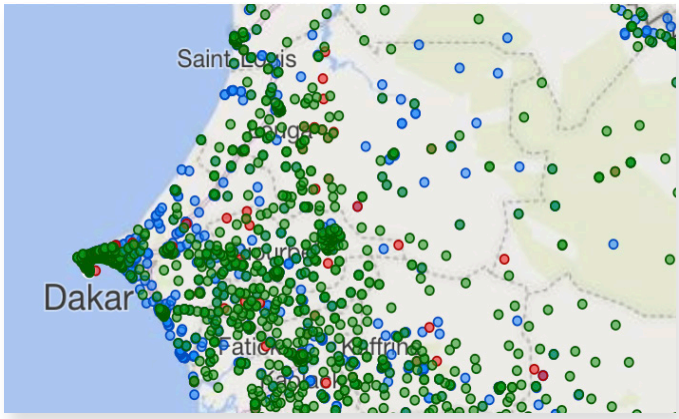
GIS: Data for action and visualization capacity building

Challenge: New technologies are essential for fighting polio. They must improve several surveillance capacities, including acute flaccid paralysis (AFP) and environmental surveillance, among other health programs.

Solution:

GIS (Geographic Information System) technologies offer an ideal solution for polio surveillance and can provide services for other health programs. Since 2017, WHO established a regional GIS Centre, and has since implemented series of capacity building programs through GIS focal points across the 47 countries in the African region. Training workshops are helping country data managers and key surveillance focal points (WHO country office and Ministry of Health GIS Focal Points) build capacity on GIS data analysis and visualization to support outbreak response activities and other interventions at regional, national and subnational levels.



Impact:

GIS capacity-building strengthened Member States' capacity to use GIS and technological innovations to support a variety of disease surveillance programs. These capacity building efforts contributed to the following key outcomes:

- Established network of over 120 GIS focal points across the 45/47 countries in WHO AFRO (2 Ministries of Health, and 1 WHO)
- Improved technical capacity in data analysis and information visualization using PowerBI, ArcGIS mapping software and other open source GIS mapping tools
- Improved design and deployment of data collection tools for polio and other disease areas including responses to COVID-19
- Equipped Member States with Smart Screen TVs to visualize ISS/eSURV/AVADAR and other country data for informed decision making in real time

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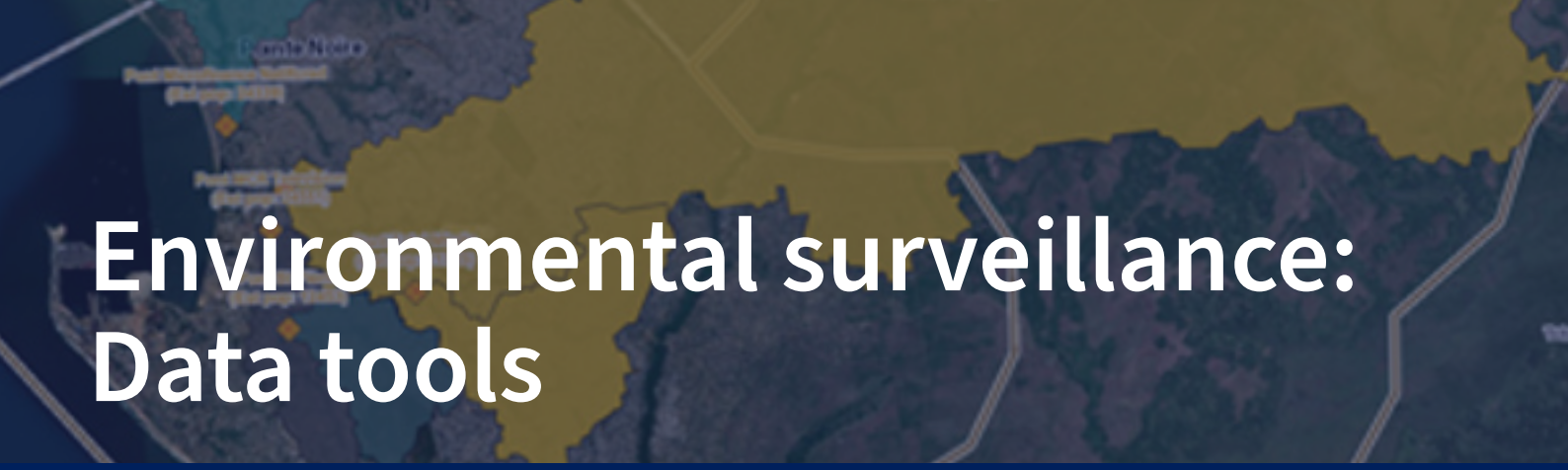

