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Harnessing the Health and Demographic Surveillance System (HDSS) infrastructure and protocols to transform death registration and mortality surveillance in Uganda

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Speaker biography

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Abstract

Background

This study examines the integration of Health and Demographic Surveillance System (HDSS) practices into Uganda's Civil Registration and Vital Statistics (CRVS) framework to enhance death registration completeness and improve mortality data quality. Conducted in Iganga and Mayuge districts, the project piloted a decentralized death notification process, leveraging Village Health Teams (VHTs) to assist households in reporting deaths using official forms. This approach aimed to reduce barriers such as travel distance and costs, which have historically limited community death registration in Uganda.

Methods

This study implemented and evaluated the integration of HDSS practices to strengthen death notification and registration across Iganga and Mayuge districts in Eastern Uganda. A decentralized death notification process was developed and rolled out in phases, initially covering 66 HDSS in 2023, and expanding to 117 HDSS and non-HDSS villages in 2024. Data from community health workers, village health teams, and health facilities were triangulated, with mortality indicators adjusted for reporting completeness. Qualitative insights from community actors and stakeholders informed system refinement.

Results

The intervention resulted in substantially higher death registration completeness, achieving rates of 73 – 79% a marked increase over prevailing national estimates of approximately 20%. A total of 2992 deaths were notified and officially registered in the national CRVS system. Mortality data from the pilot revealed high early childhood mortality and notable gender disparities in adult mortality. The study also demonstrated that local health personnel could feasibly conduct verbal autopsies in non-HDSS settings. Community sensitization and context-specific engagement strategies were identified as critical enablers of success, particularly in rural areas where trust and awareness were initially limited.

Conclusion

Leveraging HDSS infrastructure and community-based notification protocols meaningfully enhances death registration completeness and mortality surveillance in Uganda. It offers a scalable model for strengthening mortality surveillance in low-resource settings. This model supports the generation of timely, accurate mortality data essential for health policy, planning, and pandemic preparedness. The lessons learned provide actionable recommendations for national scale-up and regional adaptation to improve civil registration and vital statistics systems in Uganda and similar contexts.

Keywords: *Copy and paste your original keywords here or provide an updated version*.

Introduction

Mortality statistics by sex, age, and causes of death are essential for population health assessment, health policy and program evaluation, and epidemiological research.[1] The COVID 19 pandemic highlighted how critical timely mortality data is for early warning systems to gauge and monitor the dynamics of disease severity and effectiveness of control measures.[2] While Civil Registration and Vital Statistics (CRVS) systems are the optimal source of such information they remain weak in most low and middle-income countries (LMICs), despite several initiatives to improve this situation.[3-5] To address this, Health and Demographic Surveillance Systems (HDSS) have been established over the past three decades to continuously monitor births and deaths within defined population clusters. HDSS data have been a useful interim source to understand mortality patterns.[6] However, HDSS data are limited in terms of relatively small population size, narrow geographic coverage, and selection bias regarding population characteristics, which affect national representativeness of derived indicators. . Nevertheless, several features of HDSS could serve as a useful foundation for enhancing CRVS development, by aligning local death recording and data compilation practices with the CRVS legal and administrative framework.[7] This article describes a case study undertaken in the HDSS sites located in Iganga and Mayuge Districts of Uganda towards this objective. The rationale, methods, and experiences from this case study contain important lessons for strengthening CRVS and mortality surveillance programs in Uganda and other LMICs with similar challenges regarding mortality data availability.

Death registration in Uganda

To contextualise this study, we describe official death recording practices in Uganda. Civil registration in Uganda is mandated by the Registration of Persons Act (ROPA) 2015 and operated by the National Identification and Registration Authority (NIRA) under the Ministry of Internal Affairs.[8] As per ROPA regulations, all deaths must be reported within 14 days of occurrence, either by the health facility or the household in case of deaths at home.[9] Household informants are required to report deaths with an

endorsement letter from the village Local Chief to the Sub county Chief, where the official Death Notification Form (ROPA Form 12) is issued and submitted to the NIRA District Registration Office.[10] An analysis of the Uganda Demographic and Health Survey data in 2019 identified that only a third of all deaths were notified to NIRA and deaths occurring at home are less likely to be registered compared to deaths in health facilities.[11] The low registration of home deaths was attributed to a lack of specific registration and certification guidelines to be followed for such events, and a lack of demand for death certificates from the community.

