Sudan Journal of Medical Sciences
Volume 12, Issue no. 3, DOI 10.18502/sjms.v12i3.924
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Research Article

Health Care System in Sudan: Review and Analysis of Strength, Weakness, Opportunity, and Threats (SWOT Analysis)

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Abstract

Background: The Republic of the Sudan located in north-east of Africa and is considered to be a lower-middle income country. The country has well established healthcare system with many drawbacks mainly due to economic and managerial reasons followed by prolonged political instability and sanctions. **Objective**: The aim of this study is to give an insight over the health services system in Sudan and to analyze the strength, weakness, opportunities, and threats (SWOT). **Materials and Methods:** The search was done from two electronic databases: MEDLINE/Pubmed and from public search engines: Google Scholar and Google with key Search words used mainly as "Healthcare system in Sudan". Additionally, SWOT analysis of healthcare system in Sudan was carried out based on the Roemer's model of health service system. **Results:** The Sudanese healthcare system was analyzed for different components of the system: The system in Sudan has full package of strategic plans and policies be it in a long term or short. Despite this there is poor implementation and organization along with frail health information system. The main external factors that drawback the system is the overall economic instability which resulted in cutting of the health expenditure. **Conclusion:** The Sudan is a rich country in terms of natural resources and population. Its health service system has strengths and weaknesses. It needs to build on its qualified human work force, stress on its well-designed short and long-term strategies on health care system and the partnership with external funding institutions, while overcoming the challenges on creating the proper health information system, economic support system and centralization of health service and professionals.

Keywords: Health Care System, Sudan, SWOT analysis

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Received: 15 June 2017
Accepted: 1 July 2017
Published: 4 July 2017

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Editor-in-Chief:

1. Introduction

Health services system of one country is complex, understanding it necessitates the development of a common framework showing the interlinked interactions of the input and output components. Thus in 1984 Dr. Milton Roemer came out with a useful comprehensive model that combines management, resources, organization, and funding as components that end in delivering a health service to the people [1]. This Roemer model of the Health Services System allows to establish a baseline of a country's health service status, future monitoring and development, and also allows for comparison with other countries [1]. Although, health services system is important, it is not the only determinant of a population's status of health [2]. Figure 1 shows the components of the Roemer's model and the relationship between them aiming to study the national health system of any country.

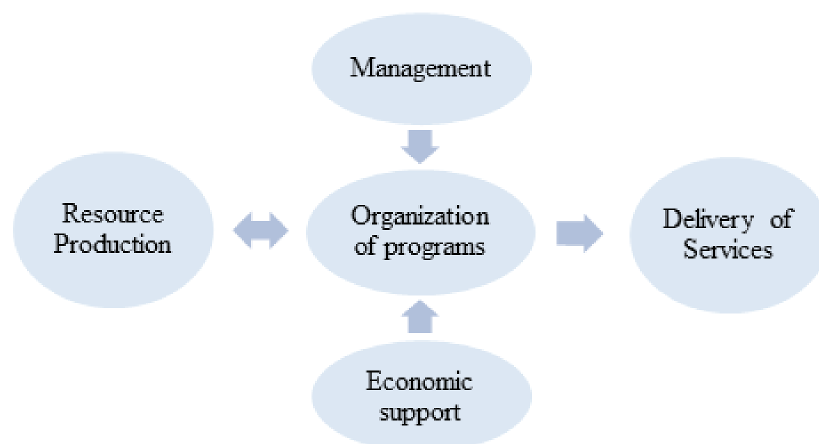

Figure 1: Roemer Model of Health Services System.

The management aspect of the model involves the processes of planning, administration, legislation, and regulation formulations which are carried out by various legal bodies and policy makers of individual country [3]. The mixture of public, private, charitable, and voluntary services providers are the organization component of the model and their size of contribution vary from one country to another. Third is the resource production component which means all resources other than gross finance as healthcare manpower, facilities, technologies, commonalities, and knowledge [3]. Fourth is the economic support which comes from different sources as insurance, governmental revenues, personal out of pocket, charity, or foreign aid [3, 4].

Generally, the country's cultural, political, and economic statuses influence the health services system. In addition to improving the health of its population, a country's health services system is also a major sector of the economy in terms of development, employment, research and, exports, as drugs, instruments, and other medical technologies [3].

