ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE
PROJECT MANAGEMENT DEPARTMENT

Assessment of Health Service Restoration in War Affected Areas of Amhara Regional State, Northern Ethiopia, 2022

A Research Project Submitted to School of Commerce in Partial Fulfillment of the Requirements for the Award of a Master's Degree in Project Management

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SEPTEMBER, 2022
ADDIS ABABA ETHIOPIA

Declaration of Plagiarism

I, Abraham Kitaw, declare that this thesis entitled "**Assessment of health service restoration in war affected areas of Amhara regional state, Northern Ethiopia**", is my own original work and that all the sources that I have been used or quoted have been indicated and acknowledged by means of complete references. I further declare that I submitted the thesis to originality checking software and that it falls within accepted requirements for the originality.

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This is to certify that the thesis carried out by **Abraham Kitaw** on the topic entitled: "**Assessment of health service restoration in war affected areas of Amhara regional state, Ethiopia**" is his original work and suitable to submission for the award of Masters of Art Degree in Project Management.

Advisor

Dakito Alemu (PHD)

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Date and Signature

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COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF COMMERCE

Department of Project Management

Assessment of health service restoration in war affected areas of Amhara regional state, northern Ethiopia, 2022

By Abraham Kitaw

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Acknowledgement

I would like to acknowledge the following people; without their support, this thesis would not have been possible:

Dr. Dakito Alemu (PHD), my advisor, for his courteous coaching, close mentoring and follow ups, his patience and consistent encouragement. His constant motivation, timely response to my work with solid feedback and direction from beginning to end motivated me to complete this thesis. It is with great honor and privilege that I recognize his wisdom and am very grateful to him. I also acknowledge the Amhara regional PHEOC leadership team, Amhara regional health bureau, and war affected hospitals' CEOs and their management teams for their collaboration during data collection. The Addis Ababa University, School of Commerce for allowing me to conduct the study. I am honored to have a student of this institution.

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List of Acronyms/Abbreviations

ANC: Antenatal Care

APHI: Amhara Public Health Institute

BEmONC: Basic Emergency Obstetric and Neonatal Care

CBHI: Community-Based Health Insurance

CEmOC: Comprehensive Emergency Obstetric Care

DHIS2: District Health Information System second version

EOC: Emergency Operations Centre

EPI: Expanded Program on Immunization

EPSA: Ethiopian Pharmaceutical Supply Agency

FP: Family Planning

HF: Health Facility

HIV/AIDS: Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome

IMNCI: Integrated Management of Neonatal and Childhood Illnesses

IMS: Incident Management System

MOH: Ministry of Health

NCD: Non Communicable Disease

NGO: Non-Governmental Organizations

OECD: Organization for Economic Cooperation and Development

OPD: Outpatient Department

OR: Operation Room

PHCU: Primary Health Care Unit

PHEOC: Public Health Emergency Operations Centre

PMTCT: Prevention of Mother to Child Transmission

RHB: Regional Health Bureau

SARA: Service Availability and Readiness Assessment

SitRep: Situational Report

TPLF: Tigray People's Liberation Front

WHO: World Health Organization

Abstract

The objective of this study was to describe the health service restoration status of war affected public health institutions in Amhara regional state in terms of service availability, readiness and utilization. Mixed method was employed to this cross sectional descriptive study. Primary data were collected from 35 of 40 war affected public hospitals with structured questionnaire since May to June 2022, and secondary data extracted from electronics health reporting system and document review. Microsoft Excel was used to do descriptive analysis. Regarding to result, the current study findings show that 0.03 hospital, 2.1 inpatient beds and 0.5 physician per 10,000 populations and the project achieved only 60% general service availability. The mean availability of 17 selected specific services was 70% in total affected hospitals. General service readiness index and mean service specific readiness index were 69% and 75% respectively which implies that those hospitals started to offer services were ready to provide general health services with the capacity of 24 hospitals and specific health services with the capacity of 26 hospitals, instead of 35. Regarding to service utilization, outpatient attendance per person per year was 1.26 and achieved only 25% of global benchmark while the inpatient admission rate was 86 per 10,000 populations in war affected community which means clients get access inpatient services only 64% and 8.6% of national average and global standard respectively.

Based on the findings of the study the investigator concludes that most of indicators in health service availability, readiness and utilization are below national benchmarks and the overall health service restoration status was 64 percent. The researcher suggests for government to avail power sources; International NGOs to offer humanitarian services in those inaccessible health facilities and communities due to active war; the ministry of health and regional health bureau to facilitate and mobilize fund to avail diagnostic and surgical service equipment, and to develop health professionals recruit and retention mechanism; and researchers for future studies to focus on community based survey, primary health care unit assessment and service-specific utilization.

Key Words: Service Availability, Service Readiness, Service Utilization, War Affected Area

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Ethiopia has faced various natural and man-made disasters over the years. Ongoing conflicts in different parts of the country have triggered humanitarian crises including death, injury, and displacement of the local population. Northern part of Ethiopia experiences armed conflict since November 3, 2020. Since July 2021 TPLF forces infiltrated and invaded Amhara and Afar regional states and there was active armed war in the regions till December 2021. (COMMISSION, 2022)

According to WHO post conflict recovery assessment, armed conflicts negatively impact the affected community health, health system and social determinants of health directly or indirectly due to physical trauma, health facility damage, medical equipment, non-medical equipment and supplies looting, and displacement of health professionals. In addition to this stressful environment exacerbate chronic diseases, psychosocial trauma and mental health illnesses. Poor living condition, over crowdedness and inaccessibility of health significantly affect health of displaced populations and exposed them to communicable disease outbreaks.(WHO, 2013)

As stated in the Amhara regional war related situational report, during the conflict the health system in the affected areas was in a state of collapse. The total of 10.7 million populations in the region directly affected due to the conflict. 40 Hospitals, 453 health centers, 1850 health posts, 466 private health facilities and 124 ambulances are damaged and looted by the TPLF group. In addition, more than 2.5 million inhabitants have been internally displaced from their residents. Not only community members but also more than 15 thousand health professionals serving the community have also been displaced due to the conflict. (Abebaw et al., 2022; PHEOC, 2021b)

The Amhara region is the second largest and populous region in the country where 22,876,999 people are living. The war affected nearly half of the regional population. The war also resulted in death and displacement of civilians. While more than 2,968 civilians were killed, about more than 2.5 million people was displaced and 1,177 faced sexual violence and

psychological abuse and torture. (Amhara Regional Health Bureau & Institute, December, 2021)

As a result, it increases mortality and morbidity among the community where the conflict occurred including infant and maternal mortality and deprives access for health care. Thus, restoration of the damaged health infrastructure and health service restoration should a top priority of the government and all stakeholders to ensure service access and avert all preventable morbidity and mortality in the community. In post-conflict period reversing the statuesque and building back the health system in a better way needs a huge investment and collaboration of all stakeholders. (MoH, 2021b)

Amhara Regional Health Bureau (ARHB) & Amhara Public Health Institute (APHI) activated its Public Health Emergency Operation Center (PHEOC) in 2018 for Covid_19 pandemic responses and revised its Incidence Management System (IMS) structure and TOR in 2021 in order to coordinate both covid_19 pandemic and war related health emergencies. The PHEOC prepared war time health emergency response plan when the affected area was in active war and health service recovery plan when the affected area cleared from the invaders. (Amhara Regional Health Bureau & Institute, December, 2021)

The health recovery project is proposed to revitalize the health system in war affected areas to restore the basic health service delivery, to provide the required health promotion and health prevention activities for the affected community in three phases and tackle the related mortality and morbidity due to the incident. Even though the implementation status of the project was regularly monitored in the IMS weekly meeting, there was no sufficient update on the health service restoration status. Therefore, this study was designed to examine the health service restoration in war affected area of the region.

1.2 Statement of the Problem

The Ethiopian MOH's health and health-related indicators 2020/21 shows the country has a total of 367 functional public hospitals (one for every 280,247 people). It also has 3,777 health centers (one for every 27,231 people) and 17,699 health posts (one for every 5,811). The same source show that Amhara regional state has a total of 88 functional public hospitals (one for every 256,098 people), 872 health centers (one for every 25,845) and 3,565 health posts (one for every 6,321). The same literature indicated that there were 12,314 physicians

(one to 8,352 people) and 1,662 (one to 13,560 people) in nationwide and in Amhara regional state respectively (MOH, 2021a).

In contrary of this the available sources show that total of hospitals 40(46%), health centers 453 (52%), health posts 1,850 (52%), private health facilities 466 (38.8%), blood banks 4 (40%), oxygen plant 2 (67%) and ambulances 124 are damaged and/or looted (PHEOC, 2021b), and 10.7 million (50%) populations in 8(50%) zones and 72(30%) districts of the region directly affected due to the conflict (PHEOC, 2022d). In addition, more than 2.5 million inhabitants have been internally displaced from their residents. Not only community members but more than 15 thousand health professionals serving the community have also been displaced due to the conflict (PHEOC, 2022a). As a result, an estimated 5,418,023 patients were unable to get general health services in war affected health facilities and a total of 8915 clients with chronic communicable illness missed their treatment and clinical follow up. Due to this destruction an estimated 74,980 women missed skilled delivery and forced to home delivery, 91 women exposed to unsafe abortion, and 161,309 children faced malnutrition. 33 maternal and 66 neonatal mortalities were occurred during the conflict due to lack of health service (Abebaw et al., 2022; PHEOC, 2021c).

The health service restoration project is designed to revitalize the health system in war affected areas to restore the basic health service delivery, to provide the required health promotion and health prevention activities for the affected community and tackle the related mortality and morbidity due to the incident in three phases within six months since January 2022 (Amhara Regional Health Bureau & Institute, December, 2021).

Even though the implementation status of the project was regularly monitored in the IMS weekly meeting and situational report, the health service availability and health facility restoration status update was not gain sufficient focus. As a result, there was major knowledge gap in what extent the health service was available and accessed by the community in war affected zones of the region after project implementation.

In addition to this there was discrepancy between PHEOC situational reports and individual health facilities report on their restoration status and there was no sufficient available data to describe health service restoration status at regional and national level at all. Therefore, this research was designed to describe the health service restoration status in war affected community of Amhara regional state.

1.3 Research Questions

1. What is the extent of health service availability in the war-affected area?
2. What is the readiness level of the public health facilities in the war-affected area to provide healthcare services?
3. What is the health services utilization status of the community in the war-affected area?

1.4 Objectives of the Study

1.4.1 General Objective of the Study

The general objective of this study was to describe the health service restoration status of war affected public health institutions in Amhara regional state.

1.4.2 Specific Objectives of the Study

1. To describe the health service availability status in war affected area and to compare it with national average.
2. To describe the health service readiness status in war affected health facilities and to compare it with national average.
3. To describe the health service utilization status in the war affected community and to compare it with national average.

1.5 Significance of the Study

The importance of this research was to find out the health service availability status on those war affected health facilities and the achievement of Amhara regional PHEOC implementation based on their early recovery plan. Therefore, it has practical significant to indicate restoration status, to identify gaps and to recommend solutions for decision makers in order to give solutions early for those identified gaps and to avail those not available services. It also shall be the initial helpful input for further detail investigation on the war related emergency response and recovery intervention effectiveness.

1.6 Limitation and Scope of the Study

Geographical scope of this study was in 8 war affected zones (N. Gondar, S. Gondar, Wagihimra, N. Wollo, S. Wollo, Dessie city, Oromo special and N. Shewa zones) of the Amhara regional state. This study used document review and self-administer questionnaire as main

source of data and focused on affected public hospitals administrative bodies as a participant. Because of resource (time and budget) shortage, primary health care units (health centers and their satellite health posts) were not included as a participant from primary level of care, community level survey was not conducted and health facility service unit was not observed. As a result, it may affect the final findings and the future studies are recommended to fill the gaps.

1.7 Definition of Terms

1.7.1 Conceptual Definition

Health Emergency: A type of incident or impending threat that has the potential to have a variety of health effects and necessitates concerted action usually quick and frequently out of the ordinary. A community's risk of major morbidity or mortality from a health emergency could be very high.(WHO, 2015a)

Disaster: A significant disruption of a household, community, ecosystem, or society that causes losses in terms of people, property, resources, or the environment that are greater than what those affected can handle with their own resources.(Health, October, 2018)

Recovery (Reconstruction & Rehabilitation): Process used by a community that has experienced a tragedy to fully recover to its previous level of operation and make it even more disaster-resistant.(Health, October, 2018)

Incident Management System (IMS) is a methodical instrument used for emergency response command, control, and coordination. An emergency management framework and set of guidelines that offer a method for directing governmental institutions, the private sector, non-governmental groups, and other players to work cooperatively in order to respond to and reduce the effects of all types of catastrophes (WHO, 2015a).

General service Availability refers to the physical presence of delivery of services that meet a minimum standard. Availability comprises health facilities, inpatient beds and the core health workforce per 10 000 populations(WHO, 2010, 2015b)

General service readiness: The overall competence of medical facilities to offer healthcare services is referred to as general service readiness. The cumulative availability of the parts needed to deliver services is known as readiness. It includes tracer items for the following key categories: basic amenities, equipment, precaution for infection prevention, diagnostic capacity and essential medications(WHO, 2015b).

Service-specific availability: The percentage of facilities that offer a particular service and the density of the facilities that provide the service per 10,000 people were used to measure service-specific availability, which refers to whether or not a particular service is provided(WHO, 2015b).

Service-specific readiness: refers to the ability of medical institutions to offer a particular service, as determined by the existence of key items like trained personnel, policies, tools and supplies, diagnostic capability, medications, and supplies(WHO, 2015b).

Service utilization: is referred to as people seek medical attention for a variety of reasons, such as diagnosing and treating illnesses, encouraging the maintenance of health and wellbeing, and learning about their current and future health conditions.

1.7.2 Operational definition

War/armed conflict/conflict/civil war: Even if it is obvious that those terminologies can be define differently and different parties use different terminologies for northern Ethiopia security problems such as conflict, war, civil war and etc. all terms (war, conflict and armed conflict) are used in this study interchangeably to describe the case.

War Affected Area/War Affected Health Facility: all parts of the region and all health facilities in the region are affected due to the war directly or indirectly. Even though zones and facilities far from war scene also were overwhelmed in casualty case management, IDPs management in collective sites and host community and resource (budget and health workforce) shifting to war related activities, the term "war affected" in this study refers to zones and facilities that are/were in the scene of armed conflict and occupied by TPLF invaders.

1.8 Organization of the Paper

This research is presented in five chapters. The second chapter next to this introduction discusses the theoretical & empirical literature review of related topics. It explores health impact of armed conflict, WHO health system building blocks and health system structure of Ethiopia, the availability of health services in emergency response and health service restoration related literature in relation to Amhara Regional State, Ethiopia. The researcher discussed research design and approach, population and sampling technique, types and source of data, methods of data collection and method of data analysis in third chapter. The fourth chapter, analysis, presentation and discussion of the research findings, covers the war related health damage,

response and recovery based on WHO health system building blocks, general and service-specific availability, general and service-specific readiness and service utilization in the war affected area. In the last chapter of the paper, conclusions and recommendations, has described the summaries of findings and provided a conclusion of the study and suggested possible recommendations of the study problem.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

A literature review is used to do assessment about a certain subject on published documents and it is a critical to understand and refine a research topic. A literature review provides better understanding and knowledge to interpret certain themes of interest. A literature review familiarizes the researcher with prior studies' expertise, assists the researcher in identifying gaps in the literature, and suggests to additional research possibilities. Reviewing literature is an important step in the research process since it allows the researcher to explore and identify knowledge gaps in the field, which they may subsequently fill. A comprehensive review of the literature aids the researcher in developing their ideas. (Yiech, 2020) Published literature on health impacts of armed conflict, the health system recovery in conflict and post conflict setting, and Health system and health service availability are covered in this study. Journals, reports, books and articles are sources of information that were reviewed.

2.2 Theoretical Review

Sean Deely in its War, Health and Recovery stated that civilians are the primary targets of today's violent wars, who are displaced from their homes and villages, or injured and killed with impunity. Their health and well-being are endangered not only by gunfire and bombardment, but also by a lack of food, water, basic health services, and disease-prevention measures. There are three main consequences that can be identified as increased health needs, reduced capacity of health services and Distorted health system. Health Needs in the war affected population is increased due to mortality, morbidity and disability as a result of fighting, displacement, hunger and disease. In other hand the availability of health services is reduced due to killings or displacement of health workforce, damage to health facilities and medical equipment, medical supply chain interruption and health finance shortage due to restrictions in local and central government budgets. The Health System is also significantly distorted and domestic health system may not be functional. (Deely, 2005)

Post-conflict health service recovery necessitates a shift away from relief-oriented programs and toward the establishment of long-term programs focused at improving the population's overall

health and developing an effective health system. It entails a shift in emphasis from short-term interventions to large-scale rehabilitation and restoration. Any service restoration strategy is faced three major challenges namely access large scale international support, rapidly increase service delivery capacity and develop a strategy for sustaining services during the post-recovery period. (Deely, 2005)

Recognizing the importance of strengthening health systems, the World Health Organization (WHO) developed a health systems framework that divides health systems into six components: service delivery, health workforce, health information system, medical products, vaccines and technologies, health financing, and leadership & governance.

Good service delivery is defined as effective, safe, and high-quality personal and non-personal health interventions are delivered to individuals who need them, when and where they are required, with minimal waste of resources.

A high-performing health staff is one that responds quickly, fairly, and efficiently to deliver the greatest possible health outcomes given the resources and circumstances. A well-functioning health information system guarantees that reliable and timely information on health determinants, health system performance, and health status is produced, analyzed, disseminated, and used. A well-functioning health system offers equal access to key medical products, vaccines, and technologies of known quality, safety, efficacy, and cost-effectiveness, as well as their scientifically sound and cost-effective application. A successful health finance system provides sufficient cash for health in such a way that people may get essential services while avoiding financial ruin or impoverishment as a result of having to pay for them.

Leadership and governance entails ensuring that policy frameworks exist, as well as effective oversight, coalition building, regulation, system design, and accountability. Strengthening the health system requires technical and political knowledge and action to strengthen these six health system building blocks and manage their interconnections in ways that achieve more equitable and sustained improvements across health services and health outcomes. (Manyazewal, 2017; World Health, 2007)

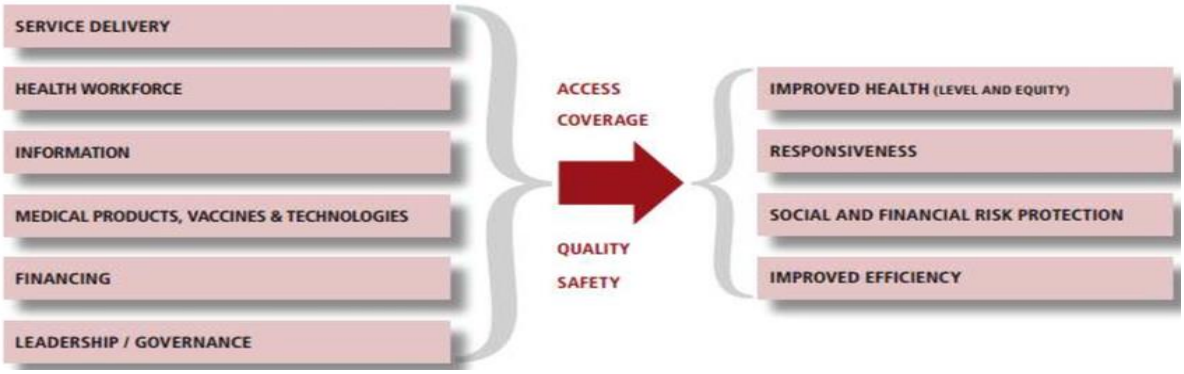

Figure 1 WHO health system building blocks framework (World Health, 2007)

"The Ethiopian health service is restructured into a three tier system; primary, secondary and tertiary level of care." The primary level of care consists primary hospital and Primary Health Care Unit (a health center with five satellite health posts). Each primary hospital expected to provide services for 60,000 to 100,000 populations with minimum of 35 inpatient beds (Agency, 2012c), health center for 25,000 people, and a health post for 5000. General hospitals are drop in secondary level of care category and expected to provide services to 1,000,000-1,500,000 estimated people with minimum of 50 inpatient beds (Agency, 2012b). Specialized hospitals are categorized under tertiary level of care and serve for 3.5 million to 5 million people with minimum of 110 inpatient beds (Agency, 2012a). (MOH, 2015)

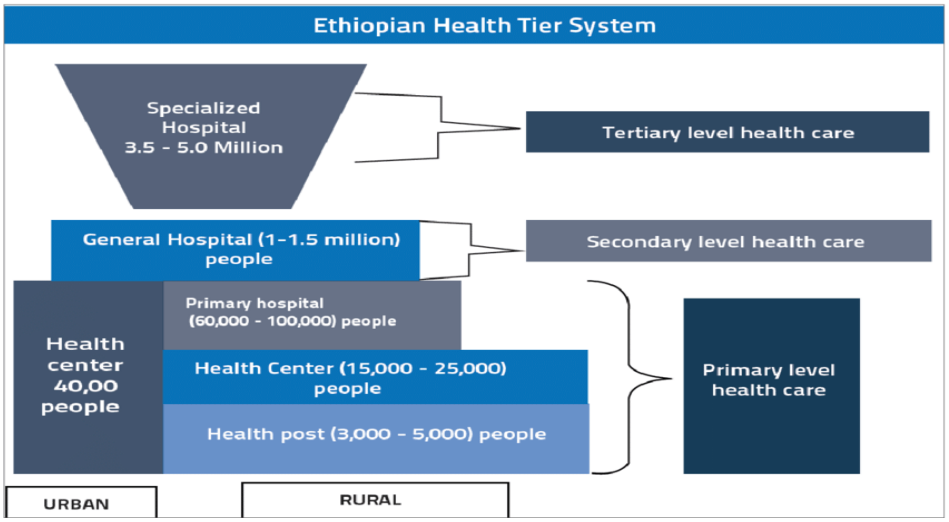

Figure 2 Ethiopian three tier health system structure (MOH, 2015)

2.3 Empirical Review

According to Armed conflict and public health of Garry & Chechi, Conflict affects many people around the world, and more than 191 million people died in conflicts during the twentieth century. In addition, war affected countries are less likely to meet the United Nations Sustainable Development. Morbidity and mortality, which are frequently trauma-related, are direct health impacts. (Garry & Checchi, 2020) The public health impact of war arises from the direct effects of combat (battle trauma and deaths) and from the indirect effects of war may last in several years after a conflict ends (Murray, King, Lopez, Tomijima, & Krug, 2002).

WHO stated that armed conflicts have been observed to occur more frequently in low-income countries, where their impact is more severe, further exacerbating the poor state of social determinants of health and weak health systems that are commonly associated with such countries. Direct and indirect effects of conflict on health include physical trauma, destruction and looting of health infrastructure, equipment, medicines, and supplies, rendering health facilities nonfunctional, resulting in disruption of health services, reduced access to, and utilization of health services. (WHO, 2013)

Ethiopia has faced various natural (flood, drought, Locust swarms) and man-made (armed conflicts) disasters over the years. Ongoing conflicts in different parts of the country have triggered humanitarian crises including death, injury, and displacement of the local population. Northern part of Ethiopia experiences armed conflict since November 3, 2020. Law enforcement by the Ethiopian government in the Tigray region was started in November 3, 2020 after the TPLF declared war and attacked the Ethiopian National Defense force. The federal government declared a unilateral ceasefire and withdrew its forces from the Tigray Region by the end of June 2021. Since July 2021 TPLF forces infiltrated and invaded Amhara and Afar regional states and there was active armed war in the regions till December 2022 (COMMISSION, 2022).