Within the framework of the Africa Programme for Accelerated Improvement of Civil Registration and Vital Statistics (APAI CRVS),[12, 13] the government of Uganda commissioned a detailed situational analysis of the design and performance of the national CRVS system in 2020. [14] The assessment identified gaps in local practices for vital events registration, and the need for clarity about the functions of institutions and personnel at different levels of the CRVS system. Local qualitative enquiry identified a lack of awareness of registration protocols in the community, levying of unofficial fees by local staff for processing documentation, and limited capacity and resources for efficient registration at sub county and district level. Although NIRA prescribes the use of a specific form for household notification of deaths, this is yet to be implemented at national scale.

Following the assessment, a detailed CRVS Strategic Action Plan was developed for implementation during 2020-2025.[15] The CRVS Plan has nominated a network of stakeholders with specific responsibilities to implement birth and death notification, registration and certification, using standard forms and procedures mandated by NIRA under the ROPA 2015. Facility deaths are to be reported directly to the Health Management Information System and the District Registration Office, using an electronic form for notification of deaths along with their medically certified causes. For deaths in the community, the Plan proposes that Village Health Teams (VHTs) and the village local leaders could serve as event notifiers and should assist

households to report deaths to the district NIRA Registration Office. The Plan also states the need for a standard and efficient process for such reporting to take place, and that HDSS experiences could guide the development of the process.[15]

HDSS death reporting protocols

At the local level, the Makerere University Centre for Health and Population Research (MUCHAP) HDSS program has demonstrated an efficient process for identification and reporting of deaths. MUCHAP HDSS has been in operation since 2005, covering 66 villages located in the Iganga and Mayuge Districts in Eastern Uganda.[16] HDSS local scouts monitor and record births and deaths in their respective villages. In many locations, the Village Health Team (VHT) serves as the HDSS scout, providing a potential bridge with CRVS death notification functions. Deaths are reported to the HDSS Office within 15 days of occurrence, using a short notification form. Subsequently, the household of the deceased is visited by a trained HDSS supervisor, who conducts a detailed verbal autopsy interview for ascertaining the probable cause of death.[17] [15] In view of the alignment of HDSS death notification practices with CRVS procedures this implementation research study was designed to pilot test t use of official NIRA protocols by the local VHTs / HDSS scouts to report deaths in the HDSS to the District Registration Office. The lessons learnt were used to develop recommendations for strengthening CRVS operations at the local level, which could then be scaled to national coverage across Uganda.

The aim was to simplify and decentralise the official process such that the VHT assists the household in completing the death notification form, in obtaining village Local leader endorsement, and in submitting the form to the District Registrar. Such decentralisation has been recommended in the National CRVS Strategy, to reduce the burden on households to comply with registration protocols and hence improve data completeness. The study also aimed to evaluate the time and resource requirements as well as capacity building needs for such decentralisation. The second phase was designed to test the implementation of Phase 1 death notification procedures in additional villages within the same districts but outside the HDSS study population (hereafter referred to as 'non-HDSS' villages). The second phase also aimed to test the HDSS verbal autopsy procedures in a sample of deaths from the non-HDSS villages, to establish feasibility of VA implementation by local health sector staff. Data from both phases would be analysed to evaluate system performance and derive mortality indicators.

Specific objectives

The specific objectives are structured in two distinct but connected phases, moving logically from an initial proof-of-concept to a broader expansion and validation model. Phase 1 focused on designing and testing a new system in a controlled environment, while Phase 2 leverages those successes to expand, enhance, and validate the model for wider, national application.

The primary goal of Phase 1 was to establish a feasible model for decentralized, village-level death registration. The objectives were internally focused on creating and validating the core components of the system within the controlled environment of the HDSS. The decentralized process was successfully designed, created the necessary training materials, and established governance mechanisms. This new system was then tested within the HDSS to confirm its feasibility and to understand the resources required for routine implementation.

Having successfully demonstrated the model's feasibility in Phase 1, the objectives for Phase 2 were designed to prepare the system for a national scale-up. This involved testing the model in a new environment, adding new functionality, and gathering rigorous evidence of its sustainability. The first objective logically expanded the proven death notification process into villages *outside* the HDSS. This tested the model's generalizability and its ability to function without the intensive support structures of a demographic surveillance site.

