GRID3

IMPACT REPORT 2025

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Mapping a way to better health outcomes

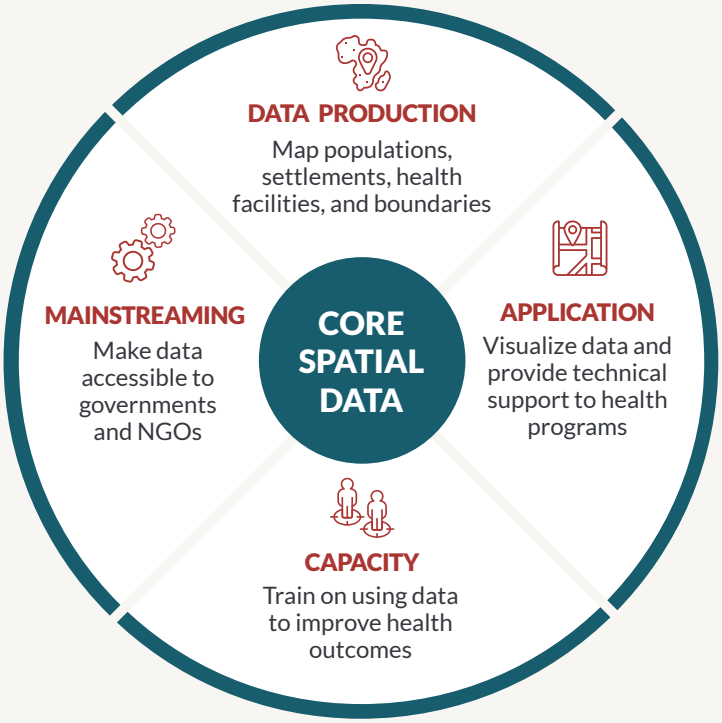
GRID3 works with countries in sub-Saharan Africa to generate, validate, and use core spatial datasets on **population, settlements, subnational boundaries, and crucial infrastructure**.

Close collaboration with local governments is central to this approach—by training and supporting stakeholders to use this information for analysis and decision-making, GRID3 encourages both **national ownership over and sustainability of the data**.

Official data are blended with new data generated by novel approaches; solutions draw on advanced data science and technology, participatory mapping, satellite imagery, and other innovations. Using the expertise of leading technical partners, GRID3 designs **pragmatic and responsive geospatial solutions** that address each country's priority needs.

This approach leads to data-driven interventions that reach communities that need them the most. GRID3 solutions are valuable across multiple development sectors, from education to infrastructure. The current focus is improving health interventions—particularly immunization coverage and malaria control—in the Democratic Republic of the Congo (DRC) and Nigeria.

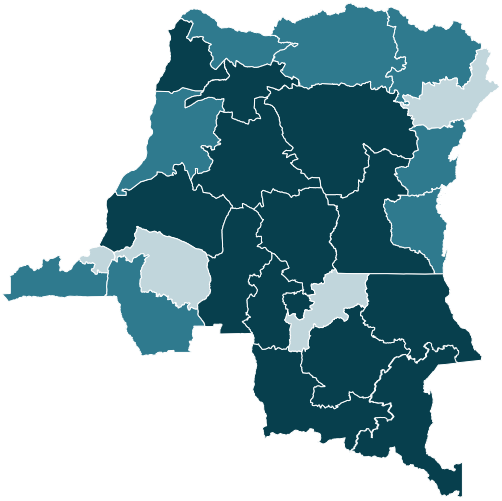
GRID3 services



GRID3 in the Democratic Republic of the Congo

Starting in 2019, GRID3 has methodically mapped the entire DRC. Working with partners and the government, GRID3 collects data, integrates various data sources, and verifies their accuracy. These data on population, settlements, subnational boundaries, and critical infrastructure are made publicly available and used to inform health initiatives, including polio and other immunization campaigns.

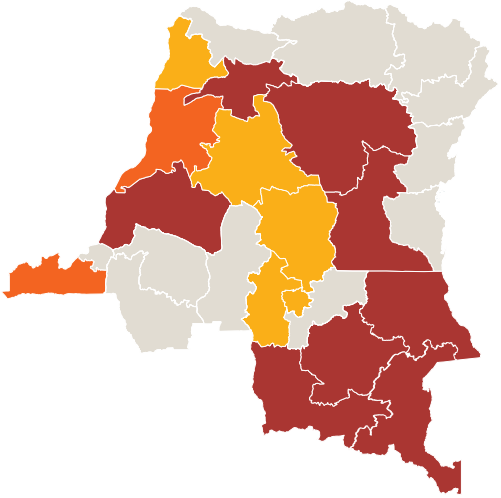
CORE SPATIAL DATA AVAILABLE



100%
DRC mapped

- Provinces with data collected in 2024–2025
- Provinces mapped using existing data sources 2024–2025
- Provinces with data collected in 2019–2021

MICROPLANNING SUPPORT



229 health zones in 15 provinces supported

GRID3 supported polio campaigns through map production, training, technical support on vaccination planning, vaccine temperature monitoring, and tracking which areas were covered by the campaigns. Routine immunization support included map production, training, and analysis of optimal distribution of vaccination teams.

- Routine immunization
- Polio
- Routine immunization and polio

Data are available at grid3.org/drc

Progress in 2025

11
provinces with new data collected

20,520
maps delivered for polio and routine immunization

1,597
people trained on use of spatial data for health interventions

Democratic Republic of the Congo

Starting in March 2025, GRID3 worked with **Village Reach, Acasus**, and **provincial health authorities in Mai-Ndombe, Mongala, and Tshopo** to optimize vaccination planning and resources in support of the government's periodic intensification of routine immunization (PIRI) strategy, which aimed to increase immunization among hard-to-reach villages. GRID3 provided spatial analyses and recommendations on how vaccination teams should be distributed across health zones, conducted training for provincial data managers on the Geospatial Tracking System (GTS), a mobile application developed by partner Novel-T, and assisted the government in monitoring vaccination teams' compliance.

In April 2025 in Kafubu Health Zone, Haut-Katanga Province, GRID3 led a training session on using the GTS, Vaccine Buddy (a data collection device by GEOPH), and microplanning maps for monitoring a polio campaign. This is part of GRID3's work to support the **COUP** (the emergency operations center for polio), the **World Health Organization (WHO)**, and the **Global Polio Eradication Initiative (GPEI)** with strategic polio response in areas most vulnerable to virus outbreaks.

From March to June 2025, GRID3 field staff in Mai-Ndombe Province collected data on settlements, health facilities, health zone/area boundaries, and points of interest. This work was part of a larger data collection effort, done in partnership with the **Kinshasa School of Public Health (KSPH)** in three other provinces, to complete core spatial data for the country. The data were published and used to create routine immunization microplanning maps for **Gavi, the Vaccine Alliance's Equity Accelerator Fund (EAF)** project.

