Exploring Health Emergency Preparedness from a System Perspective: Implications for Resource-poor Health System Resilience

By

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ABSTRACT

Background: The rising incidence of health emergencies poses significant challenges for health systems worldwide, particularly in resource-constrained settings. Despite the burdens of epidemiological, environmental, and security-related emergencies, the Ethiopian health system lacks optimal preparedness. The absence of evidence supporting policy interventions worsens the country's preparedness deficit in its health system. In Ethiopia, previous research has overlooked system-level preparedness, leaving gaps in understanding progress, current readiness, and the factors that enable or hinder system-level health emergency preparedness. Notably, the interactions among the influencing factors and the system-wide impacts of these interactions remain opaque. Given these gaps, the present research explored health emergency preparedness in Ethiopia, a country with a resource-poor health system.

Aim: This research aimed to explore health emergency preparedness within the Ethiopian health system, focusing on investigating the system's preparedness progress, current readiness, factors that enable or limit this preparedness, the interplay among these factors, and their system-wide influence.

Methods: The research adopted a constructivist grounded theory approach, with data collection and analysis conducted iteratively. Data were gathered through three rounds of in-depth interviews with healthcare managers in the Ethiopian health system and its key partner organisations. The analysis involved three stages of coding, with constant comparative analysis and memoing throughout. *Initial coding helped break* transcripts into excerpts. *Focused coding* aided in reintegrating these excerpts into coherent concepts, which later developed into categories. *Theoretical coding* helped connect the main categories and consolidate them into core categories, leading to the emerging theory. Ultimately, the emerging theory informed the creation of an explanatory conceptual framework, outlining key strategies to improve health emergency preparedness.

Findings: Data analysis revealed eight main categories that capture the key findings. The first category, "Inadequate readiness despite positive progress", highlights that overall readiness remains insufficient despite ongoing initiatives. The subsequent categories, "Embracing emerging opportunities" and "Harnessing local adaptive mechanisms", encapsulate the key enablers of preparedness. The remaining categories—"Weak coordination and poor collaboration", "System instability and change", "Constraints on healthcare resources", "Learning and education gaps", and "Low adoption of recommended approaches"—collectively present the key barriers to

preparedness. These eight categories were consolidated into two core categories, culminating in the "Optimisation of health emergency preparedness in resource-poor health systems" theory. The theory suggests that integrating optimised approaches involving attitude shifts, local adaptations, leveraging global opportunities, and addressing persistent barriers will enhance preparedness. The interactions among the elements of the theory further contributed to the development of an enablers-and-barriers-informed conceptual framework to enhance health system disaster preparedness.

Conclusion and implications: This research concludes that the Ethiopian health system's emergency preparedness can be enhanced by building on existing initiatives, leveraging identified enablers, and addressing barriers. An important insight for similar resource-poor health systems is the need to overcome the tendency to use resource limitations to justify inadequate preparedness. Another key takeaway is the necessity of shifting from the "no resources, no preparedness mentality" to prioritising available opportunities and leveraging an integrative strategy. Utilising a framework from this research will support this integrative approach.

Keywords: Barriers, Enablers, Health Emergencies, Health System, Preparedness, Readiness, Resource-poor

DECLARATIONS

I certify that this thesis, **Exploring Health Emergency Preparedness from a System Perspective: Implications for Resource-Poor Health System Resilience:**

1. does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university.
2. the research within will not be submitted for any other future degree or diploma without the permission of Flinders University; and
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LIST OF ABBREVIATIONS

AVDA	Awash Valley Development Authority
CSA	Central Statistical Authority
DPPC	Disabled Persons Protection Commission
DPPC	Disaster Preparedness and Prevention Commission
DRM	Disaster Risk Management
DTM	Displacement Tracking Matrix
ECCD	Emergency and Critical Care Directorate
ECSA	Ethiopian Central Statistical Agency
ED	Emergency Department
EDRMC	Ethiopian Disaster Risk Management Commission
EHSDP	Ethiopian Health Sector Development Plan
EM-DAT	Emergency Events Database
EMT	Emergency Medical Technicians
EPHI	Ethiopian Public Health Institute
FDRE	Federal Democratic Republic of Ethiopia
GFDRR	Global Facility for Disaster Risk Reduction
GHS	Global Health Security
GNDR	Global Network of Civil Society Organisations for Disaster Reduction
GPMB	Global Preparedness Monitoring Board
GT	Grounded Theory
HEDRM	Health Emergency and Disaster Risk Management
HEP	Health Emergency Preparedness
HFA	Hyogo Framework for Action
HSDP	Health Sector Development Program
HSTP	Health Service Transformation Plan
IFRCS	International Federation of Red Cross and Red Crescent Societies
IGT	Interpretivist Grounded Theory
IHR	International Health Regulations
IOM's	International Organisation for Migrants
JEE	Joint External Evaluation
LLMs	Large Language Model Tools
MECIP	Major Cities Emergency, Injury, and Critical Care Improvement Program
NASM	National Academy of Science and Medicine

NDMO	National Disaster Management Office
NDPPC	National Disaster Prevention and Preparedness Commission
NGOs	Non-Governmental Organisations
NHSPI	National Health Security Preparedness Index
PHEIC	Public Health Emergency of International Concern
PHEM	Public Health Emergency Management
RDS	Respondent-Driven Sampling
RIPAS	Researcher-Initiated Participant-Assisted Sampling
SBREC	Social and Behavioural Research Ethics Committee
SERO	Scientific Ethical Review Office
SFW	Sendai Framework for Action
SI	Symbolic Interactionism
SNNPR	Southern Nations, Nationalities, Peoples Region
SSA	Sub-Saharan Africa
SWE	Southwest Ethiopia
TGO	Transitional Government of Ethiopia
UHC	Universal Health Coverage
UNDRR	United Nations Office for Disaster Risk Reduction
UNISDRR	United Nations International Strategy for Disaster Risk Reduction
WADEM	World Association for Disaster and Emergency Medicine
WBG	World Bank Group
WHO	World Health Organisation

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CHAPTER ONE: INTRODUCTION

1.1. Introduction

This introductory chapter offers a comprehensive overview of the researched problem. Additionally, the current knowledge gap is explained in the context of a healthcare system with limited resources. Furthermore, the potential benefits of the research findings in policy and practice development are discussed. The research questions are presented alongside the overall aim and specific objectives of the research. The researcher's background and experience are detailed to illustrate his connection to the context of the study area. The chapter concludes with an overview of the thesis structure and a summary of the points discussed.

1.2. Background of the problem

Health emergencies involve a complex interplay of biological, environmental, and socio-political factors (WHO, 2023a). In its broader context, "health emergency" is defined as "encompassing new or re-emerging diseases, the accidental or intentional release of biological, chemical, or radiological agents, natural disasters, human-made disasters, complex emergencies, conflicts, and other incidents with the potential for catastrophic impact on human health, including the potential effects of climate change" (WHO/Europe, 2012). The impacts of natural, man-made, or a combination of the forms of disasters extend beyond immediate damage, affecting long-term health, economic, and overall societal stability (Parmesan et al., 2022; WHO, 2020c). Besides the challenges they pose to humanity, these events have shaped public health policies and fostered a collective awareness of the fragility of health systems worldwide.

Natural disasters significantly impact global health by causing immediate injuries, fatalities, and long-term health complications, which can overwhelm healthcare systems. They further result in significant property damage and cause environmental disruptions, leading to extensive damage (McGlade et al., 2019). These events can disrupt healthcare delivery and displace populations. They may even lead to outbreaks of communicable diseases due to overcrowding and compromised sanitation (WHO, 2023a). Examples of such events encompass geophysical events like earthquakes, which can destroy healthcare facilities and cause mental health crises. Meteorological phenomena, such as hurricanes, that contribute to flooding and waterborne disease outbreaks also fall into this group of events (McGlade et al., 2019). Moreover, hydrological disasters, such as floods and tsunamis, which can potentially impact the health systems and promote vector-borne diseases, are fundamentally categorised as natural disasters. Furthermore,

climatic disasters, including droughts and heatwaves, escalate health emergencies related to malnutrition and heat-related illnesses (Parmesan et al., 2022).

Events such as the COVID-19 pandemic, Ebola, and Zika are typical of biological disasters. These emergencies are characteristically known to rapidly spread, potentially overwhelming healthcare systems and leading to significant mortality and morbidity (Brief, 2020). Similarly, health emergencies can arise from the accidental or intentional release of biological, chemical, or radiological agents. The ongoing threat of bioterrorism, as well as industrial accidents like chemical spills, is considered a health emergency. Armed conflicts and terrorism are examples of human-made disasters, and these groups of events also have the potential to create precarious health situations. They affect not only physical health but also mental well-being, particularly for displaced populations (Tamanini, 2012).

Complex emergencies—situations in which multiple factors disrupt a community's stability—often result from a combination of events. For instance, conflicts exacerbated by environmental degradation or economic instability can lead to widespread health crises, particularly in low- and middle-income countries (Olu et al., 2021). The impacts and implications of climate change cannot be overlooked. Shifts in climate patterns can lead to food insecurity, water shortages, and population displacement, all of which pose significant risks to health (Pathak et al., 2022; Pörtner et al., 2022).

Health emergencies are among humanity's greatest challenges. Historical records demonstrate that every century has been marked by health emergencies that have profoundly influenced population health and societal structures. Throughout human history, societies have faced diverse health emergencies, ranging from infectious disease outbreaks to environmental disasters. (Ricciardi, 2002; Safapour & Kermanshachi, 2019). Many of these health threats continue to reverberate through today's generation. The impacts of emergencies will likely remain among the most significant challenges facing humanity, demanding innovative solutions and a paradigm shift in the approach to these global challenges (Faulkner, 2013; NASEM, 2017).

Nonetheless, currently, human risk creation is exceeding risk reduction efforts. Factors such as urbanisation, globalisation, and environmental degradation decrease the ability to implement effective risk reduction measures (Salami et al., 2017). The increasing interaction between hazardous events, such as pandemics and natural disasters, and societal vulnerabilities is alarmingly escalating (Khadka, 2022). The increases in risk creation, which go far beyond efforts to reduce them, contribute to the increasing incidences of health emergencies. This raises a critical

question on the feasibility of achieving a secure and resilient future (Burkle Jr, 2019; Safapour & Kermanshachi, 2019).

Historical patterns and current trends indicate that health emergencies will continue to pose substantial threats to humanity in the foreseeable future. The ongoing increase in economic exposure due to rapid urbanisation, the unpredictable impacts of climate change, and other destabilising factors are expected to increase the risks associated with health emergencies in the coming decades (Feng & Cui, 2021; Tesselaar et al., 2020). For instance, the 2022 Global Disaster Assessment Report predicts a staggering 40 per cent increase in disaster events this decade compared to the previous fifty years (Khadka, 2022).

The world's most significant risks in the coming decades include infectious diseases, inaction on climate change, and other environmental threats. Close behind are the risks related to weapons of mass destruction, disruptions in information technology infrastructure, and failures in cybersecurity (McLennan, 2021). Importantly, generative artificial intelligence, such as large language model tools, can be misused to create and disseminate highly convincing disinformation through text, audio, or video content. This type of misleading information can be challenging for the public to distinguish from trustworthy health information, especially during critical times such as pandemics or other health emergencies (WHO, 2024c). Political instability often leads to disruptions in health systems, the collapse of essential medical supply chains, and the breakdown of social and economic systems, presenting significant current and future health risks (Lilja & Ahmad, 2023).

Health emergencies impact population health in various ways. It is not uncommon for specific incidents to lead to adverse effects on the health system, either directly by disrupting healthcare facilities or indirectly by damaging other critical infrastructure that supports the health system (Alenezi et al., 2021). They increase mortality and morbidity. Particularly, morbidity and mortality are higher among vulnerable segments of the population, such as those with pre-existing chronic conditions, aged people, immunocompromised individuals, and people who have no immediate access to treatment. These emergencies can also disrupt healthcare infrastructure, leading to interruptions in essential services like dialysis and medication access (Khatri et al., 2023). Furthermore, the impact of the initial event is exacerbated by ongoing concurrent issues such as drought, conflict, population displacement, and systemic poor health, including widespread chronic diseases among the affected people (Giorgadze et al., 2011). While the impact of emergencies on people's health goes beyond statistics, over 170 million individuals are affected by conflict and 190 million by disasters each year (WHO, 2022a).

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Health emergencies not only jeopardise people's lives and livelihoods but also place a significant burden on the healthcare infrastructure. They increase the overall morbidity and mortality rates due to their complex nature and the interdependencies among societal systems, threatening lives and livelihoods while imposing a considerable strain on healthcare resources (Ebi et al., 2021; Nunes-Vaz et al., 2019). The sudden influx of patients for immediate medical attention can lead to resource shortages, overworked medical professionals, and overcrowded facilities. This typically results in a surge in demand that exceeds the capacity of the involved institutions (Blumenthal et al., 2020).

Emergencies exacerbate the overall population morbidity and mortality rate, primarily due to the interconnections between critical systems (Ebi et al., 2021; Nunes-Vaz et al., 2019). These interconnections within or external to the health systems result in a cascading failure (Pescaroli et al., 2018). The disruptions to external critical infrastructure, including supply chains, power, water, food, information technologies, and communication networks, impact health systems and, by extension, the health of populations (Rehak et al., 2016). These impacts may have a cascading effect, ultimately leading to a situation where many individuals are deprived of even the most basic healthcare services, thereby negatively affecting their health and well-being (Alwidyan et al., 2020). In addition, large-scale emergencies can overwhelm healthcare capacity and impede the treatment of casualties and preventive activities, thereby increasing morbidity and mortality rates (Kim-Farley, 2017).

Large-scale initiatives have been implemented in response to increasing risks and impacts of health emergencies. The Sendai Framework for Disaster Risk Reduction 2015-2030, which includes strengthening disaster preparedness for effective response and recovery as one of its four priority actions, underscores the global attention to preparedness (Wahlström, 2015). The International Health Regulations (IHR-2005), which require member states to establish essential capabilities to detect, evaluate, report, and manage potential public health emergencies, have been among the initiatives over the last several decades (Gostin, 2015). Moreover, the World Health Organisation's Health Emergency and Disaster Risk Management Framework, which emphasises interdisciplinary, cross-sectoral, comprehensive, and structured approaches to managing health-related disaster risk, has been a significant measure (Chan & Wong, 2022) Furthermore, the 2025 pandemic agreement, adopted to strengthen the global health framework for preventing, preparing for, and responding to pandemics, is another noteworthy initiative (WHO, 2025b). These and similar global initiatives have helped countries strengthen their health systems' capacity to prepare for, detect, and respond to health emergencies. Despite the improvements,

nations continue to struggle to achieve the goal of taking national and global health security to the next level (WHO, 2019b, 2021a).

Evidence suggests that health emergency preparedness is especially alarmingly inadequate in low-income countries (Rentschler, Klaiber, Tariverdi, Desjonquères, et al., 2021). For instance, findings from capacity assessments, which included 40 member states (81%) of the World Health Organisation's African Region (AFRO), showed that no country possesses all the necessary IHR capacities (Talisuna et al., 2019). An analysis of the International Health Regulations in light of the COVID-19 pandemic revealed significant disparities in countries' abilities to prevent, detect, respond to, and recover from health crises (Kandel et al., 2020). For instance, the latest Global Health Security Index report, which evaluates countries' health security and capabilities across six categories and 37 indicators closely linked to preparedness, revealed that the average global health emergency preparedness level for all countries was only 38.9 per cent. According to the same report, the average score in Africa was as low as 29.0, lower than the global average score (Bell & Nuzzo, 2021b). This data indicates that, while disparities exist among countries in their preparedness levels, nations across all income levels remain unprepared to respond effectively to health emergencies (Bell & Nuzzo, 2021b). There is a low level of overall global preparedness, with a wide disparity among countries (Shadmi et al., 2020). In the context of an increasingly interconnected world, health threats can easily cross borders. This means that the collective global health emergency preparedness is only as strong as the weakest health system (WHO, 2021a).

Inadequacies in the national health system's preparedness are attributed to several interrelated factors (Boyd et al., 2020). Notably, under-resourced settings often struggle with issues such as low income levels, insufficient human resource capacity, limited technology adoption, and the overall fragility of their health systems (Kola et al., 2021). Supporting this observation, a study by Ray et al. found that countries with greater political risks and fewer resources exhibited the largest gaps in emergency preparedness (Ray et al., 2019). Past emergencies have demonstrated that a community's health is significantly impacted when national and local systems, particularly health systems, are unprepared to handle emergencies and their aftermath (Haldane et al., 2021). Such a scenario is more challenging in fragile and vulnerable settings because disasters further decimate already weak health systems. For instance, the most recent disasters in Africa illustrate the complex interaction between health systems and disasters, where fragile health systems create favourable conditions for further deterioration of public health (Olu, 2017).

Ethiopia, which ranks twelfth according to the Fragile States Index released by the Fund for Peace (FFP, 2025), faces significant public health challenges, marked by high vulnerability to health crises. Despite some recent positive progress, the country's overall preparedness for health emergencies remains alarmingly low. The 2021 Global Health Security Index highlights this issue, revealing that Ethiopia's emergency preparedness and response planning scores a mere 16.7 per cent. This figure was below the global average of 30.3 per cent, pointing to systemic deficiencies in the nation's healthcare arrangements (Bell & Nuzzo, 2021a).

In Ethiopia, several factors contribute to this inadequate preparedness. Political instability and governance issues often disrupt healthcare services and impede the implementation of effective health policies. Furthermore, Ethiopia struggles with limited funding and access to essential medical supplies, thereby compromising its capacity to respond adequately to health emergencies. Environmental challenges, such as climate change and natural disasters, also exacerbate vulnerabilities, placing additional strain on an already overburdened health system (McEntire, 2005; Zhong et al., 2014). The absence of a resilient health system limits the country's capacity to respond to health threats. Additionally, the health system's ability to maintain or return to its pre-emergency level of health services remains constrained. This results in ongoing heightened health risks for the population, increased mortality rates, and additional pressure on existing health services. Consequently, the country finds itself ensnared in a cycle of vulnerability and inadequate response, as highlighted by ongoing reports (World Bank, 2020).

1.3. Rationale for the research

Mitigation efforts and preparedness effectiveness are often lower compared to the growing incidences and impacts of health emergencies(Horney et al., 2017). Global challenges are increasingly interconnected. In contrast, the mitigation and response efforts to these challenges remain fragmented (Peters, 2021). This disparity between the increasing incidence of health threats and response efforts highlights the urgent need for adaptive health security frameworks as a matter of survival, rather than merely an option (Franklin, 2016; Khan et al., 2018a; Li et al., 2021; WHO, 2007b, 2018a, 2019a). In this regard, the significance of generating, updating, and implementing evidence-based practices as a strategy to enhance health system preparedness cannot be overstated (Kalaiselvi & Tripathy, 2024; Lee, 2016). Nevertheless, the evidence supporting public health preparedness efforts is often either limited in scope, unevenly distributed across the world, or falling short of relevance for policymakers in unique contexts (Sohrabizadeh et al., 2021).

The general lack of evidence-based practices and policy inputs hinders effective health emergency preparedness, particularly in under-resourced settings. A study that assessed the factors influencing health emergency preparedness identified the lack of evidence-based practices as one of the primary barriers to achieving effective health system preparedness (Kennedy et al., 2020). Similarly, another study revealed that policy inputs required to tackle various challenges related to preparedness are generally inadequate (Horney et al., 2017). Evidence necessary for enhancing health system preparedness is desperately lacking in under-resourced settings (Sohrabizadeh et al., 2021). A comprehensive scoping review on disaster management in low and middle-income countries highlights that the lack of appropriate evidence is a significant obstacle to developing robust disaster management strategies in these regions (Lee et al., 2014).

Available evidence lacks suitability for policy interventions, mainly due to two reasons (Chan et al., 2022). The first limitation is that available evidence arises from the lack of a comprehensive systems-based approach, as current evidence often fails to address the complexities and interdependencies within healthcare systems (Rentschler, Klaiber, Tariverdi, Desjonqueres, et al., 2021). Failure to take the holistic view of healthcare systems, especially in the growing complexity and interdependencies, makes available evidence less applicable to interventions from a system perspective (De Savigny & Adam, 2009; Gooding et al., 2022; Greenhalgh & Papoutsi, 2018; Nunes-Vaz et al., 2019). In the interdependent health system, a compromise in one area of the health system can lead to malfunctions or failures in another interconnected component, creating a cascading effect that undermines the system's overall functionality (Nunes-Vaz et al., 2019). This indicates that evidence generated focusing on a separate part may not reflect the true picture of the health system, particularly with regard to health emergency preparedness. Therefore, understanding healthcare system preparedness requires a comprehensive approach that focuses on more than just the constituents of the system (Calonge N, 2020; Mahmoud et al., 2023). The involvement of multiple partner organisations and sectors in the management of health emergencies adds another layer of complexity (Minniti et al., 2024), further underscoring the necessity for holistic evidence that captures the complexities and interdependencies of health systems.

The second factor that makes available evidence less applicable in a unique setting, such as Ethiopia, is variation in the available evidence sources (Echendu, 2022). The majority of available evidence is contextually not feasible for this study area. Effective health system preparedness requires evidence-based policies tailored to local conditions and challenges, as highlighted by various studies, including those from organisations such as the World Health Organisation. Board

et al. argue that developing effective, evidence-based policy recommendations requires grounding the evidence in local conditions, as the opportunities and challenges related to health system preparedness can vary significantly depending on the specific setting (Board, 2019). Minniti et al. contend that tailoring preparedness strategies to meet local needs and utilise available resources can greatly enhance collective resilience capacities (Minniti et al., 2024). The review in low and middle-income countries emphasises the need for evidence that specifically addresses the unique challenges encountered in these diverse contexts (Lee et al., 2014). The World Health Organisation also promotes access to context-specific data for effective emergency preparedness (WHO, 2019c). In a notable move, the organisation recently adopted a resolution (EB156/7) titled "strengthening the evidence base for public health and social measures". This resolution emphasises the importance of conducting research tailored to specific contexts, ensuring that strategies and interventions effectively align with the unique needs and challenges of different communities (WHO, 2024a).

Despite the need for context-specific evidence, the current body of research on health emergencies predominantly focuses on higher-income nations with relatively advanced health systems (Zhong et al., 2014). For instance, a mapping study of public health emergency management research found that an overwhelming 73.7 per cent of studies focused on only four countries: the United States, China, the United Kingdom, and Australia (Yang et al., 2022). This shows a significant gap in the applicability of available evidence to resource-poor contexts, where health challenges and systemic vulnerabilities differ markedly. Hence, there is a pressing need for context-specific evidence to inform health emergency preparedness and responses in resource-poor health system settings.

In Ethiopia, the importance of developing effective and robust preparedness strategies is widely acknowledged (Atnafu et al., 2025; Firissa et al., 2023; Fufa et al., 2025). However, a substantial gap remains in the absence of documented information concerning the overall preparedness of the health system for emergencies. Health emergency preparedness and responses have not been a national research priority. Previous limited studies have overlooked a system-level approach. Consequently, the progress made in system preparedness, the current state of system readiness, and factors that enable or hinder the health system's preparedness remain poorly understood. Notably, the interactions among key influences on health system preparedness have not been thoroughly explored, leaving a gap in understanding their overall impact on system preparedness. Considering these gaps, the current research explored health emergency preparedness in

Ethiopian healthcare from a system-level and context-specific perspective, aiming to provide insights that could guide more effective policy interventions in Ethiopia and beyond.

1.4. Benefits of the research

This research generates local knowledge that addresses common challenges. It offers valuable insights into the necessary policy inputs to strengthen healthcare systems, primarily in Ethiopia. The research enhances the Ethiopian health system's preparedness for health emergencies. The identified enablers and barriers influencing the system provide important input for targeted interventions that contribute to a more resilient health system. Additionally, the implications of the findings extend to countries with similar resource-poor health systems. The findings regarding successful initiatives and challenges related to health emergency preparedness progress in Ethiopia present valuable lessons for comparable settings. Furthermore, policymakers and practitioners in similar contexts may adopt and utilise the conceptual framework developed in this research. Furthermore, the actionable recommendations outlined in this research will inform endeavours to enhance health systems' resilience.

This work plays a significant role in informing future studies on health emergencies. It emphasises the importance of viewing health emergency preparedness as a complex, multidimensional issue. The work advocates for a system-level analysis deeply rooted in each health system's context. By framing the challenges of health emergency preparedness through this comprehensive lens, the research encourages scholars and practitioners to recognise the interconnectedness of health systems in today's world. This holistic approach enhances understanding of health emergency management and helps design more effective solutions that improve health system preparedness and response capabilities.

1.5. Research questions

Four key questions guided this research. How do healthcare managers, as part of the system, assess the progress of the health system's emergency preparedness and current readiness? What key factors enable or limit health emergency preparedness in the health system? How do these factors interact and affect system-wide preparedness in the increasingly complex and interdependent health system context? Lastly, what strategies can be particularly implemented to enhance the resource-poor health system's preparedness for health emergencies?

1.6. Aim and objectives of the research

1.6.1.Aim of the research

The research aimed to explore health emergency preparedness within the Ethiopian health system, focusing on the system's progress in preparedness and current readiness, the factors that enable or limit system-level preparedness, the interactions among these factors, the system-wide influence of these interactions, and strategies to enhance health system preparedness.

1.6.2. Research objectives:

1. Document the perceptions of healthcare managers in Ethiopia concerning the progress of the country's health system and its current readiness for health emergencies.

2. Investigate the key enabling factors of health emergency preparedness in the Ethiopian health system.

3. Investigate the key limiting factors of health emergency preparedness in the Ethiopian health system.

4. Explore the relationships among the key influences that shape health emergency preparedness in a complex and interdependent health system context.

5. Develop a conceptual framework that informs strategies for enhancing the health system's preparedness for health emergencies

1.7. Background of the researcher

The researcher possesses a comprehensive understanding of the historical development and transformation of emergency medical services within the Ethiopian healthcare system. Monitoring the healthcare system's efforts to enhance the health emergency management system in the country helped the investigator gain insight into reforms and initiatives, particularly over the past fifteen years. The researcher's academic, professional, and prior research endeavours have significantly inspired the exploration of this subject as a doctoral research project. Additionally, collaborating under the valuable guidance and support of knowledgeable and experienced mentors has further facilitated articulating and examining the research problem. Furthermore, the researcher has had numerous opportunities to engage with selected experts in disaster health in Australia. Networking with these experts provided a platform to discuss and understand how the complexities and interdependencies within healthcare systems are practically addressed. Discussing these concepts from a practical perspective aided in articulating the problem and executing the research within the context of the study area.

The researcher is a product of Ethiopia's emergency medical services development efforts. He graduated with an Emergency Medicine and Critical Care Nursing degree from Addis Ababa University, School of Medicine. The opportunity to be mentored by and work alongside experts who have significantly contributed to the development of emergency medical services in Ethiopia has helped the researcher gain insight into the historical context, current achievements, and future goals of health emergency system development in the country. Moreover, the researcher has been a member of the Ethiopian Society of Emergency and Critical Care Professionals since 2016. Active participation in this professional network has broadened the researcher's understanding of Ethiopia's emergency medical service system.

After graduating with a Master of Emergency Medicine and Critical Care Nursing from Addis Ababa University, the researcher played a leading role in launching a similar program for the Bachelor of Science at Wallega University, another higher education institution in Ethiopia. From 2015 until recently, the researcher taught emergency and critical care nursing students at Wallega University. During this time, the researcher also contributed to the development and revision of curricula for training emergency and critical care nursing programs at the national level. Furthermore, the researcher has supported emergency medical technician training in the country. In addition to supporting training at colleges in the Oromia regional state, the researcher has served as a national assessor for competency examinations for emergency medical technicians. The researcher has also collaborated with the Ethiopian Ministry of Health on initiatives such as trauma life support training for healthcare workers and community first aid training.

The researcher's prior work in health disaster areas in Ethiopia helped build familiarity with relevant literature, policy documents, guidelines, and overall policy directions. This background facilitated the identification of key research and practice gaps. A few examples of previous related works by the researcher include: "Assessment of Knowledge, Attitude and Practice of Disaster Preparedness among Tikur Anbessa Specialised Hospital Health Care Workers", "Disaster Preparedness in Selected Hospitals of Western Ethiopia and Risk Perceptions of Their Authorities", "Patterns of Road Traffic Accident, Nature of Related Injuries, and Post-crash Outcome Determinants in Western Ethiopia", and "Spectrum, Pattern, and Clinical Outcomes of Adult Emergency Department Admissions in Selected Hospitals of Western Ethiopia". These and several other prior research projects have enabled the researcher to gain insights into existing research gaps in this study area.

In short, academic, professional, and research experiences motivated the researcher to undertake the present research project. This comprehensive experience has inspired the researcher to explore opportunities to enhance existing initiatives by identifying enabling and disabling factors. The research aims to improve the nation's healthcare system in this field. Essentially, the study recognises the progress made over time and seeks to identify areas where positive initiatives should be sustained while pinpointing obstacles that hinder emergency preparedness. Thus, the research does not intend to criticise or commend any specific entity or policy; rather, it aims to contribute to ongoing improvements and the rectification of existing deficiencies. Therefore, the researcher encourages all actors in the Ethiopian healthcare system's emergency services to consider the key findings of this research in their ongoing efforts to further improve these services.

1.8. Overview of the thesis chapters

This thesis is organised into twelve chapters. The first three chapters introduce the field, the setting, and the relevant literature and reports. Chapter Four focuses on the philosophical underpinning, the methodological approach, and the methods used in the research. Chapters Five through Ten present the key findings of the research. Chapters Eleven and Twelve offer interpretations and conclusions arising from these findings.

Chapter One introduces the topic and provides an overview of the significance of health emergency preparedness in the increasingly complex health system. It explains the rationale for undertaking a system–based health emergency preparedness project and emphasises the importance of this research. Moreover, the chapter outlines the research questions, aims, and objectives. Chapter Two provides a comprehensive literature review. It covers definitions of terms, characterisations of disasters and health emergencies, an overview of the magnitude and risks associated with health emergencies, and the losses and impacts involved. Furthermore, the chapter addresses subtopics such as health system resilience —including its features— and discusses the opportunities and challenges in enhancing health emergency preparedness. Chapter Three provides contextual information regarding the study area, providing a detailed background of Ethiopia, including its geography, economy, population, and government structure. Additionally, it explores the country's health system and offers insights into Ethiopia's disaster and health emergency management system, encompassing public health emergency management and the advancement of emergency and critical care services in the country.

Chapter Four discusses the underlying philosophy, methodology, and specific methods implemented in the research. This chapter covers the philosophical framework and the

researcher's ontological and epistemological positions, and describes the assumptions that led to the selection and application of the grounded theory methodology. It presents a comprehensive overview of grounded theory as an interpretive research approach, detailing the data collection and analysis methods.

Chapter Five focuses on data collection, analysis, and organisation performed according to the core principles of constructivist grounded theory. It outlines key stages of the grounded theory: Iteration, theoretical sampling, theoretical coding, theoretical saturation, and the construction of emergent theory. Chapter Six presents the key findings regarding the progress of system preparedness, specifically discussing the first emerging category, highlighting the progress of system preparedness and the current readiness level. Chapter Seven highlights the key enabling factors of health emergency preparedness within the Ethiopian health system. This chapter describes the next two categories, emphasising the enabling factors of health emergency preparedness. Chapter Eight introduces the subsequent two categories, encapsulating the first group of barriers to health system preparedness for health emergencies. Chapter Nine presents the remaining three categories and highlights the identified barriers to health system preparedness for emergencies. Chapter Ten illustrates the interactions among the key influences on system preparedness. In addition, the chapter presents a conceptual framework that outlines key strategies to enhance health system preparedness.

Chapter Eleven discusses key research findings presented in Chapters Six through Ten, covering the progress of health emergency preparedness, the key enabling and limiting factors, and the explanatory conceptual framework developed through the research. Chapter Twelve presents the policy, practice, training, research, and strategic implications of the research findings and the forwarded recommendations. The summary of the thesis chapters is illustrated in the figure below (Figure 1).

Chapter 1: Introduction

Chapter 2: A review of Literature

Chapter 3: Context of the Study Area

Chapter 4: Philosophy, Methodology, and Method

Chapter 5: Optimisation of Health System Preparedness in Resource-Poor Settings: An Emergent Theory

Chapter 7: Enablers of Health System Emergency preparedness Rooted in Local Adaptations and Emerging Opportunities

Chapter 8: Barriers to Health System Emergency Preparedness Related to the Lack of Synergy and System Stability

Chapter 9: Barriers to Health System Emergency Preparedness Related to Resource, Approach, and Learning Constraints

Chapter 6: Progress of the Health System Emergency Preparedness and Current Readiness

Chapter 11: Discussions

Chapter 10: Interactions of Factors Affecting Health System Emergency Preparedness

Chapter 12: Implications and Recommendations

Figure 1: Schematic Representation of the Thesis's Chapters

1.9. Summary

This chapter presented an introduction to the background of the problem, the research gaps, aims, and objectives of the study. The background information underscored the impact of health crises on health systems. Health emergencies are complex interplays of various factors and represent one of the all-time challenges to humanity. Despite large-scale initiatives aimed at addressing escalating risks, there remains a general lack of preparedness across all contexts, with the situation being particularly dire in low-income settings where the level of preparedness is exceptionally low. In Ethiopia, the absence of evidence significantly exacerbates this lack of preparedness, highlighting the critical need for more research. The rationale for this research has emerged from the identified evidence gap. The justification section elucidated that the research is

grounded in the necessity for a system-oriented and contextual analysis to explore emergency preparedness. It emphasised the complex and dynamic nature of health systems and the significance of a system-based, context-specific approach to understanding the opportunities and challenges of emergency preparedness within them. Furthermore, the justification section accentuated the insufficiency of evidence within resource-constrained health systems. This chapter also delineated the policy and research benefits of the study. The researcher's professional background is incorporated to signify that the researcher possesses an extensive understanding of the emergency medical service system within the study area, grounded in experience of the setting. Lastly, an overview of the thesis structure was provided to help readers easily navigate all sections.

CHAPTER TWO: A REVIEW OF THE LITERATURE

2.1. Introduction

This second chapter provides an overview of the literature on disasters and health emergencies, focusing on relevant issues and variables related to health system preparedness. It first highlights key terminologies such as disaster, disaster health, and health emergencies. Additionally, concepts such as health system resilience, health emergency preparedness, and the characteristics of resilient health systems are described. Next, the chapter discusses the magnitude of the range of disasters and health emergencies, and their potential impacts, particularly in under-resourced healthcare settings. Finally, the chapter discusses opportunities that improve health emergency preparedness and obstacles that impede it. The chapter concludes with a summary that captures the main points.

2.2. Overviews of disasters and health emergencies

2.2.1. Definitions of disaster and health emergencies

Although the primary purpose of this section is not to formulate precise definitions of the terms related to this research, it is important to provide an overview of key concepts related to disasters. It is essential to define and characterise disasters and health emergencies that arise from the interplay between natural hazards and complex human (societal) systems, such as healthcare systems. Overall, factors such as the types of threats, causes, effects, scale, scope, duration, and the unpredictable nature of the problem have become increasingly important for describing disasters (Nelson et al., 2007).

A widely accepted definition of "disaster" is from the United Nations Office for Disaster Risk Reduction (UNDRR), which defines the term as "serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts" (UNGA, 2016). The World Health Organisation adapted the UNDRR definition into the healthcare context and defines "disaster" as "a type of event or imminent threat that produces or has the potential to produce a range of health consequences and which requires coordinated action, usually urgent and often non-routine" (WHO, 2020b, 2020d).

Until recently, there was no standard nomenclature for the term "health emergency". Consequently, prior literature has lacked clarity regarding what defines this term (Kuipers & Welsh,

2017; Morgans & Burgess, 2011). In response to the increasing frequency of emergencies, the World Health Organisation (WHO) has adopted standardised terminology widely endorsed. As such, the organisation consistently uses the term "health emergency". According to the World Health Organisation's glossary of health emergency and disaster risk management terminology, a health emergency is defined as a type of event or imminent threat that produces a range of health consequences, and which requires coordinated action, urgent and often non-routine, noting that a health emergency may pose a substantial risk of significant morbidity and mortality in a community (WHO, 2020g). In its user manual titled 'Toolkit for Assessing Health-System Capacity for Crisis Management', the World Health Organisation Regional Office for Europe has defined the term "health emergencies" in a broader context, stating "health emergencies as encompassing new or re-emerging diseases, the accidental or intentional release of biological, chemical, or radio-nuclear agents, natural disasters, human-made disasters, complex emergencies, conflicts, and other incidents with the potential for catastrophic impact on human health, including the potential effects of climate change" (WHO/Europe, 2012).

The term "health emergency" also links to "health disaster" and "disaster health". While these terms appear similar, they represent different meanings. In its glossary of terms, the World Association for Disaster and Emergency Medicine (WADEM) defines "Health Disaster" as "a precipitous or gradual decline in the overall health status of a community for which the community is unable to cope without outside assistance" (WADEM, 2002). The WADEM definition emphasises consequences of a disaster, such as the spread of disease, damage to healthcare infrastructures, interruption of healthcare services, or any consequences that increase the vulnerability of populations, rather than the disaster itself. According to the World Health Organisation definition, "Disaster health" denotes the impact of a disaster on health and the need for coordinated health responses (WHO, 2018c, 2018d). The WHO-specific definition emphasises the health impact of emergencies and, therefore, the necessity of a well-coordinated and structured response to minimise these impacts.

Framing the scope of health emergencies within a broader context supports a coordinated, proactive strategy to identify, prevent, and respond to public health threats. Adopting a comprehensive approach that considers potential risks across various scenarios, rather than focusing only on one type of disaster, enables thorough preparedness (Staupe-Delgado, 2019). More importantly, a definition that supports a proactive approach will enhance preparedness. In this regard, the definition of the term provided by the WHO Regional Office for Europe (WHO/Europe) aligns with the all-hazards approach and emphasises outfitting systems

with the necessary resources and response protocols to manage any potential health emergency effectively. This definition also promotes the importance of a coordinated and proactive approach required for preventing, detecting, and responding to health emergencies (WHO/Europe, 2012).

2.2.2. Classifications of disasters and health emergencies

How disaster health is framed in terms of its classification is also important. In literature, the nature of disasters has been one of the common and ongoing discourses among researchers and experts in the field. A key point of debate was whether disaster occurrence is caused by natural, human, or both factors. The way disasters are categorised and characterised can have implications for preparedness and response strategies (Staupe-Delgado, 2019). Differentiating disasters as purely "natural" or "man-made" can influence people's perceptions of risk. This varied risk perception will consequently impact the degree, scope, and nature of people's, organisations' and systems' preparedness. A review undertaken by Wachinger et al., on risk perception implications for governance and communication of natural hazards, found that risk perception directly affected our preparedness and actions in response to potential hazards (Wachinger et al., 2013).

Moreover, people often view natural disasters as unpredictable and an "act of God". The idea that disasters are simply acts of nature undermines people's motivation to prepare. Besides weakening preparedness efforts, this type of classification also hampers prevention and risk mitigation activities. The impact of this type of misconception on prevention and preparedness is attracting increasing attention in various fields. Some organisations often prefer the term " road traffic injuries" instead of "road traffic accidents". For example, prominent medical journals, such as the British Medical Journal (BMJ), prohibit using the word "accident". The Journal of Emergency Medicine changed its name from "Journal of Accident and Emergency" for the same reason (Loimer & Guarnieri, 1996). These kinds of decisions indicate the importance of considering the implications of how disasters are understood, in terms of their definitions, classifications, and descriptions, for effective disaster management (Becker et al., 2013; Gill et al., 2021; Panda & Sethy, 2016; WHO, 2018c).

In contrast to the previous argument that emphasises disasters are mainly caused by natural forces, many scholars emphasise the role of human factors in creating risks and vulnerabilities (Chmutina & Von Meding, 2019; Eiser et al., 2012; Platte et al., 2004; Stephen, 2016; Wijkman & Timberlake, 2021). Some experts contend that disasters are seldom purely natural (Goldberg, 2021; Handmer & Dovers, 2012; O'Mathúna, 2018; Plattner, 2005). Experts who take this side assert that while specific hazards may be inevitable, implementing effective prevention and

emergency preparedness measures can reduce their impact on society. This perspective recognises disasters not only as a part of human life, but also promotes the role of human action in preventing, mitigating and preparing for risks (Goldberg, 2021; Staupe-Delgado, 2019).

The perspective that disasters result from natural and human-made factors may positively influence disaster mitigation. Effective mitigation and preparedness activities can help minimise the impacts of disasters. However, under certain circumstances, distinguishing events as "natural" versus "human-made" may lack significance because natural and human-made causes frequently interact, amplifying the severity of the initial event (Adini et al., 2012). The catastrophic events of the 2011 disaster in Japan illustrate how a series of interconnected crises can unfold. It began with a massive earthquake that struck ferociously, triggering a devastating tsunami that swept across the coastline. This dual calamity ultimately led to a nuclear emergency, highlighting how one event can escalate into a crisis with varying characters and consequences (Takano, 2011).

Disaster health can be classified as internal or external based on its origin in relation to healthcare facilities. In this context, internal disasters refer to incidents within the healthcare facility or system that can disrupt its functional and structural aspects. In contrast, external disasters are incidents that take place outside the healthcare system (Adini et al., 2012). While categorising disasters based on the location of incidents may not be as effective in complex systems, it still holds significant potential for providing valuable insights. In a broader context, understanding specific geographical patterns of disaster occurrences may help develop more effective mitigation and preparedness measures, potentially saving lives and minimising damage. On the contrary, a disaster approach based on the source of incidents may have diminishing utility within complex systems. This is because disasters that initially seem external to healthcare can become internal within an interconnected system, as in the interplay between natural and man-made disaster categorisations. Damage to external critical infrastructures, such as electricity and water supply, caused by a disaster outside healthcare facilities, could compromise healthcare delivery (Masys et al., 2020).

2.3. Prevalence and magnitude of disasters

All nations face various risks and potential health threats arising from an expanding array of factors. These include infectious diseases, chemical and nuclear incidents, food contamination, and risks related to climate change, such as extreme weather events and deforestation. According to EM-DAT, which compiles disaster information from various sources, including UN agencies, non-governmental organisations, reinsurance companies, research institutes, and press agencies,

there were 432 natural catastrophic occurrences worldwide in 2021. This number was much higher than the average of 357 yearly catastrophic incidents documented by the same database between 2001 and 2020. Overall, this accounted for 10,492 deaths, affected 101.8 million people, and caused approximately 252.1 billion dollars (USD) in economic losses (Eckstein et al., 2021b; Mazhin et al., 2021).

The EM-DAT data reveals various disaster types from the past five years (2020-2024), with floods and storms occurring most frequently. The figures indicate more than 5,750 flood incidents, over 4,580 storm incidents, and more than 1,570 earthquake incidents. Droughts and wildfires also play a major role, with over 790 recorded drought events and more than 450 wildfire incidents. The same database indicates that 187 natural disasters occurred across 79 countries during the first half of 2022. The data emphasises the severity and aftermath of these disasters, which have caused significant property damage, considerable disruption, and numerous fatalities worldwide. (Eckstein et al., 2021a). In 2023, EM-DAT recorded a total of 399 natural disasters, resulting in 86,473 fatalities, affecting 93.1 million people, and leading to economic losses of US$202.7 billion (CRED, 2023). The year 2024 saw EM-DAT report 393 natural disasters, causing 16,753 documented deaths, affecting over 167 million people, and resulting in nearly US$242 billion in damages (CRED, 2024).

The World Health Organisation (WHO) estimates that about 1.6 billion people live in conflict-affected areas, including conflict zones and displacement regions (WHO, 2025a)This figure is nearly 25 per cent of the global population. The increasing incidences and scales of conflicts contribute to a broad array of global challenges. Rising global conflict and violence involve primarily non-state actors such as political militias, criminal groups, and international terrorist organisations (Avis, 2019). Unresolved regional tensions, a decline in the rule of law, ineffective state institutions, illicit economic pursuits, and resource scarcity, worsened by climate change, are recognised as key drivers of these conflicts (UNISDR, 2020). Factors such as poverty, gender, age, migration, health and nutritional status, displacement, and unplanned urbanisation can heighten individuals' exposure and vulnerability to these dangers and hazards (WHO, 2024f).

Infectious diseases pose a significant challenge to public health worldwide and across Australia. Vector-borne and zoonotic diseases have become major threats, along with the enduring impacts of COVID-19, recent outbreaks of other illnesses, and the increasing risk of antimicrobial resistance (Sun et al., 2025). In 2024, the worldwide impact of infectious diseases remained significant, with certain regions seeing considerable rises. COVID-19 continued to impact global

health, while infectious diseases such as measles, monkeypox, and cholera occurred in various regions. Before the pandemic was declared no longer a public health emergency of international concern (PHEIC), the World Health Organisation's coronavirus dashboard update indicated that the global COVID-19 death toll had reached nearly seven million, with over 770 million confirmed cases and more than 7 million deaths worldwide (WHO, 2023b). Furthermore, there were outbreaks of dengue, measles, mpox, and highly pathogenic avian influenza A, along with potential cases of Zika virus and other arboviral diseases (Deiana et al., 2024).

The risks, profiles, and consequences of disasters in developing countries are intricately linked to the vulnerability of their populations and associated with relatively weak economies and often limited capacities to cope with hazards. According to the 2021 global climate risk estimate, by 2030, up to 118 million impoverished people in Africa will be exposed to cyclones, drought, floods, earthquakes, extreme heat, and other extreme weather conditions (Eckstein et al., 2021b). Over the past fifty years, the number of reported disasters and their related impacts in Africa has increased substantially (Freebairn et al., 2020). The vast majority of loss of life and economic burden resulting from disasters is contributed by developing countries, underlining the link between poverty and disaster (Hallegatte et al., 2020). For instance, a report indicates that of all deaths from weather, climate, and water-related hazards from 1970 to 2019, approximately 91 per cent occurred in developing economies (Zhongming et al., 2021).

Ethiopia is among the countries most vulnerable to a wide range of disasters (Ayele et al., 2021). The country faces multiple interconnected challenges. Many disasters in Ethiopia are related to climate variability and climate change (Mekonnen et al., 2021). Existing data shows that natural hazards are responsible for about three-quarters (76%) of the country's disasters, of which hydrological hazards, specifically floods (55%), are the most frequent (Amsalu & Adem, 2009). Various security, epidemiological, environmental, and socio-economic challenges in Ethiopia collectively exacerbate public health risks. The country frequently experiences extreme events, including droughts and floods, as well as unpredictable rainfall and heat waves, which adversely affect livelihoods and the economy. The primary environmental issues that contribute to disaster vulnerability include soil erosion, deforestation, recurrent droughts, desertification, land degradation, and the loss of biodiversity and wildlife (Gezie, 2019).

Drought-induced famine, floods, landslides, crop pests, and devastating wars are significant consequences that have caused immense suffering to communities in Ethiopia over the past few years (Abebe, 2010a). The Emergency Events Database record from 2020 illustrates the country's

vulnerability to a wide range of hazards, including climate-induced drought, floods, locust invasion, volcanic eruption, landslides, epidemic diseases, and storms (CRED, 2020). As a result, in 2020, more than 17.4 million people in the country's total population of 118 million were reported to require humanitarian assistance. In the northern region alone, over 6 million people require humanitarian assistance, including healthcare, due to the conflict that erupted at the end of 2020 (Weldemichel, 2021). On the other hand, Ethiopia is the second-largest host country for refugees in Africa, mainly welcoming migrants from South Sudan, Somalia, Eritrea, and Sudan. The main reasons for this displacement include conflict, which accounts for 3.5 million (85%), and climate-related issues such as droughts and floods (Tesfaw, 2022). The World Food Program report showed that over 20 million people in Ethiopia required food aid due to various disasters in 2024 alone. Recurrent and persistent drought and displacement make the largest contribution in putting millions of Ethiopians to the extent that they become dependent on aid for survival (World Bank, 2023).

During the last several years, localised conflicts of major concern have severely impacted the socio-economic conditions of the population in Ethiopia. The country has experienced many direct and indirect consequences of conflict. While all parts of the country have faced conflict to some degree, reports show that the damage to health systems in the northern Ethiopian conflict has been especially severe (Arage et al., 2023). A war-related mortality, starvation, disruptions to food systems, and forced relocation, as well as incidents of violence and rape linked to conflict, were among the consequences.

Due to the ongoing political unrest and instability, Ethiopia has one of the largest numbers of internally and externally displaced people. According to the 2024 International Organisation for Migrants (IOM) Displacement Tracking Matrix (DTM) report, there were 3.3 million IDPs in Ethiopia, displaced mainly by conflict (69%) and drought (17%). The risks of further displacement unfold amid ongoing conflicts and key unresolved issues in the country. Armed conflict has persisted for the past 7 years in Oromia, the country's largest region. Similarly, there is a wide scale of confrontation between armed conflict in the Amhara region, the second-largest region in the country. Moreover, despite the 2022 peace agreement, the effects of the conflict still impact the northern regions of Ethiopia, especially Tigray, Amhara, and Afar, where many remain displaced (IOM, 2025).

The burden of conflict on the health system is severe in the country. In most affected regions, the conflicts have caused health practitioners to flee, resulting in a shortage of health workers. The

conflicts have caused stress to the healthcare system and impacted available services. The conflict has resulted in interruptions of programs, which will have long-term health effects, such as disruption of immunisation programmes. In addition, the mental health effects, such as post-traumatic stress disorder, are substantial (Aderinto & Olatunji, 2023; Natukunda, 2022).

The country is also vulnerable to unusual hazards, such as chemical hazards and earthquakes. There is a lack of organised disposal mechanisms for hazardous chemicals, including pesticides, acidic chemicals, and electronic waste, which have been stored in various locations throughout the country. According to the Public Procurement and Property Administration Agency, there is, for example, a vast stockpile of outdated explosive chemicals (Kitila & Woldemikael, 2019). Reports indicate a significant stockpile of outdated explosive chemicals in Addis Ababa, which can annihilate the capital with the potential to cause an enormous explosion that would devastate cities and towns within a few hundred kilometres of Addis Ababa (Sahlu, 2021).

In Ethiopia, injuries, in general, and road traffic accidents, in particular, are a growing national public health concern (Ali et al., 2020a). Ethiopia ranks among the countries with the highest number of road accidents, according to multiple surveys, including the World Health Organisation's Global Status Report on Road Safety (Kussia, 2017). Every year, road traffic accidents cause numerous fatalities and injuries in Ethiopia, making the country one of the most affected by such incidents (Alemayehu et al., 2023). Ethiopia has one of the highest rates of traffic fatalities in Africa, with 68 deaths per 10,000 vehicles annually, predominantly affecting economically active age groups. Evidence indicates that traumatic injuries account for 28 per cent of all emergency room visits (Sultan et al., 2019).

Ethiopia lies within a tectonically active region susceptible to earthquakes and volcanic eruptions, so the country is not immune to disasters such as earthquakes. Although no significant events have been recorded in recent history, they could potentially cause severe damage if they happened. The northern and southern highlands are divided by the lowlands of the Great Rift Valley. These areas are especially known for their vulnerability to earthquakes, volcanic eruptions, and drought (Urama & Ozor, 2010). There are three tectonic plates that converge where the Ethiopian Rift Valley extends from the Afar Triangle across the country in a northeast to southwest direction. Several areas, including Addis Ababa, are situated along the Rift Valley in areas with a moderate earthquake risk (Ambrosetti et al., 2016). In early 2025, a series of earthquakes and tremors hit Ethiopia's Afar and Oromia regions. The tremors have caused sparking concerns of possible volcanic eruptions near areas called the Fentale and Dofan. As a result, several

earthquakes, some reaching a magnitude of 6 on the Richter scale, prompted evacuations and damaged infrastructure. Experts in the field linked the seismic activities to magma rising beneath the surface, which, according to the prediction, might lead to volcanic activity in the future (Bedassa, 2025).

In Ethiopia, exposure to hazards such as conflicts, a low level of resilience, uncontrolled population growth, and a fragile healthcare system are the main factors increasing the country's vulnerability. Its heavy reliance on rainfall for agriculture and comparatively low adaptive capacity to cope with current and predicted climate changes significantly worsen this issue, intensifying the country's vulnerability (Gbetibouo et al., 2010). Insufficient health service coverage, a high population growth rate, low economic development, inadequate infrastructure—especially in disaster-prone areas—weak institutional structures, and a lack of awareness are additional challenges that increase the country's vulnerability (Mochizuki & Naqvi, 2019). The highlighted issues of vulnerability, low resilience, and the country's current economic situation, worsened by high population growth, indicate that disaster and health emergency preparedness need more investment, including funding for scientific research.

2.4. The losses and impacts of disasters

Disasters profoundly impact individuals, economies, and society, affecting millions of people worldwide and incurring significant financial costs each year. Disaster impact and disaster loss are often used interchangeably. Although both terms express the effects of disasters, they carry different connotations. Impact relates to the effects of a disaster on people, buildings, and society. The consequences of a disaster can be extensive, including long-term social and economic impacts across education, health, and productivity.

Disaster loss is a measure of the destruction caused by a disaster (McGlade et al., 2019). Disaster losses can be classified as direct, indirect, immediate, or delayed. Direct losses refer to the physical or structural damages caused by the disaster, such as the destruction of infrastructure due to high winds, flooding, or ground shaking. Indirect effects are the subsequent or secondary consequences of the initial destruction, like business interruption (McGlade et al., 2019). Indirect impacts usually stem from interruptions in the supply of goods and services caused by a disaster (de Ruiter et al., 2020). This highlights how war affects healthcare in conflict areas and disrupts the delivery of health supplies to remote regions. For instance, reports indicated that the 2022 escalation of the Russo-Ukrainian conflict has affected the availability of materials needed to manage the COVID-19 pandemic. This occurs because some countries depend on Russia and

Ukraine for crude oil, natural gas, and certain metals used in manufacturing and transporting medical equipment (Dhawan et al., 2022). Such burdens are undoubtedly problematic for healthcare systems in countries like Ethiopia, where civil war has severely disrupted healthcare.

Accurate measurement of disaster impacts is often problematic (Green et al., 2019). Disasters and emergencies result in multifaceted consequences for the community (Kishore et al., 2018). Globally, disasters and emergencies affect millions of people each year and cost billions of dollars. The specific consequences include loss of life, economic impacts, and disruptions to social and mental well-being. Disasters and emergencies, including those associated with climate change, can have a broad range of harmful mental health effects. Notably, certain groups in society are more vulnerable or severely affected by post-traumatic stress, such as children, culturally and linguistically diverse communities, rural and remote populations, the elderly, and individuals with pre-existing mental health conditions or medical issues (Ober et al., 2000; Raphael & Ursano, 2018). This significantly affects communities in countries such as Ethiopia, where mental health services are underdeveloped, and most people reside in remote areas.

In the past, the impacts of disasters and health emergencies have been assessed based on the number of lives lost, damage to structures and functions, and effects on society and the economy (Salami et al., 2017). However, measuring the impacts of emergencies only by fatalities, injuries, financial damage, and life years lost is inadequate; it is also crucial to consider the time needed for economic development and social progress to fully recover (Khadka, 2022). This is because it is impossible to fully capture the overall loss and the complete human, social, and economic impacts of emergencies by merely counting deaths in numbers and economic losses in dollars (Chan & Wong, 2022). For this reason, assessing the potential impacts of disasters on the community's future is gaining increased attention (Kull et al., 2016). Therefore, in addition to the quantifiable damages they cause, losses related to health emergencies and disasters are thoroughly analysed beyond direct losses.

When a disaster strikes, it can have far-reaching consequences for the healthcare services in the affected area. Aside from direct health impacts and their devastating effects on human lives and the economy, disasters are known to impose unique burdens on the health system. Emergencies disrupt the health system's ability to provide services and address future health risks. They create an imbalance between the demand for healthcare services and the capacity to supply them (Sohrabizadeh et al., 2021). This is compounded by the sudden and unplanned increase in demand for health services, often associated with crises. This may include the direct impact of

disasters on health facilities. For instance, in 2021, amidst the COVID-19 pandemic, earthquakes struck the Sulawesi region of Indonesia. As a result of the earthquake, the four most prominent hospitals in the area ceased providing services due to the damage and collapse of buildings (World Bank, 2021b). The overburdened or destroyed health system is, therefore, unable to respond appropriately, and its ability to "promote, restore or maintain health" ceases, potentially increasing morbidity and mortality.

Disasters also impact surrounding regions and countries, as population displacement raises the demand for health services and places pressure on health systems in those areas (WHO, 2017c). Disasters can indirectly affect health services by overwhelming resources or compromising service delivery through the collapse of critical external infrastructure. They also strain available services due to the increased influx of victims. Beyond the immediate impact of the disaster itself, indirect effects can hinder healthcare providers' ability to deliver essential (business-as-usual) services. One such effect is the overwhelming unavailability of resources. In the aftermath of a disaster, healthcare facilities may struggle to cope with the "usual or expected" number of patients needing medical attention. This arises from post-disaster medical supplies, equipment, and staff shortages, which severely impact patients' quality of care. Another indirect consequence of disasters on healthcare services is damage to vital infrastructure. Disasters such as earthquakes, floods, and cyclones can cause extensive damage to healthcare facilities, roads, bridges, power lines, and other essential structures. Damage to one or more of these infrastructures may affect healthcare delivery by blocking access of healthcare providers to healthcare facilities, or patients may be unable to access the facilities. Damage to the road or power, for example, may impact the functionality of the facilities. In all cases, delivering services to patients is impacted, including those who need urgent help and those who may not get the necessary medical help. Absence or delays in treatment may result in loss of life (Bonnett et al., 2007).

Disasters also strain available services. The surge that commonly happens in the aftermath of a disaster can put significant pressure on healthcare resources. The increasing number of victims needing immediate, ongoing, or rehabilitative care overwhelms available capacities. This makes it difficult for providers to deliver care to everyone in need. As a result, there may be delays in treatment or a need to prioritise care based on the severity of patients' conditions. Furthermore, the ongoing demand for healthcare, mainly during the recovery phase for mental health and violence, can challenge the health system's capacity. In summary, disasters can substantially impact healthcare services.

2.5. The concept of the health system resilience

Resilience is a concept applied across different sectors and disciplines, including public health, agriculture, engineering, and economics (Kanta Kafle, 2017). Resilience encompasses several key characteristics. Alastair McAslan outlines various characteristics of resilience, of which four features closely align with the focus of this research project (McAslan, 2010). The first feature is "Being prepared". Resilience entails the ability to absorb and recuperate from abnormal events, which can be developed through formal planning and cultivating physical, economic, and human resources. It can also evolve informally through social connections or exist naturally through the inherent properties of materials. Individuals, communities, organisations, and even nations that are prepared for abnormal events tend to demonstrate greater resilience. The second characteristic of resilience pertinent to the aims of this research is "Collective and coordinated response-interdependency". This underscores the fact that as society becomes more complex and interdependent, with the impact of global factors becoming more immediate and apparent, there is a greater vulnerability to disruptive events. In confronting such interconnected threats, resilient communities, organisations, and nations are those that are well-coordinated and share common values and beliefs. The third necessary characteristic of resilience is the "Desire/commitment to survive". Survival is a fundamental human instinct, and those with the strongest will to stay alive can endure extreme and abnormal conditions and recover from traumatic events. Likewise, groups, communities, and organisations with a unified purpose and a collective commitment to survival are more likely to thrive. This is achieved through strong leadership and shared organisational values and beliefs. Lastly, "adaptability" is an important aspect of resilience. The world is constantly evolving, sometimes through natural processes and sometimes through human intervention. It is widely acknowledged in the literature that systems, organisations, and individuals who are able and willing to adapt tend to be more resilient (McAslan, 2010).

Resilience is gaining increased attention in the health sector, especially with recent health crises like the Ebola outbreak and the COVID-19 pandemic (Kruk et al., 2015). Resilience is about withstanding shocks and maintaining usual services, even in debilitating and demanding situations. The formal definition is that it is "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its necessary basic structures and functions" (WHO, 2021b).

Health system resilience is a broad concept that covers activities and capacities, including institutions, infrastructure, and populations, to prepare for, detect, adapt to, respond to and recover

from public health threats while ensuring the maintenance of quality essential and routine health services in all contexts, including in fragile, conflict and violence settings. It encompasses mitigation, preparedness, response, and recovery aspects of health emergency management in the health system. This implies that health system resilience is not limited to the response phase of events but involves the entire cycle from prevention, preparedness, response, and recovery aspects (WHO, 2024b).

2.5.1. Characteristics of resilient health systems

A healthcare system must be able to prepare for and adapt to ever-evolving challenges and uncertainties. However, mere preparedness is not sufficient. To be truly effective, healthcare systems must exhibit resilience—the ability to withstand, adapt to, and recover from disruptions. Therefore, it is imperative to recognise the importance of resilience and understand the key characteristics constituting a resilient healthcare system.

A study of healthcare systems was conducted in five countries, including Ethiopia. The researcher selected these countries because they have all achieved substantial improvements in health or access to services or have implemented innovative healthcare policies relative to their neighbouring countries, while also being able to adapt to resource limitations. That study identified several characteristics of a successful healthcare system. A successful healthcare system considers the constraints imposed by its historical context and past decisions, also known as path dependency. Acknowledging that choices made in the past shape the present and influence future decisions is essential. Considering the impact of these choices enables a healthcare system that is better suited to meet the needs of the people it serves to be developed. This involves learning from past mistakes and building on successes to develop a more efficient and resilient system. Ultimately, healthcare systems that consider path dependency are better prepared and more resilient now and in the future (Nuzzo et al., 2019a, 2019b).

Furthermore, healthcare systems are deemed successful when they promote a strong culture of societal consensus-building. When decisions regarding the healthcare delivery system are made flexibly and independently, the system meets one criterion for success. Flexibility means decision-makers and providers are not limited by strict guidelines or protocols, while autonomy indicates they have the authority to make decisions without constant supervision or micromanagement. However, this does not mean healthcare providers and administrators are exempt from making informed decisions based on the current circumstances. Effective healthcare systems are often resilient, willing to learn from experience, and committed to incorporating feedback within the policy

cycle. Another key aspect of a successful healthcare system is its support from the broader governance and socioeconomic context, which aligns with and respects the population's culture and preferences. Moreover, successful healthcare systems are characterised by fostering synergies among actors and sectors at both local and global levels. Lastly, an efficient healthcare system is open to dialogue and collaboration between the public and private sectors, supported by effective government oversight (Balabanova et al., 2013).

In their publication titled "What is a resilient health system? Lessons from Ebola," Margaret E. Kruk et al explored the vital need to build resilience within healthcare systems to effectively address health emergencies such as disease outbreaks and natural disasters. The study highlights the importance of establishing a proactive, robust healthcare delivery system that aligns with a strong public health response. It emphasises recognising the global nature of health crises and the necessity of a coordinated international response. Furthermore, it underscores the significance of legal and policy frameworks, a dedicated healthcare workforce, and strong social capital within the health system. Additionally, the authors outline five elements that characterise resilient health systems: awareness of strengths and vulnerabilities, diversity and interconnectedness, self-regulation, integration, and adaptability (Kruk et al., 2015).

Resilient health systems maintain an up-to-date inventory of human, physical, and informational resources to identify areas of strength and weakness. Their ability to address a broad range of health challenges, rather than focusing narrowly, contributes to their stability and capacity to detect and respond to disruptions. Furthermore, resilient health systems are self-regulating and can contain and isolate health threats while ensuring essential services and preventing further destabilisation. They also prioritise integration, which involves uniting different partner organisations, ideas, and groups to develop solutions and take action. This integration is supported by information sharing, clear communication, and coordinated efforts, often facilitated by a designated focal point within the health system. Finally, resilient health systems are adaptive and capable of transforming in ways that improve their function even under highly adverse conditions (Balabanova et al., 2013; Kruk et al., 2015).

Evidence shows that even if they adapt to various resource-related challenges and celebrate success stories, many healthcare systems in low and middle-income countries struggle to prepare for health emergencies adequately (Sapkota et al., 2023). Such healthcare systems often reveal numerous gaps in preparedness. Furthermore, healthcare systems in this context are often overly

burdened, significantly compromising routine services. Above all, their resilience to unexpected shocks remains persistently weak (Khatri et al., 2023).

2.5.2. Level of health system resilience

The level of a health system's resilience varies across countries and regions, even within a single nation. These variations may be attributed to several secondary factors, such as the nature of threats, common disease burdens, health system organisation, and other macro factors such as governance structures. Therefore, there is a need for a localised definition or adaptation of health systems resilience that responds to the local environment. A complex mix of factors linked to political, social, economic, health, cultural, and other influences affects the vulnerability of individuals and systems to emergencies (WHO, 2022b).

Similarly, the resilience level of a particular area is highly variable depending on the context in which healthcare operates, the strength of that healthcare system, the existing routine healthcare demand, the level of services met, and other factors (WHO, 2022b). In the realm of emergency risk management, the term "context" refers to the complex interplay of various factors that surround and influence risks and events (WHO, 2020d). These factors can be broadly categorised as the setting, circumstances, and environment in which emergency risk management is applied.

Understanding contextual nuances is important for devising effective risk management strategies tailored to specific situations. Context encompasses the cultural, social, political, legal, regulatory, financial, technological, economic, natural, and competitive environments—whether local, national, regional, or international—and the factors related to governance, organisational structure, roles, accountabilities, policies, objectives, and strategies in place to achieve those objectives (WHO, 2022b). They also include the capacities and relationships of internal and external actors and partner organisations (WHO, 2020d). Health systems are vulnerable to chronic stressors without a comprehensive, integrated approach prioritising resilience. These stressors can weaken the system, rendering it more susceptible to shocks and prolonged disruptions (Truppa et al., 2024). Therefore, building a context-driven and systemic framework that addresses resilience is important to ensure the sustainability and adaptability of health systems. Preparedness activities become the cornerstone of the healthcare system's resilience.

2.6. Health system preparedness

Health system preparedness is an integral component of a resilient health system. The term is most often used interchangeably with "readiness". However, the two terms carry slightly different

meanings. According to the United Nations Disaster Risk Reduction, "readiness" specifically refers to the ability to respond quickly and appropriately when required (UNGA, 2016). On the other hand, preparedness denotes "the knowledge, capacities and individuals to effectively anticipate, respond to, and recover from the consequences of likely, imminent, or current emergencies (WHO, 2017d).

According to the WHO's Glossary of Health Emergency and Disaster Risk Management Terminology, public health emergency preparedness is described as "the capability of the public health and healthcare systems, communities, and individuals to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities (WHO, 2017d). According to this definition, healthcare system preparedness involves the capability of a community's healthcare system to plan for, respond to, and recover from events that have both immediate and long-term impacts on public health and medical services (UNGA, 2016; WHO, 2018d). In simpler terms, readiness means the ability to respond immediately, while preparedness aims for long-term goals. Health emergency preparedness means being proactive and protecting systems against potential health crises. Preparedness aims to respond effectively, reduce impact, and facilitate a smooth recovery.

Health system preparedness encompasses a comprehensive analysis of disaster risks and robust links to early warning systems. It includes contingency planning, stockpiling equipment and supplies, establishing coordination arrangements, organising evacuation plans, preparing public information, and carrying out relevant training and field exercises. These efforts must be supported by formal institutional, legal, and budgetary capacities (UNGA, 2016; WHO, 2017d, 2020g)Health emergency preparedness encompasses a range of actions that health systems take to improve their ability to anticipate, prevent, mitigate, respond to, and recover from emergencies. This involves developing knowledge and skills in emergency management, such as identifying potential hazards, designing emergency plans, procuring necessary supplies and equipment, and participating in emergency drills and exercises.

The idea of preparedness elements is attracting interest from researchers, policymakers, and practitioners. The WHO framework for health emergency preparedness identifies three core elements, each comprising multiple sub-elements. Effective emergency preparedness relies on governance, capacities, and resources. Governance involves national policies and legislation integrating emergency preparedness, plans, and coordination mechanisms for response and

recovery. Capacities include risk assessments, early warning systems, access to diagnostic services and healthcare, risk communications, and research and development. Finally, resources comprise financial support, logistical mechanisms, necessary supplies, and a dedicated, trained workforce. Together, these elements ensure that health systems are well-prepared to respond to and recover from emergencies (WHO, 2018d).

Experts utilise several features to outline the key elements of health emergency preparedness. One aspect of preparedness involves operational considerations. In their work on conceptualising and defining Public Health Emergency Preparedness, Nelson et al. outlined various elements of preparedness. While many of their elements align with those suggested by other authors, two elements in their list are particularly important: preplanned and coordinated rapid-response capability and clearly defined roles and responsibilities. The first element addresses issues related to the "legal climate", such as legal authority and liability barriers that may hinder effective monitoring, prevention, or response to a health emergency. The latter underscores the importance of unambiguously defining, assigning, and testing responsibilities across all sectors, government levels, and individuals, ensuring seamless integration within each group (Nelson et al., 2007).

Another hallmark dimension of preparedness is determining who should be involved in the task. Preparedness is everyone's business. Understanding the importance of multi-sectoral involvement in health emergency preparedness, several countries have adopted the "whole-of-government (WOG), whole-of-society (WOS)" approach. This approach is a governance strategy for engaging with all government sectors, institutions, governmental and non-governmental organisations, and, most importantly, all communities as the pillars of society (Haghighat et al., 2023). Ensuring the involvement of multiple parties is a necessary component of preparedness.

