



South Sudan COVID-19 National Deployment and Vaccination Plan

9th February 2021

This document, the COVID-19 National Deployment and Vaccination Plan (NDVP) for South Sudan, has been written and is being presented by a working group of vaccination and public health specialists representing the South Sudan Ministry of Health (Directorate General Primary Health Care, EPI Services and COVID-19 National Steering Committee) the World Health Organization South Sudan Country Office, UNICEF South Sudan Country Office, the Health Pooled Fund (HPF) South Sudan and John Snow Inc (JSI) South Sudan. This group of experts have been collaborating since October 2020 in the process of assessing and preparing the level of readiness for the introduction of one or more COVID-19 vaccines. Through extensive discussions and focused effort, this NDVP being presented herein is being submitted for consideration.

Abbreviations

ASMT	Automated Stock Management Tool
BHW	Boma Health Worker
CCE	Cold Chain Equipment
CCEOP	Cold Chain Equipment Optimization Platform
CES	Central Equatoria State
CO	Country Office
CTWG	COVID-19 Technical Working Group
DG – PHC	Director General – Primary Health Care
EES	Eastern Equatoria State
EUL	Emergency Use Listing
EVM	Effective Vaccine Management
FO	Field Office
HPF	Health Pooled Fund
JSI	John Snow Inc
NBEG	Northern Bahr el-Ghazal
ODP	Operational Deployment Plan
PHEOC	Public Health Emergency Operations Center
TCA	Targeted Country Assistance
VAR	Vaccine Arrival Reports
VVM	Vaccine Vial Monitor
WBEG	Western Bahr el-Ghazal
WES	Western Equatoria State

PART 1

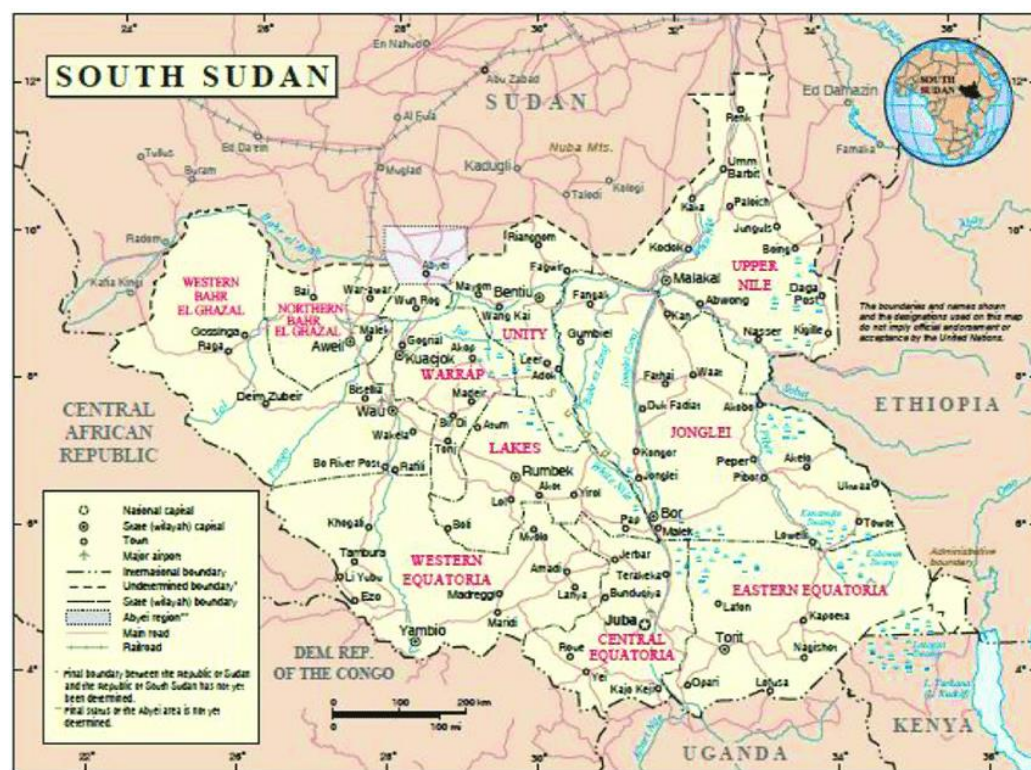
Introduction

Country Context

South Sudan is a land-locked country bordered by the Republic of Sudan to the north, the Federal Democratic Republic of Ethiopia to the east, the Republic of Kenya to the south-east, the Republic of Uganda to the south, the Democratic Republic of Congo to the south-west and the Central African Republic to the west. It lies between latitudes 3° and 13°N, and longitudes 24° and 36°E. It is covered in tropical forest, mangrove, swamps, and grassland. South Sudan covers an estimated area of 619,745 km², of which 18% consists of White Nile and its related tributaries and swamps, with the rest being made up of plateaus with numerous small hills and extensive savannah plains. It receives abundant rainfall and is rich in tillable land.

Since February 2020, the country is administratively divided into 10 States and 3 Administrative Areas (AAs). These are further divided into 80 Counties, 605 Payams, 2,532 Bomas, and 26,544 estimated villages. For health services, the Ministry of Health (MoH) is represented at State, County, and Payam levels while the Bomas are within the Local Government Structures.

Figure 1: Map of the Republic of South Sudan



Source: South Sudan Centre for Census, Statistics & Evaluation (SSCCSE), 2010

The total estimated population in 2020 is 12,060,167 as reported by the South Sudan National Bureau of Statistics with a population density of 13.33 km² and annual population growth of 3.1%. The proportion of males is 48% while females constitute 52% of the total. The population below 15 years is 47% (5, 922,748) and below 5 years is 20% (2, 646,334). Life expectancy at birth is 56.0 years for females and 54.1 years for males. The majority (87.2%) of the population lives in rural areas.

The National Health System

In the ‘Framework for State-Building in South Sudan’, the MoH is taking a sector-wide approach. This includes faith-based organizations (FBOs), non-governmental organizations (NGOs - local and international) and private clinical facilities. In 2013, several donors led by Department for International Development (DFID - United Kingdom) pooled funds to support the health services including immunization and formed the Health Pooled Fund (HPF). This initiative supports all the new States that were designated upon administrative re-organization from the eight former States - Northern Bahr el-Ghazal (NBeG), Western Bahr el-Ghazal (WBeG), Lakes, Warrap, Unity, Eastern Equatoria (EE), Central Equatoria (CE) and Western Equatoria (WE) States. UNICEF, supports health service delivery in the two former States – Jonglei and Upper Nile – through World Bank funding. These fund managers contract one non-governmental organization (NGO) in each County to be the lead health service delivery agent in working with and supporting the County Health Department.

Through the Inter-Ministerial Committee and other channels at the national level, the MoH works to ensure that all sectors consider health nationwide (Central, State and County levels). Important sectors for health include agriculture, animal, industry, water, education, community development and finance and economic planning. The inter-sectoral efforts over the years have made some marginal progress in the global development goals including the Sustainable Development Goals (SDGs).

Public health services are delivered along a four-tier system, starting from the primary level to the tertiary level. Immunization services provision is included within the Basic Package of Health Services (BPHS). The BPHS comprises of a selection of maternal and child health control, communicable diseases, improves community nutrition and control of non-communicable disease services.

Epidemiology of COVID-19 and current pandemic in South Sudan

On January 30, 2020, the World Health Organization declared that the outbreak of a novel coronavirus, SARS-CoV-2, constituted a public health emergency of international concern (PHEIC), based on the recommendation of the Emergency Committee. Within less than six weeks, the increasingly global spread of this coronavirus infection – characterized by a high level of human-to-human transmission and substantially significant rates of morbidity and mortality – was

declared a pandemic on 11th March 2020. As a disease entity, this condition has become known as COVID-19.

Within the South Sudanese context, the first laboratory-confirmed case of COVID-19 was reported on 5th April 2020. Since that time, on-going, mainly community, transmission of SARS-CoV-2 has been identified within the country, principally in the capital, Juba which accounts for the majority of COVID-19 cases (80.6%).

Daily epidemiological surveillance and reporting is compiled and reported upon through the Public Health Emergency Operations Center (PHEOC), jointly co-ordinated by the Ministry of Health and WHO epidemiological surveillance and public health specialists. Based on the most recently available national surveillance statistics, a total of 4,355 confirmed cases of COVID-19 have been reported since the start of the pandemic in the country, with 91,551 laboratory tests conducted.

A summary of the COVID-19 situational profile, as of ‘Epidemiological Week 4 - 2021’ (EW 4), is as follows:

- * The cumulative number of COVID-19 cases is 4,355 with a notable 196 new cases (61% increase in weekly case incidence compared to ‘Epidemiological Week 3 – 2021’). It merits furthermore mentioning that the trends in cases and sample positivity rates have increased during each epidemiological week since the beginning of 2021. Over the course of the pandemic in South Sudan, 302 of the total number of cases (7.4%) have been imported from outside the country.
- * The cumulative level of mortality associated with COVID-19 is 66 deaths, corresponding to a case fatality rate of 1.52%; notably one additional death occurred in EW 4.
- * As comprehensive community-based contact tracing system has registered and followed up on 10,534 cumulative contact of the laboratory-confirmed COVID-19 cases. Notably, the majority of the contacts – 9,859 (93.6%) – have completed the required 14-day quarantine period. The case-to-contact ratio is 1:2.6 in South Sudan.
- * Laboratory testing for SARS-CoV-2 is conducted in various facilities throughout the country, based on RT-PCR and GeneXpert testing techniques / platforms. In EW 4, the average test positivity rate was 5.35%, reflecting a 34% increase compared to EW 3.
- * The socio-demographic profile of COVID-19 cases is characterized by a mean age of 36.7 years (ranging from 2 months – 96 years), 84.5% of the confirmed cases are asymptomatic, with 75% of the overall cases being male. Approximately, eight-of-ten (79%) are South Sudanese nationals.

Measures of prevention, treatment and control of COVID-19

Key preventive-focused, public health risk reduction measures for reducing the potential for SARS-CoV-2 transmission have been implemented within South Sudan. These include the promotion of maintaining social distancing from other persons, regular hand washing, the wearing of facial masks and the banning of large social gatherings. These mitigating actions have been

widely communicated to the general public and have been adopted / practiced to a variable, and at-times less-than-required, degree of compliance.

Together with the Ministry of Health, WHO and UNICEF, there are various healthcare organizations – both national and international – that are involved in promotion key preventive health messages about COVID-19. Risk communication, community engagement and health promotion messaging about transmission of the coronavirus responsible for COVID-19 is being implemented at several levels of interaction - local community, County, State and nationally.

In addition to the aforementioned national laboratory testing capacity and the epidemiological surveillance system for reporting COVID-19 cases and contact tracing, additional components comprise the integrated emergency preparedness and response for this disease. Clinical case management of in-patient COVID-19 cases who required hospitalization is provided in hospitals, health facilities and dedicated isolation centers in various locations in the country. One of these in-patient settings that treats COVID-19 cases is the Infectious Disease Unit in Juba, managed by Ministry of Health clinical specialists.

Justification for vaccination

With the emergence of a novel coronavirus in late 2019 / early 2020 – subsequently denominated SARS-CoV-2 – increasing scientific discoveries and better understanding about its transmission have accrued. Likewise, on a global scale, the glaring reality of the devastating toll caused by COVID-19 has been observed, with more than two million persons succumbing to this disease, many of whom were elderly individuals.

Based on the accumulation and analysis of a vast amount of epidemiological surveillance data over the past year, a scientific consensus has developed in support of the research and development of efficacious vaccine candidates. Several scientifically rigorous clinical trials to determine the level of vaccine efficacy through antibody formation against SARS-CoV-2, a number of vaccines have been or are in the process of being identified as capable of reducing COVID-19 incidence in those who have been vaccinated compared to an unvaccinated cohort. Such development and deployment of COVID-19 vaccines and their implementation in national public health vaccine campaigns have reductions in morbidity and mortality as their principal aim. Based on the evidence to-date derived from the clinical trials performed and the recently commenced COVID-19 vaccine campaigns being conducted in several countries, achieving a protective level of herd immunity within populations against SARS-CoV-2 is a realistic and justifiable goal of vaccinating against COVID-19.

This document is the National COVID-19 Vaccines Deployment Plan. It has been developed with participation of key stakeholders in South Sudan and aligned to global guidance. It is a working document that continuously incorporates emerging contextual and technical issues raised by stakeholders and the evolving COVID-19 epidemiological scenario in South Sudan. The NDVP will be used to guide all stakeholders in the preparations, implementation and evaluation of

COVID-19 vaccination in South Sudan. The details of participating organisations and partners so far can be seen on the Annex 1, which outlines the subcommittees of the National Coordination Committee and the section on stakeholders.

1.1 Goal of COVID-19 vaccination:

To reduce the incidence of COVID-19 disease within South Sudan, whereby a decrease in the number of severe cases and deaths due to COVID-19 disease especially among high-risk groups, is achieved. Through vaccinating against COVID-19 within the country, the strengthening of key health protection measures and the restoration of the provision of essential health services for all South Sudanese will be enhanced.

1.2 Objectives of the vaccine deployment plan:

- i) To secure adequate and viable quantities of COVID-19 vaccines for the targeted population at designated vaccination points by end of 2022.
- ii) To ensure acceptance and uptake of COVID-19 vaccination through effective advocative communication, demand generation, community engagement and risk communication.
- iii) To vaccinate identified target population (40% of total population) with safe and efficacious vaccines by the end of 2022.
- iv) To monitor and evaluate preparedness, occurrence and response to adverse events following COVID-19 immunization (AEFI).

1.3 Guiding Principles

The essential principals underpinning the development of this NDVP are as follows:

- i) Strong partnerships in planning, resource mobilization and implementation.
- ii) Fairness / equity in targeting persons to benefit from initially scarce vaccine stocks as well as thereafter throughout the full implementation of COVID-19 vaccination.
- iii) Use of existing institutional frameworks and capacities in decision-making and deployment of vaccines.
- iv) State-led implementation of the vaccination activity with full participation of local government structures and local communities.
- v) Observation and full compliance with environmental protection measures required for every intervention undertaken in the course of vaccination, especially with regards to waste management.
- vi) Integrated approach to vaccine deployment guided by one plan, one implementation and integrated monitoring and evaluation framework for vaccination activities.

PART 2: The Vaccine deployment Plan

Section 1: Regulatory Preparedness

Approval of regulatory authorities

The Government shall use vaccines approved under the COVAX facility and any other vaccines with proven efficacy and safety margins after all stages of clinical trials.

All vaccines imported for use in public and private sector must comply with this standard. The regulatory approval for the vaccine will be obtained from the Drug and Food Authority (DFCA). The approval of the regulatory authorities will involve the following guidelines and standards:

- i. Since the vaccine is still new, the South Sudan Drug and Food Control Authority will rely on WHO Emergency Use Listing (EUL). The certification of WHO Emergency Use Listing will be acceptable as an alternate to WHO pre-qualification.
- ii. Regulatory decisions (marketing authorization or emergency approval) of stringent regulatory authorities (SRAs) from the US Food and Drug Administration (USFDA), European Medicines Agency (EMA), SWISSMEDIC, UK Medicines and Healthcare Products Regulatory Agency (UKMHRA), and the equivalent national medicines approval authorities of Italy, Norway and Switzerland are recognized.
- iii. Currently expedited regulatory pathways for approval of COVID-19 medical products (therapeutics and vaccines) other than reliance on WHO Emergency Use Listing, WHO Pre-qualification and/or SRA marketing authorization does not exist. However, emergency approval can be obtained within 10 working days. The list of minimum documents needed for regulatory approval of COVID-19 products under emergency/expedited pathways include:
 - Certificate of Good Manufacturing Practice (GMP) issued by a competent medicine regulatory authority in the country of origin.
 - Marketing authorization from the country of origin of the product.
 - Details on the product dossier submitted with the application, indicating all five modules and annexes.
 - Certificate of Pharmaceutical Product (CPP) conforming to the WHO format by country of origin.
- iv. An import permit for COVID-19 vaccines can be issued within 10 working days with the following documents attached;
 - Certificate of analysis signed by the responsible authority of the company
 - Certificate of origin information
 - Packaging list (batch number, manufacturing date, expiration date)
 - Proforma invoice
 - In South Sudan, the local testing of the product is not a legislative requirement and the country will fully rely on the certificate from a responsible national control

laboratory for each batch of vaccine that has WHO EUL or authorization from a stringent regulatory authority.