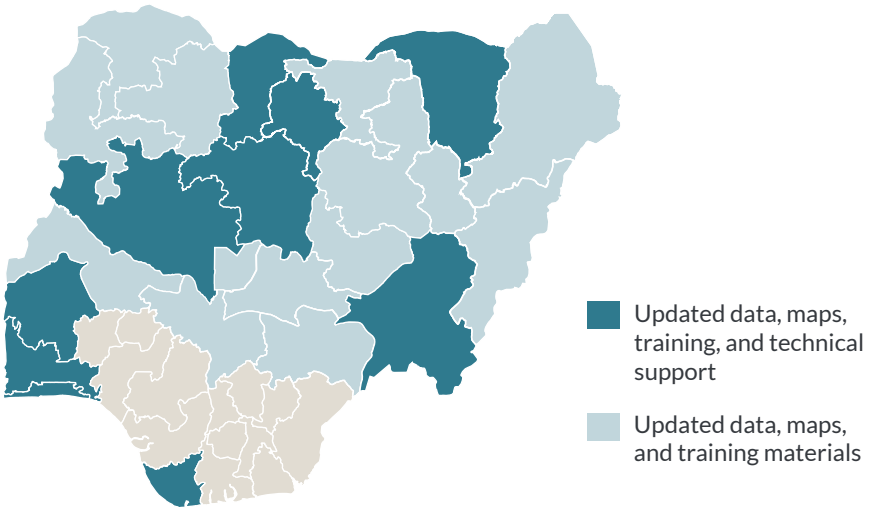
In December 2025, GRID3 and the **United Nations Office for Project Services (UNOPS)** led a workshop as part of the **EAF** project to help the **PEV** (the expanded program on immunization) reduce the number of zero-dose children in 11 priority provinces. Health zone staff from across the provinces attended the workshop, where they learned about the use of spatial data and maps for routine immunization microplanning. This workshop concluded a series of data validation and map use trainings led by GRID3 in each of the 11 provinces with local health staff throughout 2024-2025.

GRID3 in Nigeria

Nigeria remains one of GRID3's largest and most established programs. Working closely with government partners, GRID3 strengthens the spatial data systems used to plan and deliver national health campaigns. Through training and technical support in mapping and spatial analysis, we help health workers use geographic data to make informed decisions and reach underserved communities more effectively. GRID3 data support programs for measles-rubella, malaria, yellow fever, routine immunization, and polio. In 2025, key outputs included updated nationwide population estimates, revised LGA and ward boundaries for campaign planning, and a comprehensive nationwide settlement list produced in partnership with National Primary Health Care Development Agency (NPHCDA).

MICROPLANNING SUPPORT

Microplanning support usually includes **map production, training, and technical support on map and data use**. For stand-alone malaria campaigns and measles-rubella campaigns in Oyo and Bayelsa states, separate maps were also created to guide campaign implementation. Fourteen (14) integrated campaign states were supported remotely.



Supported routine immunization and malaria, measles-rubella, polio, HPV, and neglected tropical disease (NTD) campaigns across 24 states

GRID3 led technical work on a single source for nationwide settlement data

Data are available at grid3.org/nigeria

Progress in 2025

2

states targeted for fieldwork to collect new data

15,486

maps delivered for campaigns and routine immunization

3,670

people trained on use of spatial data for health interventions

Nigeria

In January 2025, GRID3 trained 1,423 ward, local government area (LGA), and state health staff in Kano, representing all 44 LGAs. They were provided with new ward maps (1,287 in total) and taught how to use them in malaria, measles-rubella, and routine immunization planning.

In March 2025, GRID3 supported the **National Malaria Elimination Programme (NMEP), Taraba State Malaria Elimination Programme**, and the **Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)** with technical support and maps for an integrated insecticide treated bed net (ITN) and seasonal malaria chemoprevention (SMC) campaign in Taraba State. During the training, health officials were taught how to use spatial data and maps to support their microplanning activities.

In August 2025, GRID3 collected data on settlements, health facilities, and points of interest in Bayelsa State. This major data collection effort was implemented in partnership with the **government of Bayelsa State** and **Fact Foundation**, and the data collected were used to create maps for an integrated measles-rubella, NTD, polio, and HPV campaign implemented in January 2026.

In November 2025, GRID3 participated in a workshop reviewing the latest version of the nationwide master list of settlements (MLoS) with the **NPHCDA** and data working group partners including **WHO, UNICEF, Solina, eHealth Africa, McKing, GIST (Dev-Afrique), Acasus, AFENET, Gates Foundation**, and government stakeholders from the **Polio Emergency Operations Center (EOC).** The MLoS was used in microplanning and implementation maps for malaria, polio, and integrated measles-rubella campaigns across the country.

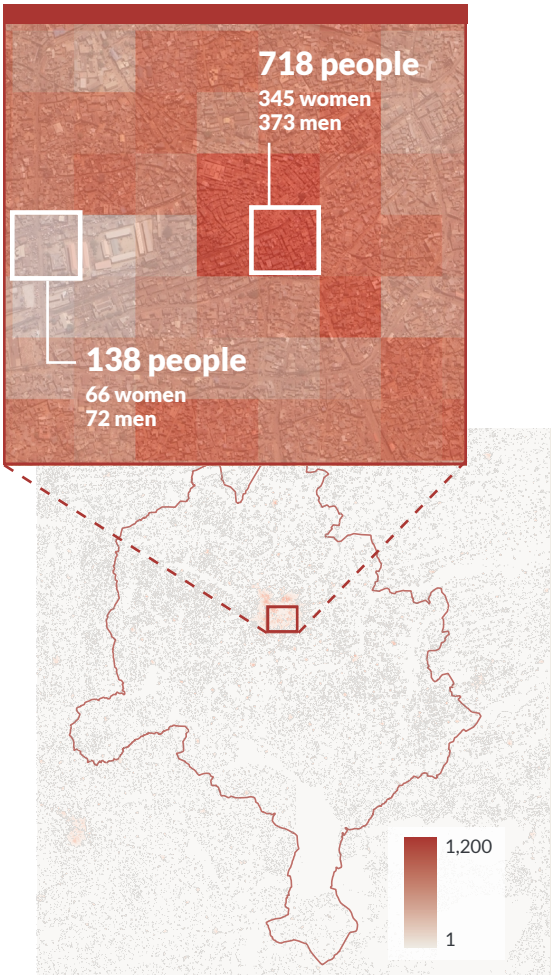
Population estimates

Effective planning in DRC and Nigeria requires demographic data that accurately reflect the distribution of subnational populations. Such data can give us a better understanding of a given population's location, density, age and sex distribution, and size.

Health planning efforts in the DRC and Nigeria often use imprecise projections of outdated census data that do not reflect local context or the impact of internal and external migration patterns.

> In 2025, **GRID3 published nationwide population estimates for both Nigeria and the DRC**. GRID3 also published regional population estimates for **all of sub-Saharan Africa**.

GRID3 takes an innovative approach to producing high-resolution population estimates. Georeferenced household survey data and spatial data derived from satellite imagery and other sources are fed into a statistical model that generates gridded population estimates at a 100mx100m resolution. In 2025, GRID3 also published gridded estimates of routine childhood immunization status, including zero-dose and undervaccinated rates. **GRID3 partner WorldPop at the University of Southampton produces these population and vaccination estimates.**



Kano, Kano State, Nigeria

EXAMPLE: KASAÏ-ORIENTAL PROVINCE, DRC

Estimating subnational populations

Timely, detailed population data at the subnational level are crucial for health programs, as both settlements and their populations can change significantly over short periods.

For example, a mining community in Kasaï-Oriental Province was estimated to have a population of 1,962 in the GRID3 data representing 2021*, whereas the most recent estimates representing 2024** place the population at 2,887. This shift highlights the importance of having accurate and up-to-date population data to help health officials allocate resources effectively and address community needs.

