



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



# Preparedness and response to covid-19 in Woreta Town, North West Ethiopia

Abdelah Alifnur Mohammed\*

Debre Tabor University, Department of Sociology, Po Box. 272



## ARTICLE INFO

### Article history:

Received 28 October 2020

Revised 20 August 2021

Accepted 19 October 2021

Editor: DR B Gyampoh

### Keywords:

COVID-19

Preparedness

Response

Woreta

South-Gondar

Ethiopia

## ABSTRACT

Preparedness and early response are proved to be best solutions for a pandemic situation. Well prepared countries have succeeded in containing the transfer of the disease and minimized its adverse impact. Ethiopia has adopted Covid-19 preparedness and response plan. Its implementation has brought good outcomes. The purpose of this study was to explore deeper in to a grass roots situation. It focused particularly on Covid-19 preparedness and response in Woreta town, Northwest Ethiopia. The study employed a qualitative approach. Data were collected from Covid-19 prevention task force members, health care workers and community members using a semi-structured interview. The data collection was conducted from September to October 2020. A framework approach and open code 4.02 software were used in the analysis. The results showed that various structures, including a Covid-19 task force, are created to take preparatory and response measures in the area. As the enforcement of preventive measures is declining, residents continue to be less engaged in their practice of Covid-19 instructions. Generally, the preparedness and response were low in health facilities and in the community. Thus, the local government has to strengthen a persistent and well-informed risk communication by broadening its social base. The existing politicization, rumor, denial and suspicion associated to COVID-19 can only be addresses by implementing a transparent and persuasive communication strategy. The health workers need to renew their effort to transmit health messages. The task force has to consider the pandemic as a strategic problem rather than a short time issue. So, it has to develop a plan to guide its activity. It also need to strengthen its partnership to better enforce preventive guidelines. On the other hand, community members shall not be deceived by the coming of COVID-19 vaccines. Rather they have to focus on prevention mechanisms.

© 2021 Published by Elsevier B.V. on behalf of African Institute of Mathematical Sciences / Next Einstein Initiative.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

## Introduction

COVID-19 is affecting the contemporary globalized society. It unequivocally resulted in wider social, economic and political impact on the world particularly on those countries which did not showed an early preparedness. In March 2020, the

\* Correspondence to: Sociology, Debre Tabor university, Debre Tabor, Ethiopia.  
E-mail address: [abdelahalifnur@gmail.com](mailto:abdelahalifnur@gmail.com)

World Health Organization (WHO) began to characterize it as a pandemic in order to emphasize the gravity of the situation and urge all countries to take action in detecting infection and preventing spread [17].

The dangerous face of the disease rests on its easy and rapid transmissibility, making it a global pandemic within a short period of time. In Ethiopia, it took 77 days (beginning from 13 March 2020) to surpass the first one thousand cases; however, it took only 7 days to record the second thousand cases [13]. The country recorded 66,224 cases as of 17 September 2020 and become the country of East Africa with the largest number of infections [15].

Amid this rapid transmission, Ethiopia set up mechanisms to boost readiness. In the meantime, various COVID-19 structures were created. Among these, a National Ministerial Committee and a Multi-Sectoral Technical Task Force are mentionable. In addition, a Public Health Emergency Operation Center was activated to coordinate tasks.

After structures are created, health extension workers are deployed, 3900 new health professionals are hired and 15,000 volunteers are mobilized in collaboration with Ethiopian Red Cross Association. Quarantine and isolation centers which can respectively accommodate 16,289 and 21,280 people were prepared, a field hospital was established [15].

National COVID-19 implementation guidelines and protocols are developed. Suspect identification, testing and isolation, as well as care and contact tracing have been performed as per the national guideline [24].

The government suspended schools, banned gatherings and sporting events three days after the first case was confirmed. It also banned night clubs and bars, subjected all passengers arriving in Ethiopia to a 14-day mandatory quarantine, expanded the holding space of correctional facilities and released prisoners sentenced for minor offenses [28].

Moreover, a National Resource Mobilization Initiative has been established with the aim of supporting the most vulnerable [14]. The country's main social safety net (8 million beneficiaries), the PSNP which caters rural areas is working actively [29].

A five-month state of emergency was issued. The emergency proclamation No.3/2020 required physical distance of at least two adult strides in banks, market places, transport stations, shops, pharmacies or any other place of public service. On the other hand, it contained prohibitions such as meeting, hand shaking, detainee visiting etc. [8]. The emergency law has expired on September 05 and measures were relaxed. For instance, public buses that were obliged to carry only half of their holding capacity were latter allowed to carry full their capacity. That means the number of passengers accommodated in a bus was initially reduced by half to keep physical distance among them.

In a more relaxed move, the Federal Ministry of Health [15] told to the parliament improvement of the country's preparedness and response capacity and recommended the possibility of holding national election with appropriate care. It also recommended the re-opening of schools and sporting events. The national condition may not reflect the specific reality of sub-national or district level situation.

With this view in mind, this study specifically focused on Woreta town in Northwest Ethiopia. Until 18 September, the number of infected persons in the town was only nine. This indicates the disease is found at its initial stage of transmission. However, the preparedness and response needed to be studied for a better practice and a positive behavioral change in the community to improve the COVID-19 preventive practices.

This paper more specifically tried to answer the following research questions

- a) What preparatory and response measures were taken in health facilities?
- b) What preparatory and response measures were taken in the community?
- c) What was the level of partnership within the task force?
- d) What looks like the community's practice of COVID-19 preventive procedures in Woreta?

## Defining preparedness and emergency response

Preparedness is defined as the capability of the public health and health care systems, communities and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities [26].

According to Nelson, et al. [26], a prepared community is one that develops, maintains, and uses a realistic preparedness plan, integrated with routine practices, having the following components: 1) pre-planned and coordinated rapid-response capability in terms of health risk assessment, legal climate, roles and responsibilities of actors, incident command system, public engagement, epidemiology function, laboratory function, counter measures and mitigation strategies, mass health care, public information and communication, robust supply chain; 2) expert and fully staffed workforce; and 3) accountability and quality improvement.

### *Global and regional preparedness and response strategies for COVID-19*

The World Health Organization and the Center for Disease Control and prevention (CDC) have their own COVID-19 preparedness and response framework. WHO's Preparedness and Response Plan has the following pillars; country-level coordination; risk communication and community engagement; surveillance; points of entry; rapid response team; national laboratory system; infection prevention and control; case management and continuity of essential services; and logistics, procurement, and supply management [32].

Africa CDC [1] on its part, has a continental strategy for limiting COVID-19 transmission and minimizing harm. The strategy focuses on enhancing surveillance; laboratory; counter measures; health care preparedness; risk communication and social engagement; supply chain management; handling of special population settings and policies.

#### *Covid-19 preparation and response and associated challenges in Ethiopia*

Ethiopia look back to its previous pandemic history to take a lesson about appropriate emergency response since the country is not new to a devastating pandemic. As a way of response, its citizens use to isolate themselves during public health crisis.