Section 2: Planning and Coordination

National Technical Working Group

The National Expanded Programme on Immunization (EPI) Technical Working Group (EPITWG) has been re-designated into the COVID-19 vaccine TWG and mandated to lead the planning and implementation of COVID-19 vaccination. The COVID-19 vaccine TWG is chaired by the Director General – Primary Health Care (DG-PHC) services and its membership includes UN agencies (WHO, UNICEF, others), international and national non-government organizations (INGOs and NNGOs) that have a stake in the COVID-19 vaccine implementation. The existing sub-committees of the EPITWG have also been expanded to serve as the COVAX sub-committees led by concerned units of the Ministry of Health, supported by partners in the following responsibilities and activities:

- i) prioritization, targeting, and service delivery (WHO, UNICEF, Health Pooled Fund [HPF])
- ii) vaccine, cold chain equipment (CCE) and logistics (UNICEF, HPF)
- iii) demand generation, advocacy and risk communication (WHO, UNICEF)
- iv) COVID-19 surveillance (PHEOC, WHO, Centers for Disease Control and Prevention [CDC])
- v) Monitoring and evaluation and monitoring of vaccine impact (WHO, CDC)
- vi) Safety, including injury prevention and AEFI detection and response (WHO)

With support from Gavi, additional technical assistance will be provided to support the aforementioned sub-committees Working Groups through UNICEF, WHO, John Snow, Inc (JSI) and HPF.

At the State level the already existing EPI coordination mechanism will be expanded, and/or other members will be co-opted into the planning and implementation actions for COVID-19 vaccination.

National Coordination Committee

At the onset of the COVID-19, the Incident Management System was evoked in the country. For the coordination at national level, a multi-stakeholder and multi-disciplinary Steering Committee was established to provide integrated, comprehensive management of the pandemic in South Sudan. The Steering Committee is headed by the Ministry of Health, with additional participatory membership from UN Agencies, INGOs, and NNGOs (Annex 2). The committee has various Technical Working Groups – epidemiological surveillance, case management, laboratory, data

management, logistics and monitoring and evaluation. A meeting of the Steering Committee meets bi-weekly with a high level of representation across agencies. This committee has been mandated by the Honorable Minister of Health to oversee the COVID-19 vaccination introduction activities. A Vaccination TWG has also been created, under this Steering Committee, which is chaired by the DG PHC. The Vaccination TWG will provide updates during the bi-weekly meeting regarding the up-coming COVID-19 implementation – once commenced. Already, presentations have been made to the Steering Committee, eg on the VIRAT readiness assessment exercise in preparation for introduction of a COVID-19 vaccine to the country, so as to appraise stakeholders of the overall process and the progress to-date achieved.

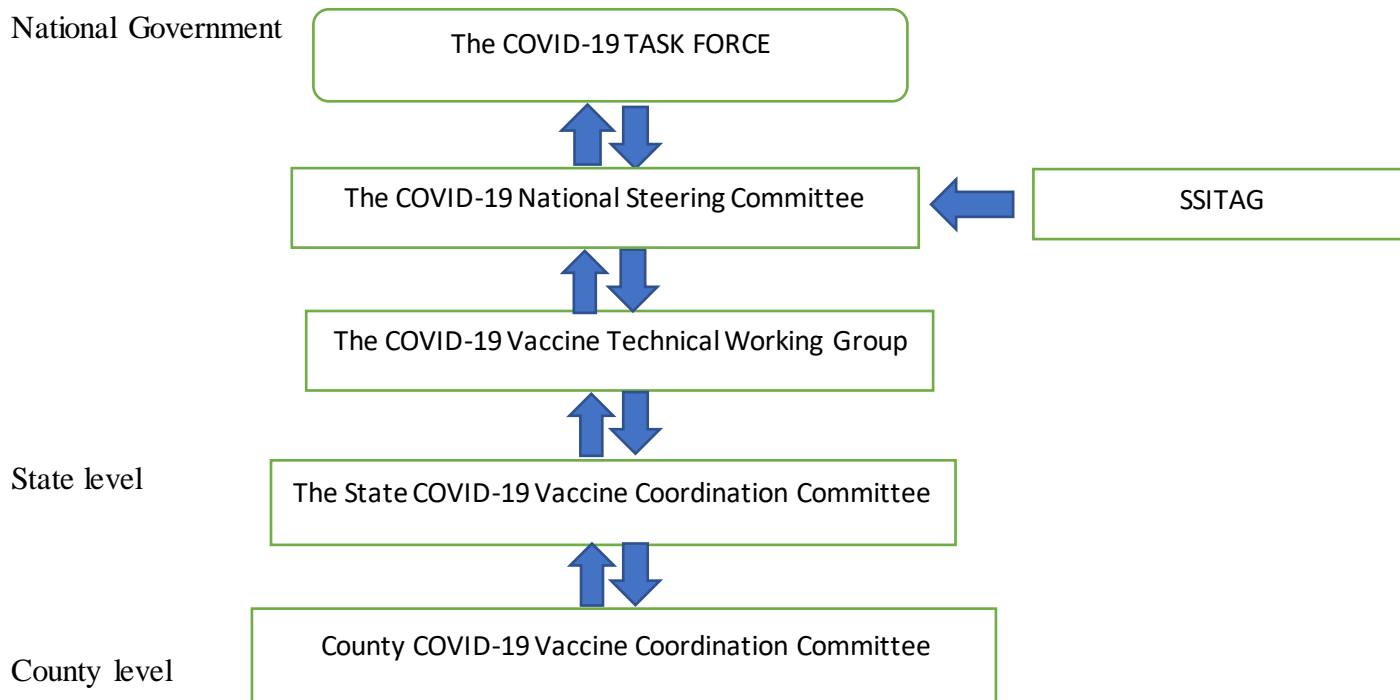
The Steering Committee aims to provide leadership on all aspects of the COVID-19 vaccine introduction process in South Sudan, including regulatory guidance, vaccine selection, equitable distribution of vaccine, procurements, financing, delivery mechanisms, prioritization of population groups, vaccine safety surveillance, communication activities regarding the vaccination programme and in terms of regional cooperation and collaborative activities with neighboring countries (eg regarding border points of entry).

South Sudan National Immunization Technical Advisory Group (SSITAG)

The South Sudan national immunization technical advisory group (SSITAG) consists of experts in the fields of infectious diseases, immunizations and public health. The SSITAG will play a key technical advisory role on the COVID-19 vaccine(s) on behalf of the national authorities and policy makers responsible for making evidence-based decisions vis-à-vis the COVID-19 vaccine(s). Given that the COVID-19 vaccine(s) will be on WHO emergency use listing (EUL), the SSITAG will deliberate on the available body of evidence (eg clinical trial results) in a credible, rigorous manner so as to appropriately provide scientifically-informed, evidence-based advice to the decision-makers in the country concerning the use of a given vaccine. Highly credible decisions by the SSITAG will positively impact perceptions within the government and the country, thereby lending additional weight to COVID-19 vaccine uptake and enhancing the ability to secure government or donor funding, support from professional organizations, and acceptance / uptake of being vaccinated by the general public.

Inter-Agency Coordinating Committee (ICC)

A well-coordinated process of rolling-out the COVID-19 vaccine programme, one that involves all levels of government, is critical for its successful implementation. The roles of the various levels of management of the vaccine programme implementation are as stipulated in this document.



Management Structure

State level

A multi-agency State Coordination Committee chaired by the State Director-General of Department of Health shall be formed to monitor the implementation of the COVID-19 vaccine implementation. The committee will meet at least once every week during the vaccine roll-out phase. Additional meetings may be held as needed. The roles of this committee are:

- i) Consolidate the database of persons targeted for vaccination in the State in each phase of the roll out.
- ii) Support counties to resolve issues related to microplanning, vaccines and logistics, human resources availability, training, waste management, adverse effects following immunization (AEFI) and concerning advocacy, communication and social mobilization (ACSM) issues.
- iii) Ensure that all AEFIs are reported to the national focal point and that initial investigations are conducted in an efficient and timely manner.

- iv) Mobilize resources from among State partners/stakeholders to supplement resources from the national government.
- v) Identify additional vaccinators (if and when needed) across government and private sectors to minimize disruption of routine immunization services while introducing COVID-19 vaccine. Anyone legally authorized to give injection may be considered as potential vaccinator.
- vi) Assign State officers to monitor accountability of the COVID-19 vaccines.

County level

At the County level, the County Health Director will co-ordinate the multi-agency health committee to request and schedule meetings regarding the introduction of the COVID-19 vaccine. Such meetings should be scheduled weekly for planning and daily during roll-out of vaccine.

- i) Collect, compile and consolidate the database of persons targeted for vaccination in the County in each phase of the roll out.
- ii) Provide supportive supervision to health workers providing COVID -19 vaccination in the counties.
 1. Monitor the progress of the roll-out of COVID-19 vaccine in the County and report timely to State and national levels.
 2. Ensure that all AEFIs are reported to the State focal point.
 3. Mobilize resources from among County partners/stakeholders to supplement resources from the national government.
 4. Ensure training of all concerned HR on COVID-19 Vaccine
 5. Monitor progress on key activities such as microplanning, communication planning, cold chain and vaccine logistics planning.
 6. Ensure IEC materials are disseminated to all facilities and communities. Have clear plans to address rumor mongering on COVID-19 vaccines.
 7. Planning and mapping of vaccination sessions to address special needs of the target populations.
 8. Identify additional vaccinators (if and when needed) across government and private sectors to minimize disruption of Routine Immunization services while introducing COVID-19 vaccine.
 9. Assign County officers to be accountable for the COVID-19 vaccines receiving, distributing and retrieving following the microplan and logistics guideline.

Section 3: Identification of target population

As previously described, the first confirmed case of COVID-19 in South Sudan was reported on 5th of April 2020. The most recently available morbidity and mortality data from the PHEOC (4th February 2021 reports 4,355 confirmed COVID-19 cases and 65 deaths (case fatality rate of 1.5%) since the start of the pandemic in the country. Previously reported epidemiological results of the COVID-19 cases and deaths by State location, is shown in Table 1 (as of 6 January 2021), with Central Equatoria State (CES, site of the capital Juba) contributing the majority of the cases and deaths nationally.

Socio-demographically, the majority of the cases are male 75% whilst the mean age of all cases is 36.7 years. The age-sex sub-group with the highest incidence is males between 20–49 years of age (Figure 1). There have been 141 healthcare workers infected to date (3.2% of all SARS-CoV-2 infections). The geographical distribution is as shown in Table 1.

Table 3.1. Distribution of cumulative number (%) of cases and deaths, by State.

State	Frequency (%) of COVID-19 Cases	Frequency (%) of COVID-19 deaths
CES	3,366 (82.8)	51 (78.5)
EES	351 (8.6)	3 (4.6)
WES	7 (0.2)	0 (0.0)
Jonglei	65 (1.6)	1 (1.5)
Unity	21 (0.5)	1 (1.5)
Upper Nile	93 (2.3)	4 (6.5)
Lakes	44 (1.1)	5 (7.7)
WBEG	47 (1.2)	0 (0.0)
NBEG	12 (0.3)	0 (0.0)
Warrap	56 (1.4)	1 (1.5)
Administrative Areas	6 (0.1)	0 (0.0)
Total	4,067	65

Source: PHEOC COVID-19 Surveillance Data (5th February 2021)

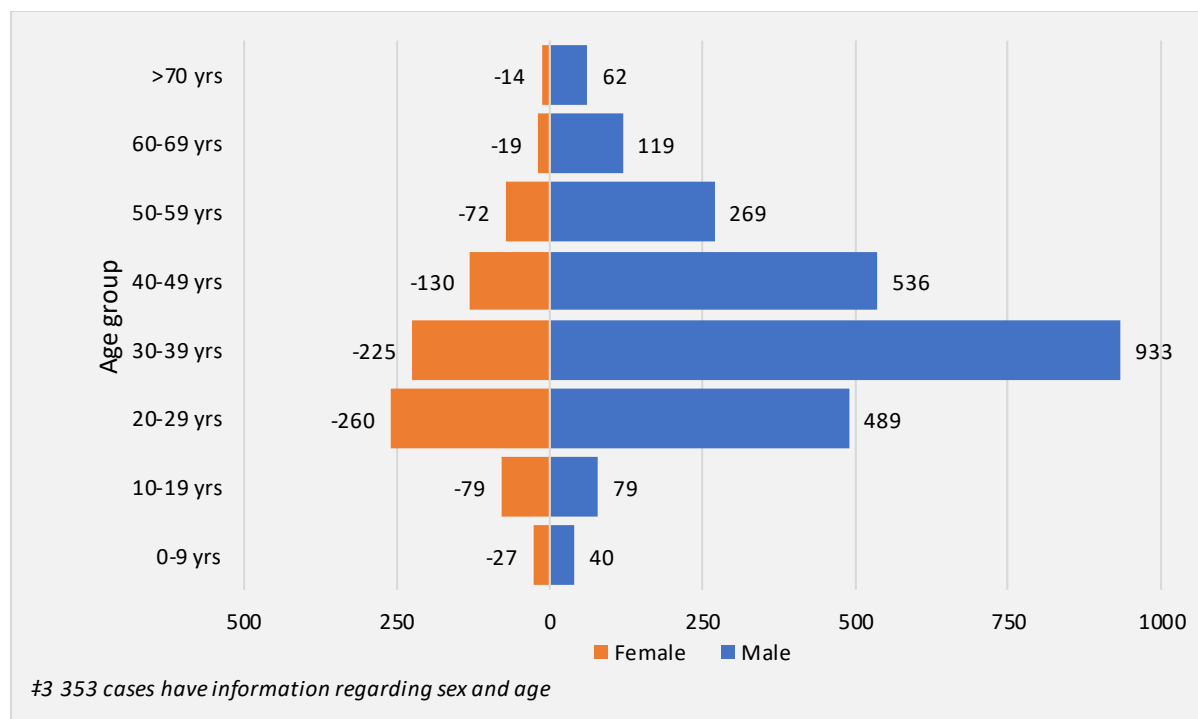


Figure 3.1 Age- and sex-distribution of COVID-19 confirmed cases (n=3,353)

Phased Prioritisation of Vaccine Programme

The Government of South Sudan has planned to vaccinate up to 40% of the population to minimize the spread of the disease and to reduce the morbidity and mortality attributed to COVID-19, as assessed over time by the epidemiological profile of the disease in the country. The target populations are prioritized based on the WHO SAGE guidelines, SSITAG guidance and the domestic COVID-19 risk profiles of persons and places in a phased manner as follows:

Phase 1: 20% of the national population considered at high risk; consisting of healthcare workers (principally doctors and nurses though also inclusive of community-based social mobilizers who are actively involved in health programmes throughout the country). The second priority population sub-group is that comprised of ‘elderly persons’, ie those aged 65 years and older.

As per international guidelines on vaccination prioritization, including those developed by WHO SAGE, these two particular sub-groups correspond to the initial 3% of the overall national population targeted for receiving COVID-19 vaccine (Table 3.2). Thereafter, other key sub-groups will be taken into account for receiving the remainder (17%) of the initial quantity of vaccine requested under the COVAX Facility. The prospective vaccine recipients within the second cohort (constituting 17% of the South Sudanese population to be vaccinated) include persons with co-morbidities (eg Type II diabetes mellitus, those with cardio-vascular disease), refugees, internally displaced persons and teachers. Other essential workers outside of the health and education sectors (eg members of the police force) in areas with high transmission (eg Juba, the border entry points) will also be targeted for vaccination.

