AFRO GIS SUMMIT 2025

Partnering to End Polio through the use of Innovative Approaches to reach Every Last Child

World Health Organization
African Region

AFRO GIS CENTRE

polio global eradication initiative

BILL & MELINDA GATES foundation

21 - 24 January 2025

Brazzaville, Republic of Congo

Session III: GIS Applications and Innovative Technologies in Public Health: Reflections on Past GIS Summit Recommendations

Martin De Wulf, CTO @Bluesquare

Dashboards for GPEI

PROJECT HIGHLIGHT

Global Polio Elimination Initiative (GPEI)
Campaign Planning and Tracking

KEY PARTNERS: WHO AFRO, UNICEF, Global Polio Eradication Initiative (WHO, CDC, BMGF)

DATA INTEGRATION AND PROCESSING

Use of two Bluesquare software data platforms (IASO and **OpenHEXA**) for the integration of the following data flows from 68 countries:

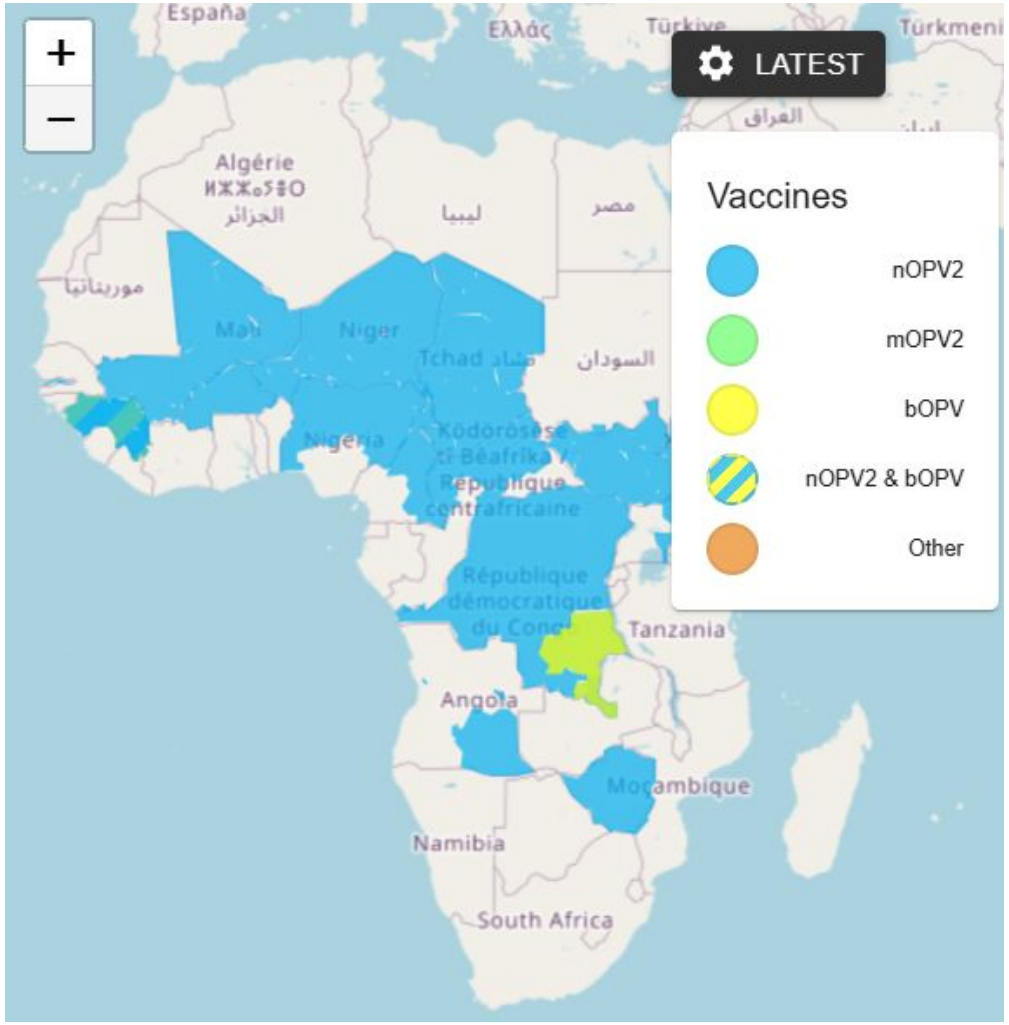
- geographical scope,
- round dates,
- key planning dates,
- preparedness level,
- virus cases,
- monitoring and evaluation with key indicators

OUTCOMES

A dedicated **web app (polioutbreaks.com)** is used to manage polio vaccination campaign data, including data before, during, and after campaigns, with a strong emphasis on geographical data management, to organize the data and present it on maps.

Dashboards embedded in the WHO website (RRT hub), including notably:

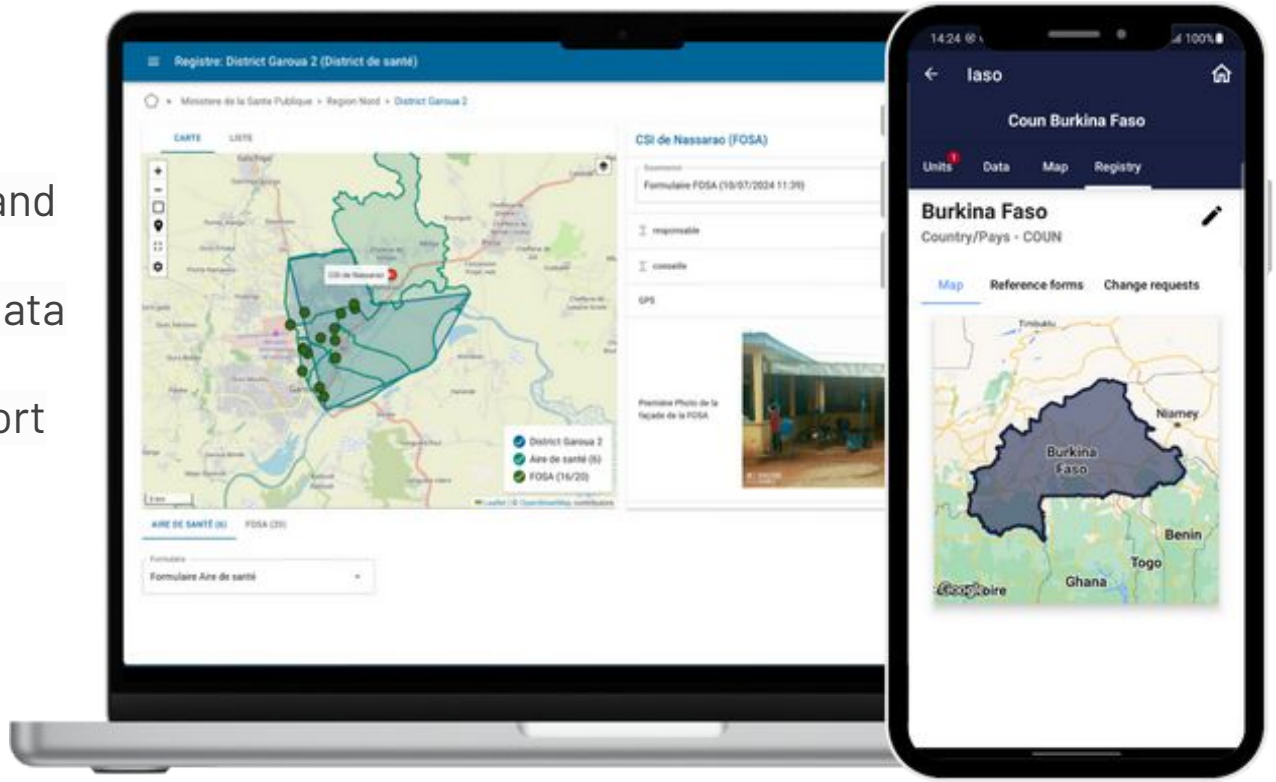
- SIA calendar with scopes per vaccine type
- Preparedness levels tracking
- Vaccines management: real-time stocks monitoring, cold chain, chronogram of activities, stocks levels reports



