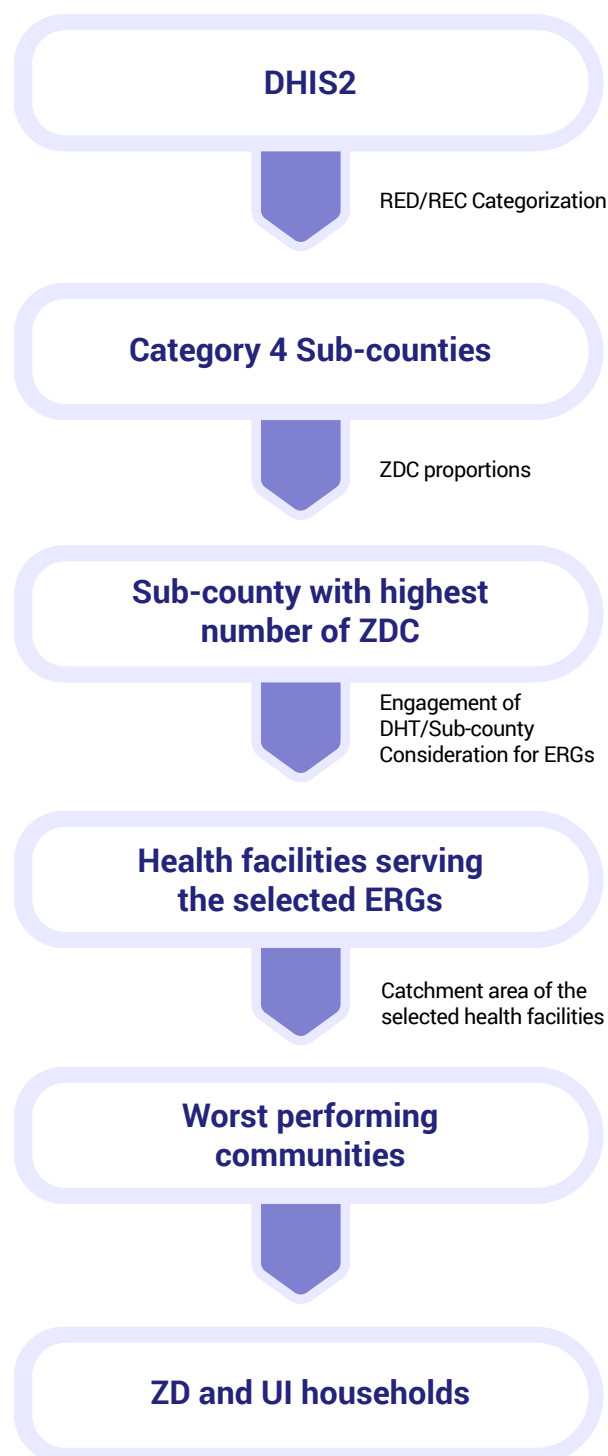
District	Criteria	District Description
Kasese	<p>Persistently had high numbers of polio and measles ZDC during the most recent campaigns</p> <p>High number of ZDC (Ranked 3rd in 2022)</p> <p>Presence of fishing communities, mountainous areas and pastoral/nomadic communities</p> <p>Part of the prioritized EAF districts for implementation of ZD activities</p>	<p>The two selected villages are hilly, mono-cultural and located at the border of Uganda and the Democratic Republic of Congo. Residents engage in cross-border trade as the main economic activity, while some are crop-based farmers. Each community is served by one HC II serving both Ugandans and Congolese. Both static and outreach immunisation services are offered monthly at each health facility.</p>
Mubende	<p>Persistently had high numbers of polio ZDC during the most recent campaigns</p> <p>High number of ZDC (Ranked 1st in 2022)</p> <p>Presence of a mix of ethnic groups</p> <p>Part of the prioritized EAF districts for implementation of ZD activities</p>	<p>The three selected villages in Mubende are hilly, multi-cultural, and bordering other districts. Residents are predominantly crop-based farmers, and some engage in mining as an economic activity. The area is generally underserved, with one government health facility (HCII) serving over 20 villages, located between 10-15 km away and offering only one static immunisation session and one outreach in a month. There is occasional flooding during the rainy season, which limits access to several services, including education and health care. Many of the residents seek health care services from neighbouring districts.</p>
Wakiso	<p>Persistently had high numbers of polio and measles ZDC during the most recent campaigns</p> <p>High number of ZDC (Ranked 2nd in 2022)</p> <p>Presence of urban communities</p> <p>Presence of fishing communities</p> <p>Part of the prioritized EAF districts for implementation of ZD activities</p>	<p>Island community: The selected villages are located on Bussi Island in Lake Victoria. There is occasional flooding during the rainy season, which limits access to several services, including education and health care. The main economic activity is fishing. The multi-cultural community is generally underserved, with one health facility serving the main island. Residents seek healthcare services from Bussi HC III which is about 5-8 kilometres away and offers only one static immunisation session and one outreach monthly.</p> <p>Urban community: The selected villages are predominantly multi-cultural and located in a slum with a few gated residences. Most residents are engaged in informal trade. One government health facility (Kireka HC II) and several private clinics and drug shops serve the population in the area.</p>

Abbreviations: EAF, Equity Accelerator Fund; ZDC, zero-dose children.

3.2 Selection of communities for the rapid assessment

To select the study communities within the three districts, we conducted a secondary analysis of DHIS2 data collected between July 2022 and June 2023. This analysis was conducted in close consultation with the participating district Biostatisticians. First, we identified the worst-performing sub-counties based on the reach every district/ reach every child (RED/ REC) categorisation (access and utilisation of vaccines)¹ and ranked them into categories 1-4. Second, the sub-counties in category four were further ranked based on the proportions of the ZDC. Sub-counties with the highest proportions were selected for the rapid assessment. Third, consultations were made with the District Health Team (DHT), Village Health Teams (VHTs) and local leaders to: i) validate the secondary data analysis findings; ii) identify existing high-risk communities and reasons for poor performance; iii) identify health facilities serving the identified high-risk communities including their catchment areas. Fourth, visits to the identified communities were made with the guidance of the VHTs. During these visits to the communities, caregivers with ZD/UI children and health facilities serving these communities were identified. We used the snowballing method to identify additional caregivers of ZDC/UI children, as illustrated in Figure 2. The study sites selected for the rapid assessment are described in Table 5.

Figure 2: Selection of communities for the rapid assessment



Abbreviations: DHIS2, District Health Information System 2; DHT, diphtheria, pertussis, and tetanus; ERG, equity reference group; RED/REC, reach every district/reach every child; VHT, village health team; ZDC, zero-dose children.

¹ Districts ranked 1 have good immunisation performance in terms of access and utilisation of vaccines while districts in the fourth category are performing poorly.