According to Kitaw and Kaba [21], the Spanish Flue Pandemic- locally termed Yehedar Besheta-affected Ethiopia in 1918. The second wave of the disease was murderous, killing about 50,000 people throughout the country and 10,000 within Addis Ababa city alone. Response measures were taken both individually and officially. Individually, public leaders run away from the town or isolated themselves in their homes to be protected.

During COVID-19, Ethiopia also adopted the experience of other countries and the recommendations of global public health institutions. A team of (Chinese) anti-pandemic medical experts arrived in Addis Ababa for experience sharing [29].

By adapting the WHO global framework, Ethiopia has devised a multi-sectoral Preparedness and Response Plan (PRP) that is directed by “one response, one plan, one team” principle under the executive leadership of Public Health Emergency Operation Center.

The plan has six pillars- that are; Coordination and Leadership; Surveillance and Laboratory; Infection Prevention & Control (IPC); Case management and Facility Readiness; Setting up Points of Entry (POEs); Risk Communication and Community Mobilization; and Logistics provision [12].

The International Health Regulations (IHR) capacities in the country also served as a good foundation for timely readiness and response. Leveraging on existing IHR capacities in the country built prior to COVID-19 helped slow down the importation and mitigated uncontrolled spread of the disease in the country [22].

However, the response operations on the ground are confronted by different challenges. For instance, the current levels of access to water and hand-washing facilities and characteristics of the home environment (in Ethiopia) are not conducive for effective implementation of basic prevention measures, including social distancing [14]. There is also non-adherence to physical distancing and other prevention advises among the public, low face mask stock and personal protective equipment (PPE), competing priorities due to superimposed disease outbreaks like cholera in some areas of the countries [13].

## **Research method**

### *Description of the study area*

Woreta town is part of South Gondar Zone. It is located in North West Ethiopia, 620 km away from the Capital, Addis Ababa and 57 km from Bahirdar. It has an area of 78.59 km<sup>2</sup> enclosed by a rice producing Fogera district in all directions. Woreta became an autonomous town administration in 2007.

The population of the town is growing fast. In 2007 it was 25,190 [9]. The population has grown to 49,849 in more than 12,000 households. Due to the strategic location of Woreta town, vehicles from various directions (including from areas more affected by COVID-19) come and converge. It is also attracting migrants from the surrounding rural areas.

The town is growing and expanding. Parallely, unemployment and lack of income continue to be a challenge for many dwellers. Small businesses and service sector jobs dominated the economic activity of dwellers. In order to protect COVID-19 related business closure, tax reduction was made in most affected sectors. COVID-19 has forced closure of schools in March 2020. Thus, nearly 15,000 students remained at home for seven months until the schools were re-opened on 1 October.

The community has strongly established system of relation built across social, religious and kinship lines. There are traditional associations and customs that facilitate such relations. The relationships are undertaken in a face-to-face encounter which can allow for COVID-19 exposure.

### *Research design*

The study followed qualitative approach with an exploratory design to investigate emergency preparedness and response at a district level.

### *Selection of study sample*

People who involved in the management of COVID-19 outbreak were included in the sample such as health workers, political and community leaders. In addition, ordinary residents were included since Covid-19 pandemic is a concern of anyone. A total of 30 interviewees were purposively drawn from three groups. The sample size was thoroughly determined using the principle of “saturation” i.e. until additional interviews did not provide additional evidence about the main themes of interest [10]. The first group included members of COVID-19 prevention task force-7. The second category included health care workers-6. The third category comprised residents of Woreta town-17 (Table 2).

In the selection of residents, attention was given for people whose working and living situation bears an exposure to COVID-19 because more preparedness and response is needed from these groups. Thus, service providers (such as people working in hotels, local drink houses, groceries, shops), and petty traders, teachers, car attendants were included.

The initial contact was made with the mayor of the town to whom the letter of permission request was submitted and objective of the study was briefed. The mayor was the leader of the COVID-19 task force and was contacted at his office. After conducting a successful discussion with him, a permission was obtained and other members of the task force were contacted by his guidance. Accordingly, kebele(sub-town) leaders, who lead lower level COVID-19 task forces, were contacted and interviewed to know the grass roots preparedness and response against COVID-19. They were contacted at their respective offices.

The second group of interviewees i.e., health workers, were recruited by the guidance of the town's health office head and by the permission of woreda health center head. They were addressed individually at office and in health facilities based on appointments. The researcher also joined the team of health workers during their home visits.

The third category of participants were community members whose working and living situation was highly exposed for COVID-19 transmission. These included people working in hotels, local drink houses, groceries, shops, markets, vehicles and schools. They were recruited by the coordination of health extension workers and the researcher. Interviews were taken place at their place of work and at home or in open spaces out of home. All of them were briefed about the objective of the research and asked to give their consent before interview.

### *Data collection*

Data were gathered through in-depth interviews from September to October 2020. An interview guide was prepared by taking in to consideration the pillars of WHO's COVID-19 preparedness and response strategy and the research questions. It was also constructed based on an insight gained from literature review. The instrument consisted semi-structured items focusing on preparedness and response to COVID-19 pandemic at community and facility levels. All the relevant issues/points of the study were covered by the instrument. The questions were prepared in English language and translated in to local Amharic language to make them easily understandable for study participants. Each interview lasted for about 40–50 min. The interview was audio recorded using a tape.

The data were collected by the researcher and his trained assistant. The principal investigator was a lead interviewer and one research assistant was assisting the lead researcher through recording and note taking. Before beginning a face-to-face interview, both the investigator and his assistant have familiarized themselves with the questions to be asked and took maximum care to have a COVID-19 free interviewing process. For instance, physical distance was kept and protective mask and sanitizer were used to minimize the risk of COVID-19 transmission throughout the data collection period.

Since interviewees were three categories, namely, members of COVID-19 prevention task force, health care workers and community members/ residents of the town, a separate instrument was designed for each category to fit their respective realities. The first two groups of interviewees were addressed using key informant interview. While the latter were addressed through in-depth interviews.

### *Ethical consideration*

Before starting the research, ethical clearance paper was obtained from Debre Tabor University Ethical Review Committee with a reference No. Dtu /RP724/20 . A verbal informed consent was also obtained from all study participants. An attempt was made to anonymize the identity of informants in this paper to maintain confidentiality.

### *Data analysis*

Interviews were audio recorded and transcribed in the local Amharic language and translated in to English. Then, transcripts along with field notes were imported in to Open Code 4.02 Software for analysis after they are checked for accuracy. The analysis was done by following framework approach. The approach is a flexible, rigorous, transparent and useful method for analyzing qualitative data [16]. It is better adapted to research that has specific questions, a limited time frame [30].

It is a step by step, rigorous analysis that begin by familiarizing oneself with the data. Based on this, the researcher (AA) and his supportive colleague (AT) have familiarized themselves with the data through repeated reading and note taking. AT is a qualified public health lecturer in Debre Tabor University but not part of this research. He rather engaged voluntarily to assist.

The notes are then organized to give a theoretical frame work, a combined set of recurrent ideas. Using the framework, the researcher has developed codes. After coding the first few transcripts independently, a two-way discussion was made to arrive at a consensus about further codes. Then coding was done on the whole body of text or the raw data.

