Returning to Khartoum:

Health Challenges, Post-Conflict Risks, and Prospects for Humanitarian Response

Towards an Integrated Strategy to Protect Returnees and Strengthen the Health System's Preparedness during the Recovery and Reconstruction Phase

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Executive Summary

Background

Following the Sudanese army's announcement in May 2025 of the restoration of control over Khartoum State, the capital experienced a large-scale return movement unprecedented since the outbreak of war in April 2023. Khartoum State recorded the highest rate of returns nationwide, with approximately 1.4 million IDPs returning [1]. The number of IDPs in Sudan peaked at approximately 11.5 million in January 2025, subsequently decreasing to 9.1 million due to these return waves [2,3].

However, the return to Khartoum is not a return to the city its inhabitants once knew. The capital, as it welcomes its people, faces extremely complex health challenges, compounded by devastating infrastructure crises, epidemic outbreaks, the threat of unexploded ordnance, and profound psychological trauma. This report identifies these primary challenges, reviews the current situation, analyzes existing gaps, and proposes urgent interventions and practical recommendations for decision-makers and humanitarian partners.

Key Risks in the Forthcoming Phase

In August 2025, the presence of landmines was confirmed in multiple locations in Khartoum, including anti-personnel mines in the Al Mugran area and anti-vehicle mines in Omdurman and Bahri [4,5]. This marks a dangerous development, as Khartoum State was previously considered mine-free despite contamination with unexploded ordnance [4]. Extensive contaminated areas remain unmonitored, awaiting comprehensive survey.

Explosive ordnance contamination poses a serious threat to civilians, particularly children. Affected areas span approximately 7,700 football fields nationwide, with over half resulting from the 2023 war [6]. In addition, seasonal risks are escalating, with an increased risk of floods during the rainy season. The World Health Organization has documented four major floods since 2013, all of which exacerbated disease spread, increased displacement, and further strained an already exhausted health system.

Regarding funding, the $4.2 billion Sudan Humanitarian Response Plan for 2025 is currently only approximately 25% funded [7,8]. This shortfall threatens the continuity of humanitarian operations and may force organizations to scale back critical, life-saving interventions.

Key Recommendations for Decision-Makers and Humanitarian Organizations

- **Restore Essential Health Services:** Urgently rehabilitate hospitals and primary care centers, rebuild medical supply chains, and provide incentives to re-engage health personnel.
- **Prioritize Water and Sanitation:** Investment in clean water infrastructure is imperative to mitigate recurrent waves of cholera and other epidemics.
- **Ordnance and Mine Clearance:** Accelerate the detection and clearance of mines and unexploded ordnance, while expanding risk education programs in returnee communities.
- **Mental Health Support:** Integrate psychosocial support services into the humanitarian response system to address trauma resulting from displacement and war.
- **Close the Funding Gap:** Call upon the international community to urgently increase humanitarian funding and ensure humanitarian partners can access Khartoum without bureaucratic impediments.

Gap Analysis

Gap analysis shows discrepancy between actual needs and available resources

Actual Needs:
Strengthening primary healthcare services, ensuring the provision of essential medications for chronic and infectious diseases, increasing hospital capacity, enhancing laboratory and diagnostic capabilities, expanding emergency and ambulance services and intensifying epidemiological surveillance activities.

Available Resources:
A limited number of operational health centers, frequent shortages of essential medicines and medical supplies, limited bed availability and medical equipment, a scarcity of specialized healthcare personnel, weak ambulance networks and operational resources.

Main Findings of the Paper

- The return to Khartoum is a widespread and real phenomenon, occurring under extremely fragile conditions.

- The health system is in a state of near-complete collapse, with recurring epidemics.

- Unexploded ordnance and landmines pose a direct and existential threat to returning populations.

- A severe funding gap undermines the ability of humanitarian organizations to respond effectively.

- Recovery is contingent upon sustainable security, comprehensive infrastructure rebuilding, and a consistent flow of international financing.

First: The Current Health Situation in Khartoum State: A System Striving to Rise

The recent conflict exposed the extreme fragility of Khartoum's healthcare system. The war rendered 73 out of 80 private hospitals non-operational due to destruction, looting, and the conversion of some facilities into military barracks, resulting in estimated losses exceeding $14 billion for the health sector [9,10].

Despite this devastation, the health situation experienced a relative improvement during 2025. The number of operational hospitals increased from only 7 during the war to 34, and 214 health centers across various localities returned to service. This contributed to alleviating pressure on hospitals and providing primary care services to citizens [9].