We build on top of IASO

IASO is an open source Georegistry

- Manage your **Master Facility Lists**
- **Data validation:** users propose changes and supervisors can **approve or reject**
- **Compare, Match and Merge** geographic data sources
- **Geopackage, DHIS2 and CSV** import/export
- **DHIS2** bi-directional integration
- **Track changes** to your geo data
- **Data versioning**
- **Public visualization interface**



https://www.openiaso.com/

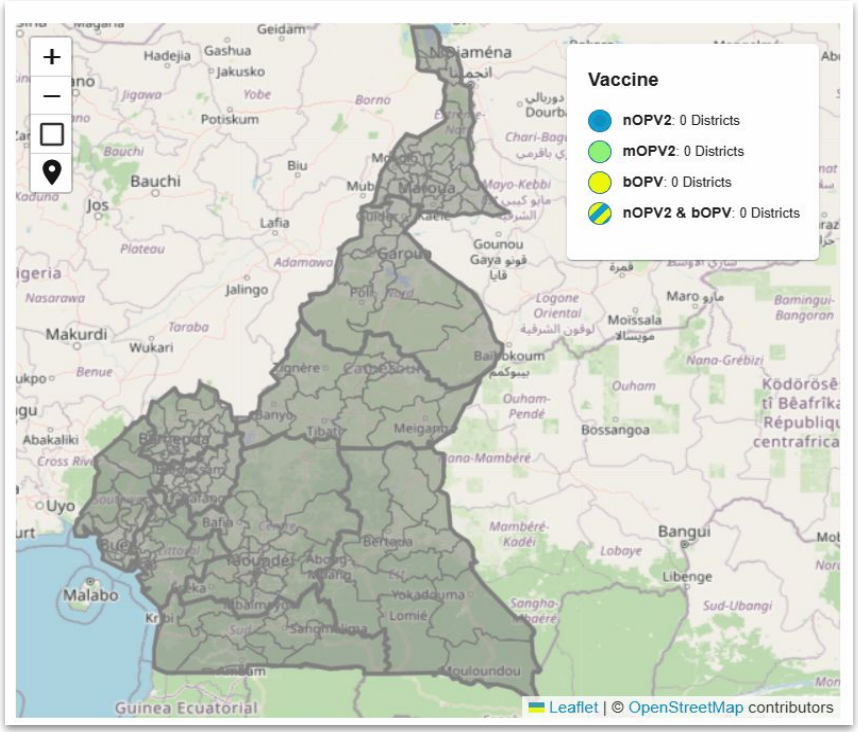
Digital Public Goods Alliance

Recognized as a **Digital Public Good**

Campaigns

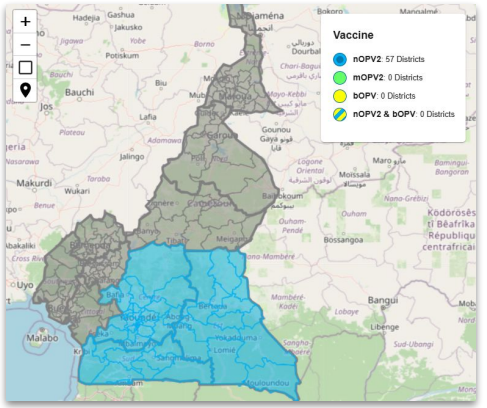
Campaigns data entry

- Key dates
  - Rounds
  - Virus notification
  - Budget approval
  - LQAS/IM
- Geographic scope
  - Per vaccine type (nOPV2, mOPV2, bOPV, nOPV/bOPV)
- Risk assessment
  - Target population
  - Target age groups
- Evaluation (LQAS/IM)
- Preparedness

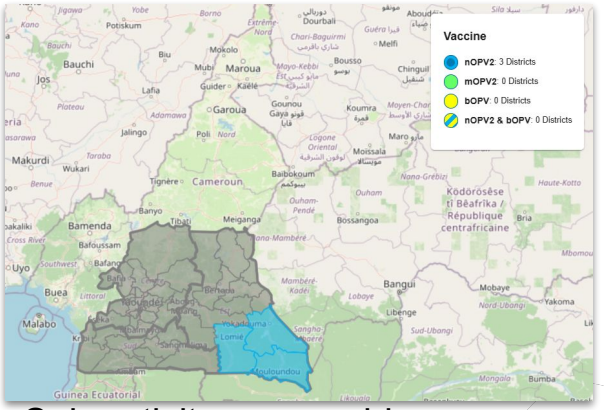


Recent additions

- Integrated campaigns: Polio, Measles, PIRI, Vitamin A, Rubella, Deworming, Yellow Fever
- Sub-activities:
  - Geographic scope within Round scope
  - Dates
  - Target age group
  - LQAS/IM dates