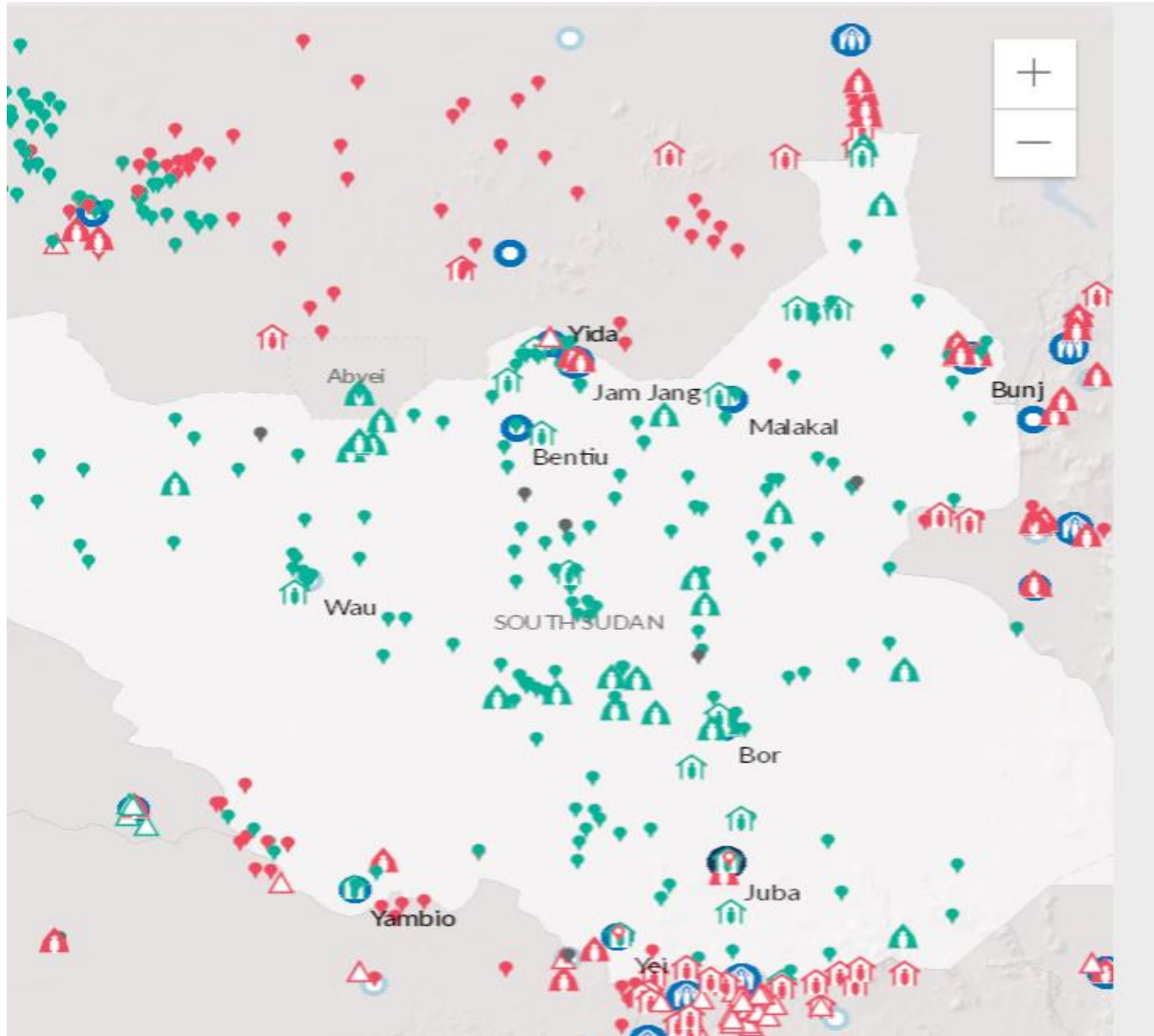


Figure 3.2. Map of South Sudan indicating locations of refugee camps and internally displaced population settlements, including 'Protection of Civilian' sites (PoCs).

Table 3.2. Estimated number of persons per targeted population sub-group to be vaccinated with COVID-19 vaccine within the initial prioritized 20% of the South Sudan population (12,060,017 in 2020).

Target Population Sub-group	Number of Persons	Percentage of National Population	Phase*	Priority Percentage
Healthcare workers	27,000	0.2	Stage Ia	3
BHWs and Social Mobilisers	5,940	<0.1	Stage Ia	3
Elderly population (aged 65 years and older)	410,000	3.4	Stage Ib	3
Persons with co-morbidities (Type II DM, CVD, others)	375,000	3.1	Stage II	17
Persons living with HIV / AIDS	190,000	1.6	Stage II	17
Teachers	46,000	0.4	Stage II	17
Refugees	63,000 [∞]	0.5	Stage II	17
Internally Displaced Persons (IDPs)	323,000 [∞]	2.7	Stage II	17
Other Essential Workers with high risk of transmission	430,000	3.6	Stage II	17
At-risk groups based on national epidemiological profile	530,000	4.4	Stage II	17
Total targeted within 20% of population	2,400,000	20.0	-	-

Σ = Total South Sudan population 12,060,167, as per National Bureau of Statistics, 2020.

* = WHO SAGE Priority Groups classification in 'WHO SAGE roadmap for prioritizing uses of COVID-19 vaccines in the context of limited supply' November 2020

South Sudan Refugee Statistics 2018. <https://data2.unhcr.org/en/documents/download/61818>

∞ = 40 years of age and older

<https://data2.unhcr.org/en/country/ssd>

Section 4: Service Delivery Strategy

The target groups will be reached using a mix of strategies leveraging both existing vaccination platforms and non-vaccination delivery approaches. Health workers including social mobilisers/ Boma health workers (BHWs) and teachers who are at high risk of acquiring and transmitting infection will receive the vaccine at the health facilities (fixed sites). Elderly population and persons living with HIV/AIDS and diabetes who can access fixed sites will be targeted at fixed sites and others through outreach activities and through mobile clinics. Special populations who are ‘hard-to-reach’ will be vaccinated through outreach and mobile clinics. Those such ‘hard-to-reach’ sub-groups include: a) internally displaced persons (IDPs), including the population displaced due to floods and conflict; b) nomadic populations including those persons living in cattle camps, and c) communities living in very remote areas who do not have access to health facilities. IDPs living in the Protection of Civilians (PoC) sites and camp-like settings will be targeted within the POCs / camp using fixed sites within the camps and through outreach interventions.

Table 2. Profile of vaccination strategies to be employed according to identified target groups

Target Group (<i>per table in preceding question</i>)	Vaccination Strategies
Health workers including social mobilisers, BHWs	Fixed sites
Elderly population (persons aged 60 years and older)	Mixed strategy: Fixed sites and outreach/mobile
Persons with co-morbidities (eg Type II DM)	Mixed strategy: Fixed sites and outreach/mobile
Persons living with HIV/AIDS	Mixed strategy: Fixed sites and outreach/mobile
Internally displaced persons (IDPs), refugees	Fixed sites within the camp and outreach/mobile
Teachers, other essential workers	Fixed sites and outreach
Economically active population 25-40 years	Fixed sites and outreach

Vaccination strategies during service delivery phases

Until a visible forecasted pipeline of vaccine availability is shared with the Ministry of Health, the service delivery strategy approach will maintain being adaptable and thus responsive to the actual deployment of vaccine. In this way, especial emphasis will be placed upon stakeholders being ‘operational’ (i.e. ready to commence vaccination) as soon as vaccine is deployed to South Sudan. Furthermore, strategic management and logistical planning will ensure efficient distribution and use of the supply of COVID-19 vaccine that is received. Upon utilizing that respective quantity, the nurses vaccinators for instance will be allowed to go return to their so-called ‘normal’ jobs until required again, thus minimizing the impact to other essential health services.

Based on current information 864,000 doses of AstraZeneca AZD1222 vaccine have been allocated for South Sudan in the first six months of 2021. Further details on the vaccine quantity to be made available in that period include:

* 35–40% (302,400 to 345,600 doses) will be made available in the first quarter (Q1) of 2021

* 60–65% (518,400 - 561,600 doses) will be deployed available in the second quarter (Q2).

In accordance with the availability of COVID-19 vaccine in-country, a phased vaccination approach is indicated and proposed, as described below.

Phase 1 (3%)

Option 1: Retain the vaccine for second dose

1a: Vaccinating nurse vaccinators (~1766 pop)

Based on the facilities with functional cold chain equipment (fridges) and appointed Nurses who have demonstrable capability of vaccine administration and management, the number of nurses who can perform as vaccinators was identified. The nurses will be trained on COVID-19 vaccination including AEFI management. During the training, the nurses will be vaccinated with COVID-19 vaccine. The total number of nurses estimated is 1,766 and the nurse vaccinators will receive the first dose of the vaccine during their training. At the defined interval per MoH guidance and allocated vaccine characteristics nurse vaccinators will receive their second dose. Therefore, a total of **3,532 doses** should be reserved for this group to complete the full dose. The available vaccine doses will be prioritized for the vaccinators to ensure they receive the full dose.

1b: Vaccinating health facility-based health care workers (~25,234 pop)

Based on County-level microplan, every healthcare worker from health facilities will be targeted for vaccination. Vaccinations would be delivered to health facilities across the ten states that have functioning cold chain equipment. A list of health facilities with functioning cold chain equipment would be mapped and healthcare workers under the guidance of the nurse vaccinators (two nurses per facility) would immediately be vaccinated with their first dose. At the required interval, the second dose of vaccine would be made available to health facilities.

Health facilities that do not have functioning CCE as well as others (eg those facilities without being appointed with Nurses) will be identified. The nurse vaccinators in each County would then create an implementation schedule to visit those facilities to provide vaccination to those additional facility-based healthcare workers. A total of 50,468 doses should be reserved for this group.

1c: Vaccinating community-based health care workers (4,400 BHWs and 1,540 social mobilisers (5,940 pop)

Vaccinations would be delivered to health facilities across the ten states that have functioning cold chain equipment. Two nurses would be stationed at each of these facilities to provide the vaccinations and BHWs and social mobilisers will be required to travel to the nearest identified

health facility to receive their vaccination. At the required time they would return to the health facility to receive their second dose. A total of 11,880 doses should be reserved for this group.

1.d: Vaccinating elderly people from 65 years and above (410,000 pop)

Vaccination would be delivered to health facilities across the ten states that have functional cold chain equipment and outreach service will be conducted to reach elderly people from 65 years and above. A total of 820,000 doses should be reserved for this group.

Based on current information the remaining 60-65 % of the 864,000 ‘indicative doses’ will arrive in the second quarter (Q2) 2021. It is unclear at present whether the vaccines will arrive in a single delivery or whether it will be dispersed in smaller tranches. **518,400 or 561,600 doses.**

Phase 2

Roll out of vaccine to other vulnerable populations (17%)

2.a. Persons with co-morbidities (565,000 pop):

These include persons living with HIV, tuberculosis, diabetics, chronic lung disease, cardiovascular disease, renal disease, obesity, etc. The vaccination will be provided both in fixed and outreach/mobile sessions.

2.b. Teachers (46,000 pop):

2.c. Persons in overcrowded settings (386,000pop):

This includes internally displaced people and refugees. The vaccination service will be provided both in fixed and outreach sessions for health facilities without cold chain.

2.d. Essential Workers (430,000pop):

This group includes police officers, workers in the security, retail food, travel, banking, and essential municipal and home affairs services. The vaccination service will be provided at fixed health facilities.

2.e. Risk by national epidemiology (530,000):

Roll out of vaccine to economically active population.

Scenario 1: All stock arrives at single point in time

ASSUMPTION: the target population will travel to a health facility to receive their vaccination

ASSUMPTION: The government equitably distributes the vaccine out across all 80 counties

Vaccine is delivered according to the population of the next-targeted vulnerable group which is the elderly, ie those 65 years and older. Health facilities will prioritize the extremely vulnerable through the work of social mobilisers and BHWs. Outreach will commence utilizing COVID-19 safety protocols already in existence to undertake community-based vaccinations of the extremely

vulnerable group. (*non-mobile cohorts of peoples*). Outreach will be conducted by the nurse vaccinator and supported by other facility staff to ensure success.

The mobile population will receive their vaccinations at designated health facilities.

Scenario 2: Vaccine comes in small tranches

ASSUMPTION the target population will travel to a health facility to receive their vaccination

ASSUMPTION: The government will distribute the COVID-19 vaccine in a phased manner across Counties.

- Nurse vaccinators in Counties where the government sends vaccine will be mobilised (if they have been on standby after phase 1) and will report for duty.
- Nurse vaccinators in Counties where vaccine will not be sent are either mobilized to provide surge input to supported Counties or will be stood down and would therefore return to their routine work until called upon to be re-involved in the vaccination implementation.
- Vaccine is administered as in Scenario one.

Administration of the vaccine

All people receiving a vaccine will be asked for their informed consent prior to being vaccinated. As part of the informed consent – clients will be required to provide a location of residence / address and if possible, a contact telephone (mobile) number.

All vaccinated persons shall receive adequate information on the vaccine that would be administered to her/him. As well, a **vaccination card** which states the type of vaccine administered and the lot/batch number, date of vaccination and date for the administration of the second dose will be provided to each client. Moreover, information as how to proceed with any suspected adverse reaction, if such were to occur, will be contained on the vaccination card. The card will be an important proof of vaccination for each individual. All persons will be requested to retain their vaccination card as it will be needed for the second round of vaccination.

The vaccine shall be prepared and administered as per the manufacturer's instructions. The procedures for the administration, management and waste of the vaccine will be part of the training for nurse vaccinators. All those who will receive COVID-19 vaccine will be advised to stay at the site for 30 minutes for observation of any AEFIs. All persons who are to be vaccinated will be advised to report any AEFIs if any such adverse reaction following vaccination were to occur later.

Pilot: SMS COVID-19 vaccine reminder

Once the beneficiary is vaccinated, they will receive an automated SMS notification with details of the dosage, followed by the date and time for the subsequent dose if applicable. They will also be provided with a digital certificate with a QR code. A follow up call will be made to beneficiaries 2 days before the date of vaccination to remind them to come for vaccination this will be piloted for Health staff and teachers.

Upon receiving the second dose, a review of the status of the vaccine recipient post-vaccination will be done to ascertain any AEFIs. During administration of the vaccines, nurses will be equipped with essential life-saving medicines and advanced emergency resuscitation equipment must always be available to treat cases of anaphylactic shock. The procedures for monitoring administration of vaccines and immediate reactions will be part of the training and included in the SOP.

Compliance with Infection Prevention and Control (IPC)

Immunization activities should be undertaken in a clean and hygienic environment that facilitates practices related to the prevention and control of infections. This includes ensuring adequate physical distancing during immunization sessions and in waiting areas; this may be done by limiting the size of sessions and using open spaces where feasible and changing the existing environment to allow for this. Immunization sessions, irrespective of the vaccination strategies used, will adhere rigorously to best practices for IPC, both to protect health workers (against communicable diseases through needlestick injuries, or close contact), protecting the receivers of the vaccines, and their families and community around them against COVID-19.

Most of the initial vaccine delivery scenarios prioritizes vaccination for target populations who are at highest risk for COVID-19. Therefore, it is particularly important to be attentive with IPC precautions to avoid having the vaccination events inadvertently become transmission events for high-risk populations.

