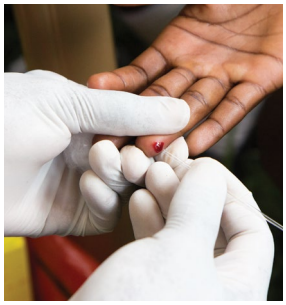

13

Toward Realization of Universal Health Coverage: Designing the Essential Health Benefits Package in Sudan

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ABSTRACT

Sudan's transitional government is striving to realize universal health coverage in the context of serious economic, political, and social challenges. To that end, it developed an essential health benefits package, selecting interventions using evidence provided by the World Health Organization Regional Office for the Eastern Mediterranean using evidence sourced from the Disease Control Priorities, among other sources. Health financing for the benefits package remains a challenge, however. The country plans to phase implementation at the state level as funding permits, and to implement institutional arrangements for sustainability. At the time of writing, the armed conflict between the Sudanese Armed Forces and the Rapid Support Forces had halted progress.

INTRODUCTION

Sudan, a vast Northeast African country, shares borders with seven neighboring countries. With a federal structure comprising 18 states, the country has a huge diversity of culture and language across its vast geography. The predominantly young and rural population of Sudan, estimated at about 49 million, is growing by 2.6 percent per annum; life expectancy at birth is 65 years.[1]

Conflict has significantly affected the Sudanese economy. Gross domestic product fell at an estimated rate of 1 percent per annum in 2022, with current gross domestic product per capita estimated at US$1,102 and hyperinflation estimated at 139 percent.[2] The population has also felt the impact of conflict. The United Nations High Commissioner for Refugees reported 1.1 million refugees and asylum seekers and 3.7 million internally displaced people as of December 2022.[3]

In April 2019, Sudan embarked on a transition from the Federal Republic to a new democratic political system, supported by a power-sharing agreement between civilians and the military. That transition was embodied in the establishment of a Sovereign Council and a civilian prime minister. Since October 2021, a military leader has headed the Sovereign Council. Despite ongoing work to agree on the next steps for the transitional government—with facilitation support provided from the the African Union, the Intergovernmental Authority on Development, and the United Nations—the country has experienced armed conflict since April 2023 between the Sudanese Armed Forces and the Rapid Support Forces. As of June 2023, that conflict had resulted in more than 2,000 deaths and internal and overseas displacement of a further 1.9 million people. The ongoing conflict has already caused significant damage to the health system and infrastructure, and a severe economic contraction is expected.[4]

Initially, the transitional government hoped that gaining access to international capital flows would help the country address poverty and the associated poor nutrition, health, and education outcomes that undermine well-being, productivity, and investment. The government made significant progress in the implementation of reforms and policy adjustments agreed with the International Monetary Fund and the World Bank (World Bank 2020). However, the challenging economic situation and the withdrawal of foreign aid following the Sovereign Council's change in leadership have hampered the government's efforts. The World Bank now classifies Sudan as a heavily indebted poor country.

Sudan's Major Health Challenges

Many people in Sudan are at very high risk of exposure to major infectious diseases, including food- or waterborne diseases like typhoid, vector-borne diseases such as malaria, water contact (schistosomiasis), animal contact (rabies), and respiratory diseases. Malnutrition presents a major risk factor issue, and communicable diseases and complications of pregnancy and birth still contribute to the top 10 causes of death and disability.[5] Those figures predate the impact of the COVID-19 pandemic.

COVID-19 and the current armed conflict have made a very challenging situation significantly worse. Sudan currently needs extraordinary aid. According to the mid-May 2023 Humanitarian Response Plan, 24.7 million people need help

(57 percent increase since 2022). The Humanitarian Response Plan targets 18.1 million more people than before the conflict; 11 million people, including 2.4 million people with disabilities, need emergency care for life-threatening physical and mental health concerns. Preconflict Integrated Food Security Phase Classification research in Sudan anticipated that 11.7 million people would be food insecure in 2023 (Phase 3 or worse), including 3.1 million in Phase 4 (emergency) and 8.6 million in Phase 3 (crisis).[6] Currently, their numbers are rising.

Conflict and endemic, waterborne, and vector-borne diseases such as hemorrhagic fevers, vaccine-preventable diseases, and malaria will certainly kill many in the country. The "Measuring the Availability and Affordability of Selected Medicines in Sudan" research concluded that just 31 percent of vital medicines are publicly available, requiring individuals to use private facilities (FMoH 2022a). Hunger and poor coverage of the extended immunization campaign make children under five years vulnerable to vaccine-preventable diseases. Measles vaccination coverage fell to 60 percent in 2022 and varied by region: 56 percent in South Darfur, 54 percent in West Kordofan, 50 percent in Central Darfur, 49 percent in South Kordofan, 46 percent in East Darfur, and 43 percent in Red Sea. Among young people under 15, 3.7 million need measles vaccination, and 700,000 children under five years missed Penta 3 vaccinations. As of September 2022, 10 states had reported 886 measles cases. As many as 50,000 children may also go without sustenance.

A recent report also shows significant challenges related to the health workforce in terms of management, training, funding, and distribution—all of which will have worsened because of the conflict (World Bank 2023). Productivity is down nationwide. Damage to food-manufacturing facilities and markets has disrupted production, so the private sector will need financial and technical help from the international community (particularly from international financial institutions through concessional loans) to restore economic activity and generate employment. Thus, public financing has drastically decreased, public health spending is at a 50-year low, and the country primarily relies on foreign support, estimated at US$1.7 billion in 2023.

Health Financing in Sudan

At the time of writing, the most recent published health accounts reflect data for 2018 (refer to table 13.1 for a summary). In 2018, health expenditure (at about US$60.80 per capita) represented 4.95 percent of gross domestic product. That amount compared with US$132.30 in 2015, a drop largely due to the fall in the exchange rate. General government health expenditure comprises federal and state government expenditure, and social health insurance (the National Health Insurance Fund [NHIF]) was 23.28 percent of current health expenditure; an increase from 14.9 percent in 2015. Out-of-pocket expenditure was relatively high at 66.95 percent of current health expenditure.

