



COALITION to STRENGTHEN  
the HPV IMMUNIZATION  
COMMUNITY

# AFRO GIS Centre Innovations for Immunizations

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CHIC SPC Symposium

HPV Vaccination Programs: From Pre-introduction Planning to Restoration and Sustainability

24 – 25 Sept 2022 – Addis Ababa, Ethiopia

**POLIO** GLOBAL  
ERADICATION  
INITIATIVE



World Health  
Organization

Regional Office  
for Africa

# Background of AFRO-GIS Center

The AFRO-GIS Center was established by the Polio Eradication Program (PEP) with funding from the Bill and Melinda Gates Foundation (BMGF) and inaugurated by the Regional Director, Dr Matshidiso Moeti in February 2017

**MISSION:** To improve the health and wellbeing of people through the collective investment and effective application of Geographic Information Systems (GIS) and mobile technological solutions to provide timely, corroborated and reliable geospatial information products to support polio certification efforts, health emergencies and other public health initiatives

# Technical Support Areas for Polio and Other Diseases

- Mapping baseline data (admin boundaries, health facilities, points of interest such as schools, etc).
- GIS for Micro Planning
- Establishing Rapid Population Estimates (RPE)
- Real time tracking of vaccination teams and other field activities
- Integrated Supportive Supervision (ISS)
- Auto-Visual AFP Detection And Reporting (AVADAR) and AVADAR Multi-Disease
- Electronic Surveillance (eSURV)
- Environmental Surveillance
- Support for Rapid Response to outbreaks
- Capacity Building for WHO and MoH in GIS technologies



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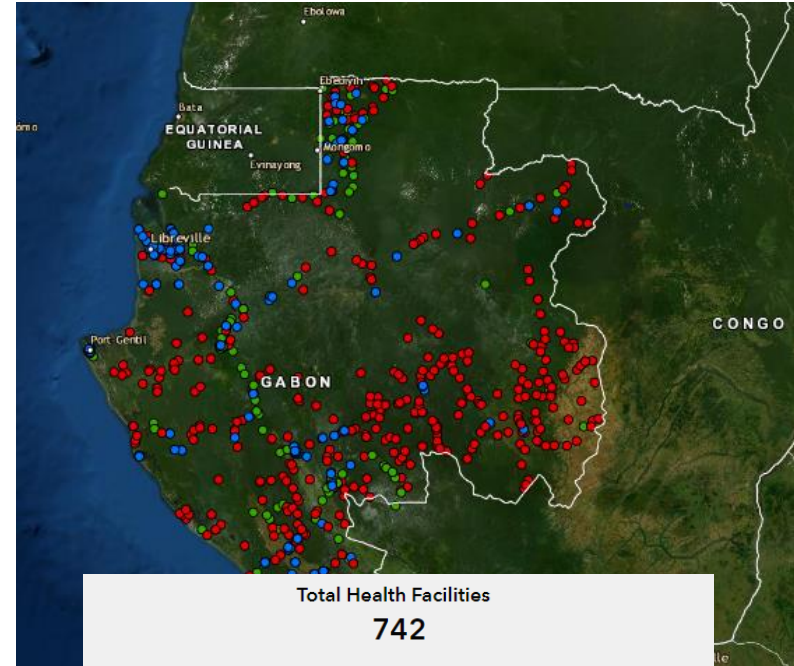
# **Baseline Map Production and Data Collation for Microplanning for Campaign Planning and Routine Immunization**

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# Producing a Master List of Health Facilities in Gabon

Through the Integrated Supportive Supervisory and electronic Surveillance visits from Jan to August 2022:

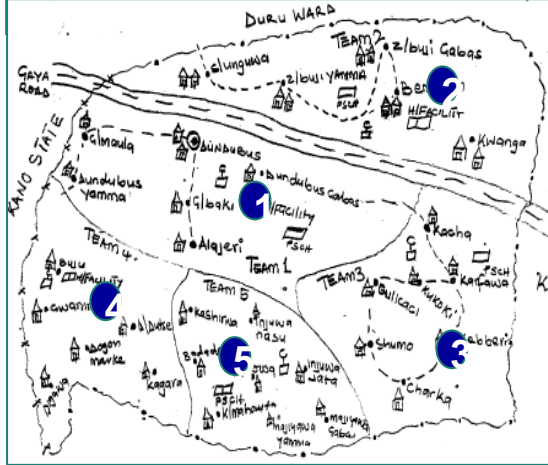
- **1512** visits in **333** sites. **23%** of the masterlist sites (542) were reached at least once in 2022
- 56% of the masterlist of health facility were completely silent with different districts which shows very low visits compared to their baseline



Total Health Facilities	<b>742</b>
Total MLHF Visited in ISS /eSURV	<b>126</b>
Silent Health Facility	<b>416</b>
New Health Facility from ISS/eSURV	<b>200</b>

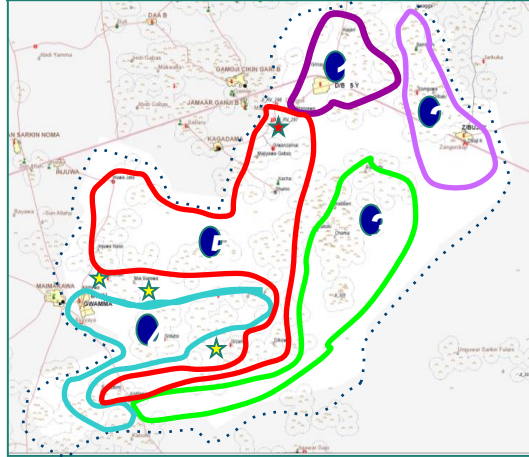
# More Accuracy in Microplanning using GIS Maps

