

2024

Sudan Joint Appraisal (JA) Report 2023-2024

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Joint Appraisal (JA)

The Joint Appraisal (JA) is an **essential element of Gavi's regular monitoring and performance management (MPM)**. The JA has evolved to align with Gavi 5.0 strategic shifts.

The JA is an **annual, country-led, multi-stakeholder** review/discussion that represents an important opportunity for countries to engage Gavi Alliance partners and other key stakeholders on annual progress of routine immunisation programmes against national goals and objectives, and to discuss how Gavi support is contributing to this progress. Key stakeholders involved in the country's immunisation programme should be represented at the Joint Appraisal, including civil society organisations (CSOs).

As an integrated part of Gavi's portfolio management process, the JA discussion should review **Gavi's contribution to immunisation programme performance** in 2023/H1 2024, including current status of your COVID-19 programme and efforts on integration. A key feature of the JA is the joint discussion about the **promising practices, challenges met and future needs** for improving immunisation performance with a focus on reaching zero-dose children and missed communities.

The modality of the Joint Appraisal exercise is tailored to the country context and may be scheduled taking into consideration other planning exercises such as EPI reviews or National Immunisation Strategy Development.¹ The JA process will involve preparatory work to assemble and analyse data in advance of the discussion, exchange on the trends and their implications for the EPI program, and will conclude with the finalisation of a report and relevant deliberation outcomes and follow-up actions. At least one live discussion (in person or virtual) of the multiple stakeholders engaged in the Joint Appraisal should be organised.

The Joint Appraisal template is structured as follows

- **Section 1: Country situation:** overview of performance of Gavi support & discussion on progress and challenges faced during 2023 and first semester of 2024
- **Section 2: Looking forward:** summary of discussion points and follow up actions

The information and indicators contained in section 1 on the country immunisation programme performance and Gavi support are mostly based on standard reporting. They are part of Gavi's monitoring and performance management framework, which will inform ongoing portfolio discussions, the JA, as well as discussions at the Alliance Partnership and Performance Team (APPT) meeting.

Results are to be analysed as (1) the absolute change in the indicator as a trend over time and; (2) the percent change in the indicator against the baseline value from the HSS or EAF application. Changes over time will be assessed against the end of grant target set during the application stage. Please ensure that sufficient data is provided to

¹ Countries which are finalising in the course of 2023 a Full Portfolio Planning are not expected to conduct a JA.

conduct such analyses, including the baseline values, targets, and sufficient annual data to infer trends.

As the country is involved in an active conflict and some parts of the country have severe access challenges while others are inaccessible. Hence the country is not a homogenous context and requires adapting the JA template to capture the different contextual situations as well as the different responses and implementation strategies for immunization activities. Information could be stratified as follows:

Country Situation:

Sudan composed of 18 states & 189 localities, is characterized by a strategic geographical location, that links the Arab world to Sub Saharan Africa, and it shares its borders with 7 countries. The total population of Sudan was approximately 48,109,006 million in 2023, growing at a rate of 2.8% annually. Children under 5 represent 15.4% of the population The total 2024 population is 53,591,002.

Recent resurgence of internal conflict and eruption of war between Sudanese Arm Forces and Rapid Support Forces has led to a humanitarian crisis of unprecedented scale, resulting in mass displacement, economic crisis, and a near-collapse of health system. It is estimated that people who are dying due to lack of access to essential and life-saving health services are much higher than those who lost their lives due to war injuries.

Women, children, and other vulnerable populations are facing extremely challenging conditions particularly, in hotspots with limited access to essential and life-saving health services including immunization and other MCH services that has resulted in increased maternal and child mortalities. In Khartoum and other hotspots, less than one third of health facilities are functional. Insecurity is preventing patients and health workers from reaching hospitals and other health facilities. Assets and staff are being attacked. The health system in the other states is overwhelmed due to the massive displacement of populations from hotspots to these less-affected states.

Prior to the onset of the armed conflict on 15 April 2023, Sudan already hosted an estimated 3,820,772 IDPs. Most were displaced across the Darfur states, with many being displaced due to conflict beginning in 2003 and 2004. Of these IDPs displaced prior to 15 April 2023, an estimated 27 per cent (1,045,439 IDPs) experienced secondary or tertiary displacement due to armed clashes after 15 April 2023, while approximately 2,775,333 IDPs reportedly remained in their initial areas of displacement. An estimated 7,987,783 individuals were displaced internally since 15 April 2023, Khartoum represents the top state of origin for IDPs: an estimated 34 per cent of all IDPs in Sudan reportedly originated from Khartoum, followed by South Darfur (19%), and North Darfur (14%) states, and 2,316,538 crossed the border (IOM).



Estimated IDPs per State 20 August 24

State of Displacement	Mobility Update (05) 06 August 2024	Mobility Update (06) 20 August 2024	Localities	Locations	Current HHs	IDPs %
Aj Jazirah	355,074	346,460	8	1,706	69,182	3%
Blue Nile	344,207	366,927	7	216	75,752	3%
Central Darfur	876,098	880,228	9	118	184,442	9%
East Darfur	777,763	778,463	9	48	153,080	7%
Gedaref	891,964	960,889	12	378	196,118	9%
Kassala	258,531	261,346	10	260	52,321	2%
Khartoum	115,779	111,535	7	366	22,236	1%
North Darfur	1,517,734	1,522,134	17	339	322,964	15%
North Kordofan	193,708	193,418	8	606	37,087	2%
Northern	400,231	414,915	7	443	83,666	4%
Red Sea	268,837	269,907	10	273	54,570	3%
River Nile	773,286	792,234	7	988	158,376	7%
Sennar	359,444	280,080	7	420	54,946	3%
South Darfur	1,827,015	1,827,425	20	152	369,887	17%
South Kordofan	445,315	446,200	14	502	84,160	4%
West Darfur	295,562	307,572	8	130	61,940	3%
West Kordofan	355,671	356,067	14	673	64,906	3%
White Nile	653,796	647,316	9	1,224	125,867	6%
Total	10,710,015	10,763,116	183	8,842	2,171,500	100%

Table 1: Estimated IDPs Per State

UN agencies considered Sudan's crisis as the worst humanitarian situation in the world with devastating consequences for civilians.

More than 24.7 million people, including 14 million children, require humanitarian assistance and protection. Over half the population (25.6M people) face crisis or worse conditions (IPC Phase 3 or above) from June to September 2024.

WHO has verified over (105) attacks on health between 15 Apr 2023 - 3 Sep 2024. These attacks resulted in (183) deaths and 125 injuries.

The war has made the delivery of health care including vaccination of target children, increasingly difficult. Critical services such as MCH, immunization, nutrition, communicable diseases, trauma and emergency healthcare, NCDs and mental health have been disrupted leaving millions of vulnerable populations without adequate access to these services.

The health service delivery system is facing many challenges in responding to the increasing health needs of populations particularly, IDPs and host communities. Below is the summary of the main challenges:

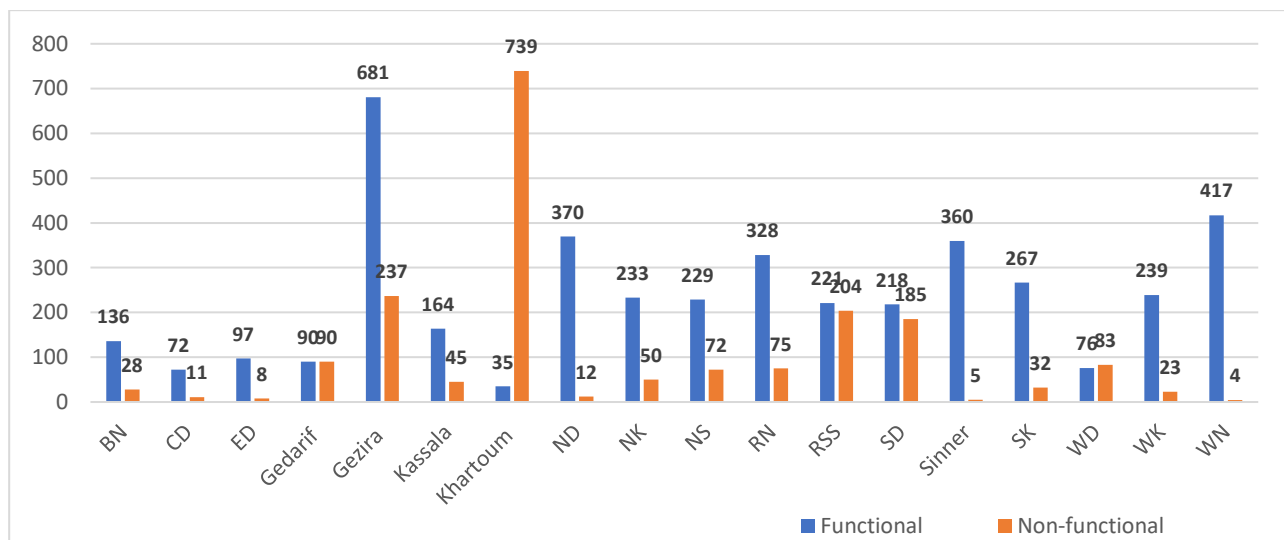
1. Insecurity and attacks on health facilities and health workers in the hotspots.
2. Inadequate capacities and infrastructures as most of the health facilities in states receiving IDPs are designed to serve a smaller number of populations.
3. Severe shortage and stock-out of medicines and supplies including life-saving items due to the interruption of the supply management system.
4. Concurrent health emergencies and outbreaks including Vaccine Preventable Diseases VPDs, due to weak capacities for preparedness and response.
5. Lack of financial resources to cover the operational cost and other priority management functions.
6. Inability to pay the salaries and other entitlements for health workforce for more than a year in some areas.
7. Inadequate capacities to perform critical functions including supervision and other M&E interventions.

Despite these challenges, ministries of health at federal and state level supported by partners, is implementing several interventions to maintain access to essential and life-saving health services through supporting existing health facilities and implementing mobile and outreach services. Humanitarian partners' role is crucial due to their field presence and other comparative advantages. The main challenge that limits the ability of partners to scale up their support beside limited access and lack of security, is the huge funding gap (>80% gap in Sudan Humanitarian response plan).

Health workers have been severely affected, facing attacks, violence and prolonged periods of unpaid work. The migration (internal and external) of health workers due to conflict has led to distribution imbalances, exacerbating staff shortages in conflict areas while creating surpluses in other states. Despite these challenges, innovative responses to the crisis are being seen, such as the utilization of displaced health workers in maintaining healthcare services. MoH and partners' comprehensive actions to address health workforce challenges, including the distribution of supplies, training initiatives, financial aid, and efforts to bridge information gaps.

Health System Variability:

The conflict has resulted in a disruption of health services that include immunization particularly, in hot spots. This has widened the inequity gap between and within the states. A rapid assessment of functionality of health facilities conducted by MoH and WHO in July 2023 revealed great variation in functionality of hospitals and PHC facilities between states. Less than 5% of PHC facilities were functional in Khartoum compared to over 90% in Sennar and White Nile States. Majority of the functional facilities do not provide the complete minimum package of health services. The status of functionality of health facilities and access to essential health services keep changing frequently as the security situation deteriorates.



Functionality of PHC facilities per state December 2023

Health system capacities vary significantly between states. Health facilities and infrastructure in hot spots have been destroyed and/or looted

Impact of the armed conflict on the EPI program:

The EPI program lies under the MCH directorate, that one of PHC directorate general, it is a three Layers program, federal, state & locality.

The major consequences observed on the EPI, including COVID-19 vaccination, include the following:

- 1- Disruption in the implementation of the immunization sessions due to the closure of health facilities or vaccine stock out.
- 2- Change of the target population due to population movement and the subsequent impact on the validity of available micro-plans in the states.
- 3- Instability of the government management team and insufficient communication with staff at the federal and state levels due to weak network connection.
- 4- High risk of vaccine-preventable disease (VPD) outbreaks.
- 5- Delayed implementation of the planned campaigns; eg MR catch-up campaign.
- 6- Disturbance of the VPD surveillance:

- Closure of the National Public Health Laboratory (NPHL).
 - Difficulty in sample collection and transportation.
- 7- Failure to follow up with the states on the ongoing VPD outbreak.
 - 8- Increased costs of routine immunization services due to an upsurge in fuel and transportation costs.
 - 9- Destruction and looting of the state EPI offices.
 - 10- Challenges in operations management due to the closure of banks, difficult cash transfers and unavailability of essential services.

Corrective actions to overcome the impact on the program:

- 1- Formulation of core team composed of national EPI expert headed by the EPI manager under direct supervision of the PHC-DG, the core team resumed program functionality from Madani city- Gazeria state. However, in December 2023, the armed conflict reached Gazeria state; the core team moved temporarily to Port Sudan and finally settled in Kassala state & resumed the program functionality.
- 2- Establishment of the VPDs lab in the Portsudan national public health lab.
- 3- Establishment of central cold chain in Red Sea state-Portsudan
- 4- Agreements for transportation of the vaccine & supplies to the states under active fighting.
- 5- Development of EPI national emergency plan, operational plan aim for EPI service continuity 2024-25 and selection of humanitarian organizations to support the plan implementation in hard to reach areas.

Performance Overview of Gavi Support:

Immunization Coverage and System Readiness:

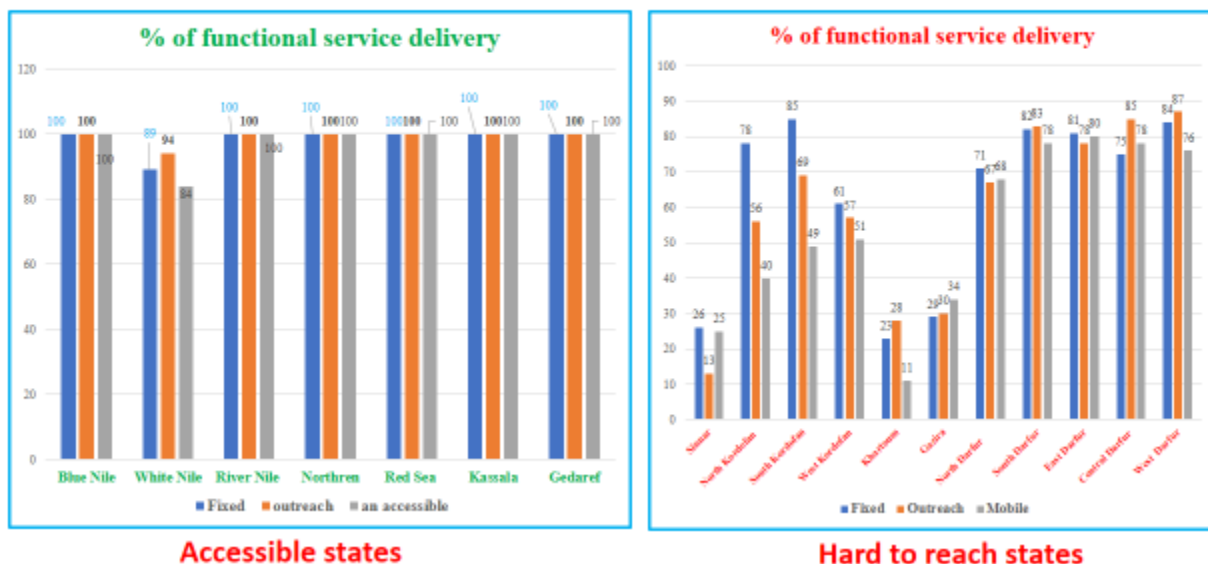
Sudan was managed to sustain the high routine immunization coverage over the past years & successfully achieved some of the global & regional targets e.g. polio free, elimination of yellow fever epidemics & control of meningitis outbreaks. On the other hand, still lagging in achievement of other targets e.g. Measles & Rubella elimination, neonatal tetanus. The routine immunization coverage was highly affected by the country instability & COVID 19 pandemic within the last few years. The impact of the 15 of April internal conflict was devastating on overall health system, including the EPI program.

Functionality of the routine immunization:

The functionality of RI strategies was affected after 15 April 2023, the displacement of the staff was one the highest risk at the beginning of the conflict at the management level, and with expansion of the conflict to other states, and the impact of the staff lost affected not only the management level but also the service delivery. The accessible states were interrupted at the beginning of the crisis due to the disruption of the national supply system and the overall security challenges in Sudan. However, the situation in the accessible states recovered to normal no longer after the crisis. The hard-to-reach

states started to collapse from Khartoum to Darfur states. After that, it rapidly expanded to Kordofan states and then dramatically expanded to involve Gazira and, recently, Sinner state. As reflected in the below graph, seven states out of the 18 states where the program functioning as usual, the remaining eleven states, mostly under active fighting, the functionality of the service delivery strategies varies between states, Sennar, Khartoum & Gazeria states had the worst functionality of the three strategies, fixed, outreach & the mobile, while the situation in the Darfur & Kordofan states is much better with the mobile strategy is the most affected. Despite the sustainability of the functionality of the services in these states, still the target coverage with all antigen were not achieved, this can be explained by the collapse of supply system, functionality of the cold chain, population movement out of their catchment areas, flow of data & lack of supportive supervision.

Functionality of RI service delivery strategies by states 2024



Functionality of RI strategies up to June 2024 in Sudan

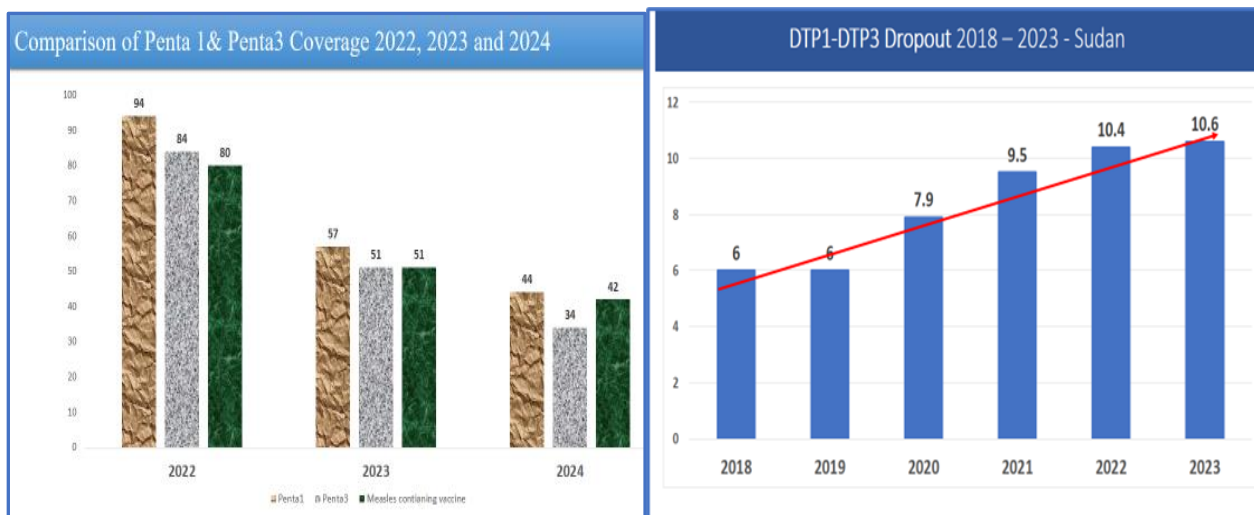
Accessibility, Utilization & Coverage of RI:

Penta1 coverage, as indicator for accessibility, had seriously reduced by end of 2023 compared to the previous last years, it was varying between 25% as the lowest to the 46% in the best performing inaccessible states. The consequence of the insecurity on service provision by looking at the Penta1 coverage achieved by accessible states to the inaccessible, which reflected the recovery of the EPI program functionality after 15 of April. The target for MCV2 coverage, wasn't achieved over the past years (2020-2022) & it was worsened by the eruption of the conflict, as indicator for measuring the protection, this low coverage put the children at high risk of measles outbreaks, considering the current other factors affecting the child immunity e.g. malnutrition. Penta1 and Penta3 coverage decreased during 2023 and 2024. However, coverage in the accessible states has recovered to its normal shape. On the other hand, the situation remained the same in hard-to-reach states due to limited access, logistical challenges, and security challenges. Overcome the challenges through strengthening the EPI

program at subnational levels, coordination, and extension of partnership & inter-sectoral agreements to ensuring reaching the target population. Over the years 2018, 2019, 2020, and 2021, Sudan kept the DOR between Penta1 and Penta3 within the acceptable rate ($\leq 10\%$), but the DOR began to increase during the years 2022 and 2023, where 78% of states had DOR $> 10\%$ through the two years. That was due to the security situation in hard-to-reach states and poor implementation of defaulters tracing strategies. Accumulation of Zero Dose Children (ZDC) seriously increased by end of 2023, by which the country jumped to be ranked number 5 globally & number one regionally for the number of zero dose children. Increasing the number of ZDC, which recall attention to create a new approaches and strategies to control generation of a new ZDC. However, Sudan EPI Emergency plan for 2024, EAF & Big Catch Up (BCU) focus on clearing the accumulation of ZDC and strengthening the system through; quality implementation of home visits, strengthening of defaulter's registration, follow-up and involvement of community in addition to decrease missed opportunities within health facility system. Resuming the functionality of VPDs surveillance & ensuring flow of quality data can be one of the top priorities for prevention of child morbidity & mortality of the VPDs outbreaks.

