



Sudan Multi-Hazard Preparedness and Response Plan

April 2020

Khartoum, Sudan

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Acronyms

AR	Attack Rate
AWD	Acute Watery Diarrhoea
BCG	Bacillus Calmette-Guerin
CBS	Community-Based Surveillance
CCHF	Crimean–Congo Haemorrhagic Fever
CFR	Case Fatality Ratio
DDK	Diarrhoeal Disease Kits
EPI	Expanded Program on Immunization
FMOH	Federal Ministry of Health
FRC	Free Residual Chlorine
GAM	Global Acute Malnutrition
GTFCC	Global Task Force on Cholera Control
HAC	Humanitarian Aid Commission of Sudan
HNO	Humanitarian Needs Overview
IDP	Internally Displaced Population
IEHK	Interagency Emergency Health Kit
IMCI	Integrated Management of Childhood Illnesses
IHR	International Health Regulation
IPC	Infection Prevention and Control
IVC	Integrated Vector Control
MCV2	Measles-Containing-Vaccine second dose
MICS	Multiple Indicator Cluster Surveys
NFI	Non-Food Items
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OCV	Oral Cholera Vaccine
PoE	Point of Entry
RRK	Rapid Response Kit
RVF	Rift Valley Fever
SAM/MC	Severe Acute Malnutrition with Medical Complications
S3M	Simple Spatial Survey Method
SMOH	State Ministry of Health
STAR	Strategic Tool for Assessing Risks
UNICEF	United Nations Children's Fund
VPD	Vaccine Preventable Diseases
WASH	Water, Sanitation and Hygiene
WHZ	Weight-for-Height Z-scores
WHO	World Health Organization

1. Background and Rationale

Most countries are likely to experience a large-scale emergency approximately every five years, and many are prone to the seasonal return of hazards such as floods, cyclones and disease outbreaks¹. What's more, hundreds of smaller-scale emergencies and other hazardous events occur locally each year. Cumulatively, these account for a high number of deaths, injuries, illnesses and disabilities. Therefore, no country is immune against disasters and hence needs to prepare for it. Preparedness should be regarded as a continuous process of developing, updating, testing and monitoring operational plans and strategically placing adequate emergency supplies.

Hazard is the source of danger while risk is the consequence. Risk is a function of the hazards exposed and the vulnerabilities² that exist in the affected communities. However, that risk can be modified by the level of the preparedness of the community at risk. Communities can minimize the health and other consequences of emergencies by preventing or mitigating hazards, reducing exposure to those hazards, minimizing their vulnerabilities, and/or strengthening their capacities.

Different types of hazards are associated with similar risks to health, and emergency preparedness for all hazards aimed at ensuring availability of the three elements of preparedness-*i.e. governance, capacity and resources*³. It is neither efficient nor cost-effective to develop separate, stand-alone capacities or response mechanisms for each individual hazard. Multi-hazard preparedness and response plan focus on building national capacities that are critical for a full spectrum of man-made and natural disasters.

Sudan is a vast country that shares porous borders with seven countries. Administratively, Sudan is divided into 18 States. Drought, flood, internal conflicts, and disease outbreaks are quite common demanding for having well-resourced multi-hazard country preparedness and response plan to mitigate impacts⁴. This year, Sudan continues to face protracted, complex and overlapping humanitarian challenges. A total of 8.6 million people needs humanitarian health assistance in 2020 which is a sharp increase from the 3.6 million people in 2019 (HNO 2020)⁵. The continuous influx of refugees and the increasing number of spontaneous settlements of Internally Displaced Population (IDPs) due to natural (e.g. floods, fires and drought) and manmade disasters (e.g. armed conflict, social unrest, economic crisis and road traffic accidents) associated with occurrences of disease outbreaks.

Implementation of multi-hazard country preparedness and response measures requires broad approaches, bringing together health authorities at different levels, national and international organizations, civil society organizations and community members.

¹ *Health Emergency and Disaster Risk Management Framework. World Health Organization; 2019.*

² **Vulnerability** is defined as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

³ WHO 2017: A strategic framework for emergency preparedness

<https://apps.who.int/iris/bitstream/handle/10665/254883/9789241511827-eng.pdf?sequence=1>

⁴ Sudan Journal of Medical Sciences: Health Care System in Sudan: Review and Analysis of Strength, Weakness, Opportunity, and Threats (SWOT Analysis) <https://knepublishing.com/index.php/SJMS/article/view/924/2573> DOI: [10.18502/sjms.v12i3.924](https://doi.org/10.18502/sjms.v12i3.924)

⁵ Sudan Humanitarian Needs Overview (HNO 2020)

To this end, a joint team of experts from Federal Ministry of Health (FMOH), the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) developed this plan with inputs from wide range of experts from respective institutions over a period of six weeks.

The joint planning team identified and prioritized four-major hazards for country-level multi-hazard preparedness and response in the coming eight months (May – Dec 2020) based on historical data and risk assessments. Namely: floods, disease outbreaks, mass casualties and drought (figure 1). Fourteen out of 18 States (78%) identified to be at greater risk of four or more of the hazards and targeted for intervention.

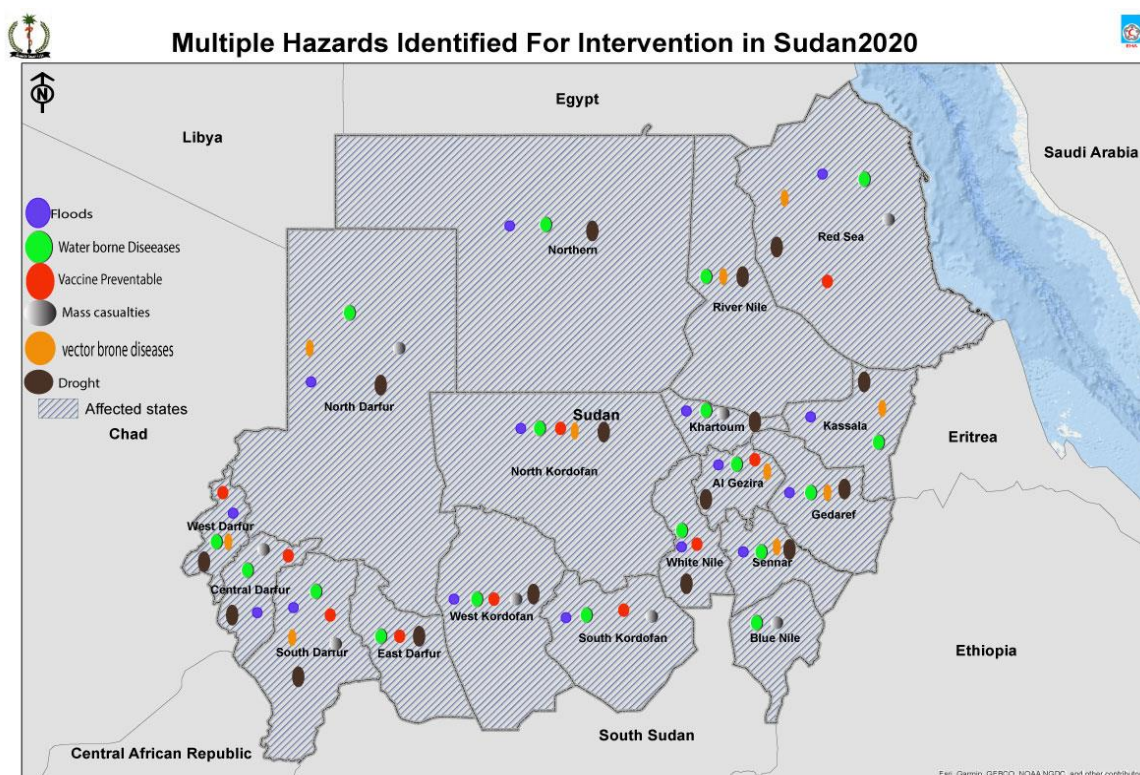


Figure 1: Multiple hazards identified for intervention by States in Sudan, 2020

Multiple data sources and methodologies were used to prioritize, and target hazards and affected populations as summarized below (table 1).

The rationale for selecting identified hazards, targeting criteria used, objectives, key interventions, and targets are summarized for each prioritized four hazards in this document. Details of the activities and budget are summarized at the end of the document.

The plan targeted to reach **8.5 M** people with wide range of interventions aimed at addressing the four major imminent health risks worth **\$ 11,666,350** over a period of 8 months in Sudan.

Table 1: Targeted population for multiple hazards per State in Sudan, 2020[1]

S.N	States	Hazards						Total
		Floods	Disease Outbreaks			Mass casualties	Drought	
			WASH-related diseases	Vector-borne diseases	Vaccine-preventable diseases			
1	Al Gezira	14,076	869,142	184,273	20,551		673	1,088,715
2	Blue Nile	2,451	153,435			1,000		156,886
3	Central Darfur	9,159	188,706		21,244	1,000	1,164	221,273
4	East Darfur	570	94,687		16,143		1,752	113,152
5	Gedaref	13,402	368,330	157,848			1,745	541,325
6	Kassala	37,819	150,329	231,792			965	420,905
7	Khartoum	11,681	1,439,114			2,000	4,936	1,457,731
8	River Nile	1,855	268,256	113,472			1,506	385,089
9	North Darfur	6,244	95,254	351,408	7,296	500	4,302	465,004
10	North Kordofan	10,558	224,550	399,155	45,179		435	679,877
11	Northern	6,413	85,121				626	92,160
12	Red Sea	7,484	138,745	213,076	14,481	500	1,590	375,876
13	Sennar	20,444	334,315	126,059			107	480,925
14	South Darfur	16,575	350,798	199,143	57,717	1,500	3,775	629,508
15	South Kordofan	5274	141,380		8,559	1,500		156,713
16	West Darfur	5,314	118,750	354,508	7,439	1,500	187	487,698
17	West Kordofan	19,094	28,300		33,752		324	81,470
18	White Nile	47,535	599,923		19,286		690	667,434
	Total	235,948	5,649,135	2,330,734	251,647	9,500	24,777	8,501,741

2. Purpose

The purpose of developing and implementing this comprehensive, risk-based, multi-hazard country preparedness plan for Sudan is three-fold: to prevent, or delay occurrences and reduce morbidity and related mortality during public health emergencies.