According to (WHO, 2015b) general service availability refers to the physical presence of delivery of services that meet a minimum standard. Availability comprises health facilities, inpatient beds and the core health workforce per 10 000 populations. The Ethiopian FMOH's health and health-related indicators 2020/21 shows the country has a total of 367 functional public hospitals (one for every 280,247 people). It also has 3,777 health centers (one for every

27,231 people) and 17,699 health posts (one for every 5,811)(MOH, 2021a). The same source show that Amhara regional state has a total of 88 functional public hospitals (one for every 256,098 people), 872 health centers (one for every 25,845) and 3,565 health posts (one for every 6,321). The same literature indicated that there were 12,314 physicians (one to 8,352 people) and 1,662 (one to 13,560 people) in nationwide and in Amhara regional state respectively (MOH, 2021a). Based on the division of the rank orders into four categories of high, moderately high, moderately low, and low levels classification a study conducted in Ethiopia on regional disparities of health sector performance stated that Addis Ababa, Amhara and Harari regions have high levels of development in terms of health facilities while Gambela and Beneshangul Gumuz were regions with poor levels of health services (Singh, 2019). According to World Health Organization 2020 the inpatient bed density of Ethiopia was 3.3 per 10,000 populations in 2016 (WHO, 2020).

According to World Health Organization (WHO) the term “general service readiness" describes the overall ability of medical facilities to offer medical services. The cumulative availability of the parts needed to deliver services is known as readiness. It includes tracer items for fundamental facilities, equipment, precautionary measures, lab testing, and needed medications. (WHO, 2010). Quality services and a successful functional health care delivery system require adequate physical infrastructure and the provision of basic amenities. Sanitation facilities, communication equipment, consultation room, improved water supply, power source, emergency transportation, and computer with internet connection were used to assess service readiness for basic amenities. Except for sanitary facilities, referral hospitals (95%) were found to be better equipped than other facility types and followed by general and primary hospitals (91% and 81% respectively) in terms of power, improved water supply, communication equipment, computer with internet, emergency transport, and computer with internet (Zemedu, 2018).

The provision of high-quality health care necessitates the presence of functional basic equipment. The World Health Organization has established a list of essential items that should be present at a health institution in order to ensure that it is ready to provide basic health services. The availability of an adult weighing scale, a child weighing scale, a thermometer, a stethoscope, a blood pressure apparatus, and a light source were used to assess service readiness for basic equipment add its mean availability is 92%, 89% and 87% in referral, general and primary

hospitals respectively (Zemedu, 2018). The same study stated that the referral, general and primary hospitals had standard precautions (84,85,79), laboratory tests (89, 88, 83) and essential medicines (86, 79, 78) percent respectively.

As it is stated in (WHO, 2015b), the term service-specific availability refers the percentage of facilities that offer a particular service and the density of the facilities that provide the service per 10,000 people. Regarding to service specific availability, the service availability and readiness assessment 2018 stated that Ethiopia had family planning (94, 93 & 96); antenatal care (94, 100 & 99); basic and emergency obstetric care and neonatal care (100, 100 & 98); and comprehensive obstetric care (97, 87 & 62) percent availability in maternal health components of specific services respectively in referral, general and primary hospitals (Zemedu, 2018). The other study conducted in Gambela region on public health service availability in humanitarian response reported that all of these maternal health service availability were hundred percent except comprehensive obstetric care service which was offered in a single hospital in the region (Yiech, 2020).

According to SARA 2018 child health service availability was reported as, child immunization (87, 78 & 79) and under five preventive and curative service (94, 92 & 96) service availability respectively in referral, general and primary hospitals. The assessment conducted in Gambela region reported that child health service availability were hundred percent in immunization and 97 percent in under five preventive and curative service (Yiech, 2020). Regarding to communicable disease control services SARA 2018 stated that Ethiopia had HIV/AIDS care and support (100, 97 & 85); prevention of mother to child HIV transmission (97, 96 & 95), tuberculosis diagnosis and treatment (94, 96 & 96), malaria diagnosis and treatment (94, 98 & 99) service availability in percent respectively in referral, general and primary hospitals (Zemedu, 2018) while the assessment of public health services availability in humanitarian responses conducted in Gambela region findings show that Gambela had HIV/AIDS care and support (75%), PMTCT (87%), TB diagnosis and treatment (88%), and malaria diagnosis and treatment service (100%) availability (Yiech, 2020). According to SARA 2018 non-communicable chronic disease diagnosis and management service was available in 95 percent of all type hospitals (Zemedu, 2018). A study conducted in 2019 shows that the absolute disparity was calculated as 1:534, which demonstrates a significant difference in BEmOC, with the lowest

score of 1 in the Gambela region and the maximum score of 534 in the Amhara region (Singh, 2019).

In addition, tertiary, secondary and primary level hospitals had basic surgery (100, 100 & 95); blood transfusion (100, 97 & 67); emergency services (100, 100 & 100) intensive care unit (87, 55 & 12) and chronic non-communicable disease management (97, 96 & 95) percent service specific availability status in their order (Zemedu, 2018). In the other assessment conducted in Gambela region also shows that 96 percent of overall facilities offered basic surgery while the blood transfusion service was available only in a single hospital (Yiech, 2020).

As it is stated in (WHO, 2015b), service-specific readiness refers to the ability of medical institutions to offer a particular service, as determined by the existence of key items like trained personnel, policies, tools and supplies, diagnostic capability, medications, and supplies. According to SARA 2018 the health facilities readiness statuses to provide specific services in referral, general and primary hospitals were ready in family planning (86, 82 & 82); antenatal care (70, 67 & 65); basic and emergency obstetric care and neonatal care (87, 88 & 87); child immunization (87, 87 & 86); under five preventive and curative service (75, 74 & 77) and HIV/AIDS care and support (85, 82 & 82) in percent respectively (Zemedu, 2018).

As stated in the (PHEOC, 2021b), during the conflict the health system in the affected areas was in a state of collapse, because the majority of the health facilities serving the society were deliberately damaged and looted. Invaders targeted civilian institutions such as health facilities, humanitarian stores, universities, research institutes, government infrastructure and offices and IDP camps as well as civilian properties and housing (PHEOC, 2021a).

Some of war related health impacts are the displacement of populations, the collapse of health and social services and the elevated risk of disease transmission. It also elaborated that the displaced people are highly vulnerable, with higher mortality, disabilities, and psychological distress due to suffering from a shortage of health infrastructure and services, a shortage of accommodation, food insecurity, and inadequate access to water and sanitation and it resulting in high risk of outbreaks and the spread of communicable diseases. Not only from host community but also the internally displaced people are more vulnerable than cross boarder displaced people (Ali, 2020)

The current ongoing conflicts in different parts of Ethiopia have triggered humanitarian crises including death, injury and displacement of the local population. Incident related injury or death, changes in living conditions, forced displacement, lack of legal protection and decreased access to health care and others are major health impacts on affected population. Based on the PHEOC SitRep of the Amhara regional health bureau, as of May 18/2022, more than 2,539,382 individuals were forced to displace from their residential area to different parts of the region by terrorist group direct and indirect influence (PHEOC, 2022b). Among those displaced, 1,241,499 were return back to their residency as of March 12/2022(PHEOC, 2022c). 6.6% off the IDP were forced to live at 37 different collective sites with compromised health service and socio-economic deprivation, while the rest 93.4% of them resides in the host communities. On top of these, due to the destruction and looting of health institutions an estimated 10.7 million peoples were living in active war scenes without essential curative, preventive and promotion health services (PHEOC, 2022e). A massacre of civilians has been committed in different areas of the region such as Maikadra, China Teklehaymanot, Agamsa, Antsokia Gemza, Kombolcha Town, etc. Furthermore, the fighters have committed sexual and gender-based violence (SGBV) against civilians including children and pregnant women. (Abebaw et al., 2022)

The armed conflict caused destruction of health system infrastructures, looting medical supplies and equipment, and interruptions of health services, leaving the community reliant on emergency medical assistance. In less than six months, 40 public hospitals, 453 health centers with their satellite 1,850 health posts, 466 private health facilities, and 124 of ambulances were first looted by the terrorist and invading group and then destroyed or turned into military camps. A full-fledged attack on the health system of the region, including health workforce, patients, health facilities, ambulances, medical supplies and equipment has been committed (Abebaw et al., 2022; PHEOC, 2021b)

On the other hand, the other health facilities outside the war-affected areas have been overwhelmed and enforced to serve beyond their capacity. Hence, an immediate health system restoration is a critical issue to avert the health-related negative consequences secondary to essential health service inaccessibility.

A study conducted in Iran on health care utilization of war survivors revealed the higher rate of healthcare utilization of war survivors compared to general population. Utilization of outpatient

healthcare services was 14 per year, which was twice the rate for the rest of the general population and they were admitted to hospital five times more than the general population (Mousavi, Maftoon, Soroush, Mohammad, & Majdzadeh, 2020). According to health and health related indicator 2020/21, average number of outpatient visits including new and repeat visits per person per year (OPD attendance per capita) 1.09 and 1.494 respectively at national level and Amhara region. Average number of inpatient admissions per 1000 population (admission rate) 13.4, average percentage of occupied beds during the period under review (Bed occupancy rate) 43.4%, and average length of stay (in days) of patients in an inpatient facility during a given period of time 4.63 at national level (MOH, 2021a).

Results of regional disparity in Ethiopia shows significant regional differences in health parameters and Amhara region (0.83) have the least disparity in most health indices following Addis Ababa City (0.74), the lead, while Benishangul-Gumuz (1.254) had the highest disparity (Singh, 2019).

The health sector's post-conflict rehabilitation can be divided into three parts: an initial response to emergency health requirements; the restoration or establishment of a package of essential health services; and health system rehabilitation. The crucial point is that these three phases are not separate from one another; how acute humanitarian needs are treated can have serious implications for long-term sustainability. Wherever possible, the three pieces should work together in a seamless manner (Waters, Garrett, & Burnham, 2009).

2.4 Research Gaps

Despite a study was conducted on the health service availability and readiness assessment immediately before the war (Zemedu, 2018), the health system in the war affected area was in the state of collapse during the war and 51 percent of health institutions in the region were either damaged or looted due to the conflict. A study on the public health service impact of war also conducted (Abebaw et al., 2022). The health service restoration project is designed to revitalize the health system in war affected areas to restore the basic health service delivery based on damage assessment and public health impact studies findings (Amhara Regional Health Bureau & Institute, December, 2021). Even though the implementation status of the project was regularly monitored in the IMS weekly meeting and situational report (PHEOC, 2022b), the health service availability and health facility restoration status update was not gain sufficient focus and there were no studies conducted on the health service restoration and

service availability status after the ceasefire of the conflict in the area. As a result, there was major knowledge gap in what extent the health service was available and accessed by the community in war affected zones of the region after project implementation. In addition to this there was discrepancy between PHEOC situational reports and individual health facilities report on their restoration status and there was no sufficient available data to describe health service restoration status at regional and national level at all. Therefore, this research was designed to describe the health service availability in war affected community.

2.5 Conceptual Framework

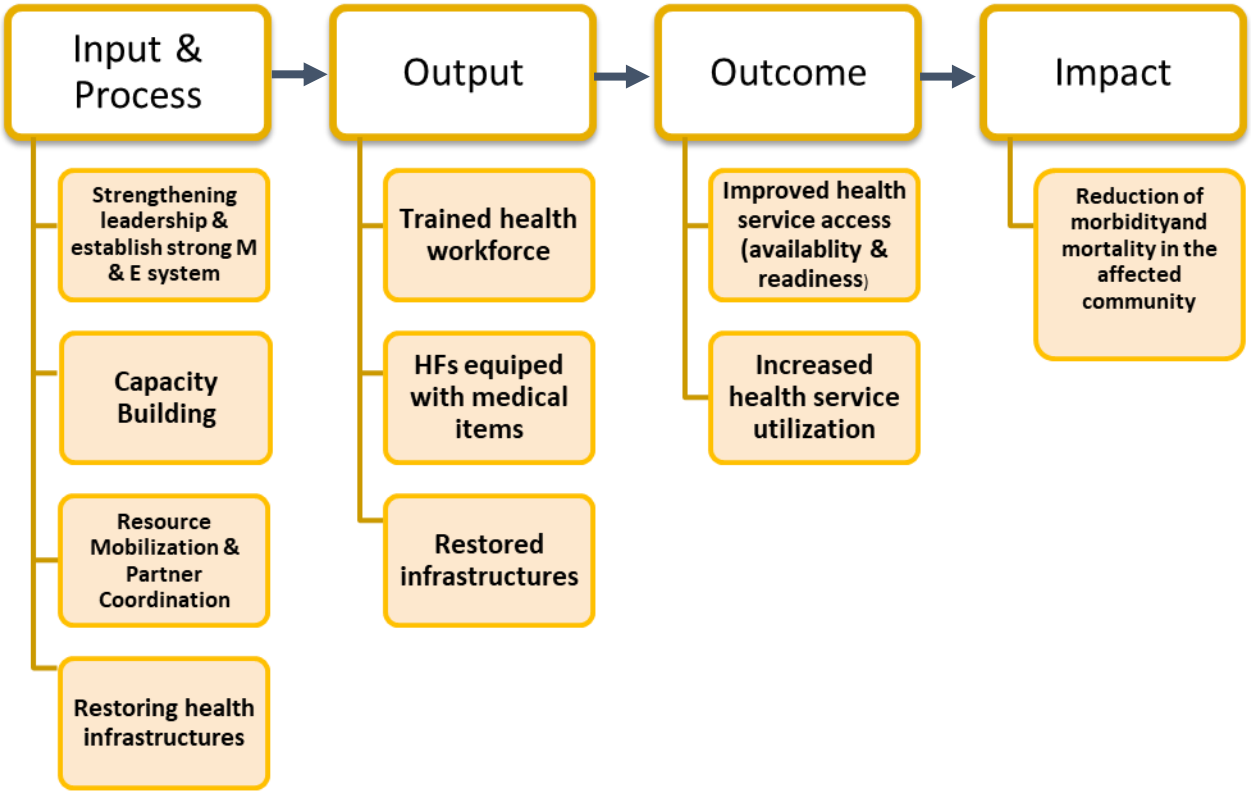

Figure 3 Conceptual framework adopted from literatures

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter has discussed the research methodology, which is composed of the research approach and design, the target population, sampling design, the process of data collection and analysis.

3.2 Research Design

Descriptive cross sectional study for the quantitative part and document review (Case study) were employed for qualitative part.

3.3 Research Approach

In the current study mixed method approach (qualitative and quantitative) was employed to study health service restoration.

3.4 Sampling Design

3.4.1 Target Population

The target population of the study were those public health facilities located at war affected areas in Amhara regional state.

3.4.2 Sampling Frame

There are different lists as war affected public health facilities which are vary each other with total numbers (quantity) and health facility name in different organizations and partners in the region. For the current study the list of armed conflict affected (damaged and/or looted) public health facilities registered in Amhara regional health bureau was used as sampling frame. The list consists 493 public health facilities (40 hospitals, 453 PHCU).

3.4.3 Sampling Technique

The study employed a non-probability sampling approach using the convenience and purposive sampling technique to select all war affected hospitals in Amhara Regional State as a sample.

3.4.4 Sample Size

All affected hospitals (40) in the region was included

3.4.5 Sampling Procedure

Based on three tiered health system structure of Ethiopia, there are 2 specialized hospitals from tertiary level of care, 12 general hospitals from secondary level of care, and 26 primary hospitals (despite (Abebaw et al., 2022) reported it as 11 general and 27 primary), 453 PHCUs from primary level of care in war affected area of the region. All of war affected tertiary (2) and secondary (12) level public health facilities and all war affected primary hospitals (26) at primary level of care was included in this study using convenient and purposive sampling technique due to time and budget constraints; and based on PHEOC priority in early recovery plan. Of the 493 total public health facilities affected by war, 453 PHCUs at primary level of care category were excluded from the study. (Abebaw et al., 2022; PHEOC, 2021b)

Table 1 Sampling procedure

#	Level of Care in the Health Tier System	Health Facility Type	Affected	Selected
1	Primary	Primary Hospitals	26	26
		Health Centers	453	0
2	Secondary	General Hospitals	12	12
3	Tertiary	Comprehensive Specialized Hospitals	2	2
	Total		493	40

3.5 Source of Data

According to WHO monitoring the building block of health system, data about health service delivery can be found in a variety of sources such as routine facility reporting systems, health facility assessments and other specific studies. There is no single approach that can offer all of the information needed to assess service delivery, and numerous methods are required to fully comprehend it. To monitor service delivery, a routine facility reporting system is typically used. The facility generates service data, which includes essential outputs from routine reporting on the services and care provided, as well as the treatments delivered. Statistics on performance connected to inpatient activities, such as the number of beds, admissions, discharges, deaths, and length of stay, are based on hospital records. Utilization data is based on outpatient records.

Health facility assessments can be carried out as a census or as a sample survey. Externally generated information is collected through interviews and/or observation in health facility assessments. In order to understand it completely, WHO recommended that using multiple sources of data on health service delivery availability. (WHO, 2010). Both primary and secondary sources of data were used for this study.

3.5.1 Primary Data Sources

Structured questionnaires were customized from WHO standard questionnaire and distributed to health facilities administrative bodies via email and primary data was collected from 35 war affected public hospitals in order to describe the availability and readiness of health service. It took nearly two months' duration since May 1st of 2022.

3.5.2 Secondary Data Sources

Quantitative type of secondary data on inpatient and outpatient services were extracted from a six-month report of routine health facility health service reports (DHIS2) since January 1st of 2022 to describe health service utilization by the affected community. On the other hand, 24 SitReps and 18 weekly minutes of PHEOC since January 1st to May 26th of 2022, post war rapid damage assessment, health service recovery plan, and other related and relevant documents were reviewed as secondary source of data for the study to describe the response given for the disaster.

3.6 Method of Data Analysis and Interpretation

3.6.1 Qualitative Analysis

The extracted data from the reviewed documents were organized in different themes in line with the WHO health system building blocks. Then the collected data were analyzed and presented in narrative summary.

3.6.2 Quantitative Analysis

The data gathered through questionnaires was coded and entered into computer. The collected data through questionnaire and extracted data from DHIS2 were analyzed by using descriptive statistics with Microsoft excel and presented in the form of text narration, tables and charts. Then both qualitative and quantitative results were presented together for a complete research report.

3.6.3 Interpretations

It was interpreted accordingly in the discussion based on the following indicators

General service availability: was determined by dividing the distribution of infrastructure, inpatient beds, and health workforce per 10,000 people for the delivery of services that satisfy a minimum standard. The availability of general services was evaluated using the following indicators.(WHO, 2010, 2015b)

1. Number and distribution of health facilities per 10 000 populations

$$Health\ Facility\ density = \frac{Total\ number\ of functional\ health\ facilities}{Total\ population\ for\ the\ same\ geographical\ area} * 10{,}000$$

2. Number and distribution of inpatient beds per 10 000 populations

$$Inpatient\ bed\ density = \frac{Total\ number\ of\ inpatient\ beds}{Total\ population\ for\ the\ same\ geographical\ area} * 10{,}000$$

3. Number of health workforce per 10 000 populations

$$Health\ professional\ density = \frac{Total\ number\ of\ \text{health professionals}}{Total\ population\ for\ the\ same\ geographical\ area} * 10{,}000$$

General service readiness: According to information on the presence and functionality of tracer items in the facility on the day of the evaluation, it refers to the overall ability of healthcare facilities to deliver healthcare services. The total score is given as a percentage, and it is calculated by averaging the domain scores for amenities, standard equipment, precautionary measures, diagnostic capacity and essential medications which are the primary indicators used to determine general service capability for healthcare facilities.(WHO, 2010, 2015b)

Service-specific availability: The percentage of services that offer a particular service and the density of the facilities that provide the service per 10,000 people were used to measure service-specific availability, which refers to whether or not a particular service is provided. Percentage of healthcare institutions providing particular services, and their distribution per 10 thousand populations were used as indicators to measure specific service availability.(WHO, 2010, 2015b)

Service-specific readiness: it is the ability of medical facilities to deliver a particular service, and it is assessed by the presence of tracer items including trained personnel, policies, tools and supplies, diagnostic capability, medications, and supplies. The total score for a certain service is given as a percentage, and it is the non-weighting average of the quantity of present and operational components.(WHO, 2010, 2015b)

Service utilization: is referred to as people seek medical attention for a variety of reasons, such as diagnosing and treating illnesses, encouraging the maintenance of health and wellbeing, and learning about their current and future health conditions.

3.7 Validity and Reliability

To measure the validity and reliability of results, the data collection instrument was customized from WHO standard questionnaire, and submitted to and evaluated by the current study advisor. The investigator checked the data completeness and consistency throughout the data collection, data entry, data management and data analysis period. The collected data were triangulated from multiple sources (primary questionnaire data, DHIS2 extracted data and document review of PHEOC report) to verify the similarities of research findings.

3.8 Ethical Considerations

The researcher requested permission from the AAU, School of Commerce by submitting a research proposal, and the organization then provided the researcher with an ethical clearance letter for data collection. The researcher submitted an application for approval to Amhara RHB after receiving a letter of authorization to conduct the proposed research at war affected hospitals in the region. Additionally, the study's aim and objectives were described, and the supporting documents made available during data collection. After the overview of the study was explained to the participants, it was also clarified that participation was completely voluntary, that no compensation would be paid, and there would be no benefits to participants as an incentive for their participation. Each selected participant was asked for their willingness to take part in the study. Nevertheless, participants were also assured that individual rights would be respected should they decide not to participate in the study. It was also explained to the study population that they had to ask for clarification on any points or questions related to the research topic. It was also explained to the participants that those who were not willing to participate had the right to withdraw. Participants were further advised that their names would not be disclosed, and they were assured that the information obtained would not be accessible to anyone other than the researcher. An electronic copy of the data was kept in multiple places with backups, and was password-protected, even after the final report was completed.

CHAPTER FOUR

4. DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

The results of the study are presented and findings of the study are discussed in this chapter. In the first section research findings from document review are presented based on WHO health system building blocks and then quantitative study findings are presented based on the specific objectives of the study that addresses the general and service-specific service availability, general and service-specific service readiness and service utilization respectively.

Quantitative data collected from 35 war affected public hospitals, DHIS2 extracted data of May 2022 monthly report and January 2022 to Jun 2022 six months' report as well as information gathered by document review from 24 PHEOC situational reports and 18 PHEOC weekly meeting minutes since December 1st 2021 to May 26th2022 besides the other related literatures are analyzed and discussed below in details.

4.2 Health crisis and Recovery on health system building blocks

Six fundamental elements or building blocks are used by the WHO to describe health systems: service provision, health workforce, health information, medical products, health financing, and leadership & governance. In various ways, these building blocks support the improvement of health systems. The foundation for the overall policy and regulation of all the other building blocks of the health system is provided by cross-cutting elements, like leadership & governance, and health information systems. Health finance and the health workforce are the two important input components for the healthcare system. The last category, which includes the medical products and services, represents the immediate results of the healthcare system, such as the accessibility and distribution of care (WHO, 2010). A war related health crisis can have a negative impact on the leadership and governance, health workforce, health information, medicines and technology, health service delivery, and financial components of the health system.

A. Governance and Leadership

World Health Organization (2010) states that strong leadership and governance are essential for developing the skills of the health workforce, coordinating the development of health policies and strategies, bringing together the stakeholders in the health sector, and managing health at the provincial and district levels (WHO, 2010). The coordination of health stakeholders had collapsed at the time of the conflict, and health planning and administration at the zone and district levels were almost nonexistent. The problem in health information has significantly hampered the leadership, administration, and accountability of the healthcare system. In the areas of armed conflict, communication and electrical networks were disrupted for months. The coordination of the health stakeholders was the main emphasis of the intervention addressing the leadership and governance block. The Amhara regional health Bureau and Amhara public health institute handled the coordination during the health emergency response and service restoration phases.

B. Health Information System

A well-functioning health information system guarantees that reliable and timely information on health determinants, health system performance, and health status is produced, analyzed, disseminated, and used (WHO, 2010). As a result of computer theft or system destruction, the patient medical record systems and the health management information system have failed in war affected zones. Key employees in the area were displaced, while 268 computers and 242 printers were either looted or damaged during the conflict (MOH, 2022). In addition, the infrastructure and systems used for data collecting and reporting have been damaged, which has hindered data recording and reporting. Production, analysis, dissemination, and use of accurate and timely data on health determinants, the effectiveness of the healthcare system, and health status were significantly hampered. As a result, there was a significant reduction in the production of strategic information for epidemiologic surveillance and early warning systems, which is a crucial component of health management.

To address the issue, resource mobilization concentrated on enhancing health monitoring and evaluation, providing better access to health information, and promoting health communication. Rehabilitating the communication system, delivering information, and offering education and communication materials, DHIS2 equipment were among the measures put into practice.