Miabi Health Zone, Kasaï-Oriental Province, satellite images taken in 2021 and 2025

* Version 3 (2022)
** Version 4.3 (2025)

Settlement data

GRID3 collaborates with governments and technical partners to collect, update, and use settlement data. We produce two types of settlement data: extents and named points. Settlement extents—representing the geographical boundaries of settled areas—are primarily based on building footprints derived from satellite imagery. These data are available for all of sub-Saharan Africa. Named settlement points include geocoordinates and names for each settlement; we map these points in close cooperation with national stakeholders. We integrate existing settlement data with new data that are either collected via fieldwork or as part of a health campaign. **GRID3 partner Center for Integrated Earth System Information (CIESIN) at Columbia University performs the technical work on settlement data.**

> In 2025, **GRID3 published new or updated named settlement point data for 20 provinces in the DRC.** GRID3 also led technical work in support of a Nigerian government initiative to create a single harmonized list of settlements.

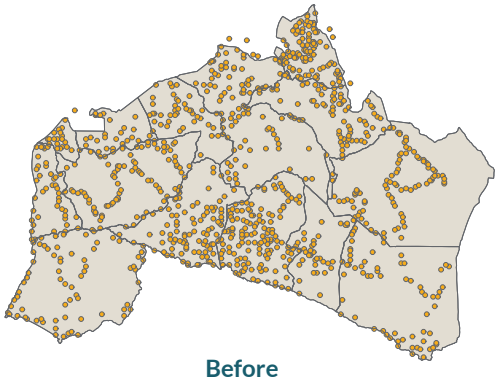
EXAMPLE: MAI-NDOMBE PROVINCE, DRC

Improving publicly available settlement data

GRID3 collaborated with the PEV and local health workers to improve settlement data for Mai-Ndombe Province. The project involved extensive fieldwork to collect and validate GPS locations and names of settlements across the province. The newly collected data were then merged with other available sources, including data from the National Malaria Control Program (PNLP).

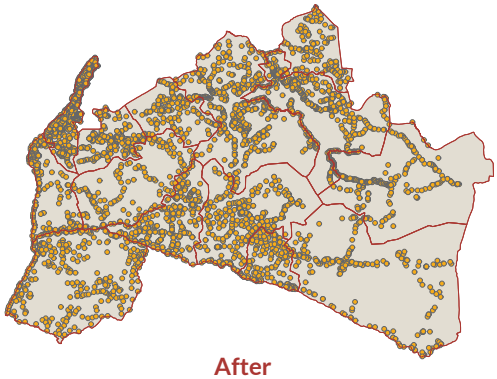
The new dataset includes 3,549 more settlements than the previous best available public data (RGC, 2010), building a more complete and robust foundation for targeting services at the settlement level.

980
settlements mapped



Before
RGC, 2010

4,529
settlements mapped



After
GRID3, 2025

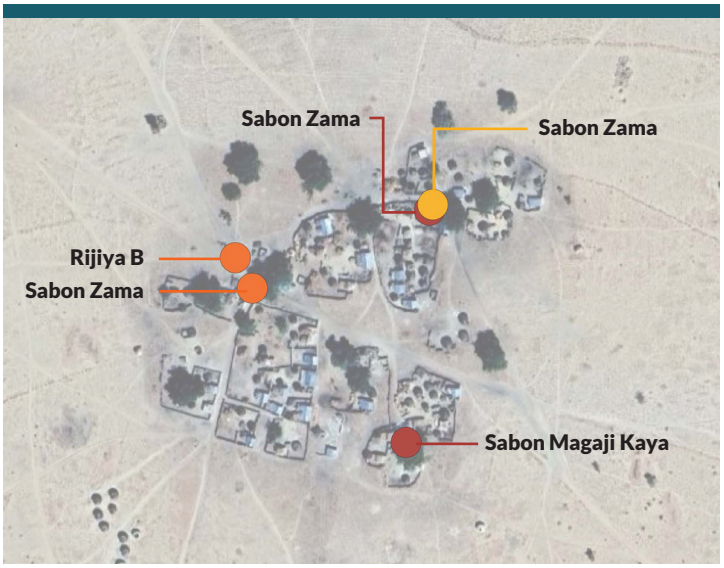
EXAMPLE: NIGERIA

Creating a single source for nationwide settlement data

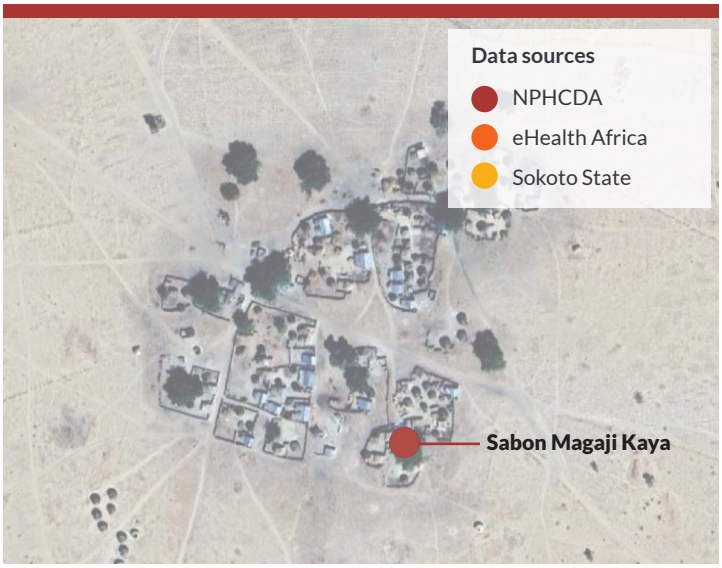
National settlement data are often incomplete, outdated, and held in silos across different organizations, leading to duplication of efforts and gaps in service delivery. Starting in late 2024, GRID3 has supported the NPHCDA and the Polio EOC on creating a MLoS by harmonizing existing settlement data sources. GRID3, with technical partner CIESIN, reviewed, edited, and harmonized over 1.7 million points across 14 datasets, leading to the identification of 621,860 unique settlement records and significantly increasing the percentage that are georeferenced.

BEFORE (NOVEMBER 2024)	AFTER (NOVEMBER 2025)
1.7M settlement records across 14 datasets	**622K** settlement records in a single dataset
57% have spatial coordinates	**77%** have spatial coordinates

Before
Five settlement points with slightly different locations and names for the same area



After
One unique name and point for this community



Soron Yama Ward, Sokoto State

Health facilities data

Timely, effective healthcare delivery requires that we have accurate data on the locations of health facilities. These data are used to delineate the health catchment areas that are so important for planning primary healthcare services, addressing accessibility, and allocating resources. We evaluate and merge a diverse collection of data sources in order to improve geolocated health facility data in the DRC and Nigeria. Our sources include spatial and non-spatial health facility lists that are often combined with insights gleaned during participatory mapping and data validation workshops with local stakeholders. GRID3 also works with local NGOs and universities to conduct fieldwork that helps address gaps in data. **GRID3 partner CIESIN, in close collaboration with GRID3's teams in the DRC and Nigeria, carries out technical work on health facility data.**

In 2025, GRID3 published **new or updated health facility data for 20 provinces in the DRC.**

EXAMPLE: SUD-UBANGI PROVINCE, DRC

Improving completeness and accuracy of health facility data

In 2025, GRID3 created a new health facility dataset for Sud-Ubangi Province. Health facility coordinates were collected and validated through extensive fieldwork in partnership with the Kinshasa School of Public Health, and this ground-truthed data was then integrated with existing data sources.