Environmental surveillance: Data tools

Challenge: Environmental surveillance (ES) is a key element in detecting and eradicating poliovirus. ES is difficult to accomplish at scale, as states have limited Public Health budgets and coverage issues often exist in less-densely populated or border areas. Surveillance units require further tools to overcome these challenges.

Solution:

Geographic information systems (GIS) based tools offer capabilities at scale to address surveillance challenges. An ES catalogue uses digital elevation models and bluelines collected on the ground to delineate catchment areas of ES sites and population Estimates.

ODK forms in mobile phones are used in:

- Site specification form: The information captured in the site specification form is used to update the global ES catalogue and also track the status of ES sites (Open, Closed) over time.
- Surveillance supervisory checklist: The information captured in this form helps to track the samples from the collection site to the lab and to monitor the application of ES SOPs during sample collection.
- Dashboards to track ES site performances ensure that low-performing sites and countries are detected and reported for action to be taken.

Impact:

Electronic data tools help to improve the site selection process, accountability of ES teams, and M&E of ES performance.

- Electronic tools help to support teams in identifying ideal locations and population estimates for ES site initiation, therefore, improving the likelihood of selecting good sites and reducing field workload.
- The use of mobile devices during collection ensures samples are collected when and where prescribed and that SOPs are respected, ensuring sample quality.
- Monitoring and Evaluation (M&E) tools provide valuable information to ES teams on the quality of ES surveillance.
  Good M&E tools further supports lab results that show the presence or absence of polioviruses in a given population.

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Environmental Surveillance: Overview

Challenge: Environmental Surveillance (ES) is essential for detecting and limiting the spread of Polio. Yet, laboratory workload, prioritization, country ownership, and laboratory supply shortages make ES difficult in Africa. The COVID-19 pandemic also limited surveillance and testing capacity, due to public health requirements and resource shifts.

Solution:

Due to recent outbreaks and continued cases of vaccine-derived polio, ES programs are being rolled out throughout Africa

- Environmental Surveillance involves wastewater collection around populated areas.
- Samples are then sent to laboratories for genetic sequencing.
- Positive samples serve as a warning to public health systems and organizations to prepare for supplementary immunization campaigns (SIVs).

Impact:

ES allows public health experts to pinpoint the locations of likely positive cases of polio virus. Environmental surveillance acts as an early warning system against polio outbreaks.

- Laboratory testing ensures that possible positive samples found in the field are positive
- Testing provides further granularity about the exact type of polio strain, allowing experts to determine which vaccines to distribute
- Environmental surveillance is essential to ensure that poliovirus is not circulating in populations or environments.

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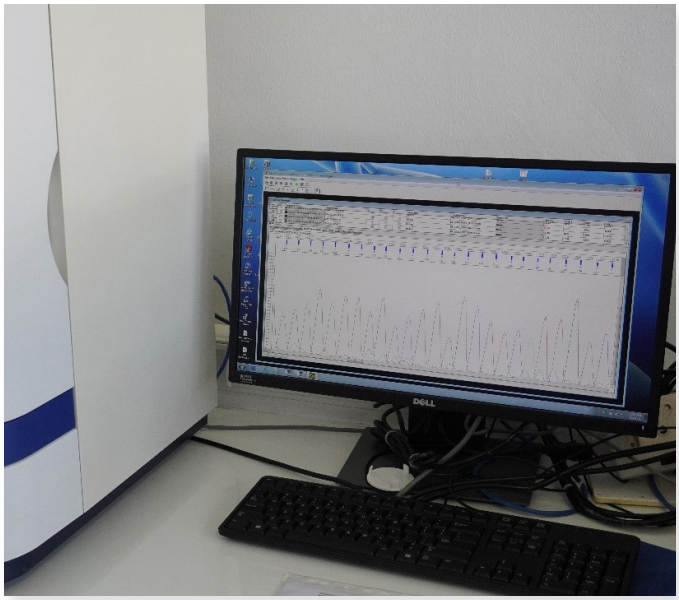
Genomic sequencing: A key tool for surveillance and alerts in Africa