Table 5: Health facilities and communities selected for the rapid assessment

District	High-risk community	Sub-county	Parish	Village	Facility
Wakiso	Urban setting	Namugongo	Kireka	Kasokoso and Kiganda	Kireka HC II
	Island and Fishing	Bussi	Gulwe	Gulwe and Kyanjazi	Bussi HC III
Kasese	National Border	Isango	Kamukumbi	Kamukumbi	Kamukumbi HC II
	Hilly	Karambi	Bikunya	Bikunya	Bikunya HC II
Mubende	Hilly, Mining, district border	Kiruuma	Kiruluma	Kiranduzi and Lugalama	Kituule HC II
	Hilly, Mining, Religious sects		Kirwanyi	Bujaala	

Abbreviation: HC, Health Centre.

3.3 Study design and methods

The rapid assessment was conducted through: 1) a desk review; 2) secondary data analysis of DHIS2 and data collected as part of house to house registration of children by Village Health Teams (VHTs) with support from UNICEF (Wakiso district only); 3) key informant interviews (KIIs) with VHTs, local leaders and health workers in communities within the three focus districts; 4) in-depth interviews (IDIs) with primary caregivers of the ZD/UI children in the selected communities; 5) discussions and meetings with district, health facility and community stakeholders; and 6) a cross-sectional household survey in three communities in Mubende district.

At the district level, communities to participate in the rapid assessment were selected in consultation with district stakeholders (District Health Teams (DHTs), health workers, VHTs, and were based on RED/REC categorisation of sub-counties and health facilities as well as the availability of equity reference groups (ERGs). The selected communities included: i) urban communities (Kasokoso and Kiganda villages in Namugongo sub-county, Wakiso district); ii) island/fishing community (Gulwe and Kyanjazi villages in Bussi sub-county, Wakiso district); iii) community at the national border (Kamukumbi village in Isango sub-county, Kasese district); iv) mountainous area (Bikunya village in Karambi sub-county, Kasese district) and v) underserved community (Kiranduzi, Lugalama and Bujaala villages in Kiruuma sub-county, Mubende district) (Table 6).

Table 6: Methods for rapid assessment

Method	Purpose	Data source
Document review	To gain insight on 1) the location of ZDC, UI communities and missed communities; 2) the number/ proportion of ZDC and UI children; and 3) known barriers to effective immunisation.	EPI planning documents, national strategies/frameworks, reports from previous EPI coverage surveys, performance assessments (e.g., facility assessments and annual progress reports), Demographic and Health Surveys reports, UNICEF consultant reports and research reports
Secondary data analysis	To gain insight on 1) the location of ZDC, UI communities and missed communities; and 2) the number/ proportion of ZDC and UIC	DHIS2 and house-to-house registration data from VHTs under UNICEF support
IDIs (37)	To explore perceptions, vulnerabilities and challenges related to non- and under-vaccination.	Caregivers of ZDC and UIC aged 4.5 to 23 months
KIIs (24)	To gain deeper insight on the main challenges of immunisation uptake in the communities.	VHTs (9), health workers (9), and local community leaders (6)
Stakeholder engagement	To understand the challenges of immunisation uptake.	Immunisation stakeholders at district, health facility and community levels.
Targeted community survey	To deeply understand and characterize the ZDC, UI children and missed communities in selected sub-counties of Mubende district, and understand the barriers and challenges of reaching them.	Household interviews

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.

3.4 Data collection

3.4.1 Qualitative data collection

A total of 61 interviews were conducted with VHTs, local community leaders, health workers and primary caregivers of ZD and UI children aged 18 weeks to 23 months as shown in table 7.

Table 7: Interviews conducted under the rapid assessment

Respondents	Mubende	Kasese	Wakiso
VHTs	3	4	2
Caregivers	12	11	14
Local Council (LC 1)	2	2	2
Health workers	1	5	3

Figure 3: Photographs of research associates with participants



Interviewer seeking consent



Participant being interviewed

3.4.2 Data collection and analysis of Secondary Data, Key Informant Interviews (KIIs) and In-Depth Interviews (IDIs)

Quantitative Data Collection and Analysis - We analysed DHIS2 to identify districts with the highest numbers and proportions of ZD and UI children. In the three LH focus districts, we analysed trends in the numbers and proportions of ZD and UI children by sub-county and by health facility to identify poor-performing sub-counties and health facilities contributing the highest number of ZDC.

We also analysed UNICEF data from house-to-house registration of children by VHTs in Wakiso and Kamuli districts. We cleaned these data and exported them to STATA version 14 for analysis. We generated descriptive statistics (frequencies, percentages, means) to characterise the study population and mapped out where the ZDC were in Wakiso districts. The analysis was disaggregated by district, sub-county, and village.

Qualitative Data Collection and Analysis - KII and IDI respondents were purposively selected from the study communities (Table 5). The interviews were administered using a topic guide, facilitating the probing for further details on topics relevant to the research questions to gain narratives from

participants. With consent from the participants, all interviews were recorded using a digital voice recorder, and notes were taken by the interviewer. Summaries of the interviews were written after each interview and discussed within the research team, to identify any new areas emerging for exploration in subsequent interviews. Interview audio recordings were transcribed manually.

Transcripts from KIIs and IDIs were analysed using a coding scheme developed from pre-defined topics and themes emerging from the data. The interview transcripts were reviewed, and all statements pertinent to the sub-themes identified were extracted and placed under the identified themes. Coding of all the statements from the data collected was completed using qualitative data analysis software NVivo 14 (QSR International in Burlington, MA).

The lead social scientist conducted the initial coding independently and then discussed it with two study team members recruited to do the coding. A final coding scheme was agreed on and applied to all transcripts. Alongside this coding, a reflective, analytical diary was kept to draw out and justify emerging themes and lines of inquiry through the fieldwork process. Interview findings were presented as paragraphs of descriptive narratives supported by participant quotes where necessary to convey key messages.