3. Objectives

The main objectives of the multi-hazard country preparedness and response plan are:

- To activate governance structures to guide and coordinate planning and response to imminent risks at national and States level.
- To build the national capacity to assess and prioritize risks, prepare for, detect and respond to and recover from multiple hazards with public health consequences in an effective and timely manner.
- To advocate for, mobilize and avail technical, financial and logistical resources required for preparedness and initial responses at national and States level.

4. Hazards

4.1. Floods

Background and Rationale:

- A total of 250,776 people across all 18 States of Sudan were directly affected by floods between the periods 2016-2019 (OCHA /HAC 2020). The worst flood in 2019 affected 731, 358 people in 17 States except East Darfur. Furthermore, 791, 323 houses, 24,974 latrines and 37 health facilities were totally damaged by the flood (HAC 2020).
- The health impact of floods includes injuries, collapse of health facilities, isolation of communities from accessing health services, interruption of routine health services, contamination of drinking water and foods and creates favorable breeding sites for mosquitos and other vectors for water-borne and vector-borne diseases to flourish. The health response to floods addresses all these consequences.

Table: Average number of floods affected population and most flood-prone localities by State, 2016-2019

Source (OCHA 2020)

S.N	States	Average affected population	Most flood-prone localities
1	Khartoum	11,681	Jebel Aulia, UmDurman, Sharag El Nil
2	Al Jazeera	14,076	Madani, El Manageel, Janoub Al Geizira
3	Gedaref	13,402	Al Mafaza, Gedaref
4	Kassala	37,819	Aroma, Kassala, Atbara River
5	Red Sea	7,484	Tokar, Ageg
6	Sennar	20,444	Abu Hujara, Alsuk, El Dender
7	North Kordofan	10,558	Shiekan, Sodari, Jaberaa Alsheikh
8	South Kordofan	5,274	Abbyassiya, Abu Kershola, Abu Jubaiha
9	West Kordofan	19,094	El Mairam, Altadamoun
10	South Darfur	16,575	Ed El Fursan, Sharq Jebel Marra, Mershing
11	North Darfur	6,244	El Fashir, Tawilla, I Kuma
12	West Darfur	5,314	Zalengi, Aredamat, Kereanik

13	Central Darfur	9,159	Umm Dukhun, Bindisi
14	East Darfur	570	Yassin, Bahr El Arab, Assalaya
15	River Nile	1,855	Barbar, El Damar, Atbara
16	Northern State	6,413	Dongola, El Golid
17	Blue Nile	2,451	El Damazine, El Roseires, El Kurmuk
18	White Nile	47,535	El Jabalian, Alsalam, El Getina
	Total	235,947	49 localities

Targeting Criteria and Assumptions:

- Prioritized most flood-prone localities in 18 States as high-risk States.
- The average number of populations affected by floods 2016-2019 will be affected this year in 2020.

Targeted Population:

- 235,947 population in 18 States and 49 localities.

Source of data:

- OCHA, HAC and FMOH annual reports on flood

Main Objective:

- To provide access to sustained essential preventive and life-saving health services for isolated communities affected by the flooding in 49 localities of 18 States in Sudan by the end of 2020.

Key Interventions:

- Participate in interagency and sector-specific assessment missions to identify needs and gaps
- Preposition essential medicines, medical supplies and kits to strategic locations before the rainy season
- Support mobile health clinics to provide essential life-saving health services to isolated/inaccessible communities due to the flooding.
- Support establishment of makeshift health service delivery points to serve affected populations
- Support rehabilitation of health facilities affected by floods
- Provide essential medicines and kits as appropriate (trauma kit, IEHK kit, DDK, etc) to respond to the needs of affected communities.
- Support health promotion activities to improve access and use of health services and promote health practices.
- Support environmental sanitation and WASH campaigns to clean residential areas and destroy breeding sites
- Coordinate with other sectors to ensure provision of WASH, food and NFIs to affected communities through flood taskforce.

Key Indicators:

- Reached 90% the population affected by floods with essential life-saving health services.
- Availability of at least 70% of buffer stocks in strategic locations before the flood.
- Established and supported 32 mobile clinics and makeshift service delivery points (1 clinic/10,000 pop; SPHERE standard) for 3 months
- Reached 90% of flood affected villages with environmental health campaigns.

4.2. Epidemic-Prone Disease Outbreaks

The WHO defines a disease outbreak as the occurrence of cases of a disease in excess of what would normally be expected in a defined community, geographical area or season. No country is immune against outbreaks. Control of some outbreaks may exceed the national diagnostic and response capacities and may constitute potential Public Health Emergencies of International Concern (PHEIC); when collaborative assistance from the international community is needed as stated in the International Health Regulation (IHR). No country is immune against infectious disease outbreaks. From 2012 to 2018, the World Health Organization (WHO) recorded more than 1,500 outbreaks in 168 countries, including those due to new or re-emerging infectious diseases⁶.

The dominant disease outbreaks in Sudan could be classified in to three major categories based on the nature of preventive and response measures. The plan advocates use of a set of interventions to control many disease outbreaks, thus, giving more value for money.

1. Provision of safe drinking water and hygiene promotion to prevent and control outbreaks due to water and sanitation-related diseases, *e.g., Cholera and Dysentery*.
2. Implementation of integrated vector control measures to prevent and control outbreaks due to vector-borne diseases, *e.g., Rift Valley Fever, Chikungunya Fever and Dengue Fever. Malaria* ⁷
3. Strengthen routine vaccination and support vaccination campaigns to prevent and control outbreaks due to vaccine-preventable diseases, *e.g. Measles, Diphtheria and whooping cough*.

4.2.1. Water and Sanitation-Related Diseases Outbreaks

Background and Rationale:

- Only 68% of the population have access to improved source of drinking water in Sudan; a-third of the population have no access to safe-drinking water sources (MICS 2014).
- Poor access to safe drinking water and sanitation services is linked to transmission of diseases such as cholera, acute watery diarrhea, dysentery, hepatitis A and typhoid.

⁶ *Health Emergency and Disaster Risk Management Framework. Geneva: World Health Organization; 2019*

⁷ *Malaria response is not included in this document. Separate plan and resource are dedicated for it under Global Fund support. The FMOH, WHO and UNICEF are supporting the malaria response.*

- Having access to filtered and chlorinated potable water would significantly reduce the incidence and transmission of most water-borne diseases.
- Sudan experienced more than seventeen outbreaks of cholera and or AWD during the years 1966-2019 (table 2)
- The rainy season along with the high population mobility including vulnerable populations between states and across the borders aggravated the spread of the disease. Among other things, the recurrent outbreaks of cholera in neighboring countries coupled with porous borders with uncontrolled mobility of population contributed to emergence of cholera outbreak in Sudan. Furthermore, there are limited access to safe potable water, rampant open defecation practices and poor hygiene practices (hand washing, and safe food preparation) to make the matter worst.
- Addressing these risk factors in this plan will significantly contribute for the reduction of water-borne diseases. Hotspots⁸ play a central role in the spread of the disease to other areas. A separate cholera 'hotspot' analysis will be commissioned by WHO to pinpoint the epicenter of cholera outbreak infection for potential preemptive Oral Cholera Vaccination (OCV) implementation.

Table 2: History of Cholera or AWD Outbreaks in Sudan, 1966 – 2019

Year	State Affected	# of cases	# of deaths (Case Fatality Ratio) (CFR%)
1966	Gadaref	-	
1970	Gadaref		
1972	Equatoria (Juba) and All Northern States	15	-
1978	No data available		
1980	South Darfur		
1981	Gadaref		
1988	Khartoum, Northern State and Red Sea	-	
1999	Khartoum, Gadaref, North Kordofan, Red Sea and Kassala	-	-
2002	North Kordofan	-	-
2000-2004	All Darfur States	-	-
2006	9 States ⁹ (Khartoum, North Kordofan, White Nile, South Darfur, South Kordofan, Kassala, Red Sea, Al Gezira and River Nile)	2,007	77 (3.8%)
2007	Kassala, Gadaref and Sennar	-	-
2008	Gadaref	-	-

⁸ **Cholera hotspot:** A geographically limited area (e.g. city, villages or health district catchment area) where environmental, cultural and/or socioeconomic conditions facilitate the transmission of the disease and where cholera persists or re-appears regularly.