Next, similarly coded items were collected and put in to a matrix with headings and sub-headings. Three main themes were developed including; public health intervention, social intervention and weakened control and retreated implementation. Finally, the data were synthesized and interpreted.

## Results

### *Public health interventions*

This paper addressed the preparedness and response measures undertaken in the health setting and in the community. It also focused on activities performed to increase the community's COVID-19 practice. The study analyzed the activity of all actors including the local government, the task force, community members and health workers.

The collected data showed that the study area had no even a primary hospital, let alone, a general hospital. Three years were passed without finishing the building of a primary hospital under construction. There were no functional quarantine and isolation centers. The less developed health system in Woreta demanded to have a dual referral system in which specimens were referred to Bahirdar city for laboratory diagnosis while infected people were referred to Debre Tabor for isolation and treatment. Besides, the non-fulfillment of the following basic pillars shows the low preparedness and response in the study area.

### *Coordination*

In Woreta, three major units of actors were organized for Covid-19 prevention and control which include a Task Force, a Technical Committee and a Rapid Response Team (RRT). The task force was a multi-sectoral force drawn from heads of various offices. It was led by the Mayor and has lower branches. But there were variations in the makeup of task forces in the lower branches.

The technical committee was composed of seven professionals working in Woreta Health Center, a governmental facility. The committee was led by the center's head and undertaken technical tasks jointly with the RRT. Both of them were supportive structures for the task force.

The taskforce had a political leverage that it could use in the town to mobilize the community in to pandemic prevention and mitigation. But its effort was restricted in this regard. The following complain was forwarded by a health extension worker

"The authorities and the police used to support our COVID-19 campaigns at the initial period of outbreak but now the support is interrupted."

It faced three major problems. First, it had no its own preparedness and response plan because of a top-down makeup of the taskforce from national to local levels. Due to this COVID-19 related work evaluations were not frequent in all ranks of the task force. Second, it faced budget constraint. Third, all members of the task force were not actively engaging in COVID-19 response since some of them gave priority for their respective sectoral tasks. They lacked a sense of ownership. linkages within the taskforce were also loose. To avoid the problems, the taskforce has to adopt and contextualize national pandemic response plan in to its own situation. It should not take the pandemic as a short time momentary issue. It also has to stretch a strict regulation mechanism up on its members to give prime attention for COVID-19 as it is a cross-cutting issue of all sectoral offices.

### *Risk communication and community engagement*

Awareness creation and communication activities were done inside and outside the health center using different mechanisms such as; home visits, leaflets, loud speaker-loaded cars, influential persons (religious leaders and political leaders), scheduled teachings arranged for patients and their care givers. In addition, public shows were made in which health workers have travelled in procession along the main street to transmit COVID-19 prevention message. Similarly, a mask-wearing show was held by governmental workers including the police, the health professionals and other civil servants.

Apart from the above, people were getting information by their own effort from national TV, radio, telecom voices, or from social media accounts. However, the communication tasks were less fruitful since misunderstandings, groundless rumors, suspicions and denials are still prevalent.

According to kebele 01 and 03 administrators, the main challenge for prevention was the politicized outlook and negligence against the government's Covid-19 response activities.

"When you tell them the right thing (to do or not do something) about Covid-19, they try to associate it with politics or certain selfish benefits of leaders and falsify your advice. Or else they accept the advice without implementing it", acting 01 kebele administrator

Denial and suspicion also existed in some members who got difficulty in accepting the health professionals' expression about the disease. For instance, an individual who was tested positive and sent to isolation center has the following comments.

"Security forces and health professionals have suddenly come with their car around the bus station and ordered me to go to an isolation center in another town. They did not allow him even to arrange things. I stayed there for 19 days. I was healthy, I don't know why they referred me to an isolation center", a resident from kebele 03

The way the positive tested person was hold was not persuasive. The person was confused to have the virus without any symptom and failed to accept the result. It was the first confirmed case in the town detected in bus station on 16 June 2020

**Table 1**  
Matrix showing the themes, categories and codes.

Theme 1	Sub-theme	Codes	Quotations
Public Health Intervention	Risk Communication and Community engagement	Rumors	"Everyone knows about Covid-19, being told always. These days, there is no talk other than Covid-19 in every house and in the media. Those who distribute false rumors are just deliberately politicizing. My reservation lies only in the continuity of awareness creation activities here", a high school teacher
		Public announcements and shows	"Our health teams perform a show, we taught six times by microphone, I personally participated in public announcement, 3000 leaflets are distributed holding health messages, the mayor
		Home to home campaign	"There are continuous campaigns for the last five months, measles campaign, family health campaign and covid-19 campaign. so, we have no time for sitting in office. Moving door to door and informing to wash hands, to use mask, and to report suspected cases for the kebele administrator." A health extension worker in kebele 01
		Community engagement	"Extension workers come and measure body temperature and ask if there is a recent cough or fever. Religious leaders also teaching in churches to keep distance, but no one practices it", a resident in 04
		Denial, Suspicion	"I was healthy, I don't know why they referred me to an isolation center", a resident from kebele 03 "Sadly, some people tag us 'corona' as if we have brought it to them". A health extension worker in kebele 01
		Politicization and intentional negligence	"When you tell them the right thing (to do or not do something) about Covid-19, they try to associate it with politics or certain selfish benefits of leaders and falsify your advice. Or else they accept the advice without implementing it" 01 kebele administrator
		Scheduled teaching	"We have a scheduled health education for patients". Health Center Head

and residents were seriously following this case. Parallel to this development, there was a rumor that laboratory results of Covid-19 cases were consciously fabricated to turn the public attention away from the hot political issues. Since the rumor was quickly disseminated, some people dared to deny its existence while others concluded that Covid-19 was not a serious health threat.

While the messages of risk communication were transparent, an ethical and persuasive approach should be followed during isolation of confirmed cases (Table 1).

The public awareness activities lacked broader social base and in-persistency. The engagement of volunteer youths and private health institutions in Covid-19 campaign was low. The messages given by health extension workers also focused on hand washing than other ways of protection such as physical distance. Health extension workers moved within their respective domain of operation and taught to keep hand hygiene and proper waste disposal practices.

#### Rapid response

COVID-19 Rapid Response Team (RRT) was in place. The team comprised nine health experts. It was led by a trained Public Health Emergency (PHEM) Officer. It collects and investigates rumors; assesses corona virus sign and symptoms; defines cases; identifies suspects; traces contact and lists them; advises self-quarantine or refers to an isolation center.

The activities were affected by lack of PPEs, equipment and services. Only one ambulance was giving transport service for all health-related tasks. It transported RRT members, referred non-Covid-19 patients, specimens and medical supplies.

#### Surveillance

Covid-19 surveillance had been conducted in Woreta. During the home-to-home visit, the health workers were measuring resident's body temperature and asking them if they had any Acute Respiratory Infection (ARI) or experienced its symptoms such fever and cough.

"Extension workers come and measure body temperature and ask if there is a recent cough or fever". A resident in kebele 04

The RRT leader stated that, prior assessment and screening was conducted in two rounds from May to June 2020. In the third round, Community Based Surveillance (CBS) was done starting from 11 August 2020. The CBS was part of a national

program simultaneously implemented throughout the country for one month. It was intended to boost COVID-19 test and public engagement in reporting events having public health significance.