Another defining feature of preparedness is what to consider from a practical perspective. In their study titled "Public Health Emergency Preparedness: A Framework to Promote Resilience", Yasmin et al. explored the fundamental components of a resilient public health system and how these systems interact as a complex adaptive system. They developed a framework for health emergency preparedness from a complex and interconnected system perspective, with various elements (planning process, collaborative networks, community engagement, risk analysis, surveillance and monitoring, practice and experience, resources, workforce capacity, communication, learning and education) converging at the core. At the heart of the framework are governance and leadership, which serve as the important link tying all other elements together.

Their framework emphasises the importance of governance and leadership in managing public health emergency preparedness (Khan et al., 2018a, 2018b).

Despite the significant and long-lasting effects of health emergencies, many institutions, systems, and policies worldwide remain predominantly reactive in their approach to these events, rather than adopting a proactive and preventive stance (Wernli et al., 2023). Focusing only on one aspect of a response can lead to negative outcomes with wide-reaching effects. Therefore, it is essential to adopt a comprehensive approach that considers how the parts of resilience interact to achieve the best results (HPG, 2021). The absence of an integrated approach is often linked to the general public's and politicians' overall lack of understanding of the concept, framing, and scope of health system resilience. This can be due to the limited efforts to develop an integrated approach that employs a public health perspective to enhance systems resilience (WHO, 2022b).

Research and expert commentary show that developing health emergency preparedness has opportunities and challenges. However, these opportunities and challenges vary from location to location. As such, a thorough assessment of unique local characteristics is important for designing the most appropriate strategies to build health emergency preparedness. This approach helps understand the full potential of health emergency preparedness and identify ways to address challenges unique to each setting.

2.6.1. Opportunities to enhance health emergency preparedness
2.6.1.1. Lessons from previous emergencies

Historical health emergencies have served as crucial moments for public health officials to refine and improve their response strategies (Koka et al., 2018). Research highlights that failing to capitalise on these moments can lead to significant challenges (Davies et al., 2019). Lessons learned from recent health emergencies have helped many countries better coordinate their resources and efforts to strengthen health systems. These experiences enable them to handle future health challenges efficiently and effectively (Nuzzo et al., 2019b). This has involved a comprehensive approach that integrates various resources and efforts to promote the population's overall well-being (Ogira et al., 2022). More effective strategies can be devised by drawing on lessons from past and recent pandemics and other natural disasters worldwide (Gensheimer, 2004). Learning from past experiences helps develop more effective strategies to reduce the impact of future disasters and safeguard communities (Faujdar et al., 2020; Neogi & Preetha, 2020). However, it should be noted that lessons have not always been taken enough from past emergencies (Brundiers, 2018). In many instances, stated lessons remain unlearned. A

combination of factors contributes to poor lesson management. Key factors include inadequate organisational memory, a lack of robust learning mechanisms, and a tendency to slip back to previous habits and procedures (Glassey, 2015).

2.6.1.2. Trained and experienced healthcare staff

Maintaining an adequately knowledgeable staff capable of responding to disasters is a necessary element in achieving an optimum level of preparedness. This makes the availability of training and education in disaster preparedness the backbone of health system preparedness efforts (WHO, 2019b). This involves having well-versed individuals with the skills to manage various situations effectively. A capable team of professionals on hand guarantees optimal preparedness to address any challenges that may arise. For example, a survey conducted by Garg et al. found that the inadequacy of the public healthcare system and the health workforce trained in epidemiology reduces the system's capacity to respond to future pandemics. (Garg et al., 2020).

2.6.1.3. Community's belief, culture, and religion

The positive influence of factors such as culture, beliefs, and religion on preparedness and resilience should also be recognised. People's social connections and shared cultural values are vital in helping them cope with, collaborate during, and recover from such calamities. Evidence shows that embracing a wide range of perspectives within a community's culture and religion cultivates a more inclusive and resilient society, better equipped to tackle the complex challenges of our times. For example, a study on Myanmar's health system resilience during Cyclone Nargis revealed that the community's capacity to withstand the cyclone's impact was strengthened by strong social capital and motivation, which were reinforced by their deep-rooted culture and religion (Grimm et al., 2021). Moreover, research focusing on communities affected by severe disaster events has shown the crucial role of social capital (linking, bonding and bridging ties) in safeguarding communities and enhancing their recovery (Yasui, 2022).

2.6.2. Challenges of enhancing health emergency preparedness
2.6.2.1. Challenges attributed to contextual factors

Emergency risk management is a complex process influenced by various contextual factors. The term "context" covers a broad range of interconnected internal and external elements that can affect a country's, system's, or organisation's capacity to handle risks and respond to emergencies effectively. The literature highlights attributes such as political leadership, partner partnership, resources, and country capacity as contextual factors that may impact health emergency preparedness (Horney et al., 2017). Factors like geography, population density, and socio-

economic conditions significantly impact how effectively disaster management is carried out across different regions (WHO, 2020d).

Governance, political systems, and the degree of democratisation can also influence the effectiveness of health emergency preparedness. Khan found that natural disaster damage results in fewer casualties in democratic nations (Kahn, 2005). Similarly, Bell and Nuzzo found in their analysis that political instability diverts attention and resources needed for health emergency preparedness (Bell & Nuzzo, 2021a). While the importance of context is increasing across various fields, it is especially crucial when evaluating resilience in fragile, shock-prone settings. In these sensitive environments, a thorough understanding of the unique challenges and dynamics involved can significantly improve our ability to respond to emergencies. The lack of a contextualised and systemic focus on resilience and chronic stressors makes health systems more vulnerable, overly exposed to shocks, and prone to prolonged disruptions (Nuzzo et al., 2019a).

Disaster incidents and the absence of social and political security mutually escalate the impact of disasters. Countries experiencing fragility, conflict, and violence often face the highest risks from disasters because of their governments' limited capacity for disaster preparedness and recovery (Grimm et al., 2021). For example, many recent disasters in Africa demonstrate the complex link between disasters and state fragility, which, in turn, undermines health systems (Sunshine et al., 2019). Similarly, a study carried out in Myanmar found that a long history of military rule, which depended on a centralised decision-making system, has hampered the effectiveness of the healthcare system in handling disasters (Grimm et al., 2021). In conclusion, fragility and centralisation in governance significantly weaken healthcare systems' capacity to respond effectively to disasters.

A country's economic situation is a key factor in health emergency preparedness. A strong and stable economy can help reduce the impact of disasters by allowing the government to invest in early warning systems, emergency response infrastructure, and other measures that save lives and prevent long-term harm to communities. On the other hand, a weak economy can hamper effective disaster response, resulting in greater suffering and loss (Iyer-Raniga & Vahanvati, 2020). This is because low economic levels can result in limited funds and contingency reserves (Hallegatte et al., 2016). Inconsistencies and inadequate funding for the health system are major barriers to health emergency preparedness (Hasan, 2021). The scarcity of resources frequently compels policymakers to prioritise one agenda over another (Sturmberg et al., 2022). Competing priorities due to the critical shortage of resources often act as barriers to effective health

emergency preparedness (Aldis, 2008; Balabanova et al., 2010; Kandel et al., 2020). Overall, the lack of financial resources and contingency funding poses universal barriers to preparedness (Miglietta et al., 2021).

However, the link between lack of resources and its impact on preparedness needs clarity. Preparedness involves planning to guarantee that essential resources are readily available to meet expected emergency needs (York & MacAlister, 2015). Despite the obvious need for resources for preparedness, evidence suggests that there is a greater need for clarity regarding the costs and benefits of investing in disaster readiness, especially given critical resource constraints (Mechler, 2016). Many authorities in developing countries see allocating funds for preparedness from limited resources as an ineffective use of money (Sturmberg et al., 2022). They argue that budgeting for a problem that is not currently evident, while other urgent priorities exist, is unwise (Calderon, 2010). For example, one study suggests that some healthcare authorities perceive the cost of disaster preparedness as a misuse of limited resources for a disaster that has not yet occurred (Habte et al., 2018).

Studies show that investing in disaster preparedness provides an overall economic benefit rather than a cost. For example, according to one study, resilient infrastructure investments have a return of 4 USD for each dollar invested, which demonstrates that resilience activities are investments, not losses (Hallegatte et al., 2019). According to the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR), the average net benefit of investing in more resilient infrastructure in low- and middle-income countries would be 4.2 trillion USD, delivering 4 USD in benefits for every USD invested (Hallegatte et al., 2019). This indicates the need to invest in disaster preparedness to address unforeseen circumstances that may arise. The fact that those with the lowest incomes are disproportionately impacted indicates that countries with weaker economies could gain from prioritising disaster preparedness. This is because effective preparedness enables a more efficient response with limited resources and can potentially lessen damage, leading to better recovery (Hallegatte et al., 2016).

Research shows that health systems are considerably stronger in higher-income economies. The response effectiveness of health systems in different countries during current global health emergencies indicates that this strength does not always lead to effective preparedness (Neogi & Preetha, 2020). According to Moussallem et al, having enough healthcare infrastructure alone did not make preparedness effective. A lack of decision-making processes and strategic vision has led to decreased trust and more confusion. Additionally, the observed power imbalance between

healthcare actors and partner organisations has influenced the decision-making dynamics and the use of scientific evidence in policy formation and execution (Moussallem et al., 2022).

Geographic disparities between regions, countries, and areas significantly contribute to varying readiness levels. People living in disaster-prone regions accept the potential risks as an inevitable part of their lifestyle and emphasise the necessity of proper preparedness. Evidence shows that communities that frequently experience disaster events tend to invest more effort into their disaster planning initiatives (Ncube & Chimenya, 2016). In contrast, areas with infrequent large-scale calamities often prioritise disaster preparedness lower (Moabi, 2008). However, it is important to remember that unexpected emergencies can still occur even in areas without a history of disasters. Besides the usual and expected risks, unforeseen risks may also lead to emergencies. For example, a study conducted in Kenya found that a region that had experienced repeated droughts actually faced floods when drought was anticipated (Mwangi et al., 2021).

2.6.2.2. Challenges attributed to organisational leadership

Defining goals, setting priorities, and accurately interpreting progress over time are important for preparedness. Experts and funding agencies often hold different views on whether to prioritise short-term or long-term solutions in the field of natural disasters, affecting the balance between preparedness and response (Abdeen et al., 2021; Lahiri et al., 2021). Setting clear objectives that align with broader strategic goals is crucial for effective preparedness planning. Identifying key tasks and evaluating the effectiveness of measures taken is essential. Failing to monitor progress against these goals, priorities, and evolving circumstances can hinder preparedness. This neglect can lead to complacency, as individuals may wrongly believe they are making sufficient progress, even when their actual preparedness falls short of the required standards (Osterholm, 2017).

An imbalance between response strategies and preparedness is a major leadership flaw that can weaken overall readiness. Effective leaders need to strike a balance between these two elements. Failing to do so can lead to inadequate preparedness, reducing the capacity to handle unexpected challenges. Poor organisational leadership often stems from limited awareness and incorrect perceptions of risk. This oversight puts pressure on resource allocation and can undermine priority issues, ultimately affecting disaster readiness. Additionally, how people perceive risk affects the level of demand for emergency preparedness (Cliff, 2007).

Effective leadership within the healthcare system is vital to disaster management. A key challenge in assessing disaster preparedness is reaching consensus on what level of readiness is enough. Often, poor organisational leadership stems from a lack of awareness and a misunderstanding of

existing risks. How people perceive risk influences how urgently they prioritise preparedness. When risks are underestimated, preparedness declines, straining limited resources and undermining response effectiveness. The perceived level of risk also shapes the perceived demand for readiness (Cliff, 2007). According to Nelson et al., this difficulty is partly due to the complex nature of the healthcare system. This complexity explains why they suggest that challenges in accurately measuring healthcare preparedness could be reduced by applying the "structure-process-outcome" framework (Nelson et al., 2007; Rehak et al., 2016).

Preparedness depends on clear communication of complex information to experienced professionals. Effectively communicating with decision-makers in health care and public health during the preparedness, response, and recovery phases presents considerable challenges (NASM, 2018). Achieving accurate and impactful messaging can be challenging, especially when decisions about preparedness activities are sometimes made by non-health professionals. These individuals may prioritise financial considerations and might not share the same values about the importance of preparedness as healthcare professionals. According to Alleyne, public health and emergency preparedness professionals often lack the authority to make public health decisions. This lack of authority results in insufficient support for the development of critical infrastructure in these areas. It is essential to strategise communication and persuasion techniques to ensure the successful implementation of the planned preparedness activities (NASM, 2018).

2.6.2.3. Challenges attributed to weak coordination and collaboration

Recognising the complex relationship between health systems and disasters indicates the need for emergency management experts and development agencies to encourage the integration of national health systems with global health security agendas (Veenema, 2018). For example, Lien emphasises that healthcare must be integrated into a country's overall emergency management and disaster response strategies (NASM, 2018). The World Health Organisation (WHO) and its partner organisations recommend promoting a broader understanding of International Health Regulations (IHR) and preparedness within national health system strategies and plans (WHO, 2020e). Additionally, the WHO promotes a "whole-of-government" and "whole-of-society" approach as an important strategy for improving coordination and sharing health responsibilities across government and societal levels (Dente et al., 2022). In line with this, evidence shows that countries that effectively integrate IHR requirements into their national health systems are better prepared for health emergencies. In contrast, a lack of integration can hinder health system preparedness (Kluge et al., 2018).

Evidence shows that, although some improvements have been made, the link between development policies and disaster management has not yet been fully realised in many countries (Becker et al., 2017; Bell & Nuzzo, 2021a; Echendu, 2022; Kahn, 2005; Priestley, 2003). The lack of integration results from several factors. In their work titled "Stakeholder Solutions for building interdisciplinary and international synergies between Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR)", Booth et al. identified the challenges of harmonising competing activities, diverging political priorities, inter-sectoral misperceptions, and miscommunication as barriers to incorporating disaster risk reduction into development policies. They also stressed the importance of encouraging closer collaboration between CCA and DRR (Booth et al., 2020). Moreover, in their study to identify the key considerations for integrating health into disaster risk reduction strategies, Dar et al. found inadequate budgets, a low knowledge base, complex bureaucracies, governance structures in various countries, and weak interdisciplinary interaction between health and other sectors to be blocking factors (Dar et al., 2014).

Similarly, although the benefits of incorporating health systems into disaster risk reduction strategies are acknowledged, the ongoing inclusion of health in national disaster risk reduction efforts remains insufficient in many countries (Mazhin et al., 2021; Red Cross & Crescent, 2020; WHO, 2024f). A review by Bayntun C. found that a comprehensive health system approach to disaster management has not been effectively put into practice (Bayntun, 2012; Belay et al., 2022). In their insights titled "Fragmented Health Systems in COVID-19: Rectifying the Misalignment between Global Health Security and Universal Health Coverage," Lal et al. 2021 highlight that many countries need to make substantial progress in fully implementing the International Health Regulations (IHR) and integrating them into their national health systems. They emphasise the urgent need for reforms to better align Universal Health Coverage (UHC) programmes with Global Health Security (GHS). According to their analysis, these changes are crucial for strengthening the resilience of health systems (Lal et al., 2021).

The lack of connectivity within the national health system makes it difficult for decision-makers, health experts, and administrators to balance priorities and properly address health emergencies (Sturmberg et al., 2022). Evidence in Ethiopia, for example, shows that although emergency health responses to specific disasters like drought and related issues such as acute malnutrition and epidemics are widely acknowledged, it remains difficult to incorporate other types of disasters and health emergencies into the healthcare system (Tadesse & Ardalan, 2014). Countries' efforts to strengthen health emergency preparedness often fall short because they over-invest in specific hazard prevention instead of adopting an 'all-hazards approach' (Becker et al., 2017).

It is widely recognised that effective emergency management depends on collaboration between various agencies. Managing health emergencies is a shared responsibility that requires cooperation across all parts of society. Everyone, from government agencies to healthcare organisations and community groups, plays a crucial role in responding to and reducing the impact of health crises. This united effort protects public safety and strengthens community resilience during health challenges. Therefore, relying solely on the strength of specific sectors may not achieve the desired results (Peters et al., 2019).

Collaboration and partnership are emphasised in policy and academic literature as important for health system resilience. One significant barrier to disaster preparedness has emerged from the lack of coordination among government sectors (Lahiri et al., 2021). The complex nature of healthcare causes weak coordination among partner organisations in the field of health in disasters (Bahadori et al., 2017). Although multi-agency collaboration is a fundamental aspect of emergency management, social and behavioural science research indicates that collaboration between different organisations during disasters remains a significant challenge. The complexities within healthcare, involving numerous partner organisations, systems, and processes, often obstruct coordination efforts during emergencies (McEntire, 2002). These complexities can significantly weaken the preparedness, overall response capabilities, and resilience of health systems during emergencies, ultimately impacting the effectiveness of interventions and support efforts (Bahadori et al., 2017).

Coordination challenges within the healthcare system present a major obstacle to effective health emergency preparedness. The organisational framework of a healthcare system—including its structure, size, governance, and levels of coordination and collaboration—has been identified in various studies as a key factor affecting public health emergency preparedness (Horney et al., 2017). Ineffective leadership in organisations, weak healthcare policies, and inadequate healthcare infrastructure within the system are major barriers to effective responses to health emergencies. These problems can cause fragmented efforts, miscommunication, and poor resource management, ultimately undermining overall preparedness and response to health crises (Bevc et al., 2014; Clarke, 2021).

2.7. Summary

This chapter overviewed key concepts related to disasters and health emergencies, focusing on significant issues and variables affecting health system preparedness. It highlighted important terms such as disaster, disaster health, and health emergency. Additionally, key concepts have been emphasised, including healthcare system resilience, health emergency preparedness, and

the traits of emergency-resilient healthcare systems. The chapter overviewed the scope and impacts of disasters and health emergencies. Finally, the chapter outlined the opportunities and challenges of enhancing health system preparedness. Opportunities, such as prior lessons and community resilience mechanisms, were highlighted. Contextual factors and gaps related to organisational leadership were outlined as the challenges.

CHAPTER THREE: CONTEXT OF THE STUDY AREA

3.1. Introduction

The chapter provides an overview of the context of the study area, focusing on relevant background information about Ethiopia and its health emergency management system. It highlights the most current and pertinent demographic data to enhance understanding of healthcare resource needs and demand in the area. Moreover, it discusses key issues related to milestones in the development of Ethiopia's emergency management system and the structure of the country's disaster and emergency management system. The evolution of the emergency management system, with a particular emphasis on the healthcare system, is also considered. This background information was compiled by reviewing relevant documents, including the country's disaster management policies, current healthcare policy, health sector development plans, other pertinent guidelines, and a limited number of published articles. Lastly, the chapter concludes with a summary encapsulating the main points discussed.

3.2. Contextual profile of the study area

Ethiopia is a landlocked country in the Horn of Africa, covering a total land surface area of 1.14 million km². The country is demarcated by Eritrea, Djibouti, Somalia, Kenya, and Sudan and South Sudan from the north and northeast, the east, the south, and to the west, respectively (Habte et al., 2018).

Ethiopia has highly variable climate conditions. This variability is due to the country's diverse topography, but its climate comprises cool, temperate, and hot zones. The highlands experience a temperate climate. The lowlands range from tropical to arid. The temperatures and rainfall vary significantly across the country (Feleke & Abera, 2020). Based on altitude, the climate is classified into three zones. The high-altitude, vegetated cool zone is called Dega. The temperature in this zone ranges from near-freezing to 16 °C. The Woinadega zones, where most of the population resides, lie between 1,500 and 2,500 metres above sea level and have temperatures ranging from 16°C to 30°c. The third zone is known as Qola and comprises tropical and arid regions with temperatures ranging from 27°C to 50°c (Tesso et al., 2012).

Ethiopia is a diverse, multinational country with over 90 spoken languages, making it one of the most linguistically diverse nations in the world. Regarding population dynamics, different organisations report different figures for Ethiopia's total population. The country has not conducted a census for nearly two decades (in 2007). At that time, its total population was 73,918,505, with

about half (50.5%) of the population being male (Bekele & Lakew, 2014; Tolu et al., 2020). In 2023, World Bank data showed that Ethiopia was the second most populous country in Africa, with approximately 126.5 million people (World Bank, 2023). As of July 2023, the Ethiopian Statistical Services 2023 estimated that the population was around 107,334,000 (ESS, 2023). Data from the World Health Organisation in the same year indicated that the country's population stood at 128,691,692, with a projected population of 225,021,875 by 2050 (WHO, 2024d).

Ethiopia follows a federal government system in which power is shared between the national government and regional states. The country established this federal system in 1995 with the adoption of the Ethiopian Constitution, which promotes the decentralisation of decision-making. The federal government is exclusively responsible for key national affairs such as defence, foreign affairs, and all country-level policies. The regional states are responsible for local affairs, including education, healthcare, and infrastructure development. As of August 2023, there were eleven regional states and two chartered cities (Addis Ababa and Dire Dawa). The regional states are Tigray, Afar, Amhara, Oromia, Somali, Harari, Benishangul-Gumuz, Sidama, South Ethiopia, Southwest Ethiopia, and Central Ethiopia (CSA, 2013; ENA, 2023). Each region is, in turn, administratively divided into four levels of administration: region, zone, districts, and woredas (district) (Hagmann & Abbink, 2011).

Addis Ababa, the capital city, is a bustling metropolis and a recognised diplomatic hub in Africa. It is home to numerous national, continental, and international organisations, including the African Union, the United Nations Economic Commission for Africa, and many other embassies. As of 2022, the estimated population of the city was over five million (Gebreegziabher et al., 2022). The current administrative division of Ethiopia by regional states is presented below in Figure 2 (ESS, 2023).

Figure 2: Map of the Federal Democratic Republic of Ethiopia by Regional States

Regarding the legal hierarchy, the national constitution is viewed as the country's supreme law, taking precedence over all other laws, including the constitutions of regional states. The second level of law comprises proclamations, which are pieces of legislation enacted by the House of People's Representatives. The Council of Ministers issues regulations, which represent the third tier of the legal system. Directives, the final level in this hierarchy, are issued by individual sectors and government departments to implement the proclamations and regulations into action (Ewan Powrie, 2012).

The country's economic situation is relevant to this research. Ethiopia is categorised as a low-income country based on its gross national income per capita. According to a World Bank report, with approximately 123 million people, Ethiopia is one of the fastest-growing economies in the region, with an estimated growth rate of 6.4 per cent in the fiscal year 2021/22. Despite this growth rate, the report indicates that the country remains one of the poorest, with a per capita gross national income of USD 1,020. Ethiopia's Gross Domestic Product growth slowed to single digits from the fiscal year 2019/20 to 2021/22 due to multiple shocks, including COVID-19 and internal conflict (World Bank, 2023).

Over the past few decades, Ethiopia's rapid economic and social progress has been challenged by increasing shocks and crises, including climate change. According to the ten-year gross domestic product (GDP) statistics from 2010 to 2020, agriculture was the largest contributor to Ethiopia's GDP. However, in the last five years, the composition of the country's GDP has shifted. The services sector has emerged as the dominant contributor, followed by agriculture and industry. In 2020, the services sector contributed the most at 36.81 per cent, while the manufacturing industry contributed approximately 23.11 per cent to the country's economy (World Bank, 2021a). The services sector now accounts for a substantial share of GDP, contributing approximately 40 per cent. In comparison, industry accounts for around 28 per cent, while agriculture contributes about 32 per cent (World Bank, 2024).

In Ethiopia, the poverty rate based on the international poverty line of $1.9 USD per day per person was predicted to be around 27 per cent in 2020. Unfortunately, this rate remained unchanged in 2021 and 2022 due to the country's struggling economy, influenced by internal conflicts and other global challenges (World Bank, 2023). Conflicts in various regions of Ethiopia particularly pose a risk to the country's economic and social development progress (World Bank, 2023).

It is worth noting that conflict is a complex issue with far-reaching consequences across various sectors and is the biggest economic challenge. Reliable reports indicate that the war in the northern part of the country has significantly impacted the economies of regions directly involved in the conflict, as well as the country's overall economy at both macro and micro levels. The war in northern Ethiopia lasted two years, from November 3, 2020, to November 3, 2022, and substantially affected the country's macroeconomic performance. It led to a decline in GDP growth and a widening fiscal deficit, adversely affecting the population's livelihoods. According to the African Economic Outlook for October 2023, the conflict has increased Ethiopia's total fiscal deficit from 2.8 per cent to 3.8 per cent of gross domestic product (ADBG, 2023). However, it should be noted that the regions of the country affected by that war continue to experience low-level and simmering violence amidst a fragile ceasefire.

3.3. Structural and functional overview of the Ethiopian health system

The Ethiopian Ministry of Health was established in 1948 as the Ministry of Public Health before being reorganised and renamed to its current title. The country did not have a formal healthcare policy governing healthcare services for about 50 years (Kassahun B, 2023). It was only in 1993 that the government of the time formulated the country's first healthcare policy, articulating a vision for healthcare sector development (Ethiopian MoH, 2024; MoH, 2024). The policy restructured the

healthcare delivery system, contributing to the nation's overall socio-economic development. The 1993 national healthcare policy outlined various levels of priority standards based on the necessity for strategies connected to the decentralisation of the healthcare system and inter-sectoral cooperation. The emphasis of the policy was on enhancing the preventive and promotive aspects of health (Hartwig et al., 2008).

Ethiopia has been one of the standing member states of the World Health Organisation since 11 April 1947 (WHO, 2020b). The long-standing agreement between the African Union and the World Health Organisation states that developing sound healthcare system policy and efficient systems should be geared towards sustainable development, including effective preparedness and response to prioritised health threats (WHO, 2020b). Following the publication of the 1993 health policy, and from 1997 onward, the Ethiopian Health Sector Development Plans have been issued every five years, until recently. The program aimed to develop a health system that is capable of rendering comprehensive and integrated primary health care services, chiefly based at community health level facilities (Barnabas & Zwi, 1997). After endorsement by the respective regional councils, regional executive councils, and regional health bureaus, the program began in 2004 across the regions of the country (Mohan, 2007).

Ethiopia embarked on a new Health Sector Transformation Plan program following the four-phased health sector development plans. From 2015/16 to 2019/20, the country launched the first Health Sector Transformation Plan (HSTP-I), which resulted in significant improvements in population health and increased access to and utilisation of health services. Ethiopia is now implementing the second five-year health strategy plan for 2020/21-24/25, known as the second Health Sector Transformation Plan (HSTP-II). This plan has four overarching objectives, with accelerating progress towards universal health coverage as the first objective. Protecting its people from health emergencies is the other main objective of the plan. Transforming the district (the lowest level of healthcare) has been prioritised as the third objective. Improving health system responsiveness to the growing healthcare demand was set as the fourth and final objective (EPHI, 2022; WHO, 2024g).

The plan aims to attain Universal Health Coverage by increasing access to services and improving the delivery of high-quality, equitable, comprehensive health care at all levels (EPHI, 2022). Reform work activities have been expanded to all regions except Afar and Somali, where the process of approving legal and operational frameworks is still underway. Implementation has already started in every other region, namely Tigray, Benishangul, Gambela, Harari, Addis Ababa,

and Dire Dawa. The strategy recognises that healthcare financing should incorporate multiple mechanisms to ensure long-term sustainability (Kassahun B, 2023). Over the past few decades, Ethiopia has sought to improve its health system. However, various assessment reports, including those under the WHO initiatives, show that outcomes have been generally unsatisfactory, with both the quality of services and equitable access remaining obstacles (WHO, 2024g).

The healthcare system in Ethiopia is complex, both organisationally and structurally. The complexity of the health sector is addressed by a hybrid approach that aims to cascade the health sector strategy to all levels. The system begins at the federal level and extends all the way to the country's lowest administrative levels in the regional states (Croke, 2020). Figure 3 displays the Ministry's general organisational structure, including federal and regional components (adapted from organisational charts).
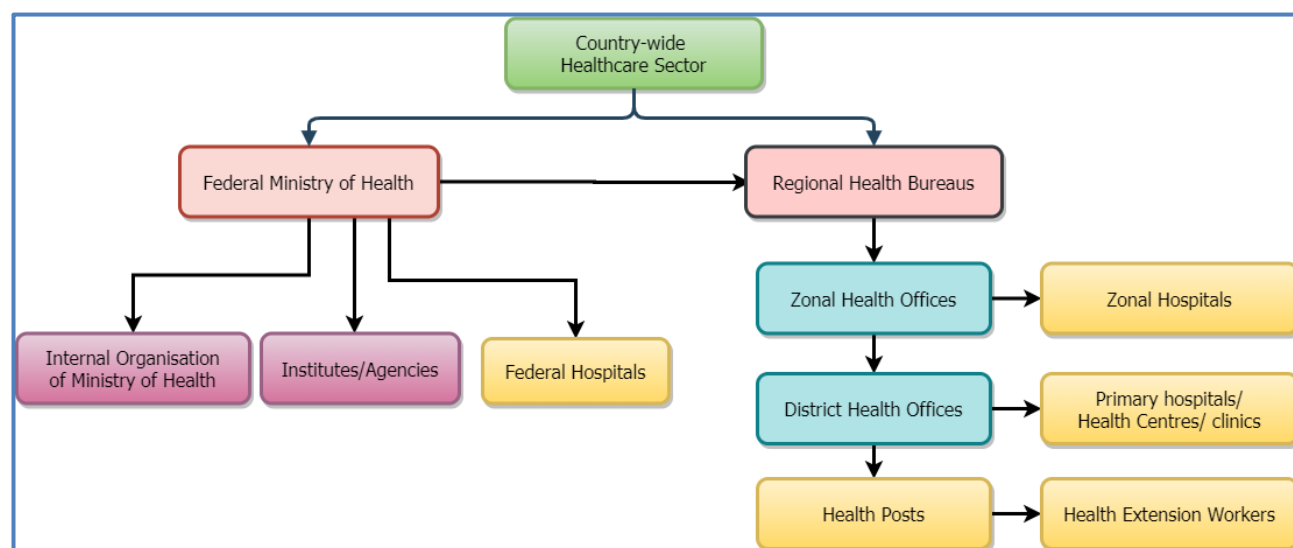
Figure 3: The Administrative Structure of the Ethiopian Healthcare Sector

The Ethiopian Ministry of Health has recently changed its name from 'Federal Ministry of Health' to 'Ministry of Health, Ethiopia', and it is organised according to the following organogram (Figure 4). From the office's organogram, it can be understood that five lead executive officers, namely the Minister Officer, Nutrition Coordinator, HIV/AIDS Prevention and Control Officer, and the Policy Strategy Research and Management Chief, are grouped under the Minister. The Minister and Management Chief Executive Officers lead four and eight executive officers, respectively. In addition, ten lead executive officers are arranged under the three state ministers (the State Minister for Program and Health Services, the State Minister for Resource Administration and Regulation,

and the State Minister for Health System and Capacity Building). These structures, adopted from an up-to-date source (Lavers, 2019), are presented in Figure 4.
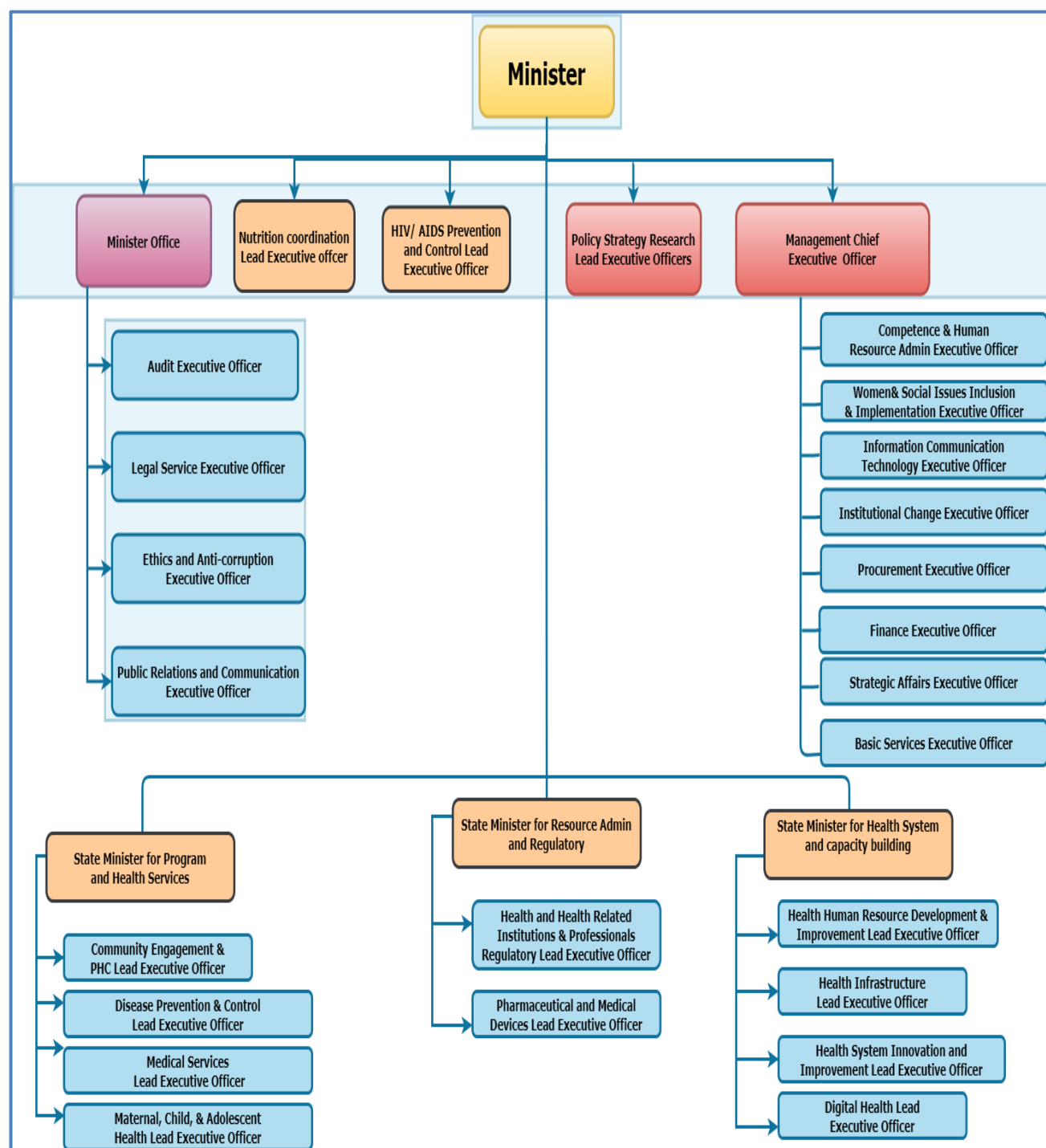
Figure 4: Organisational structure of the Ethiopian Ministry of Health

From the perspective of the healthcare delivery system and functional layout, the country's healthcare system is organised into three tiers of care: primary, secondary, and tertiary (Figure 5). The primary care level includes hospitals, health centres, and health posts. The secondary level of

care consists of general/zonal hospitals that serve 1 to 1.5 million people. The tertiary levels of health care are specialised hospitals that serve 3.5 to 5.0 million people (WHO, 2017b).

The Master Facility Registry (MFR) in the Ethiopian Ministry of Health shows 45,471 health facilities ranging from health posts to specialty centres, including pharmacies and laboratories (Ethiopian MoH, 2024). In 2024, there were nearly 17,534 health posts, excluding 77 under construction, and 3,587 active health centres and 89 under construction. In addition, there were 3,867 private clinics. In 2023/2024, Ethiopia had a total of 328,951 healthcare workers working in its health system. Of these, about 66.5 per cent were health professionals, while the remaining 33.5 per cent were administrative or support staff (Firew et al., 2022). The country had 3,643 active government hospitals and 43 private hospitals in the same year. These hospitals provide healthcare services to the population, and their presence ensures that people have access to affordable, quality healthcare. However, it should be noted that many health facilities are closed due to the ongoing conflicts in the country (Ethiopian MoH, 2024).
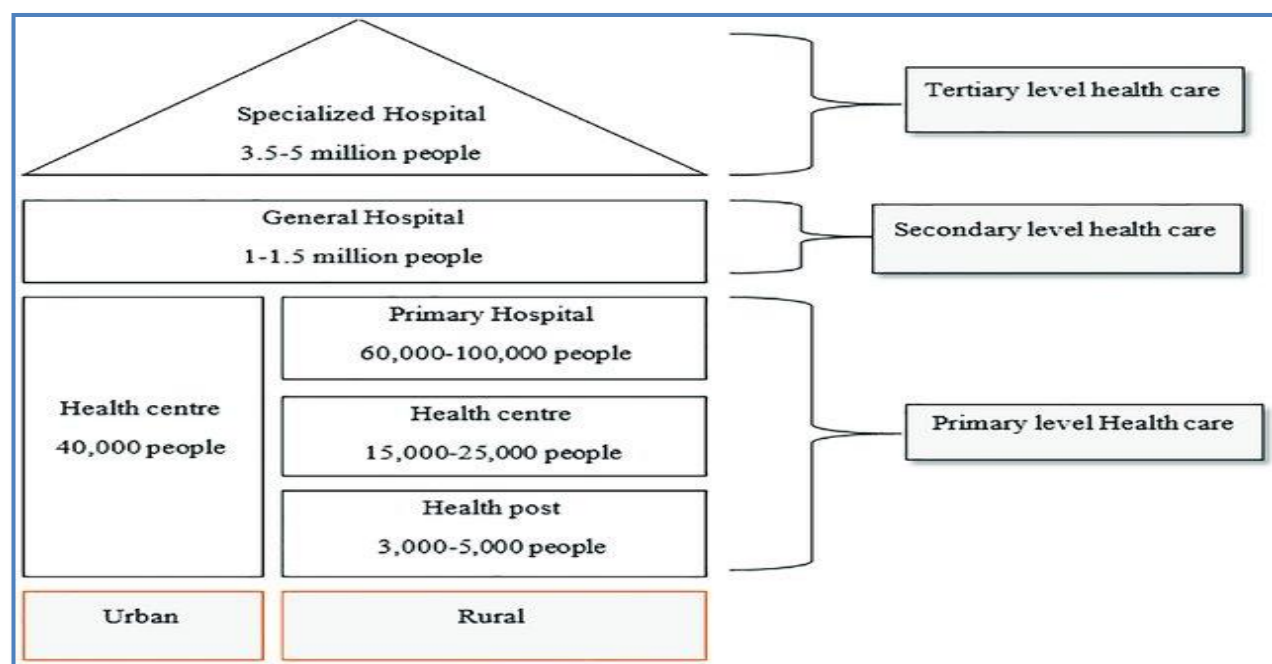
Figure 5: The Three-tiered Ethiopian Health System

The country's healthcare system receives funding from various sources, including donors, the government, and patients' out-of-pocket payments. These funding sources contribute 32 per cent, 35 per cent, and 31 per cent, respectively, to the total healthcare expenditure, which amounts to 4.2 per cent of the country's GDP (Debie et al., 2022). The Ethiopian Health Insurance Agency was established as an independent federal government body. Its primary aim is to implement and oversee the national health insurance system. The Ethiopian government is working to achieve

universal health coverage for its community. The government devised a plan to establish two types of insurance programs to achieve this goal. The first is Community-Based Health Insurance (CBHI). This insurance scheme typically serves communities engaged in informal economic sectors, such as rural communities. The scheme is currently voluntary, but the government is contemplating making it a mandatory type of insurance scheme. The second type is called Social Health Insurance (SHI). This scheme covers the population engaged in formal economic sectors, including government employees (EHIA, 2024). Providing two types of insurance schemes aims to ensure that all Ethiopians have access to quality healthcare services, according to their economic sector involvement (Lavers, 2019).

From a system perspective, Ethiopia has been working to enhance its response to health emergencies, demonstrating significant improvements over recent years (Hartwig et al., 2008). Specifically, since 2015, the Ethiopian Ministry of Health has shown its commitment to the development of emergency care systems in the country. The establishment of the Emergency and Critical Care Directorate (ECCD) under the Ministry of Health can serve as an indicator. This division was established in 2015 to improve the health impact of natural and manmade disasters by developing a national medical disaster response system. The Directorate has been responsible for creating an emergency care system within the country, and medical assistance teams that had been active before the program was restructured as Emergency Medical Teams recently (Firew et al., 2020). Furthermore, the current Ethiopian health sector transformation plan (HSTP-II) states that the health system is expected to cope with existing and emerging disease epidemics, acute malnutrition, and natural disasters of national and international concern. One of the overarching objectives of the plan is to protect the community from health emergencies. In addition, it aims to improve health system responsiveness (EPHI, 2022; MOH, 2014; WHO, 2024g). Despite the long miles to go, these initiatives reflect the country's attention to strengthening the health system's resilience and responsiveness to health emergencies.

3.4. The disaster and health emergency management system in Ethiopia

The disaster management system in Ethiopia dates to the historic 1974 drought, which cost the lives of over 200,000 Ethiopians in the northern part of the country alone. This prominent disaster is remembered in Ethiopian history and has laid the foundation for today's disaster management policies, strategies, and structures in the country (Tadesse & Ardalan, 2014). From 1974 to 1988, disaster management systems in the country focused on response, recovery, and rehabilitation, while the period between 1988 and 1993 was marked by the transition phase towards a more comprehensive approach (Abebe, 2009).

Before 1973, the country had no organised disaster management system. The Relief and Rehabilitation Commission (RRC) was established one year before that devastating drought. This was the first formal disaster management institution established to provide relief assistance to mostly drought-affected people in Wollo and Tigray. After five years, in 1978, the RRC was reorganised and merged with the Settlement and Awash Valley Development Authorities, which were responsible for settlement programs (AVDA, 1978).

In Ethiopian disaster management progress, 1993 is considered a remarkable year. It was a year in which the foundational policy that governs national disaster management and prevention was developed (Abebe, 2009). From this year onwards, the disaster management system has theoretically integrated mitigation, prevention, and preparedness phases into the already existing response and recovery approaches. However, the focus has been largely on drought alone, rather than considering all hazards (TGO, 1993). Although this policy has remarkably changed the emergency response practices in the country, the outcomes of health sector emergency management initiatives have remained insufficient (Tadesse & Ardalan, 2014).

Following the policy's endorsement, the Relief and Rehabilitation Commission, which had previously been merged with the Awash Valley Development Authorities, underwent restructuring and renaming again in 1995. Following this ratification, the Relief and Rehabilitation Commission was changed to 'The Disaster Preparedness and Prevention Commission (DPPC)' (DPPC, 1995). This has brought a notable change to both the policy's mandate and scope, extending to the integration of Disaster Prevention and Relief into other development activities. In 2008, a minor modification was made to DPPC that changed the organisation from a commission to an agency, renamed the 'Disaster Prevention and Preparedness Agency' (DPPA, 2008).

The most recent version of the policy governing disaster management in Ethiopia was revised in 2013. Key amendments include general directions and major implementation strategies, such as a decentralised Disaster Risk Management (DRM) system, early warning and risk assessment, information management, capacity building, and the integration of disaster risk reduction into development plans. The policy aims to reduce disaster risks and damage by establishing a comprehensive and coordinated disaster management system within the context of national development. As stated in this policy, the Ethiopian Disaster Risk Management Council has a structure that manages multi-stakeholder coordination. The primary responsibility for coordinating and monitoring the progress of the DRM Strategic Program lies with the DRM Technical Working Group (DRMTWG), which also supports the implementation of the new multi-sectoral and multi-

hazard DRM approach in Ethiopia, along with providing a platform for mutual engagement and support among humanitarian organisations and development partner organisations (EDPPC, 2013).

Ethiopia has developed a complex national planning system based on the National Policy on Disaster Prevention and Management, which sets out the philosophy and major components of the national structure (Abebe, 2009). The national relief plan is based on relief plans submitted annually by the regional bureaus, but obtaining these plans on a timely basis has proved problematic. Adjunct to the national plans, the country has a national coordination plan, a livestock preservation plan, and a seed provision plan.

At the apex of the structure for disaster management in Ethiopia is the National Disaster Prevention and Preparedness Committee (NDPPC), which the Prime Minister chairs. The NDPPC members include ministers of Health, Finance, Agriculture, National Defence, Planning and Economic Development, and External Economic Cooperation, as well as chairpersons of regional councils and the National Disaster Management Office (NDMO) (Tadele & Manyena, 2009). This arrangement is replicated at the regional, zonal and community levels by regional, zonal, and local councils (Ethiopian Council of Ministers, 2015). In addition to the decision-making structures, there are early warning committees and crisis management groups at the national level. The early warning committees are important for providing information to decision-makers. The system is being decentralised and attempting to leverage existing structures, such as the agricultural offices at the community level. The crisis management groups are established from different line ministries to review relief measures and resolve problems during disasters (Ethiopian Council of Ministers Regulation, 2015).

Although Ethiopia remains one of the most disaster-prone countries in Africa, numerous factors restrict its ability to deal with disasters (Tafere et al., 2013). There are still noticeable problems in the emergency and disaster management system. The country's disaster management system is still not benefiting from lessons learned from decades of exposure (Salama et al., 2004). For many years, much effort and resources were wasted on post-disaster response, recovery, and rehabilitation activities, rather than a policy incorporating pre-disaster preparedness and prevention measures (Abebe, 2010a, 2010b).

Ethiopia is continuously refining its disaster policy and implementation plans, rethinking elements that have not worked, and attempting to build planning capacity in the regions. However, the country's disaster management system still suffers from several interrelated limitations. One

significant drawback of the country's disaster management approach is that activities have tended to focus mainly on drought, the country's most frequent disaster. For several decades, the disaster management community in Ethiopia has predominantly focused on and invested heavily in managing droughts. In other words, actors in Ethiopia's disaster management realm pay little or no attention to other hazards, including disease epidemics, war, civil conflicts, and traffic accidents, to which communities are always vulnerable (Abebe, 2009).

As a result of concentrated attention and resources to specific disasters such as drought, the responses toward its ramifications, such as acute malnutrition and local epidemics, have become more comprehensive, and the impacts of drought and epidemics are declining. However, the remaining challenge is to address disasters arising from other hazards, such as earthquakes and global pandemics, in terms of mitigation, prevention, and preparedness, and integrating them into the healthcare system (Tadesse & Ardalan, 2014). Giving priority to the frequently occurring forms of disasters in resource-limited settings might be justifiable. Nonetheless, granting little attention to other disasters in the setting of a fragile healthcare system and in such a highly globalised time risks catastrophes such as deadly and highly contagious infectious disease outbreaks (Akpan-Idiok, 2010).

The all-hazards approach contends that emergency preparedness requires attention not just to specific types of hazards but also to actions that increase preparedness for all risks (Adini et al., 2012). This is because of two main reasons: one reason is that the need to respond to various emergencies, such as natural, technological, and complex mass casualty events (MCEs), is increasing (Sauer et al., 2009). While the nature of the events may differ, preparedness for various hazards appears to have much in common in terms of the knowledge, resources, and skills required (Levy et al., 2009). Secondly, despite existing misconceptions, numerous mitigation programs have proven that the all-hazard approach is highly cost-effective in preparing for diverse types of crises (Godschalk et al., 2009).

Before 2008, numerous barriers hindered Ethiopia's ability to manage disasters. These included insufficient information on vulnerabilities, historical impacts, and coping mechanisms for disasters; reactive disaster risk management that only addressed hazards after they became disasters; low levels of coordination between sectors, NGOS, and ministries, resulting in poor planning capacities; a local government sector unable to pursue diverse approaches or effectively implement decentralised planning; weak local planning and budgeting mechanisms; and

inadequate integration of disaster risk management, despite high vulnerability to climate variability and climate-related disasters (Crabtree-Condor, 2014).

Given these challenges and motivated by the Hyogo Framework for Action, the Ethiopian Government established the Disaster Risk Management and Food Security Sector (DRMFSS) in 2008. DRMFSS was responsible for overseeing the coordination and leadership for implementing the Disaster Risk Management (DRM) strategy adopted by the Government of the Federal Democratic Republic of Ethiopia in partnership with its humanitarian collaborators (Teshome, 2020). In 2013, Ethiopia revised its national disaster policy to address these limitations and to create a disaster management system as comprehensive and coordinated as possible. Despite this promising effort, the country's inability to implement the new disaster management policy and to cascade it down to essential sectors, such as the healthcare system, remains unresolved. This indicates that the country's disaster management system is not benefiting from a shift in thinking in the field and the lessons learned from decades of experience (EDPPC, 2013).

Ethiopian legislation supports the implementation of the national strategy for disaster prevention and management. The central National Disaster Management Office (NDMO) and parallel bodies at the regional level are established and ratified by government proclamations, with their activities aligned with their agency mandates and enforced through law. A problem, however, is that legal measures for addressing those who default on their responsibilities are not prescribed in the laws, resulting in weaker implementation efforts (DPPC, 1995).

3.5. Organisation of the Ethiopian disaster management system

The Ethiopian Disaster Risk Management Commission (EDRMC) is an agency responsible for managing all risks and emergencies of national concern. Established in 2015 by the Council of Ministers, the commission was recently relocated to report directly to the Prime Minister. The EDRMC coordinates and assists in implementing the 2013 Disaster Risk Management (DRM) policy and strategy across all relevant sectors, administrative levels, and organisational structures. Since 2015, Ethiopia has established national DRM platforms through the EDRMC, involving various government organisations and development partner organisations. These multi-sectoral and multi-agency platforms aim to enhance disaster risk management nationwide. For example, sector disaster risk management and early warning platforms operate at both federal and regional levels. Several sectoral working groups, including those focused on gender, agriculture, water, sanitation, hygiene, health, nutrition, and education, are included in these platforms to offer support (Wako & Shen, 2020). The EDRMC organisation is responsible for coordinating the sectors

involved in disaster preparedness and response activities. Its additional responsibilities include preparing and revising disaster-prevention and preparedness strategies for national policy, formulating implementation plans, and monitoring their progress. In cooperation with domestic and foreign information sources, it takes on the duty to monitor, forecast, and issue warnings about disasters that could impact the agricultural sector and the livelihoods of the population (EDRMC, 2024).

Primarily, the office coordinates overall response activities. It is responsible for creating, strengthening, and administering standby capacities in selected strategic areas for timely, effective, and appropriate responses to fast-onset and other disasters of national concern. When fast-onset or other national disasters occur, the office, in cooperation with relevant bodies, fulfils its responsibility to assess their causes, magnitude, and extent, identify appropriate responses, and is mandated to officially declare the disaster. The responsibility for providing financial and logistical support to relevant bodies for a timely response to fast-onset and other national disasters is managed by the organisation (WHO, 2017a).

In cooperation with relevant organisations, the agency promptly provides disaster victims with the necessary emergency and recovery assistance. In other words, when a disaster is imminent or has occurred, the agency, in collaboration with relevant entities, must take appropriate and timely measures before, during, and after the event, and coordinate the interventions. Whenever the standby capacity of a specific sector or area falls below the level necessary for a timely and appropriate response to nationally significant disasters, upon government approval, the agency is obligated to bridge the gap by requesting and receiving assistance from domestic and international sources. The office then allocates and distributes the mobilised resources to the affected regions. In doing so, it provides follow-up support to ensure proper utilisation of the resources, and, in cooperation with regional states and other concerned bodies, it guarantees the effectiveness of the programme (EDRMC, 2024).

Lastly, the office is expected to coordinate and support mainstream disaster risk management in relevant line ministries and work processes. The Ethiopian DRMC offers capacity-building activities to both governmental and non-governmental partner organisations. Specifically, it provides capacity-building support and coordinates with states to strengthen and enhance the effectiveness of disaster management and food security program-related activities. Furthermore, the organisation is tasked with coordinating, following up, and supervising the activities of non-governmental organisations engaged in disaster prevention and food security programmes;

owning property, entering into contracts; and carrying out other activities that would enhance the achievement of its objectives (EDRMC, 2024).

3.6. The public health emergency management system in Ethiopia

In the new disaster management strategy (2013), health is one of the twelve sectors considered in the multi-sectoral approach. The Ministry is required to address various human epidemics linked to disasters and malnutrition caused by food shortages in affected regions. The Ministry of Health has established the Ethiopian Public Health Institute (EPHI) as an independent body that enables the delivery of emergency health response requirements in an institutionalised manner. The EPHI manages the structure and organisation of public health emergency management in Ethiopia. Although the EPHI is established under the country's Ministry of Health, it has independent legal authority. The EPHI was established by the Ethiopian Council of Ministers Regulation No. 301/2013, recognising the Institute as an autonomous federal government office. The institute is accountable to the Federal Minister of Health. Although the ownership of health emergencies has not been clearly defined in Ethiopia, the EPHI is the country's responsible body for public health emergency management activities (Proclamation Number 803/2013). In the structure, the Public Health Emergency Management (PHEM) Centre, which oversees preparedness, early warning, response, and recovery of public health emergencies, is one of the five wings of the institute.

The Public Health Emergency Management (PHEM) wing of the Ethiopian Public Health Institute is responsible for responding to health-related disasters. At the national level, it is organised into the Public Health Emergency Preparedness and Capacity Building Team and the Early Warning and Communication Team.

The PHEM centre provides laboratory support for public health emergencies in disease identification. It also implements integrated disease surveillance and response. In addition, the centre is responsible for implementing the International Health Regulations regional strategy (WHO, 2020a). Moreover, the institute is mandated to deal with travel and border health matters. The structural organisation of PHEM in the EPHI is also replicated in all regional states and their respective lower administrative levels, such as zonal and district health offices.

The EPHI is responsible for various critical functions, including conducting extensive research, collecting vital data, and developing and implementing effective public health policies and decision-making procedures. The institute also conducts various epidemiological studies, health surveillance, and disease monitoring activities to track the population's health status and identify

potential health threats. Additionally, EPHI plays an important role in managing public health emergencies in Ethiopia by coordinating the country's response to public health crises, ensuring that appropriate measures are taken to prevent the spread of communicable diseases, and mitigating the impact of potential outbreaks.

To achieve these goals, EPHI has established an affiliated directorate for public health emergency management, responsible for designing and implementing early warning systems and preparedness, response, and recovery plans. Each resilience component has its own divisions under the directorate, each with strategies and actions required to mitigate, prepare for, and respond to public health emergencies. Moreover, public health emergency management structures are replicated in all regional states, extending to the zonal levels of each region. This aims to ensure that all areas of the country are well-equipped to handle public health emergencies and adequately prepared to respond to them, even though the focus is mainly on disease outbreaks.

In summary, public health in Ethiopia prioritises emergency preparedness. One key aspect of public health emergency management involves measures to prevent potential public health emergencies and strategic planning to ensure an effective response in the event of an emergency. The team is responsible for developing and maintaining a comprehensive system specifically designed to address health emergency preparedness, including measures to mitigate risk, coordinate resources, and respond to health emergencies.

3.7. Emergency medical service system development

While emergency and critical care services have been available in some parts of the world for many years, these services are relatively new in Africa. In South Africa, emergency medicine was only recognised as a specialty in 2003. Other African countries that provide emergency medicine services include Ethiopia, Tanzania, Sudan, Ghana, Egypt, Rwanda, Kenya, Malawi, Libya, and Mozambique (Ali et al., 2020b). In recent years, Ethiopia has taken measures to improve emergency medical services both within medical facilities and in the field. Emergency rooms are staffed with specialists and nurses trained to handle a wide range of medical, surgical, and traumatic emergencies.

In Ethiopia, emergency medicine and critical care services are similarly at an early stage, having been available for no more than fifteen years. The establishment of formal pre-hospital treatment centres or emergency departments is a relatively new occurrence in Ethiopia (Firew et al., 2022; Sultan et al., 2019). The Ethiopian Federal Ministry of Health has been working to enhance the

Emergency Medical Service (EMS) systems. This includes distributing ambulances to all regions, training paramedics, and acquiring onboard medical equipment (Sultan, Waganew, et al., 2021; Sultan, Zemede, et al., 2021).

The year 2007, also known as the Ethiopian Millennium, was a memorable time for the birth and development of this new field. One year before the establishment of the emergency medical service, a task force was created to prepare for potential emergencies during the Millennium celebrations. This task force included representatives from Addis Ababa University, the School of Medicine, the Addis Ababa City Council Health Bureau, and the Ministry of Health. In preparation for the Ethiopian Millennium celebrations, the Ethiopian Ministry of Health took the initiative to develop an emergency care system (Azazh, 2023).

This effort paved the way for establishing a better communication system, medication formularies, equipment, supplies, training, and communication channels (Firew et al., 2022). Two years later, in 2009, the first emergency medicine service unit was established at Tikur Anbessa Specialised Hospital. By 2010, this unit had evolved into a formal and more organised emergency department (ED). Since then, emergency medical services have expanded, and emergency care units are now available in many healthcare facilities nationwide (Azazh, 2023). This expansion includes the distribution of ambulances to all regions, training paramedics, and acquiring onboard medical equipment (Sultan, Waganew, et al., 2021; Sultan, Zemede, et al., 2021). Formal training programs for emergency medical services have been initiated in Ethiopia. In collaboration with the University of Wisconsin and the University of Toronto, the Addis Ababa University School of Medicine developed a curriculum and launched residency and master's programs to train emergency care professionals.

Furthermore, the Ethiopian Ministry of Health, in partnership with organisations such as the World Health Organisation, has been working to expand emergency and critical care services (Firew et al., 2022; Sultan et al., 2019). Ethiopia's prominent role in the passage of Resolution WHA76.2 on emergency care services at the recent World Health Assembly indicates that the country is prioritising investments to strengthen its emergency medical services system (Ethiopian MoH, 2024).

The Emergency Medical Service (EMS) system in Ethiopia is evolving to enhance pre-hospital care and ensure timely transportation to medical facilities nationwide. The Ministry of Health (MoH) oversees public EMS services, managing ambulance operations through initiatives to improve accessibility and response times. The MoH implements health command posts in public hospitals

to manage patient transfers and coordinate care. Furthermore, the MoH is working to establish standardised dispatch systems and a national ambulance protocol to ensure consistent responses across regions and providers. A key feature of this system is the call centre established at 9-3-9 in Addis Ababa, which coordinates emergency calls, dispatches ambulances and directs patients to medical facilities. The Ethiopian EMS system also coordinates disaster management planning and response strategies within hospitals and other medical facilities (Firew et al., 2020).

The Ethiopian EMS landscape integrates both public and private providers, including government-operated services, private entities, and organisations such as the Ethiopian Red Cross Society (ERCS). Private entities play important roles in complementing the public system and addressing coverage gaps, especially in remote areas. In particular, the ERCS enhances pre-hospital healthcare by providing patient transportation between incident sites and hospitals, in addition to providing first aid training and emergency response services (Abdulahi, 2021).

Despite efforts to improve healthcare, Ethiopia currently lacks a well-organised national Emergency Medical Services (EMS) system. Initiatives to expand EMS nationwide have not progressed as planned. The attempts to extend EMS from Addis Ababa to major cities such as Bahir Dar, Jimma, Adama, Dire Dawa, Nekemte, and Mekele, which began in 2018, have not been fully implemented. As a result of the absence of a comprehensive Emergency Medical System, available hospitals are providing transportation without essential treatment during transit. In many areas, ambulance services are not readily available for all emergencies, as the service tends to focus on emergency obstetrics (Azazh, 2023). Trauma patients often depend on commercial vehicles for transportation, leading to delays in reaching hospitals, which are associated with higher mortality rates, for example, from road traffic injuries (Denu et al., 2021). In short, while some efforts have been made to establish EMS in the country, these initiatives have not yielded the desired results (Firew et al., 2022).

3.8. Summary

This chapter provided key background information on the research context and the study area's profile, covering its social, economic, geographical, and political dimensions. It examined the structural and functional elements of Ethiopia's healthcare and disaster and emergency management systems. Furthermore, the chapter outlined the organisation of Ethiopia's emergency management system and discussed the evolution of emergency and critical care services throughout the country. It also offered a comprehensive overview of Ethiopia's disaster and health emergency management framework, emphasising the guidelines established to enhance

preparedness for public health emergencies. Additionally, a brief presentation of the Emergency Medical Service system was included. The contextual background provided in this chapter aimed to inform readers that the research was conducted in the highlighted socio-economic, political, and healthcare contexts. The chapter described an evolving, bureaucratic system operating within a federalised government structure. It should be noted that it is difficult to appreciate the clear link, role, and scope of existing entities such as the National Disaster Risk Management Commission, the Ministry of Health, and the Ethiopian Public Health Institute in relation to health emergency management, which may be a recipe for disaster.

CHAPTER FOUR: PHILOSOPHY, METHODOLOGY, AND METHOD

4.1. Introduction

This chapter covers four subtopics. First, it provides the philosophical perspectives that underpin the research. The research integrates epistemological subjectivism, ontological relativism, and implications of systems thinking. Secondly, the chapter offers the fundamental concepts and principles of grounded theory as the framework for this research. Thirdly, the chapter presents the key rationale for adopting grounded theory. Fourthly, the chapter describes the methods employed, including obtaining ethics approval, participant selection, and data collection and analysis. Fifthly, the chapter presents a section dedicated to trustworthiness as a quality control measure. Lastly, the chapter concludes with a dissemination plan for the study findings.

4.2. Philosophical underpinning of the research

Behind all research is a set of philosophical assumptions about the existence (ontology) and nature of knowledge (epistemology). In comparison, ontology examines the nature of reality and existence, while epistemology deals with how we know what we know. These philosophical underpinnings play an important role in framing the entire research process. A researcher's philosophical inclination influences everything from formulating research questions to data interpretation. Moreover, a well-defined philosophical framework guides the selection of a sound methodological approach and helps researchers maintain consistency and relevance in their inquiries.

The present research explored key influences of health emergency preparedness in the context of the health system operating in a resource-constrained environment. Given the multifaceted challenges inherent in this context, establishing clear philosophical foundations was even more important to navigate the complex health system's emergency preparedness issues. The adopted philosophical underpinnings enabled the researcher to navigate the complex interaction between theoretical constructs and practical realities. This enabled a comprehensive understanding of the problem under investigation.

Ontologically, this research is rooted in a relativist perspective. The researchers' beliefs towards the research problem have guided this adoption of an ontological position. The researcher believes that the prospects and challenges associated with health emergency preparedness in the health system will differ, at least partly, by location and context. Socioeconomic conditions, geographic locations, culture, religion, history, and other variables in the study area influence factors that

enable or limit efforts to enhance health system preparedness. Additionally, the complex nature of the health emergency management system informed the adoption of a relativist ontology. The fact that health emergency preparedness is influenced by many factors, including policy frameworks, public perceptions, and organisational cultures, further guided the adoption of a relativist ontology. According to this assumption, the interactions among these factors could generate diverse realities that must be recognised and interpreted through the lens of relativism. Adopting a relativist ontology helped researchers to acknowledge that different stakeholders might have conflicting views on health emergency preparedness. Moreover, a relativist inclination enabled the researcher to explore the factors that enable or limit preparedness comprehensively. The philosophical stance contributed to the understanding of the interaction among the key elements and how they shape overall health system preparedness in the health system interaction among key elements.

The study took a subjectivist approach from an epistemological perspective. A subjective perspective emphasises that knowledge is not an objective truth waiting to be discovered. Rather, knowledge can also be generated through a subjective understanding shaped by personal and shared experiences. In simpler terms, knowledge may stem from individual and shared experiences rather than solely from objective criteria. In this study, the researcher holds the belief that the knowledge of health system preparedness is a composite understanding developed through the interactions of healthcare managers and various other stakeholders, including political leadership and the wider community.

Further, the researcher believes that healthcare managers formulate an understanding of emergency preparedness through their unique experiences, cultural settings, values, and social interactions. In addition, the subjective experiences of healthcare managers shape how preparedness is interpreted across the various levels of the health system. This shows that healthcare managers' assessments differ and are context-dependent. Hence, exploring health emergency preparedness from this diverse set of perspectives led the researcher to incline toward the subjectivist epistemology. The adopted subjectivist epistemology enabled the researcher to explore the research questions while acknowledging these diverse perspectives.

Integrating systems thinking into the relativist ontology and subjectivist epistemology perspectives provided a further philosophical lens for this research. From an ontological perspective, systems thinking views the health system as a complex and interconnected entity rather than a collection of separate components. This viewpoint recognises that health systems operate as integrated wholes comprising various interdependent parts. These interdependent parts include policies,

organisations, personnel, and community dynamics. Systems thinking acknowledges the interactions and feedback mechanisms within and across the components of the health system. Accordingly, actions or inactions in and around a particular area or component can affect the entire system. Hence, this ontological implication of systems thinking can serve as an adjunct foundation for better understanding the existing complexity and interdependence in the health system. From an epistemological lens, systems thinking promotes a transition from reductionist thinking to a more holistic understanding. While reductionist views focus on a specific segment of the system, a holistic view emphasises the interactions among various factors influencing health outcomes (health emergency preparedness in this case).

A holistic understanding is particularly useful for exploring health emergency preparedness at the system level. As mentioned earlier, health emergency preparedness can be influenced by the interactions of multiple factors, ranging from policy decisions to resource allocation and community involvement. Interconnections surrounding the health system are another layer of interdependencies. In simple terms, health emergency preparedness in the health system is the product of all these diverse components. Therefore, systems thinking, when integrated with subjectivist epistemology, further enables the identification and analysis of the interactions among the components of the health system.

In conclusion, the combined perspectives of relativist ontology, which recognises the existence of diverse realities, a subjectivist epistemology, which emphasises the role of individuals' experiences, and the ontological and epistemological implications of systems thinking create a cohesive philosophical framework for this research. These integrated philosophical perspectives enabled a comprehensive exploration of health emergency preparedness from a systems perspective. Rooting the research within these philosophical underpinnings informed the adoption of grounded theory from the available approaches. A detailed description of the grounded theory, including its fundamental concepts, key principles, and the rationale behind its adoption in this research, is provided in the methodology section.

4.3. Methodology

4.3.1. Fundamental principles of grounded theory

Grounded theory is an interpretive methodology commonly applied to explore complex phenomena and formulate a theory that emerges directly from the data. Grounded theory is preferred when a researcher aims to generate a middle-range theory through inductive data analysis. The approach is used both as a method of inquiry and a product of that inquiry.

Grounded theory involves a structured, yet flexible and iterative, process. Its iterative nature is exhibited in the data collection and analysis process. Data collection occurs in rounds using the same technique or, when necessary, changing techniques. Similarly, iteration can be implemented in analysis through techniques such as constant comparative analysis. The constant comparative method will be discussed after the next few sections. The iterative process results in developing a theory or explaining a phenomenon (Hutchinson & Wilson, 1986). This methodological approach helps convert people's understanding into theoretical propositions to form middle-range theories. In other words, grounded theory is particularly useful when developing a theory that exists between grand theories, such as "the sun is central to the solar system," and local theories, such as "I learn from my practice" (Bryant & Charmaz, 2007).

Grounded theory is rooted in the core principles of symbolic interactionism. Symbolic interactionism (SI) is a sociological theory that provides a framework for understanding how individuals interact and assign meaning to a phenomenon. The theory focuses on how people use symbols, including language, gestures, and signs, to generate and interpret meaning in their social interactions, which sociologists employ to explain how people interpret social interactions (Chamberlain-Salaun et al., 2013).

Symbolic interactionists emphasise how people derive subjective meanings from objects, behaviours, and events through the lenses of what they believe to be true (Chun Tie et al., 2019). The theory posits that the meaning given to different experiences can greatly influence interactions and relationships with others (Aldiabat & Navenec, 2011). Hewitt et al contend that the process of meaning creation is important in developing explanatory theories (Hewitt et al., 2022). Theories originating from SI are based on the idea that individuals understand and assign meaning to the world through interactions (Klunklin & Greenwood, 2006).

Simply put, the bridge between symbolic interactionism and grounded theory lies in acknowledging the freedom of conceptualisation and promoting awareness of context to better bridge worldviews. Notably, the two theories are similar in that they both acknowledge that the researcher is an integral part of the research process. Both theories acknowledge that a researcher interprets data and cannot remain entirely detached from their work. This common feature is widely recognised in constructivist grounded theory (Charmaz, 2015).

Grounded theory constitutes several key principles that guide researchers in their quest to understand complex social phenomena (Eppich et al., 2019). While most key principles vary among the versions, there are a few principles that are common to all features of the grounded

theory. Inductive analysis is one of the integral features of all versions of grounded theory. Inductive analysis enables researchers to develop theories from the bottom up based on data gathered through real-world observations. Unlike other methodologies, grounded theory does not focus on validating existing hypotheses or frameworks. Rather, it inductively builds a theory from raw data. This analytical direction enables researchers to identify patterns and generate concepts that arise organically. Moreover, the inductive reasoning encourages researchers to remain open and attentive to the data, fostering a deeper comprehension of the phenomena under study (Charmaz, 2015). Inductive analysis helps build theories directly from the data. An inductive approach to analysis aids in creating a robust representation of the social realities (Bryant & Charmaz, 2007).

Grounded theory is not a straightforward path methodology. Instead, it involves a cyclical data collection and analysis process (Corbin & Strauss, 2014). This iterative nature is another principle that all grounded theory versions share in common. This approach allows researchers to consistently refine their theoretical frameworks based on new data and insights (Corbin & Strauss, 2014). The iterative aspect of this method encourages researchers to revisit earlier stages of data collection and analysis. This flexibility enables them to adapt their research focus as new information emerges. For example, if early analysis reveals specific incomplete themes or trends, a researcher may seek additional data that aligns with or challenges these emerging ideas. Streamlining data collection and analysis helps develop a richer and more robust theoretical framework that captures the complexities of human experience (Flick, 2022). The continuous cycle of data and theory refinement augments the validity of the final theory (Creswell & Poth, 2016).

Theoretical sampling is also an inevitable technique in all features of grounded theory research. Theoretical sampling enables researchers to purposefully select additional informants with specific characteristics or experiences likely to shed light on certain elements of the developing theory. This focused approach guarantees an in-depth investigation. The technique guides the data collection towards targeted groups or situations that can enhance the emerging theory. The method contrasts with random sampling, where participants are chosen without considering their potential contributions to theory development (Charmaz, 2006). The approach permits researchers to adjust their data collection strategy to address gaps in understanding as they go forward (Emmel, 2013).