Hence the vaccination team will be trained on IPC measures, including standard precautions, risk assessments and waste management, procedures and indications for when and how to use PPE, and understanding modes of transmission of disease, including the COVID-19 virus.

IPC at health facilities

Most health facilities have already received training on enhanced IPC protocols for COVID-19 as a measure to reduce the risk of facility-acquired infection. Health facilities need to ensure adequate access to IPC supplies and equipment, e.g., PPE, masks, alcohol rub or handwashing stations with soap and clean water in order to ensure and enable health workers to adhere to IPC measures during outreach activities. These preventative measures, intended for the health workforce, would include: a) appropriate hand hygiene (handwashing or use of hand sanitizer); b) appropriate use of masks; c) ensuring there is no shared equipment; d) confirming that adequate cleaning is occurring between recipients and e) safeguarding that the health facilities – EPI unit are restricted to essential personnel and beneficiaries. All beneficiaries coming for the vaccine should be advised to wear a mask and those who come without a mask should be provided with a mask at the vaccination site.

Clients to be vaccinated should be encouraged to perform hand hygiene upon arrival and when leaving. Functioning hand hygiene stations should be available at the entrance and exit areas and at each vaccination stations. Physical distancing as patients wait at health facilities should be monitored. In doing so, adhering to IPC would ensure the prevention of infections for health workers, the recipients of the vaccine and the community.

People who have symptoms that are known to be associated to COVID-19 (eg increased temperature, cough, shortness of breath) must stay at home and have themselves tested first. They are not allowed to come to the vaccination site.

Infection Prevention and Control during outreach vaccination

Outreach workers need to follow IPC measures to ensure that their risk of acquiring and passing on COVID-19 to communities is limited. As the focus of outreach will be the elderly population who are immobile, it is recommended that outreach should take place outside the residence in as much as possible. Specific IPC protocols and the rational use of PPE will be developed in due course.

Strategies for reducing default rate between first and second dose

There are several factors and behaviours that may prevent many well-intentioned people from completing a two-step process, like that recommended for COVID-19 vaccines. Vaccines that require more than one dose create additional behavioural challenges, including reports of side effects, false claims regarding vaccine safety and logistical barriers, that may deter people from getting vaccinated or returning for their second dose.

To reduce defaulters the nurse vaccinator will inform the client the return date on the second dose and then a return date will be indicated in the vaccination card. A nurse vaccinator will schedule reminders of the second dose with an aim of calling the client two days before the date of the second vaccination dose. If this is not possible, a mobiliser or a BHW linked to health facilities will do a follow up. Protocols of people who refuse the second dose will be developed and adhered to.

Nurse vaccinators will be trained on interpersonal communication and will be taken through tailored messages on COVID-19 vaccine. The tailored messaging elements of COVID-19 vaccine would include:

- * Education about how the vaccine works
- * Information about vaccine side effects and their treatment
- * Scheduling and reminders of second dose appointment
- * Updates and easily understandable and accessible information to dispel misinformation and rumors that could give someone doubts about getting a second dose.

Section 5: Supply Chain and Health Care Waste Management

Effectively managed supply chain is crucial to the successful deployment of COVID-19 vaccines. The COVID-19 vaccine is expected to be available in the first quarter of 2021. Therefore, the Ministry of Health and partners need to plan and prepare for COVID-19 vaccine introduction as guided by the Vaccine Introduction Readiness Assessment Tool (VIRAT/VRAF 2.0) developed by WHO, UNICEF and World Bank. Rapidly deploying and quickly vaccinating prioritized target groups within the South Sudanese population will be the key objective of the intervention. In this regard the importance of effective supply chain in general and cold chain management remains vital. In such situations, several activities need to be accomplished within a record time, this includes but is not limited to determination of the required logistics that will be informed by vaccination strategies. The storage and transportation required for the COVID-19 vaccine should be understood and the required capacity should be determined. This section of the NDVP highlights the detailed supply chain and health care waste management strategies and activities that are needed in order to enable and ensure rapid and effective deployment of COVID-19 vaccine.

Strengthen supply chain human resource capacity

- The National Logistics Working Group (NLWG) will be strengthened and the TOR and SOP of CTWG/NLWG for co-ordination and vaccine management will be adapted to include the management of COVID-19 vaccines; in doing so, this will facilitate the cascading of co-ordination and management to all levels of the immunization supply chain.
- The National MOH EPI Department will lead on the components of logistics planning and implementation.
- In addition to UNICEF CO and FO staff, two cold chain consultants supported by the Gavi COVAX TCA grant will be deployed to provide technical and operational support in planning, preparing and implementation of vaccine and cold chain management to ensure the timely and efficient implementation of COVID-19 deployment.

Vaccine logistics and cold chain capacity needs

South Sudan last conducted an effective vaccine management (EVM) assessment in 2019, with the objective of identifying and highlighting key strengths and areas for improvement in the system. The assessment identified transport capacity, cold chain coverage and capacity, human resource capacity, maintenance and stock management as key areas requiring improvement. Informed by the findings of the assessment, an EVM Improvement Plan was developed and is currently being implemented. Training of healthcare workforce on immunization in practice and effective vaccine management is ongoing. Additional cold chain technicians are recruited and deployed to the State level to support with cold chain maintenance activities. The Gavi-supported cold chain equipment optimization platform (CCEOP) project implementation has resulted in extension, expansion and replacement of cold chain equipment both at County and community level health facilities. Below is the mapping of cold chain availability in South Sudan.

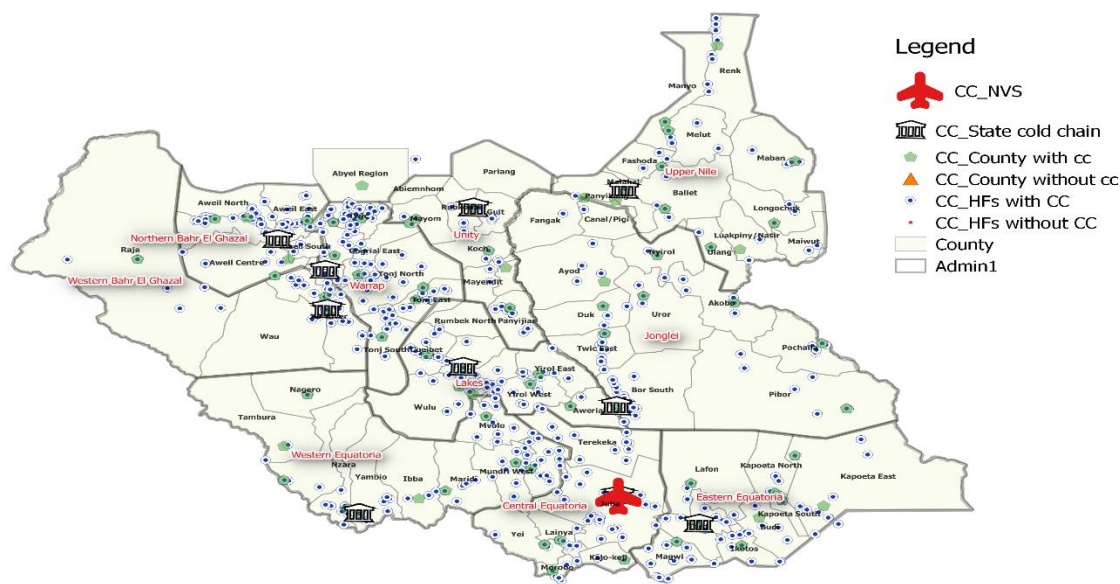


Figure 5.1 Map of the cold chain equipment, by type and location, available in South Sudan.

A cold chain capacity and gap analysis was conducted using the WHO Supply Chain Sizing Tool. Inventory data from the national cold chain inventory database was used for estimating existing capabilities at national and sub-national level for different storage requirements and projection of gaps. The working assumption was made that South Sudan would receive vaccines with the cold chain storage requirement of $+2^{\circ}$ to $+8^{\circ}\text{C}$ and that the vaccines would be sent in split shipments for 3%, 5% or 17% for the population groups that have been prioritized to benefit from the COVAX Facility COVID-19 vaccine. Existing capacity at the national vaccine store is adequate for storage of COVID-19 vaccine. However, at State and County levels, the gap increases with increased quantity of COVID-19 vaccine released at a time.

3% allocation released for country at a time					
Types	Vaccine stores			Total	Total cost
	National Vaccine Store	State cold chain	County cold chain		
Number SC unts with a gap	0	1	9	10	
Refrigerators	-	2	11	13	\$ 127,987
TOTAL BUDGET					\$ 127,987
5% of allocation released for country at a time					
Types	Vaccine stores			Total	Total cost
	National Vaccine Store	State cold chain	County cold chain		
Number SC unts with a gap	0	3		13	
Refrigerators	-	6	17	23	\$ 219,226
TOTAL BUDGET					\$ 219,226
17% of allocation released for country at a time					
Types	Vaccine stores			Total	Total cost
	National Vaccine Store	State cold chain	County cold chain		
Number SC unts with a gap	0	7	50	57	
Refrigerators	-	21	57	78	\$ 741,550
TOTAL BUDGET					\$ 741,550

As indicated in the above table, the county cold chain is the lowest distribution level in South Sudan. Due to a notable lack of good transportation infrastructure, having a cold chain facility with adequate storage capability is essential for ensuring uninterrupted availability and potency of vaccines until they reach the beneficiaries. South Sudan has requested for additional support for expansion of the cold chain capacity in States and Counties where there will be imminent capacity limitation for COVID vaccine rollout.

In addition, by increasing vaccine delivery frequency and/or cross-docking of vaccine shipment to County-level cold chain stores using cold boxes/icepacks/ prepared at the national vaccine store, efforts will be made at operational level to decongest the cold chain and avert storage limitations.

Assuming the Gavi CCE request will not be in the country by the time vaccine arrives, the country currently has around 49m³ space for the storage of RI vaccines at +2⁰ to +8⁰C and 21.6m³ space in the freezer rooms (-20⁰C). The cold chain space required for RI vaccines for one-year needs around 17m³ space at +2⁰ to +8⁰C with approximately 32m³ available for additional storage. The 860,000 doses of AstraZeneca would need around 4m³ space for storage. Therefore, the country has enough storage space for initial 3-5% of the vaccine while the Gavi CCE support is being implemented. In addition, the country has no gap at national vaccine stores for all vaccine supply scenarios.

Currently the cold chain extension project is on-going and the available solar refrigerators from the current operational deployment plan (ODP) can be mobilized to minimize the impact of potential cold chain storage capacity limitations. In addition, smaller shipment arrangements can be organized for some of the geographic locations as an interim measure. In addition, Arktek devices will be deployed for administration of the vaccines in areas where there is no reliable cold chain facility.

Temperature monitoring devices relevant to the approved vaccine characteristics (such as 30 DTR [fridge tag]) will be used for monitoring of storage temperature and irreversible freezer indicators will be used during transportation for freeze-sensitive vaccines.

There will be a system in place to conduct regular monitoring and reporting on the status of the cold chain system, installation of procured CCE and functionality of the cold chain infrastructure for safe storage of the COVAX vaccine and injection supplies.

Considering the importance of uninterrupted cold chain functionality for COVID-19 deployment, the timely response mechanisms for potential cold chain failure in order to ensure optimal functionality of the cold chain system for COVAX introduction will be established and implemented through the dedicated cold chain Consultant. The mechanism will be reviewed and strengthened for routine immunization after COVID-19 introduction. All the supply chain preparation activities will commence starting from February 2021.

COVID-19 vaccine supply for South Sudan will enter the country through Juba International Airport. Due to lack of cold chain facility at the airport, all vaccines arriving at this primary port of entry are cleared within 2 to 3 hours of their arrival and transferred to the National Vaccine Store located in Juba. At the National Vaccine Store, the package will be inspected thoroughly and transferred to either walk-in cold rooms or walk-in freezer rooms, depending on the characteristics of the candidate vaccine. Vaccine arrival reports (VAR) will be prepared and shared with UNICEF Supply Division within 24 hours of the arrival of the vaccine in-country.

With the support of UNICEF, air transportation of vaccines and immunization supplies from National Vaccine Store to states/counties is done using Humanitarian Air Service and/or chartered flights. Currently, all the ten state vaccine stores in South Sudan and more than 23 inaccessible counties are supplied directly from the National Vaccine Store in Juba. From the State/County cold chain stores, vehicles, boats, tractors or motorbikes will be hired for transporting the vaccines and other supplies to subsequent distribution or vaccination centers.

Health facilities will collect vaccines from their respective county health department, or nearby facility with cold chain. Due to lack of transportation capacity at the State MOH/County Health Department, implementing partners facilitate transportation of vaccines from state to county and service delivery points, whenever the support is feasible.

These existing supply chain levels and infrastructure would remain the primary avenue for the storage and distribution of COVID-19 vaccine from the national vaccine store to the last point of administration at service delivery points. The distribution breakdown for the vaccines and injection supplies will be dictated by the micro-plan for roll-out of the COVID-19 vaccine.

The process flow below highlights the different immunization supply chain levels, co-ordination mechanisms, and the flow of vaccines and immunization wastes throughout the system.

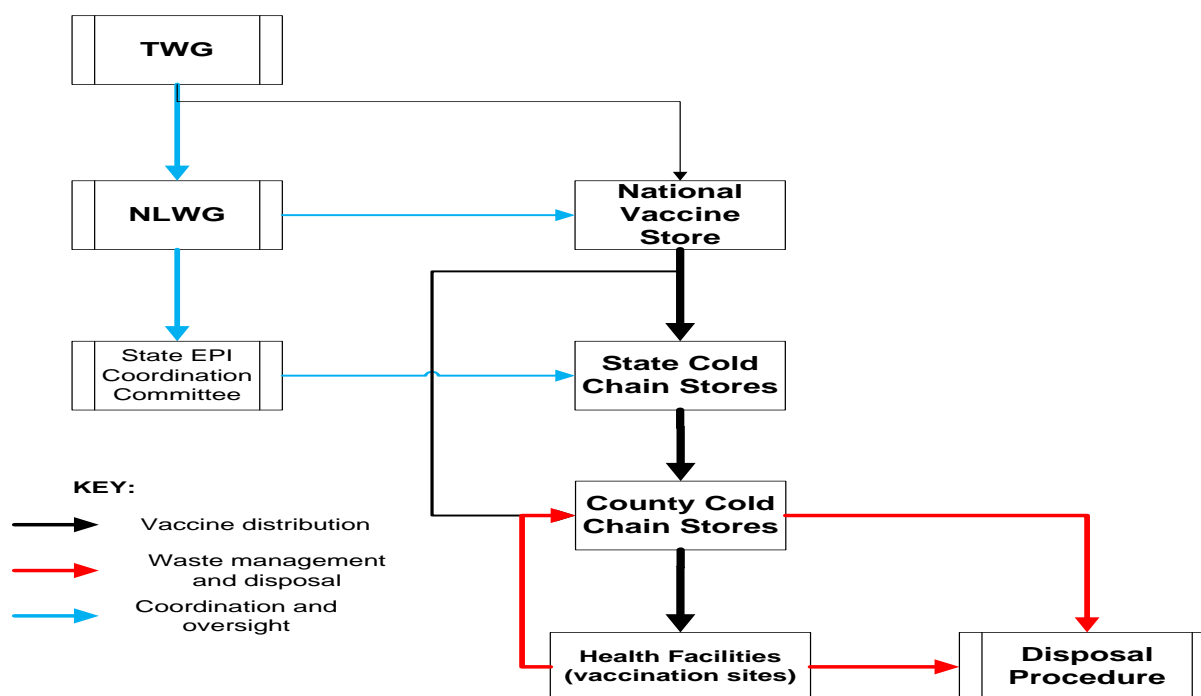


Figure 5.2 Process flow diagram of vaccine distribution, cold chain equipment co-ordination and waste disposal management.

