Uganda

Photo PATH/Heidi Good

Increasing vaccination coverage through improved data usage and geographical information system (GIS) capacity

COUNTRY-DEFINED CHALLENGE

In 2022, only 41 percent of the Ugandan population 12 years of age and older had received at least a first dose of COVID-19 vaccination[1] while just 49 percent of children under five years of age received the second dose of the measles-containing vaccine.[2] Closing the gap for routine immunization coverage and driving engagement for COVID-19 and other vaccinations were high priorities for the Uganda Ministry of Health (MOH) and its Expanded Program on Immunization (EPI).

Digital tools for tracking vaccination data are an effective way to improve the efficiency and reach of immunization programs. Geographic information systems (GIS) software, for example, allows for mapping and precision geolocation of vaccination efforts to reach the highest-priority populations at the right time. However, at the start of the project in January 2023, the Uganda MOH EPI had limited internal expertise in GIS. The MOH wanted to expand this skill set and capacity within district- and national-level biostatisticians, rather than relying on the services of technical consultants. Additionally, an assessment of the use of existing digital health tools—including those used to collect and manage COVID-19 and routine vaccination data—showed knowledge gaps related to their appropriate utilization and acceptability among health workers. Finally, the MOH sought assistance in understanding hyper-local vaccine hesitancy so that they could improve health messaging and leverage local champions to increase vaccine acceptance, particularly among young people. The EPI identified teachers as underutilized, trusted community leaders who could be better informed to help promote information about and build trust in future community vaccination campaigns.

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SOLUTION

Building local GIS capacity

At the request of the Ministry of Health (MOH), the DRIVE Demand Uganda team conducted a three-day national training of trainers (TOT) in GIS in October 2023. The TOT equipped a pool of 13 trainers in using the free, open-source Quantum Geographic Information System (QGIS) software. In turn, these trainers facilitated the training of 147 national- and district-level biostatisticians in November 2023.

These trainings followed a hands-on, applied learning curriculum developed by DRIVE Demand in partnership with a local QGIS expert with input and approval from the MOH. The curriculum enabled the trainees to effectively utilize GIS to improve immunization performance, support surveillance, respond more quickly to outbreaks, and monitor campaigns and other interventions at subnational levels.

TOP: Mr. Paul Mbaka (left) of the Ministry of Health confers a certificate of completion to a biostatistician who completed the training (right).

BOTTOM: 147 biostatisticians completed the DRIVE Demand GIS training in November 2023.

Photos: PATH/Mariam Nalukenge

SOLUTION

Improving knowledge, use, and coordination of digital immunization tools

First, DRIVE Demand Uganda conducted a landscaping analysis of digital tools used during the COVID-19 response as well as any digital tools used for routine immunization. Only three tools were found to be used for routine immunization: **Smart Paper Technology** (**SPT**), **EPIVAC**, and **DHIS2**. However, the study found major knowledge gaps among health professionals at the health facility level around the use and acceptability of these tools. Based on these findings, the DRIVE Demand team developed a report detailing recommendations, including a need for data use training and continued supportive supervision visits—a standardized process of guiding, monitoring, and coaching health workers to promote compliance with standards of practice—to health facilities.

Acting on these recommendations, in January 2024, DRIVE Demand facilitated a two-day data quality and use improvement training for health care workers in Wakiso District. The training focused on improving DHIS2 data reporting, data capture, and data use, with COVID-19 data used as an example. Additionally, DRIVE Demand conducted digital health supportive supervision visits in February 2024 to 49 health facilities in Wakiso District. These visits provided monitoring and recommendations to help ensure that health workers are utilizing best practices, receiving sufficient training, and utilizing all data reporting tools effectively.

SOLUTION

Promoting vaccine acceptance in Uganda through teachers, policies, and research

Supporting teachers' ability to be vaccine champions

At the onset of the project, DRIVE Demand worked with UNEPI to identify teachers as potential vaccine champions due to their respected position in communities and their regular engagement with community families. In September 2023, DRIVE Demand Uganda held a workshop with 25 public primary school teachers in Wakiso District from schools of different sizes and locations to understand their knowledge and information-sharing practices with school children and community families. Using focus group discussions and qualitative analysis, the workshop resulted in three key learnings:

1. Media, village health teams, and notice boards were common sources of health information for teachers, especially during disease outbreaks. However, misinformation was commonly shared via digital channels among friends and family, elevating mistrust in vaccine safety.

2. Teachers had a critical need for comprehensive, accurate vaccination information from the MOH and trusted sources to effectively bridge information gaps.

3. Teachers were not invited to actively participate in health information sessions with their students, as this is the role of health promoters who visit the schools and have discussions with students separate from the teachers. Improved communication with educators is paramount to dispelling myths and promoting accurate health information.

The workshop findings were shared with the MOH and Ministry of Education and Sports (MOES) as a valuable resource to enhance their efforts in health promotion, teacher training, and immunization programs. These findings also have the potential to enhance the effectiveness and reach of mass future vaccination campaigns for routine immunization or emergency settings. Improving preparedness for such campaigns has particular importance in the face of future climate-exacerbated disease outbreaks or pandemics.