## 1) Original hand drawn map for microplan



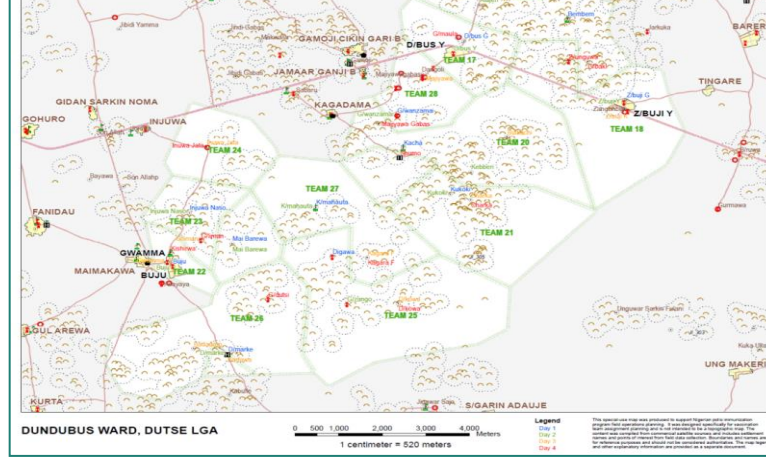
Hand-drawn maps are usually incomplete and inaccurate

## 2) GIS map showing incomplete coverage of ward with 5 teams



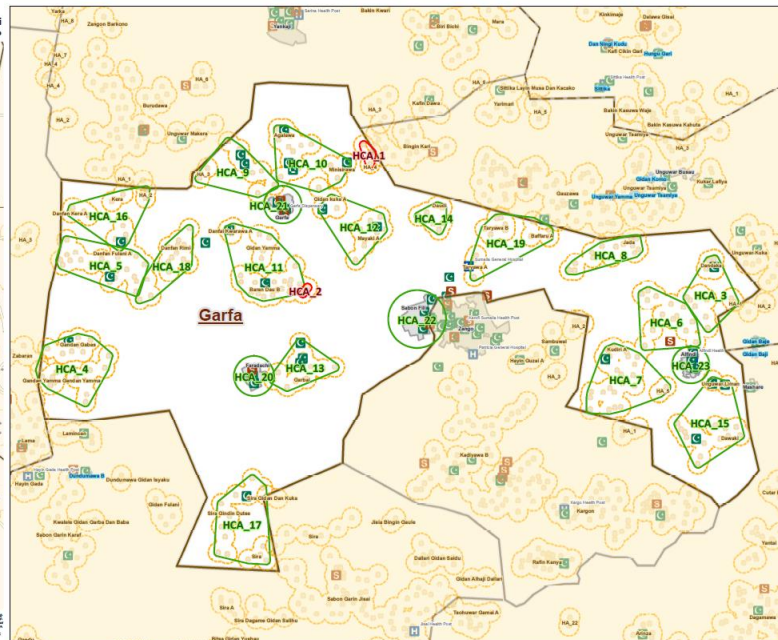
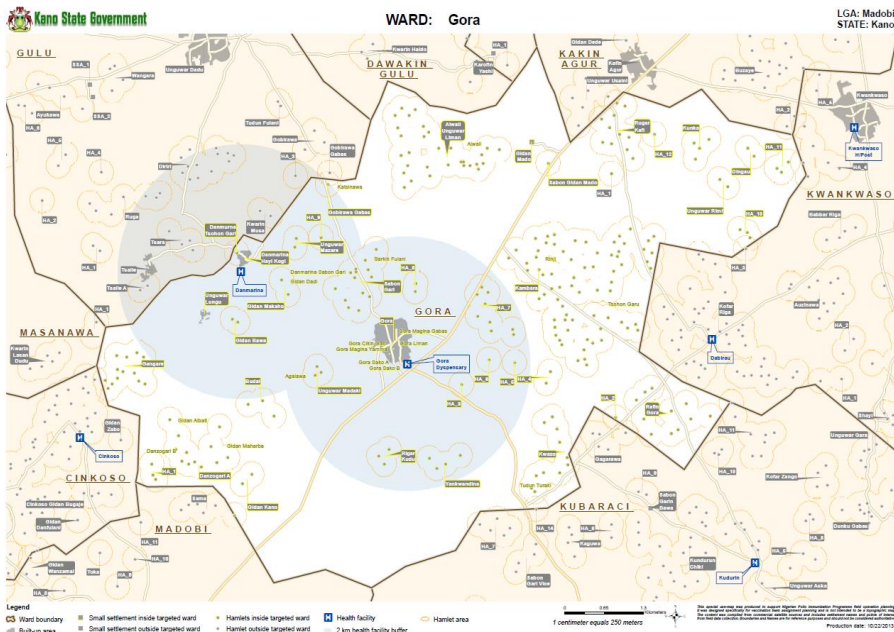
The micro planning process includes use of ward maps and settlement lists with target populations

## 3) Revised microplan map based on GIS data with optimized 11 vaccination teams



GIS maps and population estimates promote more effective and efficient microplanning