Phase 2 was built upon the initial model by adding a critical new layer of functionality of training local teams in non-HDSS villages to conduct verbal autopsies. This moves the system beyond simple death registration to include cause-of-death determination, a significant enhancement. The final objective was to conduct in-depth research on the expanded model's feasibility, generalizability, and sustainability. This is the crucial evidence-gathering step needed to make a compelling case for a national scale-up of the entire process in other parts of Uganda.

Methods

Implementation was carried out in two phases (2022 and 2023) collaboratively by MUCHAP and the district NIRA Office, with technical support from Uganda National Public Health Institute, and the US CDC Foundation. Financial support was provided by the Bloomberg Philanthropies Data for Health Initiative. Quantitative and

qualitative methods were used for data collection and analysis in each phase. The IMHDSS received ethical approval from the Makerere University School of Public Health Research and Ethics Committee.

Study setting and population.

The study population in Phase 1 was defined by the existing coverage of the IMHDSS program.

During Phase 1, the NIRA death notification protocols were used to report deaths in the HDSS villages across in Iganga and Mayuge districts. All deaths that were recorded by the HDSS during 2021 and 2022 were followed up with a household visit, to implement the death notification procedures. During Phase 2, the sample was expanded to an additional 167 villages within the two districts, where the death notification procedures from Phase 1 were implemented by local VHTs to report deaths in 2023. This expansion was restricted to a random selection of an additional 123 villages in Iganga and 44 villages in Mayuge district, based on proportional population distributions. The activity could not achieve total coverage in each district, owing to limited financial resources.

Material preparation

Death notification process mapping

The study team comprising NIRA officials, UNPHI and MUCHAP researchers and international resource persons developed a coordinated decentralised protocol for death notification and registration which is summarised in Figure 1.

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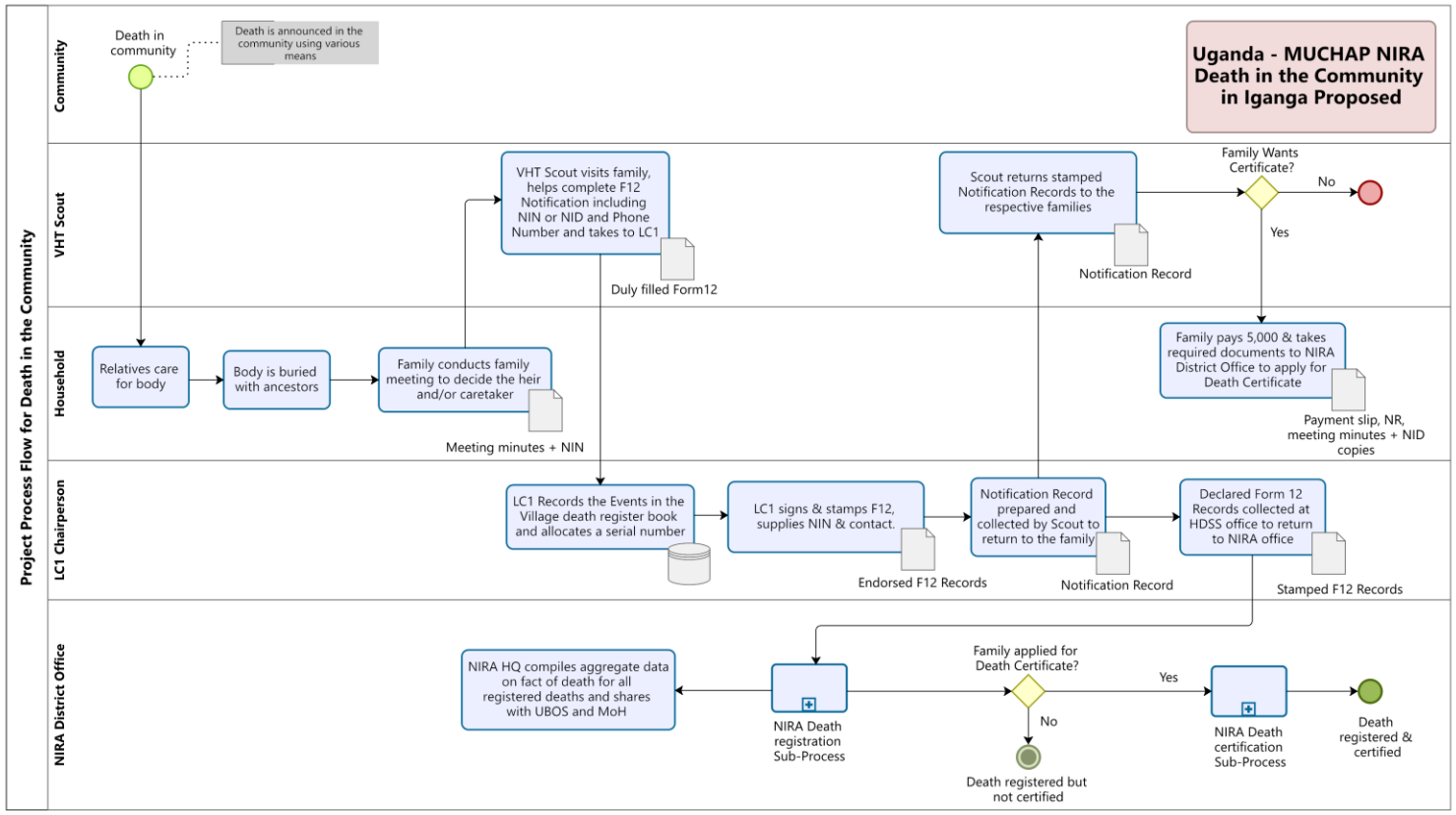