- Reinforcing supply and stock management

Automated Stock Management Tool (SMT) and ViVa are used for monitoring and managing vaccine stock at national level. At sub-national level, however, manual recording and reporting tools are used.

The stock level for all vaccines and injection supplies at national and state level is monitored closely, with the physical count of all vaccines and injection supplies at national and State level being conducted regularly.

Drawing on the experience gained during implementation of the polio outbreak response in South Sudan, sound vaccine accountability mechanisms will be instituted at all levels of the supply chain system through training and engagement of cold chain officers for vaccine accountability.

For vaccines in routine immunization, State cold chain hubs send their stock count and vaccine utilization reports to the national level on monthly basis for review and informed resupply decisions. Individual product details such as the batch number, expiry date and remaining stock balances are recorded/updated to allow tracking and traceability of the vaccines and immunization supplies in the system. This routine monitoring system will be reinforced and strengthened to ensure visibility of COVID-19 vaccine stock at national, State and County level engaging vaccine accountability team at these levels. Stock level for COVID-19 vaccine will be tracked closely and system for reporting balances and utilization from lower levels on bi-weekly basis.

A vaccine and injection materials control book is used for recording details of vaccines received and distributed at national, State and County cold chain stores. Issue vouchers are used for documenting vaccines and supplies distributed from one supply chain level to the other.

- All the stock management tools will be updated with addition of COVID-19 vaccine for vaccine visibility. The tools will be printed and distributed to all the supply chain focal and health workers. The cascade trainings will be conducted on the use of revised tools to record and report the status of vaccine and injection devices for proper distribution and monitoring of the supplies.

Vaccine management, accountability and training

In South Sudan, most of cold chain storage units (national, States and Counties) have cold chain assistants responsible for vaccine and cold chain management. Before deployment of the COVID-19 vaccine, all the cold chain assistants and EPI supervisors will receive ‘hands-on’ training for the proper handling and management of vaccines and the cold chain system. Once trained, these cadres will be tasked with the management and accountability of the vaccines with the following terms of reference:

- Ensuring that the inventory of active and passive cold chain equipment for all health facilities is updated.
- Ensuring the proper functioning of the cold chain: temperature readings, recycling of ice packs, packaging of vaccines, etc.
- Ensuring that deliveries comply with the distribution plan.

- Co-ordinating the distribution, management, stock monitoring and full availability of cold chain equipment and COVID-19 vaccine at health centers and ensuring the collection of unopened vials of COVID-19 vaccine after completing the targeted rounds.
- Ensuring effective waste management after vaccination activities.
- Developing mechanisms to accelerate the preparation and compilation of reports (vaccine utilization, stock reports and their transmission to upper levels).

Establishing a vaccine traceability system:

Some vaccine will be used under the WHO Emergency Use Listing (EUL) and at this point, allocated COVID-19 vaccine may not have established VVM or expiration dates. Thus, the strict compliance with SOPs on storage, handling, supply distribution and transport and logistics procedures are critical throughout the vaccine deployment. Proper recording and reporting of vaccine lots and batches will be very important for potential AEFI monitoring and possible batch/lot recall.

The supply chain for COVID-19 vaccine will be streamlined with the existent immunization supply chain. With reasonable changes to accommodate the peculiar characteristics and management requirements of COVID-19, the existing cold chain infrastructure, transportation modalities, human resources, amongst other components will allow the country to successfully rollout COVID-19 vaccine throughout the country.

Given the limited supply, the vaccine usage and wastage rate will be carefully monitored because that information will be useful for forecasting of the subsequent vaccine deployment.

Planning for the security of vaccines and concerned staff

The NLWG will be working with the concerned Ministries and partners to develop the safety and security measures for vaccine management at location of vaccine storage, during transport and at vaccination sites. The State/County administration and partners will be tasked to ensure adequate security arrangements for vaccines at all cold stores, during vaccine transport at all levels, and at vaccination posts. The vigilance mechanism will be in place to protect theft. The reporting mechanism will be established for immediate reporting of any such activity, so that prompt action will be initiated with clear accountability. The security arrangement will be organized at the National and State Vaccine Stores either through state or private Security institutions. The fund required for security arrangement will be estimated and costed based on experiences or practices of EVD vaccination programmes in the past.

Manage reverse logistics and health care waste

The country is responding to the cVDPV2 outbreak using mOPV2 and has gained key experiences from the vaccine accountability practices including tracking of the vaccine and back-hauling of the used and unused vials. The experiences will be helpful to establish the reverse logistics

requirement for COVID-19 vaccine especially to retrieve unused vaccine for relocation, recall or disposal by the health workers and cold chain officers. These staff will be trained on the importance of 100% accountability and mandatory return of unused vials of COVID-19 vaccine to high level store for proper management as per the country logistics plan. All vaccine vials will be accounted for in vaccine stores and service delivery points. As a mass campaign delivery strategy will be followed in South Sudan, the immunization programme waste as well as personal protective equipment (disposal or non-disposal) generated will be amplified. To prevent risk of infection, the safe disposal of used needles and syringes is a critical component of the vaccination programme to reduce the risk of contamination to health staff and the public. Strictly adhering to safe waste management protocol for discarded PPE¹, the PPE waste management plan will be developed and integrated into the training guide and logistic plan.

In addition, to minimize risk to the community, the health workers must practice on-site waste segregation and implement reverse logistics where health care waste taken back to the facilities by the vaccination team to be disposed of properly along with other hazardous waste. In line with the country waste management guideline adapted in light of COVID-19 vaccination, the costed waste management plan will be developed, and the budget will be incorporated into the logistics plan. For example, the cost of reversed logistics estimated will be available for waste management activities like back-hauling of the used vials and syringes as well as other PPE waste. As an interim measure safely burying health care waste may be done until more sustainable measures can be put in place in the context of South Sudan.

Currently, there is limited capacity of incineration at health facilities and at County Health Departments in South Sudan. The commonly used practices are ‘use of incineration of safety boxes (with needles)’ or ‘burning and burial methods’, based on the availability of incinerators with medium or high temperature. Currently, there are only two waste management facilities (incinerators) in South Sudan. However the waste management guideline will be reviewed and SOPs will be developed and training provided to health workers for the implementation of locally appropriate waste management strategy, eg, safety pit and needle cutter. The micro-planning process to identify target population and service delivery strategy, will inform the vaccine supply logistics distribution plan at sub-national level and the waste management site identification will be linked with the micro-plan process which in turn will be integrated in the training guideline for the vaccination teams and health facility managers.

The flow chart below depicts the decision tree for identifying where to conduct disposal of healthcare waste and which type of disposal method should be utilized based on the availability of incineration facilities at health facilities or County level.

¹ Water, sanitation, hygiene, and waste management for SARS-CoV-2, the virus that causes COVID-19: Interim guidance (<https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC-WASH-2020.4>)

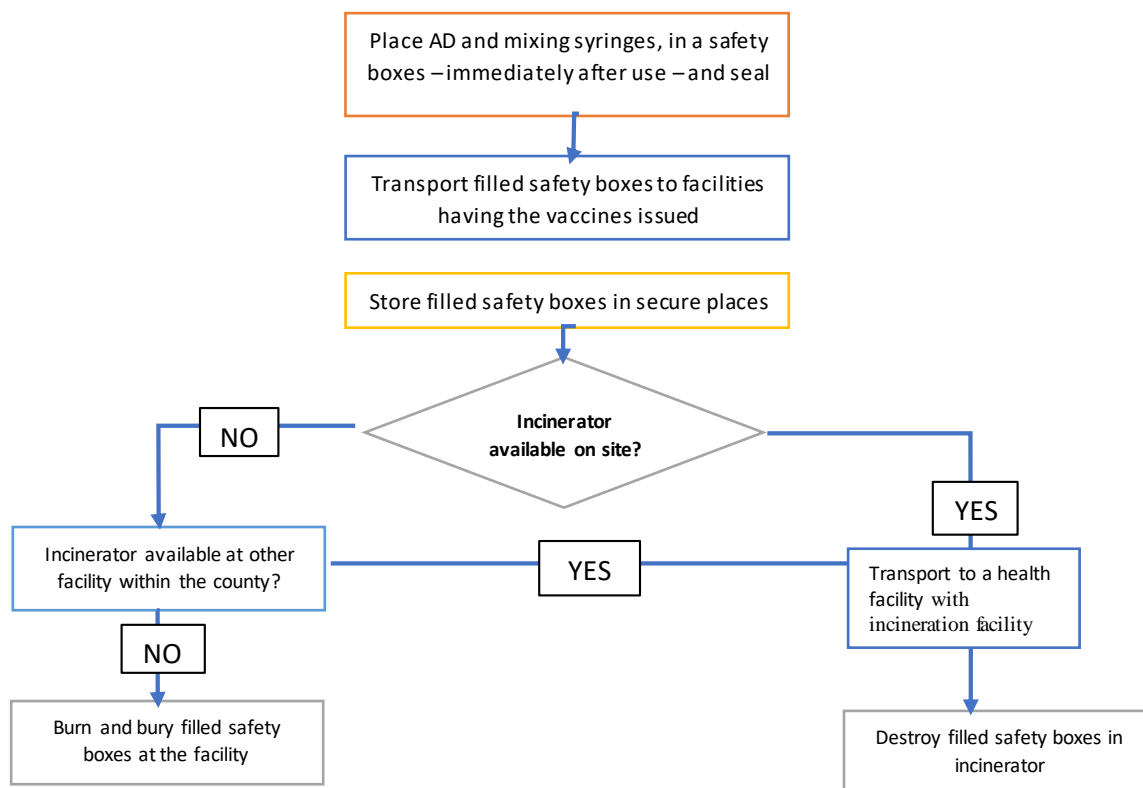


Figure 5.3 Healthcare waste disposal management decision-tree in relation to incineration capacity.

Section 6: Human Resources and Training

Background

Training and supervision are a key component for effective deployment and use of COVID-19 vaccine in South Sudan that requires a set of competent health work force. Therefore, this plan outlines the training strategies and supportive supervision plans by national and subnational MoH during NVDP for COVID-19 vaccine. It has been aligned with and WHO guidelines.

Effective deployment of vaccine and use of the various vaccination strategies depends on how well human resources are organized and quality of training provided for health workers at all levels and their qualifications and competency that match the required minimum criteria of the COVID-19 vaccine administration and handling.

Each team will comprise of two vaccinators, one mobilizer, crowd controller a

The NVDP of COVID-19 vaccine in South Sudan will leverage on the existing health workers in both private and public institutions who will be trained on administration of COVID-19 vaccination. We will conduct Microplan compilation of health workers by cadre in every County.

Team composition

The vaccination team will be composed of two vaccinators, one social mobilizer and crowd controller per site.

One vaccinator will be responsible for screening to check their eligibility for the vaccine administration, filling of the registers or tally sheets while one vaccinator will be administering the COVID-19 vaccines.

The crowd controller will be responsible for directing and controlling the crowd in each vaccination sites in order to ensure orderliness and security at the site.

The social mobilizer will be responsible for mobilizing and creating awareness sessions in the community.

One supervisor will be assigned a specific Payam to supervise and bring the reports to the County

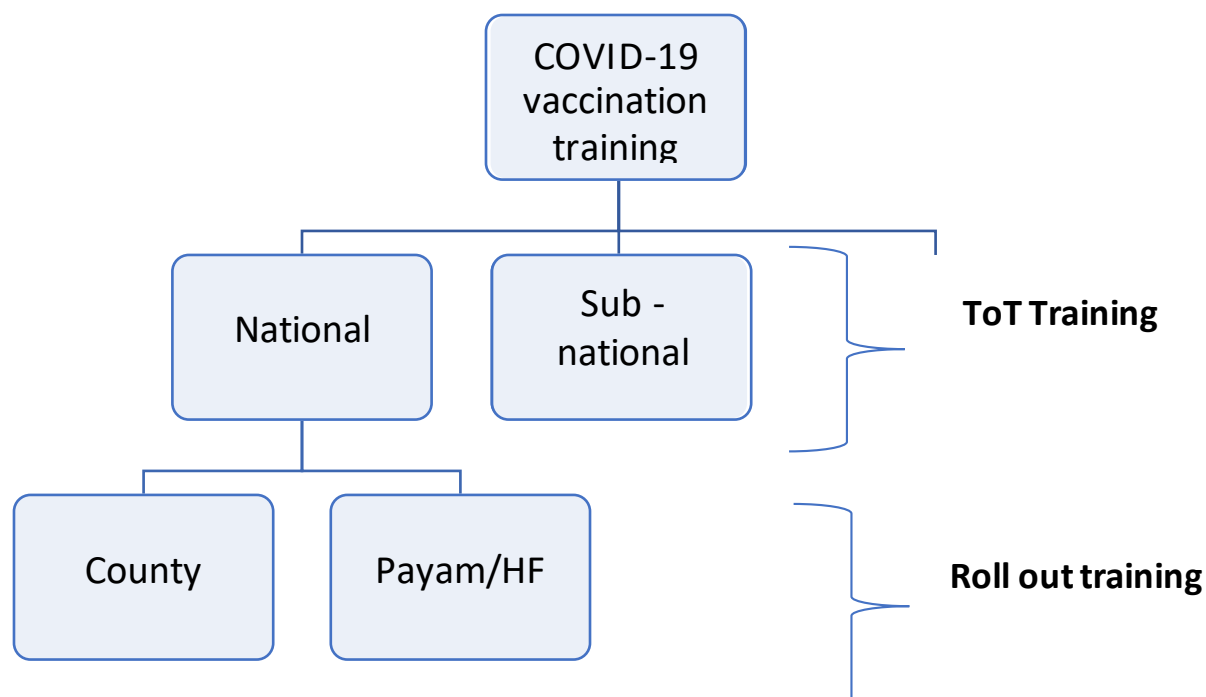


Figure 6.1: Strategies of cascading the COVID-19 vaccination training

6.1 Training methodology

This training methodology will adopt traditional classroom approach using face to face interaction with participants for practical purposes and skills training. We will use training aids such as power point presentation, visual aids such as flip charts, recorded videos for case studies and different scenarios

6.2 National Level Trainings

A trainer of trainees (TOT) training for National supervisors will be conducted with technical support from WHO, UNICEF and JSI using a traditional classroom method while observing standard operating procedure for prevention of COVID-19 infection (social distancing of 2 meters, mask and hand sanitizer or hand washing facilities will be availed). This will be a one-day training organized at national level on COVID-19 vaccination for health workers drawing competent participants selected with support from Director General and EPI manager to attend the meeting, meanwhile, EPI focal persons from UNICE, WHO JSI, HPF and other partners will be invited to attend the training with ultimate goal of cascading the training at subnational levels. A total of 10-20 participants will benefit from the national ToT training on COVID-19 vaccination

6.3 State-level training

The State-level trainings for COVID-19 vaccine roll out are expected to be conducted as soon as possible after the National level training of trainers has been completed. States should assess and nominate competent personnel who can cascade the training CHD levels. This training will target County EPI officers, surveillance, cold chain officers, maternal and child health officers from CHD

including partners staff will be involved in supervising the routine administration of COVID-19 vaccine at designated health facilities and outreach sites.