# GIS Basemaps Supporting Microplanning for Routine Immunization in Kano State, Nigeria



**Ward:** Garfa  
**LGA:** Sumaila  
**State:** Kano

Total target pop: 7829  
Total # of HC's : 16.0

Area Name	Rural Target Pop	Urban Target Pop	# HC Days
HCA_1	27	0	6.1
HCA_2	31	0	5.8
HCA_3	120	0	2
HCA_4	188	0	3
HCA_5	188	0	3
HCA_6	120	0	2
HCA_7	224	0	4
HCA_8	120	0	2
HCA_9	89	0	1.6
HCA_10	162	0	2.8
HCA_11	238	0	3.8
HCA_12	197	0	2
HCA_13	89	0	1.6
HCA_14	81	0	1.1
HCA_15	143	0	2.8
HCA_16	116	0	2
HCA_17	116	0	2
HCA_18	120	0	2
HCA_19	120	0	2
HCA_20	2	1082	11
HCA_21	0	1076	11
HCA_22	0	2287	23.1
HCA_23	0	85	8.8
<b>Total</b>	<b>2388</b>	<b>5248</b>	<b>92.5</b>

Mapping Health Facilities and settlements around them- we can even map out the schools or other points of interest in the catchment areas

Planning for Health Camp Days in Kano State

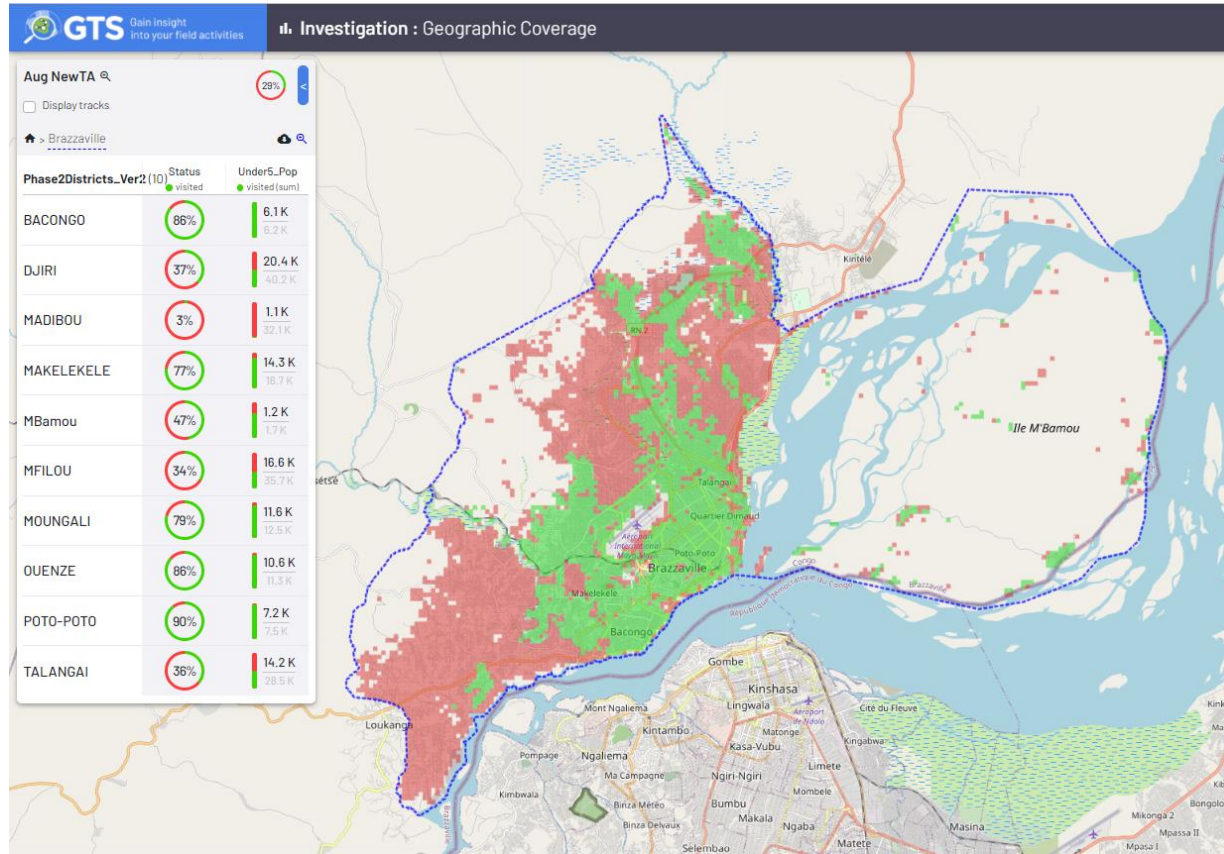
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# Real Time Tracking of Vaccination Teams and Activities

