

# The Impact of the Sudanese Conflict on the Initial Tenuous Health System

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## Abstract

Sudan, the largest country on a catastrophic continent and deadlocked nation, undoubtedly offers one of the most sad war stories. Civil wars, conflicts, tuberculosis, and malaria are competing in Sudan to become the biggest killers. Due to resource competition and colonial policies, Sudan has been embroiled in an ongoing conflict that has resulted in severe poverty, social service disruptions, and displacement. The nation's infrastructure and health services are being seriously undermined by the intensifying power struggle between the paramilitary Rapid Support Forces (RSF) and the Sudanese Army Forces (SAF), which is making the humanitarian crisis worse. We evaluate the body of research that has been done on the armed conflict in Sudan and the ensuing health catastrophe. To estimate the number of patients who died during the devastating conflict as a result of access issues or a lack of essential medical care, questionnaires were employed. The ongoing conflict in Sudan has a significant and pervasive impact on health services, including disruptions in workforce, infrastructure, and healthcare delivery. The recent capture of the National Public Health Laboratory is expected to exacerbate these issues. Sudan desperately needs humanitarian aid, enlisting both domestic and foreign support to restore and reconstruct its healthcare system.

## Introduction

Sudan, the largest country on a catastrophic continent and deadlocked nation, undoubtedly offers one of the most sad war stories. The prolonged war in Sudan has led to a worsening humanism crisis that poses a serious threat to the nation's healthcare system. [1] In May 2023, at least one million people were displaced, 550 civilians were slaughtered, and 4926 were wounded, according to the current report by the Ministry of Health [2]. More than 800,000 people could flee into neighboring countries, the UN's refugee agency has warned [3]. Beyond the direct costs of war on nonmilitant, the invisible side of reality is the incidental and prolonged effects of this war and will have on the health system. Sudanese medics have described seeing piles of bodies in the streets of the capital, Khartoum, people drinking polluted water, and doctors working under bombardments as the battle between the country's two warring generals continues despite a threadbare ceasefire. [4] There were reports of more explosions and struggling in the Bahri and Kafouri neighborhoods of Khartoum North, as well as loud explosions and shelling in Omdurman, the twin city of Khartoum over the Nile. Residents in the southern part of Khartoum said that the

Sudanese Armed Forces (SAF) shelling prompted the paramilitary Rapid Support Forces (RSF) to fire anti-aircraft missiles. Together with governments and partners, UNHCR is being ready in case more than 800,000 people decide to leave the war in Sudan for safer havens abroad. [3] Doctors and relief organizations warned that the country's healthcare system was about to collapse as residents in the capital of Sudan became more and more isolated and fundamental supplies ran out. Thousands of people who were fleeing war that had overrun Khartoum, Omdurman, and sections of Darfur sought refuge in the town of Port Sudan, 500 miles away on the Red Sea coast, which became the temporary administrative capital of the nation. As a result of the disruption of water supply in some areas of Khartoum, especially in Bahri, there had been an increase in incidents of serious illness as desperate people have tried to quench their thirst by drinking straight from the Nile. Based on the medical union, 70% of hospitals "in and around the areas used as battlegrounds are out of service," and others could only offer the most basic first aid because of a shortage of supplies, forcing them to operate at reduced capacity. "A total shutdown of these hospitals is presently a threat due to a shortage of supplies, medical personnel, water, and electricity," [3] Ahmed Al-Mandhari, the regional director of WHO for the Eastern Mediterranean, stated that fighting parties had taken over hospitals in Khartoum and Sudan's central public health laboratory, disrupting reception of basic medical care and resulting in a "instant halt to the testing of critically important laboratory samples." He called on everyone to leave the premises, claiming that the laboratory had measles, cholera, multi-drug resistant tuberculosis germs, vaccine-derived poliovirus, and other dangerous chemicals. (5)The battle has been going on for a while and involves various armed groups vying for supremacy. [6] However, on April 15, 2023, a severe upsurge in armed conflicts occurred, signifying a notable increase in hostilities. Sudan saw a startling total of 865 deaths and over 5,424 injuries between April 15 and the time this piece was written, providing a somber picture of the human cost of the fighting [7]. A significant number of people have been forced to flee their homes as a result of the unnerving turmoil, with an estimated 1.4 million people affected. An estimated one million internally displaced people still live inside Sudan's borders, and an additional 330,000 have fled over the borders of neighboring countries. [7]. Medical professionals have been forced to evacuate and health facilities have been damaged or destroyed as a result of the violence. The population's health has suffered as a result, with many finding it difficult to obtain basic medical care. Biological dangers have also been brought about by the recent takeover of the National Public Health Laboratory, since the facility houses isolates of cholera, measles, and polio [8]. Numerous medical facilities around the nation have closed as a result of the violence. Emergency, a nonprofit that manages a number of medical institutions in Sudan, claims that on April 15, the violence forced the closure of a pediatric center in Khartoum. The city's cardiac surgery hospital has likewise been compelled to limit its hours of operation to emergencies. [9] UN agencies reported that more than 100,000 individuals had fled Sudan to neighboring countries on May 2, 2023, including refugees from these countries; this number might rise to 800 000 very fast. Within the nation, about 330 000 individuals have been forced to flee. The majority of hospitals are either closed or only open during emergencies. A fear of bomb strikes has caused banks, marketplaces, and stores to close. As a result, the already severe scarcity of food and drinking water is getting worse and food costs are rising. Since 65% of Sudanese people were living in poverty even before to the most recent conflicts, the country's humanitarian needs are growing quickly. Citizens of Western embassies are being evacuated. [10] If the violence continues, the country's health system will completely collapse, according to the International Federation of Red Crescent Societies [11]. As of April 19, the fighting had forced the closure of 39 of the 59 hospitals in Khartoum and the neighboring states, as well as their evacuation. 11].