Challenge: Polio outbreaks have increased during 2022 in Africa, yet African capacity for genomic testing is still limited. Rapid detection of cVDPV is essential, which is required to confirm cVDPV2 and trigger outbreak response preparations. However, Africa hosts only two sequencing labs, NICD in South Africa and the Nuguchi institute in Ghana, leading to delayed results.

Solution:

Further sequencing capacity is essential to combat polio. The genomic sequencing project was initiated to identify, train, pilot, test, and start sequencing of polio viruses in the region. PEP identified six new labs in Cameroon, DRC, Ethiopia, Nigeria, Kenya, Senegal, and Uganda.



Sequencing Platforms at NICD (Shelina Moonsamy, Howard Wayne)

Impact:

Labs with improved genomic capacity can assist their home countries and neighbors. Such labs help states move towards public health self-sufficiency.

Poliovirus sequencing at the country level substantially reduces the timeline between identification of a suspected poliovirus case and sequence confirmation.

- Sequencing benefits will be augmented when coupled with the introduction of direct detection methodologies that are being tested with stool samples.
- The project focuses on labs with the highest programmatic importance and where sequencing at country level will show the greatest impact on reducing analysis timelines.

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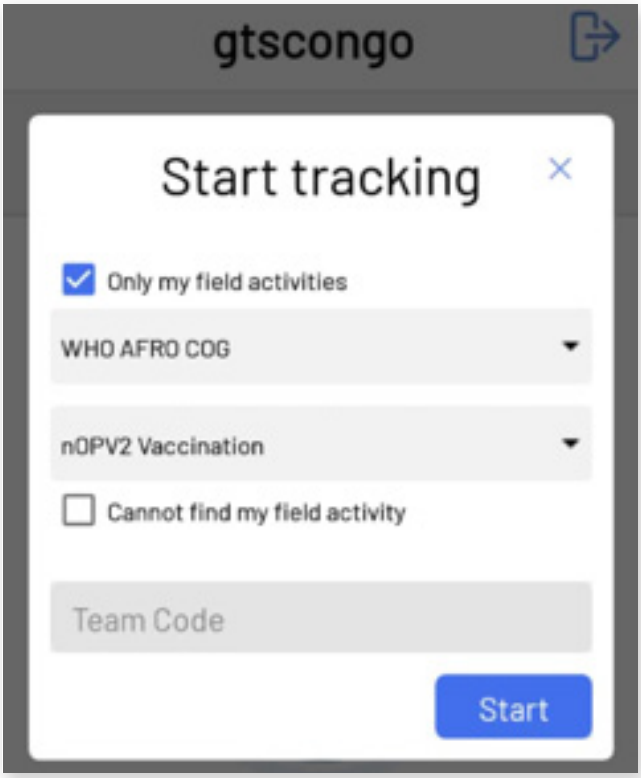
Geospatial tracking system (GTS)

Challenge: Poor campaign quality poliovirus vaccination campaigns are essential present accountability issues and may allow for future cases of poliovirus. The Polio Eradication Program (PEP) must harness new technologies to provide campaign metrics on the ground and improve campaign quality and accountability.

Solution:

GTS uses mobile phone and GIS technology to track vaccinator movement and visualize coverage in real time for campaign oversight. Geographic Information System (GIS) technologies help ensure the accountability of teams and provide significant evidence on the conduct of high-quality campaigns in the region.