Table 13.1 Summary of Health Accounts for Sudan, 2018

Category	
Total population	41,984,512
Exchange rate (SD to US$)	23.8
GDP per capita (SD/US$)	29,270/1,230
CHE as share of GDP (%)	4.95
Per capita health expenditure (SD/US$)	1,448/60.8
GGHE (SD/US$)	337/14.2
GGHE as share of GDP (%)	1.15
GGHE as share of current health expenditure (%)	23.28
Social health insurance (National Health Insurance Fund) as a share of GGHE (%)	27.62
Household OOP expenditure as share of CHE (%)	66.95
Private health expenditure as a share of CHE (%)	70.3
Donor expenditure as a share of CHE (%)	6.42

Source: WHO 2018.

Note: CHE = current health expenditure; GDP = gross domestic product; GGHE = per capita general government health expenditure; OOP = out of pocket; SD = Sudanese pound.

Health System Reform in Sudan

Despite those challenges, for many years, Sudan has aspired to increase coverage of health services and to improve the efficiency and effectiveness of its health system. The universal health effective coverage index increased from 27.5 in 1990 to 51.8 in 2019. Although NHIF has relatively broad coverage, it has relatively low depth of service coverage overall as shown by high levels of out-of-pocket expenditure. Sudan has been part of the Universal Health Coverage Partnership of the World Health Organization (WHO) for the last decade, and the new government has a strong political commitment to improve health care and population health. Currently, the Federal Ministry of Health (FMoH) and NHIF are collaborating to refresh and renew related policies and strategies as part of the newly developed National Health Sector Recovery and Reform Strategic Plan 2022–24 (FMoH 2022b).

As part of that plan, FMOH and NHIF have sought to identify and cost an essential health benefits package (EHBP) to include health care interventions that should ultimately be accessible to the entire population of Sudan. Their work will help inform the development of consistent and standardized clinical protocols and pathways and help identify investment and associated health financing requirements going forward. It will also help inform decisions about revenue contributions from government sources (such as taxation), contributions through the national health insurance, and requirements for risk pooling. This chapter describes the approach taken to designing the EHBP and plans for further development and implementation after the conflict.

DEVELOPING AN ESSENTIAL HEALTH BENEFITS PACKAGE

In 2019, FMoH and NHIF embarked on a joint project to develop an EHBP for citizens of Sudan, with guidance from WHO's Sudan Office and supporting expertise funded by the European Union. The project was governed by a Supervisory Committee chaired jointly by the Undersecretary of FMoH and the NHIF manager and comprising senior representatives of both organizations. A Technical Working Group made up of representatives from both FMoH and NHIF provided day-to-day oversight of the project and its associated tasks. The Supervisory Committee established 13 clinical expert teams comprising senior Sudanese health clinicians, public health experts, and representatives from FMoH programs and departments to provide support and advice on the prioritization process. It set up a core project team to include members of WHO's Sudan office and with the support of experts from Economics by Design Ltd. in collaboration with the University of East Anglia. The project consulted practitioners and stakeholders from state ministries of health and other state government bodies, medical societies, and civil society organizations. The project resulted in a published report (Mallender, Bassett, and Mallender 2020), with results subsequently validated in a large consensus-building workshop involving all stakeholders. The process did not include patient or public representatives, or representatives from industry.

The project ran between December 2019 and September 2020 and included the following steps:

1. *Development of approach*. The development involved a review of international frameworks for designing the EHBP and subsequent agreement on a practical approach with local stakeholders.
2. *Current state assessment*. A current state assessment was undertaken to identify needs, opportunities, challenges, and barriers and to inform priority setting.
3. *Objective setting*. A stakeholder event identified a clear consensus that the EHBP should prioritize financial protection, coverage, quality, and safety and equity.
4. *Categorizing interventions*. A categorizing framework of programs and subprograms for the EHBP list of candidate interventions was developed using draft guidance from the WHO Eastern Mediterranean Regional Office (EMRO) and input from local clinical expert teams.
5. *Priority setting*. Interventions were prioritized on the basis of (1) how well they each addressed need, (2) strong locally relevant supporting evidence, and (3) potential value for money (cost-effectiveness).
6. *Costing*. This step involved the development of local intervention costs to inform an assessment of health financing requirements over time.
7. *Institutionalization*. Proposals were developed for the Institutional and Governance Arrangements for the EHBP going forward, along with an associated road map for implementation.
8. *Capacity building*. This step involved interactive and online training for the ongoing development and implementation of the EHBP.

The original project timeline envisaged completion by April 2020, but the COVID-19 pandemic disrupted that timeline. Work did continue with individuals working remotely and with online delivery of workshops and training. However, the availability of clinical experts was limited because they rightly prioritized the need to respond to the pandemic. FMoH planned to start implementing the EHBP during 2023, funding permitting.

Current Health Benefits Package

The government of Sudan offers its population a minimum health services package that consists mainly of primary care, including medical consultations, routine and laboratory diagnostic tests, and imaging. Although very broad in principle, the current package lacks clarity on selection criteria and specificity. The package includes promotion of child health (immunization against vaccine-preventable diseases, nutrition counseling, growth monitoring, and implementation of integrated management of childhood illnesses package); promotion of reproductive health (safe motherhood and family planning); treatment of common health problems and control of endemic diseases (malaria, tuberculosis, HIV/AIDs, schistosomiasis, and so on); protection and promotion of environmental health and sanitation; treatment of simple diseases, injuries, and mental health; and basic and comprehensive emergency obstetric care. FMoH, in consultation with NHIF, updates a comprehensive list of essential medicines each year. State ministries of health also hold separate lists of medicines at the state level. People covered under health insurance are required to co-pay the cost of medicines (25 percent). Many challenges and issues affect the delivery of the current package, which goes some way in explaining the scale of out-of-pocket expenditure on health. Despite broad coverage, huge geographic variation exists in practice in the quality and availability of many basic health care interventions, and local stakeholders face great challenges in fulfilling commitments to the population.

