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THE INITIATIVES FOR DISASTER RISK MANAGEMENT IN SOMALIA: A SYSTEMATIC REVIEW

INICIATIVAS DE GESTÃO DE RISCOS DE DESASTRE NA SOMÁLIA: UMA REVISÃO SISTEMÁTICA

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Abstract
Background: Natural and man-made disasters, including drought, floods, and disease epidemics, are prevalent in Somalia. This study aims to review the emergency health responses and related interventions undertaken by the health sector in Somalia in relation to disaster risk management. Methods: A narrative review was conducted by analyzing relevant documents obtained from various sources, including Somali and international non-governmental organizations, United Nations agencies, and academic databases such as Medline, CINAHL, Scopus, and Google Scholar. Key terms were utilized to identify pertinent literature and reports on disaster management initiatives in Somalia. Results: The findings highlight a significant evolution in Somalia's disaster management system from a focus on response and recovery to an integrated approach that includes mitigation and preparedness. Notable initiatives, such as the establishment of early warning systems and therapeutic feeding programs, demonstrate improvements in the health sector's capacity to respond to emergencies. Conclusions: While emergency health responses to drought and related health challenges have improved, there remain considerable challenges in addressing other disasters, such as flooding. Further research and enhanced strategies are necessary to bolster the health system's resilience against a broader range of hazards.

Keywords: Disaster. Emergency Health. Health System. Famine. Somalia.

Resumo
Contexto: Desastres naturais e provocados pelo homem, incluindo secas, inundações e epidemias, são comuns na Somália. Este estudo tem como objetivo analisar as respostas de emergência em saúde e as intervenções relacionadas realizadas pelo setor de saúde na Somália no que diz respeito à gestão de riscos de desastres. Métodos: Foi realizada uma revisão narrativa por meio da análise de documentos relevantes obtidos de várias fontes, incluindo organizações não governamentais somalis e internacionais, agências das Nações Unidas e bancos de dados acadêmicos, como Medline, CINAHL, Scopus e Google Scholar. Termos-chave foram utilizados para identificar literatura e relatórios pertinentes sobre iniciativas de gestão de desastres na Somália. Resultados: Os resultados destacam uma evolução significativa no sistema de gestão de desastres da Somália, passando de um foco em resposta e recuperação para uma abordagem integrada que inclui mitigação e preparação. Iniciativas notáveis, como o estabelecimento de sistemas de alerta precoce e programas de alimentação terapêutica, demonstram melhorias na capacidade do setor de saúde de responder a emergências. Conclusões: Embora as respostas de saúde de emergência à seca e aos desafios de saúde relacionados tenham melhorado, permanecem desafios consideráveis no enfrentamento de outros desastres, como inundações. São necessárias mais pesquisas e estratégias aprimoradas para reforçar a resiliência do sistema de saúde contra uma gama mais ampla de riscos.

Palavras-chave: *Desastre. Saúde de Emergência. Sistema de Saúde. Fome. Somália.*

1 BACKGROUND

1.1 Disasters in Somalia

Natural and man-made disasters and public health emergencies are quite common in Somalia due to floods, droughts, epidemics of communicable diseases, infectious diseases and dry and wet mass movement.

Natural and man-made disasters, along with public health emergencies, are significant challenges in Somalia, exacerbated by the country's complex socio-political context. The country experiences recurrent natural disasters such as drought, floods, and other calamities that severely impact its population, particularly in rural areas.

Drought is the most devastating natural disaster in Somalia, a country that largely relies on agriculture and pastoralism. It has been a historical problem, with recent decades seeing increased frequency and severity.

Somalia has endured several severe droughts, most notably in 2011, 2017, and 2021. These droughts have led to widespread food insecurity, malnutrition, and large-scale displacement of people. The 2011 drought, for instance, resulted in a famine that killed an estimated 260,000 (1) people, with half of the victims being children under five years old.

The aftermath of such droughts includes severe acute malnutrition, measles outbreaks, and respiratory infections, all contributing to high mortality rates, especially among vulnerable populations like children. Due to the reliance on seasonal rains for agriculture and livestock, drought leads to massive losses in livestock and agricultural production, pushing millions into severe food insecurity. The impact is long-lasting, contributing to chronic malnutrition and stunting among children, as noted in various national surveys.