Figure 2: Map of the Republic of the Sudan.

The Republic of the Sudan is located in north-east of Africa and is the third largest African country in terms of geographical range after Algeria and Democratic Republic of the Congo, covering an area of 1.9 million km^2 States. Sudan has international borders with seven countries: Egypt, Eritrea, Ethiopia, South Sudan, Central African Republic, Chad and Libya [5]. In 2011, under the terms of the Comprehensive Peace Agreement, the Republic of South Sudan formed in formerly known as southern Sudan states. After the separation, the Sudan lost 75% of the oil resources and almost half of the country's revenue. Consequently, the Sudanese economy suffered losses from the withdrawal of oil revenues and annual percentage of growth rate of gross domestic products (GDP) decreased from 7.8% in 2008 to 3.1% in 2014 [5].

The current estimated population of Sudan is about 41,727,150 people according to the latest United Nations report in the first month of 2017 in which 33.7% of the population were reported living in the urban areas [6]. The population growth is 2.41% in the annual report of 2017. Sudan is a young population country with the median age 19.6 years [6]. The total life expectancy for male and female at birth, a measure of the general health condition and an indicator of the standard of living, was estimated around 62 and 66 years respectively, and this is considered the average of least developed countries [7]. The under-five child mortality rate was 77/1000 in 2015 compared to 128/1000 in 1990 and the maternal mortality ratio was 360/100,000 in 2015 compared to 720/100,000 in 1990 [7]. Sudan is considered a lower-middle income country—with 47% of the population living below the poverty line [8].

In addition to excessive burden of communicable diseases such as malaria, tuberculosis, and schistosomiasis, Sudan is predominantly susceptible to non-communicable diseases, natural and manmade disasters. Drought, flood, internal conflicts, and outbreaks of violence are quite common which bring about a burden of traumatic disease and demand for high quality emergency health care [9].

This review study is intended to identify the strength, weakness, opportunities, and threats of the current status on the health care system in the Sudan.

2. Materials and Methods

This is a review study about the healthcare system in the Republic of Sudan. Review of several articles was used to gather information about the healthcare system in Sudan. The search was done on 19th to 25rdof January 2016 from two electronic databases: MEDLINE/Pubmed and from public search engines: Google Scholar and Google (2000 – January 2017). The relevant keywords used in the search consisted of terms considered by the authors to describe targeted information about the healthcare system. The search query was tailored to the specific requirements of each database. Search words used were “Healthcare system”, “Healthcare system in Sudan”, “SWOT analysis of healthcare system in Sudan”, and “WHO report on health care system in Sudan”. Later, SWOT analysis was carried out based on the Roemer’s model five components of the health care services.

SWOT analysis is a common systematic tools used by evaluation specialists in any field of study [10]. This method can be used for analysis, for strategic planning, and to discover solutions in public health sector. It specifies the system objectives and tries to identify both internal and external constructive and destructive issues to achieve its objectives [11]. In a broader sense the letters of SWOT include; strengths and weaknesses which are the internal characteristics of a system and compared with other systems to see the relative strength and things that need to be addressed respectively while opportunities and threats are the external chances or elements in the environment to make greater inputs to a system or that could cause troubles to the system [12]. SWOT analysis is an examination of an organization’s internal strengths and weaknesses, its opportunities for growth and improvement, and the threats in the external environment present to its survival [13].

3. Results and Discussion

From the reviewed literature, several strengths, weaknesses, opportunities, and threats were identified. In this section and these findings are presented and discussed based on the five components of Roemer’s model.

3.1. SWOT Analysis of Sudanese HSS

The SWOT analysis of the HSS in the Sudan is summarized in Table 1.