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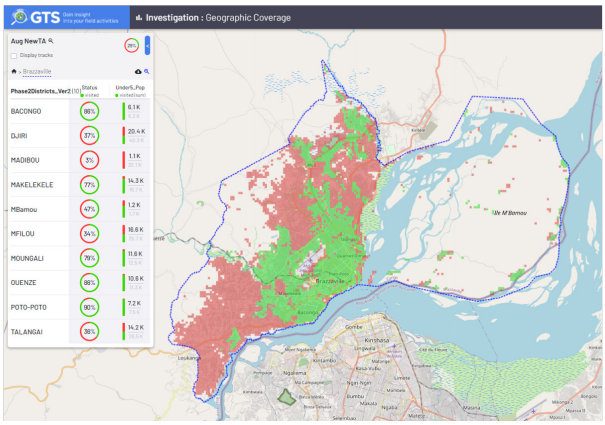
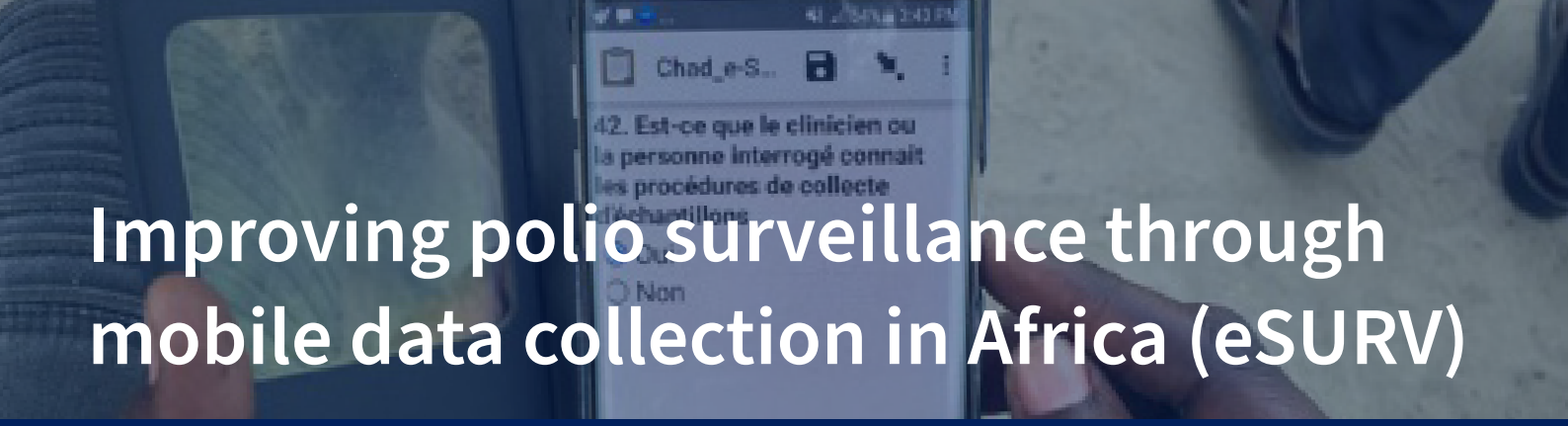
D4: GTS Geographic Coverage by Target Areas



Impact:

- GTS technology guides campaign activities and mop up to ensure that every child is reached, while ensuring campaign accountability.
- The tracking results can be used to effectively guide mop up activities by sending vaccinators to areas with limited or non-existent coverage of settlements.
- GTS produces data analytics, which can be uploaded and distributed for future planning activities.

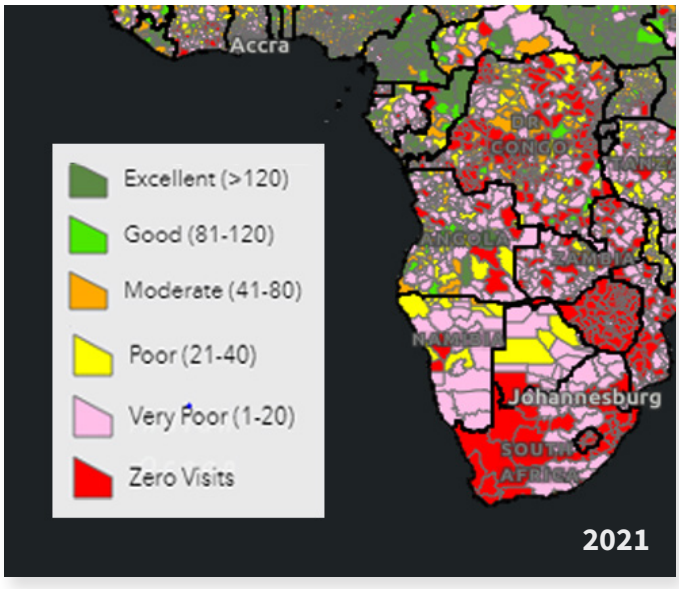


Improving polio surveillance through mobile data collection in Africa (eSURV)