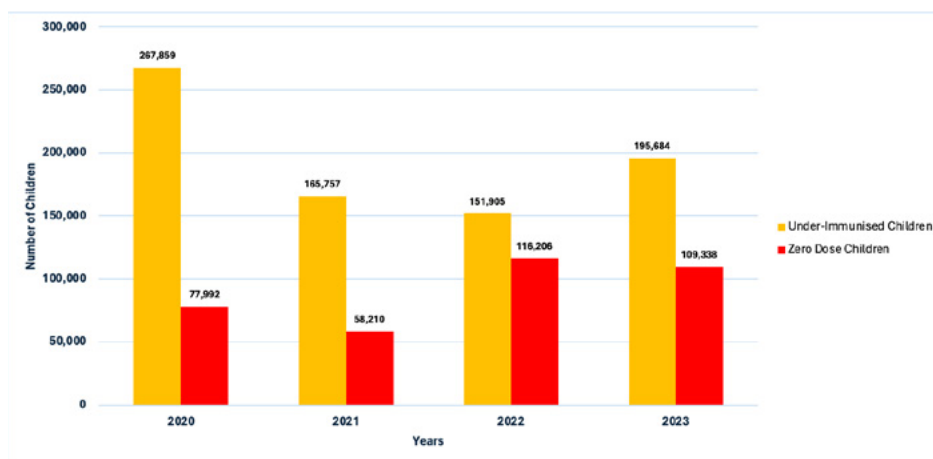
4.0 RESULTS



4.1 Number and proportion of zero-dose and under-immunised children at the national level

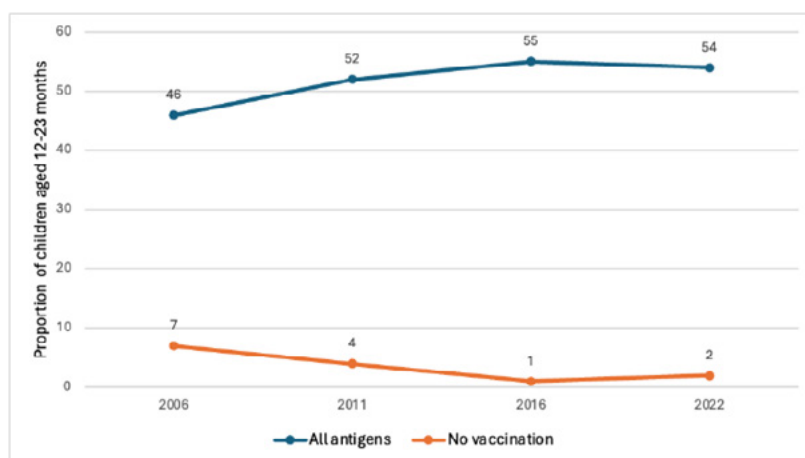
Figure 6 shows the trends in the number of ZD and UI children from 2020 to 2023. According to the District Health Information System (DHIS2) data, the number of ZDC has increased by 40%, from 77,992 in 2020 to 109,338 in 2023. In contrast, the burden of UIC has decreased by 27%, from 267,859 in 2020 to 195,684 in 2023. The Uganda Demographic and Health Survey includes trends from 2006 to 2022 reporting the proportion of children aged 12-23 months who have received all basic antigens and children of the same age who have received no vaccinations (including birth doses). The proportion of children who had not received any vaccinations was estimated at 2% in 2022 (Figure 7).

Figure 4: Number of zero-dose and under-immunised children 2020 to 2023



Source: DHIS2

Figure 5: Trends of immunisation coverage among children aged 12-23 months



Source: Uganda Demographic and Health Survey

4.2 Number and proportion of zero-dose children in the learning hub districts.

Finding: Number and proportion of ZD in LH districts

DHIS2 data

- Based on the UNEPI ZD definition (see table 3);
- The number of ZDC in 2023 were estimated at 3,600 in Mubende, 25,000 in Wakiso, and 900 in Kasese.
- Between 2020 and 2023, ZDC increased by 4% in Wakiso and by 27% in Kasese districts and decreased by 41% in Mubende.
- Wakiso and Mubende districts had an increase in UIC between 2020 to 2022 and decreased in 2023. Kasese district had an increase in the number of UIC from 2021 and 2023.

4.2.1 Number and proportion of ZDC in Wakiso, Kasese, and Mubende districts using DHIS2 data

Using DHIS2 data, we analysed for trends in the numbers of ZDC and UIC in the LH focus districts (Figure 10). Wakiso recorded the highest number of ZDC and UIC, followed by Mubende and Kasese. ZDC in Wakiso increased by 4% since 2020 and in Kasese by 27% since 2021. Conversely, the number of ZDC decreased by 41% in Mubende from 2020 to 2023.

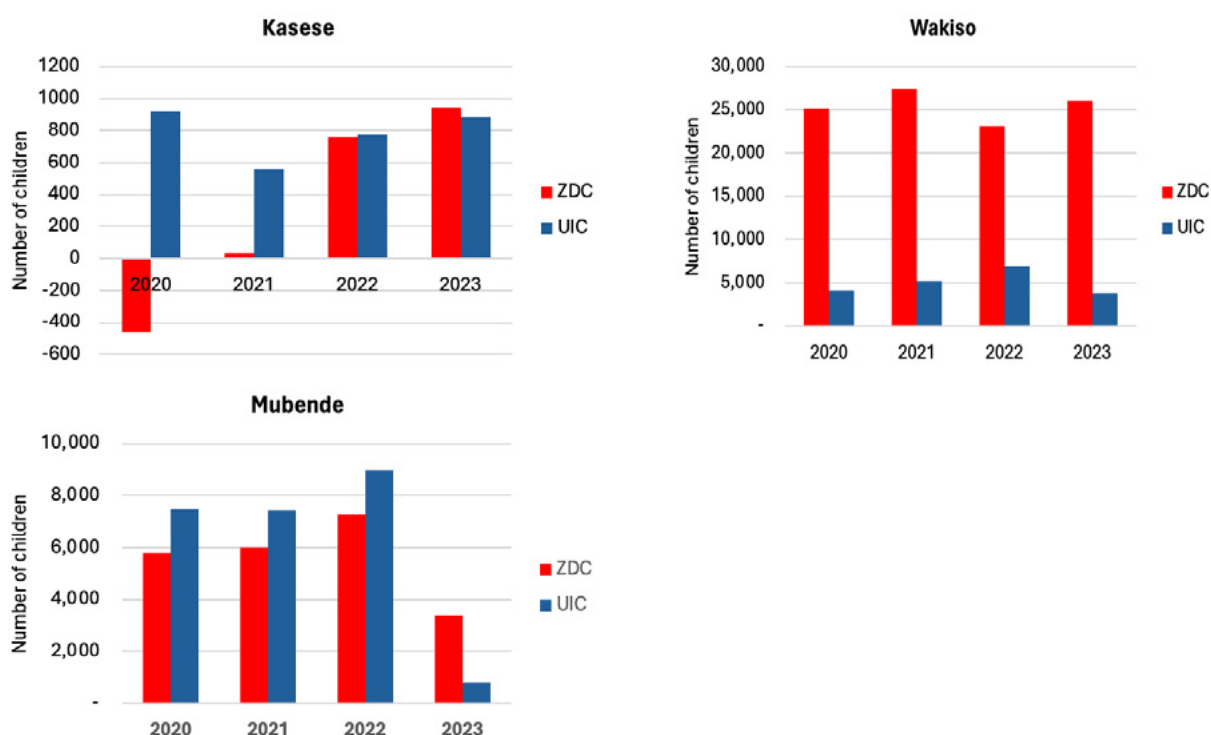
The number of UIC in all LH focus districts decreased in 2023. The number of UIC in Mubende district decreased by 89%, from 7,462 in 2020 to 785 in 2023. Wakiso and Kasese districts had 4% and 7% reductions, respectively, from 2020 to 2023.

The significant variations in the zero-dose and under-immunised estimates can be attributed to the differences in the estimation methods used for denominators across the districts. Uganda uses the Uganda Bureau of Statistics (UBOS) population figures to estimate the number of ZDC and UIC. UBOS carries out a census every ten years; the last census was conducted in August 2014, and the next one is planned for 2024. Interim to the next census, UBOS provides

national, district, sub-county, and parish-level population projections, which the programme and district local governments use to plan for service delivery, including immunisation services. Following different programme assessments and immunisation evaluations, the programme realised data inconsistencies, such as reaching more children beyond the target (DHIS2, 2021), thus affecting several programmatic areas, including planning, service delivery, and reporting. Specifically, these data inconsistencies have resulted in reporting more immunised children than some districts' estimated target (denominator).