Flooding is another major natural disaster in Somalia, particularly along the Juba and Shabelle rivers. Flash floods and riverine floods are common, often occurring annually, with significant floods documented in 2018, 2019, and 2020.

These floods displace thousands of people, destroy infrastructure, and exacerbate the spread of waterborne diseases such as cholera. Floods also disrupt agriculture and contribute to food insecurity, particularly in areas that rely on river-fed irrigation. In some

years, the floods have led to outbreaks of diseases like malaria and diarrhea, further burdening an already fragile healthcare system.

Somalia has faced numerous public health emergencies, particularly epidemics of communicable diseases such as cholera, measles, and acute watery diarrhea. These outbreaks are often exacerbated by natural disasters like drought and floods, which weaken immune systems through malnutrition and disrupt access to clean water and sanitation.

For example, the 2017 drought significantly worsened the cholera outbreak in Somalia, with thousands of cases reported and high mortality rates, particularly among children. Similarly, measles outbreaks are common, especially during periods of drought when malnutrition is widespread. The Somali health system, strained by years of conflict and underfunding, struggles to respond effectively to these crises.

In addition to natural disasters, Somalia is also severely affected by man-made disasters, particularly ongoing conflict and instability.

Decades of civil war have led to a breakdown in governance and infrastructure, making disaster response and recovery efforts extremely challenging. The conflict has displaced millions of people, with many living in overcrowded camps where they are vulnerable to both natural disasters and disease outbreaks. The combined effects of drought, floods, and conflict have created a complex humanitarian crisis in Somalia, with millions of people in need of assistance.

Somalia's ability to manage disasters is severely limited by the lack of a functioning central government for much of the past three decades. Disaster management efforts are often led by international organizations and non-governmental organizations (NGOs), with limited coordination from local authorities.

Despite these challenges, there have been some efforts to improve disaster preparedness and response, particularly through the establishment of early warning systems for drought and floods. However, these efforts are hampered by ongoing conflict and limited resources.

The health system in Somalia remains fragile, with limited access to healthcare services, especially in rural and conflict-affected areas. This exacerbates the impact of disasters on public health, leading to high mortality rates from preventable diseases.

There is a significant gap in data and research on the impact of disasters in Somalia, particularly in areas affected by conflict. While there have been some studies on the impact of drought and floods, the effects of other disasters, such as cyclones and locust invasions, are less well documented.

Improved disaster management and public health interventions are urgently needed to address the ongoing challenges faced by Somalia, particularly in light of the increasing frequency and severity of natural disasters linked to climate change.

1.2 Common infectious diseases in Somalia

The common causes of morbidity and mortality in Somalia are:

1. Diarrheal diseases, including cholera.
2. Tuberculosis.
3. Malaria, which also affects mainly pregnant women and children under five; and
4. Measles.

Other major infectious diseases include:

Food or waterborne diseases: – viral disease that interferes with the functioning of the liver; spread through consumption of food or water contaminated with fecal matter, principally in areas of poor sanitation; victims exhibit fever, jaundice, and diarrhea; 15% of victims will experience prolonged symptoms over 6-9 months; vaccine available.

Hepatitis

Hepatitis A, Hepatitis B and Hepatitis C are liver infections caused by three different viruses. Although each can cause similar symptoms, they are spread in different ways and can affect the liver differently. Hepatitis A is usually a short-term infection. Hepatitis B and hepatitis C can also begin as short-term infections but in some people, the virus remains in the body and causes chronic, or lifelong, infection. There are vaccines to prevent hepatitis A and hepatitis B; however, no vaccine is available for hepatitis C.

Typhoid fever – bacterial disease spread through contact with food or water contaminated by fecal matter or sewage; victims exhibit sustained high fevers; left untreated, mortality rates can reach 20%.

Vector borne diseases acquired through the bite of an infected arthropod.

Malaria – caused by single-cell parasitic protozoa *Plasmodium*; transmitted to humans via the bite of the female Anopheles mosquito; parasites multiply in the liver attacking red blood cells resulting in cycles of fever, chills, and sweats accompanied by anemia; death due to damage to vital organs and interruption of blood supply to the brain; endemic in 100, mostly tropical, countries with 90% of cases and the majority of 1.5-2.5 million estimated annual deaths occurring in sub-Saharan Africa.