⁹ https://www.who.int/csr/don/2006_06_21a/en/

2010	All States	-	-
2014	All States	-	-
2016-2018	All States ¹⁰	36,962	823 (2.2%)
2019	Blue Nile, Sennar, Gezeera, and Khartoum ¹¹	346	11 (3.18%)

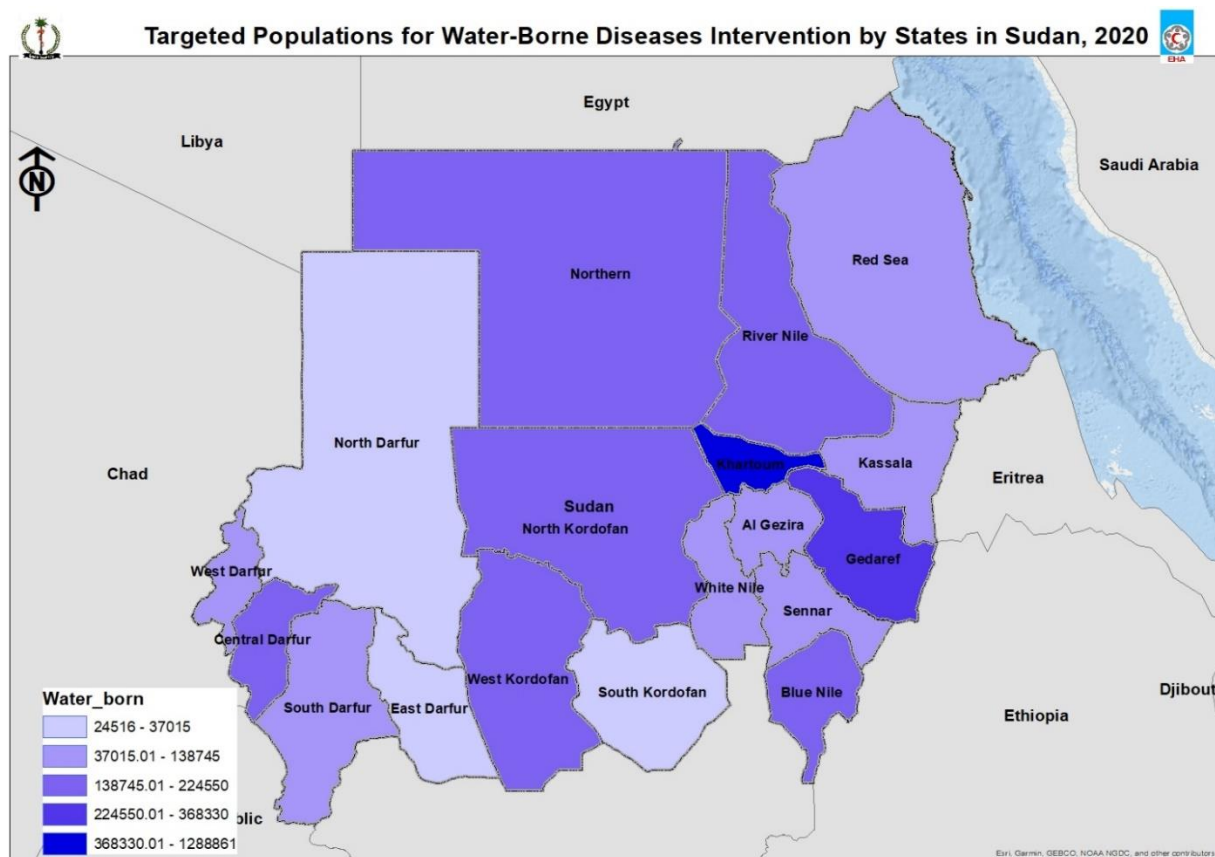


Figure 4: Targeted Population for Water and Sanitation Related Diseases in Sudan by States

Targeting Criteria and Assumptions:

- Based on the worst-case scenario prediction by FMOH/WHO, 60% of the localities affected during 2016-2018 AWD outbreak will be affected this year and hence prioritized as high-risk localities for water-borne diseases. An excel function is used to identify the cut off point for the 60% target using the locality-based surveillance data on number of cases reported i.e. 85 localities out of 187 (45% of all localities in Sudan) reported more than 87 AWD cases and hence targeted for intervention. The plan uses this number of expected cholera cases to plan supplies for case management. However, the whole population in the prioritized 85 localities will be at risk of water-borne infection and should

¹⁰ Countrywide Outbreak of Acute Watery Diarrhea in Sudan, 2016 – 2018 Available:

<https://www.echronicon.com/eccec/pdf/ECEC-03-00067.pdf>

¹¹ <http://www.emro.who.int/pandemic-epidemic-diseases/cholera/outbreak-update-cholera-in-sudan-7-december-2019.html>

be targeted for WASH intervention to prevent occurrence and spread of cholera and other water-borne diseases outbreak. For the interest of resource and capacity limitations, the plan targeted 20% of the affected population in the high-risk localities i.e. 5.6 million people.

Targeted Population:

- 22,596 cholera cases (all age groups) in 85 prioritized high-risk localities of 18 States for supplies and case management.
- 5,649,136 population in 85 prioritized high-risk localities of 18 States for WASH interventions to prevent and control water and sanitation related diseases.

Source of data:

- FMOH/WHO surveillance and projection data

Main Objective:

- To prevent occurrence and reduce the mortality and morbidity attributed to water and sanitation-related diseases outbreaks in 85 prioritized high-risk localities of 18 States in Sudan by the end of 2020.

Key Interventions/Strategies:

- The plan adopts the Global Task Force on Cholera Control (GTFCC)¹² multi-sectoral interventions as shown in the diagram below (figure 5).

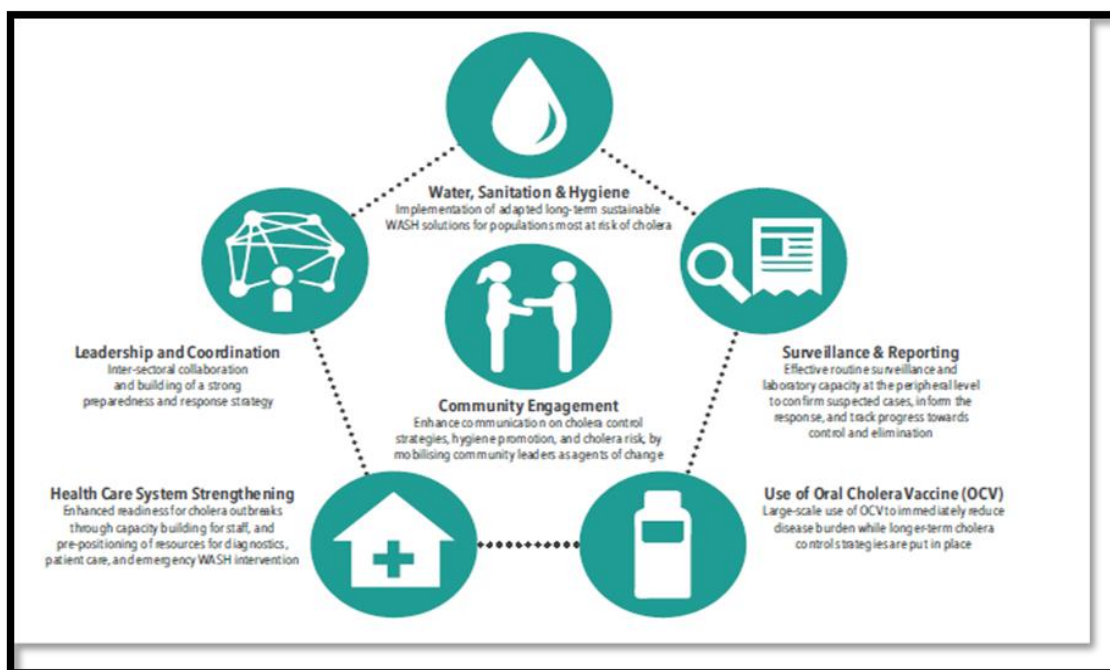


Figure 5: Multi-sectoral interventions to control cholera

¹² <https://www.who.int/cholera/publications/global-roadmap/en/>

Outcome Indicators:

- 90% cholera affected population received WASH services and information
- 90% of water sources in affected areas that meet standard Free Residual Chlorine (FRC) level
- 90 % of suspected water-borne diseases outbreak alerts investigated within 72 hours of reporting
- 90 % of cholera cases receive treatment for rehydration within 6-8 hours of developing signs and symptoms of dehydration¹³
- CFR due to cholera below 1%

4.2.2. Vector-Borne Disease Outbreaks

Background and Rationale:

- Vector-borne diseases are illnesses caused by parasites, viruses and bacteria that are transmitted by vectors.
- Epidemic-prone vector-borne diseases have been among the most important global and national public health problems.
- Diseases such as Yellow Fever (YF), Dengue Fever (DF), Chikungunya Fever, Rift Valley Fever (RVF) and malaria caused explosive epidemics affecting thousands of people.
- Sudan experienced numerous outbreaks of vector-borne disease in the past decades (Table 3)
- Point of Entries (PoE) serve as entry point for Dengue and Chikungunya (e.g. Port Sudan and Suwakin).
- The predominant mosquito vector, *Aedes aegypti*, transmits viruses causing Dengue Fever, Chikungunya Fever, Yellow Fever (YF), West Nile, Rift Valley Fever (RVF) and Zika viruses.
- *Aedes aegypti* is widely prevalent in all 18 States in Sudan although the prevalence is relatively low in Khartoum and Northern State.
- The *Aedes* mosquito breeds in domestic settings such as “Zeer”, water-storage containers, construction sites, discarded household junk items (tyres, plastic and metal cans, etc.).
- Many of vector-borne diseases are preventable, through protective measures, and community mobilization.
- Although malaria remained the leading cause of morbidity and mortality in the country, the planning team agreed to exclude malaria from this exercise due to the focus, expertise and resources invested to prevent and control malaria through the Global Fund and dedicated team at Federal and States level. Thorough analysis of the bottlenecks for country-wide spread of malaria was conducted by WHO and FMOH and remedial measures are taking place to improve the situation.