However, this improvement remains precarious in comparison to the scale of actual needs. Preliminary estimates from the Ministry of Health indicate total damages to the health sector amounting to approximately $11 billion [10]. The gravity of the situation is exemplified by the Heart Hospital, which has lost three cardiac catheterization machines and requires at least one to resume operations. This facility is the capital's sole hospital with a 24-hour cardiac trauma department.

Concurrently with the weak infrastructure, operational hospitals have experienced severe overcrowding, leading to queues for intravenous solution administration amid a rising prevalence of fevers. The Ministry of Health has acknowledged the difficulty of controlling disease vectors due to their widespread nature.

Second: Health Challenges Associated with Population Return: Epidemics and Growing Risks in a Fractured Environment

As families return to their homes after displacement, attention to health and disease prevention becomes increasingly critical. Poor water and sanitation services and the accumulation of waste may lead to the spread of numerous infectious diseases if necessary precautions are not taken.

1. Prevention of Cholera and Waterborne Diseases

Cholera is a severe diarrheal disease that can be life-threatening if not treated promptly.

Cholera Prevention Measures:

- Drink safe, treated, or boiled water.
- Wash hands with soap and water before eating and after using the toilet.
- Store food hygienically and keep it well-covered.
- Ensure safe disposal of waste and refuse.
- Seek immediate medical attention at the nearest health center upon the appearance of severe diarrhea or repeated vomiting.

2. Malaria and Dengue Fever Prevention

Malaria and dengue fever are mosquito-borne illnesses, with prevalence increasing during the rainy season and in areas with stagnant water.

Prevention Methods:

- Sleep under insecticide-treated mosquito nets.
- Keep doors and windows closed or use protective netting.
- Eliminate stagnant water sources around residential areas.
- Wear clothing that covers exposed skin, particularly during the evening.
- Seek medical attention if symptoms such as fever, chills, or severe headache develop.

3. Care for Patients with Chronic Diseases

Patients with chronic conditions such as diabetes, heart disease, hypertension, and kidney failure require continuous medical follow-up and uninterrupted treatment.

Important Recommendations:

- Store medications in a safe and appropriate location.
- Attend scheduled appointments at health centers.
- Do not discontinue treatment without medical advice.
- Seek immediate medical assistance if any complications or unusual symptoms arise.

4. Maintaining General Cleanliness

Personal and environmental hygiene are crucial for disease prevention.

Actions to Take:

- Participate in community cleaning campaigns.
- Ensure proper waste disposal.
- Periodically clean water storage tanks.
- Report any environmental or health concerns to the relevant authorities.

When to Seek Medical Care:

Promptly visit the nearest health facility if any of the following symptoms appear:

- Severe or frequent diarrhea.
- Persistent vomiting.
- High fever.
- Difficulty breathing.
- Signs of dehydration, such as extreme thirst, dizziness, or decreased urination.

Third: Risks of the Rainy Season and Potential Epidemics – Exacerbated Health Challenges

Compounding these issues is the seasonal challenge of the rainy season, which, under current conditions, heightens the risk of health crises. With compromised sanitation infrastructure, accumulating waste in neighborhoods, contamination of groundwater sources by war remnants and cadavers, and bomb craters serving as mosquito breeding grounds, the potential for new epidemic waves is a tangible threat, not merely a prediction.

A UN spokesperson has warned that heavy rains and flooding across Sudan impede the delivery of vital supplies, and that ongoing conflict exacerbates the spread of cholera and other infectious diseases [11].

Regarding the humanitarian response, as of the end of July 2025, the United Nations and its humanitarian partners had received only approximately one-quarter of the $4.2 billion required to provide life-saving assistance to an estimated 21 million at-risk individuals within Sudan [7,8].

This funding gap means that adequate preparatory interventions for the rainy season—ranging from filling potholes and removing munitions to distributing mosquito nets and providing medicines—remain largely unattainable.

Fourth: Remnants of War – A Silent Killer in Every Neighborhood

Khartoum faces an invisible danger for returning populations: unexploded ordnance (UXO) and landmines scattered throughout neighborhoods, homes, and public areas. UNMAS Sudan has indicated that previously safe areas, including the capital Khartoum and Gezira State, are now indiscriminately contaminated [4,5]. These concerns have materialized in tragic incidents, resulting in child fatalities and injuries [6,12].