Estimation of the target population is not standardised across the LH target districts. Wakiso and Kasese districts use UBOS population figures to estimate target populations and adjust them based on population estimates from local council leaders and VHTs. Mubende district triangulates the UBOS estimates with vaccine consumption at the health facility level, applying the probability-proportionate-to-size approach to estimate the catchment population irrespective of the level of government grading. As a result, there are discrepancies between district and national estimates.

Figure 6: Numbers of zero-dose and under-immunised children in Learning Hub focus districts.



Source: District DHIS2

Abbreviations: UIC, under-immunised children; ZDC, zero-dose children.

4.2.2 Number and proportion of zero-dose and under-immunised children identified through house-to-house registration by VHTs in Wakiso district.

One of the objectives of the LH is to evaluate the effectiveness and the extent of implementation of interventions designed to reduce ZDC. Since 2021, UNICEF has been providing zero-dose support to four districts: Kampala, Kamuli, Mukono, and Wakiso. These districts were chosen by UNICEF based on 1) their large numbers of UIC (74,732 children in 2020), 2) continuous measles outbreaks, and 3) representation of urban, peri-urban, and rural settings. These four districts were also estimated to have 71% of the national burden of ZDC. The main purpose of UNICEF's zero-dose support to Uganda is to strengthen the Expanded Programme on Immunisation's (EPI's)

capacity to identify ZDC and support targeted demand and awareness creation.

The LH focused on evaluating one objective: to 'strengthen micro-planning as a follow-up system to identify and immunise [ZDC and UIC] in urban/high-density population areas'. The key activities being evaluated under this objective include 1) house-to-house registration of children aged below 5 years by VHTs, 2) defaulter tracing of ZDC and UIC, and 3) the support offered to districts to update their health facility and community micro-plans with interventions that address underperformance and coverage in high-risk communities.

VHTs conducted house-to-house registration in October and November 2023. Table 8 includes the definitions of ZDC and UIC used during this exercise.

Table 8: Definitions of zero dose and under-immunised children used during the house-to-house registration of children aged below 5 years under UNICEF support

Definition	Description
Zero-dose children	*Community definition: Children aged below 5 years who have not received any antigen.
	*Health worker definition: Children aged 6 to 52 weeks who have not received DPT1.
Under-immunised children	*Children aged 14 to 52 weeks who have not received DPT3.

*Definitions adopted from UNICEF consultants

The analysed UNICEF dataset contained information from 52% (14/27) of the sub-counties in the Wakiso district. Using the health worker definition, 19.5% (588/3013) of the registered children were zero dose.

4.3 Location of zero-dose and under-immunised children in learning hub districts.

Finding

DHIS2 data shows that the sub-counties that have had persistently high ZDC numbers in the target districts are; Kasambya, Kiruuma and Southern division in Mubende district; Namugongo division, Wakiso and Kyengera Town Council in Wakiso district; and Bwera, Isango and Lake Katwe in Kasese district.

The house-to-house registration in Wakiso district shows that in November and December 2023; the sub-counties with the highest numbers of ZDC were Bweyogerere division, Nabweru division and Kyengera Town Council.

Only the finding of Kyengera Town Council in the house-to-house survey agrees with findings from the DHIS2. Some households with ZDC also had other children that were ZDC/UI, suggesting clustering of ZDC or UIC.

To identify the sub-counties with the highest number of ZDC, we analysed DHIS2 data at sub-county level in the LH focus districts. Below we present findings from the top five sub-counties with high absolute numbers of ZDC in each district, for 2020 to 2023. Figures 16, 17, and 18 show the trends in the number of ZDC at sub-county level in Mubende, Wakiso, and Kasese districts.

Mubende district

Out of the 146 districts in Uganda, Mubende ranked first with the highest number of ZDC according to the 2022 DHIS2 and IHME data. Looking at the trends over time, the overall number of ZDC were estimated at 5786 in 2020. An increase in the estimated number of ZDC was observed in 2021, with the total number of ZDC estimated at 5997, and in 2022, with the total number of ZDC estimated at 7258). There was variation in the number of estimated ZDC by sub-county. Irrespective of the year, Kasambya consistently contributed the highest number of ZDC, accounting for 15% of the children in 2020, 12% in 2021, 13% in 2022 and 27% in 2023. Kasambya was closely followed by Southern Division and Kirumira sub-counties all showing similar trends over the year. Figures 16 and 17 show the trends in the number of ZDC at a sub-county level in Mubende district.

Figure 7: Trends in the number of ZDC at sub-county level in Mubende District



Source: DHIS2

Wakiso district

Figure 17 shows the trends in the number of ZDC at the sub-county level in Wakiso district. The sub-counties that have had persistently high ZDC numbers are Namugongo Division, Wakiso, and Kyengera Town Council.

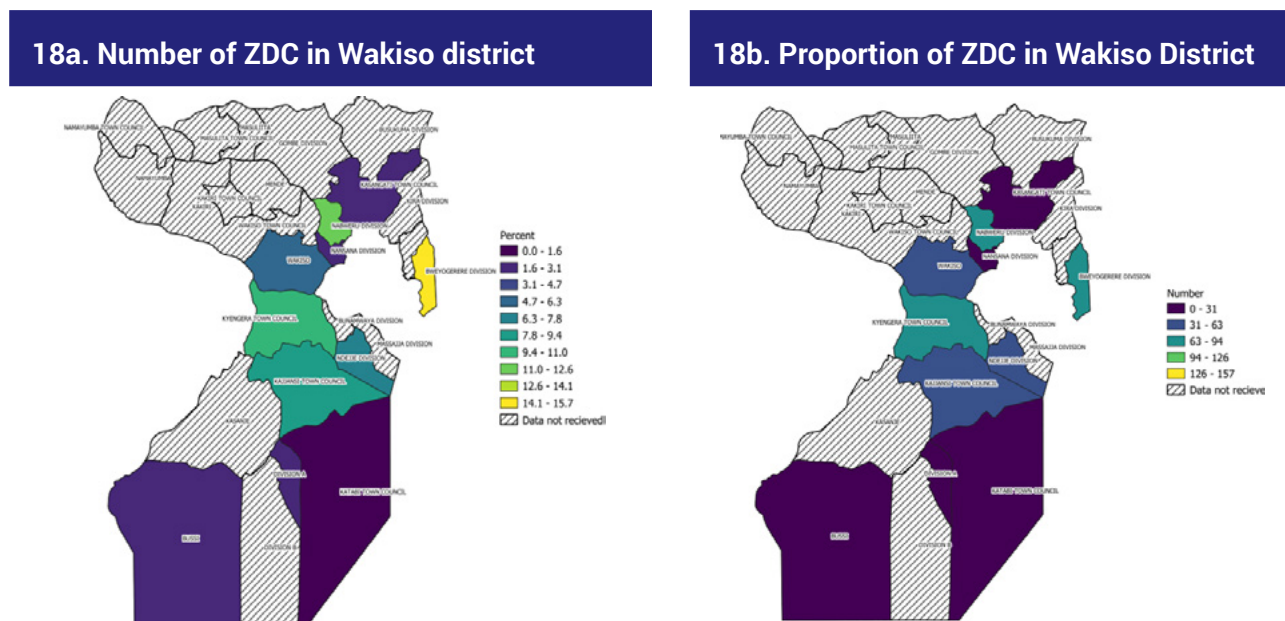
Figure 8: Trends in the number of ZDC at sub-county level in Wakiso District



Abbreviation: ZDC, zero-dose children.
Source: DHIS2

In addition, analysis of data from the house-to-house registration of children aged below 5 years by VHTs in Wakiso district shows that Kyengera Town Council, Nabweru, and Bweyogerere sub-counties (urban settlements) in Wakiso district had the highest numbers of ZDC (Figure 18).