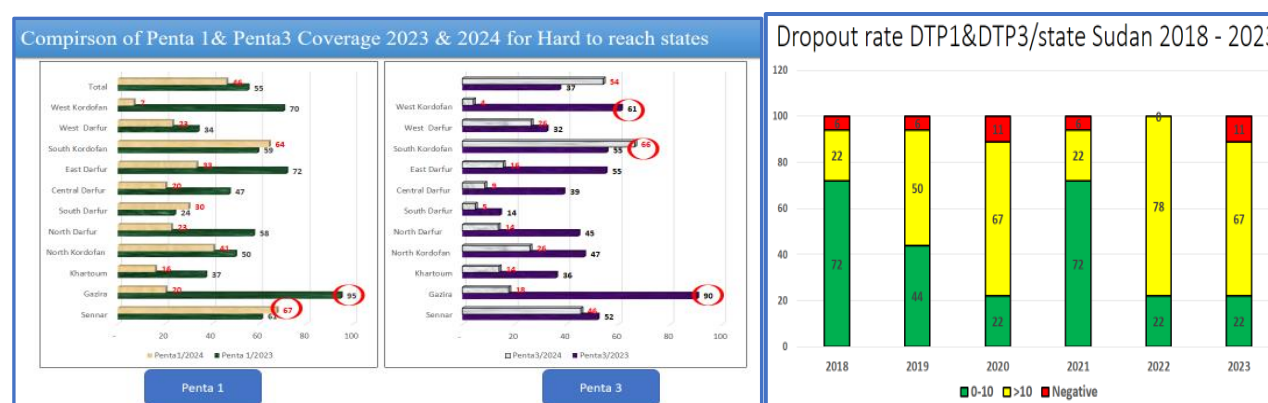
Percentage of Penta1& MCV2 2018 to 2023

% of coverage of DTP1 and the last dose of MCV by states from 2018-2023								
States	Penta1				MCV2			
	2020	2021	2022	2023	2020	2021	2022	2023
Central Darfur	99	92	99	28	52	49	56	20
East Darfur	109	100	109	44	58	45	51	6
Gedaref	97	89	100	87	72	59	74	71
Kassala	96	92	92	88	70	67	65	70
North Darfur	113	104	99	38	64	58	52	17
North Kordofan	103	94	92	46	74	65	60	19
Red Sea	102	86	82	103	63	47	45	69
Sennar	101	99	100	97	68	66	68	70
South Darfur	89	97	95	14	51	52	50	7
South Kordofan	104	96	97	39	70	59	64	38
West Darfur	104	97	100	25	65	66	74	16
West Kordofan	93	88	95	37	66	53	63	27
White Nile	100	100	94	94	67	65	65	54
Blue Nile	98	100	96	91	70	69	69	63
Gazira	94	90	88	96	76	78	67	82
Khartoum	77	83	84	28	56	64	63	19
River Nile	98	91	99	104	86	84	89	86
Northern	97	93	101	107	81	83	86	96



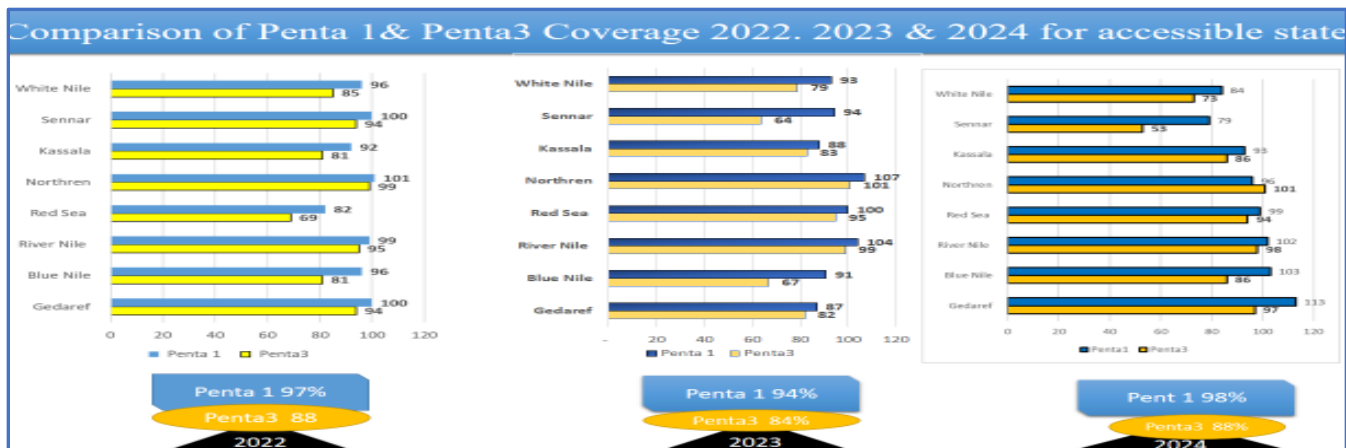
The national coverage comparison for 2022, 2023, and 2024 for Penta1 and penta 3 and the dropout rate

Penta 3 coverage in the hard-to-reach states deteriorated with the expansion of the armed conflict in 2024, as both access & utilization worsened by long duration of the armed conflict.



Coverage of Penta1 and Penta3 in the accessible states & 2022, 2023, and 2024 Penta1 & Penta3 dropout rates.

The target coverage of the Penta 3 was achieved in the accessible states. However, many challenges facing the program. The impact of the economic and banking challenges resulted in using different payment modalities, such as (financial service provider) as a supplier for the Cash Implementation Unit (CIU) in UNICEF to ensure timely payment for vaccinators and other staff. This modality faced several bottlenecks like delayed payment, security challenges, placing suitable and agreeable payment points, incomplete payment, and delayed of the transportation payment. Compared to other partner payment modalities, such as Save the Children International (SCI) in Red Sea state, which was more successful because of the maturity, flexibility and decentralized financial payment system.



Penta 1 & 3 coverage in the accessible states over 2022-2024

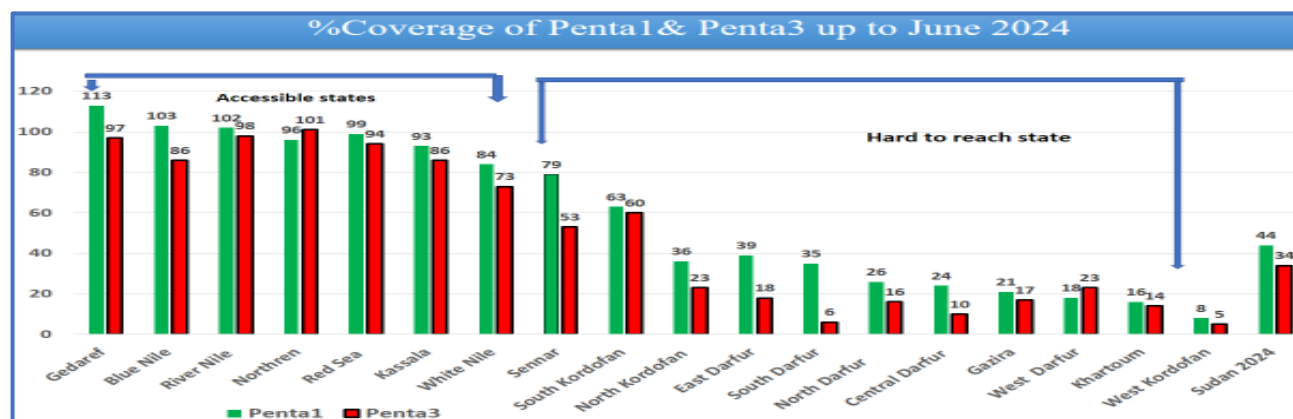
In the accessible state, the situation of RI services is stable, and most states had good coverage up to June 2024. The main challenges were **continuous population movement, climate change (heavy rain), delays in timely payments for vaccinators and other staff, and overall security challenges**. For this zone, Sudan continues to alleviate challenges by updating population data using multiple sources such as UN agencies' data (UNHCR and IOM) and HAC and SIAs.

The ongoing conflict has significantly impacted routine immunization (RI) services in Sudan's hard-to-reach states. Despite these challenges, the EPI in Sudan achieved notable breakthroughs in 2023 and 2024, thanks to strong collaboration and coordination with partners and local communities. In April 2024, after a year-long disruption, the FMOH successfully distributed vaccines to the Darfur region and resumed EPI activities. This was made possible by reprogramming funds initially allocated for COVID-19 to partially cover operational costs in some states. Simultaneously, SMOH partnered with a few humanitarian organizations to support vaccination efforts in other areas.

The primary challenge in this region lies in the functionality of the cold chain at the state level. In states like West Darfur, South Darfur, Central Darfur, and West Kordofan, the cold chain infrastructure has been severely damaged. In addition, road inaccessibility and unreliable electricity sources hinder the delivery of supplies. The high cost of services further exacerbates these issues.

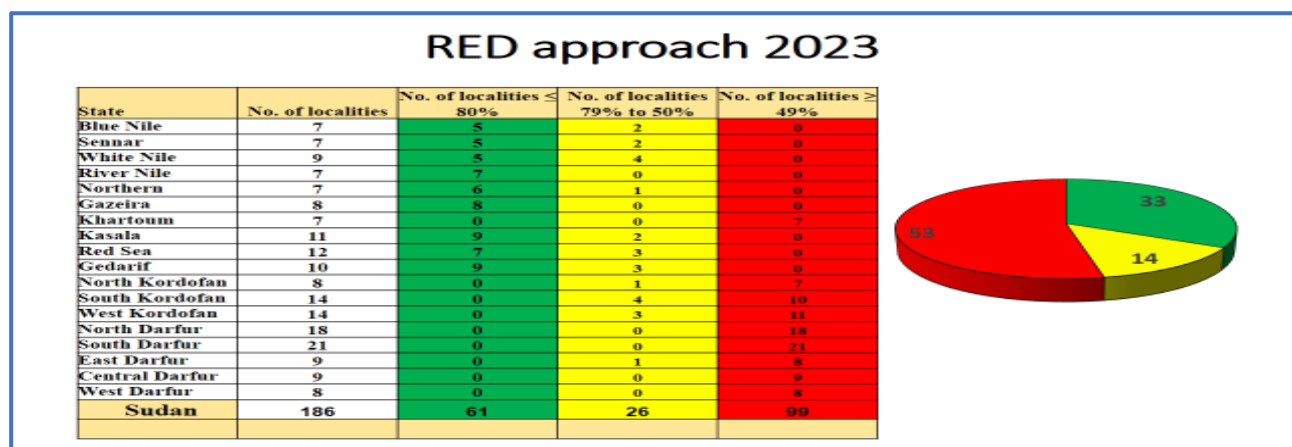
Despite these obstacles, there are opportunities to improve children's access to RI services. For example, functional cold chain systems at the locality level and the presence of motivated local communities and international non-governmental organizations (INGOs) provide a foundation for enhancing service delivery and social mobilization. One successful example of overcoming challenges was the reprogramming of COVID-19 funds to strengthen RI services in South Kordofan, implemented by Save the Children International (SCI). This initiative resulted in a significant increase in Penta3 coverage in 2024 compared to 2023.

A key lesson learned from these efforts is that community involvement and close coordination with on-ground partners are critical for success. Looking ahead, Sudan plans to deliver RI services in these zones through partnerships with organizations such as International Medical Corps (IMC), Save the Children International (SCI), Medical Teams International (MTI), and Alight, leveraging GAVI support for 2024 and 2025.



Percentage of Penta1 & Penta 3 RI coverage by state up to June 2024

As shown in the above graph, in 2023, 33% of Sudan's localities (61) achieved $\geq 80\%$ coverage by penta3, 14% (26 localities) achieved 50 – 79%, while 53% (99 localities) of Sudan's localities achieved $\leq 49\%$. This situation shows that more than two-thirds of Sudan's children in 2023 were at risk of vaccine-preventable disease unless there was an effective way to reach zero-dose children and under-immunized children, mainly in hard-to-reach states.



Percentage of Penta3 coverage by localities – Sudan 2023

Supportive Supervision:

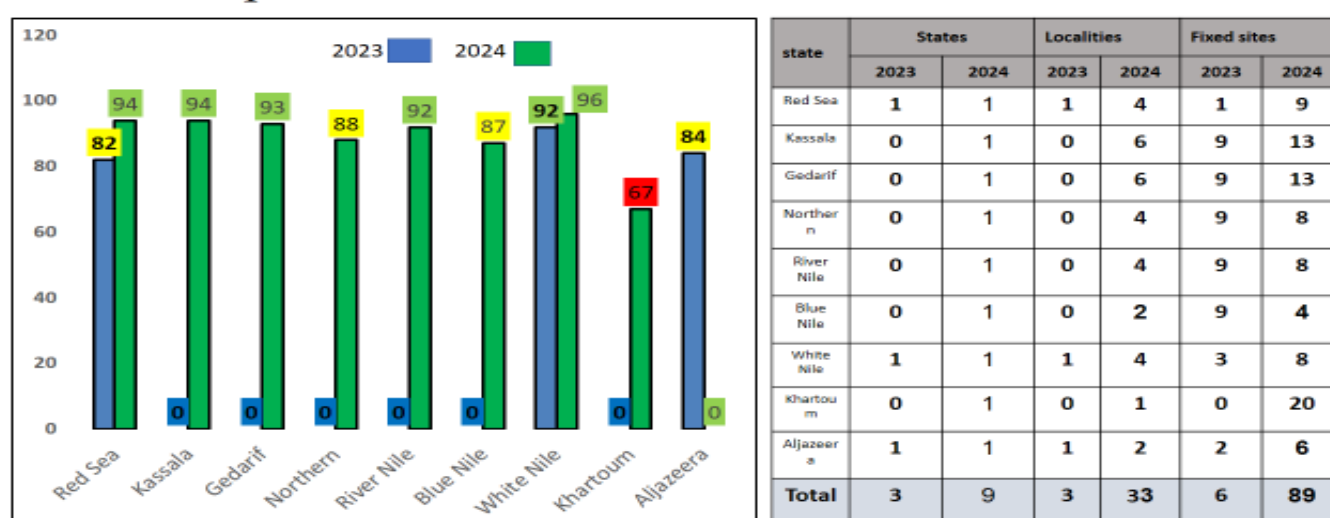
Using GAVI support for the C-19 reprogramming fund, Sudan implemented 159 supportive supervision visits to the sub-levels to assess the quality of RI services in 2023 & 2024. In 2023, only one state has been visited, while nine states in 2024. In 2024, for the state level, the results show that all program quality areas (planning, vaccine management, reporting, M&E, VPD surveillance, and budget achieved $\geq 80\%$

quality performance. On the other hand, the main bottlenecks at the state level were SBC activities and recording practices.

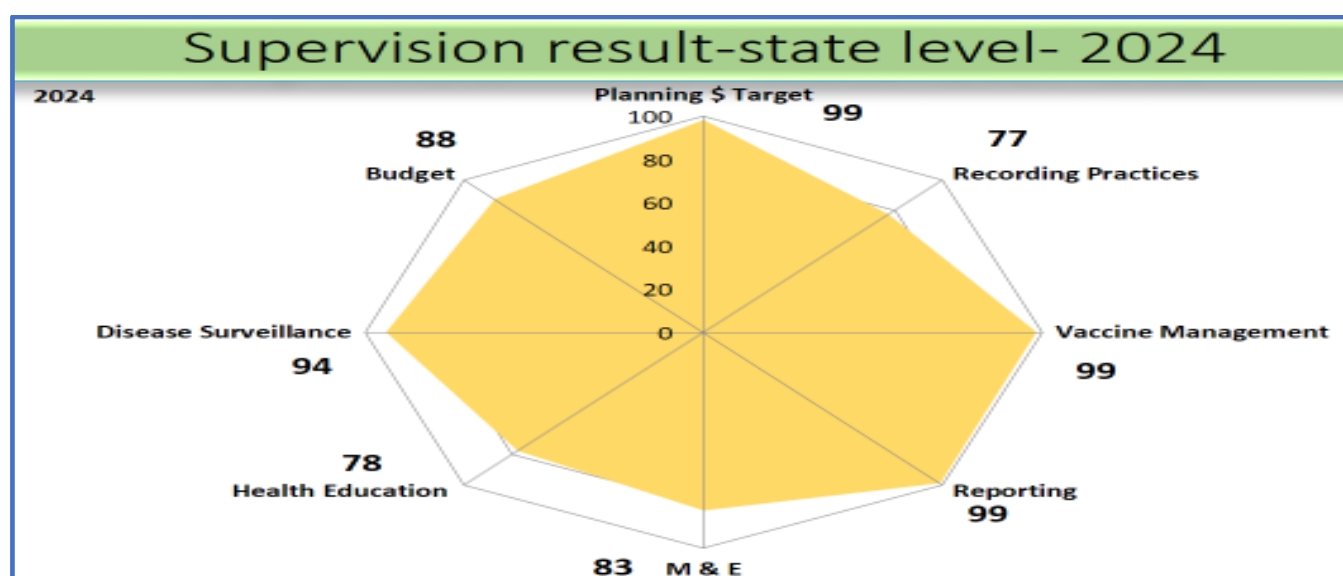
For the locality level, 36 localities were visited during the years 2023 and 2024. The result shows that all RI quality areas were poor in 2023. However, the situation improved in 2024, when most of the quality areas improved.

For the health facility level, 95 of the RI fixed sites have been visited since 2023 & 2024. The main identified bottlenecks were SBC activities and recording practices. EPI in Sudan was proposed in the emergency plan to conduct refreshment training for vaccinators to improve their skills. In addition to that, planning to conduct intensive supervision at all levels to ensure the quality of services.