Challenge: From Ebola to COVID-19, public health interventions require up-to-the-minute surveillance data to prevent pandemics. This is especially true for polio eradication in Africa. A solution should be a technologically-driven approach to crowd-sourcing data.

Solution:

Polio surveillance officers in Maiduguri, Nigeria, developed a small checklist, which then became an electronic platform known as eSURV, short for Electronic Surveillance. The tool comprises an electronic form accessed through a mobile application that also records staff geographic presence in the health facility for accountability.
A geo-coded phone application can be used to verify field activities.



eSURV sites visted by frequency in 2021

Impact:

eSURV has been rolled out in 45 African countries,

- It is now used beyond polio eradication to monitor active surveillance of priority diseases
- It can also identify disease outbreaks happening in an area
- Continuous data analysis permits the identification of non-reporting, silent areas and areas having weak surveillance performance so corrective actions can be taken.

GIS and technological solutions provided significant evidence for improved surveillance, campaign quality, and contributed to the attainment of the Wild Polio Virus Certification for the WHO African Region.

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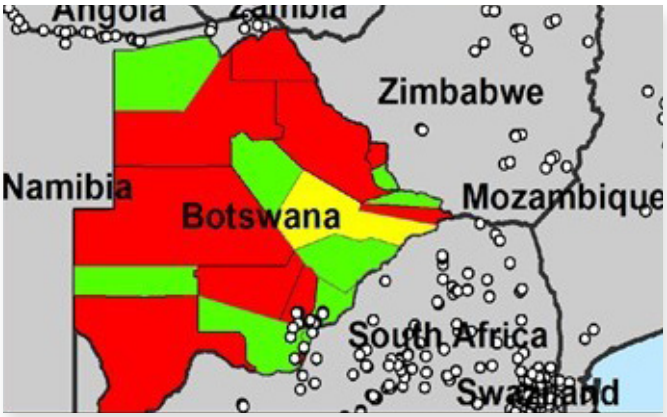
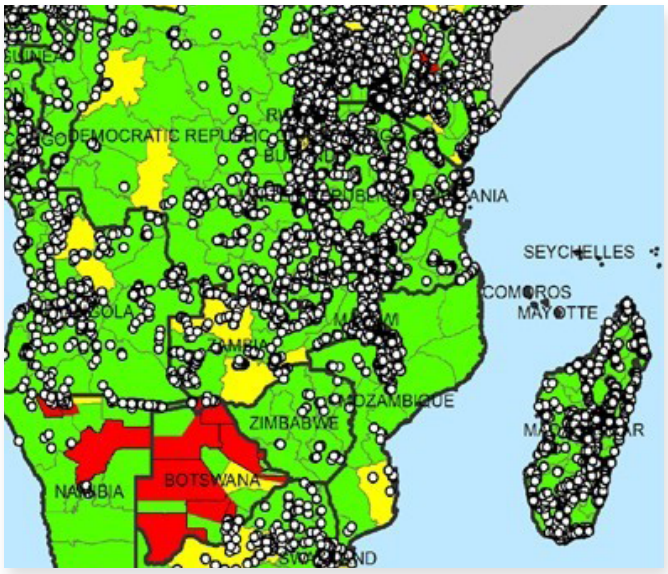
Integrated supportive supervision (ISS) program

Challenge: Routine immunization and public health procedures must be of the highest quality, especially in areas where frequent disease outbreaks occur. The challenges presented by Polio require the very best from immunization professionals, regardless of situation. Innovative technological responses are required to boost immunization efficiency, ensuring every child is protected from Polio.