Strengths	Weaknesses
1. Hard and skilled with younger generation workers, 2. Adequate number of health workers and; 3. Increasing number of the supporting staff, 4. Constitution of 25-year long term and 5-year short term strategic plans, and the national health policy extends till 2027 [14], 5. Abundant availability of policies, plans, and strategies. 6. provide free primary health care and emergency services for all citizens mainly the poor [15] 7. Existing Basic Package of Health Services 8. Existing teaching, and state hospitals 9. Enhanced human resource of health policies. 10. Availability of academy of health sciences, accreditation system increasing number of medical and health sciences schools 11. Active international health agencies and NGOs [4]. 12. Availability of updatable country cooperation strategy for WHO and Sudan [16].	1. No clear mechanisms for implementation, monitoring, and evaluation framework for policies and plans in the system 2. Poor quality of data, utilization and dissemination of the information in all components of the health system 3. Fragmented health information system [17] 4. Imprecise managerial systems for coordination and guidance among Federal and State Ministries of Health, Armed Forces, Police, universities, private sector and the civil society [4] 5. Not enough postgraduate training 6. Weak HR functions at the decentralized levels and poor geographical distribution with bias towards urban (Global health workforce alliance, 2012) 7. No continuing professional development policy for the health care 8. Deterioration of civil services due to outdatedness 9. Poor logistic supply (equipment, disposables, drugs. etc.) [19] 10. Out-of-Pocket payments has affected access and utilization of health services [4] 11. Inequitable distribution of health care facilities [19] 12. Lack of preventive medicine and health promotion (primary prevention) 13. Poor referral system. 14. Low spending on health and inefficiency in utilization of available resources [14]
Opportunities	**Threats**
1. Recent political commitments 2. Decentralization leading to better HRH decisions and actions 3. External funding opportunities (WHO, GHWA, GF, GAVI, TAF, MDTF, JICA) 4. Partnerships with international institutes and universities e. g. Leeds, Malaya, Primafamed project (training opportunities) [20] 5. Increase economic growth [21] 6. Health system reform initiative	1. Long-standing economic sanctions [22] 2. High attrition rate of well-trained medical officers and outside trained specialists to the nearby rich Gulf countries for better quality of life and job satisfaction [9]. 3. Most of health legislations are old and require changes to satisfy the new system reforms 4. Most of health legislations are old and require change to satisfy the new system reforms. 5. Economic instability after separation of the southern part of Sudan in 2011 further lowered financing the healthcare system [5]

Table 1: SWOT analysis of HSS in the Sudan.

3.2. Health Services System in the Sudan

3.2.1. Management

Policies and plans in Sudan are produced at three levels federal, state, and district (also called locality) [4]. There is one Federal Ministry of Health (FMOH) and 18 State Ministries of Health (SMOH). The federal level is responsible for provision of nation-wide health policies, plans, strategies, overall monitoring and evaluation, coordination, training, and external relations. The state level is concerned with state's plans, strategies, and based on federal guidelines funding and implementation of plans. While the localities are mainly concerned with implementation and service delivery [23].

In 1992, a ten-year strategic plan was developed to cover the period 1993-2002 as a comprehensive national strategy of the country. Its aim was to improve equity and provide basic health care to all and more sophisticated objectives were targeted including reduction or infant mortality rate, maternal mortality rate, eradication of epidemic and endemic diseases, and achieving 100% immunization coverage [4]. This 10 years plan had realized some of its goals and achieved some progress, however, there were some gaps that required to be filled. Later and in response to the national government initiative of developing a twenty five years strategies for all sectors, a newer nation-wide 25 years strategy for years 2003-2027 was prepared for the health sector by the federal ministry of health [24]. Other medium sized plans are available with different emphases at both federal and state levels [4]. It is important to highlight that although the policy making managerial component is well tailored and up to the standards to some degree, many weaknesses are faced. For example, plans and strategies for health care services although are made for both long and short terms are limitedly implemented [16]. This can be attributed to the high inflation rates, costs of civil wars, cuts in the public social expenditure, and political instability which makes health care a less priority and makes it difficult to implement the plans unless financial and political issues are solved [25, 26].