A photo showing health workers conducting home-to-home temperature checkup as part of the community-based surveillance campaign (September 2020, Woreta).

Case finding, definition, and rapid reporting of new cases was done. Self-quarantine was also advised. As of 18 September, there were 45 people in the town who entered in to self-quarantine after their contacts were tested positive. The health care workers were giving support to those people in self-quarantine.

“When one case was confirmed positive in a hotel, all workers in that hotel enter in to self-quarantine in a separate room within the hotel”. A PHEM officer.

Three concerns were raised in relation to surveillance. First, it was not supported by vigorous rumor collection. Second, surveillance data was not admitted to epidemiological analysis and projection. Third, persons identified for probable cases were allowed to give samples after a delayed period of time due to lack of kits. To the contrary, some of them hide themselves when they were wanted for giving specimen.

Samples were selectively taken. Regular sites of sample collection included; the bus station, the dry port, the food reserve station and special forces' camp. Recently, sample collection was expanded to hotels, and banks. Sometimes, suspects identified during home visit campaign hide themselves. The specimen collection was interrupted many times due to lack of kits. When kits were available, up to 80 samples were daily collected within the town. According to the RRT representative, the total number of tests within the CBS month (from mid-August up to early September) was 1200 and total caseload was nine until 18 September 2020.

Surveillance and laboratory activities were accompanied by continuous contact tracing tasks.

“Starting from day one (June 16/2020), when the first infected person was identified in the bus station, contact tracing has been made. A total of 46 close contacts were identified from the first case and two close relatives of that individual were tested positive.” A PHEM Officer.

### Laboratory

COVID-19 diagnostic services were not started in the study area because the laboratory in Woreta had no necessary kits. In collaboration with higher level structures, specimens had been collected and referred to Bahirdar city for molecular laboratory test. According to an interviewee, the results were told to the people within two or three days. Based on the test result, people are referred to isolation centers after their contacts were traced.

### Infection prevention and control

Infection prevention and control focal person of Woreta health center monitors the activities within the center. It was often challenged by shortage of disinfectants and quality PPE. Scheduled health education was given in waiting areas. The researcher had observed the schedules posted within the center's compound.

Preventive tasks such as customer sequencing, environmental cleaning and waste disposal were done. All patients and care givers were required to wear face mask and to have temperature checkup at the entrance. They were also advised to wash hands.

The practice of health professionals in frequently washing hands, cleaning utensils, re-using masks and physical distancing was helpful for infection prevention. But health extension workers were exclusively challenged in terms of practicing physical distancing. Unlike other health professionals, their work environment was risky in two ways; when they were in health posts, they were confined in a narrow class, when they were in home visit, they got difficulty of accessing PPE. Health extension workers stated that they did not receive a face mask except when there was a time bounded campaign. One of them said that “I fear to visit households without having appropriate PPE”.



Therefore, they were using their own personal networks to get PPEs. It could be said that they were especially in dangerous condition compared to other health professionals. To the worst, they faced stigmatizing tags.

“Sadly, some people tag us ‘corona’ as if we have brought it to them”. A health extension worker in kebele 01

This stigma emanated from lack of awareness and should be corrected through effective health communication.

#### *Case management and continuity of essential services*

Woreta Health Center only had a waiting room for COVID-19 suspects. Monitoring and management of symptomatic or asymptomatic cases was done after they were referred to isolation centers out of Woreta town. Most of the infected persons that were referred to Debre Tabor were found to be asymptomatic, some others manifested mild symptoms.

#### *Logistics, procurement and supply management*

Due to lack of budget and weak supply chain, the provision of medical equipment was short and irregular. For instance, there was a low stockpile of hand hygiene materials (alcohol and sanitizer). There was no supply of medical masks and full protective gowns as well as materials to furnish quarantines and isolation centers. There was no consistent supply of laboratory kits from upper government organs. Therefore, the RRT got difficulty to collect COVID-19 samples.

To reduce the problem, the health center had sought donations using its own network and secured some number of masks. In addition, it purchased locally made, re-usable, non-medical masks. The Mayor also used its own network to attract donations. Accordingly, the World Bank Branch Office had provided 400 face masks. Another organization called Che-Shire, had supported masks, sanitizers, and food items. But all these measures did not avoid the problem because the supply was not adequate and continuous.

#### *Social interventions*

##### *Humanitarian assistance*

**COVID-19** emergency response involves preventing socioeconomic consequences of the crisis on the poor and vulnerable groups. To this end, sharing meals, soaps/sanitizers, clothes and oil has been conducted. The participation of people is widely observed in social assistance contribution to the poor because of a favorable cooperative culture of residents. The Mayor Office raised 2.1 million birr (at that time it was approximately \$ 56,330), from the community for helping the poor.

“To assist the poorest people, we have collected money via teleton by instituting a 13-member committee, we have collected 2.1 million birrs, the zone had assisted us with 120 quintals of grain, we purchased maize and distributed food staffs on three rounds.” the mayor

On the other hand, food grains were provided from the zonal government and from economically better people in the town. The collected food staffs were distributed in three rounds after poorest households were identified. On its part, kebele 03 administrator said that “We have fairly distributed soap and grain for 124 poor people by selecting the poorest members in the kebele”. However, the poor were still raising a serious question of injustice and inadequacy in some kebeles. For instance, in Kebele 02, a poor man complained that “Only 25 kg grain and one liter of food oil was allotted to each of us, no more did I receive”,

##### *Market regulation*

Humanitarian assistance was not the only alternative of saving the poor. Instead, market regulation measures were correspondingly taken to check hikes on the price of basic food grains. But it was not continuous and effective because merchants hoard the grain and illegally transported it to other cities in search of better prices. So, the inflation was aggravated.

“The market is scaring us, everything is overpriced, they closed illegal business centers for some days, but they reopened them. Food grains are expensive, for instance teff costs 4250 birr per quintal”, a resident in kebele 03

According to interviews, the market control measures were exposed for corruption. Some merchants who violated price quotas were punished and their business was temporarily closed. But they were shortly allowed to restart their usual business in a “corrupt way”. This all shows the poor were still exposed for socioeconomic detriments of COVID-19.

##### *Weakened control and retreated implementation*

##### *Weakened control*

In order to enforce physical distancing and stay at home principles, measures were taken in March 2020; inter-city cars were banned, flour mills were closed and marketers were forcefully dispersed by a civil police force which was locally called “denb askebari”. Because these areas were places of concentration for people. Before the ban, a short warning was announced from the Mayor that shocked dwellers because the time limit was very brief to get prepared. People had to purchase and prepare basic food items within the given span of time.

Unfortunately, this measure failed and reversed quickly as it was not well planned, and coordinated. The decision to cancel the measure came from higher level government which allowed inter-city transportation. This shows a gap in inter-jurisdictional cooperation between the town's administration and the upper government structures. The move damaged the motive of the local administration in enforcing COVID-19 prevention measures in its boundary. From that time onwards, there was a decreasing enforcement of preventive rules. This entails the need for vertical consensus between the town's task force and upper zonal bodies.