Solution:

The Integrated Supportive Supervision (ISS) program offers a way for WHO to augment front-line worker quality. It is an integrated electronic checklist for supervision on active case finding and routine immunization. ISS helps transform the understanding of Acute Flaccid Paralysis (AFP), one of the primary symptoms of polio, among frontline workers. These workers can then better fight polio in the future.





Impact:

ISS proved particularly useful in Zambia, where it led to increases in health worker knowledge on AFP cases. This includes:

- Updated immunization monitoring charts
- Better knowledge of AFP case definition among healthcare workers
- Better knowledge of AFP case files among healthcare workers

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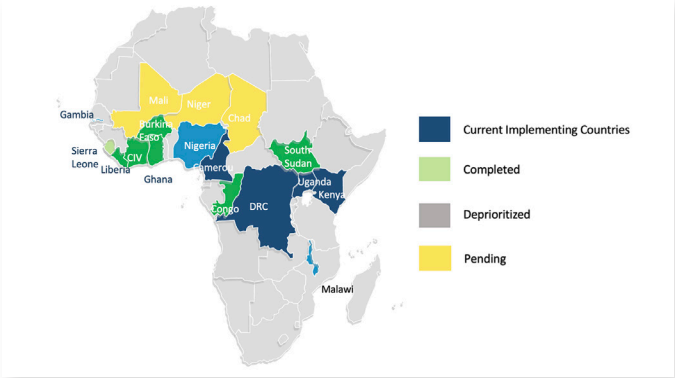
Mobile money: A must for funding public health interventions in Africa

Challenge: While frontline workers continue fighting poliovirus, they have often been confronted by limited quick and direct payment methods for their life-saving work. Such problems included delayed funds disbursement, lack of transparency, excess layers required for funds transfer. All of these have led to lower motivation, hiring, and retaining abilities.

Solution:

The Polio program designed and has begun implementing a digital payment system to reduce lag time and ensure timely payment of funds to polio campaign frontline workers. Ensure direct payment of campaign workers with little to no leakage of funds.

Build evidence through research and document processes to be scaled up to other countries, and other public health interventions.



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Impact:

Over the past year, WHO-Africa developed a database and paid over 100,000 workers in 12 countries:

- *Uganda*: Enrollment is ongoing nationwide with 203,400 beneficiaries enrolled.
- *Malawi*: Mobile money payment will be used in the 3rd and 4th rounds of the polio campaign in July and August, respectively.
- *Kenya*: Go ahead was given by Ministry of Health for implementation. Enrollment to commence in June 2022.
- *Nigeria*: Database creation has started in Kano state using Commcare and will be scaled up to all remaining 35 states.
- *Cameroon*: Enrollment for the first round of the polio campaign has been completed with 72,000 beneficiaries enrolled.
- *DRC*: Mobile money payments were implemented in North Kivu, South Kivu, Lomami, Sankuru, Tshopo, Tanganyika provinces for the polio campaign in April 2022.

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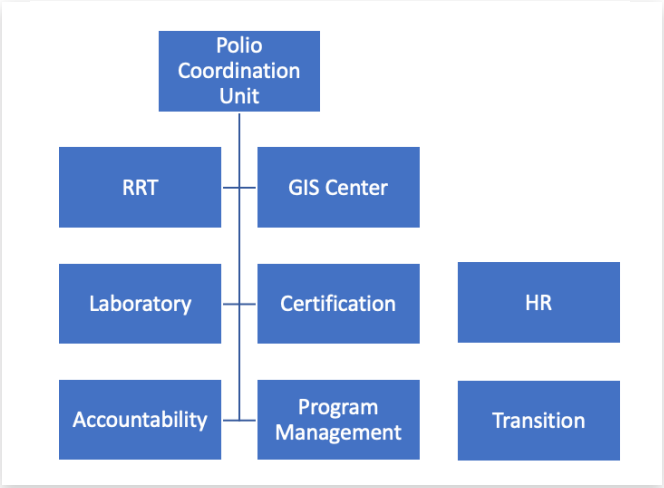
Polio coordination in Africa

Challenge: While the African Region was certified as free from wild poliovirus, the risk of importation of wild polio and the ongoing outbreaks of variant polio require strong regional coordination, particularly through WHO's Regional Office for Africa.