Selecting Interventions for Inclusion in the EHBP

Designed to cover the entire health system of Sudan, the EHBP encompassed primary health care, secondary care, and specialist tertiary services. Some interventions are already available to citizens (for example, access to malaria nets and to parental advice and support through the essential mother and child health program). Some interventions would require modest expansion (for example, access to meningitis A vaccine for infants) and could be achieved relatively quickly. Others would require significant development in workforce and/or infrastructure (for example, comprehensive antenatal care services). For those reasons, all the candidate interventions for inclusion in the health packages were assessed in terms of current coverage and practical feasibility of coverage expansion over 10 years. Intersectoral and multisectoral interventions were not considered for inclusion in the EHBP because they would be initiated separately as part of a Health-in-All Policies agenda rather than funded directly by health insurance or government health spending.

The WHO EMRO provided draft guidance on the development of priority benefit packages. The draft guide was accompanied by a draft database of interventions classified by program and subprogram. At this stage, the interventions are not consolidated as clinical pathways. It was agreed instead that consolidation would take place once the list of essential interventions had been developed and a first round of prioritization completed. Assessing the interventions as part of clinical pathways is the next stage of development of the EHBP. For each intervention, the WHO EMRO received the following information:

- Package (program and subprogram)
- Intervention description
- Minimum qualification for service provider (health care professional)
- Preferred or minimum level of care (care setting/outlet)—service delivery platform
- Commentary
- Proposed by (source of the evidence base).

Information sources included published guidelines from, for example, WHO and European Union sources, evidence from Cochrane Reviews, and *Disease Control Priorities*, third edition. Interventions were not prioritized at this stage but were instead treated as candidates for Sudan's EHBP. Some health system program interventions were included in the prioritization and costed.

The list was shared with the clinical expert teams, which added and adapted the list of interventions to best match local assessment of need and evidence of effectiveness in context. The result was an expanded list of 740 interventions (the table in annex 13A shows the number of interventions by program and subprogram). For example, in the cardiovascular and respiratory diseases category, selected interventions included the following:

- Anticoagulation for medium- and high-risk nonvalvular atrial fibrillation
- Care of acute stroke and rehabilitation in stroke units, including treatment of acute ischemic stroke with intravenous thrombolytic therapy
- Long-term management of ischemic heart disease, stroke, and peripheral vascular disease with aspirin, beta blockers, angiotensin-converting enzyme inhibitors (ACEi), and statins (as indicated) to reduce risk of further events
- Long-term combination therapy for persons with multiple cardiovascular disease (CVD) risk factors, including screening for CVD in community settings using non-lab-based tools to assess overall CVD risk
- Management of acute coronary syndromes with aspirin, unfractionated heparin, and generic thrombolytics (when indicated)
- Mass media messages concerning healthy eating or physical activity
- Mass media messages concerning use of tobacco and alcohol
- Medical management of acute heart failure
- Medical management of heart failure with diuretics, beta-blockers, ACEi, and mineralocorticoid antagonists

- Opportunistic screening for hypertension for all adults and initiation of treatment among individuals with severe hypertension and/or multiple risk factors
- Primary prevention of rheumatic fever and rheumatic heart diseases by increasing appropriate treatment of streptococcal pharyngitis at the primary care level
- Provision of aspirin for all cases of suspected acute myocardial infarction.

Each intervention was accompanied by an intervention description, an assessment of the minimum qualification for the health care professional providing the service, a preferred care setting (service delivery platform), the target population for the intervention, and any published source for the evidence of effectiveness or guideline recommendations.

Method Used for Priority Setting

The approach for prioritization was based on simple multicriteria decision analysis. Criteria for prioritization were agreed, with each criterion then assigned a weight to reflect its relative importance. Each intervention was then scored on a range of 0–5 to reflect how well it met the criteria. The resulting weighted scores allow for a prioritization assessment.

In two workshops, local stakeholders from FMoH and NHIF agreed on the differentiating criteria to enable comparison of the interventions with each other and prioritization. At the first workshop, stakeholders agreed on a relatively simple structure with only three criteria:

1. *Meets health need (and population impact).* The intervention addresses high-priority needs in terms of the epidemiology of Sudan based on causes of morbidity and mortality, and scale of impact.
2. *Quality of evidence*. The intervention is likely to be effective in the context of Sudan.
3. *Likely value for money*. The intervention is likely to offer good value in the context of Sudan (considering cost-effectiveness with higher priorities given to primary and wider social determinants of health).

At the second workshop, stakeholders agreed that, all other things being equal, interventions meeting health need and having high population impact are to be preferred over interventions with high-quality evidence of effectiveness and good value for money. Importantly, that decision did not mean that the stakeholders felt that quality of evidence and value for money are in themselves less important. Moreover, the draft database of interventions provided by the WHO EMRO came from research showing evidence of effectiveness and value. However, there was concern that the evidence used to score interventions against the effectiveness criteria came mainly from more developed countries and that small relative differences in the source would not be as important in the context of Sudan.

The evidence used to score interventions in terms of their value impact was considered less robust and thus assigned a lower relative weight.

Stakeholders at the second workshop agreed on mean average weights, with quality of evidence and value for money assigned equal importance of 20 percent each, population health need and population impact attracting a weight of 60 percent. Using these weights, interventions that earn high scores for health need and population impact but low scores for quality of evidence and likely value for money will rank higher than interventions that earn high scores for quality of evidence and value for money but low scores for health need and population impact.

Each intervention was assigned a score between 1 (very low) and 5 (very high) against each of the criteria. International expert advisers at the University of East Anglia independently assigned the initial scores using a simple scoring schema for each. Two researchers undertook the scoring independently of each other, with discrepancies referred to a third researcher for resolution. The draft scores went to the clinical expert groups for review and validation, or amendment, as required and to reflect local circumstances. A provisional list of priority interventions was then identified by combining the weights and the scores.