C. Health Workforce

A high-performing health staff is one that responds quickly, fairly, and efficiently to deliver the greatest possible health outcomes given the resources and circumstances (WHO, 2010).

The displacement of the medical workforce caused by the conflict-related crisis damaged the health system. According to information that were available 15,000 medical professionals had departed the Amhara region war affected zones (MOH, 2022). As a result, the violence has caused the displacement of not only community people but also of health professionals who serve the community. All of these things took place despite the fact that health professionals are desperately needed in places affected by armed conflict to treat injured troops and civilians impartially.

Interventions for health recovery thus concentrated on retaining health workers and training health professionals on a range of illnesses and conditions including mental health and psychosocial support. To perform various activities for the mobile clinic, including nutritional screening, immunization, health education, gender-based violence screening, linkage to treatment, and chronic follow-up, approximately 452 extra health professionals have been hired (Abebaw et al., 2022). Even if the circumstances improved the health situation somewhat, there were still many open positions.

D. Health Financing

A successful health finance system provides sufficient cash for health in such a way that people may get essential services while avoiding financial ruin or impoverishment as a result of having to pay for them (WHO, 2010). The governmental treasuries, bilateral and multilateral donors, out of pocket expenses of household and community based health insurance were some of the many funding sources for the health sectors in Ethiopia and the Amhara regional state as well (MOH, 2022). In the war-affected areas prior to the conflict, there was a viable healthcare finance system that gave community members, especially the poorest of the poor, equitable access to health services. Due to the conflict, these health financing designs have ceased, including the fee exemption program, which provided 2 million people in the conflict-affected districts with fee waivers and free access to high impact health interventions like childbirth, immunization, antenatal care, and TB, HIV, and malaria diagnosis and treatment. The estimated cost of 8,650,479,999.32 ETB (of which 3,693,319,857.59 ETB was from 24 public hospitals) was either looted or damaged during the conflict from health sectors. Community based health

insurance offices have been completely destroyed by the violence, rendering the program useless. This implies that 4,220,678 community members and an estimated 874,000 households no longer have access to health insurance (MOH, 2022). In addition to affecting households' ability to pay for health treatments directly, the economic effects of the conflict make it challenging for households to pay for health insurance premiums. The number of people who qualify for fee exemptions to obtain health services has greatly increased, which in turn raises the demands on the government for additional health spending. Interventions for health recovery regarding to health financing thus concentrated on calling all stakeholders together by identifying the existing gaps and designing thematic areas in order to assist health facilities in reactivating their health care finance and to assist affected communities in paying their CBHI premium.

E. Technologies, Vaccines and Medical Products

Technologies, vaccines and medical products address issues that hinder the availability of drugs and other medical products. For the delivery of healthcare, access to necessary pharmaceuticals, vaccines, and technology of high quality is vital. A well-functioning health system offers equal access to key medical products, vaccines, and technologies of known quality, safety, efficacy, and cost-effectiveness, as well as their scientifically sound and cost-effective application (WHO, 2010).

During the period when the area was in conflict and the health deteriorated, there were severe drug shortages. Public health organizations could no longer administer vaccinations in a way that prevented outbreaks of diseases including Covid-19. Regarding to medical equipment x-ray machines (40), Gene X-Pert machines (25) Chemistry machine (43), Hematology machine (43), CD4 count machine (43), LED Microscope (580), AFB Microscope (1050), ECG machines (19) and OR apparatus/machine (975) were either looted or damaged from 40 public hospitals and 453 health centers in the war affected zones (MOH, 2022). 3,819,644,315.40 ETB estimated cost (2,423,428,329.93 ETB from 24 hospitals) medical equipment, 2,886,106,404.59 ETB (532,036,604.72 ETB from 24 hospitals) estimated cost drugs supplies & reagents, and 1,739,126,006.17 ETB (685,304,283.34 ETB from 24 hospitals) estimated cost non-medical supplies were either looted or damaged in the war affected zones within five months of war (PHEOC, 2021c).

To solve the problem, different health actors including international partners and Ethiopian diaspora community were permitted to buy drugs to supplement government supplies. The

twinning approach of non-affected hospitals with affected hospitals did a significant role for service restoration (PHEOC, 2022d).

F. Health Service Delivery

Good service delivery is defined as effective, safe, and high-quality personal and non-personal health interventions are delivered to individuals who need them, when and where they are required, with minimal waste of resources. 205,603,273.16 ETB estimated cost of health service infrastructure (52,550,639.60 ETB from 24 hospitals) was damaged during the conflict. Routine maternal, child, nutrition prevention, and communicable and non-communicable disease treatment have been discontinued as a result of the disruption to primary health care services and referral mechanisms. Pregnant women no longer have timely access to basic antenatal care and institutional delivery services, and kids no longer have access to immunizations, vitamin A supplements, screening and treatment for malnutrition, and other pediatric illness treatment. People with HIV have neglected to follow up on their prescribed medications and treatments (Abebaw et al., 2022). For patients with chronic illnesses, stopping routine follow-ups and delaying medication refills for an extended period of time increases the risk of drug resistance, morbidity, and mortality. To address the gap 12 temporary clinics and 74 mobile health teams were employed besides the health facility restoration (MOH, 2022).

4.3 Health Service Availability Status in War Affected Area

This section of the chapter explores and describes the health service availability status in the war affected area of Amhara regional state; that was the specific objective one of the study. It gives answer for the first research question “What is the extent of health service availability in the war affected area?” and it contains two subsections: general service availability and service specific availability. Primary source of data was mainly used and information gathered from document review were used to get war affected total population, and accessible and inaccessible war affected public hospitals.

4.3.1 General Service Availability

General service availability refers to the physical presence of delivery of services that meet a minimum standard. Availability comprises health facilities, inpatient beds and the health workforce per 10,000 population (WHO, 2015b).

A. Number and distribution of health facilities per 10,000 population

It is described as the ratio of the number of healthcare facilities to the total population in a certain geographic area. The total population for the same geographic area serves as the denominator, while the numerator is the number of health facilities classified as static institutions that provide general health services(WHO, 2015b).

$$Health\ Facility\ density = \frac{Total\ number\ of\ functional\ health\ facilities}{Total\ population\ for\ the\ same\ geographical\ area} * 10{,}000$$

During data collection period 35 (referral 2, general 10 and primary 23) of 40 war affected hospitals have started to offer services to the community and the rest 5 (general 2 and primary 3) hospitals were in the active conflict area and were not accessible to any restoration activities. As stated in (PHEOC, 2022e) there were 10,689,575 populations in the war affected area of the region.

Figure 4 shows that the referral, general and primary hospital availability were 94, 94 and 22 percent based on the national standard in the war affected area of the region.

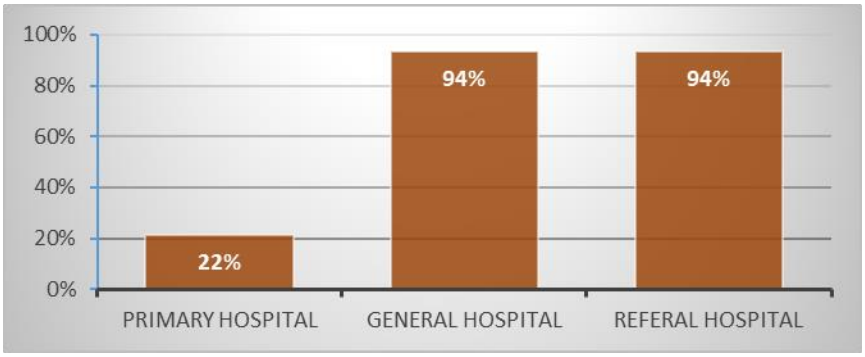

Figure 4 Health facility availability percentage in Amhara war affected area against national standard, 2022 (N=40)

Source: Document review

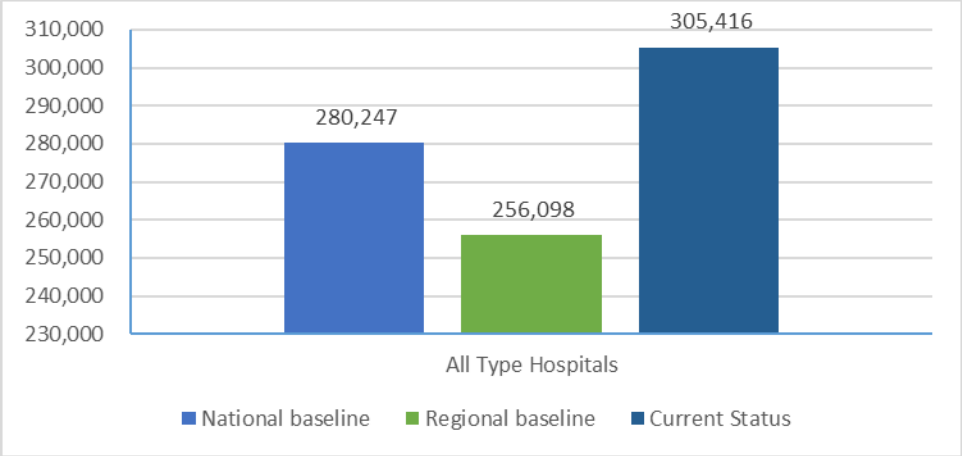

Figure 5 Average population served per each public hospital in Amhara war affected area, 2022 (N=40)

Source: Document review

This finding implies that 35 public hospitals had provided health services to 10,689,575 populations in the war affected area of the region. There were one comprehensive specialized (referral) hospital to 5,344,788, one general hospital to 1,068,958 and one primary hospital to 464,764 populations. On average each public hospital of any type started to offer healthcare service for 305,416 populations.

As it is stated in MOH 2015 "The Ethiopian health service is restructured into a three tier system; primary, secondary and tertiary level of care." The primary level of care consists primary hospital and primary health care unit. Each primary hospital expected to provide services for 60,000 to 100,000 populations. General hospitals are drop in secondary level of care category and expected to provide services to 1,000,000 estimated people in average. Specialized hospitals are categorized under tertiary level of care and serve for 3.5 million to 5 million people (MOH, 2015).

The current study findings show that the referral, general and primary hospital availability in war affected zones were 94, 94 and 22 percent of the national standards respectively. In other words, it was below the minimum health facilities requirements. In general, only 0.03 public hospital available for each 10,000 war affected populations and in average one any type public hospital had served to 305,416 populations. The Ethiopian MOH's health and health-related indicators 2020/21 shows the country has a total of 367 functional public hospitals or one for every 280,247 people which is approximately equivalent with 0.04 per 10,000 populations, and the Amhara

regional state has a total of 88 functional public hospitals or one for every 256,098 people (MOH, 2021a).

As a result, public hospital density in the current study finding is lower compare to the national average and regional average. This implies that war affected functional hospitals were overloaded by 25% additional population relative to national baseline. In other words, 25% of the war affected communities were not access public hospitals within national average distance and the health service restoration project was 25% below its hospital availability target.

B. Number and distribution of inpatient beds per 10, 000 population

It is described as the quantity of available inpatient beds in relation to the region's overall population. The number of inpatient beds is the numerator. This number includes all hospital beds, including those for children and pregnant women, but excludes delivery beds. The entire population for the same geographic area serves as the denominator (WHO, 2015b).

$$Hospital\ inpatient\ bed\ density = \frac{Total\ number\ of\ inpatient\ beds}{Total\ population\ for\ the\ same\ geographical\ area} * 10{,}000$$

At the time of data collection there were a total of 2282 inpatient beds in all 35 functional hospitals (2.1 beds to 10,000 populations). As it is shown in figure 6 bellow, the total inpatient beds in war affected hospitals were distributed as 38% in referral hospitals 35% in general hospitals and 27% in primary hospitals, and in average there were 27, 80 and 430 beds per each primary, general and referral hospitals respectively.

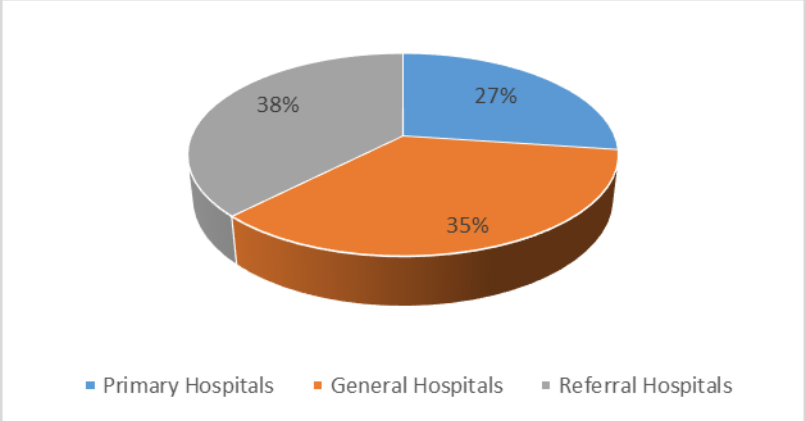

Figure 6 Total inpatient bed distributions by hospital type in Amhara war affected hospitals, 2022 (N=35) Source: Survey data

As it states on national standards of hospital requirement, each primary hospital are expected to have a minimum of 35 inpatient beds (Agency, 2012c), each general hospitals a minimum of 50 inpatient beds (Agency, 2012b) and each specialized hospitals with a minimum of 110 inpatient beds (Agency, 2012a). Based on these standards primary hospitals had 77 percent of its minimum requirements of inpatient bed while referral and general hospitals achieved their minimum requirement in average.

The current study finding 2.1 beds per 10,000 population was below national average of 3.3 beds to 10,000 populations (WHO, 2020) and the health service recovery project achieved 64% its target in functional affected hospitals. WHO stated that the global average is 27 beds per 10,000 populations while the lower and upper middle income nations have eighteen and thirty-nine inpatient beds per ten thousand populations and 25 inpatient beds per ten thousand populations is selected as a benchmark (WHO, 2015b). Therefore, only 8.4 percent hospital beds relative to WHO benchmark were available in war affected hospitals

C. Number and distribution of core health workforce per 10, 000 population

It is described as the ratio of available core health professionals in a given geographic area to the total population. The denominator is the total population for the same geographic area, and the numerator is the total number of core health professionals (WHO, 2010).

$$Health\ professional\ density = \frac{Total\ number\ of\ \text{health professionals}}{Total\ population\ for\ the\ same\ geographical\ area} * 10{,}000$$

As it is shown in table 2 and figure 7 bellow, there were a total of 3839 and in average 74, 154 and 298 core health professionals at primary, general and referral hospitals respectively while there were 568 total and 10, 22 and 60 physicians at each primary, general and referral hospitals respectively and distributed as 41, 38 and 21 percent at primary, general and referral hospitals respectively.

Table 2 total number of core health professionals and physicians in Amhara war affected functional hospitals, 2022 (N=35)

	Total numbers during data collection				Average numbers per each hospitals		
	Total	Primary Hospitals	General Hospitals	Referral Hospitals	Primary Hospitals	General Hospitals	Referral Hospitals
Physicians	568	233	215	120	10	21.5	60
Total Health Workforce	6073	3041	2270	762	132	227	381
Core Health Professionals	3839	1705	1539	595	74	154	297.5

Source: health service restoration assessment data, 2022

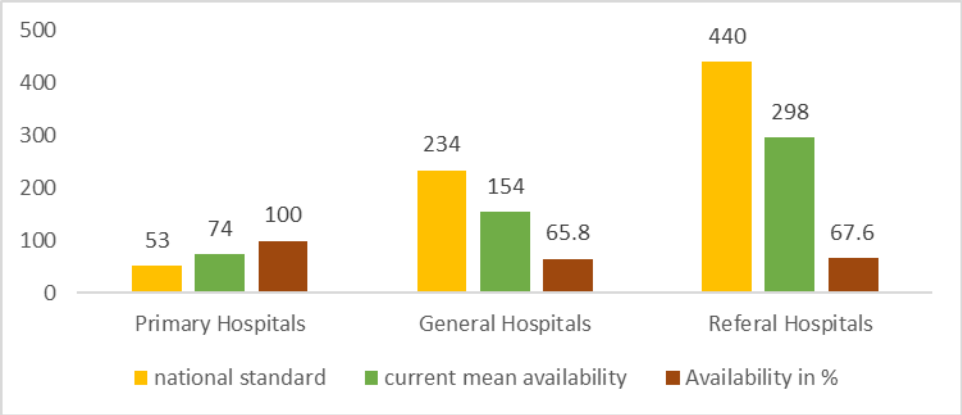

Figure 7 Health Professional Availabilities in Amhara war affected functional hospitals against national standard and hospital type, 2022 (N=35)

Source: Survey data, 2022

Figure 7 show that the average total health professional distribution was 67.6, 65.8 and 100 percent in referral, general and primary hospitals respectively against national standard while physician availability was 0.5 per 10,000 populations. Each primary hospitals are expected to provide services for 60,000 to 100,000 populations with minimum of 53 core health professionals (Agency, 2012c); each general hospitals are expected to provide services to 1,000,000-1,500,000 estimated people with minimum of 234 core health professionals (Agency, 2012b). Specialized hospitals are expected to serve for 3.5 million to 5 million people with minimum of 440 core health professionals (Agency, 2012a).

The Ethiopian FMOH's health and health-related indicators 2020/21 shows that there were 12,314 physicians (one to 8,352 people) and 1,662 (one to 13,560 people) in nationwide and in Amhara regional state respectively(MOH, 2021a). Therefore, the current study finding of physician density is lower compared to national average (one to 8,352 people equivalent to 1.2 per 10,000) and regional average (one to 13,560 people equivalent to 0.74 per 10,000).

As a result, the project achieved only 68% of its target or 42% of national average. Therefore, the problem in the war affected community was not only those functional public hospitals were overloaded with 25% additional population but also they have given the health services with a total of health professionals below minimum requirement.

D. Summary in General Health Service Availability

As it is shown in figure 8 below, the health facility, inpatient bed and physician density were 0.03, 2.1 and 0.5 per 10,000 populations which are 75, 64 and 42 percent of national average. Therefore, the overall general service availability in the war affected area of the region was 60 percent of the national average. It implies that the health service restoration project achieved only 60% of its target in terms of general service availability.

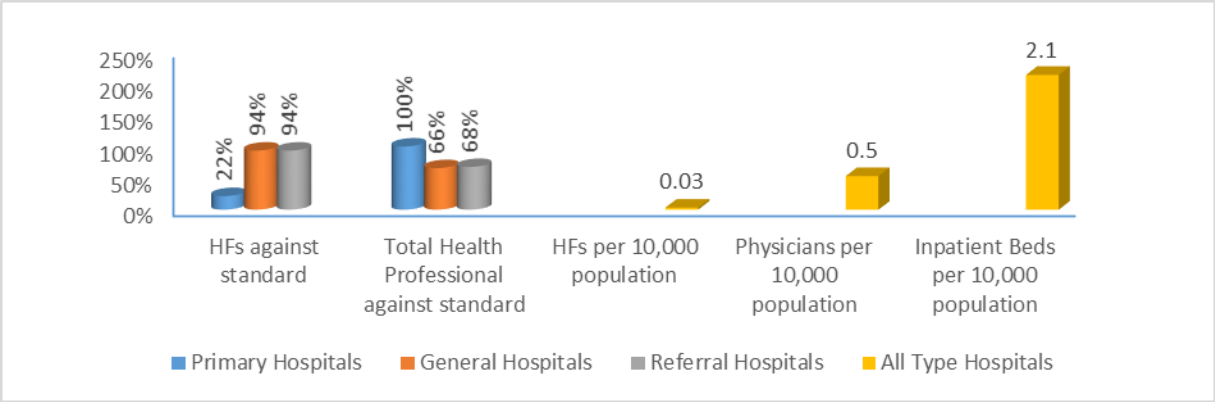

Figure 8 General service availability in Amhara war affected area, 2022

Source: Document review and survey data

Despite the Amhara regional state had had better achievements than national average in almost all parameters of health service availability, readiness and utilization in immediate previous years of before north Ethiopia war, the current study findings revealed that the availability of hospital density 0.03 per 10,000 (75% of national average); inpatient bed density 2.1 per 10,000

(64% of national average); physician density 0.5 per 10,000 (42% of national average); and the overall general service availability of 60 percent.

Results of regional disparity in Ethiopia shows significant regional differences in health parameters and Amhara region was registered in a high level of development in health sector infrastructures, facilities and services following to Addis Ababa City. The same study revealed that Amhara region (0.83) have the least disparity in most health indices following Addis Ababa City (0.74), the lead, while Benishangul-Gumuz (1.254) had the highest disparity (Singh, 2019).

4.3.2 Service-Specific Availability

The percentage of services that offer a particular service and the density of the facilities that provide the service per 10,000 people were used to measure service-specific availability, which refers to whether or not a particular service is provided (WHO, 2015b). Family planning, antenatal care, skilled birth, child immunization, under five children preventive and curative service, HIV/AIDS care and support, PMTCT, tuberculosis diagnosis and treatment, malaria diagnosis and treatment, non-communicable chronic illnesses, basic and comprehensive surgical care, blood transfusion, emergency care, intensive care unit and diagnostic services were selected specific services in current study to assess service specific availability status in the war affected public hospitals. Percentage of healthcare institutions providing particular services was used as indicator to measure specific service availability.

Table 3 and Figure 9 bellow show that the service specific availability in war affected health facilities in the region in detail.

- 13 percent hospitals (5 of 40 affected hospitals) were in the active conflict area and did not start offering any of health service deliveries during the time of data collection.
- Only 4 of 17 specific services (family planning, antenatal care, basic delivery and emergency services) were offered in 88 percent of war affected hospitals and in all 35 functional war affected hospitals while intensive care unit service was offered in 13 percent of hospitals.
- On average, 70 percent of 17 specific services were started to be offered in all war affected hospitals while only 3 hospitals (7.5%) start to offered all 17 specific services.