Round geographic scope

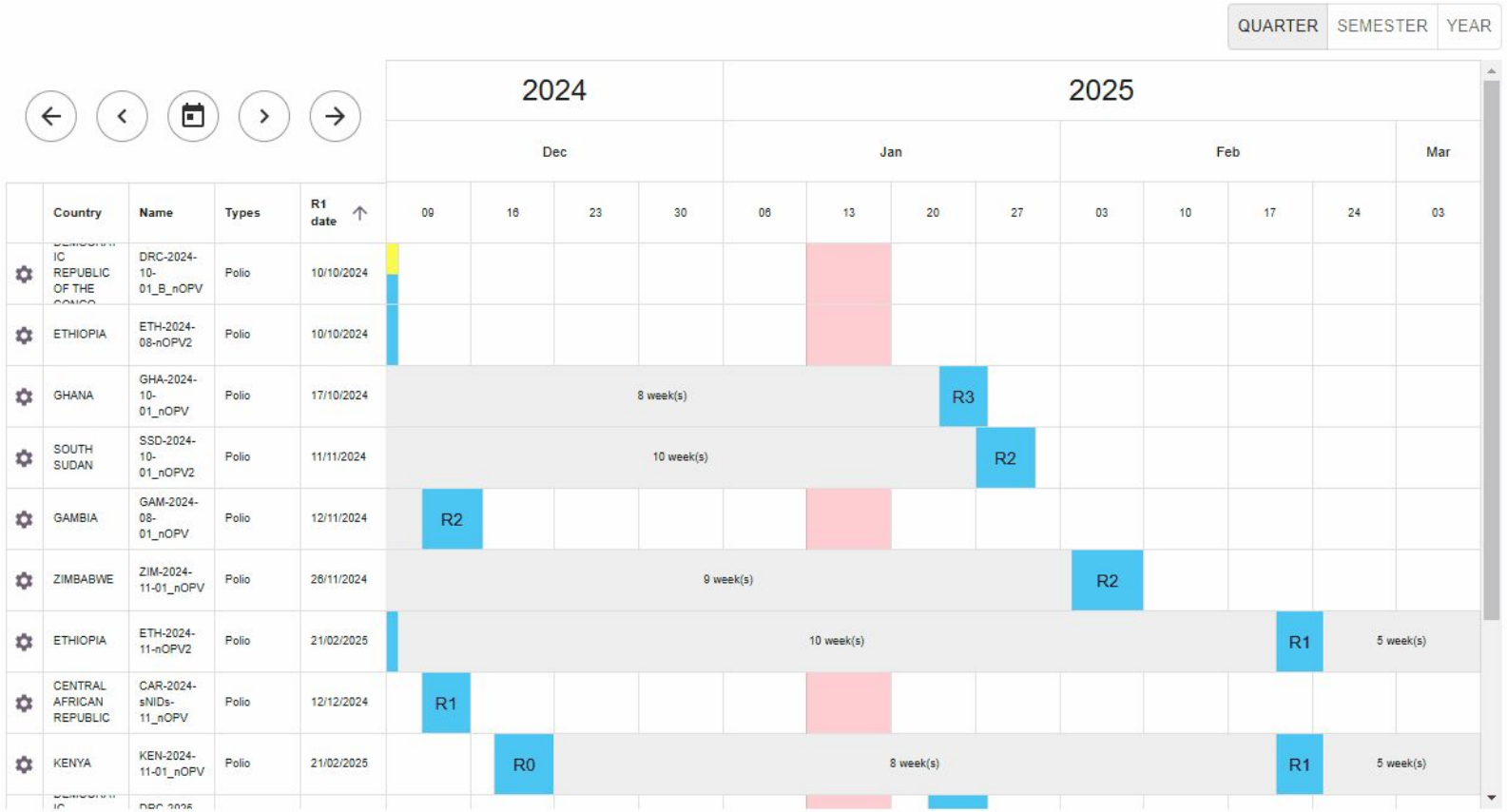


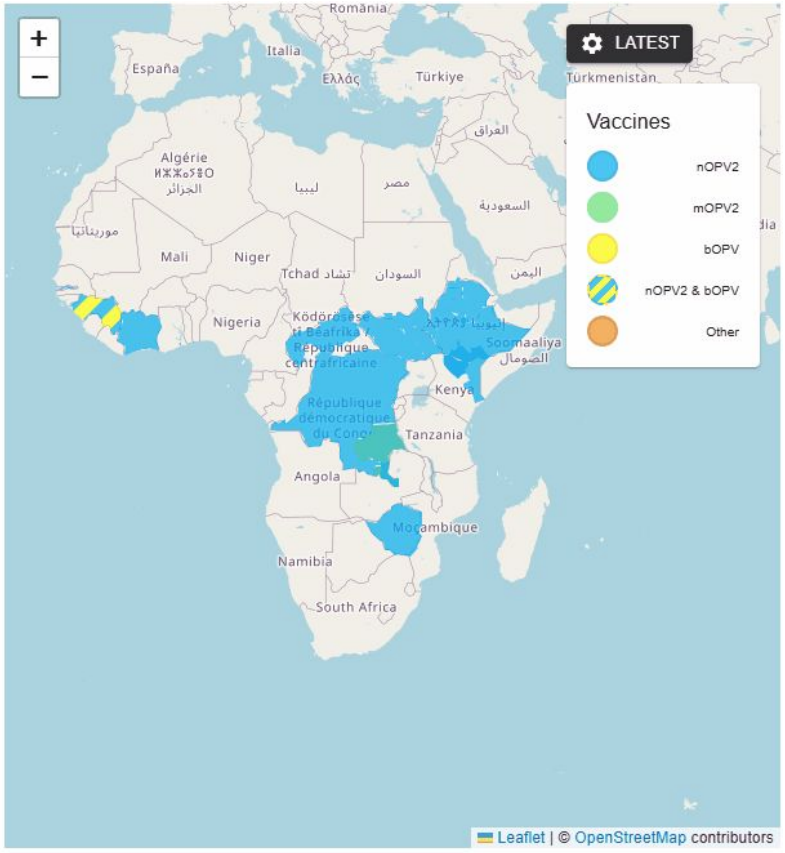
Sub-activity geographic scope

Calendar

Key data reflected on SIA calendar visualization

- Campaign type (Polio or other), Geographic scope, Round dates, Vaccine type
- Geographic scope per Round XLS download available (list of Districts in scope & vaccine type)





Management of Regions - Districts - Facilities

User-friendly geographic data management

- Organization of hierarchies (Country > Region > District > Health facilities)
- Upload of Geopackages for easy map visualizations
- Central repository of Master Facility Lists updated based on each country's ODK forms

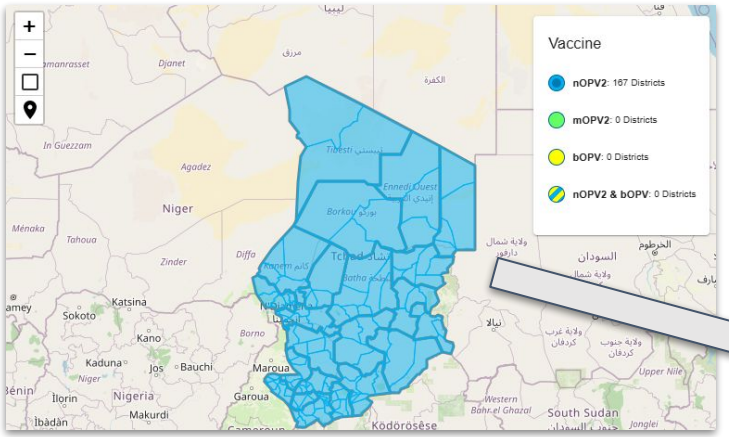
Automation of Geographic data import from ODK forms

- Email alerts ahead of Round start dates for ODK geographic data updates
  - Stocks monitoring
  - Form A
  - LQAS
  - IM
- Internal supervision dashboard
  - Country configurations
  - Check correct round number
  - Check correct OBR name