The constant comparative method is a widely applied technique in grounded theory research, with slight variations in emphasis across versions. It is an analytical techniques that encourage comparing data to identify categories and their features (Glaser, 1978b). In this analytical

technique, each new piece of information is analysed in relation to existing data. In constant, comparative researchers systematically and constantly assess similarities and differences among data. This comparative analysis enhances researchers' understanding of the connections between concepts. The technique is important in refining categories and concepts as data collection and analysis progress. This method helps discover evolving comprehension of the data. The method ultimately enables a researcher to develop a solid theoretical framework (Boeije, 2002).

Grounded theory methodology employs the principle of theoretical sensitivity. However, it does not gain equal emphasis among the versions. Theoretical sensitivity represents a researcher's ability to recognise and give appropriate meaning to the emerging patterns and categories in data. It is the researcher's ability to look and think beyond superficial levels of data and identify deeper meaning and complex relationships (Corbin & Strauss, 2014). Theoretical sensitivity is one of the key skills required to develop theory from deeper data analysis. This principle is all about the researcher's capability to recognise and interpret data just from a theoretical perspective. This enables understanding the social contexts surrounding the data (Charmaz, 2015). However, it must be noted that being mindful of one's biases and assumptions is equally important while engaging with the data. Researchers are encouraged to remain open-minded and constantly question their data interpretations and implications. Maintaining theoretical sensitivity plays a key role in developing a theory that accurately reflects the voices and experiences of participants (Ruth et al., 2023; Urquhart & Fernández, 2013).

Memo writing is a commonly applied principle in grounded theory. In particular, grounded theorists who acknowledge the researcher as part and parcel of the research process consider memoing the backbone of theory development. Memoing allows researchers to record their reflections, thoughts, and interpretations throughout the research process. The techniques encourage critical engagement with the data. It also aids in developing theoretical insights and provides a record of the researcher's evolving thought process. Memos can encompass a wide range of content. The contents could be related to spontaneous reactions to data, conceptual advancements, and questions that emerge in analysis (Birks & Mills, 2015).

The concept of theoretical saturation is one of the central principles in grounded theory methodology. Theoretical saturation is said to be reached when no new data yield significant insights that enhance the theoretical framework (Guest et al., 2006). Otherwise, researchers resume data collection until they reach this saturation point. Recognising saturation indicators informs researchers to wrap up the data collection phase and concentrate on refining and

articulating their results. Evidence of attaining theoretical saturation indicates that a robust body of evidence supports the emerging theory. This practice strengthens the validity of the developed theory. Doing so helps prevent conclusions from being drawn from inadequate data (Fusch Ph D & Ness, 2015).

Lastly, grounded theory is marked by its greater flexibility. The methodology is known for allowing researchers to modify their approaches based on the unique context and requirements of the study (Birks & Mills, 2015). This flexibility is important for navigating the complexity of human behaviours and interactions, which often resist rigid methodologies. Grounded theory researchers have the flexibility to revise research questions and analytical strategies as their understanding deepens. They can revise their data collection techniques. On top of promoting creativity within the research process, the highly flexible nature of grounded theory will increase the chances of developing a theory that is deeply rooted in the participants' real-world experiences (Charmaz, 2015; Strauss, 2017).

In summary, concepts such as inductive reasoning and simultaneous data collection and analysis enable the exploration of the dynamic interaction between data and theory. The constant comparative analysis informs iterative refinement of data, concepts, and patterns. The iterative process promotes continuous improvement and adaptation in the data collection and analysis stages. Theoretical sensitivity ensures that researchers remain attuned to the data's deeper meaning and complex relationship. Memo writing aids as a reflective practice that captures insights throughout the research journey. Ultimately, reaching theoretical saturation signals a comprehensive understanding of the studied phenomena. Of all methodological elements of grounded theory, implementing concurrent data collection and analysis, and an iterative process of data collection and analysis, are inevitable in all grounded theory research. Integrating these methodological rigours contributes to the validity of the process and the final theoretical framework.

4.3.2. The genres of grounded theory

Three distinct versions of grounded theory are recognised: Classic Grounded Theory, Interpretivist Grounded Theory, and Constructivist Grounded Theory. Feminist grounded theory is often regarded as an emerging genre of grounded theory (Chun Tie et al., 2019; Kaur & Nagaich, 2019). Each version has unique philosophical underpinnings and varied stances on researchers' roles in the research. Each variant represents a progression and refinement of the original grounded theory developed by Glaser and Strauss. While all versions of grounded theory share a foundational aim of developing theory from data, they diverge significantly in their philosophical

underpinnings, methodological rigour, engagement with prior knowledge, analysis (coding) strategies, theory creation and validation (Sebastian, 2019). Consequently, each approach provides a unique lens through which research can be undertaken. Researchers' choices between the versions vary based on their research questions, goals, and philosophical positions.

4.3.2.1. Classic grounded theory

Classic grounded theory is the first version. It is most often called traditional, classic, or Glasserian grounded theory. This oldest version was coined by Barney Glaser and Anselm Strauss. The version characterised by a systematic approach to qualitative research that seeks to generate a conceptual theory grounded in data (Strauss, 2017). Glaser and Holton define the classic grounded theory version as a set of integrated conceptual hypotheses developed systematically to produce an inductive theory about a substantive area (Glaser & Holton, 2004). In other words, the traditional GT aims to develop a conceptual theory that explains a relevant and problematic pattern of behaviour for the individuals involved (Glaser, 1978a).

This variant is also characterised by an inductive approach. Unlike many traditional research approaches that favour starting with a hypothesis, classic GT begins with data collection. Researchers immerse themselves in the context of the phenomenon they are studying. Researchers who adopt this variant gather insights through various qualitative methods, such as interviews, observations, and document analysis (Charmaz, 2006). This forwards a deep understanding of participants' experiences and the complexities of their behaviours before any theoretical framework is introduced.

Another important aspect of classic grounded theory is the coding process. Coding in this version involves breaking the data into smaller, analysable components. This process is iterative, meaning that researchers engage in constant comparison of data segments, codes, and categories (Saldaña, 2021). Initial open coding allows researchers to explore the data without constraints. This also leads to the identification of emergent patterns and concepts. Researchers refine their focus through axial coding as analysis progresses and connect categories and subcategories to form a more complex understanding of the phenomenon. Finally, they integrate the categories into a coherent narrative through selective coding. Finally, the analysis culminated in developing a grounded theory that encapsulates the core concepts identified through research (Glaser, 1998).

Classic grounded theory also emphasises the importance of theoretical sampling. This is a distinct form of sampling that differs from traditional qualitative research approaches. In this case, instead of seeking a representative sample at the outset, researchers deliberately choose participants

based on their potential to provide insights into the developing theory (Corbin & Strauss, 2014). This dynamic sampling process allows researchers to pursue specific lines of inquiry and enrich their understanding as the study progresses. Theories are not simply derived from a fixed sample. Instead, they adapt and expand based on ongoing analysis and emerging findings. As mentioned earlier, such flexibility enables researchers to remain responsive to the nuances of the data and participants' experiences.

Classic grounded theory adopts a more structured, linear approach to data collection. In the classic version, researchers create codes and categories through a process of constant comparison. The emphasis here is on formulating a theory firmly rooted in empirical data, typically focusing less on the interpretative aspects of social phenomena (Strauss, 2017). Classic grounded theory prioritises the development of substantive theories over formal theories. Substantive theories emerge from specific contexts that are designed to address particular social phenomena (Glaser, 1978b). This means that the theories generated through classic grounded theory are deeply rooted in the realities of the subject matter. The theories provide practical insights relevant to practitioners and researchers alike. In short, classic grounded theory is characterised by its inductive approach, systematic coding, theoretical sampling, and emphasis on substantive theory development. The classic grounded theory seeks to formulate a more abstract, generalisable theory,

4.3.2.2. Interpretivist grounded theory

The second genre is called interpretivist grounded theory (IGT). This version evolved from classic symbolic interactionism. The goals and assumptions of interpretivist grounded theory align with symbolic interactionism (Aldiabat & Navenec, 2011). The IGT focuses on individuals' personal meanings of their experiences and interactions. This viewpoint acknowledges that social interactions shape reality and stresses the significance of context and perspective in comprehending social phenomena (Blumer, 1986). Researchers within this framework often undertake more reflexive practices, recognising their own interpretations and biases (reflexivity) as integral to the research process.

Furthermore, the IGT approach frequently utilises methods favouring a deeper investigation of personal narratives and meanings. The methods include comprehensive interviews and participant observations (Charmaz, 2006). This leads to a more iterative and less prescriptive methodology than classic grounded theory. In other words, IGT offers researchers wider flexibility to modify their methods as new insights and themes surface throughout the research process. In short, while both approaches aim to construct theory from data, the ways they engage with meaning and context

represent a notable difference in their foundational epistemological positions. The IGT emphasises a rich contextual comprehension of particular settings and social processes (Charmaz, 2006). The focus moves from abstract theoretical constructs to thorough interpretations of individual and collective experiences within the context of social interactions.

4.3.2.3. Constructivist grounded theory

The third genre of grounded theory is the constructivist version. Kathy Charmaz developed and explained this version. Charmaz is a prominent figure among symbolic interactionists. The variant emphasises how participants construct meaning related to the area of inquiry through their participation in the process (Charmaz & Bryant, 2011). Constructivist grounded theory is rooted in the philosophical influences of constructivism and pragmatism. It adopts a subjectivist epistemological position, indicating that researchers cannot maintain objectivity. Instead, an interrelationship exists between the researcher and the participant (Birks & Mills, 2015).

Charmaz describes the constructivist grounded theory as a qualitative research approach that focuses on creating conceptual frameworks or theories by building inductive analysis from the data (Charmaz, 2006). Charmaz and their successors believe that theories are not discovered but constructed in research processes between researchers and research participants (Chamberlain-Salaun et al., 2013). Similarly, two Australian researchers (Birks & Mills) argue that a theory is not discovered but constructed through the researcher's unique worldview (Birks & Mills, 2015).

Charmaz argued that the researcher does not passively observe theory emergence but plays an active role in their designed study. A constructivist approach recognises the ongoing interaction between the researcher and the research subject, emphasising that the theory construction process involves collaborating with the research participants (Charmaz, 2006). Contrary to classic grounded theory, which discourages delving into the literature before actual data collection and holds that theory is discovered from data without external influences, constructivist grounded theory acknowledges the researcher's knowledge, experience, and understanding of the literature as integral to the analytic process.

Constructivist grounded theory proponents argue that what ensures a theory's groundedness is the researchers' active, ongoing, and deliberate commitment, as well as their priority for their data over any other input. In other words, a researcher's epistemological positioning will ultimately determine whether preconceived knowledge has a beneficial or negative effect on a grounded theory (Urquhart & Fernández, 2013). However, this version encourages researchers to analyse

their data with fresh perspectives, reducing reliance on prior knowledge while still allowing for the thoughtful integration of existing insights, provided they align with the conclusions drawn.

From a data analysis perspective, constructivist grounded theory involves several stages of data coding, including initial, focused, and theoretical coding, while employing the constant comparative method to maintain flexibility throughout the research process. This adaptability enables the integration of multiple core categories to enrich the overall analysis. Ultimately, the emerging theory is considered an interpretation shaped by the researcher's perspective. This is why grounded theory is inherently linked to the researcher's insights and evaluations rather than existing in isolation in the constructivist genre.

4.3.2.4. Similarities and differences of grounded theory genres

This section provides the key similarities and differences of the three genres described earlier. The comparison emphasises flexibility, data analysis methods, use of prior knowledge, and approaches to theory formulation and validation. Classic GT strictly adheres to a detached methodological approach when room for flexibility is considered. Researchers are inactive in mitigating their influence on the findings. In contrast, IGT is relatively more flexible and recognises that researchers are active in analysis and interpretation. Constructivist GT further extends this flexibility by highlighting the subjective nature of data interpretation, with researchers playing an active role in interpreting and constructing theories.

With respect to prior knowledge and experience, Classic GT is more restrictive and leans towards avoiding them to avoid biasing the analysis. While IGT is more lenient in utilising prior knowledge for comparison purposes, it is reserved for analysis. The constructivist version does not undermine the role of prior knowledge and considers theories as co-constructed rather than as independent discoveries. In other words, constructivist grounded theory encourages collaboration in the research process. On the researcher's role, Classic GT typically avoids it to prevent external influences from shaping the findings. IGT can utilise literature for comparative insights. Constructivist GT neither allows nor denies the use of literature. However, researchers are encouraged to use it to refine their theories if they undertake a literature review beforehand. This difference influences how researchers approach data collection and analysis within each framework. The literature review further distinguishes these approaches.

From a data analysis perspective, Classic GT emphasises a structured approach that includes substantive coding, theoretical coding, and the constant comparative method. All of these analysis stages are oriented around a single core category. In IGT, the researchers adopt a systematic,

open, axial, and selective coding method. Nonetheless, they similarly focus on a core category while allowing for deeper engagement with the data. In the Constructivist GT, coding stages involve initial, focused, and theoretical coding. However, it is relatively free of this rigidity in analysis and allows for multiple core categories. This flexibility allows the researcher's interpretive lens to reshape the understanding of data and, consequently, the resulting theories. The versions also share similarities and differences in the theory-creation and validation process. Classic and IGT converge on the necessity of developing a substantive theory to effectively conclude research. However, they differ in their emphasis and methods of verification. Classic GT typically involves quantifying findings in post-research analysis for verification, whereas IGT focuses on verification through diverse perspectives applied to the same data, thereby enriching the findings. Constructivist GT approaches theory not as a definitive answer but rather as an interpretation rooted in the researcher's own perspective. This reliance on the researcher's viewpoint means that verification in this approach looks quite different—more reflective and integrative than definitive. These key differences and similarities between the three GT variants are presented below in a more concise form (Table 1).

Table 1: Key Differences between the Three Variants of Grounded Theory

Key features	Classic GT	Interpretivist GT	Constructivist GT
Philosophical influence	Attempt to be free from influences	Interpretivism	Constructivism and pragmatism
Researchers' role	Considered to have an inactive role	Engaged and actively interprets data and discovers the theory	Engaged and actively interprets data and constructs theory rather than discovering it
Allowance of prior knowledge	Prior knowledge is discouraged	Prior knowledge is discouraged	Prior knowledge is discouraged, not prohibited
Literature review	Not encouraged, as it is considered to affect the direction of the concluding theory	It can be used for data comparison, enhancing sensitivity, and confirming/explaining the result	Neither discouraged nor prescribed (up to the researcher), but if written, should be checked for alignment with the researcher's conclusion
Data coding and analysis	Substantive coding Theoretic coding Constant Comparative method A single-core category	Open coding Axial coding Selective coding Constant comparative method A single-core category	Initial coding Focused coding Theoretical coding Flexible with the constant comparative method Allowance of more than one core category
Theory creation and research completion	Creating a substantive theory is central to completing the research.	Creating a substantive theory is central to completing the research.	The constructed theory is an interpretation rather than an exact representation.
Theory verification and research completion	Verification is done afterwards through quantitative analysis	Verification occurs in multiple perspectives on the same data	The theory is dependent on the researcher's view and cannot occur or stand without it

In summary, grounded theory has undergone various evolutions, each addressing the limitations of its predecessors. Classic grounded theory, developed by Glaser and Strauss, focused on deriving

theory directly from data; however, its rigid framework and perceived objectivity faced criticism. Strauss's adaptation enabled greater researcher involvement but struggled to integrate the existing literature effectively. Constructivist grounded theory, advocated by Charmaz, emerged to overcome these challenges by recognising the researcher's influence in shaping theory, promoting reflexivity, and embracing relativism. This research has adopted a constructivist grounded theory approach.

4.3.3. Rationale for adopting grounded theory

Despite the availability of various methodologies, this research adopted grounded theory for several compelling reasons. An underpinned philosophical perspective, the nature of the researched problem, the aim to develop a framework, and the rigour inherent in the methodology that enhances the validity and applicability of the resulting framework all contributed to this choice. The selection of grounded theory as a qualitative methodology aligns well with the researcher's philosophical perspectives highlighted earlier. Specifically, a subjectivist epistemology dovetails with grounded theory's goal of generating knowledge from participants' lived experiences, emphasising the co-construction of understanding. Using grounded theory—especially its constructivist version—the researcher conducted in-depth interviews with healthcare managers. This approach enabled rich dialogue and interaction with participants, yielding valuable insights into the factors influencing health emergency preparedness.

The preference for grounded theory over other methodologies was driven by the complex nature of the research problem. The researcher assumes that addressing health emergencies in an interdependent contemporary health system involves navigating double complexities. The dual complexity stems from the complex nature of health emergencies and the complexity in their management. This dual complexity establishes a system-of-systems. Understanding this phenomenon requires adopting a methodological approach that enables us to analyse the interactions among various components. This makes grounded theory a preferred approach. The methodology accommodates researchers' interest in diverse stakeholders' perspectives, including healthcare managers, partner organisations, and emergency responders. Adopting the methodology facilitates a nuanced understanding of the collective enablers and barriers to effective preparedness.

The researcher's commitment to developing a framework that can influence policy and have practical application drove the decision to pick grounded theory over the other approaches. Unlike other qualitative methodologies, which primarily describe phenomena, grounded theory aims to

generate actionable insights that can guide practice and policy. Other qualitative methodologies could provide valuable perspectives. Grounded theory's unique advantage lies in its ability to allow for the creation of theories relevant to the specific issues under investigation. Grounded theory is definitely not the only option for studying complex systems. However, it is the preferred approach for this research. The comparison of grounded theory with alternative methodologies commonly used to study systems of systems (complexity theory, systems thinking, and participatory action research) illustrates the appropriateness of this methodological choice.

In the context of health system research, complexity theory is a useful framework for exploring interactions within health systems. Nonetheless, it fails to offer practical, well-structured solutions. Conversely, grounded theory richly captures the intricacies of developing theoretical frameworks that will likely guide practical actions and policymaking. Systems thinking, similarly, offers a useful approach to studying interactions holistically, though it lacks the precision needed to develop concrete, actionable strategies. Grounded theory could resolve these gaps by enabling the development of concepts from the participants' experiences, and thereby producing pertinent practical solutions to the questions posed in the research.

Participatory action research is a suitable approach to studying complex phenomena and addressing diverse stakeholders in the health system, particularly in emergency management. Grounded theory, however, is more effective than participatory action research (PAR) for exploring complex problems, particularly when the intent is to expand the research beyond a certain geographical scope. Participatory action research focuses on deep stakeholder engagement and provides context-rich insights. However, its conclusions are often too localised to be relevant in broader contexts. While the methodology (PAR) produces valuable insights tailored to specific communities, its emphasis on local issues can limit the generalisability of its findings. Conversely, grounded theory's adaptable framework allows researchers to incorporate diverse stakeholder perspectives. This will potentially facilitate the identification of universal themes and principles applicable across similar contexts.

Apart from aiding in developing a theoretical framework, the methodological rigour inherent in grounded theory enhances its validity and applicability. Several key features of grounded theory, along with the previously mentioned principles, ensure that the developed conceptual framework is both valid and acceptable. Grounded theory provides data-driven insights. Methodological rigour, such as employing constant comparative analysis, theoretical sampling, and theoretical saturation, helps generate a valid theory. Putting it all together, key reasons for adopting the constructivist

variant of grounded theory include its underlying philosophical perspectives, the complexity of the research problem, and the researcher's goal of developing a framework informed by grounded theory. Additionally, the grounded theory's methodological rigour and flexibility informed the decision to use it as a methodological framework for this research. The data collection, analysis, and theory development processes described in this thesis were guided by a constructivist perspective, shaping the interpretation and understanding of the findings.

4.4. Method

This research project was accomplished in three key phases. The first phase was securing ethics approval. This critical step involved submitting a research proposal, along with other information, to ensure compliance with the ethical standards of Flinders University and the Ethiopian Ministry of Health's respective Ethics Approval Committees. After obtaining ethics approvals, the project progressed to the second phase. The second phase involved selecting initial participants in the Ethiopian health system. Recruitment strategies were developed for the first few participants. The third phase incorporated the concurrent data collection and analysis. This involved designing data collection strategies, conducting actual data collection, employing analytical methods, and undertaking the write-up. These key phases of the research project are detailed in the next few sections.

4.4.1. Ethics approval

Following the development of the research proposal, an ethics application was submitted to Flinders University's Social and Behavioural Research Ethics Committee (SBREC). The application included the research gap, objectives, methods, potential risks to participants, mitigation strategies, and measures to protect their confidentiality. After undergoing the necessary review process, ethical approval was obtained from the Flinders University SBREC with project ID 5691 (Appendix 7). Moreover, the project proposal was submitted to the Ethiopian Public Health Institute's Scientific Ethical Review Office (SERO) for conducting the study in Ethiopia. SERO is a mandated office under the Ethiopian Ministry of Health. The office is responsible for reviewing and approving scientific research. Approval was issued after the proposal was reviewed (Protocol number: EPHI-IRB-501-2023), allowing the research to proceed in Ethiopia (Appendix 8). Further support letters were obtained from the Ethiopian Ministry of Health to the respective offices and institutions where key informants were selected (Appendix 9).

Potential risks associated with emotional and psychological stress were anticipated for any participant with direct experience with a disaster event within their health service. Due to the lack of

significant traumatic events affecting the Ethiopian health service before the study, most participants exhibited no symptoms or did not report any signs of emotional disturbance during the interview. Should psychological issues arise among study participants, arrangements have been made to refer them to available healthcare services for necessary treatment, including counselling services.

4.4.2. Participant selection
4.4.2.1. Descriptions of the study participants

A total of 27 senior healthcare decision-makers in the Ethiopian health system were purposively selected for the in-depth interviews. The participants were selected from a variety of affiliations and institutions. Participants representing the federal health system level were those affiliated with the Ethiopian Ministry of Health and the Ethiopian Public Health Institute. Participants, referred to as "regional health offices", were directors of Public Health Emergency Management in the regional health offices of seven states in Ethiopia. The regional health offices include the Addis Ababa Health Office, the Oromia Regional State Health Office, the Amhara Regional State Health Office, and the Sidama Regional State Health Office. Additionally, three regional health offices, considered "remote health offices", comprised the Harari Regional State Health Office, the Somali Regional State Health Office, and the Benishangul Regional State Health Office.

Participants termed as "a hospital staff member" include managers and practitioners selected from five major hospitals in Ethiopia: Black Lion Specialised Hospital, Jimma University Teaching Hospital, Saint Paul Millennium Medical College Hospital, Addis Ababa Burn, Emergency & Trauma Hospital (AaBET Hospital), and Alert Trauma Centre. The participants, referred to as "domestic/local partner organisations/stakeholders," comprised key informants interviewed in agencies based in Ethiopia. These agencies include the Ethiopian Red Cross Society, the Ethiopian Disaster Risk Management Commission, the Addis Ababa Pre-hospital and Fire Risk Management Commission, and the Ethiopian Society of Emergency Professionals (ESEP).

Participants identified as "international partner organisations/stakeholders" were key informants selected from international-level organisations working in Ethiopia. These organisations include the country branch of the office for International Health Regulations (IHR), the country branch of the World Health Organisation (WHO), the country branch of the World Bank Group, the country branch of the United States Centres for Disease Control and Prevention (US CDC), and the country branch of the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA).

Overall, twenty-seven (27) key informants were involved in the in-depth interviews. Eight participants were from the federal level (three from the Ministry of Health, three from the Ethiopian Public Health Institute, and two from the National Emergency Medical Team (N-EMT). Seven participants were Public Health Emergency Management Directors from seven different regions. Five additional key informants were recruited from five major hospitals in the country. The remaining seven participants were interviewed from selected domestic and international partner organisations. The participants' ages ranged from 38 to 68, with an average of 44 years. Most participants (88.9%) were male. Their years of experience in various health system roles ranged from 11 to 23, averaging 14 years. A summary of participants' characteristics is provided below (Table 2).

Table 2: The Socio-Demographic Characteristics of the Interview Participants

Interview round	Source of participants	Code	Sex	Age	Years of experience	Organisations and roles
First round	Top healthcare level (Ministry of Health and EPHI)	P1	Male	40	13	National Emergency Medical Team Coordinator in the MoH
		P2	Male	44	12	National Emergency Medical Team Member in the MoH
		P3	Male	38	11	Director of Ethiopian Public Health Emergency Management
		P4	Male	39	11	Director of Travel and Border Health in EPHI
		P5	Male	58	18	Focal Person of International Health Regulation in EPHI
		P6	Male	40	13	Emergency and Critical Care Service Coordinator in MoH
		P7	Male	56	18	Emergency and Critical Care Service senior advisor in the MoH
		P8	Male	52	16	Senior Minister Advisor, Ethiopian Ministry of Health
Second round	The middle-level health system (PHEM directors of Regional Health Offices)	P9	Male	41	14	PHEM Director of the Oromia Regional Health Office
		P10	Male	35	10	PHEM Director of the Somali Region Health Office
		P11	Male	41	13	PHEM Director of Harari Region Health Office
		P12	Male	52	19	PHEM Director of Sidama Region Health Office
		P13	Male	43	15	PHEM Director of Benishangul Region Health Office
		P14	Male	39	13	PHEM Director of the Amhara Region Health Office
		P15	Male	39	11	PHEM Director of the Addis Ababa City Health Office
	Front-line healthcare managers (ED Coordinators of major hospitals)	P16	Female	43	12	Senior Nurse in Black Lion Hospital
		P17	Male	42	12	Senior Doctor of Emergency Medicine at St. Paul Hospital
		P18	Female	38	15	Senior Doctor of Emergency Medicine at Jimma Referral Hospital
		P19	Male	42	15	Senior Emergency and Critical Care Nurse in St. Paul Hospital
		P20	Male	40	14	Senior Emergency and Critical Care Nurse Alert Trauma Centre
Third round	National and international relevant partner organisations	P21	Male	68	23	Preparedness Manager of the Health Division in the Ethiopian Red Cross Society
		P22	Male	46	15	United Nations Office for Coordination of Humanitarian Affairs (UNOCHA)
		P23	Male	43	14	Director of prehospital services in the Addis Ababa City Fire and Disaster Risk Commission
		P24	Male	37	11	Global Health Security Expert at the US-CDC
		P25	Male	45	15	The World Bank Group-Ethiopian branch
		P26	Male	50	17	IHR and Preparedness Expert in the WHO-Ethiopian branch
		P27	Male	38	12	Ethiopian Disaster Risk Management Commission

4.4.2.2. Recruitment method

Initially, accessible participants, referred to as "seeds", were recruited. These seeds subsequently facilitated the recruitment of additional participants. The first three key informants were recruited from the Ethiopian Ministry of Health, the Ethiopian Public Health Institute, and the Ethiopian Red Cross Society. After conducting interviews with these three participants, they assisted in recruiting subsequent participants. For instance, a participant recruited from the Ministry of Health facilitated the recruitment of other participants within the Ministry. A participant recruited from the Ethiopian Public Health Institute helped recruit participants in the selected regional health offices, which in turn assisted in recruiting participants in the selected major hospitals. Similarly, a participant recruited by the Ethiopian Red Cross Society helped recruit key informants for domestic and international partner organisations. This recruitment method continued until a total of 27 participants were successfully recruited and interviewed. A schematic representation of the participant recruitment process is provided below (Figure 6).
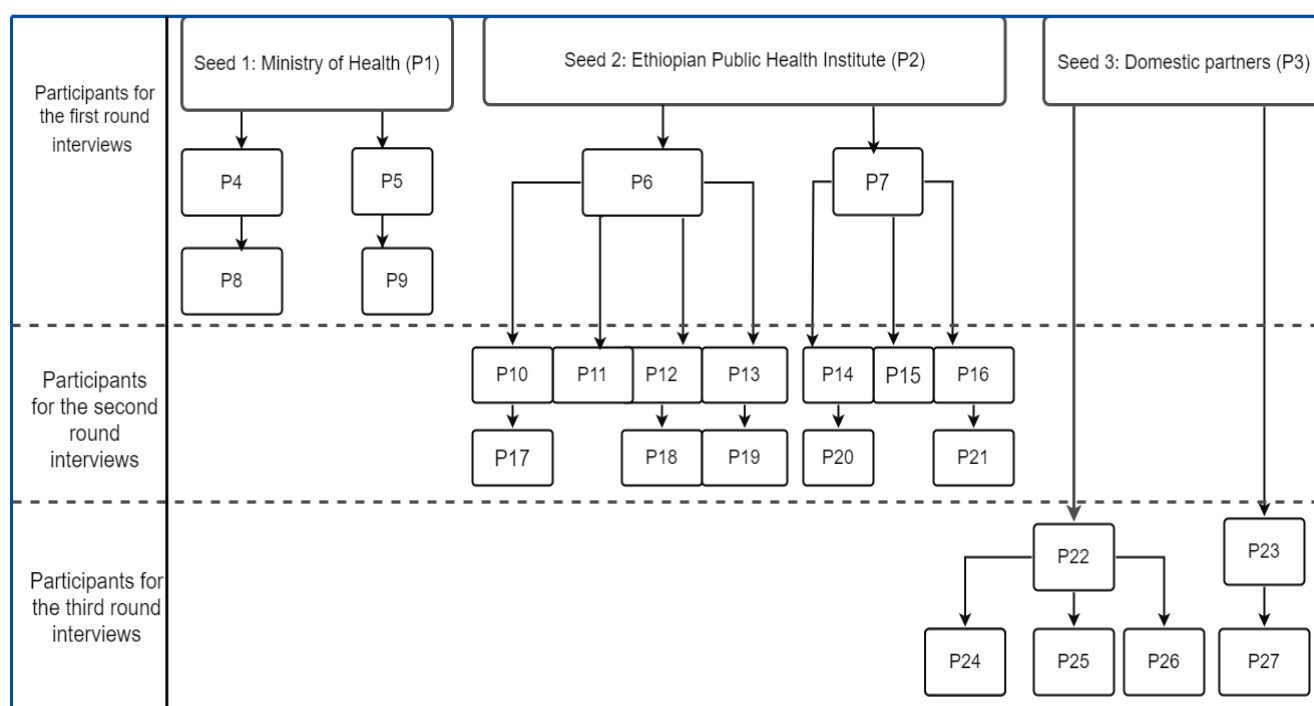
Key: P1, P2…. P27=Participant 1, Participant 2…. Participant 27

Figure 6: Schematic Representation of Participant Recruitment

The participants were contacted for the invitation to the in-depth interviews through in-person meetings, email, and phone calls. Interview invitations were sent along with participant information sheets (Appendix 4). The information sheet was prepared in English, Amharic, and Afan Oromo. It consists of the study's purpose, procedures, and any benefits or risks associated with participation. The participants were given two weeks after the initial approach and the provision of information

about the study before indicating their willingness. Once decisions to participate were confirmed, a mutually agreed-upon date, time, and venue were set for the interviews.

4.4.3. Data collection and analysis

4.4.3.1. Data collection period

Data was collected over six months, from 6 June 2023 to 7 November 2023. A large portion of this time was spent on participant recruitment. Additionally, there was a strategic pause in data collection to allow for thorough analysis of the information gathered up to that moment. The rest of the data collection period was utilised for repeated rounds of data collection and recruitment of participants until data saturation was achieved.

4.4.3.2. Data collection technique

This grounded theory research involved in-depth interviews with key informants. Data collection adhered to the principles of Constructivist Grounded Theory (CGT). The analysis of the initially collected data informed subsequent data collection until saturation was reached. The required data were gathered through in-depth interviews, facilitating a thorough exploration of the participants' perspectives. The detailed conversations yielded rich insights, ensuring a nuanced understanding of the subject under investigation.

4.4.3.2.1. The in-depth interview

The interviews were conducted in-depth with the assistance of a research assistant. The research assistant's duties included arranging interview venues, scheduling times, providing refreshments, and controlling overall interview sessions. The in-depth interviews were conducted in three languages: English, Amharic, and Afan Oromo, using both face-to-face and virtual modes. Each interview typically lasted 45-70 minutes, with an average of 65 minutes. The interview locations were organised to accommodate the participants' preferences and schedules. The face-to-face interviews were held on weekends and relatively quiet business days. Date and venue preferences were based on the participants' convenience. Most participants were interviewed at their offices. Other participants were interviewed at their homes. The remaining participants were interviewed in quiet restaurants (guest rooms). All interviews were audio recorded to ensure no detail was missed. Additionally, notes were taken during each session. Note-taking helped capture key insights and nuances of the conversation.

Written consent was obtained from all participants right before the interviews began. The researcher and the research assistant assessed and confirmed that the participants understood

the information provided in the informed consent. The informed consents obtained were documented, and each participant's anonymity and confidentiality were preserved.

4.4.3.2.2. The interview guide

A semi-structured in-depth interview was employed, which is particularly suitable for a grounded theory study when the researcher aims to expand upon existing domains of inquiry. This method allows for flexibility in questioning while ensuring that the conversation explores essential areas of interest. It is often utilised to gather rich, in-depth data that can be analysed to develop new theoretical insights. An initial interview schedule was prepared in English and later translated into the local languages of the study area (Appendix 1) for the in-depth interview. The interview questions encompass three broad areas of inquiry.

The first enquiry asked participants to explain their understanding of the progress made in developing the Ethiopian health system regarding emergency preparedness. This inquiry aimed to delve deeper into the specifics of the system's preparedness development status and the measures taken to ensure its readiness to respond to health emergencies. A set of questions regarding the health system's current state of emergency preparedness was presented. The next question focused on whether preparedness efforts addressed all health emergencies, including natural disasters, biological and chemical incidents, conflict, etc. Additionally, the examination included how any positive developments at the national level effectively trickled down to the local level. Lastly, key informants were asked to evaluate the health system's resilience to future shocks, considering all strengths and weaknesses.

The second area of questioning focused on the key factors that enhance the preparedness of the Ethiopian health system for health emergencies. This question sought diverse perspectives and insights regarding the important elements that enable the Ethiopian health system's preparedness. Participants were asked to provide detailed opinions on the factors that enabled better preparation of the health system for health emergencies. This enquiry was further probed through open-ended inquiries designed to elicit their views on the key factors contributing to improved health system preparedness. The inquiry aimed to understand the elements that enhance health emergency preparedness within the health system. Further details on policies, laws, directives, and cooperation between different regions, nations, and international entities were necessary, particularly in border health. Additionally, a question was posed regarding opportunities arising from local, national, continental, and international partner organisations. The investigation also

examined the community's unique indigenous socio-cultural and religious characteristics to identify aspects that could enhance preparedness and resilience.

The third area of enquiry focused on the key factors that may limit the preparedness of the Ethiopian health system for health emergencies. This question aimed to identify the main factors impeding the Ethiopian health system's ability to respond efficiently to health emergencies. Understanding the challenges faced by the health system will help create effective strategies to overcome these obstacles and enhance the overall response to health emergencies. Barriers to system preparedness related to resources, political commitment, socio-economic attitudes, beliefs, cultural and religious perspectives, and structural and functional aspects of health systems were specifically explored. The interview participants were asked about the availability and appropriateness of the overall framework and model of emergency management systems, specifically focusing on health emergency management systems. The interviews provided a detailed analysis of the structural, functional, and organisational barriers to emergency preparedness within Ethiopia's overall emergency management system. In this context, attempts were made to investigate the extent to which participants believe the country's health system structure is conducive to enhancing health emergency preparedness.

The enquiry aimed to determine whether participants believe that the structural and organisational arrangements of the national health system can impact efforts to build a prepared and resilient health system. Moreover, this third main enquiry explored potential obstacles to health emergency preparedness related to regional and national legal frameworks, education, strategy, and research in the health system. Furthermore, obstacles associated with multi-sectoral and multidisciplinary approaches and other influences attributable to partner organisations were thoroughly investigated. The final dimension of the interviews identified barriers to health emergency preparedness relevant to service delivery in the Ethiopian health system. Key points to consider included whether the overall infrastructure and health facilities were structurally and functionally prepared for emergencies, and the barriers to their preparedness for future shocks, including logistics, healthcare personnel, supplies, ambulances, and psychological support.

4.4.3.3. Data analysis

The researcher transcribed all the audio recordings. Initially, the researcher transcribed the audio recordings in the two local languages (Amharic and Afan Oromo), and the research assistant subsequently reviewed them. After that, two licensed translators translated the transcripts into English. Participants' anonymity and confidentiality were maintained by removing personal details

and using codes instead. Participants were labelled as participant 1, participant 2, and so forth. Once the translators provided translations on a rolling basis, the researcher and the research assistant reviewed them before importing the data into NVivo for analysis. The English versions were compared to the original texts in the local languages during the review process. The reviews identified no discrepancies between the translations. Finally, the English transcripts translated from local languages and those already available in English (those conducted in English) were imported into NVIVO 12 for analysis. The use of NVivo 12 software helped store, organise, and systematically examine data from the interviews. The researcher carried out the analysis. The constructivist grounded theory principles were applied throughout the data analysis. The practical iterative process followed for collecting, analysing, and interpreting the data is presented in the fifth chapter.

4.5. Trustworthiness

It is important to note that grounded theory, like any other type of qualitative research methodology, is susceptible to various errors. The concept of "garbage in, garbage out", which emphasises the impact of the input data on the quality of the output, also applies to grounded theory. This concept holds true for grounded theory because the quality of the collected, analysed, and interpreted data directly influences the quality of the generated theory. In addition to considering quality assurance measures in generating the data as input, the assurance steps related to data processing are also important in grounded theory. Implementing grounded theory methodology provides ways to ensure certain quality measures. Specific quality measures that enhance the accuracy of representativeness, interpretations, and overall methodological rigour of the research are outlined in the following subheadings.

4.5.1. Credibility

Credibility is a concept that relates to the plausibility of research findings. Credible research ensures cohesion among the theory, research question, methodology, sampling approach, data collection, analysis, and results. The data's depth, volume, and analytical steps must align with the chosen research methodology and framework. In this regard, attention was given to the data collection, analysis, and interpretation stages.

Ensuring credibility primarily focused on participant recruitment since developing a plausible theory relies on maintaining the quality of the collected data. The theoretical sampling technique helped avoid several biases that might have occurred at various stages of the research process. Theoretical sampling reduced selection bias by facilitating the inclusion of individuals from multiple

layers of the health system, including hospitals, regional health offices, and partner organisations. The iterative nature of theoretical sampling was a useful tool to safeguard the data quality that could have been compromised during the analysis and interpretation phases. The potential decline in quality during these stages was mitigated through the use of iterative theoretical sampling methods. This approach involved simultaneous data collection and analysis, allowing new data to be gathered based on insights gained from the analysis. This created a dynamic and robust framework for theory development. Similarly, awareness of the researcher's own bias while remaining open to emerging concepts, categories, and theories (theoretical sensitivity) helped the researcher minimise personal and theoretical bias. This balanced method reduced confirmation bias while assisting the researcher in relying on data to confirm their beliefs. Furthermore, the researcher's balanced position helped interpret the diverse perspectives within the framework of the health system operating in a resource-poor environment.

Comparing new data with existing codes and categories contributed to the ongoing validation and refinement of the emerging theory. This process enhanced credibility by enabling the continuous improvement and validation of the theory derived from the data. Additionally, memo writing is an analytical strategy that helps researchers clarify concepts and extract truths from the data, further supporting more accurate interpretations.

4.5.2. Transferability

Transferability is the ability to apply the findings of a study to different settings, contexts, or groups. This research was conducted in Ethiopia, using the country's health system as an example of a resource-limited environment. The detailed descriptions of the socio-economic and healthcare context provided in Chapter Three are the first measure to achieve transferability. The second measure ensuring transferability is the purposeful sampling strategy employed in the research. Purposeful sampling facilitated the selection of relevant participants based on specific characteristics, particularly healthcare decision-makers across all levels. This approach captures diverse perspectives and contexts, making the findings more likely to be applied to other settings. The thorough data collection procedures and analysis steps presented in Chapter Five serve as a third measure that enables readers. This improves the understanding of how the findings were derived and assesses their potential transferability.

4.5.3. Dependability

Dependability is a marker of quality that deals with the extent to which the research can be replicated under similar conditions. This research highlights the complexity of health emergencies

and the unpredictable nature of their impacts on both present and future generations. Furthermore, it emphasises that health systems are becoming increasingly complex and interdependent. Given these factors, the research advocates for a systemic approach to better understand the issue at hand. It also underscores the significance of recognising how specific contexts influence the examined subjects. Therefore, passionate researchers aiming to conduct similar studies can expand upon the concepts of complexity, interconnectedness, and system and context-based approaches. In addition to facilitating a better understanding of the problem under investigation, adopting these concepts cultivates the opportunity to select a sound methodological approach in future research.

4.5.4. Confirmability

Confirmability refers to the clarity of the connection between the collected data and its findings. It is typically demonstrated through the researcher's development of findings, accompanied by detailed descriptions supported by key examples or quotes. In this research, efforts have been made to adhere to the principles of grounded theory to ensure confirmability. Three key measures were taken to ensure the confirmability of this research. First, the study clearly articulates the methodology and data plan, including the data collection methods and analysis procedures. Second, memo writing, akin to reflexive journaling, is another important measure. The researcher documented thoughts and reflections throughout the research process in these memos, enhancing transparency and minimising subjectivity. Thirdly, the developed theory is grounded in data through iterative data analysis.

4.5.5. Reflexivity

Reflexivity is an ongoing process that involves reflecting on the researcher's own biases and assumptions. This research acknowledges two factors that could amplify the impact of the researcher's biases and assumptions on the research outcomes. First, as this is constructivist grounded theory research, the researcher plays an integral role in the research process. Second, the researcher has personal observations about what health emergency preparedness looks like in this particular setting. This means that the researcher has been closely monitoring the strengths and gaps in the health system's emergency preparedness. In addition to acknowledging the potential influences of these factors, the researcher remains neutral about the known gaps and strengths in health emergency preparedness and focuses on hearing and documenting participants' perspectives. However, given previous observations of areas needing improvement, remaining fully neutral is challenging, particularly when some participants present the country's health system preparedness as being in good shape. Additionally, using memo writing to track

thought processes and contradictions, and engaging in continuous self-reflection throughout the research process have helped minimise the researcher's existing assumptions and biases. Prior awareness of potential sources of researcher bias and demonstrated efforts to minimise these influences help maintain balance in the analysis and interpretation of the data.

4.6. Dissemination of the findings

The research findings will be shared with research consumers, including policymakers and other researchers, through various channels such as conference presentations and publications in international journals. These options ensure that the research findings achieve their desired impact by reaching a broader audience, influencing policy and implementation, and contributing to the existing body of knowledge in the field.

4.7. Definition of terms

- **All Hazards Approach –** "is a concept acknowledging that, while hazards vary in source (natural, technological, societal), they often challenge health systems in similar ways. Thus, risk reduction, emergency preparedness, response actions and community recovery activities are usually implemented along the same model, regardless of the cause" (WHO, 2021b).
- **Complex emergencies – "**A disaster complicated by civil violence, government instability, macroeconomic collapse, population migration, elusive political solutions, etc., in which any emergency response has to be conducted in a difficult political and security environment, potentially involving a multi-sectoral, international response that goes beyond the mandate or capacity of any single agency" (Anderson & Gerber, 2018; WHO, 2020g).
- **Context –** as applied to emergency risk management, context is described by several factors related to the setting, circumstances and environment of risks and events. The cultural, social, political, legal, regulatory, financial, technological, economic, natural, and competitive environment—whether local, national, regional, or international—and those factors related to the governance, organisational structure, roles, accountabilities, policies, objectives, and strategies that are in place to achieve those objectives. They also include the capabilities of and relationships between the internal and external actors and partner organisations (WHO, 2020d).
- **Critical infrastructure –** "the physical structures, facilities, networks, and other assets which provide services that are necessary to the social and economic functioning of a community or society" (Wagner, 2021).
- **Critical systems –** Within a hospital, critical systems include the electrical, telecommunications, water supply, fire protection, waste management, fuel storage, medical gases, and heating,

ventilation, and air conditioning (including HVAC) systems. Note that the failure or disruption of critical systems can stop or impede the functioning of hospitals (WHO 2015a).

- **Healthcare facility – "**Hospitals of all sizes and types; specialised medical services; primary health care clinics; general practitioners' surgery, etc" (WHO 2007b).

- **Health system –** The World Health Organisation defines a health system or health care system as "a complex system of organisations of people, institutions, and resources that deliver health care services to meet the health needs of target populations. The organisation describes the health system as six building blocks involving (1) the health workers, (2) service delivery, (3) health information, (4) medical products, technology, and vaccines, (5) health finance, and (6) governance and leadership (Bayntun et al., 2012).

- **Low-income countries –** defined as "those countries with a Gross Net Income GNI per capita, calculated using the World Bank Atlas method, of $1,085 or less per annum" (Fantom & Serajuddin, 2016).

- **Low resource settings (LRSs) –** "are typically regions where inadequate healthcare resources exist, and the health system does not meet the acceptable global standards (Lawal & Omara, 2023).

- **Point of Entry (PoE) – "**A point of entry is defined under the 2005 International Health Regulations (IHR) as 'a passage for international entry or exit of travellers, baggage, cargo, containers, conveyances, goods and postal parcels, as well as agencies and areas providing services to them on entry or exit'. International Organisation of Migrants implements critical multi-sectoral programming and aids Member States at all three types of PoE covered under the IHR: international airports, ports, and ground crossings" (WHO, 2007a).

- **Preparedness – "**The knowledge and capacities developed by governments, response and recovery organisations, communities, and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent, or current disasters. Note: Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems and includes such activities as contingency planning, the stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal, and budgetary capacities" (WHO, 2020g).

- **Readiness – "**The ability to quickly and appropriately respond when required" (UNGA, 2016; WHO, 2020g)

- **Systemic risk** – "risk that is endogenous to, or embedded in, a system that is not itself considered to be a risk and is therefore not generally tracked or managed" (McGlade et al., 2019).

- **System Thinking** – An approach to research that views the dynamic and complex context surrounding a problem, including multi-level influences on different interrelated components (WHO, 2021b).

4.8. Summary

This chapter outlined the research's philosophical underpinnings, rooted in epistemological constructivism and ontological relativism, and enriched by systems-thinking perspectives. Then, it outlined the fundamental concept, key principles, and genres of grounded theory as an adopted research framework. In addition, the chapter highlighted the rationale for adopting grounded theory in general and the constructivist version in particular. Subsequently, the chapter described the specific methods employed and the key steps taken to undertake the research, including ethics approval, participant selection, and data collection and analysis. The chapter also highlighted a section on trustworthiness, focusing on quality control measures in place and implemented throughout the research process. Finally, the chapter concluded with a dissemination plan for the findings and a glossary of key terms.

CHAPTER FIVE: OPTIMISATION OF HEALTH SYSTEM PREPAREDNESS IN RESOURCE-POOR SETTINGS: AN EMERGENT THEORY

5.1. Introduction

This chapter outlines the iterative and sequential steps taken in this research, following the principles of constructivist grounded theory. It begins with a general overview of the data collection and analysis processes. Following this introduction, the chapter then goes on to describe the specific steps that were taken during the theory construction process. It also emphasises the critical role of constant comparative analysis and memoing throughout the entire process, starting from the early stages of simultaneous data collection and analysis to the generation of the theory. The chapter concludes by providing a description of the emerging grounded theory.

5.2. Iterative and sequential process of theory construction

The process of simultaneous data collection and analysis commenced with initial data gathering and continued until saturation was attained. The conceptualisation of data, which began with focused coding, persisted until theoretical saturation was reached and a theory was developed. Data collection was briefly paused on two occasions to facilitate analysis of the collected information. Throughout this process, memoing and constant comparative analysis were integral to the data analysis. Overall, the construction of the theory progressed through three key stages, including the initial data collection and analysis, theoretical sampling, and conceptualisation and theory generation. Each stage laid the foundation for the next one and was undertaken in distinct yet iterative steps.

The iterative and sequential research process commenced with an initial stage involving simultaneous data collection and analysis. This journey began with the meticulous recruitment of participants, followed by a series of in-depth interviews. During these interviews, concurrent analysis of the gathered data took place. This analytical phase involved breaking down the information into manageable excerpts, facilitating a deeper understanding and extraction of key insights relevant to the overarching research questions. This initial stage established a solid foundation for subsequent stages of the study.

After the initial data collection and analysis, the iterative process progressed to the stage of theoretical sampling and data enrichment. This stage involved two subsequent steps, continued from the initial stage. In the second step, theoretical sampling was employed to enhance the

relevance and depth of inquiries. During this step, the data gathered underwent initial coding, which was then compared with the previous codes. At this point, data saturation had not yet been achieved. Consequently, the iterative process was continued in the third step with a second round of theoretical sampling. After interviewing the final participants, the researcher observed that no new insights emerged. Therefore, interviews were paused to facilitate an initial analysis of the data from this round. The newly generated codes from this stage were compared with earlier codes.

After data saturation was ensured, the analysis entered the conceptualisation and theory construction stage. Data analysis progressed to a more advanced level, referred to as focused coding in the fourth step. In this stage, focused coding aimed to narrow down the initial codes and develop frequent patterns or categories. Here, all excerpts obtained thus far were refined. Data conceptualisation was enhanced by reintegrating the excerpts into more abstract and focused codes, enabling the identification of key patterns and leading to the emergence of eight main categories. The fifth step advanced the analysis to theoretical coding, a more advanced step aimed at developing a conceptual framework from the identified categories. In this stage, theoretical coding explored the relationships between these categories and further conceptualised the main categories into cohesive core categories, refining the research focus and laying the groundwork for theory generation. Finally, in the sixth step, the core categories culminated in constructing a grounded theory titled "Optimisation of Health System Preparedness in Resource-Poor Settings," encapsulating all the insights gained throughout the research. The dynamics of this iterative and sequential process are illustrated in Figure 7.

Initial data collection and analysis stage

Step 1: Recruitment of eight initial participants → First round in-depth interviews

↓

Initial coding

Data saturation was not evident after the analysis ←

Theoretical sampling stage

Step 2: Second round of in-depth interviews with twelve more participants

↓

Initial coding → Data saturation was not evident after the analysis

Step 3: Third round of in-depth interviews with seven new participants

↓

Initial coding

Data saturation was achieved ←

Conceptualisation and theory construction stage

Step 4: Focused coding and emergent categories (conceptualisation) → Step 5: Theoretical coding and emergence of core categories

Consolidation of the main categories (Theoretical framework) ← Theoretical saturation was achieved

↓

Step 6: Theory construction

Constant comparative method and memoing

Figure 7: The Iterative and Sequential Process that Led to Theory Construction

5.3. The initial data collection and analysis stage

First-round in-depth interviews were conducted with eight key informants from the federal-level health system. The interviews included three managers from the Ministry of Health, two from the National Emergency Medical Team Coordinator, and three from the Ethiopian Public Health Institute. Initial coding began promptly after the first few interviews. Concepts and key phrases were identified and highlighted during initial coding, generating numerous codes. This analysis stage involved breaking down the data into conceptual components, marking the start of theorising. Initial coding involved dividing transcripts into excerpts, enabling comparisons of incidents to identify similarities and differences. From this initial analysis, concepts and key phrases were identified and highlighted, which led to the generation of numerous codes. Examples of how

the early transcripts were fragmented into descriptive and multiple codes are illustrated in the third column of Table 3.

Table 3: Examples of Initial Coding Regarding System Preparedness Progress and Readiness

Participant	Transcripts	Excerpts
P1	*We usually make available plans at an institutional level and sit comfortably as if we are strongly ready, but sometimes, that might not be the case when emergencies reach our door.*	Developing structured and comprehensive plans focusing on addressing various scenarios to guide the organisation effectively.
		Experiencing a false sense of security, as we believe we are well-prepared for any potential emergencies or challenges.
		Encountering unexpected emergencies that disrupt normal operations and test our preparedness.
		Gaining awareness of inherent vulnerabilities when faced with urgent crises that expose gaps in our planning.
		Engaging in the process of reevaluating our current strategies and approaches in light of unfolding events.
		Necessitating the swift adaptation of our responses to effectively meet the demands of a rapidly changing situation.
P2	*Now, systems are reliant on one another. When one system is hit by a disaster, the outcome may go to another.*	Highlighting the reliance of different systems on one another for functionality and support.
		Focusing on the effects that disasters have on a system, leading to potential failure or disruption.
		Exploring how the failure of one system can trigger a chain reaction affecting other interconnected systems.
		Examining the risks associated with closely linked systems and their vulnerabilities during crises.
		Looking at how the consequences of a disaster in one system can transfer to another, impacting overall stability.
		Referring to the presence of crises or urgent situations within the healthcare infrastructure.
P3	*Emergency in the health system, by its nature, as you know, has a cascading effect. When some system component is affected, the down part or vice versa. Therefore, it is wise to view emergency preparedness at the system level. That is particularly important.*	Highlighting how an issue in one component can trigger a chain reaction affecting other parts of the system.
		Indicating the interconnected nature of different elements within the health system and how they influence each other.
		Focusing on the effects that emerge in other parts of the system as a result of an initial problem.
		Emphasising the importance of approaching emergency preparedness comprehensively, considering the entire system rather than isolated parts.
		Underlining the necessity of readiness and planning to effectively handle emergencies in the health system.
P4	*Number one, the magnitude of the public health emergency in Ethiopia and the region is enormous. It has international and national implications. Internationally, pandemics are coming and growing from one corner to the other. Therefore, system-level preparation is something that time and situations require.*	Acknowledging the importance of preparedness across all levels, including the government and among partner organisations.
		Believing that the country is at a suitable level of preparedness, indicating a positive assessment of the current standing.
		Identifying various obstacles and limitations that impact preparedness, highlighting the complexity of the situation.
		Sharing understanding and recognition of preparedness among different partner organisations and partners involved, indicating a unified approach.
		Viewing preparedness as important at the system level, suggesting that it encompasses more than just individual efforts.

P5	*I think the country's optimum level of preparedness is there, although there are different challenges and limitations as well. So, in general, I think the importance of preparedness at the system level is well recognised at the ministry level and even at the partners' and partners' levels. It is well recognised. But we can talk about our limitations. Otherwise, the importance is well recognised.*	Acknowledging the importance of system-level preparedness across all levels.
		Noting the various limitations and difficulties faced in achieving optimal preparedness.
		Involving partners and partners in discussions about preparedness.
		Discussing and exploring the constraints that hinder preparedness efforts.
		Highlighting the significance of preparedness within the ministry and external partners.
		Evaluating the current state of the country's preparedness as moderate levels.
P7	*As I said, I am working in emergency preparedness and response. I have the opportunity to visit others and interact with people. Generally, Ethiopia is doing well. We can explicitly compare and say we are at this level compared to this number of countries.*	Emphasising the opportunity to meet and engage with diverse individuals fosters a sense of community and connection.
		Evaluating Ethiopia's status relative to other countries provides valuable insights into its development and global standing.
		Perceiving that Ethiopia is performing well contributes to a positive national identity.
		Highlighting the importance of understanding Ethiopia's position in an international context encourages informed discussions and collaborations.
P8	*We have been doing well recently. I am sure some of our achievements are dramatic and can be good lessons for our region.*	Indicating a sense of improvement and success, the organisation is celebrating its recent accomplishments.
		Highlighting notable achievements, the group is demonstrating major influence within the community.
		Sharing experiences and successes, they are providing valuable insights that can inspire others in the region.
		Highlighting the potential of the country's successes to serve as a model for the region
P2	*From my subjective judgment, our preparedness is extremely low, to be honest. I can elaborate: We are prone to many emergencies right now. We are handling three graded emergencies.*	Expressing a personal judgment about the current level of readiness.
		Indicating the perception that preparedness is insufficient.
		Acknowledging that there are currently three graded emergencies being handled.
		Classifying the level of readiness as low.

Similarly, Table 4 shows the early analysis stage of the key factors influencing system preparedness.

Table 4: Examples of Initial Codes about the Key Influences of System Preparedness

Participant	Transcripts	Initial codes (Excerpts)
P1	I think they are managing appropriately in that regard. However, ownership and mandate issues should be fixed. I do not see a clearly defined demarcation between the two. Both are pushing from the other end.	Recognising effective management practices.
		Highlighting the need for clarity in ownership.
		Emphasising the importance of clearly established roles.
		Seeking well-defined boundaries between responsibilities.
		Noting the pressure from different sides for clearer roles.
		Identifying confusion arising from role ambiguities.
		Managing tensions between differing perspectives.
		Indicating a need to fix critical issues.
		Feeling the friction among parties due to unclear roles.
		Recognising failures in communication about roles and responsibilities.
		Acknowledging flaws in the organisational structure.
		Striving for cooperation despite role ambiguity.
		Setting clear distinctions in roles.
		Proposing updates or changes to ownership clarity.
		Working towards a clearer understanding of individual mandates.
		Seeking better alignment between different partners' views.
		Considering changes to improve organisational structure and clarity.
P2	For instance, you can take the past Millennium Development Goal and the current Sustainable Development Goal. The former did not give sufficient attention to health emergencies as the latter did. We see competing priorities. While you put your full efforts into achieving the top priority agendas, the health emergency management, including its preparedness, might be overlooked.	Taking the past Millennium Development Goal into account
		Considering the current Sustainable Development Goal
		Noting insufficient attention to health emergencies
		Acknowledging the emphasis of the current goals
		Identifying competing priorities within agendas
		Putting full efforts into achieving top priority agendas
		Overlooking health emergency management
		Including preparedness in discussions
		Assessing the implications of competing priorities
		Recognising the need for a balanced approach
		Evaluating the distinct approaches of the former and current goals
		Highlighting the significance of health preparedness
		Integrating health emergencies into overall strategies
		Striving to improve health emergency responses
		Addressing the risks of neglecting health emergencies
P3	Ethiopia is a big, historic, traditional, and highly diversified nation. Yes, there could be a lot of indigenous knowledge. For example, you may take social integrity. Unlike other worlds, our social integrity is solid here. The important one I said is social integrity.	Recognising Ethiopia as a big, historic, traditional, and highly diversified nation.
		Highlighting the existence of abundant indigenous knowledge within its borders.
		Emphasising the importance of social integrity in the community.
		Comparing social integrity in Ethiopia with that of other parts of the world.
		Asserting the strength and solidity of social integrity present in Ethiopian society.
P4	*Public health emergency work is becoming the top priority of international organisations. Other work will support this major work, but*	Recognising the shift in global priorities,
		Identifying public health emergency work as the top focus,
		Supporting this major work through complementary efforts,

	we should be able to use the opportunities.	Leveraging opportunities created by the urgent needs,
		Collaborating among international organisations to strengthen responses,
		Engaging partners to enhance collective impact,
		Adapting strategies based on emerging challenges,
		Mobilising resources effectively to tackle pressing issues.
P5	I think the biggest enabler of our system-level preparedness is the improved commitment of political leadership and their better awareness of emergencies after COVID-19.	Reflecting on the overall perspective regarding system-level preparedness.
		Establishing a sense of importance around the political leadership's role.
		Empowering the system by enhancing the foundational elements that contribute to preparedness.
		Making strides in the commitment of political leadership, suggesting growth and development.
		Taking definitive actions to reinforce dedication towards preparedness.
		Increasing the awareness of emergencies among political leaders,
		Highlighting a shift in attitude.
		Acknowledging the lessons learned from COVID-19 to inform future strategies and actions.
		Modifying approaches and responses as a result of enhanced understanding of emergencies.
P6	*Even the health policy has mandated the Ethiopian Public Health Institute to mobilise resources to support emergency preparedness and resource activities. So, overall, we can say that the level of awareness and the environment at the policy level is fine. It is better than the previous one.*	Mandating the Ethiopian Public Health Institute to mobilise resources for emergency preparedness.
		Supporting resource activities as part of the health policy framework.
		Assessing the level of awareness in the public health sector.
		Improving the environment at the policy level compared to previous standards.
		Making overall evaluations about the advancements in health policy awareness.
		Recognising the progress made in resource mobilisation efforts.
P7	*….. the Minister of Health and the government-mandated Ethiopian Public Health Institute as an institute that coordinates the public health emergency management throughout the country. So, we have public health emergency management at the federal level, which is a key component, as well as preparedness, surveillance, early warning, response, and capacity building, at the point of interest. So, the same structure exists at the regional level.*	Coordinating public health emergency management through the Ethiopian Public Health Institute, as mandated by the Minister of Health.
		Implementing key federal public health emergency management components, including preparedness, surveillance, early warning, and response.
		Building capacity at points of interest to enhance overall public health readiness.
		Establishing a similar structure for public health emergency management at the regional level ensures effective coordination and response.
P1	*Usually, a leader is removed from a position immediately after they have started doing clever work. For example, two General Directors and three Deputy Director Generals were changed after I joined this institution.*	Noticing a pattern, a leader is removed from a position.
		Identifying that this often happens immediately after they have started doing clever work.
		Experiencing changes in leadership as I joined this institution.
		Witnessing the replacement of two General Directors.
		Observing the transition of three Deputy Director Generals.
		Reflecting on the implications of these changes for the institution.
		Contemplating how new leadership can influence innovative work.
P3	*As we speak, the PHEM Deputy Director General position has been vacant for more than four months;*	Identifying the vacancy of the PHEM Deputy Director General position, which has persisted for over four months.

	this is one indicator that the lack of stable leadership is affecting our efforts.	Recognising that this prolonged absence signifies a lack of stable leadership.
		Understanding the implications of unstable leadership on our ongoing efforts.
		Highlighting the need for effective leadership to enhance our initiatives.
		Addressing the challenges that arise from this leadership gap in our organisation.
P5	*The other is, you know, staff turnover. People who have been there for two years, gaining experience and insight into emergency preparedness and response, will not be there after some time. This situation is forcing our development status of the system efforts to be led by less experienced staff.*	Identifying staff turnover as a critical issue, where experienced employees leave the organisation after two years.
		Gaining experience and insight into emergency preparedness and response among long-term staff members.
		Facing challenges as less experienced staff lead the development of the system efforts due to turnover.
		Forcing the organisation to adapt its strategies in light of the changing personnel dynamics.
		Highlighting the need for effective training and knowledge transfer to mitigate the impacts of staff turnover.
P7	One challenge is the leadership's knowledge, awareness, and attitude, which may not be limited to higher-level leadership. Resource allocation is difficult if it is not a priority for healthcare leaders. The knowledge gap is another challenge.	Recognising leadership's knowledge and awareness as a significant challenge that extends beyond higher-level leaders.
		Prioritising resource allocation to ensure it aligns with the overarching goals of healthcare leadership.
		Addressing the challenges associated with limited awareness and attitudes among healthcare leaders.
		Identifying the knowledge gap as a critical barrier to effective resource management and decision-making.
		Engaging with various levels of leadership to foster a more comprehensive understanding of healthcare priorities.
		Bridging the knowledge gap through targeted training and development for leaders at all levels.

Coding and comparative analysis continued for all the data gathered in the initial interview round. Each initial code was compared for possible data saturation. The comparative analysis revealed that although interesting codes emerged, evidence of data saturation did not appear. Furthermore, the data collected in the first round were limited to the national level and failed to capture the perspectives of healthcare managers at both the middle (regional health offices) and frontline (hospital) levels, indicating the need for further theoretical sampling.

5.4. Theoretical sampling stage

5.4.1. First theoretical sampling and second round of in-depth interviews

The analysis, performed after each round of in-depth interviews, informed the recruitment of subsequent participants and guided further data collection. This approach enabled ongoing refinement of the data and insights as they were collected, fostering a deeper understanding of emerging patterns and categories. Interviews concluded when data saturation was reached.

Memo regarding the first round of interviews and analysis

> *Memo #1: The interviews in this round were conducted with decision-makers at the federal level, namely EPHI and the Ministry of Health. Some of the interview participants focused heavily on the good work being done. The rest, especially those who seemed neutral to the political affiliation, focused on the strengths and shortcomings. In addition, while the former group focused on good practices at the higher levels, the latter group shared their views with me, mentioning that there are vast differences between what is happening at the federal level and the regional and community levels. Based on my analysis, I didn't find a complete and consistent answer to my research question. Therefore, I realised that I needed to interview decision-makers at the regional and healthcare facility levels in the next round of interviews.*

The additional data gathered from the newly added participants underwent a thorough process of initial and focused coding, similar to the previous round of data collection. Excerpts from the new participants were meticulously compared with the existing data, enabling a comprehensive integration of insights. This comparison enriched the overall data and led to the identification of new concepts, resulting in a more nuanced understanding of the subject matter. Incorporating these insights significantly enhanced the depth and richness of the findings. However, the pursuit of data saturation revealed several concerns that required further refinement, particularly from an operational perspective. For instance, there was a question of whether the development status of the systems observed at the national and regional levels was connected to the grassroots level. Additionally, the significant improvement of the trained task force, frequently mentioned at the national level, needs to be verified at the operational level. Examples of additional data that needed further insights from regional and grassroots perspectives and informed continuation of data gathering are given in the following table (Table 5).

Table 5: Examples of Data Regarding Enablers of Preparedness Requiring Further Inquiry

Key ideas needing further data?	Questions that needed further data for saturation	Ideal source of participants	Ideal informant recruited
Promising development progress of the system at the national level	Are the national achievements cascaded to the regional levels?	Regional health offices	Regional PHEM directors
	Are the national achievements uniformly cascaded?	Health offices of remote regions	PHEM directors of the Somali, Afar, Benishangul, and Gambela regions
	Are national achievements celebrated in reports such as GHSI representative data?	Regional Health offices	Regional health offices and facility managers
Having a sound health system	Are all regions happy with the Ethiopian health system?	Health offices of remote regions (lowlanders)	PHEM directors of the Somali, Afar, Benishangul, and Gambela regions
Growing political commitment	Is the government's commitment uniform and consistent?		
Improved culture of taking lessons from past and recent incidents	Are after-action reviews inclusive?	Health offices of remote regions	Regional health PHEMS

Consequently, it was necessary to investigate the concerns and insights of middle-level and frontline healthcare managers. In the second phase of in-depth interviews, seven more participants were recruited from regional health offices in Ethiopian healthcare. Specifically, the public health emergency management (PHEM) directors from seven purposively selected regional states were included. The PHEM directors were included from the Addis Ababa city health office, the Oromia region health office, the Somali region health office, the Sidama region's health office, the Amhara region's health office, and the Benishangul-Gumuz regional health office. The regions were selected to maintain the balance of possible variations among the regions in their healthcare infrastructure coverage and their remoteness from the country's capital city. In addition to the seven PHEM directors in the selected regions, five key informants were recruited from five corresponding major hospitals, making twelve total participants for the second-round interview.

Memo regarding the second round of interviews and analysis

> *Memo # 2: The data from each participant was broken down into numerous excerpts and analysed comparatively until the second phase of the interview was finalised. At this stage, many initial codes were added to the previously generated codes from the first round of in-depth interviews. The comparative analysis between the previous and current rounds of data revealed substantial similarities in insights on most inquiries. However, participants' insights regarding specific aspects of the inquiries required further interpretation from the partner organisations' perspective.*

5.4.2. Second theoretical sampling and third round of in-depth interviews

Data gathered in the previous two rounds of interviews were obtained from healthcare managers at national, regional (state), and selected major hospitals. However, the collected data required further refinement from the perspectives of both domestic and international partner organisations. Hence, the third round of in-depth interviews continued with additional participants from the relevant partner organisations. This aimed to enrich the data primarily from the health emergency management approach, policy issues, resource allocation and utilisation, and coordination and collaboration perspectives. Seven more participants were recruited from two domestic partner organisations (the Ethiopian Red Cross and the Ethiopian Disaster Risk Management Commission), and five participants were interviewed from international partner organisations working in Ethiopia. These included the country branch of the World Bank, the World Health Organisation, the US Centres for Disease Control and Prevention, and the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA). Examples of data that necessitated further insights are presented below (Table 6).

Table 6: Examples of Data about Barriers to Preparedness Requiring Further Inquiry

Insight from previous interviews	Questions that needed further data
Resource challenges	What challenges does the health system face in utilising available resources?
	What factors exacerbate resource challenges?
The lack of coordination	Why is the lack of coordination a persistent challenge?
Weak local multi-sectoral collaboration	Do people understand concepts such as system interdependencies and the complex nature of emergency management?
	Is there a mandate problem in coordinating sectors?
Fragmented approach	Does Ethiopia have a clear philosophy and model for emergency management?
	Is our health emergency preparedness inclusive of all hazards?
Lack of stewardship	What are the inclusive and exclusive roles of EDRC, MoH, and EPHI concerning Health Emergency Preparedness?

Memo regarding the third round of interviews and analysis

> *Memo # 3: I spent several days listening to the audio recordings during the third round of in-depth interviews. After carefully listening to the audio multiple times, I transcribed, coded, and integrated the newly gathered data with the existing information. I then compared and contrasted the added views with those already gathered from the previous two rounds of interviews. I observed that most of the new insights were similar to those of the previous participants. Notably, no new insights were discovered after the fifth interview with one of the newly recruited participants. This realisation was important in informing the decision to conclude the in-depth interviews.*

The data from the third round of in-depth interviews were analysed in the same manner as the data from the first two rounds. The newly added data was compared with existing codes and patterns, which helped establish a foundation for data saturation. Data saturation facilitated advancement to the subsequent stages of analysis —focused coding and the identification of emerging categories.

5.5. Conceptualisation and theory construction stage

5.5.1. Focused coding and the emergence of main categories

Comparative analysis of excerpts helped group similar ideas into focused concepts. This comparison was instrumental in refining the large pool of data derived from all data collection and analysis phases into common and relevant codes. The relevant excerpts were organised according to the research enquiries and underwent focused coding. In addition to allowing for the summarisation of the data to a manageable level, this data analysis stage assisted in formulating more abstract concepts (focused codes) from descriptive codes (excerpts). Table 7 shows the first set of relevant initial and focused codes regarding the progress of system preparedness and the current state of readiness.