Table 3 Service-specific availability in Amhara war affected public hospitals, 2022 (N=40)

	# HFs offering services				percentage of HFs offering services					services offered in all 35 hospital
Specific Services	Total	PH	GH	CSH	PH	GH	CSH	Accessible HFs	Affected HFs	
Family planning	35	23	10	2	100%	100%	100%	100%	88%	1
Antenatal care	35	23	10	2	100%	100%	100%	100%	88%	1
PMTCT	29	18	9	2	78%	90%	100%	83%	73%	0
BEmONC	35	23	10	2	100%	100%	100%	100%	88%	1
CEmOC	26	16	8	2	70%	80%	100%	74%	65%	0
Child immunization	17	10	6	1	43%	60%	50%	49%	43%	0
IMNCI	29	19	8	2	83%	80%	100%	83%	73%	0
HIV & AIDS care and support	27	17	8	2	74%	80%	100%	77%	68%	0
TB diagnosis and treatment	33	21	10	2	91%	100%	100%	94%	83%	0
malaria diagnosis & treatment	28	17	9	2	74%	90%	100%	80%	70%	0
NCD diagnosis and management	33	21	10	2	91%	100%	100%	94%	83%	0
Basic OR	31	19	10	2	83%	100%	100%	89%	78%	0
Comprehensive OR	14	5	7	2	22%	70%	100%	40%	35%	0
Intensive Care Unit	5	0	3	2	0%	30%	100%	14%	13%	0
Emergency Service	35	23	10	2	100%	100%	100%	100%	88%	1
Blood transfusion	29	18	9	2	78%	90%	100%	83%	73%	0
Laboratory & Imaging	34	22	10	2	96%	100%	100%	97%	85%	0
HFs offering all services	3	0	2	1	0%	20%	50%	9%	8%	
Sum of specific scores					1283	1470	1650	1357	1188	4
Total number of services					17	17	17	17	17	17
Mean percentage of Service-specific availability					75%	86%	97%	80%	70%	24%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

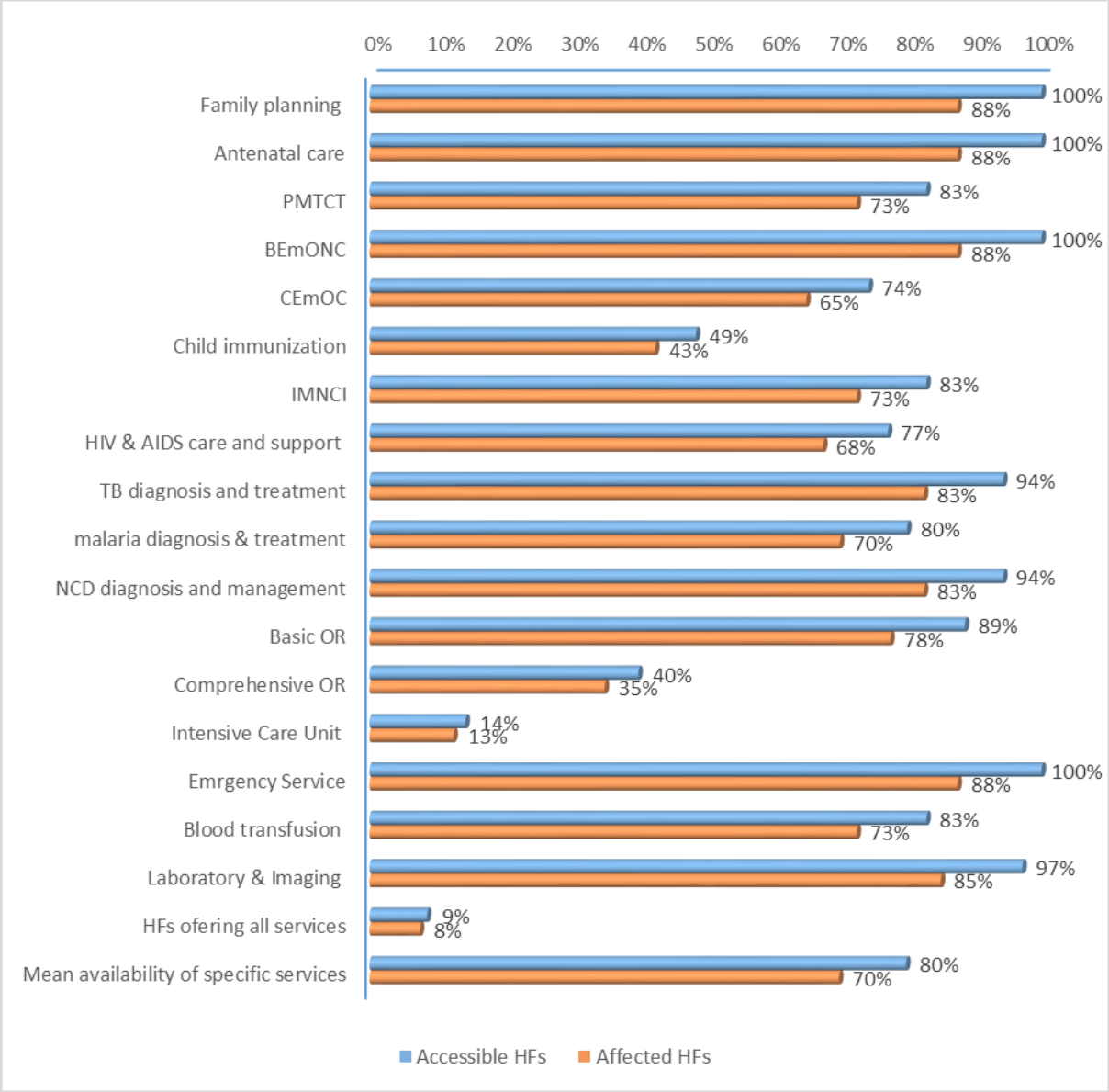

Figure 9 Service-specific availability in Amhara war affected public hospitals, 2022

Regarding to maternal health service availability, except comprehensive obstetric care (74% availability), all family planning, antenatal care, and basic emergency obstetric and neonatal care services were 100% available in those 35 functional affected hospitals which is better than national averages of SARA 2018 that 95, 99, 99 and 75 percent availability of family planning, antenatal care, basic emergency obstetric and neonatal care, and comprehensive obstetric care services respectively (Zemedu, 2018). All of these maternal health service availability findings are consistent with a study conducted to assess the public health services availability in humanitarian responses in Gambela region (Yiech, 2020).

At the time of data collection child immunization service and under five preventive and curative services were available in 49 and 83 percent of functional affected hospitals respectively which is below national average reported in (Zemedu, 2018) child immunization service and under five preventive and curative services were available in 79 and 94 percent of hospitals respectively nationwide. Both child immunization and under five children preventive and curative service availability were 100 percent in assessment of public health services availability in humanitarian responses conducted in Gambela region (Yiech, 2020).

Regarding to communicable disease prevention and control services, the current study showed that HIV/AIDS care and support, prevention mother to child transmission of HIV, tuberculosis diagnosis and treatment, and malaria diagnosis and treatment services were available in 77%, 83%, 94% and 80% of functional affected hospitals respectively. All these findings are below the national average availability of HIV/AIDS care and support (91%), PMTCT (96%), TB diagnosis and treatment (96%) and malaria diagnosis and treatment (98%) respectively in SARA 2018 (Zemedu, 2018). The assessment of public health services availability in humanitarian responses conducted in Gambela region findings show that better availability in PMTCT (87%) and malaria diagnosis and treatment service (100%) while the lower availability in HIV/AIDS care and support (75%) and TB diagnosis and treatment (88%) services (Yiech, 2020).

Non-communicable chronic disease diagnosis and management service was available in 32 of 35 functional hospitals which almost equivalent to national average (95 percent) of SARA 2018 finding.

Regarding to surgical and emergency related services basic surgery, comprehensive surgery, blood transfusion, emergency care, and intensive care unit services were available in 89%, 40%, 83%, 100% and 14% of functional affected hospitals respectively while SARA 2018 reported as availability of the same indicators in 97, 97, 82, 100 and 36 percent of hospitals respectively nationwide. In other words, both blood transfusion and emergency care services findings are consistent with (Zemedu, 2018) while basic surgery, comprehensive surgery and intensive care unit service availability findings are below the SARA 2018 findings. In the other assessment conducted in Gambela region also shows that 96 percent of facilities offered basic surgery even though blood transfusion service was available in a single hospital (Yiech, 2020).

In general, mean availability of 17 selected specific services in total affected hospitals (70%) and in functional affected hospitals (80%) was 20 and 10 percent below national mean (90 percent) of SARA 2018 respectively.

4.4 Health Service Readiness Status in War Affected Public Hospitals

This section of the chapter explores and describes the health service readiness status in the war affected public hospitals of Amhara regional state; that was the specific objective two of the study. It gives answer for the second research question "What is the readiness level of the public health facilities in the war-affected area to provide healthcare services?" and it contains two subsections: general service readiness and service specific readiness. Primary data were mainly used to describe service readiness status and secondary data extracted from DHIS2 were used as complimentary source to get reliable data on essential medicine availability.

4.4.1 General Service Readiness

The general competence of medical facilities to offer healthcare services is referred to as general service readiness. The cumulative availability of the parts needed to deliver services is known as readiness. It includes tracer items for the following key categories: basic amenities, equipment, precaution for infection prevention, diagnostic capacity and essential medications(WHO, 2015b).

A. Basic Amenities

For the delivery of quality services and for an efficient and functional health care delivery system, adequate physical infrastructure and the availability of fundamental amenities are required (WHO, 2015b). It was evaluated based on the presence or absence of improved latrine, communication tools, privacy consultation room, enhanced water supply, electricity source, emergency transportation, computer with internet access, and waiting area.

- As it is indicated in table 4 and figure 10, out of all 35 affected functional hospitals computer with internet (46%) and improved latrine (80%) were the least and most available tracer indicators of basic amenities respectively.
- Communication equipment and water source basic amenities tracer items were available in 51 and 66 percent below the average score next to the least available tracer computer with internet.

- The rest basic amenities tracer items; emergency transportation, waiting area, room with auditory and visual privacy, and power supply were available with 77, 77, 71 and 69 percent of 35 hospitals in their order.
- The mean basic amenities domain scores of all (8) basic amenities tracer items in 35 hospitals were 67% and only 14% of hospitals (5) had all 8 basic amenities tracer items.

Table 4 Basic amenities tracer items availability and Basic amenities domain score in Amhara war affected functional hospitals, 2022 (N=35)

	Number of facilities that have the item available				Availability Status			
Basic amenities tracer item	Total	PH	GH	CSH	PH	GH	CSH	All type HFs
Communication equipment	18	8	8	2	35%	80%	100%	51%
computer with e-mail and Internet	16	10	4	2	43%	40%	100%	46%
emergency transportation	27	19	6	2	83%	60%	100%	77%
Power	33	23	8	2	78%	40%	100%	69%
water source	23	14	7	2	61%	70%	100%	66%
waiting area	27	19	6	2	83%	60%	100%	77%
room with auditory and visual privacy	25	19	5	1	83%	50%	50%	71%
improved latrine	28	20	6	2	87%	60%	100%	80%
HF with all tracer items	5	2	2	1	9%	20%	50%	14%
Sum of values					5.52	4.6	7.5	5.37
Total number of items					8	8	8	8
Mean (sum / total)					0.69	0.58	0.94	0.67
Basic amenities domain score (mean × 100)					69%	58%	94%	67%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

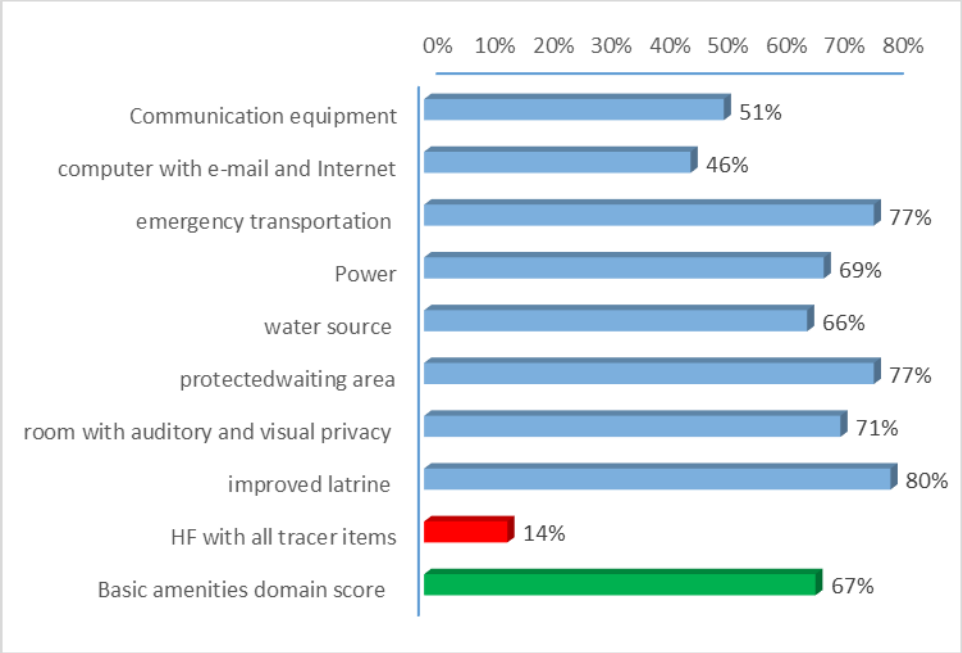

Figure 10 Basic amenities tracer items availability and Basic amenities domain score in Amhara war affected functional hospitals, 2022 (N=35)

As it is shown in Figure 11, referral hospitals were found to be better equipped than other facility types in almost all basic amenities tracer items and scored 94% and 50% in basic amenites domain score and all tracer items respectively. Primary and general hospitals were scored 69% and 53% respetively in basic amenites domain score.

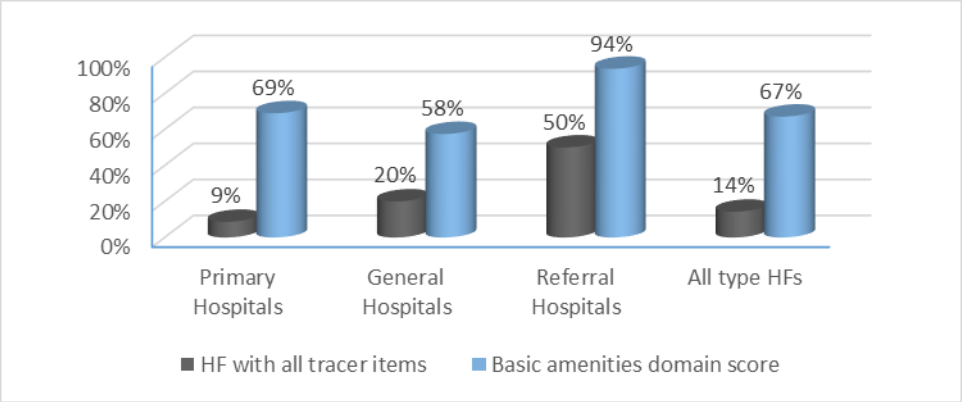

Figure 11 Basic amenities domain score by hospital type in Amhara war affected hospitals, 2022 (N=35)

The overall finding of the current study is lower and only referral hospitals score was consistent with when compare to the study findings conducted in Ethiopia on service availability and

service readiness. According to SARA 2018 except for sanitary facilities, referral hospitals (95%) were found to be better equipped than other facility types and followed by general and primary hospitals (91% and 81% respectively) in terms of power, improved water supply, communication equipment, computer with internet, emergency transport, and computer with internet. The mean domain score of all type hospital in basic amenities was 86 percent (Zemedu, 2018).

B. Standard precautions for infection prevention

The system for providing health services must include safety as a key component. Health professionals must be able to work in a secure setting and have access to all the tools and training they need to do their jobs safely. They must also be able to provide their patients with care in the safest possible way (WHO, 2015b). Based on the availability of disposable or auto-disable syringes, safe final disposal of non-sharp infectious waste, safe final disposal of sharps, autoclaves for medical equipment process, and guidelines for standard precautions, the service readiness for standard precautions for infection prevention was evaluated.

Figure 12 show the availability of tracer items to standard precautions for infection prevention as well as its domain score in the affected functional hospitals.

- On average each facility had 4 and half out of six standard precaution tracer items
- Approximately half of the functional war affected hospitals (51%) had all six standard precaution items.
- All 35 functional war affected hospitals had disposable or auto disable syringe and nearly all (34) had medical equipment processing as standard precaution for infection prevention.
- Safe final disposal of sharps (83%) and electric autoclave (80%) also were available items more than the average level (75%) while guidelines (66%) and Safe final disposal of infectious wastes 26% the least items in standard precautions for infection prevention

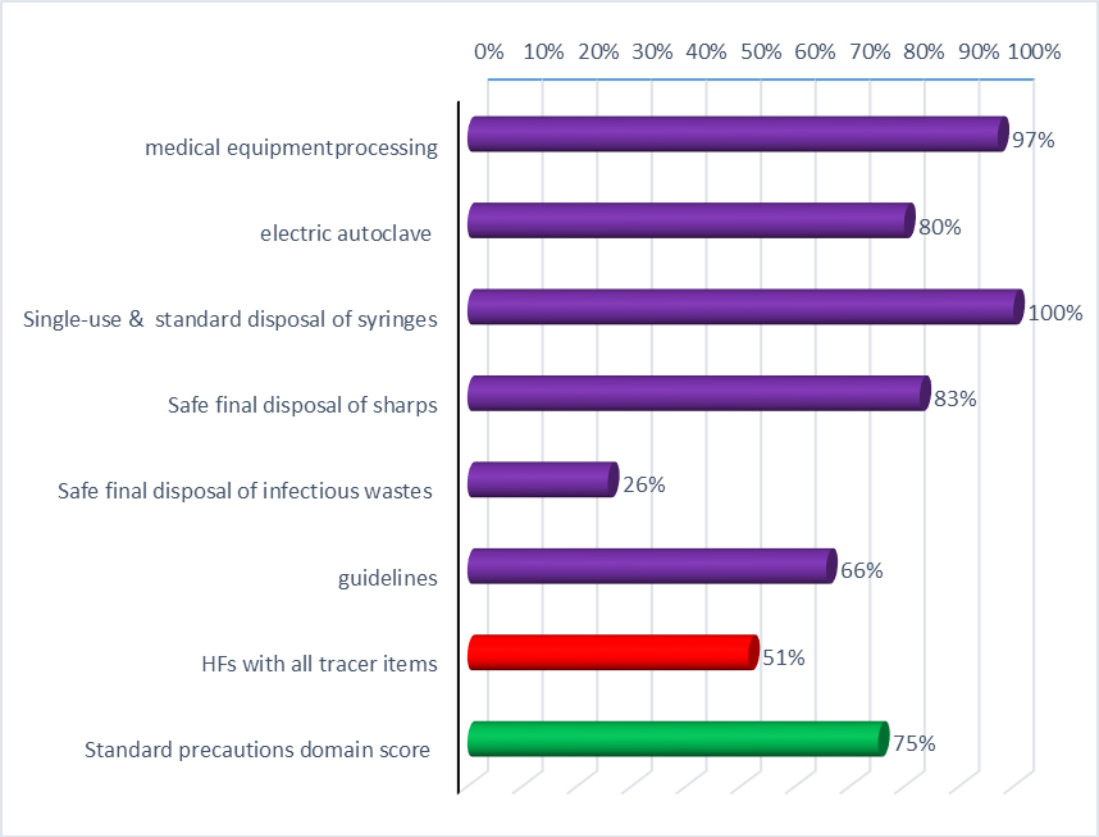

Figure 12 Standard precautions tracer items availability & Standard precautions domain score in Amhara war affected functional hospitals, 2022 (N=35)

Figure 13 shows that referral hospitals were found to be better equipped than other hospital types in all basic standard precautions tracer items and scored 100% in both standard preaution domain score and all tracer items for standard precautions. Primary and general hospitals were scored 78% and 68% respetively in standard precaution domain score while 48% and 50% primary and general hospitals had all tracer items for standard precautions respectively.

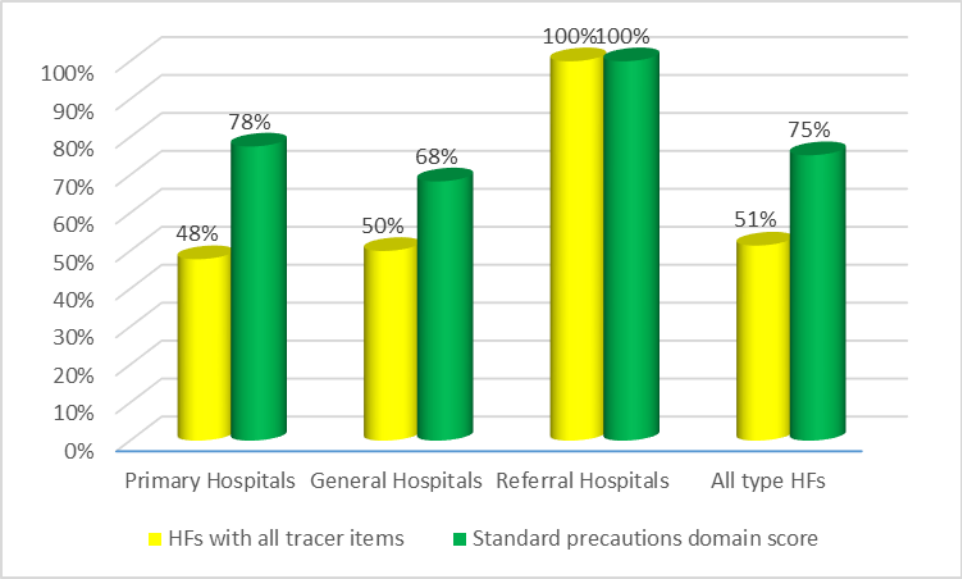

Figure 13 Standard precautions domain score by hospital type in Amhara war affected functional hospitals, 2022 (=35)

The current study findings show the overall domain score on standard precautions is lower compared to SARA 2018. In the mentiend study stated that the referral, general and primary hospitals had standard precautions domain score (84,85,79) respetively and 81 percent was the mean domain score of infection prevention standard precautions (Zemedu, 2018).

C. Basic Equipment

The availability of functional basic equipment is a requirement for providing high-quality healthcare services. In order to ensure that a health institution is prepared to provide basic health services, the World Health Organization (WHO) has suggested a list of essential pieces of equipment that should be on hand. Based on the availability of adult weight balance, infant weight balance, thermometer, stethoscope, blood pressure device, light source, and pulse oximeter, the service readiness for basic equipment was evaluated.

- On average, in all 35 hospitals in the war affected area had 5 of the 7 tracer items of basic equipment.
- Stethoscope (94%) and Light source (43%) the most and the least available items of basic equipments in all type of war affected hospitals.

- Thermometer (89%), child/infant weighing scale 86% and blood pressure apparatus 83% were available items more than the average level (73%) and adult weighing scale 60% and Pulse oximeter 60% were available basic equipment items below the average.
- 26% of hospitals were fully equipped with all seven basic equipment items.

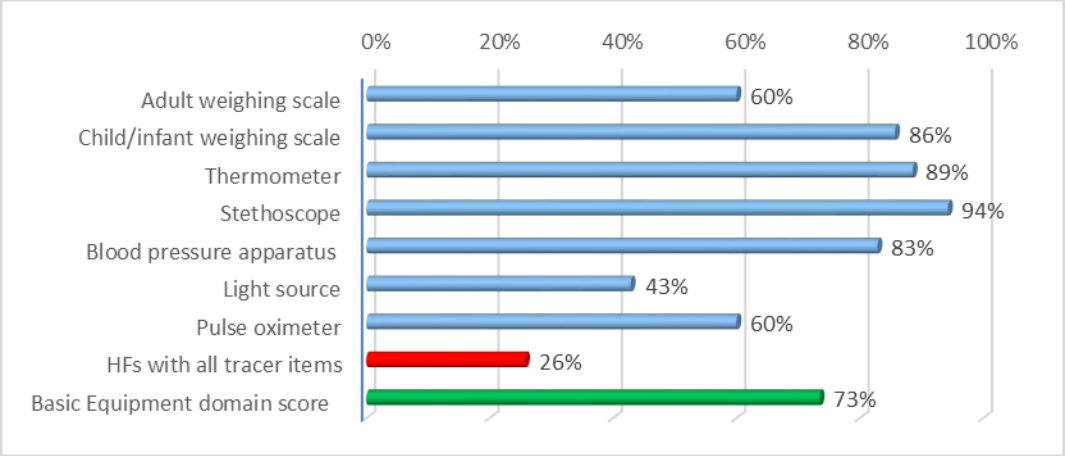

Figure 14 Basic equipment tracer items availability & domain score in Amhara war affected functional hospitals, 2022 (N=35)

As it is shown in figure 15 below, referral hospitals were found to be better equipped than other facility types in almost all basic equipment tracer items and scored 100% in both basic equipment domain score and all tracer items. Primary and general hospitals were scored 76% and 61% respetively in basic equipment domain score as it is shown in Figure 15 bellow. In addition, only 30% of primary hospitals and none of general hospitals had all basic equipment tracer items.

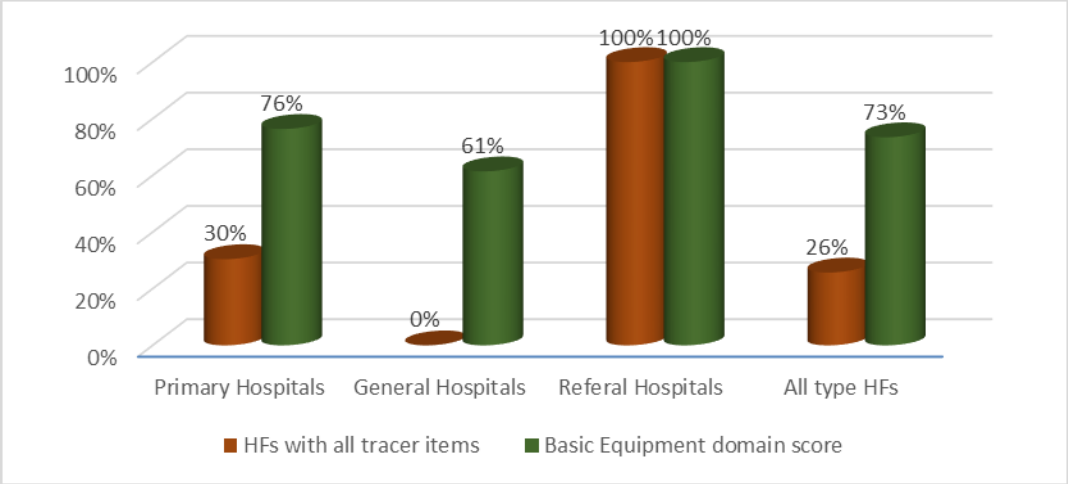

Figure 15 Basic Equipment domain score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

Despite referral hospitals were better equiped in basic equipment, the domain scores in general and primary hospitals as well as in all type hospitals were lowerd in the war affected public hospitals when compared to SARA 2018. The basic equipment domain score were 92%, 89% and 87% in referral, general and primary hospitals respectively and the domain score mean value in all type hospital was 88 percet in SARA 2018.(Zemedu, 2018).