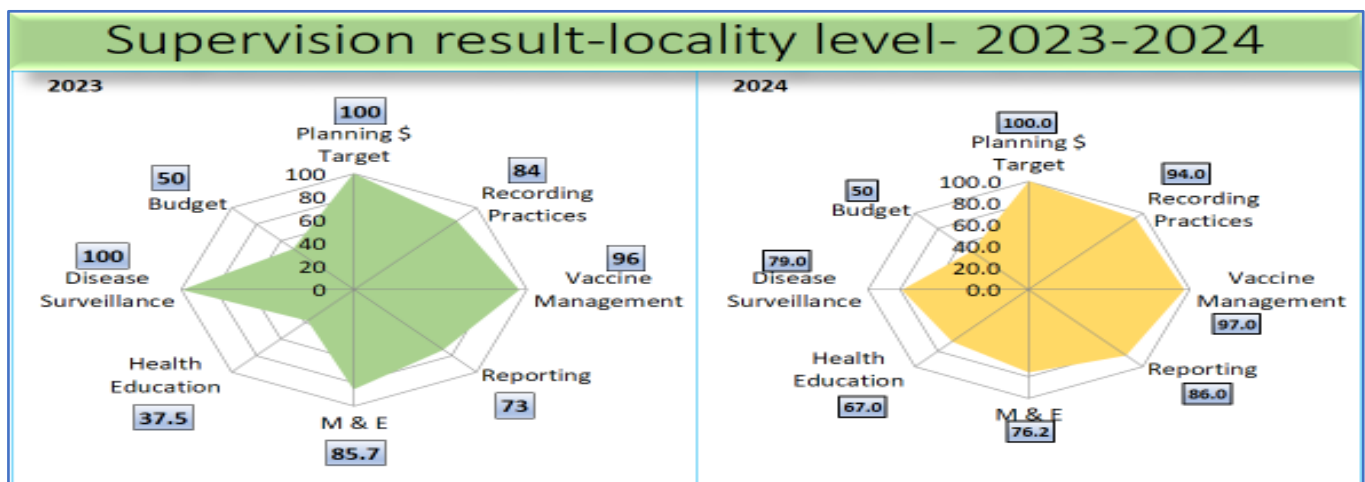
Supervision result-state level—2023-2024



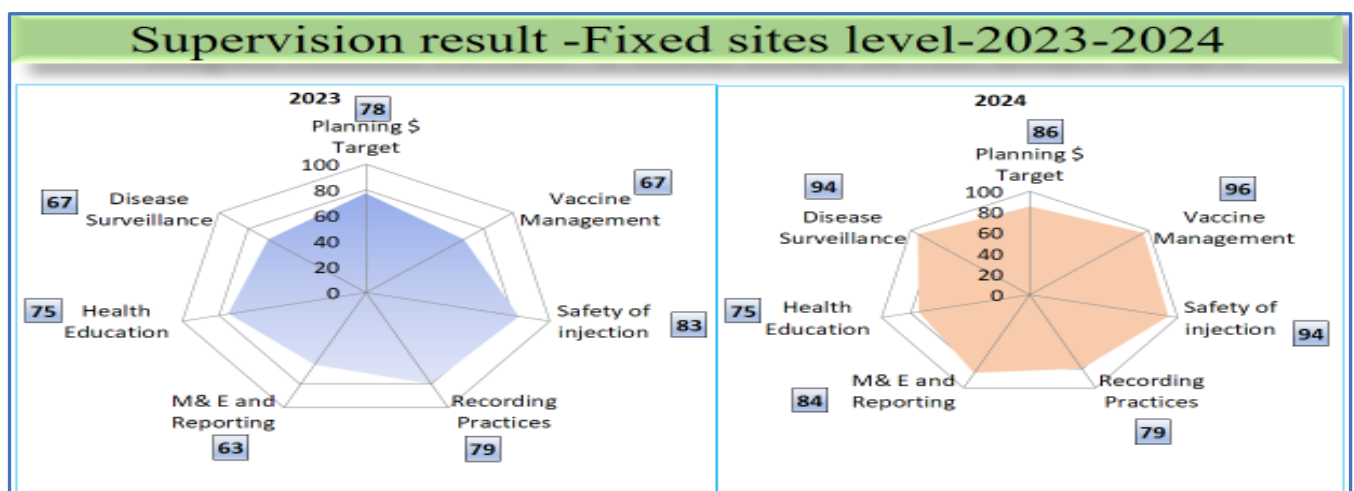
Implementation of supportive supervision visits from national level to the states and the performance of states – 2023 & 2024



Performance of RI services at the state levels 2024



Overall locality level RI services performance by federal supervisors – Sudan – 2023&2024



Overall health facility RI services performance by federal supervisors – Sudan – 2023&2024

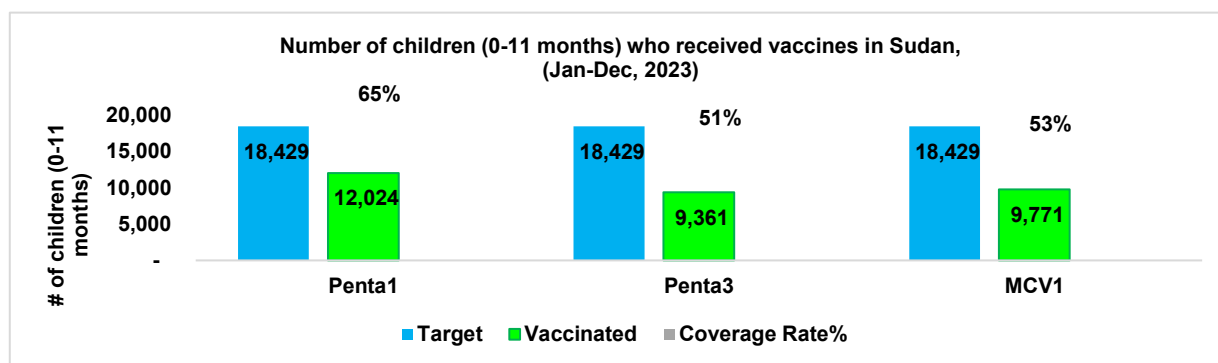
• Progress on Reaching Zero-Dose and Under-Immunized Children:

- How has the country progressed in vaccinating zero-dose and under-immunized children?
- What changes have been observed in dropout rates from DTP1 to DTP3 and MCV?

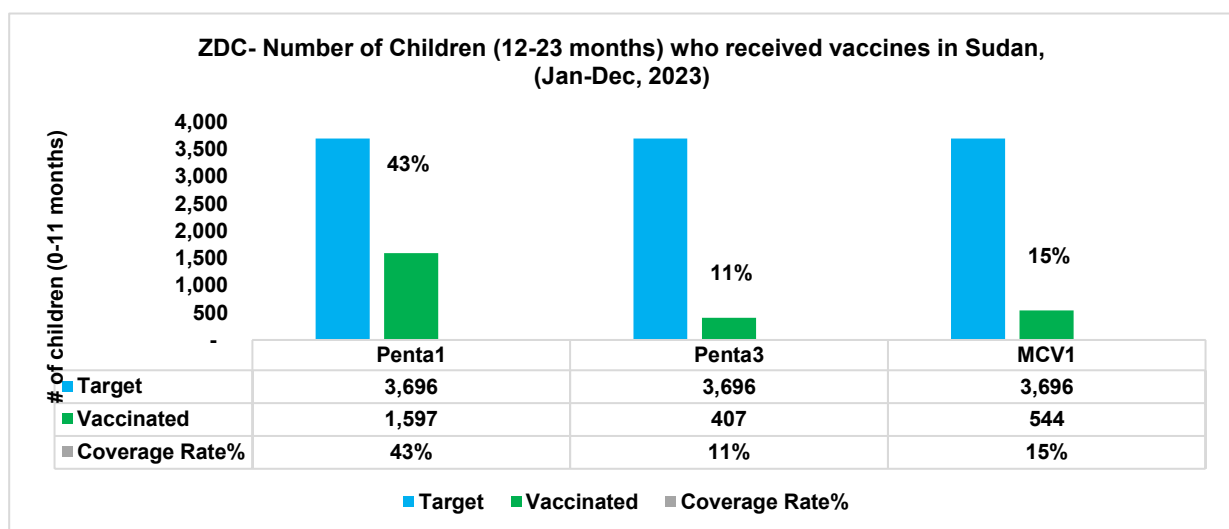
Throughout the period spanning January to December 2023, the IRC (International Rescue Committee (IRC)) diligently continued the enhancement and execution of the REACH project, focusing on zero-dose children and underserved communities in both Blue Nile and Gadarif states. This collaborative effort involved close coordination with key stakeholders, including the Ministry of Health (MoH), ADD, WHO, UNICEF, and other partners within the REACH Consortium.

Following the successful initiation of service delivery in Gadarif state in January 2023 and Blue Nile in April 2023, the IRC proactively devised a contingency plan (Plan B) to address the gap resulting from the withdrawal of IOM from the consortium. Despite facing challenges such as the impact of the war on April 15th 2023, and intercommoned violence in Blue Nile since July 2022, coupled with flooding in parts of Gedaref and Blue Nile, the program demonstrated significant resilience in navigating the evolving implementation landscape.

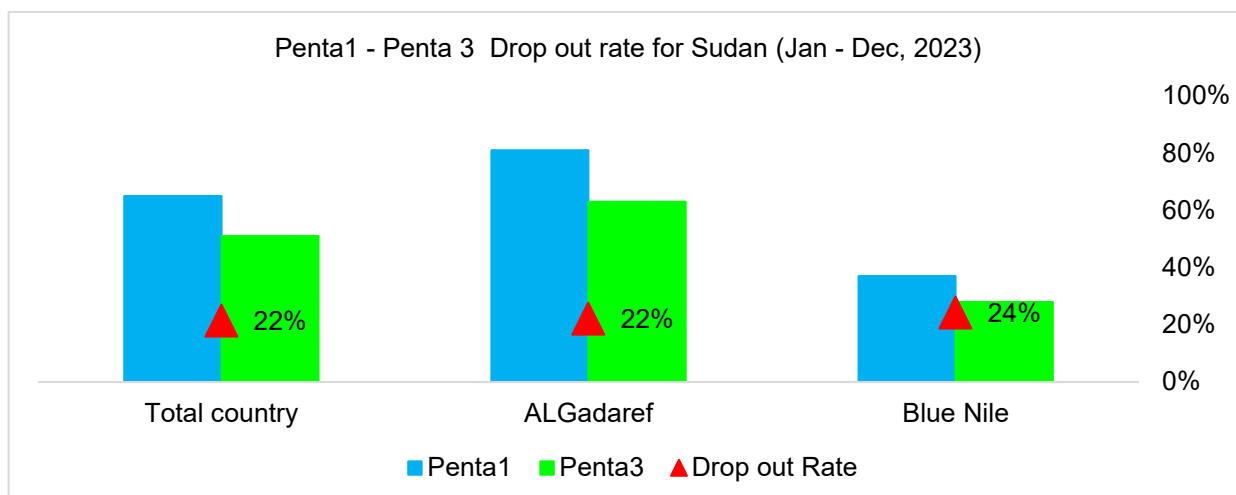
To date, a total of 13,631 children under five years have been reached with PENTA 1 doses through the REACH project, including some 1,607 zero-dose children vaccinated. Cohort of 24 to 59 months of age was given access to vaccination services because the current policy does not allow the service to be provided to them. IRC engaged in wide discussion with MOH, UNICEF, WHO to include the under-five of age children in the ZIP. The efforts were successful as all stakeholders were supportive. MOH included the under-five in their proposal for the EAF. The supplies were the main barrier to include the 24 to 59 months of age.



Number of children (0-11 months) who received vaccines in Sudan, (Jan-Dec, 2023)



ZDC- Number of Children (12-23 months) who received vaccines in Sudan, (Jan-Dec, 2023)



Penta1 - Penta 3 Dropout rate for Sudan (Jan - Dec, 2023)

The REACH project is currently considered in a piloting phase, limited to two states (Gadarif and Blue Nile) and only two localities within each state, focusing on specific immunization centers, not all strategies are being implemented in this phase, so an evaluation of the completed phase is necessary to inform future planning. This evaluation include the planning and the guideline of recording and reporting, identification of zero dose communities and how to align all the organization efforts to maximize the benefits.

- **Vaccine Stock Management:**

- How effectively are vaccine stocks being managed?
- Are there any reported stock-outs or issues with vaccine wastage?

- **Vaccine Consumption Rates:**

2. Learning Question: How well are vaccine stocks being managed by colour areas?

Despite the challenges following the conflict, vaccine stocks are being managed with notable resilience. The (EPI) in Sudan maintained immunization supply distribution for the first quarter. At the time war had erupted out on 15 April, 14 out of the 18 states had received the vaccine supply for the second quarter for all states that received the and started the distribution of the second quarter supplies.

Since the early hours of the conflict, EPI programme has rushed to secure the vaccine at the national cold store. The programme activated the emergency plan and checked on the staff who already in the cold chain building. The contingency fuel stock of 2,000

litres confirmed readily available and accessible. Back generator has been operated since the national grid went off. Fuel supplies has been maintained to the national cold store through the conflict until the technicians received death threats and forced to leave the national cold chain.

As the conflict continued to escalate, a crisis management unit was swiftly established. This unit, led by the PHC-DG, included the EPI Manager, Cold Chain Manager and Deputy, and the UNICEF/EPI Specialist and one UNICEF Logistic officer. Their primary objective was to secure the immediate evacuation and distribution of vaccines. Within the first two weeks of the conflict, vaccines were successfully evacuated to 12 states, and the distribution was later extended to 17 out of 18 states. The only exception was South Darfur, where intense fighting and the destruction of the cold chain infrastructure on the first day of the conflict made vaccine distribution impossible.

Two months into the conflict, UNICEF and the FMOH began utilizing charter flights to ship and receive vaccines. These vaccines were then directly distributed to various states. To enhance supply chain efficiency, three supply hubs were reinforced: one in Gadarif, one in Kassala, and another in Kosti. These hubs functioned as national supply centers, with Kassala and Gadarif serving as key receiving points for international shipments.

The Kosti hub played a critical role in supplying vaccines to the three Kordofan states and the five Darfur states, despite the challenging circumstances. Meanwhile, the Gadarif and Kassala hubs ensured continuity in receiving and managing international vaccine shipments, sustaining the programme's operations amidst the crisis.

With support from Gavi, the country managed to procure 10 cold rooms and deploy five of them during 2023, including establishing of main vaccine receiving point in Port Sudan by installing additional two cold rooms 40 cubic meter each. Further expansion to the cold chain in Kassala, Gadarif, White Nile and Khartoum have been completed.

Before end of 2023, the country restored the capacity to receive and store three months buffer stock in Red Sea, Kassala and Gadarif.

The key achievements in 2023 were:

1. Evacuation of vaccines from the national cold store including 11.6 million dose of MR vaccine; the total value of the vaccine and related EPI supplies that was saved by the core team is reaching 50 million USD.
2. Ensure the most possible efforts are done to ensure vaccine flow to the states and maintain immunization services in all states except South Darfur.
3. Establishment of three supply hub to start receiving international shipments.
4. Restore of the cold chain system in key states (West Darfur, West Kordofan and Khartoum) where wide range of destructions was reported.
5. Receiving and distribution of 7 charters.
6. Support implementation of MR campaign in secure states.

7. Procurement and deployment of 10 cold rooms, 40 long range passive vaccine carriers, 10 freezers and 40 Ice lined refrigerators to expand vaccine storage capacity and restoring the national capacity to keep at least three months buffer stock.
8. Navigate the conflict and access issues to maintain vaccine supply moving cross conflict line.

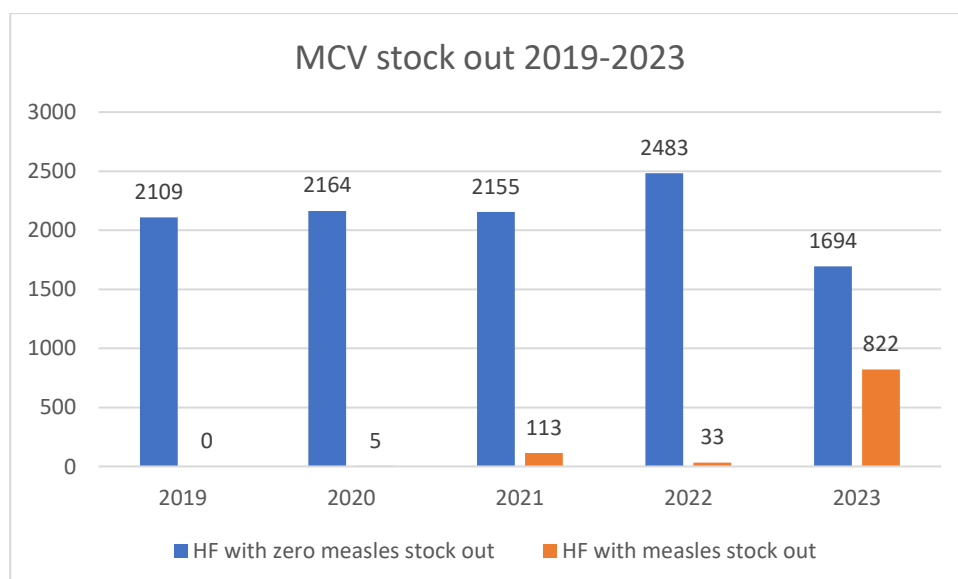
The supply chain distributing vaccines to 17 out of 18 states. Although the national cold store was destroyed, the program quickly adapted by distributing vaccine directly from Red Sea and using supply hubs in Kassala, Gadarif and White Nile states. The capacity has been bolstered with 10 new cold room by January 2024 and additional refrigerated trucks. By March 2024. The storage capacity has increased significantly allowing Sudan to maintain a three-month buffer stock and better manage vaccine distribution and catch-up activities. With cold rooms installed in June 2024 and the expansion of logistics infrastructure, the flow of supplies is stabilizing. To further facilitate vaccine distribution, a hub will be established in Adré, Chad, to support vaccine deliveries to Darfur states through West Darfur. The installation of cold chain equipment (CCE) at this hub is scheduled for November 2024. Additionally, there is a proposal to create another hub in South Sudan to cover Kordofan states, with vaccine distribution through Renk in South Sudan.

Are there any reported stock-outs or issues with vaccine wastage?

Stock-out issues have been reported, particularly due to the conflict's impact on logistics, supply chain management, and access to the states as well as to the national cold store. In the first day of the conflict, the cold chain in West Darfur and South Darfur and some localities has been destroyed. North Kordofan, South Kordofan and West Kordofan all reported stock out. Access issue and displacement of vaccinators in some areas has led to close of the immunization sites as no staff operate those health facilities. The destruction of critical cold chain infrastructure, especially in Khartoum, Darfur states, and Kordofan regions, exacerbated the situation. Vaccine wastage was a significant issue, with around \$18 million worth of vaccines confirmed as damaged due to power cuts and inaccessibility at the National Cold Store. However, with increased storage capacity and logistics improvements, stock-outs are expected to reduce, provided security and access improve. See table below showing the damaged Vaccines:

Vaccine Inventory, Consumption, and Wastage Summary 2023

Type	Stock in the conflict day 15..2023	Extracted after conflict	Reported damaged	Annual consumption	proportion of damaged to annual need 2023	Approved 2024	Approved for co-finance wavier	available for 2024 due to consumptio	Total available for 2024	Calculated Gap	Recommended action
Penta	146,400	134,400	12,000	4,167,250	0.29	4,167,250	678,450		4,845,700	-	The recommendation is to use the available vaccines and assess the need if the utilization incread by September 2024.
PCV	1,425,600	676,800	748,800	4,503,600	17	4,118,600	840,200		4,958,800	-	
Rota	1,034,400	770,000	264,400	4,270,200	6	4,788,400	-		4,788,400	-	
IPV	812,000	707,650	104,350	2,094,400	5	2,094,400	-		2,094,400	-	
YF	673,400	541,275	132,125	2,094,400	6	2,281,000	-		2,281,000	-	
MenA	339,000	327,225	11,775	3,567,500	0	3,456,500	-		3,456,500	-	UNICEF will need to secure fund for the remaining of 2024
MR Routine	-	-	-	-	-	4,850,000		3,905,175	8,755,175	-	
BCG	2,624,000	1,046,000	1,578,000	2,979,400	53	2,875,160	-		2,875,160	compensated	
bOPV	5,637,480	2,377,000	3,260,480	8,792,200	37	7,581,160	-		7,581,160	compensated	
Measles	400,000	348,000	52,000	2,669,570	2	2,669,570	-		2,669,570	compensated	
Td	990,840	606,840	384,000	4,133,900	9	3,850,460	-		3,850,460	compensated	
MR campaign											
Type	Approved	extracted	Reported damaged	proportion of damaged to approved	used for MR partial implemenatio	available	Remining target	estimated vaccine	Physically counted available	Calculated Gap	Recommended action
MR Campaig	21,859,000	11,581,500	10,277,500	47	6,189,100	5,392,400	14,981,848	17,229,125	5,392,400	11,836,725	Request to replenish 11,836,725



MCV stock out 2019-2023

- **Vaccine Consumption Rates:**

- Are vaccine consumption rates aligned with forecasts?

Overall, the consumption rates are not entirely aligned with initial forecasts. The Overall EPI coverage sharply dropped from 92% in 2022 to 50%. The Low coverage is the main driver for low consumption and hence, the differences between forecasted vaccine for 2023 and actual consumption is significant. Several factors have contributed to the low routine EPI coverage including:

- EPI system disruptions caused by conflict in 9 states, including destruction of cold chain system, displacement of population and health staff, the looting of cold chain equipment.
- Access and logistics challenges lead to stock out and interrupted vaccine flow in the conflict zones.
- Availability of flexible funds to timely implement routine immunization activities in areas that has vaccine stock.
- The shift in priorities for families and the stress caused by the conflict and the impact of prioritizations on demanding vaccination.
- The swift fall over of Gazira state to the RSF at critical time, the state has the 12% of the total population in the normal situation in addition to the fact that it is the highest state in receiving the IDPs.
- Partial implementation of routine acceleration campaigns due to access to send supplies, availability of funding and delayed vaccinator payments.

After implementation of EPI emergency plan and the humanitarian access, negotiations an alternative supply routes are expected to the help overcoming the low immunization coverage and low vaccine consumption.

The ongoing efforts to stabilize supply chains, secure access, alternative routes, secure funding, establishment of practical payment mechanisms, strengthening of effective vaccine management and improve data management will be crucial in achieving better vaccine utilization.