¹³ A Tool to Monitor Multi-Sectoral Response Activities During Outbreaks of Cholera in Sudan, FMOH/WHO 2019

Table 3. Common vector-borne viral haemorrhagic fever outbreaks in Sudan, 1976 – 2020, FMOH/WHO

Year	Type Disease	States Affected	# of Cases	# of Death (CFR %)
Before 2003	Dengue Fever (DF)	Red Sea, Kassala	Sporadic	-
2005	Yellow Fever (YF) ¹⁴	South Kordofan	605	163 (26.9%)
2007	Rift Valley Fever (RVF)	White Nile, Gazeera	673	214 (31.8%)
2008	Crimean–Congo Haemorrhagic Fever (CCHF)	South Kordofan	96	49 (51.0%)
2008	Dengue Fever	Red Sea, Kassala	449	25 (5.6%)
2010	Dengue Fever	Red Sea, Kassala	3300	12 (0.4%)
2005/2011	Chikungunya Fever ¹⁵	South Kordofan	Sporadic	-
2011	West Nile Fever	South Kordofan	Sporadic	-
2012-2013	Yellow Fever	Greater Darfur	847	171 (20.02%)
2014	CCHF	Eastern Darfur	12	5 (41.7%)
2015-16	Dengue fever	Greater Darfur	594	108 (18.2%)
2017	Dengue fever	Kassala	201	Unknown
2018	CCHF	Blue Nile	2	1 (50%)
2018-2019	Chikungunya Fever ¹⁶	Kassala, Red Sea Gedaref, River Nile, Gezira, Sennar, West Darfur, South Darfur and North Kordofan	48,763	-
2019	Dengue Fever	West Darfur, North Darfur, Red Sea, East Darfur, South Darfur, North Kordofan, Gedaref, Sennar, and Gezira	4,236	13 (0.3%)
2019-2020	Rift Valley Fever (RVF)	River Nile, Red Sea	576	11 (1.9%)

¹⁴ <https://academic.oup.com/trstmh/article-abstract/102/12/1247/1920294?redirectedFrom=fulltext>

¹⁵ <https://doi.org/10.1016/j.trstmh.2008.04.014>

¹⁶ Hassan E El Bushra, Betigel W Habtewold, Naeema Al Gasseer, Rehab E Mohamed, Salim A Mohamednour, et al. Outbreak of Chikungunya Fever in Sudan, 2018-2019. JOJ Pub Health. 2019; 4(3): 555644.DOI: 10.19080/JOJPH.2019.04.555644002

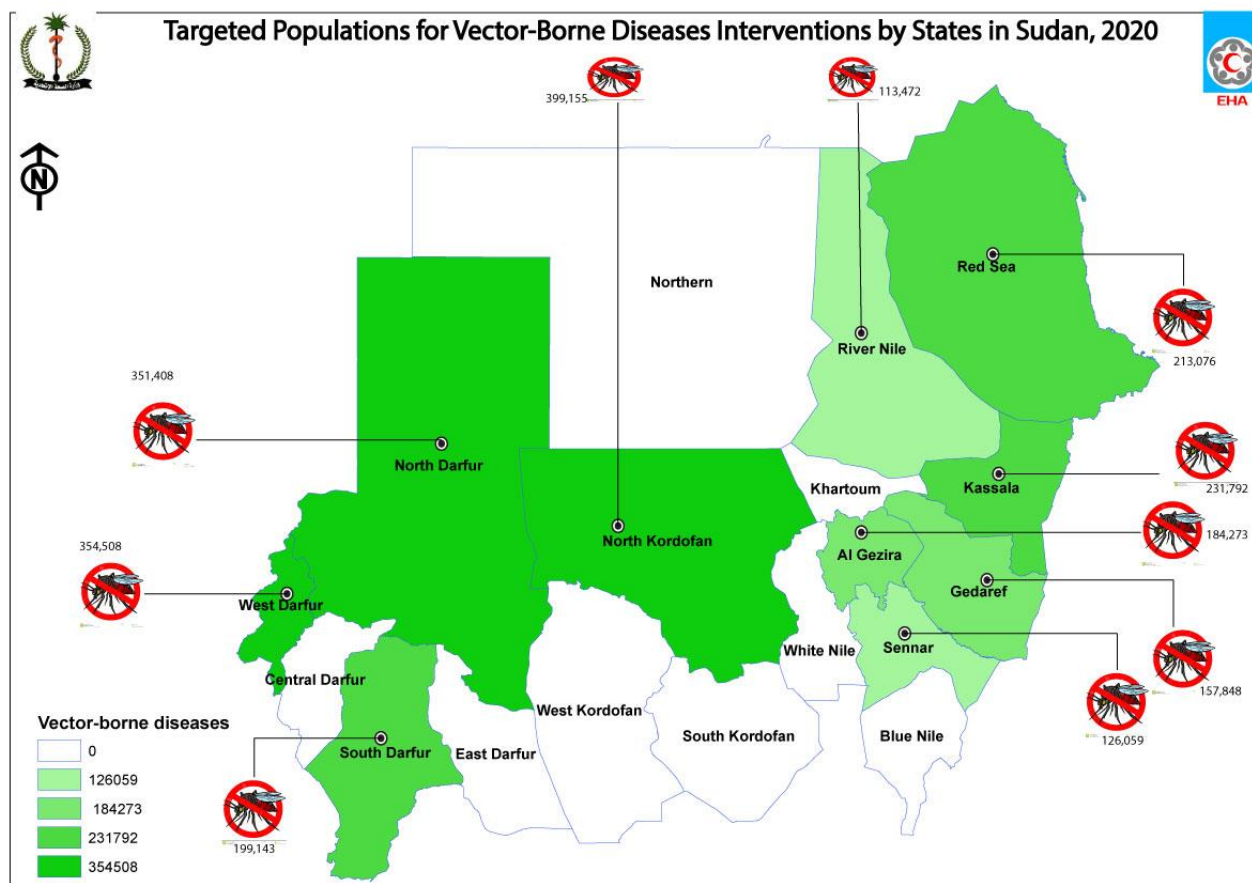


Figure 6: Targeted Population for Vector-Borne Diseases Intervention in Sudan by States

Targeting Criteria and Assumptions:

- On the basis of three years data, 2018-2020, disease surveillance data on the most common vector-borne diseases in Sudan, but malaria, i.e. Dengue Fever, Rift Valley Fever and Chikungunya Fever, the planning team agreed to prioritize localities that reported two or more of the selected vector-borne diseases (i.e. Dengue Fever, Rift Valley Fever and Chikungunya Fever) during the last three years as high-risk and hence prioritized for intervention.
- A total 11,653,671 population (total population in the affected localities) will be at risk of vector-borne diseases. However, the plan prioritizes 20% (lowest quintiles) of affected population for interventions for the interest of time and resources.

Targeted Population:

- 2,330,734 (i.e. the lowest quintiles¹⁷; 20%) for Integrated Vector Control (IVC) and 46,615 population for case management and supplies (AR¹⁸=2%) in 45 localities of 10 States in Sudan

Source of data:

- FMOH/WHO outbreak reports/surveillance data/STAR¹⁹ tool

Main Objective:

- To improve local capacity to prevent occurrence, detect and timely respond to vector-borne disease outbreaks in 45 localities of 10 States in Sudan by the end of 2020.

Key Interventions:

- Enhance integrated disease and entomological surveillance in high-risk localities for timely intervention
- Improve access to diagnosis and treatment for vector-borne diseases in high-risk locality through provision of trainings, medicines, laboratory reagents and medical supplies and equipment
- Implement integrated vector control measures that reduces vulnerability to vector-borne diseases in high-risk areas
- Enhance public awareness and risk perception about vector-borne diseases among the vulnerable communities through risk communication, community engagement and social mobilizations interventions

Outcome Indicators:

- 60 % of reduced vector indices (HI, CI, PI & BI)²⁰
- 90 % of epidemic alerts of water-borne diseases investigated within 72 hours of reporting
- < 1% reduction in CFR attributed to vector-borne diseases

¹⁷ A **quintile** is a statistical value of a data set that represents 20% of a given population, so the first quintile represents the lowest fifth of the data (1% to 20%); the second quintile represents the second fifth (21% to 40%) and so on.

¹⁸ **Attack Rate (AR)** is the measure of frequency of morbidity, the percentage of the population which contracts the disease, in an at-risk population. The cumulative AR from 2018-2019 Chikungunya Fever outbreak is used to calculate expected number of vector-borne disease/cases for maximum supply and case management requirement purpose.

¹⁹ **Strategic Tool for Assessing Risks (STAR)** is WHO's tool used to identify and prioritize risks to inform country's all-hazard emergency preparedness planning. The FMOH/WHO conducted State-level STAR exercise in 15 out of 18 States in 2019-2020 which is used to inform the prioritization of this plan.