Figure 9: Numbers/proportions of zero-dose children among children aged 6 to 52 weeks registered by VHTs in Wakiso district (October and November 2023)

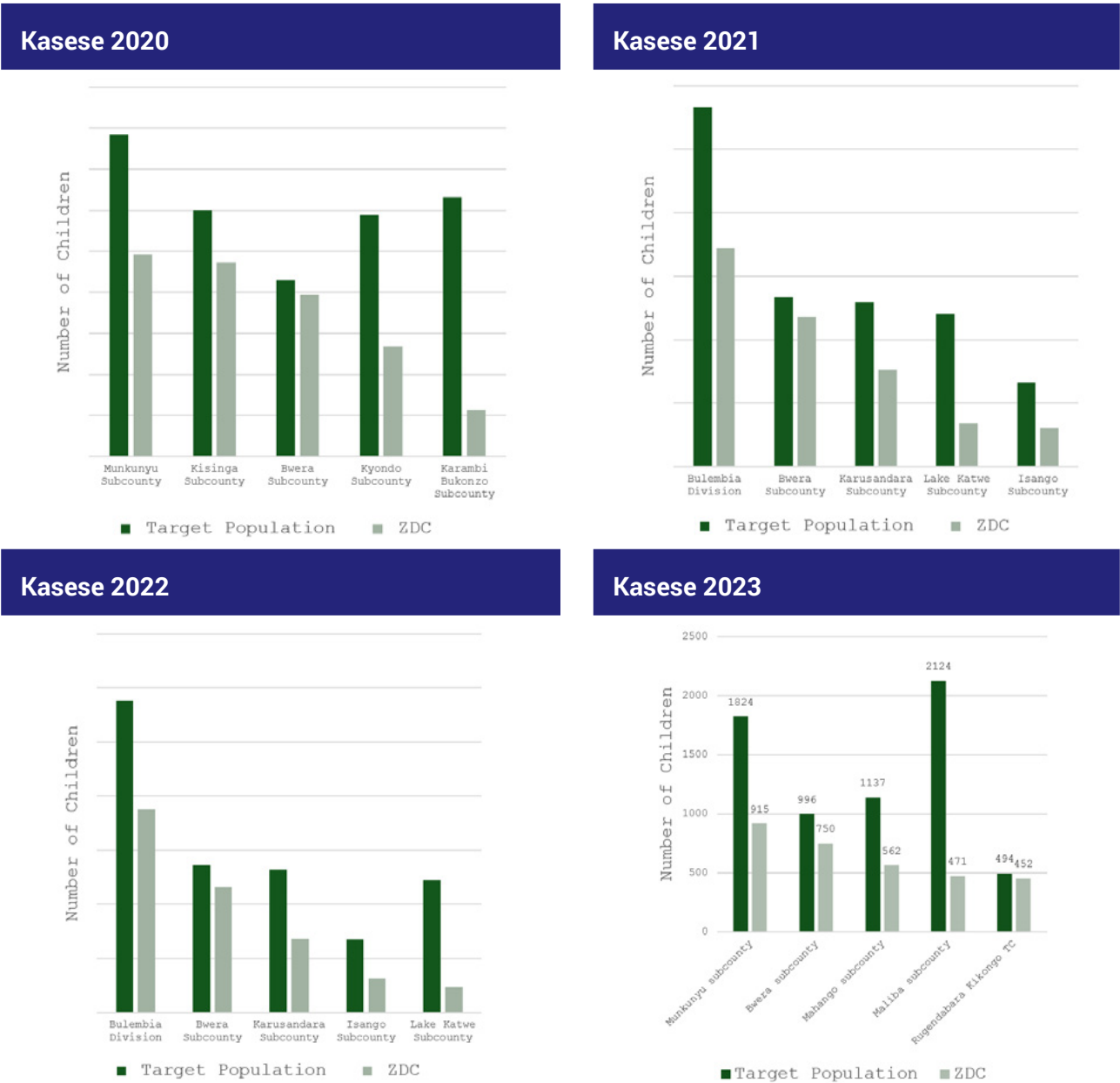


Abbreviation: ZDC, zero-dose children.
Source: UNICEF House-to-House registration data

Kasese district

Figure 19 shows the trends in the number of ZDC at sub-county level in Kasese district. The sub-counties that have had persistently high ZDC numbers were Bwera, Isango and Lake Katwe.

Figure 10: Trends in the number of ZDC at sub-county level in Kasese District.



Abbreviation: ZDC, zero-dose children.
Source: DHIS2

4.4 Barriers to reaching ZDC and UIC.

Finding

Across high-risk communities, the main barriers to immunisation among caregivers with ZDC were 1) limited physical access to immunisation services (long distances to health facilities, few/irregular outreaches), 2) inadequate client-centred services (long waiting time at health facilities, poor health worker attitudes, and costs incurred to access immunisation services [transportation, payment for cards, bribery]), 3) fear of AEFI, 4) limited spousal support for immunisation (financial and emotional), 5) myths and misconceptions about immunisation (religious beliefs, mistrust in vaccines, and cultural beliefs), 6) home births (use of TBAs), and 7) caregivers' competing priorities (household chores, gardening, community events, and jobs).

In this section, we present barriers for reaching the ZD and UI children, many of which cut across all the study areas.