Solution:

- The Polio Coordination Unit (PCU) at WHO AFRO supports members states and the region by coordinating polio activities.
- The PCU is comprised of six functional units: GIS Center, Laboratory, Rapid Response Team (RRT), Certification, Accountability, and Program Management. The PCU also has linkages to support from Transition, Procurement, and HR.



Impact:

PCU functional units support a wide variety of public health activities:

- *RRT*: leads Global Polio Eradication Initiative (GPEI) responses in the region for WHO and partners.
- *GIS*: uses innovative technologies to support polio surveillance and response, as well as other public health programs
- *Laboratory*: coordinates the work of 18 GPLN labs in the African region for rapid polio detection.
- *Certification*: ensures the highest quality of surveillance is maintained to achieve certification against all forms of polio
- *Accountability*: uses a monitoring and evaluation framework to ensure the highest efficiency of resources used
- *Program management*: provides crosscutting and enabling support for all sub-units and oversees the budget.

Ramp up response

Challenge: Today the African region is responding to outbreaks of vaccine-derived polio, introducing a new vaccine, and maintaining vital surveillance systems to eradicate all forms of polio in the region. WHO and partners must establish a rapid recruitment and management system for consultants to be deployed in support of these operations in order to ensure quality and rapid operations.

Solution:

- Polio Eradication Program (PEP) is leveraging the power of the private sector to provide flexible and fast consultant support services.
- This mechanism allows for rapid recruitment, safe deployment and routine monitoring of consultants in the field. This new mechanism allows for fast deployment and management of consultants across Africa Region to support essential Polio eradication activities, including campaigns against WPV1 and VDPV1 & 2 and surveillance strengthening.
- It is designed to be flexible to meet the emerging needs of the program, by getting the right people to the right place at the right time. Deployment to remote an insecure areas is a key advantage of this mechanism.

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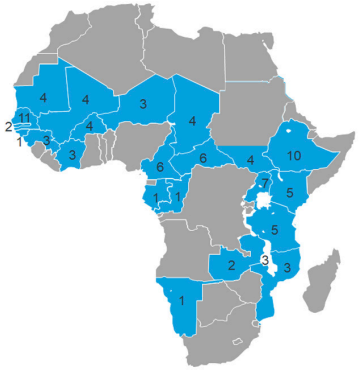
Impact:

Ramp-up responses have assisted critical public health actions across Africa in 2022:

- Deployed 93 consultants in 22 countries (including 88 field epidemiologists)
- Expanded consultants in database to 600 (100% increase from 300 in March 2022)
- Monitored activities including SIAs, Surveillance visits, HCPs trained
- 11 consultants deployed in 2 weeks for WPV1 outbreak
- Further expands WHO/AFRO's field capacity through speed, access, and accountability.



Geographic distribution of 2022 consultants as of June 2022

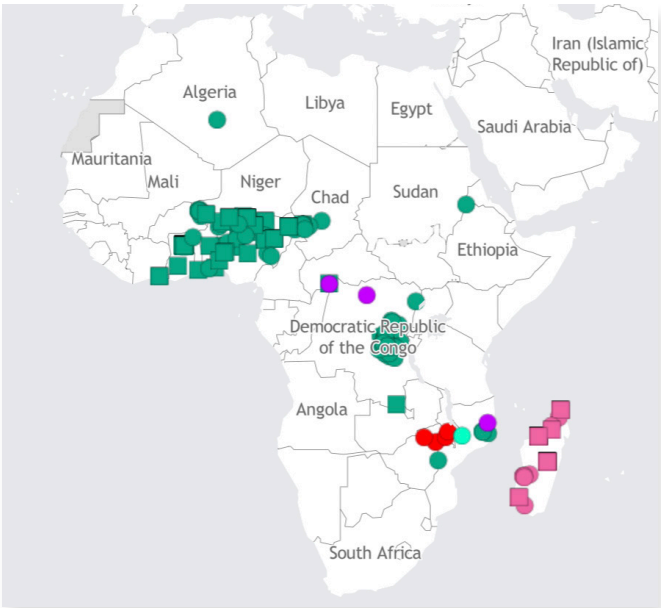
Rapid Response Team (RRT)

Challenge: Polio outbreaks can occur with little warning and sometimes in remote locations, as was seen by the 2022 Wild Poliovirus cases in Malawi and Mozambique. To prevent cases from occurring and spreading, WHO needs a team capable of deployment, surveillance, and tracking to fight polio outbreaks at the source.