Federal Ministry of Health, Ministry of Veterinary and Animal Resources, and Agriculture and Corps Ministry are members of what is called the Public Health Council which is the main national legislative body providing regulatory instructions particularly those regarding zoonotic diseases [4]. A major product of this council is the Public Health Act of 1975. Nevertheless, states and localities are empowered to set their own regulations and laws based on their needs. Additional regulatory bodies are available including the medical council and the allied health council which are in charge for doctors and health provider's certification and licensing [4]. National accreditation committee is also established to accredit all health facilities whether in public or private sectors [4]. Similarly to the implementation of plans issue, the laws and regulations are

under practiced and weakly enforced from the legal bodies particularly over the private sector [4], this can be solved via the introduction of a new unit under each SMOH responsible for such laws enforcement and to deal with the poor compliance of the health organizations and providers. Furthermore, it is an identified problem that many acts and regulations require update or amendments [4] and thus legislative bodies like the Public Health Council has to take forward actions in order to prevent further outdatedness and satisfy new changes and demands.

Decentralization of managerial authorities is a characteristic of the Sudanese health system and this has been mainly done via the three tier system described earlier (federal, state, and district) [4]. Another characteristic of the Sudanese health system is the availability of the health information system (HIS) which is one of the first information systems in the region. It involves data collection, processing, analysis, and dissemination. It begins from the district level and goes up to the SMOH and FMOH. The information obtained is used in producing periodic reports and in making decisions [27]. Health information system is also a means for monitoring the progress of plans and strategies and in studying their impacts in the health status. Additionally, it helps in allocating the resources more appropriately with less disparities [27]. On the other hand, the HIS also suffers from recognizable feebleness as well. First of which is that big amount of the community level information are not pooled into the HIS and that some programs collect and use data for their own activities and stop without disseminating their findings [17]. Second is the limited capacity of analysis, utilization, and dissemination of data and findings [28]. The addressed issues were recommended to be solved via an easy to use electronic system that can be accessed from anywhere and to provide training to the statistical technicians [28].

3.2.2. Organization of the Programs:

Health services in Sudan are provided by the Federal and State Ministries of Heath, military medical services, police, universities, and private sector. The districts or localities which are the closest to people are mainly providing primary health care, health promotion, and encouraging community participation in caring for their health and surrounding environment [4]. They are responsible for water and sanitation services as well. This well-established district system is a key component of the decentralization approach pursued in Sudan which gives in turn a broader space for local management, administration and allow for overcoming the leadership and supervision efforts by superior bodies [15].

In 1976, Sudan adopted Primary Health Care (PHC) as the principal strategy for health care and throughout the future plans and strategies PHC was emphasized on [4]. The PHC facilities are the PHC units staffed by community health workers, dressing stations

Rural/community hospitals	100,000 – 250,000
Health center	20,000 – 50,000
Basic health unit (PHC unit, or dispensary)	5,000

Table 2: Standard population covered by health institutions.

staffed by a nurse, dispensaries taken care of by a medical assistant, heath centers and rural hospitals run by doctors. Health centers are receiving referrals from lower units and are both managed by the concerned localities. The rural hospitals also receive referrals from both the health centers and lower level facilities and are on average capable to receive between 40-100 patients and is managed by the State Ministry of Health. Tertiary teaching, specialized, and general hospitals present in the capital cities of the states are also operated by the State Ministry of Health and by the Federal Ministry of Health.

There are many health programs served by these units, centers, and hospitals. The most important of which are those regarding maternal health and family planning, Child care and immunization, and control programs of communicable diseases including Malaria, Schistosomiasis, Tuberculosis, HIV/AIDS, Leishmaniasis, sleeping sickness, Filariasis, river blindness control and non-communicable disease control programs [4].

In addition to above, private sector of health care also provides wide range of health services and is mainly profitable. There are many private clinics, health centers, and hospitals all of various levels of care and specialized services [4]. On the other hand, non-profit organizations caring for many different programs are also widely spreading in Sudan and are functioning in coordination with the federal ministry of health. For instance, Médecins Sans Frontières (MSF) ran a number of hospitals is some States particularly those undergoing armed conflicts and operated some health clinics [29]. These hospitals provided secondary care, consultations, and hospitalization when needed, while health clinics provided reproductive health, antenatal care, on top of other basic primary care services. Furthermore, in collaboration with the FMOH, MSF conducted vaccination campaigns and operated some newly introduced mobile clinics concerned with education, vaccination, and child and women care [29].