Table 7: Focused Coding Regarding System Preparedness Progress and Current Readiness

Initial codes	Focused codes
Recognising the importance of ongoing epidemiology training	Commendable ongoing health workforce development
Commending short-term training initiatives for disaster response	
Acknowledging the expansion of the human resource base in the country	
Highlighting the decreasing coverage of healthcare task forces at lower administrative levels	
Indicating inadequate support for human resource development within the current structure	
Expressing concern about the data for the global report being confined to the capital city	Inadequacy of reliable data for informed decisions and reporting
Critiquing the quality of self-assessment data utilised for reports	
Identifying deficiencies in the data administration system	
Disapproving of the reliance on a retrospective approach in vulnerability assessments	
Relating the challenges of making evidence-informed decisions to insufficient data	
Affirming the struggle to utilise generated evidence effectively	
Arguing that health system data lacks the requisite quality	
Identifying obstacles in communicating risks that may disrupt community livelihoods	Weakness in communication and documentation
Illustrating community reluctance to adhere to evacuation orders	
Indicating bottlenecks in the information flow within the system	
Labelling information channels as ineffective	
Noting the absence of robust communication systems in ambulance services	
Pointing out the lack of risk communication mechanisms	
Discussing inconsistencies in communication across different sectors	
Fearing the consequences of sharing climate change early warning predictions	
Expressing admiration for the expansion of healthcare infrastructure	Commendable infrastructure expansion
Commending the Ministry of Health's initiatives to enhance system development	
Noting improvements in functional components of the health system's development status	
Critiquing healthcare facility designs for their lack of emergency readiness	Lack of uniformity, cascade, and linkage of existing structures
Observing the underutilisation of the primary health system	
Highlighting inadequacies in preparedness by critical infrastructure	
Pointing out how a poor referral system undermines facility readiness	
Feeling that the existing system is poorly connected to healthcare facilities	
Indicating disconnections among existing infrastructures	
Emphasising adverse effects stemming from a slow and cumbersome procurement system	
Justifying challenges in cascading system structures to special populations	
Voicing concern over regional disparities in infrastructure coverage	
Highlighting deficiencies in the link between the health sector and governmental administration	
Stating inadequacies in the connections between existing structures within the system	
Maintaining optimistic views regarding the health system's readiness	Mixed perspectives on readiness status
Upholding pessimistic perspectives about the health system's readiness	
Acknowledging difficulties in assessing the health system's readiness level	
Advocating for the necessity of policy updates and revisions in response to evolving situations	Gaps in policy formulation, communication, and implementation
Formulating public health laws without thorough consultations	
Noting failures in effectively cascading formulated laws to operational levels	
Relating sluggish policy implementation to the protracted nature of the health system	
Informing that operationally, national-level achievements are inadequately cascaded	
Mirroring the health system's development status to an inverted pyramid	

Similarly, the second set of codes regarding enabling factors for healthcare emergency preparedness is presented in Table 8.

Table 8: Examples of Focused Codes Regarding Enablers of System Preparedness

Initial codes	Focused codes
Emphasising accessible psychosocial support systems for crisis assistance.	Local knowledge and practices attributed to social integrity.
Highlighting community-driven practices that boost funding for local initiatives.	
Showcasing the role of social engagement in building strong community connections.	
Underscoring robust social integrity as a foundation for resilience.	
Presenting IDIR as a cultural community model that excels in challenges.	
Illustrating the community's early warning system for floods.	Local knowledge and practices attributed to culture
Depicting effective traditional warning mechanisms for droughts.	
Highlighting traditional medicine practices used during COVID-19.	
Indicating the benefits of modernising traditional systems for better efficacy.	
Linking faith-based institutions with community initiatives to strengthen bonds.	Local knowledge and practices attributed to religion
Sharing personal experiences of the influential roles of religious figures.	
Recognising the importance of faith-based systems for community resilience.	
Drawing attention to existing social systems that support community structures.	Enhancing Indigenous knowledge and practices
Proposing to integrate traditional knowledge into contemporary policies.	
Acknowledging local knowledge as a resource for preparedness efforts.	
Suggesting exploring homegrown practices that have proven effective.	
Responding to emergencies with established strategies and experiences.	Utilising experiences gained from past incidents
Underscoring the impact of historical experiences on community preparedness.	
Expressing a shared sense of risks faced across all levels.	Exploiting increasing risk-sharing as motivators
Presenting increasing vulnerabilities as motivators for proactive preparedness.	
Promoting collective security as a principle of community safety.	
Acknowledging regional focus on public health emergencies.	Unlocking the growing awareness, attention, and solidarity across all levels
Raising community awareness of the need for preparedness initiatives.	
Commending the political leadership's commitment to enhancing public health.	
Remaining optimistic about local partners recognising the importance of preparedness.	
Commending national focus on public health as a commitment to community well-being.	
Recognising the global emphasis on challenges posed by public health emergencies.	
Cultivating partnerships at local and international levels to address common threats.	
Acknowledging the need for substantial investment in system preparedness.	
Considering that information revolution initiatives are essential for development.	Commendable efforts in systematising preparedness
Ensuring clear guidelines, policies, and laws support overall system development.	
Establishing national emergency management structures for coordinated responses.	
Viewing structured leading agencies as significant opportunities for advancement.	

The third set of initial and focused codes related to limiting factors of health emergency preparedness is presented below (Table 9).

Table 9: Examples of Focused Codes Regarding Barriers to System Preparedness

Initial codes	Focused codes
Emphasising learning from international experiences	Not taking enough lessons.
Expressing dissatisfaction with emergency lessons	
Overlooking the contributions of local institutions	
Criticising for failing to customise programmes	
Lacking a culture for inclusive after-action reviews	
Highlighting awareness gaps among local administrators	The lack and need for training and education
Noting insufficient technical capacity among lower-level managers	
Raising concerns about a lack of formal training	
Advocating for expanding training opportunities	
Assuming budgeting for preparedness is imprudent	Unfavourable attitudes regarding healthcare funding
Recognising health systems as a well-funded sector	
Expecting external funding for all health challenges	
Highlighting dependency on international funding	
Reducing domestic funding due to reliance on partners	
Justifying unpreparedness with resource limitations	
Utilising funds opportunistically	
Viewing health emergency management as solely the health sector's duty	Not sharing responsibility among sectors.
Externalising responsibility for health sector ownership	
Focusing narrowly on individual sector missions	
Lacking understanding of a multi-sectoral approach	Inability to practically deal with system interdependencies
Accusing systemic interdependencies of remaining unaddressed	
Observing disconnects in appreciating system interconnectedness	
Suggesting mechanisms to connect the government and health systems	
Relating poor collaboration to misunderstanding interdependencies	
Prioritising response at the expense of system support	Low adoption of recommended approaches
Critiquing the imbalance in resilience components	
Becoming desensitised to familiar emergencies	
Reacting post-damage instead of preventing	
Emphasising a response-heavy approach	
Advocating for multi-sectoral involvement in preparedness	
Criticising funders for neglecting preparedness funding	
Revealing the prevalence of ad hoc approaches	
Neglecting urgent health issues due to a shift in disease patterns	
Recognising challenges in implementing systems thinking effectively	
Critiquing the lack of evidence in model and tool changes	Structural flux with out sufficient customisation
Highlighting the importance of updating policies to meet evolving needs	
Customising tools and guidelines poorly for specific contexts	
Frequent changes in structures, guidelines, and policies affecting long-term connectivity.	
Introducing new tools while neglecting previous ones complicates the system further.	
Maintaining continuity becomes challenging due to these ongoing complexities	
Observing the impact of frequent structural changes on stability	
Stressing the negative effects of staff and leadership turnover on continuity	Frequently changing leadership
Reflecting disconnection with memories and past experiences.	
Acknowledging the challenges that rapid changes pose to effective leadership	
Suggesting that vital connections are overshadowed by instability	
Experiencing leadership instability that leads to confusion about direction	
Observing a lack of leadership consistency that makes it difficult to assess progress	
Feeling uncertain about government efforts that contribute to scepticism	
Addressing the consequences of premature leadership transitions	
Seeking better salaries leads seasoned professionals to leave for other opportunities	Staff turnover and its impacts
Gaining expertise in emergency response is limited by the short tenure of staff	
Experiencing high turnover disrupts team stability and consistency	
Resetting with each new hire hinders preparedness and effectiveness	
Losing veteran employees creates ongoing challenges in maintaining workflow	
Selecting leaders based on non-merit criteria hinders system development	Limitations of assigning leadership to key positions
Lack of assigning qualified leaders to leadership roles	
Not assigning emergency management experts to leadership positions	
Struggling to identify competent leaders in the global health space	

Highlighting the need for skilled diplomats in international health improves collaboration.	
Prioritising technically knowledgeable and diplomatic individuals facilitates global interactions.	
Valuing diverse health professionals supports comprehensive international cooperation.	
Stressing the importance of merit-based leadership selection.	
Suggesting tackling the challenge of filling leadership roles with the best candidates.	
Noting conflicts arising from unmet healthcare and infrastructure priorities	Systemic resource limitations as justifiable causes of resource challenges
Voicing dissatisfaction with emergency funding from partners	
Recognising limitations in domestic emergency funds	
Explaining resource challenges due to increasing population demands	
Emphasising funding shortages as barriers to preparedness	
Connecting resource challenges to diverse risk demands	
Redirecting limited local funds towards conflict stabilisation	Inefficiencies in healthcare resource allocation as unjustifiable resource challenges
Addressing poor resource coordination among agencies	
Critiquing timing issues in mobilising resources	
Highlighting challenges in commitment and coordination beyond resource provision	
Pointing out failures in using funds for their designated purposes	
Identifying systemic financial issues affecting resource allocation	
Questioning the effectiveness of resource efficiency amid limitations	
Noticing delayed fund disbursement until after emergencies	
Emphasising duplicated efforts within the emergency management system	Fragmented Coordination attributed to the governmental role
Critiquing the national emergency management system's unclear operational model	
Highlighting weak cross-border collaboration in emergency responses	
Addressing underdeveloped travel and border security measures	
Focusing on selected entry points while neglecting other borders	
Advocating for stronger cross-border partnerships	
Identifying deficiencies in neighbouring countries' emergency structures	
Emphasising the need for participatory decision-making processes	
Criticising the lack of community feedback integration	
Noticing limited private sector involvement in health emergency management	
Identifying disconnections among actors and sectors in responses	
Stressing the need for a unified stakeholder framework	
Highlighting the disconnect between health emergencies and the emergency framework	
Pointing out neglected connections between healthcare systems and vital infrastructure	
Emphasising the absence of alignment between political and health security initiatives	
Identifying coordination gaps in system development	
Critiquing an ineffective partnership organisation within emergency management	
Holding the government accountable for unclear priority partnership areas	
Connecting policy limitations to insufficient collaboration among sectors	
Identifying gaps based on available resources	
Highlighting the need for proactive stakeholder engagement	
Proposing a need-based multi-sector platform	
Noting the absence of a mandated body for cross-sector collaboration	
Observing uneven political commitment to global emergencies	Intersectoral Accountability in Health Emergency Preparedness
Critiquing partners for confining support to the national level	
Challenging partners for focusing on readily accessible regions	
Noting inadequate collaborative efforts among sectors in planning and implementation	
Emphasising the influence of global priorities on national preparedness strategies	
Expecting simultaneous collaboration across sectors in emergency management	
Questioning the reliability of political commitments in emergency responses	
Asserting misalignment of policy execution with supportive frameworks	
Highlighting overemphasis on routine duties during emergencies	
Encouraging local sectors to recognise the interconnected nature of health emergencies	

As data analysis advances, consolidating focused codes establishes the foundation for developing categories. This process became evident as the analysis, which began with in-depth interviews, progressed to focused coding. Constant comparative analysis and memoing helped explore the relationships among the focused codes and refine them into more conceptual forms (categories). This endeavour helped condense numerous focused codes into broader categories that addressed

the underlying research inquiries. This stage's data analysis yielded eight main categories that collectively cover the key findings of the research. Table 10 presents these categories and their corresponding sub-categories.

Table 10: Emerged Categories Regarding System Preparedness and Key Influences

Focused codes	Emerged Categories
Positive progress in system preparedness development Challenges of system preparedness development Mixed perception regarding system readiness status	Inadequate readiness despite positive progress
Increasing risk and vulnerability as motivators of preparedness Exploiting increasing risk-sharing as a motivator Development-driven, increasing demand for preparedness	Embracing opportunities emerging from increasing risks
Local knowledge and practices attributed to social cohesion Local knowledge and practices attributed to the community's culture Local knowledge and practices attributed to the community's religion	Harnessing local adaptive mechanisms
Factors associated with weak coordination The lack of a clear model and philosophy The lack of dedicated leading institutions The lack of and the overlaps in ownership Poor communication, documentation, and data systems Factors associated with poor collaboration The lack of a shared vision among the sectors Inattention to systems interdependencies Viewing preparedness as an exclusive role of the health sector Partners' differing preferences and interests	Weak coordination and poor collaboration
Structural flux and lack of customisations Leadership and staff turnovers Leadership selection and management challenges	System instability and change
Systemic limitations and contextual factors for resource challenge Unmet Healthcare and Development Needs Population Growth-Induced Resource Demand Resource Demand from Multiple Emergencies Limited Partner Engagement in Preparedness Phase Inefficiencies as underlying cause of resource challenge Inadequacy of domestic fund mobilisation Budgeting and financial system deficiencies Unfavourable attitudes as a reason for resource limitations Misconception about budgeting for preparedness Over reliance on partner funding Using resource limitations to justify a lack of preparedness	Constraints on healthcare resources
Event-driven, response phase-focused, and reactive approaches Emphasis on single hazards rather than multiple hazards Focus on specific hazards instead of overall risk assessment Separate responsibility, and with a centralised agency model	Low adoption of recommended approaches
Poor lesson management Inadequate formal training and education Knowledge and awareness gaps across all levels	Gaps in learning and education

Category 1: Inadequate readiness despite positive progress

This category discusses the progress of system preparedness development and the perceived readiness status. It highlights positive initiatives aimed at strengthening health emergency preparedness and the associated challenges. Additionally, it provides insights into the assessment of the Ethiopian health system's readiness to respond to emergencies. The researcher's reflection on this particular category is presented in the following memo (memo #4).

> *Memo # 4: The information gathered in this category has been important for my inquiry into Ethiopia's health emergency system development. During the interview, I noticed that while leaders are optimistic about progress, they remain concerned about the current situation. Most participants see promising advancements in healthcare preparedness despite facing challenges. Notably, seven key informants expressed apprehension about disaster scenarios using phrases like "God forbid it". My initial data analysis revealed that although the current status is concerning, the system's development shows progress. I appreciate the interviewees for their thoughtful contributions, which highlight the Ethiopian Ministry of Health's efforts to improve the health system while raising valid concerns about the capacity for large-scale disasters. Mixed perception by participants on the inquiry regarding the system's readiness shows 'inadequate readiness' if neither adequate nor the worst. Therefore, I decided to categorise the concepts "Inadequate readiness status despite positive progress in system preparedness" and believe that it effectively captures participants' insights.*

Category 2: Embracing opportunities emerging from increasing risks

The second, "Embracing opportunities emerging from increasing risks", highlights several key enabling factors of health emergency preparedness. This category partially addresses a specific objective related to investigating the key enablers of health emergency preparedness. The following memo (memo # 5) presents the researcher's reflection on this category.

> *Memo # 5: The increasing risk brings a silver lining by encouraging a collaborative approach and fostering a deeper understanding of its value. Recent health crises, such as the COVID-19 pandemic, serve as poignant reminders of this. I commend my participants for recognising the emerging opportunities amidst escalating risks and vulnerabilities. It is evident that many risks are created by humans. However, the created risks bring valuable lessons for us after ending up with emergencies. While emergencies obviously lead to loss of life and economic*

disarray, they also prompt reflection and help focus on future readiness. This encourages partner organisations, including government and other sectors, to embrace a coordinated approach. My participants have wonderfully articulated the idea that risks can also present opportunities. The important point is how effectively we learn from past incidents and manage growing risks. It is necessary to acknowledge our vulnerability and capitalise meaningfully on challenges. This concept embodies the essence of our discussion about this category.

Category 3: Harnessing local adaptive mechanisms

This category emerged from the concept of incorporating local knowledge and practices into health system preparedness. The insights gained from this category effectively addressed the research question regarding the enabling factors for system preparedness. Memo #6 provides the researcher's reflections on the importance of this category.

> *Memo # 6: It may not be surprising that a diverse country like Ethiopia has rich cultural, religious, and social knowledge. However, it is worth questioning whether this indigenous knowledge impedes or facilitates health emergency preparedness. Participants noted that local knowledge often acts as a barrier to preparedness more than as an asset. Despite this, many key informants shared experiences demonstrating how local resources significantly aided in COVID-19 containment. They also pointed out that some local practices could negatively impact preparedness and emphasised the need for further research to identify which knowledge and practices enhance preparedness. My role as an interviewer was to investigate how these local factors promote readiness. The data gathered indicated that various faith-based, culture-based, and social practices contributed to effective preparedness during the COVID-19 crisis. This aligns with the introductory statement of my research: "promoting local solutions for local problems for global benefits", which relates closely to the data generated and analysed.*

Category 4: Weak coordination and poor collaboration

This category captures the inadequacy of coordination and collaboration as key barriers to the health system's preparedness. The researcher's memo about this significant category is provided next (memo # 7).

Memo # 7: *The phrase "Poor circulation despite a functional bloodstream" from one of my key informants resonated with my observations throughout my master's studies in Emergency Medicine and Critical Care Nursing. I often questioned what we lacked, which was more than just coordination. This phrase highlighted a missing cohesive force in our system and emphasised the need for better connectivity and maintenance among its components. After analysing participant responses, 16 out of 27 echoed similar feelings, validating its significance. I noted this in my notebook on July 17, 2023, and decided to use it as a category in my analysis, ultimately labelling it as "Weak coordination and poor collaboration" to gain more meaningful insights.*

Category 5: System instability and change

This category emphasises the significant barriers that hinder health systems' preparedness for emergencies. It illustrates how frequent and often abrupt changes in organisational structure, management, and leadership disrupt the continuity of health system preparedness. Memo #8 provides the researcher's reflection on the insights encapsulated in this category.

Memo # 8: If I am asked to list my most important categories based on the tone and unrecordable expressions I noticed during interviews, I would place the category titled "Frequently reorganising makes the system unstable" somewhere in the top three. Recorded and analysed data speak of the same thing, of course. The thing is that the need to strengthen system-level preparedness is well understood in Ethiopia. Key informants referenced the Ethiopian Millennium (2006 GC) and the memory of COVID-19 regarding the need for system preparedness. I noticed that risks drive understanding, and understanding drives the desire to modify structures and organisations. This leads to changing things frequently. Updating and modifying with changing and evolving situations is a big OK. However, unless carefully managed, reorganising now and then results in the dismantling of previous structures and ultimately ends up with system instability, where memories would not be kept and where we are constantly forced to begin from zero.

Category 6: Constraints on healthcare resources

In addition to inadequate coordination and collaboration, challenges arising from healthcare resource constraints significantly hinder emergency preparedness in this health system. Resource

limitations have been viewed from two perspectives: as a genuine challenge and as an excuse. The relevance of these perspectives is reflected in memo #9.

> ***Memo # 9:*** *Resource challenges are among the most cited reasons for the lack of preparedness. These challenges stem from several underlying factors. One of the main contributing factors is the unmet needs exacerbated by the rapid growth of the country's population, which has now exceeded 110 million, approximately four times the population of Australia. Providing basic health services alone presents a significant challenge, compounded by unaddressed development and healthcare infrastructure needs. The ongoing internal conflicts in the country further worsen these challenges, leading to a critical limitation of resources. Despite these limitations, some argue that the available resources are not used effectively and efficiently, suggesting that the constraint of resources is used as an excuse for the lack of preparedness. While I haven't collected sufficient data on the effectiveness of resource utilisation, I am inclined to believe that the participants' perspectives regarding the judicious use of healthcare resources should not be dismissed, and further examination is necessary. Within the scope of this research, numerous indications point to the inefficient utilisation of available resources, which I will outline here.*

Category 7: Low adoption of recommended approaches

This is the final category, which includes concepts related to management practices. The concepts in this category identify ineffective management practices from a response and resource perspective. The researcher's reflection in memo #10 further clarifies this category.

> ***Memo # 10:*** *Most focused codes have been assigned to their respective places at this stage. There were final groups of sub-categories, which made it much easier for me to resume comparing the concepts. Amid this, I realise that disaster is so dynamic and unpredictable that it requires a dynamic approach. In contrast, participants' insights show that the emergency management approach in this setting is fundamentally a haphazard take on systemic thinking and a reactive stance rather than a proactive one. Meanwhile, I realise that the lack of adherence to the recommended approach in this resource-limited setting has resource implications in addition to its negative influence on response. Hence, I was convinced there was no better phrase than "Low adoption of recommended approaches" to categorise the remaining concepts.*

Category 8: Gaps in learning and education

This category has arisen from concepts related to awareness, knowledge, and skills necessary in the emergency management system. The researcher's further insights about this category are provided in memo #11.

> *Memo # 11:* I noticed that most focused codes already had designated places. I continued exploring the relationship between the remaining concepts and realised that the inadequacy of awareness and knowledge is a bond among a group of sub-categories. As I explored this, I questioned the reasons behind these gaps and discovered two related categories: "gaps in formal training" and "not learning from experiences". I examined their connections and interactions and concluded that a lack of formal training and a poor learning culture could result in insufficient knowledge and technical skills. Hence, I grouped these sub-categories under "Gaps in knowledge and skills". However, I felt the name of the category lacked positivity. So, I changed it to "Gaps in Learning and Education", highlighting the role of training and education in skill development. While comparing this category with others, I realised that 'heightened awareness' has been presented as a key enabler. Now I am saying 'lack of awareness', which looks paradoxical. I returned to the data and realised that the' lack of awareness' I am referring to in this category is more from the leadership perspective. The 'heightened awareness' presented elsewhere is related to the improved awareness about emergencies due to escalating risks such as COVID-19.

5.5.2. Theoretical coding and the emergence of core categories

The aim of theoretical coding was to develop a framework explaining the relationships between the core categories and other categories. The process of developing core categories began by exploring the relationships among categories discovered in an earlier stage. The connections are presented using diagramming techniques (See Figure 8). Note that the texts inside the circles represent the focused codes that comprise the main categories, which are shown in rectangular boxes.

Figure 8: Emerging Categories and Their Interconnections

Column headings:

Emergent categories and focused codes regarding the system-preparedness progress and readiness status

Emergent categories and focused codes regarding the key barriers to system-preparedness

Emergent categories and focused codes regarding the key enablers of system-preparedness

Left column:
- Expansion of healthcare infrastructure
- Healthcare workforce development
- Positive Progress of System-preparedness
- Improved Structural Organisation
- Poor linkage between existing structures
- Challenges of ststem-preparedness progress
- Sustainability concerns
- Inadequate Readiness Despite Positive System preparedness
- In adequacy of cascading national experiences to grass root levels
- Perceived low to moderate levels of readiness
- Inadequate system readiness
- Perceived inability to judge readiness due to the lack of vulnerability assessment

Middle column:
- Unfavorable attitudes on healthcare funding
- Inadequacy of domestic funds
- The lack of a clear model and philosophy
- The lack of dedicated leading institution
- Weak Coordination and Poor Collaboration
- Inattention to systems' inter-dependencies
- The lack of shared vision among the sectors
- Constraints on the Healthcare Resources
- Systemic limitation and contextual factors for resource challenge
- Structural flux and lack of customisations
- Leadership selection and management challenges
- System Instability and Change
- Leadership and staff turnovers
- Inadequacy of learning from previous emergencies
- Gaps in Learning and Education
- Event-based and reactive approach
- Event-driven, response phase-focused, and reactive approaches
- Low adoption of recommended approaches
- Gaps in formal education and training
- Hazard-driven and single hazard-focused approach
- Separate responsibility and single agency approach

Right column:
- Local knowledge and practices attributed to culture
- Local knowledge and practices attributed to religion
- Harnessing Local Adaptive Mechanisms
- Local knowledge and practices attributed to social integrity
- Increasing risks and vulnerability as motivators
- Unlocking growing solidarity through dedication global health
- Embracing Emerging Opportunities
- Development-driven increasing demand for preparedness

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In addition to theoretical coding, the continuous application of the comparative method and the use of memos laid the foundation for pursuing data and theoretical saturation. The discovered categories were compared against the research questions. This comparison indicated that relevant aspects of the phenomenon under study have been explored sufficiently and that further data would offer no additional insights. This decision allowed data analysis to progress to the advanced stage of conceptualisation and theory generation.

The continued theoretical coding and the constant comparative method have illuminated the complex connections and hierarchies within the data, providing a clearer understanding of the central concepts. This understanding helped consolidate the initial pool of eight distinct categories into two core categories. These two overarching categories are: '*The need for healthcare resource optimisations*' and '*The need for management practice optimisations*'. Ultimately, the consolidation of these core categories pooled several concepts into one that emphasises the need for optimisation in both healthcare resources and management practices, which served as the building block for the emerging categories. The following concept map illustrates the emergent core categories (Figure 9).
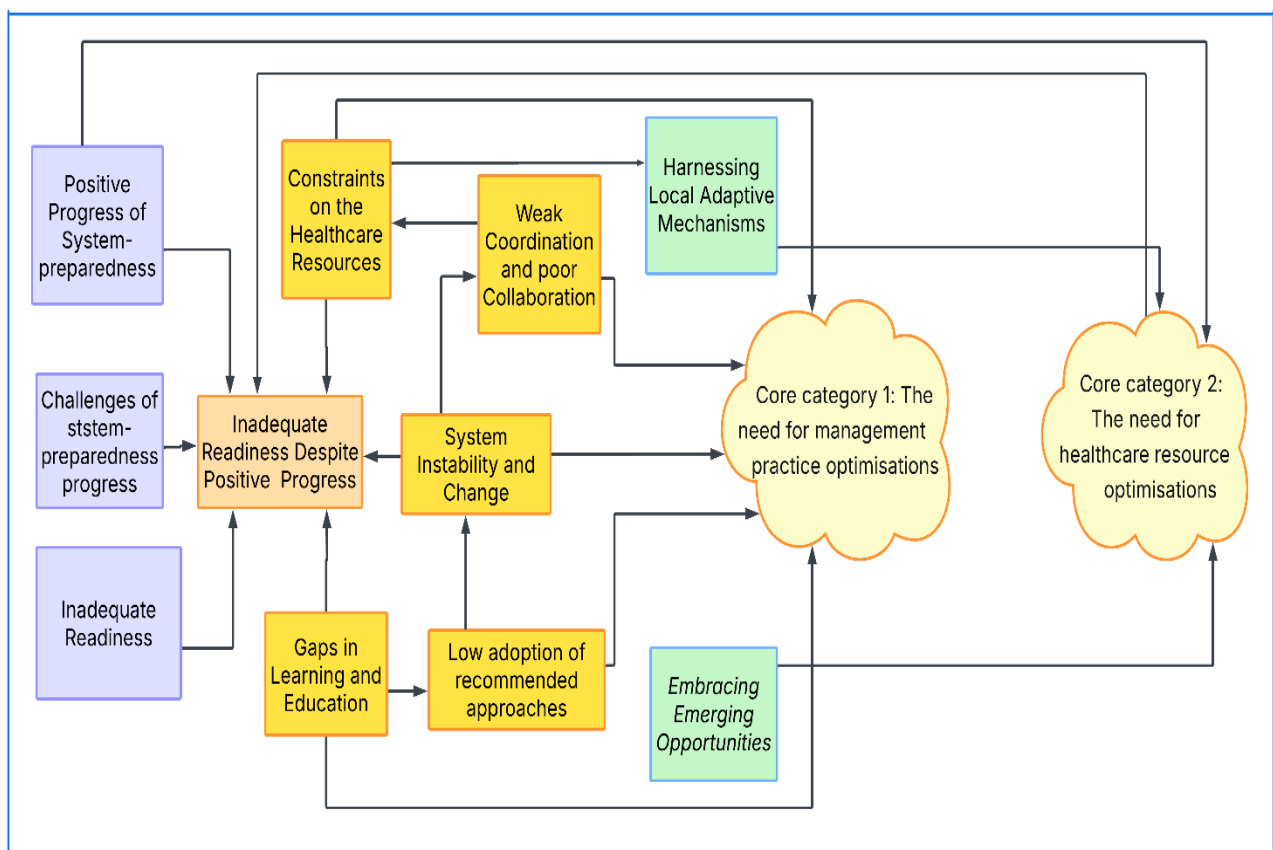
Figure 9: The Emergent Concept Diagram of Core Categories

5.5.3. Constructing the grounded theory

Following the identification of central concepts, theoretical coding was advanced by exploring the meaningful relationships that connect the two core categories. This analysis revealed an interdependence between healthcare resources and management practices. Ineffective management practices result in suboptimal resource utilisation. In contrast, effective management alone may not result in a resilient health system when faced with critical resource shortages. As a result, both core categories highlight the need to optimise current efforts, resources, and management strategies to enhance system preparedness. This convergence emphasises that the acquisition of resources, their effective and efficient utilisation, and robust management practices must be synergistically integrated to achieve the desired outcomes.

The theory generation process was more conceptualised by redefining what optimisations entail in a resource-poor context. Preparedness for health emergencies requires significant resource investment, and resources are scarce everywhere. Despite this fact, the scarcity of resources is pronounced in certain areas, such as this research setting, which makes optimising the use and utility of resources more important in this context. Data analysis shows that this resource optimisation must begin with an attitude shift from scarcity to opportunity narratives. This attitude shift helps focus on alternative solutions, such as local adaptations and effective exploitation of opportunities to enhance health system preparedness.

However, it must be noted that resource optimisation alone cannot strengthen the health system's preparedness, particularly in the context of prevailing coordination challenges. This underscores the need to optimise health system management practices. In this regard, optimising management practices entails addressing principal ineffectiveness and inefficiencies, including the lack of coordination within the health system and beyond. Hence, the two concepts can be synthesised into a cohesive theory termed **"*Optimisation of health system preparedness in resource-poor settings"*.** The interactions among the emerged categories that led to the core categories and, ultimately, informed theory generation are illustrated in the following emergent concept diagram (Figure 10).
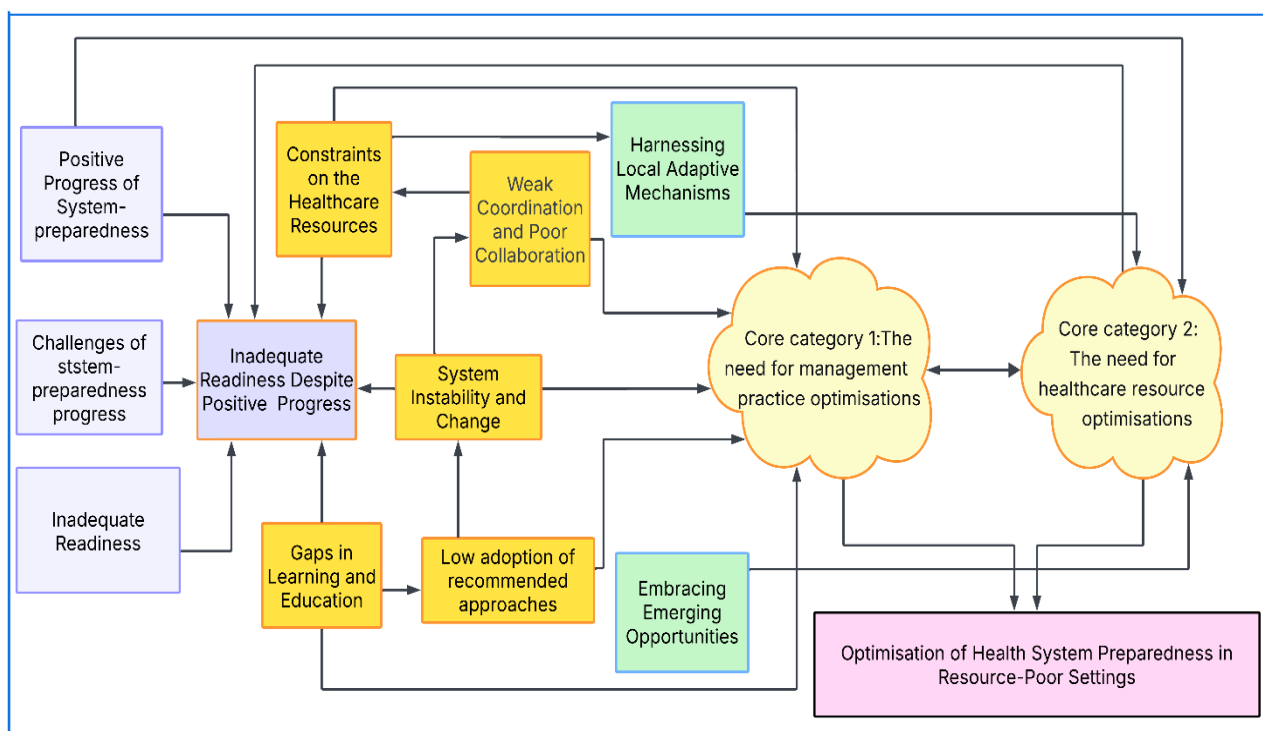
Figure 10: The Emergent Concept Diagram of Theory Construction

5.6. Description of the constructed grounded theory

The theory posits that effective health system emergency preparedness relies on a comprehensive understanding and implementation of four interrelated concepts: attitude shift, local adaptation, exploitation of global opportunities, and overcoming persistent barriers. Attitude shift is central to transforming how health systems approach emergency preparedness. The thinking that often adheres to a 'no resource, no preparedness' attitude results in a cycle of inaction and stagnation. This attitude must evolve. By advocating for a culture that prioritises continuous learning and adaptability, health system planners and policymakers can change their perception of challenges from insurmountable obstacles to potential opportunities for growth. For instance, health systems that embrace this culture are more inclined towards innovative resource acquisition and collaboration, ultimately enhancing their preparedness for emergencies. This proactive attitude is vital; it fosters an environment in which emerging threats are not seen solely as crises but as opportunities to improve existing systems and practices.

Local adaptive mechanisms can improve health system emergency preparedness, especially in resource-limited contexts, including Ethiopia. In settings where resources are constrained, leveraging existing community strengths becomes crucial. Local adaptation underscores the importance of incorporating local knowledge and practices into health system emergency preparedness. The knowledge and practices embedded within local communities can

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significantly enhance emergency responses in health systems, but are often overlooked. Health systems can access invaluable insights into local needs and priorities by actively involving community adaptive mechanisms, such as social networks and religious institutions. This engagement facilitates rapid resource mobilisation during crises and strengthens community trust and cooperation, thereby reinforcing the overall effectiveness of health response efforts. In a landscape increasingly characterised by resource challenges, leveraging local knowledge and practices enhances resource optimisation and promotes sustainability.

Social cohesion is key to bridging resource gaps. The strong relationships within communities allow for the quick mobilisation of local resources during emergencies. Communities can pool assets like food, shelter, and medical supplies, relying on trust and collaboration within their networks. This sharing of resources ensures that health initiatives continue even without extensive external support. Community leaders, especially elders such as the 'Abbaa Gadaa' and 'Haadha Siinqee', are important for fostering trust and participation in health initiatives. Their understanding of local customs and respect within the community positions them as effective communicators of health messages. In Ethiopia, where elders often mediate health-related issues, involving them in planning can align health messaging with community values. They can also mobilise community members during emergencies, encouraging participation in health campaigns and drills.

Ethiopia, with its rich traditions and cultural diversity, provides a unique opportunity to enhance health system preparedness during emergencies. The country's more than 80 ethnic groups, each with distinct languages and cultural practices, offer valuable insights for developing practical health strategies. These communities have historical knowledge of health and healing, along with social structures that influence health behaviours. Incorporating these cultural aspects into health strategies can improve emergency responses and address resource limitations. For instance, health education campaigns that utilise local dialects and culturally relevant approaches can encourage greater participation and compliance during health crises. Traditional medicine and holistic healing are deeply rooted in Ethiopia. Many communities depend on indigenous plants, herbal remedies, and traditional healing practices passed down through generations. Integrating these methods into the health system can create a more inclusive approach to health emergencies, particularly in remote areas with limited access to modern medical facilities. Training healthcare professionals in both traditional and modern practices can help establish a hybrid healthcare model that respects local customs while improving service delivery during crises.

Cultural events such as 'Irreecha', Chembelala', and 'Meskel' are significant gatherings that offer opportunities for health education. These events draw large crowds and can be effective venues for sharing important health information. Health authorities can set up booths, conduct workshops, and host discussions on relevant health topics. By utilising interest in these celebrations, health messages can reach a broader audience, increasing community engagement. Traditional communal decision-making practices can enhance collective responses to health emergencies, especially when resources are limited. Many ethnic groups have established ways to collaborate for problem-solving. This can be used to create community-based emergency preparedness plans that are both efficient and culturally relevant. Regular community meetings to discuss potential health threats and strategies can lead to tailored response plans aligned with local contexts. These gatherings can also serve as education platforms, empowering communities to take charge of their health and build resilience.

Exploiting global opportunities presents a compelling avenue for health systems to enhance their emergency preparedness. As global health threats escalate, there is a growing need for collaborative initiatives to address local constraints. Resource-poor health systems stand to gain immensely from global partnerships that provide financial resources, technical expertise, and access to innovative technologies. These collaborations can facilitate sharing best practices and lessons learned, which are critical in responding to local and global health challenges. By positioning themselves within the global health ecosystem, healthcare leaders and planners in resource-poor systems can leverage external support to build their capacities, enabling them to better anticipate and respond to emergencies. The global health community must recognise the interdependency in health preparedness—what aids one can ultimately strengthen many.

Overcoming persistent barriers to preparedness is paramount to addressing the entrenched challenges that often impede effective emergency preparedness. Organisational barriers, such as weak coordination among agencies, ineffective leadership, and instability in the system, must be systematically identified and dismantled. Notably, a concerted effort to enhance collaboration among various partner organisations, including government bodies, nonprofit organisations, and community representatives, can pave the way for a more coherent and unified approach to health emergency management. Strengthening leadership and fostering a sense of shared responsibility among the actors and sectors is necessary to promote collective action and judicious resource allocation, especially when resources are scarce. Moreover, tackling attitude-related barriers, such as using resource limitations as an excuse for inadequate preparedness,

is important. It is imperative that health systems cultivate a proactive outlook that prioritises comprehensive emergency planning over resignation to prevailing limitations.

In sum, synthesising these four interconnected elements—attitude shift, local adaptation, exploitation of global opportunities, and overcoming persistent barriers—forms a robust foundation for enhancing emergency preparedness, particularly in resource-poor health systems. This cyclical relationship illustrates how progress in one area can invigorate and reinforce advancements in others, establishing a holistic framework for resilience. Implementing this framework ensures that even in resource-limited settings, health systems can effectively prepare for, respond to, and recover from emergencies, ultimately leading to more effective crisis management and improved health outcomes. Systemic resource limitations are long-standing challenges that will not be tackled overnight. On the other hand, global health threats are increasingly growing. Therefore, adopting resource and management practice optimisation, primarily in resource-constrained health systems, is both a strategic necessity and a wise decision.

5.7. Summary

The chapter presented an overview of the iterative and sequential processes involved in data collection and analysis through the constructivist grounded theory approach. The chapter first demonstrated the initial iterative data collection and analysis that yielded foundational insights into the research questions. The chapter then highlighted the use of theoretical sampling, which enhanced the relevance and depth of the inquiries. Next, focused coding—an advanced analytical phase that aids in the conceptualisation of data and the identification of key patterns—was implemented. Focused coding led to the emergence of categories that provided clarity and context to the findings. Theoretical coding, the next stage of the advanced analytical process after focused coding, was utilised to explore relationships between these categories. This analytical stage informed the conceptualisation of the emergent categories into a central concept and the construction of a theory. In addition to the theoretical coding, memoing, and the pursuit for saturation, this helped consolidate the eight categories into two core categories, leading to the generation of a theory titled 'optimisation of health system preparedness in resource-poor settings'. The theory emphasises the potential to enhance health systems' emergency preparedness in resource-poor contexts through integrating attitude shifts, local adaptations, exploiting opportunities, and overcoming barriers. These interconnections are further detailed in chapter ten, after presenting the emerged categories in chapters six through nine.

CHAPTER SIX: PROGRESS OF HEALTH SYSTEM EMERGENCY PREPAREDNESS AND CURRENT READINESS

6.1. Introduction

This chapter outlines the main findings related to the first dimension of the research question, which focuses on how key healthcare decision-makers view the progress in system preparedness for health emergencies and the current state of readiness. The findings on this specific aspect are presented under the first emerged category: "Inadequate readiness despite positive progress". Specific insights are presented under three subcategories: 'Positive progress in system preparedness, 'Challenges in system preparedness progress', and 'Mixed perceptions regarding system's readiness'. Collectively, the perspectives indicate that system preparedness progress encompasses achievements and challenges. Moreover, participants' opinions on the current level of readiness indicate a mixed perception, characterised by pessimism, optimism, and an inability to assess the health system's readiness due to a lack of comprehensive risk assessments, all of which suggest inadequate readiness despite the noted positive progress in system preparedness. Lastly, the chapter concludes with a summary that reviews the main points discussed.

6.2. Inadequate readiness despite positive progress

This category emphasises participants' opinions on the progress of system preparedness and the perceived status of the system's readiness. Participants noted both promising progress and challenges in strengthening the health system's emergency preparedness. Overall, participants' views show that although commendable progress has been made, existing challenges have left the current state of readiness deficient. This perspective is evident from the comments made by the key informants, which will be discussed in the following sub-categories.

6.2.1. Positive progress in the system preparedness

The sub-category captures participants' positive views about the progress of system preparedness. The cited success stories are summarised under this sub-category, which comprises three subheadings: expansion of healthcare infrastructure, development of healthcare task forces, and improved organisational structure. Participants recognised that the country's health system is on a promising path to enhancing health emergency preparedness. They noted that these achievements offer valuable lessons for many African nations striving to improve the preparedness of their health systems. Below are examples of participant comments regarding this perspective.

Participant 25, a 45-year-old participant in an international partner organisation, compared the progress in the Ethiopian health system's preparedness with that of similar countries in the region and noted that Ethiopia is making exemplary progress in certain areas. They shared their perspective:

> In my position, I have had the opportunity to see how other countries in our region are doing. In general, Ethiopia's progress is noteworthy. We can confidently assert that Ethiopia has achieved a certain level of development when compared to many other countries. Recent advancements in Ethiopia have been positive, and some of these achievements are truly impressive and can offer valuable lessons for our region.

Participant 7, a 56-year-old informant in the Ministry of Health, stated:

> Regarding the management of this public health emergency, the progress at the country level has been very positive. Especially from 2009 until now, there has been notable progress. This indicates that significant efforts have been made to address the issue, and the results are visible, I believe.

Participant 19, a 42-year-old hospital staff member, added:

> Comparing our current situation to that of five or four years ago, it is clear that we have made promising progress. Our efforts to build a system for disaster preparedness have improved, especially in the areas of space, staff, supplies, and systems. Moreover, there has been a focus on identifying and meeting the supply needs for disaster response.

Moreover, participant 26, a 50-year-old from another international partner organisation, described the progress of system preparedness:

> Yeah, I can say it is a system that is being established, but not yet developed well. I think that is, in a nutshell, the evolution, or the progress, the country is making, which is promising progress.

6.2.1.1. Healthcare infrastructure expansion

Participants observed significant improvements in healthcare infrastructure, such as the establishment of pre-hospital facilities, hospitals, emergency and critical care services, and emergency operations centres. These developments were acknowledged as positive

advancements in system preparedness, enhancing the health system's ability to respond to emergencies. The following examples reflect participants' views on this progress.

Participant 8, a 52-year-old in the Ministry of Health, emphasised the ongoing infrastructure development in terms of healthcare facilities and specialised centres, stating:

> Many medical facilities, including hospitals, health centres, and clinics, were established long ago and often lack well-organised emergency and critical care units. However, I have to say, it is encouraging to see the significant progress being made recently in reorganising areas like emergency rooms and critical care services. It feels like we are really on the right path, and I am excited about the future developments in our healthcare system.

Participant 22, a 46-year-old in one of the international partner organisations, added:

> Quite honestly, the expansion of healthcare infrastructure, especially when we talk about health facilities. There has been, you know, significant development happening in areas like emergency rooms and critical care expansion, which are, I think, really important for the system. Plus, the growth of health centres has been notable as well. If you look at what Ethiopia has achieved in this regard, it is really impressive.

Participant 20, a 40-year-old hospital staff member, added about the ongoing expansion of the ICU, especially since the COVID-19 pandemic.

> Before COVID-19, the number of ICU services in Ethiopia was very limited. With a population of around 120 million, there were only about 30 to 40 ICUs, which was quite concerning. Now, we have more than 100 ICU centres. It is really remarkable how things have changed. In addition to the increased number of ICU services, there has also been a significant shift in recognising the importance of ICU services.

Participant 26, a 50-year-old manager in an international partner organisation, expressed a positive view regarding the health system's capacity, stating:

> I recently had the opportunity to visit the national health emergency operations centre in Addis Ababa, accompanied by joint external evaluators. I must say, I was genuinely impressed by the functionality and effectiveness of these

centres at both the national and regional levels. Witnessing firsthand how emergency cases are managed was truly eye-opening. Seeing such dedicated efforts in place to handle health emergencies is encouraging.

Participant 17, a 42-year-old manager in a regional health bureau, highlighted infrastructure development in terms of ambulance services, which they present as an exemplary achievement in Africa.

Even when we see just ambulances, Ethiopia has purchased nearly 3,000 or more ambulances in the past 7 or 8 years. This is a miracle in Africa. The government is opening emergency departments for many hospitals, and even establishing a field hospital as well.

Participant 21, a 68-year-old manager in one of the local partner organisations acknowledges capacity-building works such as enhancing EOCs, stating:

I think these developments really open up some great opportunities for improving our emergency preparedness. The Ministry of Health is doing an awesome job boosting the capacity of Emergency Operation Centres, which is a big step forward. We are rolling out various training programs, enhancing early warning systems, and keeping an eye on surveillance. It is important that we keep this momentum going for the long haul.

Participant 4, a 39-year-old manager in the EPHI, emphasised the promising progress in the expansion of laboratories, describing:

The feedback from external evaluations, such as Joint External Evaluation (EEJ), indicates that Ethiopia is performing well, especially in terms of laboratory expansion. They visited both animal and human laboratories and found a good capacity to detect pathogens like Ebola, Viral Haemorrhagic Fever (VHF), and other important pathogens. However, the capacity is too limited compared to the country's demand.

6.2.1.2. Health workforce development

Participants emphasised that the ongoing initiatives in human resource development represent significant progress in establishing long-term preparedness. They specifically highlighted efforts to improve human resources in emergency and critical care settings. The following comments

encapsulate participants' insights and reflections on these encouraging developments and their potential positive impact on system preparedness.

Participant 27, a 38-year-old member of the National Emergency Medical Team, stated the last fifteen years' achievements as follows:

> Human resources are the key point. In the past 15 years, from all angles, human resource development in this country has been exponential. I can tell you that Ethiopia is at the forefront, apart from South Africa or Egypt. We have seen a significant increase in the number of emergency doctors, master's nurses, and Bachelor of Science graduates. It has been truly remarkable.

Participant 16, a 43-year-old hospital staff member, mentioned that Ethiopia has significantly enhanced health emergency task forces through workforce training, yet challenges remain:

> Absolutely! In Ethiopia, there have been some really impressive strides made in creating and improving health emergency task forces. One standout initiative is the training of our emergency and critical care workforce through colleges and universities, which I believe is absolutely important for building our long-term preparedness as a healthcare system. However, despite the significant progress we have achieved so far, it is clear that there's still a lot of work ahead of us.

Participant 13, a 43-year-old from one of the selected regional health bureaus, mentioned field epidemiology training as a good opportunity to improve the healthcare task force at the district level.

> I believe that the expansion of field epidemiology training to the district level is a significant enabler. Providing frontline and intermediate training at the lower district level and assigning professionals with advanced field epidemiology training at the district level demonstrates a commitment to building capacity at the grassroots level. Additionally, the ongoing capacity-building efforts from the national to the regional level are important in creating an enabling environment.

Participant 12, a 52-year-old informant from another regional health office, added positive views about the role of field epidemiology training in improving human resource capacity.

> I think investing in human resources like field epidemiology is important for our short and long-term success. We've seen a lot of our experts and leaders at the Emergency Operations Centre come from this training. It's really about making sure Ethiopia is prepared to tackle future pandemics. Early disease detection and containment are key, and field epidemiologists will play a big role in that effort.

Participant 1, a 40-year-old National Emergency Medical Team member, stated that progress in human resource development is a top priority.

> Our organisation really focuses on continuous improvement and regular training. We've got solid support from our partner organisations, which is essential for developing our team and boosting our capacity, especially for emergencies. For instance, our staff has been trained by the WHO, so we are ready to respond quickly if something comes up.

6.2.1.3. Improved organisational structures

The third improvement noted by the key informants is the structural organisation of the Health Emergency Management System. They believe it has markedly improved compared to earlier periods. The following sample of participants' comments provides insights into their views on this improved structural organisation.

Participant 5, a 38-year-old informant in the EPHI, expressed a positive view about the structural organisation improvement:

> Ethiopia has really stepped up its public health emergency management recently. We've set up the Ethiopian Public Health Institute, which includes the Public Health Emergency Management Institute. It has offices at the federal, regional, and zonal levels, so we are working hard to coordinate everything effectively from the top down to the local areas.

Participant 21, a 68-year-old manager in one of the domestic partner organisations, expressed similar views about the ongoing improvements in the structural organisation.

> Over the last ten years, Ethiopia has really improved in handling public health emergencies. The Ministry of Health has been leading the charge, and they have set up the Ethiopian Public Health Institute to focus on tackling these issues. It is great to see everyone working together—from the federal level all the way down to the regions. We've definitely noticed some big improvements in how things are managed during crises.

Participant 15, a 39-year-old manager in a regional health office, stated:

> What's really impressive is that it has offices at the federal, regional, and zonal levels. This reflects Ethiopia's thorough approach to managing public health emergencies, right from the top down to the local levels. It is evident that the country has put a lot of effort into developing this area over the past decade. This structural organisation is one of the positive changes.

Participant 26, a 50-year-old in the office for International Health Regulations, mentioned that capacity is also growing with improved structural organisation.

> You know, emergency management used to feel a lot like just putting out fires, but that's changing. The country is really stepping up its preparedness, even with the hurdles we face. Take the IHR unit, for example; it is set up like a small office with just a few staff, but it shows we are not just focusing on the surface—we are building real capacity here. Better structures mean stronger support, sustainability, and excellence overall. And that's the kind of help organisations like the Ethiopian Public Health Institute provide for developing the system.

Participant 10, a 36-year-old informant from a regional health bureau, supported the ongoing structural organisation:

> I have observed significant progress, particularly in structural organisation. The establishment of public health institutes in every region is a game-changer—an important advancement that was lacking before. It is encouraging to see systems thinking gaining traction within the healthcare system, both in terms of

structure and function. However, I shouldn't hide the fact that there are still challenges in establishing connections with healthcare facilities.

6.2.2. Challenges of system preparedness progress

This subcategory explores the main challenges faced in improving system preparedness. These insights can be grouped into four key elements: policy implementation gaps, inadequate cascade of national-level experiences, the lack of linkage between existing healthcare infrastructures, and sustainability concerns. Participants recognised that shortcomings in these areas could hinder the progress of system preparedness efforts. Each concern is presented below under specific elements, along with examples of comments from the key informants.

6.2.2.1. Policy implementation gaps

Participants noted barriers created by policy formulation, communication, and implementation gaps. Many felt that these obstacles prevented the development of coherent strategies, resulting in fragmented efforts that are less effective at addressing on-the-ground needs.

Participant 4, a 39-year-old manager in the EPHI, mentioned that existing policies are not being translated into action:

> While necessary policies and a national emergency preparedness plan are in place, we face significant challenges. Many times, these plans lack proper budget allocation or fail to gain recognition and alignment with key partner organisations and government entities. I think our main challenge is the lack of effective implementation.

Participant 14, another 39-year-old manager from one of the regional health offices, added:

> In my view, one major challenge is the ineffective implementation of existing policies by practitioners. It is important that these policies are not only communicated effectively to lower-level executive bodies but also that there is a rigorous follow-up on how well they are being implemented. Without this level of oversight, it becomes difficult to achieve the intended outcomes.

Similarly, participant 23, a 43-year-old interviewed from a domestic partner organisation, stated:

> The main problem, however, is that sometimes, they never bypass paperwork and paper values. Usually, we conduct early assessments and put them aside, never using them for implementation purposes. This is often one point of

criticism that we raise against each other, and there is no such cooperation to implement our assessment findings.

Participant 11, a 41-year-old informant in one of the regional health bureaus, said that one of the primary reasons public health policies fail to be implemented effectively is that policies and directives are often formulated without thorough consultation and are not monitored. They stated:

> In my view, the legal and policy frameworks for health emergency preparedness in Ethiopia are mostly sound. However, there is a significant gap in the regulatory framework, as the regulatory body operates independently of the health sector. Directives are often created without adequate consultation with the health sector. Consequently, this misalignment makes it difficult to implement directives effectively.

Participant 20, a 40-year-old hospital member, pointed out that the absence of a robust monitoring system is a key reason for the inadequate implementation of health emergency preparedness policies:

> Our plans and policies have not been implemented mainly because the policies issued lack the necessary monitoring and controls. There is no liability if the interested party creates a deficiency that does not require implementation. I think these are the important reasons.

6.2.2.2. Inadequacy of cascading national-level experiences

Participants have noted that efforts to develop the system are focused on the top level and have not been adequately extended to the grassroots. According to this view, this disconnect hampers the effectiveness of preparedness initiatives at the community level.

Participant 12, a 52-year-old informant from the regional health offices, stated:

> Good things are often found at the top level. Many initiatives and investments begin at the top level, and the focus is also at the top. However, there are efforts to bring these things to the lower levels, with some practical implementations already in place. However, there is still a need for more structural changes.

Participant 12, a 52-year-old informant in another regional health office, succinctly described the situation in the following manner:

> As I said, following the policy of the Ministry of Health, there are good intentions from leaders at the ministry and regional levels to support preparedness. But as I said, it is limited to the higher level. Zonal, district, and local level preparedness is extremely poor. It is not well taught to the community.

Participants believe that relying on the federal government and NGOs for funding impedes progress toward the desired outcomes at the regional, zonal, and district levels.

Participant 27, a 41-year-old hospital member, stated:

> I cannot say that resource allocation is strictly hierarchical, with significant resources at the higher levels and minimal resources at the lower levels. I believe there are limitations in terms of resource mobilisation and allocation. For example, there is no significant local resource mobilisation if we consider regional health bureaus, such as the Oromia Regional Health Bureau. Regions heavily depend on the federal government for their budget.

Participant 4, a 39-year-old member of the National Emergency Medical Team, expressed the absence of cascading national-level capabilities in terms of the concentration of human resources they noted at the federal level, leading to significant shortages at lower levels:

> I believe we are facing a significant issue with human resources, especially at both the district and zonal levels. Currently, we lack emergency experts outside of Addis Ababa, where the Emergency Medical Teams (EMTs) are primarily located. They provide important support to various regions as needed, which reveals a critical gap in trained personnel. The trained task force we do have is largely concentrated in the capital, resulting in a severe shortage at lower levels.

Participant 3, a 38-year-old informant in the EPHI, stated that the existing trained human resources are limited to the federal level of the health system, including the EPHI, and institutions and centres located in Addis Ababa.

> As I said, healthcare managers are trained through in-service short-term training at the national level. So, I think they can operate to some extent. Even though we cannot say it is sufficient, there are initiatives. There is short-term training for emergency preparedness and response. At the bottom level, at the woreda level strata, usually, there is only one focal person assigned to coordinate all these bulky works, and the work is always challenging.

Similarly, participant 9, a 41-year-old informant in one of the regional health offices, reiterated the concentration of available trained healthcare task forces at the apex of the country's health system.

> Now, for example, if we look at the regions, let me give you an example of EPHI. There are so many case teams and professionals in the organisation. When you come here to the regions, for example, if you take our region, only eight professionals are working at the moment. Again, when we move to woredas, in every woreda in our region, there is only one PHEM officer.

The participants interviewed from remote areas expressed concerns about the inconsistency in replicating efforts at lower health system levels. For instance, participant 13, a 43-year-old informant in a regional health office, noted that this reflects existing disparities in healthcare infrastructure coverage.

> The efforts are not uniformly cascaded. There is a variation from region to region and from place to place, largely based on previous healthcare infrastructure coverage.

Participant 10, a 35-year-old manager in a remote region, suggested that preparedness activities are often perceived as a luxury when their region faces more urgent challenges.

> In our region, planning for future disasters is viewed as something luxurious. As immediate healthcare needs often take precedence, we don't worry about the importance of long-term disaster preparedness. While this challenge is faced throughout the country, it is particularly acute in remote regions like ours.

Participant 23, a 43-year-old manager in a non-remote region, reiterated that cascading national experiences lack uniformity between regions, stating:

> So, I can say there are regions, cities, and zones working towards building a strong emergency disaster response system. For example, in the capital city, we can say that they have a good experience. For example, they're working to prepare in advance for event-based planning, starting from the higher leadership and lower levels. But there are also gaps in other parts. So, I can't say all of them are at a similar level, but there are efforts. The cascading process is ongoing and has some variations.

Participant 4, a 39-year-old informant in the Ministry of Health, supported the idea that the lower levels of the health system have not yet received sufficient attention.

> Most of our focus seems to be on the federal level, especially in Addis Ababa. But when we look at the regions, zones, districts, and health facilities, that progress really drops off. It feels like we are shifting from being prepared to just reacting. Even in Addis, we see less emphasis on building a solid system as we go further down the ladder, and that decline in preparedness is pretty noticeable.

Moreover, participant 18, a 38-year-old hospital staff member, shared similar views about the lack of cascading good experiences at the grassroots levels.

> But the major problem is that things here are poorly communicated and cascaded to the lower administrative structures of regions, zones and woredas. Usually, it is suspended at a given administrative structure, and it never reaches the bottom-hand administrative structure; if, for example, you plan to work with the zonal structure and arrange a workshop, he is the only participant of that workshop alone who knows about your issues; others have no information at all.

Participant 2, a 44-year-old member of the National Emergency Medical Team, analogised the lack of cascading federal-level efforts with an inverted pyramidal shape.

> The system resembles an inverted pyramid; while we see some preparedness and response efforts at the top levels, healthcare facilities are unfortunately not reflecting similar initiatives. I believe this inconsistency indicates that while we

have some strategies in place, there's a lack of critical implementations at the grassroots level where they're really most needed.

6.2.2.3. Lack of linkage between existing healthcare infrastructures

The lack of connections between existing structures was a frequent topic of discussion. Participants observed that this disconnection leads to insufficient collaboration and support among various organisations and partner organisations, undermining the overall preparedness framework. For example, participant 23, a 43-year-old participant from a domestic partner organisation, stated:

> We have a focal point for PHEM at the facility level and are focused on strengthening its implementation in health facilities. Our strategy has already been developed and launched. However, one issue is that the structure of EPHI isn't well-connected to health facilities. Healthcare facilities aren't effectively linked to one another.

Participant 18, a 38-year-old hospital member, emphasised the lack of a proper referral system among the healthcare facilities.

> Improved referral systems, which we lack, are important for effectively utilising our healthcare facilities. This way, patients can be directed to the right care based on their needs, enhancing our health system's preparedness and emergency response efficiency.

Participant 20, a 40-year-old hospital staff member, added the lack of good linkage between the Public Health Emergency Management System (PHEMS) and the healthcare facilities.

> In my view, there's a significant need for improved coordination and stronger connections within our existing PHEMS frameworks. Right now, the ties are rather weak, which hinders our overall efficiency.

Other participants emphasised that the activities within the health system are not well integrated with government structures across all levels. For instance, participant 5, a 58-year-old informant in the office for International Health Regulations, stated:

> In our health service programs, there's a disconnect between different levels of administration. For instance, vulnerability risk assessment and management start at the district level but don't integrate well with broader administrative

functions. This lack of coordination, as district and regional administrators operate independently, creates challenges for effective preparedness and response.

Participant 24, a 37-year-old member of an international partner organisation, emphasised the importance of integrating health system activities with local government structures to improve budgeting and overall coordination.

> Coordinating human resources, financial support, and other aspects is important. The involvement of the regional district administration is important because it is responsible for allocating the district's budget. Without their support, any efforts at the health sector level would be futile.

Participant 26, a 50-year-old partner organisation, described the inadequacy of integration between the government security and health systems, which they attributed to a lack of pre-emergency coordination.

> There is a lack of coordination between government security and health services. For instance, I can give you an account of two recent incidents in Addis Ababa. We saw police dominate the scenes and restrict ambulance access. Government security forces are usually not part of the preparedness phase. That is why we do not see collaboration during the response. Things are not as integrative as they should be.

6.2.2.4. Sustainability concerns

Another major concern raised was the lack of action on sustainability. Participants expressed concerns about the long-term viability of preparedness initiatives, noting that efforts may wane without addressing sustainability challenges, thereby affecting their effectiveness over time.

Participant 25, a 45-year-old informant in one of the international partner organisations, expressed:

> Our system is tested and experienced, but the main challenge is sustainability. After managing an outbreak or disaster, it is tough to establish a structure that operates consistently over time. We often struggle to maintain a sustainable approach that works effectively day in and day out.

Participant 19, a 42-year-old hospital staff member, highlighted the uncertainty about the sustainability of preparedness post-event, describing:

> I believe that not only Ethiopia but also the entire world is not fully prepared for future disasters. While we have made progress since COVID-19 and there's a heightened awareness about potential crises, I am not certain that this level of preparedness will last.

Similarly, participant 5, a 58-year-old informant at the IHR office, emphasised that capacity-building efforts must not hinge on a particular emergency event but rather be sustained over time.

> I believe that capacity building should not be limited to a one-time or single-event effort, but should also involve maintaining it over time, particularly for developing strong laboratories and surveillance systems. In our case, this work often does not continue. The efforts cease once a specific emergency event is no longer perceived as a threat.

Furthermore, participant 19, a 42-year-old hospital staff member, emphasised the importance of effectively sustaining the capacity to manage future pandemics or public health emergencies.

> Definitely, it is super important to keep our capacity strong for handling future pandemics and health emergencies. We really need to boost our lab and surveillance systems. Right now, there are several public health operations that require ongoing support and preparation, like making sure our labs have enough reagents. Closing those capacity gaps is key to improving our readiness and response.

Participant 3, a 38-year-old informant at the Ethiopian Public Health Institutes, emphasised the importance of maintaining existing capacity in laboratories and surveillance systems to respond to future public health emergencies and pandemics effectively.

> Well, when it comes to public health emergencies, it is important that we maintain our capabilities to handle potential future pandemics. The challenge really lies in sustaining those capacities, especially within our laboratories and surveillance systems. Right now, we have several ongoing public health operations, but there's uncertainty about how effectively they can respond to emerging situations.

6.2.3. Mixed perceptions regarding system readiness

Participants' views on the system's readiness varied from extremely low to moderately prepared. The meanings behind terms such as 'very low', 'low', or 'moderate' that participants used to describe the health system's readiness level were further probed. The obtained insights were grouped into three perspectives: optimistic, pessimistic, and inability to judge the health system's readiness level.

6.2.3.1. Optimistic views on the readiness level of the health system

Key informants believe that ongoing initiatives offer a promising start, though much work remains. For instance, participant 6, a 40-year-old manager at the Ministry of Health, stated:

> I believe our approach to managing COVID-19 has been effective, particularly through public education and coordinated medical care. I am optimistic about our current capacity, but it requires sustained commitment and effort from the leadership.

Participant 8, another informant in the Ministry of Health, added that they are hopeful regarding the readiness level and acknowledged the government's commitment.

> Our health system faces significant resource challenges, yet I see opportunities for improvement. While the government's response has been commendable, our preparedness wasn't flawless. I view our current readiness as a minor setback, but I am optimistic that the lessons learned from situations like COVID-19 will drive better outcomes going forward.

Participant 17, a 35-year hospital staff member, shared a similar perspective on the current state of readiness, stating:

> Despite the significant gaps in our readiness efforts compared to the current demand, we remain optimistic about our ability to bridge these differences. While we may not be in an ideal position, we recognise our progress and are committed to achieving our goals despite the challenges ahead.

Participant 26, a member of an international partner organisation, shared their viewpoint, using the COVID-19 response as a basis for optimism about current readiness.

> The COVID-19 response indicates that we have been relatively well-prepared. The strategy for managing the pandemic has yielded positive outcomes,

especially in terms of community education and coordinated healthcare responses. While there are certainly areas that require enhancement, I wouldn't classify our response as the worst. Should we encounter a similar situation in the future, I believe the country can manage it even more effectively.

Participant 4, a 39-year-old EPHI member, expressed optimism about readiness, noting the improved capabilities they observed during the COVID-19 response.

It certainly sounds like we have made significant progress, especially in response to the COVID-19 crisis. Our increased capacity and enhanced capabilities, including the addition of genomics and sequencing facilities, are indeed reasons for optimism about our future. Additionally, achieving an optimal or even higher score in the recent Joint External Evaluation indicates that we are moving in the right direction.

Similarly, participant 21, a 68-year-old informant from one of the local partner organisations, emphasised that the health system's readiness level can be categorised as moderate and has potential for enhancement, stating that:

Yes, our health system faces challenges, but with each challenge comes an opportunity for improvement. We can strengthen our preparedness by addressing gaps and difficulties and adapting to emerging demands. I would describe our readiness as moderate. I mean, there is room for improvement and growth. I think the status is not at a frustrating level.

Participant 2, a 44-year-old national EMT member, expressed optimism about the current readiness.

I am really optimistic about how far we've come in the past five years. Our readiness is pretty solid, but we still have some areas to improve. Right now, we are focusing on four key things: space, staff, supplies, and systems. We are investing in staff training and making some important upgrades. Overall, I feel good about our preparedness and our ability to handle emergencies.

6.2.3.2. Pessimistic views on the readiness level of the health system

Other participants rated the country's readiness as low, and their overall views of the current situation were not positive. For example, participant 10, a 35-year-old manager in a remote region, expressed their perception of readiness status.

> I will go for very low. Yes, our readiness is very low as a whole. The readiness level decreases significantly as you move down the administrative structure. This is a general scenario in the Ethiopian context rather than specific to our region. It is important to acknowledge that the level of preparedness tends to decrease at lower hierarchical levels.

In addition, participant 8, a 52-year-old senior advisor at the Ethiopian Ministry of Health, shared the following views about inadequate readiness for multiple emergencies in Ethiopia.

> In my assessment, our readiness is inadequate given the multiple emergencies we are facing. The cholera crisis in East Africa, particularly in Ethiopia, alongside the ongoing aftermath of conflict in the north, highlights our significant gaps. We simply lack the capacity to meet these challenges, indicating that our preparedness remains critically insufficient.

Participant 7, a 56-year-old informant in the Ministry of Health, stated:

> First and foremost, we must hope for the best-case scenario. However, in a crisis, we might need to contemplate closing major hospitals like Black Lion Hospital, prioritising urgent cases over non-urgent ones, and allocating specific hospital wings for disaster response.

The same participant expressed concerns about the current level of preparedness, citing the lack of a reliable preparedness system and weak pre-hospital care and disaster management capabilities as key factors contributing to vulnerability to outbreaks and disasters.

> A reliable preparedness system has not been established, leaving us vulnerable to serious outbreaks and other complex disasters. In their current state, our preparedness and response systems could be put to the test. Look, our pre-hospital care and disaster management capabilities are already fluid, both operationally and structurally.

Participant 5, a 58-year-old informant interviewed at the National Office for International Health Regulations, stated that healthcare facilities lack organisation and efficiency in providing routine healthcare services.

> The other problem I see is that healthcare facilities are not organised in terms of the routine healthcare services they should provide. You do not know which hospitals provide which services, for example. I think this causes inefficiencies during high times. Structurally, we are not organised. We are not ready in that regard. That's scary, to be honest.

In addition, participant 22, a 46-year-old manager at a local partner group, emphasised that while emergency room facilities have improved in the last five to six years, older facilities still lack disaster readiness.

> Especially, in the past five years, we have really improved emergency room design and labelling, especially with dedicated areas for disaster response. Newer facilities are relatively equipped, but older ones still face challenges like overcrowding and poor ventilation, which affect their disaster readiness and general emergency care.

Participant 1, a 40-year-old participant member of the National Emergency Medical Team (N-EMT), added concerns about the fragility of emergency preparedness and the potential chaos that could arise from a major hazard or outbreak.

> I have really serious reservations about our readiness for emergencies like Ebola and COVID. We faced huge gaps in infection control and testing when they first appeared, and not much seems to have improved since then. We are even struggling with diseases like malaria and dengue due to shortages of medications and test kits. Honestly, it is hard to feel optimistic about how ready we are for future crises.

Similarly, participant 27, a 38-year-old informant manager in one of the local partner organisations, added the fragility of preparedness for emergencies and the potential chaotic consequences of a severe outbreak or hazard.

> I think our readiness level is pretty shaky overall. We have some capacity, but it gets used up quickly, which is worrying when real emergencies hit. I can't help but feel that if a serious event happens, we might face major chaos and losses

before we find a way to manage it. Even with the national EMTs' efforts, progress feels slow, and we might not be ready for what could come. It is definitely a concerning thought.