²⁰ The most used indicators for vector surveillance are: House Index (HI): percentage of houses infested with larvae and/or pupae. Container Index (CI): percentage of water-holding containers infested with larvae or pupae. Breteau Index (BI): number of positive containers per 100 houses inspected. Pupa Index (PI): number of pupae per 100 houses inspected. Estimating adult population density using ovitraps, sticky traps, human landing collections or any similar traps.

4.2.3. Vaccine-Preventable Disease Outbreak

Background and Rationale:

- Achieving universal vaccination coverage for all is one of the global sustainable development targets aimed at reducing childhood mortality from preventable deaths.
- According to the WHO guidelines, a child is fully immunized with all basic vaccinations if the child has received Bacillus Calmette-Guerin (BCG) vaccine against tuberculosis at birth; three doses each of polio and pentavalent (diphtheria-tetanus-pertussis-hepatitis B (Hep), Hemophilus influenza type B (Hib)) vaccines at 6, 10 and 14 weeks of age; and a vaccination against measles at 9 months of age.
- Inadequate immunization coverage is recognized as a major public health concern as it led to outbreaks of vaccine-preventable diseases.
- The threshold, or minimum percentage of immune individuals needed to establish herd immunity²¹, is dependent upon how infectious the disease is. For example, it is estimated that 93% to 95% of a population needs to be vaccinated to establish herd immunity against measles, whereas the threshold for polio is 80% to 86%.
- Sudan sustained high immunization coverage over years but with variation within and between the States. Coverage with routine vaccination is less than 80% in some localities in the country (Figure 7 below).
- As a result, Sudan had outbreaks of Vaccine Preventable Diseases (VPDs) such as measles, diphtheria, whooping cough, and meningitis. Outbreaks occur when the vaccination coverage is low; especially, in remote areas, conflict-affected areas and IDP camps.

²¹ **Herd immunity** is a form of indirect protection from infectious disease that occurs when a large percentage of a population has become immune to an infection, whether through previous infections or vaccination, thereby providing a measure of protection for individuals who are not immune.

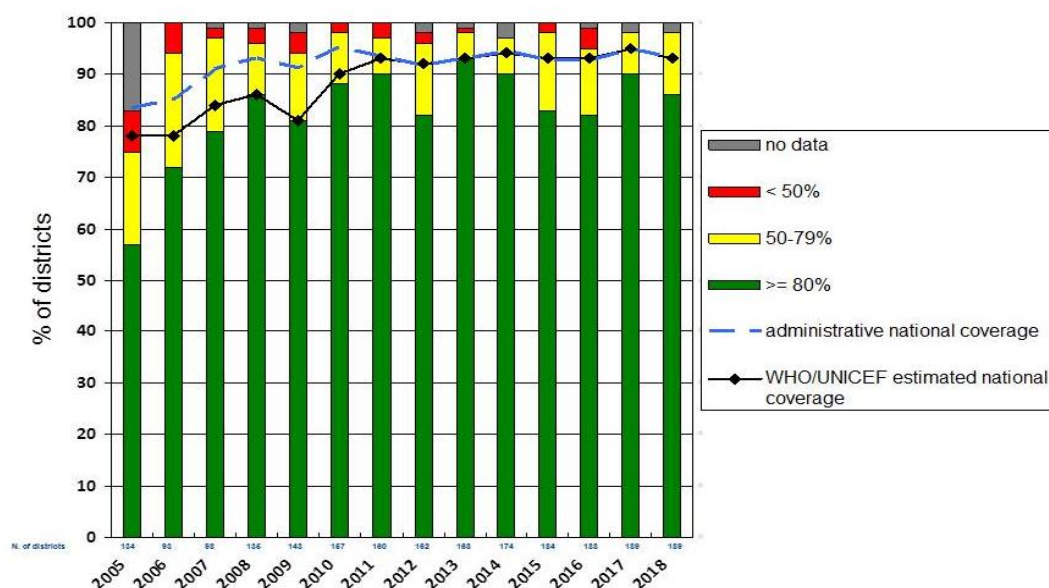


Figure 7: Percentage of districts reporting DTP3 Immunization coverage in Sudan, 2005-2018 (WHO 2019)²²

- As of December 2019, the annual MCV2 coverage stands at 75% according to the FMOH report which is less than the recommended average of 95% to develop herd immunity and prevent outbreak.
- Sudan has been hit by a large-scale measles outbreak during the period of 2011-2013. Following a nation-wide campaign in 2013, Sudan achieved a significant reduction in the number of measles cases. However, as shown in the graph below (figure 8 below) the outbreak continued in 2015 and 2016 which resulted with total confirmed cases of 5,352 cases and 45 deaths (CFR=0.84%) which affected almost all states, 72% of cases were not vaccinated.
- Following measles campaign covering children 9 month up to under 15 years, remarkable reduction of measles cases occurred in 2017.
- However, due to population movement, accumulation of susceptible and low routine MCV1 and 2 coverage, measles outbreak hit almost all states in 2018, up to week 47. Sudan reported 4,215 confirmed measles cases, most affected age group were under 10 years; 58% of the cases not vaccinated. Most cases reported from Darfur and eastern states.

²² WHO vaccine-preventable diseases: monitoring system. 2019 global summary
https://apps.who.int/immunization_monitoring/globalsummary/JPG/SDN.jpg

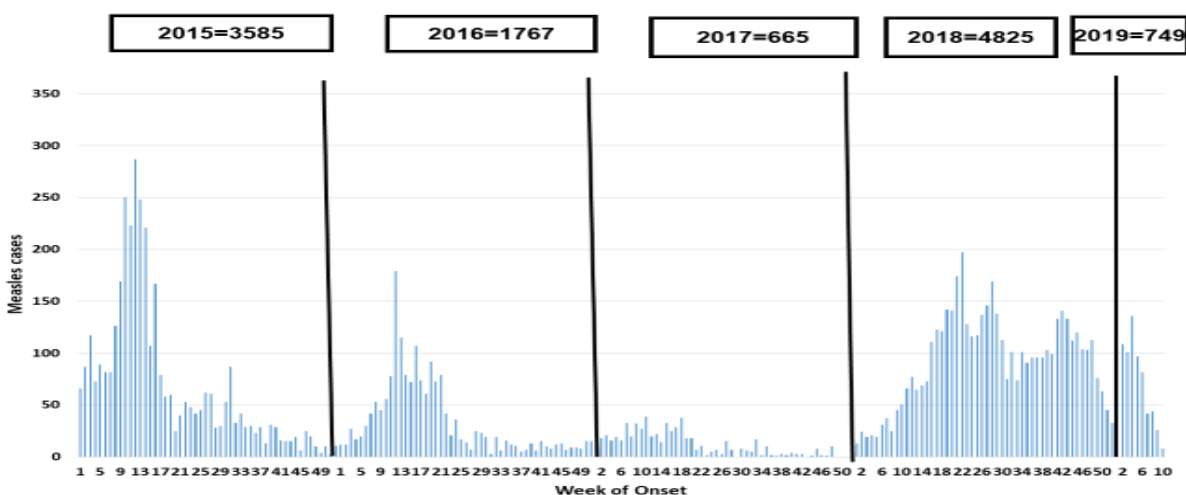


Figure 8: Distribution of confirmed measles cases in Sudan, 2015-2019, up to week 11, FMOH

Targeting Criteria and Assumptions:

- Based on the national S3M II (2018) data, the planning team targeted localities in the lowest quintiles²³ (<20%) on Expanded Program on Immunization (EPI) full coverage in children < 12 months i.e. localities reported less than 16 % in full immunization coverage. An excel function was used to calculate the lowest quintiles of localities with fully immunized children. A total of 33 localities in 11 States registered full EPI coverage less than 16% during S3M survey.
- Accordingly, all children under the age of 1 year (4% of the total population²⁴) living in localities with very low immunization coverage (<16%) will be at risk of outbreaks due to Vaccine-Preventable Diseases (VPD). The plan targets 90% of children under the age of 1 year living in the high-risk localities to be fully immunized to prevent outbreaks of VPD.

Targeted Population:

- 251,646** (90% of children under the age of 1 year living in at risk localities (lowest quintile)) targeted to be fully immunized in 33 localities of 11 States in Sudan

Source of data: S3M II (2018)²⁵

Main Objective:

- To prevent occurrence of outbreaks and reduce morbidity and mortality due to vaccine preventable diseases (VPD) in high risk 33 localities of 11 States in Sudan by the end of 2020.

²³ A **quintile** is a statistical value of a data set that represents 20% of a given population, so the first quintile represents the lowest fifth of the data (1% to 20%); the second quintile represents the second fifth (21% to 40%) and so on.

²⁴ WHO standard average for population. Under five years children=18%; under 1 year=4%

http://www.healthlibrary.com/book51_chapter755.htm

²⁵ National S3M II assessment conducted in 2018

Key Interventions/Strategies:

- Enhance social mobilization and public awareness to increase uptake of vaccines focusing on hard-to-reach and vulnerable populations (e.g. refugees, nomads, and IDPs) in targeted high-risk localities.
- Adopt and expand on the three vaccination strategies to boost immunization coverage through fixed, out-reach and mobile approaches as appropriate
- Strengthen the local health systems capacities to rapidly detect and respond appropriately to VPD outbreaks
- Improve cold-chain systems in order to ensure immunization safety
- Ensure proper case management and access to free of charge services to all patients
- Advocate for timely use of vaccine in response to outbreaks and humanitarian emergencies.