In general, the FMOH has always recognized the internal conflicts as a primary reason of health care decline [8]. This disruption of the health system is in the form of health infrastructure complete destruction or the need for maintenance and repair. This condition has been throughout the past decade and a study on health system indicated that many health facilities are not functional as a result of dilapidated buildings and lack of necessary equipment [28]. However, there are several new commitments that are people centered, long-term and has wider scope to achieve the SDGs. The Sudan has

also made some health sector reforms in order to assure the health care is a right, universal, participatory, sustainable and provides equity in all levels [30, 31].

3.2.3. Resource Production

Resource production of human, facilities, commodities and knowledge remains to be the mainstay of Sudan healthcare system. Human resources for health (HRH) are very important asset for health systems worldwide and Sudan in particular [32]. Recently the HRH is all the time more recognized as a significant area for health system progress so that the planning can address the workforce issues. There was a strategic plan for HRH from 2012 to 2016 in Sudan: with the purpose of developing human resource plans and guidelines in all levels and areas of health system in a wide-ranging tactic [33]. The aim of the strategic plans defined towards reaching the aim accordingly by prioritizing the issues in the human resources planning, production and training, distribution, management and improving the existing policies [21].

Training and production of health workforce in Sudan increased tremendously in the past 2 decades as a result of increased numbers of medical training schools both on the public and private sectors. There are over 100,000 health workers making over 20 different professions [21]. The picture of Sudan health workforce today shows almost equal distribution of female and male. The age structure points to a rather young health workforce probably due to the recent expansion of medical education and health training [4]. The Ministry of Higher Education is responsible for pre-service training and production of health workers through a total of more than 13 universities with medical and health science facilities, and 250 allied health cadre's schools and institutes. Medical Council is delegated with registration and licensing of doctors, pharmacists and dentists. Majority of health workers are employed by the civil service under the Federal and State ministry of health in addition to lower numbers in the army, police, universities and health insurance fund. Exclusive private sector staff represents only 9%, taking into account that dual practice is very common [32].

The number, ratio and type of health workers differ from state to another. The doctors to nurses ratio was 1:1.7 in 2006, 6:1 in education conduit, and improved to 1:2.5 in 2013 [34]. The proportion of medical doctors, nurses and midwives is 1.23 per 1000 population the country is still within the critical shortage zone according to the WHO criteria of 2.28 health care professionals per 1000 population [4] and currently Sudan has one physician for every 3,333 population according to world bank report [35]. In spite of the increasing production of manpower every year to meet the needs of the healthcare system, still there is deficiency in the human resources [33]. The main problem is migration of trained professionals like most African countries, in addition to the poor management and rationale distribution of the existing physicians and

paramedics [36]. So far Sudan has lost almost 60% of its physicians due to outmigration [37]. When comparing Sudan with Cuba they both have equivalent level of economy. But Cuba is one of the countries with the lowest number of patient to doctor ratio in the world. First medical education in Cuba is free [38], all doctors interested in specializing must first serve two years working in primary care, and graduating doctors are not driven to specialize by salary incentives. This Cuban approach towards medicine and medical education assures the human resources necessary to provide universal and preventative healthcare to all [39].

Following on the geographical pattern of health services inequitable and uneven distribution of the health workforce is prominent in Sudan. According to the 2006 survey report, nearly 70% of health personnel work in urban settings serving about 30% of the total country population. More than one-third of the total health workforce is located in the capital city. Around 67% of health workers staff are working in secondary and tertiary facilities,as opposed to only 33% in primary healthcare settings among which 62% of the total specialist doctors and 58% of technicians are practicing in Khartoum state [21] . The government of Sudan introduced a law of compulsory one year placement similar to the Cuban, nevertheless there is no enforcement of this policy [40]. Moreover, the non-conducive environment discourages the health professionals from continuing their posting in the rural areas which attributes to the high production with low employment [41].In terms of knowledge, the research program for resource production part of the healthcare system in Sudan was established as the health system research unit at 1998 with the help of WHO but has minimal contribution to the system [42]. There are limited information regarding commodities for instance, drugs.