D. Diagnostic Capacity

Without adequate diagnostic capabilities in the healthcare institutions, service delivery could not be completed. The ability of the institution to perform the following 11 diagnostic capacity tracer items there on-site was evaluated: blood glucose tests, urine protein dipstick tests, urine glucose dipstick tests, liver function tests, renal function tests, serum electrolyte tests, full blood counts and differential tests, blood films, fluorescence microscopes, functional x-rays, and functional ultrasound are among the diagnostic procedures that can be used.

Table 4 and Figure 16 show the availability of diagnostic capacity tracer items and diagnostic capacity score in functional war affected hospitals in details.

- Only 6%(2 of 35) functional affected hospitals had all 11 diagnostic capacity items to conduct all types of diagnostic tests and in average only five and half of eleven (50%) diagnostic tests were found in all functional war affected hospitals in the study area.

- Blood film (80%) and both renal function tests & serum electrolyte testing (20% for each) were the most and least available diagnostic tests in all functional affected hospitals.

Table 5 Diagnostic capacity tracer items availability & domain score in Amhara war affected functional hospitals, 2022 (N=35)

Diagnostic capacity	Number of facilities that have the item available				Availability Status			
	Total	PH	GH	CSH	PH	GH	CSH	All type HFs
blood glucose tests	24	14	8	2	61%	80%	100%	69%
urine protein dipstick tests	22	11	9	2	48%	90%	100%	63%
urine glucose dipstick tests	22	11	9	2	48%	90%	100%	63%
liver function tests	8	2	5	1	9%	50%	50%	23%
renal function tests	7	2	4	1	9%	40%	50%	20%
serum electrolyte testing	7	2	3	2	9%	30%	100%	20%
full blood count and differential testing	16	7	7	2	30%	70%	100%	46%
Blood film	28	17	9	2	74%	90%	100%	80%
Fluorescence microscope	27	16	9	2	70%	90%	100%	77%
functional x-rays	9	6	2	1	26%	20%	50%	26%
functional ultrasound	22	15	5	2	65%	50%	100%	63%
HFs with all tracer items	2	0	1	1	0%	10%	50%	6%
Sum of values					4.48	7	9.5	5.49
Total number of items					11	11	11	11
Mean (sum / total)					0.41	0.64	0.86	0.5
Diagnostic capacity domain score (mean × 100)					41%	64%	86%	50%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

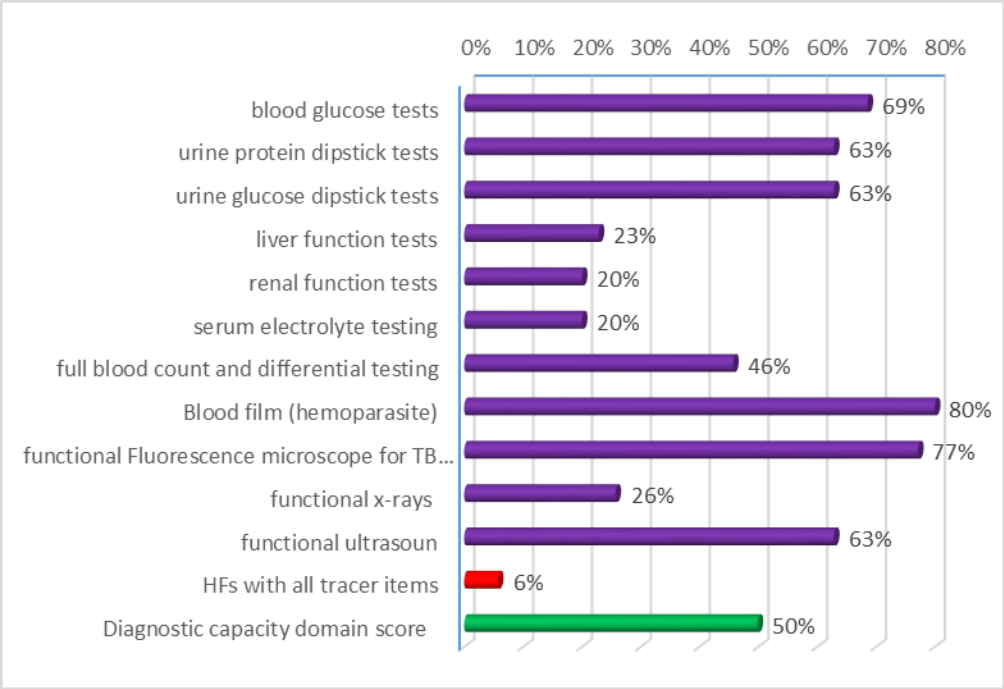

Figure 16 Diagnostic capacity tracer items availability & domain score in Amhara war affected functional hospitals, 2022 (N=35)

Figure 17 summarizes that referral hospitals (86%) were found better in diagnostic capacity while general and primary hospitals had 64% and 41% diagnostic capacity respectively.

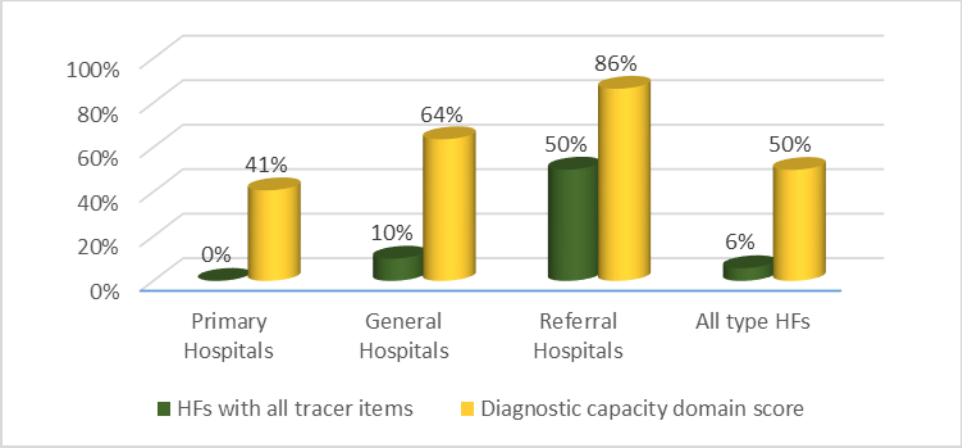

Figure 17 Diagnostic capacity domain score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

The current study findings show the diagnostic capacity of public hospitals, especially primary hospitals, in the ware affected area is remotely lower compared to SARA 2018. As it is reported

in the study, SARA 2018, the laboratory tests domain score were 89%, 88% and 83% in referral, general and primary hospitals respectively and the domain score mean value in all type hospital was 86 percet in SARA 2018.(Zemedu, 2018).

E. Essential Medicines

The availability of appropriate medications with established safety, efficacy, and quality at a reasonable price, as well as their right use, is necessary for the provision of promotional, preventative, curative, and rehabilitative health services. The medications that meet the population's top healthcare demands are considered to be essential. There are 25 tracer medications among the key medications evaluated in this study.

- As it is shown in figure 18 in details, out of the total 25 essential medicines, only Tetracycline eye ointment was available in all health facilities while only 11% of these health facilities had Dextrose in normal saline.
- On average 79% of essential medicines were available in all functional war affected hospitals and only a single hospital had all of 25 essential medicines.

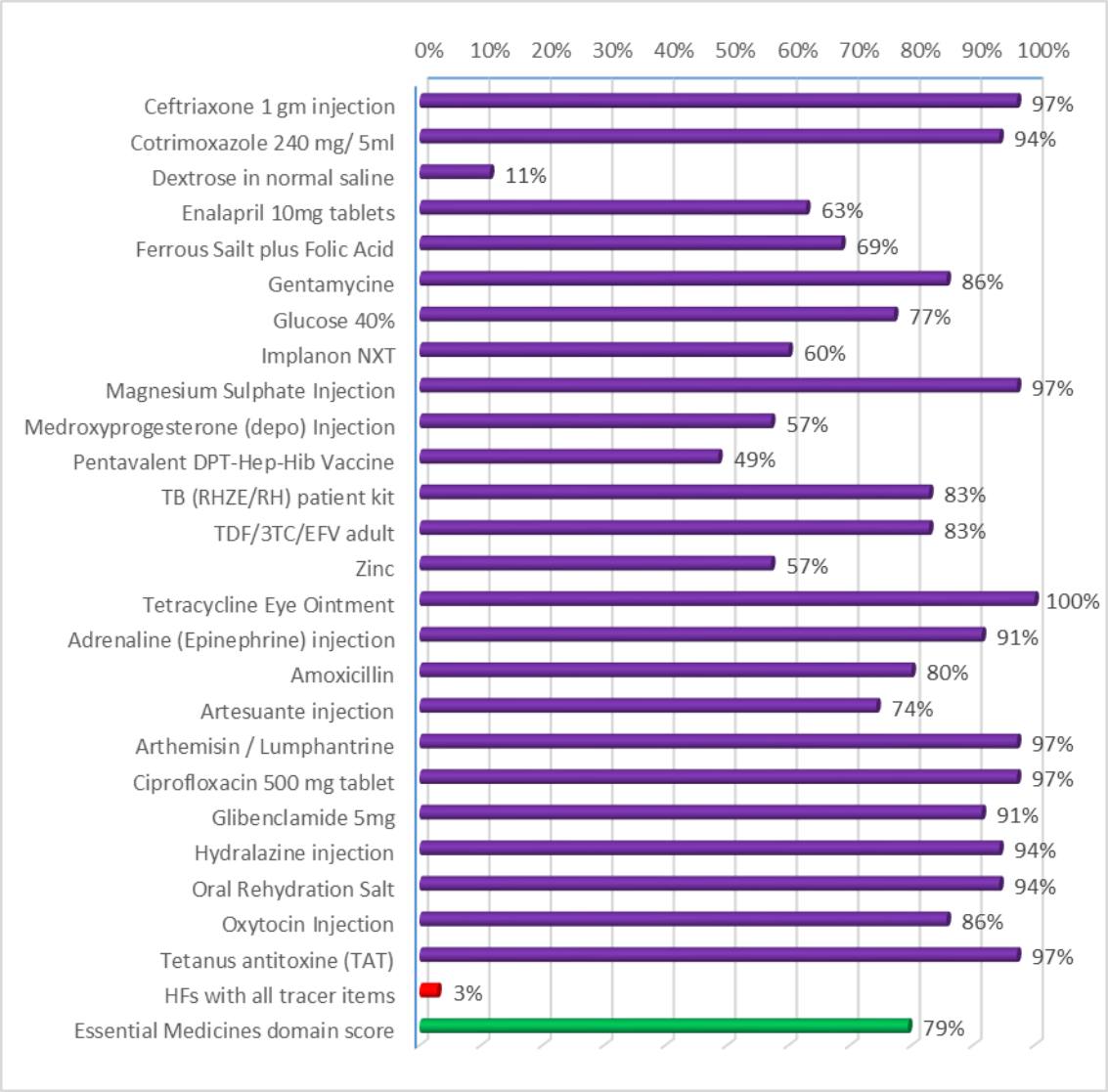

Figure 18 Essential medicines tracer items availability & domain score in Amhara war affected functional hospitals, 2022 (N=35)

Referral hospitals (86%) had relatively high percentage of essential medicines while 85% and 77% tracer drugs were available in general and primary hospitals respectively as it is shown in figure 19 bellow.

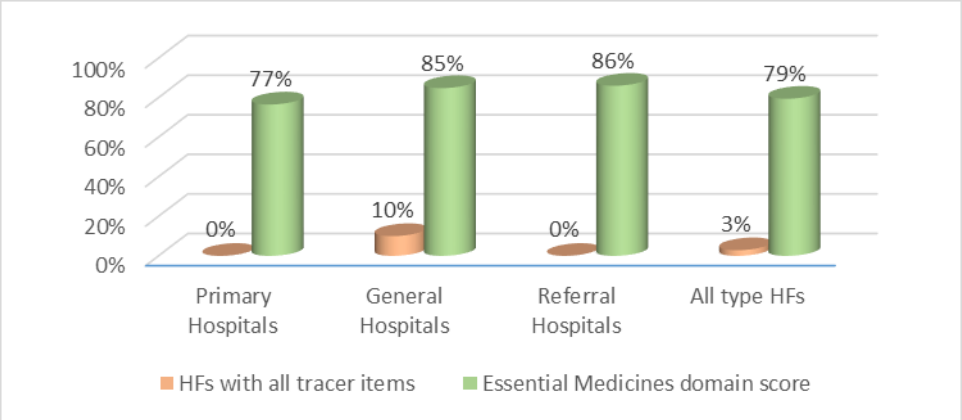

Figure 19 Essential medicines domain score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

The current study show that its findings are consistent with the study findings conducted in Ethiopia on service availability and readiness. That study reported that the essential medicine domain scores were 86%, 79% and 78% in referral, general and primary hospitals respectively and the domain score mean value in all type hospital was 79 percent (Zemedu, 2018).

F. General Service Readiness Summary Score

The general health service readiness score was created by combining data from the five general service readiness domains, namely: basic amenities, common infection prevention measures, basic equipment, diagnostics, and essential medications. The domain score for each domain was determined by looking at the average tracer item availability (WHO, 2015b).

- General service readiness index was approximately 69%, implying that 69 percent of all functional war affected hospitals were ready to provide the general health services.
- Of the 69 percent general service readiness index of these hospitals in war affected area of the Amhara regional state, the basic amenities, standard precaution, basic equipment, diagnostic capacity and essential medicines had contributed in 67, 75, 73, 50 and 79 percent domain scores respectively in all functional war affected hospitals.

- Across the five domains, the essential medicine mean score index was the highest (79%) and the diagnostic capacity mean score index was the lowest (50%)
- Regarding to the facility type, referral hospitals had the highest general health service readiness index of 90 percent followed by primary hospitals (68%) and general hospitals (67%) general service readiness indexes.
- Table 6 and Figure 20 bellow show the summary of the general service readiness domains scores and general service readiness index in war affected functional hospitals disaggregated by hospital types

Table 6 General service readiness index in Amhara war affected functional hospitals, 2022 (N=35)

General service domains	Domain scores			
	Primary Hospitals	General Hospitals	Referral Hospitals	All HFs
Basic amenities	69.0	57.5	93.8	67.1
Standard precautions	77.5	68.3	83.3	75.2
Basic equipment	76.4	61.4	100.0	73.5
Diagnostic capacity	40.7	63.6	86.4	49.9
Essential Medicines	76.5	84.8	86.0	79.4
HF with all tracer items in all domains	0	0	0	0
Sum of domain scores	340.2	335.7	449.4	345.1
Total number of domains	5	5	5	5
General service readiness index (sum of domain scores / total number of domains)	68.0	67.1	89.9	69.0

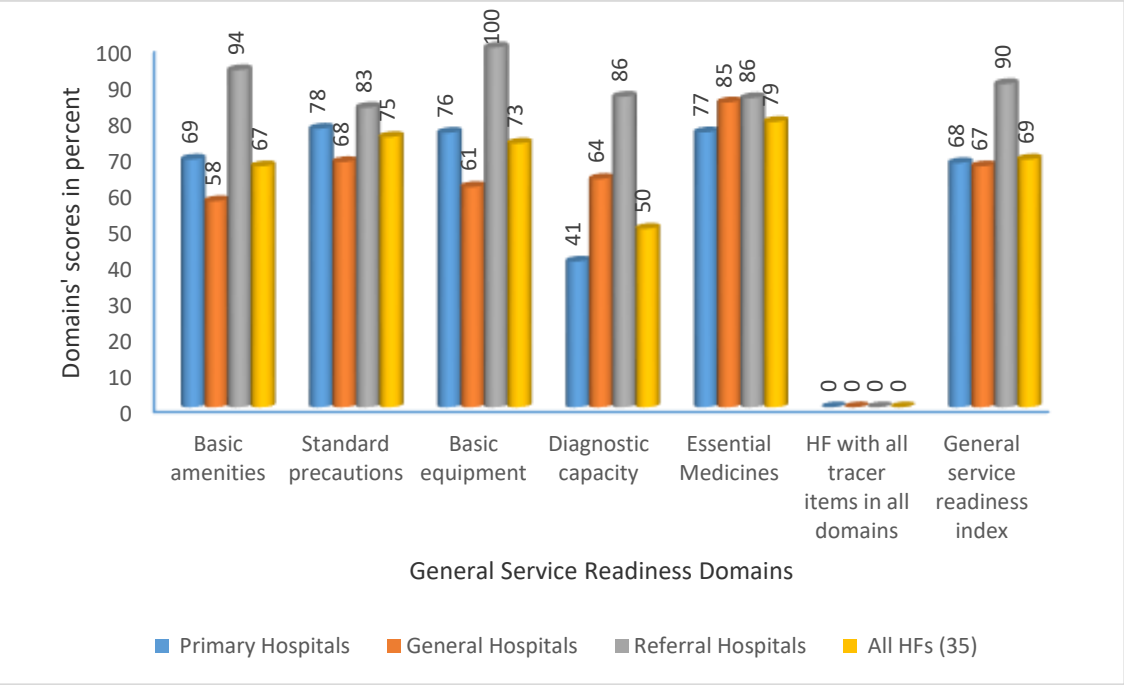

Figure 20 General service readiness index in Amhara war affected functional hospitals, 2022 (N=35)

- General service readiness index was approximately 69%, implying that 69 percent of all functional war affected hospitals were ready to provide the general health services. In other words, those hospitals started to offer services were ready to provide general health services with the capacity of 24 hospitals, instead of 35. The finding tells us the problem was not only that 13% of affected hospitals didn't start to offer services and the war affected functional hospitals were overloaded by extra 25% population but also the functional hospitals were not well equipped and ready to provide services above 69 percent of their capacity.
- The same domains basic amenities, standard precautions, basic equipment, diagnostic capacity and essential medicines in SARA 2018 were reported as 86, 82, 88, 86 and 79 percent scores. Except essential medicines general service readiness scores in war affected hospitals were below national averages in all domain scores (Zemedu, 2018). The mean general service readiness index was 15 percent below the national mean general service readiness index reported in SARA 2018.
- Regarding to the facility type, referral hospitals had the highest general health service readiness index of 90 percent which is equivalent with national mean of referral hospitals

readiness index while primary hospitals (68%) and general hospitals (67%) had general service readiness indexes below national averages of primary (82%) and general (86%) hospitals readiness indexes (Zemedu, 2018).

4.4.2 Service-Specific Readiness

The term " service-specific readiness" refers to the ability of medical institutions to offer a particular service, as determined by the existence of key items like trained personnel, policies, tools and supplies, diagnostic capability, medications, and supplies (WHO, 2015b). 10 of 17 particular services used in service specific availability assessment (family planning, antenatal care, basic and comprehensive obstetric care, child immunization, under five children preventive and curative service, HIV/AIDS care and support, PMTCT, tuberculosis diagnosis and treatment, and non-communicable chronic illnesses) are used in current study to assess service specific readiness status in the war affected public hospitals.

A. Family Planning Service Readiness

Readiness of health facilities to provide family planning service was assessed based on the availability of the 8 tracer items and the result is shown in table 7, Figure 21 and Figure 22 bellow.

- 34% of functional war affected hospitals had fulfilled all the tracer items for readiness and 3 of 8 tracer items (trained staff, urine pregnancy test and combined oral contraceptive pills) were available in all functional affected hospitals while the injectable contraceptive method (57%) was the least available.
- On average, 84% tracer items out of eight were available in all functional affected hospitals.

Table 7 Family Planning tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

Family Planning Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Trained staff	35	23	10	2	100%	100%	100%	100%	1
depo Injection	20	12	7	1	52%	70%	50%	57%	0
Implanon NXT	22	15	6	1	65%	60%	50%	63%	0
Urine Pregnancy test	35	23	10	2	100%	100%	100%	100%	1
Combined oral contraceptive pills	35	23	10	2	100%	100%	100%	100%	1
injectable contraceptives service	32	21	9	2	91%	90%	100%	91%	0
IUCD service	28	18	9	1	78%	90%	50%	80%	0
Other long acting FP methods	28	20	7	1	87%	70%	50%	80%	0
HFs with all tracer items	12	8	3	1	35%	30%	50%	34%	
Sum of values					6.74	6.8	6	6.71	3
Total number of items					8	8	8	8	8
Mean (sum / total)					0.84	0.85	0.75	0.84	0.375
FP readiness score (mean × 100)					84%	85%	75%	84%	38%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

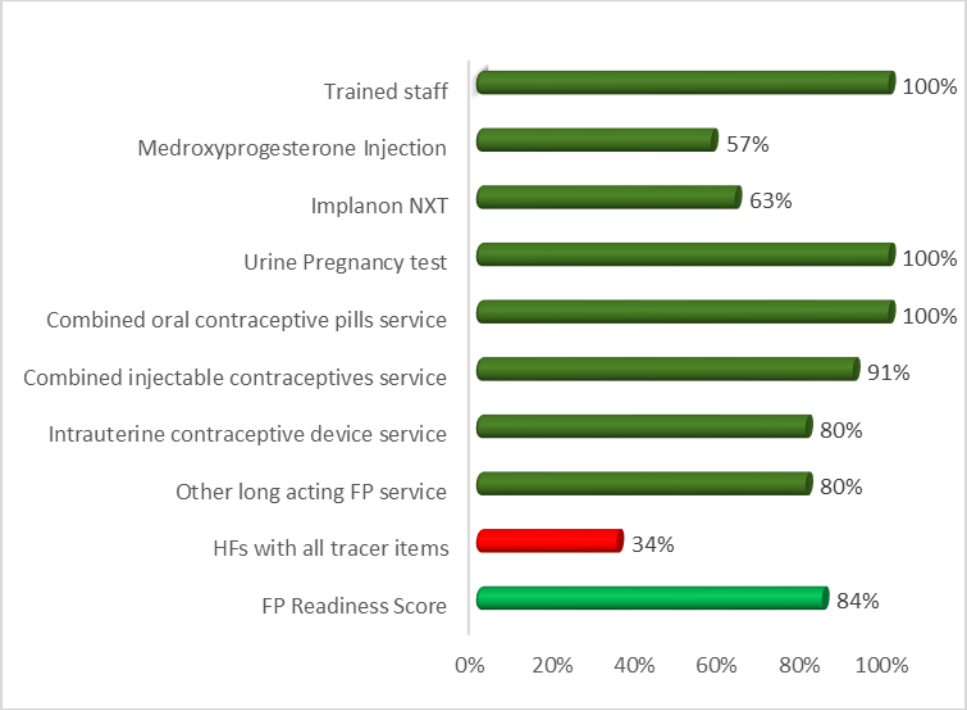

Figure 21 Family Planning tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

- On average 85% of eight tracer items were available in the general hospitals and followed by primary (84%) and referral (75%) hospitals.