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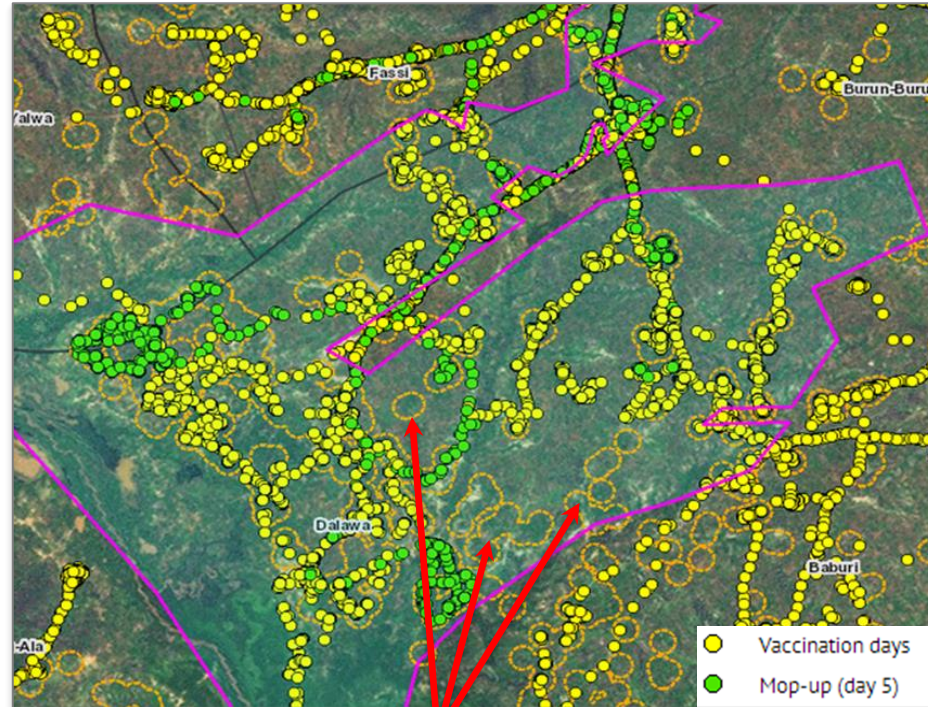


# Real Time Tracking of Vaccinators in the Field During a 2021 nOPV2 Campaign in Brazzaville



# Tracking Vaccination Teams to find Children in the Targeted Communities

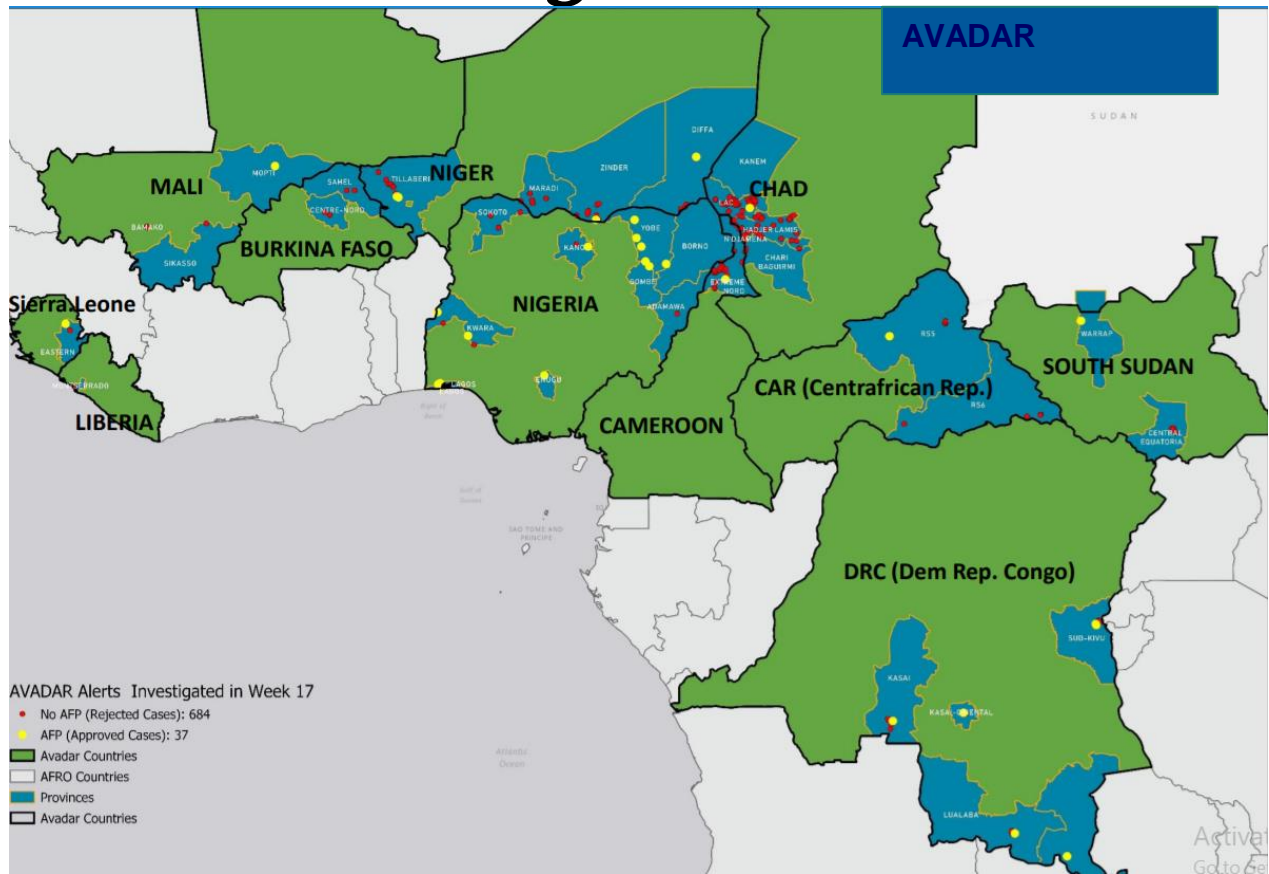
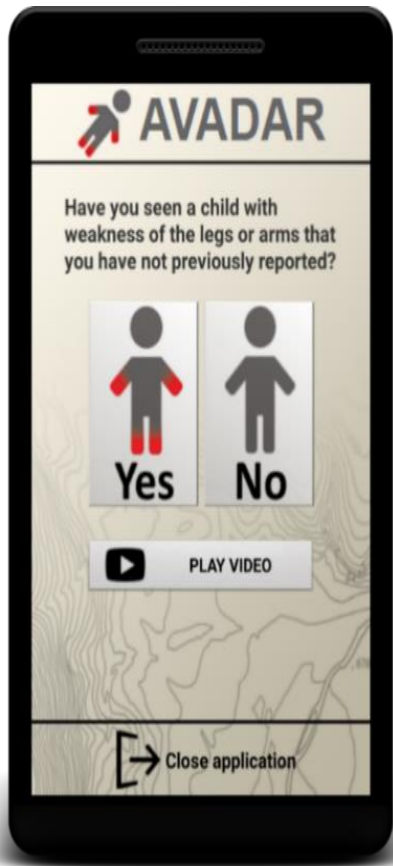
- A 2015 Polio Campaign in Kano State, Nigeria (4 Days and 1 Mop-Up Day)
- After mop up activities, the post campaign MSL is generated after validation by the GIS team
- The final list is then shared with government and partners:
  - For mop up and in between round activities
  - Investigation of vaccination coverage