Figure 1: The activity flow for MUCHAP/NIRA procedures for notification of community deaths

On becoming aware of a death event, the VHT visits the household to offer condolences and initiate the death notification procedures. Within the household, the next of kin aged 18 years and above who was best informed about the details of the deceased is selected as the respondent (notifier/declarant). The VHT guides or assists the respondent in completing the DNF, which would then be submitted for initial verification and endorsement by the Chairperson of the Local Council (LC1). The LC1 would record the event in the village death register and prepare a Death Notification Record (DNR) to be returned to the household. Subsequently, the endorsed NIRA DNF would be submitted to the District Registration Office (DRO), for recording in the electronic CRVS death register. In case the family requires an official death certificate, they approach the DRO, along with the DNR as proof of notification and other identity documents.

The study team prepared training materials, local instructions, and standard operating procedures for institutionalisation of the decentralised process. To facilitate implementation, MUCHAP/HDSS utilised its strong local relationships to conduct local sensitization activities to inform the community about this program. MUCHAP materials and procedures for verbal autopsy interviews were used in a sample of 100 cases in non-HDSS villages as part of Phase 2, to demonstrate the feasibility of local health personnel in implementing VA.

Capacity strengthening

Field staff were provided four orientation programs in each phase, attended by VHTs, Local Council chairpersons, Sub-County chiefs and health assistants. The topics in each one-day program covered included the legal requirements for death notification, study objectives, the decentralised reporting practices, roles of each stakeholder and duty bearer, conduct of the household visit, and details of variables on the DNF. Additional support was provided during field supervision visits by the project team.

Data collection and management

Data collection and compilation was implemented between May and July 2023 in Phase 1, and between October 2023 to August 2024 in Phase 2. All completed DNFs were reviewed by MUCHAP staff to check the completeness and accuracy of recorded variables, with follow back for field verification and updates, as required. All verified forms were submitted to the District Registration Office for data entry and subsequent processing. An electronic dataset of DNFs for notified deaths in each phase was also maintained at MUCHAP for data analysis.

Quantitative data analysis methods

The age-sex distribution of the study population was evaluated using population pyramids. The completeness of adult death registration in each phase was assessed by using the Adair Lopez method. [18] Age-specific death rates from Phase 2 were used to compute life tables and derive summary mortality indicators for each sex such as life expectancy at birth, risks of childhood and adult mortality, and life expectancy at age 60 years. Life tables were also computed after adjustments for incomplete death registration.

Qualitative research

Focus group discussions (FGD) and Key Informant Interviews (KII) were used to understand the enablers and barriers of community deaths notification and registration two FGDs were conducted with 12 VHT cluster leaders, covering household visit logistics (distance, time, cost) and two KII were conducted with the district registration officers Iganga and Mayuge.

Additionally, both methods investigated other aspects such as (i) the knowledge and understanding of the community about death registration (ii) the availability of local infrastructure and human resources for decentralisation(iii) the solutions for improving death notification rates and (v) the contextual interpretation of statistical results.