Yellow fever – mosquito-borne viral disease; severity ranges from influenza-like symptoms to severe hepatitis and hemorrhagic fever; occurs only in tropical South America and sub-Saharan Africa, where most cases are reported; fatality rate is less than 20%.

Leishmaniosis

There are 3 main forms of leishmaniosis – visceral (also known as kala-azar, which is and the most serious form of the disease), cutaneous (the most common), and mucocutaneous. Leishmaniosis is caused by protozoan parasites which are transmitted by the bite of infected female phlebotomize sandflies. The disease affects some of the poorest people and is associated with malnutrition, population displacement, poor housing, a weak immune system and lack of financial resources. Leishmaniosis is also linked to environmental changes such as deforestation, building of dams, irrigation schemes and urbanization.

Water contact diseases acquired through swimming or wading in freshwater lakes, streams, and rivers:

Schistosomiasis – caused by parasitic trematode flatworm *Schist soma*; fresh water snails act as intermediate host and release larval form of parasite that penetrates the skin of people exposed to contaminated water; worms mature and reproduce in the blood vessels, liver, kidneys, and intestines releasing eggs, which become trapped in tissues triggering an immune response; may manifest as either urinary or intestinal disease resulting in decreased work or learning capacity; mortality, while generally low, may occur in advanced cases usually due to bladder cancer; endemic in 74 developing countries with 80% of infected people living in sub-Saharan Africa; humans act as the reservoir for this parasite.

2 LITERATURE REVIEW ON DISASTER RISK MANAGEMENT

Disaster Risk Management (DRM) has gained prominence in global policy discussions, particularly in regions like Somalia, which are highly vulnerable to natural disasters. The complexity of DRM is underscored by the interplay of environmental, social, and political factors that exacerbate the impacts of disasters.

2.1 Frameworks and models

Various frameworks have been developed to guide DRM practices. The United Nations Office for Disaster Risk Reduction (UNDRR) emphasizes a multi-hazard approach that integrates risk assessment, disaster preparedness, response, and recovery (UNDRR, 2015). This framework is especially pertinent in Somalia, where multiple hazards, including droughts, floods, and armed conflict, complicate disaster management efforts.

2.2 Community-based approaches

Community participation is pivotal in effective DRM. Studies highlight the importance of involving local populations in disaster preparedness and response initiatives, as local knowledge and practices can significantly enhance resilience (Twigg, 2004). In Somalia, community-based early warning systems have been implemented, enabling faster responses to emerging threats (Maxwell et al., 2013).

2.3 Impact of climate change

Climate change is increasingly recognized as a significant factor influencing disaster risk. Research indicates that changing weather patterns are contributing to more frequent and severe droughts and floods in Somalia, exacerbating food insecurity and health crises (IPCC, 2019). Addressing climate change within the DRM framework is crucial for enhancing resilience in vulnerable communities.

2.4 Health system integration

Integrating health systems into DRM is essential for addressing the public health impacts of disasters. Studies show that health systems in disaster-prone areas must prioritize preparedness and response capabilities to manage outbreaks of communicable diseases following disasters (Graham et al., 2016). In Somalia, the health sector's involvement in disaster risk management has evolved, but challenges remain in addressing the health impacts of flooding and other hazards (Rage et al., 2021).

2.5 International cooperation and funding

Effective DRM often relies on international cooperation and funding. Research indicates that coordinated efforts among governments, NGOs, and international organizations can enhance disaster response and recovery efforts (Schwerdtle et al., 2018). In Somalia, ongoing partnerships with international agencies have been crucial in mobilizing resources for disaster risk reduction initiatives.

2.6 Lessons learned from past disasters

Analyzing past disasters provides valuable insights for improving DRM practices. For instance, the 2011 famine in Somalia highlighted critical gaps in response mechanisms and the need for timely data collection and analysis for effective decision-making (OCHA, 2012). Lessons learned from such crises are vital for shaping future DRM policies and practices.