April 2015 Missed Settlements by LGA		
State	LGA	# Missed Settlements
Bauchi	Bauchi	18
Bauchi	Ningi	78
Bauchi	Toro	57
<b>Bauchi Total</b>		<b>153</b>
Jigawa	Birnin Kudu	9
Jigawa	Kaugama	1
Jigawa	Kiyawa	1
Jigawa	Ringim	3
Jigawa	Sule Tankakar	3
<b>Jigawa Total</b>		<b>17</b>
Kano	Bebeji	1
Kano	Bichi	1
Kano	Dawakin Kudu	1
Kano	Fagge	1
Kano	Gaya	2
Kano	Kiru	1
Kano	Takai	1
Kano	Tofa	1
<b>Kano Total</b>		<b>9</b>
Katsina	Batsari	13
<b>Katsina Total</b>		<b>13</b>
Kebbi	Arewa Dandi	2
Kebbi	Bagudo	3
Kebbi	Yauri	1
<b>Kebbi Total</b>		<b>6</b>
Sokoto	Bodinga	2
Sokoto	Illele	3
Sokoto	Kebbe	2
<b>Sokoto Total</b>		<b>7</b>
Zamfara	Bungudu	10
Zamfara	Maru	60
Zamfara	Tsafe	17
Zamfara	Zurmi	27
<b>Zamfara Total</b>		<b>114</b>
<b>Grand Total</b>		<b>319</b>

**missed settlements**

# Real Time Tracking of AFP Cases through the AVADAR Program



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# Potential local solutions

## Data collection, Monitoring and Micro Planning

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# Routine Immunization Data Collection Parameters

## ISS ( Integrated Supportive Supervision)

### Rationale

ISS is an Integrated Electronic Checklist used for supervision during Active Case Search and Routine Immunization.

It is mostly administered by WHO and Gov't personnel via Smart android mobile phones in the field at Health Facilities and Focal Sites

These supportive visits are automatically mapped on a WHO server in AFRO.



### Form Contents

**eSurveillance:** Contains all the questions on Active surveillance, Unreported cases of AFP

**Routine Immunization:** Questions about:

- Planned , fixed, conducted, outreach, interrupted sessions
- Stock out of RI supplies
- Number of Vials
- Status of cold chain monitoring
- Functional Refrigerator
- Funding for RI

A screenshot of a mobile application interface titled "OPEN DATA KIT Integrated Supportive Supervis...". The screen displays a checklist in French: "LISTE DE VERIFICATION POUR VACCINATION DE ROUTINE". The questions listed are: "32. Est-ce que le centre offre un service de PEV de routine?", "33. Est-ce qu'il y a un micro plan à jour pour Atteindre Chaque District (ACD) (6 derniers mois)", "34. Est-ce qu'il y a un calendrier de vaccination pour le PEV de routine?", "35. Combien de sessions fixes on été planifiées le mois dernier?", "36. Combien de sessions fixes on été effectuées le mois dernier?", "37. Combien de sessions de sensibilisation ont été planifiées le mois dernier", "38. Combien de sessions de sensibilisation ont été effectuées le mois dernier?", and "39. Est-ce qu'une session de...". At the bottom, there are two buttons: "Go To Start" and "Go To End".