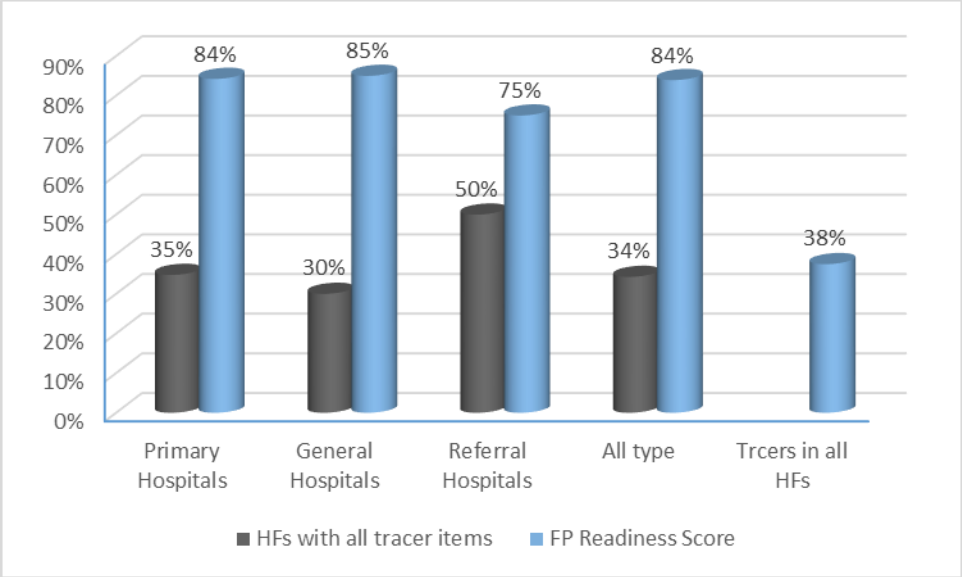

Figure 22 Family Planning readiness score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

- Despite all functional hospitals (88% of 40 affected hospitals) offered family planning service and were expected to be fully ready to provide the service, in this study only 34% of functional war affected hospitals had fulfilled all the tracer items for readiness.
- Only 3 of 8 tracer items (trained staff, urine pregnancy test and combined oral contraceptive pills) were available in all functional affected hospitals while the injectable contraceptive method (57%) was the least available. In contrary to the item trained staff was available in all functional affected hospitals the study conducted in Gambela region found that only 59% of facilities provide FP services with trained health professionals (Yiech, 2020).
- The average availability of 84% FP service tracer items in the current study is slightly higher than SARA 2018 finding of 82 percent mean readiness score of all type hospitals. According to SARA 2018 the health facilities readiness status to provide family planning service in referral, general and primary hospitals were (86, 82 & 82) respectively and its mean value for all type hospital was 82 percent (Zemedu, 2018).

B. Antenatal Care Service Readiness

The antenatal care service readiness in the war affected hospitals was assessed using seven tracer items and the result is shown in table 8, figure 23 and figure 24 bellow in details.

- only a single hospital of 35 functional war affected hospitals had fulfilled all the tracer items for readiness while only trained staff and tetanus toxoid vaccination were available in all functional affected hospitals and the most common available tracer items while the hemoglobin test (6%) was the least available.
- On average, 69% tracer items out of seven were available in all functional affected hospitals.

Table 8 Antenatal care tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

ANC Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Trained Staff	35	23	10	2	100%	100%	100%	100%	1
Ferrous Salphate plus Folic Acid	23	15	7	1	65%	70%	50%	66%	0
Hemoglobin test	2	1	0	1	4%	0%	50%	6%	0
urine protein dipstick tests	22	11	9	2	48%	90%	100%	63%	0
Iron with folic acid supplementation	24	16	7	1	70%	70%	50%	69%	0
Tetanus toxoid vaccination	35	23	10	2	100%	100%	100%	100%	1
national ANC guidelines	27	17	8	2	74%	80%	100%	77%	0
HFs with all tracer items	1	0	0	1	0%	0%	50%	3%	
Sum of values					4.61	5.1	5.5	4.8	2
Total number of items					7	7	7	7	7
Mean (sum / total)					0.66	0.73	0.79	0.69	0.29
ANC Readiness Score (mean × 100)					66%	73%	79%	69%	29%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

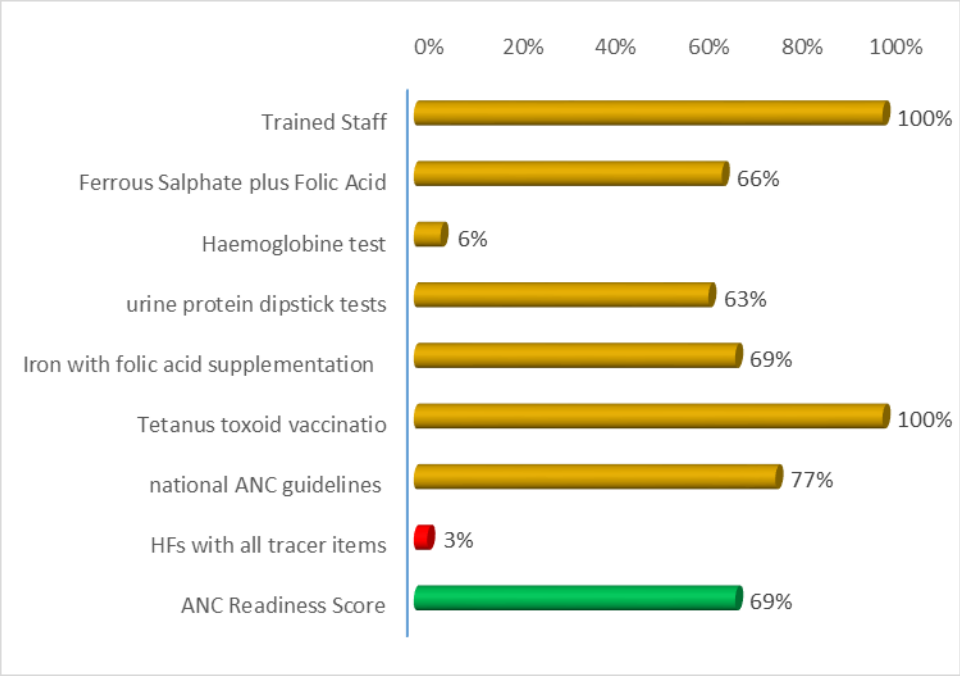

Figure 23 Antenatal care tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

- Figure 24 shows that, on average 79% of eight tracer items were available in the referral hospitals and followed by general (73%) and primary (66%) hospitals.

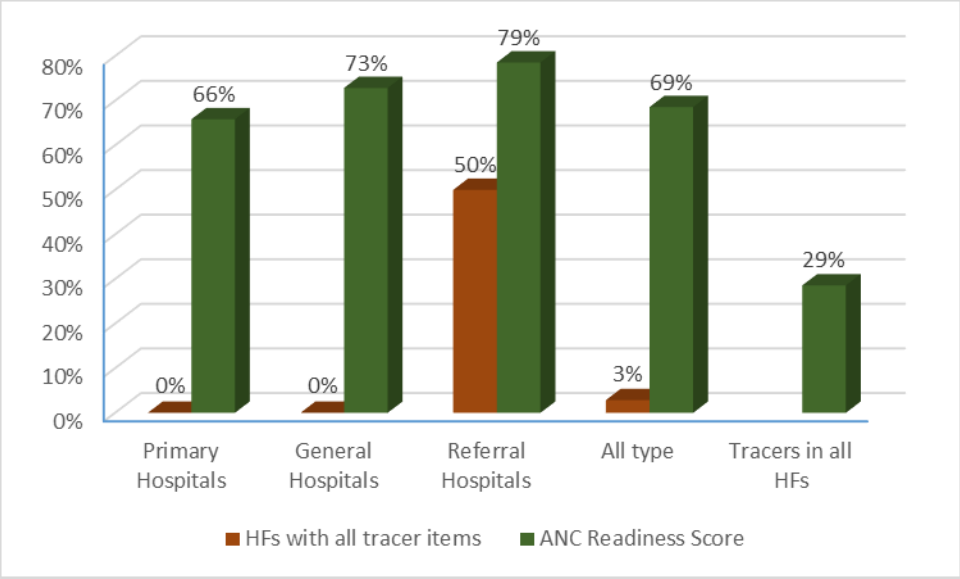

Figure 24 Antenatal care service readiness score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

Even though, all 35 functional hospitals (88%) offered antenatal care service and were expected to be fully ready to provide the service, only a single hospital of 35 functional war affected hospitals had fulfilled all the tracer items for readiness. The current study result shows the functional public hospitals readiness in the war affected zones are slightly higher when compare to SARA 2018 and it reaches at the national average of all type hospital readiness to provide antenatal care service. According to SARA 2018 the health facilities readiness statuses to provide antenatal care service in referral, general and primary hospitals were ready in antenatal care 70, 67 & 65 percent respectively and the mean value for all type hospitals was 66 percent (Zemedu, 2018).

C. **Basic Emergency Obstetric and New born care (BEmONC) Service Readiness**

Hospitals were assessed on the readiness to provide Basic Emergency Obstetric and Newborn Care Services based on the availability of the 12 tracer items and the result is presented in table 9 and figure 25 bellow in details.

Among hospitals that provided Basic Emergency Obstetric and Newborn Care service in war affected area, 31 percent of the hospitals had all 12 tracer items for BEmONC service and a single tracer item (parenteral antibiotics) was available in all functional hospitals while light source was the least available tracer item with 43 percent availability status. On average 10 of 12 tracer items were available in all functional affected hospitals.

Table 9 BEmONC tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

BEmONC Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Trained staff	30	19	9	2	83%	90%	100%	86%	0
Magnesium Sulphate Injection	31	20	9	2	87%	90%	100%	89%	0
Oxytocin Injection	29	18	9	2	78%	90%	100%	83%	0
Infant weighing scale	30	20	8	2	87%	80%	100%	86%	0
Light source	15	11	2	2	48%	20%	100%	43%	0
emergency transportation	27	19	6	2	83%	60%	100%	77%	0
electric autoclave	28	19	7	2	83%	70%	100%	80%	0
Antibiotics parenteral administration	35	23	10	2	100%	100%	100%	100%	1
Assisted vaginal delivery	34	22	10	2	96%	100%	100%	97%	0
Manual removal of placenta	34	22	10	2	96%	100%	100%	97%	0
Retained products removal	34	22	10	2	96%	100%	100%	97%	0
Neonatal resuscitation	34	23	9	2	100%	90%	100%	97%	0
HFs with all tracer items	11	8	1	2	35%	10%	100%	31%	
Sum of values					10.35	9.9	12	10.31	1
Total number of items					12	12	12	12	12
Mean (sum / total)					0.86	0.83	1	0.86	0.08
BEmONC Readiness Score (mean × 100)					86%	83%	100%	86%	8%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

All 12 tracer items were fully available in comprehensive specialized hospitals and scored in 86 and 83 percent in primary and general hospitals respectively.

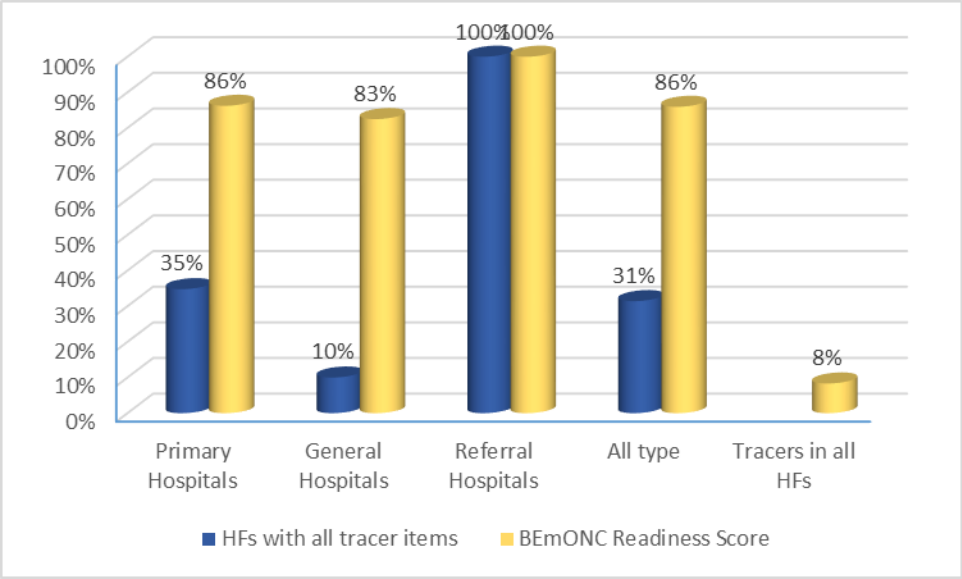

Figure 25 BEmONC service readiness score in Amhara war affected functional hospitals, 2022 (N=35)

The current study shows its findings is almost consistent with the country wide average (87%) in all type hospitals as it is stated on SARA 2018 findings. According to SARA 2018 the health facilities readiness statuses to provide basic and emergency obstetric care and neonatal care service in referral, general and primary hospitals were 87, 88 & 87 percent respectively and the mean value for all type hospitals was 87 percent (Zemedu, 2018).

C. Comprehensive and Emergency Obstetric Care (CEmOC) Services

WHO define comprehensive obstetric care services as the provision of obstetric care services that consists caesarian sections, blood transfusion and all seven signals of basic emergency obstetric and new-born care.

- Both trained staffs on surgery and trained staff on anesthesia were similarly the most common available tracer items and were available in 31 of 35 functional hospitals (89%). On the other hand, national guidelines for CEmOC (74 percent) was the least available tracer items necessary to provide CEmOC service.
- On average, 84 percent of seven tracer items were available among functional hospitals.

Table 10 CEmOC tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

CEmOC Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Trained Staffs on Surgery	31	20	9	2	87%	90%	100%	89%	0
Trained staff on anesthesia	31	20	9	2	87%	90%	100%	89%	0
Caesarean section	30	19	9	2	83%	90%	100%	86%	0
Blood transfusion	29	18	9	2	78%	90%	100%	83%	0
Blood group test	29	17	10	2	74%	100%	100%	83%	0
Blood cross match testing	29	18	9	2	78%	90%	100%	83%	0
national guidelines for CEmOC	26	16	8	2	70%	80%	100%	74%	0
HFs with all tracer items	16	7	7	2	30%	70%	100%	46%	
Sum of values					5.565	6.3	7	5.857	0
Total number of items					7	7	7	7	7
Mean (sum / total)					0.80	0.9	1	0.84	0
CEmOC Readiness Score (mean × 100)					80%	90%	100%	84%	0%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

As it is shown in figure 26 below, all the seven tracers for comprehensive and emergency obstetric care service readiness were fully available in referral hospitals followed by general hospitals (90 percent) and primary hospitals (80 percent).

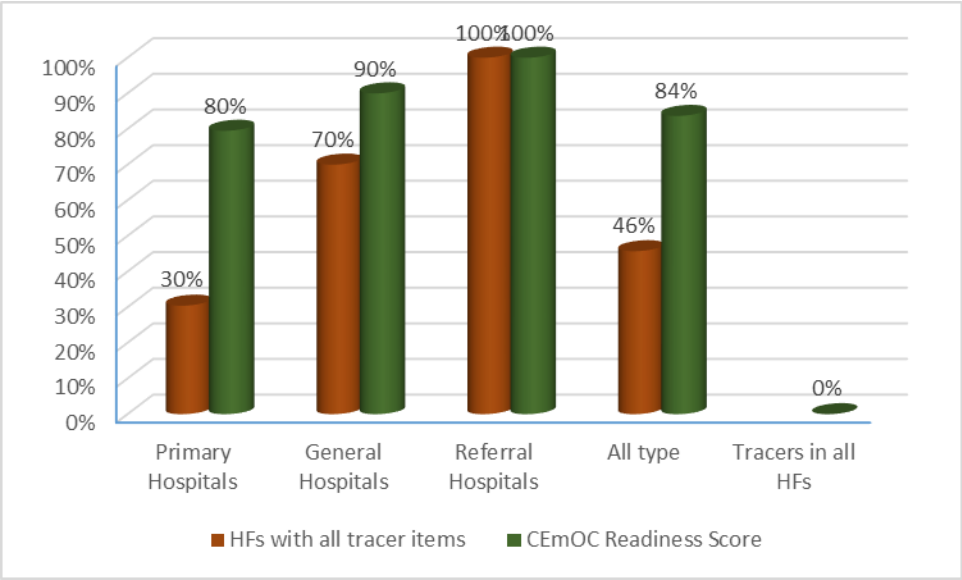

Figure 26 CEmOC Service Readiness Score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

- The current study shows that its finding is consistent with the national average (73 percent) that was reported in SARA 2018.

D. Child Immunization (EPI) Service Readiness

- 31 percent of functional affected hospitals had all tracer items while none of tracer items necessary to provide child immunization service were available in all hospitals.
- Approximately functional hospitals had only three of seven items (48 percent) that are needed to provide EPI service.

Table 11 EPI tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

EPI Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Pentavalent Vaccine	16	9	7	0	39%	70%	0%	46%	0%
measles immunization	17	10	6	1	43%	60%	50%	49%	0%
pentavalent immunization	17	10	6	1	43%	60%	50%	49%	0%
polio immunization	17	10	6	1	43%	60%	50%	49%	0%
BCG immunization	17	10	6	1	43%	60%	50%	49%	0%
national guidelines	16	10	5	1	43%	50%	50%	46%	0%
refrigerator	17	10	6	1	43%	60%	50%	49%	0%
HFs with all tracer items	11	6	5	0	26%	50%	0%	31%	
Sum of values					3	4.2	3	3.34	0
Total number of items					7	7	7	7	7
Mean (sum / total)					0.43	0.6	0.43	0.48	0
EPI Readiness Score (mean × 100)					43%	60%	43%	48%	0%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

- As it is shown in figure 27 below on average four of seven tracer items (60 percent) were available in general hospitals and three of seven (43 percent) in both primary and referral hospitals.

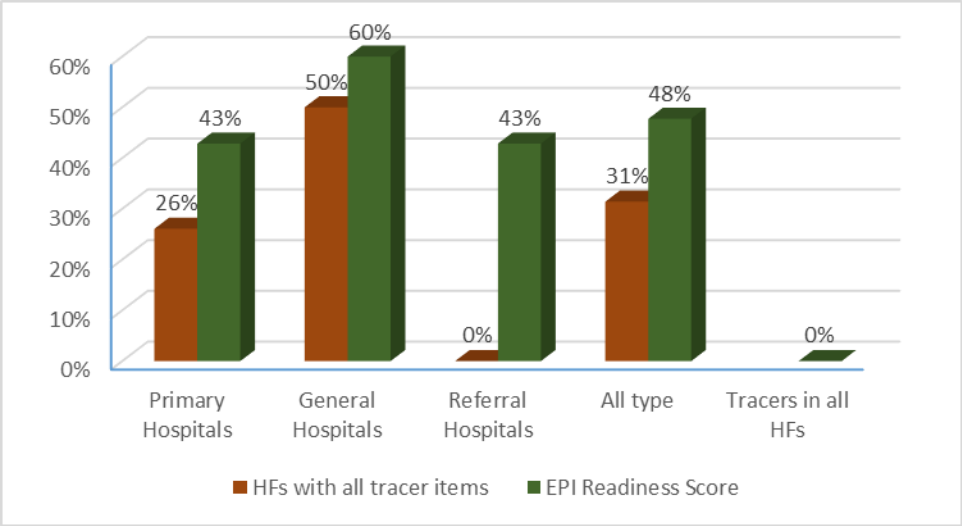

Figure 27 EPI Service Readiness Score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

- The current study result is remotely lowered than the SARA 2018 finding which was reported as 86 percent of tracer items were available in all type of hospitals (Zemedu, 2018). Similarly, the study conducted in Gambela found out that all tracer items were above 95 percent available except trained health worker and national guidelines which are reported as 47 and 66 percent respectively (Yiech, 2020). The health facilities readiness statuses to provide child immunization service in referral, general and primary hospitals were 87, 87 & 86 percent respectively in SARA 2018 report.

E. Child Preventative and Curative Care Services (IMNCI) Service Readiness

- 31 percent of functional affected hospitals had all tracer items while none of tracer items necessary to provide child preventative and curative care services were available in all hospitals.
- Oral rehydration salt was the most commonly available (89 percent) of the nine tracer items while growth and monitoring guidelines (49 percent) was the least available of them.

- On average, functional hospitals had seven of nine items (74 percent) that are needed to provide child preventative and curative care services.

Table 12 IMNCI Tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

IMNCI Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Oral Rehydration Salt	31	20	9	2	87%	90%	100%	89%	0
Zinc	19	10	7	2	43%	70%	100%	54%	0
Diagnose and treat malnutrition	27	18	7	2	78%	70%	100%	77%	0
vitamin A supplementation	28	19	7	2	83%	70%	100%	80%	0
iron supplementation	24	15	7	2	65%	70%	100%	69%	0
ORS and zinc supplementation	29	19	8	2	83%	80%	100%	83%	0
Child growth monitoring	29	19	8	2	83%	80%	100%	83%	0
IMCI guidelines	29	19	8	2	83%	80%	100%	83%	0
growth monitoring guidelines	17	9	6	2	39%	60%	100%	49%	0
HFs with all tracer items	11	5	4	2	22%	40%	100%	31%	
Sum of values					6.43	6.7	9	6.66	0
Total number of items					9	9	9	9	9
Mean (sum / total)					0.71	0.74	1	0.74	0
IMNCI Readiness Score (mean × 100)					71%	74%	100%	74%	0%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

- All the nine tracer items necessary to provide child preventative and curative care services were available in referral hospitals while 74 and 71 percent of them were available in general and primary hospitals in average.

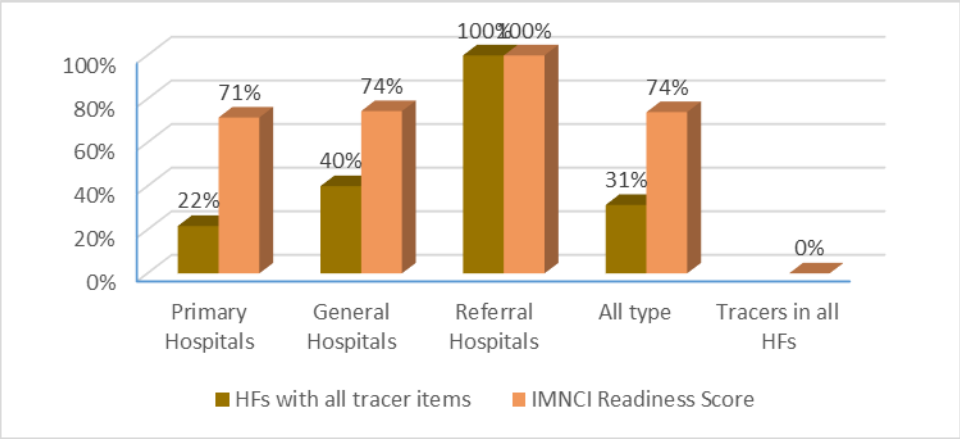

Figure 28 IMNCI Service Readiness Score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

The current study findings of readiness on under five children treatment shows that it is consistent with SARA 2018. The study conducted in Ethiopia on SARA 2018 stated that the average overall readiness of all type hospitals to provide under five preventive and curative care service was 75.7 percent which is almost consistent with the current study finding (Zemedu, 2018).

F. HIV/AIDS Care and Support Services Readiness

- 68 percent of eight tracer items necessary to provide HIV/AIDS antiretroviral therapy, care and support services were available in all functional war affected hospitals.
- TDF/3TC/EFV (83 percent) and CD4 testing (14 percent were the most and the least available necessary tracer items in HIV/AIDS antiretroviral therapy, care and support service readiness.
- 17 percent of functional affected hospitals had all necessary tracer items while none of tracer items necessary to provide HIV/AIDS antiretroviral therapy, care and support services were available in all hospitals.

Table 13 HIV/AIDS Management Tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

HIV/AIDS Management Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Trained Staff	27	16	9	2	70%	90%	100%	77%	0
TDF/3TC/EFV	29	19	8	2	83%	80%	100%	83%	0
CD4 testing	5	1	3	1	4%	30%	50%	14%	0
national guidelines	24	13	9	2	57%	90%	100%	69%	0
ART	27	16	9	2	70%	90%	100%	77%	0
treatment follow-up	27	16	9	2	70%	90%	100%	77%	0
ART guidelines	25	14	9	2	61%	90%	100%	71%	0
opportunistic infections treatment	27	16	9	2	70%	90%	100%	77%	0
HFs with all tracer items	6	2	3	1	9%	30%	50%	17%	0
Sum of values					4.83	6.5	7.5	5.46	0
Total number of items					8	8	8	8	8
Mean (sum / total)					0.60	0.81	0.94	0.68	0
HIV/AIDS Management Readiness Score (mean × 100)					60%	81%	94%	68%	0%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

- As it is shown referral, general and primary functional hospitals in war affected areas had 94, 81 and 60 percent of eight tracer items necessary to provide HIV/AIDS care and support services.