The clinical teams were also asked to assess the extent to which services already existed across Sudan (measured by current population coverage) and the technical feasibility of achieving coverage of more than 75 percent of the target population within three years and seven years. That exercise enabled a high-level strategic assessment of time frames associated with the development at scale, across the country, of each intervention. Finally, stakeholders from different health programs and from national and subnational and relevant agencies reviewed all interventions, defining the most critical, but have not yet finalized medical equipment needed by the level of care.[7]

Sudan is a wide and diverse country with different epidemiological characteristics; therefore, a wide range of defined EHBP interventions might be implemented differently according to the regional context. For that reason, regional workshops will follow to adopt regional interventions and address the local community need.

Using Evidence to Inform Priority Setting

The scoring schema used to prepare the initial scores were based on data and evidence relevant for each of the prioritization criteria. In the absence of comprehensive needs assessments and projections for the population of Sudan, the team used data from the Global Health Data Exchange to estimate levels of need and population impact. Specifically, data were extracted to show the percentage of total disability-adjusted life years (DALYs) attributed to different disease areas for Sudan for 2017. The percentage of DALYs for each disease area was transformed

into a quintile distribution of DALYs that could be used to measure need and population impact. Each disease area was mapped into one of five categories based on the percentage of total DALYs accounted for by that disease area. Interventions were then mapped to each disease and assigned a score of 1–5 depending on which disease area they related to. Some risk hazards and public health interventions do not map directly to a specific disease area—for example, COVID-19 and other emerging or reemerging diseases and all hazard risks (such as floods). For such interventions, an attempt was made to match the intervention to the expected health impact of the hazard.

Many of the interventions were proposed because of existing evidence review processes. For those reasons, a more pragmatic approach was adopted to assess the quality of evidence, based on the likely reliability of the source of the evidence included in the database. A scoring schema was developed allowing evidence to be scored on a scale of 1–5. Interventions included in the WHO official guidance attracted the highest score (5), and local anecdotal evidence attracted the lowest score (1).

For value for money, the project team considered using standard databases of cost-effectiveness such as the Tufts Medical Center Global Health Cost-Effectiveness Analysis Registry, to inform the scoring of interventions. For the following reasons, however, the standard databases of cost-effectiveness were not considered suitable at this stage of development of the methodology:

- The databases include a variety of possible definitions of cost-effectiveness, which make them hard to compare. These definitions include
  - Simple cost-efficiency studies (the most efficient way of delivering an outcome measured in natural units—for example, number of deaths);
  - Cost-utility studies (the most efficient way of delivering an outcome measured using standard utility metrics, such as quality-adjusted life years); and
  - Cost-benefit studies (to demonstrate the ratio or value of benefits to costs measured in monetary units).
- For health interventions (pharmacological, devices, or treatment interventions), cost-effectiveness is usually calculated measuring the "marginal" impact of the intervention compared with usual care or a "standard of care." Databases' definitions of usual care and standard of care differ considerably and are also context specific and vary by geography and health system. For the purpose of developing a health benefits package, the usual care is "no care"—rarely the comparator in the economics databases.
- Intervention costs, which are very context specific, vary considerably. Thus, informing local decision-making requires local economic evaluation, which is specific to the intervention in context.
- The value associated with the quality-adjusted life year, often used as the standard utility metric to compare the technical efficiency of different interventions, varies. It is also context specific.

The diversity of study designs and comparators, and the challenges with translating results to a Sudanese context necessitated a more pragmatic approach. As an alternative, the project team developed a simple scoring schema that assigned a score of 1–5 on potential value for money of interventions based on their care setting, disease/risk prevention capability, and stage in the care pathway.

Estimating Intervention Costs

Separately, detailed costing has been prepared for each intervention to show the budget impact of including those services within the EHBP. The international expert led the costing analysis to support the design of the benefits package, and to facilitate the building of a framework and tools to implement it. In a collaborative approach a national team was created to facilitate the costing process, which was composed of the national consultancy and FMoH, with technical and financial support from NHIF and WHO. The costing team was assigned to provide estimates of the potential costs of adopting each intervention at scale in Sudan. The approach taken included a bottom-up costing to include an assessment of

- Protocols and associated activities required for each intervention,
- The population need associated with each intervention,
- Staffing requirements (type and time),
- The care setting and delivery platform,
- Consumables required to support the delivery of the intervention, and
- Overheads associated with the previous items.

The process also used a top-down program budget approach, when appropriate, based on international benchmarks. For the cost of services, the main reference of the interventions' case management was lists of protocols developed by the program technical groups and clinical experts who selected and designed the package mainly using the national program's protocols. If those were not available, then WHO guidelines and standards were used.

Following discussion with the FMoH team, the stakeholders agreed that the OneHealth Tool would be the most appropriate starting point for the costing because it was structured to support the WHO guidance that underpinned many of the selected candidate interventions. The tool also contained default data of potential value in the absence of local information for Sudan. The tool was customized and updated accordingly, and all default data reviewed, edited, and adapted to the country context. Program costs were estimated using a top-down approach. No attempt was made to estimate the health outcomes impact of the interventions because data were not available to support that analysis and because the agreed scope of work for the project did not cover it. Annex 13B provides an overview of the costing methodology.

The cost of current coverage for the initial list of 740 interventions came to an estimated US$1.4 billion based on 2020 prices. Looking solely at the feasibility

and time scales of growth and development (driven by infrastructure and staffing requirements), and to achieve target population coverage of 75 percent for each intervention, funding requirements for 2023–24 would increase to an estimated US$2.4 billion. With funding support, the program could achieve full coverage for all interventions by 2030 (notwithstanding growth in demand) at a total cost of US$4.3 billion (2020 prices, 2020 population).

The estimated first-year cost based on current coverage is US$29.3 per capita. Although that first-year cost falls far below per capita health expenditure (US$60), with 67 percent of health spending financed by out-of-pocket payments, financing even the current cost of those services from public funds will be very challenging. Priorities will therefore need to be set according to the availability of health financing, health workforce, and associated infrastructure.