### Frequency of Data Entry

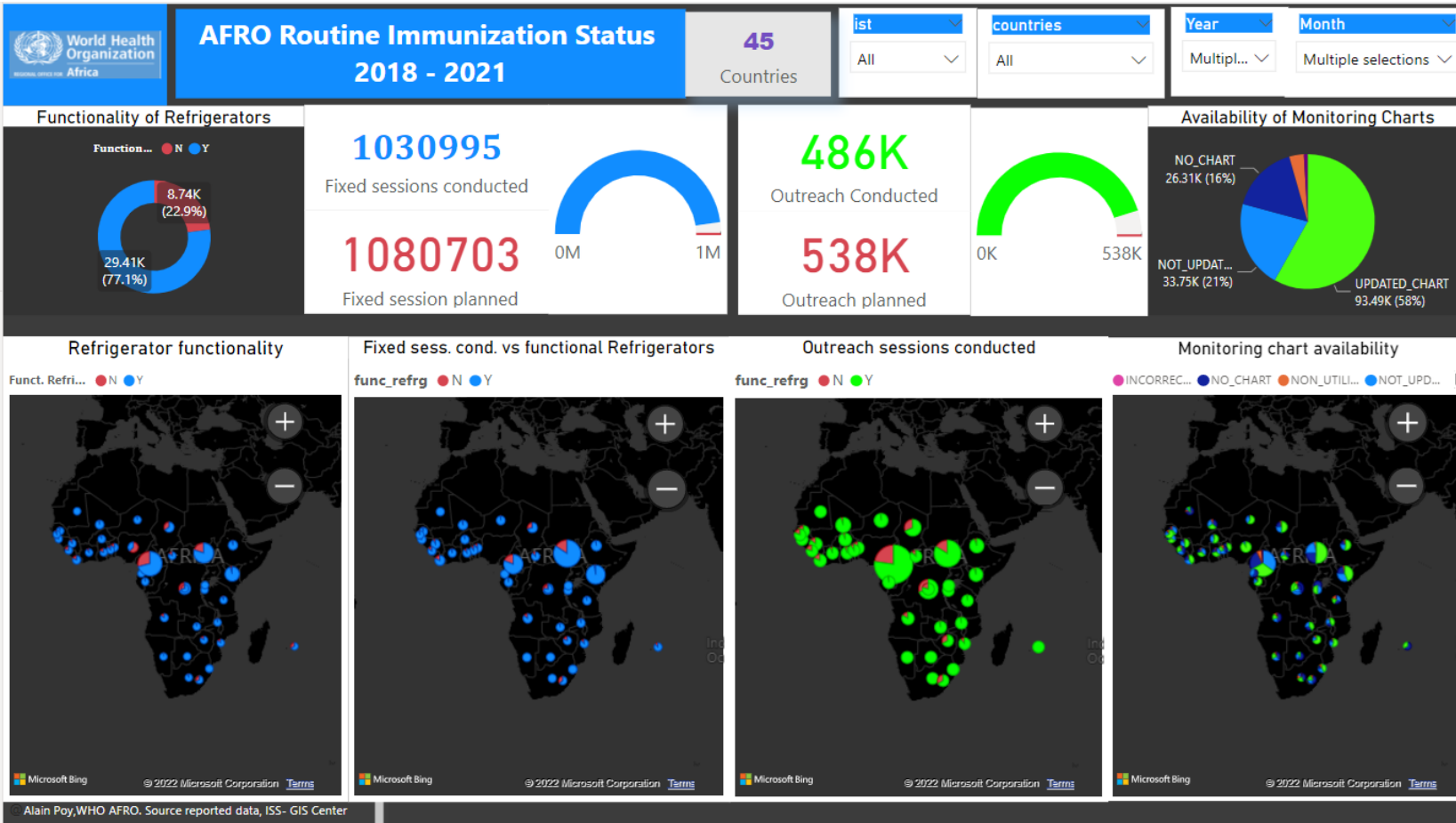
**Highest priority sites:** Refugee / IDP camps/High-risk borders/Nomadic populations: 2 x per week

**High priority sites:** AFP case would very likely seek care, High patient workload, pediatric unit ,physiotherapy units 1 x per week

**Medium priority sites:** AFP case would likely seek care; 1 x every 2 weeks

**Low priority sites :** AFP case would perhaps seek care:1 x per month

# Monitoring Immunization Activities



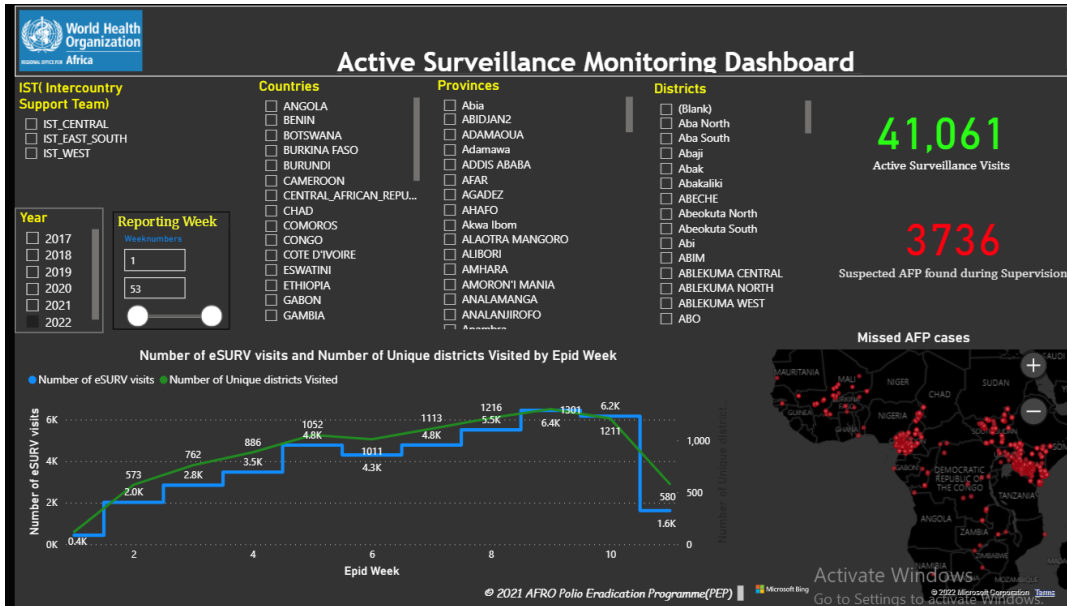
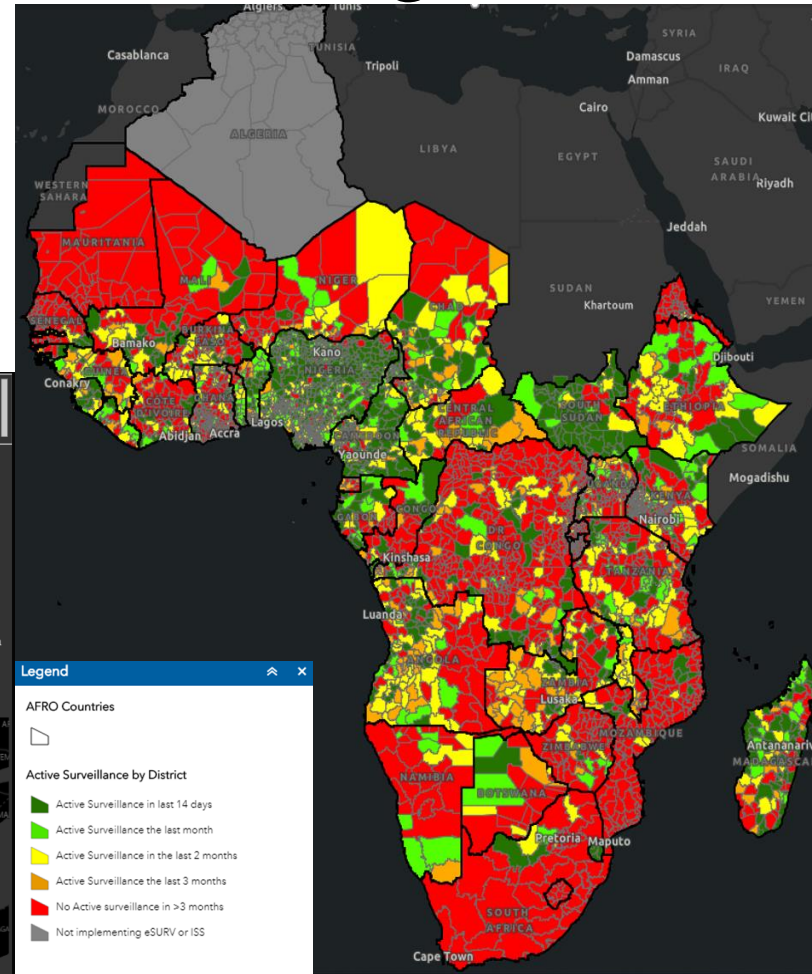
45/47 countries Reports frequently