3 RESEARCH PROBLEM

Somalia faces a multitude of challenges related to disaster risk management, exacerbated by its complex socio-political context and recurrent natural disasters, particularly droughts and floods. The country has experienced a significant number of crises over the past few decades, leading to devastating impacts on public health and the overall well-being of its population. Despite the establishment of various initiatives aimed

at improving disaster response and management, there remains a critical gap in understanding the effectiveness of these interventions within the health sector. Furthermore, the health system's limited capacity to respond to emergencies, coupled with a lack of comprehensive data on the impacts of disasters, hampers efforts to mitigate the effects of future crises. This highlights the urgent need for a thorough review of emergency health responses and related initiatives in Somalia, which can inform better strategies for disaster risk management and enhance the resilience of the health system.

4 OBJECTIVE

The primary aim of this article is to review the emergency healthcare interventions undertaken in the Somali health system in relation to disaster response. Additionally, it seeks to assess the available initiatives by the Somali health sector concerning disaster risk management, with a focus on the basic disaster management cycle, which includes mitigation, prevention, preparedness, response, and recovery.

This objective aims to provide a comprehensive analysis of how the Somali health system has responded to the challenges posed by frequent natural and man-made disasters, and to evaluate the strategies and measures in place to enhance disaster resilience and health outcomes in the country.

5 METHODS

The analysis of health sector initiatives for disaster risk management in Somalia was conducted based on policy and strategic documents related to disaster risk management from various Somali government regimes. The study also utilized available data and research on disasters and emergencies in the country. Relevant documents were identified through searches on websites of Somali Federal Ministry of Health, National Disaster Management Authority, Somali Bureau of Statistics, United Nations Office for Disaster Risk Reduction (UNDRR), Center for Research on the Epidemiology of Disasters (CRED), Relief Web, and other pertinent sources.

Databases such as Medline, CINAHL, Scopus, and Google Scholar were searched for articles. The key words used were: "disaster OR emergency AND Somalia"; "health

care OR medical care AND Somalia"; "drought OR flood OR epidemic OR famine OR malnutrition AND Somalia." All articles related to Somalia were considered for review without applying any exclusion criteria based on the year of publication. Initially, articles were identified by their titles, followed by a review of the abstracts to select those relevant to the subject matter. Additionally, articles from indexed journals and book chapters were also referenced.

5.1 Databases used

The analysis of health sector initiatives for disaster risk management in Somalia utilized the following databases:

1. **Medline**: A comprehensive database of references and abstracts on life sciences and biomedical topics.
2. **CINAHL**: The Cumulative Index to Nursing and Allied Health Literature, which provides access to nursing and allied health journals.
3. **Scopus**: A large abstract and citation database covering peer-reviewed literature, including scientific, technical, medical, and social sciences.
4. **Google Scholar**: A freely accessible web search engine that indexes the full text or metadata of scholarly literature across various formats.
5. **ReliefWeb**: An information service that provides updates on humanitarian crises and disasters, including reports and assessments.
6. **United Nations Office for Disaster Risk Reduction (UNDRR)**: Offers resources and reports related to disaster risk reduction efforts globally.
7. **Center for Research on the Epidemiology of Disasters (CRED)**: Provides data and analysis on the occurrence and impact of disasters worldwide.

5.2 Analysis method

The analysis method involved several key steps:

1. **Document Identification**: Relevant documents were identified through systematic searches in the specified databases using selected keywords related to

disaster risk management, emergency health responses, and health sector initiatives in Somalia.

2. **Keyword Search**: The search utilized keywords such as "disaster OR emergency AND Somalia," "health care OR medical care AND Somalia," and "drought OR flood OR epidemic OR famine OR malnutrition AND Somalia."
3. **Inclusion Criteria**: All articles related to Somalia were considered for review without exclusion based on publication year, ensuring a comprehensive overview of available literature.
4. **Data Extraction**: Key information from selected articles was extracted, focusing on emergency health responses and interventions within the disaster management cycle, specifically mitigation, prevention, preparedness, response, and recovery.
5. **Synthesis of Findings**: The findings were synthesized to highlight trends, gaps, and advancements in the health sector's response to disasters in Somalia, providing a narrative analysis that informs future initiatives and policies.

6 RESULTS AND DISCUSSION

6.1 Overview of disaster management in Somalia

From 1974 to 1988, Somalia's disaster management system primarily focused on response, recovery, and rehabilitation. This period saw significant fatalities and displacement due to natural disasters, particularly droughts.