The new GRID3 data improve the comprehensiveness and spatial accuracy of available health facility data and include 1,537 more health facility coordinates than the previous best-available data (DHIS2, June 2025).

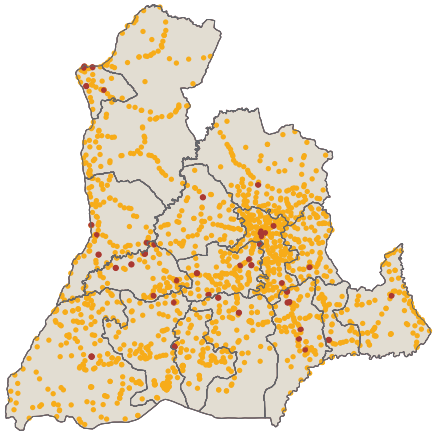
Data sources and boundaries

- Health facilities (DHIS2, 2025)
- Facilities with improved location accuracy
- Newly mapped facilities
- Health zone boundaries

133
facilities mapped

Before
DHIS2, 2025

1,670
total facilities



After
GRID3, 2025

1,545 facilities mapped for the first time and **47 have improved location accuracy** from where they were originally in the DHIS2

Boundary data

Inaccurate boundaries can cause health interventions to miss communities. Updated subnational boundary data are a crucial means of ensuring this does not happen–these data facilitate effective microplanning that reduces gaps and overlaps in service delivery. We combine numerous data sources to update data on subnational boundaries. In the DRC, this work includes mapping health zones and health areas, and in Nigeria we focus on updating and harmonizing ward-level boundaries. **GRID3 partner CIESIN, in close collaboration with GRID3's teams in the DRC and Nigeria, carries out technical work on boundary data.**

In 2025, GRID3 published **new or updated health zone and health area data for 20 provinces in the DRC.**

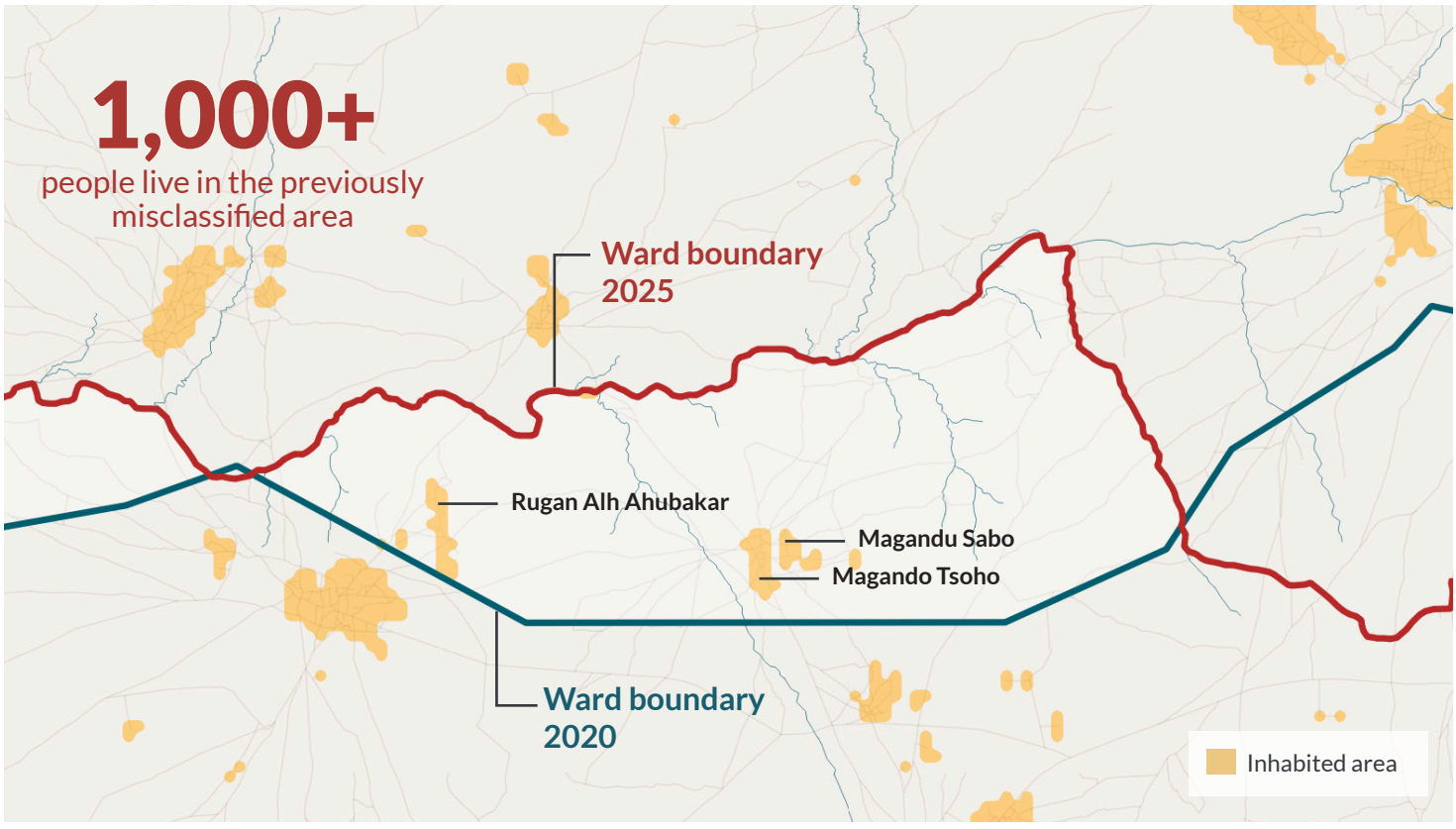
EXAMPLE: NIGER STATE, NIGERIA

Improving accuracy of ward boundaries

In 2025, GRID3 updated ward boundaries for operational use in 15 states.* This update incorporated new input data from various settlement data sources, new roads data developed by GRID3, and data on water bodies from Esri.

For example, the boundary between Yangalu Ward and Tungu Wawa Ward in Niger State was redrawn to more accurately align with settlement locations and the rivers and roads in the area. As a result, three settlements previously misclassified as being in Yangalu Ward are now correctly included in Tungu Wawa Ward, which reduces the risk of them being excluded from service delivery.

* To be published in 2026



The boundary between Yangalu Ward and Tungu Wawa Ward in Niger State redrawn

EXAMPLE: TSHUAPA PROVINCE, DRC

Filling gaps in health area boundaries

In 2025, GRID3 partnered with the Kinshasa School of Public Health (KSPH) to map health areas in Tshuapa Province. Between January and May 2025, KSPH conducted extensive fieldwork to collect new data, which GRID3 then merged with other available sources, including data from the PNLP.