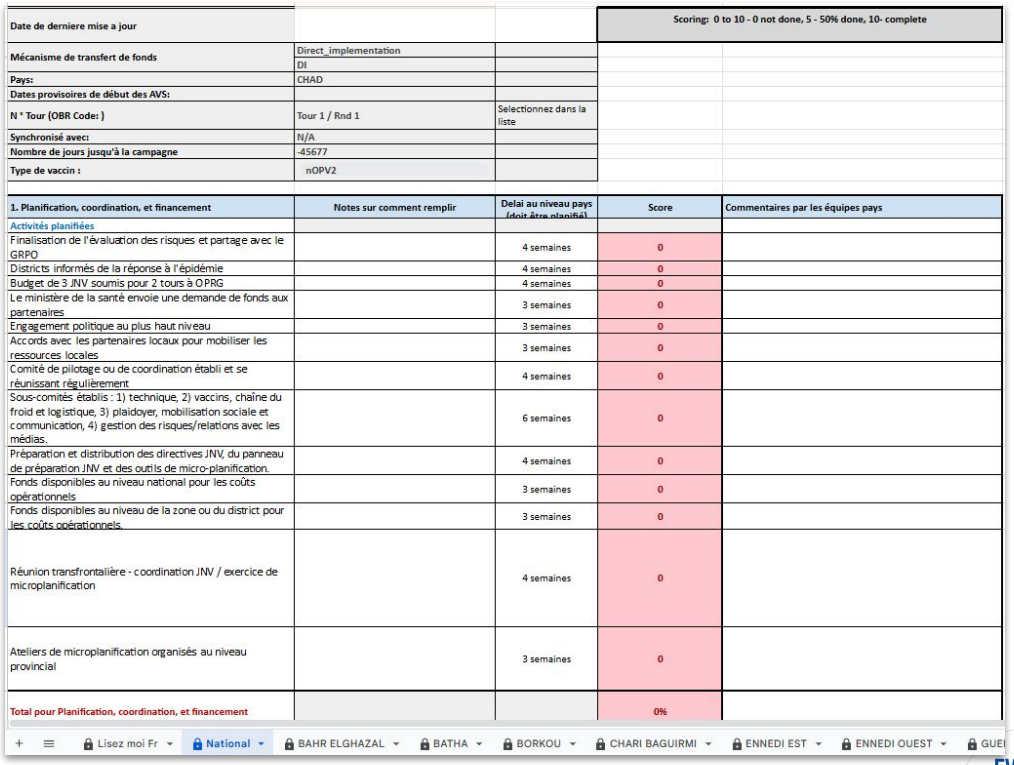
Preparedness

Generation of Preparedness Google sheets based on polioutbreaks platform's geographic data

- Geographic scope used to generate adapted Preparedness Google sheets
- Daily snapshots of Preparedness levels per level (National, Regional, District)
- Dashboard displaying preparedness levels in real time
- Weekly emails to country GPEI coordinators to update info & preparedness level in EN, FR or PT



EN, FR or PT



Date de derniere mise a jour			Scoring: 0 to 10 - 0 not done, 5 - 50% done, 10- complete
Mécanisme de transfert de fonds	Direct_implementation		
	DI		
Pays:	CHAD		
Dates provisoires de début des AVS:			
N ° Tour (OBR Code:)	Tour 1 / Rnd 1	Selectionnez dans la liste	
Synchronisé avec:	N/A		
Nombre de jours jusqu'à la campagne	-45677		
Type de vaccin :	nOPV2		

1. Planification, coordination, et financement	Notes sur comment remplir	Delai au niveau pays (doit être planifié)	Score	Commentaires par les équipes pays
Activités planifiées				
Finalisation de l'évaluation des risques et partage avec le GRPO		4 semaines	0	
Districts informés de la réponse à l'épidémie		4 semaines	0	
Budget de 3 JNV soumis pour 2 tours à OPRG		4 semaines	0	
Le ministère de la santé envoie une demande de fonds aux partenaires		3 semaines	0	
Engagement politique au plus haut niveau		3 semaines	0	
Accords avec les partenaires locaux pour mobiliser les ressources locales		3 semaines	0	
Comité de pilotage ou de coordination établi et se réunissant régulièrement		4 semaines	0	
Sous-comités établis : 1) technique, 2) vaccins, chaîne du froid et logistique, 3) plaidoyer, mobilisation sociale et communication, 4) gestion des risques/relations avec les médias.		6 semaines	0	
Préparation et distribution des directives JNV, du panneau de préparation JNV et des outils de micro-planification.		4 semaines	0	
Fonds disponibles au niveau national pour les coûts opérationnels		3 semaines	0	
Fonds disponibles au niveau de la zone ou du district pour les coûts opérationnels.		3 semaines	0	
Réunion transfrontalière - coordination JNV / exercice de microplanification		4 semaines	0	
Ateliers de microplanification organisés au niveau provincial		3 semaines	0	
Total pour Planification, coordination, et financement			0%	

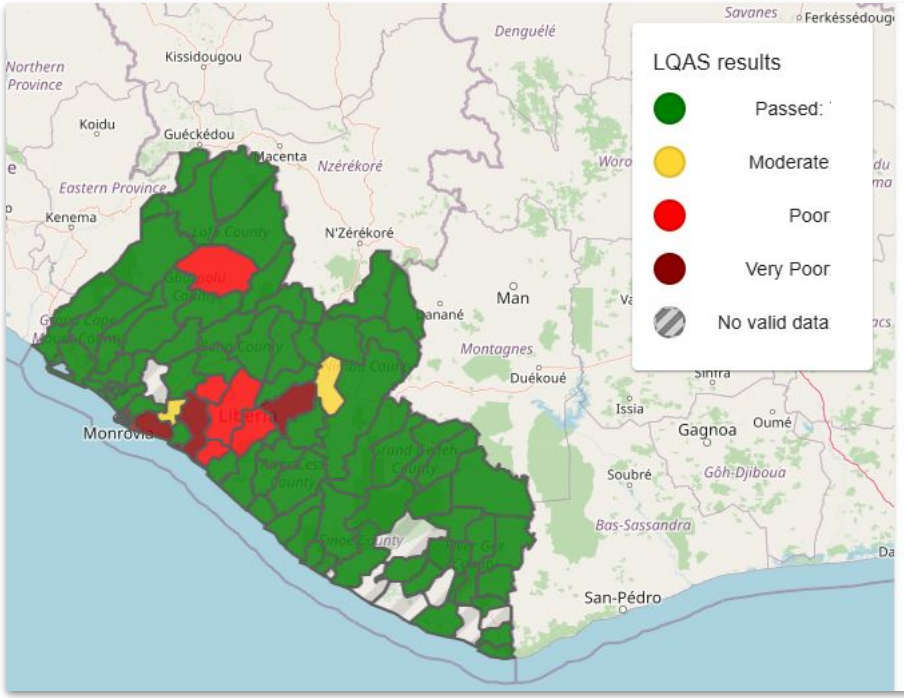
Lisez moi Fr | National | BAHR ELGHAZAL | BATHA | BORKOU | CHARI BAGUIRMI | ENNEDI EST | ENNEDI OUEST