EHBP IMPLEMENTATION PLANS

The National Health Sector Recovery and Reform Strategic Plan 2022–24 sees health services delivery as the main driving instrument for reform of Sudan's health system, and the EHBP as the principal prioritizing tool for effective health interventions and efficient resource use. The EHBP is part of a wider program of reform, including provider payment models and health financing. The health system is also expected to change with a move toward integrated people-centered health systems including primary health care, and intersectoral strategies implemented for localities, provider networks for areas within states, integrated health services for each state, and the development of regionally based tertiary care.

Delivering the Essential Health Benefits

The model of care will be rolled out nationally, together with the technical support for its implementation. Implementation will be phased at the state level. The benefits package will guide the design of the model, which will be adopted and adapted at the local level.

The integrated people-centered health systems at the primary health care level will be implemented through the family health approach. The approach builds upon the identification of the benefits package for each level, identification of the health provider level and skill set, and organizational arrangements (for example, catchment area, referral system, and information system). Subsequently, the benefits package will be enabled by strategies for workforce development, digital health, information technology, supply chain management, and reformed governance arrangements.

The newly designed EHBP is intended to cover Sudan's entire health system and encompass primary health care, secondary care, and specialist tertiary services. Some interventions are already available, some would require modest

expansion, and others would require significant development in the workforce and/or infrastructure. The implementation arrangements will keep the package contextualized and adaptable to the future changes in demography and burden of disease. A primary health care mapping survey has taken place in most of Sudan, and information from that survey will address several questions needed to inform the implementation arrangement. Those steps will be taken into consideration during the implementation phase.

With the current war raging since April 2023 and the significant vacuum in health financing, planning for health interventions and successful services delivery funding has required additional emergency prioritization. Consequently, additional prioritization of the EHBP has been undertaken and five criteria agreed upon: illness severity, socioeconomic features, financial protection, disease burden, and practicality and acceptability. Review of all EHBP interventions against those criteria resulted in identification of 280 interventions and 1,818 subactions, which are now being taken forward as emergency priorities.

Health Financing

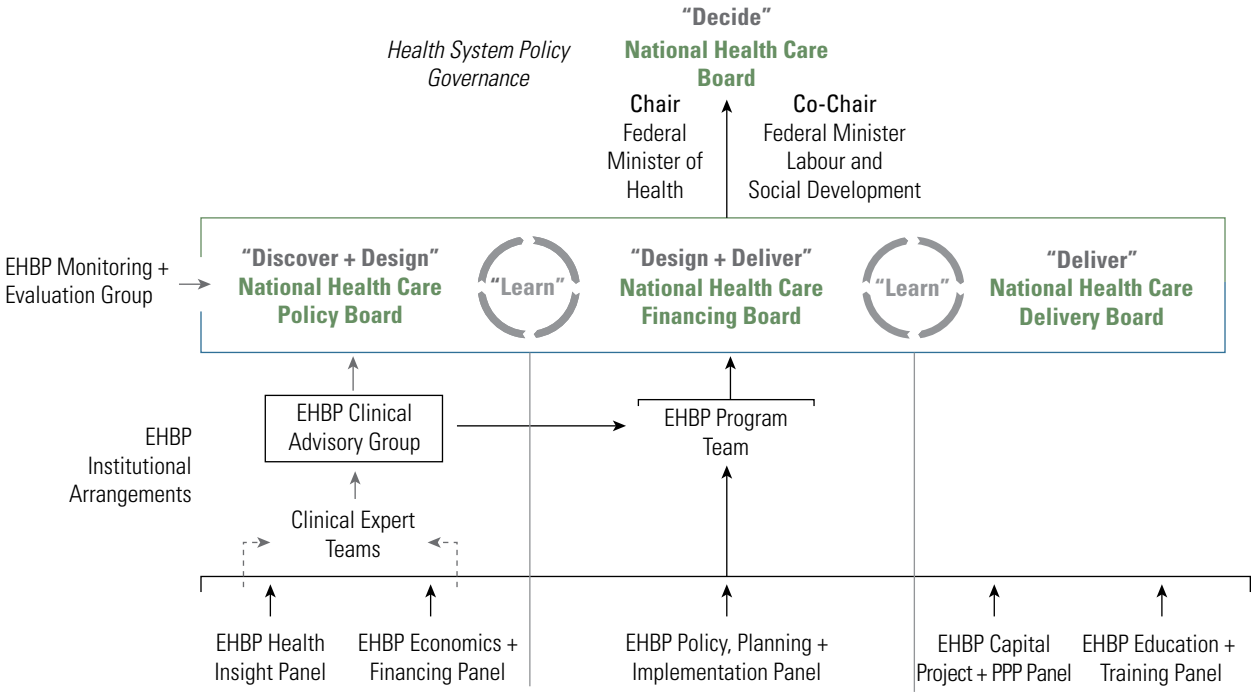
The health financing strategy combines state and federal tax funding, compulsory insurance premiums collected from those employed in the formal sector, and additional voluntary premiums from citizens as demanded. The intention is to pool state and federal tax funding, combined with funds from international donors, to pay for essential services. Compulsory insurance combined with Zakat will fund a more comprehensive package for the insured population (including the registered poor who will be passported to these services). That package will be combined with a new division of functions into purchasing, provision, and regulation. Purchasers will use new effective provider payment modalities to allocate resources to providers for the delivery of services included in the EHBP. The precise allocation of funding sources to benefits package interventions is yet to be agreed.

Institutionalizing Essential Health Benefits: Ongoing Review and Development

The project team made extensive recommendations for the institutionalization and governance of the program going forward, including proposals for revising the benefits package and for monitoring and evaluation. A document on institutionalization, alongside the development of a service package, was prepared and included as a dedicated chapter in the final technical report (Mallender, Bassett, and Mallender 2020). It proposed a set of governance conventions, management actions, and resources needed to institutionalize the EHBP and related financial mechanisms from 2020 to 2025. The distinctive feature of the document is that the EHBP will ultimately be compatible with the broader governance of Sudan's health system. The document identified all essential functions and activities needed through the five-year period along with the associated governance arrangements. It also defined advisory groups and technical panels, as required, and prepared terms of reference.