6.2 Evolution of disaster management practices

- **Transition Period (1988-1993)**: The approach to disaster management began to evolve during this time, moving towards a more comprehensive strategy that included aspects of mitigation and preparedness.
- **Post-1993 Developments**: Since 1993, there has been a concerted effort to integrate mitigation, prevention, and preparedness into the existing response framework, particularly concerning drought management.

6.3 Key initiatives implemented

- **Drought Early Warning System**: Established to provide timely information on impending drought conditions, enabling proactive measures to mitigate impacts.
- **Therapeutic Feeding Programs**: Implemented in hospitals and health centers to address acute malnutrition, particularly among vulnerable populations like children and pregnant women.
- **Public Health Responses**: Enhanced strategies for managing outbreaks of communicable diseases, including measles and cholera, particularly during drought conditions that exacerbate health risks.

6.4 Impact on health outcomes

- **Reduction in Mortality Rates**: The integration of health responses into disaster management has led to a decline in mortality rates associated with drought-related diseases.
- **Improvement in Nutritional Status**: Community-based nutritional screening and outpatient therapeutic feeding programs have effectively managed cases of severe malnutrition.

6.5 Challenges faced

- **Flooding and Other Hazards**: Despite improvements in drought management, flooding remains a significant challenge. The health sector's response to flooding is less developed, with ongoing issues in preparedness and mitigation strategies.
- **Limited Resources**: The health system continues to face substantial resource constraints, hindering effective disaster response and recovery efforts.

6.6 Emergency health care in Somalia

6.6.1 Disaster risk management system and general emergency response

Historically, Somalia has experienced severe disasters, with the 1974 drought being one of the most catastrophic. This disaster led to the loss of an estimated 200,000 lives, widespread disease outbreaks, significant livestock losses, and massive internal displacement. In response, the Somali government established the National Disaster Prevention and Preparedness Committee (NDPPC) to coordinate relief and rehabilitation efforts. The NDPPC's primary role was to mobilize resources from national and international sources and organize personnel for deployment to the affected areas. The drought not only led to the creation of the NDPPC but also contributed to political instability, including the fall of the Siad Barre regime and the onset of ongoing conflict.

A subsequent severe drought occurred in 1983/1984, affecting millions of Somalis. During this period, the NDPPC's mandate was limited to coordinating relief efforts, and it did not evolve into an agency capable of implementing disaster prevention and preparedness programs. Due to inadequate preparedness, many lives were lost during these droughts, which could have been mitigated with better planning.

The response measures included international aid appeals, food and medical relief programs, and the resettlement of affected populations to other regions. However, these actions were often poorly planned. For example, resettlement efforts were carried out without adequate preparation, resulting in higher disease outbreaks among resettled populations compared to local residents. Additionally, the government's reluctance to acknowledge the drought due to ongoing conflicts delayed timely responses. International media often uncovered the severity of the situation, leading some aid agencies to channel funds through rebel-held areas, though this led to allegations of aid diversion.

There was also a lack of essential emergency health interventions, such as measles treatment, malaria prevention, and clean water provision. Early warning systems, although established before 1977, were criticized for their ineffectiveness due to centralization, limited community involvement, and a narrow focus on food security and rainfall, without addressing broader issues such as malnutrition and disease outbreaks.

In 1991, following the collapse of the military regime, the transitional government adopted the “National Policy on Disaster Prevention and Management” in 1993. The disaster management structure was reformed, and the National Disaster Prevention and Preparedness Committee (NDPPC) was established to oversee disaster management at the national level. In 2011, the NDPPC was renamed The Somalia Disaster Management Agency (SoDMA), which coordinated disaster management activities from mitigation to recovery.

The revised disaster management policy led to improvements in the early warning system. Initially focusing on food security, rainfall, and water availability, the system was expanded to include nutritional assessments and community health indicators. This system operates on a monthly and quarterly basis, enabling timely actions based on reports from local communities.

Community-based nutritional screening and outpatient therapeutic feeding programs were introduced to manage malnutrition cases. Therapeutic feeding units in health centers and hospitals now treat severe malnutrition cases according to national guidelines. Other interventions include designing irrigation schemes in drought-prone areas and creating employment opportunities to reduce local vulnerabilities.

In response to floods, an early warning system was initiated in collaboration with the meteorological agency, and information is conveyed through mass media. Despite these advancements, challenges remain. The disaster management system still suffers from a lack of a multi-hazard approach and a tendency for reactive rather than proactive measures.