What factors are influencing vaccine consumption compared to expectations?

The forecast planning was originally developed during a period of normalcy, with security being one of the factors considered in estimating coverage and quantifying forecast needs. The key assumptions during the planning phase included:

1. The programme will reach 95% with the first dose Penta and 92% with the third dose.
2. The Progarmme will overcome 2021 and 2022 coverage drop caused by the political atmosphere, the cope and the complications that followed and will reach the zero dose children from previous years.

The key factors that are influenced vaccine consumption include:

1. Disruptions in Fund Flow for Routine Immunization:

Since 2020, delays in fund disbursement have hindered routine immunization activities. The failure to release funds on time for the EPI program resulted in suboptimal implementation of immunization sessions, with most planned mobile and outreach sessions left unexecuted. To date, arrears from 2021–2024 remain unresolved, affecting payments for vaccinators and covering logistical components of routine immunization.

2. Comprehensive Disruption of the Immunization System due to the 15th April war:

The war has severely impacted all aspects of the immunization system, including cold chain functionality, access to services, supply chain flow, population displacement, infrastructure damage, and financial systems. These disruptions have compounded the challenges, leading to significant reductions in vaccine coverage and availability.

Top risks and mitigation strategy per colour area :

What are the top risks in accessible areas, and what is the mitigation strategy

Section 1 forms the analytical foundation to structure the JA discussion with Section 2 summarising the outcome of the JA and follow-up actions.

Section 1: Country situation: overview of performance of support & discussion on progress, challenges faced

Summary of Challenges and Adaptations (example)

- **Conflict and Insecurity:** Ongoing conflict has created areas with limited or no access for health workers, requiring alternative strategies such as community-led initiatives and mobile health units.
- **Health System Variability:** The readiness of the health system varies significantly across the country, with some regions maintaining cold chain systems and regular vaccine supplies, while others face severe shortages.
- **Differentiated Strategies:** Immunization programs have been tailored to regional needs, focusing on maintaining cold chains in accessible areas and using more agile, rapid-response methods in high-risk areas.

Table Structure (to be adapted)

The following table categorizes regions by access level (Green, Yellow, Red) and outlines the immunization system's challenges and strategies in each context.

Accessibility by states

Region	State	Access Level	Health System Readiness	Target population	Number immunized (by antigen)	Key Challenges	Adapted Strategies
A	Northern River Nile	Accessible states	High	491,559	BCG 292,705 Pent1 276,380 Penta3 251,403 MCV/MR1 237,643 MCV/ME2 190,953	IDPs rainy season Change of the target population due to population movement	Regular outreach and fixed site services maintained. Used MR campaign coverage, HAC and UN data (IOM & OCHA) campaign to Estimate targets
	White Nile Gadarif Kassala Red Sea	Green					
B	Khartoum Jezira Sennar	Hard to reach	Moderate/Low	1,364,814	BCG 275,936 Pent1 223,356 Penta3 152,729 MCV1 218,844 MCV2 167,951	Intermittent access, security threats, Severe conflict, supply chain disruptions Change of the target population due to population movement	Mobile health units, community-led vaccination campaigns. Temporary vaccination posts, use of local mediators for safe access. Hit & Run Used HAC and UN population data (IOM & OCHA) to Estimate targets
	North Kordofan South Kordofan West Kordofan North Darfur South Darfur Central Darfur East Darfur West Darfur	Yellow/Red					

Accessibility by Localities

localities	Access Level	Health System Readiness	Target population	Number of localities	Key Challenges	Adapted Strategies
Region A	Green Accessible	High	842,089	113	IDPs rainy season Change of the target population due to population movement	Regular outreach and fixed site services maintained.
Region B	Yellow Partial access	Moderate	660372	51	Intermittent access, security threats IDPs rainy season Change of the target population due to population movement	Mobile health units, community-led vaccination campaigns.
Region C	Red Inaccessible	Low	327854	22	Severe conflict, supply chain disruptions Change of the target population due to population movement	Temporary vaccination posts, use of local mediators for safe access. Hit and run

- **Green (Accessible):** These states are security stable, allowing consistent access thealth services. Immunization activities are regularly conducted with minimal interruptions. This category includes the Northern, River Nile, Red Sea, Kassala, White Nile, Gadarif, and Blue Nile states. This group was secured, and access from Port Sudan can be made through roads to transport supplies to the state capital and then to the localities and service delivery sites. All EPI components can be functioning normally if all other determinant granted such as the timely release of fund .
- **(Hard to reach):** This is classified into;
 - Group (A) Yellow States** are experiencing intermittent access issues due to moderate security challenges. Health services, including immunization, are often disrupted but are operational with adapted strategies. This group includes West Kordofan, North Kordofan, and South Kordofan states.

Group (B) Areas were heavily affected by conflict, leading to significant barriers to accessing immunization services. Health system readiness is critically low, with frequent service interruptions and high insecurity. These include Khartoum, Gazira, West Darfur, Central Darfur, South Darfur, North Darfur, and recently Sinnar states.

Further details for Each Contextual Category

1. Green area 1 (Accessible area):

- **Immunisation Program Performance:** Regular services with outreach activities, maintaining high coverage rates.
- **Challenges:** Occasional logistical issues and challenge in timely release of operational fund but generally well managed.
- **Adaptations:** Continued focus on maintaining cold chain integrity and outreach activities.

2. Yellow area X (Some Challenges):

- **Immunisation Program Performance:** The RI services is partially maintained. However, the coverage is still suboptimal.
- **Challenges:** Security incidents causing temporary suspensions and stock outs.
- **Adaptations:** Implementing accelerating mobile teams and periodic security assessments to adjust strategies.

4. Red area Y (Hard to Reach):

- **Immunisation Program Performance:** Severely affected by the conflict, with frequent service interruptions.
- **Challenges:** Inaccessibility, cold chain disruptions, safety of health workers.

Adaptations: Emergency strategies including temporary vaccination posts and reliance on local on ground Nutarian actor (SCI, Alight and IMC) for supporting the RI services. Coordination for cross border hubs to have alternate vaccine supply.

- **How well is the country implementing health information systems and data strengthening activities?**
- **What steps are being taken to address data-related gaps?**

Health information systems (HIS), including routine health information systems, population-based surveys, surveillance, civil registration, and vital statistics (CRVS) systems, are the key sources of data needed for evidence-based decision-making at the national and sub-national levels. Many challenges have been encountered with the health information system even before the war.

Since April 2023, the reporting rate in the hard to reach has sharply decreased to below 13% since the majority of health facilities are non-functional, particularly

in security-compromise areas, and connectivity challenges exist. However, the reporting system in the accessible states remained functional, where more than 95% of EPI strategies were functional and submitted reports as usual.

Although maintaining DHIS2 functional during the current conflicts is a key aim for the Federal Ministry of Health and partners, the system faces critical challenges, such as damage to the main servers in Khartoum, frequent staff displacement, and internet connectivity.

Many efforts have been taken to address the data gap in the hard to reach including coordination with the partners, plan to train the staff and to make the maximum use of data digitalization.

- **Implementation of Technical Assistance:**

- Is the country effectively implementing targeted country assistance (TCA)

Country Comment:

The implementation of Targeted Country Assistance (TCA) and COVAX/CDS technical assistance in the country has faced significant challenges, primarily due to inconsistencies and delays in execution by the plan implementers. While some progress has been made, the overall effectiveness of these activities is hindered by below factors:

Consistent Delays in Implementation

- **Sluggish Execution of Planned Activities:**

For most planned activities under the TCA and COVAX/CDS frameworks, UNICEF and WHO have demonstrated a pattern of slow execution. This has resulted in persistent gaps in technical support, capacity building, and program implementation, which are critical for achieving immunization and public health objectives.

- **Limited Absorption of Funds:**

The only aspect showing consistent and effective absorption is the funding allocated for technical positions embedded within the organizations' long-term structures, such as those tied to specific posts in their organograms. These positions are typically sustained by regular salary payments and have a direct role in program continuity. However, for the broader range of planned activities, such as training, workshops, and field operations, the sluggishness in implementation remains a significant issue.

Comparative Performance: EMPHNET

In contrast to UNICEF and WHO, EMPHNET has demonstrated robust progress and efficient execution of its assigned activities. This success can be attributed to its less bureaucratic structure, which allows for faster decision-making, reduced administrative hurdles, and more direct engagement with local stakeholders. EMPHNET's agility in implementing technical assistance activities has resulted in better outcomes in terms of timeliness and effectiveness.

Underlying Causes:

- **Bureaucratic Challenges:**

The bureaucratic systems within large organizations like UNICEF and WHO often impede the timely execution of technical assistance activities. This includes prolonged internal approval processes, rigid administrative frameworks, and frequent delays in fund disbursement.

- **Lack of Accountability and Communication:**

The lack of clear justification for delays in implementing planned activities highlights accountability gaps. Improved transparency and communication with country stakeholders are necessary to address these issues and foster a more effective partnership.

In conclusion, while the country is making some progress in implementing TCA and COVAX/CDS technical assistance, significant improvements are needed to overcome the systemic delays associated with UNICEF and WHO. The contrast in performance with EMPHNET underscores the importance of adopting more flexible and responsive approaches to technical assistance. For future effectiveness, it is crucial to streamline processes, enhance accountability, and ensure that activities are executed in a timely and efficient manner.

Immunisation Programme Performance –

1. Learning Question: What progress has been made to reach zero-dose and under-immunised children with vaccinations?

Indicator	2020	2021	2022	2023	% change, 2020-2023	% change, 2022-2023
Number of zero dose children at national level ¹	41,685	127,812	111,174	817,913	5.1 %	13.6%
Drop out from DTP1 to DTP3 at national level ¹	7.9%	9.5%	10.4 %	10.6%	9.3%	10.0%
Drop out from DTP1 to last routine dose of MCV at national level ¹	34.24 %	32.0 %	32.8%	30.8%	33.01%	31.8%
Percentage of health facilities that	99.7%	89.47%	97.26%	66.29%	95.5%	81.8%

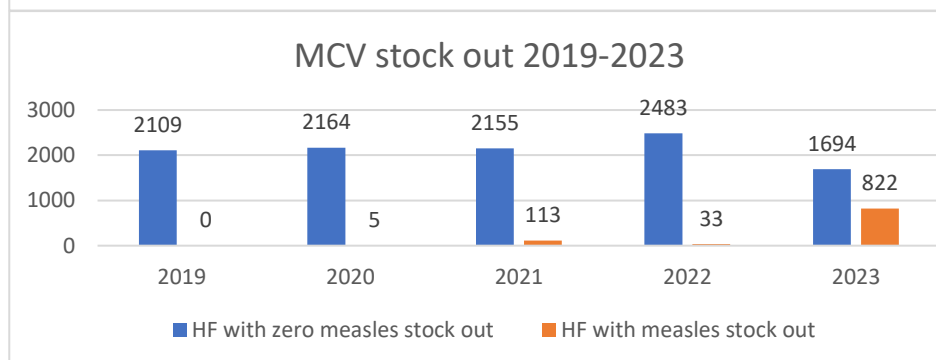
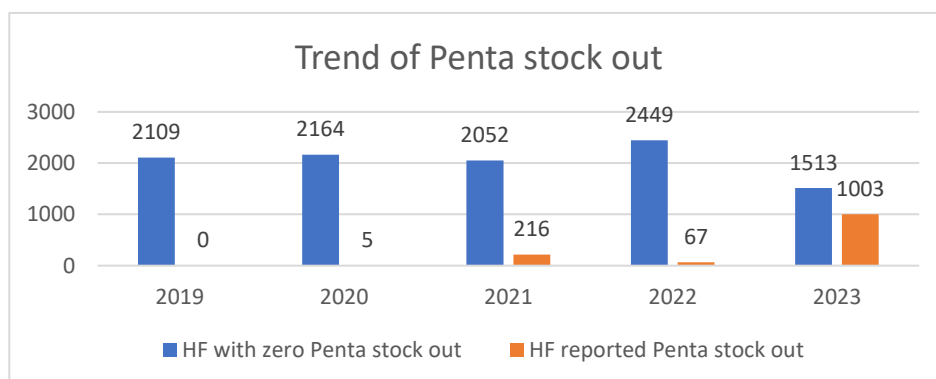
reported no stock-outs for the full year for DTP ²						
¹ Source: WHO/UNICEF Estimates of National Immunisation Coverage (WUENIC), July 2023. https://www.who.int/teams/immunization-vaccines-and-biologicals/immunization-analysis-and-insights/global-monitoring/immunization-coverage/who-unicef-estimates-of-national-immunization-coverage						
² Country data as reported to WHO/UNICEF through the electronic Joint Reporting Form (eJRF), July 2023. https://www.who.int/teams/immunization-vaccines-and-biologicals/immunization-analysis-and-insights/global-monitoring/who-unicef-joint-reporting-process						
Country comments Since the beginning of the war, the conflict has created severe challenges for the EPI especially in regions deeply affected by the crisis like Darfur, Kordofan, Gazira, and Khartoum. Here are the primary challenges that health teams and communities are facing: 1. Supply Disruptions in Conflict Zones: Delivering vaccines to states impacted by the conflict has become increasingly difficult. Unsafe roads and restricted access have halted regular vaccine transport, leaving many communities vulnerable to preventable diseases. 2. Budget and Funding Barriers: Delays in budget approvals and dependence on the Direct Payment modality have strained financial resources, hindering timely vaccine distribution and administration. This disruption has limited the program's ability to keep immunization services running smoothly, especially in area where they are needed most. 3. Displacement of Health Personnel and Beneficiaries: Health workers and Beneficiaries alike have been forced to relocate from conflict-affected areas, creating significant gaps in service coverage. This displacement leaves understaffed facilities and makes it difficult for families, especially those with young children, to access vital vaccinations. 4. Increased Zero-Dose Children: With many communities displaced or cut off from healthcare, the number of zero-dose children has reached 817,913, a concerning spike that underscores the urgent need for targeted immunization. To address these issues, a vaccination campaign targeting zero-dose children nationwide was planned. This initiative will work to reduce the ZDC, focusing on the most vulnerable children despite the many challenges ahead. 5. Sustainability and Stock Management: Unfortunately, in the past 5 years many health facilities witness vaccine/s stock-out. The condition is aggravated by the war to reach the height number of facilities with stock out since the establishment of the the program.						

2. Learning Question: How well are vaccine stocks being managed by colour areas?

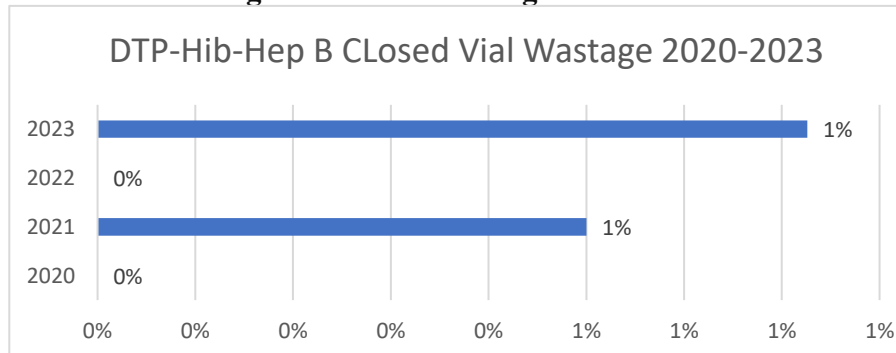
Indicator(s):

- Number of health facilities that reported no stock-outs of DTP containing vaccine
- Number of health facilities that reported no stock-outs of Measles containing vaccine
- Closed vial wastage of DTP-containing vaccine
- Number of CCE received/installed / leased through third party providers.
- Equipment maintenance and/or onsite readiness.
- Cumulative volume of C19 doses expired to date (and volume specific to COVAX supported doses if these data available)

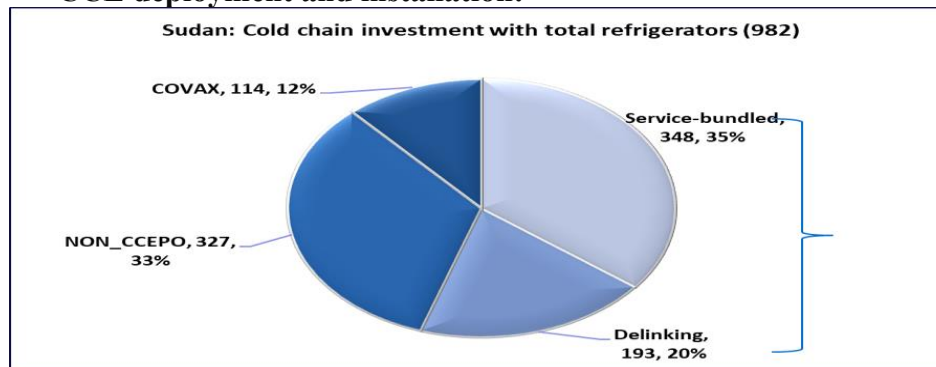
Graphs:



• Closed vial wastage of DTP-containing vaccine



• CCE deployment and installation:



Country Comments:

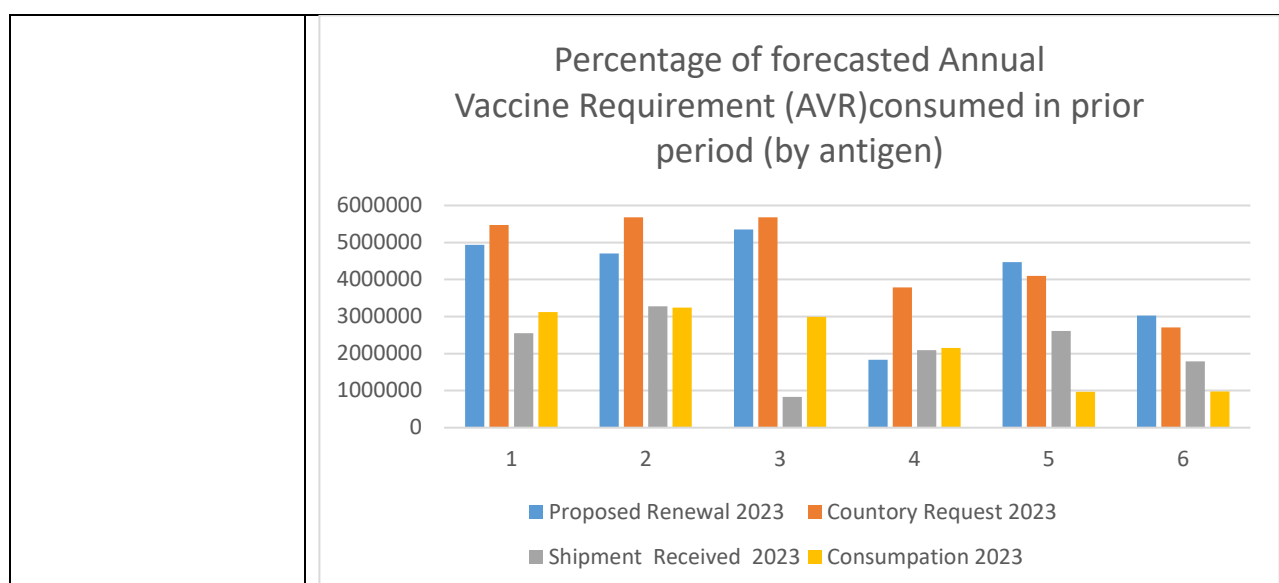
- **Health Facilities Reporting No Stock-Outs of DTP-Containing and Measles-Containing Vaccines:** In 2023, vaccine availability remained challenging due to ongoing instability, including disrupted supply chains, high turnover of key staff, and recurring port and road blockages. These factors led to intermittent stock-outs in health facilities for DTP and measles-containing vaccines, despite coordinated efforts to secure timely shipments.
- **Closed Vial Wastage of DTP-Containing Vaccine:** Closed vial wastage was reported, primarily due to quality issues from suppliers and distribution challenges. To address this, the program established protocols for real-time monitoring, and efforts to engage with suppliers to ensure quality control are ongoing.
- **CCE Deployment and Installation:** Cold chain expansion was hindered by logistical barriers and security risks, particularly in conflict zones. Though new CCE units were received, installation and maintenance were delayed, impacting the readiness of facilities in some regions.
- **Equipment Maintenance and Onsite Readiness:** Maintenance remained a challenge, as resource constraints and restricted access to conflict-affected areas delayed repairs and upkeep. Partnerships with third-party providers were utilized to partially address critical maintenance needs.