Table 9: Barriers for reaching the ZD and UI across ERGs in the three LH districts

Barriers	Fishing, Island (Gulwe, Kyanjazi)	Urban, gated communities (Kasokoso, Kiganda)	National boarder, hilly (Kamukumbi)	District boarder, hilly (Lugalama)	District boarders, hilly, religious sects and mining (Bujaala)	Hilly (Bikunya)
Long distances from health facilities	✓	✓	✓	✓	✓	✓
Fear of adverse effects from vaccines	✓	✓	✓	✓	✓	✓
Hidden immunisation costs	✓	✓	✓	✓	✓	✓
Long waiting times	✓	✓	✓	✓	✓	✓
Poor health worker attitudes	✓	✓	✓	✓	✓	✓
Vaccine stockouts	✓	✓	✓	✓	✓	✓
Few and irregular outreaches	✓	✓	✓	✓	✓	✓
Limited spousal support	✓	✓	✓	✓	✓	✓
Competing interests	✓	✓	✓	✓	✓	✓
Home births	✓	✓		✓	✓	
Myths and misconceptions	✓		✓			✓

Figure 11: Pictures showing poor network in some high-risk communities



Data were collected from caregivers of ZDC aged 4.5 to 23 months, VHTs, health workers and community leaders in selected high-risk communities. These communities included the urban informal settlement at Kasokoso and Kiganda; the island and fishing communities at Gulwe and Kyanjazzi (Wakiso district); communities living at the national border at Kamukumbi and those living in hilly terrains of Bikunya (Kasese district); and communities living in under-served, hilly and mining areas of Kiranduzi/Lugalama and Bujaala (Mubende district). Across the three districts, respondents mentioned various cross-cutting reasons as to why some children had not been reached with immunisation as presented below;

1. Limited physical access to immunisation services

a. Long distances to health facilities

Most caregivers reported walking to health centres seeking health care regardless of the distance. At Kamukumbi HC II, health workers sometimes referred caregivers to higher-level health facilities to obtain immunisation services in case of vaccine stockouts. Yet these facilities are as far as 15 kilometres away, which necessitates hiring motorcycles to reach them on time, incurring unplanned costs.

'When I went to Kamukumbi HC II, I found that there was no vaccine, health workers advised me to go to Nyabugando, and when I reached there, there were no vaccines, and they also advised me to go to Bwera Hospital. The only means to go to Bwera Hospital is by motorcycle and you can find that sometimes we don't have transport [money] at home and we end up missing that day of immunisation'. - *Caregiver, Kasese, IDI*

In Bussi Island, caregivers reported that the health facility was far from their village, about 10 to 15 kilometres; therefore, they mostly relied on outreaches. Caregivers in Kituule mentioned that Kituule HC II was very far, requiring walking on foot for long hours in hilly terrain.

'There are poor roads and you find the health facility where they immunise is very far, which puts them off. Another thing is that the money they have could be very little, and they don't even have 1,000 shillings. They are charged 5,000 shillings to reach Madudu or 7,000 shillings to go and take the child for immunisation'. - *Community leader, Mubende, KII*

'I would walk on foot to go to Kitanda Health Centre [private for-profit clinic]. It is very far from here and you pass Kiranduzi and go up the hill, yet you have put the child on your back. The mode of transport is hard because you walk a lot and reach when you're tired. It is the long distance and the money gives me a hard time'. - *Caregiver, Mubende, IDI*

b. Few and irregular outreach immunisation services

Caregivers in Wakiso, Mubende, and Kasese districts reported fewer and irregular immunisation outreach services, and health facilities are far from where they live. In Bussi, Wakiso district, where the problem was very common, caregivers mentioned that their children stopped getting immunised the moment outreach services ceased.

'He was given some vaccines, but health workers do not come regularly. He stopped being immunised at 1 year and a half. I didn't take him to be immunised again apart from during immunisation campaigns, where health workers come to communities to immunise'. - *Caregiver, Wakiso, IDI*

The service providers equally perceived the villages to be far from the public health centres where immunisation services were offered, and caregivers were left to incur the burden of transport costs.

'It is transport because we can organise for an outreach when a village is very far from the trading centre. We are given a facilitation, but it comes after 3 months or quarterly. It is given quarterly, and you can find out when the health worker doesn't have transport to go to that village. You find that children have missed because we have not gone there'. - *Health worker, Wakiso, KII*

2. Inadequate client-centred services

a. Long waiting times at health facilities

Long waiting times at the health facility discouraged caregivers from taking their children for immunisation services. Some caregivers reported arriving very early in the morning and having to leave the health facility late in the evening, straining family routine activities. In Lugalama, caregivers reported that they arrived early but waited for health workers who sometimes arrived late. Sometimes health workers sent away caregivers who were waiting in line because the health worker became tired, leading to failed access at the point of care.

'Sometimes you may go at 8 am and return at 5 pm because the line is very long like from here up to down that side. At times you go back because the health worker has said she is tired; "You will come back another day"'. - *Caregiver, Mubende, IDI*

In Kasokoso and Kiganda villages (Wakiso district), the service provider reported that caregivers were required to wait until a certain number of caregivers was attained to conduct group health education. Having to wait discouraged some caregivers.

'When mothers come, we wait like for about 5 to 10 mothers to start giving them the education talk. I select a topic to talk about. After educating them, I fill the chart and the register, and after filling those charts and register, I start injecting the child. After injecting the child, I tell the mother to sit there for like 10 to 15 minutes to see whether the child is in good condition. Then, after 15 minutes, I tell her to go home'. - *Service provider, Wakiso, KII*

In Kamukumbi (national border community), caregivers reported that health workers open the health facility late and close early. This affected the immunisation uptake as some mothers could not be attended to given the limited time allocated for immunisation.

'When you come at 3 pm, you don't find anyone here. Health workers come from midday up to 2 pm. When it comes to 3 pm and above, there's no one'. - *Caregiver, Kasese, IDI*

b. Poor health worker attitudes

In Kasokoso (informal settlement) and Lugalama (underserved and mining), caregivers reported that health workers are rude. This was also reported among immigrant caregivers from Rwanda and Burundi.

'Some health workers are nice, and others are not nice, they speak rudely. They can abuse us that we Rwandese are stupid people'. - *Caregiver, Mubende, IDI*

c. Costs incurred to access immunisation services

Costs incurred during immunisation continuum were reported to discourage uptake of immunisation. Mostly, transportation costs were incurred to access health facilities. Most caregivers reported walking by foot to the health facilities, sometimes in unfavourable weather.

'As a VHT [member], I know that there are people that don't go because of the long distances. From here to Kituule, which is the health centre close to us and in our sub-county, it is still far, and yet the roads are so poor. The motorcycle rider can charge you between 8,000 and 9,000 shillings just going. If it is a rainy season, they can ask you for 16,000 shillings to and from because of the poor roads. So, with that, there are poor people who just look for money hand-to-mouth every day. So, you cannot tell them to incur that cost. It is hard for such a person to get 8,000 shillings and go to immunise a child every month'. - *VHT member, Mubende, KII*

Furthermore, there were indirect costs, such as paying for immunisation cards and the immunisation service itself in public health facilities. In Gulwe and Kyanjazi villages, the public health centre was located on the extreme edge of the Island, which required caregivers from the opposite edge to trek for immunisation. The purchase of immunisation cards for new mothers and replacements after loss ranged between 1,000 and 2,000 shillings at both public health facilities and private facilities offering immunisation services.

'I feel so bad when sometimes I do not come for vaccination, I do not have money to buy this card for my child, so I feel so worried about it. I don't have any other source to get money here to buy an immunisation card for my child, and even if I had some money, it would be for buying food because I can't take my child for vaccination when I don't have food at home'. - *Caregiver, Kasese, IDI*

In some communities, caregivers reported bribery as one of the reasons that discouraged them from seeking immunisation services. In Lugalama, health workers were reported to ask for bribes in the form of money and in-kind goods to be prioritised during immunisation.

