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Commentary

The fight against the COVID-19 pandemic: Vaccination challenges in Sudan

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ABSTRACT

The first COVID-19 case in Sudan was announced on March 13th, 2020. 1835 deaths were recorded as of February 7th, 2021. 800,000 doses of the Oxford-AstraZeneca vaccine were allocated to Sudan through COVAX in March 2021. However, multiple challenges exist in vaccinating the Sudanese population, ranging from an inadequate cold chain system to low acceptance rates of COVID-19 vaccination among the Sudanese population. Economic crises, high inflation rates and long-standing economic sanctions have also negatively impacted the healthcare system in Sudan as a result of deprivation of access to research and development funding.

1. Introduction

Sudan announced the first COVID-19 case on March 13, 2020 [1]. On February 7, 2021, a total of 50,003 suspicious cases were recorded in Sudan, with 27,717 (55.4%) testing positive and 1835 deaths [1]. The state of Khartoum accounts for 72.5% of all confirmed cases in Sudan, followed by the state of Gezira at 8.4% [1]. The "20–29.9" age group is the most affected, accounting for 23.0% of confirmed cases, while those aged 60 and over account for 60.0% of deaths [1]. COVID-19 was found in 77.0% of 1023 health workers screened across Sudan. With a positivity rate of 95.3%, Khartoum state accounts for 38.0% of the total tested health personnel [1]. Researchers ended up with 15 authorized vaccines among different countries [2]. Sudan was the first country in the Middle East and North Africa to receive the COVID-19 Vaccines Global Access (COVAX) vaccine [3]. It was supplied by over 800,000 doses of AstraZeneca's vaccine with an immunization supply chain that consisted of the national store, 18 state stores, 183 locality stores and 2, 421 service points [3].

2. Challenges of Sudan cold chain system

Sudan has a descending economy during the transitional period, leading to several challenges with the defective immunization supply chain. By the end of 2021, Sudan is expected to receive a total of 17 million doses from the COVAX facility, covering only 20% of the population [3]. In addition, more than 38 million doses are expected to be procured to cover a minimum of 45% of the Sudanese population, before herd immunity can be achieved [3]. Efficient transport and storage of

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the Oxford AstraZeneca vaccine at 2–8° are required for maximum efficacy [4]. Vaccine transportation is not instated in Expanded Program on Immunization-Immunization Supply Chain (EPI-ISC) and no clear budget is allocated for vaccines distribution at a lower level [5]. Furthermore, lack of refrigerated vehicles, inadequate distribution fleets to match the expansion in EPI services, and poor road infrastructure make it challenging for good distribution practice [5]. Delay in resources mobilization and procurement of new equipment, slowing the distribution of COVAX immensely outside of Khartoum [1].

2.1. Distribution of the vaccine

Sudan's initial emphasis was on direct reductions in morbidity and mortality, as well as the restoration of the most basic essential services; however, it soon grew to include reducing the spread of disease and disruption of social and economic functions [1]. This was accomplished by immunizing 3% of the population, including frontline healthcare workers (HCWs) who have direct patient interaction as well as the elderly with comorbidity. The first wave of COVID vaccines preceded the goal of 4% of the population [1]. Then, based on the prioritization exercise, 16% of the population was covered to optimize the gain from the COVAX facility, which was then expanded to cover 20–60% of the population using the window of cost-sharing [1].

3. Vaccination phases

3.1. Phase 1: (very limited vaccine availability, 4% of the population)

This phase intends to target frontline healthcare workers working on Covid-19 Isolation Centers, Hospitals, Primary Healthcare Centers and out-patient clinics. 500,000 healthcare workers (HCWs) are planned to be covered, together with over-45s with medical conditions and living in areas with anticipated high transmission [1].

3.2. Phase 2: (limited vaccine availability, for 3–20% of the population.)

Phase 2 targets over-45s with chronic medical conditions, teachers and school staff and workers in essential jobs who cannot avoid a high risk of exposure to COVID-19, such as in centers for public services, transportation, energy, armed forces and bankers. Also, phase two will target people aged 16–45 years with medical conditions, over-45s without comorbidities, and over-16s living and working in crowded accommodation where self-isolation and social distancing are difficult to maintain, such as in detention facilities, incarcerated people, refugees and internally displaced people (IDPs) [1].

3.3. Phase 3 (moderate vaccine availability, for 21–50% of the population)

The third phase targets pregnant women, lactating mothers, people aged 16–45 years who did not have access to the vaccine in prior phases, children and adolescents up to 16 years [1].

3.4. Guideline for COVID-19 vaccination for Sudan

The Adverse Events Following Immunization (AEFI) committees were activated at all levels to ensure demand, community awareness, and social mobilization plan implementation [1]. In Sudan, the COVID-19 surveillance system was revised to detect immunization status [1]. The Federal Ministry of Health (FMOH) and collaborators formed COVID vaccine coordination and preparation committees, with the National Immunization Technical Advisory Group (NITAG) actively involved in all decision-making processes and supporting implementation [1]. Also, Information and Communication Technology (ICT) programs facilitate the preparation, scheduling of vaccines, the tracking, assessment of the vaccine program's progress and effectiveness [1].

3.5. Political commitment of the government toward the third phase of vaccination

Financing the third phase of COVID-19 vaccination needs the willingness of the Sudanese Government to pay for the third phase in the middle of the economic crisis following recent Democratic change [3]. Besides the lack of internal funding and support, Sudan's healthcare system has suffered the consequences of long-standing economic sanctions that lasted for 20 years and ended in 2017 [3]. The Sudanese government needs to collaborate more with other external organizations to fund and assist with improving access to vaccines among the citizens. This is considered the only way to achieve the goal of vaccinating 50% of the population and without this, the COVID-19 Situation is expected to get worse in the country.

4. Conclusion

Sudan faces a variety of challenges in adequately vaccinating the population against the COVID-19 pandemic. Amid a struggling economy, the cold chain system in Sudan remains under-resourced and cannot meet the expected increase in capacity required to store additional doses obtained through COVAX, procure and mobilize new equipment, thus culminating in an extremely slow vaccine distribution outside Khartoum State. A call to action for governmental, non-governmental organizations to implement a multilateral approach to address financial and logistical vaccination challenges. Moreover, increase awareness among the public and health professionals to address vaccine hesitancy is needed.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.puhip.2021.100205.

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