3. Learning Question: By colour area are vaccines being consumed at rates that are in-line with approved forecasts? What are the key drivers of consumption compared to expectation (e.g., stockouts, increased coverage, wastage)?

Indicator(s):

- Percentage of forecasted Annual Vaccine Requirement (AVR) consumed in prior period (by antigen)
-

Graphs:



Comments:

The chart highlights ongoing challenges in vaccine pipeline management due to a mismatch between forecasted vaccine requirements, shipments received, and actual consumption in 2023. Vaccine consumption is generally lower than both the country's requests and proposed renewals, reflecting decreased coverage primarily due to the impacts of ongoing conflict. Over the past few years, Gavi's vaccine approvals have consistently been lower than the country's requests, which, combined with lower-than-expected consumption, has led to difficulties in stock management and frequent stockouts. The recent development of a forecasting, budgeting, and financing tool for vaccines aims to help the EPI align future requests more closely with actual needs, potentially reducing these pipeline issues.

4. Learning Question: Is the country complying with co-financing requirements in a timely manner?

Indicator(s):

Country co-financing obligation met in a timely manner

Graphs:

(Examples to be replaced with specific country versions)

Country comments:

As a Gavi-eligible country, Sudan has consistently fulfilled its co-financing obligations and has never defaulted on any payment. During the COVID-19 pandemic, Sudan was granted waivers for its co-financing requirements in 2020 and 2021, reflecting Gavi's consideration of the unprecedented global crisis. In 2022, despite ongoing challenges, Sudan successfully met its co-financing obligations.

However, for 2023 and 2024, the country has requested waivers due to the ongoing armed conflict and its severe impact on national resources. It is crucial for the Federal Ministry of Health (FMoH) and Gavi to engage proactively with the Ministry of Finance (MoF) to ensure timely planning and advocacy for the sustainable management of these obligations moving forward.

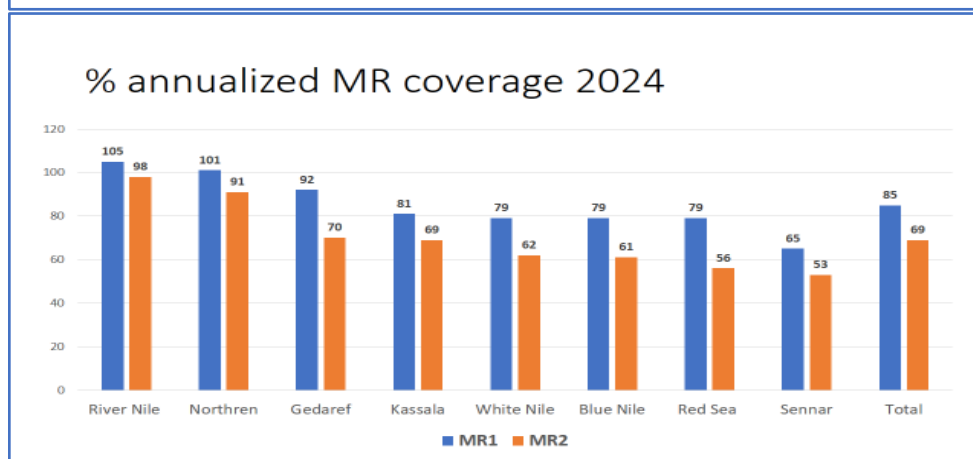
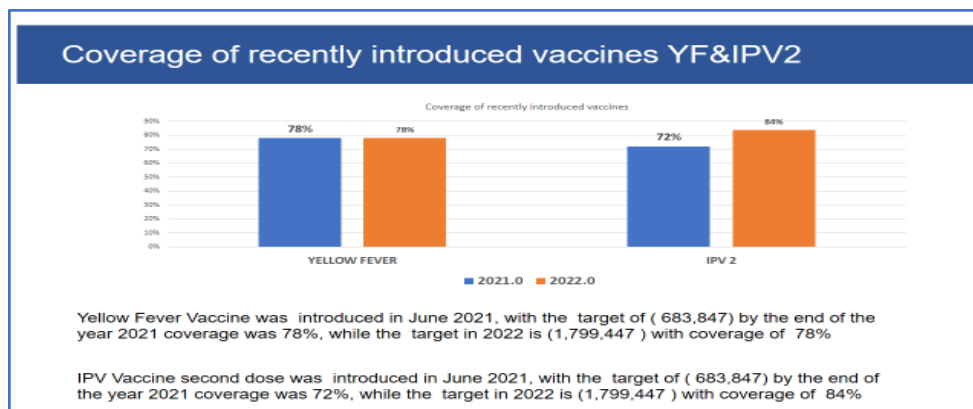
5. Learning Question: By colour area , have new vaccines been introduced as planned and if not, why? Is coverage of recently introduced vaccines being scaled-up as expected?

Indicator(s):

- Number of routine introductions completed over number of targets set for the calendar year
- Coverage of recently introduced vaccines

In addition, forecasted routine introduction & campaign dates should be validated during the JA discussion

Graphs:



Coverage of recently introduced vaccines-MR

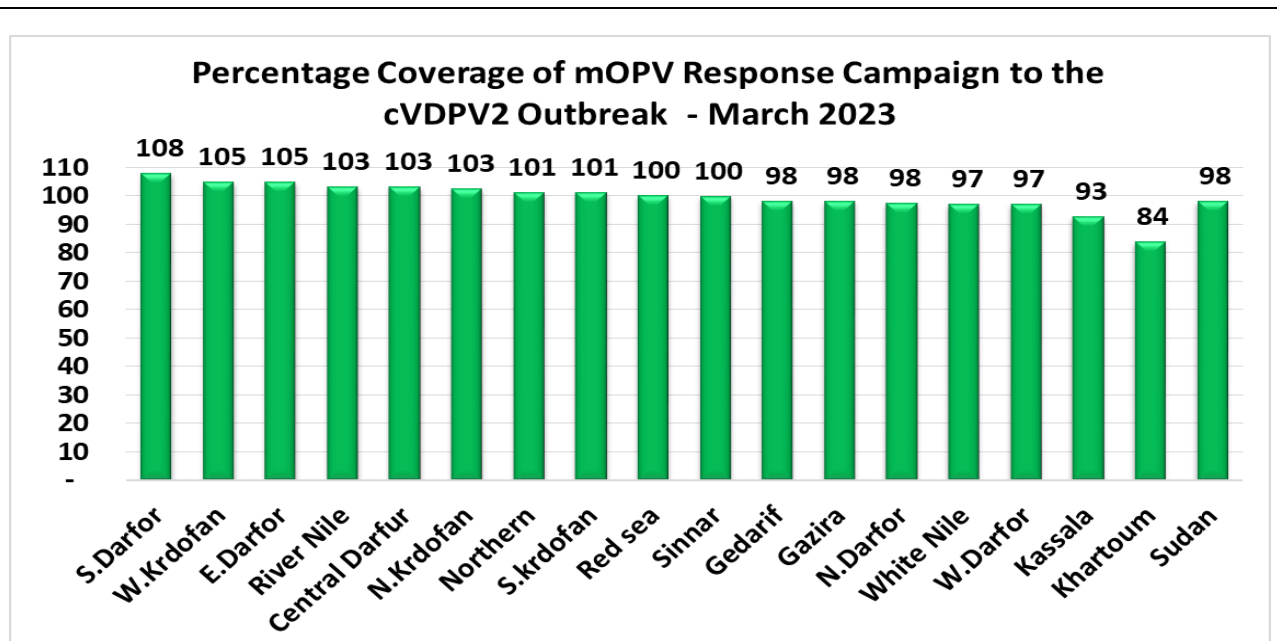
State	Target	MR 1	%	MR 2	%	DOR
River Nile	23,987	25,107	105	23,602	98	6.0
Northren	12,753	12,866	101	11,605	91	9.8
Gedaref	48,939	44,941	92	34,227	70	23.8
Kassala	39,973	32,559	81	27,619	69	15.2
White Nile	42,785	33,628	79	26,471	62	21.3
Blue Nile	19,972	15,865	79	12,221	61	23.0
Red Sea	16,407	12,930	79	9,116	56	29.5
Sennar	16,916	11,011	65	8,943	53	18.8
Khartoum	-	-	-	-	-	-
Central Darfur	-	-	-	-	-	-
East Darfur	-	-	-	-	-	-
Gazira	-	-	-	-	-	-
North Darfur	-	-	-	-	-	-
North Kordofan	-	-	-	-	-	-
South Darfur	-	-	-	-	-	-
South Kordofan	-	-	-	-	-	-
West Darfur	-	-	-	-	-	-
West Kordofan	-	-	-	-	-	-
Sudan 2024	221,733	188,907	85	153,804	69	18.6

The MR vaccine was introduced in 7 states, after Sennar State was added to the introduction in June, thus the introduction was completed in 8 states.

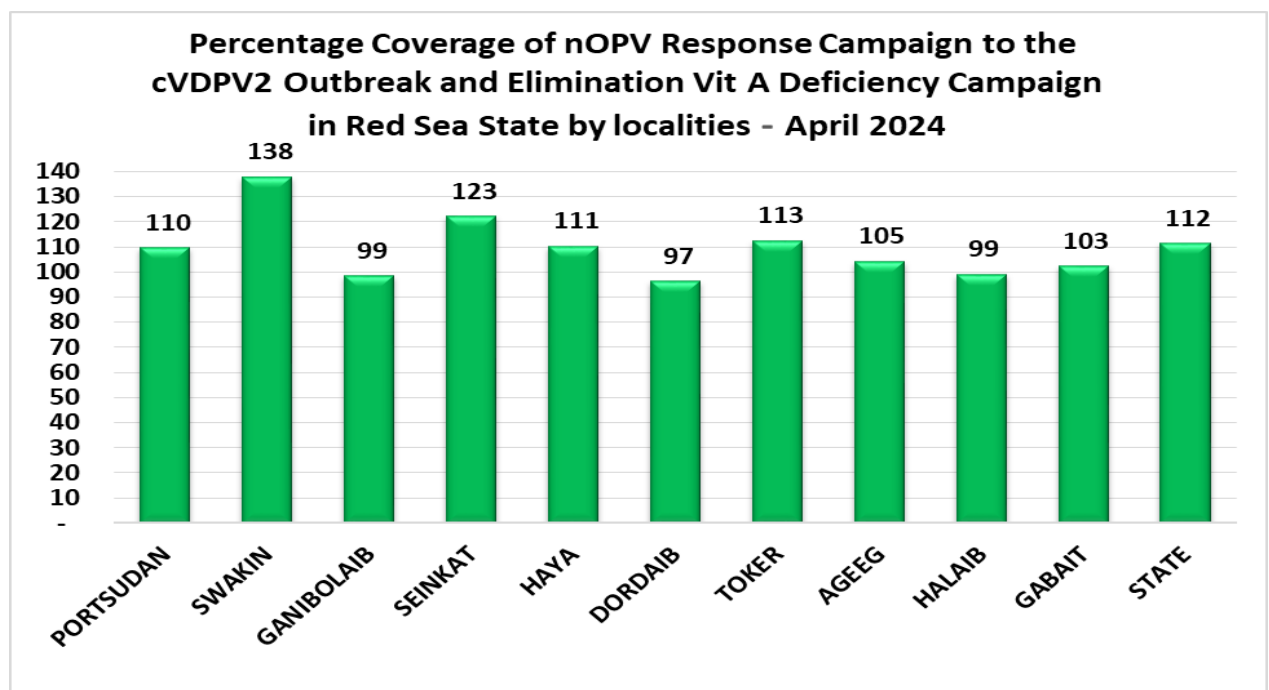
Country comments the new vaccines introduce in 2022 up to early 2024 are YF, IPV and MR. IPV second dose and YF are alliance with the coverage with simultaneal antigen (MCV1). The MR introduced in only 9 states due to the current country situation. The initial analysis revealed that MR1 coverage is better than MR2, which necessitate consideration of tailored action using the opportunities of the BCU and the planned implementation research in PEF-TCA and Malaria TA.	

6. Learning Question: If relevant, how effective have recent Gavi supported vaccination campaigns been?² Please highlight lessons learned which are applicable for routine immunisation and upcoming campaigns (e.g., timeliness of outbreak response, quality, campaign reach and link back to strengthening routine immunisation, COVID-19 campaigns, if relevant).	
Indicator(s): • Number of vaccination campaigns conducted (stratified by type of campaigns, including preventive, reactive, catch-up, follow-up, sub-national and national) • Coverage of recent Gavi-supported campaigns, compared to target (coverage rate disaggregated by sex if collected) • Number of reported outbreaks of vaccine-preventable diseases (for which Gavi supports with reactive campaigns)	
During 2023 Sudan implemented the following: ▪ National mOPV2 first round during March. Sudan declared the outbreak on 17 December 2022, detailed case investigation, initial internal consultants meeting and declaration of outbreak by Federal Ministry of Health were completed within 24 hours from Lab results. WHO and UNICEF activated Incident Management Team (IMT), Federal Ministry of Health established outbreak response National Technical Committee and Sub-committees. The ORPG approved 2 NIDs using mOPV2 in first round for a target population of 8.9 million children and nOPV2 for the second round. One NID using mono valent OPV2 was conducted in 17 states during 18-21 March 2023 with high coverage 98% verified by IM 94%. Second planned NIDs was not implemented due to start of armed conflict in 15th April 2023. The outbreak is not closed yet.	

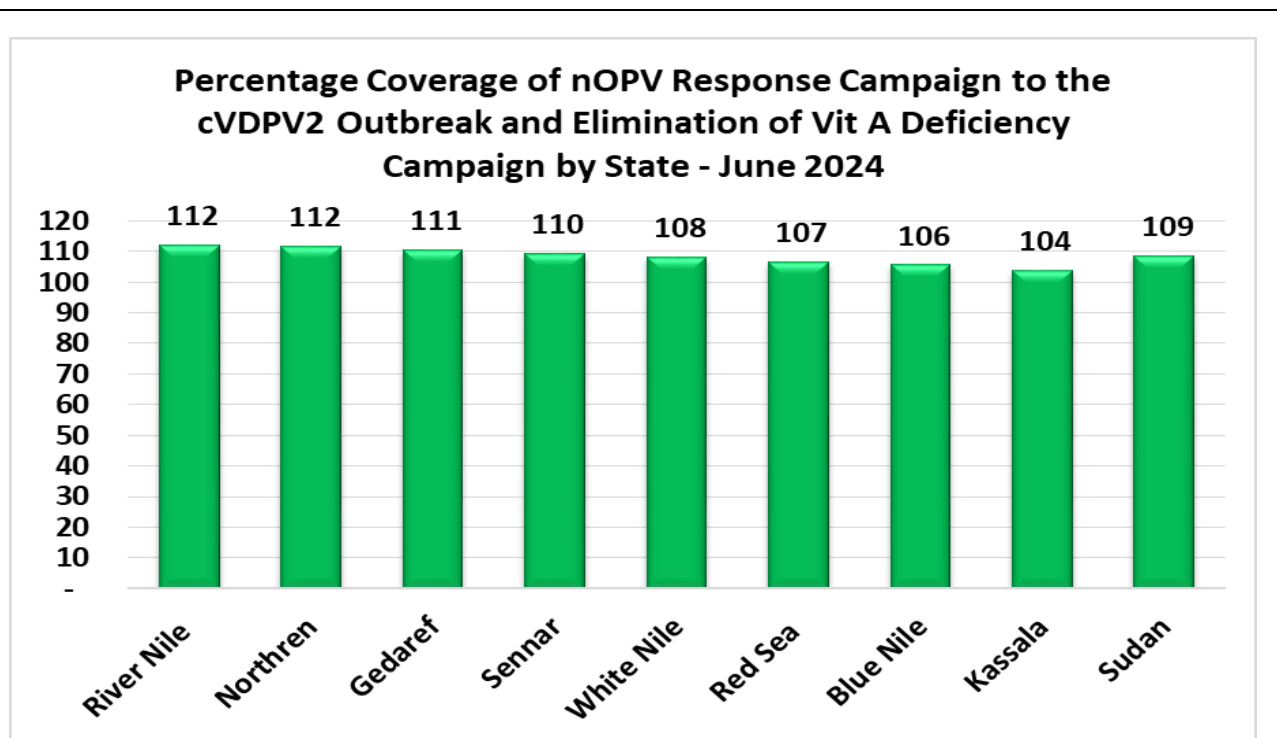
² Please reflect on those campaigns conducted since the last Joint Appraisal/Multi-Stakeholder Dialogue exercise.



On 21st January 2024, Sudan confirmed seventh outbreak with the emergence of a new circulating variant poliovirus type 2 (cVDPV2) was reported from an environmental surveillance site of Port Sudan Pediatric Hospital in Port Sudan locality, Red Sea State, the outbreak classified as a new emergence of virus doesn't link with outbreak of 2022 or circulation in countries bordering Sudan such as Chad. Sudan declared the outbreak on the 21st of January 2024, Risk assessment was completed The ORPG approved conduct urgent response in Red Sea state during April with target 198,067 children achieved high coverage 112% verified by IM 96%.

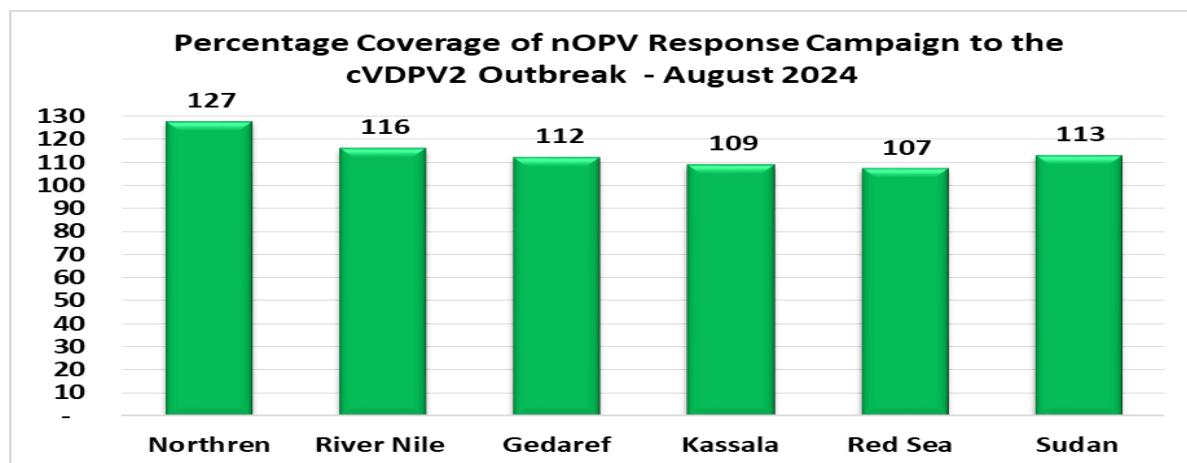


Also, OPRA approved plan for response SIAs in the 8 accessible states as first round of response and for the Red sea state as second round of response During June using nOPV2 for a target population of 3.07 million children achieved 109% and the result of IM was 96%.



Third round for Red Sea state and second round of response in 5 accessible states During August using nOPV2 for a target population of 1.9 million children achieved 113% and the result of IM was 96.8%.

Ongoing preparation to implement second round in White Nile and Blue Nile with target population 925,355 children, unfortunately Sennar state will not able to implement the second round due to ongoing conflict.



- Covid -19 second and third round mega campaign during January and March repeatedly.

Sudan started its vaccination efforts to control the covid-19 pandemic during November 2020.

Sudan received the invitation to participate in the COVAX facility. Subsequently, on the 3rd of March 2021, Sudan was the first country in the MENA region to receive the first allocation of 828,000 AstraZeneca COVID-19 vaccines. The vaccination started on the 9th of March 2021 at a low scale for the health workers at the COVID-19 isolation centers in

Khartoum state.

Initially, the target selection was based on a risk-and age-based approach, accordingly, the vaccination focused on healthcare workers and people 45 years of age and above with comorbidities. Later, the vaccination coverage expanded to include immune-compromised persons and adults with comorbidities irrespective of their age including pregnant ladies, essential workers, and disadvantaged socio-demographic populations at higher risk of severe COVID-19 such as refugees and IDPs.

FMOH set a target of 23 million which is equivalent to 52% of the population above 18 years old to reach by end of December 2022 and to reach 20 % of the target by June 2022. Then the plan divided into phases; However, this target was large to reach.

- In phase one the target was the health care providers and persons 45 years of age and above with comorbidities,
- Then below 45 years old regardless of their health condition extending to include the essential workers such as the teachers, police officers,
- Finally, the target is 18 years old and above irrespective of their health condition.