Remnants of war can include unexploded shells (artillery or mortar), scattered small munitions, hand grenades, landmines, or even foreign metal objects that resemble toys, cans, or cylinders but are extremely hazardous.

These items may be partially buried, visible in demolished homes, or along roadsides. While they may appear "normal," they are unstable and can detonate upon contact or movement.

Correct Handling Methods:

- **First: Maintain Distance.** If a suspicious object is sighted, stop immediately. Do not approach closer than several meters, and refrain from touching or moving it.
- **Second: Avoid Tampering**. Do not tamper with the object, take close-up photos, or throw anything at it. Even slight vibration or pressure can be sufficient to trigger it.
- **Third: Evacuate Quietly**. Immediately and calmly move away from the area, ensuring others, especially children, are kept at a safe distance without causing panic.
- **Fourth: Mark Location Safely**. From a safe distance, discreetly mark the location (e.g., with a visible sign or note) without returning to the object itself.
- **Fifth: Report Immediately**. Report the sighting to the competent authorities as soon as possible, such as mine clearance teams, the police, or civil defense.

Crucial Point: There is no "safe form" for war remnants. Any unknown object in conflict zones must be considered dangerous until specialists prove otherwise.

Fifth: Mental Health- The Unseen Wound

Beyond the statistics of deaths and injuries lies a silent disaster, accumulating without receiving adequate attention. A clinical psychologist at the Trauma Center in Gedaref reported that 50% of the IDPs suffer from varying psychological traumas, a situation described as profoundly challenging [13], with long-term effects on survivors, families, and children. World Health Organization data indicate a prevalence of depression, anxiety, and post-traumatic stress disorders of up to 12% among secondary school students in Khartoum, and over half of the IDP population [14].

Children and women are particularly vulnerable to these repercussions. Children lose the sense of stability provided by school, while women—especially survivors of violence—face compounded trauma amidst weak psychosocial support services. The loss of homes further exacerbates this impact, representing a loss of both security and identity.

Approaches to Correct Handling:

1. **Provide a Sense of Security:**
   - Speak calmly.
   - Reassure the child that they are in a safe place.
   - Avoid shouting or harsh punishment.

2. **Listen Actively:**
   - Allow the child to express their feelings if they wish.
   - Do not force them to discuss their experiences.
   - Listen without mockery or belittling their feelings.

3. **Maintain Routine:**
   - Daily activities help children regain a sense of stability.

4. **Encourage Positive Activities:**
   - Drawing
   - Play
   - Sports
   - Group activities

5. **Monitor for Referral Signs:**
   - Talks about self-harm.
   - Suffers from intense and constant fear.
   - Refuses to attend school for an extended period.
   - Exhibits severe and persistent behavioral changes.

Sixth: Urgent Interventions Required- A Roadmap for Community Recovery and Protection

Within Three Months:

- Extensive Sanitation Campaigns: Implement comprehensive campaigns to remove accumulated waste and clear drains and drainage channels before and during the rainy season to reduce the proliferation of disease-carrying insects and rodents.
- Disease Vector Control: Spray mosquito breeding sites, fill ponds and swamps, distribute insecticide-treated mosquito nets, and intensify awareness regarding mosquito bite prevention.
- Health Awareness Campaigns: Intensify awareness programs through media and community activities on personal hygiene, water and food safety, and early report to health facilities.
- Support for Critical Health Facilities: Provide urgent support to hospitals and priority centers with medicines, consumables, and emergency supplies, while strengthening personnel in high-population-density areas.

Within Six Months:

- Rehabilitation of Health Centers: Conduct maintenance on damaged buildings, re-provision essential medical equipment, and improve water, electricity, and communication services.
- Restoration of Immunization Programs: Restore routine vaccination services and implement catch-up campaigns to compensate for losses incurred during periods of displacement.
- Strengthening Epidemiological Surveillance: Develop early warning systems, train health personnel, improve reporting and data collection systems, and equip rapid response teams.

Seventh: Recommendations- A Future Vision for a Resilient and Sustainable Health System

In light of the health and environmental challenges accompanying the return of IDPs to Khartoum, and the consequent increased pressure on the health system and heightened risks of epidemics and seasonal diseases, it is imperative to adopt a comprehensive set of practical interventions and recommendations targeting various stakeholders. These measures aim to safeguard public health and enhance the health sector's capacity to respond effectively to growing needs.