6.4 County-level training

The County-level trainings for COVID-19 vaccination will be conducted for vaccinators using traditional method (face to face) within one week after completing State level training. This training will target vaccinators

In this context, the word ‘‘vaccinators’’ refers to any health workers who attended a formal health training institution of more than 18months in duration. This includes; Nurses, Midwives, clinical officers, medical assistant and medical officers, laboratory assistant)

This training shall be facilitated by trained county officials and supervisors who attended ToT training at the State level on COVID-19 vaccination for health workers. The category of people to benefit from this training are mainly the vaccinators as shown above and cold chain assistants and social mobilizers

Table 6.1: Training type and cadres of health workers

Training type	Level	Roles of trainees	Target participants	# of Trainees
ToT trainers	National	Conduct ToT training in States	EPI specialists, Program Managers and EPI Managers, Cold chain officer, Communication officers	10
ToT trainers	Sub national	Conduct ToT training at County-level	State EPI managers, EPI focal persons from partners, Surveillance officer, C4D officers and cold chain officers	20
Vaccination training	County	Conduct COVID-19 vaccination in counties	County EPI officers, cold chain as, MCH officers, County surveillance officers and social mobilizers	160
COVID-19 vaccination training for health workers	Payam and Health facilities or Counties	Administration of COVID-19 vaccines	Vaccinators (nurses, midwife, clinical officer, medical assistant and medical officer) and social mobilizers	1780

- COVID-19 vaccine introduction training should be conducted as per guidelines;
- Standardized training package shall be used during the trainings;
- All trainings will have some common and some cadre-specific messages;
- Key tips/messages for participants incorporated in respective training agenda.
- All trainings will adhere to IPC protocols

Training packages and contents

The objective of the training is to provide key information to health workers how to safely and effectively administer COVID-19 vaccination

This training has 6 modules consisting of video, lectures, and power point slides for participants

Module 1: Introduction to COVID-19 vaccination training

Module 2: Storage, handling, delivery and waste management of COVID-19 vaccines

Module 3: Organizing COVID-19 vaccination sessions

Module 4: Adverse Events Following immunization with COVID-19 vaccine monitoring

Module 5: Recording and Monitoring COVID-19 vaccination

Module 6: Communication with the community about COVID-19 vaccinations

The hired Consultant to assist in the adaptations of the WHO training modules, the training will have six modules.

Table 6.2. Training schedule for COVID-19 vaccination

Training	Timeline	Duration	Methodology	Role
Orientation meeting with partners at national and subnational levels	Mid Feb 2021	6 hours	Traditional classroom	Adaptation of training materials
National ToT training	Mid Feb	2 days	Traditional classroom	Training of trainers
State ToT training	Early March 2021	2 days	Traditional classroom	Training of trainers and supervision
County training	Early March 2021	2 days	Traditional classroom	Training of county supervisors
Vaccinator training at County and Payam level	Mid-March 2021	2 days	Traditional classroom	Training of health care workers(vaccinators)
Social mobilization, cold chain assistant	Mid- March 2021	1 day	Traditional classroom	Training of social mobilizers

Note: Vaccination in urban settings require orientation of city mayor, governor, County commissioner, business communities, Youth groups and associations and self-help groups need to be engaged for effective deployment of COVID-19 vaccine.

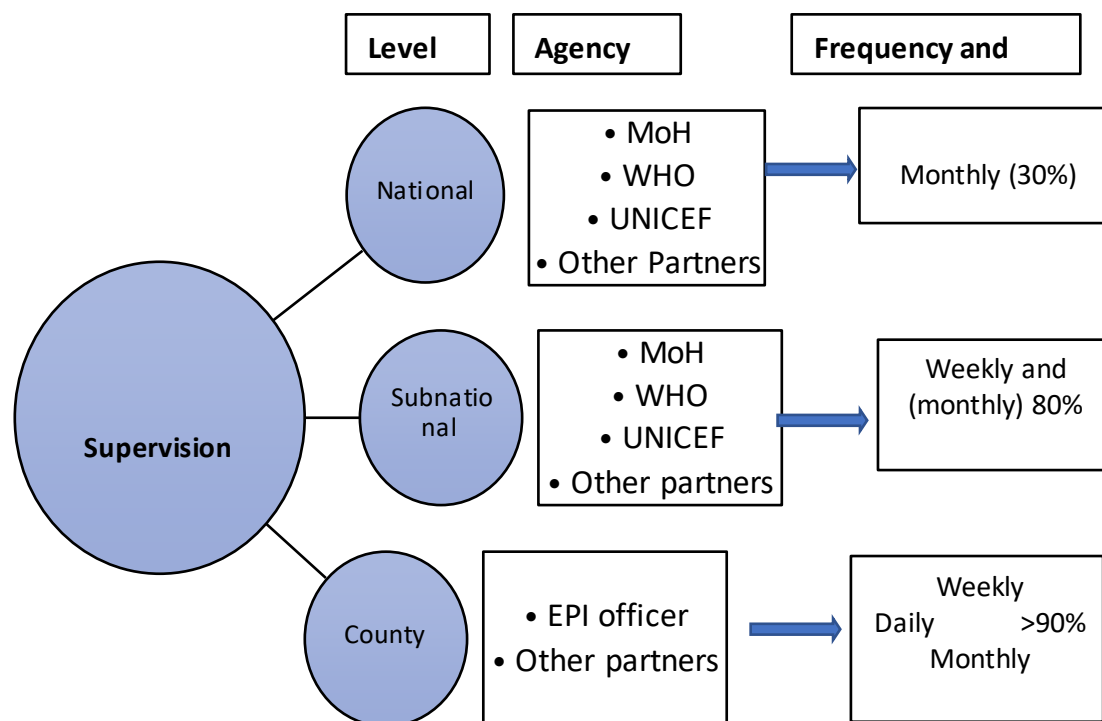


Figure 6.2: Supervision strategy

Support supervision plan during training and COVID-19 administration

For quality and effective deployment of COVID-19 vaccine in South Sudan, objective supportive supervision will have to be done by competent personnel national and subnational levels including County health department due to sensitivity of the vaccine (being in emergency use listing of WHO). Therefore, the MoH with partners will supervise both the training sessions at subnational and county levels. Gaps identified will be addressed appropriately.

The supervision plan will be developed in consultation with MoH EPI manager, WHO, UNICEF and extended partners. Below is a tentative schedule for the supervision

Table 6.3: The Supervision plans

<i>Activity</i>	<i>Methodology</i>	<i>Level</i>	<i>Responsible</i>	<i>LoE</i>	<i>Frequency</i>	<i>Tool</i>
ToT training at sub national training	Face-to-Face	States	MoH, JSI, WHO and UNICEF	30%	Monthly Quarterly	Supervision checklist
County level training	Face-to-Face	CHD and training sites	MoH, JSI, HPF and UNICEF	70%	Monthly Weekly Quarterly	Supervision checklist Vaccine monitoring summary AEFI checklist Register book
Vaccinators training	Face-to-Face	Counties and HF	MoH, HPF, UNICEF and JSI	80%	Weekly Daily	Registration book
Service delivery (Administration of COVID-19 vaccine)	Face-to-Face	Vaccination sites	Vaccinators	90%	Weekly Daily	Tally sheet VM register Supervision checklist

Target participants

- ✓ Nurses
- ✓ Midwives
- ✓ Clinical officers
- ✓ Medical assistant
- ✓ Cold chain assistant
- ✓ Surveillance officer
- ✓ EPI officers
- ✓ Social mobilizers
- ✓ Communication officers(C4D)
- ✓ Program managers
- ✓ Supervisors

Training materials

- ✓ Facilitators manual
- ✓ Participants manual
- ✓ Pre-test tool
- ✓ Post-test tool
- ✓ Projector
- ✓ Flip chart
- ✓ Marker pen
- ✓ Masking tap
- ✓ Posters
- ✓ Registration forms, tally sheet, daily summary sheet, supervisors tools, AEFI kits

Section 7: Demand Generation

Overarching Objective

To help establish public trust, confidence, acceptance and demand for COVID-19 vaccine and encourage uptake of vaccines by eligible populations.

Specific Objectives

- To provide correct, transparent, consistent and timely information on the COVID-19 vaccine and vaccination process
- To increase awareness, understanding and acceptance among the general public on the scientific logic of prioritization of the target groups and the phase by phase introduction of COVID-19 vaccination
- To initiate a public opinion monitoring mechanism for timely and effective interventions for misinformation and rumors related to COVID-19 vaccine and use crisis communication approaches where relevant.
- Maintain and sustain key preventive behaviors: wearing masks, maintaining physical distance and hand washing with soap or use of sanitizers

Based on the learnings of previous national immunization campaigns (Measles, Polio, Ebola vaccination, yellow fever, meningitis), six key elements of the strategy have been developed in order to support the rollout and introduction of the COVID-19 vaccine at the national and state level:

- 1. Advocacy:** Advocacy efforts will aim to engage the maximum number of people by promoting the benefits of COVID-19 vaccine and support in building an enabling environment. Various stakeholders and experts will lead the advocacy campaigns at national, state and county level. These include (but are not limited to): President, Vice presidents, Ministries, NMOH, Media and CBOs. Advocacy meetings with different stakeholders including national and regional media agencies, international and local non-government organizations, faith-based organizations, community-based organizations, religious and opinion leaders will be conducted to obtain support on COVID-19 vaccine introduction and acceptance by the community. Given the importance of health professionals and local leaders, these stakeholders will be engaged in advocacy activities at the national and sub-national levels. It is also planned to develop advocacy package with key messages on COVID-19 vaccine and call for action.
- 2. Capacity building of key Stakeholders:** Since the vaccine for COVID-19 is new, it will be important to orient and train all those stakeholders who will be responsible for the implementation of communications actions, in both urban and rural areas. Communications training will be carried out in line with the training modules that have been developed on communication at various levels. States will be required to identify training mechanisms to reach the extensive network of

frontline workers, health care providers, community-based volunteers, influencers and other stakeholders in remote areas to ensure outreach to the last mile, while also ensuring an equal focus on the urban areas.

- 3. Social Mobilization and Community Engagement:** Social mobilization actions will focus on risk communications and community engagement. It will respond to perceptions of communities and health service providers on the COVID-19 vaccines and ensure that all the target audience and their influencers understand the vaccination process correctly and act accordingly.

The social mobilization plan will focus on (i) the phased vaccination plan (ii) addressing vaccine eagerness on one end and vaccine hesitancy on the other.

A recent Community Rapid Assessment on COVID-19 across 10 states has shown that 72% of the respondents are open to accept the COVID-19 vaccine. The remaining 22% showed hesitancy to the vaccine. The social mobilization plan will be contextualized to state and community requirements, and address state-specific variations and vulnerabilities such as urban-rural, tribal – nontribal, and hard to reach pockets. While social mobilization actions will reach public across all categories, it will specifically focus on motivating the priority groups for COVID-19 vaccination and their family members through community consultations and inter-personal communication during house visits. A combination of outreach and messaging strategies will enable engagement and reach. This includes the robust network of social mobilisers and health workers who will engage with community-based audiences; engagement with opinion and religious leaders and media as outlined in key strategies for demand generation. A robust coordination mechanism with the EPI/health managers for listing/identification of the target population pockets will be used for communication outreach to population groups as indicated in table 2 of this document. This communication outreach will be combined with the general messaging through proven media and communication channels such and radio, megaphones and street announcements.

The social mobilization activities will include community meetings, participatory activities, traditional media group performances, rallies, talk shows, miking announcements, road shows and home visits. Interpersonal communication and group consultations will be organized using frontline functionaries and local influencers to engage people to dispel misconceptions and fears regarding the vaccination process. Communications materials and tools like posters, banners, leaflets, pamphlets, FAQs, interactive videos will be widely used for easy communication.

4. Working with Media, Mass media & social media:

Media helps in creating an enabling environment for the introduction and acceptance of COVAX vaccine in the country. In case of COVID-19 vaccination, advocacy should be done by MOH and SMOHs, along with key partners like WHO, UNICEF, CSOs, INGOs etc. to ensure that COVID-19 campaign is smoothly executed and cover the vastly and is accepted well by the community.

The mass media component will focus on well-crafted campaigns that combine radio Talk shows in programmes and spots on both state and community stations in local languages.

Mass media will be used to both provide information, as well as a call to action during the campaign. The radio talk shows will be organized from various national and vernacular radio stations focusing on the need and importance of COVAX vaccination in national, state and community stations the country. Radio jingles will be played from all radio stations in targeted states as the jingles will be produced in 10 widely spoken languages of the country. Mass media component will focus on well-crafted campaigns that combine radio Talk shows in programmes and spots on both state and community stations. The interactive design of the talk shows will ensure two-way communication. In addition, two toll free helplines (6666 and 2222) on COVID will be used for providing an interactive and real time interface with the communities to call in and seek information and provide feedback.

Social media: social media platforms, especially for rumour tracking will be used to re-enforce along with other channels. Two toll free telephone helplines will be used to provide information on demand /need basis to people on the vaccination.

- 5. Managing Crisis Emerging from AEFI, or Otherwise:** Any crisis resulting from vaccine eagerness issues, vaccine hesitancy barriers and AEFI, will be managed by rapid response and adequate preparation for managing a crisis, should it emerge. Draft Risk/Crisis communication plan is attached as an annex. The following are some of the possible crisis scenarios:
- **Vaccine Eagerness:** Given the context of the pandemic, people have been eagerly waiting for a vaccine. It is expected that once the vaccine is available there will be a huge demand to access it, which may lead to unrest.
 - **Vaccine Hesitancy:** On the other hand, there could be vaccine hesitancy – a possible result of Rumours, plain indifference or misinformation from anti-vaccination groups. Further, certain geographies or communities might continue to resist accepting the vaccine owing to their long-standing aversion to vaccination.
 - Protests/unrest as a result of Rumours and misinformation about the vaccine.
 - Sudden AEFI deaths or reactions.
 - Logistics issues, delay in delivery and other local triggers.
 - Pressure from lobby groups – educational institutes, corporates asking for prioritization.
 - AEFI situation and associated reactions, logistics issues plus other local triggers to be pre-empted and be prepared to respond to pressure from lobby groups – asking for prioritization.

Monitoring and Evaluation Framework: The Monitoring and Evaluation (M&E) framework supports the implementation of communication and demand generation strategies. The framework will also help in making any mid-course corrections and measure the impact of the communications interventions. Officials at the State/counties/ Payam level will need to identify a set of supportive supervisors and monitors who would monitor and fill the monitoring checklists at all levels.

monitoring and evaluation plan include – information from rapid assessment in sample states on knowledge, perception on vaccine eagerness, confidence and CAB behaviors using online platforms (pre-campaign and during new vaccine introduction) with the support of development partners.

Concurrent communications monitoring at state, district, block and session site is proposed to be part of the program concurrent monitoring. Suggested indicators are:

- % of people who believe that COVID-19 vaccine is safe and should be taken
- % of high-risk group who know benefit of the COVID-19 vaccine in preventing the infectious disease
- % of family members of the high-risk group who are eager to get the COVID-19 vaccines for their elderly
- Perceived prevalence of COVID appropriate behaviors among community members

Knowledge, Attitude and Practices (KAP)/CRA assessments in South Sudan using mobile technology will be used to strengthen the communication planning and roll out. Additional assessments if required will be carried out to include issues around perceptions around safety of the vaccines to be administered and eagerness on uptake of this service by the target audiences.

Section 8: Vaccine Safety

Introduction

Vaccine safety is as important as vaccine efficacy. Unlike drugs which are administered to sick persons, vaccines are often provided to healthy people therefore problems arising from vaccination are not acceptable to the public.

COVID-19 vaccines are newly developed and have been tested over a relatively short-time compared to other vaccines; moreover, COVID-19 vaccines to-date have limited post-market experience. Some vaccine technologies are novel and will be deployed within a short interval between manufacture and actual use on large numbers of people. It is possible that some rare adverse events documented and undocumented will take place. Given that some of the vaccines will be used under Emergency Use List (EUL), it is imperative that adequate preparations are put in place to detect, manage, report and document all AEFIs.

South Sudan AEFI Surveillance System

South Sudan (MoH) instituted its AEFI Surveillance system by forming and training its National and the State Adverse Events Following Immunization (AEFI) Committees in 2017 and 2018 respectively to monitor and investigate AEFIs in the country. However, AEFIs are the concern of everyone including the community members who are affected by it and the EPI system from the facility level all the way up to the National EPI Program, as demonstrated in the reporting structure in the figure below.