Outcome Indicators:

- Reached 80% immunization coverage among children under the age of 1 years in the 33 high-risk localities for all vaccines in national programme.
- Investigated 90% of VPD outbreak alerts within 72 hours of reporting

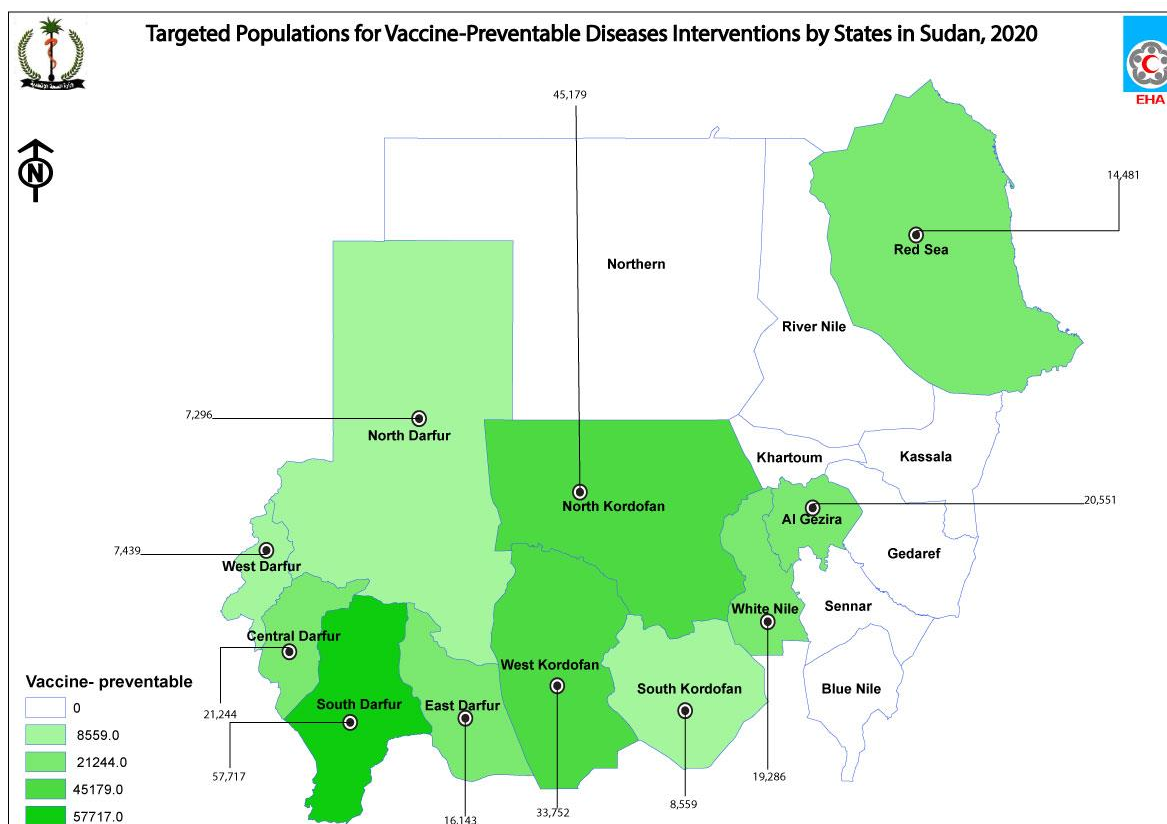


Figure 9: Targeted Population for Vaccine-Preventable Diseases in Sudan by States, 2020

4.3. Mass Casualties

Background and Rationale:

- While incidents of fighting have reduced considerably in recent years, armed conflict continues in pockets of South, Central and North Darfur (e.g. *Jebel Marra*), as well as in the ‘Two Areas’ of South Kordofan and Blue Nile.
- Tribal conflict and wildfire accidents have been reported in North Darfur, Red Sea and Kassala (STAR 2019/20).
- Mass demonstrations and civil unrest coupled with road traffic accidents are claiming mass casualties in big cities like Khartoum in the past.
- All this required preparedness for management of mass casualties in prioritized locations.

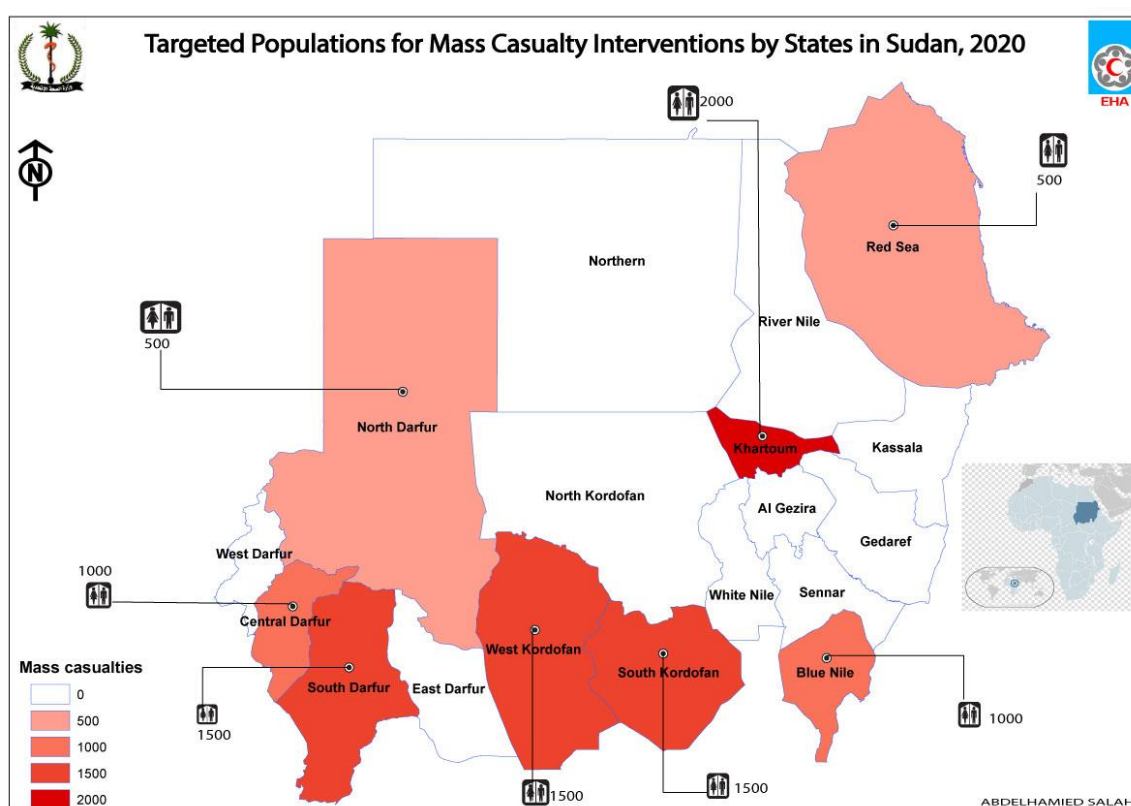


Figure 10: Targeted Population for Mass Casualty Management in Sudan by States, 2020

Targeting Criteria and Assumptions:

- Based on STAR tool exercise and recent experience, the planning team agreed to prioritize localities experienced two or more accidents of armed conflict, civil arrest, road traffic accidents, wildfire, chemical burn, etc. The estimated number of affected populations in the STAR tool and experience (reports) were used as reference to estimate affected population for planning purpose.

Targeted Population:

- 41,500 people in 32 localities of 8 States in Sudan

Source of data: STAR tool/experience (reports)

Main Objective:

- To reduce mortality and disability due to mass casualties in 32 localities of 8 States in Sudan by the end of 2020.

Key Interventions:

- Improve preparedness of health facilities for mass casualty through training, renovation, provision of medicines and medical supplies and equipment.
- Establish referral pathways and mechanisms
- Train emergency team in selected hospitals on mass casualty management
- Preposition trauma kits

Outcome Indicators:

- Increased number of health facilities providing mass casualty services
- Reduced case fatality ratio associated with injuries linked directly or indirectly to the events.

4.4. Drought (*SAM Children with Medical Complication*)

Background and Rationale:

- Increasing food prices, and poor WASH systems and health services, continue to drive malnutrition across the country. Throughout Sudan, most people – 58 per cent of households – cannot afford a basic daily food basket (HNO 2020).
- In many protracted emergencies, the prevalence rates of Global Acute Malnutrition (GAM) regularly exceed the emergency threshold of > 15% of children with acute malnutrition (< -2 weight-for-height z-scores (WHZ) or with nutritional edema), despite ongoing humanitarian interventions.
- The prevalence of GAM in children under 5 is 14.1 per cent in Sudan (HNO 2020). If 10% or more of children are classified as suffering from GAM, there is generally considered to be a serious emergency, and with over 15% the emergency is considered critical.
- Severely Malnourished Children who have medical complications, severe oedema (+++)***, or poor appetite (fail the appetite test****) or present with one or more IMCI danger signs† should be treated as inpatients.²⁶

In developing countries, 30-50% of severely malnourished children under the age of five and admitted to hospital face a fatality. With appropriate treatment, this unacceptably high death rate can be reduced to less than 5%²⁷. That is what this plan going to target.

Targeting Criteria and Assumptions:

- The plan prioritized GAM using WHZ >15% (i.e critical emergency level). The plan identified 56,380 Sever Acute Malnutrition (SAM) children under the age of five years requiring inpatient care at health facilities. Fifteen percent (15%) of SAM burden requires admission and in-patient care. For practical reasons, based on the last year's performance of the nutrition sector, the interventions can only reach 60% of the targeted population (HNO 2020).