First: Recommendations for the Government

1. **Declaration of a Health Emergency Plan for Khartoum State:** An integrated health emergency plan must be prepared and officially announced. This plan should encompass preparedness and response mechanisms for the rain season and potential epidemics, clearly define roles and responsibilities among government agencies and humanitarian partners, and establish effective systems for monitoring and rapid intervention.
2. **Increased Allocation to the Health Sector:** The current situation necessitates the allocation of additional financial resources to reinforce basic health services, ensure the provision of essential medicines and medical supplies, and improve the readiness of hospitals and health centers. This will guarantee the continuity of service delivery to both returning populations and host communities.
3. **Attraction and Support for Health Personnel:** It is crucial to implement strategies to re-engage health personnel who departed their workplaces during the conflict period, offering appropriate incentives to ensure their retention. Furthermore, addressing the shortage in vital specialties through recruitment and continuous training is essential.
4. **Strengthening Public Health Services and Epidemiological Surveillance:** Epidemiological surveillance and early warning systems must be reinforced, and capabilities for outbreak response enhanced. These measures will contribute to the early detection of diseases and limit their spread.

Second: Recommendations for Humanitarian Organizations

1. **Support for Basic Health Services:** Humanitarian organizations should continue to provide essential support to hospitals and health centers, including medicines, medical consumables, and technical staff. A particular focus should be placed on areas with high population density and significant returnee needs.
2. **Provision of Medicines and Vaccines:** Ensuring the availability of essential medicines and vaccines is a critical intervention required to prevent the spread of diseases and reduce health complications, especially among vulnerable groups such as children, pregnant women, the elderly, and individuals with chronic diseases.
3. **Support for Vector Control Campaigns:** Programs for controlling mosquitoes and other disease vectors should be strengthened through the provision of necessary pesticides and equipment. Support for spraying operations and community awareness campaigns will reduce the incidence of malaria, dengue fever, and similar diseases.
4. **Support for Health Capacity Building:** It is recommended to expand training and qualification programs for health workers in key areas such as infection control, epidemiological surveillance, health emergency management, and outbreak response.

Third: Recommendations for Civil Society

1. **Implementation of Community Awareness Campaigns:** Community institutions and national organizations should intensify awareness campaigns focusing on the prevention of infectious diseases, the importance of personal and environmental hygiene, and the safe use of water and food.
2. **Strengthening Health Education Programs:** Continuous health education plays a vital role in raising citizens' awareness of sound health practices, promoting early recognition of disease symptoms, and encouraging timely seeking of health care.
3. **Awareness of War Remnants:** It is imperative to implement awareness programs regarding the dangers of unexploded ordnance and remnants of war, particularly targeting children and youth. These programs should encourage immediate reporting of any suspicious objects and caution against their handling.
4. **Support for Community Initiatives:** Neighborhood committees and volunteers should be encouraged to participate in cleaning campaigns, monitor environmental risks, and contribute to disseminating health messages within local communities.

Fourth: Recommendations for Donors and International Partners

1. **Financing Health Recovery Programs:** Health recovery requires adequate and sustainable funding to support essential health services, disease control programs, and enhance the health system's readiness in the post-conflict phase.
2. **Support for the Rehabilitation of Health Facilities:** Resources should be directed towards rehabilitating damaged hospitals and health centers, and equipping them with the necessary medical equipment and devices to ensure the restoration of services to normal levels.
3. **Support for Health Supply Systems:** Investing in medical supply chains and ensuring the provision of medicines, vaccines, and essential supplies will contribute to improving the stability of health services and reducing the risk of recurring supply shortages.
4. **Strengthening Partnerships and Coordination:** Enhanced coordination among the government, humanitarian organizations, and donors is essential to ensure the optimal utilization of resources, avoid duplication of efforts, and achieve the greatest possible impact from health interventions.

Conclusion: Health as the Foundation for Recovery

The return of residents to Khartoum State is contingent not solely on enhanced security but is directly linked to the capacity of health and humanitarian institutions to deliver essential services and bolster prevention programs. Khartoum, now receiving hundreds of thousands of its inhabitants, requires a comprehensive health response encompassing the rehabilitation of healthcare facilities, proactive epidemic control, accelerated clearance of munitions from residential areas, and support for mental health programmes for individuals, families, and communities.

Engaging local communities and civil society organizations in awareness and mobilization efforts is crucial for mitigating health risks and fostering preventive behaviors. Close collaboration among the government, humanitarian organizations, donors, and local communities will remain the decisive factor in safeguarding public health and facilitating a secure and sustainable return, thereby preventing current health crises from escalating into future disasters. Making unrealistic commitments is not an option.

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