Figure 13.1 summarizes the proposed governance structure, showing a national health care board (chaired by the Federal Minister of Health and co-chaired by the Federal Minister of Social Development) for governance and three subordinate boards for delivery, financing, and policy issues. In addition, a dedicated EHBP team will coordinate EHBP activities with input from expert panels. The panels cover various EHBP development areas such as education and training, and monitoring and evaluation. Of the bodies defined as responsible for implementation, NHIF will hold and disburse pooled health care funds, and federal and state ministries of health will cover the sustainable delivery of the EHBP by government-owned health resources and/or in partnership with the private or third sector, meeting standards and targets for efficacy, safety, and values.

Figure 13.1 Proposed Institutional Arrangements for Ongoing Review and Development of Essential Health Benefits



Source: Mallender, Bassett, and Mallender 2020.

Note: EHBP = essential health benefits package; PPP = patient and public participation.

At the time of writing, the final proposals are still under development. However, there is a commitment to ensuring the development of capacity, infrastructure, and governance to oversee the EHBP as a long-term program, maturing into "business as usual." Institutionalization of EHBP development was also considered one of the major milestones in the National Health Sector Recovery and Reform Strategic Plan with distinctive performance indicators to measure the progress toward institutionalization. Since undertaking the work in Sudan, the Joint

Learning Network has also published a guide to health benefits package revision (JLN 2022). That guide features the Sudan case study in relation to the design of the institutionalization of the benefits package.

Wider Health System Reform

The National Health Sector Recovery and Reform Strategic Plan provides a model of care that puts the health services benefits package at the heart of the reform. The plan's vision clearly states, "All people in Sudan enjoy high quality, equitable Access to Essential Health Service and are protected from Emergencies towards a Healthier, Fairer and Safer future" (FMoH 2022b). Thus, it is accompanied by sectorwide reform to be rolled out nationally and demonstrated in a phased manner. The reform includes governance reform, hospital sector reform, emergency care reform, and human resources reform. The governance reform includes revision and updates of health and health-related laws and regulations, such as the Public Health Act, which includes affirmation of primary health care services as a basic right for the people of Sudan.

The National Human Resources for Health Strategy for 2030 aims to provide guidelines for the governance, requirements, hiring, and transfer of human resources based on the identified minimum health services packages. It also states that the criteria and standard working conditions and enabling environment for health workers (such as physical infrastructure, support staff, supplies, and equipment) will be based on the identified services packages at different levels of care.

LIMITATIONS AND FUTURE DIRECTIONS

The COVID-19 pandemic has undoubtedly slowed progress on the project because it diverted attention to addressing the immediate population health need. Notwithstanding the pandemic's impact, several critical success factors and several challenges affected the project (refer to table 13.2 for a summary).

Important things to consider as Sudan moves its health system from the current state toward achieving its long-term goals include the immense transformation involved in the process and how best to ensure continuing improvement and development while the country invests in enabling longer-term changes. Such investment will support workforce training and development; the physical environment (health clinics and hospitals); digital infrastructure and digital health technologies; and equipment, supplies, and supply chains. Parallel investments will be needed in operational and financial management capabilities and capacity. For those reasons, the project team recommended an implementation road map for the near-term tactical transformation required to improve current services, as well as a road map that sets out the steps needed to establish a long-term plan for strategic transformation and associated investment requirements.

Table 13.2 Critical Success Factors and Challenges for Sudan's EHBP

Critical success factors	Challenges
• Ministerial commitment within FMoH despite several political reshuffles • Establishment and functioning of ministerially led program Steering Group and TWG (drawn from FMoH and Ministry of Labour NHIF at federal and state levels) • Collaboration between top management of FMoH and NHIF (especially within and then beyond the TWG) • Engagement of senior clinicians in diverse specialities • Pragmatic and timely use of available funds from the European Union to undertake the EHBP development program despite limitations of agreed program scope (preparatory work and implementation both formally out of scope) • An early definition of guiding values and priorities • Identification and adoption of working methods that suited the capacity and developing capabilities of locally employed staff in Sudan—thus aiding skills transfer, program implementation, and sustainability • Using the EHBP development program as a "lever" to facilitate political consideration of wider reform of the health system—including capacity building, revisions to the distribution of health care financing roles and responsibilities, and health system governance • Planning for program pilots in two regions, outline planning, and the timeline for wider program implementation • Strong and consistent support from WHO EMRO, and valuable engagement from World Health Organization Geneva.	• Gathering timely national and subnational information on population (current and projected), fiscal space, epidemiology of diseases (current and projected), and health system capacity and capabilities (human, built, equipment, consumables) and systems (for example, information, management, financial, logistics) • Gathering reliable and detailed historic financial information (at the whole health system level)—despite Sudan's having completed more than five rounds of National Health Accounts • Gathering reliable information about current and planned public expenditure on health in the context of a transitional government • Systematic and sustained engagement with the center of government (one helpful meeting with Deputy Finance Minister) • Lack of trust that international benchmarks of the cost-effectiveness of interventions have relevance for Sudan (from either utility or costs perspectives)—possibly with some justification • Challenges with direct engagement with diverse citizens and communities and associated community engagement given the sensitive political context • Costing of EHBP conducted from a public sector perspective without considering the health private sector (which is a growing provider for NHIF benefits package) • Lack of available or updated national diseases protocols and management guidelines • Early challenges with involving the TWG and the time needed to increase their commitment and consolidate their support.

Source: Original table compiled for this publication.

Note: EHBP = essential health benefits package; FMoH = Federal Ministry of Health; NHIF = National Health Insurance Fund; TWG = Technical Working Group; WHO = World Health Organization; WHO EMRO = World Health Organization Eastern Mediterranean Regional Office.