Targeted Population:

- 33,828 (60% of the case load) children under the age of five years (0-59 months) in 67 localities of 16 States in Sudan.

Source of data: *S3M II (2018)*

²⁶ https://www.who.int/elena/titles/full_recommendations/sam_management/en/

²⁷ WHO 2003: *Guidelines for the inpatient treatment of severely malnourished children* Available: https://www.who.int/nutrition/publications/guide_inpatient_text.pdf

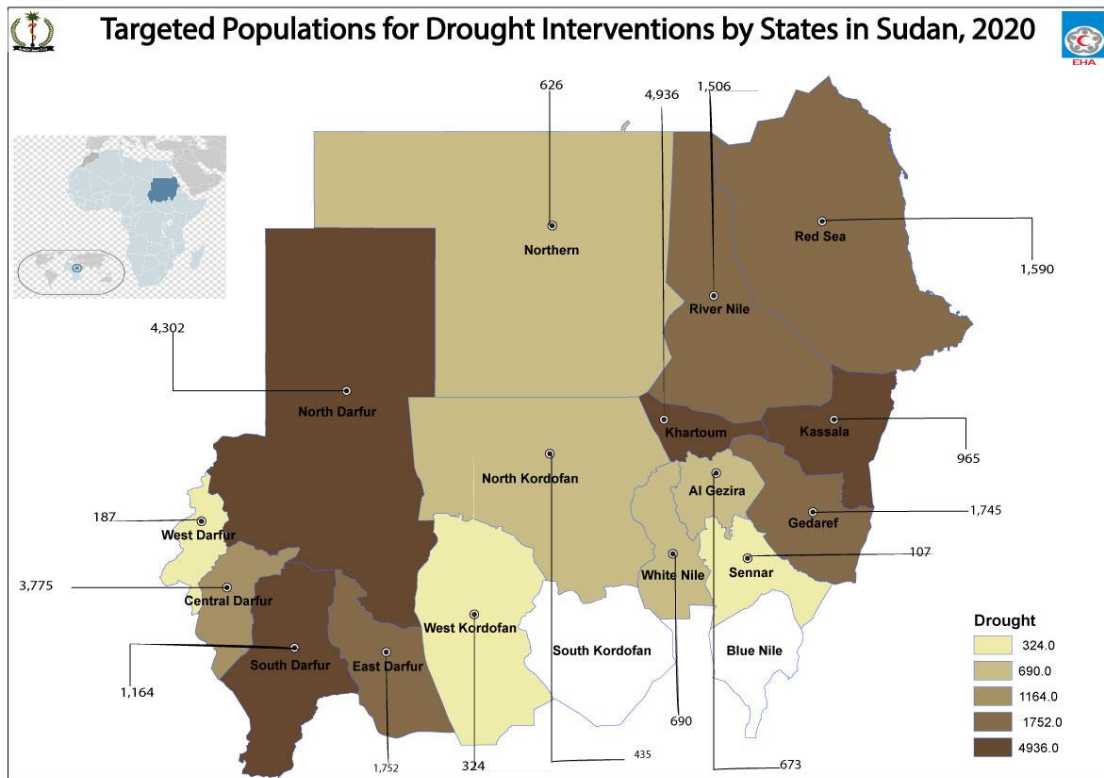


Figure 11: Targeted Population for SAM with Medical Complication in Sudan by States, 2020

Main Objective:

- To improve access to quality in patient management of SAM children (0-59 months) with medical complication in 67 localities of 16 States in Sudan by the end of 2020.

Key Interventions:

- Increase access to Stabilization Centers (SC) for management of SAM with medical complication children aged 0-59 months
- Improve the quality of health service in the management of SAM with medical complication
- Pre-position SAM kits²⁸ for timely and quality management of cases in SC.

Outcome Indicators:

- Reached 60% of targeted SAM children (0-59 months) with medical complication
- Reduced the case fatality rate among SAM with medical complication children to less than 5%.

²⁸ WHO's Severe acute malnutrition with medical complications kit (SAM/MC) kit is a standard kit designed to provide medical treatment for 50 children under five suffering from severe malnutrition with medical complications.

<https://www.who.int/emergencies/kits/sam/en/>

5. Detailed Activities and Budget

S.N	Major Intervention Areas	Specific Activities	Measuring Unit	Quant ity	Unit Cost in \$	Total Budget in \$	Timeline								Remarks
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	Leadership and Coordination														
1.1	Support to EOCs	Provide ICT equipment, cover cost of communication and utilities, train staff	# EOCs	18	4,500	81,000	x	x	x	x	x	x	x	x	Based on identified gaps
1.2	Establish taskforces and technical working groups	Develop TOR, activate taskforces and TWGs and link them with EOC functions	# of States	18		0	x	x	x	x	x				No cost required
1.3	Conduct joint FMOH/SMOH/UN Agencies supervisions	Conduct periodic joint supervision to monitor preparedness and response to emergencies	# visits	18	3,600	64,800		x	x	x	x	x	x	x	Joint team from federal to States and States to localities once per month
	Sub Total					145,800									
2	Surveillance including disease surveillance (including PoEs), water quality surveillance and vector density surveillance														
2.1	Provide trainings	Train surveillance officers from SMOH/FMOH on surveillance functions and data management	# trained	180	250	45,000		x	x						Training includes surveillance officers from private, police and military facilities to expand existing sentinel sites
2.2	Provide tools and PPEs	Update, duplicate and distribute case investigation forms and provide with airtime	States	18	1,500	27,000	x	x	x	x	x	x	x	x	
2.3	Support to PoEs	Assess technical and supplies gaps at PoEs and support as needed	# POEs	16	3,500	56,000		x	x	x	x				

	Sub Total					128,000									
3	Support outbreak alert investigation and rapid response initiatives														
3.1	Support RRT missions	Cover the cost of per diem and transport for RRTs mission to investigate alerts	# missions	288	450	129,600	x	x	x	x	x	x	x	x	2 alert/month/state
3.2	Establish and support mobile clinics	Identify needs, cover cost of staff, transport and medicines	# mobile clinics	30	54,000	432,000	x	x	x	x	x	x	x	x	4,500\$/month/mobile team for 6 months
	Sub Total					561,600									
4	Laboratory														
4.1	Training	Train lab technicians from States on sample collection and shipment	# lab technicians	90	250	22,500	x	x	x						
4.2	Supplies, reagents, PPEs and transport medium	identify needs and provide supplies to national and State labs	# of labs	11	45,000	495,000	x	x	x	x	x	x			NPHL and SPHL
4.3	Support for sample collection and transport	Cover the cost of shipment of specimens in country and international	# of lab samples	60	250	15,000	x	x	x	x	x	x	x	x	Supported 10 international and 30 local samples shipment
	Sub Total					532,500									
5	Case Management and Infection Prevention and Control (IPC)														
5.1	Water and Hygiene-Related Diseases														
5.1.1.	Train health workers	Train health workers on case definition, IPC, triaging and case management on cholera	# health workers	255	250	63,750	x	x	x	x		x	x		3 staff per 85 targeted localities

5.1.2	Train community health workers	Train community health workers (CHWs) on hygiene promotion and home management of diarrhea and referral signs	# CHWs	4,250	50	212,500	x	x	x	x	x	x			
5.1.3.	Procure and preposition DDKs	Procure and preposition 104 DDK,	# DDK	104	900	93,600	x	x	x	x					104 DDK to manage severe cases (20% of case load 22,000 cases targeted)
5.1.4.	Procure and preposition water testing kits	Procure water testing kits, consumables	# of water testing kits	22	3,000	66,000	x	x	x			x	x		
5.1.5	Provide PPEs and IPC supplies for Treatment Centres	Procure IPC materials and PPEs for CTCs, CTUs and ORTs	# Cholera Treatment Centres	180	7,500	1,350,000	x	x	x	x			x	x	18 CTCs, 36 CTUs and 72 ORPs
5.1.6.	Support isolation centers (e.g. tent, renovation)	Identify WASH facilities and other facility readiness gaps for CTCs	# CTCs	85	8,500	722,500	x	x	x	x	x				
5.1.7.	Support water quality monitoring	Conduct HHs and water source monitoring	# Missions	70	13,000	910,000	x	x	x	x	x	x	x	x	including cost of assessments
Sub Total						3,418,350									
5.2	Vector-Borne Diseases														
5.2.1.	Training health workers	Train health workers on case management	# of health workers	135	250	33,750		x	x	x	x				
5.2.2.	Training CHWs	Train CHWs on environmental sanitation and personal protection measures	# CHWs	360	120	43,200		x	x	x	x				

5.2.3.	Vector surveillance	Support vector-surveillance and evaluation of vector control interventions	# surveys	60	6,500	390,000	x	x	x		x	x			
5.2.4.	Support vector control interventions	Support integrated vector- control campaigns	# of campaigns	70	16,000	1,120,000	x	x	x	x	x	x	x		
5.2.5.	Provide IVC supplies and equipment	Provide vector surveillance tools, assorted insecticides, spraying pumps and PPEs sprayers	# units	400	500	200,000	x	x	x						
5.2.2.	Medicines and medical supplies (e.g. kits, IPC materials and PPEs)	Procure IEHK kits	# kits	120	1,200	144,000	x	x	x	x					
5.2.3.	Support isolation centers (e.g. tent, renovation)	Support renovation or tent	# units	10	8,500	85,000	x	x	x	x					
Sub Total						2,015,950									
5.3	Vaccine-Preventable Diseases														
5.3.1.	Training health workers	Train health workers on surveillance and case management	# health workers	99	250	24,750	x	x	x	x					
5.3.2.	Training CHWs	Train/refresh CHWs on VPD and referral	# CHWs	330	150	49,500	x	x	x	x	x	x			
5.3.3.	Medicines and medical supplies	Procure medicines and medical supplies	# States	10	50,000	500,000	x	x	x	x					