Covering mouth and nose -when having a cough or a sneeze -was a common respiratory etiquette embedded in the culture. In addition, frequent hand washing was mostly observed. Avoidance of hand shaking as a way of greeting was also adopted by community members. Yet, other precautions of infection prevention were not followed.

The COVID-19 emergency rules were enforced up on schools, night clubs, pool houses, groceries, khat and shisha houses that were closed in March 2020. Shops, cafeterias, restaurants, hotels and local drink centers were ordered to apply physical distancing. At the time of closure, many owners of service giving businesses had covertly continued work while others who completely shut up their service center had formally complained to the government. To solve the problem, the government made tax deduction. Later on, all of them restarted working freely. khat houses, pool houses and night clubs were re-opened. This indicates a declined control.

Although it was weak, some form of control was existing on transport sector. But at the time of writing this paper no more control was observed in the sector. The weakened traffic control - added to non-compliance of passengers and drivers to the traffic rules - had often produced a confined public transportation. Drivers aboard more people than what was allowed. Especially, those drivers which transport laborers in to the nearby Fogera rice farms carry more workers at a time in a suffocated and crowded manner. This daily practice could allow transmission of the disease.

In referring to early March, a Police offer said that;

"We have attempted to disperse the laborers from the area of assembly in Wof Amsa and around mezegaja area as well as from their temporary rented shelters called "medeb bet. We had deployed police force on places where merdo (collective mourning) was taking place. We also aware idir(funeral association) leaders not to conduct mass funerals."

But at the time of data collection (September 2020), the laborers reassembled and continued to flock. The researcher observed the site and found people concentrated in a risky manner. At that time, no control also imposed on business/marketing, religious, entertainment, and social gatherings (funeral, wedding etc.). It was common to see confined markets, religious ceremonies as well as weddings that were performed in mass. One could easily encounter multiple weddings on every Sunday.

Just as the enforcement was not even in different forms of gatherings and venues, it was also uneven among various governmental institutions. Interviewees repeatedly mentioned that the health center, the telecom, the electric power supply office, banks and the police station were checking whether their respective customers were applying preventive activities.

"The government itself do not practice social distance. Authorities do not stop gatherings. We also often do not practice it. I personally wash hands but we have shortage of water, we get pipe water once or twice a week-we have only God's water, I use face mask, I do not remain at home because I have to work, I partially stopped hand shaking, culturally, you are not expected to cover mouth when you are sneezing or coughing." an interviewee from kebele 04

Other offices only stretched non-durable hand washing system most of which were not functional in September 2020 .

#### *Retreated implementation*

The shock during the early phase of Covid-19 and associated district wise measures had temporarily raised the people's concern about the pandemic. However, it did not bring a positive behavioral change on residents in the subsequent times. Majority of them did not stay at home and keep physical distance afterwards. Nor do they apply other preventive measures such as use of alcohol/sanitizer and wearing masks. They rather participated in huge gatherings and ceremonies.

"Social gathering is not canceled, even though I care for myself, it does not bring fruit unless others are doing the same. I do not dare to remain isolated alone"

The dweller's current practice of public health and social measures was low and incomplete due to different reasons such as weakened control, denial, suspect, politicization, resilient social and communal life as well as reduced fear towards the disease.

#### **Discussion**

Ethiopia follows "whole-of-government-whole-of-society" approach to COVID-19 infection prevention and response [15]. While following a top-down strategy, simultaneously, it allowed individuals, communities and civil societies to play a role. It has organized a COVID-19 prevention and control task force from the federal up to the grassroots level. This is comparable to Belgium's public health emergency preparedness and response that has a "federal-region-municipal" structure and helped the country to achieve cooperation among stakeholders (He, 2020).

By declaring a state of emergency, Ethiopia did well in improving its preparedness and response capacity within a short period of time. The purpose of this study was to assess the preparedness and response in Woreta town. It looks in to governmental and community activities to contain the disease and avert its multi-dimensional effects.

An observation of COVID-19 response experience of different countries entails two approaches followed in dealing with the disease. The first one was early imposition of strict social measures which are then eased gradually. The other one was putting in place an adaptive or evolving measure. For instance, Belgium implemented a phased plan in the process of setting up and lifting the lockdown (He, 2020). To the reverse, China had early applied large-scale lockdown in Wuhan. It also used other successful measures including quick research on the novel coronavirus; rigorous contact tracing and isolation; timely construction of medical facilities; isolation and treatment of patients; organized arrangement of special goods; and deployment of medical teams [19].

Ethiopia followed an adaptive strategy that belonged to the first category. Instead of early imposition of lockdowns or curfews, it implemented alternative containment measures. Movement restrictions were exclusively imposed only in some areas including Woreta at the initial time. Community-based surveillance (CBS) and selective testing were also done. CBS was a strategy ingrained in country's Public Health Emergency System which is designed to detect early and respond to epidemics/other public health emergencies [2].

In the study area, an expanded testing and quarantine services was constrained by the existing poor health system which grapples with few and under-equipped facilities. There were no functional quarantine and isolation centers with adequate and furnished beds. These unfavorable conditions pushed dwellers to self-quarantine.

The country wide limited capacity forced to have a selective testing of persons with severe acute respiratory infection and workers in risky areas/venues. According to Lanyero et al. [22], the first positive case was reported on 13 March but preparations were made earlier in January and February.

The support of WHO enabled the country to facilitate testing. Samples were initially transported for testing to the National Institute for Communicable Diseases (NICD) Laboratory in South Africa, a WHO regional reference laboratory. With support from WHO and the Africa Centers for Disease Control and Prevention, EPHI set up the National Influenza and Arboviruses Reference Laboratory (NIAR) as the first COVID-19 testing laboratory in the country by 7 February 2020. Before getting its own laboratory, the collected samples were sent to South Africa for diagnosis (Lanyero, 2021).

Within seven months, the number of validated laboratories in the country became 54 [15]. In 2021, the number further increased to 72 with a daily testing capacity of 13,944 cases [25]. The validation for laboratories has been performed and provided by EPHI [24].

However, the number of laboratories with bio-safety class II facilities are very limited in the country. Besides, most hospitals and diagnostic centers are not equipped well to handle the massive inflow of samples [25].

At the current pandemic situation, the Ethiopian health system is tracked in to three: Track one with health facilities providing a full range of services only for COVID-19 patients; Track two with health facilities providing COVID-19 as well as routine care services as they have greater infrastructure and capacity; and Track three with health facilities continuing to deliver only routine care services [24].

Many local level facilities were categorized under the third track due to their limited capacity and infrastructure. The existing health facilities were not equipped to properly and extensively deliver much of COVID-19 related services. Services such as surveillance, case management, screening, IPC, rapid response, risk communication and laboratory test require a developed health system which was missing in the area. Due to this laboratory test and case management are not conducted in Woreta since there was no advanced facility having diagnostic laboratory kits and isolation units.