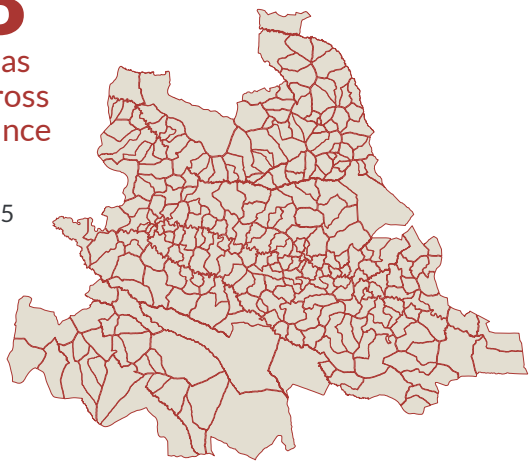
The result was a comprehensive and delineated set of health area boundaries. In total, 26 existing health areas were updated from the best available data (2020), and an additional 252 were delineated for the first time. The new GRID3 dataset provides updated health area boundaries for all of Tshuapa, benefiting an estimated 2.6 million people.

26
health areas mapped in 1 health zone

Before
IM Working Group, 2020

278
health areas mapped across entire province

After
GRID3, 2025

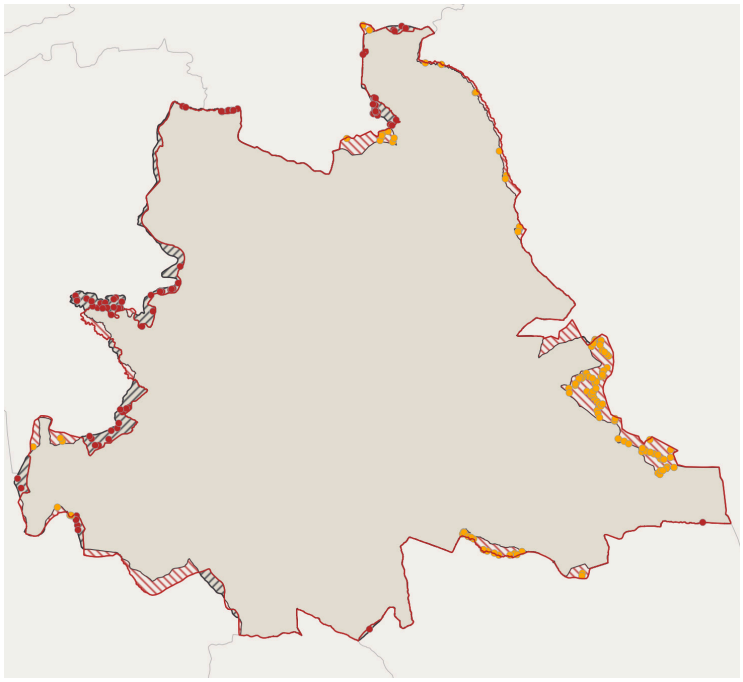


EXAMPLE: TSHUAPA PROVINCE, DRC

Ensuring border communities are in the correct health zone

When administrative boundaries are outdated or inaccurate, communities on both sides of a border are especially vulnerable to being missed by health interventions. Compared to the previously best-available health zone boundaries for Tshuapa, the new GRID3 data include approximately 2,200 additional square kilometers in the province.

> The new boundaries place **235 settlements** in different health zones and provinces, affecting an estimated **100,000 people.**



Geographic accessibility data

Many people in rural or remote regions lack reliable access to health care because terrain, distance, and poor infrastructure create significant barriers to travel. Geographic accessibility data models the time and effort required to cross a landscape, helping planners to identify isolated communities and strategically locate new services where they are easiest to reach. **GRID3 partner CIESIN, in close collaboration with GRID3's technical team, developed this geographic accessibility data.**

In 2025, **GRID3 developed comprehensive national roads and travel time data for the DRC and Nigeria** to support health services.

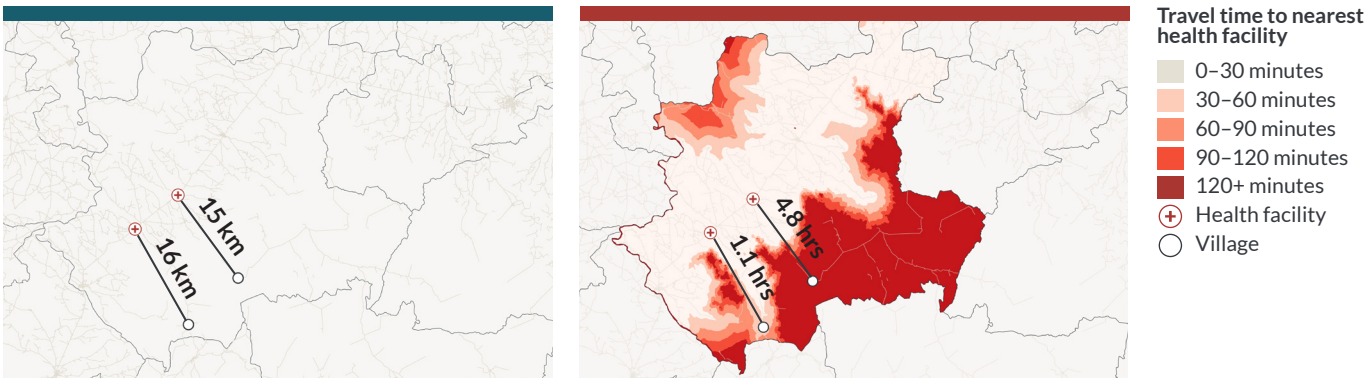
National road infrastructure

This data combines GPS tracks from field health campaigns with existing road data from OpenStreetMap and Meta. A key feature of GRID3 data is the inclusion of navigable waterways, a common transit route in many places.

Yalifafu Health Zone, Tshuapa Province, DRC

Travel time

This dataset provides speed estimates based on natural features, road type, and elevation, which can be used to calculate travel time from a given location to another specified location. These data are extremely valuable for measuring accessibility to health services.



Suntai Ward, Bali LGA, Taraba State, Nigeria has two villages that seem equally far from health services. The travel time data shows that Waldi takes much longer to reach than Kwassan Ganua.

Improving health campaigns through core spatial data

Successful health campaigns require accurate, up-to-date core spatial data. Containing precise, location-based information, these data make it possible to carry out targeted interventions, efficiently allocate resources, and optimize the placement of service delivery locations. Core spatial data help to ensure that all communities receive the health services they need, while spatial tracking of the progress of health campaigns allows for service providers to identify and then rectify any gaps in delivery. GRID3 is contributing to more effective, equitable health outcomes by giving programs in the DRC and Nigeria the training and technical support they need to integrate geospatial solutions into campaign planning and implementation.

EXAMPLE: KANO STATE, NIGERIA

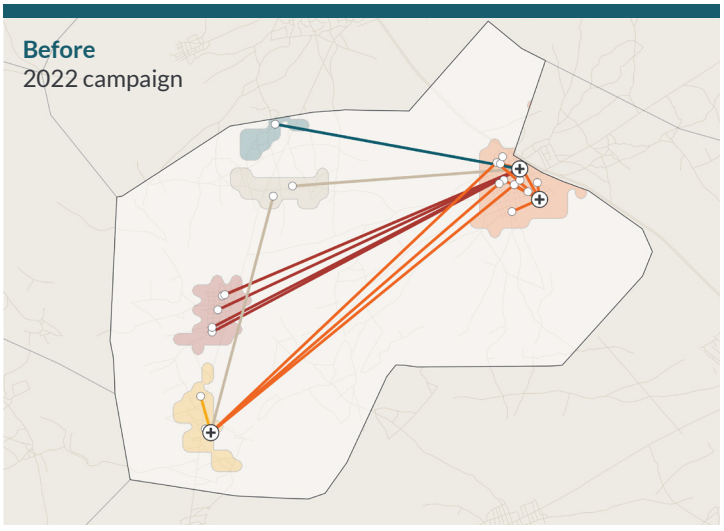
Reducing travel time for malaria prevention

In the absence of up-to-date spatial data, health staff may have difficulty knowing the correct distances between settlements and health facilities. This can lead to settlements being assigned to health facilities or other service delivery points that are farther away than necessary, which hinders health teams' ability to meet their targets.