Medical supply shortages are reported by operational medical facilities. According to WHO reports, Khartoum's medical facilities are lacking in essential supplies such as intravenous fluids, transfusion equipment, blood, and other items needed to treat injured patients. [12] One of the primary causes of these shortages is the shutdown of numerous land routes and airports. [13] Health professionals have reported attacks on medical institutions in addition to the scarce of medical supplies. Some medical professionals in Khartoum stated that strikes had occurred while the facility was still open. Prior to its evacuation, the al-Moallem Hospital was also struck by missiles. [14] Medical supplies and other equipment were taken from Save the Children's Darfur offices by armed groups during their invasion. [13] Because medical personnel could not get to the hospitals due to the fighting, even hospitals that were far from the conflict had to close. [15] The objective of the current study was to quantify the impact of the Sudanese conflict on the preliminary tenuous health system.

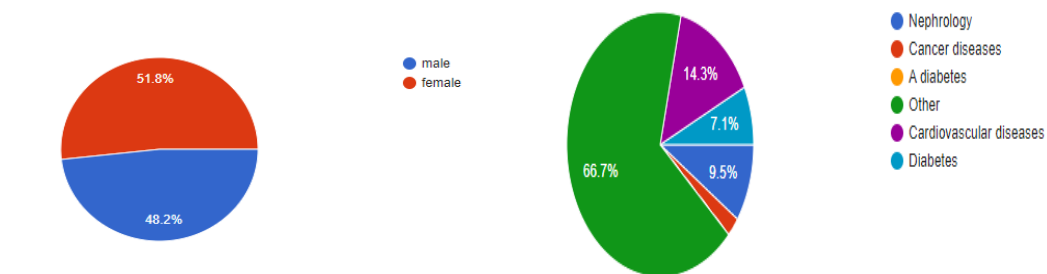
### Methods

This survey is divided into two sections: an online questionnaire survey and a scoping study, which is mostly based on a literature evaluation. In the scoping review, we review the literature on the current materials on the armed war in Sudan and the attendant health crises. Based on the findings of the scoping review, an online questionnaire survey were used to gather more data and information about the current state of patients with infectious diseases or chronic illnesses in Sudan, as well as issues pertaining to the armed conflict there. It will also be used to tally the number of patients who perished during the devastating war because they were unable to access necessary medical care or services.