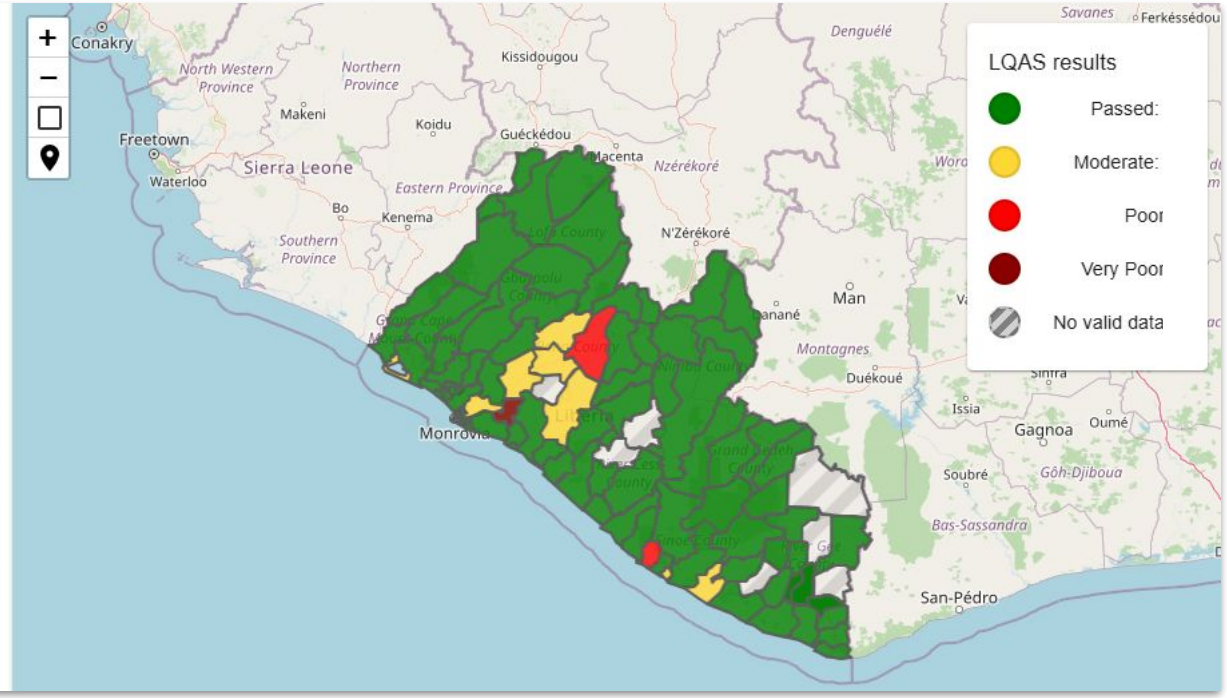
Geographic data reflected in sheet tabs (Country/Region/Districts)

LQAS

- Map at WHO AFRO level of latest data available
- Detailed view per Country - Campaign - Round
- Data fetching every day

Region	District	Result	Status
BOMI	KLAY	60/60	Passed
BOMI	DOWEIN	60/60	Passed
BOMI	SENJEH	60/60	Passed
BOMI	SUEHN MECCA	60/60	Passed
BONG	JORQUELLEH	57/60	Passed
BONG	FUAMAH	60/60	Passed
BONG	KOKOYAH	60/60	Passed
BONG	KPAAI	60/60	Passed
BONG	SALALA	55/60	Moderate
BONG	SANOYEAH	56/60	Moderate
BONG	SUAKOKO	44/60	Poor





Vaccine management

Polio vaccines management

- **Vaccines nOPV2 authorizations**
  - Authorizations: doses allowed and expiry dates
  - Automatic alerts when authorization expiry is approaching
- **Supply chain management**
  - Vaccines Request Forms
  - Pre alerts
  - Arrival report
- **Stocks management**
  - Form A
  - Incident reports
  - Destruction reports
- **Repository**
  - Management of administrative documents (upload of PDFs)
  - Tracking of missing documents
- **Chronogram**
  - Tracking of activities before/during/after a round
  - Countdown according to defined timelines

Start date	Doses requested	Doses shipped	Doses received	PO numbers	Estimated date of arrival	VAR
16/06/2023	1,781,921	3,565,000	3,565,000	45194956	10/05/2023	11/05/2023
11/05/2023	10,291,000	10,270,000	10,270,000	45194773-1	20/04/2023	21/04/2023
				45194773-2	20/04/2023	21/04/2023
26/05/2023	5,570,500	6,375,000	6,375,000	45194789	29/04/2023	01/03/2023
26/05/2023	7,137,500	7,140,000	7,140,000	45195118	08/05/2023	09/05/2023
01/06/2023	9,907,205	9,907,500	9,907,500	45194790	19/04/2023	29/03/2023
02/06/2023	2,163,400	2,165,000	2,165,000	45194846	04/05/2023	05/05/2023
22/09/2023	8,378,452	8,380,000	8,380,000	45197629	04/09/2023	09/09/2023
26/05/2023	4,296,128	4,297,500	4,297,500	45194774	01/05/2023	04/05/2023

USABLE UNUSABLE

Usable vials

17 result(s)

Date	Action	Vials IN	Vials OUT	Doses IN	Doses OUT
09/08/2022	PO #45189158	106,910	--	5,345,500	--
25/11/2022	Form A - Vials Used	--	101,884	--	5,094,200
01/12/2022	Physical inventory	2,000	--	100,000	--
04/03/2023	Vaccine expired	--	94	--	4,700
31/03/2023	Vaccine expired	--	1,000	--	50,000
31/03/2023	Vaccine expired	--	1,676	--	83,800