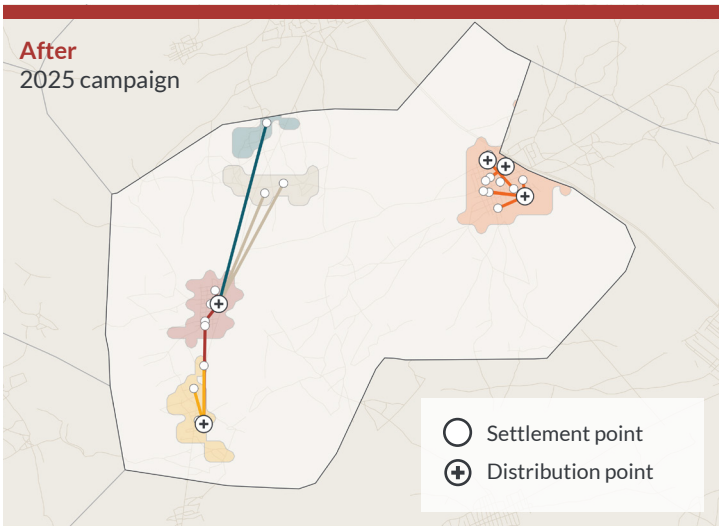
In Zogarawa Ward, Kano State, health officials used updated GRID3 maps when planning for SMC administration and ITN distribution in 2025. Compared to the previous malaria campaign in 2022, health staff improved their outreach plans—they allocated two additional bednet distribution points in the ward to ensure greater accessibility and assigned settlements to the closest distribution point.

On average, community members traveled 1.3 km less in 2025 compared to 2022.

People traveled on average 1.7 km
Not enough bednet distribution points
Communities assigned inefficiently



Average travel reduced by 76%
Two additional distribution points
Communities assigned based on accurate distances



EXAMPLE: OYO STATE, NIGERIA

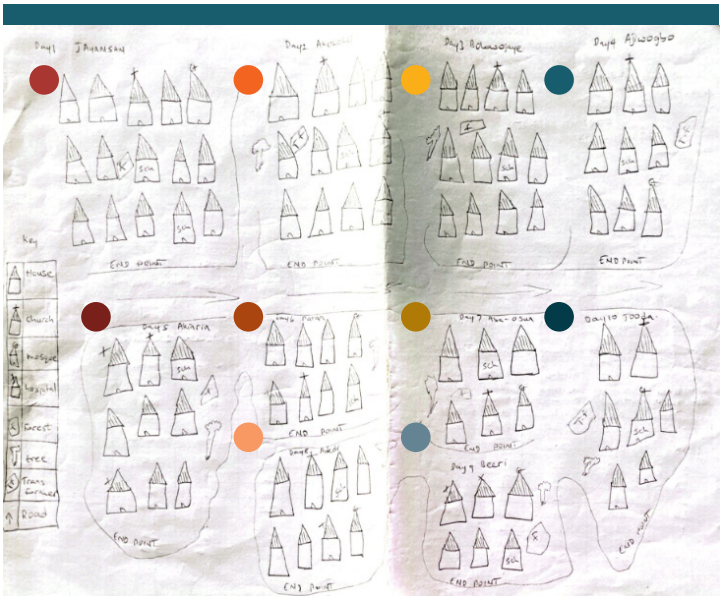
Improving planning for Nigeria's roll-out of the measles-rubella vaccine

In Oyo State, health staff used GRID3 data and maps to update their plans for the state's integrated measles-rubella campaign. Previously, health staff relied on hand-drawn maps to place vaccination sites and develop routes for vaccination teams, leading to sub-optimal plans.

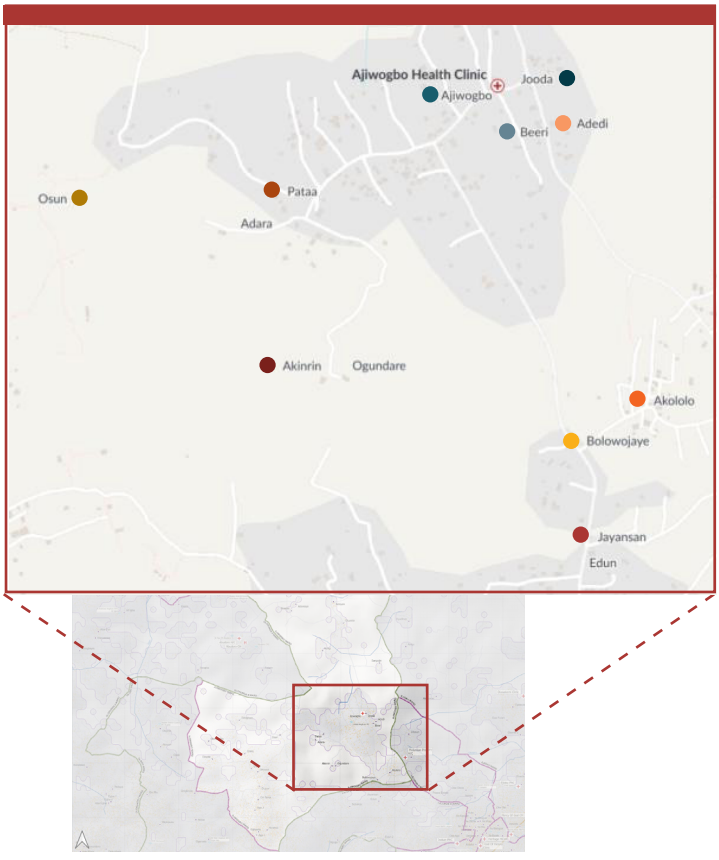
Using GRID3 maps, health workers in Egbeda LGA were able to plan based on more accurate location information. Across the LGA, improvements included **adding another vaccination post, changing the daily schedule of vaccination teams, and adding three settlements to their plans** that had been previously missed but were represented on GRID3 maps.