3.2.4. Economic Support

Sudan is bestowed in terms of natural and human resources, but economic and social development have been below expectations. Likewise, the data on health financing and expenditure is deficient and incomplete. It makes it difficult for decision makers to plan, distribute and clearly see the deficient area. Regardless of the external threats such as brain drain, prolonged economic sanction and separation from South Sudan that brought down the economic support to achieve the goals, the weaknesses with in the healthcare system internally is not satisfactory [43, 44]. The government is upholding towards ensuring that resources for health are used for intended purposes and to safeguard that the financial management system meets national and international standards, and produces reports appropriate for making decisions [8].

The available information showed that the overall government health expenditure is very low and the health sector is under-funded [4]. As overall government expenditure, has increased largely due to growth in oil revenues, allocation to health sector in absolute terms have also increased until 2011. GDP per capita for 2001 estimated at $395 when compared to $282 in 2014. The total health expenditure as percentage of the GDP was 5.4-8.5% and 8.4% for the year of 2000 and 2014 respectively [7].The main resources for states health budget come from the ministry of finance. It is noted that at best the expenditure of the allocated budgets never exceed 70% and most of it comprise the salaries component. The national states support fund gives support to some states, which is automatically added to the state's budget. Part of the budget comes from household's direct contribution through user fees or through health insurance premium [45].

The National Health Insurance Scheme, introduced in the mid-1990s which covers about 8% of the population, most of them are government employees (75%), the remaining are poor families (6%), families of martyrs (3%) and students (2%). The program is reported to spend around US$ 90 million annually, 40% of which goes to health care services and 30% to drugs. It is estimated at around 1% of GDP. However, the coverage by the National Health Insurance Fund (NHIF) increased from 25% in 2007 to 34.3% in 2012 [46].In contrast the user fees for government health services were introduced in the mid-1990s, including exemptions for vulnerable groups and for emergency services.

Like most African countries, the Sudan follows the out-of- pocket model and minimal national health insurance to some extent which benefit the better off. The increase in expenditure rose from 64% in 2008 to 70% in 2011 which is the highest in the regional countries and much higher than the WHO uppermost level (40%) [46]. This system resulted in gross disparities, that spending is highly skewed towards those who can afford only [45]. This also gave rise to deterioration of public health care in the area far from center due to lack of financial resources and managerial capacities. There are countries with minimal financial resource but still managed efficaciously by adapting different models. For instance, Cuba is the best example that practices the extreme Beveridge Model in which the government entirely control all the healthcare system and successfully accomplished so much with so little to came up with all health indicators [47]. This system assured equal distribution and the government acts mostly at the PHC stage making it easier for the expenditure by preventing the disease instead of treating [48].

The international assistance to the health sector in the past decade has not been significant but there were some international communities committed to work with the government for recovery and development including health services are managed by the World Bank. The donors' inputs for health through FMOH in the year 2002

amounted to US $ 20 million, which comes to US $ 0.6 per person. While the allocated budget for the NGOs working in Sudan is estimated at US $ 41 million in 2002. The donors' inputs are generally on control of communicable diseases (Vaccine preventable diseases, Malaria control, TB control, Leprosy control, HIV/AIDS, G. Worm control and control of river blindness), nutrition and PHC and significant amount goes to other basic social services other than health [8, 15].

3.2.5. Health Service Delivery

The health services provided in Sudan follow the classical three basic arrangements, primary, secondary, tertiary health care. The primary health care is the first encounter for the patients and includes as mentioned in the organizations the dressing stations, dispensaries, primary health care units and health centers, the latter forms the referral point from the lower facilities [4]. The importance of PHC is that it provides the essential care to all and improves the health status of the community as a whole [49]. In 2003 a package of health care services was introduced to the PHC facilities. This package included vaccination of children, nutrition, reproductive health (RH), integrated management of childhood immunization (IMCI), management of common diseases and prescribing the essential medications [4]. This line of care is almost entirely provided by the public sector.

On the other hand, both public and private sectors work together in the provision of the secondary and tertiary lines of care. Though, the private sectors has been functioning mainly in urban areas [4]. Screening, diagnostic, and therapeutic services are being provided in both health centers and hospitals as secondary care, where major surgical, rehabilitative, and subspecialized tertiary care is being provided mainly at larger public hospitals including teaching hospital, private hospitals, and in specialized centers. These hospitals and centers accepts patients without being referred from the lower facilities indicating a poor referral system [4]. In the last decade, the number of hospitals has been an increasing trend and it continues to be.