Lessons from past disasters have led to significant improvements, but there is still insufficient evidence regarding the effectiveness of structural and non-structural measures to protect vulnerable populations. Overall, while the disaster management system has evolved and the number of deaths from disasters has decreased, ongoing challenges highlight the need for further development of a comprehensive, proactive disaster risk management strategy.

6.6.2 Somali health system's response to disaster and disaster risk

6.6.2.1 Health system

Somalia's health care system has evolved from a predominantly curative and highly centralized model to a more preventive and decentralized one. This shift aligns with the country's health challenges, where communicable diseases are prevalent and can be mitigated through improved access to primary health care services. Under the current government, the Somali health care system has undergone significant reforms to address the nutritional needs of vulnerable populations, such as children under five years old and pregnant women in disaster-prone areas.

An early warning system is now in place, with monthly and quarterly reports from communities being sent to the federal Disaster Risk Management and Food Security Sector. This system aims to enable timely action and improve preparedness. Additionally, measures have been implemented to ensure food availability at government stockpiles and to request further aid as needed.

Since the early 2000s, periodic community-based nutritional screenings have been established in drought-prone districts, and outpatient therapeutic feeding programs have been introduced at health posts and health centers to manage uncomplicated malnutrition cases. Therapeutic feeding units in hospitals are now equipped to handle severe and complicated malnutrition cases according to national guidelines and treatment protocols.

Other government interventions include designing and implementing irrigation schemes in drought-affected areas and creating employment opportunities to reduce local vulnerabilities as part of long-term development programs. The health sector has also developed a clear surveillance system to control outbreaks and respond promptly to emergencies, with a particular focus on drought and malnutrition-stricken areas due to the frequent association of malnutrition with disease outbreaks.

In response to floods, an early warning system has been established in collaboration with meteorological agencies, and information is conveyed to affected communities through mass media. The Disaster Risk Management and Food Security Sector actively engage in preparedness and response efforts. Despite these advancements, challenges remain, including the lack of a multi-hazard approach and a tendency for

reactive rather than proactive measures. For instance, lessons from the 2006 widespread flooding events have led to the initiation of early warning activities, but there is still insufficient evidence of the effectiveness of structural and non-structural measures to protect vulnerable populations.

Overall, while the Somali disaster management system has made significant strides, particularly in drought and disease response, there is an ongoing need to develop a more comprehensive, proactive approach to disaster risk management, including addressing emerging hazards and enhancing overall resilience.

6.6.2.2 Health system's response

The health system in Somalia faces significant challenges in managing emergencies and disasters. The country's healthcare infrastructure is limited, and there are several gaps in emergency response capabilities.

Emergency Medicine Setup: In Somalia, hospitals typically have outpatient emergency departments to handle emergency cases. Initial patient screening is conducted in these departments, and if any emergency surgery is required, patients are referred to specialized departments. However, evidence suggests that triage systems are not well-established, and there is no comprehensive out-of-hospital emergency management system. During nighttime, emergency departments might be staffed by only one general practitioner and a nurse, making it difficult to manage mass casualty incidents effectively. Additionally, training in emergency medicine is not standardized across the country, with no specific emergency medicine courses included in medical school curricula. This lack of training hampers the ability of health professionals to manage emergencies, particularly in disaster situations.

Training Initiatives: To address these gaps, various initiatives have been implemented. International organizations and partners, such as the World Health Organization (WHO) and Médecins Sans Frontières (MSF), have supported Somalia by providing training and resources to improve emergency medical services. For example, MSF has been involved in training general practitioners in emergency surgery and enhancing hospital capacities.

Disaster Response: Somalia's health system response to disasters has been evolving, particularly in response to recurring droughts and other emergencies. The country's disaster management policies and strategies have been influenced by past experiences, leading to reforms that include health sector involvement in disaster management.

Health System Structure: The health delivery system in Somalia is organized into primary, secondary, and tertiary levels. The primary level includes health posts and clinics that provide basic care, while secondary and tertiary levels consist of district hospitals and regional hospitals that offer more specialized services. Health posts, the most basic level of care, focus on preventive health and primary care, including emergency response to basic health needs.