In the current system, once the client notifies any facility of an AEFI, the facility has to undertake two tasks – reporting of the AEFI to the national level through the County Health Department (County EPI Supervisor) and the State (State EPI Operations Officer). Serious AEFIs warrant immediate reporting while minor AEFIs are tallied and reported on a monthly basis with the EPI Monthly reports through DHIS2. Once a serious AEFI is reported, it triggers the State AEFI Committee to contact an investigation, the results of which are reported to the National AEFI Committee for causality assessment. The National AEFI Committee, in turn, gives feedback to the facility and the community in which the AEFI has occurred, whilst also reporting the incident to the DFCA for onward transmission to the Global Database. This is the ideal pathway that has been agreed upon.

However, in reality, there are many challenges to the efficient functioning of the AEFI system. We plan to use COVID 19 resources to strengthen this system. Additionally, instead of the AEFI Committees being triggered for response after occurrence of serious AEFIs, the County plans to engage the committees on full time basis during the vaccination and thereafter for as long as is required (to be informed by COVID 19 vaccine SOPs). There is also need to use innovation (eg. WhatsApp) for faster real-time data transmission and reporting.

South Sudan AEFI Reporting – Routing, Timeline and Actions

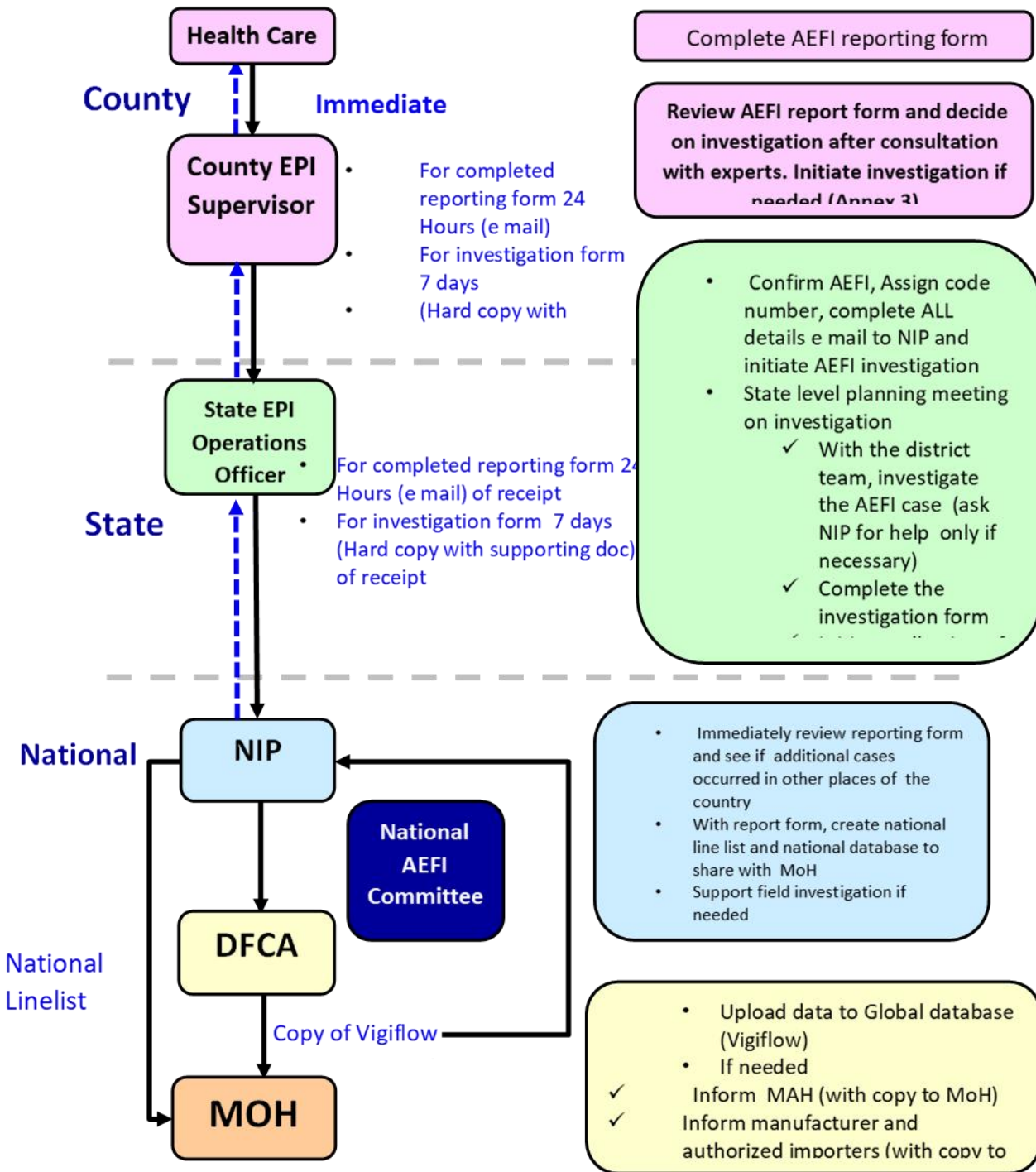


Figure 8.1 South Sudan Adverse Effect Following Immunization (AEFI) Reporting System –

The South Sudan MoH is presently drafting a National AEFI Guideline, with finalization of the guidance document planned to be completed imminently. The SOPs on vaccine safety surveillance for the COVID-19 vaccine roll-out related to adverse events following immunization (AEFI) will be incorporated to bring update the AEFI guidelines.

AEFI Surveillance during COVID 19 Vaccination

The existing system will be strengthened and used for surveillance during the roll-out of COVID 19 vaccination. It is worth noting that, given the novelty of the COVID 19 epidemiology and different priority target group of vaccination of adults, including older citizens, as opposed to the regular target of children under the age of five, it is important strengthen the AEFI surveillance system to respond to the unique sets of safety implications posed by COVID 19 vaccination. These may include higher incidence of coincidental AEFIs due to co-morbidities in the target group, interaction with medication being taken for underlying illnesses, larger volumes of AEFIs due to mass vaccination, and increased global reporting through WHO's VigiBase to ensure timely detection of global signals.

Management of AEFIs

Being a novel vaccine, it is not clear what should be expected of Covid 19 in terms of AEFIs. As such, there is need to prepare well in advance. To mitigate the occurrence of AEFIs, nurse vaccinators will be trained on vaccine handling, vaccine administration, and the contraindications to providing the specific vaccine. Also, the nurses will be trained on interpersonal communication and equipped with information that they will share with clients on what to do in case of an AEFI.

Given that vaccination will be taking place at the health facilities, every vaccination centre will be equipped with an AEFI kit with emergency drugs that would be used by the nurse to respond to AEFI. Nurses will be trained on how to respond to the AEFIs. Serious AEFIs that cannot be handled by the nurses shall be referred to the county hospital or an equivalent hospital in the county.

Each county will form an AEFI medical team consisting of clinicians headed by a medical doctor, who will be trained and propositioned to respond to serious AEFIs that cannot be handled by the nurse vaccinators and clinical officers at the peripheral health facilities. The team will be facilitated with communication and transport facilities to respond to the AEFI promptly.

The following activities are proposed for strengthening the AEFI surveillance system to be implemented, as required, during the COVID-19 vaccination activities. Targeted stakeholders will include facility staff, County and State surveillance officers (SSOs) and supervisors, EPI, SSITAG, National Supervisors, State and National AEFI Committees.

1. Training
 - a. Refresher training of State and National AEFI committees on COVID 19 vaccine safety surveillance as well as causality assessment
 - b. Training of vaccinators, supervisors (County, State and National) and include AEFI in COVID-19 general and communication training packages
 - c. Orient facilities to identify and report AEFIs that present to the facilities.
2. Strengthen Reporting
 - a. Printing and distribution of AEFI reporting and investigation forms.
 - b. Support to facilitate reporting of AEFI (Airtime, internet bundles)
 - c. Orientation of Drug and Food Regulatory Authority (DFCA) on their role in reporting of AEFIs/AESIs to the Global Database, VigiBase.
3. Orientation of AEFI Committees on AEFI investigations
4. Strengthening of AEFI Management
 - a. Identify and train teams to treat AEFIs
 - b. Procurement and distribution of AEFI Kits
5. Provision of Logistics/transport to facilitate AEFI investigation.

Section 9: Monitoring and Evaluation

Vaccines are effective at the personal level if the recommended doses are completed, while effective population immunity requires high coverage. COVID-19 vaccine target beneficiaries are outside the known routine immunization schedules. It is possible for the target population, who are mainly adults, to neither show up nor return for the second dose thus affecting the effectiveness of the COVID-19 vaccination intervention. A monitored registration data base of targeted vulnerable persons to ensure high COVID-19 vaccines coverage and completion rates is needed.

To capture the population that is vaccinated and ensure that they complete their doses,

- i. Target population for each vaccination post will be estimated
- ii. Capture of data: Tally sheets, summary and reporting sheets, registers and vaccination certificates will be printed. The register will capture dates for dose 1 and 2. This will be used for 2nd dose reminder and for defaulter tracking.
- iii. There will be independent monitoring for action during implementation
- iv. Reporting of data: The daily vaccinations will be submitted to the county level where they will be summarized by the County M&E officer. The data will be summarized for a month and reported on DHIS2 as per the reporting timelines.
- v. The DHIS2 platform will be updated to report on number of people vaccinated with COVID-19. The county M&E will upload this data onto the DHIS2 platform.
- vi. The national, state and county supervisors will support vaccination teams during vaccination to ensure that the data is well captured and reported.
- vii. The Training materials for COVID-19 vaccination will include data capture and related SOP

The following indicators will be monitored;

- Timeliness and Completeness of Reporting
- **Vaccine uptake:** The number of people vaccinated with a certain dose of the vaccine in a certain time period (e.g. during a month or year), by age-group, gender, geographical area (county & state) and by vaccine product.
- Vaccination coverage: The vaccinated proportion of a target population, by dose, age group, gender, geographical area (county & state) and by vaccine product.

To add more parameters

- Age group, sex, target group

Post Introduction evaluation of COVID-19 vaccines

A post-introduction vaccine evaluation will be carried out 6–12 months, following the introduction of COVID-19 vaccine. The objective of the evaluation will be the impact of the vaccine introduction on the country's immunization programme and to rapidly identify problems needing correction as vaccination expands in country. The documentation of the lessons learned from deployment and vaccination operations will provide essential information about the effort for both the country itself, and for other countries introducing COVID-19 vaccines.

Section 10: COVID-19 Surveillance

Epidemiological surveillance for COVID-19 is based on a rigorous, integrated reporting system consisting of a series of inter-related surveillance components, eg specimen collection, laboratory testing, data collection, reporting and analysis, daily dissemination of COVID-19-related results, amongst other elements. The establishment and on-going public health-focused management of the COVID-19 surveillance system is directly linked to the national emergency preparedness and response (EPR) strategy and procedures that have been implemented to control COVID-19 transmission in South Sudan.

The surveillance process itself consists of the following public health actions: notification of an 'alert' of a potential case of COVID-19 infection which is communicated to a designated emergency number (6666), used nationally for reporting alerts. Upon receiving notification of an alert that a possible case of COVID-19 exists, a Rapid Response Team (RRT) from the most local Ministry of Health surveillance team (community / County Health Department) investigates the alert by visiting that individual (or group of persons). Based on the clinical history and patient presentation, a naso-pharyngeal swab is obtained and sent for laboratory testing to determine whether the patient is potentially infected with SARS-CoV-2.

At national level, there are three Ministry of Health-based laboratories which conduct RT-PCR analysis, with a further three private medical / laboratory facilities which have commenced in late 2020 / early 2021 for carrying out this same type of laboratory analysis for COVID-19. Furthermore, there are 24 laboratories which are equipped with GeneXpert analysers for the detection of the coronavirus in health facilities throughout South Sudan. All laboratory results are reported to the National Public Health Laboratory (NPHL), with surveillance co-ordination and reporting of the laboratory findings carried out by the WHO and Ministry of Health NPHL laboratory scientists.

Based on the laboratory result that is obtained, the 'alert' is either confirmed as a 'case' of COVID-19 (positive detection of SARS-CoV-2) or is not, ie the alert is not considered to be a case of COVID-19 infection. If a case is diagnosed, the contacts of that individual are identified and followed-up, with the contact(s) possibly also being tested for COVID-19 depending on clinical and case-contact history. Patients with COVID-19 are isolated while contacts are instructed to remain quarantined for 14 days. Daily follow-up visits for all cases is performed by clinical case

management specialists, while all contacts are either visited in-person or reached by telephone by public health surveillance staff to monitor the condition of the case / contact.

A standard daily reporting mechanism for communicating the epidemiological surveillance data exists in all of the States of South Sudan. There is an integrated County-to-State-to-national level system for reporting COVID-19 epidemiological data – the number of alerts, laboratory tests / results, confirmed cases, contacts being followed-up, patients hospitalised, deaths due to COVID-19. The key entities and personnel involved in the compilation, analysis and reporting of the epidemiological surveillance data for COVID-19 are mainly two-fold:

- * The State Ministry of Health surveillance staff - community-based Rapid Response Team (RRT) and the State Surveillance Officers.

- * The WHO Surveillance Officers and the WHO State Hub Surveillance Co-ordinator within each of the States and in two sub-State Hubs (Nimule, Yei) located at / near the South Sudanese – Ugandan and the South Sudan – Democratic Republic of Congo border points of entry.

On a daily basis, all epidemiological surveillance data for COVID-19 (as above, alerts, confirmed cases, contacts, deaths) is compiled on a standard reporting form and forwarded electronically to the public health surveillance co-ordinators, respectively, of the Ministry of Health and the WHO. Data is further consolidated into a daily national summary report within the Juba-based Public Health Emergency Operations Center (PHEOC) which is staffed by Ministry of Health and World Health Organization public health specialists and epidemiologists. Daily reports and weekly summaries, by epidemiological week, are prepared for the COVID-19 surveillance data. The daily reports are transmitted electronically at 17.00 by the Ministry of Health PHEOC staff. Daily summaries of the data collected by the WHO Surveillance Officers / Co-ordinators is also consolidated by the WHO Public Health Co-ordinator and epidemiologists.

Particular emphasis is placed on identification of potential focal outbreaks of COVID-19 within given locations through this daily surveillance system, inclusive of community, County, State and national levels. Trend analysis for the weekly changes in the pandemic epidemic curve are prepared and disseminated. Finally, at the COVID-19 National Steering Committee fortnightly meeting, a summary of the epidemiological data and trends in the COVID-19 pandemic in South Sudan is presented and discussed amongst representatives of the Ministry of Health Public Health section, the WHO epidemiologists and public health co-ordination staff, CDC staff and by non-government healthcare agencies.

Part 3

Section 11: Costing and Funding

In this section of the NDVP, the estimated costs for the several components comprising the COVID-19 vaccination programme for 20% of the South Sudanese targeted population are presented. These allocated budgetary levels for each programmatic rubric are shown in Table 11.1, with the costs for each category being presented for vaccinating the initial 3% of the population, followed by the estimated level of budget that will be required for the remaining 17% of the prioritized population groups. Finally, the total cost, by budgetary category, for vaccination of 20% of the population is provided.

Discussions are on-going among Ministries of Health, Finance as well as different donors and agencies but until now fund mobilization for operational cost is not secured yet. However, the resources for technical assistance and cold chain equipment are secured through Gavi COVAX Facility.

Table 11.1. Estimated budgetary requirements (US\$) for vaccination of 20% of the population of South Sudan.