Results

The development of the decentralized death notification process presented in Figure 1 as well as the materials developed to facilitate implementation described in the Methods section largely meet the objectives of Phase 1. The remaining objectives are addressed in the quantitative and qualitative findings from the implementation that are presented below.

Table 2 shows the distribution of the study population by geography in terms of district, Sub County, and villages in each phase. As can be seen, the study population was increased by over 300% from Phase 1 to Phase 2. Overall, the Phase 2 population accounted for about 40% of the total population of the two districts in 2023.

Table 1: Distribution of the study population by district and Sub County in Phases 1 and 2

DISTRICT	HDSS		OUTSIDE HDSS		TOTAL	
SUB COUNTY	**VILLAGES**	**POPN**	**VILLAGES**	**POPN**	**VILLAGES**	**POPN**
IGANGA						
Ibulanku	7	7,503	21	40,862	28	48,365
Central Division	12	18,778	20	31,513	32	50,291
Bulamagi	4	3,909	22	30,142	26	34,051
Nakalama	5	10,739	26	62,827	31	73,566

Nakigo	23	44,711	34	69,394	77	114,105
MAYUGE						
Buwaya	7	5,595	24	41,025	31	46,620
Imanyiro	8	10,264	20	56,386	28	66,650
Total	**66**	**101,499**	**167**	**332,149**	**243**	**433,648**

Death notification and registration

A total of 2,992 death from seven Sub Counties were notified and officially registered in the NIRA MVRS during this study period. The initial phase in 2023 focused exclusively on the Iganga-Mayuge Health and Demographic Surveillance Site (IMHDSS), where a total of 1,185 deaths were successfully notified and officially registered from all 66 HDSS villages.

In 2024, the project entered a significant expansion phase, extending its reach beyond the original HDSS boundaries to include new communities. This second phase successfully covered 117 villages (out of a target 167), where volunteers notified and registered a total of 1,807 deaths with NIRA. This represents a 53% increase in registered deaths and a 77% expansion in village coverage compared to the previous year, demonstrating the scalability and effectiveness of the model in strengthening Uganda's national CRVS infrastructure.

Table 2: Death Notification and Registration through Community-Based Surveillance

Phases	Number of villages	Deaths notified and registered
I (2023)	66	1,185
II (2024)	117	1,807

Note: Phase I - Only the HDSS villages; Phase II - HDSS villages and beyond

Figure 2 shows the age structure of the Phase 2 population, which mirrors that of Uganda, where the population is largely young.[19] This indicates that Uganda is in the early phase of the demographic transition with high fertility and high mortality rates. In such population age-structures, mortality patterns usually demonstrate high proportions of deaths at childhood ages and from infectious diseases.[20, 21] This structure is also associated with a high population growth rate, which was estimated to be 2.9% for Uganda over the period 2014 – 2024.[19]