Participant 6, a 40-year-old participant from the Ministry of Health, expressed concern about the lack of reliable capacity to respond and the potentially devastating impact of major emergencies, stating:

We definitely have more work ahead of us. While we have made positive strides in handling emergencies, our capacity for handling such situations on the ground is not solid. If a serious crisis were to hit, the impact would be severe in our delicate system, so I am not feeling very hopeful about our current readiness level.

Participant 13, a 43-year-old from a regional health bureau, expressed concerns about the health system's lack of preparedness.

I think our readiness is quite inadequate. Just look at the situation in northern Ethiopia—health facilities have collapsed, and even hospitals in Addis Ababa ran low on essential supplies like gloves. If a major disaster hits, we are staring down the possibility of serious human losses, which is really alarming.

Similarly, participant 18, a 38-year-old informant from another health facility, added that their lack of confidence in the health system was due to critical shortages of basic supplies and concerns about potential shortages of emergency drugs.

During the recent conflict in the north, we faced severe shortages of basic supplies like gloves and urine bags, which surprisingly cost 500 birrs each. If we are struggling with these basic supplies, I worry about our ability to obtain emergency drugs if there's a sudden surge of patients. It makes me lose confidence in our health system.

Participant 12, a 52-year-old informant manager at the regional health office, raised concerns about emergency readiness in Ethiopia, particularly the health system's capacity to handle larger disasters amid economic challenges.

While ongoing improvements deserve acknowledgment, Ethiopia's current state of emergency readiness is concerning. It is hard not to feel pessimistic

from a public health emergency perspective. Are there enough health facilities and established systems to handle a more significant disaster? Given our economic challenges, the health system's capacity to respond to and absorb shocks is concerning.

Moreover, participant 20, a 40-year-old hospital staff member, emphasised the need for better preparedness and response to more widespread emergencies.

If minor emergencies pose this much of a challenge, we need to consider how we would handle a mass casualty event. Our readiness for serious outbreaks like Ebola or pandemics is currently insufficient. Our pre-hospital care and disaster management systems are not as strong as needed, and we lack a solid culture of preparedness. We must focus on strengthening our response capabilities for future crises.

6.2.3.3. Inability to judge the health system's readiness level

The key informants highlighted that they cannot evaluate the health system's level of readiness. Participant 22, a 46-year-old informant from one of the local partner organisations, emphasised that the lack of comprehensive risk assessments makes it difficult to determine the health system's readiness level.

I think we are pretty inconsistent when it comes to predicting our readiness for emergencies. This probably happens because there's a gap between the risks we recognise and how well we prepare, mainly due to weak assessment systems. We tend to overlook things like road traffic injuries and large crowds, which can be really risky. While we do a decent job assessing readiness for specific issues like epidemics, we shouldn't just stick to those. Honestly, giving our readiness a low, moderate, or high label doesn't really work.

Participant 19, a 44-year-old hospital staff member, shared that discussing readiness without linking those assessments to specific risks and existing capacity is meaningless.

Look, Addis Ababa, with its millions of residents, faces numerous risks like fires, flooding, and landslides. However, our understanding of these hazards is limited. We lack important information on risk locations, making establishing effective early warning systems difficult. To me, claiming readiness without identifying these risks feels meaningless.

Participant 24, a 37-year-old informant at an international partner organisation, stated that the main reason for overlooking other pressing risks is the lack of understanding of health emergencies. They also noted that they cannot assess the health system's readiness level due to a lack of a comprehensive risk assessment.

> I find it difficult to assess our readiness for health emergencies. Many people focus only on traditional issues like cholera or drought, neglecting other critical factors such as road traffic injuries, conflicts, mass gatherings, and chemical incidents, which can also result in significant fatalities. This limited understanding impairs our preparedness and hampers effective risk identification and response systems.

Participant 2, a 44-year-old informant in one of the international partner organisations, added:

> I think getting ready for health emergencies is pretty tough. A lot of folks just focus on the usual stuff like cholera and drought, but they miss other big risks like car accidents, conflicts, mass gathering events, and chemical spills—all of which can really be deadly. This narrow view can really hold us back from being prepared and responding well. We've got to broaden our perspective on disaster risks and figure out how to prepare for them.

6.3. Summary

This chapter presented the key findings related to the first dimension of the research question, focusing on how key healthcare decision-makers perceived the progress of system preparedness for health emergencies and the current state of readiness. The key findings regarding this aspect of the research were presented under the first category, "Inadequate readiness despite positive progress". This category included three sub-categories: 'Positive progress in system preparedness', 'Challenges in system preparedness progress', and 'Mixed perception on system readiness'. The overall perspectives illustrated that progress in system preparedness showed both successes and challenges. Additionally, participants' views on the current level of readiness indicated a mixed perception, encompassing pessimism, optimism, and an inability to determine readiness without comprehensive risk assessments, reflecting inadequate readiness despite the noted positive progress in system preparedness.

CHAPTER SEVEN: ENABLERS OF HEALTH SYSTEM EMERGENCY PREPAREDNESS ROOTED IN LOCAL ADAPTATIONS AND EMERGING OPPORTUNITIES

7.1. Introduction

This chapter presents the key enablers of the health system's preparedness for health emergencies. These enablers are categorised into the two emerging categories identified during the data analysis. The first category, 'Harnessing local adaptive mechanisms', encompasses practices and knowledge that health systems can draw upon, rooted in cultural, faith-based and social characteristics (such as social capital). These mechanisms inform how health systems can integrate local insights and established community practices to enhance their ability to respond effectively to health crises. The second category, 'Embracing opportunities emerging from increasing risks', captures a broader range of enablers that strengthen health system preparedness. This category includes four specific enablers that underpin a proactive stance in managing emerging threats. The first, 'Heightened awareness as a result of increasing health risks', highlights the growing recognition of health threats within systems and the improving level of commitment from health authorities and policymakers. Enhanced political engagement and coordinated efforts at both regional and global levels are essential for creating a unified response to health challenges. Within this framework, "Risk sharing as a motivator for collaboration and solidarity', serves as an important enabler, demonstrating how shared health risks can inspire collaboration among various health entities and partner organisations. The third enabler, 'Dedication to global health collaboration', emphasises the benefit of international cooperation in addressing common health concerns responsibly. Finally, the 'Development-driven demand for preparedness' describes the pressing need for the health system's preparedness in response to growing risks associated with developments.

7.2. Harnessing local adaptive mechanisms

The category includes participants' views on how local knowledge and practices, rooted in faith, social interactions, and tradition, can enhance the health system's preparedness. Participants emphasised the need for further research to identify relevant local knowledge and practices that can be integrated into policies to improve the health system's emergency preparedness.

7.2.1. Local knowledge and practices attributed to culture

Participants highlighted the importance of local knowledge and culturally rooted practices in promoting community engagement and preparedness. They emphasised that utilising unique community insights fosters collaboration and strengthens connections with the health system,

leading to a greater sense of ownership and involvement. Community leaders, such as elders, play a crucial role in encouraging participation in health initiatives, as their influence builds trust in health messages. Cultural events like Mesqel, Irreecha, and Chembelala are key for health communication, offering opportunities to share important health information and conduct emergency drills, allowing communities to practice responses to potential health crises.

Participant 12, a 52-year-old informant manager in the regional health office, emphasised:

> I think one of the key elements in mobilising our community for health initiatives is the involvement of our elders, such as the 'Abbaa Gadaa' and 'Haadha Siinqe'. They have such a strong influence and can really encourage participation. When they promote health messages, people tend to trust those messages much more."

Participant 19, a 44-year-old hospital staff member, noted that:

> Cultural gatherings, such as 'Mesqel', 'Irreecha', and 'Chembelala', serve as critical platforms for communicating health messages. These events gather large numbers of people, making them perfect opportunities to spread awareness.

Participant 6, a 40-year-old in the Ministry of Health, for instance, emphasised the necessity of further investigation into the community's culture that has relevance to preparedness.

> Our community has mechanisms to react to problems that help us improve our collective preparedness, especially if we follow our rules and plans. This method can also involve more people and inform others in the community. I believe this connection makes everyone feel more involved and responsible. When people feel more connected, they usually participate more and take pride in what they do.

Participant 21, a 68-year-old manager at a local partner organisation, highlighted the community's knowledge by noting that local residents tried to address a shortage of sanitiser by substituting it with a traditional drink called "Araqe" (although its effectiveness has yet to be proven) during the COVID-19 pandemic.

> One remarkable Indigenous practice in Ethiopia is traditional medicine. If we support traditional medicine practices with scientific research, I believe they

can significantly contribute to our efforts to develop supplies like vaccines. For instance, there's a local drink called "Araqe", which many villagers utilised as a sanitiser during the heightened risk of COVID-19.

Moreover, participant 13, a 43-year-old participant from one of the remote regional health services, highlighted a strong sense of responsibility ingrained in the culture and the need to leverage the health sector's preparedness, stating that:

> In some cases, ambulances may not be available to transport sick individuals or assist mothers in labour. In these instances, the community steps in to help. This sense of responsibility is deeply ingrained in the community's culture and way of life. Leveraging this existing culture and positive attitudes can greatly benefit the health sector's preparedness efforts for handling smaller outbreaks and disasters.

Participant 21, a 68-year-old manager in a local partner organisation, illustrated the traditional practices commonly used by the Gambela community, one of the regional states in Ethiopia, for predicting flood risks, stating:

> In Gambela, local people listen to the sound of frogs to predict the risk of flooding. They believe that when frogs make specific noises, it warns them about possible floods or heavy rain. At night, the frogs sing deep songs that tell villagers a flood is impending. When they hear these sounds, they quickly go to the hills to stay safe, which helps them protect their lives. This knowledge has been passed down for generations, and they use it as a traditional early warning system.

Participant 12, a 52-year-old informant from one of the regional health offices, expressed the traditional early warning system that the Somali people in Ethiopia use to predict drought risk.

> One thing I'd like to mention is how the Somali community knows a lot about predicting droughts. They pay attention to certain birds that don't come around very often. When these birds show up, it is a signal that a drought might be on its way. Sadly, not enough attention is given to these local practices. Instead of supporting these kinds of community mechanisms, we usually wait until things get really bad, like when their livestock start to die. It is really important to listen to this kind of local knowledge and take steps to design how they are included in our plans and policies.

7.2.2. Local knowledge and practices attributed to faith

In addition to the community's traditional practices, participants' insights suggest that the local knowledge and practices rooted in faith-based institutions and practices are instrumental to improving health emergency preparedness. According to this view, faith-based institutions serve not only as places of worship but also as vital hubs for information and support during crises. Participants' comments indicate that, by leveraging their established trust and relationships, they can effectively mobilise community members, disseminate important health information, and coordinate efforts during emergencies. These institutions often provide resources and outreach programs tailored to the community's needs, enhancing overall resilience to health emergencies. Additionally, the involvement of religious institutions ensures that diverse perspectives and practices are considered in preparedness strategies, leading to more comprehensive and effective responses in times of need. For example, the insights shared by a 37-year-old participant underscore the role of these institutions in strengthening health emergency preparedness, reads:

> Let me share an interesting local practice from the Waldeba Gedam Monastery, one of the oldest monasteries near Gondor. They have this interesting approach to keeping visitors safe and healthy. When people arrive, they start with a cultural screening at the entrance. After going through some health checks, only those who are considered healthy get to move on to the next section of the monastery. It is quite a detailed process that can take days, and surprisingly, the folks doing the screenings don't have any formal medical training or high-tech equipment. I think we have some similar practices in our community that could really help us be better prepared if we brought them into our policies.

Participant 10, a 35-year-old hospital member, emphasised religious leaders' role in guiding their followers toward cooperating in emergency management.

> The role of religious leaders in both preparedness and response activities is significant, especially in a country like Ethiopia, where the majority of the population strictly adheres to dominant religions such as Islam and Christianity. It is rare to find someone in Ethiopia, regardless of age or sex, who does not follow the guidance of religious leaders. We have immensely used this opportunity to contain COVID-19.

Participant 14, a 39-year-old participant in a regional health office, shared a similar view about their first-hand experiences of how religious institutions support emergency management efforts.

> Ethiopia has many local grassroots faith groups, including Christianity and Islam, that are well-connected with the communities. During emergencies, these groups assist with public education, gather donations, and disseminate information. In COVID-19, we learned valuable lessons about how local sources, like religion, can aid in emergencies like this and other health crises. They played a significant role in supporting the government's actions during the pandemic.

Furthermore, participant 8, a 52-year-old from the Ministry of Health, emphasised the need to link the role of religious institutions to the formal emergency management system.

> Absolutely! Local religious leaders, such as priests and imams, play a significant role during emergencies. People often trust them more than government officials, especially in tough times. During the recent pandemic, we saw them make significant contributions. I really think it is important to link their efforts with the government's systems. It can help the government obtain better information and funding and communicate effectively with the community. So, yeah, we definitely need some research to make sure that connection works well.

7.2.3. Local knowledge and practices attributed to social practices

Participant insights highlight that the knowledge and practices inherent in a community's social system are important in health systems' emergency preparedness. Participants believe that by tapping into these local insights, health systems can foster greater community engagement. This engagement is pivotal because it amplifies awareness of potential health threats and utilises the unique social dynamics that shape how individuals and groups respond in times of crisis. When local practices and knowledge are integrated into preparedness strategies, they create a more resilient framework, ensuring that the community is informed and actively involved in the processes that protect their health and safety during emergencies. Selected participants' comments supporting these conclusions are illustrated below.

Participant 7, a 56-year-old known in the Ministry of Health, emphasised the importance of local knowledge and practices in enhancing system preparedness.

> I can say that the communities have an established system. They have the supplies ready to respond to the disaster. They possess the structure. They have the tents and the staff. They know who will build the tent, who will cook the meal, and who will stay overnight at that patient's or family's household.

Participant 22, a 46-year-old member of one of the local partner organisations, highlighted the fact that Ethiopia's diverse communities have strong local collectives, supporting effective community engagement.

> Ethiopia has a lot of unique communities, and they play a big role at the local level, like in kebeles and woredas. People here really get involved in their neighbourhoods, tackling issues before they even need to reach the government. It's impressive how engaged the community is.

Participant 2, a 44-year-old member of the N-EMT, highlighted that a diversified population and a well-connected community will play an important role in system preparedness.

> Diversity is another enabler in our context. We are working on that. I can say we have a resilient population. That's another enabler. I think that has helped us a lot during COVID-19.

Participant 15, a 39-year-old manager from a regional health bureau, highlighted the need to enhance existing social systems through in-depth investigations.

> Social integrity is a key local way to boost our emergency preparedness. Getting our community involved in preparedness can make a big difference. For example, by organising local groups called "Edir" [a social institution in Ethiopia used for mutual aid and grants cooperative insurance within a specific community], we can ease our resource challenges. I believe using such community strengths becomes even more effective with research backing. If we include these local systems in our plans, we can overcome many challenges and improve our response to emergencies.

Participant 1, a 40-year-old informant in the National Emergency Medical Team, added a similar view about "Edir" and suggested that this kind of social system could be a strategy to support community participation. This suggestion reflects current thinking on social capital and the role of bridging, binding, and linking connections.

> I always think of how useful our community connections can be if we use them well. One example of these community connections is the "Edir". In this community social system, people discuss various social, economic, and health problems and develop solutions. The "Edir" is common across the country, and I think it is a good way to get the community involved.

7.3. Embracing opportunities emerging from increasing risks

This category represents participants' views that the health system's preparedness can be improved by leveraging shared concerns about emerging or worsening risks and vulnerabilities at national, regional, and global levels. Detailed views of the participants are presented under two subcategories: 'Increasing risk and vulnerability as motivators of preparedness' and 'Growing awareness and attention to health emergency preparedness across all levels'.

7.3.1. Heightened awareness as a result of increasing risks

One of the emerging opportunities participants cited as an enabler of health emergency preparedness is heightened awareness across all levels, including at the community level, within the Ministry of Health, among political leadership, and at the regional and global levels. Participants believe that the growing health threats and vulnerabilities heighten awareness, which they view as an important enabler for enhancing system-based preparedness.

7.3.1.1. Growing awareness at the community level

The increasing prevalence (likelihood) and risk of health emergencies drive communities' awareness and knowledge of potential emergencies and the importance of preparedness. Citing the importance of an informed community in collaborating with the health system, the participants highlighted that improved community awareness of emergencies is a key factor in enhancing the health system's preparedness. This insight can be viewed from a sample of participants' comments. For example, according to participant 19, a 42-year-old hospital staff member, the local community's awareness is enhanced through experiences from past and recent emergencies and improved information-sharing platforms.

> I believe our community awareness about emergencies is rising. Both past and recent events are awakening our people. These days, social media and

mainstream platforms are instrumental in disseminating important information and keeping everyone updated on health emergencies. This greatly contributes to strengthening our health systems.

Similarly, participant 10, a 35-year-old in a regional health bureau, noted the media's increased focus on emergencies and the need for preparedness.

You know, health emergency preparedness is really in the spotlight now. Just a few years back, no one was talking about pandemics, but now it's everywhere. This shift is great because it's getting people to understand how important it is to be ready for emergencies. An informed community is key—having people who know what to do really helps in tough situations.

7.3.1.2. Growing attention and commitment at the Ministry of Health

The perspectives shared by the participants highlight a growing recognition of the importance of strengthening health emergency preparedness within the Ethiopian Ministry of Health. Their insights reflect a burgeoning awareness and commitment to addressing this important area. Furthermore, participant remarks suggest that a supportive policy environment within the Ministry facilitates the country's health emergency preparedness and response efforts.

For example, participant 9, a 41-year-old informant from a regional health office, described the significant shift they noticed in how the Ministry of Health prioritises health emergency preparedness.

Absolutely! There's been a significant shift in how we prioritise public health in the Ethiopian Ministry of Health, especially with the Ministry of Health taking proactive steps to enhance our emergency preparedness. It is impressive to see how much things have changed; twenty years ago, discussions about emergency response were rare during my clinical practice. Now, it is a central topic, reflecting a positive evolution in our healthcare approach.

Participant 3, a 38-year-old at the Ethiopian Public Health Institute, also expressed a similar sentiment.

The Ministry of Health has gained experience from COVID-19 and other recent incidents, which have raised awareness of health emergencies. So, overall, we can say that the level of awareness and the environment at the policy level are fine. It is better compared to the previous one. A systemic approach is

increasingly being acknowledged within the health system. I am sure this contributes to future preparedness.

Participant 11, a 41-year-old hospital staff member, emphasised the favourable policy environment that emerged after recent emergencies.

> Things have really improved at the Ministry of Health, especially since the COVID-19 pandemic. It is amazing to see how much more aware government officials have become and how supportive they are of health emergency initiatives in Ethiopia now. I am optimistic that we can use this support to tackle the healthcare challenges we face and make some real progress.

Participant 26, a 50-year-old member of an international partner group, offered similar insights.

> The policy environment at the Ministry of Health is really positive. We've made great progress, especially with how the government responded during the COVID-19 pandemic. Ethiopia managed things better this time. The support is strong, and everyone wants to make our strategies better. I believe this is good for whatever happens next.

7.3.1.3. Growing awareness and commitment of political leadership

Participants emphasised the recent pledges made by political leaders, underscoring their importance for enhancing the country's preparedness for health emergencies. They articulated the importance of such high-level assurances in developing a robust framework for national health security. They underscored that these commitments are genuine (not driven by political motives) and sustainable. The following selected comments from participants support this insight.

For instance, participant 4, a 39-year-old in the Ethiopian Public Health Institutes, stated:

> I think one of the biggest changes since COVID-19 is that our political leaders are really stepping up. The Prime Minister's office and the Ministry of Health seem way more committed to ensuring preparedness for health emergencies. Plus, there is a lot more media coverage and public interest now. It's definitely a positive shift.

Similarly, participant 24, a 37-year-old from an international partner organisation, reflected that the global impact of COVID-19 has improved governments' awareness and commitment to emergency preparedness.

> I believe politicians now have a better understanding of emergencies. The significant economic, healthcare, and psychological repercussions of COVID-19 have driven authorities, the government, and the health system to confront prior shortcomings and improve preparedness measures.

However, some participants perceive that government commitment is fleeting, with its strength appearing to be directly tied to the existence of emergencies. For instance, participant 23, a 43-year-old manager in a domestic partner organisation, stated:

> In recent years, we have observed a certain level of commitment, especially during emergencies. However, once the crisis abates, the commitment usually wanes and weakens. The current focus is due to the COVID-19 pandemic. It may not necessarily translate to the same level of attention for future crises. There's a worry that the government's commitment may wane once the memory of COVID-19 fades.

Participant 10, a 35-year-old manager in a regional health office, stated that the government often neglects emergencies that attract less global attention.

> You know, the COVID-19 pandemic really got everyone's attention, and sure, the government put a lot of resources into tackling it. But when it comes to other local issues like droughts or conflicts, it feels like the same effort just isn't there. Sometimes they don't seem to recognise how serious these problems are, and I think a lot of it comes down to politics. We really need the government to genuinely commit to addressing all emergencies, big or small, because it is important for our communities.

Participant 19, a 42-year-old hospital staff member, expressed similar concerns about the political leadership's commitment.

> I believe the government's commitment needs to be both genuine and sustainable. Unfortunately, I don't see that level of dedication at the moment. Often, it seems like they downplay serious issues, like drought, just for the

sake of their political image. It is important that they prioritise the urgent needs of the communities affected instead of focusing on political motives.

7.3.1.4. Growing attention and commitment at the regional and global levels

Participants emphasised a notable shift towards prioritising preparedness at both regional and global levels, acknowledging its critical role in strengthening health systems' preparedness. They pointed out that this heightened awareness and commitment among partner organisations are significant drivers in fortifying overall preparedness, highlighting a collective recognition of the necessity of effectively preparing for health emergencies. For instance, participant 7, a 56-year-old participant in the Ministry of Health, emphasised the significance of regional organisations such as the Intergovernmental Authority on Development (IGAD) in enhancing preparedness.

> With the growing awareness of both current and emerging risks, strengthening preparedness for health crises is becoming a priority. For instance, IGAD is playing an important role in boosting health security among its member states, which demonstrates the regional commitment. IGAD is assisting member states in signing agreements, identifying risks, and establishing a framework for effective cooperation.

Participant 13, a 43-year-old regional health office manager, emphasised the global focus on the threats posed by public health emergencies and the importance of a coordinated approach to addressing these challenges.

> Absolutely, I believe we are witnessing some significant improvements in how the world collaborates on health emergencies and pandemics. It seems there's definitely more focus on these issues now than ever before. Even non-state actors are starting to really understand what constitutes an emergency, and that's quite encouraging. The deepened understanding of pandemics on a global scale helps us enhance our health system's readiness, as we want more collaboration.

7.3.2. Risk sharing as a motivator for collaboration and solidarity

Participants in the research express a firm conviction that the various risks encountered at local, regional, and global scales are interrelated and affect every nation. This common perspective fosters a sense of solidarity and motivates countries to collaborate to improve their readiness initiatives. They consider this unified strategy an important element facilitating effective reactions

to these issues. For instance, participant 8, a 52-year-old in the Ministry of Health, articulated that a threat in one country is a threat elsewhere, which they present as an enabler for collective preparedness.

> I believe that if we don't strengthen our ability to detect and respond to health threats here in Ethiopia, it will impact the USA and the rest of the world as well. We are all in this together—if one of us sinks, we all sink. Even if developed countries have strong capacities, if places like Ethiopia lack them, everybody remains at risk because that's where new pathogens can emerge. Our shared risk is what drives us towards collective preparedness.

Participant 21, a 68-year-old staff member at a domestic partner organisation, noted how the COVID-19 pandemic and the war in northern Ethiopia brought partner organisations together and laid the groundwork for future collaboration.

> You know, during times of crisis, like the COVID-19 pandemic and the 2020 war in the Tigray region, we really saw a remarkable coming together of various partner organisations. These emergencies acted as a catalyst for integrating multiple entities, showing us that risks and vulnerabilities can actually foster unity. The collaboration and solidarity that emerged during those tough times laid a solid foundation for us to work together in the future.

Participant 14, a 39-year-old member of a regional health office, described the shared nature of risks.

> You know, with commercialised air travel options, a health threat that starts in one part of the world can quickly spread to other countries and become a crisis for them too. This interconnectedness really highlights the importance of strengthening both national and local health systems to better handle such threats. I believe the shareability of risk is a strong enabler to strengthen preparedness.

In addition, participant 26, a 50-year-old informant from an international partner organisation, used the example of the COVID-19 pandemic to illustrate how the shared nature of risks can enhance preparedness.

> You know, pathogens and diseases don't exactly carry passports, do they? They don't care about borders or boundaries. That's really what sparked the

creation of the International Health Regulations. Just take a look at COVID-19, which originated in Wuhan, China. It spread to every corner of the globe in no time at all, turning into a full-blown crisis almost overnight. I can't find a better enabler than having common enemies.

Furthermore, participant 16, a 43-year-old hospital staff member, reiterated that the universal nature of risks encourages collaboration among countries.

> I believe now is a perfect time for us to unite and collaborate. The challenges we are all experiencing really show how important it is to support one another. For countries like ours, this is a chance to partner with more experienced nations. Collaborating will help us enhance our national and global preparedness. Our common risks call for us to tackle these issues together.

7.3.3. Dedication to the security of all for unlocking emerging solidarity

Participants observed that a proactive commitment to global health, exemplified by adherence to international health laws and treaties, can cultivate a strong sense of solidarity among nations. They argue that following these global standards allows countries to reinforce their alliances and improve their health system preparedness. Below are selected insights shared by participants to support this finding.

For instance, participant 4, a 39-year-old Ethiopian Public Health Institute informant, emphasised that commitment to global collaboration is an enabler for enhancing a country's health systems. They stated:

> In my opinion, committing to international health regulations helps us boost our country's health capacity and supports global health efforts. The Ethiopian Public Health Institute, which is part of our Ministry of Health, plays a key role in making sure we follow these regulations and meet the necessary standards. Our focus on global health isn't just about ticking boxes; it truly strengthens our national health system and keeps it in line with international agreements.

Participant 27, a 38-year-old manager in a domestic partner organisation, reiterated:

> I believe that security nowadays is not just about one sector or one country. We need to worry about the safety of others to protect ourselves, because when health security is lacking, it affects us all. By showing mutual support, we

can actually strengthen our health systems. It is really about giving and taking. The thing is, if you give more, you take more.

Additionally, participant 2, a 44-year-old National Emergency Medical Team member, emphasised the importance of prospects obtained from acknowledging the interconnectedness.

> I think it is really important to acknowledge that no country can go it alone when it comes to security, especially health security. The COVID-19 pandemic really brought to light how interconnected we all are. This realisation really opens up the possibilities for us to work together on a global scale.

Participant 24, a global health security expert at an international NGO, articulated the determination to implement global health treaties and agreements to open up opportunities to strengthen national health systems.

> No nation can truly succeed on its own. When we collaborate with others, we get more support from partner organisations to strengthen our health systems. Sticking to our treaties and agreements helps us build trust and attract those allies. This leads to better health security for everyone involved.

Participant 4, a 39-year-old participant in the Ethiopian Public Health Institute, underscored that a win-win approach to global health can help better prepare a country's health system.

> You know, it is really important to recognise that public health isn't always a local issue; it is a global one. We must remember that we all share this planet and are up against some common threats, especially with globalisation and how easily diseases can spread. So, it is vital to focus on public health, not just within our borders alone, but also on what's happening worldwide. A win-win thinking helps us all build a well-prepared health system for whatever comes our way.

In connection with this, participant 26, a 50-year-old manager in one of the international partner organisations, emphasised the importance of assigning competent leadership in the global health arena.

> In the global health sector, I believe it is essential to have the right people on board, specifically, individuals with strong diplomatic skills, excellent communication abilities, and solid technical expertise. These qualities play a

key role in successful cooperation and in fostering solidarity within the global health prospects.

7.3.4. Development-driven demand for preparedness as a motivator

Participants highlighted the significant role that advancements in various sectors, including industry, transportation, and infrastructure, play in highlighting the necessity for emergency preparedness. This perspective suggests that the demand for preparedness, spurred by ongoing development, ultimately strengthens health systems' ability to respond effectively to emergencies. As these sectors evolve and expand, they not only shape the landscape of everyday life but also create a pressing need for robust emergency readiness. The following are examples of participants' perspectives on how development-associated increasing risk drives the need for preparedness, stimulating the health system to strengthen its preparedness.

Participant 6, a 40-year-old in the Ministry of Health, described the role of Ethiopian Airlines in driving the need to invest in preparedness.

> Take, for example, Ethiopian Airlines, which is really vibrant in the region. It really helps link our region to the rest of the world, boosting travel and commerce. However, with such connectivity comes the need for increased vigilance regarding health risks and potential pandemics. That's why I believe that our development also drives a need for preparedness. It is an important factor to consider when it comes to strengthening the health system's preparedness.

Participant 13, a 43-year-old from a regional health office, emphasised that ongoing infrastructure development has significantly increased emergency calls related to the built environment.

> Absolutely, infrastructure development, such as buildings, roads, and stadiums, has increased. There has been a significant rise in emergency calls related to building issues. It really highlights an important point: the more we build, the greater the chances of emergencies occurring. This demand for preparedness is an enabler in itself, but we must act that way.

Participant 1, a 40-year-old member of the N-EMT, added that the country's role as a diplomatic centre for the region makes it an appealing destination for many individuals.

> Addis Ababa is the capital of Ethiopia and the centre for the African Union, diplomats, investors, and tourists. Such diplomats and tourists require two things: safety and security, which we must ensure if we want to sustain the economic and diplomatic merits that we are receiving from this.

7.4. Summary

This chapter outlined the enablers of health emergency preparedness within the health system. These enablers were categorised into two categories identified during the data analysis. The first set of enablers falls under the category 'Local adaptive mechanisms'. This category includes local knowledge and practices, rooted in culture, religion, and social practices. The second set of enablers is categorised as 'Embracing opportunities emerging from increasing risks'. This category encompasses four enablers of system preparedness. The first is 'Heightened awareness as a result of increasing risks', which reflects the rising awareness within the sector, greater attention and commitment from the Ministry of Health, increased political commitment, and an understanding of the need for regional and global engagement. The second enabler is 'shared risk as a motivator for collaboration and solidarity'. The third enabler is 'Dedication to global health collaboration to foster preparedness. The fourth enabler is 'Development-driven increasing demand for preparedness'. Together, these enablers provide a framework for understanding how health systems can adapt and thrive in the face of increasing health system-associated risks.

CHAPTER EIGHT: BARRIERS TO HEALTH SYSTEM EMERGENCY PREPAREDNESS RELATED TO THE LACK OF SYNERGY AND SYSTEM STABILITY

8.1. Introduction

This chapter presents the key barriers to the health system's preparedness related to two main categories. The first category encompasses obstacles related to "Weak coordination and poor collaboration", highlighting the need for integrating existing efforts to improve health emergency preparedness among different entities involved in healthcare. Weak coordination is associated with factors such as a lack of a clear model and philosophy, robust and dedicated leading institutions, overlaps in ownership, and poor communication and documentation systems. Similarly, poor collaboration is contributed to by factors such as the lack of shared vision and responsibility, inattention to system interdependencies, and partner organisations' focus and priority areas. The second category, 'System instability and change', sheds light on challenges arising from the structural flux and the lack of customisations, leadership and staff turnover, and leadership selection and management challenges, which hinder the system's continuity. The chapter concludes with a summary that captures the main points discussed.

8.2. Weak coordination and poor collaboration

8.2.1. Poor coordination

Participants identified the lack of coordination as a significant obstacle to health emergency preparedness within the Ethiopian health system. Data analysis revealed that no other barriers to preparedness were mentioned more frequently than the lack of coordination.

Participant 7, a 56-year-old in the Ministry of Health, emphasised that the lack of coordination is a central barrier to health emergency preparedness.

> You probably know that I have been involved in developing the medical emergency management system in Ethiopia. I remember our starting point. I am aware of our progress in the past fifteen years, and so there has been a development pattern. There is an improvement. However, I think what we still miss is the coordination part.

The same participant used the analogy of blood flow within the human body to emphasise the lack of linkage and coordination in the health system.

> You know, different programs are running in parallel without really linking or integrating. The integration part is really important. An analogy is that we have

the heart, the lungs, the liver, and the blood vessels, but they are not connected very well; therefore, the body does not get a constant blood supply.

Participant 3, a 38-year-old at the Ethiopian Public Health Institute, added, noting the separation between the public health and emergency medicine concerns and responsibilities within the system.

> Our efforts are also not properly linked to the public health emergency part. Therefore, coordination is a serious issue. Although it seems that we have a better system, there is deep fragmentation as far as disaster health management is concerned.

Participant 18, a 47-year-old hospital staff member, emphasised the importance of accuracy in coordinating opportunities available to the system.

> While we may face resource-related challenges, we mustn't falter in coordinating the opportunities available to us. We must be precise in our coordination and collaboration efforts. To me, precision in coordination is analogous to taking off or flying in an aeroplane. If an error occurs, the plane crashes and many lives are lost. That is why our folks should not underestimate the criticality of investing in preparedness.

Participant 9, a 41-year-old manager in one of the regional health offices, supported the idea that integrating the existing structures is as important as developing a preparedness plan.

> We have not yet linked our sectors as a system. So, unless it is well coordinated and budgeted and every partner organisation owns and practices it, developing a preparedness plan alone may not guarantee our effective responses and meaningful recoveries.

Participant 17, a 42-year-old hospital member, emphasised the lack of integration between the health system's components.

> Due to the fragmented nature of the system, our hospitals could easily collapse in large-scale emergencies. While there are health centres and health posts around the hospitals, no mechanisms exist to align these facilities. Hospitals are not organised to respond, and other primary health units are not prepared for emergencies. I believe we would struggle to react smoothly to large-scale emergencies.

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8.2.1.1. Factors contributing to weak coordination

The factors contributing to weak coordination within the health system and among relevant actors and sectors have been explored. Key factors include the lack of a clear model and philosophy, the absence of a dedicated coordinating institution, overlapping or unclear ownership issues or responses, and poor communication, documentation, and data systems.

8.2.1.1.1. The lack of a clear model and philosophy

Participants noted that the deficiency in coordination for health emergency preparedness stemmed from the absence of a well-defined framework for the emergency management system. According to this view, without a clear model in place, it has become challenging to coordinate responses and foster teamwork among various partner organisations involved in health emergencies.

Participant 8, a 52-year-old in the Ministry of Health, emphasised the insufficiency of coordination between the Ethiopian Disaster Risk Management Commission (EDRMC) and the Ministry of Health.

> The Ethiopian Disaster Risk Management Commission (EDRMC) is supposed to coordinate all activities. However, it appears that the EDRMC is not doing enough to ensure collaboration across different sectors, particularly with the Ministry of Health. There seems to be limited cooperation, which starts only after an emergency has occurred and the impacts are felt. I think there is a lack of a clear framework that guides who should do what and at what time.

Participant 17, A 43-year-old hospital staff member, emphasised:

> It seems we are following a multi-sectoral approach, but it is not very strong. While many reasons can be cited, I believe that our fragmentation is due to the lack of a clear model and philosophy for emergency management as a whole.

In addition, participant 9, a 41-year-old manager in a regional health office, highlighted the lack of a clear model for preparedness due to the lack of coordination.

> Necessary services such as water and electric power are critical requirements for the health system's infrastructure. From my perspective, these are the significant challenges in coordinating with the necessary services. There is a lack of a model to follow. I think existing systems are not well coordinated because of a lack of a clearly defined framework. We don't have a framework that integrates activities and partner organisations.

Participant 15, a 39-year-old in a regional health office, emphasised the absence of a clear model for preparedness.

> Necessary services such as water and power are critical requirements for the health system's infrastructure. From my perspective, these are the significant challenges in coordinating with resources and available services due to lack of a philosophy or a framework or things like that. There is a lack of a model to follow, and the existing systems are not well coordinated.

8.2.1.1.2. The lack of robust and dedicated leading institutions

Weak coordination attributed to the lack of a dedicated institution was noted. A 35-year-old participant in a regional health office highlighted:

> In my opinion, the main obstacle to preparedness is a lack of coordination across different sectors, especially when it comes to the preparedness component. The fundamental issue with this lack of collaboration is that all relevant sectors have equal authority. No strong entity that brings the partner organisations together. For example, consider the Ministry of Health and the Ministry of Education. There is currently no mechanism in place for one to give orders and mobilise the other.

Participant 6, a 40-year-old in the Ministry of Health, related the lack of coordination across the government to the lack of a strong coordinating agency.

> Some existing multisectoral coordination efforts are not as robust due to the lack of a strong coordinating agency. We have an agency, but they are not bringing all sectors together. It is also the government's responsibility to ensure that all agencies discharge their responsibilities.

Participant 15, a 39-year-old member of a regional health office, noted that reporting to multiple partner organisations led to poor use of resources.

> Due to weak coordination between the health system and partner organisations, we are often required to submit two separate reports—one for the government and another for funders. This duplication of activities leads to unnecessary expenditures of already limited resources. It is usually confusing administratively. I think this is due to the absence of a designated leading institution.

Similarly, participant 20, a 40-year-old hospital staff member, highlighted that the central government is not playing a leading role in coordinating the stakeholders and reiterated the absence of a robust leading agency.

> Unfortunately, the government does not consistently play a leading role. All our activities are driven by donor initiatives. It is indisputable that the government pays more attention to things that have implications for international communities. Likewise, road traffic accidents kill many people, but cholera receives huge attention. I believe this problem arises due to the absence of an independent central body that can manage these issues as part of a system.

Participant 26, a 50-year-old manager in an international partner organisation, emphasised that despite the presence of a designated coordinating authority for all sectors, ministries are operating independently.

> While the Ethiopian Disaster Risk Management Commission (EDRMC), an entity under the Prime Minister's office, holds significant power to oversee and guide all sectors, the current situation seems to be ministries functioning as parallel entities with minimal influence on one another. The health emergency management efforts appear to be operating autonomously now. There seems to be no link between the EDRMC and health emergency operations.

Participant 27, a 38-year-old manager in a domestic partner organisation, emphasised that the government has not effectively coordinated with many NGOs and partner organisations.

> Numerous NGOs exist, but there is a lack of proper coordination from the government's side. Ideally, partner organisations should align with the government's identified gaps, allowing us to use them as opportunities. I don't know the responsible institution for this role. It is the government's responsibility to identify its gaps and collaborate with partner organisations.

Furthermore, participant 24, a 51-year-old manager in an international partner organisation, reiterated that the lack of a mandate is contributing to poor coordination.

> I believe the lack of coordination between different sectors leads to ministries operating independently due to their inability to interfere in each other's affairs. Therefore, the Ministry of Health needs authorisation from higher authorities to

have more authority. In other words, it needs authorisation to coordinate activities across different sectors and engage other sectors in its operations.

8.2.1.1.3. The lack of and overlaps in ownership

Another factor contributing to weak coordination is the issue of ownership, which is defined as responsibility for a particular set of services, responses, or issues. This issue involves either the lack of clearly defined responsibility for certain aspects of preparedness or response to emergencies, or an overlap of responsibilities with other ministries, organisations or institutions. Participants noted the lack of clarity regarding ownership between the Ethiopian Disaster Risk Management Commission, the Ministry of Health, and the Ethiopian Public Health Institute. They also noted that there is a tug-of-war-like interaction between the Ministry of Health and the Ethiopian Public Health Institute. Further, they noted overlapping tasks between the federal and regional public health institutes, which they consider a barrier to coordinated response during emergencies.

Participant 23, a 43-year-old manager in a domestic partner organisation described the overlap in ownership in relation to their recent experience with a particular emergency event.

> Last time, there was a landslide in Central Addis Ababa, and thousands of people were affected. A number of agencies, including we, were there. None of all of us conducted risk assessment, undertook mitigation measures. Like I said we were there after the emergency happened, but we were not coordinated. We didn't know what to do. As I said, the lack of ownership and coordination is our bottleneck challenge.

Participants indicated that there is a tug-of-war-like interaction between the Ministry of Health and the Ethiopian Public Health Institute. Participant 13, a 43-year-old manager in a regional health office, stated:

> Sometimes, unnecessary competition to host program such as the national EMT, which has funding opportunity from the like of WHO. Even though the issue is not that boldly visible, there is always some kind of ownership interest from the Ministry of Health and the EPHI.

Similarly, participant 17, a 42-year-old hospital staff member, added:

> I think ownership is not clearly defined. Take, for example, EMT, the previous DMAT. It was under the Ministry of Health for years but has now moved to the

EPHI. The issue is that it could potentially be returned to the Ministry of Health, and there is no guarantee this won't happen. Similarly, the pre-hospital service is currently under the Ministry of Health—where should it actually belong? I see these offices seem to be pulled in two different directions.

Moreover, participant 11, a 41-year-old from one of the regional health offices, said that:

Even though the issue is not apparent, there seems to be a dispute over ownership of the office responsible for coordinating health crises. There is a contention over ownership, with the Ministry of Health and the EPHI parties claiming, "It is mine". I think this is one of the factors that affects proper coordination.

Participant 16, a 43-year-old hospital staff member, stated:

I think there is a lack of ownership of health emergency management. There seems to be competition over ownership of certain areas, such as the Emergency Medical Team. The issue of ownership is turning some services into sources of competition while others remain without designated ownership. For example, pre-hospital services are staggering due to a lack of proper ownership.

In addition, participant 25, a 45-year-old from an international partner organisation, emphasised that:

I do not see clear ownership for various emergencies between the Ministry of Health and the EPHI. For example, while the EPHI addresses public health emergencies, mainly the communicable diseases, the Ministry of Health handles multiple casualties and trauma. Yet, other disasters like chemical events do not have defined ownership. This fragmentation in approach prevents comprehensive preparedness and thus impacts managing emergencies in a unified way.

Participant 3, in the Ethiopian Public Health Institute, also described ambiguity in ownership.

There is confusion regarding the ownership of the office responsible for handling health emergency matters. It has not been clearly assigned to the agency, EPHI, or the Ministry of Health. So, there is a question of ownership, which is also a gap.

8.2.1.1.4. Poor communication and documentation systems

The lack of robust communication and documentation systems, and the scarcity of evidence to support informed decision-making, were also presented as factors contributing to the lack of coordination.

Participant 7, a 56-year-old informant in the Ministry of Health, described the lack of a robust communication system as problematic.

> Another issue is the information management system, which is important in these scenarios. The communication system lacks consistency and continuity. In my opinion, communication and information systems are very delicate in our case. Ambulances are not going to injury sites, disaster sites, and so on.

Additionally, participant 19, a 42-year-old hospital staff member, stated:

> There are no strong call centres or similar facilities, so communication, coordination, and access to good data and information systems are not robust in our context. This could be considered one of the barriers to coordinating resources and activities. Additionally, in terms of pre-hospital care, as I mentioned earlier, there is poor communication among ambulances.

Participant 3, a 38-year-old in the EPHI, attributed the lack of quality data to the failure to digitalise communication systems.

> Concerning information, there is a problem with digitalisation, especially at the lower administration level; the reports that come in lack quality. We are not adequately supporting our communication system with technology.

Participant 6, a 40-year-old manager in the Ministry of Health, shared that decisions are not informed by evidence due to a failure in documentation.

> The history of emergencies in Ethiopia could fill a textbook. Unfortunately, documentation of our successes, failures, and plans is lacking, even for a single incident. This is a significant gap in our emergency preparedness and response capabilities. Our decisions are not informed by data, which will reduce our effectiveness. In addition, if our data lacks accuracy, it may also cause overconfidence in our preparedness.

Participant 6, a 40-year-old informant in the Ministry of Health, added that:

> We have a significant shortage of data to inform decisions, and there is insufficient research due to the absence of a research system and low awareness of its importance. There is minimal initiative to create research platforms such as forums and symposiums. We lack research on emergencies, documentation of best practices, and evidence regarding the effectiveness of our emergency responses.

Similarly, participant 2, a 44-year-old Emergency Medical Team member, underscored that:

> We are witnessing significant changes in Ethiopia, especially in the efforts to organise health emergency management at the national level. However, there is a lack of easily accessible data to monitor the progress, as there is limited research on health risks within the health system. Funders and researchers must give priority to this critical area.

Participant 12, a 52-year-old and a member of a regional health office, shared their experiences of how the lack of data has impacted their preparedness, stating:

> In Ethiopia, one big issue we run into when it comes to preparedness for health emergencies is the lack of solid documentation. Like when we were trying to put together a preparedness plan during the Tigray conflict, we had a tough time finding any useful data. It feels like researchers often skip over this important stuff, probably because the government and funding bodies don't really make it a priority, which leads a lot of people to focus on other research topics instead.

Participants also raised concerns about the reliability of data used for reporting purposes in the health system. For example, Participant 8, a 52-year-old informant in the Ministry of Health, criticised the quality of the data reported from various health system levels.

> Most data from various sources, such as different institutes, is not of high quality. This is especially true for data from hospitals, health centres, and other areas. Therefore, the overall data quality is not satisfactory. That is really a challenge.

Participant 12, a 52-year-old from a regional health office, stated that the data collected for global-level reports regarding Ethiopian capacity are only collected from Addis Ababa, which they think lacks representativeness.

> I was looking at the recent GHSI report for other countries and noticed that the reports were minimal. However, in our own report, I found that there had been much more improvement compared to last year's report. This led me to question whether we had really achieved this much change within a year and if Ethiopia had truly reached this level of improvement. The actual situation on the ground might be quite different, which is problematic as we work towards building a system. Such reports can be misleading.

Similarly, participant 10, age 35, in a regional health office, stated the lack of involvement of their region in the evaluation of global reports.

> Based on my understanding, it appears that evaluations are never conducted in our region, where the conditions are notably different. I am uncertain if they also assess institutions in regions other than Addis Ababa. Nevertheless, I have never observed an evaluation like the ones I have heard about in our region. In that case, declaring we have established this much capacity without representative data is a real barrier to strengthening the system.

8.2.2. Poor collaboration

The absence of effective collaboration between the health sector and various other domestic sectors emerges as a significant obstacle to overall system preparedness. Participants highlighted that insufficient engagement and collaboration occur between these relevant sectors and the health sector. According to participants, this disconnect undermines efforts to create a unified response framework, ultimately diminishing the capacity to address health challenges comprehensively. Collaboration from international NGOs is also inadequate in terms of supporting health system preparedness for health emergencies.

8.2.2.1. Factors contributing to poor collaboration

Factors identified as obstacles to effective collaboration in health system preparedness for emergencies include the lack of a shared vision, insufficient attention to interdependencies within the system, the misconception that responsibility lies exclusively with the health sector, and the interests and priority areas of partner organisations.

8.2.2.1.1. The lack of a shared vision and responsibility

Based on the participants' perspectives, it is evident that the absence of a unified, clearly defined vision for emergency management among domestic partner organisations significantly hinders effective collaboration across multiple sectors. This lack of a shared understanding and common goals can lead to fragmented efforts during emergencies, ultimately undermining the overall effectiveness of response initiatives.

According to participant 11, a 43-year-old manager in a regional health office, the main contributor to weak multi-lateral collaboration is the lack of a shared vision.

> I believe the most significant barrier to collaboration is the absence of a shared vision among local partner organisations. For instance, the vision for the Ministry of Health, the vision for EPHI at the national level, and the vision of end users at the grassroots level lack a commonality. We are on different pages, and that one is prohibiting strong collaboration.

Participant 21, a 68-year-old participant in a domestic partner organisation, stated that emergency management has not been given sufficient attention in the mission and vision of responsible government sectors.

> I believe that the attention given to emergency management is limited. If you examine the policy documents of the relevant sectors, I doubt that you will find this matter addressed even at the document level.

Furthermore, participant 18, a 38-year-old hospital staff member, reiterated that the lack of a common goal among the actors impedes effective collaboration.

> I think all sectors and actors, mainly domestic sectors, do not have a shared goal. Consequently, there is no similar understanding regarding emergency management. Non-health sectors may not know their role in disaster management, including the preparedness aspect.

Participants argue that, despite the interconnected nature of health emergencies, many domestic sectors outside the health sector assume that managing them is solely the responsibility of the health sector. Consequently, they (non-health sectors) underestimate the importance of their involvement in health emergency management, including preparedness efforts.

Participant 4, a 39-year-old from the EPHI, emphasised that health emergency management is not an exclusive responsibility of the health sector.

> I think emergency preparedness shouldn't be solely on the health sector. Sectors like water, agriculture, and education have vital roles too. Right now, we lack a coordinated approach, which leaves a big gap in emergency responses that need involvement from these areas.

Participant 6, a 40-year-old manager at the Ministry of Health, added:

> I think the primary challenge in achieving effective coordination stems from the limited engagement of sectors and partner organisations during the preparedness stage. Rather than coming together to discuss and plan, entities tend to react only after a disaster has occurred. This reactive approach leads to ineffective collaboration among sectors during the response phase.

Participant 22, a 46-year-old, in a domestic partner organisation expressed their feeling that:

> While the Ministry of Health is primarily responsible for managing public health emergencies, successful management also necessitates collaboration with water and power, the environment, and other relevant sectors. Regrettably, these sectors are not collaborating to the required extent.

Furthermore, participant 12, a 52-year-old manager in a regional health office, emphasised:

> The interconnectedness between different sectors is clear. There is often confusion about multisectoral and multidisciplinary coordination, which presents a significant challenge. People in sectors outside of healthcare often mistakenly believe that the Ministry of Health is solely responsible for this task. An independent approach will take us nowhere. We either float together or sink together.

8.2.2.1.2. Inattention to systems interdependencies

Another significant factor contributing to inadequate collaboration in emergency management is the insufficient recognition of interdependencies within the entire system. According to this perspective, sectors important to the health system often overlook their importance in emergency management, especially regarding disaster health. Consequently, transportation, power, water, education, communication, and logistics sectors are not effectively integrated.

This highlights the failure to acknowledge the interconnectedness of all sectors involved in emergency management. Regarding this, participant 8, a 52-year-old from the Ministry of Health, expressed:

> I think the biggest issue is the lack of teamwork between different sectors, especially when it comes to preparedness. Everyone's on the same level of authority, so the Ministry of Health can't just tell the Ministry of Education what to do. Plus, other sectors often overlook how important they are to the health sector.

Additionally, participant 26, a 50-year-old from an international partner organisation, iterated the importance of addressing the concept of interdependencies to improve multi-sectoral cooperation.

> These days, our work touches multiple sectors. While the Ministry of Health leads the charge, other ministries are important too, especially when it comes to health security. We really can't look at health in isolation anymore; we all rely on each other. Unfortunately, I think we often overlook how one sector impacts another. Health security is truly a team effort across the board.

Participant 5, a 58-year-old from an office for International Health Regulations, highlighted the importance of recognising interconnected systems at national, regional, and global levels, emphasising the lack of attention to it.

> Health threats are everywhere, and in a place like remote Ethiopia, they can spread fast, impacting the whole country and even beyond. A lot of people don't realise how connected we all are, which makes addressing these issues tougher. Plus, those who do see the connection often overlook it, and that's a real challenge for coordination across different sectors.

Participant 9, a 41-year-old from a regional health office, emphasised the importance of understanding systems interdependencies from a practical perspective.

> The interdependence of different sectors is evident in our work. For example, we can't address cholera alone; it requires improvements in water, hygiene, sanitation, and community engagement. This issue is complex and involves many partner organisations. There's definitely a gap in understanding this. We

must prioritise collaboration and acknowledge how interconnected our systems are.

Similarly, participant 3, a 38-year-old informant in the EPHI, illustrated how simple outbreaks such as cholera connect various sectors, yet people fail to recognise this interconnectedness.

> A lot of people don't really get how connected our systems are, which makes it hard for us to work together. Take cholera, for instance; it is often viewed as an isolated issue. Sure, everyone knows it is bad news, but many don't really know how it spreads or the easy steps they can take to keep it from happening. Even if they do know, they might not see how they fit into the prevention picture. This confusion about how everything is linked creates a big gap in how we respond to these problems.

Participant 7, a 56-year-old informant in the Ministry of Health, reiterated the lack of recognition of systems' interdependence by citing the impacts of COVID-19 as an example.

> COVID-19 really showed us how interconnected our systems are—it is not just a theory. It affected everything: education, the economy, and even politics. Take Ethiopia, for example; they postponed their national election because of the pandemic, and that led to serious conflict and instability. I think the real issue is that we are not recognising this interrelatedness. There's a big gap in understanding and putting this interdependency into action.

Furthermore, participant 21, a 68-year-old manager at one of the domestic partner organisations, added:

> Linking essential services to our health system is important for both national and global health security. Everything's connected—water and electricity are key components of this. We need a multi-sectoral approach that involves everyone, from the military and police to education and energy sectors. It is important we tackle these challenges together.

8.2.2.1.3. Partner organisations' focus and priority areas

Partner organisations' interests and priority areas have been presented as a barrier to collaboration. According to participants, healthcare priorities are affected by the specific interests and goals of donors, and international partner organisations tend to under-prioritise health

emergency management. Further, those prioritising health emergencies often focus more on the response than the mitigation and preparedness phases.

Participant 7, a 56-year-old informant in the Ministry of Health, reflected that support from funders focuses more on specific problems, rather than supporting the system (system strengthening).

> There is a major funding imbalance, with most money going to specific issues while the overall system is underfunded. It is hard to get donors on board, especially since the emergency care system lacks strong local support, and services like ambulances are particularly neglected.

Participant 9, a 41-year-old informant in one of the regional health offices, added that multiple organisations tend to invest in the same areas, while other areas, such as health emergency management, lack support.

> There is a lot of overlap among organisations, which leads to redundant efforts on similar issues. This prevents us from addressing emerging gaps since we often can't identify them or guide partner organisations effectively. Instead of collaborating, many focus on their own objectives, resulting in multiple groups investing in the same areas while critical issues like health emergency management get overlooked.

Participant 18, a 38-year-old hospital member, noted that there is limited focus on health emergencies from partner organisations.

> Although the partner organisations' role are commendable, working collaboratively presents challenges. Without proper coordination, there will be duplication of efforts or a disproportionate focus on certain areas, leaving critical areas like the health emergency management system to remain fragile. This is a common scenario we observe within our health system.

Participant 3, a 38-year-old manager in the EPHI, highlighted that partner organisations are gradually reducing the financial assistance they provide.

> The current level of global support through various programs is decreasing. Given the numerous ongoing issues in the country and the reduction in funding, I doubt that the available funds are sufficient to support the

preparedness plan.

Participant 8, a 52-year-old at the Ministry of Health, stated that donor politics influence healthcare subsidies.

> I believe that healthcare subsidies are often influenced by donors' interests, which can complicate their effectiveness. These donations aren't truly free; they come with specific expectations and goals. As a result, the programs funded by these subsidies can be significantly impacted if you don't align with what the donors want. Essentially, if they feel you are not meeting their interests, the support might falter. We saw a lot about this during the war between the federal government and the Tigray region.

Participant 21, a 68-year-old in one of the domestic partner organisation, also emphasised that donors are as good as the recipients in terms of expectations.

> Some partner organisations are only as good as you are in relation to fulfilling their expectations. Unfortunately, it is not always possible to meet those expectations. In that case, the programs they fund may suffer interruptions. For example, many partner-funded programs were affected during the recent war in northern Ethiopia.

Participant 9, a 43-year-old from the regional health office, expressed that competing priorities related to global health and development programs impact the attention given to health emergency management. They noted:

> Honestly, the issue is that while a lot of money is going to global priorities, health emergency management in poorer countries ends up getting overlooked. We absolutely need to focus on basic health needs, but this can really hurt our ability to prepare for health emergencies. We should be looking for ways to turn this challenge into an opportunity to do better.

8.3. System instability and changes

This category reflects participants' views that system instability and the rate of change within the health system impede the continuity of preparedness. They believe that while adaptations are necessary in a changing environment, these changes should be carefully managed and guided by evidence. Additionally, participants acknowledged that frequent alterations may stem from good intentions to improve the system. However, they feel that it is essential to weigh the pros

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and cons of such changes and move forward in a planned and strategic manner. Participants expressed their concerns about the lack of system stability, which they attributed to several factors: structural changes, insufficient customisation to local needs, frequent turnover in leadership and staff, as well as challenges related to leadership selection and management. These insights highlight the crucial need for a stable system to build on past achievements and ensure continuity. The perspectives are reflected in comments from selected participants under the respective subheadings.

8.3.1. Structural flux and the lack of customisations

According to this view, constant restructuring and reorganising are affecting the continuity of the system. Participant 4, a 39-year-old informant in the Ethiopian Public Health Institute, expressed their concern about changes in the system.

> You know, things are really in flux in our system right now, and it is tough to keep track of who's making all these changes or why. I mean, in EPHI alone, we've had two restructuring notifications in just three months! The current setup is only a few months old, and honestly, it feels like these constant changes are disrupting our ongoing projects. I get that we need to adapt, but the way it is being handled is making it hard to stay progressive.

Participant 15, another 39-year-old informant from a regional health office, added that the system is frequently changing and becoming more complex.

> The system is quite dynamic because the structures, guidelines, and policies frequently change. This creates a significant barrier when considering long-term connectivity and continuity. The introduction of new tools without effectively utilising the former tools adds to the system's complexity.

Participant 18, a 38-year-old hospital staff member, added that changing simple things like the naming of the program, for example, DMAT (Disaster Management Team) to EMT (Emergency Medical Team), to emphasise instability in the system.

> Well, you know, the management of health disasters used to be called DMAT but is now called EMT. It shifted from the Ministry of Health to the Ethiopian Public Health Institute recently. There have been quite a few changes, and honestly, things are a bit unstable right now. While changes can be good over time, too many of them can really shake things up and affect how stable the system is.

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Similarly, participant 23, a 43-year-old manager in a domestic partner organisation, highlighted system instability, illustrating the case of prehospital care in Addis.

> In Addis Ababa, prehospital care is mainly owned by the city's fire and emergency prevention organisation. But in other regions, under the Health offices. Prehospital care is still under reform in our country. Things are not stable. We are not sure where they will have to move the structure next.

Participant 20, a 40-year-old hospital staff member, mentioned that frequently changing guidelines and tools, such as BPR (Business Process Re-engineering), are a significant barrier to system preparedness.

> The system is fluid because its structures, guidelines, and policies are constantly changing. You can take tools such as BPR and the like, which were quickly changed. This is a significant barrier when considering this system.

8.3.2. Leadership and staff turnover

Another factor contributing to system instability is staff and leadership turnover. This turnover can be seen from two perspectives: frequent leadership changes (which are intentional) and the usual staff turnover that occurs for various reasons, such as a lack of necessary incentives.

Participant 7, a 56-year-old in the Ministry of Health-on-health emergency matters, expressed concern about the lack of stability in leadership, stating:

> You know, it feels like memories just aren't being kept anymore. Even going to the ministry, I hardly recognise anyone. People change so quickly—just a few months can make a big difference. This kind of instability is a huge issue in leadership and management. I have built great relationships, but in just ten years, everything seems to be in constant flux.

Participant 9, a 41-year-old manager in a regional health office, highlighted that frequent leadership changes are impacting continuity within the system.

> I just feel like there's no continuity in leadership these days. It seems like it changes so quickly! Maybe the government is trying to make things better, but honestly, I am not sure. Whatever the reason, it creates a lack of consistency, and it makes it really tough to see how things are progressing.

Similarly, participant 2, a 44-year-old participant, the National Emergency Medical Team member, mentioned the frequent changes in leadership as a significant factor affecting the organisation. They stated:

> The change in leadership has been a notable issue, especially over the last five years. Leadership changes occur constantly, which creates an unstable organisation. I believe these frequent changes are driven by the desire to establish a better system. However, given the limitations in training, it is challenging to find capable leaders, which contributes to the ongoing turnover.

Participant 4, a 39-year-old manager at the Ethiopian Public Health Institute, emphasised that leaders are often removed from their positions too quickly, just as they begin to familiarise themselves with their roles.

> Typically, a leader is removed immediately after they start making progress. You know, it seems like a leader gets removed every time things start to progress around here. Since I've been at this institution, we've gone through more than normal leadership changes. As I speak, the PHEM deputy director general position has been vacant for several months. It really shows how tough it is to maintain stable leadership here.

According to participants, apart from leadership instability, the staff turnover is also affecting system stability. For example, participant 23, a 43-year-old manager in a domestic partner organisation, stated that:

> The other barrier to system preparedness is staff turnover. Experienced and well-equipped staff will join NGOs in search of better salaries. People who have been there for two years, having gained experience and insight into emergency preparedness response, will only be there for a short time.

Participant 17, a 42-year-old manager in a regional health office, expressed concern about the long-term impact of turnover on the system, saying:

> When you continue losing senior and experienced professionals and coach the new, less experienced professionals, this is a blow to the institution because the system cannot stand on both legs. We must have laws and guidelines that enable us to move forward consistently while building on already established processes.

Participant 7, a 56-year-old informant in the Ministry of Health, emphasised that high staff turnover is a significant barrier to system preparedness.

> You know, the high turnover really turns things upside down. Many of the folks who were here three years ago are gone, so when new people come in, they're totally new to the job. They will go again after a while. It is like we hit the reset button every time something goes wrong, which really messes with our ability to be consistently prepared. Honestly, I think that's our biggest issue.

Some participants noted that the disparity in salary scales between government and non-governmental organisations (NGOs) is causing experienced professionals to leave the health system for opportunities in NGOs. For instance, participant 3, a 38-year-old manager in the Ethiopian Public Health Institute, stated:

> Many are drawn to NGOs because the salaries there are way better. I mean, salary ranges from eight to eleven thousand here, which is like ten times less than what they'd make at most NGOs! Don't get me wrong – it is great for people to earn more; we all want to grow and get paid well. Who knows, I might find myself in that position one day. But the reality is, it makes it tough for us as an institution to attract really experienced folks.

Participant 15, a 39-year-old manager in the regional health office, emphasised the need for effective staff retention strategies.

> You know, one major issue we are dealing with is that we are losing a lot of our staff. The work in disaster zones is tough and really demanding for those on the front lines. But honestly, the pay and benefits just aren't cutting it, which makes it hard to keep people around. It is definitely one of our biggest challenges. The high turnover often comes down to a lack of incentives for those doing the hard work.

Moreover, participant 20, a 44-year-old hospital staff member, attributed staff turnover to inadequate compensation schemes.

> We do not have reasonable insurance or risk compensation. If healthcare professionals are not willing to work during peak times, they are not covered by insurance. I believe this is a significant issue. To ensure that professionals are

available to work during emergencies, the government must meet its obligations. Unfortunately, this is not the case in Ethiopia.

Participant 6, a 40-year-old manager in the Ministry of Health, discussed the high turnover rate attributed to government salary scales.

> You know, when you look at the government salary scale, it really seems like the pay is on the lower end. This makes it tough for us to bring in senior professionals who have a lot of experience and can really help out others. Honestly, we just can't attract that kind of talent with the salaries we are offering. It is a real struggle, and it definitely limits what we can do as a government.

8.3.3. Leadership selection and management challenges

The third factor contributing to system instability, as noted by the study participants, was issues related to leadership assignments in key positions. Several participants expressed the belief that the selection of leaders is often not merit-based.

Participant 25, a 45-year-old informant from an international partner organisation, remarked:

> I think assigning the wrong leaders is a real issue. We need to put the best people in key roles, not just those with connections or the right political ties. I've seen this happen in some organisations, but not all. We really need to focus on qualifications and make the selection process more about merit. It is a hurdle we've got to get past.

Participant 9, a 41-year-old manager in a regional health office, emphasised that the significance of appointing capable leaders to coordinate global health diplomacy.

> I think it is important to have someone with the right skills and diplomatic experience, even if they don't come strictly from health. When working with the international community, we need communicative and technically savvy people who know how to handle diplomacy well to keep everything running smoothly.

Similarly, participant 24, a 37-year-old manager in an international partner organisation, emphasised that leadership assignment issues are a broader problem.

> You know, it is frustrating to see so many unqualified people in leadership roles. I've got friends who got jobs at the EPHI just by paying off recruitment

teams. So, I can't help but wonder if the right people are really in charge at places like EPHI, the Ministry of Health, and the Ethiopian Disaster Risk Management Commission. There's a real lack of transparency, and it is hurting the system. We need to make sure the right folks are in the right positions if we want to see progress.

Lastly, participant 17, a 42-year-old hospital staff member, stated their concern:

I think one big issue we face is the wrong people in leadership roles, especially at higher levels. Sorry to say that. If they lack the right skills, they can easily be swayed by others, and it often leads to instability. At places like EPHI, we really need strong leaders who can develop those at the health facility level. But our recruitment process for human resources often lacks transparency, which doesn't help.

8.4. Summary

The chapter addressed key barriers to health system preparedness, focusing on two main categories. The first category highlighted obstacles related to "Weak coordination and poor collaboration". It discussed the need for better integration of efforts among various healthcare entities. Weak coordination stemmed from the absence of a clear model and philosophy, the lack of strong leading institutions, overlapping responsibilities, and ineffective communication and documentation systems. Poor collaboration results from a lack of shared vision and responsibility, neglect of system interdependencies, and differing interests among partner organisations. The second category, "System instability and change", emphasised challenges arising from structural flux, insufficient customisation, and leadership and staff turnover. These factors impede preparedness by affecting the system's continuity.

CHAPTER NINE: BARRIERS TO HEALTH SYSTEM EMERGENCY PREPAREDNESS RELATED TO RESOURCE, APPROACH, AND LEARNING CONSTRAINTS

9.1. Introduction

This chapter continues Chapter Eight, which presents additional barriers to health system emergency preparedness, focusing on the remaining three categories. The first category, "Constraints on healthcare resources", addresses significant barriers related to limited resources. These limitations arise from an unmet systemic lack of resources. This is the limitation of resources in the health system, primarily due to the country's overall low funding levels for healthcare. This aspect of the resource challenge is associated with healthcare and development needs, as well as increased demand due to population growth, multiple emergencies, and other issues that create competing priorities. In addition to systemic and contextual challenges related to resource constraints, the underutilisation of internal resources significantly impacts healthcare funding, ultimately compromising health emergency preparedness. This underutilisation is linked to several factors, including inefficiencies in budgeting and financial systems, as well as negative attitudes toward healthcare funding. These attitudes encompass misconceptions about budgeting for preparedness, an overreliance on partner organisation funding, and the use of resource limitations as an excuse for a lack of preparedness. The second category, "Low adoption of recommended approaches", highlights the failure to implement effective resource and response management practices. This section identifies barriers, including a reactive, event-based approach, a focus on individual hazards, and the compartmentalisation of responsibilities within single agencies. The third category, "Gaps in learning and education", emphasises preparedness barriers such as poor lesson management, inadequate formal training and education and perceived knowledge and awareness gaps across all levels. The chapter concludes with a summary that encapsulates the key points discussed.

9.2. Constraints on healthcare resources

Resource constraints are the primary barrier to preparedness for most participants. This resource challenge is the most frequently noted as a barrier to health system preparedness for emergencies. These challenges encompass a wide range of issues, including but not limited to financial constraints, limited access to necessary supplies and equipment, and insufficient personnel. This research explored constraints on healthcare resources, and specific barriers explored under this category include resource limitations attributed to unmet healthcare and

development needs, failure to mobilise domestic funds, high demand created by population growth, high demand created by multiple risks, limited participation by partner organisations, budget allocation and financial system failings, and unfavourable attitudes influencing healthcare funding decisions. In addition, resourcing challenges are often used as an excuse for inaction on preparedness.

9.2.1. Resource limitations due to systemic lack of funding

The study participants identified resource challenges as a major barrier to health emergency preparedness. They attributed the lack of resources in the health system primarily to the country's overall low funding levels for healthcare. These resource challenges stem from systemic and contextual issues. Comments from selected participants are included to illustrate this perspective.

Participant 9, a 38-year-old manager in the Ministry of Health, highlighted that:

> Honestly, the biggest challenge is just the lack of enough resources, especially funds. Setting up a lab for high-level pathogens such as VHS [Viral Haemorrhagic Septicaemia] requires a significant investment. Plus, getting our rapid response teams ready and deployed is also super resource-heavy. The gap between what we need and what we have is just too wide. The country's resource challenge is essentially systemic.

Participant 4, a 39-year-old from the Ethiopian Public Health Institute, noted that limited resources are prioritised for addressing current problems, which affects future preparedness.

> In Ethiopia, the biggest challenge is really the lack of resources. When you are short on supplies for current emergencies, it is hard to plan for the future. We end up putting all our energy into handling what is happening right now, especially with epidemics, rather than prepping for what might come next.

Additionally, participant 23, a 43-year-old informant from a domestic partner organisation, noted that resource limitations are a major bottleneck and systemic.

> There are plenty of hurdles, and one big one is the lack of resources—even a bottleneck challenge. Funding issues affect everything from lab access to emergency responses. It is a systemic lack of resources and a persistent problem at all healthcare system levels.

Participant 18, a 38-year-old hospital staff member, described the challenge of limited resources.

> Obviously, the biggest challenge we face at our facility is dealing with shortages of resources and supplies. It is tough just to keep the basics like medications, personal protective gear, lab services, and radiology available. We are in a pretty challenging environment, so it is understandable that these issues come up.

9.2.2. Resource limitations due to competing priorities

Competing priorities contribute significantly to healthcare resource limitations in Ethiopia. These competing priorities can be explained by unmet healthcare and development needs, resource demands induced by population growth, and the competing demand for resources due to multiple emergencies.

9.2.2.1. Unmet healthcare and development needs

A related factor contributing to constraints on healthcare resources is the concurrent unmet healthcare and development needs, which create competing priorities. Participant 9, a 58-year-old at the Ministry of Health, emphasised:

> Our challenge is primarily due to a budget deficit. As a low-income country, Ethiopia struggles to provide basic healthcare, and there is high demand in other development sectors as well. Even when we aim to make improvements, we often cannot because of a mismatch between our capabilities and current priorities.