Budget estimate (US\$)	For 3% of population	For 17% of population	Total for 20% of population	Comment
Regulatory	-	-	-	No associated costs
Vaccine safety	155,720	77,860	233,580	
Monitoring and Evaluation	308,000	-	308,000	Materials printed once
Training (National and Sub-National levels)	364,831	-	364,831	Pre-start of roll-out only
Supervision	132,947	265,893	398,840	
Planning and coordination	480,000	-	480,000	
Demand Generation	1,134,000	500,296	1,634,296	
Supply Chain and Healthcare Waste Management	1,304,990	2,609,980	3,914,970	
Service delivery	6,997,471	6,554,333	13,551,804	
Grand Total	10,877,959	10,008,362	20,886,321	

Annex 1

Estimated Cost per Vaccination Round

Based on previous SIA campaign experiences and the context of South Sudan supply chain operations, the vaccine and ancillary products transport cost for one round of SIA will be estimated first to guide the estimated cost for comprehensive/desired number of rounds.

The vaccine and ancillary product will be transported to 10 States from National Vaccine Stores (NVS) and 80 counties will be supplied with vaccine either from State Vaccine Stores or NVS. The counties' stores will supply vaccine for last mile delivery through the health facilities or vaccination teams.

The air and road are the main transport modes. The prices from current contract and institutional experiences are factored into the transport unit cost setting. For the flight cost from NVS to State is kept as 11,000 US\$ due to larger volume of vaccine and ancillary product. The flight cost for counties are also set based on the individual or combined routes as well as the size of the airstrips to land and unload the supplies. For the last mile delivery, the lumpsum fixed cost of 50 US\$ per round of the SIA. The number of health facilities which is providing immunization services is kept at 1,060.

The fuel cost is also included in the estimate as the freezers need to be run 2-3 days ahead of the SIA to prepare ice packs and the total 10 days of fuel supply is kept for State stores and 8 days is allocated for counties.

The estimated transport cost for one round (to delivery one dose) is 383,542 US\$ and the below table explains the estimated cost for completion of 2 round at different scenarios of vaccine availability and SIA plan.

Table A1.1 Estimated transport cost per round

Transport cost per Round (1 dose)		383,542 (US\$)
Scenario of SIA with Vaccine availability at one point in time	Round (to complete 2 doses)	Cost (US\$)
20%	2	767,084
10%	4	1,534,169
5%	8	3,068,338

If 20% of vaccine are received at one point in time or the complete scheduled doses (2 doses) are allocated to the prioritized States/counties by phase approach (staggered approach), there will be only 2 rounds of vaccine transport to each State, County to complete the 2 doses schedule. The estimated cost for this scenario is 767,084 US\$.

If 10% of vaccine are received at each shipment, it is assumed, 4 rounds of vaccine transport are required to each destination to conduct nationwide SIA. In this scenario of nationwide, 1,534,169

US\$ is required. Alternatively, if the available vaccines supplies (10%) is reviewed and allocated to prioritized States and counties at full schedule (phase approach), the cost will be same as 20%.

Similarly, if 5% of vaccine are received at each shipment, it is assumed, 8 rounds of vaccine transport are required to each destination to conduct nationwide SIA. In this scenario of nationwide, 3,068,338 US\$ is required. Alternatively, if the available vaccines supplies (20%) is reviewed and allocated to prioritized States and counties at full schedule (phase approach), the cost will be same as 20%.

For the first priority 3% group who will be vaccinated simultaneously across the country, it is expected that each dose will be transported separately in the context of South Sudan vaccine management practices, the estimated cost for one dose transport will be (SIA mode), US \$383,542 and for both doses to transport twice, it will cost US \$767,984.

Annex 2: Activities plan and timeline for National Vaccine Deployment Plan

https://unicef-my.sharepoint.com/:x/g/person/nthu_unicef_org/EdMwMdjCJJdOs_wChzVUURIBvdjcHsEwL7njBnSRy6WVBg?e=2NxczG

SN	Activity	Responsible	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21
1	Regulatory preparedness								
1.1	Identify the required process and documents for regulatory procedures for vaccine import	FDCA/MOH							
1.2	Facilitate import permits for medical products, based on a minimum number of documentation requirements	FDCA/MOH							
2	Planning, coordination								
2.1	Formation of NCC committee	MOH/WHO/UNICEF/INGOs/partners							
2.2	Formation of TWG and SSITAG for COVID-19 through extended TOR and fuctionation of existing TWG and NITAG	MOH/WHO/UNICEF/INGOs/partners							
2.3	Development of NVDP	MOH/WHO/UNICEF/INGOs/partners							
2.4	Meetings of NCC, TWG and SSITAG	MOH/WHO/UNICEF/INGOs/partners							
2.5	Mapping Health facilities and vaccinators which will provide vaccination	MOH/WHO/UNICEF/INGOs/partners							
3	Costing and funding								
3.1	Develop workplan and costing for NVDP	MOH/WHO/UNICEF/INGOs/partners							
3.2	Resource mobilization	MOH/WHO/UNICEF/INGOs/partners							
3.3	Budget transfer and monitoring of fund utilization	MOH/WHO/UNICEF/INGOs/partners							
4	Supply chain and waste management								
4.1	Revitalisation of National Logisitics Working Goup	MOH/WHO/UNICEF/INGOs/partners							
4.2	Conduct Cold Chain Gap Analysis	MOH/UNICEF							
4.3	Implementation of Cold Chain Expansion plan	MOH/UNICEF							
4.4	Development of stock management tools and SOP for COVID-19 (adaptation of exist)	MOH/UNICEF							
4.5	Training of cold chain assistant on Vaccine management focusing on accountability	MOH/UNICEF							
4.6	Vaccine arrival to country , custom clearance and distribute to NVS	MOH/UNICEF							
4.7	Vaccine and injection devices distirbution to State and County Stores	MOH/UNICEF							
4.8	Last mile vaccine distribution	MOH/UNICEF/HPF							
4.9	Reverse logistics and waste management	MOH/UNICEF/HPF							
5	Human resources and training								
5.1	Development of training materials and SOP	MOH/AFNET-CDC/WHO/UNICEF/partners							
5.2	Identification of vaccinators	MOH/AFNET-CDC/WHO/UNICEF/partners							
5.3	Training of vaccinators	MOH/AFNET-CDC/WHO/UNICEF/partners							
5.4	Monitoring and Supervision of vaccinators	MOH/AFNET-CDC/WHO/UNICEF/partners							
6	Demand generation								
6.1	Development of communication strategy	MOH/UNICEF							
6.2	Advocacy meetings	MOH/UNICEF							
6.3	Social mobilizaiton and community engagement activities	MOH/UNICEF							
6.4	Preparation and Implementation of Crisis management	MOH/UNICEF							
6.5	M&E actiities (KAP/CPA assessment)	MOH/UNICEF							
7	Service delivery								
7.1	Identification of target group and data collection	MOH/UNICEF/HPF							
7.2	Development of microplan	MOH/UNICEF/HPF							
7.3	Prepare vaccination post and IPC materials (handwashing, PPE)	MOH/UNICEF/HPF							
7.4	Phase I vaccination (fixed posts/health facility based)	MOH/UNICEF/HPF							
8	Vaccine safety and COVID-19 surveillance								
8.1	Strengthening of AEFI and AESI Surveillance during Covad Covid 19 Vaccination	MOH/UNICEF							
8.2	Orientation of AEFI committees on AEFI investigation	MOH/UNICEF							
8.3	Training of AEFI management to vaccinator	MOH/UNICEF							
8.4	Procurement and distribution /replenishment of AEFI kits	MOH/UNICEF							
8.5	AEFI reporting and surveillance	MOH/UNICEF							
9	Monitoring and evaluation								
9.1	Development M&E tools	MOH/AfNet/WHO/UNICEF/partners							
9.2	Printing of data tools, registers, vaccination cards	MOH/AfNet/WHO/UNICEF/partners							
9.3	Updating of DHIS2	MOH/AfNet/WHO/UNICEF/partners							
9.4	Training on DHIS2 and Data management tools	MOH/AfNet/WHO/UNICEF/partners							
9.5	Post Introduction Evaluation	MOH/AfNet/WHO/UNICEF/partners							

Annex 3: Demand Generation Risk and Crisis Communication Plan

(Reference: Adaptation from Ethiopia COVAX Communication Strategy)

Risk Communication Outline

There may be rumors, negative sentiments, public concerns and misinformation around the safety of the COVID vaccine. It is also critical to prepare for news, fake news or misinformation on the onset of AEFI cases after the COVID-19 vaccination. The risk communication plan, with clear actions to take before, during and after the crisis, will help on mitigation of the impact of those rumors, misinformation, disinformation, fake news, and crisis related to the vaccines, vaccination and adverse events following immunization.

The objective of the risk communication plan is to develop, prepare, disseminate and build capacity for a risk communication and response plan to support successful roll out of the COVID vaccine to the eligible population. Preparation, listening, understanding, and engagement are the key phases for the risk communication plan.

Formation of risk communication core team, collecting the list key media agencies and key influencers at different level, training of spokesperson and orienting journalists/reports/media personnel on the COVID-19 vaccination will be key activities in the preparation phase.

For the listening phase, monitoring of media (TV, Radio, Online, etc.) and social listening for public opinions, concerns, rumors and misinformation among the community members and technical support on risk communication activities will be done. In South Sudan the rumor tracking tool developed for Risk Communication will be used. Assessment of misinformation, rumors and communities' concern will be core activities to understand the situation and develop insights for necessary reactions. For the engagement, it will be done throughout the vaccination process with the lead agencies working on the vaccination with different stakeholders, media, and community members.

Response and communication actions will be done based on the potential impact of the vaccine related reaction to be led by the relevant lead agency working on AEFI. The key messages provided by the lead AEFI agency will be relayed to the relevant audiences.

Crises Communication Plan:

A core team (focal from AEFI committee and Communication experts) will be formed (supported by the existing RCCE in tandem with lead AEFI agency for coordinating and managing crisis communication. The key functions will include developing SOP for managing crisis communication; development of content and guidance to detect and respond to rumors, misinformation and disinformation with a real-time rapid response, especially online; development and dissemination of key messages; ensuring provision of urgent and real time response based on potential impact; ensuring immunization program and stakeholders speak with one voice; building

close partnership with media agencies; organizing trainings of media and spokespersons; and communicating with affected population and other audiences in case of AEFI.

Members of Risk Communication Core Team (TBC)

No.	Name and designation	Organization	email	Phone. No.	Area of expertise	
		EPI/MOH				
		PR/Comms MOH				
		WHO				
		EPHI				
		UNICEF				
		...				

List of Spokespersons (TBD)

No.	Name	Organization	Email	Phone no.	Region (national/state/sub national)

Contact of Key Media Agencies

No.	Name	Type	Reach (national/regional)	Language	Contact person	Phone	email
1.	Miraya Radio	Radio	National	English and Arabic			
2.	Eye radio	Radio	National	English and Arabic			
3.	SSBC	TV	National	English and Arabic			
4.	SSBC	Radio	Regional	English, Arabic and local languages messaging			
5.	Juba Monitor	Newspaper	National	English			
6.	The Dawn	Newspaper	National	English			

In case of crisis

Vaccinators need to reassure the communities that the vaccine is given to protect from COVID-19 and explain on key messages; if a person recently vaccinated has fallen seriously ill after vaccination, 1) immediately start treatment, 2) refer to the appropriate health center as needed, 3) gather details about the health problem, timing of health problem and timing of receipt of COVID-19 vaccine, and 4) contact/report supervisor with details; do not speak to the media regarding the event; refer the media to the AEFI focal point/spokesperson. Let the community know that the investigation being carried out by the government but do not give incorrect/false information.

Social Mobilizers need to reassure populations that the vaccine is safe and is given to protect people from COVID 19; ask the vaccinator to explain to people being vaccinated what could be minor side effects and what should be done in case of side effects; if they see a person has fallen seriously ill after vaccination, refer to the vaccinator immediately; do not talk the regarding the event; refer to the right person/spokesperson.

Supervisors need to communicate with the AEFI committee and crisis communication spokesperson immediately if there is any rumors or an AEFI incident; communicate to the vaccinator that they should refer all concerns from either public or media regarding the COVID 19 vaccine to supervisors; if it is a rumor with minor concerns on side effects explain to communities on key messages; do not talk the media regarding the event; and refer to the regional spokesperson.

All health workers, volunteers and stakeholders will also need to mindful about what they post on social media including Facebook, WhatsApp, Telegram, etc. on COVID-19 vaccine. Sharing on constructive and upbeat experience or story on their experience on getting the vaccination is strong encouraged. If there is any rumors or misinformation, do not reshare or repost the information but report to relevant person immediately for timely and proper action.

Timeline for Risk Communication Action for AEFI

Timeline	Communication Actions
Before AEFI	<ul style="list-style-type: none"> Set up Risk Communication Core Members Finalize messages based on technically whetted content shared Prepare communication materials Build relationships with media, partner agencies and stakeholders Train spokespersons on media relation Orient media agencies on COVID-19 vaccine and vaccination program

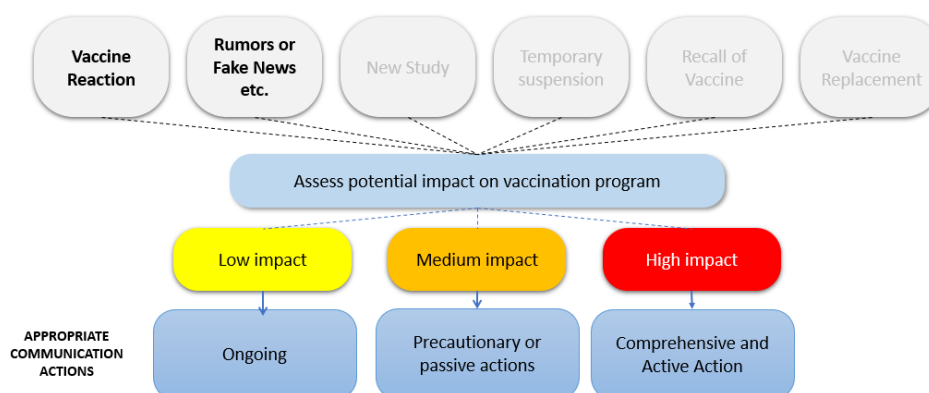
Immediately (By AEFI technical lead)

- Identify what has happened and verify the report
- Gather information and analyse data
- Decide whether to communicate by using the below flowchart

No.	Type of Event	Low Impact	Medium Impact	High Impact
1	Vaccine Reaction	<ul style="list-style-type: none"> Reaction is not serious or dramatic Reaction is serious but not relevant to the public (e.g. in another country with a vaccine not used in the country EPI program) 	<ul style="list-style-type: none"> Serious reaction in the country Serious reaction with some relevance to public (e.g. in another country with a vaccine used in the program) Anticipated media attention Reaction among children, teenagers, or pregnant woman 	<ul style="list-style-type: none"> Actual media attention Serious reaction(s) with unknown cause Reaction that is dreaded, memorable, or dramatic Serious reaction during a mass campaign Serious reactions with a new vaccine
2	Rumors, Fake News or Media Report	<ul style="list-style-type: none"> Story receives little to no public attention Story does not play upon emotions and/or fears Story is not believable 	<ul style="list-style-type: none"> Story receives some public attention Story triggers some emotional fears Story is plausible 	<ul style="list-style-type: none"> Story receives significant public attention; taps into emotional fears Source has high readership/viewership Source is credible and influential Story is relevant

During AEFI

Types of Vaccine Related Events and Impact



Within 24 hours

- Implement the communications plan
- Identify/activate the relevant spokesperson
- Identify the most effective communication channels

Time line	Communication Actions
	<p>Within 72 hours</p> <ul style="list-style-type: none"> • Prepare a press release as needed • Prepare a press conference as needed <p>Ongoing</p> <ul style="list-style-type: none"> • Provide necessary information to health care workers, partners, media and public • Update with interim information until definitive results available
<i>After AEFI</i>	<ul style="list-style-type: none"> • Evaluate on the effectiveness of the interventions • Provide ongoing information to media about the programme