The health system was identified by an overall shortage of facilities and essential workforce (particularly nurses and midwives). Ethiopia has a very low health care work force (Medical Doctors, Health Officers, Nurses and Midwives) density of about 0.96/1000 population, which is five times less than the minimum threshold of 4.45/1000 population set by the World Health Organization [6]. Likewise, the dearth of equipment and supplies is magnified. There are only 557 mechanical ventilators and 570 intensive care unit (ICU) beds for a population of 110 million [29].

The problem was more pronounced in the study area. Since no meaningful task was done in health care expansion, the highest facility available was a health center that serves nearly 50,000 residents without adequate health professionals and sleeping beds even if every health center was expected to serve 15,000–25,000 people [3]. This was extremely opposite to China's Wuhan city that built two new specialty field hospitals in 9–12 days [23].

The shortage of equipment and supplies was partly attributed to logistics and supply chain. Covid-19 has disrupted the global supply chain. It created difficulty for purchasing and transporting basic preventive equipment and supplies. A study conducted in Ecuador by Torres et al. [31] showed how the disruption of global transportation diminished imports of laboratory equipment leading to shortage of reagents, RNA extraction kits and swabs.

In Ethiopia, almost all consumables for diagnosis and the test kit itself depend on the international market under national import permit and regulations. To get minor but vital items in the local market is difficult. As a result, the Ethiopian Food and Drug Authority (EFDA) and other agencies are practicing substantially fast-tracked approval process of COVID-19 related products, yet each process of procurement should pass through the existing legal procedures (getting hard currency, shipment, certification, EFDA registration and customs clearance) which take longer than one's expectation [25].

In order to alter the situation, the country created local suppliers by establishing a factory that produces kits at home. It also allowed universities to produce sanitizers and repurposed industrial parks to manufacture PPEs. Furthermore, it sought material donations from other countries such as USA, China and UAE.

Good preparedness and response to COVID-19 in a community can be achieved when the taskforce, a body which was responsible to lead Covid-19 prevention and control, has plan and internal coordination. However, the task force in study area lacked partnership, plan and budget which resulted in weak enforcement of preventive measures. It had initially taken unplanned measures that shocked the whole community. Later, it failed and the enforcement also declined.

According to Bacha [5], the task force coordination challenge was huge at the local government and village administration levels. A study in Bangladesh found that the role of committees at local level is limited to the implementation of the plan devised at central level [7].

In Ethiopia, the National Covid-19 Guideline and the Emergency Proclamation were supposed to create a uniform system of dealing with the disease in all regions, zones, districts and cities. Covid-19 precautionary measures were detailed in the national guideline and emergency law. The emergency law consisted both prohibitions and obligations.

The prohibitions included the following: meetings for religious, government, social or political purposes, hand shaking, visiting any detainee in prisons, serving alcohol or recreational services at night clubs and bars, operating establishments that serve shisha and khat, providing entertainment services at cinemas, theatres, carrying greater than 50% passengers for inter-city transport service providers, providing services to more than three patrons in hotels, restaurants and cafes, conducting classes face to face in schools or educational institution, providing play game facilities where two or more persons participate, engaging in sport competitions or any group sport activities, disseminating any information about covid-19 that causes terror among public [8].

It also put the following obligations: distancing at least two adult strides away from any other person in banks, market places, transport stations, shops and pharmacies; providing sanitary materials for customers in service giving institutions; arranging safe working condition for employees, selling products and services at reasonable price [8].

Although the proclamation was partially implemented in Woreta, its expiry in early September after five-month had created a legal vacuum and turn of attention away from the rules. In contrast to this, countries like Belgium, have repeatedly updated their emergency decrees several times and extended the time of their applicability not create a legal vacuum [18].

The legal vacuum might have a triggering impact in decreasing people's compliance to the precautionary measures as majority of the community members did not regularly wear masks, stay at home, keep physical distance, sanitize hands and instruments. They participated in huge social gatherings, religious ceremonies, labor markets and local drink houses in a confined manner. In a similar fashion, a study in Bangladesh identified community noncompliance to social gathering and home quarantine guidelines as a bottleneck for preparedness [7].

The declined control of the police further let people engage in physical contact. A community physical togetherness without appropriate care was challenging COVID-19 fighting endeavors. So, more has to be done on social distancing by taking the south Korean model where Government's well-planned guidelines and its proactive measures played a significant role in achieving good social distancing and hygiene practices by the public. The government educated the public about the emerging virus and good prevention practices, which fostered an environment for citizens to know and follow the guidance provided from their public health authorities [33].

Likewise, the expansion of rumors was an obstacle. Although the Federal Ministry of Health [15] revealed that 78% of the total cases in Ethiopia are asymptomatic, groundless rumors are equating asymptomatic Covid-19 cases to a non-infection situation. This has led some people to deny its very existence. In a similar fashion, many of Sudanese do not believe that the virus exists and that it had spread in Sudan [11].

Health workers were exceptionally better in practice of preventive measures. Even if they were grappling with shortage of safety materials and stigmatizing tags, they frequently washed hands, cleaned utensils, re-used masks and kept physical distance. Consistent to this, a study conducted by Asemahagn [4], found that 247(62%) health workers in Amhara region had good prevention practices towards COVID-19. The majority, 326(82%) and 318(80%) health workers regularly practice hand-washing or alcohol-based sanitizer and wearing facemasks, respectively. Similarly, 271(68%) health workers frequently cover their mouth and nose while sneezing and 231(58%) of them disposed of the covering materials. and retreat in their implementation of safety measures. Compared to the situation in Jammu and Kashmir provinces of Pakistan, it is the people's practice is low.

Likewise, Khan et al. [20], stated that except three percent of the respondents, all others health care workers in Jammu and Kashmir were observed to follow the protocols for personal protection to a greater extent where 61% of the respondents were actually using recommended PPEs for COVID-19 while another 36% were maintaining a considerable level of personal protection by using gloves, masks and practicing social distancing while working in designated COVID-19 facilities.

## Conclusion

Before and after the first Corona case was confirmed on June 16,2020, certain preparatory and response measures were taken in Woreta. These include, the establishment of a task force and other supportive technical and enforcement agents. The established bodies have taken measures in early March to enforce stay at home and physical distance by restricting movement, closing various institutions and markets. But the measures failed and reversed since they were not well planned and coordinated. Other preparatory and response measures including the existence of a rapid response team, the safety practice of health workers, the conduct of sample collection activity as well as surveillance and social assistance campaigns were relatively good beginnings in Woreta. But weak and declining enforcement, loose coordination, discontinuous risk communication, politicization, unsupportive logistic and supply chain were weaknesses.

The low preventive practice of residents manifested by non-compliance to public health and social measures was another weakness. In addition, underequipped health system identified by absence of COVID-19 diagnostic laboratory, functional quarantine and isolation centers, shortage of nurses, basic supplies, and PPEs was a gap that marked low preparedness in the health setting. So, there should be a political commitment and coordinated engagement of all stakeholders grass roots level.

Although this study was conducted prior to the development of anti-Covid-19 vaccines, the pandemic's infliction upon residents is not culminated with the development such treatment. So, more task needs to be done for an effective response. In this regard, the study is expected to have a twofold importance: first, it will assist the local government to evaluate its covid-19 readiness and fill the operational and resources gaps. Second, it will help the health workers to design a local strategy for community engagement and bringing behavioral change.