LESSONS LEARNED

The value of guidance and support from international bodies cannot be underestimated. Making progress on such complex and challenging programs will require shared learning, knowledge, and expertise. This project offers several important lessons to enhance the value of that guidance still further:

- Distinguish and provide guidance for preparing, designing, implementing, and sustainably embedding a UHC (universal health coverage) EHBP.
- Translate the theory underpinning the development of an EHBP (often well understood) into clear, effective but simple and sustainable practice in highly, and sometimes increasingly, resource-contained contexts.

- Ensure increased sensitivity of guidance to country context—economic, epidemiologic, demographic (for example, urban/rural split), and technical capacity—and to political and institutional context.
- Place greater emphasis (and resources for external support) on the preparatory stage and especially on the implementation and embedding stages of developing a UHC EHBP.
- In the development of future EHBPs, factor in greater emphasis on systemwide resilience and sustainability (disease and events).
- Place greater emphasis on developing UHC EHBPs in the context of wider health system capacity building and/or adjustment and broader institutional development and reform (including governance for performance more than governance of performance).

From the beginning, the newly developed EHBP was seen as a keystone for the ongoing health sector reform because it links so closely with the new strategic directions for health financing, human resources, and service delivery. That strategy will play an important role in strengthening governance and reducing inefficiency due to fragmented pools and contradicted schemes.

The engagement of most of the relevant stakeholders was the key to the project's success. All relevant groups representing clinicians and health systems were invited to add their contributions regarding the proposed EHBP, issues of feasibility, and implementation challenges. The adoption of evidence-informed priority setting to select the most needed and cost-effective interventions was helpful given current data and resource constraints. Despite its difficulty, the task resulted in a very comprehensive and insightful output that facilitated the entire process.

ANNEX 13A. NUMBER OF INTERVENTIONS BY PROGRAM AND SUBPROGRAM (AUGUST 2021)

Communicable diseases	Antimicrobial resistance—infection prevention control	39
	HIV/AIDS	35
	Malaria	19
	Neglected tropical diseases	17
	Pandemic and emergency prep	29
	Sexually transmitted diseases	6
	Tuberculosis	45
	Vaccine-preventable diseases	13
Total		203

(continued)

Noncommunicable diseases	Cancer	26
	Cardiovascular and respiratory diseases	23
	Congenital and genetic disorders	16
	Injury prevention	3
	Poisons	1
	Mental health and drug abuse	35
	Musculoskeletal disorders	6
	Rehabilitation	36
Total		146
Older people and people with disabilities	Elderly	19
Planned procedures	Surgery	147
Women and children	Adolescent health	7
	Child health	11
	Maternal and newborn health	155
	Nutrition	16
	Reproductive health	22
	School age development	14
Total		225
Overall total		740

Source: Based on data provided by the World Health Organization.

ANNEX 13B. METHODOLOGY OF COSTING SUDAN'S EHBP

The OneHealth Tool (OHT) software was the main tool used to estimate recurrent costs of each intervention in five program components across the six delivery sites ranging from community to secondary and tertiary hospital level in the public sector. OHT presents the cost estimates by type of resource and input needed. The costing methodology combined a bottom-up approach to calculate the costs of the medical services at the community, outreach, and facilities levels and a top-down approach to estimate the program management costs.

Bottom-Up Approach

Bottom-up costing, or an engineering approach, is based on a detailed analysis of resources requirements and their costs to estimate the cost of interventions. Interventions costs are classified into direct costs—such as drugs, consumables, investigations, and medical human resources—and indirect costs, which refer to administration and overhead costs. OHT calculates costs by multiplying quantities of resources by their unit cost. Total estimates are built by summing up the percent of estimates in each level, which typically requires close work with relevant technical and clinical experts to obtain and validate detailed resources and inputs used in costing. Sudan's health system delivers health services through six levels: community,

outreach, family health unit, family health center, secondary hospital, and tertiary hospital. The bottom-up approach used the following steps.

Assessment of the protocols and associated activities required for each intervention. Data were collected and organized according to the selected intervention and delivery channel, in line with health services and OHT modules. The main reference of the interventions' case management was lists of protocols developed by the program technical groups and clinical experts, who selected and designed the package using mainly the national program's protocols. If those protocols were not available, then WHO guidelines and standards were used. OHT was customized and updated accordingly, and all default data reviewed, edited, and changed to fit the country context. Many consultative meetings with program technical groups and clinical experts were arranged to validate the information used.

Assessment of the population epidemiology associated with each intervention. To compute the annual outputs, the annual number of targets for each intervention in EHBP were calculated as following:

- *Target population.* Refers to the population on which the health intervention focuses, such as pregnant women, under-five children, adults, and so on. Population assumptions for each intervention used Sudan's national census projection 2020.
- *Population in need.* Refers to the percentage of the target population that required the intervention (incidence or prevalence). Data came from the most recent FMoH program reports and studies, such as the 2014 Sudan Multi Indicator Cluster Survey or from global burden studies and estimates when no local data were availble.
- *Coverage.* Reflects the percentage of the population in need that receives the services. Intervention coverages were collected from the FMoH program reports and studies, which represent the baseline coverage for 2020, and then projected up to 2024.

Annual Number of Targets = Target Population × Population in Need × Coverage per Year

Assessment of the average unit cost of interventions. The interventions' costing estimates included the following:

- *Treatment inputs*. The drugs and supplies, medical personnel time requirement, number of outpatient visits, and inpatient days per case. The treatment inputs varied according to the delivery channel, and each delivery channel varied in terms of drugs and supplies, type and time of skilled personnel, and other items required.
- *Unit cost per services.* Calculated using treatment inputs, such as drugs, laboratory tests, human resources type and time, and indirect cost. The project team checked and changed all prices and costs of inputs data to make them more

relevant to the country context. Secondary data collected for input costs included staff salaries and incentives, local prices and costs of laboratory and imaging services, local prices and costs of local visits and inpatient cost, national and international prices of medicines and consumables, and indirect costs including overhead and administrative costs.