Four types of COVID-19 vaccines (Sino pharm -Pfizer –Jansen-AstraZeneca) were used in Sudan.

The total number of vaccines received is, 33,389,613 doses, from (COVAX, WB through AVAT, and donated from the USA through COVAX, China, UAE, Spain.... etc.)

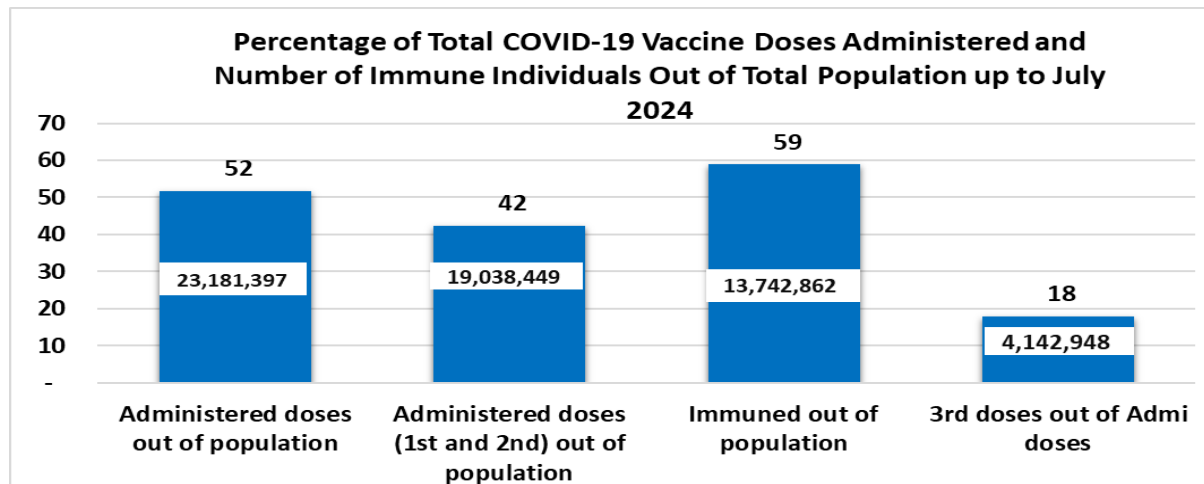
In the period 2021 - 2023 COVID-19 vaccination Strategies that used to reach the target group were:

- Fixed vaccination posts until the second half of 2021.
- Acceleration activities to cover high risk groups conducted till the end of 2021 achieved coverage was 6% vaccinated more than 2.75 million persons.
- “Around million target” campaign conducted each month up to end of 2022 to bring the Percentage of immune individual out of total population to 30% A little more than 13.4 million people were vaccinated.

The coverage rate was increase by 40% by the three rounds of mega campaign implemented during October 2022, January and March 2023 vaccinated in it 9,363,739 million persons.

In 2022, FMOH integrated **COVID-19 into routine** immunization, the coverage improved evidenced by the COVID-19 coverage rate was 4% of the target population reached by the end of 2023 during routine activities. After 15th April conflict during May and June 2024 accelerated COVID-

19 and RI was implemented in 13 states and vaccinated more than 500,000 thousand persons.

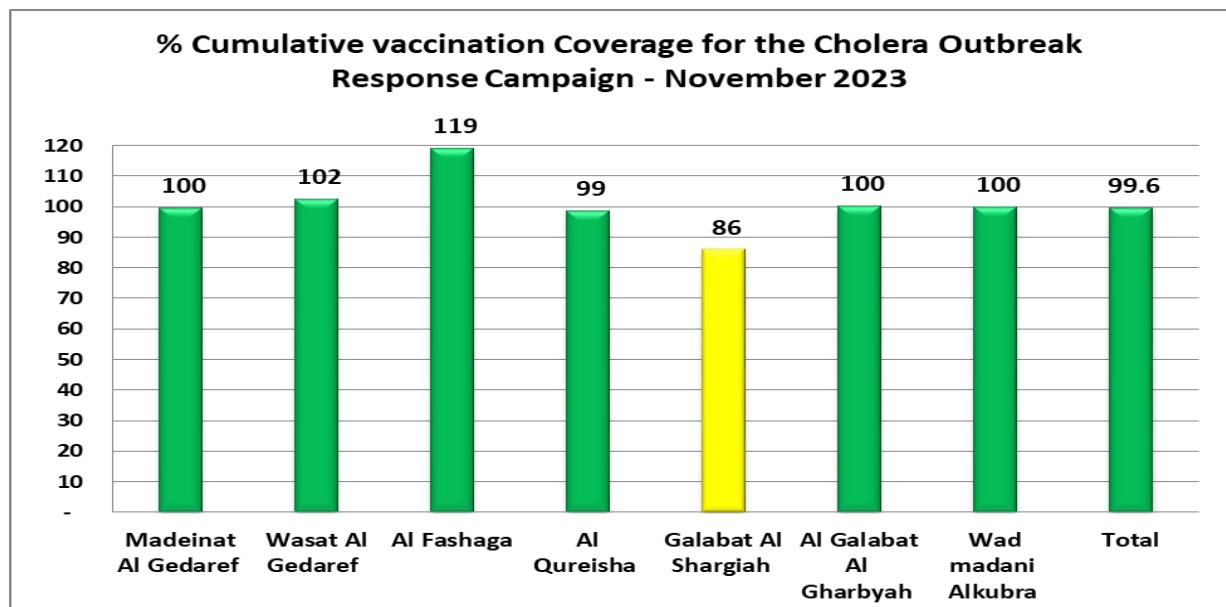


▪ **Cholera response campaign during November and December.**

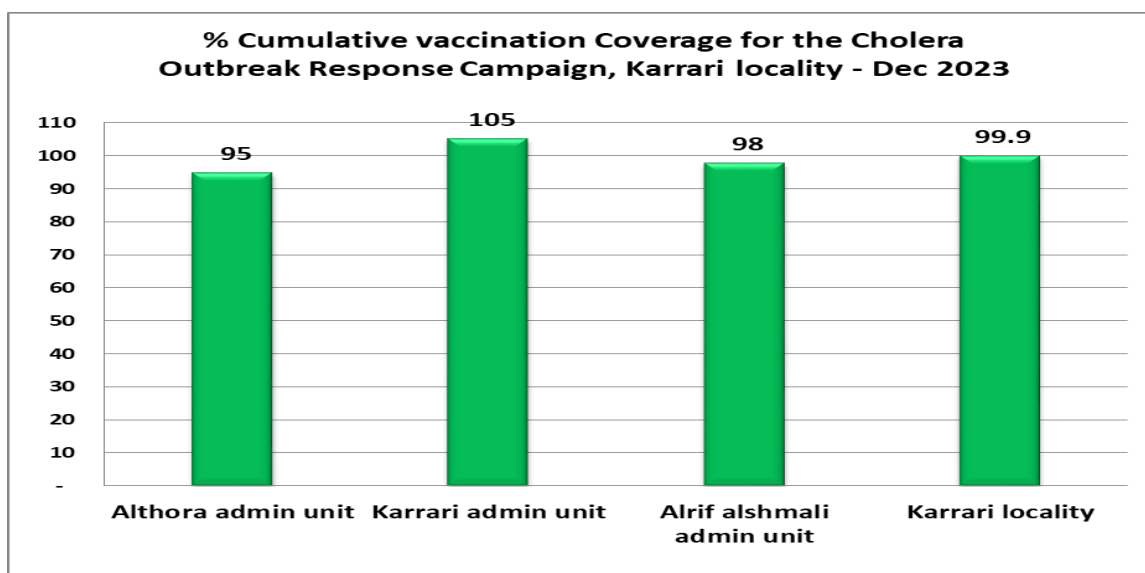
In August 2023, an outbreak of Cholera started in Gedarif in (6 localities); it has been reported from 37 localities in 7 states of Sudan. One of the most affected states is Gezira, Khartoum, Sennar, Kassala, Red Sea, and White Nile states, where the situation is compounded by internal displacement due to the 15th of April military conflict.

The reactive campaigns were implemented according to the eligibility of the epi situation and the request of the vaccine from the ICG into phases as below:

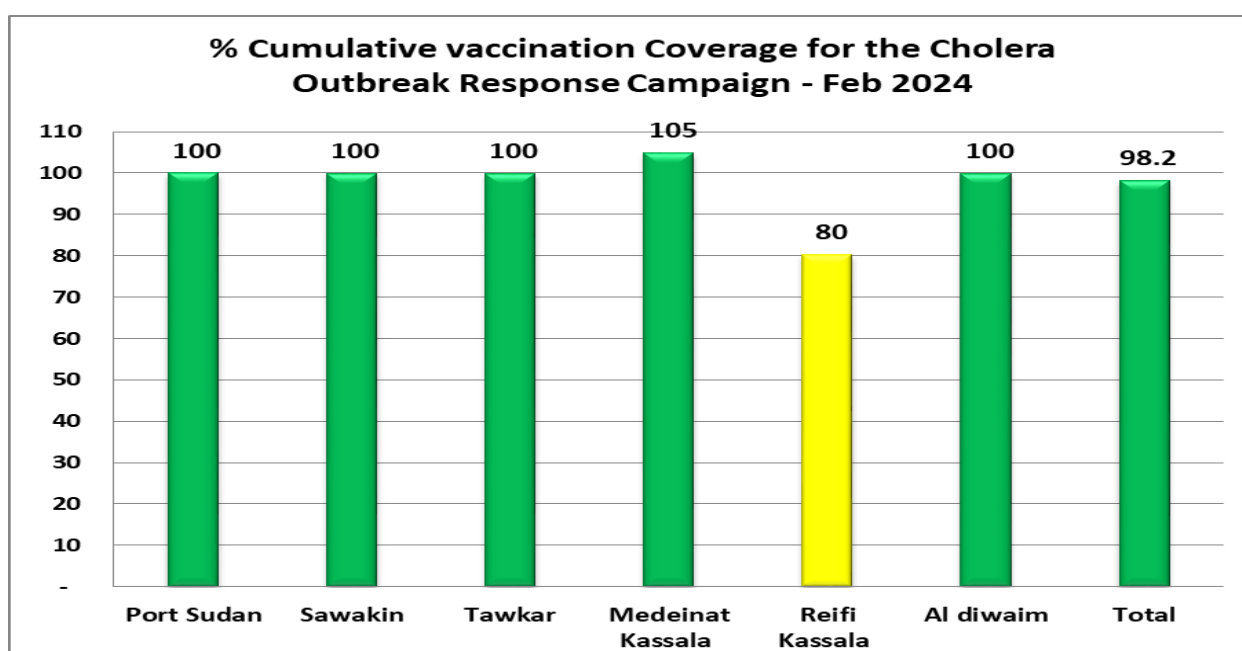
The first phase, in Gedaref state (6 localities) and Gazeira state (one locality) to vaccinate 99,9% of the 2,269,158 million targeted persons aged one year and above.



The second phase have been done in Khartoum state (one locality) to vaccinate 99,9 % of the 423,435 targeted persons aged one year and above.



The third phase was implemented in Red Sea state (3localities), Kassala state (two localities) and White Nile state (one locality) States target to vaccinate 100% of the 1,902,040 million targeted persons aged one year and above.



The campaign was launched on 20th November 2023 for 6 days in first phase, 19th January 2024 for 10 days in second phase and on 7th February 2024 for 6 days to the third phase with monitoring to all quality measures pre- during and after the campaign followed accordance with federal guidelines to have eminence and successful implementation.

The response was prompt and led to stop the spread of the outbreak, although it faced Needs and constraints as outbreak continues to affect vulnerable populations in vast areas of Sudan. The overall coverage was 99.6%, 99.9% and 98.2%. Of oral Cholera vaccination in the three phases repeatedly.

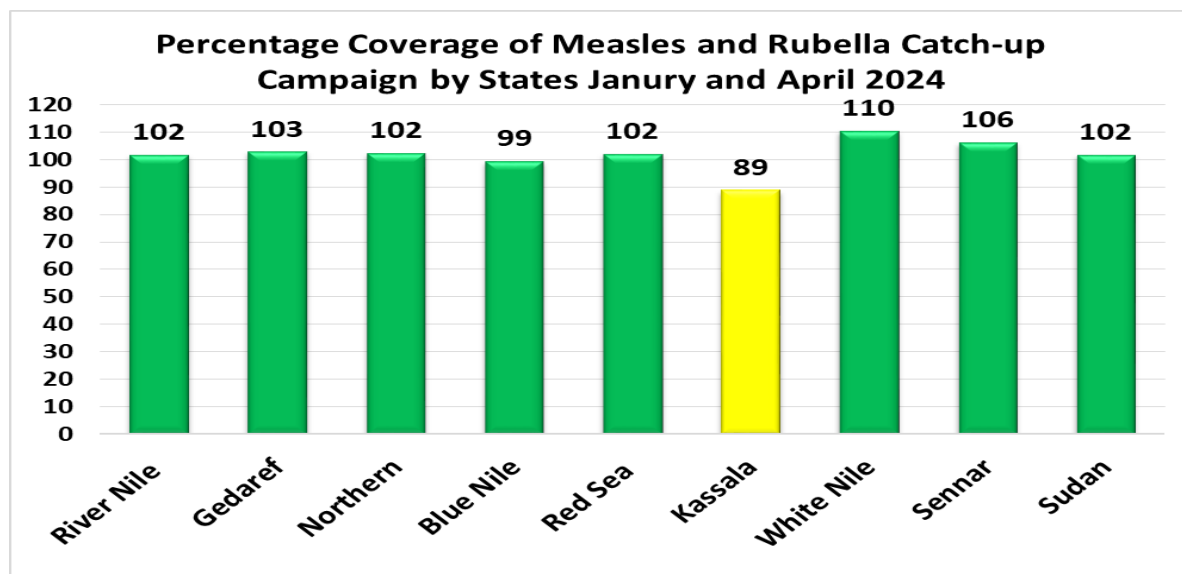
Post campaign coverage assessment verified by LQAS was done in White Nile states the result of vaccinated from total seen was **93%** and in Red Sea state was **82.5%** consecutively.

▪ MR Campaign

To protect multiple cohorts from measles and rubella infection mortality, morbidity and disability due to CRS Sudan implement catch-up campaign target under 15 years to clear all susceptible children for measles and rubella and reaching population immunity needed for achieving Measles and rubella / CRS elimination.

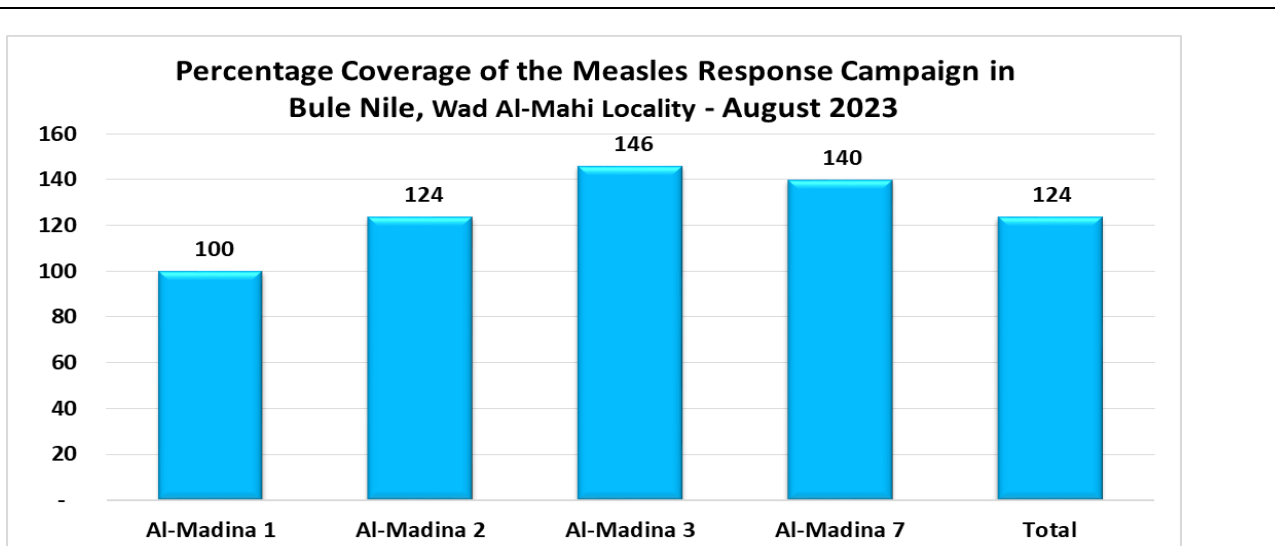
The campaign planned to cover a total of 19,693,060 children in the 18 states, but it was conducted in 8 states out of the 18 states according to the accessibility and security of these states to cover 6,729,320 children in 8 states, the campaign was planned and organized to be implemented within 6 days (22 – 27 January 2024) in 7 states and in Sennar state during April, the achieved coverage was 102% 6,851,121 million targeted children was vaccinated.

MR campaign is expected to be implemented in 2 phases in the remaining states based on the status of security and accessibility.

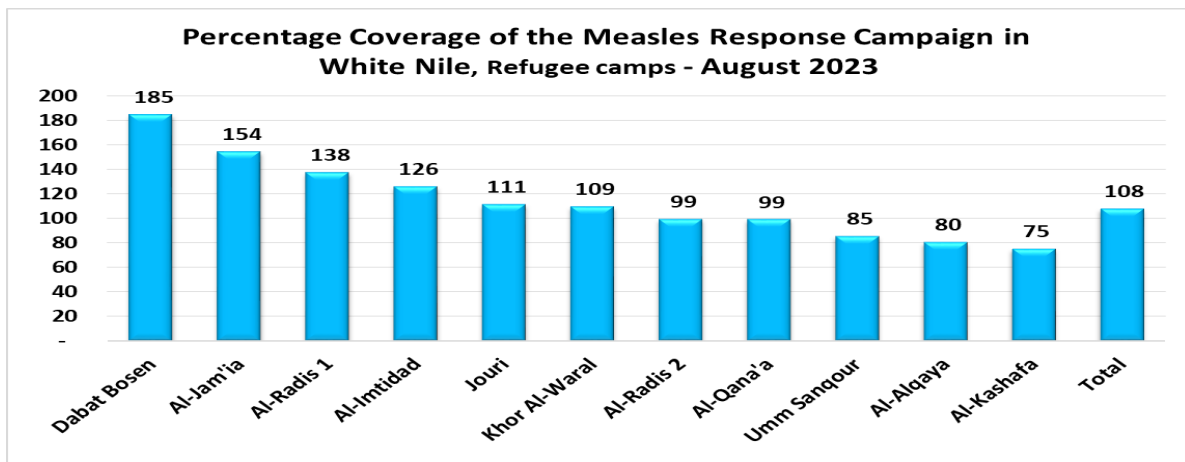


Mini Response campaign for Measles outbreak

Implemented in Blue Nile state Wad Elmahi locality during August target 13,004 achieved coverage was 124% 13,994 was vaccinated.



Also, in White Nile state in the refugees' camp during August target 42,384 under 15 years achieved coverage was 108% 45,725 children were vaccinated.



In, the campaigns implemented during 2023-2024 provided numerous valuable lessons learned.