Participant 11, a 41-year-old manager at a regional health office, highlighted resource challenges stemming from conflicting priorities over unaddressed development needs.

> There are unmet infrastructure and development needs. Health is not the government's top priority. In Ethiopia, the primary focus is on infrastructure projects, such as building roads and dams to expand electricity coverage. Maybe education and agriculture are priorities. I believe that health comes after all of these.

Participant 24, a 37-year-old from an international partner organisation, noted that the health sector is not a top priority in Ethiopia.

> In Ethiopia, it seems that [health] emergency management isn't really a priority for our political leaders. We've got major infrastructure issues. Because of this, health care doesn't get the attention it deserves, and our budget for health care is pretty minimal.

9.2.2.2. Population growth-induced resource demand

The strain on resources in the healthcare sector has been linked to increased demand driven by population growth, which often creates competing priorities. For instance, participant 6, a 40-year-old at the Ministry of Health, highlighted:

> Ethiopia is an incredibly vast country, and its population presents a significant challenge. Widespread poverty causes a critical shortage of resources, making our operations here particularly challenging.

Similarly, participant 21, a 68-year-old from a domestic partner organisation, attributed the resource challenges to high demand driven by significant population growth.

> The government is keen to provide funding, but there's a serious shortage of resources. Look, this is a country of 120 million. This is about four times that of Australia. If I am not mistaken, the population of Australia. So, we face a big deficit in hospital supplies and setups, and it is clear that resources are really limited.

9.2.2.3. Resource demand from multiple emergencies

This perspective highlights that resource challenges often arise from competing emergency priorities. These challenges result from an imbalance between available resources and the health system's diverse needs. The burden of multiple concurrent emergencies contributes to the situation.

Participant 26, a 50-year-old informant from an international partner organisation, emphasised:

> The current challenge in healthcare is the gap between capacity and demand, especially with nearly ten ongoing emergencies in the country. Some issues, like dengue fever outbreaks, aren't even officially recognised as emergencies. This situation puts a lot of pressure on emergency response teams, which are

already underfunded.

Participant 4, a 39-year-old from the Ethiopian Public Health Institute, described how they often juggle multiple contingency plans.

> Sometimes we have to juggle multiple contingency plans [all] at once. When Ebola popped up in Africa, we quickly created a response plan due to the number of travellers coming in on Ethiopian Airlines. Then another viral haemorrhagic fever outbreak hit, and we had to prepare for that too. There was even a phase where we had to manage plans for Ebola, Monkeypox, and various local outbreaks—all while facing a tight budget. In those moments, future preparedness often gets sidelined.

Participant 13, a 54-year-old from a regional health office, highlighted that handling concurrent emergencies with limited resources diverts attention from long-term preparedness.

> It is hard to stay focused with so many complex emergencies and competing priorities. We are constantly managing crises, which take away from our long-term preparedness efforts. This focus on short-term issues really hampers our ability to prepare for the future.

9.2.3. Resource limitations due to underutilisation of internal capacities

In addition to systemic and contextual challenges related to resource constraints, the underutilisation of internal resources significantly impacts the effective use of healthcare funding, ultimately compromising health emergency preparedness. This underutilisation is connected to several factors, including inefficiencies in budgeting and financial systems, and management of procurement, as well as negative attitudes such as misconceptions about the value of budgeting for preparedness, an overreliance on, or expectation of, partner funding, and the use of resource limitations as an excuse for a lack of action on preparedness. Together, these attitudes contribute to an overall lack of domestic funding and inefficient use of the available domestic funding. Comments from selected participants that illustrate these perspectives are provided under the corresponding subtopics.

9.2.3.1. Budgeting and financial system inefficiencies

In addition to genuine healthcare resource constraints, the interview participants emphasised the importance of addressing obstacles related to budget allocation failures and inefficiencies in the healthcare financial system, including priority setting, procurement, and resource allocation.

Participant 19, a 42-year-old hospital staff member, stated:

> To me, the thing is a bit different. I believe we are misusing our resources.
> Since the 1990s, Ethiopia has focused on preventing diseases, but recent
> health policy changes seem to prioritise expensive treatments instead. Our
> issue isn't really about a lack of resources; it is about mismanaging them. On
> top of that, we have no robust budgeting and financial system. I doubt we are
> using our resources effectively.

Participant 15, a 39-year-old manager in a regional health office, pointed out:

> In Ethiopia, the lack of emergency funds is not the only issue. Our financial
> system is also problematic, making it difficult to use the limited budget
> effectively. For instance, due to a lengthy procurement process, it currently
> takes up to two months to purchase supplies needed to contain an outbreak
> like cholera.

Participant 20, a 40-year-old hospital staff member, expressed concerns about the timing of
funding allocations.

> Funds may only be received after an emergency has occurred. There is no
> guarantee of funding in advance, which significantly hampers our response
> efficiency. Budgeting after an emergency differs greatly from budgeting
> beforehand. The government's financial system lacks flexibility and is burdened
> with bureaucracy.

Participant 15, a 39-year-old manager from a regional health office, emphasised that the
financial system may not be free from corruption.

> Although I do not have deep insight into how effectively and efficiently we are
> using our limited resources or investing them correctly, I believe we are not
> doing well. Our financial system is weak, and I doubt that the funds we have
> across all levels are free from corruption. I apologise for mentioning this, but I
> feel it is necessary.

Participant 21, a 68-year-old manager in a domestic partner organisation, expressed doubts
about the effectiveness of resource utilisation.

> Efficient resource coordination is crucial for making the most of budgets and
> supplies, especially during emergencies. It is important to ensure transparency

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in how resources are allocated. However, there have been concerns about misuse. I don't have specific evidence to dig deeper, but this definitely seems worth looking into. I am not very familiar with how resources are managed in Ethiopia, but it sounds like there are some significant challenges that need attention.

Participant 17, a 42-year-old hospital staff member, emphasised the importance of addressing effectiveness and prioritisation issues instead of citing the lack of resources as the sole reason for poor preparedness.

I believe the main barrier to health emergency preparedness isn't only a lack of funding, but also how resources are allocated. Often, too much of the budget goes to training instead of community needs. Donor restrictions can complicate this. If the government could steer those funds towards its priorities, it could really help.

9.2.3.2. Unfavourable attitudes affecting healthcare funding

Participants mentioned that attitudes influencing healthcare funding exacerbate resource challenges in the sector. The unfavourable attitudes, associated often with politicians in the government system and leaders in non-health sectors, include an assumption that allocations to the health emergencies preparedness budget are an unwise resource utilisation given that more pressing current demands need funding, an expectation that all 'emergency' funds should come from partner organisations, and the prevalent idea that higher levels of preparedness are not achievable in a resource poor setting.

9.2.3.2.1. Misconceptions about budgeting for preparedness

This perspective involves concerns about budgeting for future problems (preparedness) in the context of other pressing current needs, in a resource-poor setting. Participants' comments show that the government's attitude and approach to budgeting, which address current, politically driven needs —such as improved infrastructure (roads and transportation) and other critically important sectors (e.g., agriculture) —from limited resources, are impacting the level of funding available for health emergency preparedness activities. For instance, participant 12, a 52-year-old manager in the regional health office, stated:

I notice disparities in the attitude towards budgeting for preparedness. The political leadership asks, 'Why should we allocate resources to unapparent problems when there are so many pressing issues on the ground?'

Participant 4, a 39-year-old informant from the Ethiopian Public Health Institute, emphasised the impact of misconceptions with budgeting for preparedness activities.

> Funding for preparedness is lacking due to misconceptions. Two years ago, we requested about five hundred million Ethiopian birr, but we only received 150,000 birr. Unfortunately, nothing has changed since then. Ironically, when we request funds for an immediate response to an emergency, they provide support without hesitation. Don't you see the misconceptions here? There is a belief that budgeting for potential problems before they arise is unwise.

Participant 23, a 43-year-old from a local partner organisation, shared a similar observation about how misconceptions can affect preparedness.

> The government thinks it is unwise to budget for problems that haven't happened yet because of limited resources. Many decision-makers without health expertise do not grasp how interconnected resilience is, which means they don't see that we are actually preparing to respond.

9.2.3.2.2. Over-reliance on partner organisation funding for emergency management

Another unfavourable attitude that affects healthcare funding is the over-reliance on external sources of funding. According to this perspective, there is a prevailing belief that donors are the main providers of financial support during emergencies, rather than the government. Additionally, the government often assumes that non-governmental organisations (NGOs) will cover the funding for emergencies. This mindset results in inadequate domestic funding, which is crucial for sustainable preparedness across the health system.

Several participants expressed the view that this belief is affecting the level of domestic preparedness funding. For instance, participant 5, a 58-year-old from the Ministry of Health, noted that over-reliance on external donations undermines domestic funding.

> I think the government's misunderstanding is holding back our ability to use our resources effectively. There are unwritten rules about not buying equipment like ambulances because the expectation is that we often wait for donations instead. This mindset is a big reason why our domestic budget is so low.

Participant 23, a 43-year-old manager in a domestic partner organisation, added:

> We have become accustomed to waiting for donor support instead of mobilising our internal resources. This reliance has developed because many

past emergencies were funded by donors. Even when partner organisations are generous, their funds typically arrive after an emergency has already occurred and damage is evident, making their response ineffective.

9.2.3.2.3. Using resource limitations as a justification for a lack of preparedness

The final unfavourable attitude noted by the study participants regarding health emergencies preparedness funding is using resource limitations as an excuse for inadequate preparedness. Several participants emphasised that linking a lack of resources to poor preparedness represents a superficial and simplistic understanding of the complexity of the health system preparedness problem.

Participant 20, a 40-year-old from a domestic partner organisation, noted that the lack of resources is often used as an excuse for unpreparedness.

> I believe the lack of preparedness is related to leadership more than the lack of resources. Sadly, many of our folks use resource limitations to justify a lack of preparedness. This is my observation on the matter. That is what I understand.

Participant 11, a 41-year-old from a regional health office, emphasised that resource limitations are a common rationale for the lack of necessary levels of preparedness.

> Resources will always be tight, but if we don't prepare, the consequences will be even worse. When a disaster strikes, we often end up consuming even more resources. We need to acknowledge that "resource constraints" has become our catchphrase. We have to face the fact that we often use this limitation to explain our system's weaknesses. I truly believe we need to change that.

Participant 6, a 40-year-old from the Ministry of Health, emphasised that being in a resource-poor context should not justify a lack of preparedness.

> I think we've got a serious shortage of resources right now, but that doesn't mean we can let ourselves be caught off guard. It just feels wrong to be racing to find a budget only after something goes wrong. We really need to make sure we have the right resources in place ahead of time. Unfortunately, what usually happens is that we have just a handful of resources to work with, and they end up being used without proper planning, which causes a lot of confusion. I honestly believe it is time for a major shift in our approach.

Lastly, participant 19, a 42-year-old hospital staff member, stated:

> I believe the problem lies in a lack of priorities, not a lack of resources. Honestly, I feel like we are using the lack of resources as an excuse, just as a way to mask our disorganisation. I must be honest with you about this, because if we don't really change this attitude, we'll just end up stuck in a vicious cycle.

9.2.3.3. Inadequacy of domestic funding mobilisation

Participants pointed out that failure to mobilise internal resources and domestic funds is another key factor contributing to resource challenges. They largely attributed this issue to the attitude problems mentioned earlier. They emphasised the importance of shifting focus from relying on external support to mobilising domestic resources. Below are selected comments that illustrate this perspective.

Participant 3, a 38-year-old at the Ethiopian Public Health Institute, highlighted:

> There's been some improvement, but the government still doesn't fully grasp health emergencies. Ethiopia, as a low-income country, does receive significant funds for health services, but we can't rely only on external support to tackle all risks. The issue isn't about a lack of resources; it is about leadership not organising what we have.

Participant 10, a 35-year-old informant from a regional health office, emphasised the inadequacy of domestic funding for health emergency preparedness. They noted:

> There have been some advancements, yet challenges remain. The government doesn't budget for emergencies ahead of time, and when it does, the amount is tiny. Domestic funding is alarmingly poor.

Participant 19, a 42-year-old hospital staff member, emphasised the need to focus on mobilising domestic funds.

> We need to generate our own resources. It is crucial to use our local resources effectively. Establishing public health emergency funds and gathering resources to manage emergencies is necessary. Collecting and allocating at this level is essential for our health emergencies.

Participant 7, a 56-year-old informant from the Ministry of Health, underscored the importance of shifting focus toward internal resources.

> We know there are resource shortages. The biggest problem is the lack of supplies. If we had enough resources, we could improve our system and community care, including emergency preparedness. We have untapped internal potential that we need to use. Relying on external donors shouldn't be our go-to strategy.

Participant 13, a 43-year-old at a regional health office, stressed the need for domestic funding, highlighting the conditional nature of external funding.

> We must focus on building our domestic capacity since external funds often come with strings attached and can be unreliable. The recent conflicts in northern Ethiopia have shown these issues, making it hard to engage partner organisations. Many planned activities went unfunded due to sudden withdrawals of promised funds from our partner organisations.

9.3. Low adoption of recommended approaches

The study participants believe that inertia in thinking and management practice hinders system preparedness. Details of participants' perspectives about this category are presented under three subcategories: 'Event-based and reactive approach', 'Single-hazard and hazard-focused approach', and 'Separate responsibility and single agency approach'. These approaches hinder system preparedness because they do not align with current global best practices.

9.3.1. Event-based and reactive approach

This subcategory reflects the view that health emergency management plans focus on specific hazards and events, rather than an all-hazards approach based on a comprehensive risk assessment. Additionally, participants believe that the approach to health emergencies is reactive rather than proactive, which they consider to be contrary to current best practice.

Participant 4, a 39-year-old manager in the Ethiopian Public Health Institute, stated:

> Honestly, most of our activities focus on responding to emergencies rather than preparing for them. We usually involve all partner organisations when there's a crisis, like with COVID-19, but we don't prioritise collaboration in preparedness efforts. It seems we often react to specific situations instead of proactively addressing potential risks.

Participant 20, a 40-year-old hospital staff member, attributed the event-based and reactive approach to the lack of robust risk assessment.

> I think most of what we do tends to be reactive instead of proactive. We really need to shift our focus towards preparedness. Healthcare facilities are usually under a lot of constraints, so we are not in a position to afford this approach. We should prioritise identifying potential risks before they turn into actual emergencies. One big issue we face is the lack of effective risk assessment.

Participant 6, a 40-year-old manager in the Ministry of Health, described no shift in practice, though everyone acknowledges the importance of a proactive approach.

> I think we have to be bold here. It seems like our current mindset hasn't shifted much. There appears to be a preference for expensive treatments, while affordable preventive measures often get overlooked. Everyone understands the importance of being proactive, but in practice, we usually end up reacting to problems instead of working on prevention and preparedness.

Participant 13, a 43-year-old informant in the regional health office, stated:

> I think we are still stuck in that old reactive mindset rather than being proactive about emergency preparedness. Our current system focuses on responding after issues arise rather than preparing for them in advance. Clearly, being prepared and not being prepared lead to very different outcomes.

Participant 24, a 37-year-old in a domestic partner organisation, emphasised the need for proactive measures.

> I think our current approach is too focused on immediate response, especially in places like Ethiopia, where resources are limited. While it is crucial to act quickly during crises, we should also invest more in preparedness. Instead of being so reactive, we need to shift our strategy to balance the response phase and proactive measures.

Participant 25, a 45-year-old informant in an international partner organisation, emphasised that the reactive approach should change.

> Absolutely, the emergency management cycle involves prevention, preparedness, response, and recovery. Right now, we often focus too much on

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responding, which means we are reacting to crises rather than preventing them. We really need to shift our attention more towards prevention and preparation.

Participant 4, a 38-year-old participant in the Ethiopian Public Health Institute, noted that funding is typically not secured in advance.

We are still facing challenges in Ethiopia, especially when it comes to what to prioritise. Sometimes, political reasons influence these decisions, and we are often not as prepared as we should be. While we receive enough funds for responses, we typically don't get funds in advance for preparedness initiatives.

Furthermore, a 36-year-old informant from the international partner organisation commented on the procedural steps in management, stating that:

I believe Ethiopia is making progress, but its emergency management needs improvement. The focus often shifts to responding to crises rather than preparing for them. We usually conduct risk assessments, but only seek funding after emergencies occur. Securing funding beforehand is crucial to ensure we are better equipped. This approach definitely needs to change.

9.3.2. Hazard-focused rather than risk-based approach

This subcategory highlights that health emergency management approaches tend to be hazard-focused rather than risk-based. In addition, the system favours a specific hazard rather than an all-hazard approach. Participants argue that these approaches counter the current practice, which favours a risk-based over a hazard approach and an all-hazard over a specific hazard approach. The following selected comments reflect this insight.

Participant 17, a 42-year-old hospital staff member, said:

I think we are still struggling to adapt to the evolving health landscape because we are too focused on typical emergencies, like acute watery diarrhoea. There's a lack of clarity on roles when it comes to events like mass gatherings or road traffic accidents. It is essential that we shift to an all-hazard approach and be proactive in our practices, not just in theory.

Participant 10, a 35-year-old manager in a regional health office, noted that adaptability in approach is missing.

> I believe emergency management needs to be dynamic because emergencies are always evolving, and new challenges keep coming up. Right now, our preparedness isn't as adaptable as the situations we face. A lot of our focus seems to be on communicable diseases, which I think limits our overall system preparedness.

Similarly, participant 12, a 52-year-old informant from a regional health office, added that:

> Failure to adapt to the changing epidemiological landscape has led to a narrow focus on typical health emergencies, neglecting responsibilities related to others, such as mass gatherings, road traffic accidents, and other traumatic incidents.

Participant 16, a 43-year-old hospital staff member, suggested that other pressing emergencies should be given greater emphasis as public health emergencies.

> I have noticed that some officials at EPHI often say they only handle public health emergencies related to diseases, not trauma or other issues. I believe that any type of emergency, including trauma, should be considered a public health emergency. Right now, there seems to be too much focus on disease burden, and we need to adapt to address a wider range of emergencies. It is important for us to expand our focus beyond just a few specific situations.

Additionally, participant 18, a 38-year-old hospital staff member, expressed concerns about the failure to address emerging threats.

> The majority of our team members are not deviating from their usual routines. For example, are we considering other emerging threats stemming from climate change? Are we prioritising biological and chemical hazards? I doubt that we are focusing on those.

Furthermore, participant 11, a 41-year-old at a regional health office, attributed the absence of an all-hazard approach to a lack of awareness.

> In our country, there has been a longstanding emphasis on communicable diseases, and the Ethiopian Public Health Institute has done a commendable job in this area. However, the focus needs to evolve. People tend to expect only the usual outbreaks, which leaves other health emergencies

underappreciated. There's a general lack of awareness regarding what constitutes a health disaster, even among healthcare professionals. We really need to broaden our understanding of health emergencies beyond traditional views.

9.3.3. Separate responsibility and a single agency approach

This sub-category highlights that the current approach to health emergency management is going fragmented instead of embracing an inclusive and participatory strategy that involves all levels of government and society. Participants emphasised a transition towards a holistic framework that integrates various sectors and partner organisations, rather than a piecemeal approach. The following quotes from participants in the Ministry of Health, regional health offices, hospitals, and international partner organisations illustrate this insight.

Participant 7, a 56-year-old at the Ministry of Health, emphasised the importance of a holistic approach.

> I believe it is crucial to take a holistic approach involving everyone, both the government and society. Breaking down silo thinking is tough, and while we try to work together across different sectors, it can be frustrating when others don't fully commit.

Similarly, participant 26, a 50-year-old in an international partner organisation, expressed the importance of a unified strategy.

> Connecting different sectors is really important. Many people think only the Ministry of Health should coordinate these efforts, but that's not how it works. The challenges we face aren't isolated; they affect our country and other African nations. We have strengths that can help, but we also share gaps that could lead to everyone facing difficulties. Ultimately, we need to work together—it is all or nothing.

Participant 14, a 39-year-old manager at a regional health office, noted the challenges of a single-agency approach.

> The reality is, we often find ourselves managing emergencies with just one agency in charge. This creates gaps in our response. We really miss out on support from other sectors. What we need now is genuine teamwork, but honestly, it often feels like something we don't prioritise until it is too late. I see

a fundamental lack of an appropriate approach in this area.

Participant 20, a 40-year-old hospital staff member, highlighted their concerns about the current strategy.

> I think our current strategy isn't fostering genuine collaboration. It often places too much responsibility on one agency, which just doesn't work well. Other sectors tend to take a back seat instead of getting involved, and that creates challenges for us. I would really like to see a shift toward a more inclusive approach that brings all agencies together, rather than relying primarily on one.

9.4. Gaps in learning and education

This category encompasses participants' insights into the knowledge gap regarding inadequate learning, education, and training. Detailed perspectives are presented under three sub-categories: The first sub-category, 'Poor lesson management', highlights participants' views about the failure to learn lessons from recent and past emergencies. The second subcategory, 'Inadequate training and education', covers the perceived lack of formal training and education on emergencies that participants argue results in awareness and knowledge gaps across all levels of the health system. The third subcategory, 'Knowledge and awareness gaps across all levels', argues that deficiencies in lesson management, training, and education create knowledge and awareness gaps across all levels.

9.4.1. Poor lesson management

This sub-category emphasises the insight regarding the inability to learn from current and past events. Participants believe there is a gap in lessons management within the Ethiopian health system, despite the country frequently facing concurrent emergencies. A few comments from a sample of participants about this perspective are provided below.

Participant 15, a 39-year-old employee at a regional health office, noted that the system cannot learn from past emergencies.

> Honestly, it feels like the Ministry of Health and other sectors are missing the mark when it comes to learning from past incidents. We really should be looking back at those experiences to improve as a country, but we are just not good at documenting or sharing what we have learned. We fail to recognise our strengths and weaknesses, which are holding us back.

Participant 23, a 43-year-old in a local partner organisation, emphasised the importance of after-action reviews and documentation for learning from past emergencies.

> You know, when I look at past emergencies, it is clear we have done a poor job of documenting what we have gone through. We certainly need to prepare for future challenges, but without sharing those lessons learned, we are kind of stuck.

Participant 4, a 38-year-old informant at the Ethiopian Public Health Institute, emphasised that efforts to learn from recent and past incidents are insufficient.

> Yeah, we absolutely need to learn from our past, especially after the COVID-19 pandemic, but it feels like we are just not doing it. The role of various sectors, like police and ministries, was huge, but we are falling short on documenting how to work together effectively in emergencies. That's a major gap we need to fill.

Participant 3, a 38-year-old National Emergency Medical Team member, highlighted:

> Right now, we don't have enough documentation on what we are doing well, where we are falling short, the mistakes we have made, and the successes we have had. Plus, we are not holding debriefing sessions, so we are losing out on valuable lessons from our experiences.

Participant 19, a 42-year-old hospital staff member, added that:

> Historically, Ethiopia has dealt with countless emergencies, from natural disasters to health crises like cholera and COVID-19, but it doesn't feel like we have learned much from any of them. We may have some efforts in place, but they often lack sustainability and inclusiveness. We really need to step up our game to prepare for what's coming next.

9.4.2. Inadequate formal training and education

Participants highlighted the gap in disaster management training and education across various sectors. Participants expressed that there is limited availability of training institutions and that health disaster topics are absent from health professional education curricula. This perspective is evident in participants' comments, as illustrated below.

Participant 6, a 40-year-old informant from the Ministry of Health, noted the absence of disaster management courses in the curricula of health science programs.

> You know, I really feel like there's a big gap in our education system when it comes to disaster management. Most undergraduate and graduate programs just don't include it in their curricula, especially in health sciences. If you look for a chapter on disaster management, you're pretty unlikely to find one. Even in emergency and critical care programs, they only touch on the subject lightly, if at all.

Participant 12, a 52-year-old in the regional health office, added:

> We don't have any dedicated training or research institutions, even at the national level. It is concerning because disasters are a global issue, and I think our graduates, especially those in healthcare, really need to have a solid understanding of the basics of disaster and emergency management. It is essential for proper system-based preparedness.

Participant 2, a 44-year-old participant from the N-EMT, stated:

> Simulation exercises are a valuable starting point for self-assessment. Unfortunately, our rehearsal and drill activities aren't sufficient. Ideally, these drills should bring together relevant parties at least once or twice a year, but currently, we lack such systems and exercises.

Participant 4, a 39-year-old from the Ministry of Health, emphasised the lack of simulation.

> I think our understanding of health emergencies, such as pandemics, is insufficient. The gaps among health professionals and decision-makers significantly impact our overall preparedness. While we often have health emergency preparedness plans in place, these plans are rarely simulated or tested. We never practice our plans.

Participant 24, a 37-year-old manager in a domestic partner organisation, emphasised:

> I wish we had a health system that effectively integrates innovative educational programs across the country. Unfortunately, we are not there yet. Our educational institutions need to better align their programs with the healthcare industry's demands, particularly for more emergency professionals.

9.4.3. Knowledge and awareness gaps across all levels

Participants believe that deficiencies in lesson management, training, and education create a knowledge gap across all levels, including among healthcare leadership. They argue that leaders struggle to formulate and implement effective strategies for health emergencies without a solid knowledge base. Additionally, participants' perspectives reveal a knowledge gap among healthcare workers. Furthermore, participants' insights reveal that this knowledge gap extends beyond the healthcare sector, involving non-health sectors, local administrative authorities, and the wider community. Here are examples of the participants' comments regarding this perspective.

9.4.3.1. Knowledge gap among healthcare leaders

Participant 20, a 40-year-old manager in a regional health office, emphasised:

> We focus more on response efforts at the governmental, national, and regional levels. I doubt we have a proper understanding of emergency management in general. We need experts and institutions that emphasise emergency management as a field or specialty.

Participant 24, a 37-year-old participant in an international partner organisation, stated:

> The major gap I can mention here is the level of expertise in the Ministry of Health and EPHI concerning preparedness. Yeah, we don't have experienced experts who can lead the national preparedness.

Participant 8, a 52-year-old in the Ministry of Health, added:

> One challenge is the leadership's knowledge, awareness, and attitude. This may not be limited to higher-level leadership. If it is not a priority for healthcare leaders, it is difficult to allocate resources. That is one challenge. The knowledge gap around leadership is affecting even budgeting.

Participant 19, a 42-year-old hospital staff member, added:

> I think one of the barriers is the lack of knowledge at different levels, mainly at the leadership level. We don't have a dedicated institution; for example, no university or facility offers disaster-related courses. So, that has contributed a lot to the existing low technical capacity.

9.4.3.2. Knowledge gap among healthcare workers

Participant 4, a 39-year-old manager at the Ministry of Health, highlighted:

> In my view, our understanding of emergencies, especially health emergencies, is flawed. I believe even health professionals lack a comprehensive grasp of what constitutes a health emergency. While it is expected that the general public would have limited awareness, the gap among healthcare professionals is concerning. This suggests that we haven't adequately prepared them with the essential philosophies and practices needed to manage emergencies effectively.

Participant 20, a 40-year-old hospital staff member, stated:

> I have to admit that I am not entirely confident in my knowledge, skills, and attitude when it comes to handling health emergencies, even as a health professional. We often encounter real emergencies that we didn't cover in our formal training, and unfortunately, in-service training opportunities are quite rare.

Participant 18, another hospital staff member, reiterated concern about the knowledge gap among healthcare professionals.

> I have noticed that many health professionals, including myself, feel underprepared for these situations. It is a challenge that needs addressing, as staying updated and trained in emergency response is crucial for our effectiveness in the field.

9.4.3.3. Knowledge gap among non-health sectors

Participant 9, a 34-year-old manager at one of the regional health offices, emphasised:

> I think there is a lack of awareness in other sectors, which is concerning. For example, I may be aware of the EMT [Emergency Medical Team] because I am a member, and you may know about it from your studies, but many others may not have the same level of awareness. However, others are unaware of EMT, and they ask you what it is.

Participant 5, a 58-year-old employee of the International Health Regulations office, linked challenges of multi-sectoral coordination to a knowledge gap.

> I see many gaps in knowledge and attitude, particularly in relation to coordination between multiple sectors. Specifically, there are gaps in emergency management knowledge, system preparedness knowledge, and the capacity of different entities to work together. Many people in non-health sectors do not understand the concept of "one health", for instance.

9.4.3.4. Knowledge gap among local administrators

Participant 8, a 52-year-old manager in the Ministry of Health, stated:

> When we talk about emergency preparedness, local administrators need to understand that the broader emergency management system is important. While cooperation is commendable, there is frequently a significant gap in their knowledge and awareness regarding effective prevention and planning.

Participant 26, from an international partner organisation, emphasised that the lack of knowledge among local administrators is a recurring issue across many regions.

> I have seen a recurring issue across many regions. Local leaders often have a limited grasp of the complexities inherent in emergency management. Their planning tends to revolve around immediate crisis response rather than investing in prevention and long-term strategies. As an international partner, I suggest that this lack of awareness needs a solution.

Participant 10, a 35-year-old, in a regional health office, added that:

> From my experience, local administrators truly have the best intentions, but they often lack a deep understanding of the complete landscape of emergency preparedness. I think overly focusing on immediate response is due to a lack of knowledge about the importance of proactive planning strategies.

9.4.3.5. Awareness gap among the wider community

Several participants noted that, despite recent improvements following emergencies, the community still lacks a comprehensive understanding of how to prepare for potential crises. Below are selected comments that illustrate this viewpoint.

Participant 24, a 37-year-old manager from one of the international stakeholders, stated:

> I see that there is low awareness. Operating at the community level is a challenge. Even though I don't know how to design that, there should be a mechanism for the community to learn about preparedness in general. The community should be familiar with the concept of preparedness and know how to prepare for any emergency. I think that's very important.

Participant 16, a 43-year-old manager at a regional health office, noted the community's low awareness.

> The lack of awareness within the community presents a significant barrier to our work. It is closely linked to the knowledge and attitudes prevalent in the community and the spread of rumours and resistance within the community. If the community does not embrace and adhere to our recommendations, all our efforts will ultimately be futile.

Participant 5, a 58-year-old at the Ministry of Health, raised concern about community awareness, stating:

> Although there is improvement, there are still gaps in raising community awareness and ensuring community engagement. Engaging in health promotion and prevention activities can help individuals and communities better prepare for future emergencies. Therefore, it is important to implement a community mobilisation strategy or campaign to ensure that the community is ready for any potential emergency.

9.5. Summary

This chapter presented the remaining key barriers to health system emergency preparedness. The three remaining categories that emerged in data analysis. The first category, "Constraints on healthcare resources", addressed significant barriers related to limited resources stemming from a systemic lack of funding for healthcare. This aspect of resource limitation is associated with factors that create competing priorities, including unmet healthcare and development needs, population growth and the combined impact of multiple emergencies. Additionally, underutilising internal resources impacted the use of available healthcare funding, compromising health emergency preparedness. Factors contributing to this underutilisation included inefficiencies in budgeting and financial systems and negative attitudes toward preparedness funding. Negative attitudes towards healthcare funding include misconceptions

about budgeting for preparedness, an over-reliance on partner funding, and the use of resource limitations as an excuse for inaction on preparedness. Together, these attitudes contribute to the current state, characterised by inadequate domestic funding. The second category, "Low adoption of recommended approaches", highlighted the failure to implement effective resource and response management practices. This section covered participants' perspectives about an 'event-based and reactive approach', a 'single-hazard and hazard-focused approach', and a 'separate responsibility and single agency approach'. The third category, "Gaps in learning and education", emphasised the failure to learn from past and ongoing emergencies, along with deficits in knowledge and awareness across the health system, including among healthcare leaders.

CHAPTER TEN: INTERACTIONS OF FACTORS AFFECTING HEALTH SYSTEM EMERGENCY PREPAREDNESS

10.1. Introduction

This chapter provides the interactions among factors influencing health emergency preparedness in the health system. Discussions about the interactions are based on the theorisation arising from the emergent theory. The first section focuses on the convergence of enabling factors. The second section highlights the interactions among the identified barriers and how the interactions affect system-wide preparedness. The third section explains the dynamics between enabling and limiting factors of health emergency preparedness. The fourth section outlines the conceptual framework informed by these interactions. The framework emphasises the core strategies for enhancing disaster health preparedness within the health system.

10.2. Interactions between key enablers of system preparedness

The identified key enablers, including heightened awareness, emerging opportunities, past experiences, and local adaptive mechanisms, enhance the health system's preparedness either independently or in interaction. Figure 11 illustrates the relationships among the key enablers and how these interactions improve the health system's emergency preparedness.
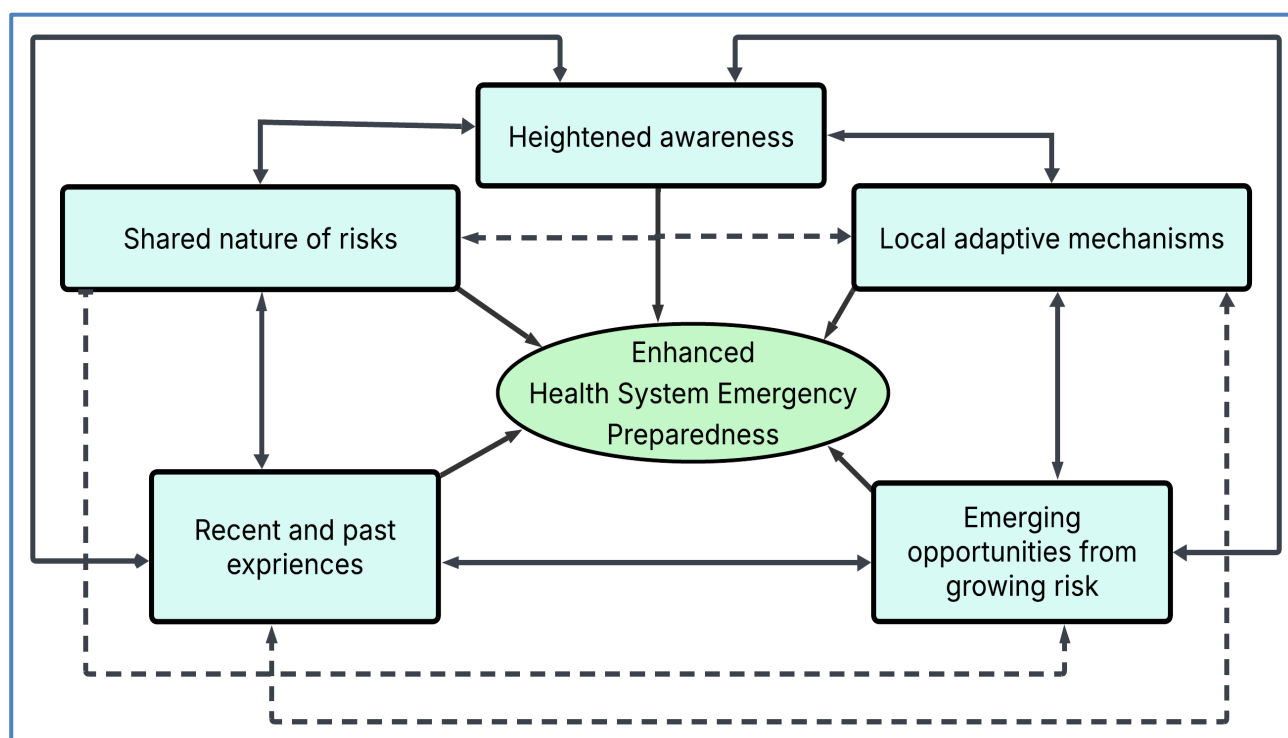

Figure 11: The Interactions of Key Enablers of Health Emergency Preparedness

The first enabler is heightened awareness, which stems from the rising risks faced by the national, regional, and global community. As awareness of potential threats escalates, the urgency to address them will be prioritised. This awareness is important as it mobilises resources and facilitates communication in the system. It also fosters collaboration among various stakeholders in the health system. When communities, healthcare managers, and healthcare planners are aware of the dangers, they are better equipped to respond effectively during emergencies. At all levels, local, national, regional, and global, increased awareness creates a foundational understanding of the importance of preparedness. Sharing recent and past experiences helps communities foster a proactive attitude, encouraging participation in preparedness efforts and overall vigilance.

The interactions of heightened awareness with local adaptive mechanisms, emerging opportunities, lessons from past experiences, and the shared nature of risks are elucidated. Increasing awareness of risks enhances the potential for communities to engage in their local adaptive mechanisms. When communities recognise the risks they could face, they are more likely to leverage knowledge and practices rooted in their culture, social cohesion, and faith. Local traditions may guide how to mobilise community resources in times of need. An increased awareness informs a better utilisation of these culturally embedded adaptations. This will potentially improve community resilience. A community with improved awareness can signal their concerns to global stakeholders. This dynamic creates a platform for dialogue and resource allocation. For example, an informed community may prompt international organisations to direct funding towards research and technologies to combat specific health challenges in high-risk areas. Furthermore, in addition to enhancing local responsiveness, heightened awareness leads to collaboration at various locations.

The relationship between heightened awareness and past experiences highlights the need for continuous learning. Communities aware of their historical responses to emergencies can better assess successful or failed strategies. This process of reflection fosters a more adaptive attitude, resulting in practices that are informed by both current risks and lessons learned from previous emergencies. Understanding that health threats go above borders fosters a sense of collaboration between communities and nations. Moreover, improved awareness heightens opportunities for collaboration. The collaboration may include sharing resources, knowledge, best practices, and information.

The second enabler is the local adaptive mechanisms. These are local knowledge and practices rooted in the community's religion, culture, and social cohesion. The mechanisms primarily enable health system preparedness by improving community engagement. When communities are engaged, resource issues will be solved to some extent. Besides this, local knowledge and practices may inform health systems to develop response strategies tailored to community-specific contexts. This, in turn, will make the preparedness and response strategies more effective.

The interconnection between local adaptive mechanisms, lessons from past experiences, and the shared nature of risks must be understood. Specifically, the interaction between local adaptive mechanisms and past experiences underscores the importance of historical context in shaping effective responses. Analysing approaches to previous health emergencies helps identify which local practices worked well. Acknowledging that health risks are shared globally prompts communities to find solutions.

The third enabler for improving one's national health system preparedness is the emerging global opportunities in response to escalating health risks. Countries that recognise their susceptibility are more likely to collaborate with others. This leads to improved cooperation across all levels. This kind of cooperation is particularly important for improving national health systems where resources are limited. In addition to easing resource challenges, the shared nature of health risks offers the opportunity to learn from collective experiences. Furthermore, it aids in transferring the technologies used to detect and respond to emergencies.

Experiences from both recent and past emergencies represent the fourth enabler. This enabler also interacts with other enablers. Historical events provide a vital foundation for recognising effective strategies and identifying unsuccessful ones. Lessons from previous emergencies further improve awareness. This will create more informed professionals, managers, and stakeholders. The lessons learned from past and recent health emergencies are important for informing research and funding acquisition. In summary, the interactions among raised awareness, local adaptive mechanisms, emerging opportunities in the global health space, lessons from past and recent emergencies, and the shared nature of risks improve national health system preparedness. The interdependence of the enablers creates a framework where awareness contributes to the need for preparedness, the shared nature of risks drives cooperation, and lessons learned inform future strategies and actions.

10.3. The interactions among the key barriers to system preparedness

In contrast to the positive multiplier effect of the interaction on the key enablers of health emergency preparedness, the convergence of the barriers further hinders system preparedness. The lack of adequate healthcare funding, system instability, and insufficient coordination are significant barriers to preparedness. Resource challenges arising from ineffective resource utilisation, over-reliance on external funds, and inadequate domestic funding exacerbate the situation by triggering additional barriers. The interactions among these key barriers are illustrated in Figure 12 and described on the subsequent few pages.
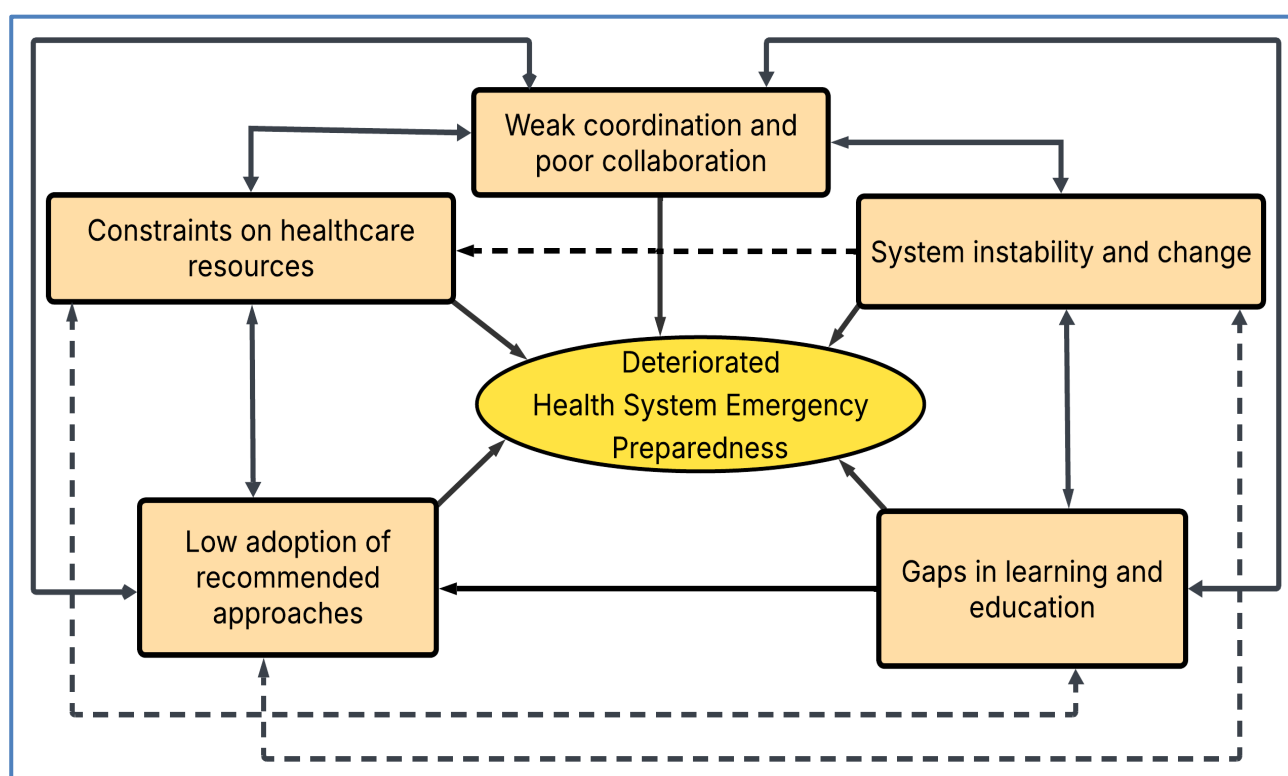
Figure 12: The Interactions of Key Barriers to Health Emergency Preparedness

Figure 12 shows the relationship among factors that hinder health emergency preparedness. In this research, several factors were identified as limiting health emergency preparedness within health systems. The first elucidated relationship among factors is the interactions that result from weakness in coordination and collaboration, along with other barriers. Weak coordination leads to fragmentation of responses during emergencies. A fragmented response is resource inefficient. On the other hand, limitations in collaboration worsen resource challenges. The implications of weak coordination go beyond immediate inefficiencies. In the context of weak coordination, efforts may also be duplicated. The duplication of efforts, especially in the context of a critical resource shortage, can have implications beyond inefficiencies. The concurrent depletion of resources from both internal capacities and external support, in an ineffective

manner, compromises access to the funds needed for mitigation and preparedness for potential new emergencies.

Another dimension is the interaction between lack of coordination and collaboration, system instability, and change. There can be a bidirectional relationship between weak coordination and system instability. An unstable system also creates a conducive environment for poor coordination. For example, frequent leadership changes can lead to weak coordination, as new leaders may not understand existing collaborative frameworks. Consequently, they may find it difficult to foster effective partnerships.

It is also important to understand how resource constraints interact with other barriers, such as low adoption of the recommended approach. The low adoption of recommended approaches further complicates resource limitations. The reactive approach is ineffective in terms of both response and resource use because a response without proper planning will not be effective. Response without careful planning also consumes already limited resources. A reactive and compartmentalised approach further depletes limited resources. Low adoption of recommended approaches is directly related to poor collaboration. This leads to an inability to share and leverage each other's resources effectively. This keeps the system in an approach that emphasises response more than proactive planning and actions.

Lastly, gaps in learning and education affect everything. A deficiency in training and education restricts the knowledge base of emergency personnel. This leads to ineffective responses. Similarly, poor lesson management exacerbates response efficacy. Lack of proper training leaves personnel unaware of evidence-informed approaches. This contributes to the low adoption of effective practices. Lack of education hinders effective coordination. If different entities lack a shared understanding of best practices, they cannot pursue common goals. A lack of a common goal is another main reason for poor collaboration. Additionally, inadequate training and education contribute to system instability. In summary, the relationships among these key barriers suggest that a given barrier can have a domino effect on the others. This ultimately deteriorates the health system's emergency preparedness.

10.4. Interactions among enablers of and barriers to preparedness

The next aspect of the relationship between key influences on health emergency preparedness addresses the interactions between the identified enablers and barriers to system preparedness. This exploration delves into how factors initially regarded as limiting factors turn

into enabling elements and vice versa. Figure 13 shows three loops of interactions among the enablers and the barriers to health emergency preparedness.
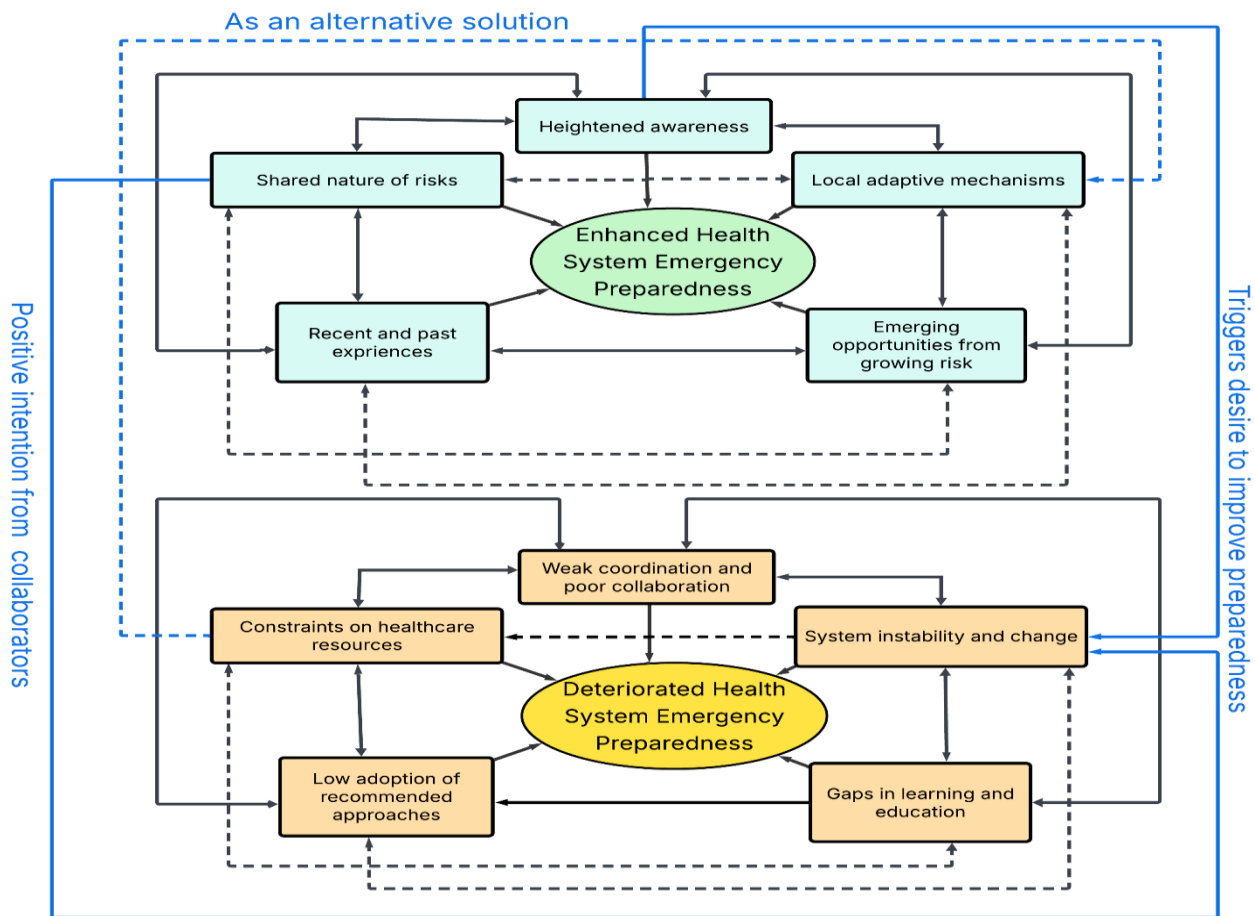
Figure 13: Interactions between Enablers and Barriers to Health Emergency Preparedness

Figure 13 illustrates three distinct areas where identified enablers and barriers interact with one another, influencing the overall impact on health emergency preparedness. The first involves a situation where heightened awareness (enabler) worsens system instability (barriers). Heightened awareness enables the health system by motivating the healthcare managers and planners to enhance preparedness. It also fosters a proactive approach to potential health emergencies. Both are enablers. However, combined with the evolving situation, this positive collaboration intention to strengthen can also complicate instability within the system. This positive intention to bring about change requires constant alterations in the health system. This ultimately disrupts operational continuity and creates an environment where health systems may struggle to maintain stability.

The second loop of interaction through which the enablers and the barriers react is in relation to the shared nature of health risks. The shared understanding of risk enables collaboration among

stakeholders. However, collaboration, necessary at every stage in disaster management cycles, can also add another layer of complexity to the health system. This added complexity can create confusion regarding roles and responsibilities, especially in environments without proper coordination. Additionally, global partnerships and cooperation often necessitate modifications to existing frameworks and protocols. These frequent adjustments and the continuous restructuring of established processes hinder long-term preparedness.

The third loop of interaction between the key enablers and the barriers is healthcare resource constraints. While these constraints certainly act as a barrier to effective preparedness, they simultaneously stimulate the consideration of local adaptive mechanisms as alternative solutions. This relationship indicates that resource limitations encourage communities and healthcare planners to focus on their internal capacities and strengths. Focusing on local adaptive mechanisms and internal resources is more sustainable than relying on external support. These multiple implications of resource limitation indicate that a challenge can also foster resilience if converted into opportunities.

In summary, the interactions noted among the key enablers and barriers to health emergency preparedness demonstrate that one factor might have a counteracting, stimulating, or multiplying effect on the other barriers. This shifts the ultimate outcome of system-wide preparedness from desirable to undesirable or vice versa. Therefore, understanding the dynamics is important for strengthening resilient health systems.

10.5. Framework for enhancing health system disaster preparedness

This framework, "Enablers and Barriers-Informed (EBI) Conceptual Framework for Enhancing Health Systems' Disaster Preparedness", was drawn from data analysis and existing literature. The proposed conceptual framework indicates that exploring key enablers and barriers and integrating them into national health system strategies to enhance the health system's emergency preparedness. The three key elements of the framework are illustrated in Figure 14. The detailed descriptions of each core strategy are provided in the text following the figure.
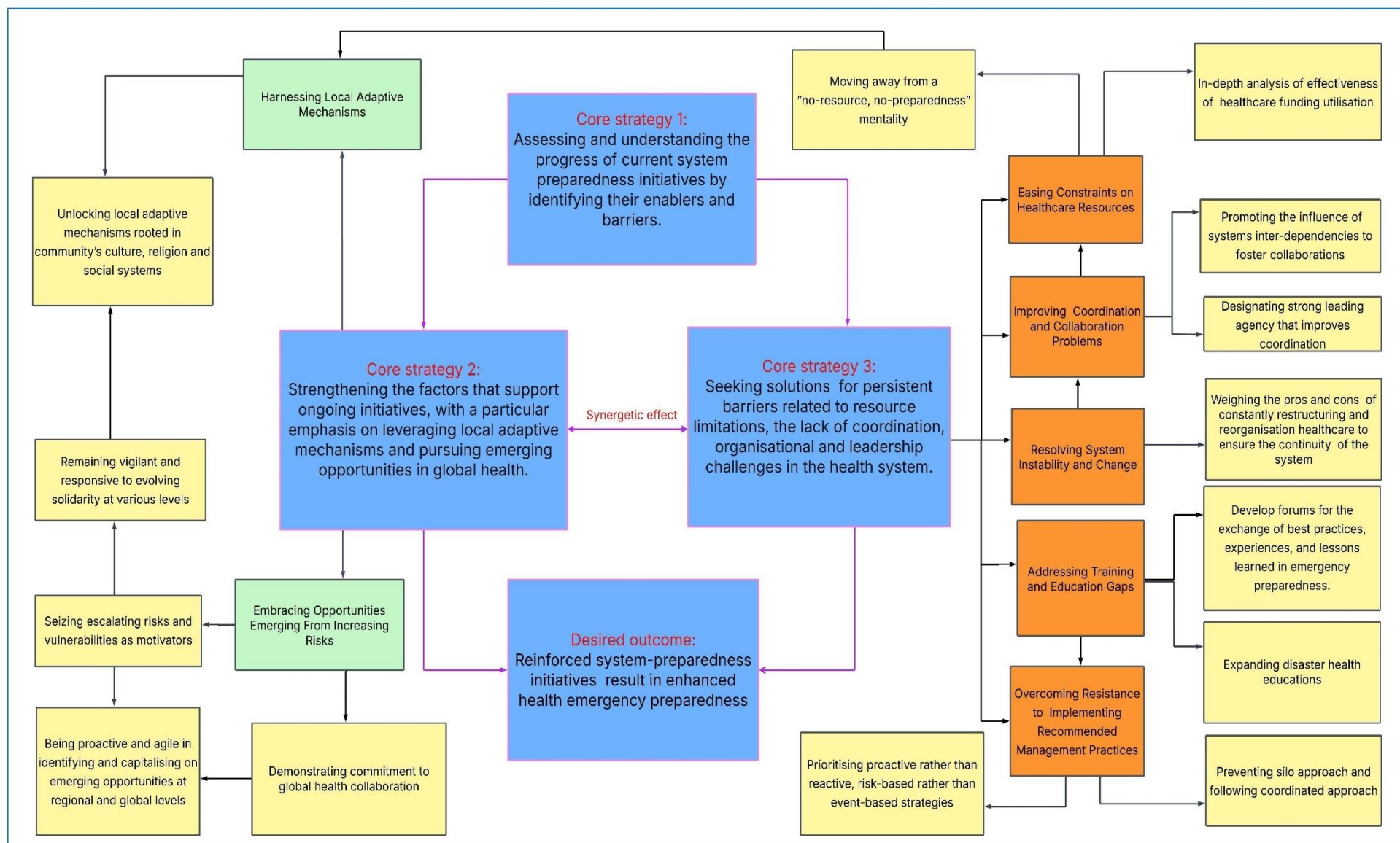
Figure 14: EBI Conceptual Framework for Enhancing Health System Disaster Preparedness

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The first component emphasises the need for a comprehensive assessment and understanding of the progress and level of current capacity. This involves an in-depth analysis of the factors contributing to ongoing initiatives. This could include thoroughly investigating untapped local adaptive mechanisms within the community. These mechanisms can offer innovative solutions to address resource challenges and enhance the health system's preparedness. Recognising these strengths helps the health system determine what works well and design strategies to scale them up. Equally important is identifying key factors that hinder health emergency preparedness within the health system. These could include issues related to logistics, insufficient training and education, coordination and infrastructure, and systemic barriers such as policies and strategies. Evaluating both facilitators and barriers helps create a clearer picture of the operational landscape in the health system. In other words, this understanding enables targeted interventions to enhance the effectiveness and sustainability of ongoing initiatives. This evaluative approach lays the groundwork for informed decision-making and strategic planning for concerned entities in the healthcare system. The comprehensive insights also help stakeholders prioritise actions that support system preparedness. More importantly, identifying key areas for enhancement becomes a strategic imperative. This is particularly important in health systems with resource limitations. It enables health systems to allocate available resources to where they are needed most. In addition to facilitating effective resource allocation, an informed approach makes tracking implementation easier and ensures efficient resource utilisation.

The assessment process becomes more effective if the approach is inclusive. Involving diverse stakeholders, including community members, health professionals, policymakers, and key partner organisations, ensures that all concerns are considered. This collaborative approach ensures that all stakeholders have a common goal. This, in turn, creates a sense of shared ownership in the preparedness initiatives. Ensuring the involvement of all parties will enable the development of comprehensive preparedness. Furthermore, prioritising inclusivity for all stakeholders during the early stage can create a dynamic, well-informed framework. In short, a robust assessment of existing preparedness initiatives and current capacity creates a framework for the area of focus in the efforts needed to build resilient health systems.

The second core strategy highlights the importance of strengthening and sustaining existing preparedness initiatives. The role of harnessing local adaptive mechanisms is emphasised in this core strategy. Harnessing local adaptive mechanisms can ensure the fulfilment of communities' unique cultural, religious, and social contexts. Promoting local adaptive mechanisms can be an alternative solution in a resource-limited context. This can enhance the

health system's resilience primarily by easing funding challenges. It also ensures a sense of ownership and engagement among community members, which is necessary for overcoming sustainability issues. Utilising potentials in the community, such as volunteer networks, traditional health practices, and local knowledge and practices, can enhance overall health system resilience. Transitioning from resource scarcity narration towards tapping into internal capacity encourages stakeholders to recognise that effective preparedness is possible despite limited resources.

Leveraging opportunities emerging from the global health space is another emphasised strategy. In the increasingly interconnected nature of health challenges marked by increasing risks, countries must remain cooperative to be part of the emerging opportunities. Proactive countries may share best practices, become eligible for funding and technical support, or access relevant technologies. However, it must be noted that such collaboration will require a mutual commitment to global health diplomacy. This includes demonstrating a commitment to ensuring the security of all nations. This requires nations to work together to address immediate resource challenges and to build long-term strategic partnerships at the regional and global levels. This interaction and partnerships offer an opportunity to make one's health systems better prepared to respond to unforeseen health threats. Overall, creating an environment that prioritises adaptability, community engagement, and active international collaboration enhances the national health system's preparedness for health emergencies.

The third core strategy focuses on the need for concerted efforts to address the persistent barriers to preparedness in the health system. System barriers could include resource limitations compounded by various factors. Associated factors include inadequate domestic funding, misallocation of existing resources, and attitudinal problems among key stakeholders, including political leadership. Key strategies suggested for this challenge could include prioritising internal capacities, playing an active role in global solidarity, and addressing attitude-related obstacles. The lack of coordination and collaboration continues to be a significant obstacle to effective health emergency preparedness. To address these challenges, the strategy proposes the establishment of dedicated organising institutions tasked with overseeing emergency preparedness efforts. It also underscores the importance of understanding and addressing interdependencies within health systems that subsequently limit collaboration among relevant sectors. The absence of stability within the health system makes maintaining continuity in rapidly changing situations difficult. Key challenges identified include frequently changing and restructuring health systems. As solutions, the framework emphasises the need

to balance the need and impact of changes, informing the pros and cons of frequently restructuring and reorganising healthcare structures and organisations with evidence.

This core strategy further highlights the need to overcome knowledge and attitude deficiencies. Targeted training programs and community awareness initiatives are encouraged. Furthermore, resistance to adopting effective, evidence-based strategies is a key issue that warrants attention. Openness to change and the embrace of adaptive improvements within health systems are necessary. Of special note, prioritising proactive, risk-based strategies over reactive, event-based approaches to preparedness is suggested as a strategy. Lastly, the strategy emphasises moving away from a siloed approach and promotes understanding of the potential adverse impacts of system interdependencies. A more integrated approach to preparedness is important for more resilient health systems capable of effectively managing emergencies.

The synergy between boosting the enablers and addressing the barriers to preparedness within the health system can significantly enhance ongoing health emergency preparedness initiatives. Enablers, such as local adaptive mechanisms, can tackle resource challenges to some extent. Fostering a proactive approach that enables health systems to respond quickly to emerging challenges. Conversely, addressing barriers such as resource limitations, coordination issues, and leadership gaps promotes a culture of continuous improvement. Overall, the synergetic effect created by core strategies two and three will further strengthen the health system's preparedness. In summary, the conceptual framework outlined strategies used to improve emergency preparedness that emphasise the assessment of current initiatives, strengthening support mechanisms, and addressing obstacles to create a responsive environment for crisis management. Each core strategy works synergistically to reinforce the others, leading to a cohesive preparedness framework. Integrating the suggested core strategies in national health plans and policy will create a resilient system.

10.6. Summary

This chapter presented the theorisation arising from the emergent theory. It described the convergence of enabling factors and the paths through which these factors enhance health system emergency preparedness. Then, it highlighted the interactions among the identified barriers and how they collectively impede health system preparedness. The complex relationships among the key barriers indicate that a barrier can cause a domino effect, further deteriorating the health system's emergency preparedness. Furthermore, the chapter analysed the dynamic interaction between the key enabling and limiting factors. Lastly, the chapter

presented the conceptual framework and outlined strategies to improve health system preparedness.

CHAPTER ELEVEN: DISCUSSION

11.1. Introduction

This research explored how healthcare decision-makers perceive the development of system preparedness for health emergencies. It has also investigated key barriers and enablers of the health system's emergency preparedness. Moreover, the study elucidates how these enabling and limiting factors interact within the increasingly complex and interdependent health system. The main findings of the research, pertinent to the study objective, are discussed, with their contextual meaning and significance for enhancing the health system's resilience. While the study examines various findings, this discussion section focuses on key findings from a system perspective and their relevance in a resource-poor context. This chapter provides a detailed discussion of key findings organised under several subheadings. The chapter begins by discussing progress in system preparedness, focusing on advancements and the challenges encountered in achieving readiness. It then addresses the key factors that support health emergency preparedness, highlighting the importance of local adaptive mechanisms and the need to seize emerging opportunities. The chapter also discusses preparedness barriers, such as limited resources, negative attitudes, low adoption of recommended practices, coordination issues, leadership challenges, organisational management, and gaps in education. Furthermore, it discusses key elements of a framework designed to enhance health emergency preparedness.

11.2. Progress of system preparedness and current readiness

11.2.1. Positive improvements in strengthening system preparedness

In recent years, the importance of health emergency preparedness has gained significant global attention, particularly in the wake of public health crises that have tested the resilience of health systems. This research aimed to document the progress of health emergency preparedness within Ethiopia's health system, which has faced unique health management and response challenges. Understanding the advancements made in this area is important, as it reflects the capacity to respond to health emergencies and sheds light on the effectiveness of existing policies and interventions. By evaluating the current state of preparedness, this research contributes to a deeper understanding of the systemic changes needed to enhance Ethiopia's ability to manage future health threats, ensuring that the lessons learned can inform ongoing efforts to strengthen the overall healthcare infrastructure in the region.

11.2.2. Key positive strides in system preparedness progress

Decision-makers reported promising improvements in system preparedness, noting successes in expanding healthcare infrastructure, enhancing human resources, and establishing effective organisations. Key advancements include the expansion of emergency and critical care services, developing Emergency Operation Centres (EOCs), and improving laboratories for urgent diagnostics. However, these enhancements are concentrated in a few areas, leaving many regions underserved.

Human resource development is critical for elevating the system's preparedness for health emergencies. Ongoing training for healthcare workers is necessary to keep their skills and knowledge current. Ethiopia prioritises training skilled professionals, resulting in many master's graduates who are pivotal in managing public health during emergencies. Additional programs, such as field epidemiology training for managers, aim to enhance emergency response capabilities further.

The Ethiopian Field Epidemiology Training program represents a positive extension of the African Field Epidemiology Network's (AFENET) efforts (Gitta et al., 2011). The African Field Epidemiology Network, established in 2005, is a non-profit alliance that supports Field Epidemiology and Laboratory Training Programs across 20 Sub-Saharan African countries. Its mission is to strengthen public health systems by enhancing the capabilities of Ministries of Health to effectively address epidemics through collaboration with government officials, academic institutions, and development partner organisations. Despite the Ethiopian field epidemiology training program being relatively recent, the program has been positively impacting and aiding the country in better detecting and responding to epidemics and addressing diseases of major public health significance (Jima et al., 2011). However, the availability of healthcare workers in emergency and critical care services is increasingly limited as one moves towards the grassroots level. This can pose a serious challenge to delivering emergency healthcare services to those in need, particularly in times of crisis.

In Ethiopia, training for emergency and critical care professionals, alongside field epidemiology training, has been recognised as important for enhancing system preparedness. Research participants noted this as significant progress, aligning with previous studies that highlight the benefits of such training. For example, a study shows that during the COVID-19 pandemic, access to emergency and intensive care services improved significantly, emphasising the need for sustained motivation and long-term investments to maintain and enhance service delivery

beyond the pandemic improvements (Sultan, Waganew, et al., 2021). In addition, in their work titled "Emergency and Critical Care Development in Ethiopia: A Lot Achieved, Yet Much Further to Go", Azazh found that emergency and critical care services have experienced significant expansion over the past decade. The study highlights that key factors contributing to this success include the commitment of university hospitals to train both higher-level and intermediate personnel in emergency and critical care, as well as the initiation of training programs for ambulance workers in regional centres (Azazh, 2023). Similarly, in their work that assessed the Ethiopian emergency medical team focusing on its formation, progress, response experience, and opportunities, Oyugi et al. noted that Ethiopia has been making positive strides in recruiting trained personnel and expanding its capacity to handle various emergencies. They concluded that the country has achieved significant and measurable advancements in establishing a solid framework for its National Emergency Medical system (Oyugi et al., 2025).

Another success is the establishment of the structural organisation of the health emergency management system. Over the last few years, Ethiopia has invested in its health emergency management system to enhance its preparedness for health emergencies. In Ethiopia, the EPHI runs public health emergency management. This structural organisation is a recent development in the country. The EPHI is a legalised structure under the Ministry of Health. The structural organisation of the institute extends from the federal level to healthcare facilities. The institute has the Public Health Emergency Management division across all levels. This division in the structure of the institute is responsible for overall public health emergency preparedness. The institute also has an IHR office connecting the national health system with global health networks. Despite the noted fragmentation in integrating these structures, the structural organisation might be considered a regional model. Other similar resource-poor countries are sharing experiences to strengthen their health system organisation.

11.2.3. Key challenges of system preparedness
Despite its advancements, Ethiopia's health system faces significant challenges in enhancing system preparedness. This research outlines various policy implementations and the difficulties stemming from ineffective initiatives. Additionally, there are concerns about the sustainability of existing efforts. The current lack of connectivity within the health system poses a serious challenge. Key issues also include gaps in documentation, communication, and reporting.

Effective emergency preparedness in healthcare hinges on a strong policy environment. While the existing policy framework is largely favourable, it exhibits notable shortcomings in practical

implementation. A significant disconnect exists between policies and their execution, and many national preparedness plans remain inactive. Key underlying obstacles include the independence of states (federalism) and inadequate communication of regulations, resulting in widespread unawareness and non-compliance. Furthermore, poor implementation often stems from insufficient involvement of partner organisations during the policy development process. A case study conducted in Pakistan explored the obstacles to effective policy implementation in climate change adaptation. The findings revealed that a dominant top-down management approach, centred on federalism, has led to misinterpretations, poor understanding among policy implementers, and the exclusion of essential partner groups during policy design and development (Masud & Khan, 2024). In a similar vein, a Nigerian study indicated that disaster management protocols in the country are centred around bureaucratic policy formulation, lacking sufficient input from experts in the built environment (Adesina & Ingirige, 2019).

Another challenge is the poor cascading of national experiences to local levels. In this research, though promising initiatives are noticed at higher administrative levels within the health system, there are significant gaps in emergency preparedness at the grassroots level. As a result of the focus of efforts at the national level, the development of Ethiopia's health system is characterised as an inverted pyramid, where achievements at the national level are not effectively communicated to local healthcare facilities. Existing efforts are focused on major regions, such as Addis Ababa, thereby exacerbating disparities between regions and often neglecting remote areas. The finding implies the need for determined effort that ensures preparedness, also involves local levels for collective preparedness. Failure to extend national-level achievements leads to disparities in preparedness. This has been shown in an Indian study (Darjeeling in the Himalayas and the Nilgiris in the Western Ghats), which found a significant gap between the initiatives at the national level and the actual outcomes of these efforts at the local levels (Ogra et al., 2021). Moreover, developing a realistic plan can be challenging if local levels are not addressed. This aligns with a Nigerian study's finding, which revealed that recovery plans from the top level often conflict with local needs, lack subsidiarity, and do not include community knowledge and capabilities. (Okunola, 2025). The lack of cascade and uniformity leads to significant disparities in emergency readiness across different areas.

Sustainability of existing effort was another issue in this research. A focus group conducted to identify the common traits and issues in existing emergency management systems found that sustainability is an important element of emergency management (Kapucu et al., 2013). This

research underscores the importance of addressing the sustainability of ongoing system preparedness initiatives. In this study area, commitments from the government and partner organisations are often inconsistent. The main sustainability concern cited in this research was in relation to funding. While financial support for healthcare initiatives is necessary, the unpredictability of funding, often influenced by political factors, leads to frustration. Funding disruptions, particularly during geopolitical conflicts, were common, and the global decline in development funds further exacerbates these concerns. This situation can affect the long-term viability of programs and projects. The finding implies the need for a more sustainable funding framework. Previous studies, such as those by Bogale et al., advocate for alternative support systems and innovative financing mechanisms (Bogale et al., 2024).