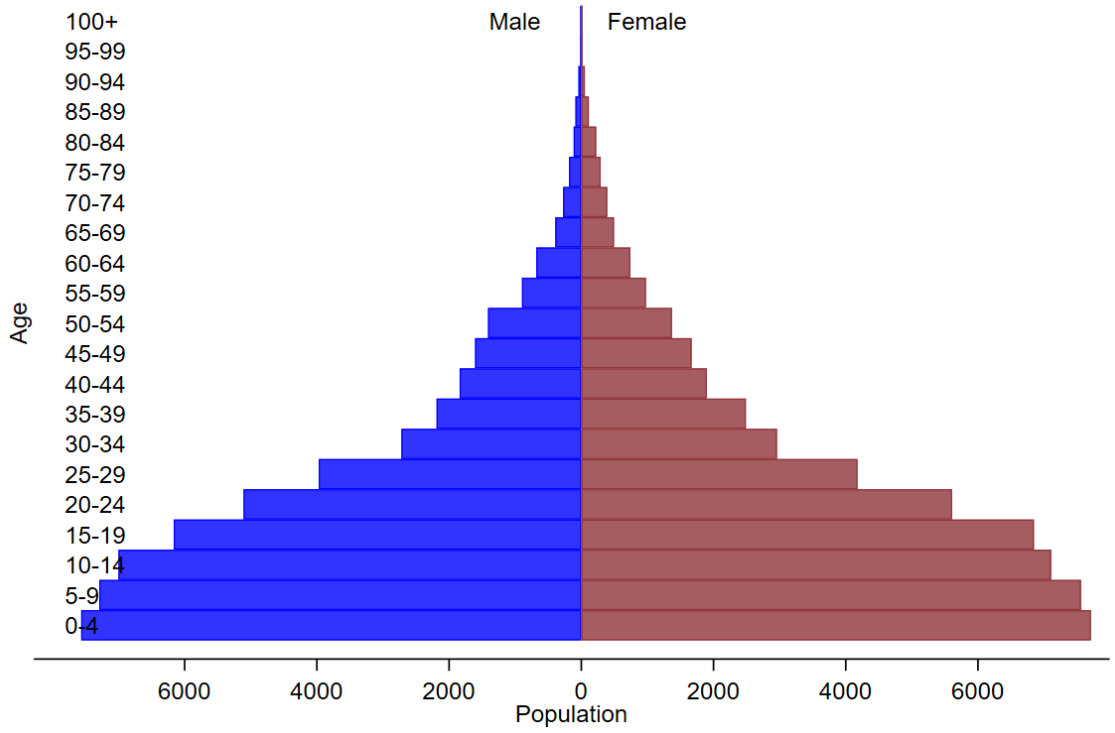

Figure 2: Population pyramid for the study population comprising HDSS and non-HDSS villages in 2023

Mortality indicators

Table 3 shows the population and deaths combined for both genders according to detailed age groups for the HDSS sites in 2021 and 2022 respectively. As can be seen, in both years the mortality rates are high in early childhood, and then taper off at school ages, followed by a general rise in mortality rates with age. However, on comparison, there are considerable fluctuations in these age trends between the two years. These fluctuations can be expected given the relatively small numbers of people in each detailed age group, leading to a high level of stochastic uncertainty in the numbers of observed deaths from year to year, although from similar population denominators.[22] The crude death rate for 2022 at 4.9 per 1000 (95% CI 4.5, 5.4) was higher than that observed for 2021 (4.3 per 1000,; 95% CI 3.9. 4.7), although the difference was not statistically significant. The estimated completeness of death reporting combined for 2022 was 79% for males and 84% for females, although with wide 95% confidence intervals due to small sample sizes (data not shown). On average, there were about 6-8 deaths per village each year, and this workload for assisting with the death notification protocols appears manageable for VHTs, in conjunction with their other existing duties and responsibilities.

*Table 1: **Crude and age-specific death rates (per 1,000 pop) for 2021 and 2022 in the study population***

Age	2021 pop	Deaths	ASDR per 1000	2022 pop	Deaths	ASDR per 1000
<1	2580	60	23.26	2632	119	45.22
1-4	9996	29	2.90	10196	59	5.79
5-9	13598	5	0.37	13870	18	1.30
10-14	14197	7	0.49	14481	9	0.62
15-19	12193	10	0.82	12437	3	0.24

20-24	10196	12	1.18	10400	14	1.35
25-29	7611	14	1.84	7763	7	0.90
30-34	5330	15	2.81	5437	17	3.13
35-39	4367	20	4.58	4454	17	3.82
40-44	3560	15	4.21	3631	11	3.03
45-49	3201	26	8.12	3265	16	4.90
50-54	2581	12	4.65	2633	26	9.88
55-59	1849	19	10.28	1886	14	7.42
60-64	1301	19	14.60	1327	20	15.07
65-69	837	24	28.67	854	13	15.23
70-74	619	15	24.23	631	22	34.84
75-79	481	33	68.61	491	11	22.42
80-85	331	24	72.51	338	36	106.63
85+	340	49	144.12	347	48	138.41
Total	**95168**	**408**	**CDR /1000=4.3**	**97071**	**480**	**CDR/1000=4.9**

The Phase 2 reported deaths were aggregated across all the villages from HDSS as well as non-HDSS sites. The data was first evaluated for completeness of reporting, which was estimated to be 79% for males and 73% for females. The reported death rates for ages above 15 years were adjusted for incomplete reporting based on these findings, and the adjusted death rates were used to compute sex-specific life tables, and summary indicators are presented in Table 4.