> "The use of GRID3 maps significantly strengthened the planning and implementation of the integrated measles–rubella campaign. GIS mapping enabled accurate identification of settlements, especially hard-to-reach, underserved, and previously missed communities. This improved microplanning, guided team movement, and reduced duplication or missed areas during service delivery."
>
> ADEDIRAN ADEMOLA O.,
> OYO STATE IMMUNIZATION OFFICER

Before
Hand-drawn maps in Ajiwogba Ward, Egbeda LGA



After
GRID3 maps with up-to-date spatial data



EXAMPLE: KONGO-CENTRAL, DRC

Improving polio campaign coverage through spatial innovations

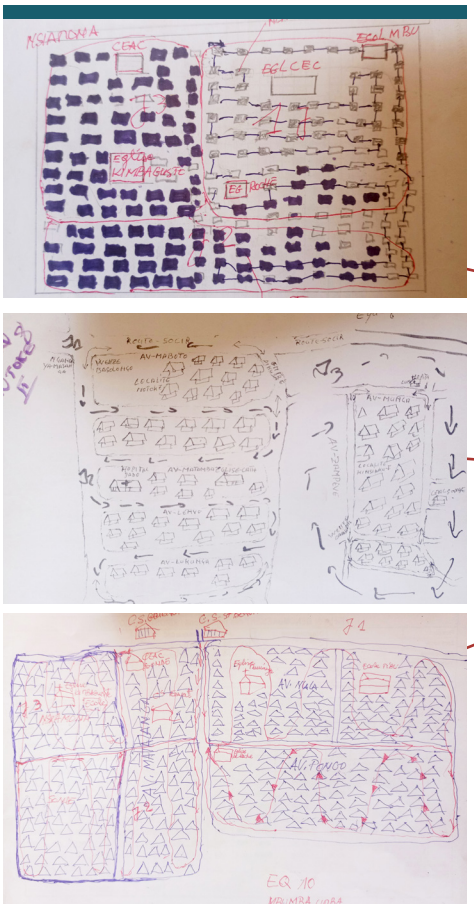
GRID3 supported local health staff in Kongo-Central Province with three polio interventions between May and September 2025. Using a three-step approach, GRID3 leveraged its data, technical support, and the GTS to help ensure vaccines reached every community.

Step 1: Spatial planning

GRID3 replaced traditional hand-drawn maps with digital maps for more accurate spatial planning. GRID3 data were first used to divide settled areas into spatial target areas for each campaign. To ensure vaccination teams were allocated to areas where children actually live—optimizing travel time and resources—these target areas were further divided into "vaccination areas" based on location and population data. Under this model, one vaccination team is assigned to one specific vaccination area, ensuring clear ownership and total coverage.

For example, in Muanda C Health Area (May 2025), GRID3 assigned 10 teams to specific spatial vaccination areas. This data-led planning resulted in **73 percent of all targeted areas being visited**, compared to 58 percent across all campaigns, by the end of the campaign.

Before
Hand-drawn maps



After
GRID3 map with optimized vaccination areas

GRID3 polio support

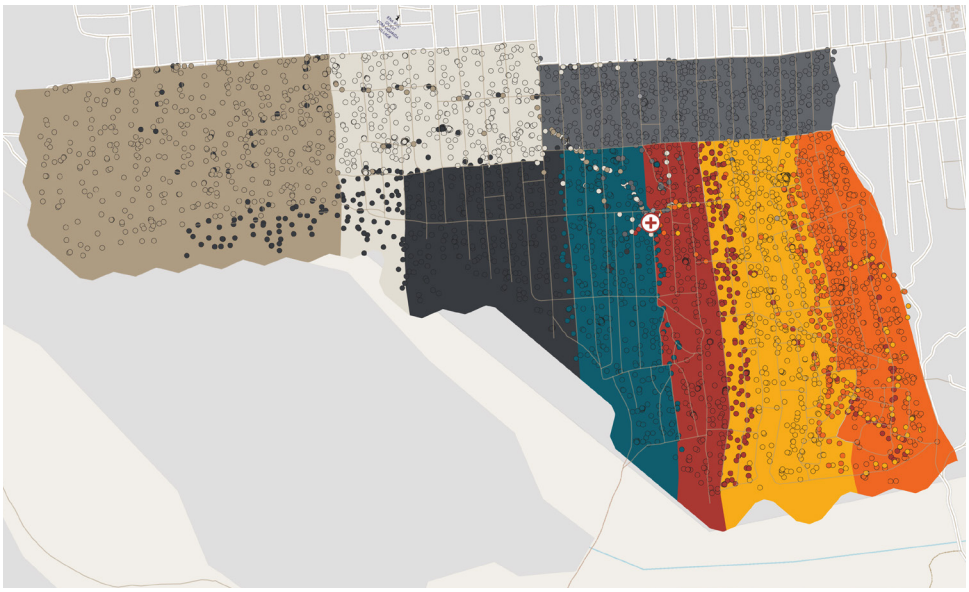
The DRC continues to face significant challenges in controlling poliovirus outbreaks, due to low routine immunization coverage, large-scale population displacement, and limited access to remote or insecure areas. Over the past three years, GRID3, in collaboration with COUP and other in-country partners, has supported polio eradication efforts by delivering spatial data, maps, and analyses; providing training on the GTS and Vaccine Buddy devices to health workers; and assisting with vaccination team tracking and cold chain monitoring.

In 2025 alone, GRID3 directly contributed to at least 226 children receiving their first-ever dose of the polio vaccine in seven health zones across four provinces.

Step 2: Tracking vaccination teams

Using the GTS, GRID3 monitored daily vaccination team movements, allowing supervisors to see if teams were following their assigned routes and if certain neighborhoods were being missed. This transparency enables health officials to make immediate adjustments for the following days, redirecting teams to unvisited areas to ensure campaign coverage is as high as possible.

For example, in Ngoyo Health Area (July 2025), GRID3 monitoring guided vaccination teams to follow their assigned plans with **74 percent compliance and led to a total campaign coverage of 75 percent of all target areas.**



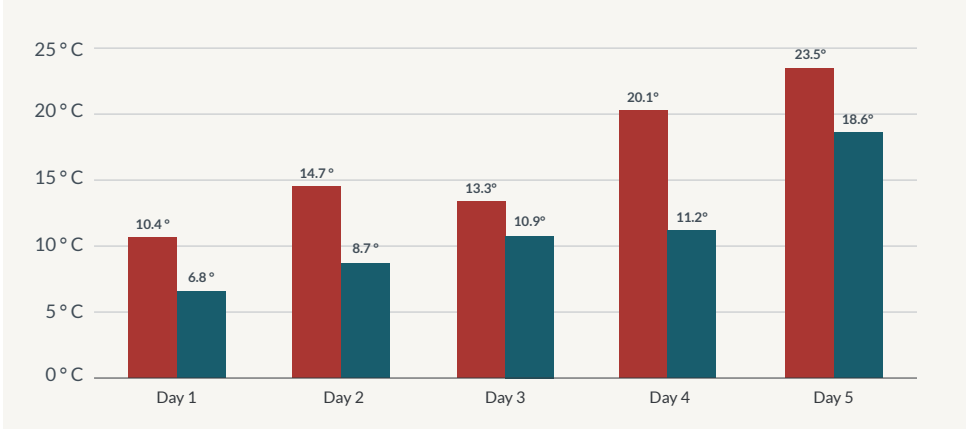
Comparison of vaccination team assignments vs. actual areas visited in Ngoyo Health Area, Kongo-Central Province

Step 3: Monitoring the cold chain

A polio vaccine is only effective if it stays cold, ideally between 2 and 8° C. In 2025, GRID3 rolled out Vaccine Buddy to monitor the temperatures of vaccine coolers and vaccination team movements through integration with the GTS.

For example, in **Muanda Health Zone**, GRID3's monitoring in May 2025 showed temperatures were consistently too high. This visibility allowed local health officials to better guide vaccine teams in safeguarding the cold chain. By the August campaign, the average cooler temperature had **decreased by 5.6° C**. While the average temperature (9.7° C) was still above the ideal range, this reduction was a significant step toward preserving vaccine potency and ensuring children receive an effective dose.