Average Unit Cost of Services = Average No. of Drugs, Supplies, and Investigations per Patients per Year × Unit Price of Each Item + Time of Medical Staff Required per Patient per Year × Average Annual Compensation + Average No. of Outpatient Days/Inpatient Day/Patient/Year × Average Outpatient/Inpatient Cost/Patient × Percent of Coverage (Delivery Channels)

EHBP interventions annual cost. The annual intervention cost was calculated by multiplying the annual number of targets with the average total unit cost of services. Finally, the total cost of EHBP was calculated from the annual cost of all interventions and the program cost. All interventions were calculated separately, and the cumulative cost was calculated.

Annual Intervention Cost = No. of Targets × Average Unit Cost of Services

Finally, the total cost of EHBP was calculated by summing up the total annual cost of all interventions and the program's cost.

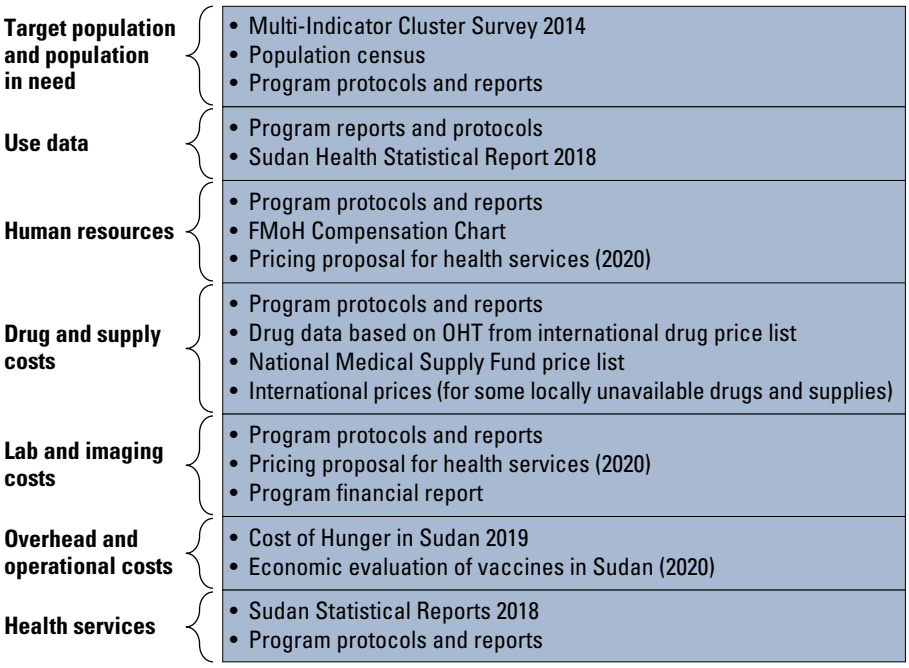
Top-Down Approach

The management cost estimations of programs were costed with a top-down/pragmatic approach based on the aggregate programs' budget for the year 2020, according to the programs' plans and strategies. Those plans captured all standardized activities and output conducted by each program at national, state, and local levels, covering detailed information about the program's human resources, training, supervision, advocacy, monitoring, and evaluation.

Data Used for Costing

Figure 13B.1 presents a list of data sources used in the costing exercise. Additionally, in a series of consultative meetings, program managers and clinical experts provided advice on unavailable data.

Figure 13B.1 Data Sources for Sudan's EHBP



Source: Original figure developed for this publication.

Note: EHBP = essential health benefits package; FMoH = Federal Ministry of Health; OHT = OneHealth Tool.

OHT contains default data based on standard WHO protocols and expert opinions. The national consultant and the study team checked and modified, when necessary, default data embedded in the tool to fit the country's context. Calculations used the following parameters:

- All EHBP interventions were assumed to be available in the base year (2020).
- The study estimated cost using prices for public sector services.
- All services and interventions were costed using national protocols and procedures, except for some services planned but not currently provided. The costing team built the costs using WHO and international protocols.
- For costing purposes, all needed medicines and laboratory tests were assumed to be available.
- Workers' compensation rates were calculated according to average staff grades and salary scale for the year 2020.
- Allowances and incentives for overtime were calculated using the proposed incentive rates developed by FMoH and NHIF for the year 2020.
- Estimated drug and medical supply prices were calculated using the National Medical Supply Fund list of prices and the international price list, built in OHT software.

- Medical testing estimations were based on the proposed medical services' prices developed by FMoH and NHIF for the year 2020.
- The cost of interventions was estimated using inputs data based on standard protocol and guidelines. For some interventions (mainly injury and surgery interventions) specialists were interviewed regarding their current practices.
- The exchange rate used in the costing study was the official rate estimated by the Central Bank of Sudan for the year 2020 (SD 55 = US$1).

The Costing Team

The exercise was conducted by a team composed of a national consultant and technical team from FMoH. That composition is important to facilitate data collection and adoption of the interventions to the national context. The national consultant was a health economist with experience on OHT.

NOTES

1. World Bank Data, Sudan Overview, https://data.worldbank.org/country/sudan?view=chart.
2. World Bank Data, Sudan Overview.
3. United Nations High Commissioner for Refugees Operational Data Portal, Sudan, https://data.unhcr.org/en/country/sdn.
4. World Health Organization Universal Health Coverage Partnership, Sudan, https://extranet.who.int/uhcpartnership/country-profile/sudan.
5. Institute for Health Metrics and Evaluation, Sudan, https://www.healthdata.org/research-analysis/health-by-location/profiles/sudan.
6. Integrated Food Security Phase Classification, Sudan: Integrated Food Security Phase Classification Snapshot, April 2022–February 2023, https://reliefweb.int/report/sudan/sudan-integrated-food-security-phase-classification-snapshot-april-2022-february-2023.
7. The data presented in this chapter refer to 740 interventions developed to inform the final consensus workshops; however, the final number of interventions has since increased from 740 to 824.

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