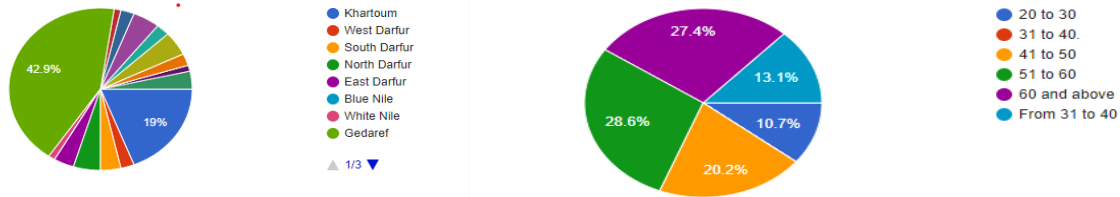
### Result

The outcomes of this study manifest the tragic impacts of the ongoing civil war on health services: 70% of hospitals and primary care facilities have been completely closed for more than six months, starting on April 15 and continuing until the writing of this article; additionally, the inability to reach those still open has resulted in a shortage of critical supplies, laboratories, and surgical equipment, endangering the lives of thousands of patients with infectious diseases and persistent illnesses.

The graphs and images bellow showing details.



Males (48.2%) to Females (51.8%) ratio of patients with chronic disorders and other infectious diseases



The graphs showing the impacts on different states and patients' ages categories



[16] The picture showing Sharg Alneel Hospital [17] .The picture showing Doctors hospital in Khartoum.

### Discussion

The results of this study unequivocally demonstrate the extraordinarily violent armed attacks against medical and health foundations, violating volunteers and medical staff. The lives of children, elderly women, and men are at risk because 70% of hospitals and primary health care facilities have been completely closed for longer than six months. Inadequate access to transportation and insufficient medical care for cancer patients, persistent renal failure patients, pregnant women, and people with other infectious and chronic illnesses. This study found that of patients with chronic illnesses, cancers, and infections with dengue fever or cholera, 51.8% of the female patients and 48.2% of the male patients died as a consequence of inadequate admission to transportation or inadequate medical care, primarily in the Gadaref state in eastern Sudan, where 42.2% of patients died from the widely spread dengue fever and cholera infections over the course of four months, followed by Khartoum (19%). West Kordofan 4.8% in addition to Al-Jazeera 4.8%, while North Kordofan 2.4, Red Sea 2.4, River Nile 2.4, and Sinnar 1.2% are included in the Darfur Stats [North 4.8%, Central 3.6%, East 3.6, South 3.6%, and West 2.4%]. Infectious diseases accounted for around 66.7% of the harvest, with cardiovascular disorders coming in second at 14.3%, nephropathy at 9.5%, diabetes mellitus at 7.1%, and cancer at 2.4%. These patients range in age from 50 to 60 and 60 and older, respectively, and the majority of the casualties are members

of the working class. The International Federation of Red Crescent Societies has warned that if combat continues, the nation's health system will completely collapse. This research's finding is in line with their warning. [3] According to WHO, Khartoum's medical facilities are suffering from a blood, transfusion equipment, intravenous fluid, and other critical supply shortfall that makes it difficult to treat the injured. [18] As long as the conflict persists, millions of people will face severe food shortages. Since the combat began on April 17, 2023, and it was the third day, residents of Khartoum reported running out of food and water. <sup>[11]</sup> Nearly 16 million people in Sudan are in need of assistance, making it one of the worst humanitarian crises in the world. Many people are unable to afford enough food due to the economic collapse and severe inflation, and Sudan has one of the highest rates of child malnutrition in the world. Furthermore, it is deemed exceedingly risky that a National Public Health Laboratory in Khartoum, which holds biological material that could be harmful, was recently taken over. The correct handling of biological materials (isolates of cholera, measles, and polio) is hampered by power outages and the dismissal of medical laboratory professionals. [19] To address the effects of bodies dumped on the streets and into the River Nile on the environment and public health, more research is required.

### Conclusion

The April conflict has an impact on many aspects of daily life, including the scarcity of food, water, fuel, and medication; it also affects banks and financial services; it disrupts the internet, telecommunications, and electricity supply; it destroys health facilities; and attacks on the healthcare system cause hospitals, ambulances, and laboratories to become distracted, patients, healthcare providers, and warehouses. Since the conflict began till August 2023, 150 attacks have been reported to the WHO Surveillance System of Attacks on Healthcare. The WHO states that over 80% of the nation's hospitals are currently closed. The recent capture of the National Public Health Laboratory is expected to exacerbate these issues. Sudan desperately needs humanitarian aid, enlisting both domestic and foreign support to restore and reconstruct its healthcare system.

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