Table 2: Mortality indicators for combined study population

Indicator	M		F	
	Reported	Adjusted	Reported	Adjusted
Total population	200,106	–	223532	–
Deaths	1101	1297	1008	1228
Crude death rate*	5.5	6.5	4.3	5.3
Estimated adult death completeness	79%	–	73%	–
Life expectancy at birth (years)	70.6	66.3	78.6	72.2
Risk of dying before age 5 years*	99	–	109	–
Risk of dying between 15 and 60 years*	184	226	106	141
Life expectancy at age 60 years	27.6	23.9	34.6	28.5

Table 4 shows the comparison of reported and adjusted mortality indicators for the study population. As can be seen, the adjusted life expectancy at birth is estimated to be 66.3 years for males, and 72.2 years for females. In comparison, the Global Burden of Disease (GBD) demographic models estimate life expectancy at birth for Uganda in 2023 to be substantially lower for both males and females, at 62.9 years and 69.3 years respectively.[23] These comparisons indicate that the GBD models estimate a higher overall mortality profile than that observed from the study data. In contrast, the study findings for under-five mortality (99 and 109 per 1000 live births) are considerably higher than the national estimates derived from the Uganda

Demography and Health Survey 2022 (58 and 47 per 1000 live births). [24] In general, the study population from Iganga and Mayuge districts may not be representative of the national population, which could account for these differences between study data and national estimates.

The study findings also identified that the adjusted risk of adult mortality for males (208 per 1000) was about 60% higher than that for females (129 per 1000), and such gender differentials in mortality are commonly observed in most populations. [25] The data collection also included implementation of VA in a sample of 107 cases from 8 non-HDSS villages in Phase 2. VA interviews were conducted by trained local Sub County health assistants using handheld computer devices, and the data was analysed by the InterVA program to derive the cause of death. Overall, there was 100% positive responses in all cases, and specific causes of death were identified in over 90% of the sample.

Logistical issues in implementation

Table 5 provides a snapshot of key logistical considerations analysed from data gathered during the focus group discussions held with field staff in each phase. The average distance travelled to visit households was relatively low at 4-5 km across all the Phase 1 and 2 villages. This clearly indicates the success in decentralization of death notification procedures, when compared to the distances involved for households to visit the District Registration Office for this purpose. Although, considerable distances (up to 30 km) were encountered in some Phase 2 villages, which suggests the need for additional outreach modalities. in certain specific circumstances. The average time taken to complete the death notification form was relatively longer in the non-HDSS villages in Phase 2 (68 minutes). The ongoing role of VHTs in death reporting in HDSS villages may have facilitated a shorter time for this process. Although transportation incurred some costs for each case, there is potential that these could be managed by combining this task with other reasons for local travel.

Overall, as this task for VHTs to support community death notification gets embedded within their routine activities, it is anticipated that the process will get more streamlined and effective in terms of time and costs.

Table 5: Logistical aspects of decentralization of CRVS death notification tasks to Village Health Teams in the HDSS CRVS Integration project

Variable	HDSS (n=13)		Non-HDSS (n=11)	
	Average	Range	Average	Range
Distance to household (in km)	3.8	0.1-7.0	4.8	0.2-30
Interview time (in minutes)	40	15-90	67	30-90
Total transportation costs (in $)	$0.93	$0.13-$2.8	$1.2	$0.28-$2.8

Qualitative results

VHTs/Scouts Experiences

The FGDs with the scouts, revealed their experience as well as what they considered to be successes from their involvement in the pilot. They took pride in participating in this exercise as it cemented their roles as community VHTs that earned them respect among their community.

Community awareness was fronted as one of the reasons why the exercise was a success in some villages. This was especially true for those villages within or near urban settings of Iganga town.

"I work in town and some other villages where people are informed about NIRA and what it does so work became easy for me."

Families struggle with the process of securing a death certificate which was affecting important cultural undertakings like appointing an heir to facilitate property sharing. This made the exercise admired and welcomed by some households. It was also embraced because it made the process easier by eliminating one stage which had proved to be costly for the household when acquiring a death notification record.

"Majority of people have issues of family property inheritance and an heir; this was an advantage for them to process death certificates for their relatives who died."

"People are happy because the process of getting a death certificate is now simpler and they no longer incur costs traveling to NIRA offices or paying fees like the 50,000 charged at the sub-county level; this ease and cost-saving encourages many to register deaths."