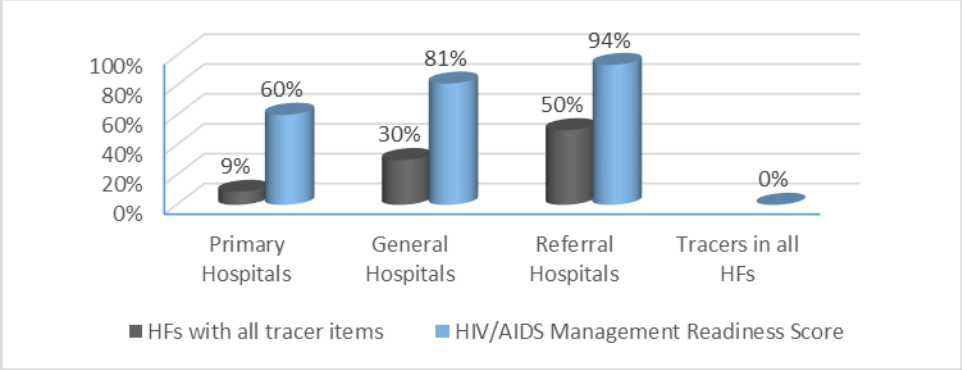

Figure 29 HIV/AIDS Care and Support Service Readiness core by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

- As it is stated on SARA 2018, on average 82 percent tracer items of HIV/AIDS care and support service were available in all type hospitals while the same indicator in referral, general and primary hospitals were 85, 82 & 82 percent respectively and it indicates that the current study finding (68 percent) is below the national average (Zemedu, 2018)

G. Prevention of mother to child transmission (PMTCT) of HIV Service Readiness

- Approximately 5 of 6 tracer items (82% readiness) necessary to provide prevention of mother to child transmission of HIV service were available in all functional hospitals in war affected area of Amhara regional states.
- The current finding is higher compared to a study conducted to assess service availability and readiness in Ethiopia where the overall readiness in all type hospitals to provide PMTCT was 60 percent.

Table 14 PMTCT tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

PMTCT Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Trained staff	29	18	9	2	78%	90%	100%	83%	0
TDF/3TC/EFV adult	29	19	8	2	83%	80%	100%	83%	0
counselling and testing HIV+ pregnant women	29	18	9	2	78%	90%	100%	83%	0
counselling and testing infants	29	18	9	2	78%	90%	100%	83%	0
ARV prophylaxis to HIV+ pregnant women	29	18	9	2	78%	90%	100%	83%	0
ARV prophylaxis to newborns of HIV+ pregnant women	28	17	9	2	74%	90%	100%	80%	0
HFs with all tracer items	24	14	8	2	61%	80%	100%	69%	0
Sum of values					4.696	5.3	6	4.9	0
Total number of items					6	6	6	6	6
Mean (sum / total)					0.78	0.88	1	0.82	0
PMTCT Readiness Score (mean × 100)					78%	88%	100%	82%	0%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

- Referral, general and primary functional hospitals in war affected areas had 100, 88 and 78 percent of eight tracer items necessary to provide prevention of mother to child transmission of HIV service.

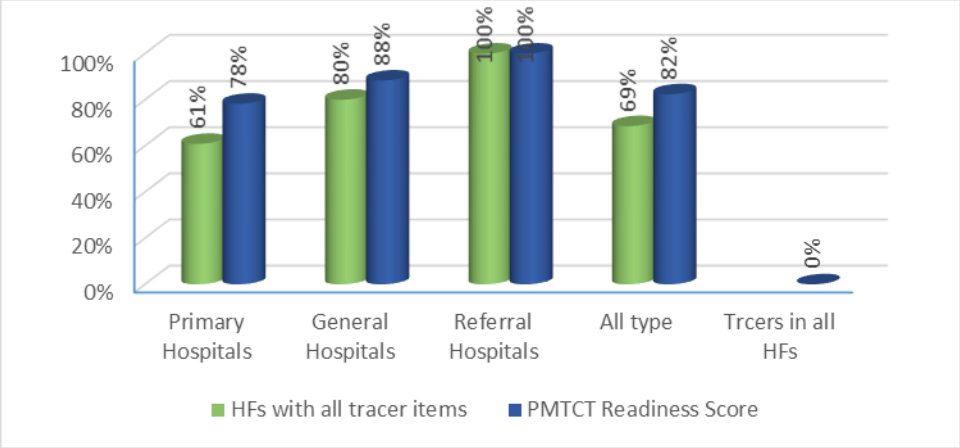

Figure 30 PMTCT Service Readiness Score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

H. Tuberculosis (TB) Diagnosis and Treatment Service Readiness

- On average five of seven tracer items necessary to provide tuberculosis (TB) diagnosis and treatment services were available in all functional war affected hospitals.
- TB treatment register (94 percent) and x-ray imaging (29 percent) were the most and the least available necessary tracer items in tuberculosis diagnosis and treatment services readiness.
- 26 percent of functional affected hospitals had all necessary tracer items while none of tracer items necessary to provide tuberculosis diagnosis and treatment services were available in all hospitals.
- The current finding is higher compared to a study conducted to assess service availability and readiness in Ethiopia where only ten percent facilities excluding health posts had all necessary tracer items and the overall readiness to provide TB diagnosis and treatment was 68 percent.

Table 15 TB treatment Tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

TB treatment Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Trained Staff	28	17	9	2	74%	90%	100%	80%	0
TB (RHZE/RH) patient kit	29	19	8	2	83%	80%	100%	83%	0
Adult weighing scale	21	16	3	2	70%	30%	100%	60%	0
Fluorescence microscope	27	16	9	2	70%	90%	100%	77%	0
X Ray imaging	10	6	2	2	26%	20%	100%	29%	0
TB treatment register	33	21	10	2	91%	100%	100%	94%	0
TB treatment of guidelines	32	20	10	2	87%	100%	100%	91%	0
HFs with all tracer items	9	5	2	2	22%	20%	100%	26%	
Sum of values					5	5.1	7	5.14	0
Total number of items					7	7	7	7	7
Mean (sum / total)					0.71	0.73	1	0.73	0
TB Management Readiness Score(mean × 100)					71%	73%	100%	73%	0%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

- As stated in figure 31 below referral, general and primary functional hospitals in war affected areas had 100, 73 and 71 percent of seven tracer items necessary to provide tuberculosis diagnosis and treatment services respectively.

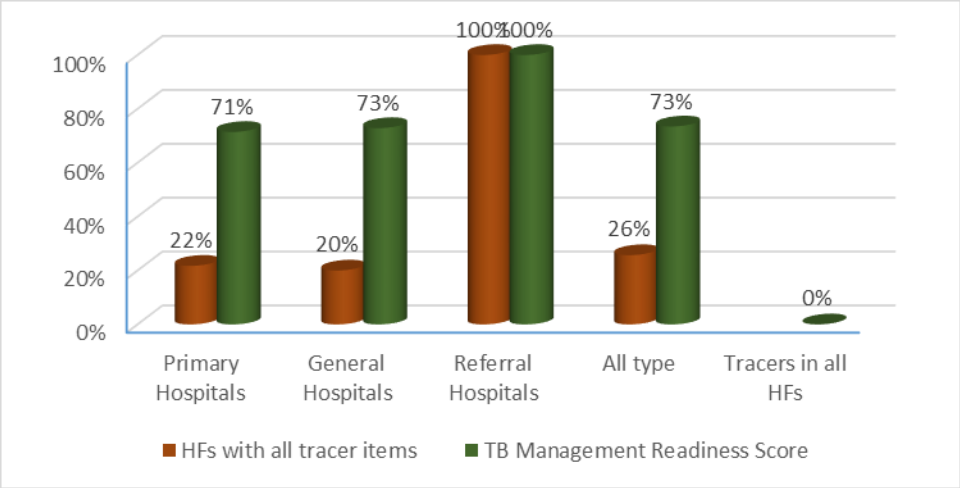

Figure 31 TB Diagnosis and Treatment Service Readiness score by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

I. Non-communicable Chronic Diseases (NCD) Care Service Readiness

- On average 77 percent of eleven tracer items necessary to provide non-communicable chronic diseases management were available in all functional war affected hospitals.
- Both stethoscope and hydralazine injection were similarly the most common (94 percent) available of the 11 tracer items while adult weighing scale (60 percent) was the least available necessary tracer items in non-communicable chronic diseases management readiness.
- Only 4 of 35 functional affected hospitals (11 percent) had all necessary tracer items while none of tracer items necessary to provide non-communicable chronic diseases management were available in all hospitals.

Table 16 Chronic NCD management tracer items availability in Amhara war affected functional hospitals, 2022 (N=35)

NCD Tracers	Available Tracers				Readiness				Tracers in all HFs
	Total	PH	GH	CSH	PH	GH	CSH	All type	
Adult weighing scale	21	16	3	2	70%	30%	100%	60%	0
Stethoscope	33	22	9	2	96%	90%	100%	94%	0
Blood pressure apparatus	29	18	9	2	78%	90%	100%	83%	0
blood glucose tests	24	14	8	2	61%	80%	100%	69%	0
urine protein dipstick tests	22	11	9	2	48%	90%	100%	63%	0
urine ketone dipstick tests	22	11	9	2	48%	90%	100%	63%	0
Enalapril 10mg tablets	22	11	9	2	48%	90%	100%	63%	0
Glucose 40%	27	19	6	2	83%	60%	100%	77%	0
Epinephrine injection	32	21	9	2	91%	90%	100%	91%	0
Glibenclamide 5mg	32	20	10	2	87%	100%	100%	91%	0
Hydralazine injection	33	21	10	2	91%	100%	100%	94%	0
HFs with all tracer items	4	1	1	2	4%	10%	100%	11%	
Sum of values					8	9.1	11	8.486	0
Total number of items					11	11	11	11	11
Mean (sum / total)					0.73	0.83	1	0.77	0
NCD Management Readiness Score (mean × 100)					73%	83%	100%	77%	0%

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

On average referral, general and primary functional hospitals in war affected areas had 11, 9 and 8 of eleven tracer items necessary to provide non-communicable chronic diseases management respectively.

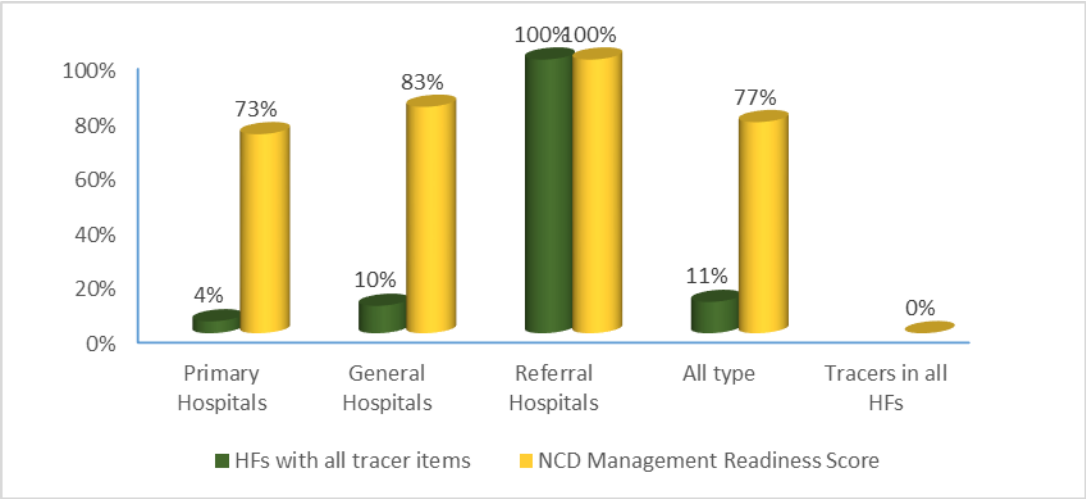

Figure 32 NCD Management Readiness Score in Amhara war affected functional hospitals, 2022 (N=35)

The current finding is higher compared to a study conducted to assess service availability and readiness in Ethiopia where the overall readiness to provide non-communicable chronic disease diagnosis and treatment services was 68 percent (Zemedu, 2018). According to SARA 2018 the health facilities readiness statuses to provide chronic NCD service in referral, general and primary hospitals was 73, 68 & 67 percent respectively (Zemedu, 2018).

J. Summary on Service-Specific Readiness

- The mean service specific readiness score of current study was created by combining data from 10 selected particular service readiness scores and it was approximately 75%.
- Of the 75% mean readiness BEmONC readiness (86%) contribute the highest followed by FP and CEmOC readiness (84% for both) while EPI readiness (48%) was the least. Regarding to the facility type, referral hospitals had the leading mean service specific readiness index of 89 percent followed by general (79%) and primary (71%) hospitals.

Table 17 Specific service Readiness Scores and its mean value in Amhara war affected functional hospitals, 2022 (N=35)

	Specific service Readiness Scores			
Specific Services	Primary Hospitals	General Hospitals	Referral Hospitals	All type HFs
Family Planning	84%	85%	75%	84%
Antenatal Care	66%	73%	79%	69%
BEmONC	86%	83%	100%	86%
CEmOC	81%	91%	100%	84%
EPI	43%	60%	43%	48%
IMNCI	71%	74%	100%	74%
HIV/AIDS care and support	60%	81%	94%	68%
PMTCT	78%	88%	100%	82%
TB Diagnosis and Treatment	71%	73%	100%	73%
NCD	73%	83%	100%	77%
HF with all tracer items in all services	0	0	0	0
Sum of service readiness scores	7.147735	7.913979	8.901786	7.45873
Total number of services	10	10	10	10
Specific service readiness mean (sum of readiness scores / total number of services)	71%	79%	89%	75%

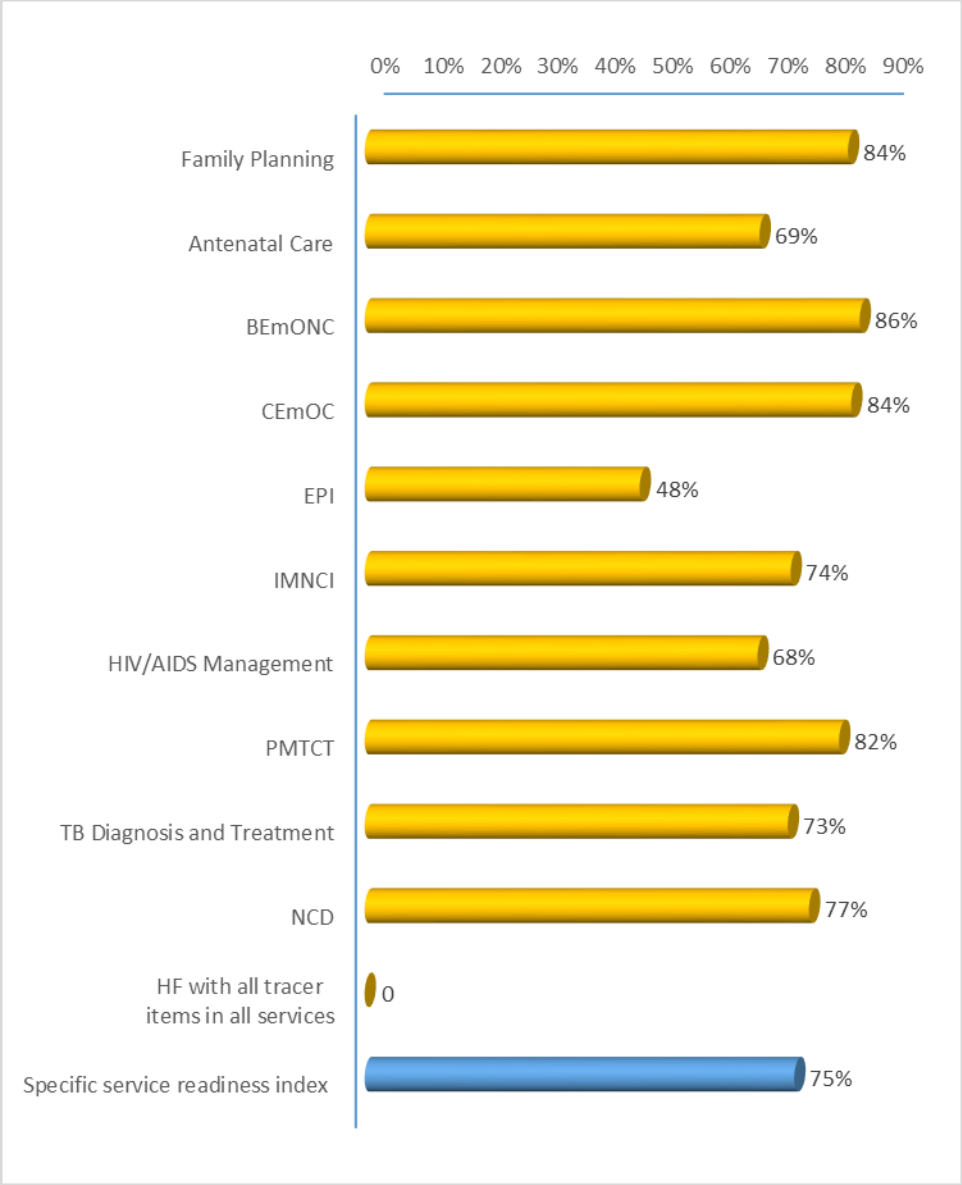

Figure 33 Specific service Readiness Scores and its mean value in Amhara war affected functional hospitals, 2022 (N=35)

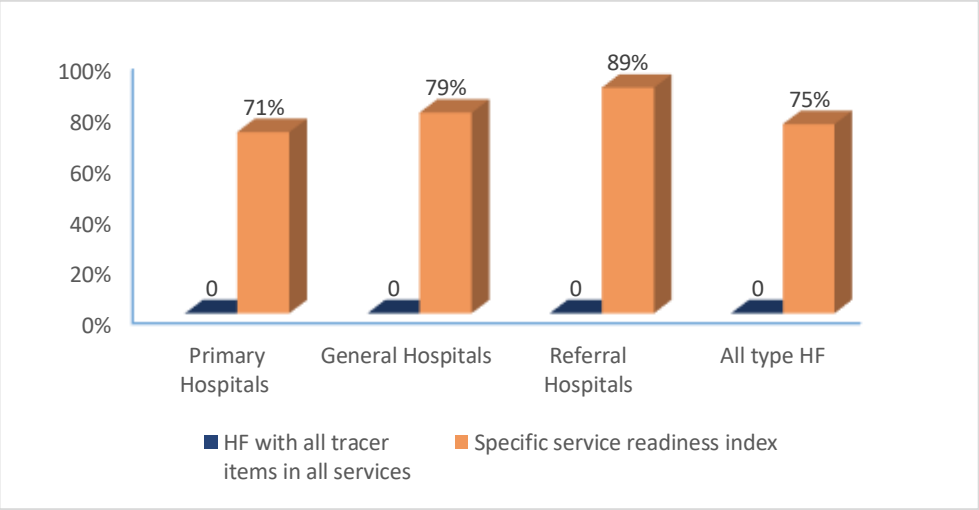

Figure 34 Specific service Readiness Scores summary by hospital type in Amhara war affected functional hospitals, 2022 (N=35)

The mean service specific readiness score of current study was created by combining data from 10 selected particular service readiness scores and it was approximately 75%, implying that 75 percent of all functional war affected hospitals were ready to provide the specific services. In other words, those hospitals started to offer services were ready to provide those selected particular health services with the capacity of 26 hospitals, instead of 35. The finding tells us the problem was not only those 13% of affected hospitals didn't start to offer services but also the functional hospitals were not well equipped and ready to provide specific services above 75 percent of their capacity.

4.5 Health Service Utilization Status in War Affected Community

This section of the chapter describes the health service utilization status in the war affected community of Amhara regional state; that was the specific objective three of the study. It gives answer for the third research question "What is the health services utilization status of the community in the war-affected area?" and the secondary data extracted from DHIS2 were mainly used to answer this question.

Service utilization is frequently measured by using different of indicators such as the quantity of services used over a period of time divided by a denominator of the population or the proportion of people who use a service relative to those who are eligible for it during a given period of time. World Health Organization stated that the quantity of patients at inpatient and outpatient services is not a useful predictor of coverage because the population in need is not clearly characterized. Low proportions, on the other hand, are an indication of poor service availability and quality. As a result, the service utilization rate is a measure of access in populations when there is a deficient or insufficient health infrastructure (WHO, 2010). Number of outpatient visits per capita per year: the proportion of ambulatory care visits to the total population that do not include immunizations. Hospital discharge rates per 100 people offers more details on the accessibility and availability of inpatient care (WHO, 2015b). All of these indications must be expressed as a percentage score in relation to a goal or standard.

A. Number of outpatient department visits per capita per year

It is defined as the proportion of outpatient visits to healthcare facilities to the local population as a whole. The total population for the same geographic area serves as the denominator, while the numerator is the number of visits to healthcare facilities for ambulant care (WHO, 2015b).

$$OPD\ attendnce\ per\ capita = \frac{Total\ number\ of OPD\ attendance}{Total\ population\ for\ the\ same\ geographical\ area}$$

Referral, general and primary hospitals are not the only health facilities to provide outpatient care services and it misleads to calculate OPD attendance rate if it excludes the rest health facilities contributions. As a result, zonal level OPD attendance rate data at war affected zones were extracted from DHIS2 in the current study. Several war affected zones and their hospitals were excluded because their major part of population and health facilities were not included in war affected area.

Table 18 shows that 5,422,381 new and repeat outpatient services were offered within 6 months' restoration period out of 8,604,799 total affected population in 6 selected war affected zones. This implies that the OPD attendance per person per half year was 0.63 which is equivalent with 1.26 OPD per capita per year.

Table 18 Outpatient attendance per person per year at war affected zones in Amhara war affected zones, 2022 (N=6)

Organization unit name	# of catchment population	# of outpatient visits (Tir to Sen 2014)	OPD attendance per person per 6 month	OPD attendance per person per year
Dessie THO	285530	292688	1.025069	2.050138
North Shewa ZHD	2370489	1186230	0.500416	1.000831
North Wollo ZHD	1688372	803517	0.475912	0.951825
Oromia Special ZHD	599940	463743	0.772982	1.545965
South Wollo ZHD	3132062	2351424	0.750759	1.501518
Waghimera ZHD	528406	324779	0.614639	1.229278
total	8604799	5422381	0.630158	1.260316

Source: DHIS2 from January to June 2022

According to health and health related indicator 2020/21, average number of outpatient visits including new and repeat visits per person per year (OPD attendance per capita) was 1.09 and 1.494 respectively at national level and Amhara region (MOH, 2021a). literatures stated that the general health service demand increases in four folds during conflict related health disaster. As a result, the current study finding shows that the outpatient visit was only 29 persent of the national average or 25% of global benchmark. According to WHO, in Organization for Economic Cooperation and Development (OECD) nations, there are approximately six outpatient visits per person year and five visits per person year is the suggested baseline (WHO, 2015b). A study conducted in Iran on health care utilization of war survivors revealed the higher rate of healthcare utilization of war survivors compared to general population. Utilization of outpatient healthcare services was 14 per year, which was twice the rate for the rest of the general population (Mousavi et al., 2020).

B. Number of inpatient admission per 10,000 populations per year

It is defined as the quantity of patients admitted to hospitals compared to the overall population of the same geographic area. The total population for the same geographic area serves as the denominator, while the numerator is the number of inpatient discharges from hospitalization with all possible outcomes (WHO, 2010).

$$Admission\ Rate = \frac{Total\ number\ of\ inpatient\ discharges}{Total\ population\ for\ the\ same\ geographical\ area} * 10{,}000$$

Six consecutive month admissions data were generated from DHIS2 (46182) and doubled in order to compare it previous national and regional yearly admission rates. As a result, the inpatient admission rate was 86 per 10,000 populations in war affected community which is equivalent with 8.6 per 1000 populations.

The current study shows that only 64% clients get access inpatient services when compared to national average of health and health indicator 2020/21 findings. According to health and health related indicator 2020/21, average number of inpatient admissions per 1000 population was 13.4 at national level (MOH, 2021a). According to WHO, in Organization for Economic Cooperation and Development (OECD) nations with aging populations, there are approximately 15 discharges per 100 inhabitants each year. A standard of ten discharges per hundred individuals annually is suggested (WHO, 2010). As a result, only 8.6 percent of the needy clients had get inpatient access based on WHO standard. A study conducted in Iran on health care utilization of war survivors revealed the higher rate of healthcare utilization of war survivors compared to general population. War survivors were admitted to hospital five times more than the general population (Mousavi et al., 2020).