It is agreed that a core component of primary health care is health promotion which is limited in Sudan while health problems suitable for health awareness campaigns are present including the enormous communicable diseases, malnutrition, and even the non-communicable diseases [50]. Furthermore, in regard to the services provided at the PHC, these services are not achieving optimum utilization rates [4]. For example, only 81.6% of PHC units provide vaccination for children and 67.3% provide family planning services. Although, these numbers are improving in comparison to the past, they are not ideal and further emphasis on coverage, availability, and accessibility is required [51]. Another notifiable weakness regarding PHC, is that unlike the secondary

and tertiary services that are increasing in number, PHC units are decreasing either due to cessation of function or in comparison to the population growth [4].

4. Lessons Learned

The analyses of Sudan Health System revealed strengths and weaknesses that can be learned to improve the system;

4.1. Plans and Strategies

The strength of the system is that they have several long-term and short-term policies and strategies but as it was seen that it was insufficient because there is no sustainability and no continuous updating of the implemented plans. Moreover, the deficiency of research and fragmented HIS didn't assist the government to act accordingly and identify the pitfalls of the system.

4.2. Human Resource

Sudan 's human resource development has increased throughout the years which positively affected the service delivery but weak governance and management systems especially at state and locality levels resulted to the failure of deployment, revitalization and the poor distribution downsized the work force ability. It is critical to have effective governance for developing strategic policies, designing, funding, and implementing plans for human resource.

4.3. Stakeholder

The involvement of Stakeholders like the army, police, universities agencies, NGO's, banks, countries donors and others has contributed to the system definitely in supporting and maintaining health economic supplies but building partnership with the communities and civil society organizations is of paramount importance in changing health scenario as public is considered to be the pillar of the health system.

5. Conclusion and Recommendations

A healthcare system is the organization of people, institutions, and resources that deliver health care services to meet the health needs of target populations. The Sudan HSS formation goes back to more than one century but healthcare in Sudan is never without its problems. This paper tried to guise in to the system functionality internally

and externally. The weaknesses are predominantly seen but this desperate state of affairs is down to combination of many factors. One is lack of resources in general. The Sudan is not a wealthy country and the long-standing economic sanctions have also severely impacted the country's ability to run a functional, robust healthcare system along with constant attrition of health professional numbers. Another reason for the recent downward spiral in healthcare provision is the economic impact after the Sudanese post-secession economy dysfunction the one which had its staggering effect from one fiscal cliff to the next.

The Sudan has under gone decentralization; however, historically, it has experienced challenges and issues in coordination between HRH policies and overall health planning, as well as difficulty in translating national level planning to all levels of a decentralized health care system. Coordination between health and education sectors has been weak, resulting in misdistribution and imbalance in the production of health workers in certain professions. The healthcare strategy enforcement, appropriate resource allocation changes and improved communication system in different level of the system components are the main pathways to accomplish the goals that needs to be achieved. Recently Sudan has also achieved several goals. The country worked with WHO along with other alliance to establish the national HRH observatory and developing a national comprehensive and evidence based HRH policy for the health sector with engagement of all related stakeholders. It also accomplished health-related millennium development goals (MDG), if not reach the goal it improved in a lot of senses. Sudan needs to work more on the strengths it has and use the opportunities available in order to improve the basic health indicators.

In order to improve the current healthcare system in the Sudan, various actions may be considered. First, establishing law enforcement units in districts, SMOH, and FMOH can greatly enhance compliance to existing policies. Also, developing a communication system between all levels of policy making can allow for proper and timely decisions of continuation, amendment, or even termination of these policies. Second, it is also recommended to not only monitor the implementation of the ongoing activities and programs but to pay extra attention to the outcome evaluation. It is also encouraged to further promote the use of HIS, improve quality of data, and emphasize on importance of dissemination of findings. Third, providing medical personnel with incentives, providing fundamental infrastructures, and increasing the paramedic to physician ratio to meet the standard can potentially reduce the high attrition rate of professionals. Lastly, upgrading the facilities of PHC delivery services and building newer units to meet new demands and population growth is recommended as well as applying a bottom up approach with major emphasis on community empowerment, disease prevention, and health promotion.

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