Comparing qualitative findings for both phases

Findings across Phase 1 and Phase 2 reveal both similarities and differences in community engagement and impact. In both phases, VHTs expressed pride in their roles and earned community respect, while motivated by public recognition from local leaders. Families valued the accessibility, convenience, and cultural relevance of the initiative, which reduced costs, facilitated inheritance processes, and helped resolve property disputes. Knowledge acquisition through interactions between NIRA and MUCHAP staff was a shared benefit. In general, urban areas saw quicker acceptance by the staff and community, while in Phase 2 rural settings required tailored sensitization and rapport-building to build trust and ensure positive engagement in the process. This highlights the need for context-specific approaches to community engagement, emphasizing the importance of addressing local challenges and leveraging cultural relevance to ensure program success.

Discussion

A primary accomplishment of the study was the successful integration of HDSS practices into Uganda's CRVS framework with decentralization, which addressed a critical gap in existing death registration practices. The decentralization approach leveraged existing community structures, particularly Village Health Teams (VHTs), to simplify and streamline the official death notification process. This strategy addressed barriers such as minimizing travel distances and the financial burden for registration. A critical finding was the differential implementation experiences between HDSS and non-HDSS villages. Urban areas demonstrated higher baseline awareness and quicker acceptance, while rural settings required more intensive sensitization and trust-building efforts. This highlights the importance of context-specific approaches in implementing health system interventions [5].

The crude death rates observed (4.29 and 4.94 per 1,000 population in 2021 and 2022, respectively) align with population-level mortality patterns in similar African contexts [4]. Notably, the study achieved an estimated registration completeness of 73 – 79%, a substantial improvement over the national estimate of 20.2% completeness from the Health Management Information System (HMIS) data for 2023 in which 46,543 out of an estimated 230,000 national deaths had been notified [9]. These improvements in completeness enabled the use of these CRVS records for empirical measurements of mortality indicators for the study population, as per standard practices.[26]

The study a highlighted that decentralized reporting mechanisms can significantly reduce barriers to death registration, making the process more accessible to communities. The success was facilitated by the fact that the HDSS Scouts (mostly VHTs) were already performing the task of death notification to their local HDSS office. However, the need to follow official CRVS procedures, as well as support the deceased families by delivering the Death Notification Records back to them, introduced added layers of tasks. Further, the field

staff were required to use the NIRA death notification form which includes more variables and additional information to be recorded and verified, than the HDSS death reporting form.

These additional tasks were made possible through standard operating procedures, training programs, and field supervision by the MUCHAP team. In both phases, the success was greatly facilitated by the community sensitization program undertaken in each village, on the importance of active participation in official birth and death registration functions. Also, the integration of VA procedures with death notification protocols represents a significant methodological contribution, with Sub County health assistants using standardized tools like the WHO 2016 VA questionnaire to ascertain causes of death. [15]. Through these experiences, the study demonstrated that existing HDSS infrastructure can be leveraged to establish a model to strengthen national CRVS systems.

While the study yielded promising results, it had certain limitations. One key limitation was the geographical scope, as it was conducted only in the Iganga and Mayuge districts, which may limit the generalizability of the findings. Additionally, there is a possibility of selection bias within the HDSS populations, as these communities are already accustomed to structured data collection processes, potentially influencing the outcomes. Variations in local contextual factors, such as availability of infrastructure, community engagement, and administrative support, may also have influenced the effectiveness of the intervention.

Future research should explore the long-term sustainability of the decentralized death notification model to assess its continued effectiveness over time. Additionally, studies should examine the scalability of this approach across different geographic and socioeconomic contexts to determine its adaptability in diverse settings. Further investigation is also needed on how this model can be integrated with broader health information systems to enhance overall mortality surveillance and strengthen civil registration processes across Uganda.

Conclusion/Recommendations

This study provides a practical, community-centered approach to addressing mortality data gaps. By simplifying registration processes and leveraging existing community health structures, such interventions can potentially transform civil registration systems in low-resource settings [3]. Recently, the Centers for Disease Control and Prevention at African Union (Africa CDC) launched an initiative to strengthen mortality surveillance across the continent, which has also been linked with global attention to improve mortality data availability and quality for pandemic preparedness and response. [27-29] It is anticipated that the findings from this study could provide lessons for other countries to utilize existing HDSS systems as platforms to launch mortality surveillance strengthening programs that would guide both routine as well as emergency public health actions at national, regional and global level.

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