### Declaration of Competing Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Acknowledgement

The researcher is indebted to Mr. Nejmu Biza ,Mr.Aragaw Tesfaw, to the Mayor of Woreta town and to all study participants.

### Appendix

#### *Preparedness and response to COVID-19 in Woreta: Northwest Ethiopia, study Information & Consent Form*

Thank you for your interest in this study which focus on preparedness and response to COVID-19 in Woreta town. This research is conducted by Abdelah Alifnur,<sup>1</sup> a lecturer in Debre Tabor University, Department of Sociology.

**Table 2**  
Sex and occupation of participants.

Occupational No	Sex	Occupation	
	M	Mayor, District Task Force leader	Covid-19 Emergency Task Force members
	F	Health Office head, District Task Force	
	M	Transport officer -District Task Force	
	M	Community Policing officer/ acting vice headof Police Office -District Task Force	
	M	Women Affairs officer-District Task force	
	M	Acting 01 kebele administrator, Kebele task force	Health Workers
	M	03 kebele administrator, kebele task force leader	
	M	Health Center Head	
	F	Health Extension worker (kebele 01)	
	F	Health Extension worker (Kebele 03)	
	F	Health Extension worker (Kebele 04)	
	F	PHEM officer, team leader	
	M	Health officer (HO), IPC Focal	
	F	Working in grocery (Kebele 03)	
	F	Working in beauty salon (Kebele 02)	
	M	Docker (kebele 03)	
	M	High school teacher, community representative (kebele 04)	
	M	Small shop owner and religious leader (Kebele 03)	
	F	Petty trader in local market (kebele 02)	
	M	Employed in gas station (kebele 02)	
	M	Hotel owner (kebele 03)	
	F	Local drink seller (kebele 02)	
	M	Car attendant (Kebele 02)	
	M	Flour mill Owner (kebele 01)	
	M	Weaver (kebele 02)	
	M	Security guard in a private bank (kebele 01)	
	M	Demobilized soldier camped in Woreta Agricultural College (kebele 01)	
	F	Small shop owner (kebele 01)	
	M	Daily labor/wage worker (kebele 01)	
	F	Wage Worker (kebele 04)	

<sup>1</sup> Email-abdelahalifnur@gmail.com

The purpose of this study is to suggest actions that promote the preparedness and response capacity of community by identifying the challenges in the context of Woreta. You are welcome to the interview that will take approximately 40–50 min to complete.

Your decision to participate in this study is completely voluntary and you have the right to end your participation at any time. You may also skip any questions you do not wish to answer. Your participation in this research will be completely confidential with no use of identifiers.

I agree to these terms:

I have read and understand the above consent form

\_\_\_ Yes

### *Interview Guide*

#### *Part I: Questions for Residents of Woreta*

1 Have you any information about COVID-19?

2 Are you currently protecting yourself from COVID-19?

Probe: If so, what are you doing at home in order to be protected from corona virus? what safety measures are you applying when you are in public places?

Generally, what preventive measures are you usually applying in your everyday life?

3 What sort of public health directives, or advices have you obtained so far from health workers or from covid-19 task force in relation to COVID-19?

Probe: Mask wearing, physical distancing, hand washing?

4 Do you think the health facilities in Woreta are prepared for the pandemic?

Probe: quarantine rooms, work force, supplies, ambulance

5 Do you think the town administration is working good in preventing and containing the virus? Probe: Closure of private/public organizations?

Provisions of necessary supplies?

Humanitarian activities to support the poor?

Market control measures?

6 Do you think the community members are actively engaging to tackle the spread of COVID-19? Probe: the socio-cultural factors that affect community engagement.

7 What are the problems that limit preventive activities in this area? Probe: socio-cultural influences.

8 What shall be done to better control the spread of covid-19 in the town?

#### *Part II: Interview Questions for Covid-19 Task Force in Woreta*

1 Is Covid-19 task force currently functional in Woreta?

Probe: From which sectors it is organized?

Does it have pandemic response plan?

Does it have regular meeting and evaluation?

What looks like the partnership among the covid-19 taskforce members?

2 What intervention measures are being taken regarding Covid-19?

Probe: What are the activities of covid-19 task force in enforcing public health measures in the town?

What looks like the application of Covid-19 prevention measures in the town particularly in risky areas such as markets, bus station, religious centers?

Is there continuity /persistence in the enforcement of those measures?

3 What were the outcomes of the intervention?

Probe: Is there a community engagement/compliance?

Are there observed positive behavioral changes on the people?

4 What is the availability of resources and infrastructure for pandemic response?

Probe: Are there quarantine and isolation centers?

Is there an easy access of necessary personal protective equipment in the town?

Provision of enough water, ambulance service?

5 What measures are taken to reduce the socioeconomic effects of covid-19 particularly on the poorest sections of the community?

6 What challenges are facing you in COVID-19 response? Probe: the logistics, procurement and supply management?

7 What are the solutions?

**Part Three: Questions for Health Workers**

- 1 Are there rapid response teams organized to prevent and respond Covid-19 at health center?
- 2 What is the partnership between each team and Covid-19 task force in the town?
- 3 As a health worker, are you practicing COVID-19 preventive measures?
- 4 What response activities are you conducting regarding covid-19?

Probe: Covid-19 related campaigns; surveillance, contact tracing; sample collection and laboratory; COVID-19 test; infection prevention and control; risk communication?

- 5 What looks like the fulfillment of resources and infrastructures?

Probe: Availability of adequate number of health workers, PPE, water, soap, alcohol, disinfectants, lab kits, means of transportation, quarantine rooms, guidelines and training, safe working environment?

- 6 Is there a referral linkage between health facilities in Woreta with those facilities in other cities?
- 7 Generally, how can you express the level of preparedness and response at Woreta Health Center?
- 8 What problems are facing the covid-19 prevention activity in Woreta?

Probe: access to protective equipment? spread of rumors, denial? the socio-cultural factors that affect people's compliance to safety rules?

**Funding**

This research did not receive any special grant from funding agencies in the public, commercial, or not-for-profit sectors.