Data Monitored Daily

# Regional Surveillance Performance Monitoring

**Impact:** e-SURV/ISS has been rolled out in 45 African countries

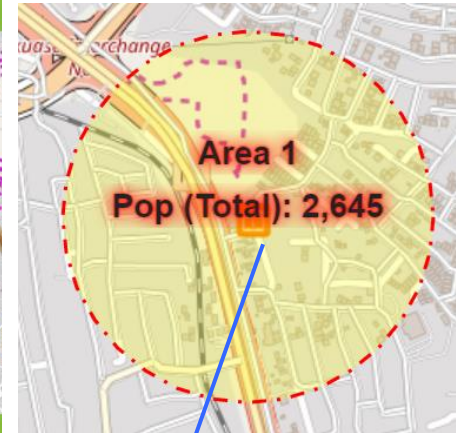
- It is now used beyond polio eradication to monitor active surveillance of priority diseases
- It can also identify disease outbreaks happening in an area
- Continuous data analysis permits the identification of non-reporting, silent areas and areas having weak surveillance performance so corrective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



# GEOPODE: A Potential HP Micro Planning Solution for HPV

The platform provides access to interactive geographic, population and demographic data to support micro planning and other field activities in the countries for which rapid population data has been generated.

E.g. a 500m buffer created around a school showing estimated total population of 2,645 people



School

Geopode Ghana Map

Go to XY  
Long:   
Lat:

Select population  
Age range [0 to 100]  
Gender  
 Male  Female  Total  
 Show Areas Table

Points of Interest

- Church
- Commercial
- General
- Health Facilities
- Infrastructure
- Mosque
- Natural
- School**
- Security
- Water

Settlements

- Hamlet Areas
- Small Settlement Areas



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# **Other Innovations and Support Provided by the AFRO-GIS Center**

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# Putting Everything in One Place: Information Hub for Polio Rapid Response

Home Our GPEI Coordinators Live Virus Tracker Country Summary Campaigns (SIAs) Deployment Tracker More ▾

nOPV2 Introduction Global Tracker / [Wider Use](#) Go to Initial Use Dashboard

Performance summary

Total Countries	33	Verified Countries	22	Countries with Global Pending	2	Countries with Regional Pending	(Blank)	Countries under revision process	2
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The Africa Rapid Response Team (RRT)

POLIO Home Our GPEI Coordinators Live Virus Tracker Country Summary Campaigns (SIAs) Deployment Tracker More ▾

Performance breakdown by country and region

Country	Verified	Global Pending	Regional Pending
Burkina Faso	13	0	0
Burkina Faso	13	0	0
Cameroon	13	0	0
Chad	13	0	0
DRC	13	0	0
Ethiopia	13	0	0
Ghana	13	0	0
Kenya	13	0	0
Liberia	13	0	0
Mali	13	0	0
Mauritania	13	0	0

Wider Use Requirements Details (13)