'But when you are going you must take something for the health worker and he works on the child. Anything like money or something that the health worker will eat. If you have chicken maybe you take some eggs, then she immunises him for you quickly. You give her what you have but you must estimate an amount that they can take, like soda. You start from 2,000 and above. It is the culture, you just get your 2,000 shillings and put it in the middle of the child's immunisation card and hand it to the health worker because she also does not allow you to hand the money to her when the rest are seeing. So, when you give [it to] her, she will open the card and see the money, remove it when the rest are not seeing'. - *Caregiver, Mubende, IDI*

3. Fear of adverse events following immunisation.

The fear of adverse events following immunisation (AEFIs) left caregivers worried, and they had no proper management plan. Most caregivers reported that their children became sick and uncomfortable after they had received vaccinations. Children were reported to cry continuously and in some cases for more than a day. Other mothers mentioned that the site of immunisation sometimes got swollen and became painful. One mother reported that her child became lame because of immunisation. Fear of AEFIs exacerbated vaccine hesitancy across all the ERGs.

'About immunisation, there is taking your child for immunisation, and they get polio, and they become lame. That's why my husband was hesitant about immunisation because I took this child, and he got polio, and the leg was bent from behind. He is the only one I took for immunisation and after being immunised he became lame, and the father said don't take him back for immunisation. So, I stopped'. - *Caregiver, Mubende, IDI*

4. Vaccine stock-outs

Across the high-risk communities, vaccine stockouts were reported as a major reason hindering access to immunisation.

'I desire to take my child for immunisation, but the most disappointing thing is that you leave your work undone at home, you rush to the facility and on reaching there you find no vaccine. So, when you come back you feel very much disappointed and even it demoralises you taking your child back another day'. - *Caregiver, Kasese, IDI*

'I have ever taken him, and he was immunised the first time. Then when I went back the second time, I was told there is no vaccine to immunise him. So, when I took him for the third time, they said they had not brought the vaccine yet. I went back again for the fourth time, they said that they had not brought the vaccine. On the fifth time, they injected him twice on the thigh, and one on the arm, here, here, and here'. - *Caregiver, Mubende, IDI*

5. Limited spousal support for immunisation

Caregivers reported limited spousal support while seeking immunisation. This was exhibited through general refusal to give financial support to facilitate transport to and from the health facility and through physical assault due to seeking immunisation services without spousal approval, especially when the husband was opposed to immunisation.

'I went in the morning and took the whole day. I realised it was getting late and I decided to come back home because if I came late, my husband would beat me. So, I came back that day and I have never gone back'. - *Caregiver, Mubende, IDI*

Limited spousal support was also reported by some health workers in Bussi.

'And you can find a mother wants to immunise, but a father doesn't want, and the mother comes [and says] "Nurse, you give me the injection early, I want to go back when the man has not come back"'. - *Health worker, Wakiso, KII*

6. Myths, misconceptions and religious sects

Several myths and misconceptions discouraged some caregivers from seeking immunisation services. These included religious beliefs, rumoured AEFIs, vaccine mistrust, cultural beliefs, and misleading statements.

'I was going to take my child, but I first inquired from the women that were coming from immunisation and I was told, "If you're taking him, take him, but there are a lot of problems". There is a time when they immunised children, and they were all well, but there are times when they bring vaccines and they are bad. Then there is a vaccine they bring, and it takes a long time in the hospital, and they bring it out to immunise children with it, and they get problems. They get abscesses, and their bodies get sick'. - *Caregiver, Mubende, IDI*

'Pentecostals come in different categories. There are some parents I contacted, and they said those vaccines they put in their children are microchips. They have the evil number 666 and the whites are on the other side monitoring them after they inserted a microchip in your body. So, I asked them where they got that information from and they said that they have the Holy Spirit that showed them these things'. - *VHT member, Mubende, KII*

'Sometime back we had one family which was not accepting the immunisation services because of their religion, and I talked to them and they denied me. People misinterpret the Bible because the Bible has very many verses. You can find out that you read some other verse; it supports something, and when you go ahead reading the Bible, you find the other verse opposing the other. So, they could read it and misinterpret it. They were not given some other reasons, but they had the other code for the devil, 666. So, they couldn't allow some other things to apply to them because for them they knew it was coming from the devil'. - *Community leader, Kasese, KII*

7. Competing priorities among caregivers

Caregivers mentioned that competing priorities have discouraged immunisation uptake. These included household chores, gardening, day-to-day jobs, and community events.

'My step-mother-in-law doesn't take her children for immunisation. She doesn't stay at home always and she reaches there at 7 pm in the night'. - *Caregiver, Kasese, IDI*

'Like first, if I have got some order from town, you know I do make bags for ladies. Maybe they will tell me, you bring me these bags maybe 30 and maybe that time has reached, you must close all that day. You must take the child to what, to immunise. Yes, you just kill that day to die like that'. - *Caregiver, Wakiso, IDI*

'She will not tell you the exact thing that happened to her when it was time she missed immunisation. She may tell you that I have been sick, we lost someone, that's why I didn't come. Those are the issues with mothers. So, after telling you that I lost someone, I will not go to any other details'. - *Health worker, Kasese, KII*

'About immunisation of children, we try but the challenges we get are that many parents just don't care, because for a responsible parent, even if the health facility is far away, they try to fight for the life of their children, but some just don't care'. - *Community leader, Wakiso, KII*

8. Home births with or without traditional birth attendants

Due to the rise in maternal and child mortality rates, the government of Uganda banned the practice of traditional birth attendants (TBAs) in 2010. Despite the ban, several caregivers across the three districts reported that they gave birth with the help of TBAs, while others delivered at home.

'By the time I go into labour, there is no money at home. Not even 1,000 shillings. It is God that helps me push that child. It comes out very well and I also get better because the woman in the village [TBA] that helped me to give birth. She knows local herbs that help with birthing and that is what I took, and by the time you give birth, you find that the child has no problem'. - *Caregiver, Wakiso, IDI*

Additionally, health workers alluded to the fact that mothers who delivered from TBAs and at home were not linked to the health facilities for immunisation services.

'Some mothers use [TBAs] and some of them birth by themselves in their homes. They say, "Ah, for me health worker I can manage". And I ask them, how? They tell you, "I get the blade and I work on myself". They are not very many, just a few cases". - *Health worker, Mubende, KII*

The high-risk community-specific barriers are highlighted in Annex 3.

4.5 Available data capture systems for immunisation data

The existing information systems used by the EPI and partners to identify, reach, and monitor ZDC, UIC, and missed communities include the DHIS2, Smart Paper Technology, and the electronic Community Health Information System (eCHIS). These systems capture information on the number of children aged under 1 year who have received DPT1 and DPT3. Data capture for DHIS2 and Smart Paper Technology is at the health facility level while that for eCHIS is at the community/household level. The denominator for DHIS2 and Smart Paper Technology is estimated based on UBOS population projections, which sometimes leads to underestimation or overestimation of ZDC because UBOS projections do not cater for local population dynamics (migrations, etc.). The denominator estimate from the eCHIS data is captured at the household/community level, as VHTs visit all households in their catchment areas. The LH is currently undertaking an evaluation of the data ecosystem for immunisation reporting, a detailed report that will be shared subsequently.