5.3.4.	Support cold chains	Support establishment and maintenance of cold chain systems	# cold chain	10	10,000	100,000		x	x	x	x	x	x		
5.3.5.	Support outreach and mass immunization campaigns	Support outreach and immunization campaigns	# campaigns	99	3,000	297,000		x	x	x	x	x			
Sub Total						971,250									
6	Mass casualty's management														
6.1	Training	Train health workers on mass casualty management and triaging	# health workers	96	250	24,000				x	x	x			
6.2	Provide trauma kits	Procure and preposition 82 trauma kits	# kits	82	1,200	98,400				x	x	x	x		
6.3	Provide equipment and IPC supplies	Provide gap filling	# hospitals	8	14,500	116,000		x	x	x					
6.4	Support trauma centers (e.g. WASH facilities renovation)	Support trauma centres	# hospitals	8	8,500	68,000		x	x	x					
Sub Total						306,400									
7	Management of SAM with medical complication														
7.1	Training	Train health workers on in patient management of SAM children with medical complication	# health workers	106	250	26,500	x	x	x			x			
7.2	SAM kits	Provide SAM kits	# SAM kit	421	1,200	505,200	x	x	x	x			x		

7.3	Support Stabilization Centers	Support SC in renovation and equipment	# SC	16	8,500	136,000		x	x	x	x	x			
Sub Total						667,700									
8	Health Promotion, Risk Communication and Community Engagement (crosscutting for all hazards)														
8.1	Train health	Train health workers on risk communication/C4D	# health workers	320	150	48,000	x	x	x						
8.2	Training community volunteers	Train CHWs on Community Engagement, risk communication/C4D	# CHWs	1,870	150	280,500	x	x	x	x	x	x			
8.3	Production and distribution of IEC materials	Produce and distribute posters and leaflets	# IEC	561,000	0	168,300	x	x	x	x	x	x			
8.4	Support TV and Radio spots	Produce and air TV and radio spots	# spots	60	10,000	600,000	x	x	x	x	x	x	x	x	
8.5	Support to community Volunteers	Support community groups to mobilize local communities and initiate community dialogues	# community gps	187	10,000	1,870,000	x	x	x	x	x	x	x	x	
Sub Total						2,918,800									
Grand Total						11,666,350									

Annex 1: Available Stocks

S.N	States	Location	Items	Unit	Qty	# of people to be covered	Agency	Remark
1	North Darfur	El Fasher	RRK ^[1]	Kit	2	6,000	WHO/FMOH	1 RRK serves 3,000 people over 3 months
2	North Darfur	El Fasher	IEHK ^[2]	Kit	1	1,000	WHO/FMOH	1 IEHK serves 1,000 population over 3 months
3	North Darfur	El Fasher	SAM ^[3]	Kit	14	700	WHO/FMOH	1 SAM kit serves 50 children
4	Central Darfur	Zalengie	SAM	Kit	50	2,500	WHO/FMOH	
5	Al Gezira	Madani	RRK	Kit	6	18,000	WHO/FMOH	
6	Al Gezira	Madani	IEHK	Kit	15	15,000	WHO/FMOH	
7	Al Gezira	Madani	Cholera Bed	Pcs	25	25	WHO/FMOH	
8	Blue Nile	Damazine	RRK	Kit	7	21,000	WHO/FMOH	
9	Blue Nile	Damazine	DDK ^[4]	Kit	1	400	WHO/FMOH	1 DDK serves 400 moderate or 100 sever cholera cases
10	Blue Nile	Damazine	Cholera Bed	Pcs	25	25	WHO/FMOH	
11	Gadaref	Gadaref	SAM	Kit	31	1,550	WHO/FMOH	
12	East Darfur	El Dain	RRK	Kit	1	3,000	WHO/FMOH	
13	Kassala	Kassala	IEHK	Kit	15	15,000	WHO/FMOH	
14	Kassala	Kassala	Cholera Bed	Pcs	25	25	WHO/FMOH	
15	Kassala	Kassala	SAM	Kit	26	1,3000	WHO/FMOH	
16	Khartoum	Khartoum, WHO	RRK	Kit	7	21,000	WHO/FMOH	
17	Khartoum	Khartoum, FMOH	IEHK	Kit	75	75,000	WHO/FMOH	
18	Khartoum	Khartoum, FMOH	DDK	Kit	19	7,600	WHO/FMOH	
19	Red Sea	Port Sudan	RRK	Kit	2	6,000	WHO/FMOH	
20	Red Sea	Port Sudan	IEHK	Kit	10	10,000	WHO/FMOH	
21	Red Sea	Port Sudan	DDK	Kit	5	2,000	WHO/FMOH	
22	Red Sea	Port Sudan	SAM	Kit	16	800	WHO/FMOH	
23	River Nile	Atbara	SAM	Kit	16	800	WHO/FMOH	
24	Sennar	Sennar	DDK	Kit	4	1,600	WHO/FMOH	
25	Sennar	Sennar	IEHK	Kit	15	15,000	WHO/FMOH	
26	South Darfur	Nyala	DDK	Kit	2	800	WHO/FMOH	
27	South Darfur	Nyala	RRK	Kit	6	18,000	WHO/FMOH	
28	South Darfur	Nyala	IEHK	Kit	3	3,000	WHO/FMOH	
29	South Darfur	Nyala	SAM	Kit	25	1,250	WHO/FMOH	
30	South Kordofan	Kadugli	DDK	Kit	1	400	WHO/FMOH	
31	South Kordofan	Kadugli	RRK	Kit	2	6000	WHO/FMOH	
32	West Darfur	Genina	RRK	Kit	4	12000	WHO/FMOH	
33	White Nile	Kosti	RRK	Kit	11	33000	WHO/FMOH	
34	White Nile	Kosti	IEHK	Kit	15	15000	WHO/FMOH	
35	White Nile	Kosti	DDK	Kit	3	1200	WHO/FMOH	
36	White Nile	Kosti	Trauma kit	Kit	1	100	WHO/FMOH	1 Trauma kit serves 100 major or 200 minor operations

^[1] **RRK**= Rapid Response Kit serves 3,000 people over 3 months

^[2] **IEHK**= Interagency Emergency Health Kit serves 1,000 population over 3 months

^[3] **SAM**= Sever Acute Malnutrition Kit serves 50 children

^[4] **DDK** = Diarrheal Disease Kit serves 400 moderate or 100 sever cholera cases

Annex 2: List of partners per States in Sudan

S.N	States	List of Agencies
1	Geziera	SMOH, WHO, ADDITION FOR DISASTER, CAFA, MSF
2	Blue Nile	SMOH, WHO, UNICEF, UNFPA, IRW, IMC, SCI, WVI, RI, IRW, SWC, GHF, ADD, PANCARE, SRCS, ADDITION, FPDO, CORD, JASMAR, Labina Mubadiroon
3	Central Darfur	SMOH, WHO, UNICEF, UNFPA, IOM, UNHABITAT, UNHCR, SRCS, IMC, IRW, CRS, SCI, WR, SAWA Sudan, JMCO, SAWA Sudan, NCA
4	East Darfur	SMOH, WHO, UNICEF, UNHCR, ARC, RI, NIDO, RI, CIS, SRCS, WVI, MSF Swiss, Al Massar, REMCO
5	Gadaref	SMOH, WHO
6	Kassala	SMOH, WHO, UNICEF, TOD, Plan Sudan, SRCS, KPHF
7	Khartoum	SMOH, UNFPA, WHO, UNICEF, SCI, MSF, SRCS
8	River Nile	SMOH, WHO
9	North Darfur	SMOH, WHO, UNICEF, UNFPA,
10	North Kordofan	SMOH, WHO, UNFPA
11	Northern	SMOH
12	Red Sea	SMOH, WHO, UNICEF, Ana El Sudan, SRCS, SCI, Oxfam Italy
13	Sennar	SMOH, WHO
14	South Darfur	SMOH, WHO, UNICEF, UNFPA, ARC, CIS, IMC, WVI, NCA, SRCS, SRCS, ARC, SRCS, PHF, NIDO
15	South Kordofan	SMOH, WHO, UNHCR, UNICEF, FAO, UNFPA, IMC, WVI, GAH, NIDAA, SC-S, SRCS, NIDAA, Direct Aid, Goal, CCIS, IMC, CONCERN, PANCARE, AFA, GHF, MSF-CH, SIBRO Mubadiroon Labina, CAFA, CIS, FPDO
16	West Darfur	SMOH, WHO, UNICEF, UNFPA, IOM, UNHCR, SRCS, TGHIMC, SAWA Sudan, SRCS, IMC, PORD, WR, SCI, CONCERN Worldwide
17	West Kordofan	SMOH, WHO
18	White Nile	SMOH, WHO, UNICEF, UNFPA, WVI, SRCS, ADDITION, CAFA, MSF