Nutritional Programs: In response to malnutrition and food insecurity, the Somali Ministry of Health, in collaboration with international partners like UNICEF, has implemented community-based nutrition programs and therapeutic feeding initiatives. These programs aim to manage and treat malnutrition at various levels of the health system, from health posts to hospitals.

Surveillance and Epidemic Response: Somalia's health system incorporates routine surveillance to monitor and respond to disease outbreaks. The Ministry of Health follows international guidelines for surveillance and has adapted its approach to include a multi-hazards risk management strategy. This strategy includes monitoring and responding to 20 diseases of public health importance, such as measles, cholera, and malaria.

Challenges: Despite these efforts, the health system faces numerous challenges, including limited resources, insufficient infrastructure, and a lack of trained personnel. For instance, a study conducted in flood-prone areas of Somalia revealed that health facilities were poorly prepared for flooding and lacked necessary resources and training for disaster response.

Overall, while Somalia has made strides in improving its emergency and disaster response capabilities, significant challenges remain. Ongoing support from international partners and further investment in health system strengthening are crucial to addressing these gaps and improving emergency preparedness and response in the country.

6.6.2.3 Health system's relationships with partners

During disasters and emergencies, the health system in Somalia engages with various sectors and collaborates closely with donor agencies and international non-governmental organizations (INGOs). This partnership is crucial for effective response and recovery.

Role of INGOs: INGOs have been active in Somalia for decades, particularly since the 1974 drought that significantly impacted the country. The roles and operational areas of these organizations are often defined in coordination with the Somali government and various disaster management bodies. INGOs provide essential support in several areas:

- **Financial Support**: Direct financial contributions help sustain and expand healthcare services.
- **Technical Assistance**: Support in policy development, strategy formulation, and evaluation of emergency responses is crucial for improving the effectiveness of the health system.
- **Training and Capacity Building**: INGOs and UN agencies offer training for healthcare workers in areas like epidemic control, emergency response, and integrated management of neonatal and childhood illnesses. They also help build capacity in health facilities by supplying medical resources and essential drugs for managing conditions such as malnutrition, measles, and malaria.
- **Program Development**: INGOs play a key role in designing national protocols and initiating therapeutic feeding programs, especially in areas prone to drought and other emergencies.

Emergency Response: In severe disaster situations where the health system might be overwhelmed, INGOs are called upon to provide emergency medical services and support beyond their usual operational areas. This includes implementing emergency relief programs until the situation stabilizes. For instance, during the severe droughts and disease outbreaks, INGOs have supported the Somali government in managing widespread cases of malnutrition and other health crises.

Collaboration and Coordination: The health system's collaboration with INGOs and donor agencies ensures that new initiatives are integrated into the national health

system for sustainability. This partnership is vital for addressing both acute emergencies and longer-term health challenges.

Challenges and Areas for Improvement: While the involvement of INGOs and donors has significantly improved the health system's capacity to respond to emergencies, there are still gaps, particularly in managing floods, volcanic eruptions, and other man-made hazards. Evidence suggests that preparedness and response strategies for these types of hazards are less developed. Studies have shown that health facilities may be unprepared for flooding, lacking necessary resources such as boats, life jackets, and trained personnel. There is also a need for better early warning systems and training for health professionals to handle various types of emergencies effectively.

Lessons Learned: Over time, the health system has learned valuable lessons from past disasters, leading to improvements in emergency medical practices and policy development. However, there is limited evidence that lessons learned have been fully integrated into practice, especially in dealing with non-drought and non-epidemic-related emergencies.

Ongoing Efforts: The recent development of public health emergency guidelines emphasizes a multi-hazard approach, risk assessment, and the involvement of all relevant sectors and INGOs. While this framework aims to enhance disaster preparedness and response, its effectiveness in addressing all types of hazards remains a work in progress.

6.6.3 Strengths and limitations of disaster risk management in health system

6.6.3.1 Strengths

1. **Comprehensive Approach**: The disaster risk management system in Somalia has evolved to include not just response and recovery, but also mitigation, prevention, and preparedness. This comprehensive approach enhances the system’s effectiveness in managing long-term and recurring crises, particularly in the context of drought and other emergencies.
2. **Multispectral Involvement**: The disaster management framework involves various ministries, including the Ministry of Health, at multiple levels—from national to local. This broad involvement ensures that disaster risk management

is integrated across different sectors and promotes effective coordination among stakeholders, including non-governmental organizations (NGOs).