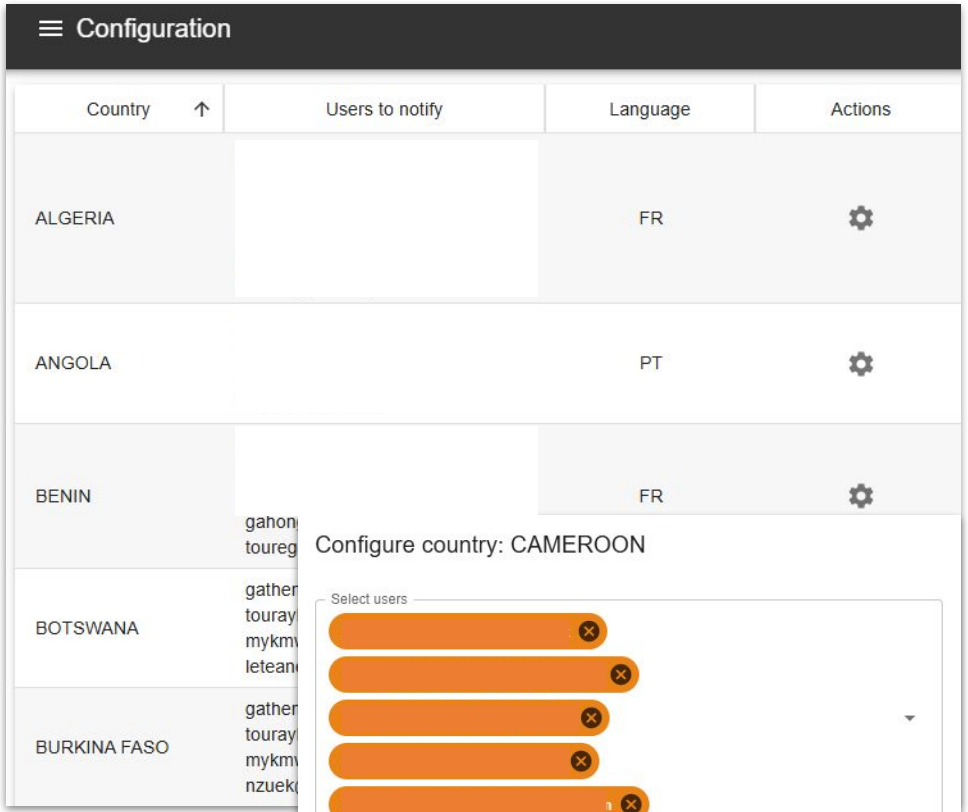
Platform user management

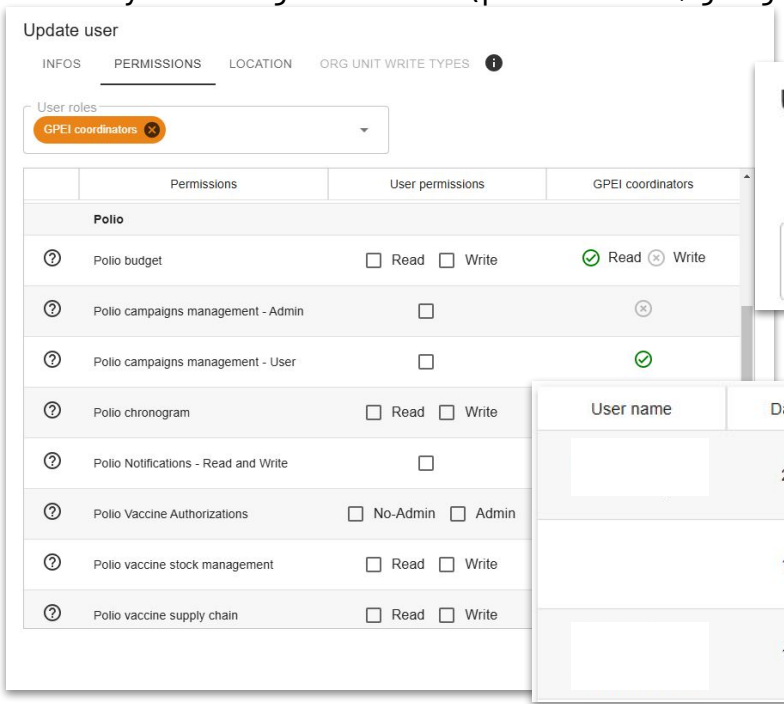
Country configuration

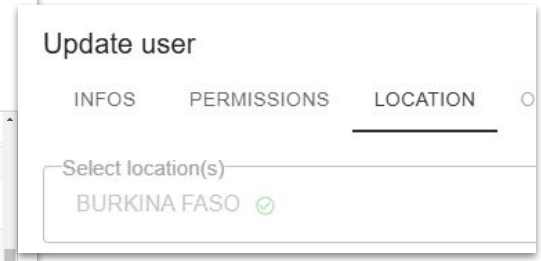
- Country configuration - preferred language (EN, FR or PT)
- Defining recipients of weekly emails and alerts - GPEI coordinators

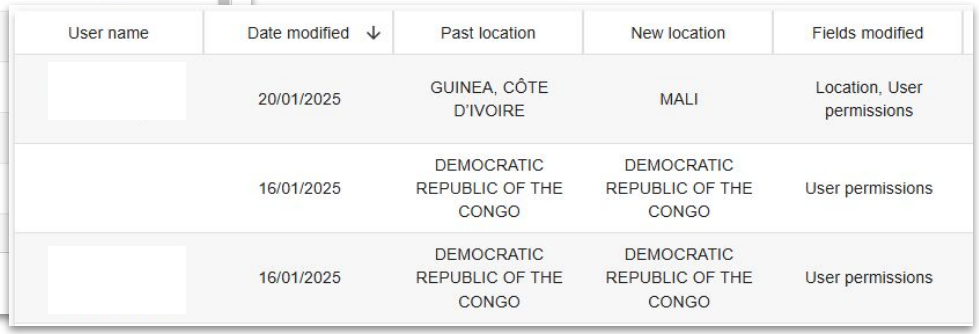
User management

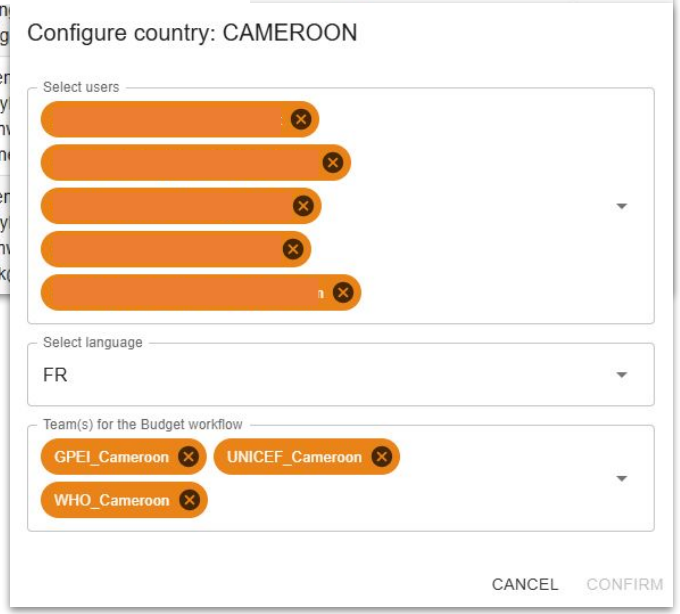
- Permissions per user and user roles (e.g. "GPEI coordinators")
- Assigning a user to her/his Geographic zone
- History of changes to users (permissions, geography, etc)











OBR Delay Analysis

WHO AFRO RRT - OBR DELAY ANALYSIS DASHBOARD

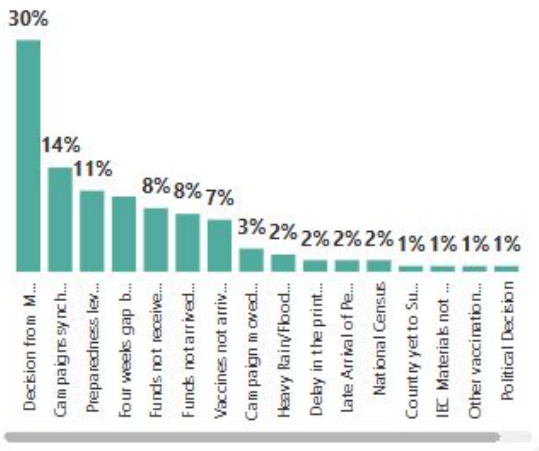
1/16/2025 5:03:43 AM
Time of Last Refresh (GMT)

Date: 2024 | **Country:** All | **Status:** All

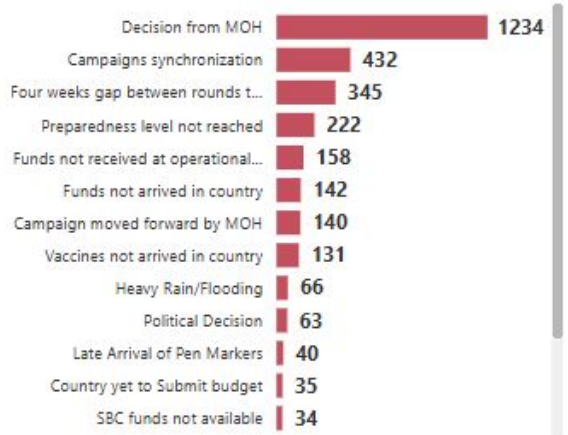
Delayed Rounds (%)	Delayed Campaigns (%)	Total Delayed Campaigns
50.5%	55.1%	38