> "If we look at past campaigns, that is, previous years without GRID3, there is a really big difference. Because now we can actually see whether households have been visited."
>
> SUELA PHILIPPE NKOSA,
> MÉDECIN CHEF DE ZONE, MUANDA HEALTH ZONE, KONGO CENTRAL PROVINCE



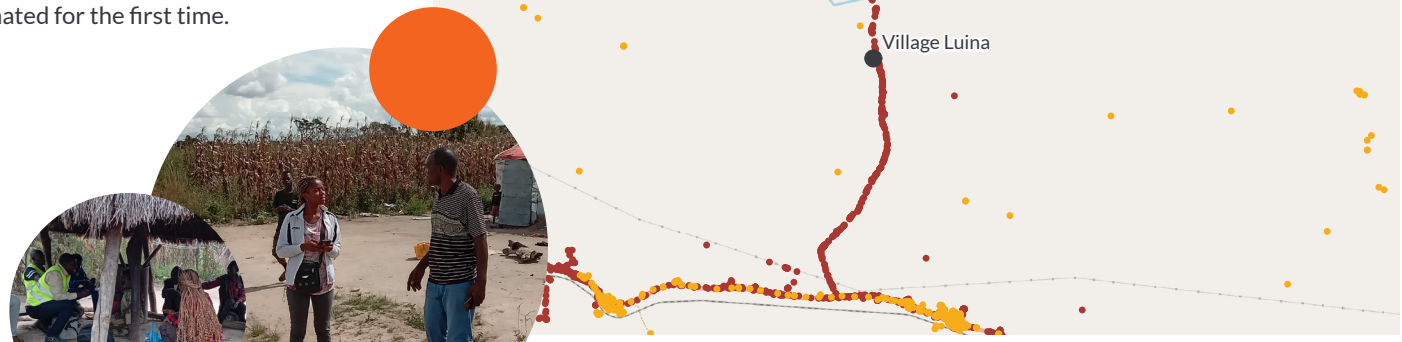
EXAMPLE: HAUT-KATANGA, EQUATEUR, AND KONGO-CENTRAL PROVINCES, DRC

Helping polio campaigns reach zero-dose children

By cross-referencing high-resolution settlement data with campaign plans and historical GTS tracks, GRID3 can identify communities that have been entirely missed by the health system. In 2025, this work led to the discovery and vaccination of more than 226 children in 7 health zones in 4 provinces who had never received a single vaccine.

Haut-Katanga

In Kitotwe Health Area, Haut-Katanga Province, GRID3 analyzed data from a 2023 campaign that had been tracked using the GTS and identified settled areas that had not been visited at the time. During the April 2025 polio campaign, the team traveled to this remote region and discovered four permanent villages. After confirming that these villages were previously unknown to local health officials, they returned the next day with a vaccination team, and 18 zero-dose children were found and vaccinated for the first time.



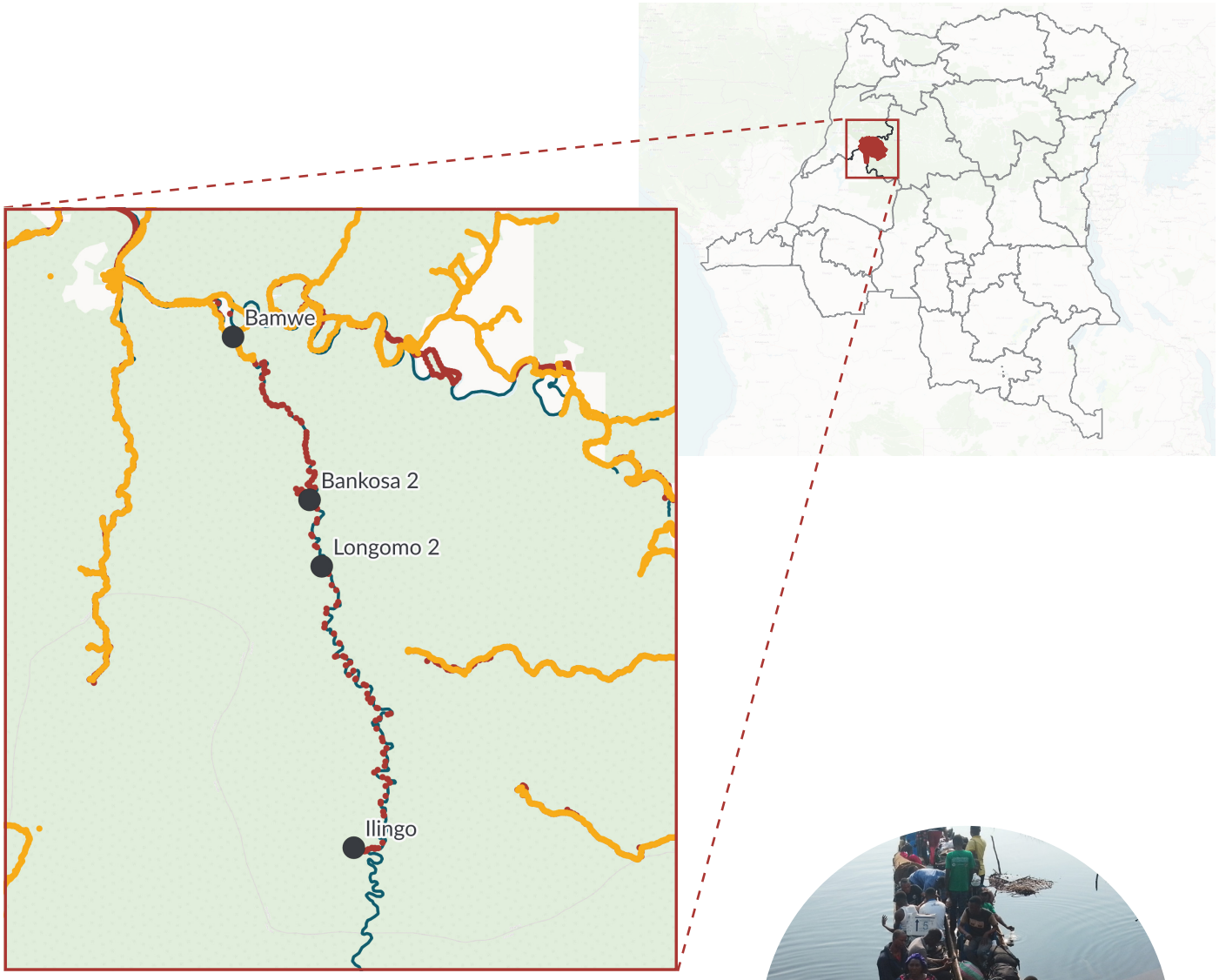
Previously-missed villages in Kitotwe Health Area (Chez Kibambe 2)

Kongo-Central

In Nsiafumu Health Area, Kongo-Central Province, GRID3 identified an area on the outskirts of Madidi that had not been visited during the previous campaigns in 2025. While local health staff believed this was an uninhabited seasonal farming area, closer investigation found a permanent community of 167 households. Health workers identified and vaccinated 34 zero-dose children during the July 2025 campaign.

Equateur

In Lotumbe Health Zone, Equateur Province, GRID3 identified settled areas along the Lokoro River that had not been visited during the previous campaign in October 2025. The health zone staff thought these areas were uninhabited due to frequent flooding, but during the November-December campaign GRID3 and local health officials traveled down the river and located four villages, where 13 zero-dose children were found and vaccinated.



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