Solution:

The Rapid Response Team (RRT) uses a flexible organizational structure and the dedicated work of partners to:

- Conduct heightened surveillance throughout the region
- Continuously track virus data
- Deploy specialized teams of experts to stop outbreaks within 48-72 hours of their detection.



Impact:

Provided key support for vaccination campaigns across Africa:

- Provided strategic responses to cVDVPV2 and WPV1 outbreaks.
- Implemented bOPV vaccination campaigns across the region
- Conducted surveillance programs across Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe to detect further Wild Poliovirus Type 1 cases
- Deployment to Malawi in February 2022 within 48 hours of known case.
- Established key payment processes for front-line workers in remote locations.

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Web-IFA: A new data management approach

Challenge: Polio's Information for Action (IFA) data management system is over 20 years-old, and is becoming obsolete, incompatible with new operating systems, and does not work well with new programs (ES, PID, and data synchronization). A new system is critical for detecting and responding to potential outbreaks.

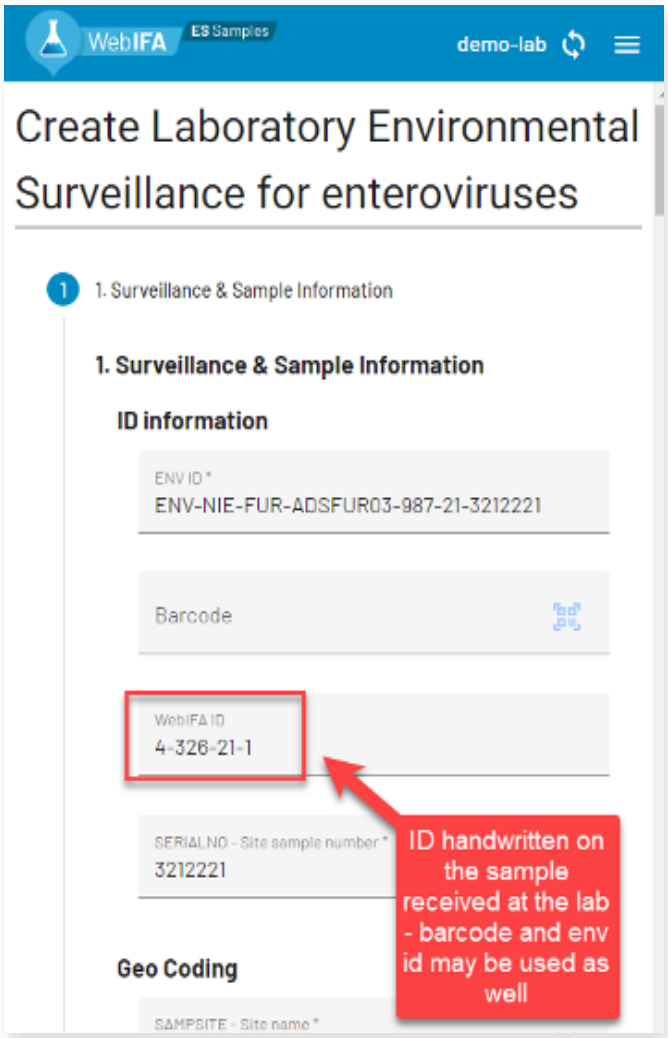
Solution:

A web-based online system (Web-IFA) that enables access to real time data via an internet connection and uses a centralized platform consolidating all surveillance and lab data in one place (case, specimen, environmental samples, and lab results). The Web-IFA uses a streamlined workflow, supports data collection in the field and is paperless, thereby eliminating double or multiple entries.

Impact:

Web-IFA transition is leading to:

- Better data quality by reducing duplication, paper errors, and lab overload
- Integrated surveillance and lab information on a single platform
- Simplified data access through a "one system" approach



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