Average Delay Time per Round (days)	Campaign Max Delay Identified (days)	Total Campaigns
63.4	790	69

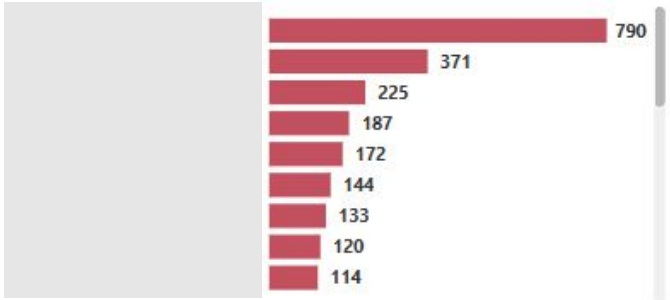
Reason of Delays (%)



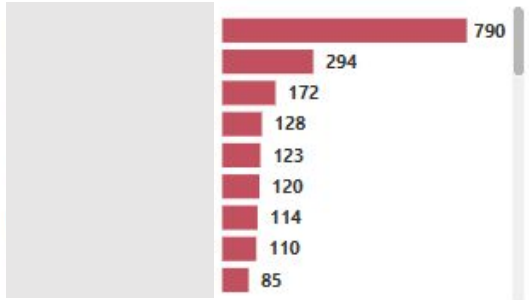
Accumulated Days of Delay per Reason



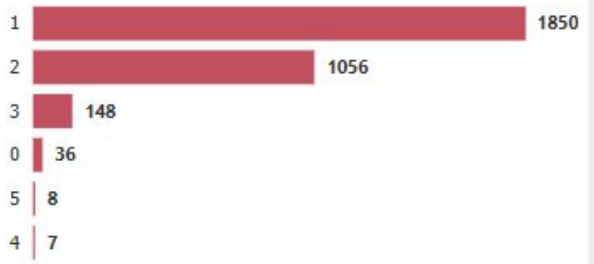
Accumulated Days of Delay per Country



Campaign Delays



Accumulated Delay Days per Round Number



Notification line list

Last notifications

Country: All | OBR: All | Onset/Collection Date: 5/18/2023 – 12/8/2023 | Date Result Received: Last 1 Select | PV type: All | Lineage: All | Source: All

No filters applied

Country	Province	District	PV type	Lineage	Source	Onset / Collection Date	Date Result Received	Last Conducted SIA - Date	Last LQAS - OBR	Last LQAS - score	LAST LQAS - result	Last Conducted SIA - District Preparedness	No of SIA Implemented since DOO	Next Planned SIA
CHAD	N'DJAMENA	N'DJAMENA NORD	cvdpv2	NIE-ZAS-1	ENV	07/07/2023	23/10/2023	10/11/2023	CHD-2023-10-1_nOPV	60/60	Passed		4	01/04/2025
CHAD	N'DJAMENA	N'DJAMENA SUD	cvdpv2	NIE-ZAS-1	ENV	08/08/2023	26/09/2023	10/11/2023	CHD-2023-10-1_nOPV	58/60	Passed		4	01/04/2025
CHAD	OUADDAI	ABECHE	cvdpv2	NIE-ZAS-1	AFP	06/06/2023	14/08/2023	16/06/2023	CHD-2023-05-1_nOPV	60/60	Passed	94%	5	01/04/2025
CHAD	OUADDAI	ABECHE	cvdpv2	NIE-ZAS-1	AFP	08/06/2023	06/09/2023	16/06/2023	CHD-2023-05-1_nOPV	60/60	Passed	94%	5	01/04/2025
CHAD	OUADDAI	ABECHE	cvdpv2	NIE-ZAS-1	AFP	04/09/2023	08/11/2023	10/11/2023	CHD-2023-10-1_nOPV	59/60	Passed	97%	4	01/04/2025
CHAD	OUADDAI	ADRE	cvdpv2	NIE-ZAS-1	AFP	13/08/2023	21/11/2023	10/11/2023	CHD-2023-10-1_nOPV	49/60	Failed	98%	4	01/04/2025
CHAD	SALAMAT	AM TIMAN	cvdpv2	NIE-ZAS-1	AFP	12/09/2023	08/11/2023	10/11/2023	CHD-2023-10-1_nOPV	58/60	Passed	97%	4	01/04/2025
CHAD	SALAMAT	AM TIMAN	cvdpv2	NIE-ZAS-1	AFP	15/09/2023	05/12/2023	10/11/2023	CHD-2023-10-1_nOPV	58/60	Passed	97%	4	01/04/2025
CHAD	TANDJILE	KELO	cvdpv2	NIE-ZAS-1	AFP	30/08/2023	21/11/2023	10/11/2023	CHD-2023-10-1_nOPV	60/60	Passed	99%	4	01/04/2025
CÔTE D'IVOIRE	ABIDJAN 1	ABOBO EST	cvdpv2	NIE-ZAS-1	ENV	02/08/2023	30/08/2023	22/09/2023	CIV-2023-06-01_nOPV	57/60	Passed	10%	3	28/02/2025
CÔTE D'IVOIRE	ABIDJAN 1	ABOBO EST	cvdpv2	NIE-ZAS-1	ENV	14/09/2023	23/11/2023	22/09/2023	CIV-2023-06-01_nOPV	57/60	Passed	10%	3	28/02/2025
CÔTE D'IVOIRE	ABIDJAN 1	ABOBO EST	cvdpv2	NIE-ZAS-1	ENV	20/09/2023	13/10/2023	22/09/2023	CIV-2023-06-01_nOPV	57/60	Passed	10%	3	28/02/2025
CÔTE D'IVOIRE	ABIDJAN 1	ABOBO EST	cvdpv2	NIE-ZAS-1	ENV	28/09/2023	08/11/2023	27/10/2023	CIV-2023-06-01_nOPV	57/60	Passed	10%	2	28/02/2025
CÔTE D'IVOIRE	ABIDJAN 1	ABOBO EST	cvdpv2	NIE-ZAS-1	ENV	05/10/2023								025
CÔTE D'IVOIRE	ABIDJAN 1	ABOBO EST	cvdpv2	NIE-ZAS-1	ENV	26/10/2023								025
CÔTE D'IVOIRE	ABIDJAN 1	ABOBO EST	cvdpv2	NIE-ZAS-1	ENV	04/12/2023								025
CÔTE D'IVOIRE	ABIDJAN 1	YOPOUGON EST	cvdpv2	NIE-ZAS-1	ENV	20/09/2023								025
CÔTE D'IVOIRE	ABIDJAN 1	YOPOUGON EST	cvdpv2	NIE-ZAS-1	ENV	05/10/2023								025
CÔTE D'IVOIRE	ABIDJAN 1	YOPOUGON EST	cvdpv2	NIE-ZAS-1	ENV	14/11/2023	16/01/2024	06/09/2024	CIV-2024-04-01_nOPV	59/60	Passed	10%	1	28/02/2025
CÔTE D'IVOIRE	ABIDJAN 1	YOPOUGON EST	vdpv2		ENV	25/10/2023	20/12/2023	27/10/2023	CIV-2023-06-01_nOPV	59/60	Passed	10%	2	28/02/2025
CÔTE D'IVOIRE	ABIDJAN 2	ADJAME-PLATEAU-ATTECOUBE	cvdpv2	NIE-ZAS-1	ENV	24/07/2023	28/08/2023	22/09/2023	CIV-2023-06-01_nOPV	51/60	Failed	10%	3	28/02/2025