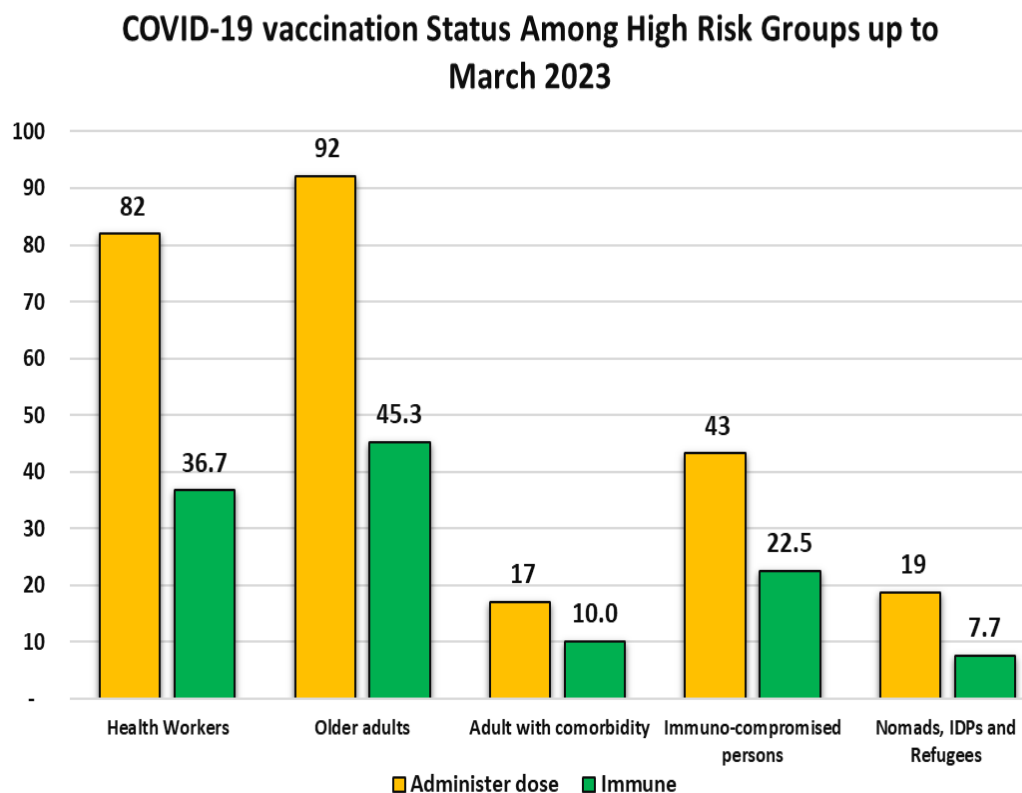
The resilience of the immunization program was evident through the execution of reactive campaigns in response to various outbreaks, including measles in the Blue and White Nile states, nOPV in eight states, and cholera in 26 affected localities. Key insights and best practices derived from these efforts include:

- A well-planned, executed, and outcome-oriented immunization program demonstrated resilience.
- High-level coordination and collaboration facilitated the implementation of activities in crisis-affected zones.
- Innovative strategies were adapted for campaign execution, such as a house-to-house vaccination approach for the cholera vaccine, which prioritized the most at-risk populations given the constraints on vaccine availability for the entire population.

- The integration of the Oral Cholera Vaccine (OCV) campaign with the nOPV campaign proved successful. Building upon the initial small-scale integration of both campaigns, a wider integration of both vaccines was conducted in two localities—Ad Diuaim and Al-Gitaina—within the White Nile state, achieving coverage rates of 100.66% and 99.01%, respectively. This campaign emphasized effective vaccine management practices supported by high-quality supervision through the implementation of a house-to-house strategy.
- The OCV campaign was conducted in Karrari locality during a period of intense conflict. The immunization program coordinated efforts at the federal, state, and local levels with youth groups who were providing food and medical assistance to vulnerable populations. Collaborative networks were established with humanitarian organizations, notably the Kuwait Fund for Patient Care. Through careful estimation of the target population in each catchment area, vaccines were supplied to identified centers from which designated personnel administered the vaccines to previously identified families, reporting coverage to local authorities. These effective vaccine management practices were instrumental in reaching high-risk populations, particularly in areas where other interventions, such as case management and safe water supply, faced significant challenges.
- The COVID-19 campaign was integrated with routine immunization (RI) at a time when operational costs for RI—particularly outreach and mobile strategies—were heavily constrained. This integration enabled the outreach to a considerable number of targeted RI children during the COVID-19 campaign period.

7. Learning Question: By colour areas what is the status of your COVID-19 vaccination programme?	
Indicator(s) : Report and reflect on progress in uptake, with particular emphasis on older adults, health workers and other high-priority population groups (as defined by WHO SAGE	Graphs:

guidance).
Analyse
both primary
series uptake
and
boosting.



Country comments

Health workers: the estimated group to be around 3% of the total population, this was calculated on the basis of that the total number of people working and health-related students at their final class of medical-related schools exposed to the health settings. the total number of health workers registered as vaccinated in the COVAX electronic system is **735,770** people, the electronic system is underachieving where only 64.6% equal to **14,982,227** of the reported coverage is captured by the electronic system up to March 2023 before 15th April conflict.

Older adults: according to the 2008 census projection of 2020, the total number of the population aged 65 years and above is **1,360,753** people. The data analysis from the electronic system shows that out of the total number of the people aged 65yrs and above, the number of people reach with C19 is **1,254,628**.

Adult with comorbidity: according to 2008 census projection was **774,992** The data analysis from the electronic system show that the number of people reach with C19 is **132,212**.

Immuno-compromised persons: the estimated target was **294,981** Based on the analysis of the vaccination data from the electronic system, there are only **127,521** people with comorbidities vaccinated.

Nomads, IDPs and Refugees the estimated target was **2,109,275** from the electronic system shows that out of the total number **393,491** was vaccinated.

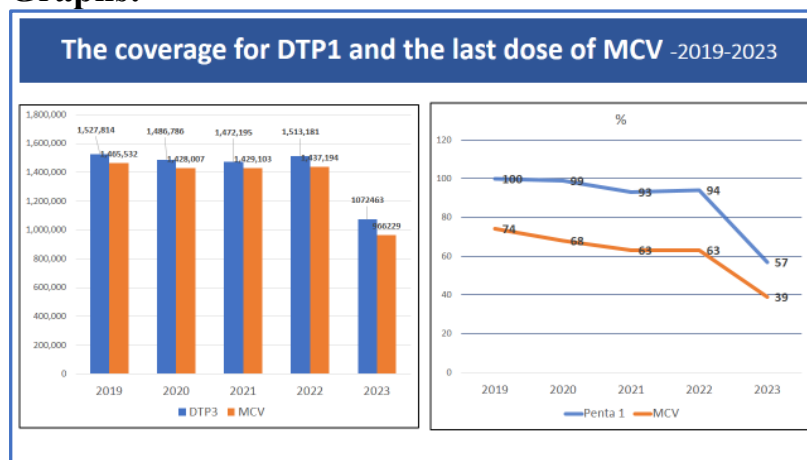
8. Learning Question: Trajectory and progress against targets set

- What has been done to maintain and restore immunisation and what has been the impact of it (please include reference to trends in DTP3 and MCV1 coverage)?
- If there are **other factors** (e.g., government transitions, natural disasters, other disease outbreaks, etc.) which have led to disruptions in your immunisation programme over the last year, please also reflect on those.

Indicator(s):

- Number of children who received DTP3 and number of children who received MCV1 in the past year compared to the number who received those vaccines in 2019.
- Qualitative information

Graphs:



Country comments:

Over the past five years, Sudan's EPI has faced numerous disruptions that have hindered progress toward achieving immunization targets. Among these challenges, the timely flow of funds to the EPI has emerged as a consistent and critical barrier, compounding the effects of other factors and contributing significantly to immunization backsliding.

❖ Timely Flow of Funds: A Persistent Challenge

While the allocation of funds for immunization has not been a primary issue, budget execution and delays in disbursing funds for essential activities such as staff incentives, transportation allowances, and operational costs have severely disrupted the program. This issue is at the core of several systemic problems affecting RI services, including:

○ Delayed Staff Incentives and Retention:

The majority of EPI staff are volunteers reliant on Gavi-funded incentives. Delayed payments have demoralized staff, many of whom have had to leave their roles due to financial insecurity.

In the context of rising inflation and currency devaluation, any delay in payments significantly diminishes the real value of earnings, making it unsustainable for staff to continue their work. This has resulted in critical gaps in service delivery and weakened the program's ability to maintain consistent operations.

○ Disruption of Field Activities:

Limited funds have delayed or entirely halted critical activities such as mobile and outreach sessions, microplanning, and vaccine distribution. This has led to lower vaccine utilization, particularly in hard-to-reach and

underserved areas. The inability to conduct timely campaigns or routine immunization sessions has caused a cascading effect on vaccine coverage, particularly for DTP3 and MCV1.

- Accumulation of Financial Arrears:

Since 2021, the accumulation of arrears has created a backlog that undermines the efficiency of the program. Even when new funds are allocated, they are often diverted to address past dues, delaying current activities and exacerbating gaps in service delivery.

- Impact on Zero-Dose Children:

The financial constraints have significantly hindered efforts to reach zero-dose children. The number of children who have not received a single dose of vaccines in 2022 has quadrupled since 2019, largely due to limited outreach and mobile activities caused by funding delays.

- ❖ Other Contributing Factors

While the timely flow of funds remains the most significant challenge, other factors have exacerbated the situation:

1. Political Instability:

- The revolution (2018–2019), the transitional period, and the 2021 coup have created a fragile political environment. The war that erupted in April 2023 further disrupted the healthcare system, including immunization, making fund management and service delivery even more challenging.

2. COVID-19 Pandemic:

- The pandemic disrupted RI services in 2020, particularly in urban epicenters, though recovery efforts were swift. However, the financial challenges in subsequent years hindered the program's ability to maintain these gains.

3. Natural Disasters:

- Flooding has made several areas inaccessible, limiting vaccine delivery and caregiver access to services. Impact on Immunization Coverage

- ❖ DTP3 Coverage: Declined in 2020 and 2021 due to the combined effects of funding delays, COVID-19 disruptions, and logistical challenges. Although acceleration campaigns partially improved coverage, funding issues continue to constrain sustainable progress.

- ❖ MCV1 Coverage: Similar trends were observed, with periodic recovery efforts undermined by systemic financial delays.

- ❖ Zero-Dose Children: The increase in zero-dose children reflects persistent gaps in access, particularly in conflict-affected and underserved areas, where financial and operational challenges are most acute.

Conclusion

The issue of timely fund flow to EPI has consistently undermined Sudan's immunization program, compounding the effects of other challenges such as political instability, natural disasters, and disease outbreaks. Addressing this issue is paramount, as it directly impacts staff retention, operational efficiency, and the ability to reach underserved populations. Without reliable and timely disbursement of funds, efforts to restore and sustain immunization progress will remain compromised. A strategic focus on improving financial systems, ensuring timely disbursements, and addressing arrears is critical to reversing immunization backsliding and achieving coverage targets.

A. Programme Management

Financial implementation of Gavi cash grants

Grant	Recipient	Period	Status as of 30 June 2024			Compliance**		Comments
			Grant Value \$	Expenditure \$	Utilisation %	Fin. Rep	Audit	
Emergency EPI fund 2023-24.	UNICEF	12/31/2024	7,575,384.26	6,063,640.84	80%	1,511,743.42		
HSS3	UNICEF	31.10.2024	490,580.95	490,580.95	100%	-		
PEF TCA 2022-2024	UNICEF	31.12.2025	2,386,352.53	1,114,628.64	47%	1,271,723.89		
CCEOP delinking	UNICEF	31.12.2024	733,811.11	105,140.92	14%	628,670.19		
MR Catch Up	UNICEF	30.06.2025	13,472,731.48	4,676,161.29	35%	8,796,570.19		
MR VIG	UNICEF	28.02.2025	1,475,043.52	768,883.57	52%	706,159.95		
Malaria VIG	UNICEF	31.12.2025	119,140.74	-	0%	119,140.74		
YELLOW FEVER	WHO	June-December 2024	1,493,910.00	1,467,228.00	1.80%	26,682.00		YF-IPV campaign was fully implemented, payment in process
COVID19 CDS	WHO	Jan-December 2024	1,543,702.00	786,557.00	51.00%			NCE was approved by GAVI to cover the VPDs Preparedness plan
OCV OPL COSTS	WHO	November 2023 – June 2024	2,578,716.20 USD	2,578,716.20 USD	100%			will Be Reimbursing the balances from HSS with PMU & use the available budget to cover the EPI emergency plan
PEF TCA 2022-2024	WHO	Dec 21-Dec 2025	2,416,804.00	1,819,422.00	75.30%			
EMPHNET	GHD EMPHNET	Jan – June 2024	1,250,190.00	195,387.85	16%	1,054,802.15		

SCI	SCI TCA	June2024- Dec 2025	295,000.00	-	0%	295,000.00		
IRC	GAVI Zero Dose	June 2023-June 2024	1,548.828	1,300.532	84%	248,296		
Acasus	Acasus TCA	2021- Dec 2025	1,884,180.00	1,072,688.00	57%	811,492.00		

Cash³ Support Summary*

*All amounts are in USD

**Comment below in case of non-compliance

9. Learning Question: How well is the country able to absorb Gavi funding and what are the drivers? (This should cover all funding including funds channelled through partners.) Comment on the financial implementation progress of grants including but not limited to the utilisation rates. What are the key issues? Indicator(s): Percentage of grant funds utilised and amount of cash balance in-country: UNICEF: 47% of funds utilized up to June 2024. The balance in country is \$1,271,723.89. WHO:63.2% of the funds utilized, the balance is \$ 3,085,244 (noting that the YF & IPV catch up campaign was implemented, the payment is pending) EMPHNET: The percentage utilized is 13.5% until June 2024 (from the original contract before the reprogramming). The balance in country is not Applicable (EMPHNET's type of contract is reimbursable and deliverable- based payment). Country comments: The country has faced notable challenges in fully absorbing Gavi funding across all grants, with varying utilization rates and balances across the recipient partners. While efforts have been made to utilize funds effectively, several systemic and contextual issues have affected progress: - Utilization Rates and Balances: - UNICEF: As of June 2024, 50% of allocated funds have been utilized. The utilization rate indicates slower-than-expected progress, likely due to operational delays and administrative bottlenecks in fund execution.

³ All HSIS grants (HSS, VIGs, OPS, Switch), EAF and CDS cash support as applicable.

- WHO: The utilization rate is higher at 63.2%, with a balance of \$3,085,244. Notably, the pending payments for the Yellow Fever (YF) and Inactivated Polio Vaccine (IPV) catch-up campaigns are contributing to this balance. While the campaigns were implemented in March 2023, delays in payment processing have slowed full fund absorption.
 - EMPHNET: The utilization rate is significantly lower at 13.5%, reflecting delays in activity implementation from the original contract. The reimbursable and deliverable-based payment structure of EMPHNET's contract has further complicated timely fund utilization and reporting.
2. Key Issues and Drivers of Low Absorption:
- Operational Delays: Challenges in planning and executing activities, particularly in a context of political instability and conflict, have slowed the pace of fund utilization.
 - Lack of Comprehensive Reporting: Broader Gavi partners such as Save the Children (STC), Acasus, and the International Rescue Committee (IRC) have not provided clear reporting to the FMOH. This limits the ability to track and coordinate fund utilization effectively.
 - Contextual Challenges: The ongoing armed conflict, inflation, and logistical barriers, including inaccessible areas due to flooding and insecurity, have further compounded delays in fund utilization and program execution.
3. Recommendations for Improvement:
- Enhanced communication and reporting mechanisms between the FMOH and all Gavi partners to ensure timely updates on fund utilization and activity progress.
 - Streamlining Financial Processes through addressing administrative bottlenecks and explore more flexible financial mechanisms to accelerate fund disbursement and utilization, particularly in contexts of urgency.
 - Context-Sensitive Planning through adapting implementation plans to the current operational challenges, prioritizing activities that can be executed despite conflict and logistical barriers.
 - Enhance Accountability through establishing clear accountability mechanisms for all implementing partners to ensure alignment with country priorities and timely fund utilization.

Despite these challenges, the country remains committed to improving the absorption and effective utilization of Gavi funding, recognizing its critical role in supporting routine immunization and catch-up campaigns. Addressing these systemic and operational issues will be pivotal to enhancing the efficiency and impact of future funding. In addition, the country has undertaken the initiative to expand its network of immunization partners in order to ensure the provision of immunization services in conflict-affected areas. This effort involves collaboration and coordination with

on-ground humanitarian organizations such as the International Medical Corps (IMC) and ALIGHT. Such partnerships are anticipated to enhance the reach of immunization services, provide greater protection for children, and consequently improving the utilization of Gavi funding.

10. Learning Question: How well is the country resolving issues arising from assurance activities? What issues are left to solve and what is the path forward?

- Comment on the improvements that have been made to financial management and risk assurance activities with support of assurance providers (e.g., Fiscal Agents, Monitoring Agents, Financial Management Technical Assistance)?

Country comments:

GAVI previously channelled its funding through its PMU at the FMOH, with oversight provided directly by the GFA (Fiscal Agent). However, following the flare of conflict in Sudan in April 2023, funding has been channelled through partners, such as UNICEF, WHO, EMPHNET, SCI, etc. Each of these partners manages the funds using their own financial systems and regulations.

11. Learning Question: Please comment on any other financial management-related bottlenecks for implementation and compliance.

Country comments:

- The issue of timely operational funding for core EPI activities remains one of the most significant and chronic bottlenecks undermining Sudan's immunization program. Despite various efforts, delays in disbursing funds continue to disrupt critical activities, widening the immunity gap and contributing to outbreaks, preventable disabilities, and child mortality.
- Key Financial Management Bottlenecks
 - ❖ National Financial System Reform: From 2021 to 2023, GFA, as the fiscal agent supporting the FMOH PMU unit, assessed Sudan's national financial system, which had been effectively used for EPI payments before 2020 and contributed to Sudan's "golden era" in immunization.
 - GFA initiated reforms to align the national system with Gavi's fiduciary requirements, aiming to create a responsive, accountable, and efficient financial model.
 - A national workshop was convened on April 15, 2023, to advance these reforms. Regrettably, this was the same day the war erupted, halting all reform efforts.
 - The FMOH strongly believes that Gavi can and should continue this reform initiative, even while funds are currently channelled through UNICEF and Save the Children (STC). Strengthening the national financial system remains critical for building a sustainable, cost-effective, and efficient funding model.
 - ❖ Current Funding Model Inefficiencies:

- The centralized system used by UNICEF, through the CIU (Country Implementation Unit), is cost-inefficient and heavily reliant on fund transfer agents. Also, this model requires EPI technical staff at the federal and state levels to implement 90% of the payment's operational requirements, detracting from their focus on program improvement and technical capacity building. The capacity of EPI staff to focus on program improvement has been compromised, further weakening the program's ability to recover from setbacks.
- ❖ Donor Restrictions and Fiduciary Models:
 - Overly restrictive donor frameworks, even with fiduciary layers in place, delay implementation and hinder flexibility, compromising the timely delivery of immunization services. Balancing compliance with operational flexibility is crucial to addressing Sudan's immunization challenges.
- ❖ Accountability and Coordination Issues:
 - Weak reporting and coordination mechanisms between the FMOH, Gavi, and implementing partners continue to slow fund absorption and program execution. These gaps highlight the need for stronger oversight and alignment across all stakeholders.
- ❖ Recommendations for Improvement
 - Continue National Financial System Reforms: despite current challenges, Gavi should prioritize resuming the initiative to strengthen Sudan's national financial system. This system, once aligned with Gavi's fiduciary requirements, has the potential to serve as a cost-effective, accountable, and efficient model for EPI funding. Even under the current fund flow arrangements with UNICEF and STC, will pave the way for long-term sustainability and reduced dependency on centralized mechanisms.
- ❖ Decentralize and Optimize Current Models:
 - UNICEF to explore decentralized funding models to reduce dependency on fund transfer agents and administrative bottlenecks.
 - Enhance cost-efficiency by streamlining processes and reducing the administrative burden on EPI technical staff, allowing them to focus on program improvement and service delivery.
- ❖ Strengthen Accountability and Coordination:
 - Establish robust reporting mechanisms to ensure transparency and real-time tracking of fund utilization.
- ❖ Advocate for Flexibility in Donor Models:
 - Advocate for donor models that balance compliance with operational flexibility to ensure timely and effective fund utilization in urgent contexts.

❖ Conclusion

Since 2020, the lack of timely and efficient financial management remains a significant barrier to Sudan's immunization program. Addressing these

bottlenecks requires resuming the reform of the national financial system, optimizing current funding mechanisms, and fostering greater accountability and coordination. By prioritizing these measures, Sudan can build a resilient and sustainable financial framework, enabling the EPI program to recover and achieve its immunization targets while safeguarding the health of its children.

12. Learning Question: Is the country effectively addressing gender related barriers (e.g. faced by caregivers or adolescents in accessing immunisation services and barriers faced by health workers in delivering immunisation services)?

Indicator(s):

- Has the country implemented initiatives that remove or reduce gender related barriers?

Please use the below table when reporting on initiatives that remove or reduce gender related barriers.