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of Major Findings

Only 35 of 40 affected hospitals had started to offer health services to the war affected community. The general service availability index was 60 percent and the mean service specific availability was 70 percent in the war affected community of the region while those started to offer services were ready to provide general health services with the capacity of 69 percent and specific health services with the capacity of 75 percent. This study reveals that the health facility, inpatient bed and physician density were 0.03, 2.1 and 0.5 per 10,000 populations. Regarding to service utilization the current study shows that 1.26 OPD per capita per year while the inpatient admission rate was 86 per 10,000 populations in war affected community which implies that the overall service utilization index was 47% of national average.

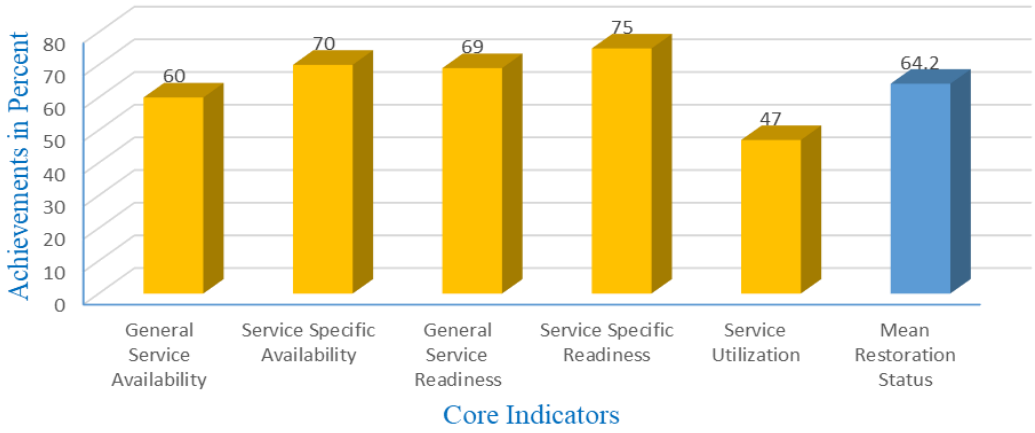

Figure 35 summary of health service restoration status in Amhara war affected area, 2022 (N=35)

5.2 Conclusion

Based on the current study findings the researcher concludes that most of indicators in health service availability, readiness and utilization are below national and global benchmarks and the health service restoration project in war affected area of Amhara regional state achieves behind its target. As a result, public hospital density in the current study finding is lower compare to the national average and regional average. This implies that 25% of the war affected communities were not access public hospitals within national average distance and the health service restoration project was 25% below its hospital availability target. The problem in the war affected community was not only those functional public hospitals were overloaded with 25% additional population but also they have given the health services with a total of health professionals below minimum requirement. Therefore, the overall general service availability in the war affected area of the region was 60 percent of the national average. It implies that the health service restoration project achieved only 60% of its target in terms of general service availability. The mean service specific availability was 20 and 10 percent below national mean availability in total affected hospitals and functional affected hospitals respectively.

Based on the findings the investigator conclude that the problem was not only that 13% of affected hospitals didn't start to offer services and the war affected functional hospitals were overloaded by extra 25% population, but also the functional hospitals were not well equipped, and ready to provide general health services with only the capacity of 24 hospitals and specific health services with only the capacity of 26 hospitals, instead of 35. Except essential medicines general service readiness scores in war affected hospitals were below national averages in all domain scores (Zemedu, 2018). The mean general service readiness index was 15 percent below the national mean general service readiness index reported in SARA 2018.

Regarding to service utilization the current study shows that OPD attendance rate achieved only 29% of national average while the inpatient admission rate achieved 64% of national average. The current study shows that only 64% clients get access inpatient services when compared to national average of health and health indicator 2020/21 findings or only 8.6 percent of the needy clients had get inpatient access based on WHO standard. Therefore, the overall service utilization index was 47% of national average or the project achieved only 47 percent of its target in terms of service utilization. As a result of the current study findings the investigator concludes that

beyond efforts to address the health service need in the war affected community of Amhara regional state, the overall health service restoration project was only 64 percent at the time of data collection period and it lags behind its target.

5.3 Recommendation

The researcher recommends the following major points to maximize the health service availability, readiness and utilization in the war affected area of Amhara regional state.

- The government should avail infrastructures specially power sources in war affected zones
- International NGOs should have conduct humanitarian services in those inaccessible health facilities and communities due to active conflict.
- The ministry of health and regional health bureau should facilitate and mobilize fund to avail diagnostic equipment such as chemistry machine, x-ray machines, hematology machine, CD4 count machine, ECG machines and OR equipment
- The RHB should develop health professionals recruit and retention mechanism specially for physicians
- Researchers for future studies should focus on Community based survey, PHCU assessment and Service-specific utilization

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Appendices

Appendix A: Basic data extracted from document review

N	Variables/indicators/issue	Value	Source of data
1	**Affected population**		
	# Of people displaced	2,539,382	SitRep 74, May 18/2022
	# returnee	1,241,499	SitRep 64, March 12/2022
	# current IDP	1,297,883	SitRep 74, May 18/2022
	# current IDP at host community	1,208,970	SitRep 74, May 18/2022
	# current IDP in collective site	88,913 (6.9%)	SitRep 74, May 18/2022
	Estimated number of U5 children	370,521	projected (14.591% of total)
	Estimated number of PLW	85,374	Projected (3.362%)
	Number of affected populations	10,689,575	SitRep 61 Feb 15/2022
	# of collective IDP sites	37	SitRep 52 Dec 14/2021
2	**Infrastructure and supplies**		
	Total number of health posts damaged/looted	1850	SitRep 52 Dec 14/2021
	Total number of health centers damaged/looted	453	SitRep 52 Dec 14/2021
	Total # Of hospitals damaged/looted	40	SitRep 52 Dec 14/2021
	# Of blood banks damaged/looted	5	SitRep 52 Dec 14/2021
	# Of Zonal health departments damaged/looted	8	SitRep 52 Dec 14/2021
	#Of Woreda Health offices damaged/looted	72	SitRep 62 Feb 25/2022
	# Of institutions damaged/looted (EPSA hub and ARHA office)	2	SitRep 52 Dec 14/2021
	# Of private health facilities damaged/looted	466	SitRep 52 Dec 14/2021
	Medical products (equipment and diagnostic)		
	# Of equipment (x-ray machines) damaged or lost	40	Ministry of Health and Amhara National Regional State Health Bureau
	# Of equipment (Gene X-Pert machines) damaged or	25	
	# Of equipment (Chemistry) damaged or lost	43	
	# Of equipment (Hematology machine) damaged or	43	
	# Of equipment (CD4 count machine) damaged or	43	
	# Of equipment (LED Microscope) damaged or lost	580	
	# Of equipment (AFB Microscope) damaged or lost	1050	
	# Of equipment (ECG machines) damaged or lost	19	
	# Of OR apparatus/machine damaged	975	
	# Of ambulances damaged or lost	124	
	# Of telephones damaged or lost	36	
	# Of computers damaged or lost	268	

	# Of printers damaged or lost	242	
	Health Workforce		
4	# Of health workers who left the conflict area	15,000	SitRep 65, March 19/2022
	Response		
5	# of mobile health and nutrition team (MHNT)	74	SitRep 74, May 18/2022
	# of temporary clinics	12	SitRep 74, May 18/2022
	# of U5 IDPs essential health service	45,652	SitRep 74, May 18/2022
	# of adult IDPs essential health service	117,957	SitRep 74, May 18/2022
	# of IDPs essential health service	163,609	SitRep 74, May 18/2022

Appendix B: Data extracted from Amhara RHB damage assessment database

Row Labels	Drugs Supplies & Reagents	Infrastructure	Medical equipments	Non-medical supplies	Grand Total
Health Center	2,254,693,534.27	76,308,264.13	892,269,772.40	619,027,797.34	3,842,299,368.15
Health Post	34,529,195.68	34,352,238.00	100,372,009.68	68,879,725.33	238,133,168.68
Blood bank		565,530.43	335,100.00	2,832,700.00	3,733,330.43
Hospital	532,036,604.72	52,550,639.60	2,423,428,329.93	685,304,283.34	3,693,319,857.59
Institute	6,636,963.57	5,693,214.00		69,300.00	12,399,477.57
Oxygen plant		5,000,000.00	371,180,000.00	743,000.00	376,923,000.00
Woreda health office	57,630,106.36	31,057,589.00	32,059,103.39	341,117,760.16	461,864,558.91
Zonal health department	580,000.00	75,798.00		21,151,440.00	21,807,238.00
Grand Total	2,886,106,404.59	205,603,273.16	3,819,644,315.40	1,739,126,006.17	8,650,479,999.32

Appendix C: List of war affected public hospitals

	Zone	#Affected Hospitals	Woreda	Hospitals	Remark
1	Dessie Town	2	Dessie Town	Borumeda GH	On Restoration
			Dessie Town	Dessie CSH	On Restoration
2	North Gondar	6	Adirkay	Adirkay PH	Inaccessible
			Dabat	Dabat PH	On Restoration
			Debark Town	Debark GH	On Restoration
			Wolkait	Wolkait PH	On Restoration
			Humera	Humera GH	On Restoration
			Maitebri town	Maitebri PH	Inaccessible
3	North Shewa	5	Efratana Gidim	Ataye PH	On Restoration
			Menz Gera Midir	Mehal Meda GH	On Restoration
			Menz Mama Midir	Molalie PH	On Restoration
			Shewarobit	Shewarobit PH	On Restoration
			Taremaber	Debresina PH	On Restoration
4	North Wollo	8	Alamata Town	Alamata PH	Inaccessible
			Habru	Habru PH	On Restoration
			Kobo Town	Kobo PH	On Restoration
			Lalibela Town	Kidus Lalibela GH	On Restoration
			Mekete	Shediho Meket PH	On Restoration
			R/Alamata	Merewa PH	Inaccessible
			Wadla	Wadila PH	On Restoration
			Woldia Town	Woldia CSH	On Restoration
5	Oromo Sp. Zone	2	Bati Town	Bati PH	On Restoration
			Kemisie Town	Kemisie GH	On Restoration
6	South Gondar	1	Lay Gayint	Nifas Mewucha PH	On Restoration
7	South Wollo	12	Borena	Mekane-Selam GH	On Restoration
			Delanta	Dellanta PH	On Restoration
			Jamma	Jamma PH	On Restoration
			Kelela	Kelela PH	On Restoration
			Kombolcha Town	Kombolcha GH	On Restoration
			Legambo	Akesta GH	On Restoration
			Mekdela	Mekdela PH	On Restoration
			Sayint	Sayint PH	On Restoration
			Tehulederie	Hayik PH	On Restoration
			Tenta	Tenta PH	On Restoration
			Wegdi	Wegidi PH	On Restoration

			Woreilu	Woreilu PH	On Restoration
			Dehana	Amdework PH	On Restoration
			Korem Town	Korem GH	Inaccessible
			Sekota Town	Tefera Hailu Metasebia GH	On Restoration
8	Waghimera	4	Ziquala	Tsitsika PH	On Restoration
	Total	40			5 of 40 were inaccessible

PH = Primary Hospital, GH = General Hospital, CSH = Referral (comprehensive specialized) hospital

Appendix D: Consent Form

Addis Ababa University, School of Commerce

Questionnaire Consent Form

Good Morning/afternoon! My name is Mr. Abraham Kitaw, a postgraduate student at Addis Ababa University, School of Commerce, conducting an empirical research on Assessment of health service restoration to assist the government in knowing more about health services in war affected area of Amhara Regional State.

Your facility was selected to participate in this study. I will be asking you questions about various health services. Information about your facility may be used by the Amhara regional health bureau, ministry of health and other organizations supporting services in your facility, and researchers, for planning service improvement or for conducting further studies of health services.

Neither your name nor that of any other health worker respondents participating in this study will be included in the dataset or in any report; however, there is a small chance that any of these respondents may be identified later. Still, we are asking for your help to ensure that the information we collect is accurate.

You may refuse to answer any question or choose to stop it at any time. However, we hope you will answer the questions, which will benefit the services you provide and the nation.

If there are questions for which someone else is the most appropriate person to provide the information, I should appreciate if you introduce us to that person to help us collect that information. At this point, do you have any questions about the study? Do I have your agreement to proceed? May you begin the questionnaire? 1. YES 2. NO

Appendix E: Data Collection Instrument (Questionnaire)

English version

Code No._____

Zone_____ Woreda/Town_____

HF Name _____ Type of HF_____

Date _____Time started_____ Time ended_____

MODULE 1: SERVICE AVAILABILITY

SECTION 1: SERVICES SPECIFIC AVAILABLITY

S.No	Question	Result		Skip
		Yes (1)	No (2)	
	Does this facility offer any of the following client services? In other words, is there any location in this facility where clients can receive any of the following services?			
	Family planning services			
	Antenatal care (ANC) services			
	Services for the prevention of mother-to-child transmission of HIV (PMTCT)			
	Delivery (including normal delivery, basic emergency obstetric care and newborn care services			
	comprehensive emergency obstetric care			
	Child immunization services, either at the facility or as outreach			
	Preventative and curative care services for children under 5			
	HIV & AIDS antiretroviral prescription or antiretroviral treatment follow-up services			
	HIV & AIDS care and support services, including treatment of opportunistic infections and provisions of palliative care			
	Diagnosis, treatment prescription, or treatment follow-up of tuberculosis			
	Diagnosis or treatment of malaria			
	Diagnosis or management of non- communicable diseases, such as diabetes, cardiovascular disease, or chronic respiratory disease			
	Any surgical services, including caesarean section			
	Comprehensive surgical services			
	Intensive Care Unit Service (including adult ICU, Neonatal ICU and pediatric ICU)			
	Emergency Service			
	Blood transfusion services			
	Laboratory diagnostics, including any rapid diagnostic testing			

SECTION 2: GENERAL SERVICE AVAILABILITY (STAFFING)

S.No	Question	Number	Skip
	how many staff with each of the following qualifications are currently employed to this facility?		
	General Practitioner (non-specialist) medical doctors		
	Specialist medical doctors		
	Non-physician clinicians/paramedicalprofessionals		
	Nursing professionals		
	Midwifery professionals		
	Nursing associate professionals		
	Midwifery associate professionals		
	Pharmacists		
	Pharmaceutical technicians		
	Laboratory scientists/technologists		
	Laboratory technicians/assistants		
	Health workers not elsewhere classified		
	Health management and support workers		

SECTION 3: GENERAL SERVICE AVAILABILITY (INPAIENT BED)

S.No	Question	Result		Skip
		Yes (1)	No (2)	
	Does this facility routinely provide inpatient care?			
	Excluding any delivery beds, how many inpatient beds in total does this facility have, both for adults and children?			

MODULE 2: SERVICE READINESS

SECTION 4: BASIC AMMENITES AND STANDARD PRECUASTIONS

S.No		Result		Skip
	COMMUNICATIONS	Yes (1)	No (2)	
	Does this facility have a functioning land line telephone that is available to call outside at all times client services are offered?			
	Does this facility have a functioning computer?			

	Is there access to email or internet within the facility today?			
	AMBULANCE/TRANSPORT FOR EMERGENCIES			
	Does this facility have a functional ambulance for emergency transportation for clients that is stationed at this facility or operates from this facility?			
	POWER SUPPLY			
	Is this facility connected to the central supply electricity grid?			
	Does this facility have a functional backup Generator?			
	ENVIRONMENTAL HEALTH			
	Is there improved water source available within 500 meters radius of the facility?			
	Is there a waiting area for clients where they are protected from the sun and rain?			
	Is there a room with auditory and visual privacy available for patient consultations?			
	Is there adequate improved latrine in functioning condition that is available for general outpatient client use?			
	INFECTION CONTROL			
	PROCESSING OF EQUIPMENTS FOR REUSE			
	Are medical equipment that are used in the facility processed (i.e., sterilized or chemical HLD) for re-use?			
	Is there adequate electric autoclave (pressure & wet heat) for medical equipment processing in the facility?			
	Does this facility have any guidelines on final processing or sterilization of equipment?			

S.No	HEALTH CARE WASTE MANAGEMENT	Burn Incinerator (1)	Open Burning (2)	Dump Without Burning (3)	Remove Offsite (4)
	How does this facility finally dispose of sharps waste (e.g., filled sharps boxes)?				

	How does this facility finally dispose of medical waste other than sharps boxes?				

SECTION 5: BASIC EQUIPMENT

S.No	Question	Result		Skip
	BASIC EQUIPMENT	Yes (1)	No (2)	
	I am interested in knowing if the following basic equipments and supplies used in the provision of client services are available in the general outpatient area of this facility. For each equipment or item, please tell me if it is available today and functioning.			
	Adult weighing scale			
	Child/infant weighing scale			
	Thermometer			
	Stethoscope			
	Blood pressure apparatus (may be digital or manual sphygmomanometer with stethoscope)			
	Light source (flashlight acceptable)			
	Pulse oximeter			

SECTION 6: SERVICE SPECIFIC READINESS

A. MATERNAL HEALTH

S.No	Question	Result		Skip
	FAMILY PLANNING SERVICES	Yes (1)	No (2)	
	Does this facility *provide* or *prescribe* any of the following modern methods of family planning?			
	Combined oral contraceptive pills			
	Combined injectable contraceptives			
	Intrauterine contraceptive device (IUCD)			
	ANTENATAL CARE SERVICES			
	Does this facility offer Antenatal Care services?			
	Do ANC providers provide Iron with folic acid			

	supplementation to pregnant women as part of routine ANC services?			
	Do ANC providers provide Tetanus toxoid vaccination to pregnant women as part of routine ANC services?			
	Do you have the national ANC guidelines available in this facility today?			
	PREVENTION OF MOTHER-TO-CHILD TRANSMISSION (PMTCT)			
	Does this facility offer PMTCT services?			
	As part of PMTCT services, please tell me if providers in this facility provide the following services to clients:			
	Provide HIV counselling and testing services to HIV positive pregnant women for PMTCT			
	Provide HIV counselling and testing services to infants born to HIV positive pregnant women for PMTCT			
	Provide ARV prophylaxis to HIV positive pregnant women for PMTCT			
	Provide ARV prophylaxis to newborns of HIV positive pregnant women for PMTCT			
	OBSTETRIC AND NEWBORN CARE SERVICES			
	Does this facility provide any facility-based normal delivery services?			
	Please tell me if any of the following interventions are carried out by providers of delivery services as part of their work in this facility.			
	Parenteral administration of antibiotics (IV or IM)			
	Parenteral administration of oxytocic (IV or IM)			
	Parenteral administration of anticonvulsant for hypertensive disorders of pregnancy (IV or IM)			

	Assisted vaginal delivery			
	Manual removal of placenta			
	Removal of retained products after delivery			
	Neonatal resuscitation			
	Caesarean section			
	Blood transfusion			
	Do you have the national guidelines for Comprehensive Emergency Obstetric Care (CEmOC) available today in this facility today?			

B. CHILD AND ADOLESCENT HEALTH

S.No	Question	**Result**		**Skip**
	CHILD IMMUNIZATION	Yes (1)	No (2)	
	Does this facility provide any of the following immunization services for children under 5 years of age?			
	Routine measles immunization			
	Routine DPT-Hib+HepB immunization (pentavalent)			
	Routine polio immunization			
	BCG immunization			
	Do you have the national guidelines for child immunizations available in this facility today?			
	Does this facility have a refrigerator for the storage of vaccines?			
	CHILD PREVENTATIVE AND CURATIVE CARE SERVICES			
	Please tell me if providers in this facility provide the following services:			
	Diagnose and/or treat child malnutrition			
	Provide vitamin A supplementation			
	Provide iron supplementation			

	Provide ORS and zinc supplementation tochildren with diarrhea			
	Child growth monitoring			
	Do you have the IMCI guidelines for the diagnosis and management of childhoodillnesses available in this facility today?			
	Do you have the national guidelines for growthmonitoring available in this facility today?			

C. COMMUNICABLE DISEASES

S.No	Question	Result		Skip
	HIV COUNSELLING, TESTING, TREATMENT and CARE & SUPPORT	Yes (1)	No (2)	
	Does this facility offer HIV/AIDS treatment, care and support services?			
	Do you have the national HIV counselling andtesting guidelines available in this facility today?			
	Do providers in this facility prescribe ART?			
	Do providers in this facility provide treatmentfollow-up services for persons on ART, including providing community-based services?			
	Do you have the national ART guidelinesavailable in this facility today?			
	Do you prescribe treatment for any opportunistic infections or symptoms related to HIV/AIDS? This includes treating topical fungal infections.			
	TUBERCULOSIS			
	Do providers in this facility diagnose TB?			
	Is microscopic sputum examination available in this facility for diagnosing TB?			

	Is X Ray imaging available in this facility for diagnosing TB?			
	Do providers in this facility prescribe treatment for TB or manage patients who are on TB treatment?			
	Do you have the national guidelines for the diagnosis and treatment of TB available in this facility today?			

D. NON-COMMUNICABLE DISEASES

S.No	Question	Result		Skip
		Yes (1)	No (2)	
	Do providers in this facility diagnose and/or manage diabetes in patients?			
	Do providers in this facility diagnose and/or manage cardiovascular diseases such as hypertension in patients?			
	Do providers in this facility diagnose and/or manage chronic respiratory diseases in patients?			

E. SURGERY

S.No	Question	Result		Skip
	SURGICAL SERVICES	Yes (1)	No (2)	
	Does this facility offer major surgical services?			
	Please tell me if providers in this facilityprovide the following services:			
	Incision and drainage of abscesses			
	Wound debridement			
	Acute burn management			
	Suturing			

	Closed treatment of fracture			
	Cricothyroidotomy			
	Male circumcision			
	Hydrocele reduction			
	Chest tube insertion			
	Tracheostomy			
	Tubal ligation			
	Vasectomy			
	Dilatation & Curettage			
	Obstetric fistula repair			
	Episiotomy, cervical and vaginal laceration			
	Appendectomy			
	Hernia repair (strangulated, elective)			
	Cystostomy			
	Urethral stricture dilatation			
	Laparotomy (uterine rupture, ectopic pregnancy, acute abdomen, intestinal obstruction, perforation, injuries)			
	Congenital hernia repair			
	Neonatal surgery (abdominal wall defect, colostomy imperforate anus, intussusceptions)			
	Cleft lip repair			
	Contracture release			
	Skin grafting			
	Open treatment of fracture			
	Amputation			
	Cataract surgery			

	Cleft lip repair			
	Contracture release			
	Skin grafting			
	Open treatment of fracture			
	Amputation			
	Cataract surgery			
	BLOOD TRANSFUSION			
	Do providers in this facility offer BLOOD TRANSFUSION SERVICES for the clients			

SECTION 6: DIAGNOSTICS

I would like to know if the following diagnostic tests are available today in this facility.

Number	Question	Result		Skip
	CLINICAL CHEMISTRY	Yes (1)	No (2)	
	Does this facility do blood glucose tests using aglucometer?			
	Does this facility do urine chemical testingusing dipsticks?			
	Does this facility do urine protein dipsticktests?			
	Does this facility do urine glucose dipsticktests?			
	Does this facility do urine ketone dipsticktests?			
	Does this facility do ALT or creatinine testing?			
	Does this facility do liver function tests?			
	Does this facility do renal function tests?			
	Does this facility do serum electrolyte testing?			
	HEMATOLOGY			
	I would like to know if the following equipment items for haemoglobin testing are available and functional today or not available or not functioning today.			

	Does this facility do full blood count and differential testing?			
	Does this facility do CD4 count (absolute and percentage) testing?			
	BACTERIOLOGY			
	Does this facility have functional Fluorescence microscope (FM) and do Ziehl-Neelson testing for TB (AFB)?			
	IMAGING			
	Does this facility perform diagnostic x-rays, ultrasound, or computerized tomography?			
	Does this facility has functional x-rays today?			
	Does this facility has functional ultrasound today?			
	Does this facility has functional computerized tomography today?			
	Does this facility has functional ECG today?			

Appendix F: Guiding checklist for document review

1. **Did they prepare response and recovery plan including health facility restoration?**
2. **Is resource needed, actors to response and mechanism for restoration clearly identified?**
3. **Did they assess the extent of war related health damage and clearly identified it?**
4. **How they coordinate the resource and actors toward the restoration?**
5. **What are the major activities implemented in terms of health workforce, medical and non-medical supplies and equipment, physical infrastructure and health finance?**
6. **The service uptake and essential drug availability in war affected hospitals**