District view - from virus notification down to last SIA that happened in that district and relating LQAS results

Supply Chain

VACCINE SUPPLY DASHBOARD

Monthly Report | Shipment Status | Country Stock Cards

Country Block: All | Country: All | Vaccine: All | Start Date: 1/1/2023 – 4/1/2025

1/16/2025 2:34:30 PM
Time of Last Refresh (GMT)

Country Block	Country	Vaccine	SIA Code	Round Number	Start Date	VRF Submitted	ORPG Approval	Stock in Hand (doses)	Stock coverage	Forms A Received	Stock of Unusable Vials
WCARO	Chad	nOPV2	CHD-2025-05-1_nOPV_NID	1	01/04/2025	Missing	Missing	82,200	-		
WCARO	Côte D'Ivoire	nOPV2	CIV-2025-02-01_nOPV_NIDs	1	28/02/2025	Yes	Yes	755,650	7.3%		
WCARO	Guinea	bOPV	GUI-2025-01-NID_bOPV-nOPV	2	21/02/2025	Yes	Yes				
WCARO	Guinea	nOPV2	GUI-2025-01-NID_bOPV-nOPV	2	21/02/2025	Yes	Yes	6,037,500	103.1%		
WCARO	Guinea	bOPV	GUI-2025-01-NID_bOPV-nOPV	1	24/01/2025	Yes	Yes				
WCARO	Ghana	nOPV2	GHA-2024-10-01_nOPV	3	24/01/2025	Yes	Yes	861,600	148.5%		
WCARO	Guinea	nOPV2	GUI-2025-01-NID_bOPV-nOPV	1	24/01/2025	Yes	Yes	6,037,500	103.1%		
WCARO	Central African Republic	nOPV2	CAR-2024-sNIDs-11_nOPV	1	12/12/2024	Yes	Yes	1,435,450		No	-20,178
WCARO	Gambia	nOPV2	GAM-2024-08-01_nOPV	2	12/12/2024	Yes	Yes	148,000		Yes	0
WCARO	Democratic Republic Of The Congo	bOPV	DRC-2024-10-01_B_nOPV	2	05/12/2024	Not Required	Not Required	37,017,460		No	
WCARO	Democratic Republic Of The Congo	nOPV2	DRC-2024-10-01_B_nOPV	2	05/12/2024	Yes	Yes	28,643,000		No	-233,829

Chronogram of Activities Before/During/After Campaigns

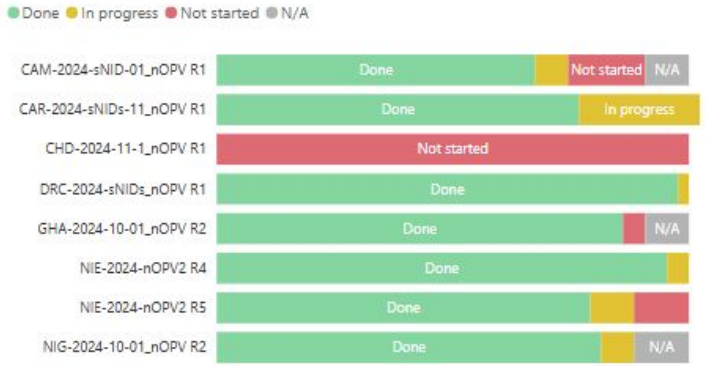
Group	Country	Campaign	Period	Start Date	
All	All	All	All	9/6/2024	12/12/2024

1/16/2025 2:06:00 PM
Time of Last Refresh (GMT)

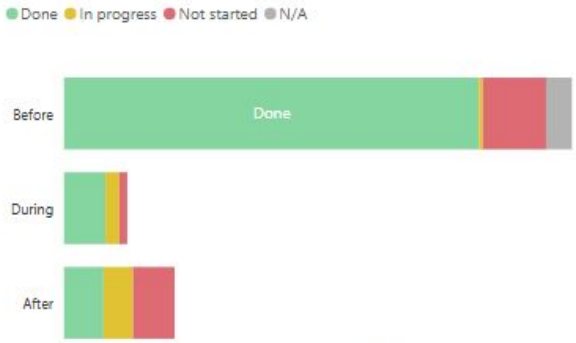
Activities Overview

Country	Campaign	Start Date	Days to Start Date	% of Activities Done	% of Activities In Progress	% of Activities Not Started	% of Activities NA
Central African Republic	CAR-2024-sNIDs-11_nOPV	12/12/2024		75%	25%		
Niger	NIG-2024-10-01_nOPV	02/12/2024		81%	7%		12%
Nigeria	NIE-2024-nOPV2	30/11/2024		79%	9%	12%	
Cameroon	CAM-2024-sNID-01_nOPV	22/11/2024		67%	7%	16%	9%
Chad	CHD-2024-11-1_nOPV	22/11/2024				100%	
Ghana	GHA-2024-10-01_nOPV	21/11/2024		86%		5%	9%
Nigeria	NIE-2024-nOPV2	02/11/2024		95%	5%		
Democratic Republic Of The Congo	DRC-2024-sNIDs_nOPV	31/10/2024		98%	2%		

Activities per Campaigns and Status



Activities per Period and Status



Activities List

Status: All

Campaign	Period	Task	Deadline Date	Status	Delay (days)
DRC-2024-sNIDs_nOPV	Before	Estimate vaccine needs for both rounds based on risk analysis	01/10/2024	Done	0
DRC-2024-sNIDs_nOPV	Before	Update the nOPV2 national logistics plan (needs, transport, waste management and management tools) and integrate the improvement plan and logistics strategies for special populations	01/10/2024	Done	0
DRC-2024-sNIDs_nOPV	Before	Develop and transmit to the RRT the vaccine request form	03/10/2024	Done	0

CONCLUSION

The platform is now quite stable and the next step is full platform transfer to WHO AFRO

Day to day challenges

- Main challenge is maintenance of the master district and facilities list
- Geographic data alignment between ODK forms and the platform
    - Last minute changes done on facility lists in forms, sometimes during campaigns, impacting data quality and dashboard reliability for instant decision-making

USEFUL RESOURCES

Useful links

- Platform: www.polioutbreaks.com
- User guide: https://docs.polioutbreaks.com/
- Main dashboards:
  - SIA calendar: https://afro-rrt-who.hub.arcgis.com/pages/Campaigns%20(SIAs)
  - Preparedness dashboard: https://www.polioutbreaks.com/pages/preparedness-dashboard/
  - Vaccine management: https://afro-rrt-who.hub.arcgis.com/pages/vaccine-management
  - Notification line list: https://www.polioutbreaks.com/pages/notifications-and-sias/
- More about IASO: https://www.openiaso.com/

BLUESQUARE

Thank you!

www.bluesquarehub.com
mdewulf@bluesquarehub.com

THANK YOU

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