- A1 Confirmation that a national coordinating mechanism/body has been created and technical committees have been established to oversee preparations for nOPV2 across the following critical areas: a) cold chain, logistics and vaccine management; b) safety/easeability; c) advocacy, communications and social mobilization; d) surveillance, and e) laboratory
- B1 Official documentation (letter, meeting minutes) confirming national decision by the relevant national immunization body to use nOPV2 for outbreak response B2 Documentation from the NRA confirming approval for the import and use of nOPV2
- C1 National logistics plan is updated to include a) cold chain equipment inventory and gap analysis; b) updated vaccine management tools for nOPV2 (SD dose vial); and c) vaccine management plans, outlining how re-training and disposal will be handled
- D1 National surveillance guidelines and supporting documents are updated to include a) plans for active case search at priority sites; b) plans confirming ED site follow-up for all AFP cases with nOPV2 detected in stool samples; and c) plan for collecting vaccination coverage data from community members around AFP nOPV2 cases. D2 Provide evidence that the ICF has been adapted (if needed) and records policy routine and SIAs dates by submitting a ICF fixed in. D3 A Primary immunodeficiency Diagnostic (PID) specialty chestnut has been completed

		2021												2022				
		SEP			OCT			NOV			DEC			JAN				
COUNTRY	NAME	R1 DATE ↑	27	04	11	18	25	01	08	15	22	29	06	13	20	27	03	10
GUINEA	PREVENTIVE CAMPAIGN BOPV - GUINEA	22/10/2021				R1												
CENTRAL AFRICAN REPUBLIC	PREVENTIVE CAMPAIGN BOPV- CAR	22/10/2021				R1												
ETHIOPIA	ETH-114DS-08-2021	22/10/2021				R1							R2					
CHAD	PREVENTIVE CAMPAIGN BOPV - CHAD	29/10/2021				R1												
SENEGAL	SEN-79DS-01-2021	11/11/2021																
MAURITANIA	MAU_57DS_08-2021	11/11/2021																
UGANDA	UGA-148DS-08-2021	12/11/2021																

Tracking VDPVs and Response Rounds in AI No issues detected AFRO POLIO GIS CENTER/RAPID RESPONSE TEAM (RRT)

VDPVs 2021 VDPVs 2020 VDPVs 2019 Overview

Country:	None	Province:	None	District:	None	Virus Type:	None
420 # Viruses	261 # vDPV2 (AFP)	125 # vDPV2 (ENV)	13 # vDPV2	54 # Viruses in Response Zone	366 # Viruses in Response Zone		

**Virus List**

- ENV-KEN-MOM-MVI-MGC-21-001
- ENV-SEN-DAK-PIK-KHO-21-088
- RSS-WAR-GGE-21-003
- RSS-UNI-PAY-21-001
- ENV-SIL-WEA-WAU-CTB-21-001
- ENV-SIL-WEA-WAU-KCS-21-001
- ENV-SIL-WEA-WAU-MSB-21-001
- NIE-SOS-GAD-21-001

**VDPVs 2021**

Virus Type

- vDPV1
- vDPV2
- vDPV1
- vDPV1 (ENV)
- vDPV2
- vDPV2 (ENV)

**VDPVs 2021**

**vDPV1/2 (AFP/ENV) by Month of Onset**

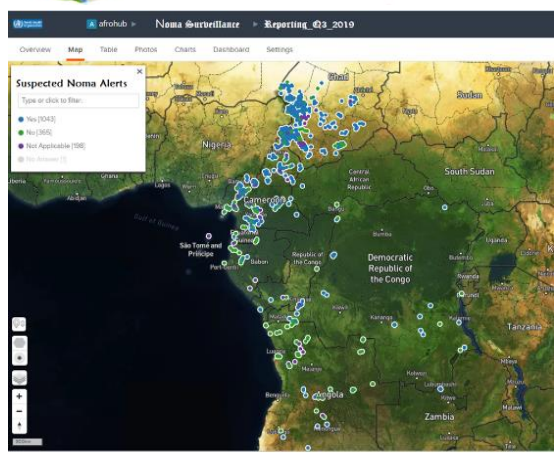
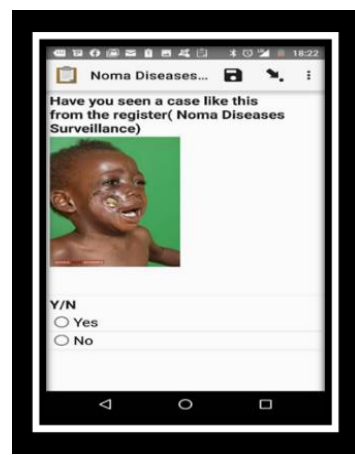
Powered by Esri

The innovation has simply transformed the email repository of sharing *dashboards on pre, intra and post campaigns, SIA Calendar, consultant deployment, tracking viruses and response rounds* to a simple one Stop Shop where all the information visualization products are available in near real time

<https://afro-rrt-who.hub.arcgis.com/>

# GIS Support for COVID Vaccination Activities in the Region

- Using existing polio program solutions as entry points such as eSURV/ISS, several tools and dashboards were developed by the Polio-GIS Centre to support COVID-19 response
  - COVID-19 monitoring dashboard
  - Contact Tracing APPs
  - Service Continuity Tracking Tool
  - COVID Vaccine readiness assessment
  - IHR Measures and COVID-19 variants Dashboards
- The GIS Centre collaborates and supports other disease areas e.g. Noma disease surveillance and mapping schistosomiasis prone areas



# Key Stakeholders



RRT-POLIO

WHO/AFRO-ISTs

WCO-AFRO



WHO-HQ

MoH-AFRO

BILL & MELINDA GATES foundation





Merci

Thank You

Asanteni



GIS Capacity building for IST West Africa countries-  
Dakar/Senega



GIS Capacity building for IST Central countries-  
Libreville/Gabon



GIS Capacity building for ESA countries- Nairobi/Kenya

## Participants

- GIS focal points
- Data Managers
- Surveillance Officers