Supporting school health policies to help teachers and schools promote vaccination

To further support teachers and schools with the inclusion of appropriate messaging to encourage uptake of COVID-19 and routine vaccinations, DRIVE Demand Uganda and the MOH co-hosted a five-day workshop with 34 government and partner stakeholders to review and finalize the school health service standards and develop supporting guidelines. The workshop resulted in the establishment of a multi-sectoral content development team. This team set a meeting cadence to ensure continued progress on an updated school health policy, updated guidelines, an implementation roadmap, and a monitoring and evaluation framework.

My passion lies in caring for children. Although many parents initially hesitate to embrace vaccination, we, as teachers, have strived to clarify that it is safe for their children and themselves. I feel at ease sharing vaccination information, particularly in today's world where vaccination is vital to protect against numerous diseases. Our collective effort contributes to a healthier community."

Kitaka Roald is a teacher at Naggulu Umea Primary School in Wakiso District, Uganda. He took part in the focus group discussions for DRIVE Demand in September 2023.

Photo: PATH/ Heidi Good

Understanding hyper-local barriers and enablers to vaccine acceptance

To better understand vaccine hesitancy and inform social and behavior change (SBC) messaging, DRIVE Demand enlisted the Busara Center for Behavior Economics to conduct behavioral research in Bamako Mali; Dar es Salaam, Tanzania; Kampala, Uganda; and Lusaka, Zambia. The study used focus group discussions to gather information on three populations: adults who had not received COVID-19 vaccine in the past year, pregnant women who had not received COVID-19 vaccine in the past year, and health care providers who provide vaccination.

In Uganda, focus group discussions were conducted in February 2024 in Nabweru sub-county in Wakiso District. Busara interviewed a total of 35 individuals from the approved target populations (unvaccinated adults (14), pregnant women (10), and health care workers (11)). In these discussions, the most-cited beliefs leading to vaccine hesitancy were around side effects and the risk of falling sick. To create vaccine buy-in, respondents noted that they appreciated witnessing the vaccination of others, particularly leaders.

Findings across the four countries are presented in *Dynamics of Vaccine Hesitancy: A Practitioner Playbook*.[3]

ENSURING PROJECT SUSTAINABILITY

DRIVE Demand Uganda sought to ensure that all activities could be sustainably carried on after the life of the project to enable lasting impact. To do this, DRIVE Demand partnered closely with the MOH and UNEPI throughout the project to ensure alignment, a shared vision, and adequate capacity to manage efforts going forward. DRIVE Demand helped increase local technical capacity through GIS and data quality and use trainings, and the team helped ensure the forward progression and sustainability of school health service efforts by providing technical assistance and developing a roadmap for implementation.

At a project sustainability workshop held in February 2024, stakeholders discussed the skills acquired and expanded through DRIVE Demand activities and how these can be leveraged by the MOH for future pandemic preparedness, for climate-health data activation, and in other health areas. The workshop highlighted the need for continued capacity strengthening in GIS, expansion of GIS use beyond immunization, and the potential automation of GIS outputs to inform decision-making. From these conversations, the MOH renewed its commitment to strengthening data mapping for precision health and fostering GIS capacity throughout all levels of the health system.

To ensure continued GIS advancement, DRIVE Demand Uganda worked with the MOH to develop a sustainability roadmap outlining key considerations, costs, and recommendations for the next five years. This roadmap can be used to guide and inform climate health data warehousing, epidemic preparedness, and responsive health services.

DRIVE Demand's capacity building activities enable health clinics like this one in Wakiso District to more optimally use and manage data for decision-making. Photo: PATH/Heidi Good

STRATEGIC RECOMMENDATIONS FOR THE MINISTRY OF HEALTH

1. **Strengthen the use of digital health tools for immunization,** including DHIS2, to improve coverage, improve contact tracing, increase targeted outreach and communication for accurate information sharing, and reduce loss to follow-up.
2. **Leverage GIS digital health mapping** to reach hard-to-reach areas and improve data accuracy for patient follow-up.
3. **Continue building capacity** in reporting and use of digital health tools for health workers, owners of private clinics, and drug shops through routine mentorships and targeted training sessions.
4. **Foster coordination with key community champions,** such as teachers, to empower families with accurate, timely health information via trusted local leaders.
5. **Provide continuous supportive supervision** in data use and improvement to the mentored private facilities in Wakiso District.

References

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2. Johns Hopkins University of Medicine. Uganda country overview. Johns Hopkins: Baltimore, 2022. https://coronavirus.jhu.edu/region/uganda. Accessed October 1, 2022
3. Busara Center for Behavioral Economics and PATH. *Dynamics of Vaccine Hesitancy: A Practitioner Playbook*. 2024.

About DRIVE Demand

With support from The Rockefeller Foundation, Digital Square at PATH launched the Digital Results Improve Vaccine Equity and Demand (DRIVE Demand) project in June 2022 with the goal of increasing vaccine demand and acceptance rates in six countries: Honduras, Mali, Tanzania, Thailand, Uganda, and Zambia. By driving demand for COVID-19 vaccination awareness, acceptance, and activation, the project aims to increase each country's overall vaccine uptake while also strengthening the broader routine immunization program for long-term sustainability.