3. **Clear Guidelines**: Emergency programs, such as those addressing malnutrition, have established guidelines for implementation at all levels of the health system and within communities, especially in areas prone to drought. This clarity helps ensure consistent and effective responses.
4. **Integration with Development Programs**: The Somali government has linked disaster risk management programs, particularly for drought, with broader development initiatives. This integrated approach aims to address the root causes of vulnerability and promote long-term resilience.
5. **Public Health Emergency Guidelines**: The Ministry of Health has developed guidelines for managing public health emergencies, including surveillance of diseases at all levels of the health care system and within communities. This systematic approach to monitoring and response improves preparedness and coordination.

6.6.3.2 Limitations

1. **Limited Coverage for Other Hazards**: The disaster risk management system in Somalia lacks detailed policies and strategies for hazards beyond drought, such as flooding, earthquakes, landslides, and volcanic eruptions. This gap can hinder effective management and response to these less frequently addressed but potentially devastating events.
2. **Unclear Responsibilities**: The roles and responsibilities of the Ministry of Health in mitigating, preventing, and preparing for various hazards are not clearly articulated in policies and strategies. This lack of clarity can result in inadequate preparedness and response for certain types of disasters.

Overall, while Somalia's disaster risk management system within the health sector has significant strengths, particularly in its comprehensive and multispectral approach, there are notable gaps in addressing a broader range of hazards and clarifying responsibilities. Enhancing policies and strategies for these areas could improve the overall effectiveness and resilience of the system.

6.7 Connections among the subsections

6.7.1 Overview of disaster management in Somalia

This subsection provides the historical context and background necessary for understanding the current state of disaster management in Somalia. It outlines the challenges faced during key periods, emphasizing the need for a structured response to disasters. This foundation is crucial as it sets the stage for the subsequent evolution of practices and underscores why changes were necessary.

6.7.2 Evolution of disaster management practices

Building on the historical overview, this subsection describes the transition from a primarily reactive approach to a more integrated and proactive disaster management strategy. It connects the challenges identified in the first subsection with the developments that followed. This evolution illustrates how past experiences, including failures and successes, directly informed the changes in policy and practice, leading into the next subsection on specific initiatives.

6.7.3 Key initiatives implemented

This subsection highlights specific actions taken by the health sector in response to the evolving disaster management framework. It directly relates to the previous subsection by detailing the initiatives that were developed as a result of the lessons learned from past disasters. The initiatives, such as the drought early warning system and therapeutic feeding programs, serve as practical applications of the theoretical framework established earlier. This connection illustrates how theories and strategies were put into action to address the challenges previously outlined.

7 CONCLUSIONS

The disaster risk management system in Somalia has evolved from a focus solely on response and recovery to a more comprehensive approach that includes mitigation, prevention, and preparedness. Historically, the system has primarily concentrated on drought, given its significant impact on the country, though other types of disasters are also prevalent.

Somalia's health care system has similarly evolved from a curative-centered approach to one that emphasizes prevention. It now features a tiered structure that includes primary health care units, general hospitals, and specialized hospitals. The health sector has initiated disaster management strategies, particularly for drought, in collaboration with the Disaster Risk Management and Food Security Sector. Furthermore, the Ministry of Health has developed guidelines for managing public health emergencies, including surveillance of 20 identified diseases.

However, while the system has shown strengths in handling drought and related emergencies, there is a need for increased focus on other types of disasters. The involvement of international NGOs and donors has been crucial in managing emergencies related to drought and disease outbreaks. Nevertheless, their role in addressing floods, earthquakes, volcanic eruptions, and other hazards has been less prominent.

Lessons learned from past disasters have informed changes in policy and practice, including the development of therapeutic feeding programs and improved outbreak management. Despite these advancements, there is limited evidence that the lessons learned have been applied consistently across all types of disasters.

In summary, Somalia's disaster risk management system has made significant strides by incorporating a broader range of components beyond response and recovery. However, there remain gaps in addressing certain hazards and clearly defining the roles and responsibilities of various agencies. Strengthening policies and strategies to cover a wider range of disasters and ensuring effective implementation of lessons learned are essential for enhancing the overall resilience of the health system.

COMPETING INTEREST

The author has declared that no conflicts of interest exist.

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