The rapid assessment had some limitations;

1. The unreliable denominators/targets used at the district and national levels could have led to overestimation or underestimation of the ZD and UI burden in Uganda. As such, the results discussed should be interpreted with caution. Despite this, the LH triangulated the DHIS2 data with data from other sources including the ongoing house-to-house survey.
2. The house-to-house registration data also had its limitations. Firstly, the dataset was incomplete. The analysed dataset contained data from 52% of the sub-counties in Wakiso district and 72% of the sub-counties in Kamuli district. As such, it is unclear whether all the eligible children were registered. Additionally, the dataset did not include the exact dates of children's registration. Given that the registration was conducted in October and November of 2023 in Wakiso district, and from May to October of 2023 in Kamuli district, analysis was based on the set cut-off dates (i.e. 30th November for Wakiso district and 31st October for Kamuli district)
3. This rapid assessment was conducted in Uganda to locate missed communities with ZDC and UIC and identify the barriers to reaching them. Nationally, the number of ZDC increased while the number of UIC declined between 2020 and 2023. Considering the LH districts, the number of ZDC in Kasese and Wakiso districts increased while it decreased in Mubende district from 2020 to 2023.
4. Identification of ZDC and UIC remains a challenge in Uganda because the main data capture system being used currently (DHIS2) does not collect information at the community level. As such, it does not capture data on children that have not interfaced with the health system. This leads to an inaccurate estimation of the zero-dose and under-immunised burden.
5. Across the various high-risk communities studied, the main barriers to immunisation among caregivers with ZDC and UIC were 1) limited physical access to immunisation services (long distances to health facilities, few/irregular outreach services), 2) inadequate client-centred services (long waiting time at health facilities, poor health worker attitudes, and costs incurred to access immunisation services [transportation, payment for cards]), 3) fear of AEFI, 4) limited spousal support for immunisation (financial and emotional), 5) myths and misconceptions about immunisation (religious beliefs, mistrust in vaccines, and cultural beliefs), 6) home births (use of TBAs), and 7) caregivers' competing priorities (household chores, gardening, community events, and jobs).

Gavi developed a five-step framework (Identify-Reach-Monitor-Measure-Advocate, or IRMMA) to reach ZDC and UIC and bring them towards full immunisation and into primary health care services. We adopted this framework to document learnings from the rapid assessment, as presented below.

Identify

1. There are different definitions of ZDC among UNEPI partners at national and subnational levels, which leads to conflicting data on ZDC.
2. VHTs are key players in the identification of ZD and UI children at community level.
3. House-to-house registration by VHTs identifies ZDC in the communities. However, it is unclear whether all children identified during the registration exercise are reached with immunisation.
4. Identifying ZDC, UIC, and missed communities requires a data capture system that collects data at the community level and facilitates real-time data use at all levels.
5. The zero-dose burden is a moving target that requires routine assessments to align interventions as the situation changes. The health system must be adaptable to changing situations to reach ZDC.
6. Some households that had ZDC also had other children that were zero dose and/or under-immunised, suggesting clustering of ZD or UI children.

Reach

1. Some barriers to uptake of immunisation services differ by context and therefore require tailored approaches to address them.
2. Caregivers have limited awareness about other vaccine-preventable diseases beyond the commonly known ones, such as measles and polio.
3. Despite the government ban on TBAs, they still offer delivery services in some communities. Children delivered by TBAs are often not referred for immunisation services which increases their likelihood of being ZD.
4. There are emerging high-risk communities that are not documented by UNEPI. These include communities at national and district borders, mining areas, underserved areas, and those that have immigrants.

Measure and Monitor

1. Reliance on government administrative data (UBOS and DHIS2) is not adequate to identify and monitor ZDC, because it focuses on individuals who access services through health facilities, missing out on those who remain in communities. ZDC can better be identified through the triangulation of both qualitative and quantitative data at the community level.
2. Unreliable denominators used at district and national levels lead to overestimation or underestimation of the zero-dose burden in Uganda.
3. There is no standard way of estimating target populations at the district and catchment populations at the health facility level.
4. The district-level data may be unreliable because they are estimated based on the district's catchment areas of health facilities. However, the catchment areas overlap and may lead to multiple counts of the same population.

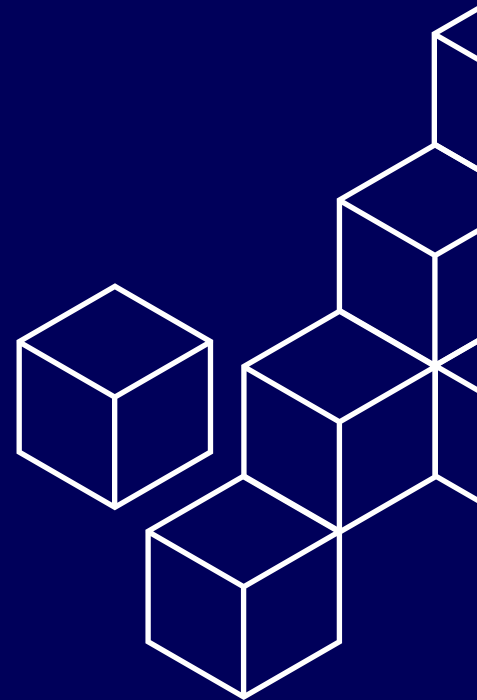
Recommendations

Near term:

1. UNEPI should harmonise the definition of zero-dose children at national and subnational levels to allow uniform understanding and reporting. The definition of ZDC varies across stakeholders in Uganda, and this lack of standardisation may lead to conflicting data on ZDC.
2. The Ministry of Health should extend delivery services to communities to reduce deliveries at home/by TBAs.
3. UNEPI should support existing structures (health workers, VHTs, and local, cultural, and religious institutions) to enhance and promote sensitisation at the community level to address vaccine hesitancy and its underlying causes (fear of AEFIs, myths and misconceptions, rumors).
4. UNEPI should enhance communications to address gender-related barriers to immunisation uptake.
5. UNEPI should consider implementing EAF interventions in high-risk communities that are currently not documented. These include communities at national and district borders, mining areas, underserved areas, and those that have immigrants.

Medium term:

1. UNEPI could consider leveraging the efforts of existing child registration bodies to identify and track ZDC, UIC, and missed communities. These bodies include NIRA and ongoing partner support programmes such as the Integrated Community Case Management programme, antenatal clinics, and school-based programmes
2. There is a need to evaluate the effectiveness and sustainability of the existing interventions to identify and reach ZD and UI children, including house-to-house registration.
3. UNEPI should consider the provision of static sites in underserved areas and upgrade existing health facilities to higher service-delivery levels.
4. There is a need to explore the underlying causes of poor health worker attitudes



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