Despite Ethiopia's commitment to strengthening its healthcare workforce, a significant shortage of qualified staff remains evident. Factors such as the rapid expansion of healthcare facilities, a growing population, and frequent emergencies drive these discrepancies. The health care workforce shortage at the grassroots level is alarmingly insufficient. The uneven distribution of healthcare professionals becomes increasingly apparent at local levels. This is one aspect of failing to cascade national-level achievements down to the grassroots, which was mentioned earlier. A survey on health workforce status in the WHO Africa Region revealed that the shortage and uneven distribution of health workers continue to pose significant challenges to achieving universal access to health services (Ahmat et al., 2022).

11.2.4. The current state of the system's readiness

The findings about managers' perceptions of the current readiness of the health system show a mixture of optimistic, pessimistic and neutral perspectives. This varied perspective shows inconsistency in the health system's ability to respond to emergencies. Participants who showed optimism expressed the government's commitment to public health emergency management. They presented measures taken to contain various localised outbreaks. Besides this, they noted the coordinated efforts observed during the COVID-19 pandemic and the success gained in containing the pandemic as indicators of current capacity. Overall, an optimistic perspective indicates the availability of capacity to respond to similar health emergencies.

Conversely, participants who shared a pessimistic view emphasised the concerns of existing systemic weaknesses. They expressed deep concerns about the system's capacity to manage large-scale emergencies effectively. They consider that the currently available capacity could deplete quickly in large-scale and severe emergencies. Moreover, their reservation stems from

the imbalance between available capacity and the potential of multiple simultaneous emergencies. Furthermore, they were concerned about the capacity to recover after managing unexpected shocks. The lack of confidence in the current capacity among the participants of this study is consistent with several other comparable studies regionally. For example, a study titled 'The COVID-19 pandemic and health systems in Africa', conducted to evaluate preparedness, impact, and response levels, concluded that the health systems in Africa were inadequately prepared for the pandemic, and responses were slow and did not meet the magnitude of the problem (Tessema et al., 2021).

Participants also expressed an inability to evaluate the current levels of readiness. They indicated that they lacked the necessary information to form an informed opinion. This group of participants presented the absence of a comprehensive vulnerability assessment as a reason for their inability to make a judgment. This segment of participants generally recognises the positive progress and challenges encountered. Nevertheless, they remain unsure about the overall readiness of the system at that time. It should be noted that the assessment of current readiness in this research does not lead to a conclusion about the exact readiness level. This research focused solely on the subjective perceptions of key healthcare decision-makers regarding the readiness status of their systems, as observed. A more comprehensive analysis that quantifies readiness indicators or elements might be necessary if a relatively accurate level of readiness is needed. The triad of opinions noted regarding current capacity implies the need to determine how far the available capacity can take the health system in the continuum of disaster management cycles. In addition, available capacity should be gauged in terms of worst-case scenarios, such as large-scale emergencies or disaster-on-disaster situations.

11.3. Enablers of health emergency preparedness in the health system

The findings of this research illuminate several key enabling factors used to enhance health emergency preparedness within the Ethiopian health system. The enabling factors include focusing on local adaptive mechanisms and leveraging emerging opportunities at all levels. Central to these factors is the significance of local knowledge and community practices, which can underpin foundational strategies to bolster preparedness. This research highlights how leveraging this community-rooted knowledge and practices can empower healthcare and enable a more effective response during health emergencies. This research further underscores the role of taking advantage of emerging opportunities globally in the context of responding to increasing health threats and the shared (international) nature of these threats.

11.3.1. The need to consider local adaptive mechanisms in the health system

This research highlights the need to consider local mechanisms in health emergency preparedness strategies as an alternative to addressing resource challenges. The positive influence of factors such as culture, belief, and religion on preparedness and resilience should be considered and incorporated into implementation and response planning. People's social connections and shared cultural values are vital in helping them cope with, collaborate during, and recover from such calamities. Evidence shows that embracing a wide range of perspectives in a community's culture and religion cultivates a more inclusive and resilient society, better equipped to tackle the complex challenges of our times. For example, a study on Myanmar's health system resilience during Cyclone Nargis revealed that the community's capacity to withstand the cyclone's impact was strengthened by strong social capital, such as trust and shared social norms and motivation, which were reinforced by their deep-rooted culture and religion (Grimm et al., 2021). Moreover, research focusing on communities affected by severe disaster events has shown the crucial role of social capital (linking, bonding and bridging ties) in safeguarding communities and enhancing their recovery (Yasui, 2022).

The first element of the local adaptive mechanism is knowledge and practices rooted in tradition and culture. This insight is consistent with several previous studies. For example, a study conducted in Small Island Developing States (SIDS) emphasised the importance of acknowledging cultural knowledge and practices in shaping communities' adaptive decisions (Kuruppu & Willie, 2015). Similarly, Ali et al. documented that traditional knowledge and practices could enhance resilience and improve outcomes during disasters (Ali et al., 2021). Elsewhere, a study that assessed the role of cultural values in disaster preparedness concluded that integrating shared local values, experiences, and memories into disaster response plans was found to encourage community disaster preparedness (Appleby-Arnold et al., 2018). Furthermore, a more recent study in Pakistan that explored how local perspectives can be integrated into community-based disaster risk reduction strategies concluded that various local processes contribute to overall community resilience (Okoli et al., 2024).

Another local adaptive mechanism noted in the current research is the role of social systems. Evidence shows that social systems can potentially support health emergency preparedness. For example, a study that examined the community responses to various disasters found that communities with strong political, social, and financial resources generally experienced better outcomes immediately after emergencies (Himes-Cornell et al., 2018). Chandra et al. argue

that the decentralised and flexible nature of local social networks facilitates quicker cooperation (Chandra et al., 2010). Similarly, Pfefferbaum concluded that effective disaster management depends on an informed and engaged public. According to them, social networks play an important role in preparedness and should be linked to disaster care systems (Pfefferbaum et al., 2017).

This research explored how these local adaptive mechanisms could improve the health system's preparedness. The commonly cited mechanisms were community mobilisation and the creation of a sense of ownership. Studies show that communities with stronger social connections can mobilise needed resources more quickly. Ma et al. found that local knowledge and social networks improve leveraging internal potentials and cultivating a sense of ownership and responsibility (Ma et al., 2023).

A health system with a community support base will get the necessary resources and community cooperation during health emergencies. Despite the emphasis of participants in this research and the support of several pieces of evidence, integrating local knowledge and practices into health emergency preparedness strategies needs further study. The present study did not delve deeply into specific local knowledge and practices relevant to health emergency preparedness. In addition, the relevance and potential undesirable effects of these local resources need deeper investigation. For example, one concern is the impact of local adaptive mechanisms on worsening the health system's complexity. Therefore, evidence-based practices are warranted to determine which specific communities, traditions, faith-based practices, and social systems could enhance the health system's preparedness with minimal layers of complexity.

11.3.2. Harnessing opportunities emerging from escalating risks

This study examined the crucial role of seizing opportunities arising from increased risks in strengthening health emergency preparedness within the Ethiopian health system. Rising health risks raise awareness across all sectors, including non-healthcare sectors, boosting the commitment of the community, the Ministry of Health, political leaders, and other government sectors. The idea of shared risk encourages solidarity driven by the interconnectedness of health challenges, resulting in more effective partnerships both nationally and internationally. Cooperation grounded in a deep commitment to the security and well-being of all nations creates opportunities to improve national-level preparedness and response strategies in return.

It is widely recognised that effective emergency management depends on collaboration between various agencies. Managing health emergencies is a shared responsibility that requires cooperation across all parts of society. Everyone —from government agencies to healthcare organisations and community groups —plays a crucial role in responding to and reducing the impact of health crises. This united effort protects public safety and strengthens community resilience during health challenges. Therefore, relying solely on the strength of specific sectors may not achieve the desired results (Peters et al., 2019).

This study emphasised that recognising the growing risk enhances awareness of the need for system preparedness. Heightened awareness benefits the health system by facilitating the healthcare leaders' voices to be heard. Healthcare leaders will get the cooperation they need from political leadership, the local community, and other partner organisations. The present study noted that past events and incidents have shaped decision-makers' views on health emergency preparedness in Ethiopia. For instance, the Ethiopian Millennium Celebration in 2006 underscored the health risks associated with mass gatherings and laid the groundwork for the country's health emergency management initiatives. The COVID-19 pandemic further illuminated the need for preparedness. A study done by Herstein et al. concludes that there has been an evolution of emergency preparedness programs in response to various disasters over recent decades (Herstein et al., 2021). In the same way, recurrent disease outbreaks in the country further underscored the need to invest in system-based preparedness.

The increasingly shared nature of risks was noted as an additional enabler of health emergency preparedness. The perspective holds that recognising risks as a shared challenge fosters a sense of global solidarity. According to this perspective, being an active part of this emerging solidarity enhances the preparedness of one's national health systems. This prospect is particularly important for resource-poor contexts to strengthen their health system preparedness.

The enabling role of the international nature of health emergencies is increasingly gaining attention in the literature and among experts. For instance, Oramen and Buyx argue that emerging health threats can promote global solidarity by revealing shared vulnerabilities and illustrating the commonalities among individuals worldwide. This heightened awareness drives a solidaristic atmosphere used to tackle challenges collaboratively. According to them, such infrastructures are vital for immediate responses and ensuring long-term resilience against future health crises (West-Oram & Buyx, 2017).

Such a strategy aligns with global health experts' calls for global health diplomacy (GHD) to shape humanitarian approaches. Considering the shared nature of health risks as an enabler of health emergency preparedness aligns well with the recent WHO Pandemic Agreement, adopted to strengthen the global health framework for preventing, preparing for, and responding to pandemics. The shared nature of pandemic risk has been a key driver for creating a shared desire among the WHO member states' governments that approved the agreement (WHO, 2025b). This situation highlights the need for healthcare planners in resource-limited settings to explore and leverage this opportunity for both their own benefit and the collective security of the global community.

This research also underscored that the key strategy for benefiting from global solidarity is having equal concern for collective security. Demonstrating dedication towards ensuring the security of all nations is a key strategy to unlock the opportunities packed in global health solidarity. This strategic perspective for unlocking international cooperation is consistent with findings from the limited literature. For example, a recent study used COVID-19 as a case study to examine how promoting global solidarity can benefit low-income countries. The authors argued that donor countries are more likely to support developing nations if they believe such assistance could help prevent future virus outbreaks domestically. They emphasised the role of the commitment from the recipient countries in the decision-making process regarding assistance for the potential benefits for the donor countries (Kobayashi et al., 2021). Another example is the Ebola outbreaks in the Democratic Republic of Congo, which illustrated how diplomacy in global health can significantly influence health outcomes in fragile settings (Falqui et al., 2024). However, it should be noted that some countries are moving away from supporting global health initiatives, failing to recognise the mutual benefits of investing in global health. The current outstanding example is the United States of America, where there has been a significant shift away from funding global health initiatives, including the World Health Organisation.

11.4. Barriers to system preparedness for health emergencies

This research explored various factors that impede emergency preparedness within the health system. Two barriers to preparedness are most important in this research context. The first significant barrier is the limitation of resources, which plays a critical role. While resource constraints are frequently cited as a primary reason for insufficient preparedness, focusing solely on this issue may overshadow other systemic barriers. Challenges such as frequent organisational restructuring and a reluctance to adopt best management practices also considerably hinder the attainment of optimal emergency preparedness. The second significant

barrier is weak coordination and collaboration. Mirroring the issue of resource limitations, this barrier introduces additional obstacles that collectively undermine healthcare preparedness for emergencies. Specific hindrances arising from the lack of strong coordination and collaboration include the absence of a dedicated coordinating body, insufficient ownership of this problem space, inattention to system interdependencies, weak structural and functional linkages, and a lack of a shared vision among the relevant sectors. In this discussion, these two primary barriers are emphasised due to their importance from a systemic perspective.

11.4.1. The role of resource limitations in undermining preparedness

As a study conducted in an area facing a critical resource shortage, this research finds that the impact of resource limitations on the health system's emergency preparedness is significant and apparent. On the one hand, the limitations of healthcare resources are justifiable challenges that pose a significant barrier to the health system's preparedness for health emergencies. The lack of funding due to pervasive poverty and competing priorities created by this complex challenge leaves health systems struggling to go beyond addressing basic needs. Factors that cause competing priorities include population growth, widespread poverty, and unmet healthcare and infrastructure needs. As a result of these competing priorities, areas such as health emergency preparedness are often overlooked, even though they are urgent in reality.

On the other hand, the present research also highlights that the lack of resources is often used as an excuse for insufficient preparedness. Presenting resource constraints as a justification for inadequate preparedness in the context of utilisation gaps can lead to complacency and a failure to prioritise allocating available resources for emergency preparedness. However, this research did not examine healthcare resource utilisation and acknowledges that an in-depth, reliable study with innovative methods is needed. This research also highlights several underlying factors that contribute to the inadequacy of funding for health emergency preparedness, beyond mere resource constraints. A qualitative study investigating barriers and opportunities for an integrated prehospital emergency response system in Ethiopia found that insufficient resources were not the primary reason for the lack of prehospital emergency care in the region. Rather, the study pinpointed a lack of commitment, ownership, and a high turnover of decision-makers as the key factors contributing to the absence of such a system (Denu et al., 2022). This finding is also similar to a Nigerian study that found that financial bottlenecks hinder recovery efforts even when funds are available (Okunola, 2025). In this regard, the lack of coordination among partner organisations leads to duplication of efforts, further contributing to inefficient resource use.

The present research has explored several underlying causes of the inability to use available resources for preparedness programs. One major issue is the inadequacy of domestic emergency funds. The budget allocated for emergency preparedness within the health sector is disproportionately low, indicating a failure to prioritise financial planning for preparedness. This finding aligns with a recent study on national emergency preparedness and health security financing conducted by the World Bank and its partner organisations. The study revealed that many countries lack an annual increase in per capita expenditure needed to maintain or improve their capabilities to detect, prevent, and respond to health security challenges (WHO, 2018b).

11.4.2. The influences of unfavourable attitudes on health system preparedness

The current research identified three features of attitude problems that affect healthcare funding allocation and utilisation. The first attitude problem is related to budgeting for preparedness. This unfavourable attitude often arises from the belief that allocating funds to issues that have not yet become apparent is an unwisely given limited resources. As a result of this belief, funding for health emergency preparedness is often neglected. In this study setting, the government does not have a problem with budgeting to respond to more immediate healthcare needs, including apparent emergencies. There are two reasons behind this attitude. Limited available resource (funding) is prioritised for emergencies that have become apparent. Second, it is linked to a lack of understanding of the profit and loss of investing in the preparedness phase. He and Zhuang argue that challenges in resource allocation for disaster mitigation and recovery raise important concerns about decision-making processes, and they recommend an optimal policy on balancing pre-disaster preparedness and post-disaster resource allocations (He & Zhuang, 2016).

The second feature of attitude challenge noted in this research is the tendency to rely on external partner organisations for all emergencies. This attitude contributes to insufficient effort to enhance domestic funding, which is more likely to be sustainable. In other words, this particular attitude impedes health emergency preparedness by creating an environment of funding unsustainability. It also causes organisations to remain dependent on temporary external support, creating a vicious cycle of resource challenge. External funds are influenced by factors such as donors' interests, which is why domestic funding should be prioritised according to participants in this research. Bertone et al emphasised the importance of promoting local funding in health financing (Bertone et al., 2019).

The third feature of the attitude problem related to healthcare funding is the tendency to use resource constraints as an excuse for inadequate preparedness. This needs to shift. However, the challenge lies in fostering this attitude shift amid genuine resource constraints. In the case of Ethiopia, the complaint of resource shortage is a genuine challenge, given a systemic funding shortfall compounded by competing priorities. There have been unmet development and healthcare demands, concurrent and multiple emergencies, and socio-economic and political challenges, such as population growth and recurrent conflict, collectively driving competing priorities. This situation results in low funding for the health sector compared to other sectors, such as security and agriculture. Health emergency management receives lower funding from the overall healthcare budget, even though basic healthcare services remain unmet in the country. Therefore, changing the scarcity narrative while, in fact, there are real resource challenges requires further research.

11.4.3. Low adoption of recommended approaches

This research identified notable discrepancies in the recommended resources and response-effective frameworks. The findings show an approach that runs counter to established recommendations due to ongoing reluctance to shift from traditional management methods in three key areas.

The initial challenge highlighted in this research is the inability to shift from a reactive management approach to a more proactive strategy for handling health emergencies. This indicates a persistent trend of responding to crises only after they occur, rather than implementing anticipatory measures to mitigate risks and enhance preparedness in the face of potential health threats. Organisations such as the United Nations Office for Disaster Risk Reduction (UNDRR) have advocated a shift from a response-based paradigm to a proactive, prevention-focused approach since the 1990s. However, many countries, including Ethiopia, have been slow to make this transition. Current research indicates that Ethiopia's health emergency preparedness remains largely response-oriented, revealing resistance to moving away from established practices (Ogra, 2021). Because of limited local initiatives on preparedness-oriented programs, international donors invest more in response than in mitigation and preparedness activities. Evidence shows that significant disaster-related funding concentrates on immediate response and recovery efforts rather than preventing future crises. Alarmingly, for every $100 allocated in international disaster assistance, only 50 cents is dedicated to prevention and risk reduction initiatives. This imbalance suggests that there is an

urgent need for a shift in funding priorities to foster resilience and minimise the impact of future disasters (Kellett et al., 2013).

Secondly, while best practices advocate for an all-hazard strategy, this research found that health emergency management in Ethiopia is largely disease-specific, neglecting other potential threats. Emergencies arising from mass gatherings, chemical and biological events, and natural phenomena have not received sufficient attention. This implies that a comprehensive approach aims to better prepare and respond to a wide range of potential health emergencies, ultimately enhancing overall emergency management and response efforts. This observation contrasts with the comparative analysis conducted on disaster management systems in India, which predominantly focuses on natural disaster preparedness. A commonality across these studies is the insufficient attention given to proactive, preventive, and regulatory measures to address the risks and consequences of man-made hazards (Shakeri et al., 2021).

The third area where low adoption of the recommended approach was noted is the fragmented emergency management system. Instead of adopting the whole-of-government and whole-of-society strategy, specific agencies practically run the system. This observation is similar to findings from a study analysing sectoral participation in developing Joint External Evaluations for global health security index reports. It revealed that while the development process typically sees strong involvement from traditional sectors like health and agriculture, there is potential for greater participation from the defence and energy/nuclear sectors (McPhee et al., 2019).

11.4.4. Weak coordination and collaboration as barriers to preparedness

Weak coordination and poor collaboration were the most frequently cited barriers in this study area. Weak coordination was observed from intra- and inter-sectoral perspectives, and poor collaboration at the government, local sector, and international partner organisation levels. The weak coordination observed in this setting is attributed to several underlying causes. The absence of a dedicated coordinating institution is one of the main contributors. The absence of a leading institution is, in turn, associated with two main gaps in the governance of Ethiopia's health disaster management system. First, while the Ethiopian Public Health Institute oversees emergencies related to communicable diseases and the national emergency medical team, there is no designated department within the Ministry of Health for managing emergencies arising from mass gatherings and mass casualty events. Second, the Ethiopian Disaster Risk Management Commission (EDRMC) prioritised post-emergency humanitarian

aid. This limit prevents the organisation from effectively coordinating efforts among various agencies.

A lack of clarity in ownership is another related challenge. This challenge arises from the lack of a dedicated leading institution. For instance, competition for control between the Ministry of Health and the Public Health Institute creates ambiguity in roles and responsibilities. Disaster health management in this context can be likened to a tug-of-war. A primary reason for this analogy is the overlapping mandates among various responsible agencies at different levels. A study conducted in Zimbabwe to explore the barriers to investing in disaster risk reduction (DRR) revealed that one significant factor limiting local authorities' investment in DRR was the absence of clear mandates (Mavhura & Mapuva, 2022). This significant gap has prompted suggestions for establishing independent disaster and health emergency management agencies. This finding aligns with a comprehensive study that revealed a lack of clearly defined ownership in the African region. The study concluded that establishing a dedicated governing institution is necessary to promote collaboration across multiple sectors. This is paramount in ensuring effective distributed leadership and decision-making (Mbachu et al., 2024).

A study conducted in Iran revealed the absence of a strategic perspective in disaster-related health initiatives, inadequate integration of infrastructures and resources, insufficient enforcement, a focus on organisational approaches rather than a national strategy, and the low priority assigned to disaster management within the overall health system as attributors for the lack of coordination in disaster health management (Bahadori et al., 2017). The differences in factors across the studies show that the underlying causes of the lack of coordination vary from place to place. This finding indicates that coordination problems across settings are best addressed by focusing on the realities of a particular context.

In the present research, another cause of the observed lack of proper coordination is the lack of integration among available resources and entities. The lack of integration is evident both within and outside the health system. Within healthcare, numerous programs are unlinked and function in isolation. One area of disconnection noted in this research is between national emergency preparedness structures and local healthcare facilities. These disconnections undermine collective preparedness efforts and diminish overall response efficacy. The lack of integration implies that available healthcare structures, such as clinics, primary health care units, and hospitals, are not involved in preparedness and responses. Ensuring health system resilience is challenging amid persistent integration gaps. The lack of involvement of lower-

level healthcare facilities burdens larger healthcare facilities, such as referral hospitals. In other words, the lack of collective preparedness results in an ineffective response to emergencies. This aligns with insight from the WHO, which shows that a lack of integration results in the underutilisation of certain healthcare segments, such as primary healthcare units (WHO, 2018c).

A study by Lal et al. demonstrated that the lack of interconnectivity within national health systems has broader implications. Researchers have reported that this disconnection poses significant challenges for decision-makers and health experts, who often operate within "self-protecting silos" across various sectors. These specialties are sometimes intentionally separated to prioritise certain areas of the health system over others. Consequently, poor communication and collaboration between institutions and national health systems hinder efforts to unify policies related to global health security and universal health coverage at all levels of governance (Lal et al., 2021).

The lack of linkage between existing structures identified in the present research aligns with several works in the literature concerning resource-poor health systems. For example, a commentary review titled "Conflict and Fragmented Public Health Emergency Management System in the Tigray Region of Northern Ethiopia" was conducted to inform policymakers and urge them to take action in line with this finding. The review concluded that significant challenges have arisen from the lack of cohesion among various entities claiming responsibility for public emergency management, including the Regional Public Health Emergency Management, the Regional Health Bureau, and the Research Institute. This disjointed system has resulted in weak coordination and fragmentation among these organisations. According to the researchers, unclear leadership and the duplication of resources create a service delivery structure that prioritises personal and professional interests over the needs of the community (Ajemu et al., 2024). Similarly, a comparable study on health system strengthening in fragile and conflict-affected states revealed that the lack of coordinated and integrated approaches hinders efforts to strengthen fragile health systems (Bogale et al., 2024). Furthermore, a study in Brazil reported insufficient integration between primary health and emergency care networks (Uchimura et al., 2018).

Another arm of the disconnection noted in this research was the lack of linkage between the healthcare sector and critical infrastructure. In addition to insufficient internal linkages, external connectivity—such as electricity, water, and telecommunications systems—remains insufficient. The lack of integration in this wing stems from a lack of a shared vision among the

responsible sectors. In addition, a lack of attention to system interdependencies may have led to poor communication and integration. This echoes findings from an Indian study that noted the limited importance placed on communication with external partner organisations (Bhakta Bhandari et al., 2014). Hence, integrating healthcare facilities with critical infrastructure planning is necessary to enhance the overall system's preparedness and resilience in response to crises.

In this study, the lack of coordination was related to poor documentation, communication, and reporting systems. Emerging insights indicate gaps in data accuracy and quality for communication and reporting, hindering emergency preparedness. Another study conducted in Ethiopia noted the lack of communication services dedicated to emergency response (Sasie et al., 2024). In the same context, a more recent study in Nigeria underscored the detrimental consequences of unreliable data on the effectiveness of decision-making processes in disaster management. The study's conclusions indicate that disaster management officials and agencies are unable to respond to disasters efficiently due to the overwhelming presence of inaccurate or misleading critical data, thereby impeding their ability to safeguard lives and property (Okunola, 2025). Hence, during health emergencies, accessible data ensures that partner organisations are well-informed, guaranteeing timely responses and appropriate actions.

11.5. Framework for enhancing health emergency preparedness

The three core components of the framework developed in this research are elucidated in this discussion section, based on the extant literature. The first core strategy underscores the need for continuous assessment and understanding of health system preparedness. This approach is not a one-time effort but an ongoing evaluation and adaptation process. This core element is consistent with the insight from the work of Herstein et al, which found that a continuous cycle of assessing, planning, training, exercising, and revising is vital to maintaining healthcare system preparedness (Herstein et al., 2021). Okyere argues that continuous evaluation of the health system ensures it is equipped with appropriate tools and technologies while remaining flexible enough to adapt to the ever-changing landscape of public health emergencies (Okyere et al., 2024). Moreover, the researcher emphasises that continuous evaluation of the health system facilitates evidence-based decision-making and informs effective policy development. Furthermore, this core strategy also aligns well with the World Health Organisation's "Roadmap for Action for Building Health System Resilience". The framework states that cultivating resilience requires a comprehensive understanding of the current state of the health system.

This involves evaluating the health system's capabilities, identifying gaps, and determining what is necessary to enhance resilience (WHO, 2024e).

The second key element of the conceptual framework is the need to utilise factors that effectively support system preparedness. This encompasses the need for an attitude shift towards optimism to promote internal capacities. A study on health system resilience in fragile, conflict-affected areas highlighted that while adaptive interventions were often prioritised, transformative approaches were rarely discussed. This emphasises the need for a focus on both adaptive and transformative strategies in future research to strengthen health system resilience (Khan et al., 2018a).

This research emphasises the need to shift from a no-resource, no-preparedness attitude (pessimistic/learned helplessness) to a unified adaptive mechanism (optimistic/proactive) to improve preparedness. This change recognises the value of existing resources and promotes resilience in the face of challenges. Recognising the importance of an integrated and sustainable approach in vulnerable settings, Olu et al. developed a public health policy brief titled "Integrated Approaches to COVID-19 Emergency Response in Fragile, Conflict-Affected, and Vulnerable Settings". The authors suggested that public health policymakers, partners, and donors adopt these comprehensive policy options to address emerging public health threats effectively (Olu et al., 2023).

A recent study examining health emergencies in Sub-Saharan Africa, including responses, challenges, and strategies for the future, concluded that the region must adopt a proactive and integrated approach to preparedness and response (Armstrong-Mensah et al., 2025). This aligns with the need for a unified approach proposed in this framework. The use of integrated approaches enables health systems to enhance communication, streamline operations, and utilise resources more effectively. Engaging partners from different sectors, such as public health, emergency services, and community organisations, can foster a more comprehensive and coordinated emergency preparedness strategy (Kapucu et al., 2013).

This research also underscores the need for targeted interventions to address persistent systemic barriers that impede preparedness. This aspect mainly addresses a lack of coordination and collaboration, reluctance to adopt proactive, risk-based approaches, and the tendency to use resource limitations to justify inadequate preparedness, alongside other organisational management challenges. Most importantly, it is necessary to comprehend the implications of tackling the ongoing lack of coordination. This lack of coordination leads to two

types of jeopardy: responses become ineffective, and available resources are depleted, ultimately undermining recovery efforts and obstructing the development of system preparedness. Operating in a resource-constrained environment does not excuse a lack of coordination. This viewpoint aligns with a recent multisectoral preparedness coordination framework developed by the World Health Organisation (WHO), emphasising that effective planning, rather than substantial funding, is key to successful coordination (WHO, 2020f). Therefore, a scarcity of resources should catalyse improved coordination rather than permitting inadequate coordination to worsen the challenges associated with limited resources.

11.6. Strengths and limitations of the research

This research possesses several strengths. First, the research framed the investigated problem (health emergency preparedness) from a systems perspective. This approach allowed for exploring the complexity and interdependence of various factors—an approach that has often been overlooked in previous studies. The plausible adoption of constructivist grounded theory is another notable strength of the research. Additionally, significant efforts were made to rigorously implement the methodology. The data used to inform the conceptual framework were derived from the opinions of experts within the system. This is an important starting point. Documenting managers' perspectives at various levels as part of the system contributed to the validity of the research outcomes. A further strength is developing a conceptual framework derived from the study's findings. This will be instrumental in informing policy and practice in strengthening health systems.

Despite its strengths, the study presents several constraints that the researcher would like to acknowledge. The first limitation of the research is the potential for subjective bias regarding the assessment of system preparedness and current readiness for health emergency preparedness. Further research is needed to interrogate empirical data that will describe the system-wide level of preparedness and help to prioritise future preparedness policy decisions, guided by the conceptual framework developed here. Second, the generalisation of these findings to other resource-poor settings may be limited by the unique context in which the study was undertaken. Incorporating expert opinions from similar resource-poor health systems through methods such as the Delphi technique would have expanded the framework's scope and impact even further, but due to time constraints, this was not feasible.

11.7. Summary

This chapter presented a discussion of the principal findings from the research, aiming to provide contextual insight and clarity regarding these discoveries. Although numerous findings could be explored further, this discussion selectively incorporates only those insights considered most pertinent from a systems perspective and useful in a resource-limited context. The selected key findings are succinctly summarised, analysed, and contrasted with the existing body of literature. The analysis is organised into five subheadings that align with the research objectives. It began with discussing progress in system preparedness and the readiness levels. Subsequent headings delved into the identified enablers and barriers to preparedness, elucidating the interplay among these factors within an increasingly complex, interdependent health system. Finally, the discussion culminated in the discussion of the key elements of the conceptual framework designed to enhance the health system's disaster preparedness.

CHAPTER TWELVE: IMPLICATIONS AND RECOMMENDATIONS

12.1. Introduction

This concluding chapter first summarises the key findings. The findings are summarised across four dimensions: overall system preparedness and current readiness; key enablers of preparedness; key barriers to preparedness; and the interplay among these factors, which together influence the health system's preparedness. Secondly, the chapter offers conclusions drawn from the study. Thirdly, it describes policy, practice, training, and strategic priority implications. Fourthly, the chapter presents actionable recommendations based on the study findings. The recommendations address seven key areas. The first recommendation area focuses on promoting optimism to foster health system emergency preparedness. The second area focuses on fostering inclusive collaboration to improve health emergency preparedness within the health system. The third group of recommendations highlights the need to coordinate health emergency preparedness efforts across sectors and partner organisations within the health system. The fourth area highlights recommendations to address policy implementation gaps in health emergency preparedness. Developing sustainable funding models for health emergency preparedness in the health system constitutes the fifth recommendation area. The sixth area emphasises recommendations for managing changes in the health system to ensure continuity of system preparedness. The seventh recommendation area addresses the need and how to enhance training and education relevant to improving health system preparedness. The eighth group of recommendations focuses on the need to prioritise a resilient health system as a strategic national issue.

12.2. Summary of the findings

The first dimension pertains to the system's preparedness progress and current readiness, summarised under the first emerging category, "Inadequate readiness despite positive progress". Overall, perspectives from key healthcare decision-makers indicate that while there had been notable strides in developing system preparedness, substantial challenges led to insufficient readiness. The specific findings were delineated into three sub-categories. The first sub-category, 'Positive progress in system preparedness', emphasises significant advancements in healthcare infrastructure, workforce development, and improvements in organisational structure. The second sub-category, "Challenges in system preparedness", identifies obstacles such as gaps in policy implementation, inadequate outreach at the grassroots level, and a lack of sustainability in ongoing initiatives. The third sub-category, "Mixed

perceptions regarding system readiness status", reveals that participants held divergent views on the current state of system readiness, ranging from pessimism to optimism. Participants expressed that they could not judge the system's readiness level. Key reasons for this include the absence of a tracking mechanism, robust documentation and communication systems, and comprehensive risk and vulnerability assessments.

The second dimension encompasses findings about the key enabling factors that support ongoing initiatives and enhance the long-term preparedness efforts in the health system. The first set of enablers falls under the second category labelled 'Local adaptive mechanisms'. These enablers include local knowledge and practices rooted in culture, religion, and social cohesion. The second set of enablers is categorised as 'Embracing opportunities emerging from increasing risks', consisting of four additional enablers. The first enabler, 'Heightened awareness as a result of increasing risks', signifies a growing awareness within the community, enhanced attention and commitment from the Ministry of Health, increased political commitment, and improved engagement at both regional and global levels. The second enabler is characterised by 'risk sharing as a motivator for collaboration and solidarity'. The third enabler focuses on 'dedication to global health collaboration to foster emerging solidarity. The fourth enabler is 'development-driven increasing demand for preparedness'. Together, these enablers create a comprehensive framework for understanding how health systems can adapt and flourish amid increasing health threats.

The third dimension comprises barriers to health system preparedness, organised into the remaining five categories. The fourth category encompasses obstacles related to "Weak coordination and poor collaboration", highlighting the need for integrating existing efforts to improve health emergency preparedness. Weak coordination is associated with factors such as a lack of a clear model and philosophy, dedicated leading institutions, overlaps in ownership, and poor communication and documentation systems. Similarly, poor collaboration is attributed to factors such as the lack of shared vision, inattention to system interdependencies, viewing preparedness as the exclusive role of the health sector, and partner organisations' focus and priority areas. The fifth category, 'System instability and change', sheds light on challenges arising from structural flux, the lack of customisation, leadership and staff turnover, and leadership selection and management challenges. These factors impede preparedness by affecting the system's continuity. The sixth category, "Constraints on healthcare resources", addressed significant barriers stemming from a systemic lack of funding for healthcare. This aspect of resource limitation is associated with factors that create competing priorities, including

unmet healthcare and development needs, population growth, and the experience of multiple emergencies. Additionally, the underutilisation of internal resources impacts healthcare resourcing. Factors contributing to this underutilisation include inefficient budgeting and financial systems and negative attitudes toward healthcare funding. These negative attitudes encompass misconceptions about budgeting for preparedness, an over-reliance on partner funding, and the use of resource limitations as an excuse for a lack of preparedness. Together, these attitudes contribute to inadequate available domestic funding. The seventh category, "Low adoption of recommended approaches", highlighted the failure to implement effective resource and response management practices. This section covers perspectives about the 'event-based and reactive approach', 'single-hazard and hazard-focused approach', and 'separate responsibility and the single agency approach'. The eighth category, "Gaps in learning and education", emphasises the failure to learn from past and ongoing emergencies, along with deficits in knowledge and awareness across all levels, including among healthcare leaders.

The fourth dimension comprises the interactions among the various factors that affect health system preparedness. These interactions informed the development of a grounded theory titled "Optimisation of health system preparedness in resource-poor settings". This theory demonstrated that improving preparedness requires a combination of attitude shifts, local adaptations, leveraging global opportunities, and overcoming entrenched barriers. The interactions also contributed to the formulation of the "Enablers and barriers-informed conceptual framework for enhancing health system disaster preparedness", comprising three core strategies. The first aspect of the framework emphasises the importance of periodic assessment and understanding the existing preparedness status. The second core strategy highlights the need to strengthen elements that sustain health system preparedness initiatives. The third central strategy covers addressing the persistent barriers to health emergency preparedness. Collectively, these interconnected strategies reinforce ongoing preparedness initiatives and ultimately enhance overall emergency preparedness across health systems.

12.3. Conclusion

Challenges associated with health emergencies are growing, making effective health system preparedness more important than ever. Adaptable strategies are paramount for establishing resilient healthcare systems. In this regard, this thesis explored the situation in the Ethiopian health system. It offers insights and calls for action from policymakers in the country and other resource-constrained environments. Beyond a call to action, the research provides a framework outlining key strategies to enhance health system preparedness.

The research assessed the preparedness of Ethiopia's health system for health emergencies. It pinpointed key factors that enable the ongoing efforts. Besides this, it delved into key factors that hinder system preparedness. A grounded theory emerged from exploring the interactions between the key influences. The factors at play also contributed to a conceptual framework that describes strategies to enhance preparedness. Based on the findings, it is possible to conclude that, despite strides in the health system in terms of healthcare infrastructure, workforce, and organisational structure, Ethiopia remains inadequately prepared for health emergencies. The conclusion about the inadequacy of readiness is based on healthcare managers' perspectives, which showed pessimism and concern about the insufficient risk and vulnerability assessment, as well as a reactive rather than proactive approach. Lack of integration, weak coordination and collaboration, resource constraints, knowledge gaps, and attitude problems all contribute to the noted inadequacy of readiness level.

The country's health system preparedness can be improved by sustaining ongoing initiatives, leveraging local adaptive strategies, and pursuing opportunities arising from heightened awareness at the local, regional, and global levels. The shared nature of risks, which is gaining traction and support from international partner organisations, offers an opportunity to collaborate internationally within a framework of mutual benefit. Meanwhile, the need for concerted effort to address, especially the central challenges on which the rest of the barriers hinge, is key to building a resilient health system. Coordination issues causing ineffectiveness, ongoing restructuring that contributes to instability in the system, negative attitudes, and low uptake of recommended strategies are the root barriers that need special attention. An important insight for similar resource-poor health systems is the need to overcome the tendency to use resource limitations to justify inadequate preparedness. Another key takeaway is the necessity of shifting from the "no resources, no preparedness mentality" to prioritising available opportunities and leveraging an integrative strategy. Adopting a conceptual framework from this research will support this integrative approach. This integrative approach enhances health emergency preparedness, particularly in resource-poor health systems, by optimising resource acquisition, its utilisation, and management practices.

12.4. Implications of the findings

The contemporary global health landscape demands a well-prepared health system. In this regard, our research reflects policy, practice, training, research, and strategic implications that contribute to strengthening the health system. Considering these implications in the national health strategy will help create a better preparedness and a more resilient health system.

12.4.1. Implications for policy

The first policy implication of this research is the mismatch between a good policy environment and inadequate implementation of those policies. This implies that policymakers must emphasise developing comprehensive mechanisms that ensure policies are disseminated, reach grassroots levels, and are effectively implemented. Further, it reflects the need to establish clear pathways for translating policy intentions into tangible actions. Further, designing and implementing a controlling mechanism, such as robust monitoring and evaluation systems, is paramount. The monitoring and evaluation mechanisms must be designed to provide data-driven insights to adapt and refine strategies as needed, and to measure the effectiveness of policies. Fostering a culture of accountability and continuous improvement increases the likelihood that policies will significantly impact the communities they are intended to serve.

The second policy implication of this research concerns the sustainability of current initiatives and efforts to strengthen health system preparedness. This insight implies that the initiatives need to be institutionalised and supported by sustainable funding models. Policymakers must strategically allocate resources for both immediate projects and, at the same time, prioritise long-term preparedness projects. This balanced approach will ensure that initiatives have a lasting impact rather than serving solely a short-term purpose. In short, considering sustainability as a core principle in planning and implementation helps create a framework that enables ongoing efforts to build a resilient health system.

The third policy implication of this research focuses on the need for policy intervention in coordination and collaboration issues. This research showed the critical need to address the ongoing lack of coordination and collaboration, whether originating within or outside the health system. This finding hints at a serious policy intervention to ensure the availability of strong, dedicated institutional frameworks that address coordination and collaboration issues by fostering shared visions, platforms, and communication channels. Addressing coordination issues will solve numerous related challenges. For instance, a well-coordinated system solves the problem of duplicate efforts. A coordinated approach also improves collaboration among entities. It overcomes the ongoing disconnect between healthcare and overall emergency management systems. The observed limitations in partner organisations' collaboration signal the need for integrative policies that incentivise partnerships, facilitate information-sharing platforms, and align missions and visions. Such an integrative approach ensures a collective response to the complex challenges faced within healthcare systems. Overall, having a

dedicated, robust lead institution in emergency management will improve resource allocation and response effectiveness.

The fourth policy implication of this research is the need to consider local adaptation and community solutions in national health system strategies. Prioritising and integrating local adaptive mechanisms into policy frameworks helps foster community engagement, a powerful resource in emergency management. Ensuring community engagement could be the best strategy to address the sustainability concerns mentioned earlier. A policy framework rooted in local knowledge and practice could address the policy implementation gaps identified in this research. This approach enhances the effectiveness of health interventions and builds community resilience and ownership over their health matters. In a nutshell, a policy that nurtures grassroots knowledge and practices fosters environments in which communities are not passive recipients of prescribed solutions but become active participants in their own health and well-being.

12.4.2. Implications for practice

Besides policy, the practice implications of findings about poor collaboration show implications for practice. Unified response capability can only be ensured if collaboration among sectors—including healthcare, emergency services, environmental agencies, and community organisations —is strengthened. This requires establishing multi-disciplinary teams to develop integrated response plans, exercise them, implement them in real emergencies, and evaluate their effectiveness. Establishing effective communication channels is necessary for emergency management. It's crucial to clearly define the shared responsibilities of everyone involved in these roles. Regular inter-agency meetings and collaborative exercises can significantly enhance mutual understanding and foster teamwork. Moreover, involving community partner organisations in the planning and decision-making processes is vital. Their active participation contributes to the development of effective emergency management strategies. Engaging with community members through town hall meetings, focus groups, and outreach initiatives is essential for gathering various perspectives. This inclusive approach builds trust and ensures that the solutions crafted are tailored to the specific needs and concerns of the community. Investing in community resilience is crucial for a robust emergency response. Equipping local leaders and organisations with training and resources empowers them to take charge of preparedness efforts. This empowerment fosters a sense of responsibility among residents, ultimately enhancing their ability to cooperate during challenges. In summary, planning together and joint training exercises improve interoperability among different sectors. Involvement

evaluation of the implementation reinforces partnerships for future work. This cycle of togetherness cultivates a culture of collaboration and enhances the overall response efforts.

The findings regarding the observed low adoption of recommended management practices carry significant implications for practice. Following evidence-based practices and approaches ensures resource and response-effective strategies are implemented in preparing for and responding to emergencies. Health systems should favour multi-hazard frameworks that recognise the interplay among different types of emergencies. However, it should be noted that this holistic approach requires a thorough understanding of how different hazards can interact.

Understanding the impact of simultaneous emergencies on long-term preparedness requires an integrated approach. Concurrently handling multiple emergencies depletes resources. As the response phase is prioritised for specific events, it also diverts attention from future, comprehensive, and long-term preparedness. Therefore, these findings imply the necessity of a fundamental shift in focus from merely identifying individual hazards to embracing a comprehensive risk-based approach that evaluates the likelihood and potential impact of various forms of hazards, including important but under-prioritised hazards. In short, the health system should be guided by comprehensive risk assessments that systematically evaluate a wide range of potential threats.

This research found that the emergency management approach is largely reactive rather than proactive. A reactive approach leads to ineffectiveness both in terms of response and resources. In the case of critically resource-limited settings, this means the available resources will be depleted in unplanned responses. This will affect long-term preparedness efforts. The reactive approach to emergencies indicates the absence of proactive emergency preparedness plans that are informed by comprehensive risk and vulnerability assessments. Preparedness plans that incorporate strategies to prevent emergencies, prepare for them, mitigate their impacts, and ensure quick recovery must be in place at all levels. Developing a preparedness plan alone may not bear fruit. The plans must be tested, revised, well communicated and budgeted ahead of various eventualities. An important focus should be placed on implementing ongoing training sessions and simulation exercises, which are vital for preparing staff, community members, and all partner organisations to respond effectively to various emergencies. Integrating comprehensive risk and vulnerability assessments, proactive planning, adopting multi-hazard strategies, and fostering collaborative efforts across sectors and communities will create a well-prepared, more resilient system.

The last practice implication of this research is the need to balance change and stability in the health system. This research noted that the frequent restructuring of health systems jeopardises the continuity of system preparedness. Given that preparedness is not a one-time program, such instability could negatively impact the continuity of system preparedness. This underscores the necessity for a balanced practice. In other words, ensuring the drive for change does not undermine the stability of ongoing preparedness and effective response. While adjustments and responses to evolving health challenges are often necessary, policymakers must implement them cautiously. When considering modifications to existing structures and processes, decisions should be guided by thorough analysis. The analysis helps determine the pros and cons of that change. If changes are necessary, the analysis may inform strategies that spare the ongoing effort to strengthen health system preparedness. Adhering to this method can help ensure that current initiatives remain sustainable while allowing necessary changes to adapt to the evolving situation.

12.4.3. Implications for training

The identified knowledge and awareness gaps indicate a pressing need for relevant training programs that equip emergency responders with the necessary knowledge, skills and attitudes. Training should also involve healthcare leadership, managers, local administrative and political leadership and policy makers. This is because increased focus on developing leadership's understanding of emergency protocols helps navigate the emergency management cycles, including effectively guiding response teams. Notably, knowledge deficiencies among healthcare workers suggest that health emergency management should be incorporated into the health science training curriculum. Moreover, the disparities in awareness across sectors show the need for an interdisciplinary educational approach. Furthermore, this research found that assigning leadership to key positions lacks a merit-based approach. In addition, the professional mix in leading institutions lacks balance. This, in other words, indicates that ensuring the availability of already trained professionals in key positions across all levels will ease challenges created due to knowledge and technical skill gaps.

12.4.4. Implications for research

This research project has been undertaken within a defined time frame and limited budget, implying the availability of areas needing further research. This research primarily looked into how health emergency preparedness has been progressing. In addition, it assessed how healthcare managers, as part of the system, evaluate the Ethiopian health system's capacity to respond to unforeseen events. The participants' insights show mixed perceptions of current

readiness levels. The insights obtained will have their own importance for policy and practice; however, they do not reflect the exact readiness level. Therefore, rigorous evaluation studies that meticulously assess the positive progress, challenges, in current health initiatives and overall readiness levels in quantifiable terms. In-depth and independent exploration of the underlying factors contributing to successes and failures will be essential. Health system preparedness is a multifaceted issue that intersects with various disciplines. In this case, the role of involving social sciences, economics, environmental science, and public policy cannot be overstated. Adopting interdisciplinary approaches that address diverse perspectives will create a more comprehensive understanding of preparedness. For instance, insights from sociology could shed light on community dynamics. An economic analysis might focus on cost-effectiveness and resource allocation strategies. Conclusively, integrating knowledge from different disciplines helps better address the complexities of health system preparedness and devise more holistic solutions that consider the interplay of various factors influencing health outcomes. This type of evaluation provides a more robust evidence base to inform policy decisions.

Another area of research arising from this research is in relation to the proposed approach that promotes an attitude shift towards optimism. This research emphasised the necessity of changing the scarcity-driven attitude that prioritises external and distant resources. As this research indicates, a scarcity attitude leads to a cycle of ill-preparedness, reactive measures, and ineffectiveness rather than building a prepared and resilient health system. Fostering an attitude of optimism helps view challenges as opportunities for innovation and collaboration, ultimately leading to better utilisation of existing resources. Shifting to an optimistic outlook is not merely about encouraging positivity but about fundamentally rethinking how local resources can be mobilised and optimised. It is about exploring and leveraging local knowledge and practices. It is about ensuring sustainability. Overall, it encourages looking beyond conventional funding models. For instance, involving partner organisations, such as local businesses or community organisations, can create a more holistic and robust emergency response framework.

What needs further research here is how the desired attitude can be cultivated, especially in the context where a scarcity attitude is widely accepted by both donors and recipients due to genuine resource shortages. This makes it challenging to cultivate a culture of optimism and resourcefulness. To address this, further research that explores strategies that can effectively shift attitudes in these challenging environments is needed. This could involve case studies of successful interventions on resilience-building. Another example is looking into the cultural

factors that inhibit or promote optimistic thinking. The approach for research in this area could vary, but the goal should be to create actionable frameworks that health systems can adopt, even when resources are limited. This lays the groundwork for sustainable emergency preparedness initiatives.

Further investigation into local adaptive mechanisms is also necessary. This research did not delve deeper into the local adaptive mechanisms that have proven successful in various contexts. This implies the need for more research in similar resource-poor contexts to uncover insightful strategies tailored to specific environments. This understanding can significantly inform scalable best practices to enhance preparedness in similar resource-poor settings. Examining the specific local knowledge, practices, and cultural contexts underlying these mechanisms may yield valuable insights that can be harnessed to design interventions to improve resilience and healthcare systems.

The enablers and barriers that informed the conceptual framework developed in the present research will inform policy and practice. However, the framework can still be made more impactful through further research. For example, further research that facilitates expert opinions may improve the framework. Future studies validating the framework could improve its acceptability and applicability across diverse contexts. Moreover, the enablers and barriers to health system preparedness that informed the conceptual framework were grounded in the Ethiopian health system context. The prospects and challenges of health emergency preparedness in a resource-poor context might have similarities, if not exactly the same ones. This indicates that the framework still can work in similar contexts. However, further studies that investigate the specific barriers and enablers affecting one's health system can yield greater policy impacts.

12.4.5. Strategic implication

The discourse on strengthening health system preparedness extends beyond the healthcare sector, making the findings of this study more useful in a broader context. Health emergency preparedness enhances health systems' ability to respond effectively to emergencies such as disease outbreaks, pandemics, natural disasters, and other humanitarian crises. However, strengthening health system preparedness surpasses responding to emergencies. This is because health system preparedness is an integral part of a resilient health system, which in turn contributes to overall national resilience.

In Ethiopia, the importance of health emergency preparedness as an instrument to ensure health system resilience has never been more important than it is now. The country's contemporary socio-economic and political context underscores the importance of a resilient health system far beyond the healthcare sector. Ethiopia confronts challenges related to rapid population growth. More worrisome is not only the population growth rate. There are no proper control mechanisms in place at the policy level or in practice. Having remained at the lowest level for many years, the country's economic level is not rising at the required speed. The country remains at risk of conflicts driven by internal instability and geopolitical uncertainties. The promising economic developments registered over the past few decades have not continued due to recurrent conflict. In addition to damaging achieved economic growth, conflict is diminishing productivity. Combined, they are putting the wider population at worrisome risk of poverty. Continuing fragility of the health system in this context is a real national disaster. These unfolding vulnerabilities and growing risks of health emergencies position preparedness as a priority in the national health system strategy.

A robust health system ensures access to essential medical care during emergencies while maintaining critical health services for the population's well-being. Resilient health systems are the cornerstone of the broader national resilience framework. Primarily, a resilient health system supports overall national disaster management. A resilient health system contributes to the resilience of interconnected sectors, including infrastructure, security, business, tourism, education, agriculture, and services. Health system resilience ultimately contributes to societal stability, economic recovery, and sustainable development. This is the reason why health system resilience should be viewed as a strategic national issue.

In conclusion, establishing health system resilience as a national strategic priority in Ethiopia is crucial than optional. The complexities of the current socio-economic landscape, characterised by demographic shifts, evolving public health burdens, economic challenges, and the constant threat of health emergencies, necessitate a coordinated approach to health system preparedness. Recognising that health system preparedness is integral to national stability and progress can help stakeholders work towards a vision where health and resilience are embedded in every aspect of societal development. This strategic focus will ultimately contribute to a more robust Ethiopia, equipped to face current challenges and future uncertainties.

12.5. Recommendations

The findings from this research illuminate several key implications for policy, practice, training, future research, and national strategic priorities. Based on these implications, specific actionable recommendations have been forwarded. Policymakers, healthcare decision-makers within the Ministry of Health, academic and research institutions, and NGOs working to strengthen preparedness within health systems can utilise the following recommendations, presented under seven key areas.

12.5.1. Promoting optimism to foster health system emergency preparedness

1) Encourage health systems to adopt an optimistic approach that helps leverage existing resources, including local knowledge and practices

2) Implement training sessions and workshops for healthcare planners and policymakers to promote proactive resource management and foster a culture of creativity and resourcefulness.

3) Document and share success stories of innovative solutions that emerged from limited resources to inspire the healthcare community working elsewhere in the system.

12.5.2. Fostering collaboration to improve health system preparedness

1) Establish innovation hubs promoting collaboration between local companies and academic institutions to develop pilot projects that address specific healthcare issues.

2) Establish clear protocols for collaboration among healthcare entities, including developing standard operating procedures that enable seamless communication and coordination during emergencies and proactive planning.

3) Encourage investment from private entities by showcasing successful models where public-private partnerships have enhanced long-term sustainability.

4) Facilitate business partnerships with health initiatives to foster shared ownership of outcomes.

5) Create networks or forums at national and subnational levels to exchange experiences related to emergency preparedness, identify common challenges, and develop successful strategies.

6) Encourage cross-training initiatives among staff from various institutions to facilitate knowledge exchange and collaboration during emergencies.

7) Continuously assess the effectiveness of collaborative strategies and community engagement efforts, using findings to refine and adapt methods to improve overall emergency preparedness outcomes.

8) Develop a proactive framework to identify and assess potential opportunities arising from global health challenges.

9) Promote a collaborative attitude among partner organisations, emphasising the importance of mutual benefit in resource acquisition and emergency response efforts.

12.5.3. Coordinating efforts of health emergency preparedness across sectors

1) Create dedicated coordinating bodies to facilitate collaboration among healthcare entities, including the health sector, private sectors, communication networks, critical services, and community organisations.

2) Create training opportunities for partner organisations from different sectors (healthcare, social services, education, etc.) to facilitate better understanding and coordination. Programs can be modelled on successful interdisciplinary training experiences that have improved service delivery.

3) Establishing strong institutions that promote a shared vision, platforms, and communication channels among partner organisations can reduce duplication of efforts and enhance coordination and collaboration. It is essential to further explore the reasons behind this ongoing disconnect, especially in resource-constrained areas.

4) Develop and apply a standardised evaluation framework to assess the ongoing health initiatives. This framework should incorporate qualitative and quantitative measures to capture the outcomes, community context, stakeholder satisfaction, and long-term sustainability of these initiatives.

12.5.4. Addressing policy implementation gaps related to health emergency preparedness

1) Make policy formulation more inclusive of healthcare experts, healthcare workers, personnel from monitoring and evaluation, and community leaders.

2) Revise policies and guidelines to tailor to real contextual situations rather than copying and pasting

3) Communicate each policy and guideline development stage, including up to end users.

4) Organise evidence-based workshops with policymakers, healthcare professionals, and community leaders to identify gaps in policy implementation using real-life case studies and data to guide discussions.

5) Establish a system within the monitoring and evaluation framework where community partner organisations can regularly provide feedback on policy implementation. This can be done through surveys or focus groups to ensure continuous adaptation based on community needs.

6) Conducting action research can facilitate comprehensive assessments that identify unidentified obstacles and develop strategies to overcome these barriers.

12.5.5. Developing sustainable funding models for health emergency preparedness

1) Prioritise adequate domestic healthcare funding and critically assess how existing resources are being utilised within these limitations.

2) Advocate for increased investment in healthcare and transparent, accountable resource allocation to fortify health emergency preparedness's financial underpinnings.

3) Provide facilitations for businesses to partner organisations with health initiatives to foster shared ownership of outcomes.

4) Develop a funding model that prioritises multi-year financial commitments to support projects committed to sustainability.

5) Reverse the negative outlook on healthcare funding, which is a critical aspect of health emergency preparedness. Engaging partner organisations in discussions about prioritising health emergency preparedness can drive the necessary reforms.

12.5.6. Managing changes to ensure continuity of health emergency preparedness

1) Develop specific, measurable indicators for projects, focusing on aspects such as community engagement, resource mobilisation, and outcome measures. Use evidence from successful programs to inform these indicators.

2) Before fully implementing systemic changes, pilot them in a controlled environment to assess their impacts on preparedness. Use data from these pilot tests to guide broader policy adjustments, ensuring that changes stabilise the health system rather than disrupt it.

3) Create a structured tool for analysing the potential impacts of proposed changes on health system preparedness, based on existing evidence and metrics.

12.5.7. Enhancing training and education to improve preparedness of the health system

1) Implement regular joint drills and scenario planning exercises among healthcare teams to enhance overall preparedness. Focus on familiarising participants with each other's protocols and communication styles and identifying potential weaknesses in response efforts.

2) Implement structured training programs for healthcare workers and multidisciplinary teams, focusing on emergency preparedness, resilience building, and adaptability to evolving health challenges. s

3) Develop comprehensive plans based on lessons learned from previous incidents to better prepare for similar situations in the future.

4) Ensure that training is ongoing and adaptive to reflect the dynamic nature of health threats to maintain a well-prepared workforce.

5) Promote collective learning across healthcare institutions by facilitating knowledge sharing and experiential learning.

6) Conduct thorough analyses of past emergencies and management strategies to improve future responses, identifying successful approaches and areas for enhancement.

7) Establish mechanisms to incentivise academic institutions to allocate budget resources for prioritising training in emergency preparedness.

12.5.8. Prioritising a resilient health system as a strategic national issue

1. In light of the chain of contribution among health emergency preparedness, resilient health system, and the national resilience, prioritise the development of a resilient health system as a national strategic issue rather than solely a health sector concern.

2. Strengthen the sustainability of health emergency preparedness from the perspective of fostering resilience against the intertwined socio-economic and political security challenges facing the country, rather than viewing it as a one-time event-based initiative.

12.6. Summary

This chapter presented a summary of findings obtained from this research to enable the readers to get the findings altogether. The chapter then presented conclusions drawn from the findings. Subsequently, the chapter outlined the study's policy, practice, training, and research implications. Lastly, it outlined the forwarded recommendations under several key areas, including prioritising resilient health system as national strategic issue, promoting optimism, fostering inclusive collaboration, coordinating the efforts across sectors and partner organisations in the health system, developing sustainable funding models, managing changes in the health system to ensure continuity of system preparedness, and enhancing training and education relevant to improving health system preparedness. Overall, the recommendations offer valuable input across various entities working to strengthen health system preparedness and resilience.

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APPENDICES

Appendix 1: English Version Initial Interview Schedule

![Flinders University logo]

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PART I: INTRODUCTION

My name is Ashenafi Habte. I am a PhD student at Flinders University (Australia). I am undertaking my PhD project titled "Exploring Health Emergency Preparedness from a System Perspective: Implications for Resource-Poor Health System Resilience." This research investigates the enablers and barriers to health emergency preparedness within the Ethiopian health system. Identifying these factors will be valuable to enhancing our preparedness as a country. Therefore, I encourage you to give me detailed responses from your perspective and understanding.

This in-depth interview has four main parts. First, we will discuss your personal and professional background and experiences relevant to health emergency preparedness. Next, we will discuss general inquiries about the health system's preparedness for emergencies. Then, we will discuss system-level enablers and barriers to health emergency preparedness within Ethiopian healthcare.

In this in-depth interview, we repeatedly use two broader terminologies. These are:

1. "**Health Emergencies**"—The term "health emergencies" refers to the health threats associated with new or newly emerging diseases, the accidental release or deliberate use of biological, chemical, or radio-nuclear agents, natural disasters, human-made disasters, complex

emergencies, conflicts, and other events with a potentially catastrophic impact on human health, including the potential implications of climate change.

2. "**Health system**" - the term health system refers to "a complex system of organisation of people, institutions, and resources that deliver health care services to meet the health needs of target populations. WHO describes the health system as six building blocks involving (1) the health workers, (2) service delivery, (3) health information, (4) medical products, technology, and vaccines, (5) health finance, and (6) governance and leadership.

Again, I appreciate your commitment to talking with me about health emergency preparedness in the Ethiopian health system. There are no right or wrong answers, and your responses will help me understand more about the enablers and barriers to preparedness.

The interview will take about 45-60 minutes. You may stop the interview at any time and choose not to answer any question you would prefer not to answer. Your responses will be recorded. Is that okay for you?

Before we start, let me know your language preference for this interview [English, Amharic, or Afan Oromo?]

Do you have any questions before we start?

PART II: BIOGRAPHY OF THE PARTICIPANTS

1. Can you describe your personal, academic, and professional background?

1.1.   Would you first introduce yourself?

- Title, name, gender, age, address
- Profession, your maximum level of education

1.2.   Can you tell me your relevant experiences?

- Total years of experience
- What experience related to health emergency preparedness do you have?
- What is your specific role in health emergency management?
- Can you tell me more about your area of professional expertise?

1.3.   Would you tell me more about your current organisations and their role?

- Please provide me with more detailed information about your current organisation.
- Tell me the role of your organisation in health emergency preparedness.
- What is your current role/responsibility in the organisation?
- How long have you been in this role?

PART III: THE PROGRESS AND STATUS OF THE DEVELOPMENT OF HEALTH EMERGENCY PREPAREDNESS

2. **Can you explain your understanding of the progress made in the development of the Ethiopian health system in relation to preparedness for health emergencies?**

2.1. What do you think of the importance of viewing health emergency preparedness at the system level?

   Probe: If you think it is important, how do you think it is important?

2.2. Do you think health emergency preparedness is being viewed at the system level in Ethiopian healthcare?

   Probe: If not, what is some of your evidence?

2.3. Is strengthening the health system's preparedness for health emergencies more important than ever?

   Probe: Please elaborate on the necessity of current and future health emergency preparedness from the global, continental, and national perspectives.

2.4. How would you characterise the Ethiopian health system's overall preparedness for health emergencies? Please share both strengths and weaknesses.

2.5. What are the current improvements in the Ethiopian health system related to health emergency preparedness?

   Probe: What specific improvements do you see in terms of (1) the health workers, (2) service delivery, (3) health information, (4) medical products, technology, and vaccines, (5) health finance, and (6) governance and leadership?

2.6. What noticeable progress have you observed in emergency preparedness at your organisational level?

   Probe: What specific achievements are you particularly proud of?

   Probe: Have you seen improvements in infrastructure, resources, or training programs that enhance preparedness?

   Probe: Can you describe any specific task forces or initiatives that have been established to improve health emergency preparedness? What outcomes have emerged from these efforts?

Probe: How has the organisational structure of the health system evolved regarding emergency preparedness? Are there new roles or relationships that have been established?

2.7. What do you identify as the most pressing challenges facing the Ethiopian health system in preparing for health emergencies?

Probe: Are there specific gaps in policy implementation that hinder preparedness?

Probe: Do you perceive a disconnect between national emergency preparedness initiatives and their implementation at the grassroots level?

2.8. How do these challenges affect the overall readiness of the health system to respond to emergencies?

2.9. Can you provide examples of challenges you have encountered in your role that illustrate these systemic issues?

3. How would you evaluate the current state of readiness within the healthcare system to respond effectively to health emergencies?

3.1. What specific elements contribute to your perception of the system's readiness?

3.2. Are there particular incidents that inform your perspective?

3.3. Do you believe there are differing perceptions of readiness among various stakeholders (government, NGOs, healthcare workers)? If so, how do these views differ?

PART IV: ENABLERS OF HEALTH EMERGENCY PREPAREDNESS IN THE ETHIOPIAN HEALTH SYSTEM

4. What are the key factors that can enhance the preparedness of the Ethiopian health system for health emergencies?

4.1. Regarding health emergency preparedness, what do you think is currently working well in the Ethiopian health system?

Probe: Which aspect of the Ethiopian health system do you think is enabling enhanced health emergency preparedness?

4.2. What are the enablers of preparedness for health emergencies from the perspective of the Ethiopian Health system?

Probe: What specific enablers of health emergency preparedness do you see in the Ethiopian health system, in terms of (1) the health workers, (2) service delivery, (3) health

information, (4) medical products, technology, and vaccines, (5) health finance, and (6) governance and leadership?

4.3.   What enablers do you see in the system in relation to national policies, laws, directives, and political commitment?

4.4.   What enablers do you see from regional and international perspectives, including in relation to interregional and international cooperations, importing demands, neighbouring countries' experiences, international agreements and regulations, global health, and development agendas?

4.5.   What are the health emergency preparedness enabling factors from the perspective of national, regional, and international partner organisations working in Ethiopia?

4.6.   Do you think there are Indigenous socio-cultural and religious attributes that could serve as enablers of health emergency preparedness?

   Probe: If YES, could you mention some of them?

4.7.   In addition to what we have discussed, would you like to share anything else with me about the enablers of preparedness?

PART V: BARRIERS OF HEALTH EMERGENCY PREPAREDNESS IN THE ETHIOPIAN HEALTH SYSTEM

5.   What are the key factors that are currently limiting the preparedness of the Ethiopian health system for health emergencies?

5.1.   What do you think is wrong with the Ethiopian health system in relation to health emergency preparedness (Structural, functional, organisational, coordination, contextual aspects)?

5.2.   Do you think the Ethiopian health system is conducive to adequately strengthening health emergency preparedness?

   Probe: If not, please elaborate in more detail.

5.3.   What specific barriers to health emergency preparedness do you see in the Ethiopian Health system?

   Probe: What specific barriers do you notice in the system in terms of (1) the health workers, (2) service delivery, (3) health information, (4) medical products, technology, and vaccines, (5) health finance, and (6) governance and leadership?

5.4.   How do you elaborate on these barriers in relation to the country's policies (health system, education, and training), legal framework (legislations, constitution, laws, and other directives), and context (resources, political commitment, socioeconomic, cultural, and religious aspects)?

Probe: Have you noticed that there are possible interdependencies among these factors that can become barriers to health emergency preparedness?

Probe: What do you think are possible strategies to tackle these challenges?

5.5.   Do you think there are other obstacles to health emergency preparedness from the perspective of national, regional, and international partner organisations (e.g., geopolitical influences and priority issues related to global health agendas)?

Probe: If YES, could you explain how they are obstacles?

Probe: What do you think are possible strategies to tackle these challenges?

5.6.   In addition to what we have discussed, would you like to share anything else with me about the barriers to preparedness?

PART VI: CLOSING

- I have completed my interview for this round!
- Do you have any questions for me in today's interview?
- Thank you for your time.
- I hope we will meet again for the next round of interviews.

Participant:

Signature: _____

Name: _____

Date: _____

Data collector:

Signature: _____

Name: _____

Date: _____

Appendix 2: Amharic Version Initial Interview Schedule

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በኢትዮጵያ የጤና ጥበቃ ስርዓት ውስጥ ለጤና ድንገተኛ ዝግጅት አስተዋጽኦ የሚያደርጉ ነገሮችና ሊኖር የሚችሉ እንቅፋቶችን ለመመርመር የተዘጋጀ የመጀመሪያ ቃለ መጠይቅ

ክፍል 1: መግቢያ

- ስሜ አሻናፊ ሀብቴ ይባላል። በፍሌንደርስ ዩኒቨርሲቲ (አውስትራሊያ) የዶክትሬት ዲግሪ ተማሪ ነኝ። በኢትዮጵያ የጤና ጥበቃ ስርዓት የጤና ድንገተኛ አደጋዎች ዝግጅት ላይ የዶክትሬት ፕሮጀክትን እየሰራሁ ነው።

- የዚህ ጥናት ትኩረት በኢትዮጵያ የጤና ጥበቃ ስርዓት ውስጥ ለጤና ድንገተኛ ዝግጅት አስተዋጽኦ የሚያደርጉ ነገሮችና ሊኖር የሚችሉ እንቅፋቶች መመርመር ነው። እነዚህን ነገሮች ለይቶ ማወቅ እንደ አገር ያለንን ዝግጁነት ለማሳበት ጠቃሚ አስተዋፅኦ ይኖረዋል። እንግዲህ ዝርዝር ሀሳቦች/ነጥቦች ዘገባዎችን ከእርስዎ እይታ አመለካከት እና መረዳት እንድትሰጡኝ አበረታታለሁ።

- በዚህ ቃለ መጠይቅ ውስጥ ሁለት ሰፋፊ ጽንስ-ሀሳቦችን ያቀፈ ሁለት ቃላት ("የጤና ድንገተኛ አደጋዎች" እና "የጤና ጥበቃ ስርዓት") የሚሉት በተደጋጋሚ እንጠቀማለን።

- "የጤና ድንገተኛ አደጋዎች" - የሚለው ቃል ከአዳዲስ ወይም አዲስ ከመጡ በሽታዎች ጋር ተያይዘው ብቅ የሚ የሚመጡ የጤና ስጋቶችን፣እና በአጠቃሚ ወይም በባዮሎጂያዊ፣ በኬሚካል ወይም በሬዲዮ-ኑክሌር ምክንያት ጋር ተያያችነት ያላቸው አደጋዎች, በተፈጥሮ አደጋዎች፣ በሰው ሠራሽ አደጋዎች፣ ውስብስብ የሆኑ ድንገተኛ አደጋዎች፣ ግጭቶችና አየር ንብረት ለውጥ ጋር ተያያችነት ያላቸውን ሌሎች ክስተቶች ጨምሮ በሰው ልጅ ጤንነት ላይ ተጽእኖ ሊያስከትሉ የሚችሉትን አደጋዎች ያመለክታል።

- "የጤና ጥበቃ ሥርዓት" - የሚለው ቃል የጤና አገልግሎት የሚሰጡ ሰዎችን፣ ተቋማትን እና ሀብቶችን ያቀፈ ውስብስብ ሥርዓት ነው። በዓለም ጤና ድርጅት ፍቺ መሰረት *የጤና ጥበቃ ስርዓት* ማለት (1) የጤና ሠራተኞችን ፣ (2) አገልግሎት መስጠትን ፣ (3) የጤና መረጃን ፣ (4) የሕክምና ውጤቶችን ፣ ቴክኖሎጂና ክትባቶችን ፣ (5) የጤና ፋይናንስ እና (6) የጤና አጠባበቅ ስርዓት አስተዳደር የሚመለከቱ ስድስት ሕንፃዎች እንደሆነ ገልጿል።

- ይህ ቃለ መጠይቅ 4 ዋና ዋና ክፍሎችን ይዟል።

- የእርስዎ የግል ተምክሮዎች በተለይ ከጤና ድንገተኛ አደጋዎች ዝግጅት ጋር ተያያዥነት ያላቸው:

- አጠቃላይ ጥያቄዎች የጤና ድንገተኛ ዝግጁነት አስፈላጊነት እና በኢትዮጵያ የጤና አጠባበቅ ሥርዓት ውስጥ ዝግጁነት ደረጃ:

- በኢትዮጵያ የጤና አጠባበቅ ውስጥ ለጤና ድንገተኛ አደጋዎች ዝግጁነት አስተዋጽኦ የሚያደርጉ ነገሮችና

- በጤና አጠባበቅ ስርዓት ውስጥ ሊኖር የሚችሉ የጤና ድንገተኛ እንቅፋቶች ዝግጁነት እንቅፋቶች

- በኢትዮጵያ ጤና አጠባበቅ ስርዓት ውስጥ ስለ ጤና ድንገተኛ አደጋ ዝግጁነት ከእኔ ጋር ለመነጋገር የገባችሁትን ውሳኔ በድጋሜ አደንቃለሁ ።

- በዚህ ቃለ መጠይቅ ውስጥ: ትክክልም ሆነ የተሳሳተ መልስ የለም፤ የእርስዎ ምልሾች ለጤና ድንገተኛ አደጋዎች ዝግጁነት አስተዋጽኦ የሚያደርጉ ነገሮችና ሊኖር የሚችሉ እንቅፋቶች የበለጠ ለመረዳት ይረዳናል።

- ቃለ መጠይቁ ከ40-60 ደቂቃ ያህል ይወስዳል። ቃለ መጠይቁን በማንኛውም ጊዜ ልያቆሙ ይችላሉ፤

- በዚህ ቃለ መጠይቅ ውስጥ የእርስዎ ምልሾች ይመዘግባል: እንዲሁ ድምጽዎ ይቀዳል, ፈቃደኛ ነዎት?