Barriers faced by caregivers

Barrier (state the barriers that restricts the caregiver from access the service)	Intervention that addresses barriers (state the interventions planned)	Was the intervention implemented? (no, partially, fully)	What was the impact (provide evidence)?
Majority of the caregivers are women, who are currently facing accessibility issues to the health service due to security issues and fearing attacks and sexual violence. Moreover, Their socio-economic status is negatively affected by war hindering them access to resources like money, transportation and time needed for seeking immunization	Support mobile service and outreach activities. awareness and communication for outreach and mobile sites targeted both mothers and fathers.	Ongoing specially in the states directly affected by the war and the states that are receiving high number of IDPs. Communication interventions not done due to gap in Funds	EPI team to add the number of people reached out by the mobile services and EPI campaigns

services for her and her children				
Majority of the displaced people are women and girls who have moved to relatively safe places with very limited availability of health services and face significant barriers: Their priorities shifted, and vaccination is no longer a priority; Parents' greatest concern become safety, shelter and food, this increases the burden of rearing and caring of children on mothers while fathers works to feed them. They lack awareness about vaccination centres sites and session schedules in the areas to which they have been displaced, as most of them lost their vaccination cards, thus they cannot keep track of Immunization schedules.	Expand the health services including vaccination in the areas that have huge number of IDPs and overstretched health services. Raise of awareness for both mothers and fathers about the importance of vaccination for IDPs. Appoint key persons (community leaders) from the IDPs were oriented about immunization services importance. Raise of awareness for both fathers and mothers about sessions for IDPs, mobile theatre with outreach vaccination sessions in IDPs and camps, targeted both fathers and mothers. focus group discussions in IDP and Camps(Mothers group) Design IEC materials and interventions with tailored information and engagement for both mothers and fathers.	Ongoing	60 PHC facilities are providing services for IDPs in ten states.	
Cultural barriers: The traditional setting among some tribal groups, promote gender segregation of separating between	Engagement of community leaders (increase engagement of women). Increase women's meaningful	Partially		

males and females most of the day time make it difficult for vaccinators and health promoters to come in contact with young children since they live with women in the female village which is often closed to outsiders.	participation at different levels of service delivery and demand creation process. Design gender sensitive intervention.			
Religious Reasons: Women and Girls needs privacy and well isolated areas when receiving vaccines due to religious reasons	Engagement of Religious leaders (increase engagement of women). Provide privacy for vaccinating WCBA, and appointing women for awareness raising and vaccination.	partially		
Missed-trust in vaccine safety and vaccine delivery	Trust building Committees activation and engagements Community engagement Dissemination of IEC materials with Gender sensitive key messages. Mass and social media campaign. Unified the visibility for service providers Increase women's meaningful participation at different levels of service delivery and demand creation process.	Partially Partially Partially Partially Partially Not done		

Fear of Adverse Effect following immunization.	Dissemination of IEC materials with gender sensitive key messages, using communication strategies consider literacy levels and tender to favour both rural and urban fathers and mothers. Design SBC interventions at time considering availability of both mothers and fathers. Sharing Human Interest Stories Engaging trusted Practitioners to interact with target communities on TV/Radio interviews Focus group discussion with Women Support Groups in IDPs. Regular training for vaccinators on IPC to ensure that key messages are delivered properly during RI sessions. Updated of IEC printing materials at fixed sites level with gender sensitive key messages.			
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Barriers faced by health worker

Barrier (state the barriers that restricts the health worker from accessing services)	Intervention that addresses barriers (state the interventions planned)	Was the intervention implemented? (no, partially, fully)	What was the impact (provide evidence)?
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Feminization of health HR, where majority of the health care providers are females mainly the vaccinators who cannot provide the service during the current insecurities.	Engagement of the displaced health care providers in providing services in the places where they have moved for with focus on the IDPs.		
As majority of the vaccinators and health care providers are female, whom they have been affected by the war. These health care providers they do give priority for their families which affect the provision of the services for the other needy people.	MoH in collaboration with humanitarian partners are providing support to retain the health care providers which includes financial support for the ones that are working in providing lifesaving services including vaccination and EPI services.	Ongoing	
There is displacement among the health care providers fleeing from the war to safe places inside and outside the country which resulted in disruption of the services including vaccination.	Engagement of the displaced health care providers in providing services to other displaced people in their gather points on the nearby IDPs gathering points.	Ongoing	24 displaced midwives are currently providing services for IDPs in eight gathering points in four states.

Barriers faced by adolescents

Barrier (state the barriers that restricts the adolescents from accessing services)	Intervention that addresses barriers (state the interventions planned)	Was the intervention implemented? (no, partially, fully)	What was the impact (provide evidence)?
The only routine antigens for adolescent are COVID 19 at TD	Tailored of interventions to cope with the adolescent cohort	Developed and being implemented	Adolescent service package is integrated in the national health benefit packages well as

			the national humanitarian services package. Rolling out of the regional operational guide for child and adolescent health in emergency setting in collaboration with MPOH and health cluster partners.
Adolescents themselves are not fully aware of their health right which affects their health seeking behaviors	Engagement of the youth and adolescent in the identification of their health needs and priorities as well as their engagement in the service deliver and community awareness activities.	Ongoing	Partnership with the medical and nursing students in leading community outreach intervention in five states (Kassala, Gadaref, River Nile, Northern state and Red sea state).
Missed perception among girls and WCBA toward the TT vaccine is only during pregnancy, besides other misconceptions regarding the vaccine causes infertility.	Awareness sessions for Woman in Child Bearing Age. Orientation for SCOs	Partially Partially	

Country comments:

Sudan's instability has had a significant impact on the country's population, particularly in terms of economic development and access to basic services such as healthcare. The instability has led to widespread displacement of people, resulting in overcrowding and inadequate living conditions, which have contributed to poor health outcomes and contributed to inequalities in accessing basic services including health.

In adherence to the national health strategies and response plans towards ensuring health equity principles are upheld, whereby no individual or group is neglected or discriminated against, FMOH and other key partners are working closely to address gender related barriers in accessing health services with focus on the major programs

including immunization, nutrition, SRH, Malaria, TB, HIV, and other essential programs.

Key health partners under the lead of the FMOH are supporting several initiatives at different levels to address the gender related barriers starting by advocacy among decision makers, community sensitization, building the capacities of the health care providers to provide quality health services without any discrimination and prioritizing the vulnerable people aiming at reducing gender inequalities and capitalizing on Sudan's strong political will.

13. Learning Question: How well is the country implementing its health information systems and data strengthening, monitoring and learning activities?

- What is the progress of planning and implementing health information system and data strengthening, monitoring and learning activities?
 - Since its launch, the DHIS system has incorporated routine immunization reporting tools. Between 2015 and 2016, personnel from the Federal Immunization Administration and state-level staff were trained on its use.
 - In 2022, DHIS reporting templates were updated to include new vaccine doses, keeping the system aligned with the evolving needs of the Expanded Program on Immunization (EPI).
 - Coordination with the EPI program is ongoing, with support from WHO and Gavi facilitating the development of the EPI Tracker. This tool integrates monitoring, evaluation, and supervision forms into a single electronic platform to strengthen immunization program operations.
- How will the country address remaining data-related gaps or barriers to immunization programme performance?
 - The use of DHIS will be enhanced by improved design, user-friendly features, and better data analysis tools, including a DHIS tracking system that facilitates data collection via an Android app for tablets and phones, allowing for online and offline data entry.
- Comment on key results or findings for identified learning priorities based. Specifically, what actions have been taken to improve immunization programme performance based on these data? e.g. better understand specific barriers to immunisation, successfully guide implementation, inform course correction for grant activities.
 - Coordination between EPI and the Health information department will soon be strengthened to leverage the DHIS system's capabilities.

With WHO's support, the EPI tracker was developed by HISP Rwanda, an external consultancy. Additionally, GAVI provided funding for HISP Rwanda to finalize a comprehensive set of reports, monitoring, evaluation, and supervision forms, ensuring an integrated electronic system for the immunization program.

Country Comments:

Sudan has made significant progress in strengthening its health information systems and leveraging the DHIS2 platform for routine immunization reporting. While the EPI currently uses a vertical data system, there is a clear opportunity to transition to the DHIS2 platform, which offers enhanced integration, efficiency, and scalability. The experience of other programs such as malaria, which have successfully transitioned to DHIS2 as an integrated system, serves as a strong model for the EPI. Leveraging these lessons will accelerate the EPI's move toward integration. By aligning DHIS2 with EPI needs and drawing on the successful experiences of other programs, Sudan can create a unified, robust data system that supports better immunization outcomes and overall health system performance.

B. Implementation of Technical Country Assistance (PEF-TCA)

14. Learning Question: Is the country implementing PEF TCA and CDS TA as expected? Please explain how the TCA has helped to support the achievement of the country objectives.

Indicator(s): Country analysis on partner performance as per work plans

The implementation of Targeted Country Assistance (TCA) and COVAX/CDS technical assistance in Sudan has faced significant challenges, particularly in the timely execution of planned activities. While progress has been made in certain areas, systemic delays and inefficiencies have hindered the overall effectiveness of these initiatives in supporting the country's immunization and public health objectives.

Planned activities under the TCA frameworks, by UNICEF and WHO, have experienced slow implementation, creating persistent gaps in technical support, capacity building, and program operations.

While funding allocated for long-term technical positions embedded within UNICEF and WHO structures has been effectively absorbed, broader activities such as training, workshops, and field operations have suffered from sluggish execution.

In contrast, EMPHNET has shown strong progress in implementing its assigned activities. This success is attributed to agility in Operations as EMPHNET's less bureaucratic structure enables faster decision-making and more efficient execution.

Lessons Learned and Recommendations

- Streamlining Processes: To improve the effectiveness of TCA and CDS TA, implementing partners should streamline administrative processes and reduce bureaucratic hurdles that delay technical assistance delivery.

- Enhancing Accountability: Strengthened accountability frameworks and improved communication with country stakeholders are essential for addressing implementation delays and ensuring timely execution of activities.
- Leveraging Flexible Models: The success of EMPHNET underscores the importance of adopting more agile and responsive approaches to technical assistance. Applying similar models within UNICEF and WHO could enhance their effectiveness.

Country comments:

While the implementation of TCA and COVAX/CDS technical assistance has supported Sudan's immunization and public health objectives to some extent, significant delays and inefficiencies have limited their overall impact. Streamlining processes, enhancing accountability, and adopting more flexible approaches are critical for ensuring that technical assistance effectively supports the country's objectives in a timely and efficient manner.

Organization	Row Labels	Completed	Major Delays	Minor Delays	On Track	Re-programmed	Un reported	Grand Total	Achievements up to June 2024
UNICEF	TCA	10	1	1	3	-	-	15	66%
WHO	TCA	5	2	1	10	-	-	18	62%
EMPHNET	TCA	-		1	5	-	-	6	59%

Section 2: Looking forward: Summary of key discussion points and follow up actions

Briefly summarise the **key discussion points**, including **identified needs** and **follow up actions** resulting from the Joint Appraisal review and dialogue.

This may include

- Identified (future) needs and priorities
- Follow-up actions to accelerate planned activities
- Expected adjustments to activities and as applicable the Gavi workplan, targets and budget, such as budget reallocations, modifications in TCA planning, revision of dates for anticipated new vaccine applications or introductions, etc.⁴
- Roll-out or expansion of promising practices and innovations
- Other aspects and follow up actions

Guiding principle for the JA recommendations:

⁴ This refers to all types of Gavi support.

1. Program Sustainability and Flexibility:

- Safeguard the functionality of the Expanded Program on Immunization (EPI) to ensure the seamless execution of planned activities, even under challenging circumstances such as conflict or natural disasters.
- Increase flexibility in the use of Gavi funds to align with EPI needs and ensure optimal utilization of resources.
- Consider reprogramming existing Gavi grants to address emerging needs during emergency situations effectively.

2. Accountability and Transparency:

- Strengthen mechanisms for accountability and transparency to ensure the timely receipt and utilization of funds. This is critical to maintaining Sudan's resilience and the continuity of immunization activities despite ongoing challenges.

3. Stakeholders Engagement:

- Foster meaningful engagement with all stakeholders, including community members, government entities, and international partners, to align objectives, enhance collaboration, and improve information sharing.

4. Capacity Building and Knowledge Transfer:

- Ensure continuous training and capacity building for EPI staff at all levels to maintain program quality and sustainability.

5. Hard-to-Reach Populations:

- Prioritize the identification and mapping of hard-to-reach areas through tailored assessments and community consultations.
- Collaborate with migration authorities and humanitarian organizations to maintain updated demographic data, especially for Internally Displaced Persons (IDPs) and migrants.
- Engage community leaders, NGOs, and local governments to develop innovative solutions for reaching isolated communities.
- Establish additional vaccination outreach centers and mobile clinics in states with large IDP populations, in collaboration with state Ministries of Health (MOH) and NGOs.

6. Data and Monitoring:

- Disaggregate and analyze data by geographical area and IDP status to identify high-impact localities and target resources where they are most needed.
- Monitor and evaluate the effectiveness of outreach services to ensure all IDPs and underserved populations receive necessary immunizations.

7. Cold Chain and Vaccine Logistics:

- Harmonize vaccine stock distribution, traceability, and systems with the National Medical Supply Fund (NMSF) and other active partners.
- Invest in strengthening the dry and cold chain infrastructure, including storage capacity expansion and the implementation of solarization improvements.

- Enhance vaccine transportation capacity to reach hotspot and underserved areas.
- Innovative Vaccine Delivery, adopt and implement alternative vaccine delivery mechanisms to address logistical challenges in remote and emergency-affected areas.

8. Research and Evidence Generation:

- Emphasize the importance of research and serological studies to assess vaccine efficacy and efficiency, ensuring data-driven decision-making.
- Segregate the data of zero dose by geographical areas/ do analysis at state level or even localities (high impact localities should be supplied first).

9. Infrastructure and Facility Improvements:

- Support the development of facility infrastructure, including improvements in energy solutions like solarization, to ensure reliable service delivery.

Recommendation for Action by thematic area:

No	Planning recommendations		
	Follow up action	Responsible	Timeline
1	Immediate initiation of the implementation of existing grants		
1.1	Commence planning for 3 rounds of RI in 2024	FM0H-Partners	End of October,2024
1.2	Accelerate kick- off of the EPI emergency plan	FM0H-Partners	End of October,2024
2	Ensure Program Continuity and Implementation Capacity		
2.1	Conduct quarter review meetings to identify progress and challenges including evaluation of metrics related to program outcomes, efficiency, and resource utilization to identify areas for improvement.	High level committee EPI coordination committee	Last month of each quarter
2.2	Develop quarter plans	EPI and partners	Last month of each quarter

No	Data quality and information system recommendations		
	Follow up action	Responsible	Timeline
3	Identify Key Information and conduct In-depth a.nalysis to inform program planning		

3.1	Perform assessments to understand and address accessibility due to ongoing conflicts.	FMoH	Monthly
3.2	Update population estimates (including data for population in need) by states and localities	FMoH (partners to support)	The second month of each quarter
3.3	Draft a process for a robust documentation system for monitoring progress and identifying gaps	FMoH and WHO	December 2024
3.4	Conduct operational needs assessment (including stakeholder, employees and beneficiaries feedback)	FMoH/WHO	December 2024
3.5	Identify a strategy/process to address challenges that exist with the national health information system (DHIS2), especially in ensuring data accuracy and aligning with a strategic vision, action plan to address the challenges. Importance to maintain one Health management system to avoid parallel systems and processes such as DHIS	FMOH and WHO to lead, partners to contribute	Quarterly update during coordination meeting.

No	Leadership, Management and Coordination (LMC) including supervision recommendations		
	Follow up action	Responsible	Timeline
4	Enhance Coordination at all levels	FMOH	Dec 2024
4.1	Strengthening the National Immunization Technical Working Group	FMOH	Oct 2024
4.2	Establish and activate coordination mechanism at state level	FMOH	Oct 2024
4.3	Revisit the roles of Technical Working Groups (TWGs) at both national and subnational level with defined deliverables and regular updates	FMoH	Dec 2024
5	Ensure Timely Reporting from All Partners for More Effective Monitoring:		
5.1	Design a standardized monitoring process including standardized reporting templates with regular frequencies	FMoH (EPI/HP)	Dec 2024

No	VPD Surveillance recommendations		
	Follow up action	Responsible	Timeline
6	Address gaps in VPD surveillance		
6.1	Establish and equip decentralized regional public health laboratories	FMOH/WHO	Dec 2024
6.2	Re-activate the weekly surveillance meeting	FMOH	Oct 2024

6.3	Accelerate the implementation of surveillance activities in the last 3 months of emergency plan	FMOH/WHO	Oct 2024
6.4	Establish VPDs surveillance focal person within the IDPs & to be linked to the catchment/locality system	FMOH/WHO	Dec 2024

No	Service delivery and routine immunization recommendations		
	Follow up action	Responsible	Timeline
7	Address Population Movements and Revitalize of program to reach hard-to-reach areas		
7.1.	Conduct and assessment of the feasibility of integration of EPI with other programs	FMOH/WHO	March 2025
7.2.	Monitor and evaluate the effectiveness of outreach services to ensure all IDPs receive necessary immunizations.	FMOH/StC/Alight/IMC and partners	Commence in Nov. 2024 and quarterly monitoring
8	Link equity mapping with existing GIS microplanning and technology (collaborate with other departments in FMOH and partners).	FMOH EMPHNET	Commence in Nov. 2024 and quarterly monitoring

No	CVM recommendations		
	Follow up action	Responsible	Timeline
9	Investment on the stock management and other CVM component.		
9.1.	Accelerate deployment and use of vLMIS and improve the use of use of Thrive 360 vaccine tracking dashboard.	FMOH & UNICEF	First update Nov 2024
9.2	Activate and strengthen the NLTWG	FMOH/UNICEF	Nov 2024
9.3	Ensure quality submission of CCEOP2 application by November.	FMOH/UNICEF	30 Nov 2024
9.4.	Conduct periodic targeted assessment and monitoring of iSC performance.	FMOH/UNICEF	Quarterly monitoring
9.5	Ensure availability of operation costs to move the vaccine to inaccessible areas.	FMOH/ Partners/Gavi	Commence Nov. 2024
9.6	Update vaccine supply system strategy to have additional vaccines hubs in the sub national level	FMOH/UNICEF	Quarterly monitoring

No	Cash grants and financial management recommendations		
	Follow up action	Responsible	Timeline
10	Ensure Maximum use of available grants		
10.1	Assess different payment models used and funding issues	GAVI and partners	Ongoing, quarterly monitoring
10.2	Complete all the arrears payments (IPV/YF). Transfer of PMU remaining fund to WHO and payment of arrears (Nov & Dec RI arrears & PMU arrears).	GAVI /WHO/FMoH	Oct 2024
10.3	Re- allocate the money left due to change in exchange rate from the 2014 YF and other grants to bridge the gap in BCU and other requested activities, after complete the payment of the YF& IPV joint campaign	GAVI WHO	Oct 2024, to be completed by Dec 2024
10.4	Fuel and car rental arrears for 2022 up to June 2024.	GAVI ,FMoH, UNICEF	Dec 2024
10.5	vaccinators payments in hard – to reach area	GAVI ,FMoH, UNICEF	Nov 2024

No	Human resources and technical assistance recommendations		
	Follow up action	Responsible	Timeline
11.	Ensure maximum use of available human resources		
11.1	Revise the (WHO) field immunization officer's qualifications and TOR to help EPI to implement high quality functions.	FMOH/WHO	Quarterly updates
11.2	Conduct workforce assessment including mapping the human resources at the sub-national level, know their readiness to work and their qualifications.	FMOH and partners	Baseline established Dec 2024, quarterly monitoring

No	SBC recommendations		
	Follow up action	Responsible	Timeline
12.1	To mobilize more resources and increase investments on HP in RI.	PHC DG , HP, EPI, UNICEF, WHO, STC, IRC, EMPHNET	Last Quarter 2024- 1st Quarter 2025
12.2	To conduct comprehensive research to study the social economic factors affecting the community acceptance and	HP, EPI, UNICEF, WHO, STC,	preparation Last Quarter 2024,

	uptake of immunization services within ongoing conflict, especially in high zero dose areas and missing communities.	IRC, EMPHNET	implementation in 1st Quarter of 2025
12.3	To invest in HR capacity for Health Promotion at Federal and state levels this includes monthly incentives.	PHC DG, EPI, HP- Technical capacity can be supported by partners	Last Quarter of 2024
12.4	To have a National SBC strategy for RI and all partners to contribute with technical support and resources.	PHC DG, HP, EPI, UNICEF, WHO, EMPHNET, SCI, IRC	Post completion of the research mentioned above, 2nd Quarter of 2025
12.5	Implementation of HCD for zero dose and defaulter reduction and retrieving.	HP, IRC, SCI, UNICEF, WHO, EPI	Last Quarter 2024- 1st Quarter 2025