**References**

- [1] C.D.C. Africa, *Africa Joint Continental Strategy for Covid-19 Outbreak*, Addis Ababa, Ethiopia, 2020 5 March 2020.
- [2] T. Alemu, H. Gutema, S. Legesse, T. Nigussie, Y. Yenew, K. Gashe, Evaluation of public health surveillance system performance in Dangila district, Northwest Ethiopia: a concurrent embedded mixed quantitative/qualitative facility-based cross-sectional study, *BMC Public Health* 19 (2019) 1343, doi:10.1186/s12889-019-7724-y.
- [3] M. Argaw, B. Desta, T. Bele, A. Ayne, Improved performance of district health systems through implementing health center clinical and administrative standards in the Amhara Region of Ethiopia, *BMC Health Serv. Res.* 19 (127) (2019), doi:10.1186/s12913-019-3939-y.
- [4] M. Asemahagn, Factors determining the knowledge and prevention practice of healthcare workers towards COVID-19 in Amhara Region, Ethiopia: a cross-sectional survey, *Trop. Med Health* 48 (72) (2020) Retrieved from, doi:10.1186/s41182-020-00254-3.
- [5] K. Bacha, The COVID-19 Pandemic and the Ethiopian Public Administration: Responses and Challenges, 2020 Retrieved from <https://www.researchgate.net/publication/340827994>.
- [6] A. Birhanu, Y. Meseret, D. Pandey, Challenges and opportunities to tackle COVID-19 Spread in Ethiopia, *J. Peer Sci.* 2 (2) (2020), doi:10.5281/zenodo.3756676.
- [7] K. Biswas, S. Huq, A. Afiaz, A systematic assessment on COVID-19 preparedness and transition strategy in Bangladesh, *J. Eval. Clin. Pract.* 26 (2020) 1599–1611.
- [8] Council of Ministers State of Emergency Proclamation No. 3/2020 Implementation Regulation No. 466/2020, Addis Ababa, 2020 Federal Negarit Gazette of the Federal Democratic Republic of Ethiopia No.20, Retrieved from Ethiopia. [www.moh.gov.et/default>files](http://www.moh.gov.et/default>files).
- [9] CSA Statistical Tables for the 2007 Population and Housing Census of Ethiopia, 2007 Addis Ababa, Ethiopia.
- [10] Nk Denzin, Ys Lincoln, *The Sage Handbook of Qualitative Research*, Sage Publications, Thousand oaks, 2005.
- [11] Y. Elhadi, Y. Adebisi, K. Hassan, S. Mohammed, X. Lin, D. Lucero-Priso, The formidable task of fighting COVID-19 in Sudan, *Pan Afr Med J* 35 (2) (2020) 137 Retrieved from [www.panafrican-med-journal.com](http://www.panafrican-med-journal.com)>full. Accessed 25 October, 2020.
- [12] EPHI and FMOH, Multi-sectoral Preparedness and Response Plan Covid-19 Scenario 3, Addis Ababa, Ethiopia, 2020 April 2020.
- [13] EPHI and FMOH Covid-19 Pandemic Preparedness and Response in Ethiopia (Bulletin No. 6), Addis Ababa, Ethiopia, 2020 8 June 2020 Retrieved from <https://www.ephi.gov.et>. Accessed 12 September 2020.
- [14] FDRE Policy Studies Institute COVID-19 Prevention Measures in Ethiopia: Current Realities and Prospects, Strategy support Program, MOH Working Paper 142, Addis Ababa, Ethiopia, 2020.
- [15] FMOH Press Release, Covid-19 Response and Future Measures Report and Proposal September 18), 2020 Retrieved from [www.moh.gov.et](http://www.moh.gov.et). Accessed 24 September.
- [16] C. Furber, Framework analysis: a method for analyzing qualitative data, *Afr. J. Midwif. Women's Health* 4 (2) (2010).
- [17] R. Guner, I. Hasanoglu, F. Aktas, Covid-19 prevention and control measures in community, *Turk J Med Sci* 50 (2020) 571–577.
- [18] R. He, J. Zhang, Y. Mao, O. Degomme, W. Zhang, Preparedness and responses faced during the COVID-19 Pandemic in Belgium: an observational study and using the national open data, *Int. J. Environ. Res. Public Health* 17 (2020) 7985 [www.mdpi.com/journal/ijerph](http://www.mdpi.com/journal/ijerph), doi:10.3390/ijerph17217985.
- [19] M. Hou, K. Ma, A. Quan, S. Talaat, E. Yan, T. Grimmer, *The Kreab China Report on Covid-19: Impacts, Challenges and Opportunities*, 2020 Kreab Beijing April 3, 2020. Retrieved from, <https://www.kreab.com>.
- [20] F. Khan, M. Mahmood, N. Hasret, B. Javed, Perception, preparedness and response of health care personals towards COVID-19 pandemic in Azad Jammu & Kashmir, Pakistan: a cross sectional interview-based study, *Clin Epidemiol Glob Health* 11 (2021) 100783.
- [21] Y. Kitaw, M. Kaba, A century after Yehedar Besheta (The Spanish Flu in Ethiopia): are we prepared for the next pandemic? *Ethiop. J. Health Dev* 32 (1) (2018) Retrieved from <https://www.ejhd.org/article/view>. Accessed on 28 August 2020.
- [22] B. Lanyero, Z.A. Edea, E.O. Musa, et al., Readiness and early response to COVID-19: achievements, challenges and lessons learnt in Ethiopia, *BMJ Glob. Health* 6 (2021) e005581, doi:10.1136/bmjgh-2021-005581.
- [23] H. Luo, J. Liu, C. Li, K. Chen, M. Zhang, Ultra-rapid delivery of specialty field hospitals to combat COVID-19: lessons learned from the leishnshan hospital project in Wuhan, *Autom Constr.* 119 (2020) 103345 available at [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)>PMC7334964, doi:10.1016/j.autcon.2020.103345.
- [24] H. Mohammed, L. Oljira, K. Roba, G. Yimer, A. Fekadu, T. Manyazewal, Containment of COVID-19 in Ethiopia and implications for tuberculosis care and research, *Infect. Dis. Poverty* 9 (2020) 13.
- [25] A. Mulu, A. Bekele, A. Abdissa, T. Tolera, M. Habtamu, A. Mihret, D. Hailu, G. Tesfaye, A. Genetu, The challenges of COVID-19 testing in Africa: the Ethiopian experience, *Pan Afr. Med. Jo.* (6) (2021) 38 [doi:10.11604/pamj.2021.38.6.26902].
- [26] C. Nelson, N. Lurie, J. Wasserman, S. Zakowski, Conceptualizing and defining public health emergency preparedness, *Am. J. Public Health* 97 (Suppl 1) (2007) S9–S11 Retrieved from [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)>PMC1854988. Doi:10.2105/AJPH.2007.114496.
- [27] PMO (Prime Minister Office) Press release, 20 March 2020, 2020 Retrieved from [et.usembassy.gov](http://et.usembassy.gov)>News & Events Accessed 26 August 2020.

- [29] Z. Shigute, A. Derseh, G. Alemu, A. Bedi, Containing the Spread of COVID-19 in Ethiopia, *J. Glob. Health* 10 (1) (2020) 1–4 Accessed on 21 September 2020.
- [30] A. Srivastava, S.B. Thomson, Framework analysis: a qualitative methodology for applied policy research, *JOAAG* 4 (2) (2009).
- [31] I. Torres, R. Sippy, F. Sacoto, Assessing critical gaps in COVID\_19 gaps in testing capacity: the case of delayed results in Ecuador, *BMC Public Health* 21 (637) (2021).
- [32] WHO. *Novel Coronavirus (2019-nCov): Strategic and Response Plan.3 February 2020, 2020* Retrieved from [www.who.int/docs>coronaviruse](http://www.who.int/docs/default-source/coronaviruse). Accessed 4 September 2020.
- [33] K. Yoo, S. Kwon, Y. Choi, D. Bishai, Systematic assessment of South Korea's capabilities to control COVID-19, *Health Policy* 125 (2021) 568–576.