- ከመጀመሬ በፊት ለዚህ ቃለ መጠይቅ የቋንቋ ምርጫችሁን አሳውቀኝ [እንግሊዝኛ ወይስ አማርኛ ወይም አፋን ኦሮሞ]?

- ከመጀመራችን በፊት ጥያቄ አለዎት?

ክፍል 2: የተሳታፊዎቹ የሕይወት ታሪክ የግል ተሞክሮዎች የሕይወት ታሪክዎ (ስም, ያታ ዕድሜ, ሙያ, ርዕስ, ጠቅላላ ዓመት ልምድ):

1. የግል፣ የትምህርት ና የሙያ አስተዳደጋችሁን ልትንግሩኝ ትችላላችሁ?

1.1. በመጀመሪያ ራስህን ማስተዋወቅ ትችላለህ?
    - ርዕስ, ስም, ያታ, ዕድሜ, አድራሻ
    - ሙያ, የእርስዎ ከፍተኛ የትምህርት ደረጃ

1.2. ተያያዥ ተሞክሮዎችህን ልትነግረኝ ትችላለህ?
    - ጠቅላላ ዓመታት ልምድ
    - ከጤና ጋር በተያያዘ ከድንገተኛ አደጋ ጋር በተያያዘ ምን ተሞክሮ አለህ?
    - የጤና ድንገተኛ አደጋን በማስተዳደር ረገድ ምን የተለየ ድርሻ አለህ?
    - ስለ ባለሙያ ክህሎትዎ አካባቢ ተጨማሪ ልትንግሩኝ ትችላላችሁ?

1.3. ስለአሁኑ አደረጃጀትህና ስለድርሻው ተጨማሪ ትነግሩኛላችሁ?
    - እባክዎ ስለ ወቅታዊ ድርጅታችሁ ተጨማሪ ዝርዝር መረጃ ይንገሩኝ።
    - የእርስዎ ድርጅት በጤና ድንገተኛ ዝግጁነት ውስጥ ያለውን ሚና ንገሩኝ.
    - በድርጅቱ ውስጥ አሁን ያለዎት ሚና/ኃላፊነት ምንድን ነው?

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o አንተስ በዚህ ሥራ ላይ የቆየኸው ለምን ያህል ጊዜ ነው?

ክፍል 3: አጠቃላይ ጥያቄዎች የጤና አስቸኳይ ዝግጁነት አስፈላጊነት እና ዝግጁነት ደረጃ

2. **ለጤና ድንገተኛ አደጋዎች ከመዘጋጀት** *ጋር* **በተያያዘ** በኢትዮጵያ የጤና አጠባበቅ ስርዓት ልማት ላይ ስለተደረገው መሻሻል ያለዎትን ግንዛቤ ማስረዳት ትችላላችሁ?

2.1. የጤና ድንገተኛ አደጋ ዝግጁነትን በስርዓት ደረጃ መመልከት አስፈላጊ ይመስላችኋል?

ጨማሪ ምርመራ: አስፈላጊ ከሆነ፣ አስፈላጊነት ምንድን ነው ብለው ያስባሉ?

2.2. የጤና ድንገተኛ ዝግጁነት በኢትዮጵያ የጤና አጠባበቅ ስርዓት ወስጥ በስርዓት ደረጃ እየታየ ያለ ይመስላችኋል?

ጨማሪ ምርመራ: ካልሆነ አንዳንድ ማስረጃዎች ምንድን ናቸው?

አይደለም ከሆነ፣ ምክንያቶቹ ምንድን ናቸው ብለው ያስባሉ?

2.3. በጤና አጠባበቅ ሥርዓት ወስጥ የጤና ድንገተኛ አደጋ ዝግጁነትን ማጠናከር ከመቼውም ጊዜ ይበልጥ አስፈላጊ ይመስላችኋል?

2.4. እባክዎ አሁን ያለውንና የወደፊት ዝግጁነት ከዓለም አቀፍ፣ አህጉራዊና አገራዊ አስፈላጊነት አኳያ ያብራ

2.5. የኢትዮጵያ የጤና አጠባበቅ ሥርዓት ለጤና ድንገተኛ አደጋዎች አሁን ያለውን ዝግጁነት እንዴት ያዩታል?

2.6. በኢትዮጵያ የጤና አጠባበቅ ስርዓት አሁን ያለው የጤና አደጋ ዝግጁነት እየታየ ካለው ፍላጎት ያለው እንዴት ይመዝናል?

2.7. በኢትዮጵያ የጤና አጠባበቅ ስርዓት የጤና ድንገተኛ ዝግጁነት ላይ በአሁኑ ወቅት እየተሻሻሉ ያሉት ነገሮች ምንድን ናቸው?

ተጨማሪ ምርመራ: በተለይ፡ በ (1) በጤና የሰው ኃይል፣ (2) አገልግሎት አሰጣጥ፣ (3) የጤና መረጃ፣ (4) የሕክምና፣ የቴክኖሎጂ እና የክትባት ውጤቶች፣ (5) የጤና ፋይናንስ፣ እና (6) የጤና አጠባበቅ ስርዓት አስተዳደር እየተሻሻሉ ያሉት ነገሮች ምንድን ናቸው?

2.8. ኢትዮጵያ ዘሬም ሆነ ለወደፊት ዝግጁነትን ለማሻሻል ካለፉት የጤና ድንገተኛ አደጋዎች በቂ ትምህርት የወሰደች ይመስልዎታል?

2.9. የኢትዮጵያ ጤና አጠባበቅ ሥርዓት የጤና ድንገተኛ ዝግጁነትን ለማጠናከር ያልተጠቀምናቸው እድሎች ነበሩ ብለው የሚያስቡ ከሆነ ያልተጠቀምናቸው አጋጣሚዎች ምን ምን ናቸው?

እነዚህ እድሎች ያልተጠቀምነው ለምን ይመስልዎታል?

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3. የጤና ድንገተኛ ዝግጁነትን የማጎልበት ሚና እየተጫወተ ያለው የትኛው የኢትዮጵያ የጤና አጠባበቅ ዘርፍ ይመስላችኋል?

3.1. በኢትዮጵያ የጤና ጥበቃ ስርዓት ውስጥ ለጤና ድንገተኛ አደጋዎች ዝግጁነትን ያሉ አስቻይ ሁኔታዎች ምንድን ናቸው?

በተለይም በ: (1) በሰው ኃይል፤ (2) የአገልግሎት አሰጣጥ፤ (3) የጤና መረጃ፤ (4) የሕክምና ውጤቶች፣ ቴክኖሎጂ እና ክትባቶች፤ (5) የጤና ፋይናንስ፤ እና (6) የጤና አጠባበቅ ስርዓት አስተዳደር ጋር በተያያዘ ለዝግጁነት አስቻይ ሁኔታዎች ምንድን ናቸው?

ከብሔራዊ ፖሊሲዎች፣ ሕጎች፣ መመሪያዎች፣ ከፖለቲካዊ ቁርጠኝነት ጋር በተያያዘ ምን አስቻይ ሁኔታዎች አሉ?

3.2. ከአህጉራዊ እና አለም አቀፋዊ ትብብር አኳ: ማለትም የክልል ትብብር፣ የጎረቤት ሀገራት ፍላጎቶች፣ ተሞክሮዎች፣ ዓለም አቀፍ ስምምነቶችና ደንቦች፣ ዓለም አቀፍ የጤና እና የልማት አጀንዳዎች ያሉ አስቻይ ሁኔታዎች ምንድን ናቸው?

3.3. ከብሔራዊ፣ ከክልልና ከዓለም አቀፍ ባለድርሻ አካላት አኳያ ለጤና ድንገተኛ አደጋዎች ዝግጁነት አስቻይ ነገሮች ምን ምን ናቸው?

3.4. በእናንተ አመለካከት ለድንገተኛ አደጋዎች ዝግጁነት አስተዋጽኦ የሚያደርጉ አገር-በቀል ማኅበራዊ-ባህላዊ እና ሃይማኖታዊ ያሉ ይመስላችኋል?

ተጨማሪ ምርመራ: አዉ ከሆነ አንዳንዶቹን መጥቀስ ይችላሉ?

ከተወያያንበት ሌላ በኢትዮጵያ የጤና ጥበቃ ስርዓት ውስጥ የጤና ድንገተኛ ዝግጁነት አስቻይ ሁኔታዎች ልታክፍሉኝ የምትወዱት ነገር አለ?

4. በኢትዮጵያ የጤና ጥበቃ ስርዓት ውስጥ ለጤና ድንገተኛ አደጋዎች ዝግጁነት ያሉ ለማጠናከር እንቅፋቶች ምን ምን ናቸው?

4.1. እንቅፋቶቹ ከአገሪቷ ፖሊሲዎች (የጤና አጠባበቅ ሥርዓት፣ ትምህርትና ስልጠና) ጋር በተያያዘ ፤ የሀገሪቱ የህግ ማዕቀፍ (ህግ፣ ህግ መንግስት፣ ህግ እና ሌሎች መመሪያዎች) ፤ የነባራዊ ሁኔታዎች (የመረጃ፣ የፖለቲካ ቁርጠኝነት፣ ማህበራዊ-ኢኮኖሚያዊ፣ ባህል፣ ሃይማኖት) እንዴት ያብራሩታል?

4.2. በተለይም በ: (1) በሰው ኃይል፣ (2) የአገልግሎት አሰጣጥ፣ (3) የጤና መረጃ፣ (4) የሕክምና ውጤቶማነቅፆዎቹ፣ ቴክኖሎጂ እና ክትባቶች፣ (5) የጤና ፋይናንስ፣ እና (6) የጤና አጠባበቅ ስርዓት አስተዳደር ጋር በተያያዘ ዝግጁነት ማነቆቹ ምንድን ናቸው?

4.3. የኢትዮጵያ የጤና ጥበቃ ስርዓት እንደ ስርዓት የድንገተኛ አደጋዎች ዝግጁነትን በበቂ ሁኔታ ለማጠናከር የሚሞች ይመስላችኃል?

ጨማሪ ምርመራ: ካልሆነ እባክዎ በዝርዝር ያብራሩ።

4.4. ለድንገተኛ የጤና ዝግጁነት እንቅፋት ከሆኑ ከእነዚህ ምክንያቶች መካከል እርስ በርስ የሚተሳሰሩ ነገሮች ሊኖሩ እንደሚችሉ ይመስላችኃል?

ጨማሪ ምርመራ: እነዚህን ተፈታታኝ ሁኔታዎች ለመፍታት ምን አይነት ስልቶች ያሉ ይመስላችኃል?

4.5. ከብሔራዊ፣ ከክልልና ከዓለም አቀፍ ባለድርሻ አካላት (ጂኦፖለቲካዊ ተፅዕኖዎች፣ ከዓለም አቀፍ የጤና አጀንዳዎች ጋር የተያያዙ ቅድሚያ የሚሹ ጉዳዮች) ሌሎች እንቅፋቶች ያሉ ይመስላችኃል?

ጨማሪ ምርመራ: አዎ ከሆነ እባክዎ እንቅፋት የሚሆኑበትን መንገድ በዝርዝር ያብራሩ?

ጨማሪ ምርመራ: :- እነዚህን ተፈታታኝ ሁኔታዎች ለመፍታት ምን ምን ዘዴዎች ሊኖሩ ይችላሉ?

የጤና ድንገተኛ አደጋዎች ዝግጁነት መሰናክሎች ጋር በተያያዘ ከተወያየንበት ሌላ ልታካፍሉኝ የምትሹት ነገር አለ?

ክፍል 6: መዝጊያ

ለዚህ ዙር ቃለ-መጠይቄን አጠናቅቄያለሁ።

የዘፈውን ቃለ መጠይቅ ላይ ጥያቄ አለዎት?

ስለ ጊዜዎ እናመሰግናለን።

ለቀጣይ ቃለ ምልልስ በድጋሚ እንደምንገናኝ ተስፋ አደርጋለሁ።

ተሳታፊው:

ፊርማ:_____ ስም:_____ ቀን: _____

የመረጃ ሰብሳቢ:

ፊርማ: _____ ስም:_____ ቀን: _____

Appendix 3: Oromo Version Initial Interview Schedule

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AF-GAAFFII SIRNA EEGUMSA FAYYAA ITIYOOPHIYAA KEESSATTI DANDEESSITOOTAA FI GUFUUWWAN QOPHII FAYYAA HATATTAMAA QORACHUUF QOPHAA'E

KUTAA 1 FFAA: SEENSA

Maqaan koo Ashennaafii Habtee Wayyeessaa jedhama. Yuunivarsiitii Flinders kan biyaa Awustraliyaatti argamu keessatti barataa digrii 3ffaa ti. Yeroo ammaa kanatti mata-dureen isaa "*Qophaa'ummaa Sirni Eegumsa Fayyaa Rakkoo Fayyaa Hatattamaatiif Qabu*" kan jedhu irratti qorannoo gaggessaan digrii koof na barbaachisu geggeessaa jira.

Xiyyeeffannaan qorannoo kanaa sirna eegumsa fayyaa Itiyoophiyaa keessatti dandeessistootaa fi gufuuwwan qophii rakkoo fayyaa hatattamaa adda baasuu dha. Qabxiilee kanneen adda baasuudhaan rakkoolee fayyaa hatattamaa mudachuu malaniif qophaa'ummaa akka biyyaatti qabnu daran guddisuuf gumaacha ol-aanaa qaba. Gaaffiin isin gaafadhu deebiin sirriis ta'e dogoggora jedhamu hin qabaatu. Kanaaf ilaalchaa fi hubannoo keessan bilisaan akka bal'iftanii naaf qooddan kabajaan isin gaafadha.

Gaaffii fi deebii keessatti mat-duree 4 jalatti gaaffiwwan dhiyaatan irratti waliin haasofna. Isaanis:

- Qophha'ummaa rakkoo fayyaa hatattamaa waliin walqabatee odeeffannoo dhuunfaa keessanii fi muuxanno isin qabdan
- Bbarbachisummaa fi qophaa'ummaa sirni eegumsa fayyaa Itiyoophiyaa qabu
- Dandeessiftootaa (enablers) qophaa'ummaa rakkoo fayyaa hatattamaa sirna eegumsa fayyaa keessa jiran

- Hudhaawwan (barriers) qophaa'ummaa sirna eegumsa fayyaa Itiyoophiyaa keessatti argaman dha.

Gaaffii fi deebii kana keessatti, jechoota yaad-rimee babal'aa qaban lama irra-deddeebiin fayyadamna. Isaanis "**Rakkoo fayyaa hatattamaa (**health emergencies) fi "**Sirna eegumsa fayyaa**" (health system) kan jedhamaniidha.

1. "**Rakkoo fayyaa hatattamaa**" - kan jedhu rakkoowwan fayyaa hatattamaa kanneen akka dhukkuboota haaraa (emerging) ykn irra deebiin mul'achaa jiran (re-emerging), rakkoo fayyaa tasaa kan baayoloojiikaalaa, keemikaalaa ykn raadiyoo-niwukilaraan wal qabatan, balaa uumamaa, balaa nam-tolchee, balaa tasaa walxaxaa (complex emergencies), walitti bu'iinsaa fi taateewwan biroo jijjiirama qilleensaan walqabatan kan of keessatti hammatu jechuudha.

2. "**Sirna eegumsa fayyaa**"- kan jedhu ammo sirna walxaxaa kan namoota, dhaabbilee fi kunuunsa fi bulchiinsa qabeenya kan tajaajila fayyaaf oolan kan of keessaa qabuudha. Akka hiika DhFA tti sirni eegumsa fayyaa ijaarama (building blocks) ja'a of kessaa qaba. Isaninis: (1) humna hojjetaa fayyaa, (2) kenniinsa tajaajilaa, (3) odeeffannoo fayyaa, (4) bu'aa wal'aansaa, teeknooloojii fi talaallii, (5) faayinaansii fayyaa, fi (6) bulchiinsaa fi hoggansaa eegumsa kenniinsa tajaajila fayyaatiif oolan of keessaa qaba.

- Ammas irra-deebiin sirna eegumsa fayyaa Itiyoophiyaa keessatti qophii balaa fayyaa hatattamaa irratti na waliin haasa'uuf kutannoo argisiiftan nan dinqisiifadha.

- Af-gaaffiin kun walumatti gara daqiiqaa 40-60 ni fudhata. Gaaffiiwaan isin gaafannu keessaa kan isinitti hin tolle yoo jiraate deebisuu dhiisuu filachuu ni dandeessu. Deebiin keessan ni galmaa'a, akkasumas ni waraabama.

- Jalqabuu keenya dura af-gaaffii kan gaggeessuuf filannoo afaanii keessan naaf himaa [Afaan Ingiliffaa, Afaan Amaaraa, ykn, Afan Oromo?]

- Tole, filannoo keessaniif galatoomaa jechaa, osoo gara gaaffif deebiitti hin seenin akka waliigalaatti waan isiniif hin galle gaaffii gaafachuu dandeessu.

KUTAA 2 FFAA: MUUXANNOO DHUUNFAA SEENAA JIREENYAA HIRMAATTOTAA

1. **Seenaa jireenyaa keessanii natti himuu dandeessuu**
1.1.   Odeeffannoo dhuunfaa
- Maqaa

- Saala

- Umurii

- Bakka itti argamaa

- Gosa ogummaa

- Sadarkaa barnootaa isa ol-aanaa

1.2. Muuxannoo hojii:

- Muuxannoo waliigalaa

- Rakkoo fayyaa hatattamaa wajjin walqabatee dandeettii fi ogummaa akkamii qabdu?

- Waa'ee ogummaa keessanii (expertise) bal'inaan natti himuu dandeessuu?

- Balaa fayyaa hatattamaa bulchuu/hogganuu keessatti gaheen addaa qabdan maali dha?

1.3. Odeeffannoo dhaabbata keessanii:

- Maqaa dhaabbatichaa

- Ga'ee dhaabbatichaa

- Gaheen/ittigaafatamummaan isin yeroo ammaa dhaabbaticha keessatti qabdan

- Ga'ee hojii kana irratti yeroo hammamiif akka hojjettaniittan

KUTAA 3 FFAA: DANDESSITOOTA QOPHAA'UMMAA RAKKOO FAYYAA HATATTAMAA SIRNA EEGUMSA FAYYAA ITOOPHIYAA KEESSA JIRA

2. **Guddina sirna eegumsa fayyaa Itiyoophiyaa kan qophaa'ummaa balaa tasaa waliin wal qabatu hubannoo qabdu ibsuu dandeessaa?**

2.1. Qophaa'ummaa rakkoo fayyaa hatattamaatiif taasifamu sadarkaa sirnaatti (system level) ilaaluun barbaachisaa dha jettanii yaaddu?

   Yoo barbaachisaa dha jettanii yaaddu ta'e, barbaachisummaan isaa maal isinitti fakkaata?

2.2. Sirna eegumsa fayyaa Itoophiyaa keessatti qophaa'ummaan jiru sadarkaa sirnaatti ilaalamaa jira jettanii yaaddu?

2.3. Sadarkaa sirnaatti ilaalamaa hin jiru yoo jettan, ragaan keessan tokko tokko maali?
   Sadarkaa sirnaatti ilaalamaa hin jiru yoo jettan, sababoonni himuu dandeessan maal fa'i?

2.4. Sirna eegumsa fayyaa keessatti qophaa'ummaa rakoo fayyaa hatattamaa cimsuun yeroo kamiiyyuu caalaa barbaachisaa akka ta'e iiti amantuu?
   Kanaaan wal qabatee gara fuul-duraatti qophaa'ummaa rakkoo fayyaa hatattamaatiif sirni eegumsa fayyaa qabaachuu qabu akka addunyaatti, akka ardii keenyaatti fi akka biyyaalessaatti barbaachisummaa jiru bal'inaan nuuf ibsaa.

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2.5. Qophaa'ummaa yeroo ammaa sirni eegumsa fayyaa Itiyoophiyaa rakkoo fayyaa hatattamaatiif qabu akkamiin madaaltu?

Sirna eegumsa fayyaa Itiyoophiyaa keessatti sadarkaa qophaa'ummaan rakkoo fayyaa hatattamaa yeroo ammaa fi barbaachisummaa/fedhii jiru waliin wal bira yoo qabamu akkamiin madaaltu?

2.6. Sirna eegumsa fayyaa Itoophiyaa keessatti, qophaa'ummaa rakkoo fayyaa hatattamaa ilaalchisee yeroo ammaa wantootni fooyya'aa jiran maali fa'i?

Keessattuu fooyya'iinsi karaaa: (1) humna hojjetaa fayyaa, (2) kenniinsa tajaajilaa, (3) odeeffannoo fayyaa, (4) meeshaalee wal'aansaa, teeknooloojii fi talaallii, (5) faayinaansii fayyaa, fi (6) karaa bulchiinsaa fi hoggansa eegumsa fayyaaatiin jiran maal fa'i?

2.7. Itoophiyaan fooyya'iinsa qophaa'ummaa har'aatii fi kan gara fuula duraatiif galtee ta'uu kan danda'an rakkoowwan fayyaa hatattamaa kanaan dura mudatan irraa barnoota ga'aa fudhatteetti jettanii yaaddu?

Akka sirna eegumsa fayyaa Itiyoophiyaatti, qophaa'ummaa eegumsa fayyaa cimsuuf carraawwan itti hin fayyadamin hafame maal fa'i jettanii yaaddu?

2.8. Carrawwan kunneen sababa maaliitiif nu miliqan jettanii yaaddu?

KUTAA 4 FFAA: SIRNA EEGUMSA FAYYAA ITOOPHIYAA KEESSATTI SADARKAA QOPHAA'UMMAAN RAKKOO FAYYAA HATATTAMAA IRRA JIRU

3. **Gama sirna eegumsa fayyaa Itoophiyaatiin qophaa'ummaan fayyaa hatattamaa sadarkaa barbaachisuun fooyyessuuf haalawwan dandeessisan maal fa'itu jira?**

3.1. Dandeessiftootni qophaa'ummaa qaamolee sirna eegumsa fayyaa (1) humna hojjetaa fayyaa, (2) kenniinsa tajaajilaa, (3) odeeffannoo fayyaa, (4) meeshaalee wal'aansaa, teeknooloojii fi talaallii, (5) faayinaansii fayyaa, fi (6) bulchiinsaa fi hoggansaa kessa jiran maal fa'i?

3.2. Imaammata, seera, dambiiwwan, kutannoo siyaasaa biyyaalessaa kan Itiyoophiyaa wajjin walqabatee haalli dandeessistuu maaltu jira?

3.3. Waliigalteewwan, hariiroo fi wal tumsis karaa idil-addunyaa, fi naannoo kan akka fedhii fi muuxannoo biyyoota ollaa, waliigalteewwanii fi dambiiwwan idil-addunyaa, ajandaawwan fayyaa fi misooma idil-addunyaa waliin wal qabatee dandeessiftootni qophaa'ummaa rakkoo fayyyaa hatattamaa jiran maal fa'i.

3.4.   Qabxiileen qooda fudhattoonni sadarkaa biyyaalessaa, naannoo fi idil-addunyaa kan sirna eegumsa fayyaa Itoophiyaa waliin hojjetaniin wal qabatee dandeessiftootni qophaa'ummaa rakkoo fayyaa jiraaachuu malan maal fa'i?

3.5.   Akka yaada keessaniitti, bu'uura hawaas-aadaa fi amantii ummatoota kan biyya keessaa kan qaban akka dandessiftootaatti qophaa'ummaa rakkoo fayyaa hatattamaaf gumaacha gochuu malu jiru jettanii kan yaaddan ni jiruu?

Jiru jettanii kan yaaddan yoo ta'e, isaan keessaa muraaasa maqaa dhahuu dandeessaa?

4.   **Sirna eegumsa fayyaa Itoophiyaa keessatti waa'ee qophii balaa fayyaa hatattamaa ilaalchisee waan irratti mari'anne malee wanti naaf qooduu barbaaddan jiraa?**

5.   **Sirna eegumsa fayyaa Itiyoophiyaa keessatti rakkoolee fayyaa hatattamaatiif qophaa'uummaa godhamuu maluuf danqaaleen mul'atan maal fa'a?**

5.1.   Danqaawwan qophaa'ummaa qaamolee sirna eegumsa fayyaa (1) humna hojjetaa fayyaa, (2) kenniinsa tajaajilaa, (3) odeeffannoo fayyaa, (4) bu'aa wal'aansaa, teeknooloojii fi talaallii, (5) faayinaansii fayyaa, fi (6) bulchiinsaa fi hoggansaafi kessa jiran maal fa'i?

5.2.   Caaseffamni ykn ijaaramni sirni eegumsa fayyaa Itiyoophiyaa qophii balaa tasaa cimsuuf mijata dha jettanii yaaddu?

5.2.1.   Yoo hin taane bal'inaan ibsaa.

5.3.   Gufuuwwan imaammata biyyattii (sirna eegumsa fayyaa, barnootaa fi leenjii) waliin walqabatan; Bu'uura seeraa biyyattii (seera, heera, seerotaa fi qajeelfamoota biroo); Haala biyyaalessaa (odeeffannoo, kutannoo siyaasaa, hawaas-dinagdee, aadaa, amantii) akkamitti ibsitu?

5.3.1. Haalotni armaan olil (Q14.3) gufuuwwan qophaa'ummaa rakkoo fayyaa hatattamaa uumuu keessatti shoora qaban kun irratti walitti hidhamiinsa qabaachuu akka danda'an hubattaniittuu?

5.3.2. Qormaata kana furuuf tooftaaleen sirnaan akkamitti furmaata argachuu danda'u jettanii yaaddu?

5.4.   Qophaa'ummaa rakkoo fayyaa hatattamaa tiif danqaalee ta'uu kan malaniifi qooda-fudhattoota sadarkaa biyyaalessaa, naannoo fi idil-addunyaa (fkn dhiibbaa ji'oopoolitikaa, dursa ajandaa fayyaa addunyaa waliin walqabatee) ni jiru jettanii yaaddu?

5.4.1. Danqaaleen qophaa'ummaa qooda-fudhattoota waliin wal qabatan jiiru jettanii kan yaaddan yoo ta'e, akkaataa isaan itti qophaa'ummaa sirna eegumsa fayyaa gufachiisan bal'inaan ibsuu dandeessuu?

5.4.2. Danqaawwan kunneen maqsuuf maloota akkamii fayyadamuun ni danda'ama jettanii yaaddu?

5.5. Gufuuwwan qohaa'ummaa rakoo fayyaa hatattamaa kan armaan olitti mari'anne ilaalchisee qahxiin dabalata naaf qooduu barbaaddan jiraa?

KUTAA 6 FFAA: XUMURA

- Marsaa kanaaf gaaffii fi deebii koo xumureera.
- Gaaffii fi deebii har'aaf qabduu?
- Yeroo nuuf kennitaniif galatoomaa.
- Yeroo aanuuf irra deebi'ee akka wal argu abdiin qaba.

Hirmaataa:

Mallattoo:_____Maqaa:_____Guyyaa: _____

Kan odeeffannoo funaanu:

Mallattoo: _____Maqaa: _____Guyyaa: _____

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Appendix 4: English Version Participants' Information Sheets and Consent

Ashenafi Woyessa

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4.1. Participant Information Sheet

Title: Exploring Health Emergency Preparedness from a System Perspective: Implications for Resource-Poor Health System Resilience

Chief Investigator

Ashenafi Habte Woyessa (PhD student)

College of Nursing and Health Sciences (Torrens Resilience Institute)

Flinders University

Supervisors

1. Professor Paul Arbon (Director of Torrens Resilience Institute)

College of Nursing and Health Sciences (Torrens Resilience Institute)

Flinders University

2. Associate Professor Amanda Muller

College of Nursing and Health Sciences (Torrens Resilience Initiative)

Flinders University

Description of the study

Background: The increasing incidence of health emergencies in the setting of rapidly growing complexity and inter-dependency of health systems entails the need for context-specific and systems-based research. Unfortunately, the evidence required to understand the status of health systems' preparedness for health emergencies is not well-documented, mainly in under-resourced settings such as Ethiopia. With this gap in mind, the present research explores the health emergency preparedness of the Ethiopian health system, focusing on the enablers and barriers to preparedness within the system. The research benefits inform the policy required to strengthen the resilience of health systems in Ethiopia and similar low-income countries.

Aim: This research aims to improve our understanding of the enablers and barriers to health emergency preparedness in the Ethiopian health system. It will also inform policy required to strengthen health emergency preparedness in Ethiopia and similar resource-poor settings.

Method: This research employs a qualitative research approach. The research project is accomplished in two stages. This particular study is the first stage of the project, and it aims to investigate the enablers and barriers to health emergency preparedness in the health system through in-depth interviews with key informants. The key informants are selected from senior healthcare managers, the focal points of healthcare-related sectors, and relevant national and international partner organisations (NGOs) in Ethiopia. In addition, the enablers and barriers to health emergency preparedness will be further explored through a review of relevant policy and other documents. Moreover, the contents of the investigation will be validated by experts' opinions through the Delphi survey. Lastly, the theories emerging from this step will be used to develop a preparedness framework. Analysis of qualitative data in grounded theory will be done using NVivo software.

Benefits of the study

Ascertaining locally generated knowledge and solutions is often the best strategy to reveal local and system-wide challenges. The study aims to develop a framework for health emergency preparedness by taking the Ethiopian health system as an exemplar for under-resourced systems. Therefore, the study will inform health system/health emergency policy, future in-depth research, and education for preparedness. The study findings will have policy implications for building a more resilient health system in resource-poor countries with three main benefits.

1. The study findings will inform policy that strengthens health emergency preparedness in Ethiopia.
2. Healthcare planners in other less-resourced countries may use the preparedness framework to inform and improve their health systems' resilience.
3. Future research will build on this work: understanding preparedness for health emergencies as a complex and multi-dimensional problem.

Participant involvement and potential risks

If you agree to participate in the study, you will attend an audio-recorded one-on-one interview with a researcher. This in-depth investigation of the enablers and barriers to health emergency

preparedness may require 2-3 repeats of interviews. Each round of the interview will take about 45-60 minutes.

Participation in the interview is entirely voluntary. We do not expect the questions to cause harm or discomfort. However, if you experience feelings of distress because of participation in this research, please let the research team know immediately about available support services and counselling services already in place in the Ethiopian health service systems. Participants are encouraged to discuss possible risks with the researcher.

Withdrawal Rights

You may decline to take part in this research. If you decide to participate and change your mind, you may withdraw at any time without explaining. You can withdraw from the research project without penalty and without feeling discomfort. To withdraw, please contact the Chief Investigator (Mr. Ashenafi Habte), or you may refuse to answer any questions by leaving the interview.

Confidentiality and Privacy

Only researchers listed on this form can access the information you provided. Privacy and confidentiality are assured at all times. The research outcomes may be presented at conferences or in publications. However, the privacy and confidentiality of participants will be protected at all times. Your individual information, including your name, location, organisation, and your role, will be removed from any research products. No data will be shared–including identifiable, non-identifiable, and de-identified datasets –nor will it be used in future research projects.

Data Storage

The information collected will be stored securely on a password-protected computer and/or the Flinders University server throughout the study. Any identifiable data will be de-identified for data storage purposes unless indicated otherwise. All data will be securely transferred to and stored at Flinders University for five years after the results are published. Following the required data storage period, all data will be securely destroyed according to university protocols.

Recognition of Contribution/Time/Travel costs

We appreciate your cooperation and contribution to this project, which indirectly benefits all of us by strengthening health emergency preparedness in Ethiopia and similar settings. No stipend, reimbursement, or fee for participation will be paid for this project.

How to receive feedback

On project completion, a summary of the outcomes will be emailed to all participants or published on Flinders University's website. Alternatively, participants can receive a document containing a final report of this project directly from the researcher through email (woye0001@flinders.edu.au).

Ethics Committee Approval

The project has been approved by Flinders University's Human Research Ethics Committee (*Project ID: 5691*). Further ethics approval has been obtained from the Ethiopian Public Health Institute Institution Review Board (Project ID: EPHI-IRB-501-2023).

Queries and Concerns

Queries or concerns regarding the research can be directed to the research team. If you have any complaints or reservations about the ethical conduct of this research, you may contact Flinders University's Research Ethics and Compliance Office team via telephone at 0882012543 or emailhuman.researchethics@flinders.edu.au. In addition, for any questions related to the study or if you experienced any adverse event before/during participation in the study.

> PI's full name: Mr. Ashenafi Habte Woyessa
>
> Mobile phone: +251 922183065
>
> Email Address: woye0001@flinders.edu.au

For Any ethical complaint and your right

> Ethiopian Public Health Institute/EPHI
>
> Scientific and Ethical Review Office/SERO
>
> EPHI-IRB Tel:+251 118685503/15

Thank you for reading this information sheet. If you accept our invitation to be involved, please read and sign the attached Consent Form (available on the next page).

Ashenafi Woyessa

College of Nursing and Health

Sciences (Torrens Resilience

Institute)

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Email: woye0001@flinders.edu.au

4.2. Consent statement and signature for informant interviewees

Title: Health Emergency Preparedness in the Ethiopian Health system: Implications for Under-resourced Settings

- ☐ I have read and understood the information about the research, and I understand I am being asked to provide informed consent to participate in this research study.

- ☐ I understand I can contact the research team if I have further questions about this research.

- ☐ I am unaware of any condition preventing my participation, and I agree to participate in this project.

- ☐ I understand that I can withdraw at any time during the study.

- ☐ I understand that I can contact Flinders University's Research Ethics and Compliance Office if I have any complaints or reservations about this research's ethical conduct.

- ☐ I understand my involvement is confidential and the information collected may be published.

- ☐ I understand that my identities (name, location, organisation, and role) will not be identified in any research products.

- ☐ I understand that the information collected may be published without revealing my identity.

- ☐ I further consent to participate in all the required rounds of in-depth interviews that will be audio recorded.

Participant's

Signature: _____ Name: _____ Date: _____

Data Collector's

Signature: _____ Name: _____ Date: _____

Appendix 5: Amharic Version Participants' Information Sheets and Consent

Ashenafi Woyessa

College of Nursing and Health
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Tel: +61 410746610

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<hr>

የተሳታፊ መረጃ እና ስምምነት ፎርም

5.1. የተሳታፊ መረጃ

የምርምሩ ርዕስ: በኢትዮጵያ የጤና ጥበቃ ስርዓት የጤና ድንገተኛ አደጋ ዝግጁነት አጋቾች እና መሰናክሎች - ከከፍተኛ የጤና ጥበቃ ሥራ አስኪያጆች እና ከባለድርሻ አካላት አንፃር

ዋና ተመራማሪ

Ashenafi Habte Woyessa (የዶክትሬት ተማሪ)

የነርስና ጤና ሳይንስ ኮሌጅ (ቶሬንስ ሪሲሊየንስ ኢንስቲትዩት)

ፍሌንደርስ ዩኒቨርሲቲ, አውስትራሊያ

ስልክ ቁጥር: +61410667410/+251922183065

የፕሮጀክቱ ተቆጣጣሪዎች

ፕሮፌሰር ፓውል አርቦን (የቶሬንስ ሪሲሊየንስ ኢንስቲትዩት ዳይሬክተር)

የነርስና ጤና ሳይንስ ኮሌጅ (ቶሬንስ ሪሲሊየንስ ኢንስቲትዩት)

ፍሌንደርስ ዩኒቨርሲቲ, አውስትራሊያ

ስልክ ቁጥር: +61418856560

ፕሮፌሰር አማንዳ ሙለር

የነርሲንግና ጤና ሳይንስ ኮሌጅ

ፍሌንደርስ ዩኒቨርሲቲ, አውስትራሊያ

ስልክ ቁጥር: +61882013378

የጥናቱ መግለጫ

የጥናቱ ዓላ: ከጊዜ ወደ ጊዜ እየጨመረ የሚሄደው የጤና ድንገተኛ አደጋዎች የአለም ሀገራት የጤና አጠባበቅ ስርዓቶቻቸውን ዝግጁነት ማጠናከር እንዳለባቸው ያሳያል። እንደ ኢትዮጵያ ባሉ ዝቅተኛ ሀብት ላይ ለሚገኙ የጤና አጠባበቅ ሥርዓቶች ዝግጁነት በጣም ጥቂት ማስረጃዎች አሉ። ከዚህም በላይ ይህንን ችግር ከተወሰነ እና ከስልታዊ እይታ አንጻር የሚመለከት ማንም የለም ማለት ይቻላል። በመሆኑም በኢትዮጵያ እና በመሳሰሉት ዝቅተኛ ሃብት ባላቸው ሀገራት ያለው የጤና አገልግሎት

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ዝግጅነት ሁኔታ ግልፅ አይደለም። የሥርዓት ደረጃ የጤና ስጋት ዝግጅነትን የሚገፋፋ ወይም የሚገድበው ምን እንደሆነ ለመረዳት በኬዝ-ተኮር እና በስርዓት-ዓታ ላይ የተመሰረተ ጥናትና ምርምር ያስፈልጋል በፍጥነት እያደገ ባለው እና እርስ በርስ በሚደጋገፉ የጤና አጠባበቅ ዝግጅነት እና ስርዓቶች አውድ። ይህ ጥናት የኢትዮጵያን የጤና አጠባበቅ ሥርዓት የአደጋ ጊዜ ዝግጅነት እና የጥናቱ ውጤት ከኢትዮጵያ ጋር ተመሳሳይ ገቢ ባላቸው ሀገራት ያለውን ጥቅም ይቃኛል።

የምርምሩ ዘዴ: ይህ ፕሮጀክት የተደባለቁ የጥናትዘዴዎችን ይጠቀማል። ፕሮጀክቱ በ2 ደረጃዎች የተከፈለ ሲሆን ይህ ጥናት 1ኛ ምዕራፍ ነው። ትኩረቱም በኢትዮጵያ የጤና ጥበቃ ስርዓት ውስጥ የድንገተኛ ጤናን ዝግጅነት አስቻይ ሁኔታዎች እና መሰናክሎች መመርመር ነው ። የሚፈለገውን መረጃ ለመሰብሰብ ዋና ዋና መረጃ ሰጪዎችን በጥልቀት ቃለ መጠይቅ ያደርጋል።

የጥናቱ ጥቅሞች

የጥናቱ ግኝቶች በሀብት ድሃ አገሮች ውስጥ የማይበገር የጤና ስርዓት ግንባታ ላይ የፖሊሲ አንድምታ ያለው ሲሆን የሚከተሉትን ሶስት ዋና ጥቅሞች አሉት።

1. የጥናቱ ግኝቶች በኢትዮጵያ የጤና አስቸኳይ ጊዜ ዝግጅነት ፖሊሲዎችን ማጠናከር እንደሚያስፈልግ ያመለክታሉ።

2. በሌሎች ዝቅተኛ ሀብቶች ውስጥ ያሉ የጤና አጠባበቅ እቅድ አውጪዎች የጤና አጠባበቅ ስርዓቶቻቸውን አቅም ለማጠናከር እና ለማሻሻል ዝግጅነት ማዕቀፉን መጠቀም ይችላሉ.

3. የወደፊት ምርምር በዚህ ሥራ ላይ ይገነባል:- የጤና አደጋ ዝግጅነትን እንደ ውስብስብ እና ባለብዙ ገፅታ ችግር መረዳት።

ተሳታፊዎች ተሳትፎ እና ሊያስከትሉ የሚችሉ አደጋ

በጥናቱ ላይ ለመሳተፍ ከተስማማችሁ በድምፅ ከሚቀዳ አንድ ተመራማሪ ጋር በአንድ ላይ በሚደረግ ጥልቀት ያለው ቃለ ምልልስ ላይ ትገኛላችሁ። ለአስቸኳይ ጊዜ ዝግጅት የሚቻሉትን እና እንቅፋቶችን በጥልቀት መመርመር ከ 2-3 ተደጋጋሚ ቃለ-ምልልስ ሊጠይቅ ይችላል. እያንዳንዱ ቃለ መጠይቅ ከ45-60 ደቂቃ ያህል ይወስዳል። ቃለ መጠይቁ ላይ መሳተፍ ሙሉ በሙሉ በፈቃደኝነት የሚደረግ ነው። ጥያቄዎቹ ምንም ዓይነት ጉዳት ወይም ሥቃይ ያስከትሉብሃል ብለን አንጠብቅም ። ይሁን እንጂ በዚህ ጥናት በመሳተፍችሁ ምክንያት የጨንቀት ስሜት ካጋጠማችሁ፣ በኢትዮጵያ የጤና አገልግሎት ስርዓቶች ውስጥ ቀደም ሲል ለተገኙ የድጋፍ አገልግሎቶች እና የምክር አገልግሎት የምርምሩ ቡድን ወዲያውኑ ያሳውቁ። ተሳታፊዎቹ ሊያስከትሉ የሚችሉትን አደጋዎች ከዋናው መርማሪ ጋር እንዲወያዩ ይበረታታሉ።

በዚህ ጥናት ውስጥ የመሳተፍ መብት

በዚህ ጥናት ውስጥ መሳተፍ ሙሉ በሙሉ በፈቃደኝነት ነው። በጥናቱ ላይ ለመሳተፍም እምቢ ማለት ይችላሉ። ለመሳተፍ ከወሰኑ፣ በማንኛውም ጊዜ ሃሳብዎን ያለምንም ቅድመ ሁኔታ መቀየር ይችላሉ። ከጀመሩ በኋላ ተሳትፎን ለማቋረጥ ከወሰኑ፣ እባክዎ ዋና መርማሪውን (አቶ አሸናፊ ሀብቴ) አነጋግሩ።

ሚስጥራዊነት እና ግላዊነት

የግል መረጃ ማየት የምችሉት በዚህ ቅጽ ላይ የተዘረዘሩት ተመራማሪዎች ብቻ ይሆናሉ ። የእርስዎ ግላዊነት ሁልጊዜ የተጠበቀ ይሆናል። የምርምር ውጤቶች በኮንፈረንስ ወይም በሕትመቶች ላይ ሊቀርቡ ይችላሉ. ሆኖም ስምህን፣ አካባቢህን፣ ኩባንያህን እና ሚናህን ጨምሮ የግል መረጃ ከማንኛውም የዳሰሳ ጥናት ምርቶች ይወገዳል። ምንም አይነት ውሂብ አይገራም - ተለይተው የሚታወቁ፤ የማይታወቁ እና ሊለዩ የሚችሉ የውሂብ ጎተዎችን ጨምሮ - እና ለወደፊት የምርምር ፕሮጀክቶች ጥቅም ላይ አይውሉም።

የአስተዋጽኦ/ጊዜ/የጉዞ ወጪን ይዋቂ

ለዚህ ጥናት ያደረጋችሁት ትብብር እና አስተዋፅዖ እናመሰግናለን። በበጀት ችግሮች ምክንያት ለጊዜዉ እና ለጉልበትዎ መክፈል አልቻሉም። ይሁን እንጂ የዚህ ጥናት ውጤት እንደ ሀገር እና በአጠቃላይ የድንገተኛ ጤና ዝግጁነትን ለማጠናከር ከፍተኛ አስተዋፅዖ እንደሚያበረክት በመረዳት ላደረጋችሁልን ትብብር በድጋሚ ልናመሰግን እንወዳለን።

አስተያየት እንዴት ማግኘት እንደሚቻል

በፕሮጀክት መጠናቀቅ ላይ የውጤቱን ማጠቃለያ ለሁሉም ተሳታፊዎች በኢሜይል ወይም በFlinders ዩኒቨርሲቲ ድረ-ገጽ ላይ ይፋ ይሆናል. በሌላ በኩል ደግሞ ተሳታፊዎች የዚህን ፕሮጀክት የሚጨርሻ ሪፖርት በቀጥታ ከዋና መርማሪው በኢሜይል (woye0001@flinders.edu.au) ማግኘት ይችላሉ።

የሥነ ምግባር ኮሚቴ ተቀባይነት

ፕሮጀክቱ በፍሌንደርስ ዩኒቨርሲቲ የሰብአዊ ምርምር ሥነ-ምግባር ኮሚቴ (*የፕሮጀክት መታወቂያ 5691*) ፀድቋል። በተጨማሪም ፕሮጀክቱ በኢትዮጵያ ደረጃ ያለውን የምርምር ስነምግባር በማሟላት በኢትዮጵያ የህብረተሰብ ጤና ኢንስቲትዩት እንደገና የፀደቀው (የፕሮጀክት መታወቂያ: EPHI-IRB-501-2023) ነው።

ይህን መረጃ ወረቀት ለማንበብ ጊዜ ወስዳችሁ አመሰግናችኋለሁ። በዚህ ጉዳይ ላይ እንድንካፈል የቀረበልንን ግብዣ የምትቀበል ከሆነ እባክህ ከዚህ ጋር የተያያዘውን ስምምነት ፎርም (በሚቀጥለው ገጽ ላይ ይገኛል) አንብበህ ፈርም።

ጥያቄዎችና አሳሳቢ ሁኔታዎች

ከጥናቱ ጋር ለተያያዙ ማናቸውም ጥያቄዎች ወይም ከጥናቱ ተሳትፎ በፊት/ወቅት ምንም ዓይነት መጥፎ ክስተት ቢያጋጥምዎ

የዋና መርማሪው ስም - አቶ አሸናፊ ሀብተ የዎሳ

ስልክ አድራሻ: +251 922183065

የኢሜይል አድራሻ፦ : <u>woye0001@flinders.edu.au</u>

ለማንኛውም የስነ ምግባር ቅሬታ እና መብትዎ

የኢትዮጵያ ህብረተሰብ ጤና ኢንስቲትዩት/EPHI
ሳይንሳዊ እና ስነ-ምግባር ክለሳ ቢሮ/SERO
EPHI-IRB <u>Tel:+251</u> 118685503/15

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5.2. የስምምነት መግለጫ እና የተሳታፊ ፈርማ

የምርምሩ ርዕስ: በኢትዮጵያ የጤና ጥበቃ ስርዓት የጤና ድንገተኛ አደጋ ዝግጁነት አጋቾቹ እና መሰናክሎች - ከከፍተኛ የጤና ጥበቃ ሥራ አስኪያጆች እና ከባለድርሻ አካላት አንፃር

☐ የምርምሩን መረጃ አንብቤና ተረድቼዋለሁ። በዚህ ጥናት ላይ ለመሳተፍ በእውቀት ላይ የተመሠረተ ስምምነት እንድሰጥ እየተጠየቅኩ እንደሆን ተረዳሁ።

☐ ይህን የምርምር ጥናት በተመለከተ ተጨማሪ ጥያቄዎች ካሉኝ ከምርምር ቡድኑ ጋር መገናኘት እንደምችል ተገንዝቤያለሁ:

☐ ተሳትፎዬን የሚያግድ ምንም ዓይነት ሁኔታ እንዳለ ስለማላውቅ በዚህ ፕሮጀክት ለመካፈል ተስማምቻለሁ ።

☐ በጥናቱ ወቅት በማንኛውም ጊዜ የማገግም ነፃነት እንዳለሁ ተገንዝቤያለሁ ።

☐ የዚህን ጥናት የሥነ ምግባር አካሄድ በተመለከተ ቅሬታ ወይም ቅስቀሳ ካለኝ የፍሌንደርስ ዩኒቨርሲቲ የምርምር ሥነ-ምግባር (Compliance Office) ማነጋገር የምችል መሆኑን ተረድቻለሁ።

☐ የኔ ተሳትፎ ምስጢራዊ እንደሆነና የተሰበሰበው መረጃም ሊታተም እንደሚችል ገብቶኛል።

☐ ማንነቴ (ስሜ፣ ቦታ፣ አደረጃጀትና ድርሻ) በየትኛውም የምርምር ውጤቶች ላይ እንደማይታወቅ ተረድቻለሁ።

☐ የተሰበሰበው መረጃ ማንነቴን ሳይገልጥ ሊታተም እንደሚችል ገብቶኛል።

☐ በተጨማሪም በድምፅ በሚቀዱ ጥልቀት ያላቸው ቃለ ምልልሶች ላይ ለመሳተፍ እስማማለሁ።

ተሳታፊ:

ፈርማ: _____ ስም: _____ ቀን: _____

የመረጃ ሰብሳቢ:

ፈርማ: _____ ስም: _____ ቀን: _____

ፈርማ: _____ ስም: _____ ቀን: _____

Appendix 6: Oromo Version Participants' Information Sheets and Consent

Ashenafi Woyessa

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Waraqaa odeeffannoo fi unka eeyyama hirmaattootaa

6.1. Waraqaa Odeeffannoo Hirmaattotaa

Mata duree: Dandeessitoota fi gufuuwwan qophaa'ummaa rakoo fayyyaa hatattamaa sirna eegumsa fayyaa Itoophiyaa keessa jiran – gama hoggantoota olaanoo eegumsa fayyaatii fi qoooda fudhattotaa birootiin

Qorataa Olaanaa

Ashenafi Habte Woyessa (barataa PhD)

Kolleejjii Narsii fi Saayinsii Fayyaa (Torrens Resilience Institute).

Yuunivarsiitii Flinders, Awustraaliyaa

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Suppervaayizaroota

1. Piroofeesar Paawel Arbon (Daarektara Dhaabbata Toreens Resilience Institute).

Kolleejjii Narsii fi Saayinsii Fayyaa (Torrens Resilience Institute).

Yuunivarsiitii Flinders, Awustraliaya

Bilbila: +61418856560

2. Piroofeesara Amanda Muller

Kolleejjii Narsii fi Saayinsii Fayyaa (Torrens Resilience Initiative)

Yuunivarsiitii Flinders, Awustraaliyaa

Bilbila: +251922183065

Ibsa qorannichaa

Seensa: Taateewwan balaa fayyaa hatattamaa dabalaa dhufuu isaa biyyoonni addunyaa qophii sirna eegumsa fayyaa isaanii cimsuun barbaachisaa ta'uu mul'isa. Biiyyonni qabeenya xiqqaa qaban kan akka Itoophiyaa keessatti qophaa'ummaan sirni eegumsa fayyaa rakkoo fayyaa hatattamaaf qban ilaalchisee ragaaleen jiran baay'ee muraasadha. Caalattimmoo rakkoo kana ilaalcha haala addaa fi sirna irratti hundaa'een ilaalu hin jiru jechuun ni danda'ama. Kanarraa kan ka'e, haalli qophii sirna eegumsa fayyaa Itoophiyaa fi biyyoota kana fakkaatan qabeenya gadi aanaa qaban ifa miti. Haala qophii fi sirna eegumsa fayyaa saffisaan guddachaa jiruu fi wal-irratti hirkattummaa sirna eegumsa fayyaa keessatti qophii balaa fayyaa sadarkaa sirnaa maaltu akka oofu ykn daangessu hubachuuf qorannoon haala addaa fi sirna irratti hundaa'e barbaachisaadha. Qorannoon kun qophii balaa fayyaa hatattamaa sirna eegumsa fayyaa Itoophiyaa fi faayidaan argannoo qorannichaa biyyota galiin isaanii Itoophiyaa dhaan wal fakkaatu keessatti qabu qorata.

Akkaataa qorannichi ittiin hojjetamu: Projektiin kun maloota qorannoo-walmakaa fayyadama. Pirojektichi tarkaanfii lamaan kan hojjetamudha yummuu ta'u, qorannoon inni kun gulantaa isa jalqabaati. Kunis sirna eegumsa fayyaa Itoophiyaa keessatti qophii rakkoo fayyaa hatattamaatiif taasifamuu qabuuf wantoota akka dandessiftootaa fi danqitootaatti jiran kan qoratuu dha. Odeeffannoon qorannicha keessatti barbaadamus hoggantoota eegumsa fayyaa kan akka keessaniifi fi qooda fudhattoota kan biro irraa kan funaanamuudha. Odeeffannoon barbaachisu sassaabuuf af gaaffii marsaaa 2-3 tti xumuramu isinii wajjin kan goonu ta'a.

Faayidaa qorannichaa

Argannoon qorannichaa biyyoota qabeenya hin qabne keessatti sirna fayyaa dandamachuu danda'u ijaaruuf dhiibbaa imaammataa kan qabu yoo ta'u, faayidaa gurguddoo sadan armaan gadii ni qabaata.

1. Argannoon qorannichaa imaammata qophii balaa fayyaa Itiyoophiyaa keessatti cimsuun akka barbaachisu ni beeksisa.
2. Karoorsitoonni eegumsa fayyaa biyyoota qabeenya xiqqaa qaban biroo keessatti bu'uura qophii fayyadamuun dandeettii sirna eegumsa fayyaa isaanii cimsuu fi fooyyessuu danda'u.
3. Qorannoon gara fuula duraatti taasifamu hojii kana irratti kan ijaaramu ta'a: qophii balaa fayyaa akka rakkoo walxaxaa fi kallattii hedduu qabuutti hubachuu.

Hirmaannaa hirmaattotaa fi balaawwan mudachuu danda'an

Yoo qorannoo kana irratti hirmaachuuf walii galtan, turtiin isin marsaa tokkotti nu waliin gootanyeroo keessan daqiiqaa 30-40 fudhachuu akka malu isin beeksifna. Gaaffiiwwan isin gaafannu hundinuu miidhaa ykn miira namatti hin tolle isinirraan gahu jennee hin eegnu. Haa ta'u malee, qorannoo kana irratti hirmaachuu irraa kan ka'e miirri dhiphinaa yoo isin mudate, tajaajila deggersaa fi tajaajila gorsaa sirna tajaajila fayyaa Itoophiyaa keessatti duraan hojiirra jirutti akka ergamtaniif hatattamaan garee qorannoof beeksisaa. Hirmaattonni balaawwan mudachuu danda'an qorataa ijoo waliin akka mari'atan ni jajjabeeffamu.

Mirga Hirmaannaa qaronno kana keessaa bahuu

Qorannoon kana irratti hirmaachuun guutummaatti fedhii keessaniin kan hundaa'ee dha. Qorannoo kana irratti hirmaachuu diduus ni dandeessu. Yoo hirmaachuuf murteessitanis yeroo barbaaddanitti haal-duree tokko male yaada keessan jijjiiruu ni dandeessu. Erga eegaltaniin booda hirmaannaa keessan addaan kutuuf yoo murteessitan, maaloo qorataa ol-aanaa (Obbo Ashennaafii Habtee) qunnamaa.

Iccitii fi Dhuunfaa

Odeeffannoo dhuunfaa isin kennitan kan arguu danda'u qorattoota unka kana irratti tarreeffaman qofa. Yeroo hunda iccitii keessan ni eegama. Bu'aan qorannoo konfiraansii irratti ykn maxxansaalee irratti dhiyaachuu danda'a. Haa ta'u malee, odeeffannoon dhuunfaa kanneen akka maqaa, bakka, dhaabbata keessanii, fi gahee hojii keessanii dabalatee oomishaalee qorannoo kamiyyuu keessaa ni haqama. Daataan kamiyyuu hin qoodamu – kuusaa deetaa adda baafamuu danda'u, adda baafamuu hin dandeenye, fi adda baafamuu irraa kan hafe dabalatee – pirojektoota qorannoo gara fuula duraa keessattis hin fayyadamu.

Baasii Gumaacha/Yeroo/Imalaaf beekamtii kennuu

Qorannoo kana keessatti tumsi keessan fi gumaachi isin gootan kan dinqisiifatamuu dha. Sababa hanqina baajatatiif yeroo fi human keessaniif kan malu kanfaluu hindandeenye. Ta'us, bu'aan qorannoo kanaa akka biyaattis ta'ee akka walii galaatti qophii balaa fayyaa hatattamaa cimsuuf gumaacha olaanaa kan qabu ta'uu isaa hubattanii nu tumsuu keessaniif iira debiin isin galateeffanna.

Akkamitti yaada argachuu dandeenya

Pirojektichi yeroo xumuramu, bu'aa argame gabaabinaan hirmaattoota hundaaf karaa imeelii ni ergama ykn marsariitii Yunivarsiitii Flinders irratti ni maxxanfama. Akka filannootti, hirmaattonni

sanada gabaasa pirojektii kanaa of keessaa qabu kallattiin qorataa ijoo irraa karaa imeelii (woye0001@flinders.edu.au) argachuu ni danda'u.

Koree Naamusaa Raggaasise

Pirojektichi koree naamusa qorannoo namaa Yunivarsiitii Flinders'n mirkanaa'eera (Project ID: 5691). Dabalataanis Piroojektiin kun naamusa qorannoo sadarkaa Itoophiyaatti jiru kan guttate ta'uu isaa Dhaabbata Fayyaa Hawaasaa Itoophiyaatiin raggaasifameera (Lakk. Prootokoolii: EPHI-IRB-501-2023).

Gaaffii fi Yaaddoowwan

Qorannicha ilaalchisee gaaffiin ykn yaaddoon jiru garee qorannootiif dhiyaachuu ni danda'a. Yoo waa'ee gaggeessa naamusaa qorannoo kanaa komii ykn shakkii qabaattan, garee Waajjira Naamusa Qorannoo fi Ulaagaa Yunivarsiitii Flinders karaa bilbila 0882012543 ykn emailhuman.researchethics@flinders.edu.au qunnamuu dandeessu. Kana malees, gaaffilee qorannichaan walqabatan kamiifuu ykn qorannicha irratti hirmaachuu keessan dura/yeroo taatee gadhee kamiyyuu yoo isin mudate, qorataa ol-aanaa fi dhaabbata fayyaa hawaasaa Itoophiyaa quunnamuu dandeessu.

Qorataa ol-aanaa: Ashenafi Habte Woyessaa

Teessoo bilbila harkaa: +251 922183065

Teessoo Imeelii: woye0001@flinders.edu.au

Komii naamusaa fi gaaffii mirgaa qabdan kamiifuu

Dhaabbata Fayyaa Hawaasaa Itoophiyaa/EPHI

Waajjira Gamaaggama Saayinsii fi naamusaa/SERO

EPHI-IRB Bilbila: +251 118685503/15 irratti bilbilaa

Yeroo keessan fudhattanii waraqaa odeeffannoo kana dubbisuu keessaniif galatoomaa.

Waamicha keenya hirmaannaa keessaniif dhiyaate yoo fudhattan, maaloo unka hayyamaa walitti qabame (armaan gaditti dhiyaate) dubbisaatii mallatteessaa.

Ashenafi Woyessa

College of Nursing and Health Sciences

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Email: <u>woye0001@flinders.edu.au</u>

6.2. Ibsa hayyama fi mallattoo hirmaattota

Mata-duree: Dandeessitoota fi gufuuwwan qophaa'ummaa rakoo fayyyaa hatattamaa sirna eegumsa fayyaa Itoophiyaa keessa jiran – gama hoggantoota olaanoo eegumsa fayyaatii fi qoooda fudhattotaa biroon:

☐ Odeeffannoo waa'ee qorannichaa dubbisee hubadheera, qorannoo kana irratti hirmaachuuf hayyamamaa ta'uu koo barreeffamaan mirkaneessuuf gaafatamaa akkan jiru nan hubadha.

☐ Waa'ee qorannoo kanaa gaaffii dabalataa yoon qabaadhe, garee qorannoo kana geggeessu qunnamuu akkan danda'u nan hubadha.

☐ Haalli hirmaannaa koo dhorku tokkollee hin akka hin jirree ibsaa pirojektii kana irrattis hirmaachuuf walii galeera.

☐ Yeroo qo'annichaa kanaratti hiramaadhu yoon barbaade bilisa addaan kutuu kanin danda'u ta'uu koo nan hubadha.

☐ Waa'ee naamusa qorannoo kanaa irratti komii ykn of eeggannoo godhamuuf male yoon qabaadhe, Waajjira Naamusa Qorannoo fi Ulaagaa Yuunivarsiitii Flinders qunnamuu akkan danda'u nan hubadha.

☐ Hirmaannaan koo keessatti iccitiin kook an eegamu akka ta'e, akkasumas odeeffannoon walitti qabame maxxanfamuu akka danda'u nan hubadha.

☐ Oomisha qorannoo kamiyyuu keessatti odeeffannoon dhuunfaa kootii akka adda hin saaxilamne nan hubadha.

☐ Odeeffannoon walitti qabame maxxanfamuu akka danda'uu fi eenyummaan koo ifa ta'uu akka danda'u nan hubadha.

☐ Dabalataanis af-gaaffii qoronnoo kanaaf barbaachisan kan marsaa addaa addaan gaaftamu irratti hirmaachuuf koof heyyama ta'uu koo ibsaa, sagaleen koos akka waraabamu nan heyyama.

Hirmaataa:

Mallattoo:_____Maqaa: _____ Guyyaa:_____

Kan odeeffannoo funaanu:

Mallattoo: _____Maqaa: _____ Guyyaa: _____

Appendix 7: Flinders University Ethics Approval Notices

Dear Mr Ashenafi Woyessa,

The below proposed project has been **approved** on the basis of the information contained in the application and its attachments.

Project No: 5691

Project Title: HEALTH EMERGENCY PREPAREDNESS IN THE ETHIOPIAN HEALTH SYSTEM

Chief Investigator: Mr Ashenafi Woyessa

Approval Date: 30/01/2023

Expiry Date: 30/03/2026

Approved Personnel: Mr. Dessalegn Geleta

Supervisory Panel: Professor Paul Arbon, Associate Professor Amanda Muller, Dr Mayumi Kako

Conditions of Approval: None

Please note: *Due to COVID-19, researchers should try to avoid face-to-face testing where possible and consider undertaking alternative distance/online data or interview collection means. For further information, please go to https://staff.flinders.edu.au/coronavirus-information.*

Please note: *For all research projects wishing to recruit Flinders University students as participants, approval needs to be sought from the Pro Vice-Chancellor (Learning and Teaching Innovation), Professor Michelle Picard. To seek approval, please provide a copy of the Ethics approval for the project and a copy of the project application (including Participant Information and Consent Forms, advertising materials and questionnaires, etc.) to the Pro Vice-Chancellor (Learning and Teaching Innovation) via michelle.picard@flinders.edu.au.*

RESPONSIBILITIES OF RESEARCHERS AND SUPERVISORS

1. Participant Documentation

Please note that it is the responsibility of researchers and supervisors, in the case of student projects, to ensure that:

all participant documents are checked for spelling, grammatical, numbering and formatting errors. The Committee does not accept any responsibility for the above-mentioned errors. the Flinders University logo is included on all participant documentation (e.g., letters of Introduction, information Sheets, consent forms, debriefing information, and questionnaires – with the exception of purchased research tools), and the current Flinders University letterhead is included in the header of all letters of introduction. The Flinders University international logo/letterhead should be used, and documentation should contain international dialing codes for all telephone and fax numbers listed for all research to be conducted overseas.

2. Annual Progress / Final Reports

In order to comply with the monitoring requirements of the *National Statement on Ethical Conduct in Human Research 2007 (updated 2018),* an annual progress report must be submitted each year on the approval anniversary date for the duration of the ethics approval using the HREC Annual/Final Report Form available online via the ResearchNow Ethics and Biosafety system.

Please note that no data collection can be undertaken after the ethics approval expiry date listed at the top of this notice. If data is collected after expiry, it will not be covered in terms of ethics. It is the responsibility of the researcher to ensure that annual progress reports are submitted on time; and that no data is collected after ethics has expired.

If the project is completed *before* ethics approval has expired, please ensure a final report is submitted immediately. If ethics approval for your project expires, please either submit (1) a final report; or (2) an extension of time request (using the HREC Modification Form). For student

projects, the Low-Risk Panel recommends that current ethics approval is maintained until a student's thesis has been submitted, assessed, and finalised. This is to protect the student in the event that reviewers recommend that additional data be collected from participants.

3. Modifications to Project

Modifications to the project must not proceed until approval has been obtained from the Ethics Committee. Such proposed

- changes/modifications include:
- change of project title;
- change to the research team (e.g., additions, removals, researchers, and supervisors)
- changes to research objectives;
- changes to research protocol;
- changes to participant recruitment methods;
- changes / additions to source (s) of participants;
- changes of procedures used to seek informed consent.
- changes to reimbursements provided to participants.
- changes to information/documents to be given to potential participants;
- changes to research tools (e.g., survey, interview questions, focus group questions, etc) ; extensions of time (i.e. to extend the period of ethics approval past the current expiry date).

To notify the Committee of any proposed modifications to the project, please submit a Modification Request Form, which is available online via the ResearchNow Ethics and Biosafety system. Please note that extension of time requests should be submitted prior to the Ethics Approval Expiry Date listed on this notice.

4. Adverse Events and/or Complaints

Researchers should advise the Executive Officer of the Human Research Ethics Committee at human.researchethics@flinders.edu.au immediately if any complaints regarding the research are received;, a serious or unexpected adverse event occurs that affects participants; or an unforeseen event occurs that may affect the ethical acceptance of the project.

Yours sincerely,
Hendryk Flaegel
on behalf of
Human Ethics Low-Risk Panel
Research Development and Support
human.researchethics@flinders.edu.au
Sturt Road, Bedford Park, South Australia, 5042
GPO Box 2100, Adelaide, South Australia, 5001
Flinders University

Appendix 8: Ethiopian Public Health Institute IRB Approval Notice

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Ethiopian Public Health Institute
አዲስ አበባ-ኢትዮጵያ Addis Ababa, Ethiopia

ስልክ - Tel: + 251 11 2133499, +251 11 2751522, ፋክስ Fax: +251 11 2758634,
የመ.ሳ.ቁ-P. O. BOX: 1242/5654 e-mail: ephi@ethionet.et
www.ephi.gov.et

ቁጥር **B P H I** 6.13/08
Ref. N⁰ **0 5 -06- 2023**
ቀን
Date

Ethiopian Public Health Institute
Institutional Review Board (EPHI-IRB)
Certificate of Approval

Protocol number: **EPHI-IRB-501-2023**
Minutes No; 120

Protocol Title:	**Health Emergency Preparedness in the Ethiopian Healthcare System: Implications for Low-income Countries**	
Investigators:	**Ashenafi Habte**	
Institute:	Flinders University	
Study site/s	Ethiopia	
Elements Reviewed (EPHI-IRB AF 01-008/02.0):	☐ Attached ✔ Not attached	
Mode of Review	✔ Expedited ☐ Full Board	
Decision of the meeting	✔ Approved	

I. Elements approved: 1. Protocol Version No: 02
2. Protocol Version Date: 17-05-2023
3. ICF Version No.; 02
4. ICF Version Date: 17-05-2023

II. . Obligations of the PI:
1. Should comply with the standard international &national scientific and ethical guidelines
2. All amendments and changes made in protocol and consent form needs IRB approval
3. The PI should report SAE within 48 hours of the event
4. This approval certificate is valid for only one year (specified below). The PI should Submit continuation request before expire date of approval, if projects is to continue
5. Final report/Thesis and Manuscripts should be submitted to the IRB secretariat after completion of the study.

Institutional Review Board Approval Date: May 15, 2023
Approval Period: From <u>May 15, 2023 to May 14, 2024</u>
Follow up report expected in:
6 months   ✔   9 months _____   one year _____

EPHI-IRB Chairperson

Name _Atkure Defar_

Signature _____

Date: _____ 23 May _____

EPHI Director General

Name _____

Signature _____ Messay Hailu (PhD) Director General

Date: _____

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Appendix 9: Permission Letter from the Ethiopian Ministry of Health

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የዜጎች ጤና ለሀገር ብልፅግና!

Minostry of Health - Ethiopia
Healthier Citizens for Prosperous Nation!

ቀን ___13 JUN 2023___
Date

ቁጥር ___MTI/24/44/165___
Ref. No.

To Whom It May Concern

Subject: Support Letter

In the application dated 9th of June 2023, Mr. Ashenafi requested our office to issue him a support letter to the list of attached offices and organizations for the data collection on *"Health Emergency Preparedness in the Ethiopian Healthcare System- Implications for Low-income Countries"* as part of his PhD research project at Flinders University (Australia). Ethiopian Public Health Institute Review Board had reviewed and granted ethical clearance (Protocol Id: EPHI-IRB-501-2023) which is attached with this letter.

Therefore, we kindly request the attached offices/organizations to cooperate Mr. Ashenafi by providing him a required data for the aforementioned research project.

Regards,

Abraham Alemayehu Gatta (PHD)
Policy and Strategy Research A/Lead
Executive

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+251-115-518031
+251-115-159657   Fax +251-115-519366
+251-115-524549
+251-115-516378   እባክዎን መልስ ሲሰጡ የእኛን ደብዳቤ ቁጥር ይጥቀሱ
+251-115-513301   **In Reply Please Refer to Our Ref.No.**

1234
Addis Ababa, Ethiopia

E-mail: moh@moh.gov.et
Website: www.moh.gov.et

Ministry of Health, Ethiopia
@FMoHealth